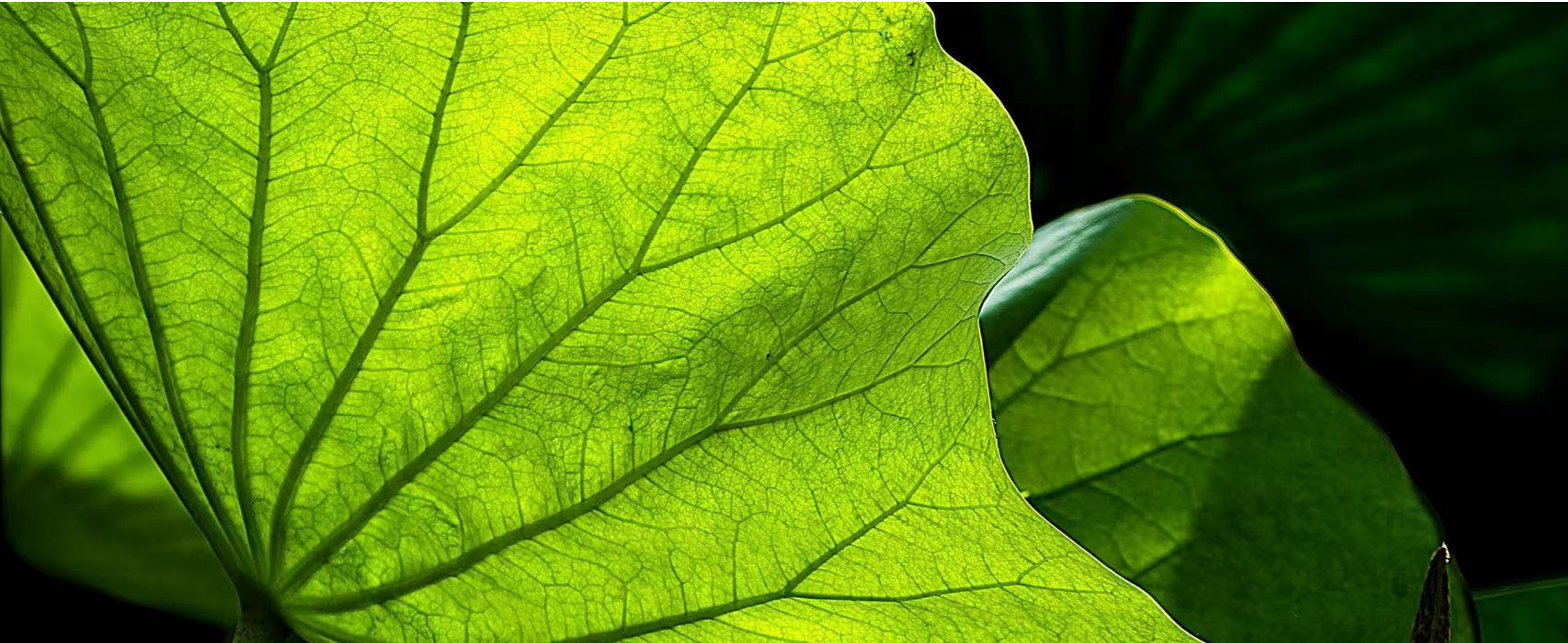


# 2021 ESG

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## Sustainability Report







## Forward Looking Statements

This report has been prepared by Canadian Solar Inc. (the “Company” or “Canadian Solar”) solely to facilitate the understanding of the Company’s performance and strategies on sustainability-related topics.

The information contained in this report has not been independently verified. None of the Company or any of its affiliates, advisers, or representatives will be liable (in negligence or otherwise) for any losses incurred from any use of this report or its contents or otherwise arising in connection with the report.

Certain statements in this report are forward-looking statements that involve a number of risks and uncertainties that could cause actual results to differ materially. These statements are made under the “Safe Harbor” provisions of the U.S. Private Securities Litigation

Reform Act of 1995. Forward-looking statements may be marked by such terms as “believes,” “expects,” “anticipates,” “intends,” “estimates,” or other comparable terminology. Though we consider our expectations expressed in such forward-looking statements reasonable, we cannot guarantee their realization. We refer you to a more detailed discussion of the risks and uncertainties contained in the Company’s annual report on Form 20-F, as well as other documents filed with the Securities & Exchange Commission. In addition, all information provided in this report, including these forward-looking statements, is as of the date of this report’s release on the Company’s website unless otherwise stated, and the Company undertakes no duty to update such information except as required under applicable law.

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## Message from the Chief Executive and Chief Sustainability Officers

Effectively navigating the risks posed by climate change, social injustices, and other, ever more pressing global issues will require continuous, proactive efforts from businesses like our own.

As part of the green energy revolution, we at Canadian Solar recognize the crucial role we will play in those efforts. Our commitments to environmental sustainability, human rights, and positive social impact thus represent both our efforts to safeguard our shared future and our dedication to building long-term value for all our stakeholders.

In last year's report, we reaffirmed our longstanding commitment to reducing our environmental impact while empowering our customers to do the same. Our use of more comprehensive environmental standards has helped us deliver more energy and materially efficient products with lower carbon footprints in all stages of production, such as our BiHiKu6 and BiHiKu7 modules, unveiled in 2021. Likewise, despite expanding production output, we achieved year-on-year improvements in energy intensity, water intensity, and waste intensity in 2021 and kept increases in GHG emissions intensity within 4% even after recalculating our environmental metrics using more holistic calculation standards. Overall, we remain on track to meeting our goal of using 100% renewable energy in our operations before 2030.

We aim to help future leaders from diverse backgrounds thrive, both within Canadian Solar and across the solar industry. In 2021, we hosted recruiting events with organizations that support underrepresented groups

in the solar industry, such as BlackOak. To bring us closer to gender parity at all levels of employment, we have also partnered with Cornell University to offer female leaders in our company critical leadership training and mentorship to accelerate their career advancement. And we added Women in CSI Solar to the ranks of our existing development groups for women in renewable energy industries, hosting events such as the Women's Career Development Forum in 2021 for female employees at all different levels of seniority.

Finally, we continuously work to ensure ethical labor practices in our own operations and those of our suppliers, conducting supplier ESG audits and establishing our interdepartmental Anti-Modern Slavery Task Force in 2021. To further solidify these commitments, our Board passed a resolution in May 2022 mandating a third-party assessment, at reasonable cost, on the extent to which Canadian Solar's policies and procedures effectively protect against forced labor in its operations, supply chains, and business relationships.

We are proud of these achievements but recognize that continued success requires continued vigilance. We continuously work towards newer, more stringent, and more holistic calculation standards for our social and environmental metrics. As we focus our strategy to prioritize long-term resilience, we have also adjusted our environmental targets to match. These adjustments will allow us to more effectively control quality, manage raw material usage, and hold to our commitments to worker safety & equitable labor standards.



**SHAWN QU**  
Chairman and Chief Executive Officer

Last year, we at Canadian Solar reaffirmed our pledge to model responsible stewardship for our global community, or, as in our company motto, to "Make the Difference." By making sustainability a pivotal aspect of our strategic action in the face of global challenges, we hope to continue doing just that.

We are hugely grateful for your interest and look forward to engaging with you further.



**HANBING ZHANG**  
Chief Sustainability Officer

**Shawn Qu**  
Chairman and Chief Executive Officer

**Hanbing Zhang**  
Chief Sustainability Officer



# Highlights



**100%**

Revenues related to renewable energy



**21-year** track record as a **global tier 1 player** in the solar industry



Over **6.6 GWp** of solar projects energized globally



**36%** of workforce is female, with 25% of middle management positions and 8% of senior management positions filled by women in 2021



Approximately **13,500** employees



**1 year**

GHG payback time of crystalline solar modules, after which they become carbon negative assets that typically last for 30 years or longer



Over **71 GW** of solar modules delivered to customers globally, equivalent to displacing approximately 188 million tons of CO<sub>2</sub> emissions or powering over 18 million households



From 2017 to 2021:

**53%** decrease in water intensity

**36%** decrease in waste intensity

**18%** decrease in energy intensity

**17%** decrease in GHG emissions intensity



Positive Impact on **UN SDGs** of: Climate Action; Affordable and Clean Energy; Industry, Innovation and Infrastructure; Peace, Justice and Strong Institutions; Reduced Inequalities; Good Health and Wellbeing; Gender Equality; Partnership for Goals



Committed to and on track to powering global operations with **100%** renewable electricity before 2030



# 1 About Canadian Solar

7 AFFORDABLE AND  
CLEAN ENERGY



Founded in Canada in 2001, Canadian Solar Inc. (the “Company” or “Canadian Solar”) is one of the world’s largest solar technology and renewable energy companies.

Canadian Solar is a manufacturer of solar photovoltaic modules, provider of solar energy and battery storage solutions, and developer of utility-scale solar power and battery storage projects with a geographically diversified pipeline consisting of projects in various stages of development. Over the past 21 years, Canadian Solar has delivered around 71 GW of premium quality, solar photovoltaic modules to customers across the world. Since entering the project development business

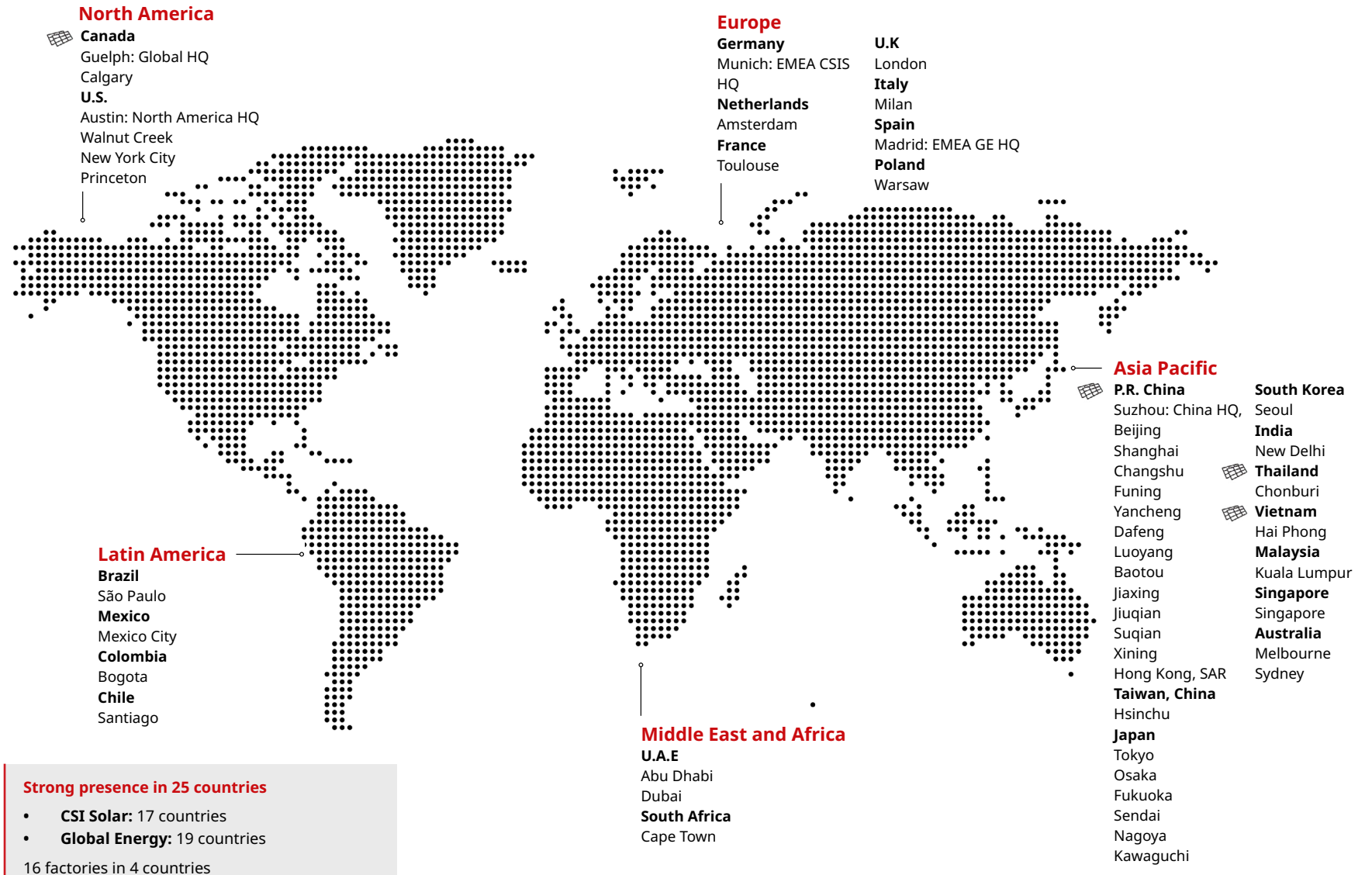
in 2010, Canadian Solar has developed, built, and connected over 6.6 GWP in over 20 countries across the world. As of March 2022, the Company has 800 MWp of projects in operation, 5.3 GWP of projects under construction or in backlog (late-stage), and an additional 18.5 GWP of projects in pipeline (mid- to early- stage). Canadian Solar is one of the most bankable companies in the solar and renewable energy industry and has been publicly listed on the NASDAQ since 2006.



Canadian Solar has two business segments:  
CSI Solar and Global Energy.

The **CSI Solar** segment (“CSI Solar”) develops, manufactures, and sells solar modules and provides total system solutions, including inverters, solar system kits, and EPC (engineering, procurement, and construction) services. CSI Solar also includes the Company’s battery storage integration business, delivering bankable, end-to-end turnkey battery storage solutions for utility-scale, commercial and industrial, and residential applications. These storage systems solutions are complemented by long-term service agreements, which include future battery capacity augmentation services. Canadian Solar currently owns approximately 80% of CSI Solar’s shares and expects to hold approximately 64% of CSI Solar’s shares after the planned initial public offering on the Shanghai Stock Exchange in China.

The **Global Energy** segment (“Global Energy”) develops and constructs solar power and energy storage projects in over 20 markets worldwide. The Company develops both stand-alone solar and stand-alone battery storage projects, as well as hybrid solar plus storage projects. Its monetization strategies vary between develop-to-sell, build-to-sell, and build-to-own depending on business strategies and market conditions with the goal of maximizing returns, accelerating cash turn, and minimizing capital risk. It is also responsible for delivering operation and maintenance services globally both to projects developed by us and by third parties.





# Sustainability at Canadian Solar

As a global leading renewable energy company, Canadian Solar aims to power the world with solar energy and to create a cleaner Earth for future generations.

The total electricity generated by the 71 GW of solar modules we shipped over the past 21 years is equivalent to displacing approximately 188 million tons<sup>1</sup> of CO<sub>2</sub> emissions or powering over 18 million households.

At Canadian Solar, we incorporate ESG, or environmental, social, and governance factors, across our business and in our strategic decision-making and continuously make efforts to improve our practices to ensure long-term sustainability.

## Working sustainably within our planetary boundaries

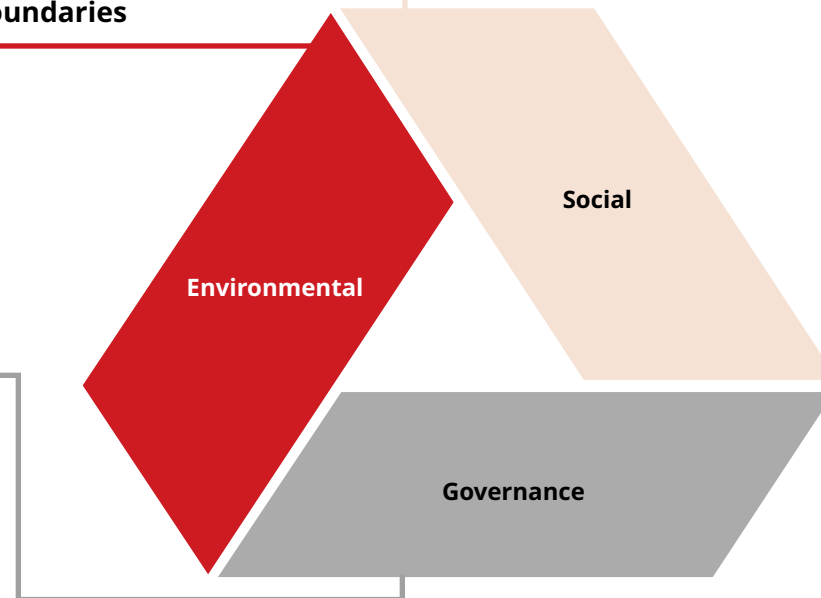
- GHG emissions and manufacturing energy intensity
- Commitment to 100% renewable energy before 2030
- Solar PV system carbon payback time of 1 year
- Water intensity management
- Material use, waste, and circularity
- Environmental stewardship in project development
- Assessing climate risks and opportunities

## Demonstrating responsible conduct

- Governance foundation for business ethics
- Policies and procedures
- Board oversight – Sustainability Committee
- Chief Sustainability Officer responsible for sustainability strategy and implementation
- Appropriate due diligence processes
- Responsible supply chain
- Transparency and risk management
- Robust ESG reporting

## Committing to socially responsible and equitable outcomes

- Human rights
- Equal opportunity employer
- Equity, diversity, and inclusion
- Talent strategy, training, and development
- Freedom of association and collective bargaining
- Health and safety
- Community commitments and partnerships



The following Corporate Policies provide a framework for Canadian Solar's sustainability commitments:

### Environmental

- *Environment, Occupational Health, and Safety Policy* ([link](#))

### Social

- *Labor and Human Rights Policy* ([link](#))
- *Equal Employment Opportunity Policy* ([link](#))
- *Anti-Modern Slavery Policy* ([link](#))
- *Global Diversity Policy* ([link](#))
- *Supplier Code of Conduct* ([link](#))
- *Conflict Minerals Policy* ([link](#))

### Governance

- *Code of Business Conduct and Ethics* ([link](#))
- *Whistleblower Policy* ([link](#))
- *Insider Trading Policy* ([link](#))
- *Related-Party Transactions* ([link](#))
- *Prohibition against Giving Bribes* ([link](#))
- *Prohibition against Accepting Bribes* ([link](#))



<sup>1</sup> Actual CO<sub>2</sub> net avoided emissions depend on specific PV project location, application, and grid electricity mix. The estimate presented here provides an approximate value for PV energy production's impact on slowing climate change. Calculations are based on the utility PV annual average capacity factor and avoided CO<sub>2</sub> emissions rate reported by the U.S. Environmental Protection Agency (EPA). GHG emissions from PV modules and balance-of-systems (BOS) manufacturing, as well as transport, construction, operation, and decommissioning, have been taken into account. Please see EPA website for further details ([link](#)).

## Approach to Environment, Health, and Safety (EHS)



Canadian Solar is committed to providing a safe and enriching work environment for all our employees and contractors, striving to reduce the environmental impact of our business activities.

Our EHS strategy is incorporated in our solar

products and services, from product design and production to delivery.

We standardized our EHS goals to drive continuous, measurable improvements across our business. We abide by international standards certified under ISO14001 environmental and ISO45001 occupational health and safety management systems. These certifications cover waste reduction, energy conservation, injury reduction, and other environmental, safety, and health objectives.



10kW Domingo Residential Solar System, Spain

## Compliance with Environmental Regulations

We have obtained all necessary environmental permits, including those relating to air emissions, wastewater discharge, the handling and disposal of solid and hazardous waste and chemicals, etc., to conduct business at existing manufacturing facilities and continuously monitor regulatory changes where we operate to remain in compliance with environmental laws.

Noise, wastewater, air emissions, and other industrial waste are produced from our manufacturing operations. We have obtained all necessary environmental permits, including those relating to air emissions, wastewater discharge, the handling and disposal of solid and hazardous waste and chemicals, etc., to conduct business at existing manufacturing facilities and continuously monitor regulatory changes where we operate to remain in compliance with the applicable environmental laws. We also conduct extensive environmental studies during the development phase of our solar and battery storage projects to assess and reduce their

environmental impact. In 2021, we have further increased our scrutiny of our suppliers on ESG requirements and implemented ESG compliance audits across our supply chain.

At the product level, our solar modules and system solutions comply with the European Union's REACH (Registration, Evaluation, Authorization, and Restriction of Chemicals) regulation for chemicals (EC) No. 1907/2006, as well as its implementation guidelines issued by the European Chemical Agency (ECHA). Our products, classified as "articles" within the REACH directive, do not release any chemical substances under normal or reasonably foreseeable conditions of use. Our system solutions, including string inverters, also comply with the European Union's RoHS (Restriction of Hazardous Substances) Directive 2011/65/EU and its amendments<sup>2</sup>. Our photovoltaic modules are exempted from CLP (Classification, Labelling, and Packaging of substances and mixtures) regulation according to (EC) No. 1272/2008.

All our photovoltaic module designs undergo Toxicity Characteristic Leaching Procedure (TCLP) testing to monitor the presence of any toxic metal substances (arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver) according to TCLP Standard EPA Test Method 1311, as issued by the U.S. Environmental Protection Agency (EPA) under the Toxic Substances Control Act (TSCA) for landfill disposal of modules. We also closely monitor any changes in regulations under the EPA's TSCA, which aims to regulate the manufacturing and use of chemical substances in the U.S. Our photovoltaic modules comply with the latest ruling requirements over PBT (Persistent, Bioaccumulative, and Toxic) Chemicals under the TSCA.



<sup>2</sup> Solar PV modules are exempted from European Restriction of Hazardous Substances (RoHS) legislation ([link](#)) as part of the European Commission's decision to ensure achievement of energy renewable targets. Per article 2 of the RoHS directive, "This directive does not apply to: [...] photovoltaic panels intended to be used in a system that is designed, assembled and installed by professionals for permanent use at a defined location to produce energy from solar light for public, commercial, industrial and residential applications."



## 2 Environmental Metrics and Targets



As a technology-driven company, Canadian Solar has produced many groundbreaking innovations over the years that have firmly established solar PV as the most promising solution in decarbonizing electricity production across markets worldwide.

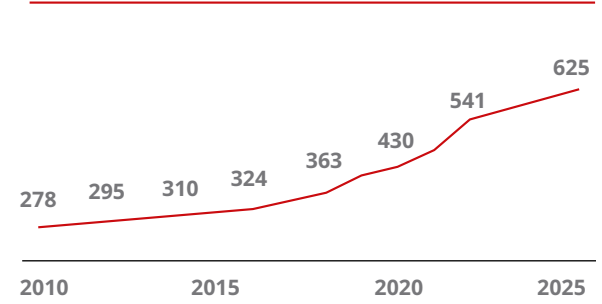
These innovations have helped reduce the LCOE (Levelized Cost of Energy) of solar systems to unprecedentedly low levels by improving durability and lowering manufacturing costs for solar modules. They have also enabled significant improvements in the environmental payback time of solar modules, as measured in GHG emissions and energy use, as well as other key environmental metrics, such as water and waste intensities.

In 2016, we designed the first half-cell solar modules in the industry, which improved solar module power output, performance, and durability. In the years following, we successfully launched polycrystalline Passivated Rear Emission Contact (PERC) cells and overcame the 400W module wattage limit by mass-producing 166mm wafer size modules, firsts for the industry. All these technological improvements contributed meaningfully to improving the performance and reliability of solar energy while reducing its cost.

More recently, we have introduced even larger wafers and have continued to make product design and efficiency improvements, increasing our solar module

efficiencies from 13.9% in 2010 to 21.2% in 2021. These improvements have allowed us to more than double our module power output from 278W in 2010 to 660W in 2021 (larger utility module type HiKu7). Continuous technological innovations have allowed us to reduce silicon usage and increase the power output of our solar modules, thereby reducing both the environmental footprint of our production on a per watt basis and the BOS (balance of systems) costs for solar projects.

*Average module wattage (W)*



5.5 MW Muda Commercial Solar Rooftop System, Malaysia



## Understanding the Environmental Impact of Manufacturing

To fully comprehend the environmental results and targets reported in the following sections, it is important to understand the impact of our manufacturing operations structure on defined environmental metrics, which can be evaluated through the following framework:

- Scale of production & process efficiency.** The more we produce, the more energy and water we consume and the more waste and GHG emissions we release. However, the more efficient our processes are, the smaller our energy and water consumption and the lower our waste and GHG production will be per unit produced. As such, energy efficiency has been one critical parameter for selecting manufacturing processes and equipment.
- Level of manufacturing vertical integration.** Crystalline silicon PV manufacturing comprises of the processes of ingot, wafer, cell, and module production. We may outsource the production of such materials, and each production process has different environmental impact intensities. Changes to our own manufacturing capacity

structure would thus directly impact our total environmental footprint. For example, the higher our level of manufacturing vertical integration is, the more energy we would consume in-house to produce a given volume of module products.

- Product technologies.** To a large extent, the choice of product technologies defines the environmental impact of our manufacturing process. For instance, Heterojunction (HJT) cell manufacturing consumes roughly 30% less energy than the competing TOPCon technology. At the same time, products based on new technologies have higher conversion efficiency, helping reduce per-watt energy, water, and material consumption, as well as waste and GHG emissions, when in operation.



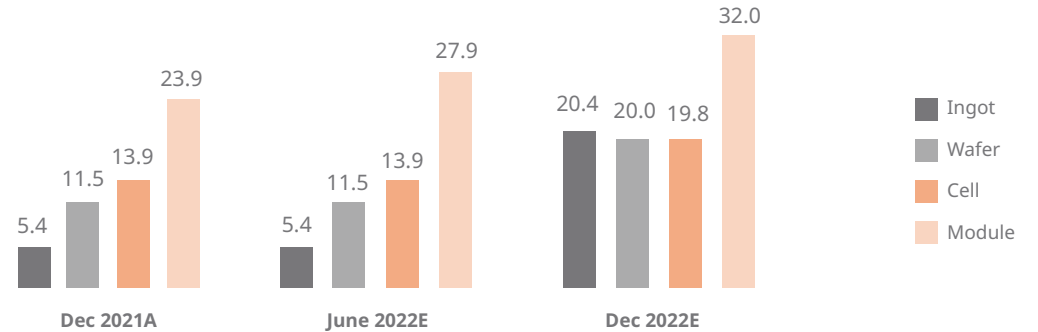
11.2 MW Qujing Zhanyi Utility Solar Plant, China

## Manufacturing Capacity Expansion Roadmap

In 2021, we increased our level of vertical integration, ramping up manufacturing capacities of crystalline ingots, wafers, cells, and modules to 5.4 GW, 11.5 GW, 13.9 GW, and 23.9 GW, respectively. The combined production output of our manufacturing operations, once converted to a common unit in Megawatts (MW), rose by 37% year-over-year, with actual production outputs of our ingot, wafer, cell, and module operations increasing by 91%, 56%, 14%, and 40%, respectively. The increase in production scale, along with the shift to monocrystalline ingoting technology, led to higher absolute energy consumption, water withdrawal, and waste production in 2021.

In 2022, we are transitioning to a trapezoid-shaped manufacturing capacity structure by increasing our ingot, wafer, and cell capacities each to around 20 GW and our module capacity to 32 GW. We thus expect our environmental metrics, in particularly energy consumption, to increase next year purely due to the magnitude of our increase in production scale despite continued decreases in the energy intensity of our manufacturing processes. To offset this change in the coming years, we plan to prioritize capacity expansions for products that use more efficient and less energy-intensive N-type technologies.

**Manufacturing Capacity**  
(GW)





## Well on track to achieve the goal of powering all our operations with 100% renewable energy before 2030

	2020	2021	2026	2030
<b>Renewable energy %</b>	20%	23%	69%	100%
<b>Total Electricity Consumption (MWh)</b>	1,127,000	1,434,000		

We are committed to achieving the goal of powering our global operations with 69% renewable electricity by 2026 and 100% before 2030.

To achieve this goal, we will reduce our electricity and energy consumption while increasing the use of renewable energy.

Around 94% of our total Scope 1 and 2 carbon emissions (see definitions on p.12-14) come from the energy consumed by our manufacturing operations, for which electricity accounts for approximately 99% of total energy consumption. Therefore, one of our priorities is to reduce the carbon emissions of the electricity we use in manufacturing operations.

We will reduce our energy intensity by leveraging our expertise and strength in product technologies, manufacturing process know-how, and energy savings while we continue to grow our business.

On the energy supply side, the paths we follow to

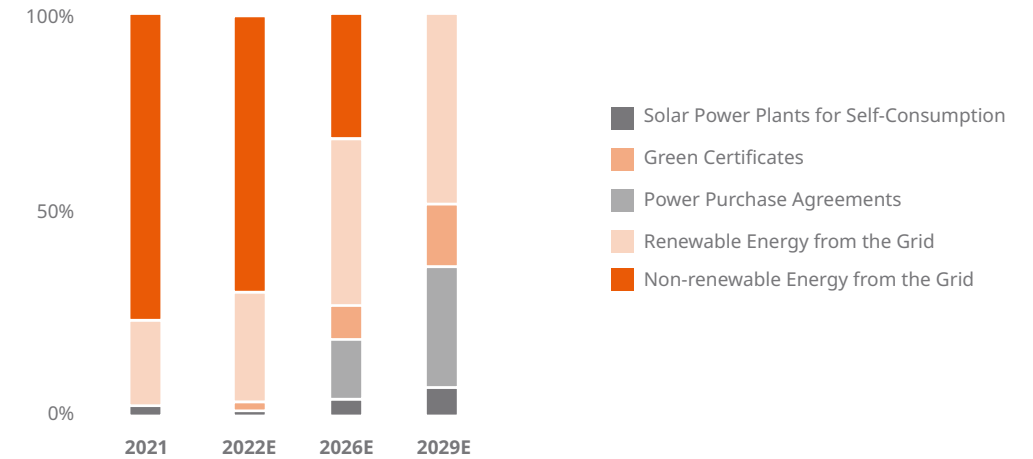
decarbonize the electricity we use are, in order of priority, installing distributed solar on the rooftops of our factories, signing renewable power purchase agreements (PPAs), and purchasing green electricity from the spot market.

Most of our manufacturing facilities are in China, where solar energy has reached grid parity. In 2021, Chinese regulations endorsed PPAs signed directly between renewable energy producers and electricity users ([link](#)), and carbon-emission trading became mandatory for power producers to facilitate the price-setting of renewable PPAs ([link](#)). Altogether, renewable PPAs are expected to be a market norm in two years and will become one of our major sources of renewable energy from 2024 onwards.

Just as importantly, we expect the grid's renewable mix will continue to increase due to increased penetration of renewable energy, which will help us speed up our decarbonization progress.



**Total Electricity Consumption**  
(%)



47 MW Marville Utility Solar Plant, France

## Key Environmental Achievements Over 2017-2021



**17% reduction**  
GHG Emissions Intensity



**18% reduction**  
Manufacturing Energy Intensity



**53% reduction**  
Manufacturing Water Intensity



**36% reduction**  
Manufacturing Waste Intensity

In the following sections, we report detailed environmental intensity metrics covering all our global manufacturing operations, including ingot, wafer, cell, and module operations. For each manufacturing process, weighted average intensity metrics are calculated with respect to the actual production output of each manufacturing site.



## Greenhouse Gas Emissions

Since 2021, Canadian Solar has been quantifying and reporting Greenhouse Gas (GHG) emissions covering all our global manufacturing operations by following the latest and strictest ISO14064-1:2018 standard (Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals).

To provide a more holistic understanding of our GHG footprint, we present GHG emission metrics from multiple angles, providing data on total GHG emissions (direct and indirect) and GHG intensity associated with manufacturing activities, as well as estimations of net avoided GHG emissions for representative project applications. We adhere to a variety of different methodologies to evaluate our environmental performance more rigorously, such as French CRE standards and Life Cycle Assessment (LCA) analysis per ISO14040/44:2006 environmental management standards.

### Methodology

In 2021, we expanded the scope of our greenhouse gas inventory to include the following:

1. Organizational boundaries: we included two new module assembly facilities and one new wafer facility, and extended coverage to our auxiliary materials manufacturing, which includes the production of solder-coated copper ribbons, various encapsulation recipes, photovoltaic junction boxes, and connectors.
2. Reporting boundaries: we included methane emissions from anaerobic wastewater treatment, which are considered type 2 indirect emissions under ISO14064-1:2018, following a refinement in our cut-off criteria and increase in emissions share of this source.
3. Emissions factors (the average emission rate of a source): we updated our gasoline emission factor in accordance with the 2021 China Energy Statistical Yearbook, our electricity emission factor for operations in China in accordance with the Chinese National Development and Reform Commission<sup>3</sup>, our electricity and fuel emission factors for operations in Thailand and Vietnam according to the UK Environmental Agency 2021 updated data<sup>4</sup>, and all our Global Warming Potential (GWP) values based on the most recent IPCC 2021 report AR6<sup>5</sup>.

Based on these changes, we recalculated our carbon emissions for the period from 2017 to 2020, particularly for our base year of 2020.

<sup>3</sup> <https://www.ccchina.org.cn/archiver/ccchina.cn/UpFile/Files/Default/20140923163205362312.pdf> (link)

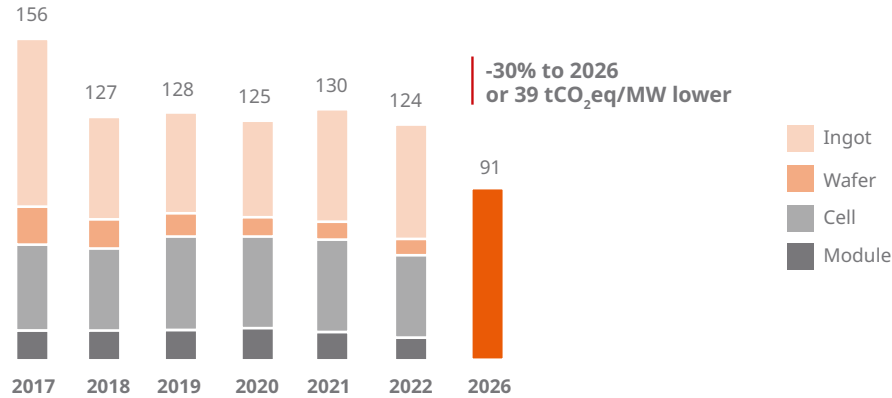
<sup>4</sup> <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2021> (link)

<sup>5</sup> <https://www.ipcc.ch/report/ar6/wg1/#FullReport> (link)



**GHG emissions intensity**

(tCO<sub>2</sub>e/MW)



To simplify comparison across different years, we use GHG emissions intensity or carbon intensity (emissions per MWp) as our main reporting metric. In 2021, we were able to keep our increase in carbon intensity within 4% while still bolstering production output and switching to more energy-intensive monocrystalline ingoting technology. Improvements in cell and module efficiency, faster adoption of thinner wafers, and deployment of new, less energy-intensive production tools helped realize a 16% (1.6 tCO<sub>2</sub>e/MWp) and 3% (1.7 tCO<sub>2</sub>e/MWp) reduction in our wafer and cell operations carbon intensities, respectively.

In 2022, we plan to achieve a moderate decrease in our carbon intensity of around 5% (6 tCO<sub>2</sub>e/MWp) as the share of monocrystalline ingot production continues increasing, pushing up our ingot operations energy consumption. Accordingly, we have updated our 5-year rolling goals to reflect greater contributions to our GHG emissions from our upstream ingot operations, with our carbon intensity reduction goal now down to 30% (39

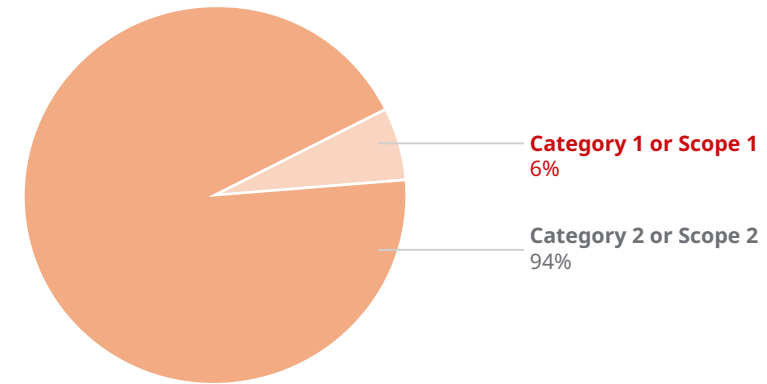
tCO<sub>2</sub>e/MWp) by 2026.

The targeted emissions reductions will be primarily driven by further improvements in module efficiency and manufacturing yields and more proactive energy conservation measures focusing on our cell and ingot facilities. We will also continue to ramp up manufacturing capacity of our high efficiency BiHiKu7 modules (210mm wafer size) and improving silicon usage (watts by grams of silicon).

In 2021, we successfully launched our next generation of solar PV modules based on N-type HJT cells. The technology offers a greater uplift in energy conversion efficiency, minimal degradation, and simpler, less energy intensive manufacturing processes. However, given the additional R&D work required to fully commercialize HJT technologies at a GW-scale, we have taken a conservative approach and have not included the potential environmental upside that N-type modules could contribute to our corporate emissions reduction targets.

**Carbon Emissions in 2021**

(tCO<sub>2</sub>e)



Category 1 or Scope 1		
Stationary combustion	9,801	1%
Mobile combustion	493	0%
Process emissions	16,468	2%
Fugitive emissions	35,184	3%
<b>Total</b>	<b>61,946</b>	<b>6%</b>

Category 2 or Scope 2		
Imported Electricity	959,436	93%
Imported Steam	11,579	1%
<b>Total</b>	<b>971,014</b>	<b>94%</b>

**Total carbon emissions** in 2021 amounted to 1,032,960 tCO<sub>2</sub>e, or tons of CO<sub>2</sub> equivalent, which include Category 1 direct GHG emissions (referred to as “Scope 1”) and Category 2 indirect GHG emissions from imported energy (referred to as “Scope 2”), as defined in the ISO14064-1:2018 standard. A detailed breakdown of our emissions is shown in the chart above.

## Environmental Metrics and Targets

Our GHG emissions are primarily driven by Category 2 (Scope 2) indirect emissions, i.e., emissions generated from the electricity purchased and other forms of imported energy used in our operations, which contributed to approximately 94% of total GHG emissions. Emissions in 2021 increased by 37% from the year 2020, mainly driven by the establishment of new production sites (+13% contribution) and increased production output in our existing factories (+24% contribution). A detailed comparison with our 2020 GHG emissions, broken down into sub-categories, can be found in the table below.

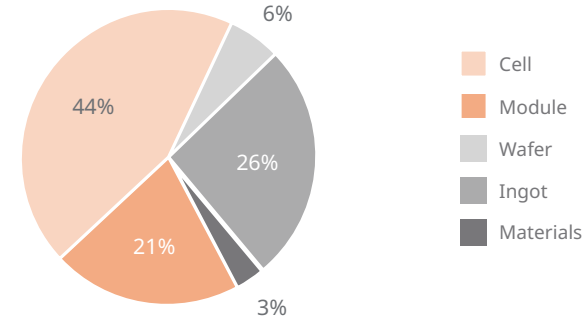
Within Category 1 or Scope 1 emissions, we observed an increase in process emissions related to a new cell manufacturing process we deployed in 2021. While this translated to an approximately 2% increase in our cell process carbon intensity, this new process could also significantly improve

our cell efficiency by around 0.5%, largely offsetting the additional carbon emissions from this source by reducing silicon usage per watt. Overall, we expect this new process to thereby reduce the carbon intensity of our upstream ingoting activities.

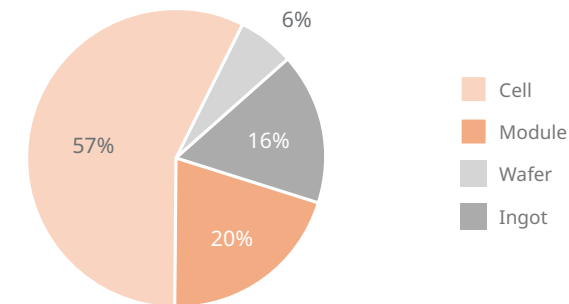
We also report how each manufacturing operation stage impacted our total GHG emissions and how these proportions changed between 2020 and 2021. As shown in the pie charts, our ingot manufacturing operations contributed 10% more to our total carbon emissions in 2021 than in 2020. The change was driven by an increase in monocrystalline production output following our strategic shift from 166mm polycrystalline to 210mm monocrystalline wafers. New to the reporting scope, our auxiliary materials manufacturing operations accounted for 3.3% of the total emissions in 2021.

Emissions category	2021			2020
	Existing factories	New factories	Total	Total
<b>Category 1 or Scope 1</b>	<b>44,285 (+132%)</b>	<b>17,658 (+92%)</b>	<b>61,946 (+224%)</b>	<b>19,117</b>
Stationary combustion	9,627	173	9,801	2,946
Mobile combustion	359	132	493	198
Process emissions	16,468	0	16,468	1,108
Fugitive emission	17,831	17,353	35,184	14,865
<b>Category 2 or Scope 2</b>	<b>888,524 (+21%)</b>	<b>82,491 (+12%)</b>	<b>971,014 (+33%)</b>	<b>732,528</b>
Imported electricity	877,172	82,263	959,436	714,533
Imported steam	11,351	227	11,579	17,995
<b>Total</b>	<b>932,809 (+24%)</b>	<b>110,149 (+13%)</b>	<b>1,032,958 (+37%)</b>	<b>751,645</b>

### Carbon Emissions in 2021



### Carbon Emissions in 2020





## Case Study: Solar PV System’s GHG Payback Time (Generally 1+ Years)

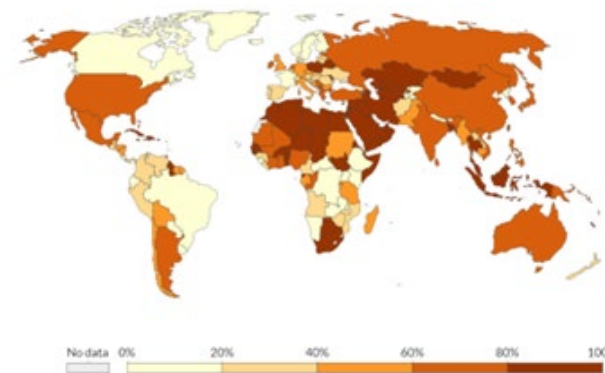
When evaluating a technology’s potential against global warming, the most comprehensive metric remains net GHG emissions avoided.

For solar systems, net emissions avoided are calculated by multiplying total GHG-free energy production by the local electricity grid emissions rates, then discounting the solar system’s carbon footprint, which takes into consideration the GHG emissions from its entire life cycle, including those from manufacturing solar modules and components, transportation, construction, operation, and decommissioning.

For illustrative purposes, we estimate the net GHG avoided emissions and the GHG payback time—the time it takes for excess GHG emissions associated with the system’s production and installation to be offset by the system’s net GHG avoided emissions—of our systems using two utility-scale solar projects that are 200 MWp each, one located in Texas, the United States, and the other in Côte d’Azur, France. Both are built with Canadian Solar’s BiHiKu7 bifacial modules, use single-axis solar trackers, and are assumed to produce electricity for 30 years before decommissioning. We compare the GHG payback time of this baseline scenario with a project using a specialty low-carbon long-lifetime module design.

The solar plant in Texas is reflective of the GHG payback time of most markets, as the share of fossil fuels in Texas’s electricity mix amounts to approximately to 65%, compared to the global average of 62%. The projected Texas GHG payback time of one year coheres with the GHG payback times typical in countries with larger populations and the highest electricity consumptions (China, US, India, Russia, Japan), further supporting these results. This means that after 12 months or so of electricity generation, plants like the Texas plant will generate close to 100% emissions-free electricity for the remainder of their useful lives.

Even in markets whose energy grids are already decarbonized, such as France (the French electricity grid relies mostly on nuclear energy, a non-renewable low-carbon energy source), GHG payback times may only increase to just over 10 years, which remains attractive from a decarbonization standpoint given that the lifetime of fuels-based electricity production assets usually exceeds 40 years. As research in photovoltaics continues, the development of less energy-intensive and more durable systems, along with electricity decarbonization, will further decrease GHG payback times. Our system installed with specialty low-carbon modules with a 40-year lifespan, for example, has a 20-month shorter GHG payback time when installed in France than the baseline system.



Share of electricity production from fossil fuels, 2021

### Did you know?

According to the U.S. SEIA (Solar Energy Industries Association), the US installed 23.6 gigawatts (GWp) of solar PV capacity in 2021 to reach 121.4 GWp of total installed capacity. This corresponds to an annual net avoided emissions amount of up to 155,000,000 tCO<sub>2</sub>, or about 0.45% of annual global GHG emissions (34.8 GtCO<sub>2</sub>).

### System Life Cycle Analysis

Project Location	Texas, US	Cote d’Azur, France	Unit	
<b>System carbon footprint</b>	1,146	1,146	966	kgCO <sub>2</sub> /kWp
	229,200	229,200	193,200	tCO <sub>2</sub>
<b>Project lifetime</b>	30	30	40	Years
<b>Total production</b>	12,554,054	10,139,812	13,480,392	MWh
<b>GHG PAE (Potential Avoided Emissions)</b>				
<b>Gross avoided emissions<sup>6</sup></b>	227,207	21,632	21,569	tCO <sub>2</sub> /year
<b>Net avoided emissions</b>	219,567	13,992	16,739	tCO <sub>2</sub> /year
<b>Net avoided emissions (lifetime)</b>	6,587,024	419,748	669,545	tCO <sub>2</sub>
<b>GHG payback time</b>	1.0	10.6	8.9	Years

<sup>6</sup> Avoided emission rates and capacity factors sources: the U.S. Environmental Protection Agency ([link](#)), and the French CRE.

<sup>7</sup> Source: Our World in Data based on BP Statistical Review of World Energy, Ember Global Electricity Review (2022) & Ember European Electricity Review (2022)

## Module Carbon Footprint Improvement

We have been developing and offering our customers PV modules with an optimized carbon footprint supply chain in compliance with the French Energy Regulation Committee (CRE) solar tender requirements since 2015.

The CRE module carbon footprint analysis is more comprehensive than the corporate GHG emissions intensity analysis, as it also includes the indirect GHG emissions from the upstream manufacturing of raw materials, up to material mining.

When we expanded our competitive low carbon footprint supply chain to include our BiHiKu6 and BiHiKu7 products in 2021, we also implemented new third party Life Cycle Assessment (LCA) analysis in our most recent production facilities in accordance with ISO14040/44:2006 environmental management standards. LCA methodology requires analysis of all stages of product manufacturing, including raw material extraction and making of materials used; transportation of raw materials and intermediate products; manufacturing of all components, including packaging, energy and water consumption, emissions, and waste, as well as infrastructure dedicated to product manufacturing.

Under this comprehensive framework, our latest ingot, wafer, and module manufacturing facilities were granted reduced Global Warming Potential (GWP) factors by the French Agency for Ecological Transition (ADEME – Agence de l'Environnement

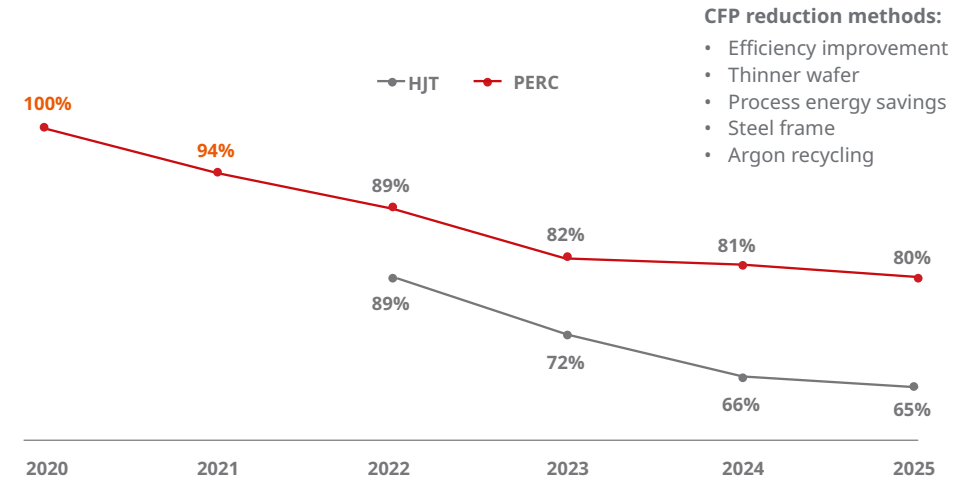
et de la Maitrise de l'Energie). Compared to our previous HiKu product generation, our HiKu6 module carbon footprint has decreased to 500 tCO<sub>2</sub>e/MW, 6.0% lower than that of our prior HiKu product<sup>8</sup>.

The chart on the right presents our short-term roadmap to further bring down our modules' carbon footprint calculations based on French CRE methodology, with 2020 as the base year for our roadmap. These calculations include gate-to-gate carbon emissions for a standard double glass module design.

Meanwhile, we are progressing with our first Environmental Product Declaration (EPD) certifications, expanding our analysis to a full-lifecycle carbon emission evaluation, which involves consideration of downstream transportation, solar plant construction, operations and maintenance, and end-of-life disposal. This will provide a more complete picture of how our products contribute during their whole life cycles, allowing us to develop tools to guide our customers, particularly by empowering solar plant owners to calculate their projects' GHG payback time.

<sup>8</sup> Per the French CRE methodology, the reported carbon footprint numbers exclude the impact of aluminum frame production.

Product carbon footprint reduction roadmap





## Air Emissions Breakdown

We comply with local and international laws and regulations related to emissions. We monitor and assess all relevant emissions regularly and employ sophisticated exhaust and filtration technology in all manufacturing facilities to minimize emissions. The table below shows a detailed breakdown of our air emissions.

As our main cell factories transitioned from poly- to monocrystalline, our processes generated less nitric acid, which in turn led to a strong reduction of our NOx emissions. From 2020 to 2021, our total air emissions remained roughly constant, totalling 91.3 tons, while our various operations grew in volume.

Air emissions <sup>9</sup> (global, metric tons)	2017	2018	2019	2020	2021
Nitrogen oxides (NOx)	28.1	37.4	38.2	33.9	13.6
Sulfur oxides (SOx)	0.1	0.2	0.1	0.1	0.1
Fine dust (PM10)	3.7	7.4	9.1	14.8	15.7
Hazardous air pollutants (HAP)	0.2	0.9	0.6	6.6	10.1
Volatile organic compounds (VOC)	12.2	4.1	16.4	13.7	17.5
Persistent organic pollutants (POP)	0	0	0	0	0
Other standard air emissions <sup>10</sup>	3.4	23.2	16.2	23.3	30.2

<sup>9</sup> Certain historical figures contain measurement abnormalities which we cannot revise given the amount of time that has lapsed. Consider 2020-2021 figures as the most accurate and reflective measurements of our actual air emissions. While the Company's emissions already comply fully with local regulations, the Company is making significant efforts to further treat and reduce air emissions.

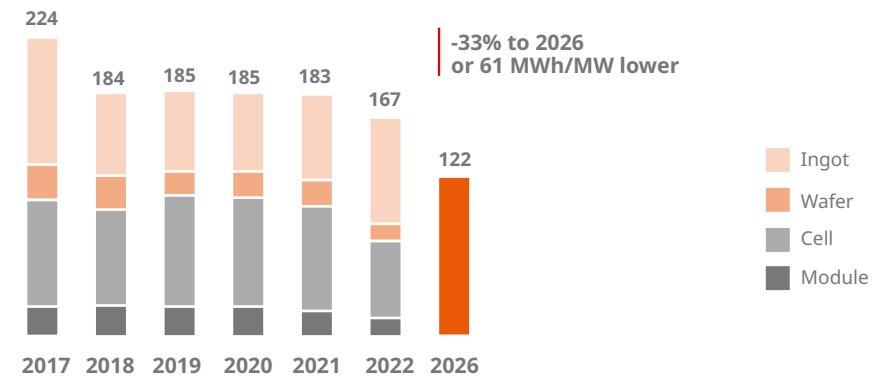
<sup>10</sup> From 2020, ammonia NH3 emissions have been included in "other standard air emissions" as per relevant Chinese air quality control regulations.

## Energy Intensity

We use production-weighted averages to track our energy intensity through our ingot, wafer, cell, and module manufacturing operations. Such methodology, while allowing for an accurate and representative snapshot of the energy intensity of our global manufacturing operations, tends to underrepresent the potential energy savings from newer production workshops, as production at these sites is ramped up over the course of the calendar year.

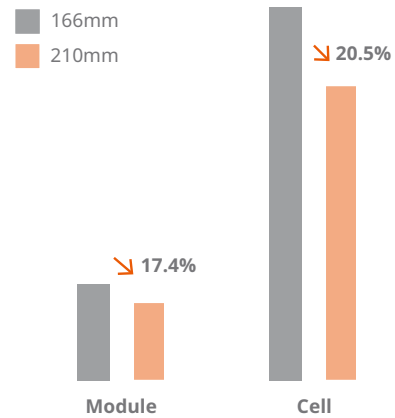
Overall, we achieved year-on-year energy intensity savings of 23%, 5%, and 8% for our wafer, cell, and module manufacturing operations, respectively, which translates to a combined total of about 100 GWh of absolute energy savings in 2021 (assuming that energy intensities did not change from 2020, but using 2021 wafer, cell, and module production volumes).

### Energy Intensity (MWh/MW)



To give some perspective, the chart below compares the energy intensities of our new 210mm cell and module workshops in Jiangsu Province relative to the incumbent 166mm production facilities based on 2021 data. The observed energy savings were in line with our expectations for new efficient production tools and demonstrate how we might meet our renewed 2022 target as we continue to upgrade our production tools to larger 182mm and 210mm wafer sizes.

**210mm vs. 166mm energy intensity**



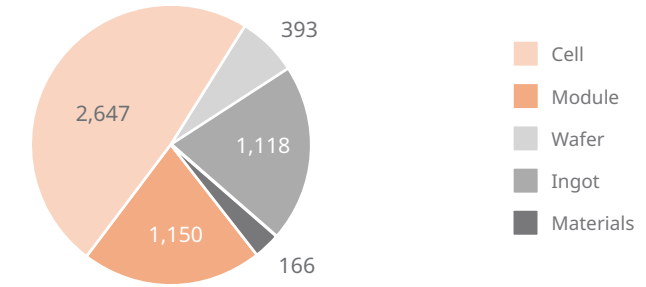
In the second half of 2021, certain factories in China faced power curtailment, which affected the capacity utilization rate. This was further affected by our accelerated shift from poly- to monocrystalline wafer production. Due to the combination of systemic and company-specific factors, our ingot manufacturing saw an increase in energy intensity of 15% in 2021.

Additionally, our monocrystalline wafer and ingoting operation output grew 1.6 and 1.9 times, respectively, from 2020 to 2021, shifting our energy consumption share between the different business units. In 2021, we significantly expanded our bill-of-materials manufacturing capacity, with new capacity extensions at our Jiaying manufacturing hub, and accordingly started reporting this new business unit's contribution to our total energy consumption (3%), as shown on the charts to the right.

With our 210mm production capacity now fully ramped up, we are well positioned to deliver on our 2022 target, with an expected 246 GWh savings on our total energy consumption.

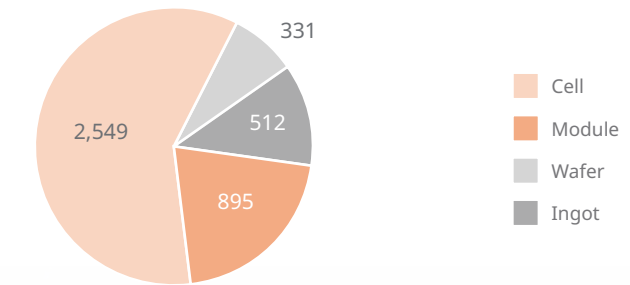
**Energy consumption in 2021**

(TJ)



**Energy consumption in 2020**

(TJ)





**Energy Consumption Breakdown<sup>11</sup>**

Global	2017	2018	2019	2020	2021
<b>Total energy consumption (GJ)</b>	<b>2,002,393</b>	<b>2,701,707</b>	<b>3,757,188</b>	<b>4,286,130</b>	<b>5,473,504</b>
<b>Gas</b>	11,295	24,020	40,249	59,001	192,332
<b>Diesel</b>	2,536	2,455	2,162	3,164	4,321
<b>Gasoline</b>	3,737	700	857	2,535	1,786
<b>Steam</b>	133,523	136,874	166,942	165,157	112,433
<b>Grid electricity</b>	1,800,956	2,474,601	3,484,479	3,972,449	5,078,445
<b>Self-generated solar PV electricity</b>	50,346	63,056	62,500	83,824	84,187

<sup>11</sup> Numbers reported in this table may differ slightly from previous sustainability report editions. We have revised historical calculations for accuracy and prior report estimations should no longer be considered. Self-generated PV electricity share has been revised in accordance with SASB (Sustainability Accounting Standard Board) standard reporting practices.



**CASE STUDY:  
CHANGSHU MODULE AND YANGCHENG CELL**

**Energy management measures**

- Following the publication of China's 14th Five-Year Plan (2021-2025), we started implementing two energy management pilot programs in our Changshu module and Yangcheng cell factories. Both programs followed the ISO 50001 international standard.

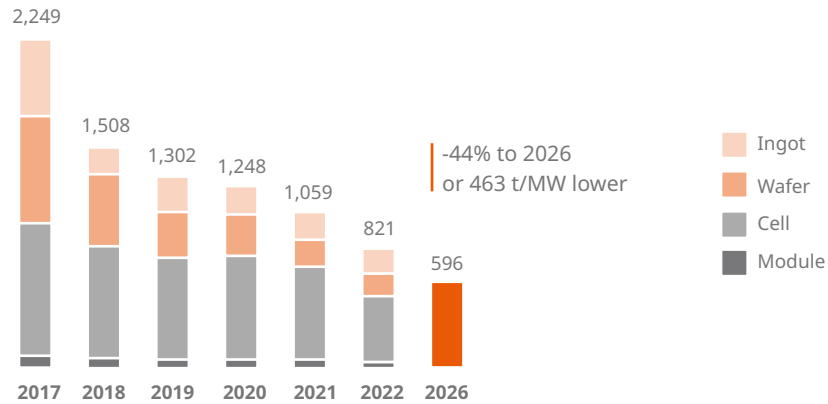
**Project achievements**

- Both factories were granted ISO50001 energy management certification.
- Changshu module energy consumption per unit product has been certified at 22.2 MWh/MW and was granted the "Green Factory" award by China Quality Certification Center
- In 2022, the ISO50001 management system framework will be extended to all our manufacturing sites.



# Water Intensity

**Water Intensity**  
(t/MW)



Water intensity is defined as the total amount of water withdrawn from all sources per MW produced. We use production-weighted averages across all our manufacturing units to track our water intensity, as shown in the chart above.

We achieved a 15% year-on-year reduction in water intensity between 2020 and 2021, mainly driven by the incremental deployment of new large size 210mm wafer and cell operations, as well as further decreases in silicon use (down to 2.5 g/W by the end of the year), which allowed us to reduce water use per watt of production.

The photovoltaic industry supply chain and integrated manufacturing can be water intensive,

particularly as more and more complex cell technologies gain market share, increasing demand for ultra-pure water quality. At Canadian Solar, we have been cognizant of the challenges this may pose to our long-term operations and sustainability. Our water conservation and recycling schemes, combined with the improvements in module efficiency and production yield, helped drive a 53% reduction in manufacturing water intensity between 2017 and 2021. Over the same period, absolute water withdrawal increased by only 57% despite our global module shipments more than doubling, saving 8,339 million liters of water in 2021 due to the decrease in water intensity from 2017.

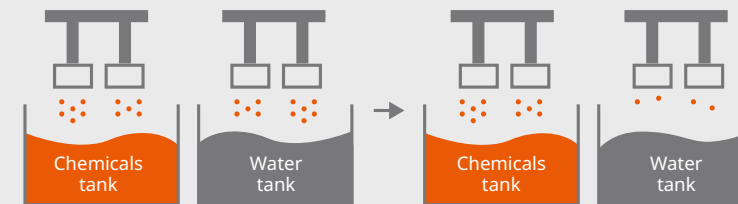
### Did you know?

According to the U.S. Environmental Protection Agency, an average American family uses more than 300 gallons of water per day at home (approx. 1.25 tons). The average U.S. residential solar system is around 7 kW. By these metrics, it takes the same amount of water as an American family uses in five days to manufacture the solar modules in an average residential system in the U.S. The amount of water used is lower for most other regions, although residential solar systems are also smaller outside of North America (3-5 kW).



### CASE STUDY: FUNING 210MM CELL WORKSHOP

- **Improvements in cell front side texturing and rear side polishing processes**
- **Water conservation measures:**
  - Optimize and standardize water inflow rate over each equipment (305 t/day).
  - Reduce cross-contamination between process chemicals and pure water tanks (887 t/day).



- **Project achievements**
  - Manufacturing water intensity reduced by 125 t/MW (~23%).
  - 2022 annual expected water withdrawal savings up to 580 thousand m<sup>3</sup>



# Water Risk Management Strategy

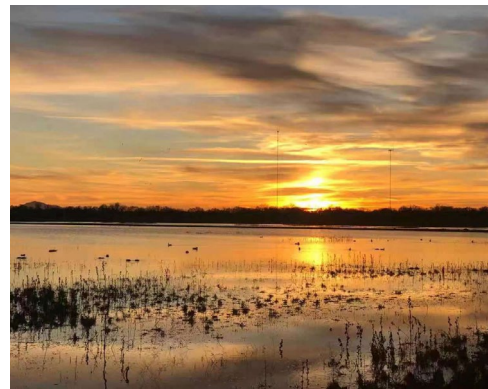
Water conservation is one of the top priorities in our sustainability initiatives.

As such, we constantly seek to improve process utilization rates and reduce water withdrawal in our water management strategy. When designing production processes, we maximize water utilization rates by considering the water quality requirements for each process and recycling discharged water flows the appropriate number of times to achieve that quality.

In 2021, 100% of our water withdrawals came from municipal freshwater supplies. All statistics on water withdrawals and discharges, as shown on the table on the right, are based on invoices provided by water and wastewater utilities, respectively. Recycled water quantities are based on direct meter measurements within our various facilities.

Our wafer and cell manufacturing operations accounted for 79% of our total water withdrawals in 2021. Thanks to our water intensity reduction achievements (35% and 10% for wafer and cell operations, respectively), our total water withdrawal increase was limited to roughly 7% (609,000 m<sup>3</sup>, of which 118,000 m<sup>3</sup> was used in our auxiliary materials manufacturing facilities). More importantly, our total water consumption decreased by approximately 27%, a change driven by more efficient production tools and stricter water conservation management. Our total water recycling rate went down to 21% in 2021, primarily due to our rapid transition from poly- to monocrystalline upstream wafer and ingot

manufacturing. The closure of our Suzhou cell factory during the first half of 2021 exacerbated this decrease, as this site has historically had the highest water recycling rate among our cell operations (about 45%). In 2022, we expect our corporate aggregated water recycling rate to significantly improve, exceeding 35%, which, alongside our other water conservation measures, will reduce our water intensity by an additional 22%. Our China cell operations are currently performing trials to deploy new processes for recycling dilute acid wastewater to support our water conservation efforts.



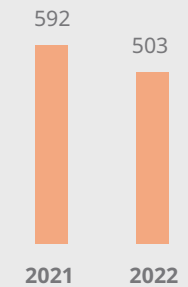
	2020	2021
<b>Total water withdrawals (thousand m<sup>3</sup>)</b>	8,418	9,027
<b>Withdrawals within high baseline water stress areas (%)</b>	45	34
<b>Total water consumption (thousand m<sup>3</sup>)</b>	3,634	2,653
<b>Consumptions within high baseline water stress areas (%)</b>	57	30
<b>Total water recycling (thousand m<sup>3</sup>)</b>	2,480	1,930
<b>Water recycling rate (%)</b>	30	21



## CASE STUDY: YANCHENG CELL WORKSHOP

- Water conservation measures:**
  - Recycling of dilute acid wastewater with high fluoride content.
- Project expectations:**
  - Manufacturing water consumption reduced by 1600 t/day.
  - 2022 annual expected water withdrawal savings up to 292 thousand m<sup>3</sup>

**Annual water intensity**  
(t/MW)



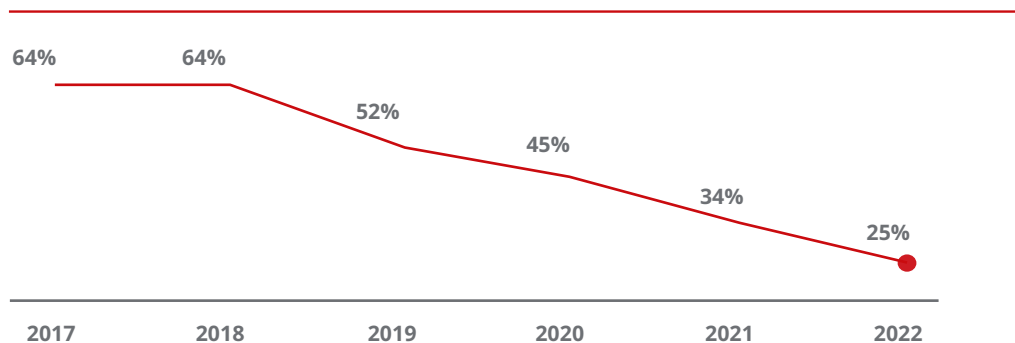
In the past five years, strategic re-deployment of our water-intensive activities to regions with lower baseline water stress (BWS), as classified by the World Resources Institute (WRI) Water Risk Atlas tool, Aqueduct, have also allowed us to significantly decrease our water access risk. In particular, we focused on transferring our manufacturing base from regions with high to moderate or lower baseline water stress. A detailed breakdown of our operations' withdrawals from high BWS areas for our module, cell, wafer, and ingot manufacturing operations is shown in the table here:

Overall, the share of our total water withdrawal in such areas decreased from 64% (3,570 thousand m<sup>3</sup>) in 2017 to 34% (3,100 thousand m<sup>3</sup>) in 2021, of which 608 thousand m<sup>3</sup> came from groundwater and 2,492 thousand m<sup>3</sup> came from surface water. We expect a further decrease to 25% (2,402 thousand m<sup>3</sup>) in 2022, not including withdrawals associated with the ramping up of our new ingot facility in Xining, Qinghai province, China, which will help reduce water access risk for our ingot manufacturing operations starting in 2023.

**Water withdrawals in high or extremely high Baseline Water Stress locations (thousands m<sup>3</sup>)**

	2017	2021
<b>Modules</b>	337 (6%)	457 (5%)
<b>Cells</b>	1,587 (28%)	554 (6%)
<b>Wafers</b>	1,429 (26%)	1,181 (13%)
<b>Ingots</b>	217 (4%)	790 (9%)
<b>Auxiliary materials</b>	-	118 (1%)

**Share of water withdrawals in regions with high or extremely high baseline water stress (BWS)**



Canadian Solar Funing Cell Factory, China

## Water Pollutants and Effluents

Our goal is to ensure safe, reliable, and sustainable water access not just for our own operations, but also for the local communities that we may impact.

resources and on other water users. Wastewater from production is collected and treated internally first and then sent to local wastewater treatment facilities for clean up until it meets water discharge requirements. The table below shows a detailed breakdown of our wastewater relevant pollutants and effluents:

We observe applicable local and international laws and regulations related to wastewater pollutants. We also perform thorough analyses and plan out measures to reduce our impact on local water

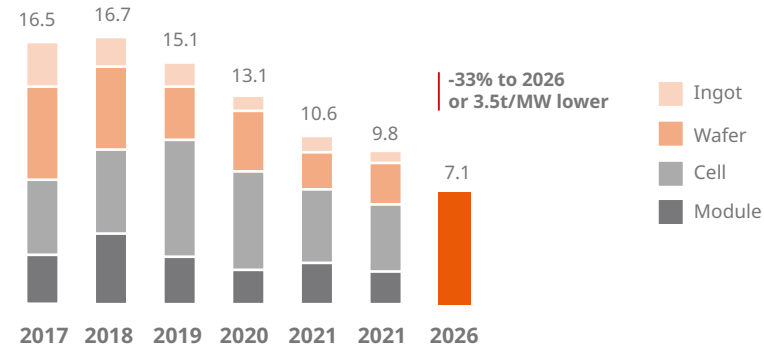
**Wastewater pollutants (global, metric tons)**

	2020	2021
<b>Fluoride</b>	11.7	12.9
<b>Chemical Oxygen Demand (COD)</b>	341.0	288.3
<b>Suspended Solids (SS)</b>	109.6	186.6
<b>Ammonia Nitrogen</b>	28.4	23.6
<b>Total Nitrogen</b>	62.2	65.2



# Waste Intensity

**Waste Intensity**  
(t/MW)



In 2021, we exceeded our original waste intensity reduction target of 10.9 t/MW, realizing a 19% year-on-year reduction in our manufacturing operations waste intensity.

Strong reductions were achieved on our ingot and cell operations, with 36% and 32% reductions, respectively. The deployment of new and more efficient manufacturing equipment for the manufacturing of the larger 210mm cell format, coupled with an aggressive recycling and waste reduction management program driven at the corporate level, were critical to making these achievements possible. For a concrete example of these changes, see the study case presented on the right.

We were thus able to contain our total waste generation increase to around 10kt (approximately +10%) in 2021 while maintaining a strong increase in the production output of all our manufacturing operations. The total percentage of waste we recycled or reused also increased from 78% (72kt) to 82% (85kt)<sup>12</sup>.

While our total waste generation increased, this was offset by progress made in reducing our total hazardous waste<sup>13</sup> generation. Notably, total hazardous waste generation decreased from 13.9kt in 2020 to 3.8kt in 2021 and total disposed hazardous waste decreased from 943kg (1.0% total waste) in 2020 to 738kg (0.7%) in 2021.

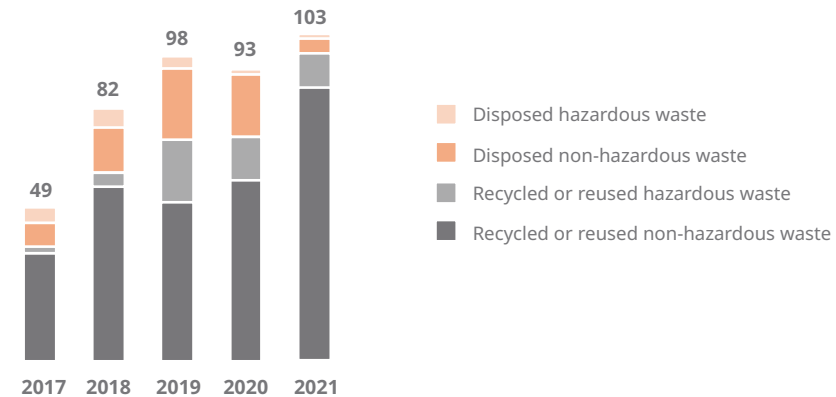


## CASE STUDY: MODULE MANUFACTURING OPERATIONS

- Hazardous waste reduction measure**
  - Implemented improvement of silicone sealant packaging (bucket and plastic bag) through all module assembly facilities, including residual silicone sealant savings and strict reuse of packaging.
- Project achievements**
  - Disposed waste intensity reduced by 7kg/MW (weighted average).
  - Corresponding hazardous waste in 2021 reduced by 116 metric tons.



**Waste by type and disposal**  
(kt)



<sup>12</sup> Numbers reported in this chart may differ slightly from previous sustainability report editions. For part of our operations, we have revised historical waste accounting methods and boundaries for greater accuracy.

<sup>13</sup> Hazardous waste, classified according to the definitions used by the countries in which we operate (such as the Solid Waste Pollution Prevention and Control Law 2020 in China, Law No. 55/2014/QH13 on Environmental Protection in Vietnam; and Notification of the Ministry of Industry about How to Dispose Waste, 2006 in Thailand), is disposed of safely to specialized and accredited local treatment facilities.

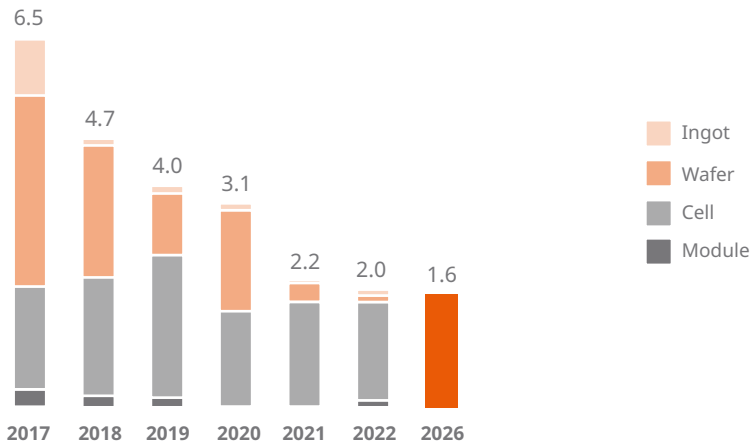




This year, we include data for disposed (landfilled or incinerated) waste intensity, a metric intended to replace the currently reported waste intensity metric. We believe this metric will provide a more meaningful target for our progress towards greener solar manufacturing.

**Disposed waste intensity**

(t/MW)



114.3 MW Jaiba I Utility Solar Plant, Brazil



## Product End-of-Life Management and Recycling

Canadian Solar strictly abides by the e-waste management laws and regulations of the countries in which we operate and advocates for both recycling and reuse of end-of-life products.

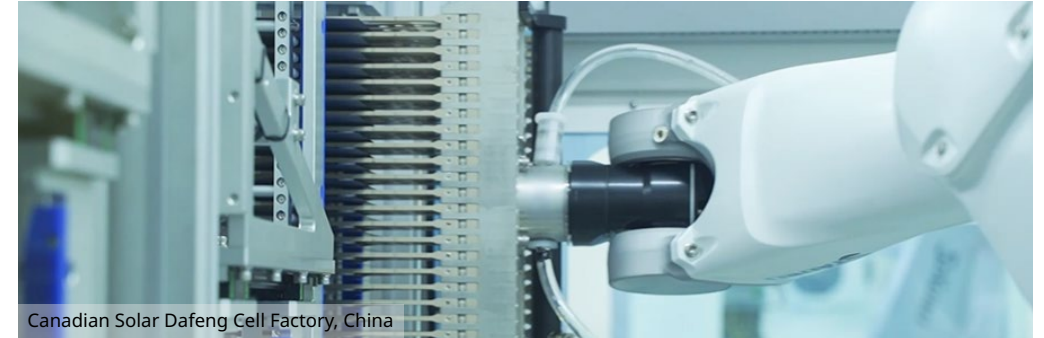
Our solar PV modules have complied with the WEEE (Waste of Electric and Electronic Equipment) European Directive, which regulates the disposal of solar modules in all EU countries, since February 2014. Canadian Solar works closely with recycling service providers such as PV CYCLE ([link](#)) and Rinovasol Group ([link](#)) to ensure full compliance with all legal WEEE obligations and appropriate market import actions are followed. In 2021, around 184,882 pieces of Canadian Solar modules (totaling 40 MW, or approximately 3.4 tons) were repaired for reuse by Rinovasol Group, and around 5,719 pieces, or 1.2 MW, were recycled by PV CYCLE.

In Australia, Canadian Solar partners with Reclaim PV Recycling ([link](#)) for solar module end-of-life management activities. In 2021, 3,209 pieces of modules totaling 0.7 MW, or 0.6 tons, were recycled through Reclaim PV Recycling. The aluminum frames were disassembled and sold to aluminum

recycling companies, and the remaining module parts were broken down into parts using thermal deconstruction. The recovered components were sorted and delivered to relevant materials companies for reuse or safe disposal.

The longer the solar modules last, the fewer will be replaced or recycled. As such, the total pieces of solar module reused or recycled decreased in 2021 from 2020 as we continue to enhance incoming material quality control and implement more strict testing standards.

We are committed to minimizing the environmental impact of our products from design and manufacturing to installation and end-of-life management. We are developing new technologies that optimize product design, simplify the recycling process, and extend the useful life of a solar module to 40 years. The new technologies we are working on include fluorine-free back sheets and lead-free solder trips that can enhance module recyclability. We plan to apply more environment friendly materials to module production in coming years.



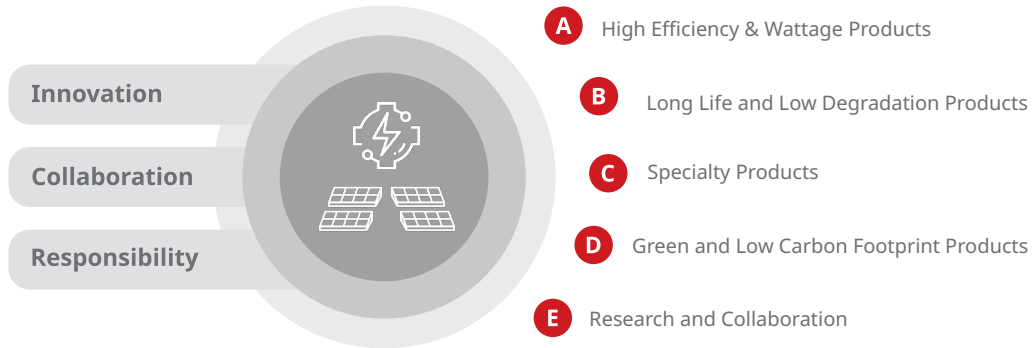
Canadian Solar Dafeng Cell Factory, China

### *Did you know?*

Typically, there are 5 layers in a crystalline silicon PV module: a front cover (tempered glass), the electrical circuit (solar cells matrix) in between two encapsulant layers (front/back), and a back cover (backsheet or tempered glass). Aluminum metal frames are used to improve mechanical resistance of the PV modules and facilitate installation. Approximately 75% of a solar module's weight is tempered glass, 10% is plastic parts, 8% is aluminum, 5% is silicon, and 1% is other materials. Thus, 95% of the materials used in a typical silicon solar module can be disassembled, sorted, processed, and recycled.

# Research & Development Roadmap

Investing in technological innovation is critical to Canadian Solar’s competitive advantage.



We continue our efforts in product research, development, and designs to continuously increase the efficiency of our products, reduce the environmental impact of our manufacturing activities and products, and contribute to global decarbonization goals.

Our technology roadmap for the period of 2022 to 2025 is highlighted below, along with the expected contributions to various key environmental metrics of the most critical projects.

1. We successfully launched our high efficiency N-type Heterojunction (HJT) module in 2021. Targeting residential and commercial rooftop applications, the HJT modules use about 20% less silicon, generate 20W higher

module power, and significantly lower energy consumption compared to PERC modules due to lower cell processing temperatures. The carbon footprint of our HJT modules is expected to fall below 400 tCO<sub>2</sub>e/MW, which is well below the carbon footprint of our existing PERC modules of approximately 500 tCO<sub>2</sub>e/MW. The technology offers a greater uplift in energy conversion efficiency, minimal degradation, and simpler, less energy intensive manufacturing processes.

2. Mass production of our new generation N-type TOPCon modules is slated to begin in the second half of 2022. Especially developed for bifacial utility applications, this product line will further increase the module wattage

output from around 690W in 2022 to 715W by 2025 over the incumbent PERC module technology. The production process of N-type TOPCon modules will also decrease our energy and water use intensity.

3. After more than two years of extensive reliability research, we have completed the development of our long lifetime modules, which are expected to reach 40 years. Long lifetime modules are designed for utility-scale applications and are expected to decrease photovoltaic systems’ carbon emissions by more than 33% due to the modules’ longer warranty and higher performance.
4. Manufacture of our modules’ aluminum frames currently accounts for around 10% of our total module carbon footprint and is one of the main contributors to PV modules’ shipment density. In the second half of 2022, we will introduce a highly engineered frame with reduced material consumption, decreasing downstream module shipment emissions by up to 5%. We also launched several R&D programs aiming to develop innovative steel frame designs, which could further reduce our module carbon footprint by at least 30 tCO<sub>2</sub>e/MW.
5. While most of the materials in PV modules can be recycled, it is highly costly to do so.

To decrease recycling costs and improve the recyclability of PV modules, we plan to introduce the first fluoride- and lead-free module design in 2024, aiming at recycling rates above 95%. We have also started working with various partners to research easier-to-recycle module designs, innovative recycling methods, and opportunities to reuse modules that have reached the end of their lifespans and lengthen their useful periods.

6. Our main research around ingoting methods includes increasing pulling speed and the number of ingots produced in a single pull (up to 9 ingots) while reducing oxygen content and increasing minority carrier lifetime. These methodologies will contribute to reducing energy intensity by at least 3% per year. We have also started recycling the specialized argon gas used in the process, which will further reduce the carbon footprint of our ingot process by an estimated 5%.
7. Wafering technologies are accelerating towards even thinner diamond wire and innovations in new alloy-based wires. We anticipate these technologies will bring wire diameter down to 30 μm or lower, resulting in more pieces of wafer being cut per kilo of ingot. Altogether, we expect these developments to directly drive 5% annual reductions in energy and cooling water consumption intensity.



Beyond PV modules, our power electronics products development focuses on the integration of PV panel, inverter, and energy storage. Our ready-to-install solar system kits have been deployed in various markets worldwide, with most of our own residential inverter volume shipping to the Latin and North America markets in 2021. In 2022, we will continue to boost our system integration capabilities with the development of our own energy

monitoring platform. While the solar inverter manufacturing process is by nature less energy intensive compared to PV module manufacturing, the development of high energy density residential inverters and competitive energy storage solutions will be critical in further reducing the LCOE of solar systems and enabling higher clean, solar energy grid penetration.



Canadian Solar Jiaxing Module Factory, China

## Environmental Stewardship in Project Development



Canadian Solar is one of the world's largest solar and energy storage project developers. The projects we develop contribute to the world's adoption of solar energy and thus have a positive impact on the environment and social development. Project development activities, however, may have an adverse environmental and ecological impact, including visual impacts on land, habitat disruption, and construction noise. Canadian Solar is committed to proactively minimizing these impacts while we develop projects and monitor progress and results.

Early in the project development process, we integrate the evaluation of environmental and ecological impacts, as well as community engagement into our internal approval process for each solar and battery storage project we develop. These impact assessments require extensive environmental and ecological studies, as well as community engagement. These evaluations are conducted as part of the Investment Committee (IC) approval process, and teams are required to submit detailed assessments of the environmental and ecological impacts expected throughout the full lifecycle of a project. Some of our environmental and ecological efforts include:

- Investigation of new technologies, such as mixed-use projects incorporating agriculture and PV ("Agro-PV")
- Contractors hired by Canadian Solar must have a site-specific Environmental and Safety plan to begin construction
- Environmental and safety performance of a project is integrated into the KPIs of Canadian Solar's EPC and O&M teams
- Utilizing sheep for vegetation management around a project where permitted
- Compensation land Canadian Solar has acquired during project development to support native species, which are protected and maintained for at least 20 years to ensure a healthy habitat for native plant and animal species
- Module recycling on project sites where modules have been damaged during installation. These activities help ensure waste is not sent to landfills, but to recycling facilities where the materials can be recovered and reused

These efforts have helped us achieve zero project delays related to environmental and ecological impacts or community engagement in 2021, as these factors were already considered during the project planning phase.

# Climate-Related Risks and Opportunities



Climate-related risks pose a serious threat to human wellbeing and societal development.

Canadian Solar is proud that 100% of our revenues are derived from clean, renewable energy, which is crucial to achieving the global

decarbonization goals established in the Paris Agreement. However, our operations, especially our manufacturing activities, do have environmental impacts. To manage these impacts, we have established an Environmental Management System to measure these impacts and set up 5-year rolling targets on environmental metrics to reduce the impacts.

## Climate-Related Risks

We have identified the following climate-related risks associated with the development of our business. These risks include but are not limited to:

Please refer to our annual report Form 20-F ([link](#)) filed with the US Securities and Exchange Commission for a more detailed discussion of the risks associated with our business.

Climate-Related Risks	Time Horizon	Potential Impacts	Estimated Financial Implications	Management Method
Compliance with climate-related regulations and initiatives	Short to long term	There may be increased costs and administrative responsibilities due to changes in regulations and policies in the areas of climate, energy, and environment	These may change depending on how the regulations and initiatives will evolve and how they will impact our business	Monitor and comply with the development of the regulations and initiatives in an efficient way
Environmental impact from our operations	Short to long term	Although 100% of our revenues are related to renewable energy, our operations, especially our manufacturing activities, have impacts on the environment from the perspective of GHG emissions, energy and water consumption, and waste generation	Our environmental related expenditure for 2021 was around US\$33mn, including capital expenditures and other expenses.  The environmental related expenditure depends on the scale of expansion of our business, and we expect it will increase in 2022, considering we are significantly expanding our manufacturing capacities	We have established an Environmental Management System to measure these impacts and set 5-year rolling targets on environmental metrics to reduce the impacts
Environmental and ecological impact on solar and battery storage project development	Short to long term	Environmental and ecological impact on the community where we develop the projects, including visual impacts, habitat disruption, wildlife fatalities, and construction noise	Project development related expenses are expected to increase to optimize project design to minimize visual impacts, optimize project locations to minimize risk of habitat disruption, and minimize noise resulting from construction activities	We have integrated the environmental and ecological risks associated with each of the project we develop into our internal project review and approval process to minimize the impacts
Product end of life management	Short to long term	Environmental impact of our solar modules after they come to end of life	It increases our R&D expenses in terms of module recycling related technologies and technologies to prolong module's lifetime	Work on module recycling related R&D
Environmental impact among our supply chain	Short to long term	Our suppliers' manufacturing activities have impacts on the environment from the perspective of GHG emissions, energy and water consumption, and waste generation		We conduct supply chain ESG audit to make sure our suppliers comply with our standards on ESG. We aim to leverage this exercise to reduce the environmental impact from our suppliers



### Climate-Related Opportunities

The widespread adoption of renewable energy, including solar, is critical to meeting global decarbonization goals.

Meanwhile, solar has become the cheapest source of energy with the most competitive Levelized Cost of Energy (LCOE) across global major power markets, according to Lazard’s 2021 LCOE Report ([link](#)). Therefore, market forces serve as a tailwind to global adoption of solar energy.

According to calculations by the International Renewable Energy Agency (IRENA) ([link](#)), to reach the 1.5 degree Celsius Paris Agreement goal, solar PV’s global installed capacity needs to reach 5,200 GW by 2030 and 1.4 TW, or 14,000 GW, by 2050 from approximately 950 GW by the end of 2021. This implies an average of 500 GW of annual solar installations. Meanwhile, solar energy remains significantly underpenetrated, accounting for only 3% of the global energy mix. Therefore, the growth opportunity for solar is immense, and we are only at the early stages of the structural growth trend.

Likewise, we believe the value and demand for energy storage will increase significantly with the greater adoption of clean renewable energy, including solar. The increasing penetration of renewable energy lowers power costs and decarbonizes the power grid but creates price volatility and affects grid stability. Energy storage can mitigate the uncertainties of renewable energy on the grid; as such, energy storage has entered a phase of exponential market growth. According to Wood Mackenzie estimates, the cumulative capacity for energy storage could reach 1.3 TWh by 2031 from 24 GWh in 2021.

For Canadian Solar, the significant growth visibility for both solar and energy storage represents major growth opportunities in both the short and long term, as the nature of our business and strategy is directly aligned with providing clean solar energy and integrated end-to-end energy storage solutions.

We have identified the following climate change-related opportunities associated with the development of our business. These opportunities include but are not limited to:

Climate-Related Opportunities	Time Horizon	Potential Impacts	Estimated Financial Implications	Management Method
Growing demand for solar modules	Short to long term	Growth of our solar manufacturing business	2022 revenue contribution is expected to be US\$7.0-7.5 billion. 100% of our revenue is associated with solar energy.  Long-term revenue growth is expected, as we aim to increase our global market share to 15% in 3-5 years from 9% in 2021	Continue to invest in technology R&D to further increase efficiency of solar cells and modules and product quality and reliability
Growing demand for battery storage system solutions	Short to long term	Growth of our battery storage system solutions business		Continue to invest in R&D of battery storage system solutions
Growing demand for solar power plants	Short to long term	Growth of our project development business and O&M business		Capture market opportunities and expand solar project pipeline
Growing demand for battery storage plants	Short to long term			Capture market opportunities and expand battery storage project pipeline
Green financing to support the development of our business	Short and long term	Supporting the growth of our project development business	In 2021, we successfully issued a EUR30 million green bond ( <a href="#">link</a> ) to support the development of our solar and battery storage projects in the EMEA region  Also in 2021, we received JPY8.1 billion (US\$75 million) through the issuance of Green Project Bonds in Japan to support the construction and operation of the 43 MWp Ibaraki and Hiroshima projects developed by us. We received the “Green Bond of the Year” award ( <a href="#">link</a> ) from Environmental Finance, an online news and analysis services headquartered in London for this green project bond  We expect to receive further support in green financing as the demand for solar and battery storage increases to achieve decarbonization goals	Maintain good relationship with financial institutions as we execute on and expand our project pipelines

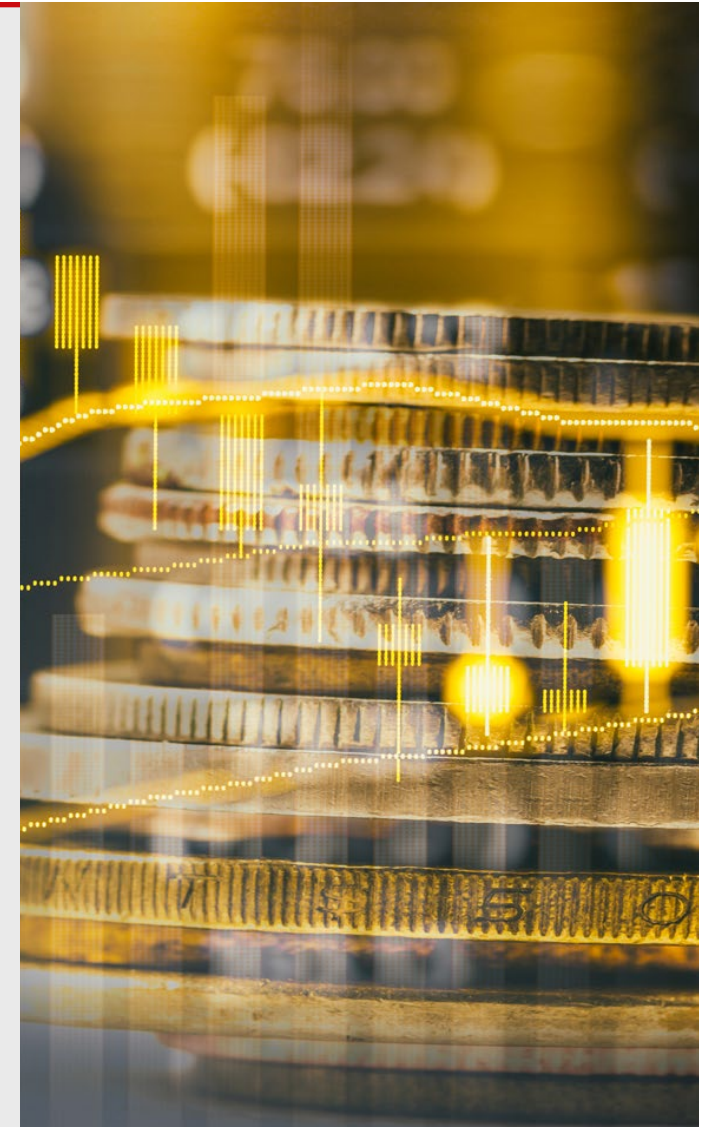


### CASE STUDY: CANADIAN SOLAR INFRASTRUCTURE FUND

- Canadian Solar captures climate-related opportunities not only in EMEA, but also in Japan. Canadian Solar owns approximately 15% of CSIF, Japan's largest publicly listed solar infrastructure fund (TSE: 9284). CSIF invests in renewable energy power generation facilities in Japan and embraces ESG ([link](#)) as a core tenet to enhance shareholder value. Canadian Solar's subsidiary, Canadian Solar Asset Management K.K. ("CSAM"), serves as the asset manager of CSIF and became a signatory of the UN PRI (United Nations Principles for Responsible Investment) in 2019. CSAM is committed to fulfilling its social responsibilities as an asset management company and integrates ESG factors into its investment and ownership decisions. CSAM was the first asset manager of a listed infrastructure fund on the Tokyo Stock Exchange to adopt this approach to sustainable investing.
- The table below details green finance that has been secured by CSIF:

Date	Amount (JPY billion)	Type of Debt	Agency	Rating
2017.11.22	15.7	Green Loan	JCR	Green 1
2020.5.11	N/A	Green Finance Framework (Corporate)	JCR	Green 1
2021.1.26	3.8	Green Investment Bond	JCR	Green 1
2021.3.8	17	Green Loan	JCR	Green 1
		Green Loan	Shinsei	Shinsei Green

- CSIF's Corporate Green Finance Framework is based on ESG investment guidelines such as the Green Bond Principles (2018 Edition) published by the International Capital Markets Associations, and the Green Bond Guidelines (2020 Edition) published by the Ministry of Environment in Japan. CSIF's Green Finance Framework, as well as its other bonds and loans, have received the **highest rating of Green 1** from the Japan Credit Rating Agency, Ltd. (JCR).





### 3 Social Responsibility

As one of the world's largest solar technology and renewable energy companies, Canadian Solar aims to power the world with solar energy and to create a cleaner Earth for future generations.

To meet our company goals, we strive to "Make the Difference" in our work by cultivating a corporate culture of equity, diversity, and inclusion, and creating a lasting positive impact on society and the communities where we operate. Our culture and people are our most important assets and a key source of our competitive advantage.



**Mission**

Lead the energy revolution and create a brighter future together



**Vision**

Power the world with solar energy and create a better and cleaner Earth for future generations



**Slogan**

Make the difference



**Core Values**

Customer Success, Innovation, Grit, Excellence



## Working at Canadian Solar

As of December 31, 2021, Canadian Solar had 13,535 employees, including 13,124 full-time employees, 68 trainees, and other part-time employees. 12,924 of these employees work for CSI Solar and 611 work for the Company's Global Energy business.

## Equity, Diversity, and Inclusion

Our culture has always been to put people first and treat everyone with dignity.

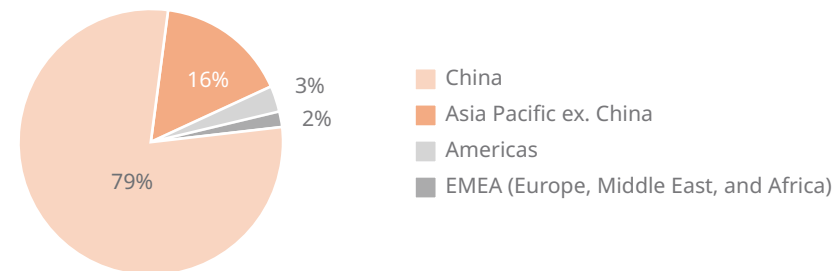
We promote equity, diversity, and inclusion, as we believe a diverse workforce is the driver of creativity and innovation and is critical to our long-term success. Best practices are implemented locally in keeping with our global strategies across our operating operations, from manufacturing to sales and project development.

Canadian Solar is an **equal employment opportunity employer** ([link](#)) and does not tolerate discrimination of any kind, including, but not limited to, race, color, ethnicity, gender, religion, political or other opinion, sexual orientation, age, disability status, or other distinguishing characteristics. We hire, promote, and reward employees based on their qualifications, experience, development potential, and performance, and also take diversity into account, with the goal of assembling a group of talented and skillful individuals with diverse

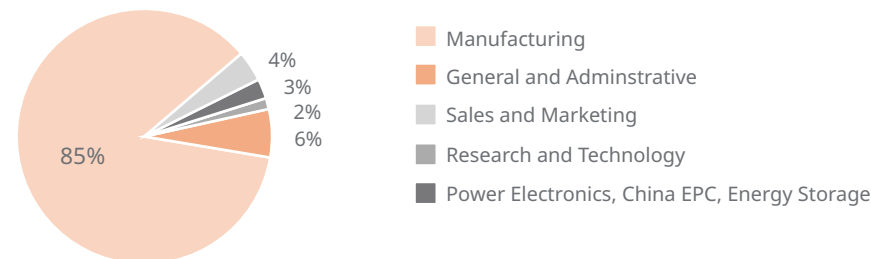
backgrounds, experiences, and perspectives. Likewise, we follow and go beyond what is required by the employment laws and regulations in the jurisdictions where we operate. We have filed the **Equal Employment Opportunity Form or EEO form** ([link](#)) for our operations in the US, which provides a demographic breakdown of our workforce in the US by race and gender.

We are committed to ensuring that all employees and persons related to our business are treated fairly, respectfully, and with dignity. **Canadian Solar's Labor and Human Rights Policy** ([link](#)) sets forth our labor and human rights standards and the rights our employees are entitled to, including, but not limited to, sick leave, parental leave, special leave, and annual holidays.

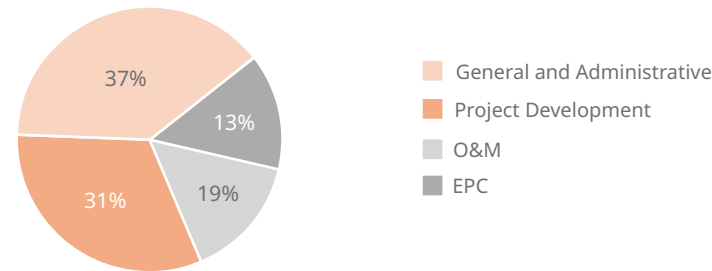
### Employee Breakdown by Region



### CSI Solar



### Global Energy







**Implementing unconscious bias training** across our global operations has also been a major part of Canadian Solar's push for more inclusivity in the workplace. Some of the trainings we have provided include:

- "Micromessaging," led by Stephen Young, one of the U.S.'s foremost experts on diversity and inclusion
- "Diversity and Inclusion," led by Anjali Bindra Patel, a speaker, author, lawyer, and expert on diversity and inclusion strategies

## Gender Equity



At Canadian Solar, we believe gender equality is important not just from a human rights perspective, but also from a business standpoint.

Encouraging and attracting women to join our talented workforce strengthens and diversifies our talent pool, as women offer crucial perspectives for decision making, thereby improving the efficiency and results of execution. Given that the renewable energy sector as a whole is significantly under-indexed in female talent, we have made gender equity a priority at Canadian Solar.

**Equitable pay:** We engage external parties to conduct pay equity studies, including periodical pay equity reviews, to ensure that our female employees are paid fairly and equally to male counterparts who

**Accountability:** We have made diversity and inclusion part of our team leaders' key performance metrics to ensure accountability in creating a diverse and inclusive workplace in our teams.



have similar responsibilities and achievements. This is a periodic auditing and improvement process to help us ensure we are rewarding all our employees equitably.

**Women in leadership program:** In 2022, we are partnering with Cornell University to launch a comprehensive women in leadership program, which will provide training content specifically tailored to guiding women on their leadership journeys. Currently, we are working with regional leadership to identify key women in leadership positions across the company to participate. Upon completion of the three-month training program, each member of the cohort will be assigned an executive sponsor who will serve as her champion. The goal of the women in leadership program is to accelerate the development of our female leaders, thereby enhancing female representation in senior leadership.

## Development Groups

### WIRE: Women in Renewable Energy

Recurrent Energy, Canadian Solar's wholly owned subsidiary for North America's project development business, founded Women in Renewable Energy (WIRE), an internal affinity group focused on supporting women in renewable energy, in the U.S in 2015. WIRE was expanded to cover all female employees of Canadian Solar after Recurrent Energy's acquisition during the same year. WIRE's steering committee organizes many events during the year that include initiatives to attract female talent, leadership development, and group discussions. International Women's Day's celebrations are also part of WIRE's annual programming.

### WISE: Women in Solar Energy

In 2019, Canadian Solar founded Women in Solar Energy (WISE), an industry association that promotes the participation and career development of women in the solar industry in China. WISE's membership includes female executives who come from different companies in the industry. WISE regularly organizes events to discuss solar technology and industry trends, aiming to provide mentorship and resources to female talent in the solar industry.



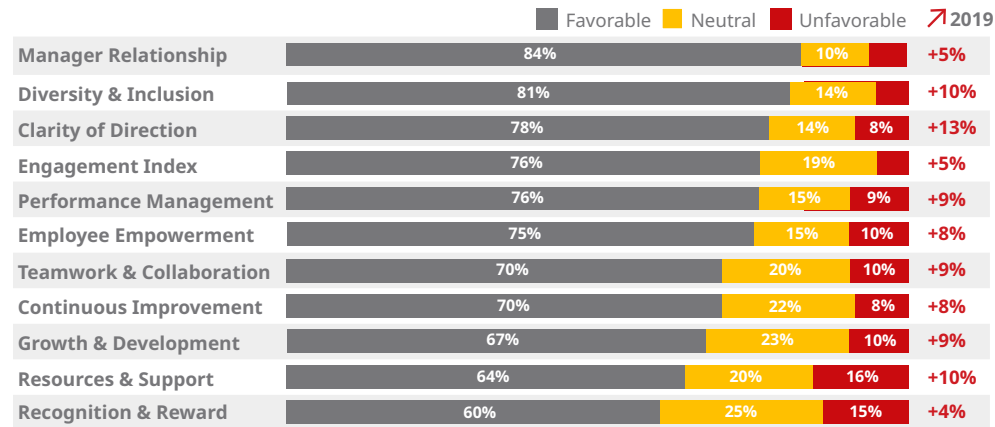
### Women in CSI Solar

In 2021, CSI Solar, Canadian Solar's majority owned subsidiary, founded Women in CSI Solar, an internal group that provides development support and psychological assistance and organizes events on diversity for female employees. In 2021, we organized a Women's Career Development Forum that was attended by more than 70 female employees across different levels of seniority.



## Employee Engagement

We conduct engagement surveys every two years to gauge our employee engagement level relative to internal and industry benchmarks and to consider employees' feedback on areas of positive performance and areas for improvement.



Our Q1 2022 engagement survey was conducted by Perceptyx, an employee listening and people analytics platform headquartered in Temecula, California. Our Q1 2022 survey had a 71% response rate across the Company and found that the Company had delivered improvements in all categories compared to our 2019 survey results. We are proud of these improvements, particularly in the wake of the challenges presented by the global pandemic.

84% of respondents rated their relationship with their manager favorably, the highest scoring category. Diversity and Inclusion was the second highest scoring category, with 81% of respondents rating Canadian Solar's performance favorably, a 10% increase over the 2019 survey results. The most significant improvement from the previous survey

was in the Clarity of Direction category, whose favorability rating increased by 13% from 2019, with 78% respondents rating CSI's performance favorably.

The engagement survey also informed one of our key areas of focus: recognition and reward. One of the most important drivers for engagement for our company was whether employees felt valued in their positions, the area with the greatest gap between highly engaged employees and disengaged employees. We will focus our efforts on addressing these gaps and ensuring all our employees are appropriately recognized for the work they do.

## Talent Strategy, Training, and Development

Our people are our most important asset.

They are the driver of our sustainable competitiveness and key to achieving our goals and mission. As such, we recalibrate our talent strategy and monitor progress annually to ensure that we remain on track with our short, medium, and long-term goals.



### Talent Review and Succession Planning

To prioritize talent skillsets that we have identified as critical for the long-term success of our business, we build out and review our talent pipeline on a regular basis. Our human capital development team helps employees develop skills and knowledge sets that may not be readily available in the market. We have also established a succession planning process based on business needs, talent availability, and employee feedback.

In 2022, we partnered with Development Dimension International, a global leadership and human resources consulting firm, to adopt a more methodical approach to evaluating our talent potential and capability for succession planning purposes. This approach has been an effective tool for identifying and nurturing talent for key management positions worldwide.

### Leadership and Key Talent Development Programs

As demand for solar grows, our succession planning calls for a robust leadership development program.

Initiatives such as the Business Leader Development Program, where we partner with prestigious universities to provide online lectures, webinars, and project assignments, meet this need by providing training and development opportunities for all different levels of leadership. We also have a Middle Manager Development Program and a Frontline Leadership Program, where we partner with Franklin Covey to deliver leadership, individual effectiveness, and business execution training to our business leaders.

In addition, we demonstrate our commitment to high potential, top performing employees by accelerating their career development and providing opportunities for long-term growth.

Our key talent development program utilizes a tailored approach based on individual qualities and contributions. Individualized development actions can include professional assessments, 360-degree feedback, coaching, targeted training, and development stretch assignments.

### Canadian Solar University



Canadian Solar University, or CSU, aims to help employees gain a broader understanding of our business, drive innovation, and stimulate more effective collaboration within the company.

It also helps further develop employees' expertise across disciplines, both within and across business functions. CSU provides employees of our Global Energy business with learning resources covering all key business functions, including project development, project sales, energy storage, asset management, O&M, and EPC management. Each topic will eventually have different levels, from entry level 101 courses to expert level 401 courses. In 2021, we designed and launched eleven 201 courses with an employee satisfaction score of 4.5 out of 5.

Major courses launched in 2021 include:

- Project Sales 201: Case Study Session
- Project Finance 201: Financial Modeling
- Development 201: Multi-Discipline Approach
- PPA 201: Global Power Markets & EMEA Case Studies
- PPA 201: Global Power Market & North America Case Studies
- EPC 201: System Design – Energy Modeling
- EPC 201: Inverter & Power Electronics Technology - Advanced Course
- Energy Storage 201: Storage Values & Demystifying Revenue Streams
- Asset Management 301: Overview – Basic to Intermediate

For 2022, we have designed and plan to launch 40 courses on key workstreams such as project sales, storage, business development, asset management, PPA, O&M, procurement, risk management, etc. We have also designed and expect to launch certification programs such as EPC project management and construction management. Currently, we are in the process of developing a curriculum focused on solar module products and R&D, which is expected to launch later this year.

### Internal Trainer Program

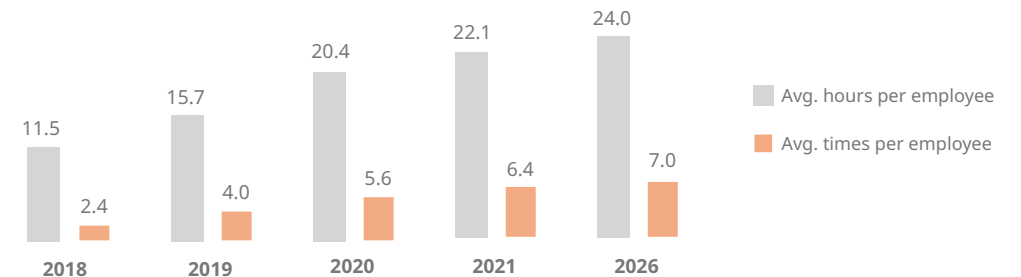
We developed and launched a series of internal trainer-led courses on project management, public speaking, and time management. A total of 11 courses have been implemented so far with an average employee satisfaction score of 4.4 out of 5.



### On the Job Training

Canadian Solar also provides regular on-the-job training on EHS, compliance, markets and industrial development, professional skills, and trade knowledge to all employees of our CSI Solar business.

#### On-the-Job Training





Our employees received an average of 22.1 hours of training in 2021. A total of 22 courses were delivered, either online or in person, covering five categories: general courses, professional courses, special skill courses, compulsory courses, and leadership courses.

	Quantity	2020
<b>General Course</b>	10	Efficient office skills, project management skills
<b>PV Industry Professional Course</b>	30	Quality tools, new material knowledge, greenhouse gas emission standards
<b>Special Skill Course and Projects</b>	8	New Power Camp, school enrollment talent cultivating project, IEC 62941 photovoltaic module manufacturer quality system
<b>Compulsory Course</b>	6	Annual compliance training, EHS fire-fighting skills and fire evacuation drill, quality awareness, information security awareness
<b>Leadership Course</b>	10	Leadership of middle and senior managers, women's leadership

## Freedom of Association and Collective Bargaining

Canadian Solar strictly abides by the employment laws and regulations in the jurisdictions where we operate. We respect employees' rights to form or join a labor union or equivalent organizations of their choice and respect our employees' rights to collective bargaining in support of their interests. Canadian Solar's **Labor and Human Rights Policy** ([link](#)) sets forth our employees' rights of freedom of association and collective bargaining.



## Grievance Procedure and Zero Tolerance for Retaliation

As part of our commitment to providing our employees with a safe and inclusive environment, we have established internal procedures to protect our employees from acts of discrimination and other misconduct. We have a robust complaint and investigation process outlining how to file a complaint, the stages of the investigation process, and our zero-tolerance policy for retaliation. We regularly promote awareness of these

support mechanisms to encourage our staff to confidentially submit grievances regarding policy breaches, bullying, discrimination, harassment, or any other sensitive issues that may arise. As such, we are confident in our ability to take immediate action to address grievances should they arise, thereby mitigating risk, limiting the impact of violations, and reinforcing a healthy and positive work environment.

## Occupational Health and Safety

At Canadian Solar, employee safety is our top priority.



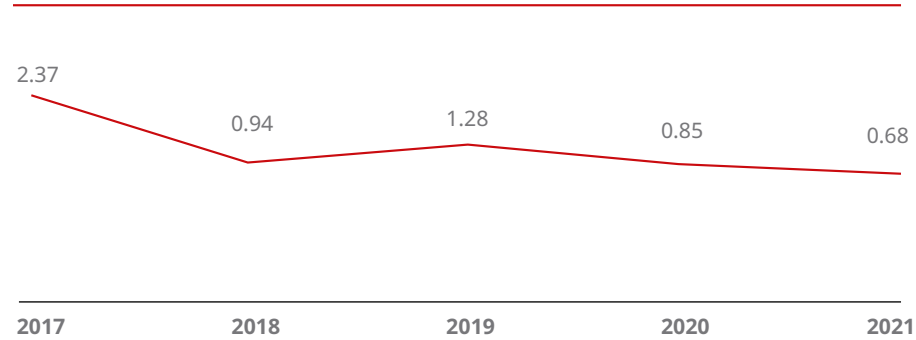
In 2008, we implemented the ISO45001 occupational health and safety management system (formerly OHS18001). Since 2011, our factories have been certified under ISO45001.

incidents, including "near misses," are reported and addressed in accordance with our strict safety protocols. Any lost time incidents must be reported within one hour of occurrence. We conduct internal investigations into all such incidents and enforce solid corrective and preventive measures to avoid future accidents.

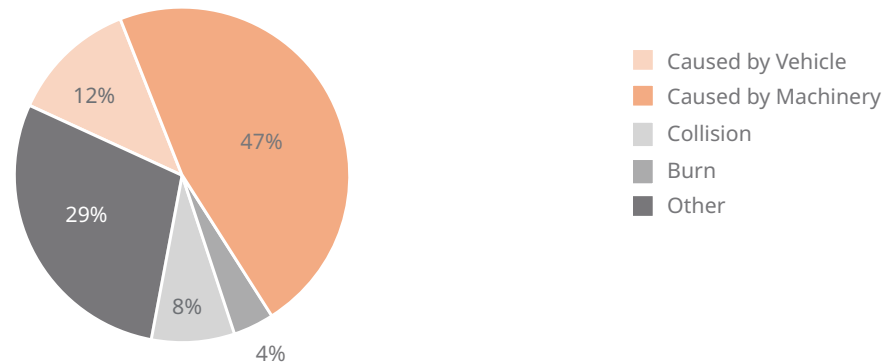
Our safety policies require that a Safety Committee and dedicated Safe Operation Management Team are in place before a factory starts operating. The Safety Committee meets regularly to review, discuss, and decide on safety-related measures. Employees receive regular trainings and are required to pass related tests prior to starting work. They are also equipped with appropriate personal protective equipment (PPE). Safety

Our rigorous safety policies and procedures have helped us maintain a low rate of safety-related incidents. In 2021, our recordable injury (any injuries requiring medical treatment) rate was 0.68 cases per million working hours, our lowest rate in the past five years.

**Recordable injury rate**  
(per million working hours)



**Types of injuries**



**Hazardous Materials and Environmental Management**



Canadian Solar Funing Cell Factory, China

Our environmental management system (ISO14001) and occupational health and safety management system (ISO45001) both cover chemical and operating equipment safety management to ensure that hazards in the workplace are systematically identified and evaluated and that relevant control measures are put in place.

Hazardous materials and dangerous chemicals are allowed within our facilities only after a formal review and approval process, which includes the Safety Data Sheet (SDS) review and a potential hazards and risks review. All relevant employees receive tailored training on the risks of handling hazardous chemicals and are required to strictly follow safety precautions while handling hazardous chemicals. We also provide general training programs to employees, including mandatory EHS training for all new employees and regular EHS

refresh trainings. Warning signs are clearly posted, and relevant employees are required to have unimpeded access to information regarding hazardous materials. Medical checks are provided to employees working in relevant sites that may be exposed to occupational hazardous agents.

Our safety procedures in all factories include Hazard Identification and Assessment, Management of Changes, Contractor Safety, Emergency Response Management, Confined Space, etc. When building a new factory, we conduct Equipment Safety Reviews to ensure all equipment deployed are intrinsically safe.

We require our key suppliers and contractors to sign a Supplier's EHS Agreement before commencing deliveries and services.



## Response to COVID-19

Canadian Solar developed a COVID-19 response plan in line with recommendations and policies issued by local health authorities and governments to provide guidance to all our global offices.

**Emotional support:** We organized various online activities to help ease the emotional stress of the pandemic. Events such as Online Coffees, the CSI Talent Show, and What's Cooking at CSI received positive feedback from employees.

**Office safety:** We prepared for office re-openings by rearranging office floorplans and setting up new office protocols and policies to ensure that employees could safely return to the office.

**Volunteer service:** Our employees in China participated in local volunteer activities, providing support and service to communities in need.



**Work-life balance:** We have continued our practice of providing a hybrid working model to relevant office-based employees, in which they can split their time between working onsite and at home. Based on employee feedback and our internal assessment, this hybrid model provides greater work flexibility, work-life balance, and employee satisfaction while also improving individual and collective productivity.

## Connecting Employees with Company Mission



Sustainability is a core part of Canadian Solar's mission a mission in which we hope all our employees can share.

We have adopted the following approaches to engage our employees in the company's vision.

## Advocacy

Our annual Earth Day celebration and Canadian Solar's founding anniversary remind all employees of the importance of sustainability and of fighting climate change. As part of these celebrations, we organize a variety of educational workshops and teambuilding events to promote sustainability and ways to live a greener life. We also hold brainstorming sessions in which hundreds of employee participants volunteer to work together and come up with a multitude of ideas on how we can help advocate for and participate in the changes necessary to protect our environment. In 2022, we are planning to further expand our advocacy activities to local communities, making these educational resources and events publicly accessible.



## Volunteering

As part of Canadian Solar's coordinated effort to engage with and give back to local communities, employees around the globe have engaged in various sustainability-related volunteer activities, such as tree planting and river, beach, and street cleanups. Before the pandemic, we also partnered with GRID Alternatives to build solar roofs for local affordable housing. We not only donated panels to GRID, but our employee volunteers also received training on how to install solar on the roofs and worked to complete rooftop solar projects.



### Zero Waste Office

In the first quarter of 2022, we launched our **Zero Waste Office Program** ([link](#)) in our offices around the world. Reducing electricity consumption and energy on transportation, purchasing eco-friendly and reusable supplies, and recycling as much as possible are some of the many ways we are systematically transitioning to a Zero Waste organization.

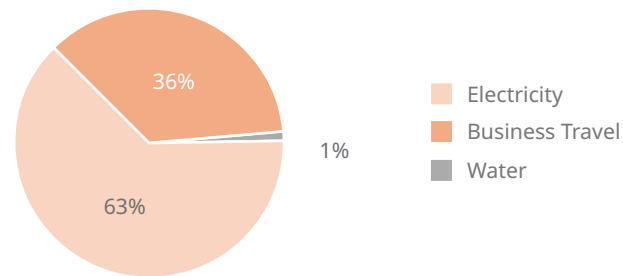
### Sales offices GHG

In 2021, we initiated a global campaign to decarbonize all our global offices. We assessed the Categories 1 and 2 (Scope 1 and 2) carbon emissions of 10 global offices accommodating 364 employees and spanning sales, marketing, technical support, product management, order fulfilment, logistics, planning, HR, and administrative functions. We estimated that the total GHG emissions across these offices were 350 tons equivalent of CO<sub>2</sub>, averaging 0.96 tons per employee per year, or approximately 20% of reported global CO<sub>2</sub> emissions per capita



(4.79 tons per capita per year)<sup>15</sup>. Most of these emissions came from office electricity consumption and business travel. Accordingly, we are working with our local sales teams to implement carbon emission reduction or compensation measures. Examples of such changes include reducing business travel by holding video conferences instead, utilizing natural light instead of electric light, and encouraging use of public transportation as much as possible.

### Sales offices carbon emission composition



<sup>15</sup> As reported by <https://www.worldometers.info/co2-emissions/co2-emissions-per-capita/>

## Making the Difference through Community Commitment



Our goal is to cultivate long-term relationships that enable us to work together in the communities where we operate, making a difference through a positive contribution to society and the environment.

We recognize that when communities thrive, everyone benefits, which is why we are committed to working closely with all stakeholders in the communities where we develop projects. From local grid experts to first responders, we strive to partner with local organizations to ensure we are able to fully integrate solar and battery storage projects into existing energy infrastructure and surrounding communities.

Below are examples of how we work to mitigate risks when integrating solar and battery technology into existing infrastructure, as well as our community engagement, ecological focus, and energy policy efforts.





### North America

We actively engage with local, state, and federal agencies early in the development cycle to assess and mitigate any risks. Significant resources are invested early in the development process to thoroughly vet projects for potential fatal flaws. Further, our business has a true commitment to community values and local ecological concerns. We actively engage with communities to seek development opportunities where environmental and permitting obstacles are minimized or avoided.

### United Kingdom

We are committed to helping the UK achieve its target of carbon neutrality by 2050 through our deployment of solar and storage solutions that follow the highest engineering standards. We identify any impacts our projects may have on both stakeholders and the environment to inform the design, construction, and operation of our projects. Community engagement, careful design,



and thorough planning drive our work towards our end goals of minimizing negative impacts and optimizing benefits over each project's life.

Upgrades to the national energy transmission system and its operating procedures are a key part of the energy transition in the UK, and while complex, they have made viable grid connections available for our projects. While the contractual arrangements and technical solutions for these connections are continuously evolving in design, the integration of co-located solar and storage projects are becoming increasingly common, which lowers the risk and maximizes benefits to the grid system and the energy market, as both the renewable energy industry and grid operators prefer the pairing of the two technologies. We will continue to work closely with technical and grid experts to ensure that our grid connections are fit for their purpose and are delivered on time and at an appropriate cost.



### Japan

The Japanese government announced a target goal of carbon neutrality by 2050, a goal that requires more sustainable solutions for Japan's grid. We expect that deregulations will be announced to boost the installation of renewable energy to meet this goal. Wind and solar are variable resources whose power output cannot be controlled; therefore, transmission system operators must expertly navigate the demand and supply of power within their grid system to ensure resilience. Our solar solutions, combined with battery storage, are thus ideal for this market.

At the project level, ongoing consultation with local communities and government officials is crucial throughout the development, construction, and operation phases of our projects. Project development adheres to rigorous design protocols, including the implementation of extensive drainage and storm water prevention measures to ensure water in and near the project site avoids



contamination. The mountainous terrain of Japan adds another level of complexity, a contingency we have developed expertise successfully navigating over the past 10 years.

### Australia

As a result of Australia's Net Zero by 2050 objectives and large pipeline of renewable energy projects, the energy network in Australia is undergoing rapid change and investment. The grid was built to service large loads from large generation centers in each state, creating a grid connection problem for renewable projects, which are sited in remote areas with weak grid infrastructure. To address this issue, we complete multiple studies for each project with the network service provider, as well as ensuring that our equipment will integrate with the system and that commissioning and construction activities are detailed in our contracts. Further, marginal loss factor and curtailment during project operation can impact the asset's lifetime generation. As a prerequisite to any investment, and as requested

during our financing process, we thus commission reputable firms to produce long-term forecasts, which are vetted by technical advisors and financiers.

In the development process, we actively engage rule-making bodies, such as the Australian Energy Market Commission, as well as monitoring any energy policy changes that are proposed by the State and Federal Government. Our goal is to advocate for the most cost-effective energy transition to a lower emissions electricity network that will increasingly focus on solar and hybrid projects that incorporate energy storage and technical innovations not previously featured in the Australian network.

Given the rapid renewable energy and electrification targets in Australia, it is increasingly important for communities and stakeholders to be a primary focus of our development. Constant engagement with these stakeholders allows us to comprehensively address local concerns during the project development process. Project sites are chosen to minimize potential impact to native flora and fauna, farmland, tree removal, and local wildlife. If complete avoidance is not possible, biodiversity offsets are created or purchased to ensure no net loss to the environment.



**Brazil**

Social work and hiring in local communities are always performed whenever possible. For example, our Salgueiro project is located in a local community where quilombola (descendants of former enslaved Africans) reside. We built a community center with computers and printers and soccer fields, and organized social activities, such as dance classes and gardening.



47 MW Marville Utility Solar Plant, France



## Non-Governmental Organizations and Memberships

Country	Organization
Australia	Australian Institute of Energy
	Business Renewables Centre
	Clean Energy Council
	Clean Energy Investor Group
	Smart Energy Council
	The Australian Industry Group
Brazil	Brazilian Solar Photovoltaic Energy Association (ABSOLAR)
	Brazilian Association of Distributed Generation
Chile	The Canadian Chamber of Commerce in Chile
	The Chilean Association of Renewable Energies and Storage
China	China Chamber of Commerce for Import and Export of Machinery and Electronic Products (CCCME)
	China Photovoltaic Industry Association (CPIA)
	SEMI Standards
	Society of Entrepreneurs & Ecology (SEE)
	Women in Solar Energy (WISE)
Columbia	The Association of Renewable Energies Colombia
Costa Rica	The Costa Rican Solar Energy Association
France	CEMATER
	ENERPLAN
	The Renewable Energies Syndicate
Italy	Alliance for Photovoltaics <sup>(1)</sup>
	Future Electricity
	The Association of the Italian Solar PV Community

(1) Membership only valid for 2021

Country	Organization
Japan	Asia Pacific Real Assets Association Limited (APREA)
	Japan Association of Asset Management (JAAM)
	Japan Builders Network (JBN)
	Japan Climate Initiative (JCI)
	Japan Climate Leaders' Partnership (JCLP)
	Japan Electrical Manufacturers' Association (JEMA)
	Japan Photovoltaic Energy Association (JPEA)
	Principles for Responsible Investment (PRI) Signatory
	Renewable Energy Association for Sustainable Power Supply (REASP)
	Investment Trusts Association, Japan (JITA)
Mexico	The Mexican Solar Energy Association
	The Canadian Chamber of Commerce in Mexico
Middle East and Northern Africa	Middle East Solar Industry Association (MESIA)
Netherlands	Holland Solar
Portugal	The Portuguese Renewable Energy Association
Puerto Rico	Solar and Energy Storage Association (SESA)
South Africa	South African Photovoltaic Industry Association (SAPVIA)
Spain	Spanish Photovoltaic Union
	American Clean Power
	Kentucky Solar Industries Association (KYSEIA)
	Mid-Atlantic Renewable Energy Coalition (MAREC)
	Solar Energy Industries Association (SEIA) <sup>(2)</sup>
	Southern Renewable Energy Association (SREA)
	Tennessee Solar Energy Industries Association (TenneSEIA)
Texas Solar Power Association	

(2) Membership renewed in 2022 after suspension in 2021





Canadian Solar Suzhou Module Factory, China

### Spotlight on Memberships

Smart Energy Council is an independent organization committed to building connections within the Australian smart energy industry, building momentum, and unlocking the barriers that hold people back from embracing a smart energy future. It delivers tailored solutions for the members, delivering practical help to meet all members' individual needs to grow Australia's renewable and smart energy industries. As a member of the council, Canadian Solar joined its 2021 Solar PV Market Update webinar to present on solar's large-scale global outlook and trends.

**Society of Entrepreneurs & Ecology (SEE)** is an environmental conservation NGO in China with corporate executives and entrepreneurs as members. SEE is dedicated to restoring the ecologies of deserts and major water bodies. Canadian Solar is strongly committed to environmental protection and conservation, and actively supports SEE.

In November 2021, SEE Tai Lake Center organized a meeting for the Green Supply Chain Program in Tai Lake Basin, hosted by Dr. Shawn Qu, CEO of Canadian Solar, and Vice Chairman of the Center.





## 4 Responsible Supply Chain

Canadian Solar prioritizes responsible procurement of materials in all parts of our business, from module manufacturing to project development.

Over the years, CSI Solar, Canadian Solar's majority-owned manufacturing subsidiary, which works with various third-party suppliers of raw materials and components, has entered into a range of supply agreements with suppliers of solar silicon, ingot, wafer, cell, PV glass, aluminum, silver metallization paste, back sheet, ethylene vinyl acetate encapsulant (EVA), and lithium iron phosphate battery cells in its manufacturing process for crystalline silicon solar modules and supply of battery storage solutions. To better control our supply chain, we are now significantly increasing our in-house ingot, wafer, cell, and module manufacturing capacities, which will allow us to better control our costs and product quality.

Our Global Energy business uses centralized procurement strategies to ensure adequate supply, quality, consistency, and cost-effectiveness of components for solar and battery storage projects we develop across the world. We have developed strong management systems for global procurement of solar modules, inverters, trackers, mounting hardware, grid interconnection and power stability equipment, and other key equipment. Our scale of operations and centralized procurement help us maintain the stability of supply, innovation, quality control, and economies of scale we need to maximize the performance and competitiveness of our projects.

1.2MW Huaxia Commercial Solar Rooftop System, China







## ESG Integration in Supply Chain Management Strategy

Our Procurement Management Strategy follows a centralized procurement approach, controlled at group level, and supported by each division.

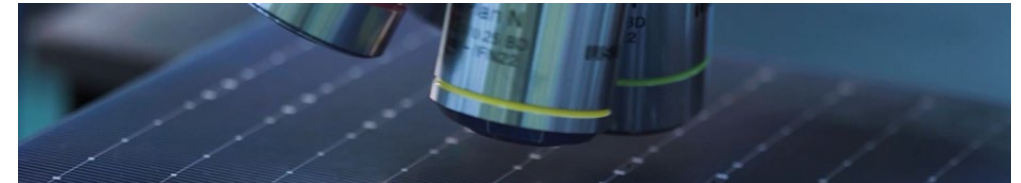
We implement Canadian Solar’s supply chain related policies, screening our supplier base

and conducting a supplier auditing program, aiming to establish a sustainable, efficient, and healthy supply chain that meets the development needs of the Company and the interests of our stakeholders.

## Anti-Modern Slavery Initiatives

Canadian Solar does not tolerate forced labor or any form of modern slavery and is committed to ensuring that modern slavery does not take place anywhere in our business, including our supply chain.

To achieve this goal, we have established anti-forced labor measures, including policy development, trainings, execution, and compliance, to prevent modern slavery in our operations and supply chain.



## Policy Development, Communication, Training, and Compliance

Canadian Solar has formed teams dedicated to developing anti-modern slavery policies and enforcing these policies and processes.

At the Company level:

- Legal Department, led by the Group General Counsel and Legal Senior Directors
- Human Resources, led by the Group Head of HR
- Internal Audit, led by the Global Director of Internal Audit
- Global Compliance, led by the Chief Compliance Officer

- Anti-Modern Slavery Policy ([link](#))
- Labor and Human Rights Policy ([link](#))
- Supplier Code of Conduct ([link](#))
- Code of Business Conduct and Ethics ([link](#))
- Environmental, Health and Safety Policy ([link](#))
- Conflict Minerals Policy ([link](#))
- Whistleblower Policy ([link](#))

In October 2021, for example, Canadian Solar established a dedicated Anti-Modern Slavery Task Force to bolster group-wide efforts to prevent modern slavery, such as forced labor. The task force is responsible for developing and communicating anti-modern slavery policies and procedures and implementing trainings and conducting due

diligence to ensure the effectiveness of our anti-modern slavery efforts.

Members of this Task Force include management employees from HR, Legal, Compliance, Procurement, Customer Services/Tech, and Safety, Quality, and Environment.



## Supplier Code of Conduct

To maintain a responsible supply chain, Canadian Solar require our suppliers to adhere to Canadian Solar's **Supplier Code of Conduct** ([link](#)), which establishes our standards on human rights, environmental protection, health, safety, and business ethics.

We use the Code as part of our due diligence to assess new suppliers, who are required to sign this Code. We also require our suppliers to require their own suppliers to act in adherence to the standards and requirements set forth in the Code.

## Supplier ESG Audits

We actively monitor our suppliers through an ESG auditing program, including onsite and desk audits.

Our supplier audits cover quality control, environment, health, safety, human rights, business ethics, and other sustainability aspects based on our Supplier Code of Conduct. Failure to meet Canadian Solar's standards or Code may result in termination of the business relationship, especially if warnings are not properly addressed. Canadian Solar provides suppliers with trainings on compliance with the Code and consultations on how to improve in line with ESG priorities.

We map our supplier base on an annual basis to identify critical suppliers based on purchase volumes and potential ESG risks associated with suppliers' industry sector, size, and type of work performed. We also split critical suppliers into three

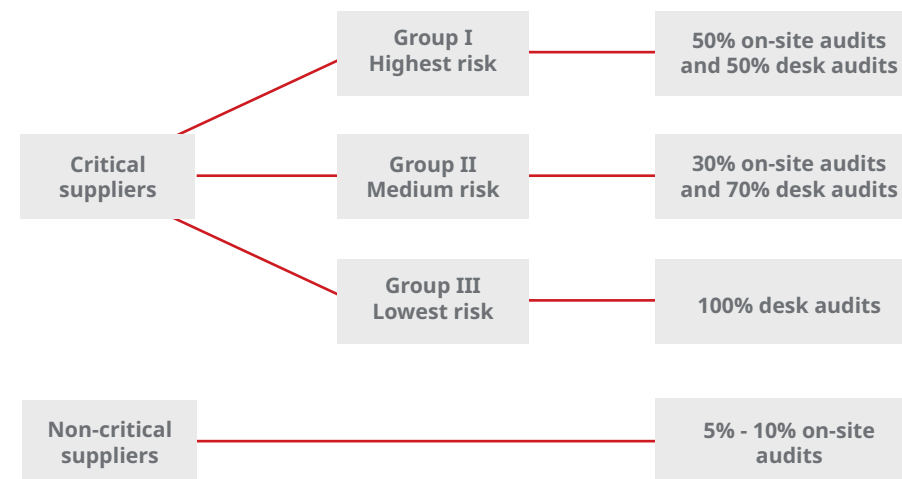
In addition, we also include clauses related to anti-modern slavery, including no forced labor, in the purchase agreement with which our supplier must comply, such that any deviance from our established labor standards may be met with legal consequences.

groups based on their ESG risks, as shown in the following table.

We conduct onsite or desk audits to all our critical suppliers and 5-10% of our non-critical suppliers on an annual basis.

On-site and desktop ESG audits are conducted in the form of supplier questionnaires supported by evidentiary documentation. Canadian Solar reviews the answers and supporting documents either on-site or remotely.

The audits evaluate suppliers on a range of criteria divided between *veto* and *scored* criteria. *Veto* criteria are evaluated on a *yes or no* basis (i.e., the supplier is either qualified or not). Any negative answers automatically disqualify suppliers from conducting business with us. For example, the



potential presence of forced or child labor based on our audit would automatically render the supplier ineligible to work with Canadian Solar.

Scored factors require suppliers to achieve a minimum total score of 60 to qualify to work with us. We issue warnings to suppliers that fall below minimum scoring requirements and provide them with consultations to address the identified issues. We will terminate the business relationship with any suppliers who fail to meet our standards within a certain period varying from 1 month to 6 months after consultation has been provided.

## Conflict Minerals

Conflict minerals refer to certain mineral resources that are produced in the Democratic Republic of the Congo and its neighboring countries.

According to the U.S. Department of State, serious human rights abuses have been inflicted by local armed forces that mine and trade those minerals to finance their armed conflicts. To address this problem, the U.S. Securities and Exchange Commission adopted a mandate by the Dodd-Frank Wall Street Reform and Consumer Protection Act (Section 1502), requiring companies listed on U.S. stock markets to disclose information about the usage of columbite-tantalite (coltan), cassiterite, gold, wolframite, and their derivatives, which are limited to tantalum, tin, and tungsten.

We are committed to keeping our supply chain free of these conflict minerals, as explained in our **Conflict Minerals Policy** ([link](#)). This is one of the key criteria for selecting new suppliers that we screen in supplier audits. All of our suppliers are required to sign the Declaration of Conflict-Free Minerals before contracting with us, especially suppliers of tin-containing products,

as after reviewing all the materials used during the production of our products, we determined that tin was the only conflict mineral necessary to the functionality or production of products that we manufacture or contract to be manufactured from January 1, 2021 to December 31, 2021. We require our suppliers to describe the source of the tin used in their products and provide confirmation statement to ensure the tin used is not sourced from the Democratic Republic of the Congo or an adjoining country. We do not make purchases of raw ore or unrefined conflict minerals and makes no purchases in the Democratic Republic of the Congo or adjoining countries.

After taking the aforementioned measures, we have no reason to believe that the tin we use may have originated in the Democratic Republic of the Congo or an adjoining country. As such, and as we procure the tin that we use directly from suppliers in China, we are confident that our production is free of conflict minerals. We file a Specialized Disclosure Report, or Form SD, with the U.S. SEC annually regarding conflict minerals. A copy of our filed Form SD can be found on SEC or our website ([link](#)).





## 5 Governance

Canadian Solar's Board of Directors ("the Board") is responsible for managing and supervising the business and affairs of the Company.

Our Board is composed of 9 directors, including 6 independent non-executive directors. Together, our Board brings a broad range of skills and industry knowledge to overseeing management performance, doing critical work to ensure

the success of our business and create long-term value for stakeholders.

Each director is required to stand for election at every annual general meeting (AGM). Our **Corporate Governance Guidelines** ([link](#)) are intended to serve as a framework within which the Board may conduct its business.

### Board Committees

Our Board has established five committees to discharge its duties. **The chairs and members of the Audit Committee, Compensation Committee and Nominating and Corporate Governance Committee are all independent board members.** Board committees meet periodically with the Company's senior management team and external auditor to review business performance and risk management practices.








Below is a summary of all the Board committees:

- **Sustainability Committee:** Reviews sustainability (including climate)-related risks and opportunities associated with our strategy and business development; monitors progress, advises, and assists the Board on strategic measures related to the Company's long-term sustainability; and oversees the progress and execution of ESG plans. The Sustainability Committee meets at least twice a year to review ESG matters. In addition to Sustainability Committee members, all other Board members join Sustainability Committee meetings to ensure that the full board remains aware of the latest ESG-related issues.
- **Audit Committee:** Oversees the Company's accounting and financial reporting processes and the audit of the financial statements of the Company.
- **Compensation Committee:** Reviews, evaluates, and if necessary, revises compensation plans, policies, and programs of the Company.
- **Nominating and Corporate Governance Committee:** Identifies qualified candidates to become Board members; selects nominees for election as directors at the next annual meeting of shareholders; selects candidates to fill any vacancies of the Board; develops and recommends to the Board of a set of corporate governance guidelines and principles applicable to the Company; oversees the evaluation of the Board and Company management and monitors compliance with the Company's Code of Business Conduct and Ethics.
- **Technology Committee:** Reviews, gives guidance, and makes recommendations to management of the Company and the Board relating to the Company's technology strategy, initiatives, and investments in support of the Company's overall strategy and performance.



13.6 MW Ibaraki Kasama Utility Solar Plant, Japan

■ Summary of Board Members and Duties

		Age	Board Tenure	Audit Committee*	Compensation Committee	Nominating & Governance Committee	Technology Committee	Sustainability Committee	Independent / Non-Independent
	<b>Dr. Shawn (Xiaohua) Qu</b>	58	16				Member		Non-Independent
	<b>Dr. Harry E. Ruda</b>	63	11	Member	Member		Chair		Independent
	<b>Andrew (Luen Cheung) Wong</b>	64	8		Chair	Member			Independent
	<b>Lap Tat Arthur Wong</b>	62	3	Chair		Member			Independent
	<b>Lauren C. Templeton</b>	46	2		Member	Chair			Independent
	<b>Karl E. Olsoni</b>	64	2	Member				Chair	Independent
	<b>Leslie Li Hsien Chang</b>	67	2			Member		Member	Independent
	<b>Yan Zhuang</b>	58	2						Non-Independent
	<b>Dr. Huifeng Chang</b>	56	2					Member	Non-Independent
	<b>Average</b>	60	5						

\*Mr. Arthur Lap Tat Wong qualifies as an “audit committee financial expert” as required by the SEC. Each of Messrs. Olsoni and Dr. Ruda is “financially literate” as required by the NASDAQ rules.



## Board Diversity

Canadian Solar believes having diversity on the Board, including in terms of gender, race, ethnicity, religion, cultural and social background, age, language, nationality, and sexual orientation, brings diverse viewpoints that can enhance the Board's effectiveness in overseeing the Company.

As such, we continuously make efforts to improve the diversity of our board of directors and strive to further improve diversity at the board level and meet the NASDAQ New Rule 5605(f) for Diverse Board Representation in the specified time frame, including based on gender,

nationality, ethnicity, age, and expertise. The Board considers diversity in the nominating process and evaluates each candidate in the context of the whole Board's composition.

The Company's **Corporate Governance Guidelines** ([link](#)) and **Nominating and Corporate Governance Committee Charter** ([link](#)) were modified in December 2021 to incorporate these commitments to diversity.

Below is our Board Diversity Matrix based on self-determined identity:

**Board Diversity Matrix (As of April 15, 2022)**

<b>Country of Principal Executive Offices</b>	Canada			
<b>Foreign Private Issuer</b>	Yes			
<b>Disclosure Prohibited Under Home Country Law</b>	No			
<b>Total Number of Directors</b>	9			
	<b>Female</b>	<b>Male</b>	<b>Non-Binary</b>	<b>Did Not Disclose Gender</b>
<b>Part I: Gender Identity</b>				
<b>Directors</b>	1	7	0	1
<b>Part II: Demographic Background</b>				
<b>Underrepresented Individual in Home Country Jurisdiction</b>			7	
<b>LGBTQ+</b>			0	
<b>Did Not Disclose Demographic Background</b>			2	

## Board Expertise and Training

Our Board has a broad range of skillsets and industry knowledge, with experts in solar technology, strategy, global operations, corporate finance, auditing, accounting, corporate reporting, capital markets, investing, mergers and acquisitions, risk management, marketing management, and corporate branding.

See our annual report on **Form 20-F** ([link](#)) for more details.

We also provide directors with training in various areas, including training on securities laws in both the U.S., where the Company is listed, and Canada, where the Company is legally domiciled; training on directors' duties; training on different aspects of the solar industry, such as high-efficiency cell and storage technologies; and training on piercing the corporate veil. Those trainings are designed to ensure our board has the right skillset and knowledge to act in our stakeholders' best interests.

## Board Meeting Attendance

In 2021, our board of directors held 12 meetings and passed 51 resolutions by unanimous written consent. Board meeting attendance rate was 99%.



## Third-Party Audit of the Corporation's Operation and Supply Chain

In May 2022, our Board passed a resolution mandating a third-party assessment, at reasonable cost, on the extent to which Canadian Solar's policies and procedures effectively protect against forced labor in its operations, supply chains, and business relationships.

The assessment will draw upon international

standards such as the UN Guiding Principles on Business and Human Rights, ILO Declaration on Fundamental Principles and Rights at Work, and ILO Forced Labor Convention, 1930 (No. 29). We have initiated our efforts to search for a reputable, international auditing firm to conduct this assessment at reasonable cost and expect to report back to the Board on the results of the audit in due course.

## Executive Management

Our Chief Sustainability Officer (CSO), Ms. Hanbing Zhang, is responsible for our sustainability strategy and implementation. She leads an ESG working group with members from the Company's Strategy, R&D, Product Reliability, EHS, Human Resources, Global Energy, Investor Relations, and Global Marketing teams. The ESG working group receives guidance from external advisors on ESG strategies and implementation, and on the latest standards on disclosures and

reporting GHG emissions. The ESG team works closely with the Company's management teams to integrate ESG strategy into the Company's strategic decision-making process, including by incorporating sustainability targets, such as targets on environmental metrics, into operation teams' KPIs.

Our CSO reports to the Board Sustainability Committee at least twice a year.

## Executive Management Team

### Work Experience



**Dr. Shawn (Xiaohua) Qu**  
Chairman and CEO

- Founded Canadian Solar in 2001 with NASDAQ IPO in 2006
- Director and VP at Photowatt International S.A.
- Research scientist at Ontario Hydro (Ontario Power Generation)



**Yan Zhuang**  
President, CSI Solar Co., Ltd.

- Head of Asia of Hands-on Mobile, Inc.
- Asia Pacific regional director of marketing planning and consumer insight at Motorola Inc.



**Dr. Huifeng Chang**  
Senior VP and Chief Financial Officer

- Co-Head of Sales & Trading at CICC US in New York
- CEO of CSOP Asset Management in Hong Kong
- Vice President of Citigroup Equity Proprietary Investment in New York



**Ismael Guerrero Arias**  
Corporate VP and President of Global Energy

- President, Head of Origination and COO at TerraForm Global
- Vice President of Global Projects at Canadian Solar
- Director of Operations for Asia at the Global Sustainable Fund



**Jianyi Zhang**  
Senior VP, General Counsel and Chief Compliance Officer

- Senior advisor to several Chinese law firms
- Senior assistant general counsel at Walmart Stores, Inc.
- Managing Partner, Hong Kong office, Troutman Sanders LLP



**Guangchun Zhang**  
Senior VP, CSI Solar Co., Ltd.

- Vice President for R&D and Industrialization of Manufacturing Technology at Suntech Power Holdings
- Centre for Photovoltaic Engineering at the University of New South Wales and Pacific Solar Pty. Limited



**Hanbing Zhang**  
Corporate VP and Chief Sustainability Officer, CSI Solar Co., Ltd.

- Global Head of Marketing at Canadian Solar
- Founder and President of Women in Solar Energy (WISE)



## Ethical Business Conduct



Canadian Solar is committed to upholding the highest standards of business ethics. Our Code of Business Conduct and Ethics applies to all directors, officers and employees of Canadian Solar and its subsidiary entities.

Below is a summary of our key governance documents and guidelines:

Policy	Description
<b>Code of Business Conduct and Ethics</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Environment, health, and safety</li> <li>Harassment and discrimination</li> <li>Employment practices, including anti-discrimination, freedom of association, privacy, and collective bargaining</li> <li>Conflict of interests</li> <li>Confidential information</li> <li>Competition and fair trading</li> <li>Gifts and entertainment expenses</li> </ul>
<b>Whistleblower Policy</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Provides a 24/7 reporting channel where internal and external stakeholders can report their concerns on financial reporting and disclosure, fraudulent activity, breaches of compliance policies, etc. to the Board</li> <li>Protection from retaliation for whistleblowers</li> <li>Anonymous reporting and confidentiality</li> </ul>
<b>Insider Trading Policy</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Procedure for preventing insider trading</li> </ul>
<b>Related-Party Transactions</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Policy and procedures on reporting, approval and disclosure of related-party transactions</li> </ul>
<b>Anti-Corruption Policies</b>	<ul style="list-style-type: none"> <li>Prohibition against giving bribes (<a href="#">link</a>)</li> <li>Prohibition against accepting bribes (<a href="#">link</a>)</li> </ul>



Policy	Description
<b>Anti-Modern Slavery Policy</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Measures taken to ensure modern slavery does not occur anywhere in Canadian Solar's business, including through its supply chain</li> </ul>
<b>Labor and Human Rights Policy</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Labor and human rights standards to which Canadian Solar's employees are entitled</li> </ul>
<b>Equal Employment Opportunity Form</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Canadian Solar's commitment to providing an equal opportunity and discrimination-free workplace</li> </ul>
<b>Global Diversity Policy</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Emphasizes our commitment to diversity at all levels, including its senior management and board of directors</li> </ul>
<b>EHS Policy</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Canadian Solar's guiding principles and objectives for environmental preservation and providing a healthy and safe workplace for employees</li> </ul>
<b>Supplier Code of Conduct</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Canadian Solar's standards on human rights, environmental protection, health, safety, and business ethics for our suppliers and their suppliers</li> </ul>
<b>Conflict Minerals Policy</b> ( <a href="#">link</a> )	<ul style="list-style-type: none"> <li>Measures taken to ensure Canadian Solar's supply chain remains free of conflict minerals illegally produced in the Democratic Republic of the Congo and its neighbors</li> </ul>

## Business Ethics Awareness and Compliance Trainings

All Canadian Solar employees are informed and trained on our compliance policies, which are publicly accessible on our website ([link](#)).

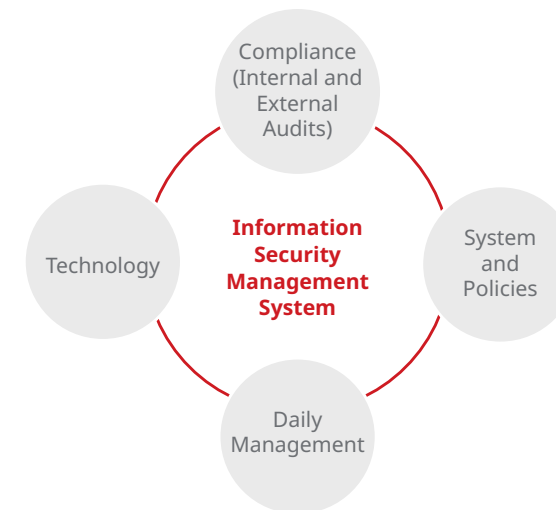
responsibilities, supplier expectations, etc., and may include tests to ensure employees' successful completion of each training.

We conduct trainings on policies to our employees on an annual basis and to new employees on a quarterly basis. Trainings may cover major definitions, Canadian Solar employees'

Below are examples of business ethics awareness and compliance trainings we provide to our employees:

Training/ Result Review	Scope	Frequency
Business ethics training, including Foreign Corrupt Practices Act (FCPA)	All employees	Annual or quarterly for new employees
Anti-modern slavery training	All employees	Annual or quarterly for new employees
Compliance declaration and questionnaire, declaring conflict of interest, if any, and the acknowledgement and adherence to Canadian Solar's policies and procedures	All employees from Sales, Business Development and Procurement departments, and employees of manager or above levels from other departments	Annual
Compliance test of compliance awareness and Canadian Solar's policies and procedures	All employees	Annual

## Information Security and Privacy Protection



Canadian Solar highly values privacy protection and information security.

audits and verifications.

We have established an Information Security Committee responsible for information security management of the Company, including the development and implementation of information security strategy and policies and the provision of information security measures training to employees. The Information Security Committee is led by the heads of Information Technology (IT) Departments of both CSI Solar and Global Energy.

**Policies:** Information Technology Security Strategy Policy, Information Technology Security Management Procedure, Information Technology Security Incidents Management Policy, Employee Handbook.

**Information Security Technology:** Multi-dimensional technology from workstations, servers, networks, and physical applications to ensure information security, completeness, and usability.

In addition to complying with laws and regulations that are applicable to our businesses, this committee has helped establish a sound information security management system covering all our subsidiaries. Our information security system has passed annual third-party

Failure to comply with Canadian Solar's information security policies will lead to disciplinary and legal actions, including termination of employment. Canadian Solar has had no breach of information security incidents in the past three years.



## 6 About this Report

Canadian Solar's Sustainability Report was developed in accordance with the Task Force on Climate-Related Disclosures (TCFD), the Sustainability Accounting Standards Board (SASB) framework under Solar Technology & Project Developers standards, and the Global Reporting Initiative's (GRI) Core Sustainability Reporting Standard.

This report was designed to highlight our ESG strategy and disclosures based on feedback from the investment community and other stakeholders. The reporting period of this report is from January 1, 2021 to December 31, 2021, unless otherwise specified.

We did not seek third-party verification for this report. However, the data collection and calculation of our greenhouse gas emissions inventories of scope 1 and scope 2 sources were based on the methodology advised by SGS, a qualified, well-known, and international inspection, verification, testing and certification organization.

To provide feedback on our sustainability report, please contact:

[support@canadiansolar.com](mailto:support@canadiansolar.com)

**Acknowledgements:** This report was produced as a collective effort across various departments in Canadian Solar. I would like to express gratitude to every individual who contributed to the production of this report, namely Jean-Nicholas Jaubert, Isabel Zhang, Mary Ma, Emily Du, Natasha Tang, Raffaella Balzaretti, Holly Zhang, Heidi Peng, Shaoting Wan, Katherine Xiong, Xiaobin Zhang, Angela Zhang, Jianyi Zhang, Antonio Adami, Pauline Wong, Annie Sun, Stella Su, Xianglun Wang, Rain Yao, and Bernie Jungreithmayr. I would also like to thank the members of the Board including Sustainability Committee members for their constructive guidance.

Hanbing Zhang

Chief Sustainability Officer

## Materiality Assessment and Stakeholder Engagement

Both internal and external stakeholders were involved in our materiality assessment. Internal stakeholders included our board of directors, executive management, and employees across our global operations. External stakeholders included our customers, suppliers, investors, and creditors, with insights drawn from local communities, industry associations, NGOs, media reporting, and the scientific community as well.

This sustainability report presents the key ESG topics, our strategies and actions based on our materiality analysis, and has been reviewed by our CSO and the Sustainability Committee. The results of the assessment helped us define opportunities, mitigate risks, and better integrate ESG into our business.

The chart on the right describes Canadian Solar’s approach to stakeholder engagement.

Stakeholders	Engagement Methods	Engagement Frequency	Focus Areas
Employees	Training, meetings, emails, surveys, townhalls	Ongoing	Company performance, environmental impact and social responsibility
Customers	Meetings, emails, conferences, trade shows, technical workshops	Ongoing	Company performance, product quality, social responsibility, supplier assessments
Suppliers	Meetings, emails, conferences, trade shows, technical workshops, surveys, audits	Ongoing	Company performance, product quality, procurement practices
Investors / Shareholders	Meetings, earnings calls, emails, conferences, roadshows	Ongoing	Company performance, ESG performance
Creditors	Meetings, emails, conferences, trade shows	Ongoing	Company performance, credit quality, key risks, ESG performance
Rating agencies	Meetings, emails, conferences	Ongoing	Company performance, credit quality, key risks, ESG performance
Media	Interviews, emails, meetings, trade shows	Ongoing	Company performance, ESG performance
Local communities	Community presentations and meetings, local tours, training programs	Ongoing	Environmental and ecological impacts, job creation, occupational health & safety
NGOs	External surveys, emails, partnerships, meetings, workshops	Ongoing	Environmental, ecological, and social impacts
Scientific community	Conferences, emails, standards development meetings, technical workshops	Ongoing	Product quality, environmental impacts, social responsibility, job creation, supplier assessment



# APPENDIX: Alignment with Standardized Reporting Frameworks

## Task Force on Climate-Related Financial Disclosures (TCFD)

Canadian Solar follows TCFD recommendations and provides disclosures on its climate-related financial risks and opportunities, aiming to contribute to the global transition to a more stable and sustainable economy.

TCFD Recommended Disclosures	Response
<b>Governance</b>	
A) Describe the board's oversight of climate-related risks and opportunities	2021 Sustainability Report 1) Environmental Metrics and Targets, Climate-Related Risks and Opportunities, p. 28-29 2) Governance, Sustainability Committee, p.49
B) Describe management's role in assessing and managing risks and opportunities.	2021 Sustainability Report, Governance, Executive Management, p.52
<b>Strategy</b>	
A) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	2021 Sustainability Report Environmental Metrics and Targets, Climate-Related Risks and Opportunities, p. 28-29
B) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	2021 Sustainability Report Environmental Metrics and Targets, Climate-Related Risks and Opportunities, p. 28-29
C) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	2021 Sustainability Report Environmental Metrics and Targets, Climate-Related Risks and Opportunities, p. 28-29

TCFD Recommended Disclosures	Response
<b>Risk Management</b>	
A) Describe the organization's processes for identifying and assessing climate-related risks.	2021 Sustainability Report 1) Environmental Metrics and Targets, Climate-Related Risks and Opportunities, p. 28-29 2) Governance, Executive Management, p.52
B) Describe the organization's processes for managing climate-related risks.	2021 Sustainability Report 1) Environmental Metrics and Targets, Climate-Related Risks and Opportunities, p. 28-29 2) Governance, Executive Management, p.52
C) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	2021 Sustainability Report, Governance 1) Sustainability Committee, p. 49 2) Executive Management, p.52
<b>Metrics and Targets</b>	
A) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.	2021 Sustainability Report, Environmental Metrics and Targets, p.9-27
B) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.	2021 Sustainability Report, Environmental Metrics and Targets, Greenhouse Gas Emissions, p.12-14
C) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.	1) 2021 Sustainability Report, Environmental Metrics and Targets, p.9-24 2) Target to achieve powering our global operations with 100% renewable energy before 2030

**■ Sustainability Accounting Standards Board (SASB) Content Index**

Topic	Accounting Metric	Category	Unit of Measure	Code	Response
<b>Energy Management in Manufacturing</b>	(1) Total energy consumed	Quantitative	Gigajoules (GJ)	RR-ST-130a.1	5,473,504
	(2) percentage grid electricity		Percentage (%)		92.8
	(3) percentage renewable		Percentage (%)		1.5 (only including solar energy generation on site for self-consumption. The percentage would be 23% if including renewable electricity from the grid)
<b>Water Management in Manufacturing</b>	(1) Total water withdrawn	Quantitative	Thousand cubic meters (m <sup>3</sup> )	RR-ST-140a.1	9,027
	(1) Total water consumed		Thousand cubic meters (m <sup>3</sup> )		2,653
	(2) Total water withdrawn, percentage of each in regions with High or Extremely High Baseline Water Stress		Percentage (%)		34.3%
	(2) Total water consumed, percentage of each in regions with High or Extremely High Baseline Water Stress		Percentage (%)		30.3%
	Description of water risks management and discussion of strategies and practices to mitigate those risks	Discussion and Analysis	n/a	RR-ST-140a.2	2021 Sustainability Report, Environmental Metrics and Targets, Water Risk Management Strategy, p. 21-22
<b>Hazardous Waste Management</b>	Amount of hazardous waste generated	Quantitative	Metric tons (t)	RR-ST-150a.1	3,826
	Hazardous waste percentage recycled	Quantitative	Percentage (%)	RR-ST-150a.1	80.7
	Number and the aggregate quantity of reportable spills		Number		0
	Spills quantity recovered		Kilograms (kg)		0
<b>Ecological Impacts of Project Development</b>	Number and duration of project delays related to ecological impacts	Quantitative	Number, Days	RR-ST-160a.1	None
	Description of efforts in solar energy system project development to address community and ecological impacts	Discussion and Analysis	n/a	RR-ST-160a.2	2021 Sustainability Report, Environmental Metrics and Targets, Environmental Stewardship in Project Development, p.27



Topic	Accounting Metric	Category	Unit of Measure	Code	Response
<b>Management of Energy Infrastructure Integration &amp; Related Regulations</b>	Description of risks associated with integration of solar energy into existing energy infrastructure and discussion of efforts to manage those risks	Discussion and Analysis	n/a	RR-ST-410a.1	2021 Sustainability Report, Social Responsibility, Making the Difference through Community Commitment, p. 40-42
	Description of risks and opportunities associated with energy policy and its impact on the integration of solar energy into existing energy infrastructure	Discussion and Analysis	n/a	RR-ST-410a.2	2021 Sustainability Report, Social Responsibility, Making the Difference through Community Commitment, p.40-42
<b>Product End-of-life Management</b>	Percentage of products sold that are recyclable or reusable	Quantitative	Percentage (%)	RR-ST-410b.1	2021 Sustainability Report, Environmental Metrics and Targets, Product End-of-Life Management and Recycling, p.25
	Weight of end-of-life material recovered, percentage recycled	Quantitative	Metric tons (t), Percentage (%)	RR-ST-410b.2	2021 Sustainability Report, Environmental Metrics and Targets, Product End-of-Life Management and Recycling, p.25
	Percentage of products by revenue that contain IEC 62474 declarable substances, arsenic compounds, antimony compounds, or beryllium compounds	Quantitative	Percentage (%)	RR-ST-410b.3	Our modules are free of IEC 62474 declarable substances except for lead, which is a material used for soldering crystalline PV modules. Lead accounts for 0.03% of a solar module's weight. One of our top R&D and sustainability priorities over the coming years is to reduce lead content in our modules. IEC 62474 is an international standard for material declarations for the electrical and electronics industry and its suppliers. It provides requirements for material declarations including a Declarable Substance List and a material declaration procedure.
	Description of approach and strategies to design products for high-value recycling	Quantitative	n/a	RR-ST-410b.4	2021 Sustainability Report, Environmental Metrics and Targets, Product End-of-Life Management and Recycling, p.25
<b>Materials Sourcing</b>	Description of the management of risks associated with the use of critical materials	Discussion and Analysis	n/a	RR-ST-440a.1	Polysilicon manufacturing processes involve the use of volatile or dangerous chemicals and waste. Those chemicals are required to be handled with proper training provided. Wastewater and waste gas are processed through various treatments so that they meet the respective discharge standards. Most solid waste generated during the manufacturing process can be reused and does not contain hazardous materials. Pollution control systems are set in place to reduce, treat, and recycle the waste generated in the manufacturing process. Furthermore, laws and regulations are in place to govern water, air, solid waste, and noise pollution, as well as hazardous chemicals, among other regulations, in places where the upstream polysilicon suppliers operate. Polysilicon suppliers are required to obtain all the necessary environmental permits to conduct business and are subject to regulation and periodic monitoring by local environmental protection and work safety authorities. Where there are environmental non-compliance incidents, the polysilicon suppliers are subject to substantial fines and potentially suspension of production or cease operations.
	Description of the management of environmental risks associated with the polysilicon supply chain	Discussion and Analysis	n/a	RR-ST-440a.2	

## ■ Global Reporting Initiative (GRI) Metrics

General Disclosures		
GRI 102: Organizational Profile		
102-1	Name of the organization	Canadian Solar Inc.
102-2	Activities, brands, products, and services	2021 Sustainability Report, About Canadian Solar, p.5-6
102-3	Location of headquarters	Guelph, Ontario, Canada
102-4	Location of operations	Operates in 25 countries, including CSI Solar offices in 17 countries, Global Energy offices in 19 countries, and 16 manufacturing facilities in 4 countries; 2021 Sustainability Report, "About Canadian Solar", p.6
102-5	Ownership and legal form	Investor-owned corporation, NASDAQ: CSIQ. <a href="#">2021 Annual Report</a> , Share Ownership, p.96-97
102-6	Markets served	Delivered 71 GW of solar modules to customers across the world; built and connected over 6.6 GWp solar power projects in over 20 countries, 2021 Sustainability Report, "About Canadian Solar", p. 5-6
102-7	Scale of the Organization	2021 Sustainability Report, Working at Canadian Solar, p.32, About Canadian Solar, p.5-6 <a href="#">2021 Annual Report</a> , Results of Operations, p.69
102-8	Information on employees and other workers	2021 Sustainability Report, Social Responsibility, Working at Canadian Solar, p.32
102-9	Supply chain	2021 Sustainability Report, Responsible Supply Chain, Supply Chain Management, p.45-48 <a href="#">2021 Annual Report</a> , Supply Chain Management, p.45
102-10	Significant changes to the organization and its supply chain	In 2022, we ceased to operate as a business under the Business Corporations Act (British Columbia) (BCBCA) and will be continued under the Business Corporations Act (Ontario) (OBCA)
102-11	Precautionary Principle or approach	2021 Sustainability Report, Social Responsibility, Occupational Health and Safety, p.37-38

102-12	External Initiatives	2021 Sustainability Report, Social Responsibility, Non-Governmental Organizations and Memberships p.43-44
102-13	Membership of associations	2021 Sustainability Report, Social Responsibility, Non-Governmental Organizations and Memberships p.43-44
GRI 102: Strategy		
102-14	Statement from senior decision-maker	2021 Sustainability Report, Message from the Chief Executive and Chief Sustainability Officers, p.3
102-15	Key impacts, risks, and opportunities	2021 Sustainability Report, Environmental Metrics and Targets, Climate-Related Opportunities and Risks, p.7-30
GRI 102: Ethics & Integrity		
102-16	Values, principles, standards and norms of behavior	2021 Sustainability Report Social Responsibility, p.31, 37 Governance, Ethical Business Conduct, p.53
102-17	Mechanisms for advice and concerns about ethics	<a href="#">Whistleblower Policy</a>
GRI 102: Governance		
102-18	Governance structure	2021 Sustainability Report, Governance, p.49-52 <a href="#">2021 Annual Report</a> , p.91-93
102-20	Executive-level responsibility for economic, environmental, and social topics	2021 Sustainability Report, Governance, Executive Management, p.52
102-21	Consulting stakeholders on economic, environmental, and social topics	2021 Sustainability Report, Materiality Assessment and Stakeholder Engagement, p.56
102-29	Identifying and managing economic, environmental, and social impacts	2021 Sustainability Report, Climate-Related Risks and Opportunities, p. 28-29; Governance, p. 49-53; Materiality Assessment and Stakeholder Engagement, p.56
102-31	Review of economic, environmental, and social topics	2021 Sustainability Report, Climate-Related Risks and Opportunities, p. 28-29; Governance, p. 49-53
102-32	Highest governance body's role in sustainability reporting	Sustainability Committee of the Board 2021 Sustainability Report, Governance, Board Committees, p.49



<b>GRI 102: Stakeholder Engagement</b>		
102-40	List of stakeholder groups	2021 Sustainability Report, Materiality Assessment and Stakeholder Engagement, p.56
102-41	Collective bargaining agreements	2021 Sustainability Report, Social Responsibility, Freedom of Association and Collective Bargaining, p.37
102-42	Identifying and selecting stakeholders	2021 Sustainability Report, Materiality Assessment and Stakeholder Engagement, p.56
102-43	Approach to stakeholder engagement	2021 Sustainability Report, Social Responsibility, Making the Difference through Community Commitment, p.40-42 Materiality Assessment and Stakeholder Engagement, p.56
102-44	Key topics and concerns raised	2021 Sustainability Report, Materiality Assessment and Stakeholder Engagement, p.56
<b>GRI 102: Reporting Practice</b>		
102-45	Entities included in the organization's consolidated financial statements	<a href="#">2021 Annual Report</a> , Organizational Structure, p.59
102-46	Defining report content and topic boundaries	2021 Sustainability Report, About this Report, p.55
102-47	List of material topics	2021 Sustainability Report, Materiality Assessment and Stakeholder Engagement, p.56
102-48	Restatements of information	2021 Sustainability Report, Environmental Metrics and Targets, Air Emissions Breakdown, p.17 Energy Consumption Breakdown, p.19 Waste by type and disposal. p.23
102-49	Changes in reporting	<a href="#">2021 Annual Report</a> , Item 5, Operating and Financial Review and Prospects, p.61
102-50	Reporting period	January 1 to December 31, 2021, unless otherwise noted
102-51	Date of most recent report (if any)	July 2021
102-52	Reporting cycle	Annual
102-53	Contact point for questions regarding the report	support@canadiansolar.com

102-54	Claims of reporting in accordance with the GRI Standards	Core
102-55	GRI Content Index	GRI Content Index
102-56	External assurance	2021 Sustainability Report, About this Report, p.55
<b>Economic</b>		
<b>GRI 201: Economic Performance</b>		
201-1	Direct economic value generated and distributed	<a href="#">2021 Annual Report</a> , Results of Operations, p.69
201-2	Financial implications and other risks and opportunities due to climate change	2021 Sustainability Report, Environmental Metrics and Targets, Climate-Related Opportunities and Risks, p. 28-29
<b>GRI 203: Indirect Economic Impacts</b>		
203-1	Infrastructure investments and services supported	<a href="#">2021 Annual Report</a> , p.42-45-50, 63, 65-67, 69-71; Notes to the Consolidated Statements, p.F-4, F-13, F-15, F-20, F60-62
<b>GRI 205: Anti-Corruption</b>		
205-1	Operations assessed for risks related to corruption	2021 Sustainability Report, Governance, Ethical Business Conduct, p.53
205-2	Communication and training about anti-corruption policies and procedures	2021 Sustainability Report, Governance, Ethical Business Conduct, p.53
<b>Environment</b>		
<b>GRI 301: Materials</b>		
301-2	Recycled input materials used	2021 Sustainability Report, Environmental Metrics and Targets, Water Intensity, p.21 Waste Intensity, p.23, 25

<b>GRI 302: Energy</b>		
302-1	Energy consumption within the organization	Unit: Gigajoules (GJ) Total energy consumption: 5,473,504 Gas: 192,332 Diesel: 4,321 Gasoline: 1,786 Steam: 112,433 Grid electricity: 5,078,445 Solar PV electricity: 84,187
302-3	Energy intensity	Unit: MWh/MW Ingot production: 67.5 Wafer production: 15.1 Cell production: 79.4 Module production: 20.7
302-4	Reduction of energy consumption	2021 Sustainability Report, Environmental Metrics and Targets, Energy Intensity, p.17-19
<b>GRI 303: Water and Effluents</b>		
303-3	Water withdrawal	9,027 thousand cubic meters (m <sup>3</sup> )
303-4	Water discharge	6,374 thousand cubic meters (m <sup>3</sup> )
303-5	Water consumption	2,653 thousand cubic meters (m <sup>3</sup> )
<b>GRI 305: Emissions</b>		
305-1	Direct (Scope 1) GHG emissions	61,946 metric tons of CO <sub>2</sub> equivalent (tCO <sub>2</sub> eq)
305-2	Energy Indirect (Scope 2) GHG emissions	971,014 metric tons of CO <sub>2</sub> equivalent (tCO <sub>2</sub> eq)
305-4	GHG emissions intensity	Unit: tCO <sub>2</sub> eq/MW Ingot production: 58.6 Wafer production: 8.5 Cell production: 49.1 Module production: 13.8

305-7	Nitrogen oxides (NOx), sulfur oxides (SOx), and other significant air emissions	Unit: metric tons (t) Nitrogen oxides (NOx): 13.6 Sulfur oxides (SOx): 0.1 Fine dust (PM10): 15.7 Hazardous air pollutants (HAP): 10.1 Volatile organic compounds (VOC): 17.5 Persistent organic pollutants (POP): 0 Other standard air emissions: 30.2
<b>GRI 306: Waste</b>		
306-3	Waste generated	Unit: Metric kilotons (kt) Disposed hazardous waste: 0.7 Recycled or reused hazardous waste: 3.1 Disposed non-hazardous waste: 17.8 Recycled or reused non-hazardous: 81.8
<b>GRI 307: Environmental Compliance</b>		
307-1	Non-compliance with environmental laws and regulations	None
<b>GRI 308: Supplier Environmental Assessment</b>		
308-1	New suppliers that were screened using environmental criteria	2021 Sustainability Report, Supplier ESG Audits, p.47
308-2	Negative environmental impacts in the supply chain and actions taken	We terminated the cooperation with 1 supplier in 2021 as it did not pass our EHS standards and audit
<b>Social</b>		
<b>GRI 403: Occupational Health &amp; Safety</b>		
403-1	Occupational health and safety management system	2021 Sustainability Report, Social Responsibility, Occupational Health and Safety, p.37
403-2	Hazard identification, risk assessment, and incident investigation	2021 Sustainability Report, Social Responsibility, Hazardous Materials and Environmental Management, p.38
403-3	Occupational health services	2021 Sustainability Report, Social Responsibility, Occupational Health and Safety, p.37-38



403-4	Worker participation, consultation, and communication on occupational health and safety	2021 Sustainability Report, Social Responsibility, Occupational Health and Safety, p.37-38
403-5	Worker training on occupational health and safety	2021 Sustainability Report, Social Responsibility, Occupational Health and Safety, p.37-38
403-6	Promotion of worker health	2021 Sustainability Report, Social Responsibility, Occupational Health and Safety, p.37-38
403-9	Work-related injuries	2021 Sustainability Report, Social Responsibility, Occupational Health and Safety, p.37-38
<b>GRI 404: Training &amp; Education</b>		
404-1	Average hours of training per year per employee	22.1 hours per employee for 2021 2021 Sustainability Report, Social Responsibility, On the Job Training, p.36
404-2	Programs for upgrading employee skills and transition assistance programs	2021 Sustainability Report, Social Responsibility, Talent Strategy, Training and Development, p.35-37
404-3	Percentage of employees receiving regular performance and career development reviews	100% of full-time employees
<b>GRI 405: Diversity &amp; Equal Opportunity</b>		
405-1	Diversity of governance bodies and employees	2021 Sustainability Report, Social Responsibility, Equity, Diversity and Inclusion, p.32-34 Governance, Board Diversity, p.51
<b>GRI 407: Freedom of Association &amp; Collective Bargaining</b>		
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	2021 Sustainability Report, Social Responsibility, Freedom of Association and Collective Bargaining, p.37 Responsible Supply Chain, p.47, <a href="#">Supplier Code of Conduct</a>

<b>GRI 408: Child Labor</b>		
408-1	Operations and suppliers at significant risk for incidents of child labor	None
<b>GRI 409: Forced or Compulsory Labor</b>		
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	None, we have been taking action to prevent this 2021 Sustainability Report, Responsible Supply Chain, Anti-Modern Slavery Initiatives, p46 <a href="#">Supplier Code of Conduct</a> , p.47
<b>GRI 413: Local Communities</b>		
413-1	Operations with local community engagement, impact assessments, and development programs	2021 Sustainability Report, Environmental Metrics, Environmental Stewardship in Project Development, p.27 Social Responsibility, Making the Difference through Community Commitment, p.40-42
413-2	Operations with significant actual and potential negative impacts on local communities	None
<b>GRI 414: Supplier Social Assessment</b>		
414-1	New suppliers that were screened using social criteria	2021 Sustainability Report, Responsible Supply Chain, p.47
414-2	Negative social impacts in the supply chain and actions taken	2021 Sustainability Report, Responsible Supply Chain, p.45-48



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