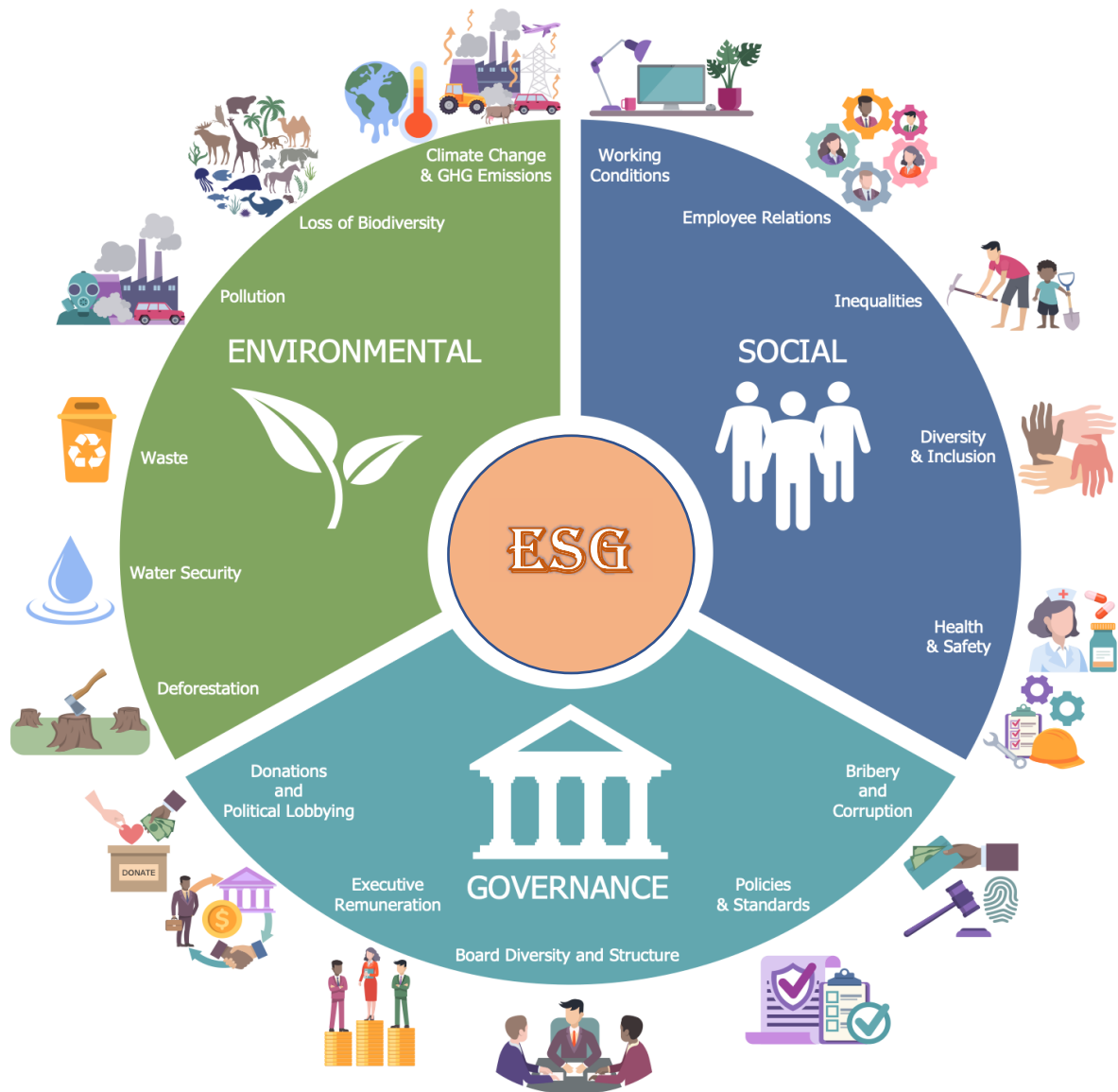




# INDOSOL SOLAR ESG REPORT

**FY 24-25**

*Released On  
26<sup>th</sup> November 2025*

*Report by  
ESG Department*

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## ABBREVIATIONS

| <i>Abbreviations</i> |                                                                     |              |                                                   |
|----------------------|---------------------------------------------------------------------|--------------|---------------------------------------------------|
| <i>AC</i>            | Air Conditioning                                                    | <i>CSRD</i>  | Corporate Sustainability Reporting Directive      |
| <i>ACT</i>           | Assessing low Carbon Transition                                     | <i>CVM</i>   | Brazilian Securities and Exchange Commission      |
| <i>ANSI</i>          | American National Standards Institute                               | <i>DEFRA</i> | Department for Environment Food and Rural Affairs |
| <i>AP</i>            | Andhra Pradesh                                                      | <i>DG</i>    | Diesel Generator                                  |
| <i>AR</i>            | Assessment Report                                                   | <i>DJSI</i>  | Dow Jones Sustainability Indexes                  |
| <i>BRSR</i>          | Business Responsibility and Sustainability Report                   | <i>e.g.,</i> | Example                                           |
| <i>C</i>             | Category                                                            | <i>EF</i>    | Emission Factors                                  |
| <i>CBAM</i>          | Carbon Border Adjustment Mechanism                                  | <i>EHS</i>   | Environment, Health, and Safety                   |
| <i>CCA</i>           | Climate Change Agreement                                            | <i>EI</i>    | Emission Intensity                                |
| <i>CCL</i>           | Climate Change Levy                                                 | <i>ELV</i>   | Emissions Limit Values                            |
| <i>CDP</i>           | Carbon Disclosure Project                                           | <i>EPA</i>   | Environmental Protection Agency                   |
| <i>CFD</i>           | Climate-related Financial Disclosure                                | <i>EPEAT</i> | Electronic Product Environmental Assessment Tool  |
| <i>CH4</i>           | Methane                                                             | <i>EPR</i>   | Environmental Permitting Regulations              |
| <i>CII</i>           | Confederation of Indian Industry                                    | <i>ESG</i>   | Environmental Social Governance                   |
| <i>CNG</i>           | Compressed natural gas                                              | <i>ESOS</i>  | Energy Savings Opportunity Scheme                 |
| <i>CO2</i>           | Carbon Dioxide                                                      | <i>ETS</i>   | Emissions Trading Scheme                          |
| <i>CO2-FFI</i>       | Carbon dioxide from Fossil Fuel combustion and Industrial processes | <i>EU</i>    | European Union                                    |
| <i>CO2-LULUCF</i>    | Carbon dioxide and Land Use, Land-Use Change, and Forestry          | <i>EV</i>    | Electric Vehicle                                  |
| <i>COP</i>           | Coefficient of Performance                                          | <i>FO</i>    | Furnace Oil                                       |
| <i>COP</i>           | Conference of the Parties                                           | <i>FRFI</i>  | Federally Regulated Financial Institutions        |
| <i>CRC</i>           | Carbon Reduction Commitment                                         | <i>FY</i>    | Financial Year                                    |
| <i>CRD</i>           | Climate Related Disclosures                                         | <i>GHG</i>   | Green House Gas                                   |
| <i>CRGO</i>          | Cold Rolled Grain Oriented Steel                                    | <i>GRI</i>   | Global Reporting Initiative                       |
| <i>CSA</i>           | Corporate Sustainability Assessment                                 | <i>GWP</i>   | Global Warming Potential                          |
| <i>CSDDD</i>         | Corporate Sustainability Due Diligence Directive                    | <i>HDV</i>   | Heavy Duty Vehicle                                |
|                      |                                                                     | <i>HFC</i>   | Hydrofluorocarbon                                 |
|                      |                                                                     | <i>HSD</i>   | High Speed Diesel                                 |
|                      |                                                                     | <i>HVAC</i>  | Heating, Ventilation, and Air Conditioning        |

|                  |                                                |
|------------------|------------------------------------------------|
| <i>ICAO</i>      | International Civil Aviation Organization      |
| <i>IEC</i>       | International Electrotechnical Commission      |
| <i>IFRS</i>      | International Financial Reporting Standards    |
| <i>INDOTECH</i>  | Indo Tech Transformers Limited                 |
| <i>IPCC</i>      | Intergovernmental Panel on Climate Change      |
| <i>IPCC SR15</i> | IPCC Special Report on Global Warming of 1.5°C |
| <i>ISO</i>       | International Organization for Standardization |
| <i>ISPL</i>      | Indosol Solar Private Limited                  |
| <i>ISSB</i>      | International Sustainability Standards Board   |
| <i>kg</i>        | Kilogram                                       |
| <i>km</i>        | Kilometre                                      |
| <i>kVA</i>       | Kilo Volt Ampere                               |
| <i>L</i>         | litre                                          |
| <i>LCA</i>       | Life Cycle Assessments                         |
| <i>LDV</i>       | Light Duty Vehicle                             |
| <i>LED</i>       | Light-emitting diode                           |
| <i>LLP</i>       | Limited Liability Partnership                  |
| <i>LPG</i>       | Liquefied Petroleum Gas                        |
| <i>MCPD</i>      | Medium Combustion Plant Directive              |
| <i>MCR</i>       | Mandatory Carbon Reporting                     |
| <i>MDV</i>       | Medium Duty Vehicle                            |
| <i>MS</i>        | Mild Steel                                     |
| <i>MSCI</i>      | Morgan Stanley Capital International           |
| <i>MVA</i>       | Mega Volt Ampere                               |
| <i>MW</i>        | Megawatt                                       |
| <i>N/A</i>       | Not Applicable                                 |
| <i>N2O</i>       | Nitrous oxide                                  |
| <i>NF3</i>       | Nitrogen trifluoride                           |
| <i>NFRD</i>      | Non-Financial Reporting Directive              |

|                |                                                                       |
|----------------|-----------------------------------------------------------------------|
| <i>Nos</i>     | Numbers                                                               |
| <i>NSF</i>     | National Sanitation Foundation                                        |
| <i>NZD</i>     | New Zealand Dollar                                                    |
| <i>OHS</i>     | Occupational Health and Safety                                        |
| <i>OIP</i>     | Oil Impregnated Paper                                                 |
| <i>OLTC</i>    | On-Load Tap Changer                                                   |
| <i>PAS</i>     | Publicly Available Specification                                      |
| <i>Pax-km</i>  | passenger-kilometre                                                   |
| <i>PCR</i>     | Product Category Rules                                                |
| <i>PFC</i>     | Perfluorocarbon                                                       |
| <i>PPA</i>     | Power Purchase Agreement                                              |
| <i>ppb</i>     | Parts per billion                                                     |
| <i>ppm</i>     | Parts per million                                                     |
| <i>PRC</i>     | People's Republic of China                                            |
| <i>PSR</i>     | Product-Specific Rules                                                |
| <i>PV</i>      | Photovoltaic                                                          |
| <i>QI</i>      | Quality Infrastructure                                                |
| <i>RE</i>      | Renewable Energy                                                      |
| <i>REACH</i>   | Registration, Evaluation, Authorisation, and Restriction of Chemicals |
| <i>REC</i>     | Renewable Energy Certificates                                         |
| <i>RMB</i>     | Chinese yuan                                                          |
| <i>RoHS</i>    | Restriction of Hazardous Substances                                   |
| <i>RTCC</i>    | Remote Tap Changer Control                                            |
| <i>S&amp;P</i> | Standard & Poor's                                                     |
| <i>SAF</i>     | Sustainable Aviation Fuel                                             |
| <i>SAP</i>     | Systems Applications and Products in Data Processing                  |
| <i>SASB</i>    | Sustainability Accounting Standards Board                             |
| <i>SBTi</i>    | Science Based Targets initiative                                      |
| <i>SDG</i>     | Sustainable Development Goals                                         |

|                         |                                                     |
|-------------------------|-----------------------------------------------------|
| <i>SEBI</i>             | Securities and Exchange Board of India              |
| <i>SEC</i>              | Securities and Exchange Commission                  |
| <i>SECR</i>             | Streamlined Energy & Carbon Reporting               |
| <i>SF6</i>              | Sulphur hexafluoride                                |
| <i>SFC</i>              | Specific Fuel Consumption                           |
| <i>SFRD</i>             | Sustainable Finance Disclosure Regulation           |
| <i>Sl.no</i>            | Serial Number                                       |
| <i>SOP</i>              | Standard Operating Procedure                        |
| <i>t</i>                | Tonne                                               |
| <i>T&amp;D</i>          | Transportation and Distribution                     |
| <i>TC</i>               | Technical Committee                                 |
| <i>TCFD</i>             | Task Force on Climate-related Financial Disclosures |
| <i>tCO<sub>2</sub>e</i> | Tonne of Carbon Dioxide equivalent                  |
| <i>TG</i>               | Telangana                                           |
| <i>TNFD</i>             | Task Force on Nature-related Financial Disclosures  |
| <i>ts</i>               | short ton                                           |

|               |                                                       |
|---------------|-------------------------------------------------------|
| <i>UAE</i>    | United Arab Emirates                                  |
| <i>UK</i>     | United Kingdom                                        |
| <i>UL</i>     | Underwriters Laboratories                             |
| <i>UN</i>     | United Nations                                        |
| <i>UNFCCC</i> | United Nations Framework Convention on Climate Change |
| <i>C</i>      | Convention on Climate Change                          |
| <i>UNSD</i>   | United Nations Sustainable Development Group          |
| <i>G</i>      | Development Group                                     |
| <i>UOM</i>    | Unit of Measurement                                   |
| <i>UPS</i>    | Uninterruptible Power Supply                          |
| <i>USA</i>    | United States of America                              |
| <i>USD</i>    | United States Dollar                                  |
| <i>VCS</i>    | Voluntary Carbon Standards                            |
| <i>VERRA</i>  | verification                                          |
| <i>WBCS</i>   | World Business Council for Sustainable Development    |
| <i>D</i>      | Sustainable Development                               |
| <i>WEEE</i>   | Waste from Electrical and Electronic Equipment        |
| <i>WRI</i>    | World Resources Institute                             |
| <i>WTT</i>    | Well-To-Tank                                          |
| <i>WWF</i>    | World-Wide Fund for Nature                            |
| <i>YoY</i>    | year over year                                        |

# 1. INTRODUCTION

## 1.1 Company Overview

Indosol Solar Private Limited (ISPL) was established in 2022 with an objective of emerging as an eminent player in India's solar manufacturing sector. The company is developing a state-of-the-art, 100% vertically integrated Giga-scale Solar PV manufacturing facility, encompassing the entire value chain from quartz to photovoltaic (PV) modules. Currently, a 500 MW module line is operational and supplying the market, while equipment and machinery for expansion are being procured to achieve 1 GW ingot-cell-module capacity by April 2026. Plans are also underway to expand the facility further to a 10 GW module line in the subsequent year.

Indosol Solar has distinguished itself as a recipient of the Production Linked Incentive (PLI) scheme, designed to enhance the domestic production capabilities of integrated solar module manufacturing in India. This accolade underscores Indosol's commitment to bolstering India's solar manufacturing ecosystem and aligning with the nation's energy sustainability goals.

The inception of Indosol Solar marks a strategic expansion of Shirdi Sai Electricals Limited (SSEL), one of India's largest transformer manufacturing company in the energy sector. SSEL's core competencies include the manufacturing of power and distribution transformers, as well as providing engineering, procurement, and construction (EPC) services. Additionally, SSEL is involved in projects such as electrification, substation construction, and system strengthening works. This strategic alignment leverages SSEL's extensive industry experience and robust infrastructure to drive growth in solar technology and enhance the company's renewable energy portfolio.

By harnessing the synergistic strengths of SSEL, Indosol Solar is positioned to play a pivotal role in transforming India's solar landscape.

### Our Vision

Indosol strives to be a catalyst in the clean energy revolution, driving economic growth, creating green jobs, and contributing to a brighter, more sustainable future for India and beyond.

### Our Mission

To revolutionize the energy landscape in India by being a front-runner in solar manufacturing. We aim to empower individuals, businesses, and communities with sustainable energy options and drive the adoption of solar power to create a greener, more resilient future for India.

### Our Values

#### 1. Empowerment

We are dedicated to empowering all stakeholders, including employees, customers, partners, and communities and creating an environment that fosters growth and positive impact.

## 2. Responsibility

We prioritize integrity and accountability in all our actions, ensuring trust and reliability in every endeavor.

## 3. Sustainability

We shall integrate sustainability into every facet of our business, contributing to a balanced future that factors environmental, social, and economic considerations.

## 4. Excellence

We are committed to upholding the highest standards of quality with relentless effort.

### Location:

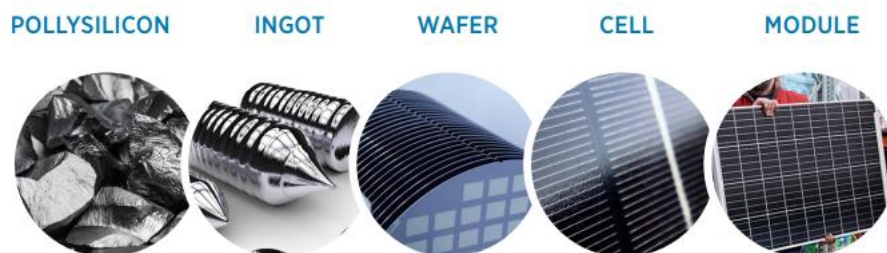
#### Corporate Office:

Plot no:1, Survey no:83/1, Opp IKEA, Aurobindo Galaxy Towers, 16th Floor, A wing, Rayadurgam, Serilingampally, Hyderabad Telangana , India -500081

#### Manufacturing Plant:

Survey No: 585/2, 585-5, 593-2A Near Ramayapatnam Port Road, Chevuru Village, Gudluru, Nellore Dist. Andhra Pradesh, India – 523291

### 1.1.1 Our Manufacturing Facility



*Figure 1: Upstream and Downstream Production*

We are developing a state-of-the-art, fully vertically integrated giga-scale solar PV manufacturing facility in Ramayapatnam, Andhra Pradesh, India. This facility will span the entire value chain, from sourcing quartz to producing high-efficiency photovoltaic modules. In March 2024, we launched a plant focused on manufacturing high-efficiency solar modules.

Our core technology focuses on TOPCon solar cells and modules, produced in a fully automated facility incorporating advanced processes such as tabber-and-stringer systems, automated junction box fixing, quality control laboratory testing, electroluminescence (EL) testing, auto-sorting, and reliability laboratories.

Our production process covers both upstream and downstream stages, ensuring complete control and optimization at every step.

## Upstream Production

- Sourcing quartz
- Producing metallurgical-grade silicon and polysilicon

## Downstream Production

- Manufacturing of ingots, wafers, cells, and modules
- Glass production
- Ancillary component manufacturing, including EVA, POE, back sheet, aluminum frames, and more.

We also maintain an in-house, state-of-the-art quality control laboratory that adheres to global testing and certification standards. Staffed by experienced specialists, the facility conducts durability, safety, and performance validation to ensure long-term reliability. Through the integration of high-efficiency solar cells with EVA, solar glass, and advanced manufacturing technologies, we deliver modules that are reliable, cost-effective, and engineered to exceed international benchmarks for quality and performance.

### 1.1.2 Certifications held

#### IEC 61215

- IEC 61730 (Part 1&2)
- IEC 61701 (Salt Mist)
- IEC 61716
- IEC 62804
- IEC 61853
- IEC 60068
- ISO 9001:2015
- CE



## 1.2 Solar Cell Manufacturing Technology

### 1.2.1 TOPCon Technology

TOPCon (Tunnel Oxide Passivated Contact) is a solar cell technology that uses a thin oxide layer to improve efficiency and performance.

How it works

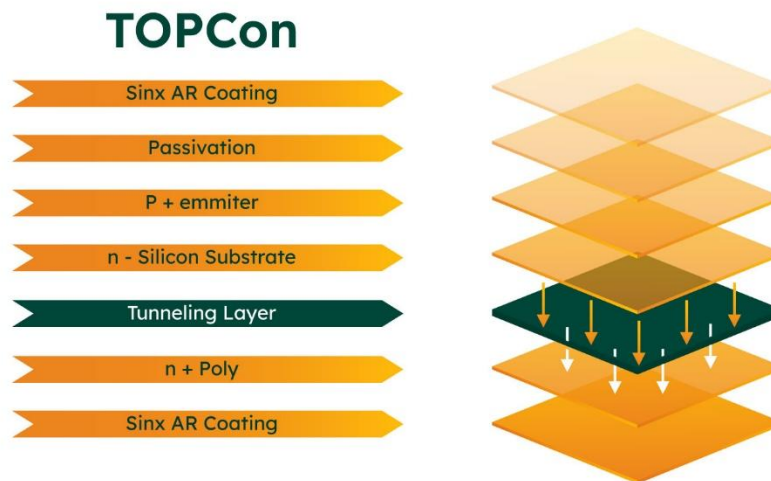
- A thin layer of silicon oxide acts as a selective gate, allowing electrons to pass through to the rear side of the cell while blocking holes
- The n+ polysilicon layer creates an electric field that attracts electrons and repels holes
- This structure minimizes recombination losses and maximizes charge carrier collection

Benefits

- Higher efficiency: TOPCon cells can achieve efficiency rates exceeding 25%

- Enhanced low-light performance: TOPCon cells can generate electricity even when sunlight is limited
- Lower degradation: TOPCon cells have a longer lifespan with minimal power degradation over time
- Bifaciality: TOPCon modules can generate power from both the front and rear sides

Advanced TOPCon (Tunnel Oxide Passivated Contact) technology will be incorporated throughout the process to maximize efficiency and performance in solar module production.



*Figure 2: TOPCon Technology*

TOPCon cells employ a micro-nano tunnelling oxide layer, a carrier-selective microcrystalline silicon film, and cutting-edge passivation contact technology. This advanced structure provides a significant boost to cell conversion efficiency and power output. The unique tunnel oxide layer minimizes subsurface recombination, resulting in improved overall theoretical efficiency, reaching up to an upper limit of 28.7%. Currently, in manufacturing scenario, it has reached up to 25%+ cell efficiency and 23%+ module efficiency.

N-type TOPCon solar PV modules are designed for high efficiency and reliability, even in extreme weather like heavy snow and strong winds. They ensure consistent energy production, excel in low-light conditions, and resist potential degradation. With excellent thermal performance, our modules improve commercial returns and lower energy costs. Discover the future of solar technology with our innovative solutions.

### **1.2.2 Mono PERC Technology**

Mono PERC (Passivated Emitter and Rear Cell) is a solar panel technology that uses a rear passivation layer to increase light absorption and efficiency. This technology is an improvement on traditional monocrystalline solar cells.

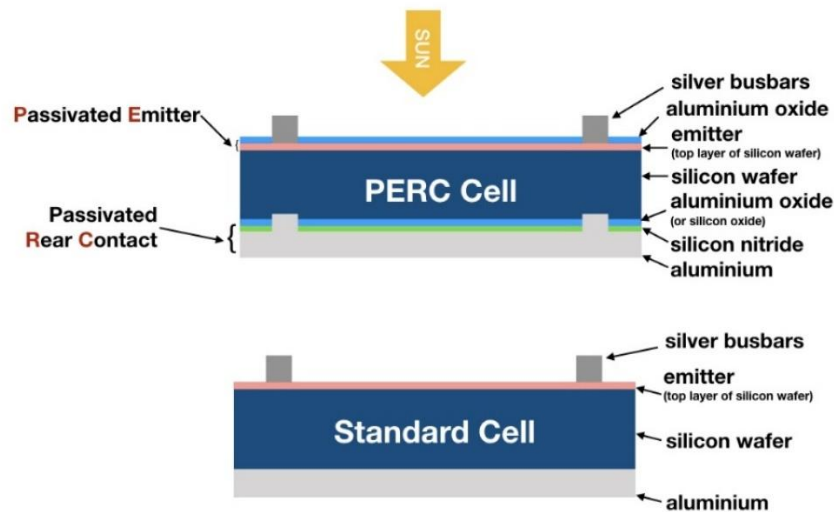
How it works

- A passivation layer is added to the back of the cell. This layer is usually made of aluminum oxide.
- The passivation layer reflects unabsorbed sunlight back into the cell.

- This increases the amount of light absorbed, which generates more electricity.
- Mono PERC cells also reduce electron recombination, which is when absorbed electrons lose energy.

#### Benefits

- Mono PERC solar panels are more efficient than traditional solar panels.
- They perform better in low-light conditions and high temperatures.
- They have a higher energy density per square foot than conventional monocrystalline cells.



*Figure 3: Mono PERC Technology*

Monocrystalline solar panels boast the highest efficiency rates, usually ranging from 19% to 22%. This elevated efficiency allows them to generate more power per square foot, making them highly space-efficient. Additionally, these panels generally perform better in warmer weather conditions.

### 1.3 Global Solar PV Development

At the 28th United Nations (UN) Climate Change Conference (COP28) held in the United Arab Emirates, the global energy community formally declared its intent to triple renewable energy capacity and double the energy efficiency improvement rate by 2030 in recognition of the fact that the energy transition remains off track (IRENA, 2023a, 2024a). The International Renewable Energy Agency's (IRENA's) analysis found that the acceleration of renewable technology and adoption of energy efficiency measures can lead to a 43% reduction in global greenhouse gas emission by 2030. This finding conforms with the analysis of the Intergovernmental Panel on Climate Change (IPCC)

To ensure sustained success, it is crucial that new renewable energy deployment is coupled with systematic innovation that goes beyond the technological dimension alone

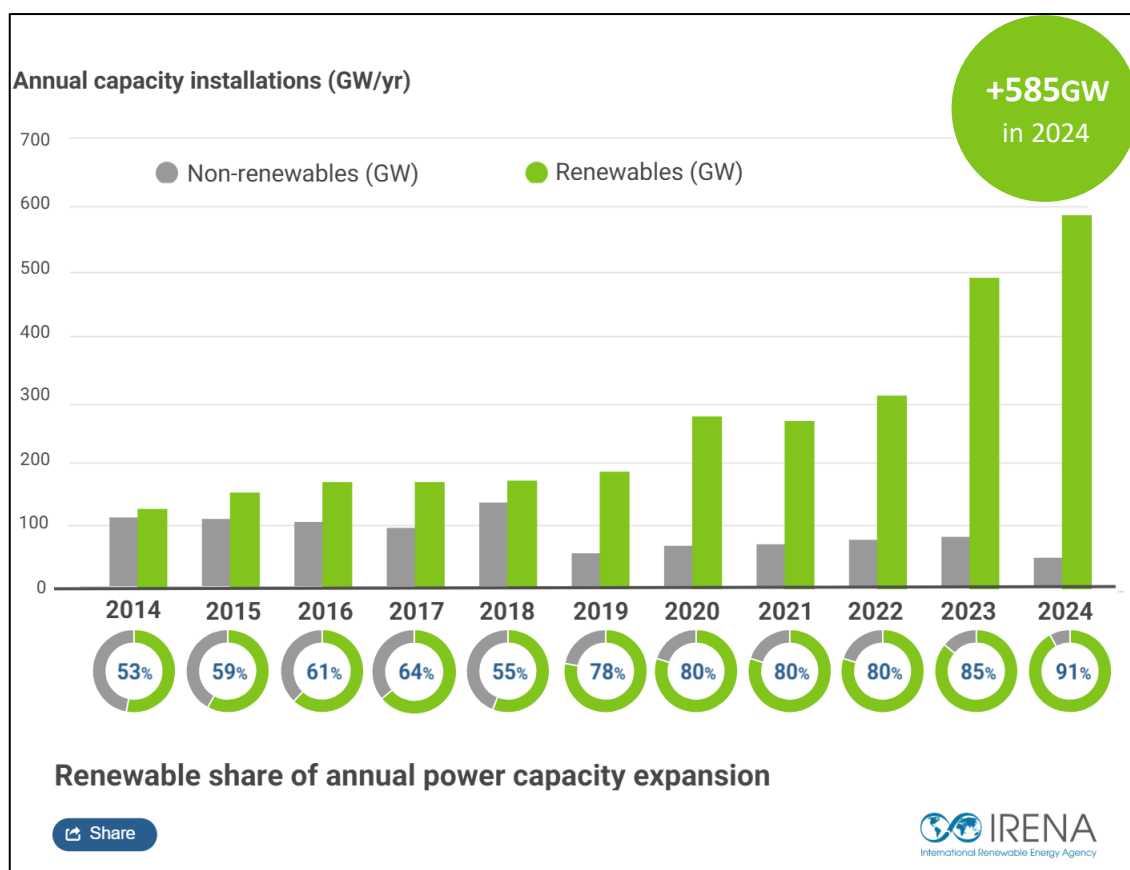


Figure 4: Renewable Energy Capacity Additions, 2003-2024 (IRENA)

Global renewable power capacity increased by 585 GW in a single year, indicating a record rate of 15.1% annual growth, which surpasses 2023's growth rate of 14.3%. The increase marks a consistent trend of renewables breaking their own expansion records each year, which underscores renewables' strong business and investment case. (IRENA)

Regional disparities in renewable energy capacity deployment intensified from 2023 to 2024, with Asia strengthening its dominance from 69.3% to 72% of global additions at 421.5 GW. China alone accounted for over 88% of Asia's increase. By contrast, the region of Central America and the Caribbean contributed the least with only 3.2% share of the global addition, while the Small Island Developing States saw their contributions decline from 1.1 GW in 2023 to just 0.7 GW in 2024. Africa's capacity grew by only 4.2 GW and the Middle East by 3.3 GW, reflecting the persistent geographic disparities in renewables deployment, which presents a significant challenge to achieving the global tripling target.

Solar energy remained the driving force behind this expansion, responsible for 42% of the total global renewable power capacity mix. The solar sector alone grew by 32.2%, adding almost 452 GW to reach a total capacity of 1 865 GW worldwide. Solar photovoltaic (PV) technology accounted for virtually all solar capacity growth, demonstrating its continued cost-effectiveness and scalability. In 2023, the global weighted average cost of electricity from new solar PV projects dropped by 12%, the steepest decline among major renewable sources.

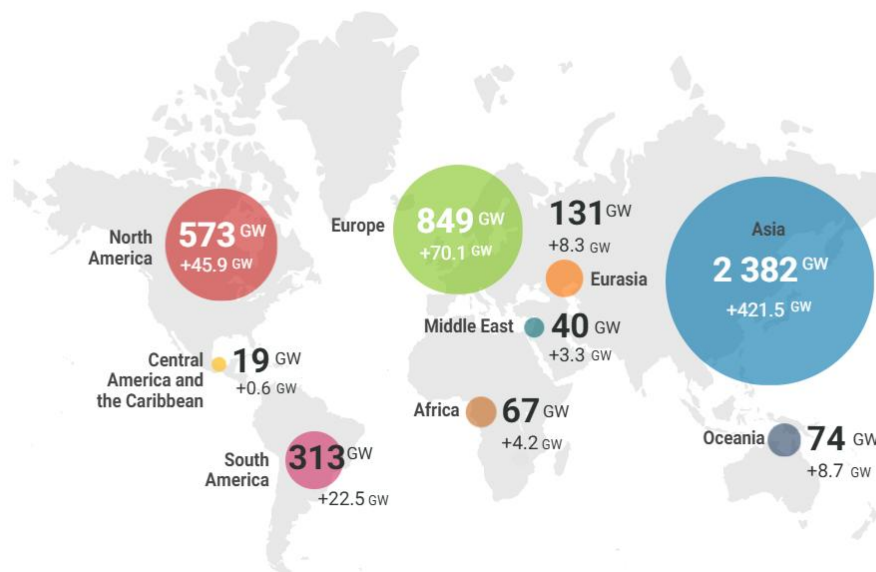


Figure 5: Share of Solar Capacity addition in Renewable energy (IRENA)

### 1.3.1 Solar PV - Leading the Renewable Energy Generation Sources

Looking to the future, to be compliant with a 1.5°C Scenario, IRENA projects that renewable capacity additions will need to reach approximately 1122 GW/year between 2025 and 2030, representing a 16.6% compound annual growth rate, up from the 16.1% growth required each year when the trajectory was originally presented in the first edition of the IRENA report.

Solar energy accounted for most of the new capacity additions in 2024. More than three quarters of this new added capacity was in the form of solar PV, with 452.1 GW added in 2024 (27% higher than in 2023, and the highest annual addition of any renewable power technology in a single year); this was followed by wind energy, with an addition of 114.3 GW – of which 105.7 GW was in the form of onshore wind. This exponential growth in solar PV in recent years has been driven by rapid cost reductions, short project development timelines, large-scale deployments – averaging 139 MW per project for solar PV in 2024 – fossil fuel price shocks, supportive policies and mature supply chains. Global solar PV capacity tripled between 2019 and 2024. At the current pace, the 2030 solar PV target of 6.15 TW appears achievable, requiring a rise in average annual additions to 716 GW of capacity each year between 2025 and 2030, inclusive. Variable renewables, i.e. energy sources that have an intermittent profile, are expected to play a significant role in shaping electricity systems and markets. Solar PV will continue to be a major contributor to renewable technology deployment. This growth is envisioned due to factors such as technology cost reductions, advancements in energy storage and continued efforts towards implementing cohesive policy frameworks for renewable development. In the 1.5°C Scenario, installed solar PV capacity would exceed 5,400 GW by 2030 and 18,200 GW by 2050 (see Figure 6).

### 1.3.2 Global installed capacity by energy source

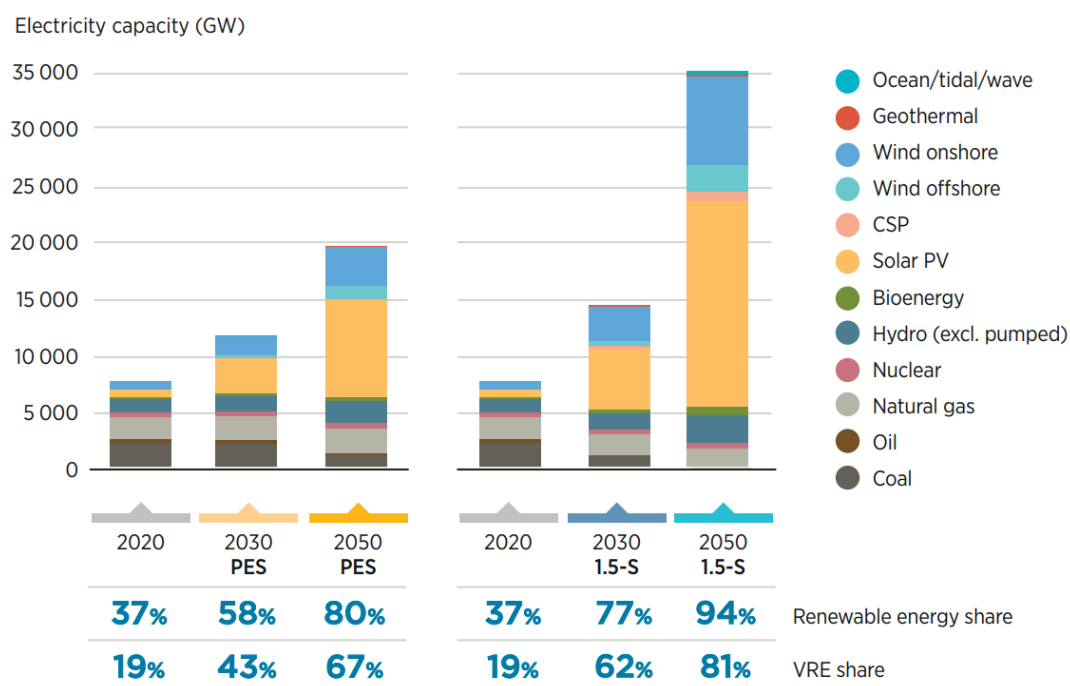


Figure 6: Global Energy Source by Energy Source; 1.5°C Scenario in 2020, 2030 and 2050 (IRENA)

Given the increased and prominent role solar PV will play in achieving the energy transition.

The solar PV industry has undergone rapid expansion of cell and module manufacturing plants. In 2024 alone, global operational module capacity increased by 315 GW to reach 1,554 GW, a growth of 25% (Wood Mackenzie, 2025a). Notwithstanding soaring interest in diversifying supply chains in many countries, China continues to have the biggest share of manufacturing capacities and produced 82% of the world's PV modules in 2024. Southeast Asia had a 7.4% share, India 4.5%, the United States 2.6% and Europe 1.5% (Wood Mackenzie, 2025a).

The industry's transition to next-generation cell technologies gained momentum in 2024. N-type modules accounted for the majority of shipments from several top-tier manufacturers. Jinko Solar, the top global shipper, reported that over 87% of its 2024 shipments were N-type. However, TOPCon remained the leading advanced technology, with average conversion efficiencies exceeding 24%. Heterojunction (HJT) and back contact technologies also posted strong gains, with efficiency benchmarks reaching 24% and 25%, respectively.

It is imperative that solar supply chains are transformed to ensure they are sustainable – by ensuring compliance with relevant international standards & certification schemes; resilient – to have strong buffers against potential external shocks as well as flexibility; and broadly distributed – to ensure greater participation of economies in different segments of the solar PV value chain. A key avenue to achieve this goal is to improve the availability of quality infrastructure<sup>1</sup> (QI) services for this industry, specifically environmental, social and governance (ESG) principles and standards.

### 1.3.3 ESG Standards for Sustainable solar PV Supply Chains

ESG standards to make solar PV supply chains sustainable as demand for this technology grows. The Key recommended action to promote ESG development in the solar PV Supply Chain is shown in figure 7.

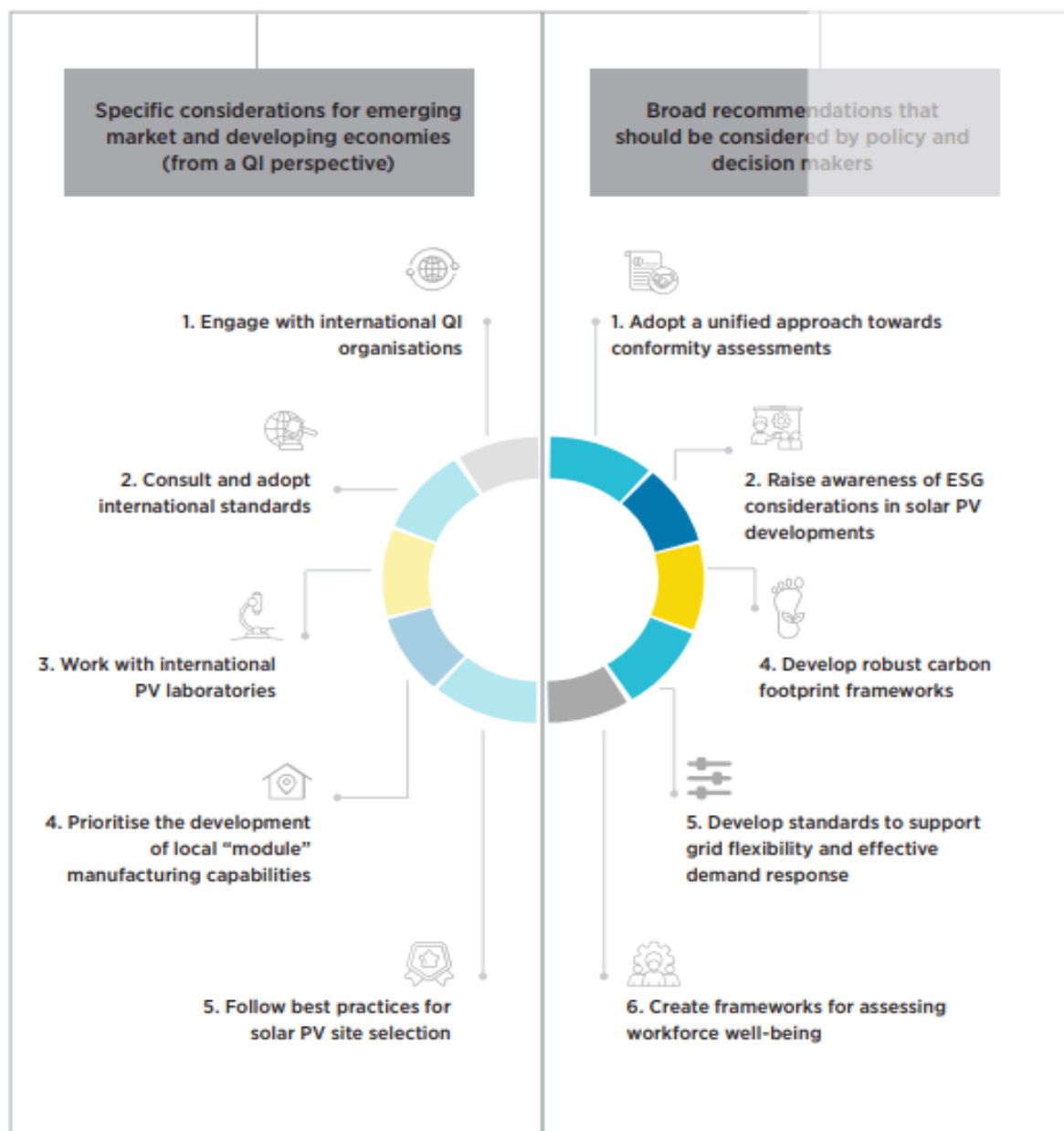
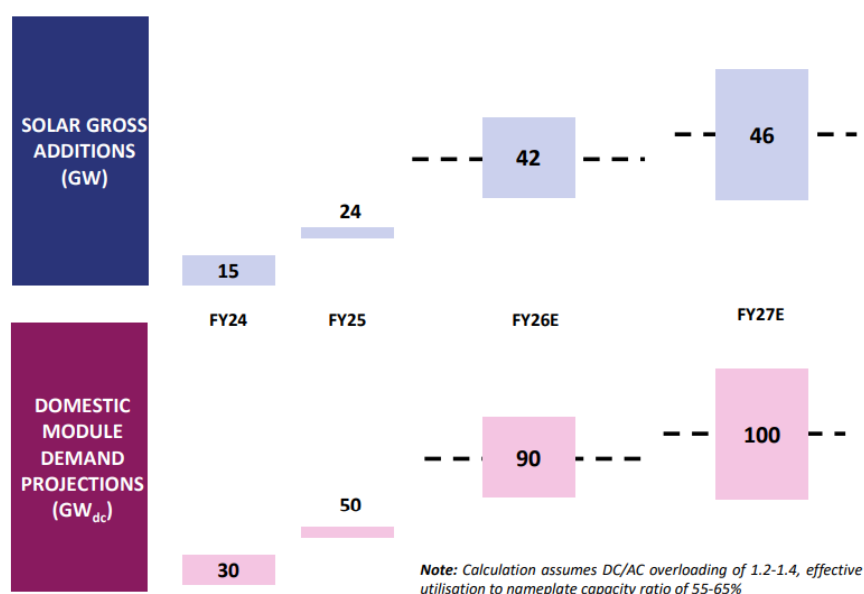


Figure 7 : Key recommended action to promote ESG development in the solar PV Supply Chain

### 1.3.4 India PV Outlook



*Figure 8: India's solar capacity outlook, 2024-2028 (SBI Caps: Report on Solar Sector Aug'25)*

Between April 2024 and March 2025, India installed approximately 23.83 GW of solar PV capacity. The cumulative renewable energy capacity rose to 220.10 GW at the end of FY24-25. The total installed solar capacity now stands at 105.65 GW. This includes 81.01 GW from ground-mounted installations, 17.02 GW from rooftop solar, 2.87 GW from solar components of hybrid projects, and 4.74 GW from off-grid systems. The growth demonstrates continued uptake of solar energy across utility-scale and distributed categories. (Ministry of New and Renewable Energy, 2025). Solar PV is expected to continue to play an increasing role in India's energy transition activities, with 85-90 GW expected to be added in year 2026 and 2027 (SBI Caps, 2025).

India is also placing a growing premium on enhancing its manufacturing capacity by orienting itself from a module-based system to one that is vertically integrated.

India's solar manufacturing sector includes key components like solar modules, solar PV cells, and ingots and wafers. Producing these within the country supports the domestic economy and reduces dependence on imports. In just one-year, solar module manufacturing capacity nearly doubled—from 38 GW in March 2024 to 74 GW in March 2025 (Press Information Bureau). The National Solar Energy Federation of India notes the following solar PV manufacturing trends:

**Modules:** India has the largest manufacturing capacity in the region after China. Approximately 23 companies have communicated plans to establish GW-scale module manufacturing capabilities, with a target of reaching 125 GW by 2027 (NSEFI and Solar Power Europe, 2023; Solar Power Europe, 2024).

**Cells:** In FY2024-25, India's solar cell manufacturing capacity rose significantly, reaching 25 GW by March 2025, up from 9 GW in March 2024. This expansion was driven by PLI-supported projects and new large-scale facilities, positioning India

on track to achieve a fully integrated domestic solar value chain in the coming years. (Press Information Bureau)

Ingots and wafers: India currently have one active manufacturing plant for ingots and wafers of 2 GW capacity, however polysilicon is still imported.

### 1.3.5 India's Nationally Determined Contributions (NDC)

The 21<sup>st</sup> session of the Conference of the Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC) was held in Paris in November and December 2015. 195 participating countries negotiated and adopted the Paris Agreement, which includes objectives to peak greenhouse gas emissions as soon as possible, to limit the global average temperature increase above pre-industrial levels to well below 2°C, and to pursue efforts to limit the increase to 1.5°C.<sup>[1]</sup>

The Paris Agreement, which entered into force on 4 November 2016, requires Parties to put forward their best efforts through "Nationally Determined Contributions" (NDCs). These NDCs represent targets and actions for the post-2020 period with reference to the base year 2005.

India initially submitted its Intended Nationally Determined Contribution (INDC) in October 2015, before the Paris Agreement was adopted in December 2015 and India ratified its contribution on 2<sup>nd</sup> of October 2016 and it became the India's first NDC.

India's NDC Target and current progress shown in below table:

| India's NDC Target and Current Progress        |                                                                                                                                                                                          |                                                                                                                                                                |
|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category                                       | Commitments & Updates                                                                                                                                                                    | Achievements/Running Targets/Current Progress                                                                                                                  |
| <b>Emissions Intensity Reduction</b>           | <b>NDC 2015:</b> To reduce Emissions Intensity of India's GDP by 33 % -36% by 2030, from 2005 level.                                                                                     | <ul style="list-style-type: none"> <li>Achieved 36% by 2020<sup>[2]</sup> (33% by 2019)<sup>[3]</sup></li> </ul>                                               |
|                                                | <b>Updated NDC 2022:</b> To reduce Emissions Intensity of its GDP by 45 % by 2030, from 2005 level.                                                                                      | Running Target                                                                                                                                                 |
| <b>Non-Fossil Fuel Electric Power Capacity</b> | <b>NDC 2015:</b> To achieve 40 % cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030                                                        | <ul style="list-style-type: none"> <li>Achieved 40% in 2021<sup>[3]</sup></li> </ul>                                                                           |
|                                                | <b>Updated NDC 2022:</b> To achieve about 50 % cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030                                          | <ul style="list-style-type: none"> <li>Achieved <b>50.08%</b> in June-25 <sup>[4]</sup> five years ahead of the target set under its NDC</li> </ul>            |
| <b>Promoting Sustainable Living</b>            | <b>NDC 2015:</b> To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation                              | Current progress: <ul style="list-style-type: none"> <li>Mission LiFE launched Oct 2022, aiming to mobilize 1 billion people by 2028.<sup>[5]</sup></li> </ul> |
|                                                | <b>Updated NDC 2022:</b> To put forward and further propagate a healthy and sustainable way of living based on traditions and values of conservation and moderation, including through a |                                                                                                                                                                |

|                                                    |                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                    | mass movement for 'LIFE'– 'Lifestyle for Environment' as a key to combating climate change                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>NDC 2015 Target and continuing</b>              |                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Additional Carbon Sink from base year 2005</b>  | To create an additional carbon sink of 2.5 to 3 GtCO <sub>2</sub> e through additional forest and tree cover by 2030, from base year 2005.                                                                                                  | <ul style="list-style-type: none"> <li>India's forest and tree cover has consistently increased from 20.60% in 2005 and as on year 2023 stands at 25.17% of the total geographical area of the country.<sup>[2]</sup></li> <li>Achieved 2.29 GtCO<sub>2</sub>e by 2021.<sup>[1]</sup> (1.97 GtCO<sub>2</sub>e by 2019)<sup>[2]</sup></li> </ul> <p>Running target:</p> <ul style="list-style-type: none"> <li>0.21 GtCO<sub>2</sub>e away from achieving the 2030 target.</li> </ul> |
| <b>Adopting a Cleaner Development Path</b>         | To adopt a climate friendly and a cleaner path than the one followed hitherto by others at corresponding level of economic development.                                                                                                     | <p>Current progress:</p> <ul style="list-style-type: none"> <li>India is promoting circular economy principles to reduce waste and resource use.</li> <li>Initiatives like the Solid Waste Management Rules and Plastic Waste Management Rules push for better recycling, reduction of single-use plastics, and waste segregation at source.</li> </ul>                                                                                                                              |
| <b>Enhancing Climate Change Adaptation</b>         | To better adapt to climate change by enhancing investments in development programmes in sectors vulnerable to climate change, particularly agriculture, water resources, Himalayan region, coastal regions, health and disaster management. | <p>Current progress:</p> <ul style="list-style-type: none"> <li>Adaptation-relevant expenditure increased to 5.60% of GDP by 2021-2022<sup>[2]</sup></li> </ul>                                                                                                                                                                                                                                                                                                                      |
| <b>Mobilizing Finance</b>                          | To mobilize domestic and new & additional funds from developed countries to implement the above mitigation and adaptation actions in view of the resource required and the resource gap.                                                    | <p>Current progress:</p> <ul style="list-style-type: none"> <li>₹36,000 crore raised via sovereign green bonds in 2023.<sup>[2]</sup></li> <li>\$66 billion annual finance gap remains.<sup>[3]</sup></li> </ul>                                                                                                                                                                                                                                                                     |
| <b>Building Capacity &amp; Technology Transfer</b> | To build capacities, create domestic framework and international architecture for quick diffusion of cutting edge climate technology in India and for joint collaborative R&D for such future technologies.                                 | <p>Current progress:</p> <ul style="list-style-type: none"> <li>Reliance on domestic resources due to lack of international technology transfer (as of Dec 2024, 4<sup>th</sup> BUR).<sup>[4]</sup></li> </ul>                                                                                                                                                                                                                                                                       |

*Table 1: India's NDC Target and Current Progress*

- [Press Information Bureau, Government of India. \(2025, January 3\). India submits its Fourth Biennial Update Report \(BUR-4\) to UNFCCC \[Press release\]](#)
- [Press Information Bureau. \(2024, July 22\). Despite Being One Of The Fastest-Growing Economies In The World, India's Annual Per Capita Carbon Emission Is Only About One-Third Of The Global Average](#)
- [Economic Survey: India on track to create additional carbon sink through forest cover, Mint](#)
- [Lack of tech transfer slowing climate action in India: Government to UNFCCC. The Times of India](#)

In addition to that at the 26<sup>th</sup> Conference of the Parties (COP26) in Glasgow, Prime Minister Modi outlined several significant commitments, often referred to as the “Panchamrit” (five nectars) goals <sup>[1]</sup>, along with other key points:

### Panchamrit Goals:

- **Achieve 500 GW of non-fossil fuel energy capacity by 2030:** This target aims to significantly boost India’s green energy capacity. The break-up of all installed capacity of energy sources from Central Electricity Authority database for **Aug-25** <sup>[2]</sup> is as follows.

| Category               | Energy Source     | Total (GW)    | % Share       |
|------------------------|-------------------|---------------|---------------|
| <b>Fossil Fuel</b>     | Coal              | 216.8         | 43.75%        |
|                        | Lignite           | 6.62          | 1.34%         |
|                        | Gas               | 20.13         | 4.06%         |
|                        | Diesel            | 0.59          | 0.12%         |
|                        | <b>Total</b>      | <b>244.14</b> | <b>49.27%</b> |
| <b>Non-Fossil Fuel</b> | Nuclear           | 8.78          | 1.77%         |
|                        | Hydro             | 50.11         | 10.11%        |
|                        | Small Hydro Power | 5.11          | 1.03%         |
|                        | Wind Power        | 52.68         | 10.63%        |
|                        | Bio-Power         | 11.6          | 2.34%         |
|                        | Solar Power       | 123.13        | 24.85%        |
|                        | <b>Total</b>      | <b>251.41</b> | <b>50.73%</b> |
| <b>Grand total</b>     |                   | <b>495.55</b> | <b>100%</b>   |

*Table 2: Percentage Share of Installed Capacity as of Aug-25*

- **Meet 50% of energy requirements from renewable energy by 2030:** This includes sources like solar, wind, and hydropower, marking a transformative step towards reducing dependency on fossil fuels.
- **Reduce total projected carbon emissions by 1 billion tonnes by 2030:** This commitment focuses on cutting down India’s carbon footprint without hindering economic growth.
- **Lower carbon intensity of the GDP by 45% by 2030:** This goal aims to decouple economic growth from carbon emissions by improving energy efficiency and promoting sustainable practices across industries.
- **Achieve net-zero emissions by 2070:** This signifies a long-term commitment to neutralize greenhouse gas emissions by balancing them with carbon absorption through natural and technological solutions.

### Other Noteworthy Points:

- **Greener Infrastructure:** Prime Minister Modi announced that the Indian railway system had set a target of achieving “Net Zero” emissions by 2030, aiming to reduce emissions by 60 million tonnes annually. He indicated that this trend would extend to other infrastructure areas as well <sup>[3]</sup>.
- **Climate Finance Expectations:** Modi reiterated the expectation for developed countries to provide \$1 trillion in climate finance. However, he also noted that past promises regarding climate finance had been “hollow,” signalling India’s understanding that it cannot solely depend on developed nations for funding and would pursue self-financing through initiatives like “Make-in-India” and “Vocal-for-Local”

1. [Press Information Bureau. \(2022, February 3\). India's stand at COP-26 \[Press release\]. Ministry of Environment, Forest and Climate Change, Government of India.](#)

2. [Central Electricity Authority, Government of India. Installed capacity report for Aug-25.](#)

3. <https://www.roedl.com/insights/india-modi-panchamrit-cop26-implication-industrial-perspective>

## **1.4 Environmental, Social, and Governance (ESG)**

ESG is critically important for a solar panel manufacturing plant because it directly impacts sustainability, stakeholder trust, and long-term profitability. Here's how:

### **Environmental (E)**

- Sustainable Production – Solar panels are an eco-friendly product, but their manufacturing can still be resource-intensive. ESG ensures sustainable sourcing of raw materials and efficient energy use in production.
- Carbon Footprint Reduction – Using renewable energy for manufacturing and minimizing emissions aligns with ESG goals and enhances brand reputation.
- Waste Management – Proper disposal and recycling of old or defective solar panels prevent environmental harm.
- Water Conservation – Solar panel production often involves water-intensive processes. ESG encourages water recycling and conservation strategies.

### **Social (S)**

- Worker Safety & Fair Labor – Ensuring safe working conditions, fair wages, and ethical labor practices reduces risks and builds a positive corporate culture.
- Community Engagement – Supporting local communities, creating jobs, and investing in education or clean energy projects enhance social impact.
- Supply Chain Ethics – Partnering with responsible suppliers who uphold fair labor standards and avoid conflict minerals ensures ethical production.

### **Governance (G)**

- Regulatory Compliance – Adhering to environmental regulations and industry standards avoids legal risks and fines.
- Transparency & Reporting – Clear ESG reporting builds investor and customer confidence in the company's sustainability efforts.
- Board & Leadership Accountability – A strong governance structure ensures ethical decision-making and long-term business resilience.

By embedding ESG principles, a solar panel manufacturer can enhance operational efficiency, attract ESG-conscious investors, comply with global sustainability standards, and strengthen its brand image.

### **1.4.1 Why ESG Focus Should Be Higher for an Integrated Solar Supply Chain?**

#### **Environmental (E) - Higher Resource & Emissions Impact**

- High Energy Use in Polysilicon & Glass Production
  - Polysilicon refining is highly energy-intensive, requiring high-purity quartz and large amounts of electricity (often from coal in some regions). ESG principles should push for renewable energy sourcing and energy efficiency improvements.
  - Glass manufacturing (used in solar panels) emits significant CO<sub>2</sub> due to melting and processing raw silica sand. ESG efforts should prioritize low-carbon glass production and alternative materials.

- Chemical & Waste Management
  - Upstream processes involve hazardous chemicals like silane gas, hydrochloric acid, and fluorine compounds, which need proper handling, recycling, and disposal.
  - Implementing closed-loop production systems to reuse waste materials is a key ESG practice.
- Supply Chain Traceability & Circular Economy
  - Sourcing of quartz and other raw materials should avoid environmental degradation (e.g., illegal mining, deforestation).
  - Establishing recycling programs for end-of-life solar panels to recover glass, silicon, and metals enhances ESG credibility.

## **Social (S) - Greater Labor & Human Rights Responsibilities**

- Labor Conditions in Polysilicon Supply Chains
  - ESG scrutiny is high regarding forced labor allegations in polysilicon supply chains (e.g., Xinjiang, China). Ensuring ethical labor practices and third-party audits is crucial.
  - Partnering only with certified ethical suppliers is an ESG best practice.
- Health & Safety Risks in Manufacturing
  - Workers in polysilicon, wafer, and glass factories face risks from exposure to chemicals, dust, and high-temperature processes. Implementing strict safety protocols and worker training is essential.
- Community & Stakeholder Engagement
  - Large-scale solar manufacturing facilities impact local communities (land use, pollution, job creation). ESG-driven companies invest in local infrastructure, education, and environmental restoration.

## **Governance (G) - Higher Transparency & Regulatory Compliance Needs**

- More Stringent ESG Reporting
  - Investors and customers demand full traceability of materials (from quartz to module) to ensure ethical sourcing and sustainable production.
  - Compliance with global standards like EU CBAM (Carbon Border Adjustment Mechanism) and U.S. Uyghur Forced Labor Prevention Act (UFLPA) is critical.
- Supplier ESG Due Diligence & Audits
  - The company must conduct regular ESG audits of upstream suppliers to avoid human rights violations and environmental non-compliance.
  - Adopting blockchain or digital tracking of raw materials can enhance governance and trust.

## **Stronger ESG Focus is Essential for Vertical Integration**

Since an integrated solar production model (polysilicon → glass → wafer → module) amplifies environmental, social, and governance risks, companies must strengthen ESG commitments by:

- Transitioning to renewable energy-powered manufacturing
- Implementing ethical supply chain monitoring
- Enhancing circular economy and waste reduction
- Conducting regular ESG audits and transparent reporting

### 1.4.2 Sustainability & Energy Related Framework & Standards

Since the release of the Intergovernmental Panel on Climate Change (IPCC) “Global Warming of 1.5°C” report in 2018 which positioned the efforts of the private sector as integral to ensure that global warming stays within the 1.5°C limit, reporting frameworks, voluntary and mandatory, have grown to facilitate the integration of sustainability into organizations’ strategies and to guide them towards greater transparency for their stakeholders.

There are more than 30 voluntary environmental reporting frameworks that companies can use. It is therefore difficult to determine which ones are the most appropriate.

**Below are a few of the important such frameworks that we run into on a regular basis:  
Energy & Emissions – Standards**

|          |                     |                                                                                                                                                                                                                            |
|----------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard | GHG Protocol        | An internationally credible methodology for the calculation of Scopes 1, 2 & 3 emissions which can be used in mandatory and voluntary reporting frameworks                                                                 |
|          | ISO 14064           | An internationally credible standard for the calculation of Scopes 1, 2 & 3 emissions which can be used in mandatory and voluntary reporting frameworks                                                                    |
|          | ISO 14068-1:2023    | An internationally recognized voluntary standard for carbon neutrality, ISO 14068-1:2023 replaced PAS 2060 and provides requirements through which companies can demonstrate and certify achievement of carbon neutrality. |
|          | ISO 50001           | An international energy management standard which assists in implementing a continual improvement approach to energy efficiency                                                                                            |
|          | ISO 14001           | ISO 14001 is an internationally agreed and recognized standard for Environmental Management Systems                                                                                                                        |
|          | Net-Zero Standard   | New Net-Zero Standard from the Science-Based Targets initiative (SBTi), considered global best practice for companies setting net-zero strategies                                                                          |
|          | Net Zero Guidelines | The Net-Zero Guidelines, published by the ISO, establish a standardization framework based on 12 guidelines to help companies achieve net-zero emissions                                                                   |
|          | ACT Initiative      | The ACT (Assessing low Carbon Transition) initiative offers several sector-specific methodologies to assess the extent to which an organization has a strategy aligned with the decarbonization trajectories of its sector |

*Figure 9: Energy & Emission related Standards*

|                |                                    |                |                                                                                                                                                                                                                                                                      |
|----------------|------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sustainability | Environment, Social and Governance | SDG            | 17 UN environmental, social and economic goals with 169 associated targets that companies can voluntarily demonstrate that they are contributing to                                                                                                                  |
|                |                                    | Ecovadis       | An online sustainability framework that provides performance ratings for companies within global supply chains                                                                                                                                                       |
|                |                                    | GRI            | An internationally recognized and comprehensive framework for sustainability reporting, with standards covering economic, environmental, and social topics, providing requirements, recommendations, and guidance for disclosures                                    |
|                | Investor-led                       | ISSB Standards | A set of recommendations to assist companies in better accounting for climate-related risks in their financial and mainstream disclosures. In 2023, the ISSB published two standards to facilitate the risks & opportunities reporting of any company's value chain. |
|                |                                    | TNFD           | Global science-based initiative that develops and delivers risk management and disclosure frameworks for organizations to report and act on evolving nature-related issues                                                                                           |
|                |                                    | DJSI           | Published indices of the top 10% of companies who respond to a questionnaire covering Economic, Environmental and Social issues                                                                                                                                      |
|                |                                    | CDP            | One of the largest international, investor-led sustainability reporting frameworks. It is voluntary, but companies can be asked to respond by their stakeholders                                                                                                     |
|                |                                    | RE100          | The Renewable Energy 100 initiative brings together major companies that want to source 100% of their energy from renewable energy sources by 2050                                                                                                                   |
|                |                                    | EV100          | Global initiative promoted by the Climate Group to bring together companies that are committed to electrifying their owned and contracted fleets                                                                                                                     |
|                | Legislation                        | CSRD           | As of 2025, the EU's CSRD is set to gradually extend ESG reporting to thousands of large companies, though proposed threshold changes may reduce the total number from the originally planned 50,000.                                                                |
|                |                                    | EU Taxonomy    | A regulatory classification system under which companies may define which of their economic activities are environmentally sustainable                                                                                                                               |
|                |                                    | CFD            | The Companies (Strategic Report) (Climate-related Financial Disclosure) (CFD) Regulations were implemented from April 2022 in United Kingdom.                                                                                                                        |

*Figure 10: Sustainability related framework*

We have elaborated below a few of the important frameworks and standards which we need to commence/renew/improve upon and include the newer additions in the series. While some are specifically related to energy or environment, certain others are evolving frameworks in a global and national (Indian) context, the adherence to which is not just important but increasingly mandatory to be accepted as a partner or vendor.

### **ISO 14000 Series:**

- ISO 14001 (Environmental management systems) "provides requirements with guidance for use that relate to environmental management systems. Other standards in the ISO 14000 series focus on specific approaches such as audits, communications, labelling and life cycle analysis, as well as environmental challenges such as climate change".
- Within the ISO 14000 series, a notable standard is ISO 14067 (Carbon footprint of products), which provides guidance and requirements on the carbon footprint reporting for a product while following life cycle assessments (LCAs) as specified in ISO 14040 and ISO 14044.
- Aligned with the Greenhouse Gas (GHG) Protocol and compatible with most GHG programs, the ISO 14064 series gives specifications for the quantification, monitoring and validation/verification of greenhouse gas emissions, while ISO 14067 specifies the principles, requirements and guidelines for quantifying and reporting the carbon footprint of products.

## IEC 63366:

IEC 63366, published on June 2025 in TC 111 (Environmental standardization), is intended to provide common rules for the LCA of electrical and electronic products. It will be used as a template for product committees (like TC 82) to develop their own LCA standards with product-specific rules (PSRs)/product category rules (PCRs). TC 111 has published IEC 63366 as a horizontal publication, which means two things:

- For LCA practitioners, this horizontal standard shall be applied when there is no PSR standard; LCA practitioners can use the applicable requirements and adapt requirements according to the specific product or product group/product family applied.
- For product committees, this horizontal standard shall be used as a starting point for developing their PSR standard. If a PSR standard is available, it will take precedence over this horizontal PCR standard.

Some examples where countries/regions are mandating stronger compliance to ESG requirements include (but are not limited to):

## Corporate Sustainability Reporting Directive (CSRD):

- The European Union in 2023 commenced the enforcement of its Corporate Sustainability Reporting Directive (CSRD), which provides updated guidance on the rules concerning the social and environmental information that companies (across different sectors and industry) must report. The main objective of this legislation is to provide investors/stakeholders with information they require on how people and the environment are impacted by the operational activities of firms in which they would invest financially and/or identify opportunities arising from climate change and other sustainability issues. Companies that are subject to the CSRD are obliged to report on their ESG compliance according to European Sustainability Reporting Standards.
- While primarily aimed at companies operating within the EU, the CSRD increasingly impacts non-EU companies that supply to the European market. It mandates detailed reporting on ESG performance.
- This covers all aspects of ESG, requiring companies to disclose their environmental, social, and governance impacts.
- In 26<sup>th</sup> Feb 2025 the European Commission has adopted a package of proposals called as **"Omnibus Packages"** to reduce reporting burdens and compliance costs on companies, particularly SMEs, while maintaining ESG objectives of the Green Deal and Sustainable Finance Action Plan.
- The revised CSRD applicability and timeline are updated based on Omnibus Packages Proposal amendment in the below table 3.

| Sl.No | Companies                                                | Applicability/Criteria                                                                                                                                                                                                   | Implementation Timeline                                                                                   |
|-------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| 1     | Companies Under NFRD or Large Public Interest Companies) | <ul style="list-style-type: none"><li>• Publicly listed, employ more than 500 employees (<b>Now Revised to &gt;1000 employees</b>).</li><li>• Total Assets &gt; €25 million, or net turnover &gt; €50 million.</li></ul> | <ul style="list-style-type: none"><li>• From January 1, 2024</li><li>• First report due in 2025</li></ul> |

|   |                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                       |
|---|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Large Companies (Non-NFRD) | Meet at least two of the following: <ul style="list-style-type: none"> <li>• Total Assets &gt; €25 million</li> <li>• Net turnover &gt; €50 million</li> <li>• Employee count &gt; 250</li> </ul>                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>• From January 1, 2025 (<b>Now Revised to 2027</b>)</li> <li>• First report due in 2026 (<b>Revised to 2028</b>)</li> </ul>                                                                    |
| 3 | Listed SMEs                | Listed on EU markets, and meet two or more of: <ul style="list-style-type: none"> <li>• More than 50 employees</li> <li>• Total Assets &gt; €5 million</li> <li>• Net turnover &gt; €10 million</li> </ul>                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>• From January 1, 2026 (<b>Now Revised to 2028</b>)</li> <li>• First report due in 2027 (<b>Revised to 2030</b>)</li> <li>• Optional two-year opt-out with an explanatory statement</li> </ul> |
| 4 | Non-EU Companies           | Non-EU companies with a significant EU presence, either through meeting any of the criteria above, or: <ul style="list-style-type: none"> <li>• A net turnover &gt; €150 million (<b>Now Revised to &gt; €450 million</b>) in the EU for two consecutive years, and fulfils any of the following: <ul style="list-style-type: none"> <li>▪ At least one subsidiary in the EU considered a "large company"</li> <li>▪ At least one listed subsidiary on an EU market</li> <li>▪ Has an EU branch with net turnover &gt; €40 million</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• From January 1, 2028</li> <li>• First report due in 2029</li> </ul>                                                                                                                          |

*Table 3: CSRD Applicability and Timeline*

## CBAM:

- The EU's Carbon Border Adjustment Mechanism (CBAM) is the EU's tool to put a fair price on the carbon emitted during the production of carbon intensive goods that are entering the EU, and to encourage cleaner industrial production in non-EU countries.
- CBAM will apply in its definitive regime from 2026, while the current transitional phase lasts between 2023 and 2025. The CBAM will initially apply to imports of certain goods and selected precursors whose production is carbon intensive and at most significant risk of carbon leakage: cement, iron and steel, aluminium, fertilisers, electricity and hydrogen.
- Carbon leakage occurs when companies based in the EU move carbon-intensive production abroad to countries where less stringent climate policies are in place than in the EU, or when EU products get replaced by more carbon-intensive imports.
- If the production of transformers involves significant greenhouse gas (GHG) emissions, and if these emissions are not already accounted for in the exporting country's carbon pricing system, these could fall under CBAM in the future, particularly if the mechanism's scope expands to include finished electrical equipment.

### **Australia's Treasury Law:**

- In August 2024, Australia has also passed an amendment to its Treasury Law which requires large and medium-sized firms, starting in 2025, to disclose climate related risks and opportunities – in tandem with GHG emission reporting. Australia is also planning to establish a Net Zero Economy Authority that will provide support to workers in the energy sector with access to skills development opportunities as well as guiding new investors towards net zero transformation avenues.

### **UAE sustainable finance regulatory framework:**

- As the host country for COP 28 in 2023, the UAE announced USD 30 billion pledge to support the development of clean energy projects globally. During the UAE's recent COP presidency, the Abu Dhabi Global Market implemented its own sustainable finance regulatory framework which provides guidance and regulations on ESG disclosures by companies which engage in this market.

#### **1.4.3 ESG impact on Solar PV business**

- Closely tied to the **EU CSRD**, the Waste from Electrical and Electronic Equipment (WEEE) Directive 2012/19/EU applies the principle of extended producer responsibility. This principle requires manufacturers to ensure their operational responsibilities also cover management of the post-consumer stage to ensure national/EU recycling and/or recovery targets are met (EU Commission, 2024b; EUROPEAN, 2015). Solar PV panels, inverters and charging stations are covered under this legislation.
- The **US Federal Regulation Acquisition** FAR 23.108 includes requirements for PV modules and inverters, recognising the EPEAT ecolabel to meet government sustainability goals through federal procurement of solar energy in construction and power purchase agreements (PPAs) via EPEAT- SOLAR PV SUPPLY CHAINS: TECHNICAL AND ESG STANDARDS FOR MARKET INTEGRATION 48 registered PV modules and inverters (United States Government, 2024). While the US federal government is not yet a significant purchaser of PV modules and inverters, it procures a significant amount of PV-generated electricity via PPAs.

#### **1.4.4 Solar Stewardship Initiative - Solar Industry Specific ESG Standards and Services**

- The Solar Stewardship Initiative (SSI) was established by Solar Power Europe and Solar Energy UK in October 2022. The SSI is in the process of becoming a fully-fledged multi-stakeholder initiative by 2025. SSI endeavors to work with all stakeholders across the solar PV sector, namely manufacturers, developers, installers and purchasers, with the objective of fostering ESG principles (responsible sourcing and production in tandem with stewardship of materials) across the supply chain.
- SSI also strives to ensure a just and inclusive energy transition as well as the respect of human rights to enhance end-to-end transparency, sustainability and ESG performance across the solar supply chain.

Businesses actively involved in the solar value chain can apply to join the SSI and have their production sites certified against the SSI Standards (Solar Stewardship Initiative,)

- The SSI provides independent third-party assurance of production sites in the global solar value chain. The SSI ESG Standard, published in December 2023, covers ESG requirements for production sites engaged in the silicon supply chain, from raw materials to modules. The covered requirements are outlined in Table 4.
- The SSI Traceability Standard, to be published in December 2024, is set to take the SSI assurance scheme further. With the combination of the SSI ESG Standard and the SSI Supply Chain Traceability Standard, the SSI will be able to certify exactly how each link of the supply chain is connected, creating the so-called chain of custody (Solar Stewardship Initiative)

| Governance and business ethics  | Environment                           | Human and labour rights            |
|---------------------------------|---------------------------------------|------------------------------------|
| 1. Business integrity           | 6. Greenhouse gas emission management | 12. Human rights                   |
| 2. Policy and management        | 7. Water management                   | 13. Labour rights                  |
| 3. Stakeholders and communities | 8. Waste management                   | 14. Occupational health and safety |
| 4. Transparency                 | 9. Pollution management               |                                    |
| 5. Responsible sourcing         | 10. Biodiversity management           |                                    |
|                                 | 11. Circularity                       |                                    |

*Table 4: Topics Covered by the Solar Stewardship Initiative*

#### **1.4.5 Country Wise GHG Emissions Linked Regulations**

Globally, legislation mandating carbon emission disclosure has gained momentum as governments aim to combat climate change and ensure accountability from businesses. Various countries and regions have introduced laws, regulations, or frameworks requiring companies to disclose their greenhouse gas (GHG) emissions, particularly carbon dioxide (CO<sub>2</sub>), as part of broader efforts to track progress toward climate targets such as the Paris Agreement.

Here's an overview of key global legislation mandating carbon emission disclosures:

*Table 5: Country Wise Legislation Mandating Carbon Emission Disclosures*

| Country             | Regulation-Implementations                                                                                                                                                                                                                        | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| European Union (EU) | Corporate Sustainability Reporting Directive (CSRD) (formerly Non-Financial Reporting Directive, NFRD) is effective from 2024, with the first reporting required in 2025.                                                                         | <ul style="list-style-type: none"> <li>Requires detailed climate-related disclosures, including the company's transition plans toward net-zero emissions.</li> <li>Aligns with the EU's Taxonomy Regulation, which defines what qualifies as environmentally sustainable activities.</li> <li>Additional Legislation: EU Emissions Trading System (ETS) and Sustainable Finance Disclosure Regulation (SFDR)</li> </ul>                                                                                                                                                                                                                                                                                                                                                          |
| United Kingdom      | Streamlined Energy and Carbon Reporting (SECR) Introduced in April 2019                                                                                                                                                                           | <ul style="list-style-type: none"> <li>Requires large UK companies to report their energy use, carbon emissions, and energy efficiency measures.</li> <li>Applies to quoted companies, large unquoted companies, and large Limited Liability Partnerships (LLPs).</li> <li>Builds on the previous Mandatory Carbon Reporting (MCR) regime, which required listed companies to disclose their GHG emissions.</li> <li>TCFD Compliance: From 2022, the UK government also mandates TCFD-aligned climate disclosures for large companies and financial institutions, making the UK the first G20 country to require TCFD reporting. However, it will soon be replaced by newly developed UK Sustainability Reporting Standards (UK SRS) which is based on ISSB Standard.</li> </ul> |
| Canada              | Federal climate-related financial disclosure requirements for large corporations. As of 2025, Canada is phasing in mandatory climate disclosures for federally regulated financial institutions (FRFIs), including banks and insurance companies. | <ul style="list-style-type: none"> <li>Requires large financial institutions to disclose climate-related risks and GHG emissions using the TCFD framework.</li> <li>Applies to companies with assets over certain thresholds and publicly traded companies.</li> <li>Canadian Sustainability Standards Board (CSSB) has published voluntary sustainability reporting standards — the Canadian Sustainability Disclosure Standards (CSDS) - in December 2024. This standard is built upon ISSB Standard which will replace TCFD.</li> <li>The government also aims to integrate climate disclosures in investment and pension fund management.</li> </ul>                                                                                                                         |
| Australia           | Australia has adopted mandatory climate-related financial disclosures for large, medium and small sized companies starting from 1 <sup>st</sup> January 2025.                                                                                     | <ul style="list-style-type: none"> <li>Entities in scope are required to lodge a 'sustainability report' containing climate-related disclosures prepared in accordance with Australian Sustainability Reporting Standards (ASRS), which have been issued by the Australian Accounting Standards Board (AASB)</li> <li>It requires reporting on climate-related financial risks, including emissions and the impact of climate change on business operations.</li> </ul>                                                                                                                                                                                                                                                                                                          |
| New Zealand         | Climate-Related Disclosures (CRD) Bill New Zealand became the first country to pass mandatory climate risk                                                                                                                                        | <ul style="list-style-type: none"> <li>Requires companies, including banks, insurers, and investment managers, to disclose climate-related risks and opportunities based on Aotearoa New Zealand's Climate Standards.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|             |                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | disclosure legislation in 2021.                                                                                                   | <ul style="list-style-type: none"> <li>• Mandatory for large publicly listed companies and financial institutions.</li> <li>• Applies to entities with assets over NZD 1 billion, banks with total assets over NZD 1 billion, and insurance companies with premiums over NZD 250 million.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Japan       | While Japan has not fully mandated carbon disclosures, it has developed SSBJ standards for large companies                        | <ul style="list-style-type: none"> <li>• The Tokyo Stock Exchange encourages listed companies to disclose climate-related risks in line with TCFD.</li> <li>• The Sustainability Standards Board of Japan (SSBJ) has also issued its three sustainability disclosure standards (SSBJ standards) on 5<sup>th</sup> March 2025. The standards are aligned with the ISSB standards with some jurisdiction-specific alternatives.</li> <li>• Following the issuance of the SSBJ Standards, Prime-listed companies are given two years of voluntary compliance period before such rules become mandatory as early as March 2027.</li> <li>• Japan's Corporate Governance Code encourages companies to address sustainability issues, including climate change, within their reporting.</li> <li>• Government initiatives like the Green Growth Strategy aim to support industries in reducing carbon emissions through transparency and regulation.</li> </ul> |
| South Korea | Korea Stock Exchange ESG Guidelines                                                                                               | <ul style="list-style-type: none"> <li>• South Korea encourages companies listed on the Korea Stock Exchange to disclose ESG factors, including carbon emissions.</li> <li>• The country has a voluntary framework for climate-related financial disclosures, with growing pressure to mandate emissions reporting for large companies and certain sectors.</li> <li>• South Korea's K-ETS (Emissions Trading System) also obligates industries with high emissions to report their carbon footprints.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| China       | China has not mandated comprehensive carbon emissions disclosure, but there are movements toward increased transparency.          | <ul style="list-style-type: none"> <li>• China's government encourages large companies to disclose environmental impacts, especially those listed on the Shanghai Stock Exchange.</li> <li>• They are also developing "Sustainability Disclosure Standards for Business Enterprises", a national unified sustainability disclosure standards that reflect the beneficial experience of ISSB Standards.</li> <li>• A growing number of Chinese companies are voluntarily adopting GRI and ISSB standards.</li> <li>• As part of its Dual Carbon Goals (carbon peak by 2030 and carbon neutrality by 2060), China is expected to move toward stricter reporting requirements for industries with high emissions.</li> </ul>                                                                                                                                                                                                                                 |
| Brazil      | Brazilian Securities and Exchange Commission (CVM) ESG Reporting Guidelines                                                       | <ul style="list-style-type: none"> <li>• In 2022, the CVM introduced requirements for publicly listed companies to disclose ESG information, including GHG emissions.</li> <li>• Brazil is developing frameworks for mandatory climate risk disclosures as part of its commitment to the Paris Agreement.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| India       | Business Responsibility and Sustainability Report (BRSR) Introduced by the Securities and Exchange Board of India (SEBI) in 2021. | <ul style="list-style-type: none"> <li>• The BRSR mandates listed companies to disclose ESG data, including carbon emissions, from the 2022-23 fiscal year.</li> <li>• This reporting aligns with India's national sustainability and climate targets, including reducing carbon intensity by 45% by 2030.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### **1.4.6 ESG – To Build a Sustainable Business**

Environmental, Social, and Governance (ESG) factors have become a crucial consideration for investors worldwide. Companies that integrate ESG principles into their operations attract capital by demonstrating sustainability, ethical business practices, and effective risk management.

#### **ESG as a Risk Mitigation Tool**

Companies with strong ESG policies:

- Manage climate-related and regulatory risks more effectively.
- Reduce exposure to fines, lawsuits, and reputational damage.
- Foster ethical governance, minimizing corruption and fraud risks.
- Strengthen supply chain resilience, reducing operational disruptions.

#### **Enhanced Financial Performance & Competitive Advantage**

Numerous studies indicate that ESG-compliant companies achieve superior long-term financial performance.

Benefits include:

- Improved operational efficiency, leading to cost savings in energy, waste management, and resource utilization.
- Higher revenue growth due to increased customer trust and loyalty.
- Better valuation multiples and lower capital costs compared to non-ESG firms.
- Outperformance in economic downturns, as observed during the COVID-19 crisis.

#### **Growing ESG Investment Opportunities**

The ESG investment landscape is rapidly expanding, with sustainable assets under management (AUM) exceeding **\$40 trillion globally**.

Investment opportunities include:

- ESG Exchange-Traded Funds (ETFs) and Mutual Funds.
- Green bonds and sustainability-linked loans.
- Inclusion in ESG indices such as the MSCI ESG Index and Dow Jones Sustainability Index.

#### **Regulatory & Compliance Advantages**

Governments and regulatory bodies worldwide are implementing stringent ESG reporting requirements, such as:

- EU Taxonomy and Sustainable Finance Disclosure Regulation (SFDR) in Europe.
- Task Force on Climate-related Financial Disclosures (TCFD) framework.
- Business Responsibility and Sustainability Reporting (BRSR) by SEBI in India. Companies that proactively adopt ESG frameworks position themselves ahead of compliance requirements, avoiding legal and financial penalties.

## **Meeting Investor Demand & Fiduciary Responsibility**

Institutional investors, including pension funds and sovereign wealth funds, are shifting capital toward ESG-focused investments.

This shift is driven by:

- Increased investor demand for sustainable investment options.
- ESG integration as part of fiduciary duty to ensure long-term value creation.
- Greater alignment between investment strategies and global sustainability goals.

## **Resilience in Market Downturns**

Empirical evidence suggests that ESG-focused companies demonstrate stronger resilience during economic downturns by:

- Prioritizing employee well-being and corporate social responsibility.
- Strengthening supply chain ethics and risk management.
- Attracting long-term investors who value stability over short-term gains.

## **Improved Brand Reputation & Customer Loyalty**

Consumers are increasingly favouring brands with strong sustainability commitments. ESG-focused companies:

- Build brand loyalty and trust, reducing customer acquisition costs.
- Enhance their corporate reputation, attracting ethical investors.
- Differentiate themselves from competitors in a saturated market.

## **Stronger Human Capital & Innovation**

ESG-aligned companies attract and retain top talent, leading to:

- Higher employee engagement and productivity.
- A culture of innovation that fosters breakthrough technologies (e.g., renewable energy, circular economy solutions).
- Improved diversity and inclusion, which correlates with better financial performance.

## **Companies that adopt ESG frameworks gain a competitive advantage by:**

- Attracting long-term investors.
- Reducing financial and operational risks.
- Aligning with regulatory expectations and global sustainability goals.
- Enhancing their brand reputation and financial performance.

## 2 ENVIRONMENTAL

### 2.1 Climate Change

As the world becomes more conscious of climate change, industries are under increasing pressure to manage their environmental impact. Climate change refers to significant shifts in global temperatures and weather patterns over time. While Earth's climate has naturally fluctuated over millions of years, the current phase of change is largely driven by human activities.

Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above pre-industrial level (1850–1900) in 2011–2020. Global warming is likely to reach 1.5°C between 2030 and 2052 if it continues to increase at the current rate.

Human-caused climate change is already affecting many weather and climate extremes in every region across the globe. This has led to widespread adverse impacts on food and water security, human health and on economies and society and related losses and damages to nature and people. Vulnerable communities who have historically contributed the least to current climate change are disproportionately affected.

Climate change represents an urgent and potentially irreversible threat to human societies and the planet. In recognition of this, the overwhelming majority of countries around the world adopted the Paris Agreement in December 2015, the central aim of which includes pursuing efforts to limit global temperature rise to 1.5°C.

Figure 11 shows, the causal chain from emissions to resulting warming of the climate system. Emissions of GHG have increased rapidly over recent decades.

Panel (a): Global net anthropogenic GHG emissions include CO<sub>2</sub> from fossil fuel combustion and industrial processes (CO<sub>2</sub>-FFI) (dark green); net CO<sub>2</sub> from land use, land-use change and forestry (CO<sub>2</sub>-LULUCF) (green); CH<sub>4</sub>; N<sub>2</sub>O; and fluorinated gases (HFCs, PFCs, SF<sub>6</sub>, NF<sub>3</sub>) (light blue). These emissions have led to increases in the atmospheric concentrations of several GHGs including the three major well-mixed GHGs CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O

Panel (b), annual values: To indicate their relative importance each subpanel's vertical extent for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O is scaled to match the assessed individual direct effect (and, in the case of CH<sub>4</sub> indirect effect via atmospheric chemistry impacts on tropospheric ozone) of historical emissions on temperature change from 1850–1900 to 2010–2019. This estimate arises from an assessment of effective radiative forcing and climate sensitivity. The global surface temperature (shown as annual anomalies from an 1850–1900 baseline) has increased by around 1.1°C since 1850–1900.

Panel (c): The vertical bar on the right shows the estimated temperature (very likely range) during the warmest multi-century period in at least the last 100,000 years, which occurred around 6500 years ago during the current interglacial period (Holocene). Prior to that, the next most recent warm period was about 125,000 years ago, when the assessed multi-century

temperature range [0.5°C to 1.5°C] overlaps the observations of the most recent decade. These past warm periods were caused by slow (multi-millennial) orbital variations. Formal detection and attribution studies synthesize information from climate models and observations and show that the best estimate is that all the warming observed between 1850–1900 and 2010–2019 is caused by humans.

Panel (d): The panel shows temperature change attributed to: total human influence; its decomposition into changes in GHG concentrations and other human drivers (aerosols, ozone and land-use change (land-use reflectance)); solar and volcanic drivers; and internal climate variability.

Figure 12 shows the Impact from human caused climate change.

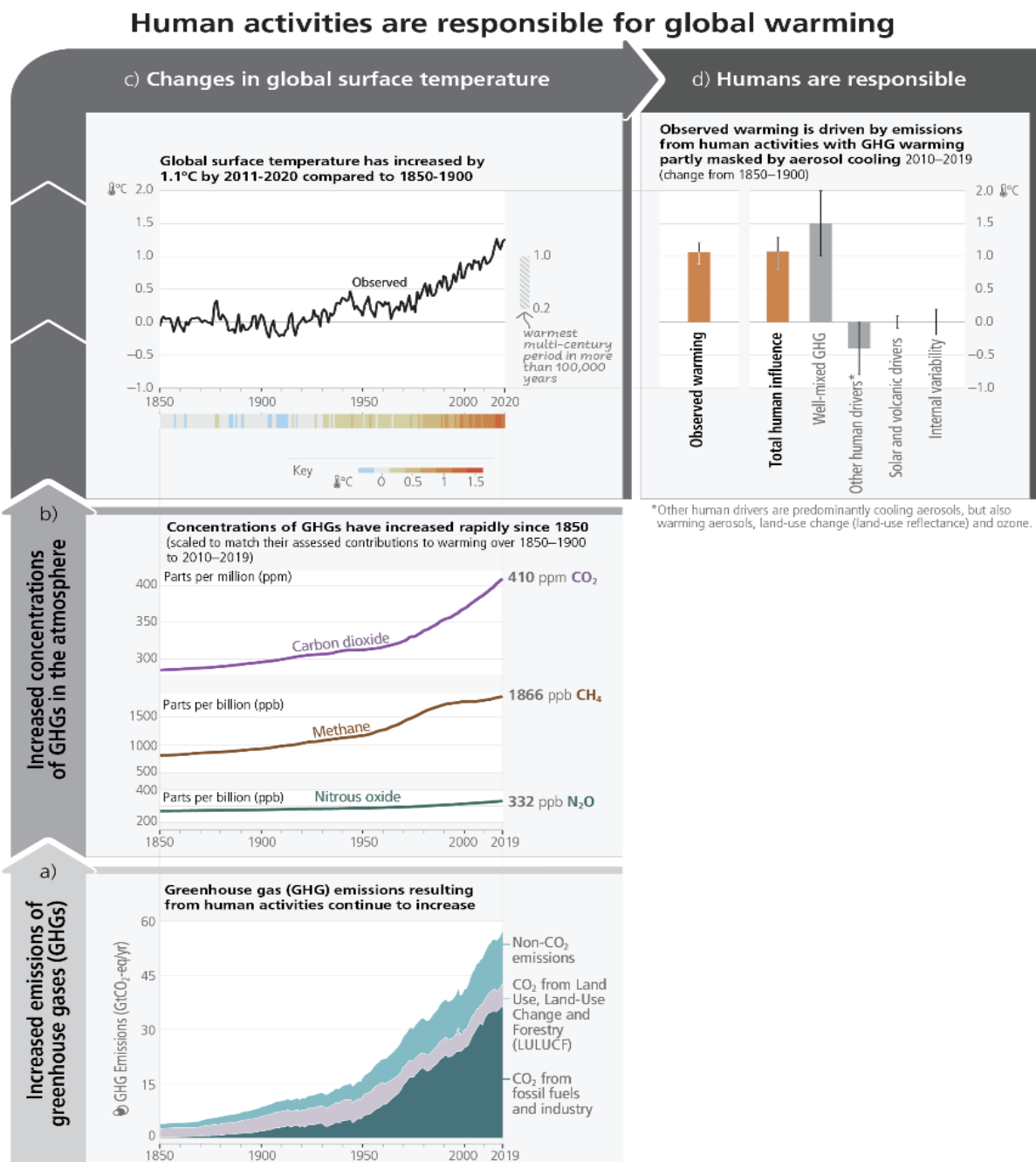
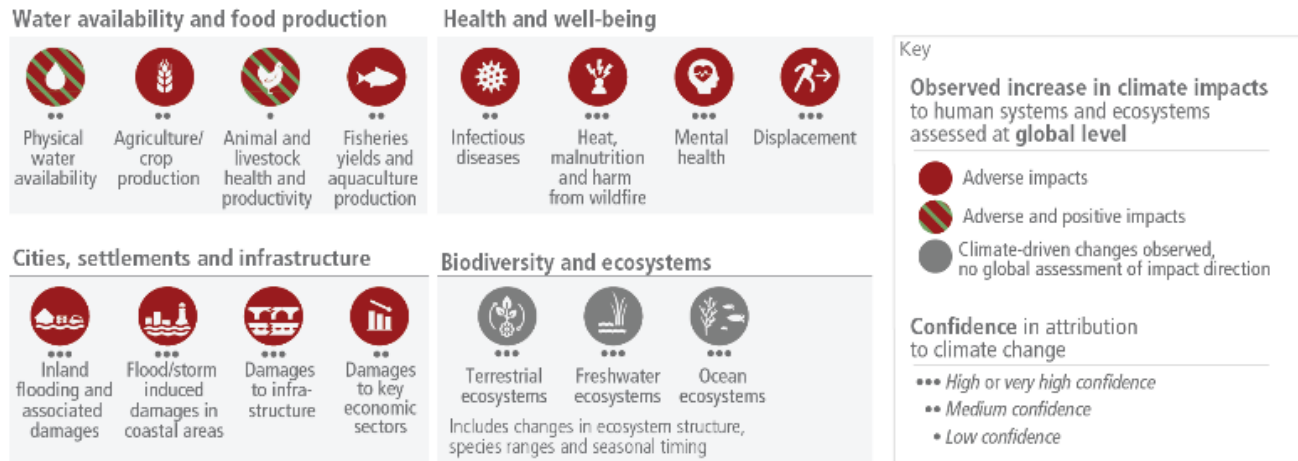


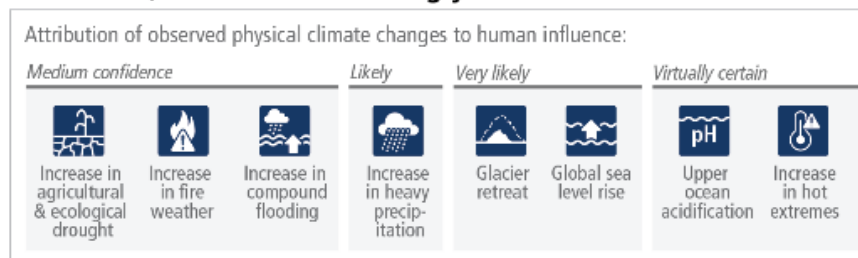
Figure 11: Human activities are responsible for global warming

## Adverse impacts from human-caused climate change will continue to intensify

### a) Observed widespread and substantial impacts and related losses and damages attributed to climate change



### b) Impacts are driven by changes in multiple physical climate conditions, which are increasingly attributed to human influence



### c) The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near-term

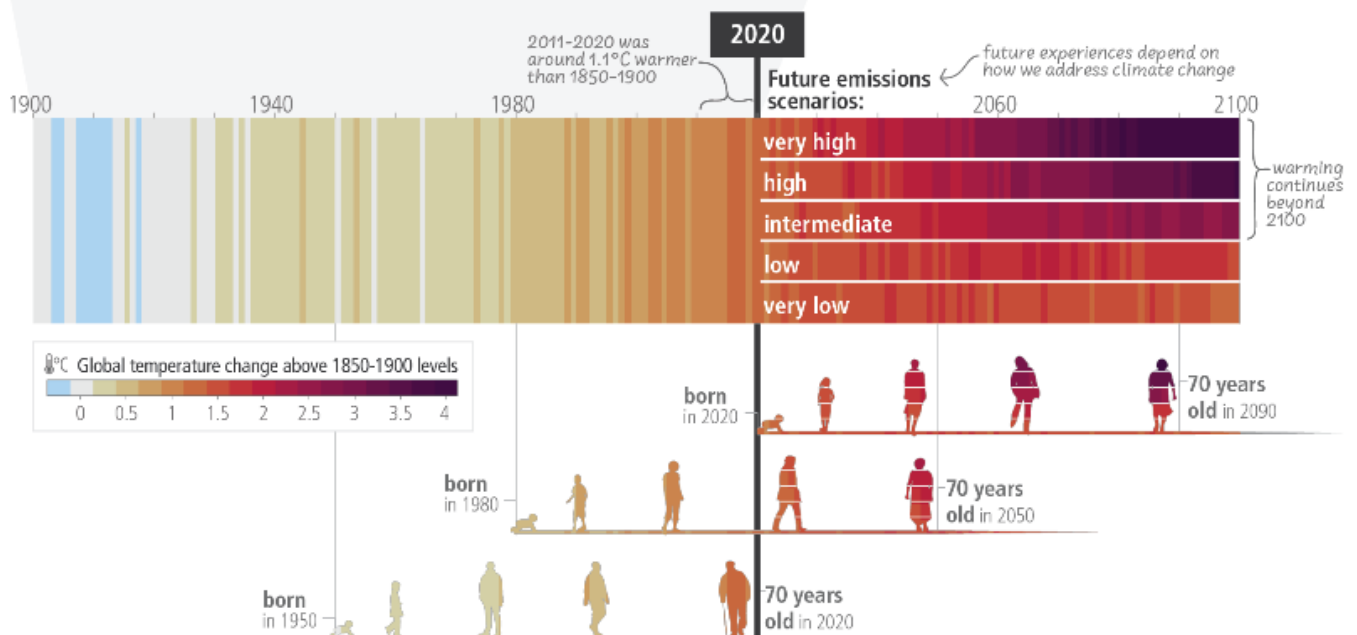


Figure 12: Impact from human caused climate change

## 2.2 Carbon Footprint

### 2.2.1 Overview

1. Standard used for calculations:  
GHG Protocol Corporate Accounting and Reporting Standard
2. GHG Accounting and Reporting Principle:
  - **RELEVANCE:** Ensure the GHG inventory appropriately reflects the GHG emissions of the company and serves the decision-making needs of users both internal and external to the company.
  - **COMPLETENESS:** Account for and report on all GHG emission sources and activities within the chosen inventory boundary. Disclose and justify any specific exclusions.
  - **CONSISTENCY:** Use consistent methodologies to allow for meaningful comparisons of emissions over time. Transparently document any changes to the data, inventory boundary, methods, or any other relevant factors in the time series.
  - **TRANSPARENCY:** Address all relevant issues in a factual and coherent manner, based on a clear audit trail. Disclose any relevant assumptions and make appropriate references to the accounting and calculation methodologies and data sources used.
  - **ACCURACY:** Ensure that the quantification of GHG emissions is systematically neither over nor under actual emissions, as far as can be judged, and that uncertainties are reduced as far as practicable. Achieve sufficient accuracy to enable users to make decisions with reasonable assurance as to the integrity of the reported information.
3. Greenhouses Gases (GHG):  
GHG Protocol Corporate Accounting and Reporting Standard covers the accounting and reporting of seven GHGs covered by the Kyoto Protocol.
  1. Carbon dioxide (CO<sub>2</sub>)
  2. Methane (CH<sub>4</sub>)
  3. Nitrous oxide (N<sub>2</sub>O)
  4. Hydrofluorocarbons (HFCs)
  5. Perfluorocarbons (PFCs)
  6. Sulphur hexafluoride (SF<sub>6</sub>)
  7. Nitrogen trifluoride (NF<sub>3</sub>)
4. Overview of the scopes:

As per GHG Protocol the GHG emissions are classified into two types (Direct emissions & Indirect emissions) and three Scopes (Scope 1, Scope 2 & Scope 3).

The table 6 shows the definition of the Scopes.

| Emissions type   | Scope   | Definition                                                                                                                                                | Examples                                                                                                                                                        |
|------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Direct emissions | Scope 1 | Emissions from operations that are owned or controlled by the reporting company                                                                           | Emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment |
|                  | Scope 2 | Emissions from the generation of purchased or acquired electricity, steam, heating, or cooling consumed by the reporting company                          | Use of purchased electricity, steam, heating, or cooling                                                                                                        |
|                  | Scope 3 | All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions | Production of purchased products, transportation of purchased products, or use of sold products                                                                 |

Table 6: Definition of the Scopes

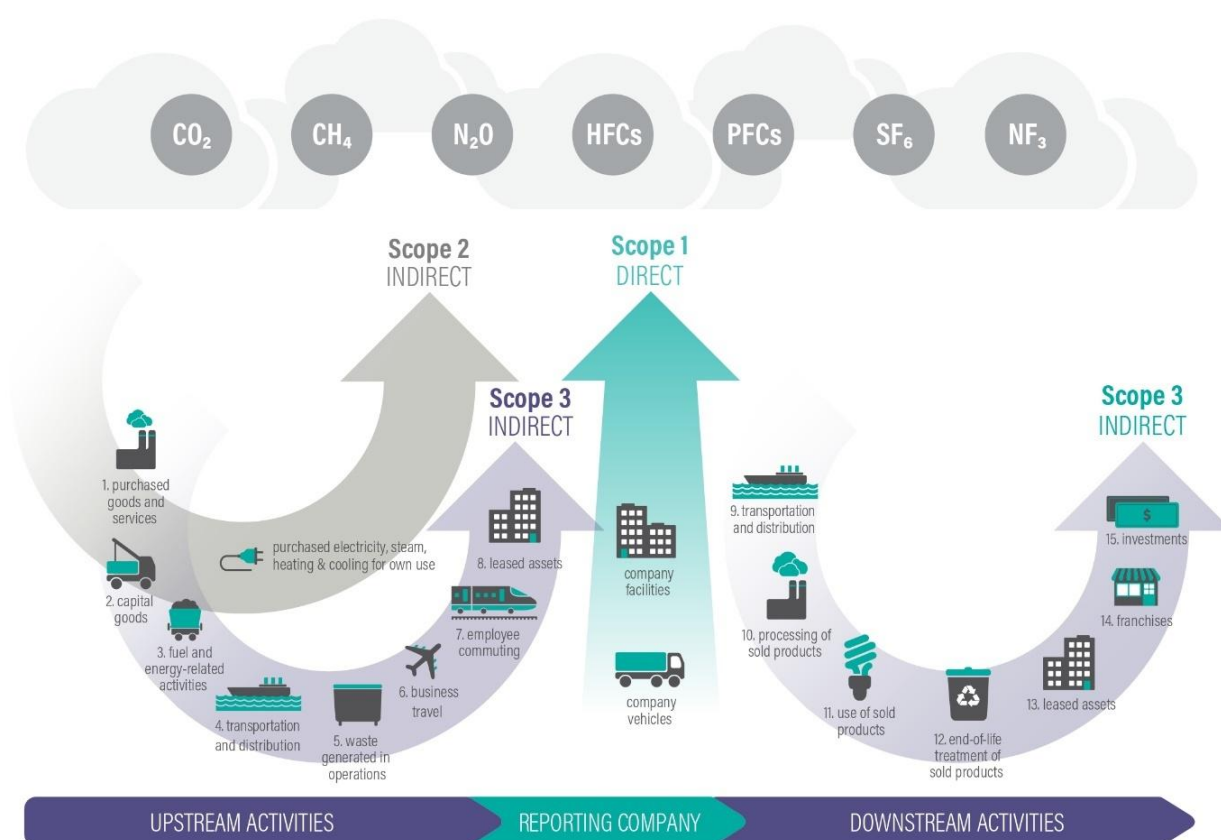


Figure 13: Overview of the Scopes

Scope 3 Emissions: Scope 3 Emissions are further classified into two category which is Upstream Scope 3 Emissions and Downstream Scope 3 Emissions.

*Table 7: Upstream Scope 3 Emissions*

**Upstream scope 3 emissions**

| Category                                                                           | Category description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Minimum boundary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Purchased goods and services</b>                                             | <ul style="list-style-type: none"> <li>Extraction, production, and transportation of goods and services purchased or acquired by the reporting company in the reporting year, not otherwise included in Categories 2 - 8</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <ul style="list-style-type: none"> <li>All upstream (cradle-to-gate) emissions of purchased goods and services</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>2. Capital goods</b>                                                            | <ul style="list-style-type: none"> <li>Extraction, production, and transportation of capital goods purchased or acquired by the reporting company in the reporting year</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <ul style="list-style-type: none"> <li>All upstream (cradle-to-gate) emissions of purchased capital goods</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>3. Fuel- and energy-related activities (not included in scope 1 or scope 2)</b> | <ul style="list-style-type: none"> <li>Extraction, production, and transportation of fuels and energy purchased or acquired by the reporting company in the reporting year, not already accounted for in scope 1 or scope 2, including: <ul style="list-style-type: none"> <li><b>a.</b> Upstream emissions of purchased fuels (extraction, production, and transportation of fuels consumed by the reporting company)</li> <li><b>b.</b> Upstream emissions of purchased electricity (extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, and cooling consumed by the reporting company)</li> <li><b>c.</b> Transmission and distribution (T&amp;D) losses (generation of electricity, steam, heating and cooling that is consumed (i.e., lost) in a T&amp;D system) – reported by end user</li> <li><b>d.</b> Generation of purchased electricity that is sold to end users (generation of electricity, steam, heating, and cooling that is purchased by the reporting company and sold to end users) – reported by utility company or energy retailer only</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li><b>a.</b> For upstream emissions of purchased fuels: All upstream (cradle-to-gate) emissions of purchased fuels (from raw material extraction up to the point of, but excluding combustion)</li> <li><b>b.</b> For upstream emissions of purchased electricity: All upstream (cradle-to-gate) emissions of purchased fuels (from raw material extraction up to the point of, but excluding, combustion by a power generator)</li> <li><b>c.</b> For T&amp;D losses: All upstream (cradle-to-gate) emissions of energy consumed in a T&amp;D system, including emissions from combustion</li> <li><b>d.</b> For generation of purchased electricity that is sold to end users: Emissions from the generation of purchased energy</li> </ul> |

## Upstream scope 3 emissions

| Category                                    | Category description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Minimum boundary                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4. Upstream transportation and distribution | <ul style="list-style-type: none"> <li>Transportation and distribution of products purchased by the reporting company in the reporting year between a company's tier 1 suppliers and its own operations (in vehicles and facilities not owned or controlled by the reporting company)</li> <li>Transportation and distribution services purchased by the reporting company in the reporting year, including inbound logistics, outbound logistics (e.g., of sold products), and transportation and distribution between a company's own facilities (in vehicles and facilities not owned or controlled by the reporting company)</li> </ul> | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of transportation and distribution providers that occur during use of vehicles and facilities (e.g., from energy use)</li> <li><i>Optional:</i> The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure</li> </ul> |
| 5. Waste generated in operations            | <ul style="list-style-type: none"> <li>Disposal and treatment of waste generated in the reporting company's operations in the reporting year (in facilities not owned or controlled by the reporting company)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of waste management suppliers that occur during disposal or treatment</li> <li><i>Optional:</i> Emissions from transportation of waste</li> </ul>                                                                                                         |
| 6. Business travel                          | <ul style="list-style-type: none"> <li>Transportation of employees for business-related activities during the reporting year (in vehicles not owned or operated by the reporting company)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of transportation carriers that occur during use of vehicles (e.g., from energy use)</li> <li><i>Optional:</i> The life cycle emissions associated with manufacturing vehicles or infrastructure</li> </ul>                                               |
| 7. Employee commuting                       | <ul style="list-style-type: none"> <li>Transportation of employees between their homes and their worksites during the reporting year (in vehicles not owned or operated by the reporting company)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of employees and transportation providers that occur during use of vehicles (e.g., from energy use)</li> <li><i>Optional:</i> Emissions from employee teleworking</li> </ul>                                                                              |
| 8. Upstream leased assets                   | <ul style="list-style-type: none"> <li>Operation of assets leased by the reporting company (lessee) in the reporting year and not included in scope 1 and scope 2 – reported by lessee</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of lessors that occur during the reporting company's operation of leased assets (e.g., from energy use)</li> <li><i>Optional:</i> The life cycle emissions associated with manufacturing or constructing leased assets</li> </ul>                         |

Table 8: Downstream Scope 3 Emissions

### Downstream scope 3 emissions

| Category                                      | Category description                                                                                                                                                                                                                                                                                                                                                     | Minimum boundary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9. Downstream transportation and distribution | <ul style="list-style-type: none"> <li>Transportation and distribution of products sold by the reporting company in the reporting year between the reporting company's operations and the end consumer (if not paid for by the reporting company), including retail and storage (in vehicles and facilities not owned or controlled by the reporting company)</li> </ul> | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of transportation providers, distributors, and retailers that occur during use of vehicles and facilities (e.g., from energy use)</li> <li><i>Optional:</i> The life cycle emissions associated with manufacturing vehicles, facilities, or infrastructure</li> </ul>                                                                                                                                                                                                                                                                    |
| 10. Processing of sold products               | <ul style="list-style-type: none"> <li>Processing of intermediate products sold in the reporting year by downstream companies (e.g., manufacturers)</li> </ul>                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of downstream companies that occur during processing (e.g., from energy use)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 11. Use of sold products                      | <ul style="list-style-type: none"> <li>End use of goods and services sold by the reporting company in the reporting year</li> </ul>                                                                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>The direct use-phase emissions of sold products over their expected lifetime (i.e., the scope 1 and scope 2 emissions of end users that occur from the use of: products that directly consume energy (fuels or electricity) during use; fuels and feedstocks; and GHGs and products that contain or form GHGs that are emitted during use)</li> <li><i>Optional:</i> The indirect use-phase emissions of sold products over their expected lifetime (i.e., emissions from the use of products that indirectly consume energy (fuels or electricity) during use)</li> </ul> |
| 12. End-of-life treatment of sold products    | <ul style="list-style-type: none"> <li>Waste disposal and treatment of products sold by the reporting company (in the reporting year) at the end of their life</li> </ul>                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of waste management companies that occur during disposal or treatment of sold products</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 13. Downstream leased assets                  | <ul style="list-style-type: none"> <li>Operation of assets owned by the reporting company (lessor) and leased to other entities in the reporting year, not included in scope 1 and scope 2 – reported by lessor</li> </ul>                                                                                                                                               | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of lessees that occur during operation of leased assets (e.g., from energy use).</li> <li><i>Optional:</i> The life cycle emissions associated with manufacturing or constructing leased assets</li> </ul>                                                                                                                                                                                                                                                                                                                               |

### Downstream scope 3 emissions

| Category               | Category description                                                                                                                                                                             | Minimum boundary                                                                                                                                                                                                                                                                 |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>14. Franchises</b>  | <ul style="list-style-type: none"> <li>Operation of franchises in the reporting year, not included in scope 1 and scope 2 – reported by franchisor</li> </ul>                                    | <ul style="list-style-type: none"> <li>The scope 1 and scope 2 emissions of franchisees that occur during operation of franchises (e.g., from energy use)</li> <li><i>Optional:</i> The life cycle emissions associated with manufacturing or constructing franchises</li> </ul> |
| <b>15. Investments</b> | <ul style="list-style-type: none"> <li>Operation of investments (including equity and debt investments and project finance) in the reporting year, not included in scope 1 or scope 2</li> </ul> | <ul style="list-style-type: none"> <li>See the description of category 15 (Investments) in section 5.5 for the required and optional boundaries</li> </ul>                                                                                                                       |

## 2.2.2 Methodology

- Organization Boundary:
  - Approach used: Operational Control Approach
  - Boundary:
    - ISPL Corporate Office, Hitech city, Hyderabad, Telangana
    - ISPL Manufacturing Facility, Ramayapatnam, Andhra Pradesh
- Operational Boundary:

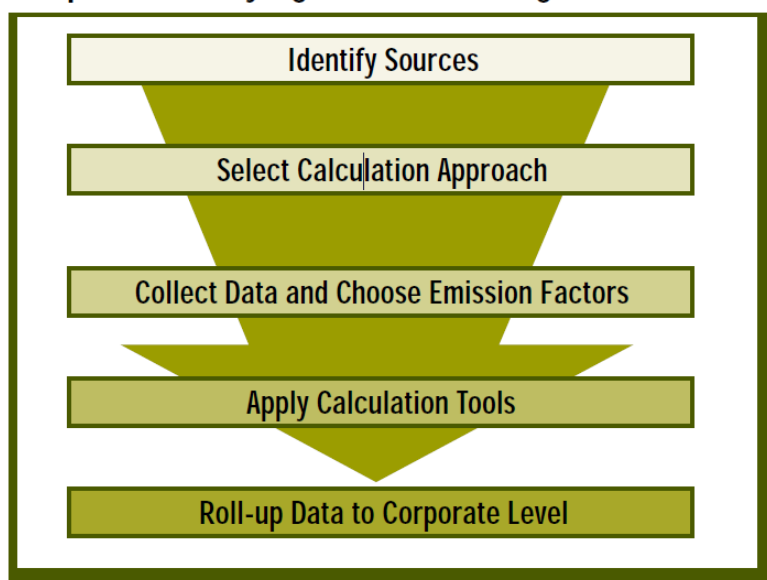
| Sl.no | Indicators                                                    | ISPL,<br>Corporate<br>Office | ISPL,<br>Ramayapatnam |
|-------|---------------------------------------------------------------|------------------------------|-----------------------|
| 1.    | Scope 1 (Direct Emissions)                                    |                              |                       |
|       | Stationary combustion source (e.g. DG set)                    | ✓                            | ✓                     |
|       | Mobile emission source (e.g. Company Owned Vehicle)           | ✓                            | ✓                     |
|       | Fugitive emission source (e.g. Refrigerant and CO2 refilling) | ✓                            | ✓                     |
| 2.    | Scope 2 (Indirect Emissions)                                  |                              |                       |
|       | Purchased Electricity                                         | ✓                            | ✓                     |
|       | Purchased heat or cooling                                     | ✓                            | ✓                     |
| 3.    | Scope 3 (Other Indirect Emissions)                            |                              |                       |
|       | Category 1: Purchased Goods and Services                      | N/A                          | ✗                     |
|       | Category 2: Capital Goods                                     | N/A                          | ✗                     |
|       | Category 3: Fuel & Energy related activities                  | ✓                            | ✓                     |
|       | Category 4: Upstream Transportation and Distribution          | N/A                          | ✓                     |
|       | Category 5: Waste Generation in Operations                    | ✓                            | ✓                     |
|       | Category 6: Business Travel                                   | ✓                            | ✓                     |
|       | Category 7: Employee Commute                                  | ✓                            | ✓                     |
|       | Category 8: Upstream Leased Assets                            | N/A                          | N/A                   |
|       | Category 9: Downstream Transportation and Distribution        | N/A                          | ✗                     |
|       | Category 10: Processing of Sold Products                      | N/A                          | ✗                     |

|  |                                                     |     |     |
|--|-----------------------------------------------------|-----|-----|
|  | Category 11: Use of sold products                   | N/A | ×   |
|  | Category 12: End of Life treatment of Sold Products | N/A | ×   |
|  | Category 13: Downstream Leased Assets               | N/A | N/A |
|  | Category 14: Franchises                             | N/A | N/A |
|  | Category 15: Investments                            | N/A | N/A |

*Table 9 : Operational Boundary*

3. Reason for Exclusion in Scope 3 Categories at ISPL, Ramayapatnam:
  - a. Not applicable: Categories 8, 13, 14 & 15.
  - b. Not relevant: Since production is not started yet so the categories 9, 10, 11, & 12 are excluded.
  - c. Due to Complexity: Categories 1 & 2
4. Identify GHG emissions sources:

#### Steps in identifying and calculating GHG emissions



*Figure 14: Approach to Calculate GHG Emissions*

5. Calculation method used in Scope 3:

| <b>Scope 3 Categories</b>                            | <b>Calculation Method Used</b> |
|------------------------------------------------------|--------------------------------|
| Category 3: Fuel & Energy related activities         | Average-data Method            |
| Category 4: Upstream Transportation and Distribution | Distance-based Method          |
| Category 5: Waste Generation in Operations           | Waste-type-specific method     |
| Category 6: Business Travel                          | Distance-based method          |
| Category 7: Employee Commute                         | Distance-based method          |

*Table 10: Calculation method used in Scope 3*

6. Activity Data Collected:

Scope 1:

| Scope 1 Activity Data |                                                                    |     |                        |                    |                       |                    |
|-----------------------|--------------------------------------------------------------------|-----|------------------------|--------------------|-----------------------|--------------------|
| Sr. No.               | Emission Source                                                    | UOM | FY 23-24 (Base year)   |                    | FY 24-25              |                    |
|                       |                                                                    |     | ISPL, Corporate office | ISPL, Ramayapatnam | ISPL Corporate office | ISPL, Ramayapatnam |
| 1.                    | Diesel used in DG sets                                             | L   | 0.00                   | 6495.3             | 0                     | 71132              |
| 2.                    | Company Owned Vehicles                                             |     |                        |                    |                       |                    |
|                       | Diesel                                                             | L   | 0.00                   | 2309.87            | 0                     | 17841              |
|                       | Petrol                                                             | L   | 0.00                   | 0.00               | 0                     | 82                 |
| 3.                    | Diesel (hydras, tractor cranes, forklifts tractors)                | L   | 0.00                   | 0.00               | 0                     | 20918              |
| 4.                    | LPG used in Canteen                                                | kg  | 0.00                   | 0.00               | 0                     | 4978               |
| 5.                    | Refrigerant used/refilled                                          |     |                        |                    |                       |                    |
|                       | R 22                                                               | kg  | 0.00                   | 0.00               | 0                     | 15                 |
|                       | R 32                                                               | kg  | 0.00                   | 0.00               | 0                     | 3                  |
|                       | R 410 A                                                            | kg  | 0.00                   | 0.00               | 0                     | 0                  |
|                       | R 134A                                                             | kg  | 0.00                   | 0.00               | 0                     | 186                |
| 6.                    | CO <sub>2</sub> used for refilling into fire extinguisher (Top-up) | kg  | 0.00                   | 0.00               | 0                     | 0                  |

Table 11: Scope 1 Activity Data

Scope 2:

| Scope 2 Activity Data |                              |     |                        |                    |                        |                    |
|-----------------------|------------------------------|-----|------------------------|--------------------|------------------------|--------------------|
| S.No                  | Emission Source              | UOM | FY 23-24 (Base year)   |                    | FY 24-25               |                    |
|                       |                              |     | ISPL, Corporate office | ISPL, Ramayapatnam | ISPL, Corporate office | ISPL, Ramayapatnam |
| 1                     | Net Power consumed from GRID | kWh | 89918.56               | 3880.00            | 146157                 | 876170             |
| 2                     | Purchased DG Power           | kWh | 928.063                | -                  | 474                    | -                  |
| 3                     | Purchased Cooling            | kWh | 224076                 | -                  | 426770                 | -                  |

Table 12: Scope 2 Activity Data

Scope 3:

Scope 3 activity data is captured in Scope 3 questionnaire.

7. Emission Factors Used:

| Emission Factors (FY 23-24) (Baseline Year) |                                     |                  |                             |                                  |
|---------------------------------------------|-------------------------------------|------------------|-----------------------------|----------------------------------|
| Scope 1 & 2                                 |                                     |                  |                             |                                  |
| S.No                                        | Emission Source                     | Emission Factors | UoM                         | Source                           |
| 1                                           | Diesel/HSD                          | 2.925            | kgCO <sub>2</sub> /l        | IPCC                             |
|                                             | Petrol                              | 2.303            | kgCO <sub>2</sub> /l        | IPCC                             |
| 2                                           | LPG Consumption                     | 2.992            | kgCO <sub>2</sub> e/kg      | IPCC                             |
| 6                                           | R- 22                               | 1960             | kg CO <sub>2</sub> e/kg     | IPCC (AR5)                       |
| 7                                           | R- 32                               | 771              | kg CO <sub>2</sub> e/kg     | IPCC (AR5)                       |
| 8                                           | R- 410                              | 2255.5           | kg CO <sub>2</sub> e/kg     | IPCC (AR5)                       |
| 9                                           | R-134a.                             | 1530             | kg CO <sub>2</sub> e/kg     | IPCC (AR5)                       |
| 10                                          | Grid Electricity                    | 0.727            | kg CO <sub>2</sub> e/kwh    | Central Electricity Authority    |
| Scope 3                                     |                                     |                  |                             |                                  |
| Category                                    | Emission Source                     | Emission Factor  | UOM                         | Source                           |
| C3                                          | Petrol                              | 0.6066           | kgCO <sub>2</sub> e/Ltr     | DEFRA                            |
|                                             | Diesel                              | 0.6241           | kgCO <sub>2</sub> e/Ltr     | DEFRA                            |
|                                             | LPG                                 | 0.3493           | kgCO <sub>2</sub> e/T       | DEFRA                            |
|                                             | Grid electricity WTT                | 0.1675           | TCO <sub>2</sub> e/MWh      | WRI                              |
|                                             | Electricity T&D 2022-23             | 19.16%           | %                           | India Climate & Energy Dashboard |
|                                             | Electricity 2022-23                 | 0.727            | kgCO <sub>2</sub> e/kWh     | Central Electricity Authority    |
|                                             | Refrigerant - R22                   | 4.2600           | kgCO <sub>2</sub> e/kg      | IPCC                             |
|                                             | Refrigerant - R32                   | 10.0100          | kgCO <sub>2</sub> e/kg      | IPCC                             |
|                                             | Refrigerant - R410A                 | 10.3500          | kgCO <sub>2</sub> e/kg      | IPCC                             |
|                                             | Refrigerant - R134A                 | 10.4800          | kgCO <sub>2</sub> e/kg      | IPCC                             |
|                                             | Air                                 | Default          | kg CO <sub>2</sub> e/pax-km | ICAO Tool                        |
| C6                                          | Rail                                | 0.0078           | kg CO <sub>2</sub> e/pax-km | India GHG Program                |
|                                             | Road - Car - Petrol Sedan (<1600CC) | 0.1530           | kg CO <sub>2</sub> e/km     | India GHG Program                |
|                                             | Road - bus                          | 0.0152           | kg CO <sub>2</sub> e/pax-km | India GHG Program                |
|                                             |                                     |                  |                             |                                  |
| C7                                          | Car-Sedan (<1600CC)                 | 0.1530           | kg CO <sub>2</sub> e/km     | India GHG Program                |
|                                             | Motorcycle (<135CC)                 | 0.0356           | kg CO <sub>2</sub> e/km     | India GHG Program                |
|                                             | Bus                                 | 0.0152           | kg CO <sub>2</sub> e/pax-km | India GHG Program                |
| C4 & C9                                     | Road – LDV (<3.5T)                  | 0.0877           | kg CO <sub>2</sub> e/ton-km | India GHG Program                |
|                                             | Road - MDV(<12T)                    | 0.0741           | kg CO <sub>2</sub> e/ton-km | India GHG Program                |
|                                             | Sea- Bulk Carrier cargo ship        | 0.0035           | kg CO <sub>2</sub> e/ton-km | DEFRA                            |
|                                             | Road - HDV(>12T)                    | 0.0615           | kg CO <sub>2</sub> e/ton-km | India GHG Program                |

Table 13: Emission Factors Used for FY 23-24 GHG Emission Calculations

| Emission Factors (FY24-25) |                                   |                  |                             |                                        |
|----------------------------|-----------------------------------|------------------|-----------------------------|----------------------------------------|
| Scope 1 & 2                |                                   |                  |                             |                                        |
| S.No                       | Emission Source                   | Emission Factors | UoM                         | Source                                 |
| 1                          | Diesel/HSD                        | 2.925            | kgCO <sub>2</sub> e/l       | GHG Protocol                           |
| 2                          | LPG Consumption                   | 2.992            | tCO <sub>2</sub> e/t        | GHG Protocol                           |
| 3                          | FO/Residual fuel oil              | 3.023            | kgCO <sub>2</sub> e/l       | GHG Protocol                           |
| 4                          | Petrol                            | 2.303            | kgCO <sub>2</sub> e/l       | GHG Protocol                           |
| 5                          | CNG/Natural Gas                   | 2.701            | tCO <sub>2</sub> e/t        | GHG Protocol                           |
| 8                          | R- 22                             | 1960             | kg CO <sub>2</sub> e/kg     | IPCC (AR6)                             |
| 9                          | R- 32                             | 771              | kg CO <sub>2</sub> e/kg     | IPCC (AR6)                             |
| 10                         | R- 410                            | 2255.5           | kg CO <sub>2</sub> e/kg     | IPCC (AR6)                             |
| 11                         | R-134a                            | 1530             | kg CO <sub>2</sub> e/kg     | IPCC (AR6)                             |
| 12                         | Grid Electricity 2023-24 (v20)    | 0.727            | tCO <sub>2</sub> /MWh       | Central Electricity Authority of India |
| Scope 3                    |                                   |                  |                             |                                        |
| Category                   | Emission Source                   | Emission Factor  | UOM                         | Source                                 |
| C3                         | Petrol                            | 0.6066           | kgCO <sub>2</sub> e/Ltr     | DEFRA – 2025                           |
|                            | Biomass                           | 0.0304           | T CO <sub>2</sub> e/T       | DEFRA – 2025                           |
|                            | Diesel                            | 0.6241           | kgCO <sub>2</sub> e/Ltr     | DEFRA – 2025                           |
|                            | LPG                               | 0.3493           | kgCO <sub>2</sub> e/kg      | DEFRA – 2025                           |
|                            | FO                                | 0.7149           | kgCO <sub>2</sub> e/Ltr     | DEFRA – 2025                           |
|                            | Acetylene                         | 4.4334           | kgCO <sub>2</sub> e/kg      | IPCC guidelines                        |
|                            | Grid electricity WTT              | 0.1675           | TCO <sub>2</sub> e/MWh      | WRI                                    |
|                            | Electricity T&D 2023-24           | 19.16            | %                           | India Climate & Energy Dashboard       |
|                            | Grid Electricity 2023-24 (v20)    | 0.727            | tCO <sub>2</sub> /MWh       | Central Electricity Authority of India |
|                            | Refrigerant - R22                 | 4.2600           | kgCO <sub>2</sub> e/kg      | MDPI                                   |
|                            | Refrigerant - R32                 | 10.0100          | kgCO <sub>2</sub> e/kg      | MDPI                                   |
|                            | Refrigerant - R410A               | 10.3500          | kgCO <sub>2</sub> e/kg      | MDPI                                   |
|                            | Refrigerant - R134A               | 10.4800          | kgCO <sub>2</sub> e/kg      | MDPI                                   |
| C6                         | Air                               | Default          | kg CO <sub>2</sub> /pax-km  | ICAO Tool                              |
|                            | Rail                              | 0.0078           | kg CO <sub>2</sub> e/pax-km | India GHG Program                      |
|                            | Road - Car - Petrol Sedan (<1600) | 0.1530           | kg CO <sub>2</sub> e/km     | India GHG Program                      |
|                            | Road - bus                        | 0.0152           | kg CO <sub>2</sub> e/pax-km | India GHG Program                      |
| C7                         | Car-Sedan(<1600CC)                | 0.1410           | kg CO <sub>2</sub> e/km     | India GHG Program                      |
|                            | Motorcycle(<135CC)                | 0.0356           | kg CO <sub>2</sub> e/km     | India GHG Program                      |
|                            | Bus                               | 0.0152           | kg CO <sub>2</sub> e/pax-km | India GHG Program                      |
|                            | Rail                              | 0.0078           | kg CO <sub>2</sub> e/pax-km | India GHG Program                      |
| C4 & C9                    | Road – LDV (<3.5T)                | 0.0877           | kg CO <sub>2</sub> e/ton-km | India GHG Program                      |
|                            | Road - MDV(<12T)                  | 0.0741           | kg CO <sub>2</sub> e/ton-km | India GHG Program                      |
|                            | Road - HDV(>12T)                  | 0.0615           | kg CO <sub>2</sub> e/ton-km | India GHG Program                      |
|                            | Rail                              | 0.0100           | kg CO <sub>2</sub> e/ton-km | India GHG Program                      |
|                            | Air                               | 1.0990           | kg CO <sub>2</sub> e/ton-km | DEFRA – 2025                           |
|                            | Sea- Bulk Carrier cargo ship      | 0.0035           | kg CO <sub>2</sub> e/ton-km | DEFRA – 2025                           |

Table 14: Emission Factors used for FY 24-25 GHG Emission Calculations

## 2.2.3 GHG Emissions Result Overview

### Absolute Emissions:

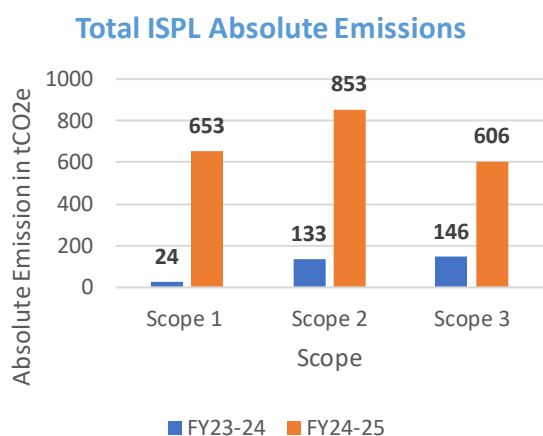


Figure 15: Total ISPL Absolute Emissions

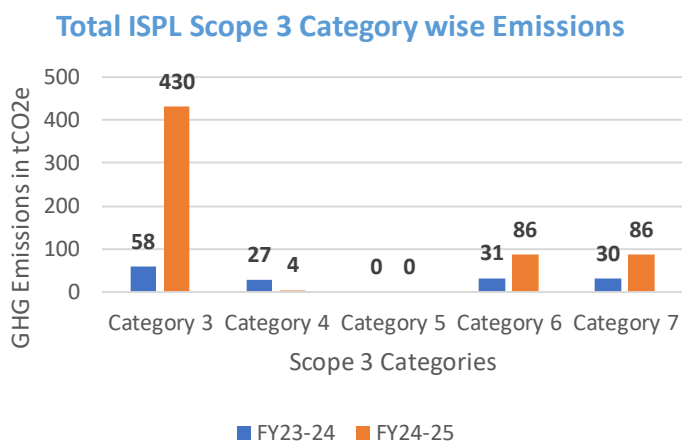


Figure 16: Total ISPL Scope 3 Categories wise Emissions

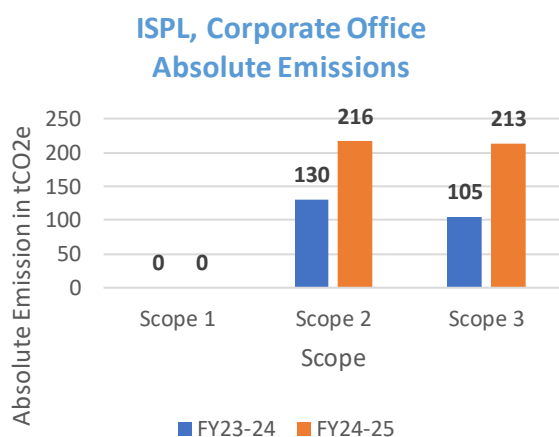


Figure 17: ISPL Corporate Office Absolute Emissions

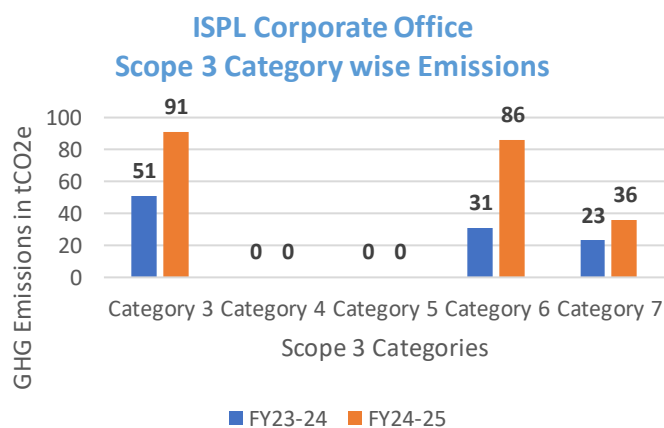


Figure 18: ISPL Corporate Office Scope 3 Categories Wise Emissions

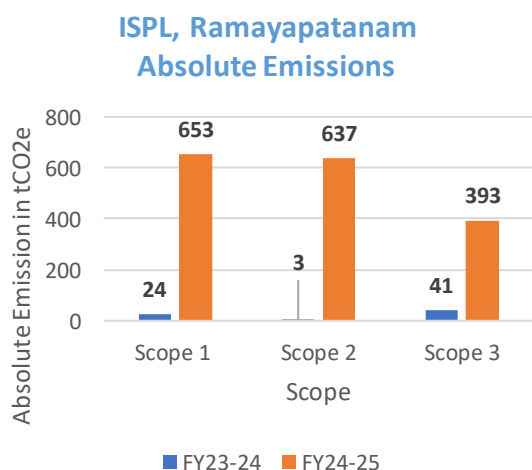


Figure 19: ISPL Ramayapatnam, Absolute Emissions

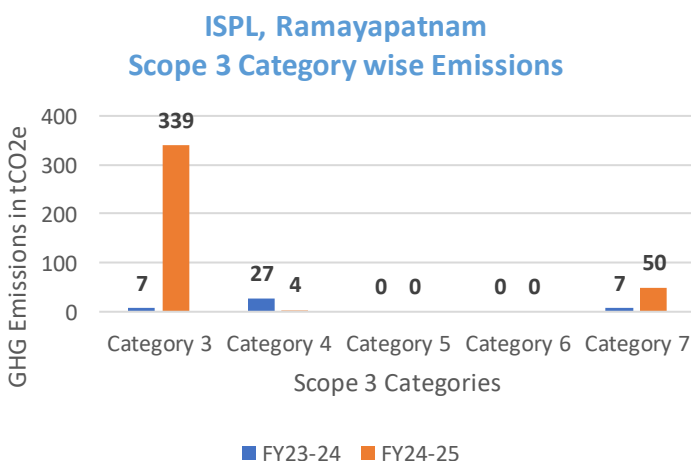


Figure 20: ISPL, Ramayapatnam Scope 3 Categories Wise Emissions

| <b>Absolute Emission in tCO<sub>2</sub>e</b> |                              |                       |            |                              |                       |               |
|----------------------------------------------|------------------------------|-----------------------|------------|------------------------------|-----------------------|---------------|
|                                              | FY 23-24 (Base year)         |                       |            | FY 24-25                     |                       |               |
| Description                                  | ISPL,<br>Corporate<br>Office | ISPL,<br>Ramayapatnam | Total      | ISPL,<br>Corporate<br>Office | ISPL,<br>Ramayapatnam | Total<br>ISPL |
| Scope 1                                      | 0                            | 24                    | 24         | 0                            | 653                   | 653           |
| Scope 2                                      | 130                          | 3                     | 133        | 216                          | 637                   | 853           |
| Scope 3                                      | 105                          | 41                    | 146        | 213                          | 393                   | 606           |
| Total<br>(Scope<br>1+2+3)                    | 235                          | 67                    | <b>302</b> | 429                          | 1683                  | 2112          |
| Category 3                                   | 51                           | 7                     | 58         | 91                           | 339                   | 430           |
| Category 4                                   | -                            | 27                    | 27         | -                            | 4                     | 4             |
| Category 5                                   | -                            | 0                     | 0          | -                            | -                     | 0             |
| Category 6                                   | 31                           | -                     | 31         | 86                           | 0                     | 86            |
| Category 7                                   | 23                           | 7                     | 7          | 36                           | 50                    | 86            |

*Table 15: Absolute Emissions of Indosol Solar*

## Limitations

### ISPL Corporate Office:

- In Scope 3, we have taken 3 categories only, which is category 3, 6 & 7. Remaining categories are not relevant to corporate office.
- Under Scope 3, Category 6 (business travel), train and bus travel data were not included due to the unavailability of data.**

For Air travel wherever data was available the distance flown was not calculated as crow flies but with knowledge of stopover and via routes.

- For Scope 3, Category 7 (employee commute), a common survey was conducted for both the SSEL corporate office and the ISPL corporate office. A total of 75 out of 92 employees from the ISPL corporate office participated. Based on this, we extrapolated the emissions for the remaining employees.

### ISPL, Manufacturing Plant, Ramayapatnam:

- Reference document for R22 Refrigerant refilling qty of 18 kg is not yet received so data has been accepted based on report from EHS department.**
- Under Scope 3, Category 6 Business Travel: All air travels done by the employees are accounted under ISPL Corporate office. The distance flown was not calculated as crow flies but with knowledge of stopover and via routes. Train and bus travel data were not included due to the unavailability. **Location team has been intimidated that the data for other modes of business travel also needs to be documented and provided for emission calculations.**

## Key details

### ISPL Corporate Office:

- There is no stationary combustion and mobile combustion sources in ISPL Corporate Office. Cooking for employees are outsourced and induction stove were used in pantry. Therefore, the Scope 1 emissions for the ISPL corporate office are zero. Only split ACs are under scope 1, and during FY 24-25, no refrigerant top-up was done.
- Under Scope 2, to calculate the purchased DG power and cooling capacity, we assumed the Diesel Generator generate 3 kWh electricity per liter of diesel consumed, and the Coefficient of Performance (COP) of the chiller is 2.842 (Output kWh / Input kWh) for emission calculations.
- CO2 fire extinguisher refilling not done in ISPL Corporate Office

### ISPL Ramayapatnam:

- Refrigerant refilling done Only in FY 24-25.
- No CO2 refilling into fire extinguishers were done during any reporting year.
- No operational waste was disposed or reported during any reporting year.
- Production activities started from 30.03.2024 and significant production did not happen till the end of FY24-25 (it is 0.33MW out of 500MW capacity).

## Tracking Emissions Over Time

Companies often undergo significant structural changes such as acquisitions, divestments, and mergers. These changes will alter a company's historical emission profile, making meaningful comparisons over time difficult. In order to maintain consistency over time, or in other words, to keep comparing "like with like", historic emission data will have to be recalculated.

Companies may need to track emissions over time in response to a variety of business goals, including:

- Public reporting
- Establishing GHG targets
- Managing risks and opportunities
- Addressing the needs of investors and other stakeholders

A meaningful and consistent comparison of emissions over time requires that companies set a performance datum with which to compare current emissions. This performance datum is referred to as the base year emissions. For consistent tracking of emissions over time, the base year emissions may need to be recalculated as companies undergo:

- significant structural changes such as acquisitions, divestments, and mergers.
- Outsourcing and insourcing of emitting activities.

- Changes in calculation methodology or improvements in the accuracy of emission factors or activity data that result in a significant impact on the base year emissions data.
- Discovery of significant errors, or a number of cumulative errors, that are collectively significant.

### **GHG Emission Datum**

Currently we are accounting GHG emission from FY 23-24. The 500 MW module factory were expected to start full production from 2025. So, once started full production, then we will establish FY 25-26 GHG emission as a datum emission for the respective factory and develop the emission reduction strategy accordingly.

In the mean time we will incorporate world best sustainability practices into our day-to-day industrial activities.



## 2.3 Environmental Policy

### **INDOSOL SOLAR ENVIRONMENTAL POLICY**

Version 1.0 Dated 16.12.2024

No. of Pages: 3

Developed by: ESG Department

Owner Department: EHS Department & ESG Department

Approved by : Group CEO

At Indosol, we seek excellence in business, while being committed to the triple bottom line of Planet People and Profit, and we strive to be a responsible corporate by ensuring to comply with all relevant and applicable compliances, environmental laws and regulations as obligated under the law of the land where we have our operations.

We endeavour to reduce the impact of our operations and business activities on the environment while influencing the people in our value chain as well as our social interactions to follow the path of continuous improvement towards an environmentally sustainable living. And, in the process also endeavour to align with global environmental frameworks and sustainable development goals

**Our Commitment:**

We are committed to mitigation of climate change, protection of biodiversity and related ecosystems, and adoption of sustainable resource use. We understand the global concerns and commit to work towards the regulatory norms of clients and partners.

Our commitment to the environment, while not limited to, is actively in the following areas:

**Climate Change Action:**

We undertake a commitment of reduction of our Carbon Footprint across all our emissions for our operations through the practice of RRR; Reduce – consumption, Review – source of energy and switch to green energy and Restore – the CO<sub>2</sub> balance in the atmosphere through carbon offset and carbon-capture technology.

Becoming Carbon Neutral and Net Zero Emissions company is the ultimate goal of our carbon and emissions reduction strategy.

**Energy Consumption:**

Innovation and use of clean and green technologies in our operations to minimize our carbon footprint is part of our commitment to the environment, to innovate and stay ahead of the technology curve to reduce energy consumption by services, equipment use, and office premises is our endeavour.

**Office Space and Production Units:**

Efficient use of office space and production units, with energy efficient devices and pro-active approach to replace conventional sourced energy with green energy

Consciously embrace the acknowledged green building certifications while leasing a premises and work to achieve the same for our own premises

**Water Consumption:**

Introduce water efficiency management programs that continuously identify opportunities for water efficiency improvement and formulate actions reduce water consumption and improve waste water quality.

**Waste Management:**

Manage the waste generated from our business offices according to the principles of reduce, re-use and recycle.

Pledge to eliminate single use plastic and reduce non-bio-degradable waste generation.

Follow immaculate waste disposal processes to reduce the harm to environment.

Completely eliminate waste to landfill, including food waste in our existing locations.

**Employee Alignment:**

Communicating the importance of environmental issues to our employees and motivating them to embed environmental responsibility in our work culture.

**Training and Communication:**

All employees would receive a mandatory training regarding the implementation and adherence to the policy as a part of their new-hire induction program as well as annual refresher trainings as part of ESG awareness to understand the impact of their activities on the environment.

**Environment Champions:**

Every vertical shall select Environment Champions from amongst the employees based on their passion and willingness to take up environmental causes both within the strategy and company as well as voluntary activities in the community. The Environment Champions will work to deliver goals in their chalked out path and will be rewarded and recognised.

**Influence Across Value Chain:**

To be a strong influence through our Supplier Code of Conduct (SCoC) wherein we encourage our vendors and partners to embed environmental sustainability in their businesses.

Ensure to optimize logistics processes to minimize distribution losses through efficient supply chain systems.

**Responsibilities:**

We prioritize our commitment towards the adherence of this policy and create a sustainable ecosystem where we strive to leave a low bearing impact through our business operations.

The Company shall constitute an ESG Working Group who would be responsible to oversee the implementation and compliance of the policy and report any discrepancies to the ESG Committee of the Board while also providing an annual status update on the achievement of commitment.

**Review:**

There will be an Annual Review and make any necessary modifications to this Policy.

Approved  
  
17/12/24

## **3 SOCIAL**

### **3.1 Occupational Health and Safety**

Occupational health and safety (OHA) are a discipline with a broad scope involving many specialized fields. In its broadest sense, it should aim at:

- the promotion and maintenance of the highest level of physical, mental and social well-being of workers in all occupations;
- the prevention among workers of adverse effects on health caused by their working conditions;
- the protection of workers in their employment from risks resulting from factors adverse to health;
- the placing and maintenance of workers in an occupational environment adapted to physical and mental needs;
- the adaptation of work to humans.

In other words, occupational health and safety encompasses the social, mental and physical well-being of workers, that is the “whole person”.

Successful occupational health and safety practice requires the collaboration and participation of both employers and workers in health and safety programmes, and involves the consideration of issues relating to occupational medicine, industrial hygiene, toxicology, education, engineering safety, ergonomics, psychology, etc.

Occupational health issues are often given less attention than occupational safety issues because the former are generally more difficult to confront. However, when health is addressed, so is safety, because a healthy workplace is by definition also a safe workplace. The converse, though, may not be true - a so-called safe workplace is not necessarily also a healthy workplace. The important point is that issues of both health and safety must be addressed in every workplace. By and large, the definition of occupational health and safety given above encompasses both health and safety in their broadest contexts.

#### **3.1.1 Poor working conditions affect worker health and safety**

- Poor working conditions of any type have the potential to affect a worker's health and safety.
- Unhealthy or unsafe working conditions are not limited to factories — they can be found anywhere, whether the workplace is indoors or outdoors. For many workers, such as agricultural workers or miners, the workplace is “outdoors” and can pose many health and safety hazards.
- Poor working conditions can also affect the environment workers live in, since the working and living environments are the same for many workers. This means that occupational hazards can have harmful effects on workers, their families, and other people in the community, as well as on the physical environment around the workplace. A classic example is the use of pesticides in agricultural work. Workers can be exposed to toxic chemicals in a number of ways when spraying pesticides: they can inhale the chemicals during and after spraying, the chemicals can be absorbed through the skin, and the workers can ingest the chemicals if they eat, drink, or

smoke without first washing their hands, or if drinking water has become contaminated with the chemicals.

- The workers' families can also be exposed in a number of ways: they can inhale the pesticides which may linger in the air, they can drink contaminated water, or they can be exposed to residues which may be on the worker's clothes. Other people in the community can all be exposed in the same ways as well. When the chemicals get absorbed into the soil or leach into groundwater supplies, the adverse effects on the natural environment can be permanent.

Overall, efforts in occupational health and safety must aim to prevent industrial accidents and diseases, and at the same time recognize the connection between worker health and safety, the workplace, and the environment outside the workplace.

### **3.1.2 Importance of OHS**

Work plays a central role in people's lives, since most workers spend at least eight hours a day in the workplace, whether it is on a plantation, in an office, factory, etc. Therefore, work environments should be safe and healthy. Yet this is not the case for many workers. Every day workers all over the world are faced with a multitude of health hazards, such as:

- dusts
- gases
- noise
- vibration
- extreme temperatures.

Unfortunately, some employers assume little responsibility for the protection of workers' health and safety. In fact, some employers do not even know that they have the moral and often legal responsibility to protect workers. As a result of the hazards and a lack of attention given to health and safety, work-related accidents and diseases are common in all parts of the world.

### **3.1.3 Costs of occupational injury/disease**

Work-related accidents or diseases are very costly and can have many serious direct and indirect effects on the lives of workers and their families. For workers some of the direct costs of an injury or illness are:

- the pain and suffering of the injury or illness;
- the loss of income;
- the possible loss of a job;
- health-care costs.

It has been estimated that the indirect costs of an accident or illness can be four to ten times greater than the direct costs, or even more. An occupational illness or accident can have so many indirect costs to workers that it is often difficult to measure them. One of the most obvious indirect costs is the human suffering caused to workers' families, which cannot be compensated with money.

The costs to employers of occupational accidents or illnesses are also estimated to be enormous. For a small business, the cost of even one accident can be a financial disaster. For employers, some of the direct costs are:

- payment for work not performed;
- medical and compensation payments;
- repair or replacement of damaged machinery and equipment;
- reduction or a temporary halt in production;
- increased training expenses and administration costs;
- possible reduction in the quality of work;
- negative effect on morale in other workers.

Some of the **indirect costs** for employers are:

- the injured/ill worker has to be replaced;
- a new worker has to be trained and given time to adjust;
- it takes time before the new worker is producing at the rate of the original worker;
- time must be devoted to obligatory investigations, to the writing of reports and filling out of forms;
- accidents often arouse the concern of fellow workers and influence labour relations in a negative way;
- poor health and safety conditions in the workplace can also result in poor public relations.

Overall, the costs of most work-related accidents or illnesses to workers and their families and to employers are very high.

On a national scale, the estimated costs of occupational accidents and illnesses can be as high as three to four per cent of a country's gross national product. In reality, no one really knows the total costs of work-related accidents or diseases because there are a multitude of indirect costs which are difficult to measure besides the more obvious direct costs.

### **3.1.4 Health and safety programmes**

For all of the reasons given above, it is crucial that employers, workers and unions are committed to health and safety and that:

- workplace hazards are controlled - at the source whenever possible;
- records of any exposure are maintained for many years;
- both workers and employers are informed about health and safety risks in the workplace;
- there is an active and effective health and safety committee that includes both workers and management;
- worker health and safety efforts are ongoing.

Effective workplace health and safety programmes can help to save the lives of workers by reducing hazards and their consequences. Health and safety programmes also have positive effects on both worker morale and productivity, which are important benefits. At the same time, effective programmes can save employers a great deal of money.

### **3.1.5 Extent of the problem worldwide**

#### **A. Accidents**

In general, health and safety in the workplace has improved in most **industrialized** countries over the past 20 to 30 years. However, the situation in developing countries is relatively unclear largely because of inadequate accident and disease recognition, record-keeping and reporting mechanisms.

It is estimated that at least 250 million occupational accidents occur every year worldwide. 335,000 of these accidents are fatal (result in death). (Since many countries do not have accurate record-keeping and reporting mechanisms, it can be assumed that the real figures are much higher than this.) The number of fatal accidents is much higher in developing countries than in industrialized ones. This difference is primarily due to better health and safety programmes, improved first-aid and medical facilities in the industrialized countries, and to active participation of workers in the decision-making process on health and safety issues. Some of the industries with the highest risk of accidents worldwide are: mining, agriculture, including forestry and logging, and construction.

#### **Identifying the cause of an accident**

In some cases, the cause of an industrial injury is easy to identify. However, very often there is a hidden chain of events behind the accident which led up to the injury. For example, accidents are often indirectly caused by negligence on the part of the employer who may not have provided adequate worker training, or a supplier who gave the wrong information about a product, etc. The consistently high fatal accident rates in developing countries emphasize the need for occupational health and safety education programmes that focus on prevention. It is equally important to promote the development of occupational health services, including the training of doctors to recognize work-related diseases in the early stages.

#### **B. Diseases**

Some occupational diseases have been recognized for many years, and affect workers in different ways depending on the nature of the hazard, the route of exposure, the dose, etc. Some well-known occupational diseases include:

- asbestosis (caused by asbestos, which is common in insulation, automobile brake linings, etc.);
- silicosis (caused by silica, which is common in mining, sandblasting, etc.);
- lead poisoning (caused by lead, which is common in battery plants, paint factories, etc.);
- and noise-induced hearing loss (caused by noise, which is common in many workplaces, including airports, and workplaces where noisy machines, such as presses or drills, etc. are used).

There are also a number of potentially crippling health problems that can be associated with poor working conditions, including:

- heart disease;
- musculoskeletal disorders such as permanent back injuries or muscle disorders;
- allergies;
- reproductive problems;
- stress-related disorders.

Many developing countries report only a small number of workers affected by work-related diseases. These numbers look small for a variety of reasons that include:

- inadequate or non-existent reporting mechanisms;
- a lack of occupational health facilities;
- a lack of health care practitioners who are trained to recognize work-related diseases.

Because of these reasons and others, it is fair to assume that in reality, the numbers of workers afflicted with occupational diseases are much higher. In fact, overall, the number of cases and types of occupational diseases are increasing, not decreasing, in both developing and industrialized countries.

### **Identifying the cause of occupational disease**

The cause of work-related diseases is very often difficult to determine. One factor is the latency period (the fact that it may take years before the disease produces an obvious effect on the worker's health). By the time the disease is identified, it may be too late to do anything about it or to find out what hazards the worker was exposed to in the past. Other factors such as changing jobs, or personal behaviours (such as smoking tobacco or drinking alcohol) further increase the difficulty of linking workplace exposures to a disease outcome.

Although more is understood now about some occupational hazards than in the past, every year new chemicals and new technologies are being introduced which present new and often unknown hazards to both workers and the community. These new and unknown hazards present great challenges to workers, employers, educators, and scientists, that is to everyone concerned about workers' health and the effects that hazardous agents have on the environment.

#### **3.1.6 The range of hazards**

There is an unlimited number of hazards that can be found in almost any workplace. There are obvious unsafe working conditions, such as unguarded machinery, slippery floors or inadequate fire precautions, but there are also a number of categories of insidious hazards (that is, those hazards that are dangerous but which may not be obvious) including:

- chemical hazards, arising from liquids, solids, dusts, fumes, vapours and gases;
- physical hazards, such as noise, vibration, unsatisfactory lighting, radiation and extreme temperatures;
- biological hazards, such as bacteria, viruses, infectious waste and infestations;

- psychological hazards resulting from stress and strain;
- hazards associated with the non-application of ergonomic principles, for example badly designed machinery, mechanical devices and tools used by workers, improper seating and workstation design, or poorly designed work practices.

Most workers are faced with a combination of these hazards at work. For example, it is not difficult to imagine a workplace where you are exposed to chemicals, unguarded and noisy machines, hot temperatures, slippery floors, etc. all at the same time. Think about your own workplace. Are there various hazards there that you can think of?

Workers do not create hazards - in many cases the hazards are built into the workplace. The trade union position on occupational health and safety is to ensure that work is made safer by modifying the workplace and any unsafe work processes. This means that the solution is to remove the hazards, not to try to get workers to adapt to unsafe conditions. Requiring workers to wear protective clothing which may not be suited or designed for the climate of your region is an example of forcing workers to try to adapt themselves to unsafe conditions, which is also shifting the responsibility from management to the worker.

It is important for unions to maintain this position because many employers blame workers when there is an accident, claiming that the workers were careless. This attitude implies that work can be made safer if workers change their behaviour or if employers only hire workers who never make mistakes. Everyone makes mistakes — it is human nature, but workers should not pay for mistakes with their lives. Accidents do not stop simply by making workers more safety conscious. Safety awareness may help but it does not remove unsafe work processes or conditions. The most effective accident and disease prevention begins when work processes are still in the design stage, when safe conditions can be built into the work process.

### **3.1.7 Importance of management commitment**

In order to develop a successful health and safety programme, it is essential that there be strong management commitment and strong worker participation in the effort to create and maintain a safe and healthy workplace. An effective management addresses all work-related hazards, not only those covered by government standards.

All levels of management must make health and safety a priority. They must communicate this by going out into the worksite to talk with workers about their concerns and to observe work procedures and equipment. In each workplace, the lines of responsibility from top to bottom need to be clear, and workers should know who is responsible for different health and safety issues.

### **3.1.8 The importance of training**

Workers often experience work-related health problems and do not realize that the problems are related to their work, particularly when an occupational disease, for example, is in the early stages. Besides the other more obvious benefits of

training, such as skills development, hazard recognition, etc., a comprehensive training programme in each workplace will help workers to:

- recognize early signs/symptoms of any potential occupational diseases before they become permanent conditions;
- assess their work environment;
- insist that management make changes before hazardous conditions can develop.

### **3.1.9 Role of the health and safety representative**

As health and safety representative your role is to work proactively (this means taking action before hazards become a problem) to prevent workers from being exposed to occupational hazards. You can do this by making sure management eliminates hazards or keeps them under control when they cannot be eliminated.

Steps to help you reach your goals are:

1. Be well informed about the various hazards in your workplace and the possible solutions for controlling those hazards.
2. Work together with your union and the employer to identify and control hazards.
3. Although these Modules have been developed for the protection of workers, you may occasionally need to share some of this information with your supervisors and employer in the process of working towards a safe and healthy workplace.

**Being a health and safety representative is not always easy, but helping to protect the lives of your fellow workers is worth all the time and effort you put into the job.**

Workers in every occupation can be faced with a multitude of hazards in the workplace. Occupational health and safety addresses the broad range of workplace hazards from accident prevention to the more insidious hazards including toxic fumes, dust, noise, heat, stress, etc. Preventing work-related diseases and accidents must be the goal of occupational health and safety programmes, rather than attempting to solve problems after they have already developed.

Hazards in the workplace can be found in a variety of forms, including chemical, physical, biological, psychological, non-application of ergonomic principles, etc. Because of the multitude of hazards in most workplaces and the overall lack of attention given to health and safety by many employers, work-related accidents and diseases continue to be serious problems in all parts of the world. Therefore, trade unions must insist that employers control hazards at the source and not force workers to adapt to unsafe conditions.

Management commitment to health and safety and strong worker participation are two essential elements of any successful workplace health and safety programme. The most effective accident and disease prevention begins when work processes are still in the design stage

## 3.2 OHS in Our Site

### 3.2.1 OHS/EHS Department Chart



Figure 21: OHS/EHS Department Chart

### 3.2.2 Emergency Team Details

| Sl. No | Name                | Designation           | Department        |
|--------|---------------------|-----------------------|-------------------|
| 01     | Mr. B Ranga Reddy   | Asst. General Manager | Project Execution |
| 02     | Mr. M A Israel      | Asst. General Manager | HR & Admin        |
| 03     | Mr. Harish Simhadri | Asst. General Manager | EHS               |
| 04     | Mr. Shanmukh Rao    | Manager               | Civil             |
| 05     | Mr. Ramesh B        | Manager               | Production        |
| 06     | Mr. Tirupal Rao     | Manager               | Maintenance       |
| 07     | Mr. Prasath D       | Sr. Manger            | Warehouse         |

Table 16: Emergency team Details

### 3.2.3 Safety Committee Members Details

| Sl. No | Name                | Designation           | Department              | Position/ Role          |
|--------|---------------------|-----------------------|-------------------------|-------------------------|
| 01     | Mr. B Ranga Reddy   | Asst. General Manager | Project Execution       | Chair Person            |
| 03     | Mr. Harish Simhadri | Asst. General Manager | EHS                     | Secretary               |
| 02     | Mr. M A Israel      | Asst. General Manager | HR & Admin              | Member                  |
| 04     | Mr. Shanmukh Rao    | Manager               | Civil                   | Member                  |
| 05     | Mr. Ramesh B        | Manager               | Production              | Member                  |
| 06     | Mr. Tirupal Rao     | Manager               | Maintenance             | Member                  |
| 07     | Mr. Prasath D       | Sr. Manger            | Warehouse               | Member                  |
| 08     | Mr. sai             | IT Exe Support        | IT                      | Member                  |
| 09     | Mr. Kiran Kumar     | Executive             | EHS                     | Member                  |
| 10     | Mr. Sai             | Engineer              | Vignesh Roofing         | Worker's representative |
| 11     | Mr. Ankush          | Supervisor-EHS        | Vignesh Roofing         | Worker's representative |
| 12     | Mr. Harish          | Supervisor            | T. Srinu                | Worker's representative |
| 13     | Mr. Venkatesh       | Supervisor            | Akshaya Infra           | Worker's representative |
| 14     | Mr. Shivaji         | Supervisor            | Arka logistics          | Worker's representative |
| 15     | Mr. Nikhil kumar    | Supervisor            | Siddhartha Construction | Worker's representative |
| 16     | Mr. Sai             | Supervisor            | Naveen Source           | Worker's representative |
| 17     | Mr. Mastan          | Supervisor            | Grace security          | Worker's representative |

Table 17: Safety Committee Members Details

### 3.2.4 Statutory Licenses/ Approvals

| Sl. No | Description     | Corresponding Legislation   | Validity    |            |
|--------|-----------------|-----------------------------|-------------|------------|
|        |                 |                             | From        | To         |
| 1.     | Factory License | Factories Act, 1948         | 01-01-2025  | 31-12-2025 |
| 2.     | CTO – Air       | The Air Act, 1981           | 23-02-2024  | 23-02-2029 |
|        | CTO – Water     | The Water Act, 1974         | 23-02-2024  | 23-02-2029 |
| 3.     | HWA             | Hazardous Waste Rules, 2016 | 23-02-2024  | 23-02-2029 |
| 4.     | Fire Safety NOC | Factories Act, 1948         | Not started |            |

Table 18: Statutory Licenses/ Approvals

### 3.2.5 Compliance Documents Availability

| Document Name/Description                             | Corresponding Legislation        | Availability Status (Y/N/NA) |
|-------------------------------------------------------|----------------------------------|------------------------------|
| Organizational OHS Policy                             | OSH Code, 2020                   | Y                            |
| Standard Operating Procedures (SOPs)                  | OSH Code, 2020                   | Y                            |
| Risk Assessment Reports (HIRA)                        | OSH Code, 2020                   | Y                            |
| Emergency Response Plan                               | OSH Code, 2020                   | Y                            |
| OHS Audit Reports (Internal/External)                 | OSH Code, 2020                   | N                            |
| Training Calendar and Logs                            | OSH Code, 2020                   | Y                            |
| Equipment Testing Certificates (Lifts, Boilers, etc.) | Factories Act, 1948              | Y                            |
| Register of Adult Workers (Form 11 - Factories Act)   | Factories Act, 1948              | Y                            |
| Health Check-up Records                               | Factories Act, 1948              | N                            |
| Accident/Incident Register                            | Factories Act, 1948              | Y                            |
| Records of Occupational Diseases                      | Factories Act, 1948              | Y                            |
| Inspection Reports (Electrical, Mechanical)           | Factories Act, 1948              | Y                            |
| Safety Equipment Maintenance Logs                     | Factories Act, 1948              | Y                            |
| PPE Distribution Records                              | Factories Act, 1948              | Y                            |
| Inventory of Hazardous Substances                     | Environment Protection Act, 1986 | Y                            |
| Material Safety Data Sheets (MSDS)                    | Environment Protection Act, 1986 | Y                            |
| Spill Response Logs                                   | Environment Protection Act, 1986 | Y                            |
| Fire Extinguisher Inspection Logs                     | OSH Code, 2020                   | Y                            |
| Evacuation Drill Reports                              | OSH Code, 2020                   | Y                            |
| Emergency Contact List                                | OSH Code, 2020                   | Y                            |
| Contractor Pre-qualification Records                  | OSH Code, 2020                   | Y                            |
| Safety Training Records for Contractors               | OSH Code, 2020                   | Y                            |
| Workplace Air Quality Reports                         | OSH Code, 2020                   | Y                            |
| Noise Level Monitoring Records                        | OSH Code, 2020                   | Y                            |
| Inspection Notices from Authorities                   | OSH Code, 2020                   | NA                           |
| Response to Notices                                   | OSH Code, 2020                   | NA                           |
| Annual Compliance Reports                             | OSH Code, 2020                   | NA                           |
| Pre-audit Questionnaire                               | OSH Code, 2020                   | NA                           |
| Previous Audit Findings                               | OSH Code, 2020                   | NA                           |
| Corrective and Preventive Action (CAPA) Status        | OSH Code, 2020                   | NA                           |

Table 19: Compliance Documents Availability

- As per Factories act 1948 and OSH Code 2020 the above-mentioned document should be maintained at the site. So, please do the internal/external OHS audit and document the findings as well as document the health checkup records.
- Since production is not yet started some of the compliances are marked as not applicable (N/A). Once it is become applicable do document the respective actions.

### 3.2.6 Master Document List (List of the documents being maintained in the site)

| Sl. No | Document Name                                    |
|--------|--------------------------------------------------|
| 01     | ISPL HSE Plan                                    |
| 02     | Job Safety Analysis (JSA)                        |
| 03     | Hazard Identification and Risk Assessment (HIRA) |
| 04     | Work Permits                                     |
| 05     | Employee Safety Induction records                |
| 06     | Visitor safety induction records                 |
| 07     | Training Records                                 |
| 08     | TBT records                                      |
| 09     | Canteen Inspection records                       |
| 10     | Vehicle inspection records                       |
| 11     | Firefighting equipment inspection record         |
| 12     | Third-party Inspection reports                   |
| 13     | First aid box record.                            |
| 14     | First-aid register.                              |
| 15     | Incident report                                  |
| 16     | Incident investigation reports                   |
| 17     | PPE Register                                     |
| 18     | Mock Drill Reports                               |
| 19     | Safety Committee Meetings                        |
| 20     | Disciplinary policy                              |

Table 20: Master Document List

### 3.2.7 FY24-25 OHS Consolidated Data

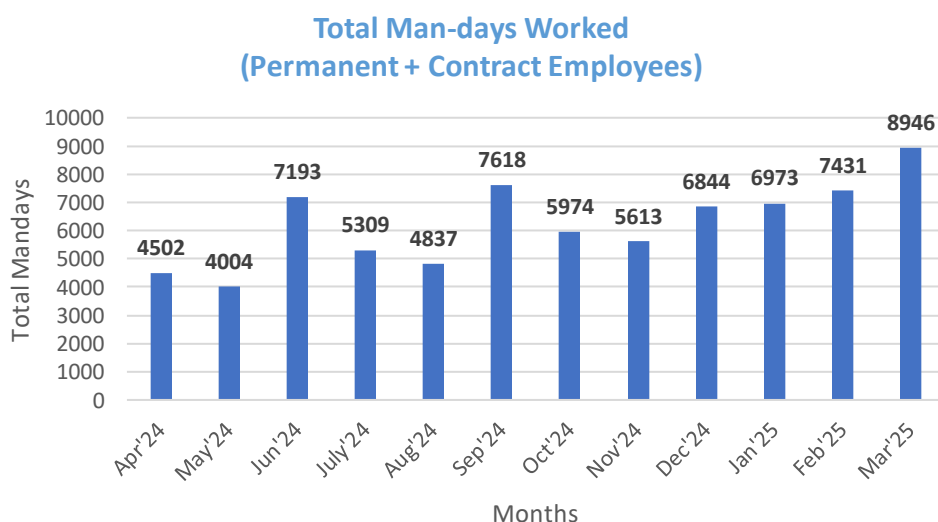


Figure 22: Month Wise Man-days Worked

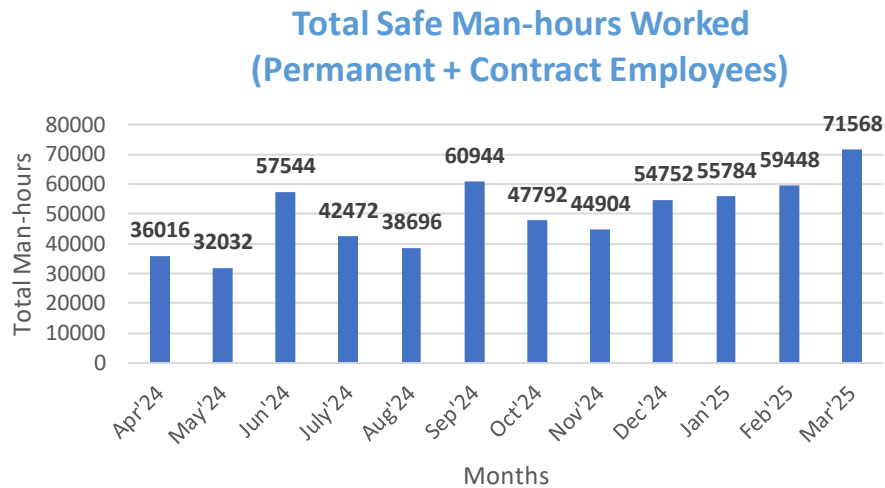


Figure 23: Month Wise Man-hours Worked

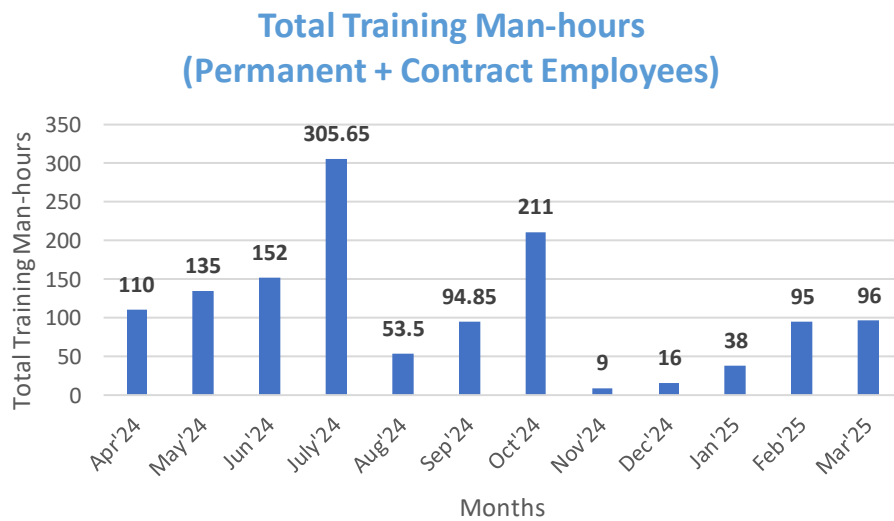


Figure 24: Month Wise Training Man-hours

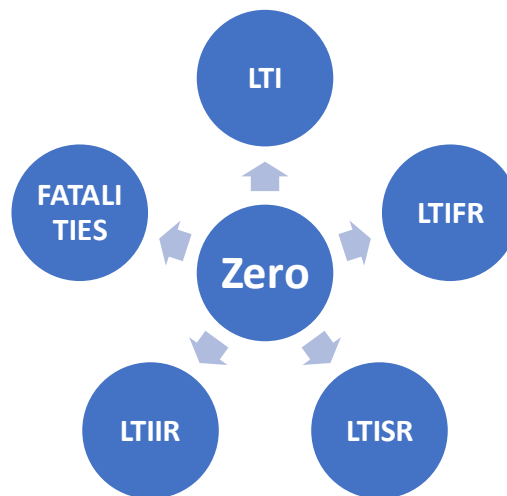


Figure 25: OHS Essential Indagators

| FY24-25 OHS Consolidated Data |                                                  |        |                           |
|-------------------------------|--------------------------------------------------|--------|---------------------------|
| Sr. No.                       | Descriptions                                     | Values | UOM                       |
| 1.                            | Total Man-days (Permanent + Contractual)         | 75244  | Man-days                  |
| 2.                            | Total Man-hours worked (Permanent + Contractual) | 601952 | Man-hours                 |
| 3.                            | Total Safe Man-hours worked                      | 601952 | Man-hours                 |
| 4.                            | Man-days lost due to lost time injury            | 0      | Man-days                  |
| 5.                            | Total Number of Lost Time Injury (LTI)           | 0      | Nos                       |
| 6.                            | Lost Time Injury Frequency Rate (LTIFR)          | 0      | No.of.LTI / million hours |
| 7.                            | Lost Time Injury Severity Rate (LTISR)           | 0      | Lost day / million hours  |
| 8.                            | Lost Time Injury Incident Rate (LTIIR)           | 0      | No.of.LTI / 100 emp       |
| 9.                            | Fatalities                                       | 0      | Nos                       |
| 10.                           | Total Number of Accident/Incident                | 13     | Nos                       |
| 11.                           | Total Number of Near Miss                        | 5      |                           |
| 11.                           | Total Number of Observations                     | 526    | Nos                       |
| 12.                           | Total Number of Observation points open          | 517    | Nos                       |
| 13.                           | Total Training Man-hours                         | 1316   | Man-hours                 |
| 14.                           | Total Number of Mock drills conducted            | 2      | Nos                       |

Table 21: OHS Consolidated Data – FY 24-25

### 3.2.8 Accident/Incident Details

| Sl.no | Date       | Incident Details                                                                           | Root cause                                                                                                                                                  | Corrective action taken                                                                                                   |
|-------|------------|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 1.    | 04.04.2024 | Electric spark on puff panel                                                               | Earthing not provided in workpiece, placing aluminum frame between earth flat and puff panel triggered the spark, and failure of proper supervision of job. | Removed the aluminum frame and proper earthing provided. safe welding procedure explained and proper supervision ensured. |
| 2.    | 05.04.2024 | Energy Meter burned and power interrupted                                                  | Power over load.                                                                                                                                            | Power restored with DG set and rectification done.                                                                        |
| 3.    | 24.04.2024 | Puncture of LT cable outer insulation and partial damage of armored layer by JCB Operation | Incompetence of JCB operator. Overlook /unable to judge the incident.                                                                                       | Stopped the activity. Explained safe work procedure to operator.                                                          |
| 4.    | 02.07.2024 | A snake bit one of our contract                                                            | There is no provision for a toilet at the workplace, so he went near the bushes                                                                             | First aid and proper treatment given to him and advised to                                                                |

|     |            |                                                                                                                   |                                                                                               |                                                                                                                  |
|-----|------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
|     |            | employee's right thumb at 7:30 pm.                                                                                | in the mango garden at night.                                                                 | use the toilet available in our industry premises.                                                               |
| 5.  | 13.09.2024 | A Scorpion bit one of our contract employee's hand at 10:40 am.                                                   | Precheck of work area not done. Unaware of risks associated with the work. PPE not used.      | Treatment given to him.                                                                                          |
| 6.  | 16.09.2024 | Puff panel slipped from workers hand and fell down from scaffold platform.                                        | Incompetency in using of the tools with the job and lack of experience on the particular job. | Workplace inspected and Meeting conducted with workers                                                           |
| 7.  | 10.10.2024 | Hydra boom collided with Module Building's canopy causing a minor dent                                            | Poor operator visibility. Incompetent signal man and lack of supervision                      | Operator instructed to follow PTW system and competent riggers deployed in lifting activity.                     |
| 8.  | 23.11.2024 | Minor abrasion/cut injury on employee's index finger due to sharp edge of Tin Sheet                               | Sharp edge of tin not covered. Worker used bare hand                                          | Ensured PPE use (gloves) and eliminated sharp edges during setup                                                 |
| 9.  | 25.11.2024 | Employee's left index finger got caught between two diesel drums while shifting causing minor scars/ cut injuries | Unsafe manual handling method. Close gap between drums not maintained                         | Trained workers on proper material handling<br><br>Provide barrel tongs or mechanical aid.                       |
| 10. | 30.11.2024 | Forklift damaged a puff panel while shifting causing a dent over it                                               | Restricted passage. Lack of guidance during turning.<br>Lack of banksman.                     | Defined one-way traffic inside warehouse and provided floor markings.<br><br>Assigned Banksman and blind corner. |
| 11. | 23.01.2025 | Worker got a minor abrasion on dorsal area of                                                                     | Sharp edge of reinforcement not visible due to soil. No gloves used                           | Barricaded or tag sharp objects and ensured gloves use                                                           |

|     |            |                                                                                                           |                                                                                                        |                                                                                                                                          |
|-----|------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
|     |            | little finger from shard edge of steel rod while working                                                  |                                                                                                        | during excavation/cleaning                                                                                                               |
| 12. | 27.02.2025 | Canteen worker got bitten by Scorpio on the middle finger of his right hand                               | Presence of pests in food area. Lack of routine pest control                                           | Scheduled pest control near canteen windows.<br><br>Close window gaps with mesh.                                                         |
| 13. | 18.03.2025 | Employee lost his balance and fell from steps, sustained a minor scratch on the right leg below knee      | Uneven step and poor housekeeping. Inattention during movement.                                        | Awareness given during induction session to all employee regarding watch your step.<br><br>Conducted awareness on "Three Point Contact". |
| 14. | 20.03.2025 | Worker got abrasion on right hand thumb finger due to sharp edges of metal sheet while roof sheeting work | Handling sharp metal sheet without gloves. No enforcement of PPE                                       | Mandatory glove use for sheet work and toolbox talk given on handling sharp materials                                                    |
| 15. | 23.03.2025 | Curing water tanker fell into the excavation area, no personnel were injured                              | Poor ground condition and lack of barricade. No supervision during movement.                           | Maintained safe distance between excavation and traffic.<br><br>Compacted soil and barricaded excavation zones.                          |
| 16. | 26.03.2025 | Hydra chose a narrow shortcut passage near excavation area and almost fell into open pit                  | Unsafe route selection and poor ground stability. Lack of supervision during movement                  | Planned vehicle route and check ground condition. Used spotter for heavy vehicle shifting.                                               |
| 17. | 27.03.2025 | JCB bucket touched a live cable (415V) while working                                                      | Absence of underground cable marking. Work done without electrical clearance. Poor Compliance with PTW | Ensured PTW and utility clearance before excavation. Marked underground                                                                  |

|     |            |                                                                                                                                                    |                                                                                         |                                                                                                                                     |
|-----|------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
|     |            | causing power to trip                                                                                                                              |                                                                                         | cables with danger signage.                                                                                                         |
| 18. | 28.03.2025 | Personnel got a minor cut injury on the tip of the right-hand index finger from the rotating shaft of the jig conveyor while lubricating a bearing | Lubrication is done while the machine is in motion. Inadequate awareness of Pinch point | <p>Implemented "Lock-out / Tag-out" (LOTO) before maintenance.</p> <p>Trained workers on safe work practices near moving parts.</p> |

Table 22: Accident/Incident Details

### Site Observation Details

From Apr'24 to Sep'24 526 nos of observation points were recorded and 517 observations are cleared and only 9 observation points were pending.

### 3.3 Training Details

#### 3.3.1 Training Calendar followed by site team

##### Yearly Training Calendar-2025

| Month         | TOPIC & DATE                               |                                           |
|---------------|--------------------------------------------|-------------------------------------------|
| <b>Jan-25</b> | 11th Jan (2nd Saturday)                    | 28th Jan (4th Saturday)                   |
|               | General EHS Awareness & Workplace Safety   | Fire Safety- fire prevention & protection |
| <b>Feb-25</b> | 08th Feb (2nd Saturday)                    | 22nd Feb (4th Saturday)                   |
|               | Mechanical Hazards and Machine guarding    | Incident Management                       |
| <b>Mar-25</b> | 08th March (2nd Saturday)                  | 22nd March (4th Saturday)                 |
|               | Electrical safety                          | LOTO procedures                           |
| <b>Apr-25</b> | 12th Apr (2nd Saturday)                    | 26th Apr (4th Saturday)                   |
|               | Chemical safety & MSDS                     | Heat stress Prevention                    |
| <b>May-25</b> | 10th May (2nd Saturday)                    | 24th May (4th Saturday)                   |
|               | Hierarchy of Risk Control & PPE            | Ergonomics and Workplace Comfort          |
| <b>Jun-25</b> | 14th June (2nd Saturday)                   | 28th June (4th Saturday)                  |
|               | Construction Safety- Protection of workmen | Material Handling and MHE safety          |
| <b>Jul-25</b> | 12th Jul (2nd Saturday)                    | 26th Jul (4th Saturday)                   |
|               | Confined space safety                      | basic first aid treatment                 |
| <b>Aug-25</b> | 09th Aug (2nd Saturday)                    | 23rd Aug (4th Saturday)                   |
|               | Mechanical Hazards and Machine guarding    | Incident Management                       |
| <b>Sep-25</b> | 13th Sep (2nd Saturday)                    | 27th Sep (4th Saturday)                   |
|               | Electrical safety                          | LOTO procedures                           |
| <b>Oct-25</b> | 11th Oct (2nd Saturday)                    | 25th Oct (4th Saturday)                   |

|               |                                            |                                  |
|---------------|--------------------------------------------|----------------------------------|
|               | Chemical safety & MSDS                     | Heat stress Prevention           |
| <b>Nov-25</b> | 08th Nov (2nd Saturday)                    | 22nd Nov (4th Saturday)          |
|               | Hierarchy of Risk Control & PPE            | Ergonomics and Workplace Comfort |
| <b>Dec-25</b> | 13th Dec (2nd Saturday)                    | 27th Dec (4th Saturday)          |
|               | Construction Safety- Protection of Workmen | Material Handling and MHE safety |

*Table 23: Training Calendar for the Year 2025 by site team*

### **3.3.2 Shine - Voluntary Themed Events Initiated by ESG Department**

In order to standardize, streamline and **SHINE** (Safety and Health Innovations Nurturing Excellence) we bring you a Special Quarterly OHS Themed Event.

The aim of this themed event is to make OHS more interesting and creative, so that there is an enthusiastic participation and recall of the activities. The research and content for the activities will be done by ESG team and shared with site team every quarter.

This themed event is based on the 4 elements – Water, Air, Earth and Fire as a theme. Please refer to the below table 24.

| <b>SI No</b> | <b>Month</b>        | <b>Theme</b> |
|--------------|---------------------|--------------|
| 1.           | January to March    | Earth        |
| 2.           | April to June       | Fire         |
| 3.           | July to September   | Water        |
| 4.           | October to December | Air          |

*Table 24: Elements of Themed Events*

Starting from July 2024, we are conducted the themed event in every quarter. And, once in a quarter, our ESG team member will travel to every location to implement with your support, one Voluntary OHS activity. By Voluntary – we mean an activity that does not fall under regulatory/compliance list of activities.

#### **1. July to September 2024: Water Theme**

The below mentioned training ppt are prepared by ESG team and shared with site team to conduct the safety awareness drive related to water related disaster.

Figure 26: Themed Event PPT – Water

## ACTIVITIES OF SPECIAL EVENT :

| Sl.No | Date & Day                       | Activities to Conduct                                                                                                                    | Note                                                                                                                                                                                                                                                                                                              | Impact                                                                                                                                                           |
|-------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.    | Day 1:<br>22.07.24,<br>Monday    | Awareness Session                                                                                                                        | <ul style="list-style-type: none"> <li>OHS/EHS head will present the PPT and invite the top management to speak at this event– Location person to fill it.</li> </ul>                                                                                                                                             | <ol style="list-style-type: none"> <li>Emphasize the H&amp;S focus of the organization.</li> <li>Make H&amp;S more creative &amp; interesting.</li> </ol>        |
| 2.    | Day 2:<br>23.07.24,<br>Tuesday   | Training Sessions<br>1. Preparedness for flood hazards for H & S<br>2. Coastal zone plant to include preparedness on Tsunami/Cyclone.    | <ul style="list-style-type: none"> <li>Location OHS can select any one training and execute –Location person to fill it.</li> </ul>                                                                                                                                                                               | Improve awareness and preparedness for water based disaster.                                                                                                     |
| 3.    | Day 3:<br>24.07.24,<br>Wednesday | Mock Drill of any one scenario based on day 2 training section.                                                                          | <ul style="list-style-type: none"> <li>Location OHS can select and execute– Location person to fill it.</li> </ul>                                                                                                                                                                                                | Improve awareness and preparedness for water based disaster.                                                                                                     |
| 4.    | Day 4:<br>25.07.24,<br>Thursday  | Public Interactive- with family, school, general public, specific organizations. Drawing competition, Slogan Writing Competition & quiz. | <ul style="list-style-type: none"> <li>Location OHS can select any one option and execute– Location person to fill it.</li> </ul>                                                                                                                                                                                 | <ol style="list-style-type: none"> <li>Emphasize the H&amp;S focus of the public.</li> <li>Make H&amp;S more creative &amp; interesting.</li> </ol>              |
| 5     | 26.07.24<br>Friday               | Closing Ceremony                                                                                                                         | <ol style="list-style-type: none"> <li>Location OHS to invite external guest only after consulting with location head</li> <li>Location OHS to take approval for budgets from location head well in advance</li> <li>Prize distribution and closing ceremony festivities</li> </ol> – Location person to fill it. | <ol style="list-style-type: none"> <li>Reward &amp; Recognize enthusiasm and pro-active safety behavior.</li> <li>Enable pleasant recall of the event</li> </ol> |

### AWARENESS SESSION ON WATER THEMED DISASTER

#### OUTLINE:

1. Types of Water Disasters
2. Common Threats in Manufacturing Plants Related to Water Disasters
3. Health Hazards and Their Effects on Employees
4. Preparedness and Mitigation
5. Conclusion



### TYPES OF WATER DISASTERS

1. **Floods:** Overflow of water onto land, often due to heavy rainfall, river overflow, or dam failure.
2. **Tsunamis:** Large sea waves caused by underwater earthquakes, volcanic eruptions, or landslides.
3. **Storm Surges:** Elevated sea levels caused by strong winds and atmospheric pressure changes during storms.
4. **Droughts:** Extended periods of deficient rainfall leading to water scarcity and adverse impacts on agriculture and water supply.



#### Causes:

- Human-Induced Factors: Urbanization, deforestation, and poor water management practices exacerbate the frequency and intensity of water disasters.

#### Impact:

- Environmental and Societal Impacts: Destruction of ecosystems, loss of biodiversity, displacement of populations, economic losses, and health crises.

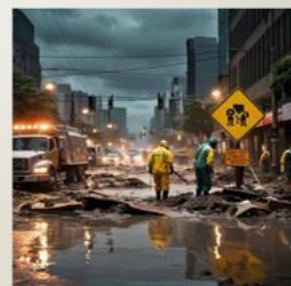
### COMMON THREATS IN MANUFACTURING PLANTS RELATED TO WATER DISASTERS

- Flooding and Water Damage:** Floodwaters can damage machinery, infrastructure, and inventory, leading to operational disruptions.
- Contaminated Water Supply:** Water contamination can compromise the safety of water used in manufacturing processes.
- Electrical Hazards from Water Exposure:** Water exposure increases the risk of electrical malfunctions and accidents.
- Damage to IT Equipment:** Water can damage computers, servers, and other IT equipment, leading to data loss and operational disruptions.



### HEALTH HAZARDS AND THEIR EFFECTS ON EMPLOYEES

- Waterborne Diseases:** Employees are at risk of diseases caused by contaminated water, such as cholera and leptospirosis.
- Health Issues:** Respiratory Issues, Musculoskeletal Problems, Hypothermia, Skin Irritation and Infections, Mental Health Issues etc.,
- Chemical Exposure Due to Water Contamination:** Floodwaters can introduce hazardous chemicals, increasing the risk of chemical burns and poisoning.
- Injuries from Slips and Falls:** Wet and slippery surfaces increase the risk of falls, leading to injuries.
- Impaired Visibility:** Heavy rain can reduce visibility, making it difficult to operate machinery safely.



## PREPAREDNESS AND MITIGATION

- **Purpose and Importance of Preparedness:** Preparing for water disasters ensures safety and minimizes damage. Effective preparedness can save lives and resources.
- Each disaster has unique risks and requires specific preparedness strategies.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Flood Preparedness</b> <ul style="list-style-type: none"> <li>• <b>Understanding Flood Risks:</b> Identify flood-prone areas and stay informed about weather forecasts and flood warnings.</li> <li>• <b>Emergency Supplies and Plans:</b> Prepare an emergency kit with essentials such as food, water, medication, and important documents. Develop a family communication plan.</li> <li>• <b>Evacuation Procedures:</b> Know the evacuation routes and shelters in your area. Follow instructions from local authorities and evacuate immediately when advised.</li> </ul> | <b>Tsunami Preparedness:</b> <ul style="list-style-type: none"> <li>• <b>Recognizing Tsunami Warnings:</b> Understand natural tsunami signs such as strong earthquakes, rapid sea level changes, and loud ocean noises. Pay attention to official tsunami alerts.</li> <li>• <b>Safe Locations and Routes:</b> Identify high ground and safe locations away from the coast. Plan evacuation routes to reach these areas quickly.</li> <li>• <b>Post-Tsunami Safety:</b> Stay away from the coast until authorities declare it safe. Be aware of potential aftershocks and secondary waves.</li> </ul> | <b>Storm Surge Preparedness:</b> <ul style="list-style-type: none"> <li>• <b>Understanding Storm Surge Risks:</b> Storm surges are elevated sea levels caused by strong winds and low pressure from hurricanes. Recognize the risk in coastal areas.</li> <li>• <b>Preparing Your Property:</b> Secure outdoor objects, reinforce doors and windows, and move valuable items to higher ground.</li> <li>• <b>Safety During a Storm Surge:</b> Evacuate if advised by authorities. Avoid driving or walking through floodwaters and stay in a safe location until the storm passes.</li> </ul> | <b>Drought Preparedness:</b> <ul style="list-style-type: none"> <li>• <b>Recognizing Drought Conditions:</b> Monitor local water levels, rainfall, and official drought declarations. Understand how drought impacts your area.</li> <li>• <b>Water Conservation Techniques:</b> Implement water-saving practices such as fixing leaks, using drought-resistant plants, and reducing water usage.</li> <li>• <b>Long-Term Drought Strategies:</b> Develop sustainable water management plans, invest in water-saving technologies, and promote community awareness on water conservation.</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Ensure availability and proper use of PPE to protect employees from hazards.

## CONCLUSION

- **Summary of Key Points:** Reviewed preparedness steps for floods, tsunamis, storm surges, and droughts. Highlighted the importance of planning and safety measures.
- **Importance of Continued Awareness and Preparedness:** Ongoing education and community engagement are crucial for effective disaster response and risk reduction.
- **Call to Action:** Encourage proactive measures, participation in preparedness programs, and support for policies aimed at mitigating water disasters.



Thank You

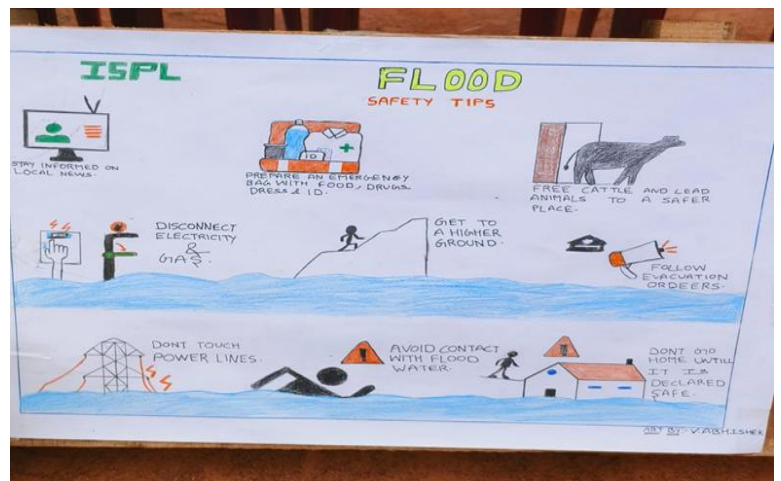
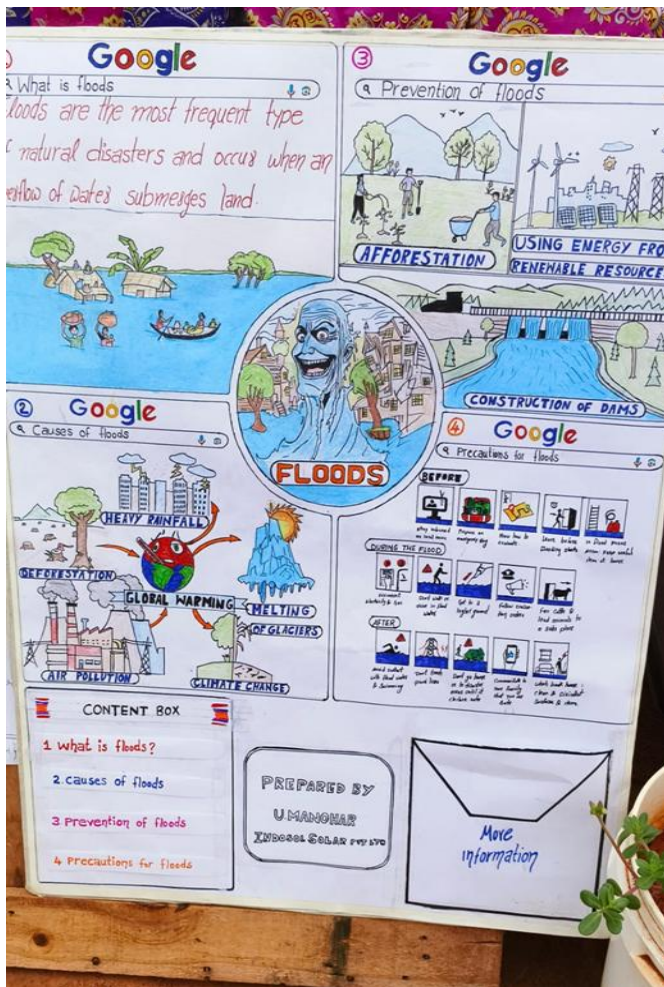
## Snapshot of the water themed event:

- 100+ participant.

Figure 27: Snapshot of the Water Themed Event



- Drawing Competition Conducted



- Sweet & Prize distribution



- Prize winner of drawing competition:
  - Manohar (GET), Adilaxmi (worker), Kalyini (worker), Bhanu (survey), Abishek (GET)

## 2. October to December 2024: Air

The below mentioned training ppt are prepared by ESG team and shared with site team to conduct the safety awareness drive related to Air related disaster.

Figure 28: Themed Event PPT – Air

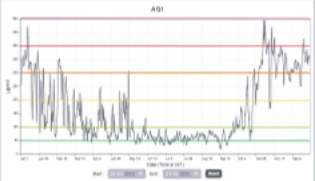
| ACTIVITIES OF SPECIAL EVENT |                                  |                                                                                                                                                                      |                                                                                                                                                                                                                                                                                |                                                                                                      |
|-----------------------------|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|
| Sl.No                       | Date & Day                       | Activities to Conduct                                                                                                                                                | Note                                                                                                                                                                                                                                                                           | Impact                                                                                               |
| 1.                          | Day 01<br>21.10. 2024,<br>Monday | Awareness Session                                                                                                                                                    | OHS/EHS head will present the PPT and invite the top management to speak at the event (location person to fill as per plan note in ppt)                                                                                                                                        | Emphasize Health & Safety initiatives, make it more creative and engaging                            |
| 2.                          | Day 02<br>22.10.24,<br>Tuesday   | Training Sessions<br>1.Preparedness for Toxic gases release hazards for H & S<br>2.Preparedness on smoke Emission due to fire accident                               | Location OHS can select any one training and execute (location person select one of the two options and write a brief note here before presenting)                                                                                                                             | Improve awareness and preparedness for pollution at workplace                                        |
| 3.                          | Day 03<br>23.10.24,<br>Wednesday | Mock Drill of any one scenario based on day 2 training section.                                                                                                      | Location OHS can select and execute (Location person to fill here as per mock drill)                                                                                                                                                                                           | Improve awareness and preparedness for pollution at workplace                                        |
| 4.                          | Day 04<br>24.10.24,<br>Thursday  | Public Interactivewith family, school, general public, specific organizations. Drawing competition, Slogan Writing Competition Quiz, & Air pollution awareness rally | (Location person to fill selected option before presenting this ppt)                                                                                                                                                                                                           | Improve awareness of air pollution among public                                                      |
| 5                           | Day 05<br>25.10.24,<br>Friday    | Closing Ceremony                                                                                                                                                     | 1.Location OHS to invite external guest or after consulting with location head<br>2. Location OHS to take approval for budget from location head well in advance<br>3. Prize distribution and closing ceremony festivities<br>( Location person to fill this note as per plan) | Provide positive feedback and recognize proactive efforts<br><br>Enable pleasant recall of the event |

### INTRODUCTION TO AIR POLLUTION IN INDIAN INDUSTRY

- Definition of air pollution in the industrial context:**
  - Air pollution in the industrial context is the release of harmful substances into the atmosphere from industrial activities, which can negatively impact air quality, human health, and the environment.
  - The graph shows the trend in Air Quality Index (AQI) in the year 2023.
- Importance of addressing Air pollution:**
  - According to WHO:
    - Globally, The combined effects of ambient air pollution and household air pollution is associated with **7 million premature deaths annually**, equivalent to **800 people every hour** or **13 people every minute**.
    - Globally, **93%** of all children live in environments with air pollution levels above the WHO guidelines.
    - Globally, Both ambient air pollution and household air pollution contribute to respiratory tract infections that resulted in **543 000 deaths** in children under the age of 5 years in 2016.

**Did you Know Project Kaatru by IIT Madras?**

- Researchers (Team Kaatru) at IIT Madras developing a google maps like app that will even tell you which lane is the least polluted.
- It gives real time IoT based localized data on air quality which will help combat environmental injustices.



**CENTRAL POLLUTION CONTROL BOARD'S AIR QUALITY STANDARDS**

| AIR QUALITY INDEX (AQI) | CATEGORY     |
|-------------------------|--------------|
| 51-100                  | Satisfactory |
| 101-200                 | Moderate     |
| 200-300                 | Poor         |
| 301-400                 | Very Poor    |
| 401-500                 | Severe       |

### TYPES OF AIR POLLUTANTS

|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1.Primary pollutants:</b><br>These are directly emitted from sources such as: <ol style="list-style-type: none"> <li>Vehicles (e.g., particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide)</li> <li>Industrial processes (e.g., ammonia, sulfur dioxide)</li> <li>Power generation (e.g., sulfur dioxide, nitrogen oxides)</li> <li>Cooking and heating with polluting fuels (e.g., particulate matter, carbon monoxide)</li> </ol> | <b>2.Secondary pollutants:</b><br>These are formed through chemical reactions between primary pollutants and other substances in the atmosphere: <ol style="list-style-type: none"> <li>Ground level Ozone (O3)</li> <li>Nitrogen dioxide (NO2)</li> <li>Sulfuric acid (H2SO4)</li> <li>Particulate matter (PM)</li> </ol> |
| <b>3.Biological pollutants:</b><br>These are living organisms or substances derived from living organisms: <ol style="list-style-type: none"> <li>Mold spores</li> <li>Bacteria</li> <li>Viruses</li> <li>Volatile organic compounds (VOCs) emitted by plants and microorganisms</li> </ol>                                                                                                                                                             | <b>4.Particulate matter (PM):</b><br>This includes: <ol style="list-style-type: none"> <li>Fine particulate matter (PM2.5)</li> <li>Coarse particulate matter (PM10)</li> <li>Black carbon</li> </ol>                                                                                                                      |

### HAZARDS OF AIR POLLUTION

| Health Hazards from Industrial pollution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Environmental Hazards from Industrial Pollution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Respiratory Issues:</b> <ul style="list-style-type: none"> <li>Industrial pollution contributes significantly to poor air quality, leading to increased cases of respiratory diseases such as asthma, bronchitis, and chronic obstructive pulmonary disease (COPD).</li> </ul> <b>Increase in Premature Deaths:</b> <ul style="list-style-type: none"> <li>Air pollution is a leading factor in premature deaths in India, especially in highly industrialized and urban areas. According to recent government data, air pollution accounted for approximately 1.67 million premature deaths in India in 2023.</li> </ul> <b>Occupational Diseases among Industrial Workers :</b> <ul style="list-style-type: none"> <li>Workers in industrial sectors are at higher risk of developing occupational diseases due to prolonged exposure to harmful pollutants like sulfur dioxide, nitrogen oxides, and particulate matter. Common conditions include silicosis, lung cancer, and other respiratory diseases.</li> </ul> <b>Impact on Vulnerable Populations :</b> <ul style="list-style-type: none"> <li>Vulnerable groups, including children, the elderly, and those with pre-existing health conditions, are disproportionately affected by industrial pollution.</li> </ul> | <b>Climate Change:</b> <ul style="list-style-type: none"> <li>According to the Central Pollution Control Board (CPCB), India's industrial sector emitted approximately 2.88 billion metric tons of CO<sub>2</sub> in 2023, contributing to rising temperatures and altered weather patterns.</li> </ul> <b>Acid Rain :</b> <ul style="list-style-type: none"> <li>Emissions of sulfur dioxide (SO<sub>2</sub>) and nitrogen oxides (NOx) from industries are leading causes of acid rain.</li> </ul> <b>Carbon Footprint :</b> <ul style="list-style-type: none"> <li>India's industrial sector accounts for around 24% of the country's total carbon footprint, with major contributions from steel, cement, and chemical industries.</li> <li>Efforts to reduce the carbon footprint through cleaner technologies have shown minimal progress, as reported by the Ministry of Environment, Forest and Climate Change (MoEFCC) in 2023.</li> </ul> <b>Smog Formation:</b> <ul style="list-style-type: none"> <li>Smog, primarily formed by the interaction of industrial pollutants (NOx, SO<sub>2</sub>) and volatile organic compounds (VOCs) with sunlight, is a significant issue in industrial regions.</li> </ul> |

### PREPAREDNESS AND MITIGATION FOR TOXIC GAS RELEASE HAZARDS

| Preparedness:                                                                                                                                                                                                                                                                                     | Mitigation:                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-Risk Assessment:</b> Conduct thorough assessments to identify potential sources of toxic gas releases in the workplace.                                                                                                                                                                       | <b>-Ventilation Systems:</b> Install and maintain adequate ventilation systems to disperse toxic gases and maintain safe air quality.                                                                                                          |
| <b>-Training:</b> Regularly train employees on recognizing signs of gas leaks and the proper emergency response procedures.                                                                                                                                                                       | <b>-Shutoff Systems:</b> Automate gas shutoff systems to quickly halt leaks from equipment or pipelines.                                                                                                                                       |
| <b>-Emergency Plans:</b> Develop and regularly update emergency response plans specific to toxic gas release scenarios.                                                                                                                                                                           | <b>-Emergency Response Drills:</b> Conduct regular drills to practice evacuation procedures and emergency response actions.                                                                                                                    |
| <b>a. Understanding Wind Direction</b> with the help of wind socks or flags flapping<br><b>b. Upwind and Crosswind Evacuation</b><br><b>-Upwind:</b><br>-Evacuate away from the source of the hazard (e.g., toxic gas release, chemical spill).<br>-The wind will carry the hazard away from you. | <b>-Communication Systems:</b> Establish clear communication protocols for alerting workers and emergency responders in case of a toxic gas release.                                                                                           |
| <b>Crosswind:</b> <ul style="list-style-type: none"> <li>Move perpendicular to the wind direction.</li> <li>This can help avoid being exposed to harmful toxic gas or smoke</li> </ul>                                                                                                            | <b>-First Aid Measure:</b> Get the person into fresh air as soon as possible and if the person vomits, turn the person's head to the side to prevent choking. Call ambulance and shift the person's to nearest hospital for further treatment. |

## PREPAREDNESS AND MITIGATION FOR SMOKE EMISSION DUE TO FIRE ACCIDENTS

### Preparedness:

**Fire Risk Assessment:** Regularly assess fire hazards in the workplace, including sources of ignition and combustible materials.

**Fire Safety Training:** Train employees on fire prevention strategies, evacuation routes, and how to use fire extinguishing equipment.

**Emergency Action Plan:** Create and maintain a comprehensive emergency action plan that includes procedures for fire emergencies.

**Smoke Detectors and Alarms:** Install and regularly test smoke detectors and alarms to provide early warning of smoke emissions.

### Mitigation:

**Fire Suppression Systems:** Implement fire suppression systems such as sprinklers and fire extinguishers in key areas.

**Proper Storage:** Store flammable materials in approved containers and locations to minimize the risk of fire.

**Regular Maintenance:** Conduct regular maintenance of electrical systems and machinery to reduce the risk of ignition.

**Evacuation Drills:** Conduct regular evacuation drills to ensure employees are familiar with emergency exits and procedures.

## NOISE POLLUTION

### Noise pollution:

- Noise pollution has become a significant environmental issue in India, particularly in urban areas.
- The rapid industrialization, urbanization, and increasing vehicular traffic have contributed to the rising noise levels.
- This excessive noise can have detrimental effects on human health and wildlife.

### Health impacts:

- The World Health organization (WHO) has estimated that 1.2million disabilityadjusted life year are lost annually in Europe due to environmental noise pollution. This estimate refers to the number of years of healthy life lost due to premature death or living with disability caused by noise exposures.
- These health impact are primarily associated with cardiovascular diseases, sleep disturbance, cognitive impairment in children, tinnitus and annoyance. Noise pollution is recognized as the second most significant environmental risk factor for public health in Europe, after air pollution.

**Environmental effects:** Excessive noise can disrupt wildlife habitats, affecting their behavior and reproduction.

| Permissible Level |                       |                                 |                                   |
|-------------------|-----------------------|---------------------------------|-----------------------------------|
| Area Code         | Category of Area/Zone | Limits on dB                    |                                   |
|                   |                       | Day Time<br>(6:00AM to 10:00PM) | Night Time<br>(10:00PM to 6:00AM) |
| A                 | Industrial area       | 75                              | 70                                |
| B                 | Commercial area       | 65                              | 55                                |
| C                 | Residential area      | 55                              | 45                                |
| D                 | Silence zone          | 50                              | 40                                |

**Silence Zone Norms:**

Silence zones: Areas within 100 meters around premises like hospitals, educational institutions, courts, and religious places where noise levels are strictly regulated.

**Restrictions:** Prohibits the use of horns, loudspeakers, fireworks, and any activity that causes noise beyond the set limits.

**Enforcement:** Violations can lead to penalties under the Noise Pollution (Regulation and Control) Rules, 2000.

## NOISE POLLUTION PREPAREDNESS AND MITIGATION MEASURES AT INDUSTRY

### Preparedness Measures

#### Noise Monitoring Systems:

- Installation of continuous noise monitoring systems in high-noise areas.
- Regular monitoring to ensure compliance with prescribed noise limits (usually 75 dB(A) for industrial areas).

#### Noise Assessment and Mapping:

- Conducting noise mapping in industrial zones to identify high-impact areas.
- Implementation of baseline noise level surveys before starting operations.

#### Regulatory Compliance:

- Adherence to standards set by the Noise Pollution (Regulation and Control) Rules, 2000.
- Industries required to submit annual noise level reports to state pollution control boards.

### Mitigation Measures

#### Engineering Controls:

- Use of noise barriers and acoustic panels to minimize sound transmission.
- Implementation of quieter machinery and equipment to reduce noise generation.

#### Operational Controls:

- Scheduling of noisy operations during off-peak hours to minimize impact on surrounding communities.
- Regular maintenance of machinery to prevent noise escalation due to wear and tear.

#### Employee Training:

- Training programs for workers on noise awareness and hearing conservation.
- Promotion of the use of personal protective equipment (PPE), such as earplugs or earmuffs.

## REGULATORY, MONITORING FRAMEWORK IN INDIA

### Regulatory Framework

#### 1. Air (Prevention and Control of Pollution) Act, 1981

#### 2. National Ambient Air Quality Standards (NAAQS)

#### 3. Environment (Protection) Act, 1986

#### 4. National Air Quality Index

#### 5. National Clean Air Programme (NCAP)

### Monitoring Framework

#### 1. Central Pollution Control Board (CPCB)

#### 2. National Green Tribunal (NGT)

#### 3. State Pollution Control Boards (SPCBs)

#### 4. Real-time Air Quality Monitoring Stations

#### 5. Satellite Monitoring and Remote Sensing

### Other Act indirectly connected to air

#### 1. Noise Pollution Regulation & Control rules-2000.

#### 2. Noise Limit for electricity generator sets run with diesel

#### 3. Notification of Fly Ash Utilization, and amendments 2008

#### 4. Central Motor Vehicle Act – 1988 and Rules there under.

## CASE STUDIES

### Air Quality in India

#### a. Delhi Smog Crisis (CPCB AQI Report 2023)

- The Air Quality Index (AQI) in major Indian cities varies significantly, with northern cities like Delhi and Ghaziabad often falling under the "unhealthy" category due to PM2.5 levels exceeding safe limits. In 2023, Delhi's average AQI was recorded at 205, indicating "very poor" air quality. Other cities such as Ghaziabad and Noida also reported high PM2.5 concentrations around 77.7 µg/m³, far surpassing the World Health Organization's recommended annual limit of 5 µg/m³.

World's Most Polluted Cities in 2023 is shown below:

| Rank | City                      | PM2.5 | PM10 | O3 | SO2 | NO2 | CO | AQI | Category  |
|------|---------------------------|-------|------|----|-----|-----|----|-----|-----------|
| 1    | Bangalore, India          | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 2    | Delhi, India              | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 3    | Patna, India              | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 4    | Bombay, India             | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 5    | Hyderabad, India          | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 6    | Chennai, India            | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 7    | Kolkata, India            | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 8    | Jaipur, India             | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 9    | Surat, India              | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 10   | Thiruvananthapuram, India | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 11   | Varanasi, India           | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 12   | Indore, India             | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 13   | Pune, India               | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 14   | Lucknow, India            | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 15   | Bhopal, India             | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 16   | Guwahati, India           | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 17   | Agartala, India           | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 18   | Dispur, India             | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 19   | Imphal, India             | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |
| 20   | Shillong, India           | 100   | 150  | 10 | 10  | 10  | 10 | 100 | Very Poor |

#### b. Taj Mahal Discoloration

- Air pollutants like sulfur and nitrogen dioxide from industrial emissions and vehicular traffic react with the Taj Mahal's marble, causing it to yellow and discolor.



## CASE STUDIES

### c. Crop Burning in NCR and its Impact

- The impact of stubble burning in the NCR (National Capital Region) on AQI levels.
- Statistics on seasonal increases in air pollution during the crop-burning season.

### d. Impact of Fireworks

- Effects on neighboring states (Punjab, Haryana) and its spread to Delhi.
- The use of fireworks around festival time was linked to a considerable spike in PM2.5 levels, leading to health advisories urging citizens, particularly vulnerable populations like children and the elderly, to minimize outdoor activities during and after fireworks displays.

### e. Burning of Waste

- Many regions in India exceed the permissible limits of air quality standards due to waste burning practices. This is especially prevalent during certain seasons when waste burning increases, worsening overall air quality.

### f. Noise Pollution

- Noise pollution in India, particularly in urban areas, frequently exceeds permissible limits, especially near traffic, construction sites, and industrial zones.
- Major cities recorded noise levels reaching 80 dB, which is significantly above safe thresholds.



## CONCLUSION

### Solutions for Reducing Industrial Air Pollution:

- Adoption of cleaner technologies (e.g., electrostatic precipitators, scrubbers in factories)
- Use of alternative fuels (natural gas, renewable energy)
- Implementing strict emission norms and penalties for industries exceeding limits
- Public-private partnerships for cleaner production practices

### Mitigation Measures:

- Effective use of cleaner technologies (e.g., electrostatic precipitators, scrubbers) and personal protective equipment
- Tree plantation is an effective natural solution for reducing air pollution, providing multiple environmental benefits like (Absorption of Pollutants, Carbon Dioxide Absorption)

### Employee Health & Safety:

- Emphasis on the importance of preparedness, training, and health monitoring systems.



## Snapshot of the air themed event:

Figure 29: Snapshot of the Air Themed Event



- 100+ Participant
- Prize distributed to the winners of drawing competition
- Emergency Mock Drill cum rescue operation conducted at the plant to check the emergency preparedness at the plant.

### 3. January to March 2025: Earth

The below mentioned training ppt are prepared by ESG team and shared with site team to conduct the safety awareness drive related to Earth related disaster and the site team going to execute this training on the month of Feb'25.

Figure 30: Themed Event PPT – Earth

## ACTIVITIES OF THEMED EVENT :

| Sl. No | Date & Day                      | Activities to Conduct                                                                                                                                                    | Note                                                                                                                                                                                                                                                         | Impact                                                                                                                                                         |
|--------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.     | Day 1:<br>17.01.25,<br>Saturday | Awareness Session with Special Mention of Road Safety.                                                                                                                   | OHS/EHS Head will present the PPT and invite the top management to speak at this event – Location person to fill                                                                                                                                             | 1. Emphasize the H&S focus of the organization.<br>2. Make H&S more creative & interesting.<br>3. Special reference to Road Safety for drivers and pedestrians |
| 2.     | Day 2:<br>18.01.25<br>Friday    | Public Interactive Session – i) Road safety awareness rally with employees and local community/school/ college students.<br>ii) Drawing/Slogan Writing/quiz Competition. | Location OHS can select any one competition and execute – Location person to fill it.                                                                                                                                                                        | 1. Emphasize the H&S focus of the public.<br>2. Make H&S more creative & interesting.                                                                          |
| 3.     | Day 3:<br>20.01.25,<br>Monday   | Training Sessions<br>1. Preparedness for Earthquakes.<br>2. Preparedness for Landslides.                                                                                 | Location OHS can select any one training and execute – Location person to fill it.                                                                                                                                                                           | Improve awareness and preparedness for earth based disaster.                                                                                                   |
| 4.     | Day 4:<br>21.01.25,<br>Tuesday  | i) Mock Drill of any one scenario based on day 3 training section.<br>ii) Participation/Suggestions during training session – Recognition/prize                          | Location OHS can select and execute – Location person to fill it.                                                                                                                                                                                            | Improve awareness and preparedness for earth based disaster.                                                                                                   |
| 5      | Day 5:<br>22.01.25<br>Wednesday | Closing Ceremony & Prize Distributions.                                                                                                                                  | 1. Location OHS to invite external guest only after consulting with location head<br>2. Location OHS to take approval for budgets from location head well in advance<br>3. Prize distribution and closing ceremony festivities – Location person to fill it. | 1. Reward & Recognize enthusiasm and pro-active safety behavior.<br>2. Enable pleasant recall of the event                                                     |

### AWARENESS SESSION ON EARTH THEMED DISASTER

#### OUTLINE:

1. Types of Earth Disasters – Human Caused and Natural Disasters
2. Alarming Facts
3. Disasters – Causes – Impact – Prevention – Preparedness – Mitigation
4. Common Threats in Manufacturing Plants Related to Natural Disasters
5. Health Hazards and Their Effects on Employees
6. Key Points to Enforce -Conclusion



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### TYPES OF EARTH DISASTERS – PREPAREDNESS AND PREVENTION

#### A. Human-Caused Disasters:

- A1 Directly Impacting Man:**
- Road Accidents
  - Unregulated Construction
  - Urban Sprawl

- A2 Impacting Earth:**
- Resource Exploitation and Pollutions
  - Soil Contamination
  - Oil Spills



#### B. Natural Disasters:

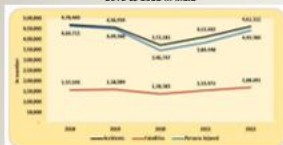
- B1 Geological Disasters:**
- Earthquakes
  - Volcanic Eruptions
  - Tsunamis
  - Landslides
  - Sinkholes

- B2 Climatological Disasters:**
- Desertification



### ALARMING FACTS:

Trends in Number of Accidents, Fatalities and Persons Injured: 2018 to 2022 in India



#### Do you Know?

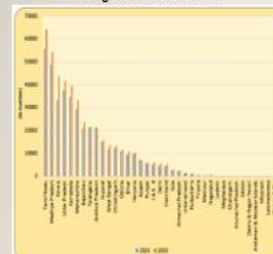
Globally 1.19 million road traffic deaths in 2021; this corresponds to a rate of 15 road traffic deaths per 100 000 population.

In India 0.15 million road traffic deaths in 2021; this corresponds to a rate of 11 road traffic deaths per 100 000 population and Globally ranked Highest in road traffic deaths.

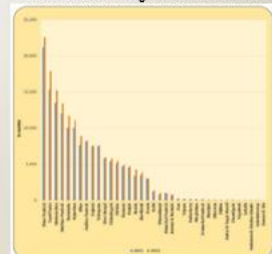
<https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries>

### ALARMING FACTS:

State/UT – Wise distribution of Number of accidents during 2021 and 2022 in India



State/UT – Wise distribution of Number of accidents/deaths during 2021 and 2022 in India



## A1 EARTH SURFACE RELATED DISASTERS- ROAD ACCIDENTS

| Disasters     | Causes                                                                                                                                                                                                                                               | Impact                                                                                                                                                                                              | Prevention & Mitigation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Road Accident | <b>Human Factors:</b> <ul style="list-style-type: none"> <li>Speeding</li> <li>Driving under the influence of alcohol or drugs</li> <li>Distracted driving (e.g., phone use)</li> <li>Fatigue</li> <li>Lack of adherence to traffic rules</li> </ul> | <b>Human:</b> <ul style="list-style-type: none"> <li>Loss of lives</li> <li>Physical injuries (temporary or permanent disabilities)</li> <li>Psychological trauma</li> </ul>                        | <ul style="list-style-type: none"> <li>Enforcement of traffic laws (speed limits, helmet use, seat belts)</li> <li>Development of safer road infrastructure (barriers, crossings, lighting)</li> <li>Implementation of intelligent transportation systems-traffic monitoring systems</li> <li>Encouraging use of public transportation and carpooling</li> <li>Emergency response systems for accidents</li> <li>Driver training and licensing regulations</li> <li>Public awareness campaigns on safe driving practices</li> </ul> |
|               | <b>Vehicle Factors:</b> <ul style="list-style-type: none"> <li>Poor vehicle maintenance</li> <li>Mechanical failure (brakes, tires, etc.)</li> <li>Lack of safety features</li> </ul>                                                                | <b>Economic:</b> <ul style="list-style-type: none"> <li>Medical costs and rehabilitation</li> <li>Vehicle and property damage</li> <li>Loss of productivity and income</li> </ul>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|               | <b>Other Factors:</b> <ul style="list-style-type: none"> <li>Poor road conditions</li> <li>Weather-related issues (rain, fog, snow)</li> <li>Insufficient lighting or signage</li> </ul>                                                             | <b>Social:</b> <ul style="list-style-type: none"> <li>Grief and emotional distress for families</li> <li>Increased pressure on healthcare systems</li> <li>Traffic congestion and delays</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



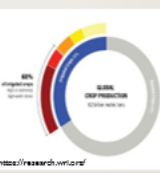
## A1 EARTH SURFACE RELATED DISASTERS -OTHERS

| Disasters                | Causes                                                                                                                                                                                                        | Impact                                                                                                                                                                                         | Prevention & Mitigation                                                                                                                                                                                                            |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Unregulated Construction | <ul style="list-style-type: none"> <li>Lack of enforcement of building codes</li> <li>Corruption and negligence</li> <li>Rapid urbanization without planning</li> <li>Use of substandard materials</li> </ul> | <ul style="list-style-type: none"> <li>Building collapses</li> <li>Infrastructure failures</li> <li>Loss of life and property</li> <li>Long-term economic consequences</li> </ul>              | <ul style="list-style-type: none"> <li>Enforcing regulations</li> <li>Retrofitting unsafe structures</li> <li>Sustainable urban design</li> <li>Community participation in planning</li> <li>Public awareness on safety</li> </ul> |
| Urban Sprawl             | <ul style="list-style-type: none"> <li>Population growth</li> <li>Poor urban planning</li> <li>Automobile dependence</li> <li>Land-use changes (deforestation, farmland loss)</li> </ul>                      | <ul style="list-style-type: none"> <li>Traffic congestion</li> <li>Increased greenhouse gas emissions</li> <li>Loss of biodiversity</li> <li>Strain on infrastructure and resources</li> </ul> | <ul style="list-style-type: none"> <li>Transit-oriented development</li> <li>Green infrastructure</li> <li>Reforestation</li> <li>Promoting high-density housing and Land-use zoning</li> </ul>                                    |

## A2 ALARMING FACTS:

- World Oil, Natural Gas and Coal reserves will last only for 53.5 years, 48.8 years and 139 years respectively
- 749M people worldwide lack access to electricity in 2023
- 73% of global GHG emissions are from energy consumption
- 3.7 million hectares of forest lost globally in 2023 which is equal to 10 football (soccer) fields of forest per minute
- One out of every 11 people in the world grapples with hunger. A hidden and growing driver is lack of water.
- One-Quarter of World's Crops Threatened by Water Risks
- India generates over 62 million tons (Mt) of waste annually. Of this, only 43 Mt is collected, with 12 Mt treated before disposal. The remaining 31 Mt is discarded in wastelands without treatment.
- India is a significant contributor to global plastic pollution, emitting around 9.3 million tonnes of macroplastic waste annually accounting for one-fifth of the world's plastic waste.
- In 2023, approximately 2,000 tonnes of oil were lost to the environment from tanker spills.
- The National Earthquake Information Center (NEIC) estimates that around 20,000 earthquakes occur globally each year, or about 55 per day.

Global Crude Production at risk



Global primary energy consumption in Exajoules (EJ) - (10<sup>18</sup> J)



World Fuel Reserves and years left to last it.

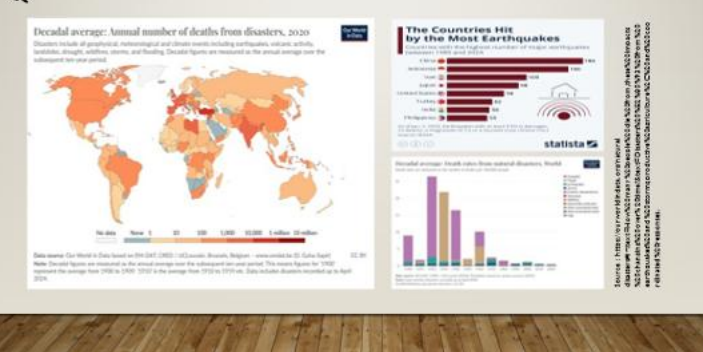
| S.No | Fuel Name   | Reserves at the end of 2020 | Production in 2023 | Consumption in 2023 | Left in year |
|------|-------------|-----------------------------|--------------------|---------------------|--------------|
| 1.   | Oil         | 2444 Gt                     | 4314 Gt            | 4331 Gt             | 53.5         |
| 2.   | Natural Gas | 188.1 Tcf                   | 4059 Tcf           | 4010 Tcf            | 48.8         |
| 3.   | Coal        | 107.4 Gt                    | 179.24 Gt          | 164.03 Gt           | 139          |

Source: <https://www.energytimes.org/statistics/energy-regional-overview>

## A2 HUMAN-CAUSED EARTH DISASTERS AND PREVENTION

| Disasters                                          | Causes                                                                                                                                                                                                                        | Impact                                                                                                                                                                                                                                                                                                                                                                                 | Prevention & Mitigation                                                                                                                                                                                                                                                                                                                               |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Exploitation/Degradation of and Causing Pollution; | <ul style="list-style-type: none"> <li>Population Growth</li> <li>Industrialization</li> <li>Economic Pressure</li> <li>Poor Regulation</li> <li>Technological Advancements</li> </ul>                                        | <ul style="list-style-type: none"> <li>Environmental Impact</li> <li>Loss of Biodiversity</li> <li>Climate Change</li> <li>Soil Degradation</li> <li>Social Impacts</li> <li>Displacement of Communities</li> <li>Loss of Traditional Livelihoods</li> <li>Health Issues</li> <li>Economic Impacts</li> <li>Short-Term Gains, Long-Term Losses</li> <li>Cost of Restoration</li> </ul> | <ul style="list-style-type: none"> <li>Sustainable Practices- Conservation of</li> <li>Forestry</li> <li>Water</li> <li>Energy</li> <li>Sustainable Agriculture</li> <li>Strict Enforcement of Policy and Regulation</li> <li>RRR and Circular Economy</li> <li>Public Awareness Campaigns</li> <li>Creation of protected natural reserves</li> </ul> |
| Soil Contamination                                 | <ul style="list-style-type: none"> <li>Improper disposal of industrial waste</li> <li>Overuse of pesticides and fertilizers</li> <li>Oil and chemical spills</li> <li>Illegal dumping</li> </ul>                              | <ul style="list-style-type: none"> <li>Reduced agricultural productivity</li> <li>Groundwater contamination</li> <li>Health issues (cancer, respiratory diseases)</li> <li>Long-term ecological damage</li> </ul>                                                                                                                                                                      | <ul style="list-style-type: none"> <li>Soil testing and monitoring</li> <li>Bioremediation techniques and Phytoremediation</li> <li>Stricter regulations for polluters</li> <li>Promotion of organic farming</li> <li>Public awareness programs</li> </ul>                                                                                            |
| Oil Spills                                         | <ul style="list-style-type: none"> <li>Accidents in oil drilling, transportation, or storage</li> <li>Equipment failure</li> <li>Natural disasters affecting oil facilities</li> <li>Human error during operations</li> </ul> | <ul style="list-style-type: none"> <li>Marine ecosystem destruction</li> <li>Loss of biodiversity</li> <li>Economic impact on fisheries and tourism</li> <li>Long-term water pollution</li> </ul>                                                                                                                                                                                      | <ul style="list-style-type: none"> <li>Regular maintenance of oil infrastructure</li> <li>Training for emergency response</li> <li>Real-time monitoring systems</li> <li>International safety protocols</li> </ul>                                                                                                                                    |

## B1 ALARMING FACTS:



## B1 EARTH RELATED NATURAL DISASTERS- GEOLOGICAL DISASTERS

| Disasters          | Causes                                                                                                                                                                                         | Impact                                                                                                                                                                                             | Preparedness                                                                                                                                                                   | Impact Mitigation                                                                                                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Earthquakes        | <ul style="list-style-type: none"> <li>Tectonic plate movement</li> <li>Volcanic activity</li> <li>Human activities (e.g., fracking)</li> </ul>                                                | <ul style="list-style-type: none"> <li>Building collapse</li> <li>Loss of lives</li> <li>Economic losses</li> <li>Environmental changes (landslides, tsunamis)</li> </ul>                          | <ul style="list-style-type: none"> <li>Early warning systems</li> <li>Seismic retrofits-resistant structures</li> <li>Emergency kits</li> <li>Community drills</li> </ul>      | <ul style="list-style-type: none"> <li>Seismic-resistant structures</li> <li>Land-use planning</li> <li>Rapid response teams</li> <li>Financial insurance mechanisms</li> </ul>                  |
| Volcanic Eruptions | <ul style="list-style-type: none"> <li>Plate tectonics</li> <li>Gas accumulation</li> </ul>                                                                                                    | <ul style="list-style-type: none"> <li>Lava flow and ashfall destruction</li> <li>Respiratory issues from ash</li> <li>Pyroclastic flows</li> <li>Climate cooling effects</li> </ul>               | <ul style="list-style-type: none"> <li>Heard maecies</li> <li>Seismic monitoring</li> <li>Evacuation plans</li> <li>Public education</li> </ul>                                | <ul style="list-style-type: none"> <li>Reassessment programs</li> <li>Lava diversion infrastructure</li> <li>No-development zones</li> <li>Public health measures</li> </ul>                     |
| Tsunamis           | <ul style="list-style-type: none"> <li>Undersea earthquakes</li> <li>Volcanic eruptions</li> <li>Submarine landslides</li> <li>Human impacts</li> </ul>                                        | <ul style="list-style-type: none"> <li>Drowning and injuries</li> <li>Infrastructure destruction</li> <li>Economic disruption (tourism, fisheries)</li> <li>Soil and water salinization</li> </ul> | <ul style="list-style-type: none"> <li>Real-time warning systems</li> <li>Coastal evacuation protocols</li> <li>Reinforced shelters</li> <li>Education campaigns</li> </ul>    | <ul style="list-style-type: none"> <li>Maritime restoration</li> <li>Tsunami walls</li> <li>Zoning regulations</li> <li>Global alert systems</li> </ul>                                          |
| Landslides         | <ul style="list-style-type: none"> <li>Heavy rainfall</li> <li>Earthquakes</li> <li>Deforestation</li> <li>Steep slopes with weak rocks</li> </ul>                                             | <ul style="list-style-type: none"> <li>Burial of homes</li> <li>Transportation blockades</li> <li>Environmental degradation</li> <li>Economic recovery costs</li> </ul>                            | <ul style="list-style-type: none"> <li>Geological risk mapping</li> <li>Drainage systems</li> <li>Soil stabilization through vegetation</li> <li>Monitoring devices</li> </ul> | <ul style="list-style-type: none"> <li>Retaining walls</li> <li>Terracing</li> <li>Land-use restrictions</li> <li>Community training</li> </ul>                                                  |
| Sinkholes          | <ul style="list-style-type: none"> <li>Dissolution of limestone</li> <li>Over-extraction of groundwater</li> <li>Broken infrastructure</li> <li>Heavy rainfall accelerating erosion</li> </ul> | <ul style="list-style-type: none"> <li>Collapse of roads and buildings</li> <li>Asset loss</li> <li>Sudden fatalities</li> <li>Economic repair costs</li> </ul>                                    | <ul style="list-style-type: none"> <li>Geotechnical surveys</li> <li>Underground monitoring</li> <li>Infrastructure standards</li> <li>Public awareness campaigns</li> </ul>   | <ul style="list-style-type: none"> <li>Groundwater regulation</li> <li>Grout and fill techniques</li> <li>Prohibits development in high-risk zones</li> <li>Quick evacuation measures</li> </ul> |

## B2 EARTH RELATED NATURAL DISASTERS- CLIMATOLOGICAL DISASTERS

| Disasters       | Causes                                                                                                                                          | Impact                                                                                                                                                   | Prevention and Mitigation                                                                                                                                                                                          |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Desertification | <ul style="list-style-type: none"> <li>Overgrazing</li> <li>Unsustainable agriculture</li> <li>Deforestation</li> <li>Climate change</li> </ul> | <ul style="list-style-type: none"> <li>Loss of arable land</li> <li>Food insecurity</li> <li>Dust storms</li> <li>Displacement of populations</li> </ul> | <ul style="list-style-type: none"> <li>Soil restoration programs</li> <li>Sustainable farming &amp; Water conservation techniques</li> <li>Land use Reforestation Policies</li> <li>Community education</li> </ul> |



## COMMON THREATS IN MANUFACTURING PLANTS RELATED TO NATURAL DISASTERS

| S.No | Disaster              | Threats                                                                                                                                                                                                                            | Example of Impact                                                                                            |
|------|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 1.   | Earthquakes           | <ul style="list-style-type: none"> <li>Structural damage to buildings and machinery.</li> <li>Disruption of power supply and communication systems.</li> <li>Gas leaks or chemical spills caused by ruptured pipelines.</li> </ul> | Damage to manufacturing plants during the 2011 Japan earthquake, leading to global supply chain disruptions. |
| 2.   | Landslides            | <ul style="list-style-type: none"> <li>Damage to transport infrastructure, disrupting supply chains.</li> <li>Plant facilities located near slopes are at risk of structural damage.</li> </ul>                                    | Landslides during monsoon seasons have disrupted operations in regions with hilly terrains.                  |
| 3.   | Droughts              | <ul style="list-style-type: none"> <li>Water shortages impacting cooling systems and processes reliant on water.</li> <li>Reduced production capacity due to resource limitations.</li> </ul>                                      | The Millennium Drought (1992-2009) - Australia, Maharashtra Drought (2012-2016) in Maharashtra, India        |
| 4.   | Resource Exploitation | <ul style="list-style-type: none"> <li>Overmining leading to ground subsidence near plants.</li> <li>Environmental degradation disrupting raw material supply.</li> </ul>                                                          | Ground subsidence due to coal mining impacting nearby manufacturing facilities.                              |

| HEALTH HAZARDS AND THEIR EFFECTS ON EMPLOYEES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | KEY POINTS TO ENFORCE – CONCLUSION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Physical Hazards:</b> <ul style="list-style-type: none"> <li>- Debris and Falling Objects: <ul style="list-style-type: none"> <li>• Risk: Injuries from collapsing structures, heavy equipment, or falling objects during earthquakes.</li> <li>• Effects: Fractures, lacerations, and head injuries.</li> </ul> </li> <li>- Electric Shock and Burns: <ul style="list-style-type: none"> <li>• Risk: Damaged electrical systems due to earthquakes.</li> <li>• Effects: Severe burns or electrocution.</li> </ul> </li> <li>- Increased Physical Strain: <ul style="list-style-type: none"> <li>• Risk: Lifting heavy debris or operating equipment in emergency conditions.</li> <li>• Effects: Musculoskeletal injuries and chronic pain.</li> </ul> </li> <li>- Toxic Chemical Exposure: <ul style="list-style-type: none"> <li>• Risk: Release of hazardous substances from ruptured storage tanks or pipelines.</li> <li>• Effects: Respiratory issues, skin irritation, and long-term organ damage.</li> </ul> </li> </ul> | <b>2. Mental Health Hazards</b> <ul style="list-style-type: none"> <li>- Stress and Anxiety: <ul style="list-style-type: none"> <li>• Risk: Fear of future disasters or job insecurity due to operational disruptions.</li> <li>• Effects: Emotional distress, sleep disorders, and depression.</li> </ul> </li> <li>- Post-Traumatic Stress Disorder (PTSD): <ul style="list-style-type: none"> <li>• Risk: Witnessing or experiencing traumatic events during disasters.</li> <li>• Effects: Long-term mental health issues requiring professional intervention.</li> </ul> </li> </ul> | <b>Pre-Disaster Preparedness</b> <ol style="list-style-type: none"> <li>1. Disaster Preparedness Plans: <ul style="list-style-type: none"> <li>• Establish protocols for evacuation, equipment shutdown, and emergency response.</li> </ul> </li> <li>2. Structural Reinforcements: <ul style="list-style-type: none"> <li>• Build earthquake-resistant structures and flood-proof designs.</li> </ul> </li> <li>3. Monitoring and Early Warning Systems: <ul style="list-style-type: none"> <li>• Use sensors and real-time data for early disaster detection.</li> </ul> </li> <li>4. Diversified Supply Chains: <ul style="list-style-type: none"> <li>• Reduce dependency on high-risk regions and establish alternate suppliers.</li> </ul> </li> <li>5. Insurance Coverage: <ul style="list-style-type: none"> <li>• Ensure comprehensive policies to cover disaster-related damages.</li> </ul> </li> <li>6. Emergency Training: <ul style="list-style-type: none"> <li>• Conduct drills and educate employees on evacuation and first-aid protocols.</li> </ul> </li> <li>7. Safety Equipment: <ul style="list-style-type: none"> <li>• Provide helmets, gloves, respirators, and other personal protective equipment (PPE).</li> </ul> </li> </ol> | <b>During the Disaster:</b> <ol style="list-style-type: none"> <li>1. Emergency Medical Response: <ul style="list-style-type: none"> <li>• Set up on-site medical teams and supplies.</li> </ul> </li> <li>2. Clear Communication: <ul style="list-style-type: none"> <li>• Use alarms and communication systems to direct employees during emergencies.</li> </ul> </li> </ol> <b>Post-Disaster Recovery:</b> <ol style="list-style-type: none"> <li>1. Medical Support: <ul style="list-style-type: none"> <li>• Offer healthcare facilities for injury treatment and disease prevention.</li> </ul> </li> <li>2. Mental Health Support: <ul style="list-style-type: none"> <li>• Provide counselling services and stress management programs.</li> </ul> </li> <li>3. Workplace Rehabilitation: <ul style="list-style-type: none"> <li>• Gradual resumption of work to ease employees back into routine.</li> </ul> </li> </ol> |

## Snapshot of the Earth themed event:

Figure 31: Snapshot of Earth themed event



### 3.3.3 Other Events

#### June 2024: National Electrical Safety Week

National Electrical Safety Week is celebrated on 26<sup>th</sup> June to 2<sup>nd</sup> July 2024. The below Introduction and Activities plan ppt is prepared by ESG department and shared with site team to execute the plan.

Figure 32: National Electrical Safety Week PPT



## National Electrical Safety Week

### | 26<sup>th</sup> June – 2<sup>nd</sup> July 2024 |

“EMBRACE ELECTRICAL SAFETY, SAFEGUARD LIVES”



## Introduction

- **Electrical Safety Week-2024 Theme :**  
**“EMBRACE ELECTRICAL SAFETY, SAFEGUARD LIVES”**
- **Driving Force :**
  - The Central Electricity Authority (CEA), Govt of India
  - National Safety Council (NSC)
- First National Electrical Safety Week (NESW) commenced on 26th June 2020
- **Objective:**
  - To raise awareness and enthusiasm among the public and industries.
  - To renew the commitment of employees and the public to promote a participative approach towards the safe use of electricity.

*Coinciding with Nation wide celebrations, it is proposed as an ESG adherence, to celebrate Electrical Safety Week From 26 June – 2 July at all our locations to the extent possible.*

## Activities List Proposed

| Sl.No | Date & Day             | Activities to Conduct                                                | Note                                                                                                                                                                                                                                                                                                                      | Impact                                                       |
|-------|------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| 1.    | 26.06.24,<br>Wednesday | Opening Ceremony                                                     | <ul style="list-style-type: none"> <li>Plant leaders will speak about the importance of Electrical safety at work place , home and public places.</li> <li>Ensure sufficient promotional banners, standees, placards and dangles are placed to create awareness and atmosphere of celebrations</li> <li>Pledge</li> </ul> | showcase commitment to safety                                |
| 2.    | 27.06.24,<br>Thursday  | Electrical Safety awareness & training to staff & workmen.           | <ul style="list-style-type: none"> <li>Training should include Mock drill on electrical shock, recognizing electrical dangers and reporting mechanism.</li> </ul>                                                                                                                                                         | Improve awareness and preparedness in case of accidents      |
| 3.    | 28.06.24,<br>Friday    | Awareness training program for selected neighborhood school children | <ul style="list-style-type: none"> <li>One plant team can take these initiative do training session on electrical safety at nearby school.</li> <li>Pledge</li> </ul>                                                                                                                                                     | Extend the awareness to public                               |
| 4.    | 29.06.24,<br>Saturday  | Drawing Competitions for Employees children.                         | <ul style="list-style-type: none"> <li>Organize employee children drawings done at their houses and submitted by employees on 29 June in plant. Those drawing will be displayed at Plant locations and also winners will be selected</li> </ul>                                                                           | Include entire family in the safety drives                   |
| 5     | 01.07.24<br>Monday     | Conduct various completions like slogans, Quiz, awareness drawings   | <ul style="list-style-type: none"> <li>Among the staff &amp; workmen.</li> </ul>                                                                                                                                                                                                                                          | Reward & Recognize enthusiasm and pro-active safety behavior |
| 6.    | 02.07.24               | Closing Ceremony                                                     | <ul style="list-style-type: none"> <li>Prize distribution and closing ceremony festivities</li> </ul>                                                                                                                                                                                                                     | Enable pleasant recall of the event                          |

### Snapshot of the event:

*Figure 33: Snapshot of the National Electrical Safety Week Celebration*

- Electrical Safety Awareness created among our both permanent and contract employees (100+ Participant)



- Emergency response drill conducted



- Electrical Safety Awareness training given to nearby polytechnic college students and staffs.



### March 2025: National Safety Week

National Safety Week was celebrated from 4<sup>th</sup> March to 10<sup>th</sup> March 2025 to raise awareness about workplace safety and health. It marks the foundation day of the National Safety Council (NSC).

### Snapshot of the event:

*Figure 34 Snapshots of National Safety Week Celebrations*



## Swachh Andhra

Every third Saturday of each month, the Swachh Andhra activity is conducted on site with a new theme. Two volunteers from each department, totaling 20 participants, take part to promote awareness and support responsible environmental practices.

### Snapshot of the event:

*Figure 35 Snapshots of the Swachh Andhra Event*

- Volunteers from Swachh Andhra Event



- Addressing the Volunteer team about theme and importance of Swachh Andhra, and collection of waste from different location of site



### 3.4 OHS Policy

#### **INDOSOL SOLAR**

#### **OCCUPATIONAL HEALTH & SAFETY POLICY**

Version 1.0 Dated 16.12.2024

No. of Pages 2

Developed by: ESG Department

Owner Department: EHS Department & HR Department

Approved by : Group CEO

ISPL is committed to providing a safe and healthy work environment for all employees, contractors, and visitors.

Our aim is to achieve zero work related injuries and illnesses. We believe that all incidents are preventable through proactive risk management and continuous improvements.

This policy applies to all employees, contractors, and visitors across all SSEL/ ISPL facilities.

**Commitment to Occupational Health and Safety:**

- We are dedicated to maintaining a safe workplace by preventing accidents, promoting health and safety awareness, and complying with all relevant safety laws and regulations.
- We will implement and maintain **ISO 45001** international standards at all our facilities.
- Our commitment to OHS is based on national and global leadership indicators reflected in various global frame work and standards.
- In addition, regular risk assessments and emergency preparedness plans to address & mitigate potential health and safety hazards, will be taken up.

**OHS Projects & Activities:**

- Our quarterly OHS calendar includes activities like internal training, external third-party training, regular health checkup of employees.
- It also includes several voluntary activities which emphasize building a Safety-First culture.
- These activities are aligned to our ESG goals. Examples are wellness related activities, cross department audit and safety walk.
- Several events which include family, children and community also be conducted to create heightened awareness of safety.

**Training & Awareness:**

- Regular OHS awareness will be done to ensure all employees understand and adhere to our health and safety protocols.
- All employees will receive mandatory safety training, and to constantly remind them of safe practices, communication through posters, banners and the like will be displayed.
- We will support employee well-being through health screenings, wellness programs, and mental health resources.

**Documentation and Reporting:**

- Data, photographs, case studies, suggestions, interactive dialogue capture and much more go into creating a transparent report.
- Based on the above reports, achievement of long-term and short-term targets can be measured and reported.

**Champion and Responsibilities:**

- Every employee is the safety champion. The more senior the designation the higher is the safety responsibility to an employee. Influencing not just colleagues and subordinates but also vendors, suppliers and all other stakeholders is every employee's responsibility.
- All employees must follow OHS guidelines, reporting hazards, unsafe acts, unsafe conditions near misses, and participate in safety training.
- Employees should follow safety procedures, including the use of PPE and adherence to emergency response plans, with regular drills conducted.

- Employees should ensure that all tasks are performed in a manner that minimize risk to health and safety
- The site EHS/OHS team will report all incidents, including near-misses, immediately, and a thorough investigation will be conducted to identify root causes, implement corrective actions and preventive actions.

**Influencer in the Value Chain:**

- SSEL/ ISPL will take up the mantle of being an influencer in the value chain by ensuring that all value chain partners observe in their respective location/plant/factory/, stringent safety parameters and will be open to visit and audit by SSEL/ ISPL of their safety compliance. This clause will be included in all work/ purchase order released to vendor.
- SSEL/ ISPL will proactively carry message and awareness of Safety First in difference scenarios to members of public, community, students and families through various activities conducted by its employees

**Legal and Regulatory Compliance:**

- We will adhere to all relevant OHS regulations and standards, as per Indian laws and enactment and global standards wherein India is signatory

**Continuous Improvement:**

- Our OHS performance will be monitored regularly, with progress reported to senior management quarterly and shared with stakeholders regularly.
- This policy will be reviewed and updated annually to incorporate new safety standards to ensure its ongoing effectiveness.

Approved  
  
 17/12/24

### **3.5 Supplier Code of Conduct**

A Supplier Code of Conduct is essential for ensuring ethical, sustainable, and high-quality production. It sets clear expectations for suppliers, promoting responsible business practices across the supply chain.

#### **1. Ensures Ethical Sourcing & Labor Practices**

- Prevents forced labor, child labor, and unfair wages within the supply chain.
- Upholds fair working conditions, worker rights, and safe labor environments in accordance with ILO conventions.
- Promotes diversity, inclusion, and non-discrimination among suppliers.

#### **2. Promotes Environmental Responsibility**

- Regulates raw material sourcing, chemical usage, and waste management to minimize environmental harm.
- Encourages sustainable extraction of key materials such as silicon, silver, and rare earth metals.
- Supports energy-efficient and low-emission manufacturing to reduce the carbon footprint.

#### **3. Enhances Product Quality & Safety**

- Ensures suppliers meet strict quality control and safety regulations to maintain high industry standards.
- Reduces the risk of defective or substandard solar panels entering the market.
- Supports the development of durable, reliable, and high-performance solar PV products.

#### **4. Strengthens Compliance & Legal Adherence**

- Aligns with international trade regulations (e.g., EU Green Deal, US Uyghur Forced Labor Prevention Act).
- Helps companies avoid legal risks, financial penalties, and reputational damage.
- Ensures compliance with ISO standards (e.g., ISO 14001 for environmental management and SA8000 for social accountability).

#### **5. Boosts Brand Reputation & Market Acceptance**

- Builds trust with consumers, investors, and businesses that prioritize ethical sourcing and sustainability.
- Strengthens Environmental, Social, and Governance (ESG) performance, attracting responsible investors.
- Enhances eligibility for government incentives, partnerships, and corporate procurement programs.

#### **6. Encourages Transparency & Accountability**

- Implements supplier audits, reporting mechanisms, and third-party verifications to uphold ethical standards.
- Establishes a whistleblower system for reporting violations or unethical practices.
- Provides a structured framework for continuous improvement in sustainability and corporate responsibility.

A well-defined Supplier Code of Conduct is a crucial component of a responsible and resilient solar PV supply chain. It not only ensures compliance with global regulations but also enhances brand reputation, operational efficiency, and long-term sustainability in the rapidly growing solar industry.

### 3.6 Supplier Code of Conduct Policy

**INDOSOL SOLAR**

**SUPPLIER CODE OF CONDUCT POLICY**

Version 1.0 Dated 16.12.2024

No. of Pages 5

Developed by: ESG Department

Owner Department: PROCUREMENT DEPARTMENT

Approved by : Group CEO

**Background:**

Indosol Solar Private Limited (ISPL) believes in conducting business with honesty and integrity, treating all people with dignity and respect, supporting our communities, and abiding by the laws, regulations and treaties of the countries in which we operate.

**Purpose:**

In selecting its suppliers, ISPL endeavors to choose reputable business partners who conduct their business in a manner that shows commitment to high ethical standards, safe and healthy working environments, protection of human rights and dignity, protection of the environment and compliance with the law.

The thread of Sustainability runs through the entire value chain and binds us to a common goal of sustainable development. We believe that our ESG practices make us resilient, better equipped for a tomorrow – risk ready and innovation advanced. And, moving forward as a value chain with common principles, beliefs and aspirations!

**Scope:** This Supplier Code of Conduct (SCoC) outlines our expectations regarding the workplace standards and business practices of our suppliers, along with their parent entities, subsidiaries, affiliates, subcontractors and others who are within their supply chain (“supplier”).

The expectations contained in this code are factors essential to our decision whether to enter into or extend existing business relationships. Each supplier is responsible for ensuring that its employees, representatives, and subcontractors understand and comply with this code.

This code is focused on principles that uphold consistent compliance obligations throughout our operations. Suppliers are also expected to comply with all laws and treaties of the territories in which they operate. Transparency at all stages is a non-negotiable mark of business responsibility, which we expect from our suppliers.

**Workplace, Labor and Human Rights**

Business partners/suppliers must respect, protect and endorse all internationally recognized Human Rights Standards like the UN Universal Declaration of Human Rights, UN Guiding Principles on Business and Human Rights among others. Business partner/suppliers must also commit to fair employment practices.

**Prevention of Forced Labor:** Bonded labor, involuntary labor including human trafficking. Employees must have the freedom to terminate their employment with reasonable notice.

**Prohibition of Child Labor:** Business partners/suppliers must categorically abstain from directly or indirectly employing children below the legal minimum age for employment.

**Respect and Dignity:** Suppliers are expected to keep their workplaces free of harassment, harsh treatment, violence, intimidation, corporal punishment, mental or physical coercion, verbal abuse, or discrimination.

**Fair remuneration & Decent Working Hours:** Suppliers must follow all laws governing wages and working hours including compensation, benefits, and overtime.

**Freedom of Association and Collective Bargaining:** Suppliers must respect the right of their employees to join or not to join any lawful association without fear of retaliation.

**Employment Eligibility & Voluntary Labor:** Supplier shall only employ workers with a legal right to work. Suppliers must refrain from any conduct – and require their contractors to refrain from any conduct – that uses threats, force or any form of coercion, abduction, intimidation, retaliation or abuse of power for the purpose of exploitation, forced labor or slavery of any individual, suppliers must comply with all laws governing human trafficking and slavery.

#### **Occupational Health & Safety**

**Safeguards to prevent incidents:** We expect suppliers to promote and provide secure, safe and healthy work sites. Suppliers should have everything in place that is needed to reduce the risk of accidents, injuries and exposure - especially where hazardous materials are present.

**Processes that ensure safety adherence:** They must have well-established safety procedures, preventative maintenance and protective equipment in compliance with the law.

**Regular Training & Awareness Drives:** Regular training must be provided to the employees to foster a culture of safety and encourage behavior that respects safe practices

**Business Conduct and Ethics:**

**Anti-corruption & Bribery:** Suppliers must not engage in illegal payments, bribes or corruption and other unethical practices as it erodes trust, distorts competition and poses significant legal and reputational risks. A supplier must use every effort to legally understand and determine while dealing with a government official, when a payment may be legitimate and not a bribe.

**Gifts and Hospitality:** Any hospitality or gift provided should be for genuine purposes of goodwill and fall within the boundaries of what is generally considered normal, reasonable, and appropriate. Offer of gifts, favors or entertainment where they are intended – or appear intended to obligate the receiver are strictly discouraged.

**Antitrust and Competition Laws:** Suppliers must avoid agreements or actions that illegally limit trade or competition. They should avoid cartelization tactics that are detrimental to ISPL and the fair play principles. They may not offer our employees any confidential information about ISPL competitor.

**General Contracting Ethics and Fiscal Integrity:** When providing goods and services, suppliers must meet their contractual obligations and follow the law. Any representation must be accurate and truthful. Suppliers must not indulge in any corrupt, fraudulent, collusive or coercive practices which can attract termination. Furthermore, suppliers must keep accurate records that comply with the law.

**Conflicts of Interest:** Suppliers shall disclose to SSEL any potential conflict of interest, such as when one of their employees (or someone close to the employee) has a relationship with SSEL employee who can make decisions that will affect the supplier's business- or when a SSEL employee has any kind of interest in the supplier's business

**Securities and Insider Trading:** If a supplier learns of any material non-public information while working for SSEL they must not share that information with others or use it for market trading.

**Intellectual Property and Data Privacy:** Suppliers must protect all of SSEL intellectual property rights, trade secrets and proprietary information. They must also protect personally

identifiable information that they keep for SSEL from unauthorized access, destruction, changes, use and disclosure.

**Responsibility to the Earth & Communities:**

**Adherence to Environmental Laws:** Suppliers must comply with all environment laws, including those relating to hazardous materials, wastewater, solid waste and air emissions.

**Demonstrate commitment to environmental sustainability:** We encourage our suppliers to reduce the environmental impact of their operations and safeguard the natural resources on which we all depend, especially through responsible efforts to reduce or eliminate waste of all types. Such efforts include source reduction, recycling, reusing materials and conserving water and energy.

**Transparency of Impact Achieved:** The impact thus achieved would be crucial as regulatory oversight on environmental impact, carbon footprint, circularity are now important to determine vendors and pricing. Hence, suppliers must be transparent and open to audit when the same is necessary for the value chain to clinch business.

**Communities:** We expect Suppliers to have an understanding of how their activities impact their local area and wider community. We encourage them to make positive contributions and investments including local employment opportunities, workforce volunteering, and charitable activities as well as minimizing disruption to communities.

**Implementation:** Suppliers must comply with this code and the law. They shall be responsible for any monitoring of their compliance and their efforts to promote compliance within their supply chains.

ISPL reserves the right to investigate any instances of a supplier's non-compliance of which it becomes aware. Non - Compliance may be grounds for SSEL to void or terminate contractual obligations with a supplier.

**SUPPLIER ACKNOWLEDGEMENT:** We here by acknowledge the receipt of the Supplier Code of Conduct (SCoC) of SSEL and agree to abide by the SCoC as an integral and obligatory covenant in the agreement between us and ISPL

For

[Industry Name]

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name of Signatory: \_\_\_\_\_

Designation of Signatory: \_\_\_\_\_

Approved  
  
17/12/24

## 4. GOVERNANCE

### 4.1 Overview of the Policies

All policies of ISPL are documented in ISPL Policies Manual and It is categories into four categories as follows:

1. **Workplace Conduct & Culture Policies** (*Affecting Inter-Employee Relations & Organizational Culture*)
2. **Operational & Compliance Policies** (*Ensuring Legal & Industry Standards Compliance*)
3. **Employee Management Policies** (*Focusing on Effective Talent Recruitment & Management*)

### 4.2 Prelude of the policy categories

#### 4.2.1 Workplace Conduct & Culture Policies (Affecting Inter-Employee Relations & Organizational Culture)

#### Importance of Workplace Conduct & Culture Policies

Workplace conduct and culture policies are fundamental to fostering a healthy, productive, and inclusive work environment.

These policies help in:

- Promoting Fairness & Respect: They ensure that all employees are treated with dignity and respect, which leads to a positive workplace culture.
- Preventing Harassment & Discrimination: These policies are designed to eliminate discriminatory behaviors and ensure compliance with legal and ethical standards.
- Enhancing Employee Engagement: Clear guidelines on behavior, ethics, and workplace culture can drive higher morale, motivation, and retention rates.
- Risk Mitigation: By proactively addressing potential issues like harassment or unethical behavior, organizations can avoid costly lawsuits, reputational damage, and regulatory sanctions.
- Attracting Talent: A clear and inclusive culture fosters a sense of belonging, which helps attract diverse talent, particularly in competitive markets.

#### Importance as per the UNSDGs

The United Nations Sustainable Development Goals (UNSDGs) emphasize the role of businesses in contributing to global sustainability, including social equality and ethical workplace practices. Several UNSDGs align with these policies:

- Goal 5: Gender Equality - Anti-harassment policies and promoting equal opportunities for all employees support gender equality in the workplace.
- Goal 8: Decent Work and Economic Growth - A focus on fair and respectful working conditions, non-discrimination, and diversity within workplace culture enhances economic participation for all employees.
- Goal 10: Reduced Inequality - These policies are central to promoting equality in the workplace, helping to reduce social and economic disparities, especially in terms of gender, race, and disability.

- Goal 16: Peace, Justice, and Strong Institutions - Policies such as whistleblower protection and codes of conduct reinforce ethical behavior, ensuring that organizational practices align with rule of law and justice principles.

### **Frameworks that Assess the Implementation of These Policies**

Several frameworks assess the implementation and effectiveness of workplace conduct and culture policies:

- ISO 26000 (Social Responsibility) - Provides guidelines on how organizations can operate in a socially responsible manner, which includes promoting fairness and equity in the workplace.
- Global Reporting Initiative (GRI) - Standards for sustainability reporting, including social and workplace issues like employee treatment and diversity.
- UN Global Compact Principles - Encourages businesses to adopt sustainable and socially responsible policies that focus on human rights, labor, environment, and anti-corruption.
- Great Place to Work Certification - This recognizes organizations that foster an excellent workplace culture and prioritize employee well-being, inclusivity, and fair treatment.
- B Corp Certification - Measures a company's social and environmental impact, including workplace culture and policies on employee rights and satisfaction.

### **Role of General Counsel in Ensuring Policy Implementation**

As the custodian of workplace conduct and culture policies, the General Counsel (GC) plays a critical role in ensuring their proper implementation, monitoring, and enforcement. Here's why the GC's involvement is crucial:

- Ensuring Legal Compliance: The General Counsel ensures that the workplace policies align with local, national, and international legal requirements (e.g., anti-discrimination laws, labor laws, harassment regulations). The GC's oversight ensures that the organization remains compliant with evolving legal frameworks, reducing legal risk.
- Guiding Ethical Standards: The GC is responsible for embedding ethical standards into organizational practices, ensuring that policies like the Code of Conduct, Anti-Harassment, and Whistleblower policies align with the organization's core values and foster trust both within and outside the company.
- Training & Awareness: The General Counsel often leads the creation of training materials and awareness campaigns to promote understanding of these policies across the organization. By ensuring proper communication, the GC helps in maintaining a culture of transparency and respect.
- Conflict Resolution & Risk Management: In case of disputes or grievances, the General Counsel oversees investigations, ensuring fairness, confidentiality, and compliance with internal procedures. Effective conflict resolution reduces reputational damage and legal liabilities.

- **Embedding Culture into Governance:** The GC ensures that workplace culture and ethical policies are incorporated into governance practices. This involvement reinforces the organization's commitment to building an inclusive and respectful workplace, which is critical to long-term success and sustainability.

In conclusion, the General Counsel's role in driving these policies forward ensures not only legal compliance but also promotes a culture of fairness, integrity, and respect, aligning with global standards and safeguarding the company's reputation.

#### **4.2.2 Operational & Compliance Policies** (Ensuring Legal & Industry Standards Compliance)

##### **Importance of Operational & Compliance Policies to an Organization**

Operational and compliance policies are crucial for organizations as they provide the structure and guidelines needed to ensure adherence to legal, regulatory, and industry standards. The importance of these policies includes:

- **Risk Mitigation:** These policies help organizations identify, assess, and mitigate operational, legal, and financial risks, ensuring smooth operations and avoiding costly fines or legal penalties.
- **Consistency & Efficiency:** They promote consistency in decision-making, operations, and employee conduct, ensuring that all actions align with organizational goals, legal requirements, and industry standards.
- **Reputation Management:** By adhering to operational and compliance policies, organizations can protect their reputation and credibility, which is crucial for retaining customers, investors, and business partners.
- **Regulatory Compliance:** These policies ensure that organizations comply with relevant laws and industry regulations, avoiding legal consequences and protecting the interests of stakeholders.
- **Operational Continuity:** Well-defined policies ensure that key operational functions, such as supply chain management, quality control, and financial reporting, continue seamlessly, minimizing disruptions and increasing organizational resilience.

##### **Importance as per the UNSDGs**

Operational and compliance policies align closely with several United Nations Sustainable Development Goals (UNSDGs):

- **Goal 8: Decent Work and Economic Growth** - Ensuring that operational and compliance policies align with labor laws and industry standards fosters economic growth and provides decent working conditions for employees.
- **Goal 9: Industry, Innovation, and Infrastructure** - Operational policies related to innovation, technology management, and infrastructure ensure compliance with international standards, fostering sustainable industrial growth.
- **Goal 12: Responsible Consumption and Production** - Policies related to environmental compliance and sustainable business practices contribute to

reducing waste, improving resource efficiency, and minimizing negative environmental impacts.

- Goal 16: Peace, Justice, and Strong Institutions - These policies ensure that businesses adhere to the rule of law, anti-corruption measures, and transparency standards, which contribute to stronger institutions and ethical governance.
- Goal 17: Partnerships for the Goals - By maintaining compliance with industry standards and regulatory frameworks, companies promote transparency and trust, which is critical for forming partnerships that contribute to broader sustainability goals.

### **Frameworks that Assess the Implementation of These Policies**

Several established frameworks can assess the implementation and effectiveness of operational and compliance policies:

- ISO Standards (e.g., ISO 9001, ISO 14001, ISO 45001) - These certifications provide frameworks for quality management, environmental management, and occupational health and safety, which organizations can adopt to ensure they meet regulatory and industry standards.
- COSO Framework (Committee of Sponsoring Organizations of the Treadway Commission) - This widely accepted framework provides guidelines for enterprise risk management (ERM) and internal controls, helping organizations align their policies with global standards.
- SOX Compliance (Sarbanes-Oxley Act) - For publicly traded companies, the SOX Act establishes requirements for financial reporting, corporate governance, and internal controls to ensure transparency and accountability.
- Global Reporting Initiative (GRI) Standards - The GRI standards guide businesses in reporting their environmental, social, and governance performance, aligning with sustainability and regulatory compliance goals.
- OECD Guidelines for Multinational Enterprises - These guidelines help businesses adhere to international standards, ensuring responsible business conduct in areas like anti-corruption, supply chain management, and environmental protection.
- Anti-Corruption and Compliance Frameworks (e.g., FCPA, UK Bribery Act) - Frameworks addressing anti-corruption laws ensure that businesses adhere to ethical standards and regulatory requirements in their global operations.

### **Role of the General Counsel & CSO in Ensuring Policy Implementation**

As the custodian of operational and compliance policies, the General Counsel (GC) is critical to ensuring the effective implementation, monitoring, and enforcement of these policies within the organization. Here's why the General Counsel's role is indispensable:

- Legal Oversight & Compliance Management: The General Counsel ensures that the organization's operational policies align with evolving local, national, and international laws. This involves staying informed about changes in the legal landscape, regulatory shifts, and industry standards, ensuring that policies remain relevant and compliant. By doing so, the GC

minimizes legal and financial risks, ensuring the company avoids penalties, lawsuits, and regulatory sanctions.

- **Governance & Ethical Leadership:** As a key member of the leadership team, the GC provides guidance on ethical issues, corporate governance, and risk management. The GC helps shape policies that reflect the organization's commitment to transparency, fairness, and ethical business practices. This leadership strengthens the organizational culture, reinforces compliance at all levels, and builds stakeholder trust.
- **Policy Communication & Training:** The GC ensures that operational and compliance policies are clearly communicated throughout the organization. This includes overseeing training programs and awareness campaigns, ensuring that employees understand the importance of compliance and the consequences of non-adherence.
- **Crisis Management & Internal Investigations:** In cases where policies are violated or non-compliance occurs, the GC plays a crucial role in investigating the matter, guiding corrective actions, and managing legal or reputational crises. By proactively managing these issues, the GC helps the company navigate challenges and maintain its reputation.
- **Alignment with Business Strategy:** The GC works closely with other executives to align operational and compliance policies with the company's overall business strategy. This ensures that compliance doesn't just meet regulatory requirements, but also supports sustainable growth, innovation, and ethical operations across the organization.

By ensuring the consistent application and evolution of operational and compliance policies, the General Counsel serves as a strategic advisor and protector of the organization, ensuring long-term success, risk mitigation, and regulatory adherence.

#### **4.2.3 Employee Management Policies** (Focusing on Effective Talent Recruitment & Management)

##### **Importance of Employee Management Policies to an Organization**

Employee management policies are crucial for creating a structured, fair, and supportive workplace that fosters employee well-being, productivity, and retention. Their importance includes:

- **Employee Satisfaction & Engagement:** Clear, fair policies ensure that employees know what to expect in terms of compensation, benefits, work expectations, and performance standards. This contributes to job satisfaction and engagement, which boosts productivity.
- **Legal & Regulatory Compliance:** These policies ensure that the organization is in compliance with labor laws, health and safety regulations, and anti-discrimination laws, protecting the organization from legal risks and penalties.
- **Consistency & Fairness:** Well-defined policies ensure that all employees are treated equally and consistently, reducing biases and promoting fairness in recruitment, promotions, compensation, and other key areas.

- **Retention & Talent Attraction:** Competitive compensation and benefits policies, along with clear pathways for growth, help attract top talent and reduce turnover. Effective management of employee performance and development supports long-term employee retention.
- **Conflict Resolution & Grievance Handling:** Employee management policies provide a clear process for resolving disputes or grievances, promoting a harmonious and productive workplace.

### **Importance as per the UNSDGs**

Employee management policies play a significant role in achieving several United Nations Sustainable Development Goals (UNSDGs):

- **Goal 5: Gender Equality** - Policies related to equal pay, anti-discrimination, and opportunities for career advancement ensure gender equality in the workplace. Policies like the Equal Employment Opportunity (EEO) and Anti-Sexual Harassment promote a diverse and inclusive workforce.
- **Goal 8: Decent Work and Economic Growth** - Fair labor practices, performance management, and career development policies contribute to economic growth by creating decent work conditions for employees. These policies help improve employee welfare, which drives greater productivity and sustainable economic growth.
- **Goal 10: Reduced Inequality** - Employee management policies aimed at diversity and inclusion promote equality in the workplace by supporting underrepresented groups and eliminating discrimination. This helps reduce workplace inequality.
- **Goal 3: Good Health and Well-Being** - Policies that support work-life balance, employee well-being, and mental health ensure that employees are physically and mentally healthy, which is essential for productivity and overall organizational success.
- **Goal 4: Quality Education** - Training and development policies ensure employees have opportunities for continuous learning and growth, improving their skills and increasing their potential for career advancement.

### **Frameworks that Assess the Implementation of These Policies**

Several frameworks can assess the implementation and effectiveness of employee management policies:

- **ISO 30414 (Human Resource Management – Guidelines for Internal and External Human Capital Reporting)** - This standard provides guidelines for measuring and reporting on human capital, assessing how well employee management policies are supporting organizational goals and employee well-being.
- **Great Place to Work Certification** - This framework assesses organizational culture, including employee satisfaction and trust in leadership, which is influenced by the company's employee management policies.
- **Human Capital Management (HCM) Frameworks** - These frameworks assess how effectively an organization is managing its workforce, ensuring that

policies related to recruitment, training, compensation, and performance management align with business needs.

- Gallup Q12 Engagement Survey - This survey assesses employee engagement and satisfaction, providing insights into how well employee management policies are driving positive outcomes.
- SHRM Competency Model (Society for Human Resource Management) - This model outlines key competencies for HR professionals and provides a framework for assessing the effectiveness of employee management policies in fostering a positive work environment and organizational success.

### **Role of the CHRO in Ensuring Policy Implementation**

As the Chief Human Resources Officer (CHRO) is the custodian of employee management policies, their involvement in ensuring the successful implementation and ongoing evaluation of these policies is critical for the organization's success. Here's why the CHRO's role is indispensable:

- **Leadership in People Strategy:** The CHRO is responsible for aligning employee management policies with the organization's broader goals and vision. This involves ensuring that recruitment, development, compensation, and performance management systems are not only compliant with legal standards but also drive employee engagement, productivity, and retention. By championing these policies, the CHRO contributes to building a motivated, skilled, and diverse workforce that drives organizational success.
- **Promoting an Inclusive & Fair Work Culture:** The CHRO ensures that the organization's employee management policies promote fairness, transparency, and inclusivity. By implementing policies like equal opportunity, diversity & inclusion, and anti-harassment, the CHRO fosters a work environment where all employees feel valued and supported. This enhances employee satisfaction and loyalty while also helping to prevent workplace conflicts and legal challenges.
- **Employee Development & Performance Management:** A key part of the CHRO's role is ensuring that employees are supported in their growth and development. The CHRO ensures that training, appraisal, and succession planning policies are in place to help employees advance in their careers. By establishing clear paths for growth, the CHRO helps retain top talent and maximizes workforce potential.
- **Risk Mitigation & Compliance:** The CHRO is responsible for ensuring that employee management policies comply with local, national, and international labor laws. By staying up to date with legislative changes and ensuring that policies are reviewed regularly, the CHRO helps mitigate legal risks and ensures that the organization avoids penalties for non-compliance.

Overall, the CHRO plays a critical role in fostering a positive organizational culture, ensuring legal and regulatory compliance, and enhancing employee engagement

and retention. Their leadership ensures that employee management policies not only align with legal requirements but also support the organization's strategic objectives, making them an essential driver of both short-term success and long-term organizational sustainability.

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Refer the link for the ISPL Policies Manual: [ISPL Policies](#)

#### 4.4 ESG Training

The ESG Department conducted a "Policies Overview and E of ESG" training session between Feb'25 to Mar'25. A total of 158 employees were invited, of which 143 employees (90.5%) attended.

The total training man-hours for this training session amounted to **157.25** man-hours.

| S. No | Date       | Training Topic                  | Participants Invited | Participants Attended | Training Duration | Training Man-hour |
|-------|------------|---------------------------------|----------------------|-----------------------|-------------------|-------------------|
| 1.    | 21.02.2025 | Policies Overview - Part 1      | 27                   | 27                    | 60 m              | 27                |
| 2     | 24.02.2025 | Policies Overview - Part 1      | 30                   | 30                    | 60 m              | 30                |
| 3     | 25.02.2025 | Policies Overview - Part 1      | 35                   | 29                    | 60 m              | 29                |
| 4     | 26.03.2025 | "E of ESG" Training Session - 1 | 13                   | 14                    | 75 m              | 17.5              |
| 5     | 27.03.2025 | "E of ESG" Training Session - 1 | 12                   | 10                    | 75 m              | 12.5              |
| 6     | 02.04.2025 | "E of ESG" Training Session - 1 | 13                   | 11                    | 75 m              | 13.75             |
| 7     | 03.04.2025 | "E of ESG" Training Session - 1 | 13                   | 8                     | 75 m              | 10                |
| 8     | 17.04.2025 | "E of ESG" Training Session - 1 | 15                   | 14                    | 75 m              | 17.5              |
| Total |            |                                 | 158                  | 143                   | 555 m             | <b>157.25</b>     |

Table 25: ESG Training at ISPL, Ramayapatnam by ESG department

#### Screen Shot of the training conducted in Teams meeting:



Figure 36: Screen Shot of the ESG Training conducted in Teams Meeting

#### PPT 1: Policies Overview:

This presentation, followed by a Q&A session, was designed for all employees. This session briefly introduces ESG and moves into the Governance part of ESG covering the workplace conduct and culture policies.

The Goal of this training section is to foster a culture of integrity, inclusion, and respect, while ensuring adherence to Indosol Solar's core values and legal obligations. The policy covered is listed below.

1. Code of Conduct
2. Diversity & Inclusion (D&I) Policy
3. Prevention of Sexual Harassment (POSH) Policy
4. Gifts & Hospitality Policy
5. Employee Undertaking Code of Conduct & Ethical Behaviour
6. Grievance Redressal Mechanism (SpeakUp)

#### **Participants List for Policies Overview Under Governance of ESG:**

| <b>Sl.No</b> | <b>Participants on 21<sup>st</sup> Feb 2025</b> | <b>Participants on 24<sup>th</sup> Feb 2025</b> | <b>Participants on 25<sup>th</sup> Feb 2025</b> |
|--------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| 1            | Pankaj Kumar                                    | Ch.Saicharan                                    | K.Shanmukarao                                   |
| 2            | D. Prasath                                      | B. Mallikarjun                                  | P.Jayakishore                                   |
| 3            | Pichandi Venkattraman                           | G. Ramesh                                       | M.Nageswar Rao                                  |
| 4            | Shailesh Arayil                                 | K. Manikanta                                    | C.Murali                                        |
| 5            | Subburaj N                                      | Sugam Kumar Swain                               | Sistu Vidyasagar                                |
| 6            | Varadarajan Ventarayan                          | Mitra Bhanudas                                  | Jagadeesh.N                                     |
| 7            | Utsav Sen Chowdhury                             | Shaik. Imrankhan                                | Naveen Dande                                    |
| 8            | Israel M A                                      | Sidhant Padhiali                                | Y.Gopikrishna                                   |
| 9            | Bhavana Madhu Babu                              | Kata Rathna Raju                                | Mekiri Raviteja                                 |
| 10           | Sreedhar Pinjala                                | Ayashakanta Sethi                               | Bharatachari                                    |
| 11           | Ganesh Kumar Kudupudi                           | T.Yehshuva                                      | Bv Prabhakar                                    |
| 12           | Manas Nayak                                     | Tejeswar Pradhan                                | Akhil Mohammad                                  |
| 13           | Mahesh Godla                                    | Papu Pradhan                                    | Bv Prabhakar                                    |
| 14           | Niladri Sekhar Mondal                           | K Venkatesh                                     | K.Bharath Achari                                |
| 15           | Bhanu Kumar Rajampeta                           | Venu Babu                                       | S.Dinesh Kumar                                  |
| 16           | Selva Kumar                                     | P. Jaya Kumar                                   | Sudeep                                          |
| 17           | Balakrishna Yadavalli                           | Senapati Undramajhi                             | Anand Yadhav                                    |
| 18           | Naveen Dande                                    | Challa Hazarathaiah                             | Sk. Siddaiah                                    |
| 19           | Rajesh Dodla                                    | Soumya Ranjan Panda                             | I. Venkatesh                                    |
| 20           | Kethavath Raju                                  | U.Yesu                                          | K.Mukesh                                        |
| 21           | Mohanraj Rethinam                               | Silu Swain                                      | T.Venkatesh                                     |
| 22           | Simhadri Harish                                 | G.Rakesh Reddy                                  | Chandhhan Dalai                                 |
| 23           | Yalamarthi Gopi Krishna                         | Jella Anjaneyulu                                | J.Visweswara Rao                                |
| 24           | Sarath Kumar S                                  | Naveen Kumar Nagothi                            | G.Naga Venkata Sriranga Vamsi                   |
| 25           | Naresh V                                        | Satyajith Sahani                                | N.Bhanu Prasad                                  |
| 26           | Dibyasingh Rautary                              | S.Syam Naidu                                    | M Raviteja                                      |
| 27           | Sure Ramakoteswara Rao                          | L .Vairavan,                                    | K Raju                                          |
| 28           | -                                               | Suman,                                          | Shankar Swain                                   |
| 29           | -                                               | G Azhagupandi                                   | Ramesh G                                        |
| 30           | -                                               | Ravikumar                                       | Virupaksha                                      |
| 31           | -                                               | -                                               | Srikanth                                        |

*Table 26: Participant List for Policies Overview training Session conducted by ESG Dept*

## PPT 2: E of ESG

This presentation, followed by a Q&A session, was designed for employees who directly involved in data gathering and documentation. It is focused on Introduction to ESG and Environmental aspects of ESG.

### Key topics covered included:

- Carbon footprint, Global Warming, Green House Effect and Paris Agreement
- Global GHG Emission Trends
- GHG Protocol Standards and Scopes overview
- Data Collection and Documentation
- GHG Emission Calculation Methods
- Internal & External Verification

### Participants List for Emissions Data Gathering Under Environment of ESG:

| Sl.No | Participants on 26.03.2025   | Participants on 27.03.2025 | Participants on 02.04.2025 | Participants on 03.04.2025 | Participants on 17.04.2025    |
|-------|------------------------------|----------------------------|----------------------------|----------------------------|-------------------------------|
| 1     | Dibyasingh Rautary           | Venu Babu G                | Mohan                      | Sainadh Reddy E            | Ravindra Deshmukh             |
| 2     | Simhadri Harish              | Ramaiah Alapakam           | Ravi Teja Mekiri           | Naresh.V                   | Shailendra Gupta              |
| 3     | Gopi Krishna Challa          | Yalamarathi Gopi Krishna   | Somasekhar G               | Vidya Sagar S              | Ramanjaneyulu                 |
| 4     | Gudapati Venkata Manoj Kumar | Dande Naveen               | Sarathkumar S              | Mula Sharath Teja Reddy    | Venkata Giri Charan Madireddy |
| 5     | Prasath.D                    | Ramu Rowthu                | Premkumar J                | Sunil Kumar Ahelleya       | Tejaswi Ganta                 |
| 6     | Selva Kumar                  | Nagiseti Babu              | Krishnachandra Tiwari      | Surya Prakash Vimal        | Manoj Kumar Akulla            |
| 7     | Jeevan Kumar                 | B.Venkatagiri Prabhakar    | Anshuman Tiwari            | Svv Satyanarayana          | Omprakash                     |
| 8     | Kammara Bharath Achari       | Shanmukharao. K            | Madhur Agrawal             | Syed Fyzulla               | Karthik Kumar                 |
| 9     | Vairavan Lakshman            | Phani Kalyan Y             | Bala Venkata Sai Krishna   |                            | Niladri Sekhar Mondal         |
| 10    | Shanmukharao. K              | Janardhan T                | Venu Babu                  |                            | Utsav Sen Chowdhury           |
| 11    | Jaya Kishore P               |                            | Karthick                   |                            | Manas Kumar Nayak             |
| 12    | Rajesh Chaparala             |                            |                            |                            | Sreedhar Pinjala              |
| 13    | Mohanraj Rethinam            |                            |                            |                            | Subburaj                      |
| 14    | Om Prakash Misra             |                            |                            |                            | Rajesh Dodla                  |

Table 27: Participant list for E of ESG training session conducted by ESG Dept

## 4.5 Materiality & Peer comparison

Materiality is the study of sustainability factors that are relevant for long-term value creation, considering the interrelation between external impact on society or the environment on the one hand and internal impact on enterprise value on the other hand. It therefore considers the dual nature of materiality, also referred to as double materiality.

Investors are increasingly interested in both sides of this equation. The same holds for regulations across the world, who are requiring reporting on this broader and integrated understanding of materiality.

A sustainability issue is seen as material if it presents a significant impact on society or the environment and might have a significant impact on a company's value drivers, competitive position, and long-term shareholder value creation. Material ESG issues can significantly affect an entity's business operations, cash flows, legal or regulatory liabilities, and access to capital. They can also significantly improve or undermine an entity's reputation and relationships with key stakeholders, society and the environment. Over time external impacts on society and environment translate into internal impact on a company itself, including its financial value drivers.

| Materiality Peer Comparison  |                                       |
|------------------------------|---------------------------------------|
| LONGi                        | First Solar                           |
| Environment                  |                                       |
| Product carbon footprint     | Energy and emissions                  |
| Reducing waste and emissions | Circular economy                      |
| Social                       |                                       |
| Human rights due diligence   | Health and safety                     |
| Customer satisfaction        | Diversity, inclusion, belonging       |
| Supply chain management      | Responsible sourcing and human rights |
| Governance and Ethics        |                                       |
| Business ethics              | Ethics and compliance                 |
| Responsible marketing        | Sustainable products and innovation   |

*Table 28: Materiality and Peer Comparison*

## 4.6 Risk and crisis management – CRO – IRC – Risk Governance process – Board approval

A key factor for a Company's capacity to create sustainable value is the risks that the Company is willing to take and its ability to manage them effectively. Ability to identify and manage risks promptly is also a critical aspect of corporate governance at any Company. Many risks exist in a Company's operating environment and continuously emerge on a day-to-day basis. Risk management does not aim at eliminating them, as that would simultaneously eliminate all chances of rewards/ opportunities. Risk Management is instead focused at ensuring that these risks are known and addressed through a pragmatic and effective risk management process.

The Securities and Exchange Board of India (SEBI) has included Risk Management as part of Securities & Exchange Board of India. (Listing Obligations and Disclosure

Requirements) Regulations 2015 (LODR) requirement as amended time to time. As per Regulation 17 of the SEBI LODR, disclosures to the Board are to be made by the listed entity on whether the risk assessment and its minimization procedures are in place. As per the Companies Act 2013, there are specific requirements for Risk Management that a Company needs to comply with. In addition, the Board of Directors and Audit Committee have been vested with specific responsibilities in assessing the robustness of risk management policy, process and systems.

### **Definition of Risk:**

Risk is any event/non-event, the occurrence/non-occurrence of which can adversely affect the objectives of the Company. These threats may be internal/external to the Company, may/may not be directly influenced by the Company and may arise out of routine/non-routine actions of the Company.

### **Definition of Risk Management:**

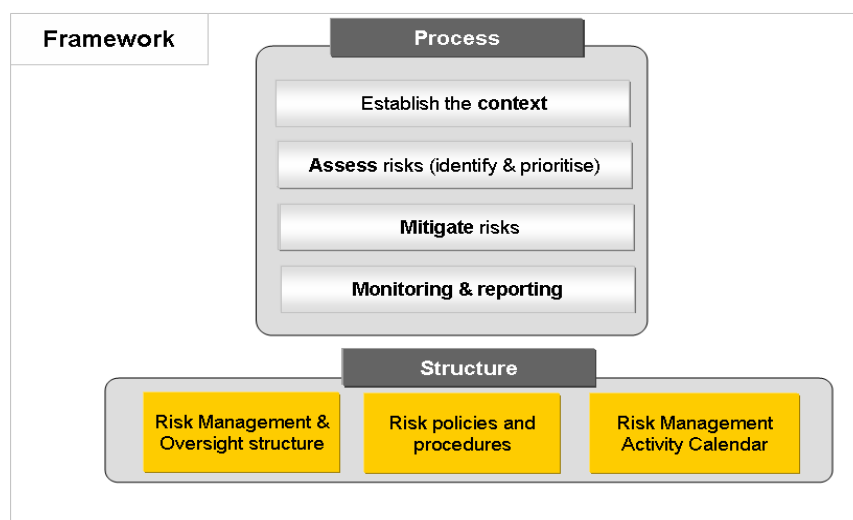
Risk Management is a structured, consistent, and continuous process across the whole organization for identifying, assessing, deciding on responses to and reporting on the opportunities and threats that may affect the achievement of its objectives.

### **Objectives of Risk Management:**

- Better understand the Company's risk profile.
- Ensure that the Senior Management is in a position to make informed business decisions based on risk assessment.
- Sound business opportunities are identified and pursued without exposing the business to an unacceptable level of risk.
- Contribute to safeguard Company value and interest of shareholders; and
- Improve compliance with good corporate governance guidelines and practices as well as laws & regulations.

### **Risk Management Framework:**

Below is a diagrammatic representation of the Risk Management Framework.

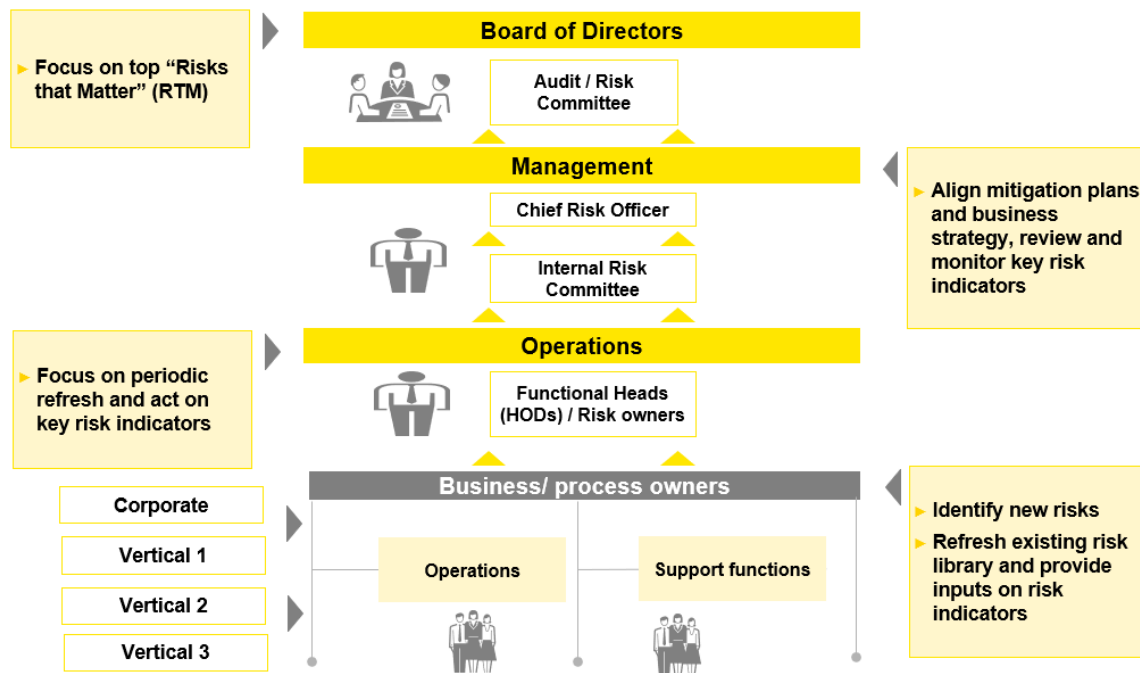


*Figure 37: Risk Management Framework*

The Risk Management Framework comprises essentially of 2 elements:

- **Risk management process** i.e., the process to identify, prioritize and manage risks in the Company; and
- **Risk management structure** i.e., the enablers that are created to operationalize the process. These take the form of roles & responsibilities, reporting calendars etc.

### Risk Management Flow:



*Figure 38: Risk management Flow*

### The roles and structure for risk management and oversight:

#### Governance:

The Board of Directors is responsible for defining and approving the Risk Management framework. The Board of Directors has delegated direct oversight responsibility for Risk Management to the Risk Management Committee. The Risk Management Committee is thus responsible for monitoring the risks and risk management process by reviewing: (i) periodic risk reporting produced by the CRO and internal risk committee; and (ii) reports from the various Assurance functions.

#### Execution:

CRO and internal risk committee is responsible for operationalizing the risk management framework at the Company. This includes identifying & prioritizing risks, operationalizing mitigation strategies and reporting on risk mitigation. Internal Risk committee shall be constituted by Management which shall be headed by CRO and approved by the Risk Management committee of the board.

- **For routine business activities:**
  - Business Unit ('BU') head/Function heads are required to implement the risk management framework within their respective area. While they are responsible for performance on risks, they may designate specific risk owners to assist them in managing risks. Each business unit/function has a risk coordinator who oversees & coordinates the deployment of risk management activities within the BU/function.
- **For non-routine business activities:**
  - Certain activities/decisions are non-routine and represent one-off transactions. These include activities such as mergers & acquisitions, divestments, entering new lines of business, ERP implementation etc. The Executive-in-charge of such a transaction has the responsibility for operationalizing risk management for such activities.

### **Monitoring:**

CRO is entrusted with the responsibility to review and provide independent assurance on overall effectiveness and efficiency of the risk management process. While all risks cannot be audited, the CRO, External Audit, or any other function(s) entrusted by the Risk Committee may provide independent assurance on the effectiveness of defined risk mitigation strategies for certain areas. As part of their annual audit planning exercise, these functions shall take specific inputs from the Risk Committee on the level and extent of assurance required on specific risks. In addition, these functions through their regular audit/ fieldwork at various levels might identify additional risks, which will serve as an input for the subsequent risk identification and definition process.

### **Risk Management Structure:**

The Risk Management Organization comprises of the following:

#### **Primary role**

- A. Board of Directors (BoD).
- B. Risk Committee
- C. BU Heads / Function Heads
- D. Executive-in-Charge (for non-routine transactions)
- E. Risk Owners
- F. Mitigation Plan Owners ('MPO')

#### **Support role**

- G. Risk Management Coordinator ('RMCO')
- H. Assurance

## 4.7 Human Rights Due Diligence Survey at Indosol Solar

Companies must have an active commitment to respect human rights in their business relationships in line with the UN Guiding Principles or any other internationally accepted standards. There must also be a company-specific policy with a company-wide commitment and not just for a single site, business unit, or project.

Following the most recent international developments in the field of corporate non-financial disclosures, we have conducted Human Rights Due Diligence survey to assess policy awareness among employees and identify any violations of human rights, safety, and inclusivity. We are committed to keeping our organization fair for everyone and complying with internationally recognized frameworks such as the UN Guiding Principles on Business and Human Rights and the UN Global Compact, as well as relevant national and international laws pertaining to human rights.

We have conducted separate surveys for Permanent employees, permanent women employees, contract/ employees to ensure all relevant points are covered.

### 4.7.1 Analysis of survey results conducted for Permanent Employees

The survey conducted among permanent employees to understand if they are aware of company policies and if their rights are being respected. We also enquired whether the employees had previously used the grievance redressal mechanism, whether their concerns were addressed, and if they were satisfied with the working conditions.

| Human Due Diligence Survey (Permanent Employees) |                                                                                                                                                        |      |      |       |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-------|
| Sr. No.                                          | Questions                                                                                                                                              | yes  | No   | Maybe |
| 1                                                | Do you understand your employment terms like pay and other compensation terms?                                                                         | 63%  | 30%* | 7%*   |
| 2                                                | Does our company have proper policies and procedures in place to ensure the protection of data related to employees?                                   | 50%  | 24%* | 26%*  |
| 3                                                | Are you aware of your rights & responsibilities and company policies on fair treatment?                                                                | 56%  | 28%* | 16%*  |
| 4                                                | Does our company have a non-discrimination policy that covers race, language, gender, marital status, disability, religion, and personal opinions?     | 54%  | 29%* | 16%*  |
| 5                                                | Does our company have procedures in place to address grievance related to any workplace violation, sexual harassment or discrimination?                | 59%  | 23%* | 18%*  |
| 6                                                | Does our company have a confidential and zero retaliation complaint mechanism to report issues concerning threats and discrimination in the workplace? | 48%  | 28%* | 24%*  |
| 7                                                | Does our company encourage its employees to report threats and discrimination in the workplace?                                                        | 54%  | 36%* | 9%*   |
| 8                                                | Have you experienced discrimination or unfair treatment at work?                                                                                       | 16%* | 76%  | 9%*   |
| 9                                                | Do you feel comfortable reporting workplace issues?                                                                                                    | 78%  | 18%  | 4%    |

|            |                                                                                                                                           |                     |             |             |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------------|-------------|
| <b>10</b>  | Do you know how to access grievance mechanisms?                                                                                           | <b>36%</b>          | <b>50%*</b> | <b>14%*</b> |
| <b>11</b>  | Have you ever been pressured to work overtime without fair compensation?                                                                  | <b>11%</b>          | <b>83%</b>  | <b>6%</b>   |
| <b>12</b>  | Does our company have a transparent appraisal procedure in place that ensures no discrimination?                                          | <b>39%</b>          | <b>24%*</b> | <b>37%*</b> |
| <b>13</b>  | Do you feel the company provides equal opportunities regardless of gender and other factors for career growth?                            | <b>66%</b>          | <b>14%*</b> | <b>20%*</b> |
| <b>14</b>  | Does our company provide adequate training and development opportunities to employees?                                                    | <b>44%</b>          | <b>31%*</b> | <b>25%*</b> |
| <b>15</b>  | Does our company provide health and safety related training?                                                                              | <b>73%</b>          | <b>11%</b>  | <b>16%</b>  |
| <b>*16</b> | Does our company provide paternity leave?                                                                                                 | <b>44%</b>          | <b>30%</b>  | <b>26%</b>  |
| <b>*17</b> | Does our company provide maternity benefits?                                                                                              | <b>47%</b>          | <b>24%</b>  | <b>28%</b>  |
| <b>18</b>  | Does our company have a no child labor policy?                                                                                            | <b>67%</b>          | <b>19%*</b> | <b>14%*</b> |
| <b>19</b>  | Do employees have the ability to access areas such as canteen or restroom without restrictions?                                           | <b>63%</b>          | <b>30%*</b> | <b>7%*</b>  |
| <b>20</b>  | Does our company encourage the recruitment of differently abled people and provide adequate facilities for their ease of access and work? | <b>24%</b>          | <b>29%*</b> | <b>47%*</b> |
| <b>21</b>  | Does our company provide safe working conditions to all its employees, including women?                                                   | <b>79%</b>          | <b>6%</b>   | <b>15%</b>  |
| <b>22</b>  | What improvement would you suggest for fair workplace policies                                                                            | <b>25% Answered</b> |             |             |

#### How long have you been associated with the company?

| 1-3 years  | 3-5 years | Less than 1 year | More than 5 years |
|------------|-----------|------------------|-------------------|
| <b>27%</b> | <b>2%</b> | <b>70%</b>       | <b>1%</b>         |

#### Have you used the grievance mechanism before? (If Yes, was your concern addressed?)

| No         | Yes, but my concern was not addressed | Yes, my concern was addressed |
|------------|---------------------------------------|-------------------------------|
| <b>88%</b> | <b>7%</b>                             | <b>5%</b>                     |

#### How satisfied are you with your working conditions?

| Very satisfied | Very dissatisfied | Somewhat satisfied | Somewhat dissatisfied | Neither satisfied nor dissatisfied |
|----------------|-------------------|--------------------|-----------------------|------------------------------------|
| <b>31%</b>     | <b>5%</b>         | <b>41%</b>         | <b>9%</b>             | <b>14%</b>                         |

*Table 29: Permanent Employees Survey Responses*

### Detailed interpretation of analysis

The survey responses shown in table 29. Out of 335 permanent employees at Indosol Solar, 116 employees responded to the survey form, which is about 35% responses. The interpretation on low response would be as follows

- 70% and above is generally considered strong.
- 60–70% is acceptable but should be interpreted with caution.
- Below 60% may be too low for high-confidence organizational decisions.

The next step when low responses is recorded would be as follows;

- Look into why employees didn't participate (e.g., via anonymous pulse checks).
- Communicate action plans transparently based on feedback.
- Improve future participation through trust-building and better survey design.

However, despite response being only around 35%, those who have responded have done so with complete involvement in the spirit of the survey. Of the 116 responses 83 employees have given additional comments in which they have clearly expressed certain grievances which has been addressed promptly by the management.

On conducting discrete enquiry, it was understood that there was a communication gap on the reason for the survey and the impact of responses, due to which responses were low.

Hence, the mitigation strategy has been planned for all responses where a negative response plus the doubtful response percentages exceeded 25%. On a perusal, it can be seen that fair treatment, non-discrimination, zero retaliation, confidentiality, confidence to report, access to grievance redressal mechanism, have all shown consistent lack of either sufficient information on process, knowledge of existence of redressal forum or confidence in outcomes post complaints.

In order to strengthen the information, accessibility and trust, ESG department has planned to take up multiple platforms of communication on availability of forum, while bringing in leadership teams to instil assurance and trust.

The leadership team is also looking into avenues for increasing differently abled persons in the workforce, paternity leave, training and development, transparent appraisal process as these questions also received response which translate to employees seeking higher expectations from the company.

Maternity leave and employee data protection, both are legal compliances under Indian law, and hence need to be complied with. The HR department will undertake an exercise to educate the employees on the same, including access to areas such as canteen or restrooms.

A similar survey will be conducted again in March 2026 and the results will speak on successful implementation of the mitigation strategy based on May 2025 survey results.

#### **4.7.2 For Permanent Women Employees**

A separate survey was conducted specifically keeping permanent women employees in mind. It included questions about separate hygiene and sanitation facilities, procedures for addressing discrimination and sexual harassment, ensuring safe working conditions, and providing health and safety training. We also checked if Indosol encouraged women to report threats and discrimination, offered equal opportunities regardless of gender, and had a confidential sexual harassment mechanism that assures zero retaliation. Additionally, we looked at maternity benefits, training, resting rooms for women employees, and

transparency. The survey responses shown in table 30. Based on the responses, an analysis of which you can see below, women have raised dissatisfaction on the issue of equal access to training, promotion and leadership, flexible working hours, increased child cares facilities and skill development training. These issues are being addressed by the HR department.

47% response has been received from women permanent employees.

| Human Rights Due Diligence survey (Women Employees) |                                                                                                                                                       |              |      |        |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------|--------|
| Sr. No.                                             | Questions                                                                                                                                             | Yes          | No   | Maybe  |
| 1                                                   | Do you feel safe and respected in your workplace?                                                                                                     | 88%          | 12%  | 0.00%  |
| 2                                                   | Have you ever faced or witnessed gender discrimination at work?                                                                                       | 0%           | 88%  | 12%    |
| 3                                                   | Does the company have a mechanism to report sexual harassment?                                                                                        | 100%         | 0%   | 0%     |
| 4                                                   | Is the mechanism to report sexual harassment confidential and assure zero retaliation?                                                                | 100%         | 0%   | 0%     |
| 5                                                   | Does our company encourage women to report threats and discrimination?                                                                                | 87.50%       | 0%   | 12.50% |
| 6                                                   | Do you have equal access to training, promotions, and leadership opportunities?                                                                       | 63%          | 12%* | 25%*   |
| 7                                                   | Do you believe women have equal growth opportunities?                                                                                                 | 88%          | 0%   | 12%    |
| 8                                                   | Does our company provide gender specific basic hygiene and sanitation facilities?                                                                     | 88%          | 0%   | 12%    |
| 9                                                   | Does our company provide maternity benefits?                                                                                                          | 100%         | 0%   | 0%     |
| 10                                                  | Are maternity benefits and parental leave policies clear?                                                                                             | 87%          | 0%   | 13%    |
| 11                                                  | Does our company provide any additional benefits to women employees, including training, childcare facilities, resting rooms, and wellbeing measures? | 62%          | 25%* | 13%*   |
| 12                                                  | Does your workplace support flexible working arrangements?                                                                                            | 75%          | 25%* | 0%     |
| 13                                                  | Do you feel comfortable discussing workplace challenges with HR?                                                                                      | 87%          | 0%   | 13%    |
| 14                                                  | What challenges do women face in your workplace?                                                                                                      | 0% Answered  |      |        |
| 15                                                  | What policies or initiatives could improve gender inclusion?                                                                                          | 18% Answered |      |        |

| How long have you been associated with the company? |           |                  |                   |
|-----------------------------------------------------|-----------|------------------|-------------------|
| 1-3 years                                           | 3-5 years | Less than 1 year | More than 5 years |
| 25%                                                 | 0%        | 75%              | 0%                |

| Have you used the sexual harassment reporting mechanism? (If yes, was your issue addressed?) |                                    |     |
|----------------------------------------------------------------------------------------------|------------------------------------|-----|
| Yes, my issue was addressed                                                                  | Yes, but my issue was not resolved | No  |
| 12%                                                                                          | 0%                                 | 88% |

Table 30: Permanent Women Employees Survey Responses

### 4.7.3 For Contract/Consultant Employees

The survey for Contract employees encompassed questions about their employment and working conditions. We assessed whether employees understood their pay and compensation terms, if they had a written employment contract and comprehended its terms and regulations, if they were compensated for overtime or compensatory work, and if they received company benefits. Additionally, it evaluated whether the company provided safe working conditions, ensured fair and non-discriminatory treatment, granted unrestricted access to facilities like canteens and toilets, and had a grievance mechanism to address workplace violations, sexual harassment, or discrimination.

| Human Rights Due Diligence survey (Contract/Consultant Employees) |                                                                                                                                     |             |                  |                   |
|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-------------|------------------|-------------------|
| Sr. No.                                                           | Questions                                                                                                                           | Yes         | No               | Maybe             |
| 1                                                                 | Do you understand your engagement terms like pay and other compensation terms?                                                      | 62%         | 25%*             | 13%*              |
| 2                                                                 | Do you receive wages and benefits as per the contract?                                                                              | 40%         | 54%*             | 6%*               |
| 3                                                                 | Are you paid for overtime or compensatory payment?                                                                                  | 21%         | 65%*             | 14%*              |
| 4                                                                 | Does the company have any grievance mechanism to report and remediate any workplace violation, sexual harassment or discrimination? | 36%         | 56%*             | 8%*               |
| 5                                                                 | Have you experienced unfair treatment or discrimination as a contract worker or consultant?                                         | 25%*        | 67%              | 8%*               |
| 6                                                                 | Are you aware of whom to contact in case of a workplace issue?                                                                      | 73%         | 25%*             | 2%*               |
| 7                                                                 | Does our company provide safe working conditions to all its employees?                                                              | 87%         | 11%              | 2%                |
| 8                                                                 | Do you receive safety training and protective equipment?                                                                            | 85%         | 13%              | 2%                |
| 9                                                                 | Does our company treat all its employees fairly, equally without any discrimination?                                                | 65%         | 33%*             | 2%*               |
| 10                                                                | Do the employees get benefits as per the terms of engagement from the company?                                                      | 48%         | 39%*             | 13%*              |
| 11                                                                | Are you provided with the necessary health and safety measures at work?                                                             | 87%         | 11%              | 2%                |
| 12                                                                | Do you have equal access to workplace facilities and support as permanent employees?                                                | 58%         | 32%*             | 10%*              |
| 13                                                                | Are you provided rest breaks and reasonable working hours?                                                                          | 69%         | 27%*             | 4%*               |
| 14                                                                | Do you know how to report workplace grievances?                                                                                     | 77%         | 21%              | 2%                |
| 15                                                                | Have you raised any concerns that have not been addressed?                                                                          | 23%*        | 65%              | 12%*              |
| 16                                                                | Any additional comments regarding your engagement with the company?                                                                 | 3% Answered |                  |                   |
|                                                                   |                                                                                                                                     |             |                  |                   |
| How long have you been associated with the company?               |                                                                                                                                     |             |                  |                   |
| 1-3 years                                                         |                                                                                                                                     | 3-5 years   | Less than 1 year | More than 5 years |
| 33%                                                               |                                                                                                                                     | 6%          | 59%              | 2%                |

Table 31: Contract/Consultant Employees Responses

The survey responses shown in table 31. Out of 197 contract employees at Indosol Solar, 52 employees responded to the survey form, which is about 26% responses.

The area of concern in the feedback pertains to the grievance mechanism, including Unfair treatment, discrimination, equal access, redressal systems, and ensuring accessibility and responsiveness, which will be taken up by the ESG department across all employees -permanent and contract.

The Contract/Consultant employees have also raised concerns regarding the wages and benefits, rest breaks, and reasonable working hours. This issue will be taken up by the HR department

## 5 ESG ROADMAP

### 5.1 Charting the ESG Journey

It is important now more than ever to implement necessary processes and drive top-down cultural change that multiple stakeholders are giving priority to. Stakeholder capitalism is becoming mainstream, stakeholders are increasingly interested in knowing **“How do you make profits” rather than “How much profit do you make”**

Regulators are setting high social, governance and environmental standards.

Investors invest in companies that are responsible sustainable and resilient.

Talented staff are prioritizing purpose over salaries.

Consumers are increasingly embracing brands that align with their social values.

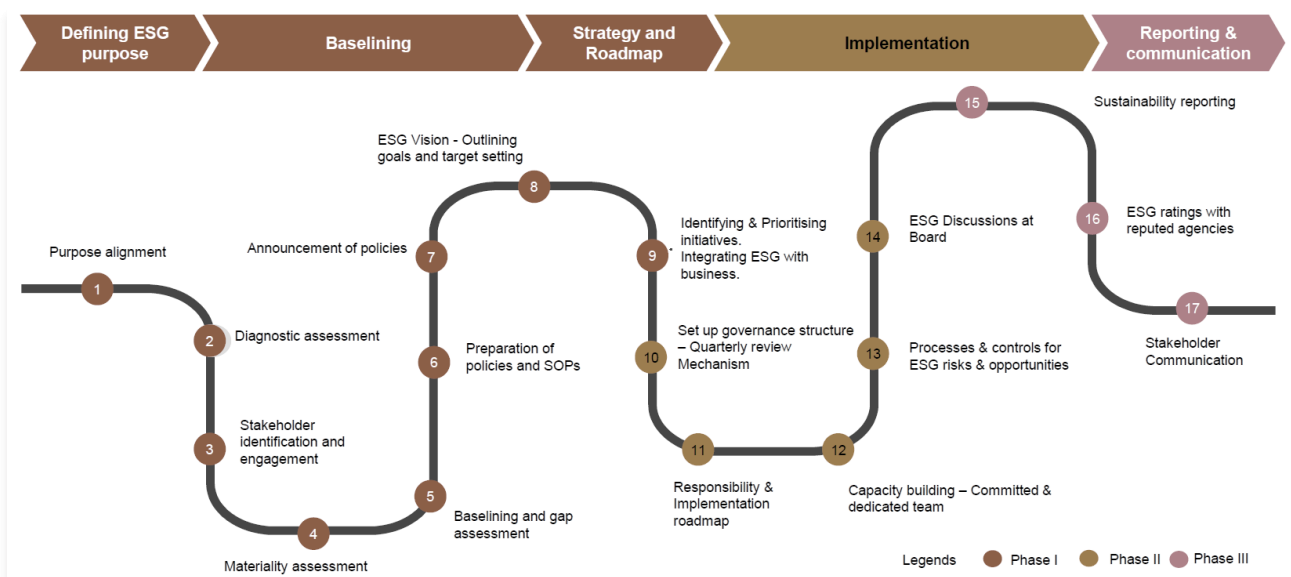


Figure 39: Typical phases of the ESG journey of a company

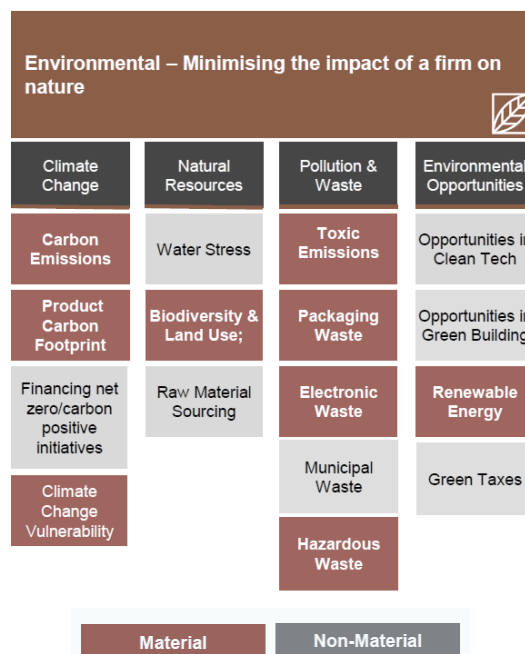


Figure 40: Key focus areas under Environment, E of ESG, for manufacturing companies

## 5.2 Corporate Sustainability Assessments

As we move towards implementing ESG into our business plans and corporate culture we need to understand from a global point of view what needs to be done to be recognized as a company that is driven by global standards of adherences.

Working backwards from achieving scores, we can make the journey more focused and thus a clarity of the path that we take.

Assessment Agencies that provide scores that are a touchstone to ESG adherences are multiple in number and also have slightly different assessment frameworks. The most popular and most respected are the DJSI scores which are given by S&P Global on an annual basis based on a CSA questionnaire that is answered by the participant company. This CSA – Corporate Sustainability Assessment is the basis for companies with the eligible market capitalization to be listed in the Dow Jones Sustainability Index – World, USA, Europe, Asia Pacific and Emerging Markets.

There are several other assessment agencies which provide scores on basis of disclosures done by the companies that they track which includes MSCI, Bloomberg, Sustainalytics. What is important for a good score is adherence to the respective guidelines, frameworks and standards of Environment Social and Governance standards advocated by global guidelines like UNSDGs, frameworks & standards like the SBTi, TCFD, CDP. It would be pertinent to mention the CII GreenCo Rating certification at this juncture.

The CII GreenCo Rating System is a first-of-its-kind framework that recognizes and facilitates the growth of top-notch green companies in India. This framework is developed by the CII Sohrabji Godrej Green Business Centre and launched in 2011. Total GreenCo Rated companies are 880+ and 1170+ companies are working on to get the GreenCo Rating.

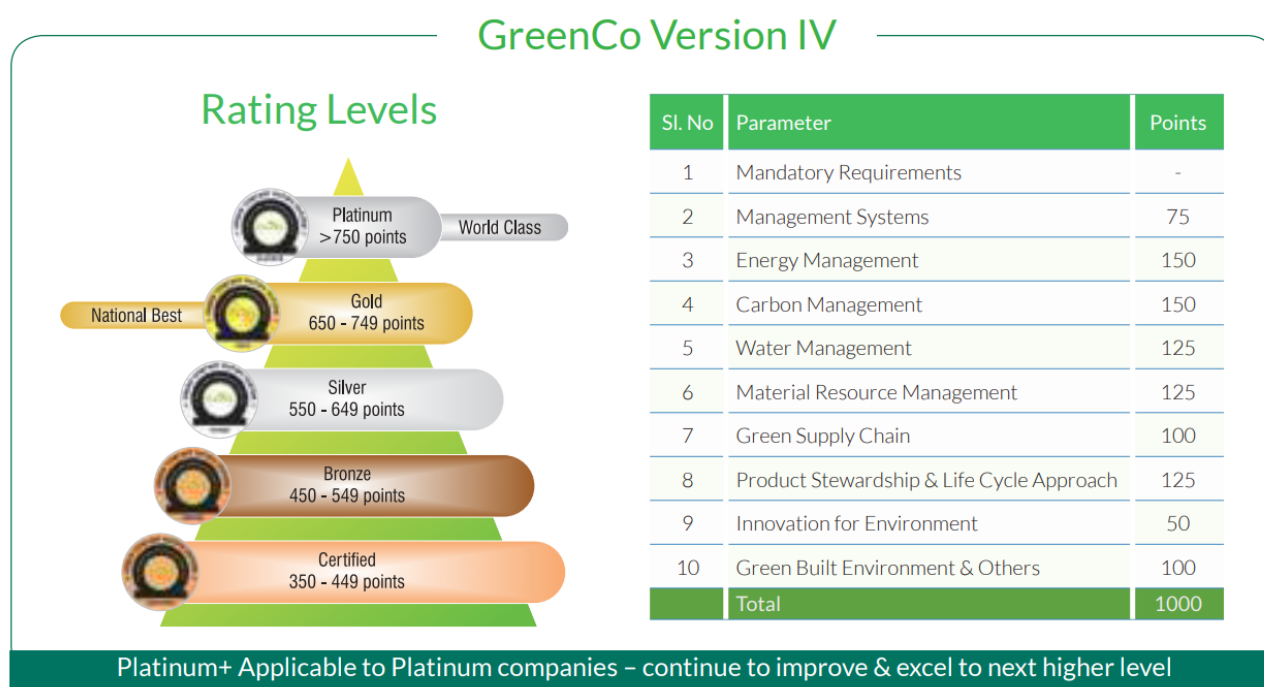
This rating system reflects the collective wisdom and expertise of industry leaders, policymakers, and environmental experts. This collaborative effort ensures that the framework encompasses diverse perspectives and addresses the evolving needs of industries in achieving sustainability.

The objective of the GreenCo rating system is to assist companies in improving their environmental performance in a comprehensive manner and go beyond sheer compliance.

The GreenCo rating system embraces a life cycle approach that focuses on key environmental performance aspects addressing energy efficiency, renewable energy, water conservation, greenhouse gas emissions reduction, waste management, material conservation, green supply chain, product stewardship & life cycle assessment, innovation for environment and green infrastructure & ecology. These areas provide a framework for evaluating and enhancing sustainability practices across industries.

The rating system categorizes companies based on their total score, across Platinum, Gold, Silver, Bronze, and Certified, providing recognition and motivation for continual improvement.

The threshold criteria for certification levels are provided in the figure 41.



*Figure 41: CII GreenCo Rating Levels and Points*

Under Environment of ESG the process would start with aligning the policies and activities of the companies with such standards and frameworks right from the structuring of the Environmental Policy.

The policies need to take into its drafting the Pillars on which it is being structured, what are the Operational processes, the Legal and regulatory matrix which is being adhered to, how and who support the Implementation of the policies, Influencers & Champions who are responsible to drive it and the Yardstick on which the YoY targets achievement will be measured.

The roadmap should include important ISO certification like ISO 14001:2015 - Environmental management systems, ISO 14064:2018 – GHG emission inventory and reporting standards, ISO 14067:2018 – Carbon Footprint of Products, ISO 14072:2024 – Life Cycle Assessment (LCA) and the ISO 50001 – Energy Management.

### 5.3 Climbing the ESG Ladder Through ISOs



*Figure 42: Climbing the ESG Ladder*

The International Organization for Standardization (ISO) announced the launch of the IWA 48:2024 in Nov 2024 in COP29 which provides guidance on environment, social, and governance principles - a new set of guidance aimed at enabling companies globally to improve ESG integration, performance, measurement and reporting.

IWA stands for International Workshop Agreement, which is a type of ISO standard. It is developed through a workshop process that is faster than the normal ISO committee process. An IWA is used for the sector to develop clear rules on an issue. It enables a more rapid response to requirements for standardization.

The new principles are being released, according to ISO, as companies face increasing ESG scrutiny and a substantial increase in ESG regulations, including the EU's CSRD, the UK's Modern Slavery Act, and the ISSB's IFRS S1 and S2 disclosure requirements, while sustainability reporting continues to suffer from inconsistencies and variations across different jurisdictions, company sizes and sectors, with the guidance aimed at enabling more consistent reporting. ISO said that the principles are applicable to organizations ranging from small businesses to multinational corporations, as well as ESG consultants, academia, research institutions, and NGOs.

According to ISO, the new principles are designed to support management of ESG performance, improve measurement and reporting under existing disclosure frameworks to enable consistency, comparability, and reliability of ESG reporting and practices globally, facilitate interoperability by aligning with existing reporting standards, and promote global consistency, to enable clear communication of sustainability efforts. ISO said that the guidance will provide a structure to help organizations integrate existing ESG requirements, establish KPIs, and assess maturity in their ESG practices.

To achieve global sustainability standards under E, S, & G there are several ISO certifications already developed and used, by following which over the period of 3 to 5 years an organization can claim advanced inroads as per the UN Sustainable Development Goals. Below are given the 17 UN SDGs:

## SUSTAINABLE DEVELOPMENT GOALS



*Figure 43: UN Sustainable Development Goals*

In order to release a Sustainability Report based on GRI principles and submit data to global assessment agencies, like the DJSI assessment done by S&P Global, we need to ensure all 17 UN SDG are ticked by our activities.

|       |                                    |                                                                                                                                                                                                                                                   |  |
|-------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| E,S,G | Sustainability Report (GRI Based)  | Sustainability reporting has no set format, but broadly involves disclosure of a company's environmental, social, and governance (ESG) goals and communicating the company's progress and efforts to reach those goals.                           |  |
| E,S,G | ESG Assessment (S&P Global - DJSI) | 1. The S&P Global Corporate Sustainability Assessment (CSA) is a questionnaire-based process that evaluates a company's sustainability performance.<br>2. The CSA score is measured on a scale of 0–100, with 100 representing the maximum score. |  |

*Table 32: ESG Reporting and Assessment*

And the following three tables 33, 34 & 35 give the ESG Road Map through ISOs and other global certifications so that once we enter this journey, we will be at constantly incremental stages of ESG adherence.

*Table 33: Environment Related ISOs & Other Global Certifications*

| ESG Road Map |                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                        |                |
|--------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| ESG          | Description of the Certificates                                                                       | Requirements                                                                                                                                                                                                                                                                                                                                                                                           | UN SDG linkage |
| E            | ISO 14001: Environmental Management Systems                                                           | <ol style="list-style-type: none"> <li>1. Environment Policy, Objectives and Targets.</li> <li>2. Environmental Performance Monitoring and Documentations.</li> <li>3. Environmental Impact Assessment.</li> <li>4. Compliance obligations record.</li> <li>5. Emergency preparedness and response.</li> <li>6. Operational control.</li> <li>7. Review Commite and Continuous Improvement.</li> </ol> |                |
| E            | ISO 14064: Greenhouse Gases                                                                           | <ol style="list-style-type: none"> <li>1. GHG Inventory.</li> <li>2. Accurate measurements, Record keeping and Reporting.</li> <li>3. Emission reduction projects.</li> <li>4. Third party audit/verification.</li> </ol>                                                                                                                                                                              |                |
| E            | ISO 14067:2018 :Greenhouse gases — Carbon footprint of products                                       | <ol style="list-style-type: none"> <li>1. Define the scope</li> <li>2. Gather data</li> <li>3. Calculate the carbon footprint of the product</li> <li>4. Verify the results and communicate the results.</li> </ol>                                                                                                                                                                                    |                |
| E            | ISO 14040/14044: Life Cycle Assessment (LCA)                                                          | <ol style="list-style-type: none"> <li>1. Goal and Scope definition.</li> <li>2. Life Cycle Inventory Analysis (LCI)</li> <li>3. Life Cycle Impact Assessment (LCIA)</li> <li>4. Life Cycle Interpretation</li> </ol> <p>Note : LCA done for 2 products - Name &amp; Date</p>                                                                                                                          |                |
| E            | ISO 50001: Energy Management Systems                                                                  | <ol style="list-style-type: none"> <li>1. Develop an Energy Management Plan(After energy audit completion).</li> <li>2. Document and Implement the plan.</li> <li>3. Perform an internal audit.</li> <li>4. Undergo an external audit.</li> </ol>                                                                                                                                                      |                |
| E            | ISO 14046: Water Footprint                                                                            | <ol style="list-style-type: none"> <li>1. Identify the scope</li> <li>2. Develop a water footprint assessment</li> <li>3. Conduct a third-party audit</li> </ol>                                                                                                                                                                                                                                       |                |
| E            | ISO 14068-1:2023 (Known as PAS 2060 untill 2025) : Climate change management — Transition to net zero | <ol style="list-style-type: none"> <li>1. Commitment to achive Carbon Neutrality.</li> <li>2. Select subject and boundary</li> <li>3. Quantify GHG emissions and removals</li> <li>4. Create a carbon neutrality management plan</li> <li>5. Reduce and remove GHG emissions</li> <li>6. Offset</li> <li>7. Report</li> <li>8. Claim</li> </ol>                                                        |                |
| E            | ISO 14015:2022 : Environmental management — Guidelines for environmental due diligence assessment     | <ol style="list-style-type: none"> <li>1. Define the Scope</li> <li>2. Environmental Aspects</li> <li>3. Environmental Issues</li> <li>4. Risk Assessments</li> <li>5. Recommendations</li> <li>6. Documentation</li> <li>7. Verification</li> </ol>                                                                                                                                                   |                |

Table 34: Social Related ISOs & Other Global Certifications

| ESG Road Map |                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                |
|--------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| ESG          | Description of the Certificates                                    | Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | UN SDG linkage |
| S            | ISO 45001: Occupational Health and Safety                          | <ol style="list-style-type: none"> <li>1. Plan for implementation.</li> <li>2. Plan for emergency</li> <li>3. Ensure compliance</li> <li>4. Conduct a gap analysis</li> <li>5. Investigate Incidents</li> <li>6. Maintain training records</li> <li>7. Undergo regular audits</li> <li>8. Continuously improve.</li> </ol>                                                                                                                                                                                                                                                                                                                                |                |
| S            | ISO 26000:2010 Guidance on Social Responsibility                   | <p>ISO 26000 is not a certification standard. It is a guidance standard that provides principles and frameworks for organizations to integrate social responsibility into their operations, policies, and practices. This can help demonstrate their commitment to social responsibility and sustainability, but it does not provide a formal certification.</p>                                                                                                                                                                                                                                                                                          |                |
| S            | ISO 30415:2021 Human Resource Management – Diversity and Inclusion | <ol style="list-style-type: none"> <li>1. Implementation of a diversity management model and measurement of the level of integration of gender equality principles in procedures</li> <li>2. Demonstration of a commitment to valuing diversity and promoting inclusion in the workplace</li> <li>3. Compliance with the ISO 30415 standard, including documentation and commentary</li> <li>4. Evidence of ongoing commitment to diversity, equity, and inclusion.</li> </ol>                                                                                                                                                                            |                |
| S            | ISO 20400:2017 Sustainable Procurement                             | <ol style="list-style-type: none"> <li>1. Develop a sustainable procurement policy and strategy aligned with the standard.</li> <li>2. Implement sustainable procurement practices throughout the organization and supply chain.</li> <li>3. Establish metrics and targets to measure and improve sustainable procurement performance.</li> <li>4. Conduct internal audits and assessments to ensure conformance to the standard.</li> </ol>                                                                                                                                                                                                              |                |
| S            | SA 8000                                                            | <ol style="list-style-type: none"> <li>1. Companies must provide a safe and healthy work environment</li> <li>2. Companies must pay employees a living wage that meets all minimum legal standards</li> <li>3. Companies must not discriminate against employees based on race, caste, national origin, religion, disability, gender, sexual orientation, union membership, or political affiliation</li> <li>4. Companies must protect the rights of workers to form and join trade unions and to bargain collectively</li> <li>5. Companies must not engage in corporal punishment, mental or physical coercion, or verbal abuse of workers.</li> </ol> |                |

Table 35: Governance Related ISOs & Other Global Certifications

| ESG Road Map |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |
|--------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| ESG          | Description of the Certificates                | Requirements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | UN SDG linkage |
| G            | CII GreenCo Rating                             | <ol style="list-style-type: none"> <li>Employee welfare initiatives</li> <li>Supply chain associates' welfare initiatives</li> <li>Community welfare initiatives</li> <li>Workplace Safety</li> <li>Environmental Sustainability Efforts Beyond the Fence.</li> <li>Innovation</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                          |                |
| G            | ISO 9001: Quality Management Systems           | <ol style="list-style-type: none"> <li>Top Management Commitment</li> <li>Adequate resources</li> <li>Employee Competence</li> <li>Process Management</li> <li>Quality planning</li> <li>Product Service and Design</li> <li>Customer complaint resolutions</li> <li>Corrective actions</li> <li>Documentation and Internal audits</li> <li>Continuous Improvement</li> </ol>                                                                                                                                                                                                                                                                                                      |                |
| G            | ISO 31000:2018 Risk Management                 | <ol style="list-style-type: none"> <li>ISO 31000 certification is not available, but organizations can demonstrate their competence in risk management by implementing a risk management process based on ISO 31000 principles and integrating it into their key business processes. Individuals can pursue certification through alternative standards or organizations offering risk management certifications.</li> <li>The PECB (Professional Evaluation and Certification Board) offers certification in ISO 31000 risk management, which demonstrates an individual's competence in establishing and implementing a risk management framework based on ISO 31000.</li> </ol> |                |
| G            | ISO 27001:2022 Information Security Management | <ol style="list-style-type: none"> <li>Establish an Information Security Management System (ISMS)</li> <li>Conduct a risk assessment</li> <li>Develop security policies and procedures</li> <li>Implement risk management processes</li> <li>Review the ISMS's effectiveness</li> <li>Communicate and train employees on the ISMS</li> <li>Perform internal audits</li> </ol>                                                                                                                                                                                                                                                                                                      |                |
| G            | United Nations Global Compact (UNGC)           | <ol style="list-style-type: none"> <li>Commit to meeting fundamental responsibilities in the areas of: Human rights, Labor, Environment and Anti-corruption.</li> <li>Publicly express support for the UNGC and its principles.</li> <li>Implement the principles in our operations and business practices.</li> <li>Report annually on our progress and actions taken to implement the principles.</li> </ol>                                                                                                                                                                                                                                                                     |                |
| G            | ISO 37001: Anti-Bribery Management Systems     | <ol style="list-style-type: none"> <li>Anti-Corruption policy</li> <li>Appoint Compliance Manager</li> <li>Employee training</li> <li>Due diligence</li> <li>Financial controls</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |
| G            | ISO 37301:2021 Compliance Management Systems   | <ol style="list-style-type: none"> <li>Compliance policy</li> <li>Compliance culture</li> <li>Competence, communication, and awareness</li> <li>Policies, procedures, and controls</li> <li>Due diligence</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |

## 5.4 Peers & Their ESG Scores (S&P Global)

Peers have shown the way in Environment Stewardship by implementing and showing excellent results in this area. A few examples from globally acclaimed Environment related activities are shown in table 37.

Table 36: Peer ESG Scores (S&P Global)

| Peer              | Country | 2023 Score | 2024 Score |
|-------------------|---------|------------|------------|
| LONGi / SEM       | PRC     | 50         | 58         |
| First Solar / SEM | USA     | 50         | 50         |
| JA Solar / SEM    | PRC     | 42         | 48         |
| Jinko Solar / SEM | PRC     | 39         | 69         |

SEM - Semiconductors & Semiconductor Equipment

## 5.5 Peer Strategy

Table 37: Peer Strategy

| Peer         | Emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Energy management                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>LONGi</b> | <ul style="list-style-type: none"> <li>LONGi joined the RE100, EP100, EV100 initiatives and the Science Based Targets initiative (SBTi) in 2020</li> <li>LONGi SBTi Target: <ul style="list-style-type: none"> <li>Scope 1 and 2 emissions are reduced by 60 % by 2030 compared to 2020</li> <li>Scope 3 emission intensity per tonne of purchased goods and services is reduced by 52 % by 2030 compared to 2020</li> </ul> </li> <li>RE 100: <ul style="list-style-type: none"> <li>Achieve 70% renewable energy use by 2027</li> <li>Achieve 100% renewable energy use by 2028</li> </ul> </li> <li>EV 100: <ul style="list-style-type: none"> <li>Install charging facilities 100 % at all manufacturing sites by 2030.</li> </ul> </li> <li>Emission reduction in operations: <ul style="list-style-type: none"> <li>25 production bases have been certified with the ISO 50001 Energy Management System</li> <li>253 charging piles have been installed at 23 operating sites.</li> <li>the Group's overall energy productivity increased by 31.2% compared with 2015</li> <li>Accelerated the construction of Baoshan LONGi "Zero Carbon Factory" and have been awarded the PAS 2060</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>EP 100: <ul style="list-style-type: none"> <li>Complete the deployment of an energy management system by 2025</li> <li>Improve energy utilization rate by 35 % from the baseline of 2015</li> </ul> </li> <li>Power Saving Targets in 2023: <ul style="list-style-type: none"> <li>13.43 % lower than that of 2020 (Achieved 18.32%)</li> </ul> </li> <li>Total electricity consumption came from renewable energy, accounting for about 31.10% of the total electricity consumption, which was equivalent to about 2,124,399.46 tCO<sub>2</sub>e emission reduction.</li> <li>Monocrystalline silicon: <ul style="list-style-type: none"> <li>Using the waste heat of the air compressor, we can heat the pure water in the washing machine and increase its temperature by 25~30°C, thus saving the power originally required for the process</li> <li>Estimated annual electricity savings 61.78 million kWh</li> <li>2023 specific electricity saving by product: 59,489.50 (10k kWh)</li> </ul> </li> <li>Wafers <ul style="list-style-type: none"> <li>Utilizing the cool air outdoors in winter, we can shut down the chiller unit and still cool off the</li> </ul> </li> </ul> |

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | <p>Carbon Neutral Certification in December 2023 by SGS.</p> <ul style="list-style-type: none"> <li>Supply Chain Emission Reduction: <ul style="list-style-type: none"> <li>Launched the “Supply Chain Green Partner Empowerment Program”, with more than 550 suppliers actively participating in two consecutive sessions</li> <li>Completed the carbon inventory of 50 key suppliers and assisted them in analyzing their energy use and conducting carbon inventories to explore their reduction potential.</li> </ul> </li> <li>In 2023, the company set up its sustainable development philosophy, known as LIGHT (“Lead”, “Innovative”, “Green”, “Harmonious”, and “Trustworthy”)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>chilled water used for the slicing process</p> <ul style="list-style-type: none"> <li>Estimated annual electricity savings 6.32 million kWh</li> <li>2023 specific electricity saving by product: 24,252.89 (10k kWh)</li> <li>Modules <ul style="list-style-type: none"> <li>Dual-channel air supply through the stringer can help us increase the volume of air supply, reduce the set pressure at the power station, and thus save the energy consumption of the compressed air system</li> </ul> </li> <li>Estimated annual electricity savings 2 million kWh</li> <li>2023 specific electricity saving by product: 8,438.86 (10k kWh)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                               |
| Jinko Solar | <ul style="list-style-type: none"> <li>Science-based Targets Commitment: <ul style="list-style-type: none"> <li>Net-zero GHG emissions across the value chain by 2050</li> <li>Reduce absolute Scope 1 and 2 GHG emissions 50.4% by 2032 &amp; 90% by 2050 from a 2022 base year,</li> <li>Reduce Scope 3 GHG emissions from purchased goods and services 58.2% per MW by 2032 &amp; 97% per MW by 2050 from a 2022 base year,</li> <li>Increase renewable electricity to 100% by 2030.</li> </ul> </li> <li>As of the beginning of 2024, four subsidiaries have been certified as “Zero-Carbon Factory”, with 3,046 tons of carbon credits and 93,124 green certificates purchased.</li> <li>15 products have carried out product Life Cycle Assessment (LCA); 9 products have passed the Italian Environmental Product Declaration Certification, 10 products have passed the French Product Carbon Footprint Certification, 182 module series have ISO 14067 certificate.</li> <li>Launched Self-assessment of energy conservation and emission reduction program for Core Suppliers.</li> <li>Launched “Supply Chain GHG Emission Management Enablement Program”</li> </ul> | <ul style="list-style-type: none"> <li>64.29% of the Company’s bases in operation have passed the ISO 50001 Energy Management System Certification.</li> <li>Promoting Energy Storage System</li> <li>the Company carried out a series of energy-saving technological transformation projects, such as waste heat recovery, energy efficiency renovation of high-efficiency machine rooms, and boiler thermal field switching.</li> <li>During the reporting period, the Company carried out 136 technological transformation projects, saving 135,639.58 MWh of electricity, equivalent to avoiding about 77,355.25 tons of GHG emissions.</li> <li>Thoroughly explored the potential for energy saving in facilities and equipment, and proposing practical and feasible energy-saving solutions.</li> <li>Electricity Consumption per Unit of Production is significantly reduced from 56,323.55 to 40546.32 MWh/GW</li> <li>Natural Gas Consumption per Unit of Production (unit: 10,000 m<sup>3</sup> /GW) is significantly reduced from 6.42 to 2.28.</li> </ul> |

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## ANNEXURES

### ISPL Corporate Office, Hitech City

| ISPL Corporate Office - Carbon Emission Calculations - FY 23-24 (Base year) |                                           |               |                                             |                          |          |                            |                          |
|-----------------------------------------------------------------------------|-------------------------------------------|---------------|---------------------------------------------|--------------------------|----------|----------------------------|--------------------------|
| Sl. No                                                                      | Description                               | Activity Data | Unit                                        | Emission Factor          | Unit     | Reference                  | Carbon Emission in tCO2e |
| Scope 1 Emissions                                                           |                                           |               |                                             |                          |          |                            |                          |
| 1                                                                           | Refrigerant top up                        |               |                                             |                          |          |                            |                          |
|                                                                             | R-32                                      | 0             | kg                                          | 677                      | † CO2/†  | IPCC(AR5)                  | 0                        |
|                                                                             | R-410A                                    | 0             | kg                                          | 1924                     | † CO2/†  | IPCC(AR5)                  | 0                        |
| Total                                                                       |                                           |               |                                             |                          |          |                            | 0                        |
| Scope 2 Emissions                                                           |                                           |               |                                             |                          |          |                            |                          |
| 1                                                                           | Power obtained from GRID                  | 89918.56      | kWh                                         | 0.716                    | †CO2/MWh | CO2 Baseline Database V.19 | 64.38                    |
| 2                                                                           | Purchased DG Power                        | 928.063       | kWh                                         |                          |          |                            |                          |
|                                                                             | Diesel Consumption                        | 0.309         | kL                                          | 2.68                     | †CO2/kL  | IPCC                       | 0.83                     |
| 3                                                                           | Purchased Cooling Capacity                | 224076        | kWh                                         |                          |          |                            |                          |
|                                                                             | Electricity Power Consumption for cooling | 90109.78      | kWh                                         | 0.716                    | †CO2/MWh | CO2 Baseline Database V.19 | 64.52                    |
| Total                                                                       |                                           |               |                                             |                          |          |                            | 129.73                   |
| Scope 3 Emissions                                                           |                                           |               |                                             |                          |          |                            |                          |
| 1                                                                           | Business Travel                           |               |                                             |                          |          |                            |                          |
|                                                                             | Air                                       | 472869        | Pass-km                                     | ICAO GHG Emission Tool   |          |                            | 31.45                    |
| 2                                                                           | Employee Commute                          | 573097        | km                                          | Refer Survey Spreadsheet |          | India GHG Program          | 23                       |
| 3                                                                           | C3 Fuel & Energy related Activities       |               | Refer Scope 3, Category 3 calculation sheet |                          |          |                            | 50.71                    |
| Total                                                                       |                                           |               |                                             |                          |          |                            | 105.162                  |
| Total Scope 1+2                                                             |                                           |               |                                             |                          |          |                            | 129.73                   |
| Total Scope 1+2+3                                                           |                                           |               |                                             |                          |          |                            | 234.89                   |

| ISPL, Corporate Office - Carbon Emission - FY 24-25 |                                           |               |         |                         |          |                                                        |                          |
|-----------------------------------------------------|-------------------------------------------|---------------|---------|-------------------------|----------|--------------------------------------------------------|--------------------------|
| Sl. No                                              | Description                               | Activity data | Unit    | Emission Factor         | Unit     | Reference                                              | Carbon Emission in tCO2e |
| Scope 1 Emissions                                   |                                           |               |         |                         |          |                                                        |                          |
| 1                                                   | Refrigerant top up                        |               |         |                         |          |                                                        |                          |
|                                                     | R-32                                      | 0             | kg      | 1960                    | t CO2e/t | IPCC (AR6)                                             | 0                        |
|                                                     | R-410A                                    | 0             | kg      | 2255.5                  | t CO2e/t | IPCC (AR6)                                             | 0                        |
| Total Scope 1                                       |                                           |               |         |                         |          |                                                        | 0                        |
| Scope 2 Emissions                                   |                                           |               |         |                         |          |                                                        |                          |
| 1                                                   | Power obtained from GRID                  | 146157.33     | kWh     | 0.727                   | tCO2/MWh | CO2 Baseline Database for the Indian Power Sector V.20 | 106.33                   |
| 2                                                   | Purchased DG Power                        | 473.939       | kWh     |                         |          |                                                        | 0.00                     |
|                                                     | Diesel Consumption                        | 0.158         | kL      | 2.926                   | tCO2e/kl | IPCC                                                   | 0.46                     |
| 3                                                   | Purchased Cooling Capacity                | 426770        | kWh     |                         |          |                                                        | 0.00                     |
|                                                     | Electricity Power Consumption for cooling | 150133.61     | kWh     | 0.727                   | tCO2/MWh | CO2 Baseline Database for the Indian Power Sector V.20 | 109.22                   |
| Total Scope 2                                       |                                           |               |         |                         |          |                                                        | 216.01                   |
| Scope 3                                             |                                           |               |         |                         |          |                                                        |                          |
| 1                                                   | Business Travel                           |               |         |                         |          |                                                        |                          |
|                                                     | Air                                       | 1173149       | Pass-km | ICAO                    |          | ICAO                                                   | 85.96                    |
| 2                                                   | Employee Commute                          | 648887.04     | km      | Refer Calculation sheet |          | India GHG Programe                                     | 35.90                    |
| 3                                                   | C3 Fuel & Energy related Activities       |               |         |                         |          |                                                        | 91.02                    |
| Total Scope 3                                       |                                           |               |         |                         |          |                                                        | 212.88                   |
| Total Scope 1+2                                     |                                           |               |         |                         |          |                                                        | 216.01                   |
| Total Scope 1+2+3                                   |                                           |               |         |                         |          |                                                        | 428.90                   |

## ISPL, Ramayapatnam

| ISPL, Ramayapatnam - Carbon Emission Calculations - FY 23-24 |                                                |               |                                             |                 |               |                                  |                          |
|--------------------------------------------------------------|------------------------------------------------|---------------|---------------------------------------------|-----------------|---------------|----------------------------------|--------------------------|
| Sl. No                                                       | Description                                    | Activity Data | Unit                                        | Emission Factor | Unit          | Reference                        | Carbon Emission in tCO2e |
| Scope 1 Emissions                                            |                                                |               |                                             |                 |               |                                  |                          |
| 1                                                            | Company Owned Vehicles                         |               |                                             |                 |               |                                  |                          |
|                                                              | Diesel (Car, buses, Ambulances etc.,) (9593 L) | 2309.87       | L                                           | 2.68            | kgCO2/l       | IPCC                             | 6.19                     |
| 2                                                            | Refrigerant top up                             |               |                                             |                 |               |                                  |                          |
|                                                              | R-22                                           | 0             | kg                                          | 1760            | † CO2/t       | IPCC(AR5)                        | 0.00                     |
|                                                              | R-32                                           | 0             | kg                                          | 677             | † CO2/t       | IPCC(AR5)                        | 0.00                     |
|                                                              | R-410A                                         | 0             | kg                                          | 1924            | † CO2/t       | IPCC(AR5)                        | 0.00                     |
|                                                              | R 134A                                         | 0             | kg                                          | 1300            | † CO2/t       | IPCC(AR5)                        | 0.00                     |
| 3                                                            | CO2 used for refilling into fire extinguisher  | 0             | kg                                          | 1               | † CO2/t       | IPCC(AR5)                        | 0.00                     |
| 4                                                            | Diesel used in DG sets                         | 6495.3        | L                                           | 2.68            | kgCO2/l       | IPCC                             | 17.41                    |
| Total                                                        |                                                |               |                                             |                 |               |                                  | 23.60                    |
| Scope 2 Emissions                                            |                                                |               |                                             |                 |               |                                  |                          |
| 1                                                            | Power obtained from GRID                       | 3880          | kWh                                         | 0.716           | tCO2/MWh      | India CO2 Baseline Database V.19 | 2.78                     |
| Total                                                        |                                                |               |                                             |                 |               |                                  | 2.78                     |
| Scope 3 Emissions                                            |                                                |               |                                             |                 |               |                                  |                          |
| 1                                                            | C4 - Upstream Transportation & Distribution    |               |                                             |                 |               |                                  |                          |
|                                                              | Sea                                            | 4464837       | t-km                                        | 0.0035          | kg CO2e/t-km  | DEFRA                            | 15.80                    |
|                                                              | Road                                           | 149933.56     | t-km                                        | 0.0741          | kg CO2e/t-km  | India GHG Program                | 11.11                    |
| 2                                                            | Employee Commute                               |               |                                             |                 |               |                                  |                          |
|                                                              | Car - Petrol                                   | 9664          | km                                          | 0.153           | kg CO2e/km    | India GHG Program                | 1.48                     |
|                                                              | Bike - Petrol                                  | 152208        | km                                          | 0.0356          | kg CO2/km     | India GHG Program                | 5.42                     |
|                                                              | Bus                                            | 21744         | km                                          | 0.0152          | kg CO2/pax km | India GHG Program                | 0.33                     |
| 3                                                            | C3 Fuel & Energy related Activities            |               | Refer Scope 3, Category 3 calculation sheet |                 |               |                                  | 6.584                    |
| Total                                                        |                                                |               |                                             |                 |               |                                  | 40.72                    |
| Total Scope 1+2                                              |                                                |               |                                             |                 |               |                                  | 26.38                    |
| Total Scope 1+2+3                                            |                                                |               |                                             |                 |               |                                  | 67.10                    |

**ISPL, Ramayapatnam - Carbon Emission Calculations - FY 24-25**

| Sl. No                   | Description                                                                                               | Activity data | Unit | Emission Factor         | Unit      | Reference                                              | Carbon Emission in tCO2e |
|--------------------------|-----------------------------------------------------------------------------------------------------------|---------------|------|-------------------------|-----------|--------------------------------------------------------|--------------------------|
| <b>Scope 1 Emissions</b> |                                                                                                           |               |      |                         |           |                                                        |                          |
| 1                        | Company Owned Vehicles                                                                                    |               |      |                         |           |                                                        |                          |
|                          | Petrol (Car, buses, Ambulances etc.,)                                                                     | 81.53         | L    | 2.303                   | kgCO2e/l  | IPCC                                                   | 0.19                     |
|                          | Diesel (Car, buses, Ambulances etc.,)                                                                     | 17840.88      | L    | 2.925                   | kgCO2e/l  | IPCC                                                   | 52.19                    |
| 2                        | Refrigerant top up                                                                                        | 0             |      |                         |           |                                                        | 0.00                     |
|                          | R-22                                                                                                      | 15            | kg   | 1960                    | t CO2e/t  | IPCC (AR6)                                             | 29.40                    |
|                          | R-32                                                                                                      | 3             | kg   | 771                     | t CO2e/t  | IPCC (AR6)                                             | 2.31                     |
|                          | R-410A                                                                                                    | 0             | kg   | 2255.5                  | t CO2e/t  | IPCC (AR6)                                             | 0.00                     |
|                          | R 134A                                                                                                    | 186           | kg   | 1530                    | t CO2e/t  | IPCC (AR6)                                             | 284.58                   |
| 3                        | CO2 used for refilling into fire extinguisher                                                             | 0             | kg   | 1                       | t CO2/t   | IPCC                                                   | 0.00                     |
| 4                        | Diesel used in DG sets                                                                                    | 71132.12      | L    | 2.925                   | kgCO2/l   | IPCC                                                   | 208.09                   |
| 5                        | LPG used in Canteen                                                                                       | 4978          | kg   | 2.97                    | kgCO2e/kg | IPCC                                                   | 14.78                    |
| 6                        | Diesel supplied to 3rd party                                                                              | 20917.94      | L    | 2.925                   | kgCO2e/l  | IPCC                                                   | 61.19                    |
| <b>Total Scope 1</b>     |                                                                                                           |               |      |                         |           |                                                        | <b>652.85</b>            |
| <b>Scope 2 Emissions</b> |                                                                                                           |               |      |                         |           |                                                        |                          |
| 1                        | Power obtained from GRID                                                                                  | 876170        | kWh  | 0.727                   | tCO2/MWh  | CO2 Baseline Database for the Indian Power Sector V.20 | 637.41                   |
| 2                        | Power generated from Solar PV plant (offset)                                                              | 0             | kWh  | 0.727                   | tCO2/MWh  | CO2 Baseline Database for the Indian Power Sector V.20 | 0.00                     |
| <b>Total Scope 2</b>     |                                                                                                           |               |      |                         |           |                                                        | <b>637.41</b>            |
| <b>Scope 3 Emissions</b> |                                                                                                           |               |      |                         |           |                                                        |                          |
| 1                        | C4 - Upstream Transportation & Distribution                                                               | 58838.09      | t-km | Refer Calculation sheet |           | India GHG Program                                      | 3.82                     |
| 2                        | Business Travel                                                                                           |               |      |                         |           |                                                        |                          |
|                          | C6 Fuel & Energy related Activities not included in scope 1&2 (Diesel Supply to 3rd party free of charge) | 20917.94      | L    | 2.68                    | kgCO2/l   | IPCC                                                   | 56.06                    |

|                   |                                     |        |                             |          |                |                   |         |
|-------------------|-------------------------------------|--------|-----------------------------|----------|----------------|-------------------|---------|
| 3                 | Employee Commute                    |        |                             |          |                |                   |         |
|                   | Car - Petrol                        | 98028  | km                          | 0.153    | kg CO2e/km     | India GHG Program | 15.00   |
|                   | Bike - Petrol                       | 451200 | km                          | 0.0356   | kg CO2/km      | India GHG Program | 16.06   |
|                   | Bus                                 | 881568 | Pax km                      | 0.0152   | kg CO2/ pax km | India GHG Program | 13.40   |
|                   | Rail                                | 24640  | Pax km                      | 0.007837 | kg CO2e/pax-km | India GHG Program | 0.19    |
|                   | 13 seater tempo traveller           | 24000  | km                          | 0.226    | kg CO2e/km     | India GHG Program | 5.42    |
| 4                 | C3 Fuel & Energy related Activities |        | Refer C3 calculations sheet |          |                |                   | 339.33  |
| Total Scope 3     |                                     |        |                             |          |                |                   | 393.23  |
| Total Scope 1+2   |                                     |        |                             |          |                |                   | 1290.25 |
| Total Scope 1+2+3 |                                     |        |                             |          |                |                   | 1683.49 |



Green City



Clean Air  
Production



Green  
Development



Green Globe



Leaf



Green  
Power Plant



Recycled  
Plastic Bottle



Wind Turbine



Solar Panel



Water Recycling



Recycling Symbol



Electric Vehicle



Green Heart



Green  
Energy Battery



Geothermal  
Power Plant



Green Public  
Transport



Carbon  
Reduction



Energy  
Regeneration Wheel



Green Technology



Sustainable  
Agriculture



Nuclear  
Power Plant