



SOLAR'S MOST TRUSTED



# REC GROUP ESG REPORT 2023

TIME TO SWITCH TO MORE  
RESPONSIBLE SOLAR ENERGY



# INTRODUCTION

## Advocating for a global energy transition and green economy

As a leading international solar energy company, REC Group provides the world with a reliable source of clean energy. The global demand for solar power continues to grow and this is driven by the need to rapidly decarbonize our energy system.

Despite emissions reduction pledges made by 195 countries globally under the historic Paris Agreement<sup>1</sup>, the world is still falling short of its climate goals set in this agreement. According to the United Nations Emissions Gap report, we must reduce our greenhouse gas emissions by 45 percent if we are to achieve the Intergovernmental Panel on Climate Change (IPCC) global target to limit temperature increases to 1.5 degrees Celsius<sup>2</sup>. More must be done, and solar energy has a key role in decarbonizing the global power sector.

According to an REC study, we need between 500 and 600 GW of photovoltaic (PV) capacity per year<sup>3</sup> between 2016 and 2025 to mitigate enough carbon dioxide (CO<sub>2</sub>) emissions to be on track to meet this target.

Everyone has a part to play, including REC, to accelerate engagement and sustainability practices for the benefit of the environment and society. REC continues to empower people with clean, affordable solar energy while upholding responsible, sustainable business practices.

As a global innovator in solar technology with more than 25 years of experience in the industry, REC's ESG efforts aim to empower people through clean solar energy to positively impact the planet, people and the communities we live, work and serve. We are driven by two key objectives in particular for our global communities: to limit the global temperature increase to 1.5° C and to maintain ethical sourcing through all our supply chains.

**"Our mission is to empower people with clean, affordable solar energy through innovative technology."**



Jan Enno Bicker, CEO at REC Group

<sup>1</sup>Source: [https://www.un.org/en/climatechange/paris-agreement#:~:text=Today%2C%20194%20Parties%20\(193%25States,strengthen%20their%20commitments%20over%20time](https://www.un.org/en/climatechange/paris-agreement#:~:text=Today%2C%20194%20Parties%20(193%25States,strengthen%20their%20commitments%20over%20time).

<sup>2</sup>Source: [https://wedocs.unep.org/bitstream/handle/20.500.11822/40932/EGR2022\\_ESEN.pdf?sequence=8](https://wedocs.unep.org/bitstream/handle/20.500.11822/40932/EGR2022_ESEN.pdf?sequence=8)

<sup>3</sup>Source: [https://www.recgroup.com/sites/default/files/documents/rec\\_cop21\\_study\\_final\\_web.pdf?t=1700212338](https://www.recgroup.com/sites/default/files/documents/rec_cop21_study_final_web.pdf?t=1700212338)



At the end of 2022, REC had delivered a total installed capacity of 13.2 GW since the company was founded in 1996. This translates to 17.16 TWh of clean solar energy per year, enough to meet the energy needs of over 20 million people. In 2022, REC solar panels saved 12 million tons of CO2 emissions.

While it is important for REC to promote the use of solar energy, we look to educate customers to go beyond power and price and how it is important to choose solar panels that are more responsibly made through ESG practices in the solar industry.

Founded and headquartered in Norway in 1996, with production sites in Singapore and Norway, REC is a pioneer in the solar energy industry and has a

responsibility to the people and planet we serve. REC is committed to further accelerate its ESG efforts by focusing on the entire value chain and continuously reduce resource consumption from production to the end of a product's life.

Our dedicated ESG Steering Committee is made up of a diverse group from our corporate departments, who drive how we act and report against our strategy. We are committed to providing transparent and holistic communication that inform on our environmental, social and governance initiatives and to educate consumers and installers about how to choose solar panels more responsibly.



We have reported on our sustainability initiatives through our annual reports since 2020 in alignment with the core subjects defined in the ISO 26000 standard. REC works under the guidance of the seven key principles of ISO 26000; accountability, transparency, ethical behavior, respect for stakeholder interests, respect for the rule of law, respect for international norms of behavior and respect for human rights.

Thanks to our high-efficiency products and eco-conscious approach towards manufacturing, REC is guided by and contributing also to the United Nations' Sustainable Development Goals (SDGs), paying particular attention to SDG 7 (Affordable & Clean Energy), SDG 9 (Industry and Innovation) and SDG 12 (Responsible Production & Consumption).



This ESG report 2023 reports on initiatives and results for the calendar year 2022. We invite you to review our achievements in 2022 and join us on our journey

as we strive for a more sustainable solar industry that benefits people, society and the environment.

**“At REC, we believe it is important for the solar industry to continue to maintain a strong growth trajectory without losing sight of investing in more sustainable product design and manufacturing processes for the benefit of the environment and people.”**

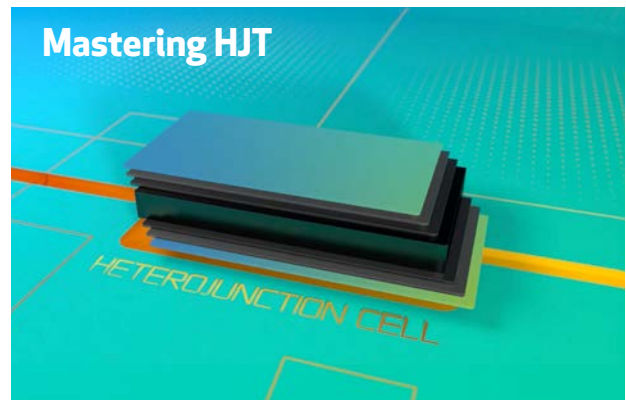
## SUSTAINABLE DEVELOPMENT GOALS



# WHO WE ARE

## More than 25 years of driving innovation and manufacturing excellence

REC has been innovating to continuously increase the efficiency and performance of our solar panels. In parallel, we have also updated and implemented new measures to reduce the consumption of resources.



In 2022, REC launched the world's highest-power solar panel for residential installations with G12 heterojunction solar cell technology (HJT), the REC Alpha Pure-R Series. HJT cells offer superior performance and reliability to end-users by increasing panel performance while minimizing its environmental footprint. Currently, REC is one of the pioneers in the solar panel manufacturing industry to offer HJT technology, which also uses less steps in the production process at lower temperatures to reduce energy consumption during manufacturing.

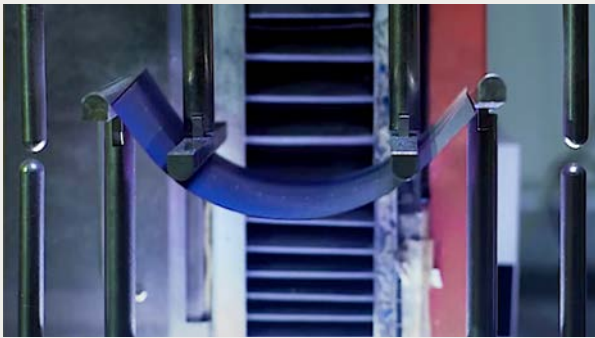
With over four years of HJT manufacturing expertise, bringing four innovative panels to the market based on REC's advanced Alpha HJT technology, REC has

continuously mastered the HJT technology. Our REC Alpha Series panels have won two Intersolar Awards, making REC the only active solar panel manufacturer with three Intersolar Awards in total and being a Top Performer in the PV Module Reliability Scorecard by PVEL DNV GL for eight consecutive years.

REC maintains consistently high standards for technology innovation and manufacturing for its products to ensure high long-lasting performance for our customers. In 2022, REC continued to secure a low cumulative claims rate of well below 100 ppm, making REC a reliable partner for distributors, solar professionals, and consumers.







Our products are backed by our comprehensive REC ProTrust warranty, which offers up to 25-years of warranty coverage on product, performance and labor (subject to conditions). For our premium Alpha solar

panels, REC guarantees at least 92 per cent of the nameplate power in year 25, a testament to the high long-term performance of its products.

## Sustainability

In 2022, three REC panels received Environmental Product Declarations (EPD) from EPD Norway. The EPDs provide independent verification on REC's continued commitment to reducing the environmental impact of the solar panels it manufactures.

REC's focus on quality and sustainability goes hand-in-hand. Our investment in product technology along the entire value chain spans from sourcing and manufacturing to the disposal of solar panels at the end of life. For REC, sustainability means designing products with a minimum service lifespan of 25 years.

We take sustainability seriously and our senior management is committed to upholding these principles in all business activities. In line with our broader commitment towards social responsibility, REC aims to minimize the environmental impact of our products throughout their entire service life.

Leading the solar industry towards a more sustainable future, all REC Alpha Pure solar panels are lead-free and Restriction of Hazardous Substances (RoHS) compliant to reduce their environmental impact. In addition, many of REC's solar panels have been independently confirmed as Low Carbon Footprint (LCF) products by CERTISOLIS, the PEP ecopassport®, received Environmental Product Declarations (EPDs) or the Declare label from the International Living Future Institute (ILFI).



# REC GROUP ESG FACTS

Key Results 2022

## ENVIRONMENT

### WATER



**171,487 m<sup>3</sup>**  
of water saved  
(equivalent to  
consumption of  
2,973 people)

**628 m<sup>3</sup>/MW**  
of process water  
consumption in  
Singapore (-17.5%)

**895,000 m<sup>3</sup>/MW**  
of wastewater  
in Norway  
(-22%)

### ENERGY



**90 MWh/MW**  
of energy  
consumption in  
Singapore

**31.3 kWh /kg**  
silicon of energy  
consumption in  
Norway (-40%)

**846 t CO<sub>2</sub>**  
saved through own clean  
solar power generation

### WASTE



**4.4 t /MW**  
of waste generated  
in Singapore (-7%)

**3,132 t**  
of total waste  
generated in Norway  
(-3%)

**100%**  
recycling rate of scrap  
modules in Singapore  
(31,581 modules)

## SOCIAL



**38%**  
of female employees  
(stable)

**719**  
new installers  
trained

**36**  
supplier audits  
(+24%)

**0**  
deviations for ESG and HSE  
identified at suppliers (stable)

**17.16 TWh**  
of clean solar power generated  
by installed REC panels

**20.43 m**  
people empowered with solar  
power by installed REC panels

**12m t**  
of avoided CO2 by  
installed REC panels

**<100PPM**  
of claims rate since 2010  
with >80% of claims processed  
within 14 days

**3**  
ESG activities by  
REC employees

**8**  
social projects supported by  
education and donations

## GOVERNANCE



**100%**  
re-certification of  
employees on Code  
of Conduct and  
Anti-Corruption

**0**  
deviations identified  
from REC's Fair  
Advertising and  
Promotion guidelines

**0**  
deviations identified  
from REC's Trade  
Control Policy



# ENVIRONMENT

## WATER, ENERGY AND WASTE

For many years, REC has continuously driven energy, water and waste savings programs. In addition, we have set ourselves the following mid-term goals to save water, energy and waste from our operations:

- Reduce water consumption in cells production by 5 per cent and for modules by 10 per cent by 2024 (baseline 2019)
- Reduce electricity consumption in cells production by 5 per cent and for modules by 10 per cent by 2024 (baseline 2021)
- Further improve the Chiller System Efficiency
- Continue to produce less than three tons of HF sludge per MW cells

### Water

Water Saving & Recycling Programs

- **171,487 m<sup>3</sup>** water saved/year - equivalent to annual water usage of ~2,973 people



### Energy

Energy Saving Initiatives  
Clean Solar Power Generation

- **2,190 t** CO<sub>2</sub> emissions saved/year



### Waste

Non-hazardous Waste  
Hazardous Waste  
Modules and Kerf Recycling

- **31,581 modules** sent for recycling



## Water-saving and wastewater recycling programs

We have measures in place to use water responsibly during our production processes. In addition to looking at ways we can reduce water consumption, we treat as much water as possible to be reused at our manufacturing facility.

**In Singapore, specific process water consumption for 2022 was 628 m<sup>3</sup> per MW, down from 761 m<sup>3</sup> per MW in 2021 (-17.5%).**

Through our focus on responsible manufacturing, water recycling is important as water is considered a scarce resource in Singapore. Approximately 171,487 m<sup>3</sup> of water is saved each year and this is equivalent to the annual water usage of approximately 2,973 people in Singapore.

Year	Specific water consumption in Singapore
2020	1,223 m <sup>3</sup> / MW
2021	761 m <sup>3</sup> / MW
2022	628 m <sup>3</sup> / MW

### Reverse Osmosis Reject Recycling

The Reverse Osmosis (RO) Reject Recycling at our production site in Singapore has resulted in water savings of 171,487 m<sup>3</sup> in 2022.



## WATER

### Treated Wastewater Recycling

REC is committed to the responsible use of water required for production (process water).

Having completed pilot testing for non-Hydrogen Fluoride (HF) wastewater recycling in 2020, we are working towards full implementation. Once fully implemented, wastewater treatment is projected to save 131,400 m<sup>3</sup> per year.

### Improved Rainwater Harvesting

Rainwater is harvested and pumped to cooling towers after filtration. This is sourced from 50 per cent of connected sitewide trenches where rainwater is collected for the Singapore plant. To connect the remaining trenches, we are modifying stormwater drains to increase our rainwater harvesting capabilities. When this is completed, we are projecting water savings of about 10,000 m<sup>3</sup>/year.

The amount of wastewater treated in Norway was reduced to 895,000 m<sup>3</sup> in 2022, down from 1,150,000 m<sup>3</sup> in 2021. This is due to adjustments in the amount of silicon produced in Norway.

Year	Total wastewater from water treatment in Norway
2021	1,150,000 m <sup>3</sup> / year
2022	895,000 m <sup>3</sup> / year



# ENERGY

## Energy savings

We continue to monitor our workflows and manufacturing processes at our Singapore and Norway plants to identify potential energy savings and to reduce consumption.

Despite the fact that manufacturing solar panels with silicon as the base material is an energy intensive process, every year we further investigate measures to reduce our own energy consumption in the manufacturing process. REC has reduced our CO<sub>2</sub> emissions by 2,190 tons in year 2022 and we have already proven our solar panels have an Energy Payback Time of less than one year.

We have reduced the amount of energy we use in our manufacturing facility in Singapore on an annual basis thanks to our continuous energy savings programs. Specific electricity consumption at our Singapore production site was 90 MWh per MW in 2022, compared to 106 MWh in 2021 (-15%).



Year	Specific energy consumption in Singapore
2020	148 MWh / MW
2021	106 MWh / MW
2022	90 MWh / MW

In 2022, we have taken additional measures at our Singapore plant which have resulted in significant energy and emissions savings:

- **Shutting down of few RAH/FCU in Modules**

Energy savings: 725 MWh per year

CO<sub>2</sub> emission reduction: 290 tons per year

- **5D Pressure drop from 4.4 bar to 2.3 bar**

Energy savings: 1,786 MWh per year

CO<sub>2</sub> emission reduction: 714 tons per year

- **15D Pressure drop from 3.5 bar to 2.1 bar**

Energy savings: 851 MWh per year

CO<sub>2</sub> emission reduction: 340 tons per year

- **Replacement of chillers under MEES (under progress)**

Projected Energy savings: 11,000 MWh per year

CO<sub>2</sub> emission reduction: 4,400 tons per year



### REC in Singapore



To help to further reduce our carbon footprint, REC generates energy through our rooftop solar installations at our Singapore production site. The solar panels we've installed help us to save energy and to demonstrate to customers that solar can provide a reliable source of energy for manufacturing businesses. Around 3,000 kWp of solar panel systems have been installed, reducing CO<sub>2</sub> emissions by approximately 846 tons in 2022.

### Chiller optimization at REC in Singapore



The Norway plants report on energy consumption in terms of consumption per kg of silicon. Total specific electricity consumption in 2022 was 31.3 kWh per kg silicon, compared to 52.4 kWh per kg silicon in 2021 (-40%).

Year	Specific energy consumption in Norway
2021	52.4 kWh / kg Si
2022	31.3 kWh / kg Si

### REC in Norway



# WASTE

## Waste Reduction Program

We separate our production and operations waste to recycle and reuse as much material as possible. In 2022, we sent 31,581 of our scrap solar modules for recycling.



## Non-hazardous waste

REC closely monitors and accounts for recyclable non-hazardous waste including glass, metal, aluminum, paper, wood and plastics throughout its entire production chain daily.

In 2022, our Singapore operations achieved an average recycling rate of recyclable materials of 56.7 per cent. We have reduced the total amount of non-hazardous waste produced in 2022 at 3.46 tons per MW production output compared to 3.72 tons per MW in 2021 (-7%).

In Norway, REC takes most of its side streams into production. Of the amounts not taken back, over 90 per cent is sold as new products, such as Solarite, which can be used as liming agents and fertilizers and to clean drainage water from roadwork landfill sites. We deliver the same recycling streams as our Singapore production site with metal, aluminum, paper, wood and plastics that are sent for recycling. In 2022, REC in Norway reduced its amount of non-hazardous waste by roughly three per cent to 3,127 tons compared to 3,212 tons in 2021.

Year	Specific non-hazardous waste in Singapore	Total non-hazardous waste in Singapore	Total non-hazardous waste in Norway
2020	4.22 t / MW	4,282 t	1,795 t
2021	3.72 t / MW	4,164 t	3,212 t
2022	3.46 t / MW	4,553 t	3,127 t

## Hazardous waste

Hydrogen Fluoride (HF) sludge forms the largest category of non-recyclable waste at our production site in Singapore (86 per cent), a by-product of cell production that is sent to landfill. Our focus for hazardous waste is to develop and implement innovative ways to reduce and recycle it.

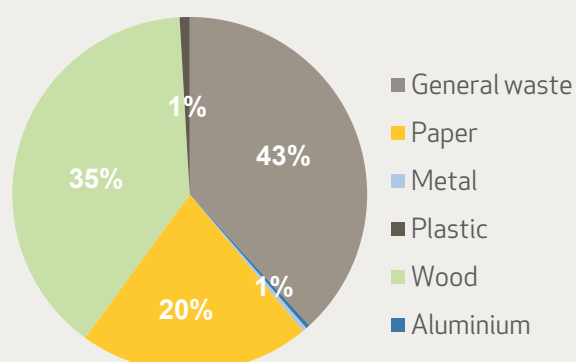
REC is pilot-testing lime sludge purification and recycling it as aggregate materials. The aim is to purify and reuse 100 per cent of lime sludge and avoid external landfilling.

Further studies to recover HF have been ongoing in 2022, including exploring options to recover HF from HF wastewater and re-use it in production or sell it as raw material.

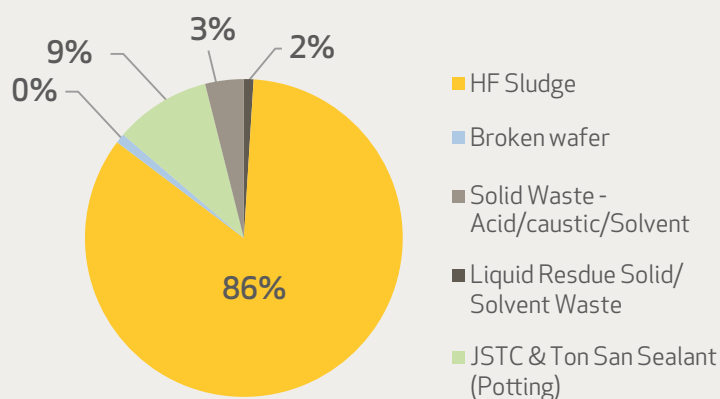
In 2022, 0.98 tons per MW of hazardous waste was generated from our Singapore plant, compared to 1.06 tons per MW in 2021 (-8%). In Norway, the total hazardous waste material increased to 5.2 tons in 2022 from 4.3 tons in 2021.

Year	Specific hazardous waste in Singapore	Total hazardous waste in Singapore	Total hazardous waste in Norway
2020	2.57 t / MW	2,615 t	2.8 t
2021	1.06 t / MW	1,181 t	4.3 t
2022	0.98 t / MW	1,278 t	5.2 t

Non-Hazardous Waste



Site wide Hazardous waste





# RECYCLING

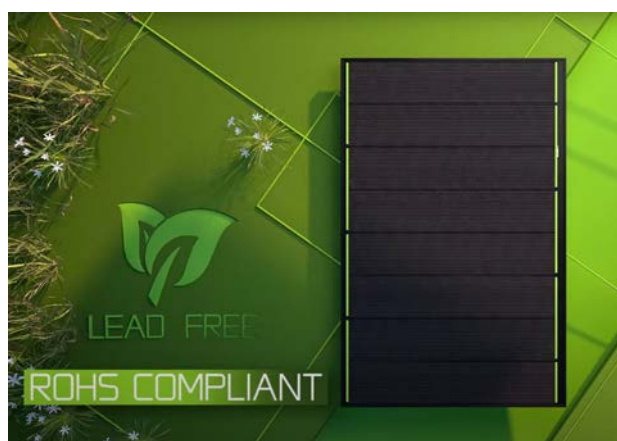
## Longevity

As the solar industry continues to grow, the International Renewable Energy Agency (IRENA) expects that in the early 2030s we will be facing significant waste streams from the solar PV industry.<sup>4</sup> This poses a significant challenge as the complete recycling of solar PV panels has yet to be fully implemented globally.

While the industry looks to find a solution, REC's goal is to extend the lifespan of our solar panels by producing a high-quality product. This reduces the need for our panels to be replaced and saves on resources required

to manufacture solar panels. It is one of REC's key priorities to ensure the longevity and reliability of our products of 25 or more years, giving consumers and the environment a greater peace of mind.

The high quality of REC products is validated by nine external certifications of ISO, IEC and other standards. Additionally, REC solar panels are certified to withstand snow loads of up to 7,000 Pascal and wind loads of up to 4,000 Pascal.



## Lead-free

When released into the environment, lead can enter soil, groundwater and food. In 2020, around 400 million solar panels were produced worldwide, each typically containing approximately 24 g of lead. These solar panels can equate to 10,000 tons of lead in the environment over time. Innovations such as the REC Alpha Pure lead-free solar panels which are RoHS compliant are important to curb environmental lead, simplify recycling of solar panels and provide an environmentally sound alternative to customers.

## Module and Silicon Recycling

Since REC launched the scrap solar modules recycling program in 2014, we have achieved a recycling rate of 100 per cent. Based on REC's manufacturing excellence, the scrap rate is low, averaging less than one per cent of production. In 2022, 31,581 solar modules were sent for recycling, out of more than 4 million panels produced.

REC sends its scrap solar modules to third party suppliers who recover aluminum from the frames, silver

from the cells and copper from cables, connections and ribbons through its module recycling initiatives.

With recycling requirements differing between countries in which REC operates in, we abide to local regulations set in these markets. In Europe, REC is a partner of the 'take-e-away' program and we comply with the Waste from Electrical and Electronic Equipment (WEEE) directive.



## Panel production circularity

Project developers are increasingly sourcing Low Carbon Footprint (LCF) solar panels to comply with environmental and public policy regulations. For example, developers in France must offer LCF solar

panels to be eligible to participate in public tenders. Therefore, circular and low-carbon footprint production of solar panels has become a key differentiator for solar panel brands in the industry.

## Turning waste into an industry resource

Within the production process of solar panels, silicon production is the most energy-intensive process, accounting for roughly 50 per cent of a panel's total carbon footprint<sup>4</sup>. Although REC's polysilicon already has the world's lowest carbon footprint at 14.3 kg CO<sub>2</sub>-eq/kg silicon, REC has invented a unique process technology to upcycle silicon kerf to further reduce energy consumption.

Kerf is a very fine material generated during wafer sawing. For more than 20 years, the industry has tried to find a way to upcycle kerf back to solar-grade silicon at full scale. Often, the silicon kerf from wafer production is a low-quality by-product, with around 30 per cent of the silicon remaining as waste.

To mitigate this, REC Solar Norway has invented a unique kerf processing technology that allows fully upgrading this otherwise low-value silicon material to a quality level that can be reused in wafer and solar panel production.

Compared to the conventional Siemens process used by majority of the industry, REC's unique kerf process technology allows to reduce energy consumption by 50 to 60 per cent and the carbon footprint for the

processing of kerf by around 90 per cent. With 300,000 tons of kerf generated in silicon production worldwide each year, REC's recycling innovation demonstrates an important impact on the solar industry.

Additionally, by upcycling kerf, we can eliminate quartz in the processes and reduce the extraction of raw materials.

REC has used this unique kerf processing method in production since 2020, and REC Solar Norway can now prevent almost 25,000 tons from being discarded. With this process innovation, REC has reduced direct electricity consumption by 50 to 60 per cent to 31.3 kWh for each kilogram of silicon it produces, translating into an estimated reduction in emissions to 8.44 CO<sub>2</sub>-eq per kilogram of silicon, representing a decrease of up to 90 per cent when compared to the standard Siemens process.

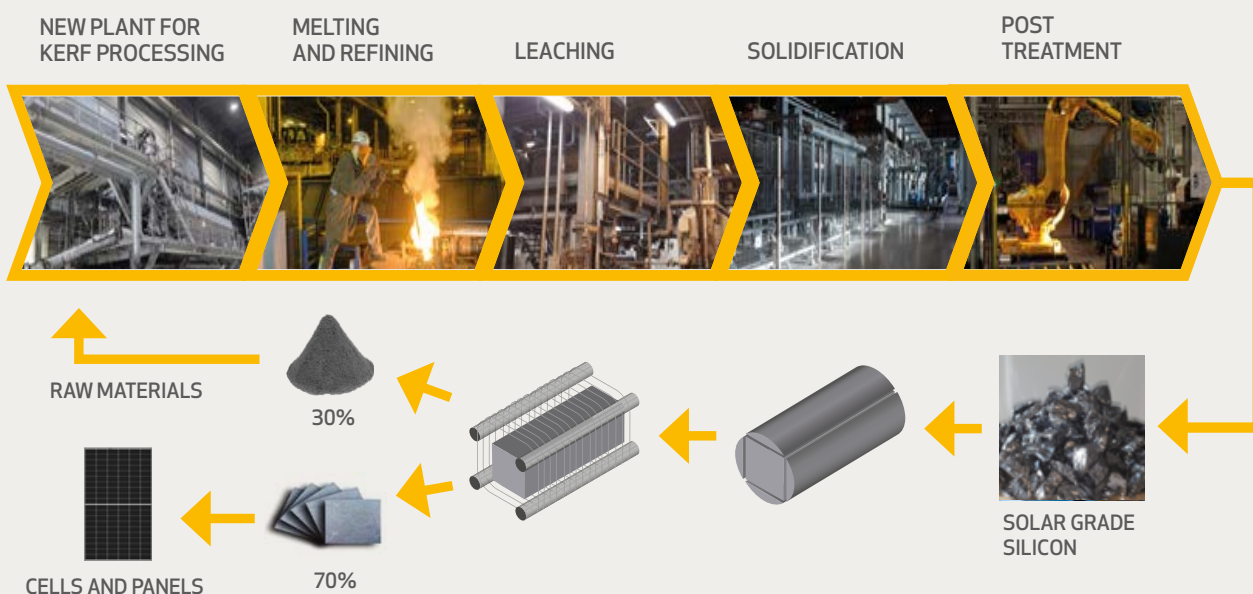
This means, we have reduced our direct energy consumption by roughly 116 million of kWh/year for production of 8,400 tons/year of solar-grade silicon. These energy savings from kerf upcycling equates to the energy consumption of nearly 6,000 homes in Norway, including their electrical heating.



<sup>4</sup> French CRE4 methodology



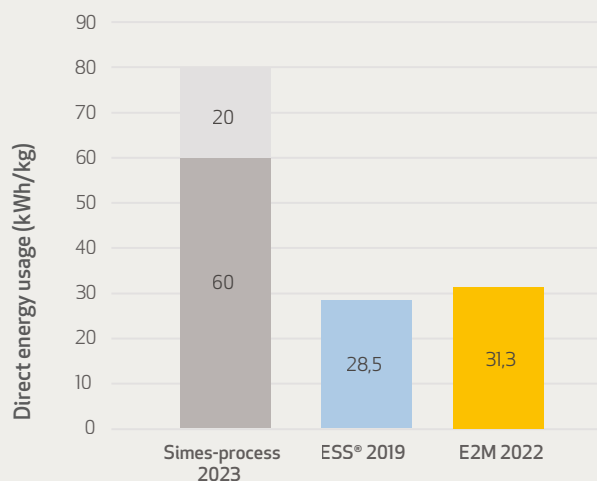
# REC's New E2M Process



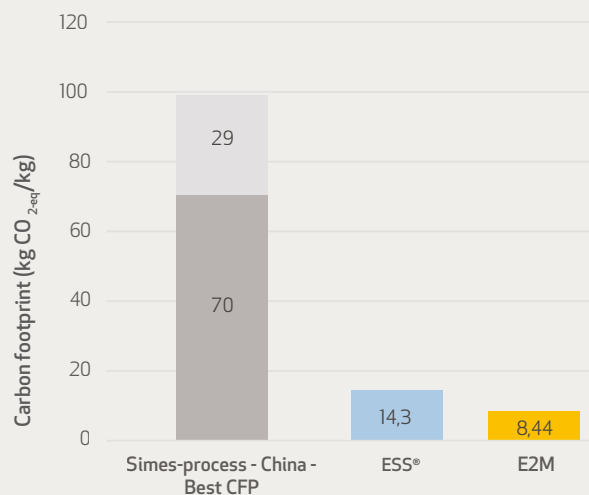
**LOWEST  
CARBON FOOTPRINT**  
for solar grade silicon



## 50-60% Lower Energy Consumption



## ~ 90% Lower carbon footprint



# SOCIAL

## Renewables empowering people

REC remains committed to empower people with clean solar energy and deliver positive outcomes for our employees, supplier employees and customers, as well as consumers and communities. We are driven by KPIs that allow us to compare our performance year-to-year to ensure we are improving against our areas of focus.



## HUMAN RIGHTS

REC Group is committed to maintaining and continuously improving systems and processes to avoid human rights violations related to our operations, our supply chain, and our products. This has been reflected in our Modern Slavery Act Statement.

At REC, we value our employees and the employees of our suppliers. We pay close attention to human rights and sustainable labor practices across our value chain. While efficiencies in production and sourcing are key to module prices, REC also considers the conditions under which our employees and upstream suppliers work.

To remain globally competitive and act as a strong corporate citizen, REC looks beyond costs and abstains from business activities that might exploit employees or compromise human rights, such as child, prison or forced labor. We acknowledge that the solar industry is still experiencing human rights violations. We are committed to upholding the strict human rights laws in the countries we operate, Singapore and Norway, and to growing our practices to prevent modern slavery in our operations and from our suppliers.



# LABOR PRACTICES

## Labor Practices Employees

REC is committed to developing our employees and bringing them on a journey to grow together with our business. In addition to celebrating the achievements of our employees through our annual CEO Excellence Awards since 2020, we are focused on improving diversity and equality across our global workforces.

REC's objective is to improve the quality of employees' working lives through health, safety, learning and

development programs. We do this through consistent standards and policies that require long-term commitment, such as regular health check ups and flexible work arrangements. This has been reflected in the high employee retention rate at 81.2 per cent and about 29 per cent of REC's employees have remained in the company for more than eight years.

### Key employee focus areas in 2022

- Offered 22 free health talk webinars to educate and inform employees about issues that matter to their wellbeing
- Launched Safety, Quality and Learning Week to engage more employees to improve their skills.
- Sponsored National ITE Certification training for 10 employees in mechatronics and robotics
- Introduced LinkedIn e-learning with 270 LinkedIn Learning Courses and 7,137 LinkedIn Learning Videos completed
- Offered 2 SGIS Scholars, 1 WS Diploma scholarships and 18 internships
- Offered re-employment to four people who reached retirement age



Irrespective of gender, age or ethnicity, REC is committed to diversity and equality. In 2022, our percentage of women in REC's workforce remained strong at 38.3 per cent.

Through our CEO Excellence Awards, we recognize employees for outstanding contributions, customer excellence, innovation excellence and team excellence.

In addition, we are committed to developing new talent for the solar industry and offer a pathway for new employees in partnership with universities and polytechnics in Singapore as work-study programs for degree and diploma students.





## A Shared ESG Commitment for Employees

In line with REC's role as a global advocate for sustainability, we consistently engage employees with ESG activities that reflect their commitment. We also encourage eco-friendly practices at our facilities and offices that go beyond standards mandated by local regulations.

From our employee survey in 2021, we know that 98 per cent of employees believe it is important for their organization to be socially responsible. This employee sentiment gives us the confidence that they are engaged in our ESG efforts and actions.

In 2022, REC implemented ESG employee engagement initiatives worldwide. In particular, we launched a dedicated ESG intranet portal for educational content and quizzes. Employees also uploaded photos of their own personal ESG activities with REC awarding several prizes for their participation. All employees were provided an additional Social Day that didn't impact their holidays. In addition, we conducted book donations, plant giveaways and reduced plastic use in the canteen.



## Supplier audits

We expect high standards in quality, environmental and social responsibility from our upstream suppliers. REC has a zero tolerance policy towards non-compliant behaviors and undertakes regular audits to examine labor practices, working conditions and HSE management systems. We are proud to report we recorded no deviations as a result of the 2022 audits. We abstain from business activities that might exploit employees or compromise human rights, such as child, prison or forced labor.

REC has a strong Due Diligence framework in place across our global operations to check for human rights compliance on identified supply chains of concern based on the following:

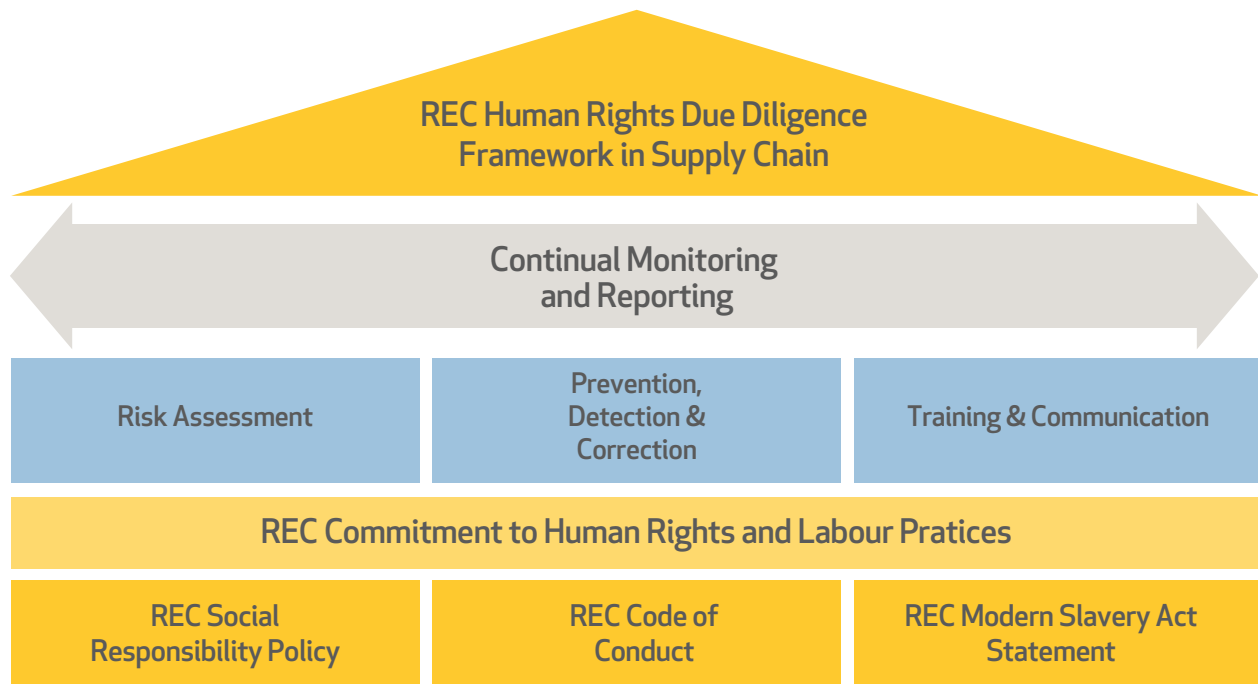
1. Risk assessment
2. Prevention
3. Training.

To help trace these upstream supply chains, our Risk Assessment is based on the following three-step approach:

1. Self-declaration based on a comprehensive questionnaire
2. Document drill based on random PO number to provide relevant traceability documents within two weeks
3. Two-day on-site traceability audit based on results of the above two steps, resulting in a SWOT analysis of each audited supplier

REC is committed to lead by example. As such, we use the SWOT analysis of our suppliers to support them and further improve on their ESG performance.





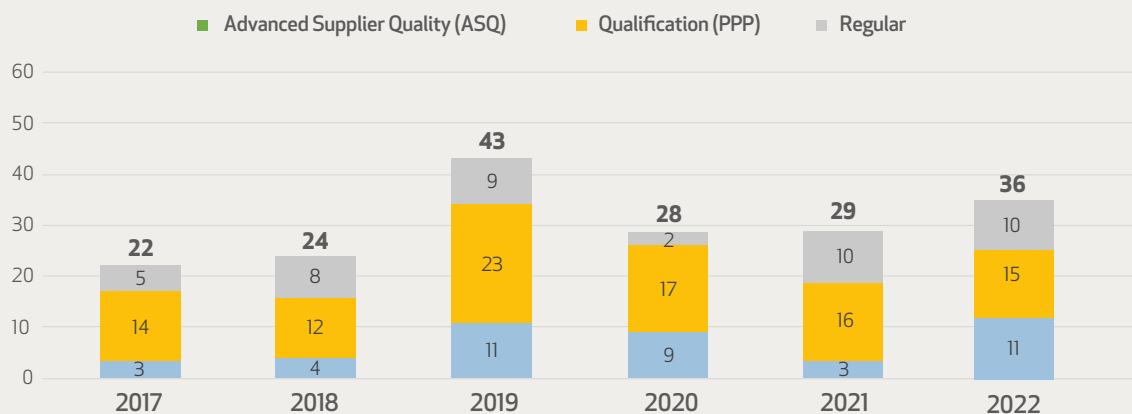
In parallel, we are continuously improving our traceability system in response to new regulations and new critical points. We monitor new policies and review our audit checklist to ensure the scope remains fully aligned with changes in regulatory frameworks globally and locally. At REC, we positively welcome stricter rules to ensure high standards can be achieved by all manufacturers.

Today, we are able to track every main component of our solar panels and identify manufacturer, production

location, production date badge and more. Moving forward, REC is conducting Traceability Audits to ensure full document traceability for direct suppliers in line with the US Customs Border Protection.

In 2022, REC conducted 36 supplier audits (29 audits in 2021). These audits included a forced labor check and observation to demonstrate due diligence to prevent forced labor in their supply chains.

### No. of Supplier Audits





## CONSUMER ISSUES

### Growing Together with our Customers

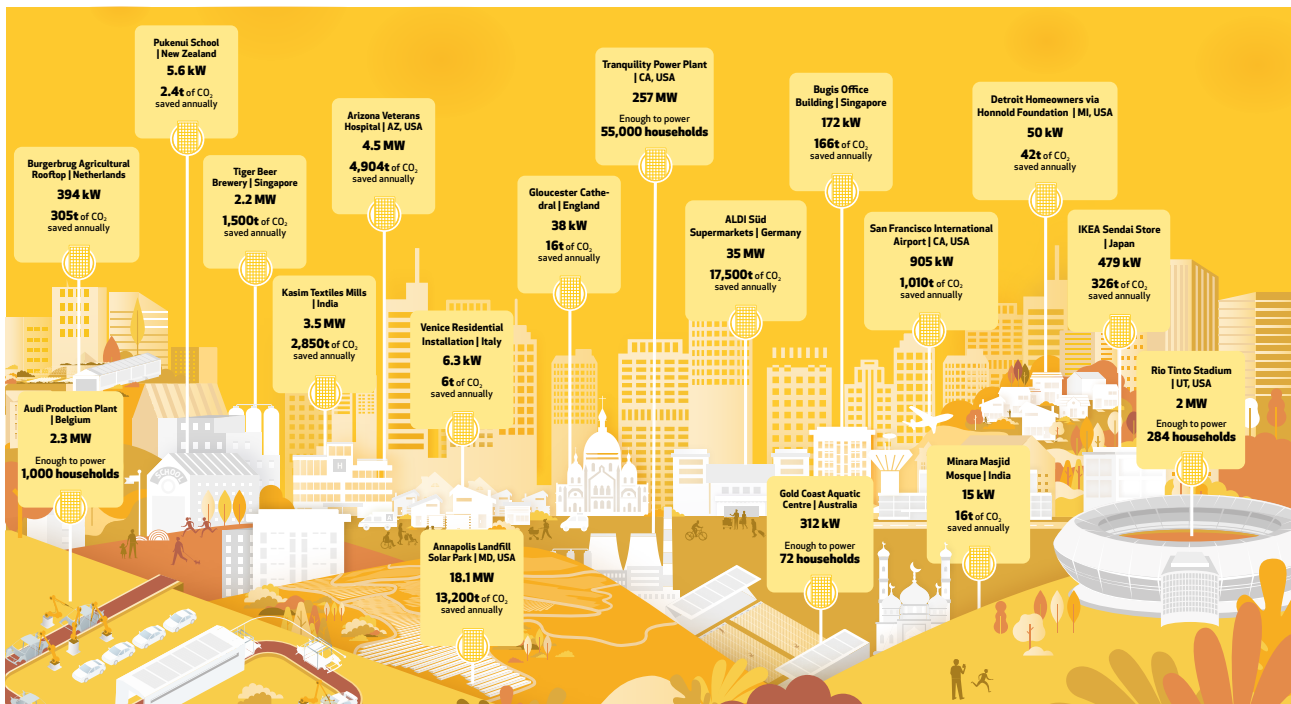
Our business relations with our partners and installers are based on 'Growing Together' approach. Education through the REC Certified Solar Professional Program is key to ensuring we are contributing to the industry in

a socially and environmentally responsible manner. In 2022, we increased our network of trained installers to 5,795 (up from 5,076 in 2021).

#### Continuous strengthening of REC's Channel Network

REC Partners: 80 (80 in 2021)

Installers trained cum.: 5,795 (5,076 in 2021)



**13.2 GW**  
REC solar  
panels  
installed

Generating  
**17.16 TWh**  
of clean solar  
energy

Empowering  
**20.43**  
million  
people

Saving  
**12 millions tons of**  
**CO<sub>2</sub> emissions**  
every year

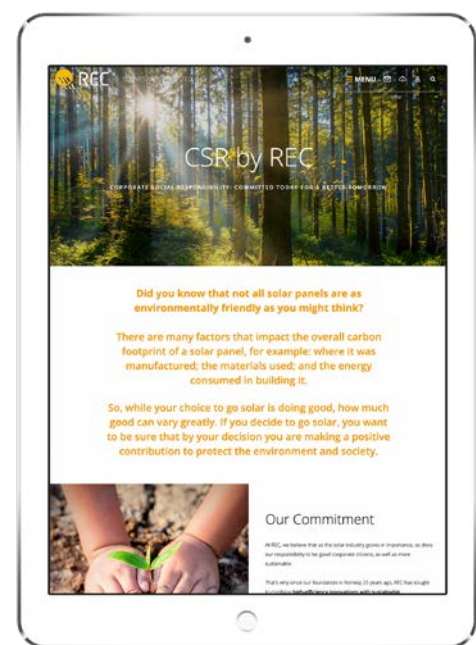
We continuously expand our channel network and solar footprint in line with REC's mission to empower consumers with clean solar energy and drive the global energy transition. In 2022, 13.2 GW of REC solar panels were installed globally, empowering 20.43 million people in communities worldwide, translating to 17.16 TWh of clean solar energy, saving 12 million tons of CO<sub>2</sub> emissions per year.

Our Certified Solar Professional Program ensures that all REC certified installers fully understand how to best and safely install solar panels, also in the interest of end-consumers. Furthermore, REC is regularly providing



detailed installation manuals and quick guides on various specific subjects, such as Connections & Connectors.

REC's dedicated sustainability website provides insights into our various initiatives and results. Information is updated regularly to create greater transparency for our consumers and industry customers to make informed decisions. In addition, this ESG report provides an overview of our initiatives, performance and KPIs to provide an overview and record of our performance year on year.























## Customer Satisfaction

REC achieved a high Net Promoter Score (NPS) of 65 in 2022 (no change from 2021) and showed continued confidence in our products and services among our customers worldwide. Our NPS scores rank REC highly for the way we handle our claims, product quality and the availability and supply of our products.

We continue to demonstrate a high level of satisfaction from not having any product recalls and a cumulative return authorization rate of under 100ppm since 2010. In the exceptional case that solar panels need to be returned, we are committed to keeping claims

process cycle times short to minimize the impact on our customers and consumers. In 2022, more than 80 percent of our claims were resolved within 14 days of receipt as per our target cycle times for processing claims.

Through external verification by third party certifiers, REC has achieved certifications for international standards set for a range of indicators that demonstrate the industry's satisfaction with the quality of our products.

CERTIFICATION	INTERNATIONAL STANDARD	TEST INSTITUTE
 Ammonia Corrosion Resistance	IEC 62716	
 Salt Mist Corrosion Resistance	IEC 61701 Severity Level 6	
 Potential Induced Degradation	IEC 62804	
 Non-uniform Snow Load	2PfG 2310/11.12.	
 Dynamic Mechanical Load	IEC 62782	
 Hail Impact	IEC61215 (35mm)	
 Cyclic Strength Wind Loads	BCA 2012 LH	
 Ignitability/Fire Resistance	ISO 11925-2; UL 1703	 
 Quality, Environmental & Safety	ISO 9001; ISO 14001; IEC 45001, IEC 62941	 

REC's products are backed by our comprehensive ProTrust warranty, which offers up to 25 years warranty on product, labor and performance, subject to conditions. With this, REC provides our customers with the peace of mind knowing their solar systems are performing at its optimal capacity when they are installed by REC Certified Solar Professionals.

Our REC Alpha and Alpha Pure Series panels have won two Intersolar Awards, making REC the only active solar panel manufacturer with three Intersolar Awards in total and being a PVEL Top Performer for seven consecutive years.



REC

EXPERIENCE  
 $\alpha$   
PERFORMANCE



7 consecutive years



## COMMUNITY INVOLVEMENT & DEVELOPMENT

Looking beyond our own production and customers, REC remains committed to empowering people worldwide with clean solar energy and education, in particular, people and communities in need. We have guidelines for community involvement and a community involvement checklist in our ESG framework.

We are proud to support a range of projects and initiatives that benefit the communities we work in and serve.

### USA

The REC Native American Solar Education scholarship aims to increase Native American Indian representation in the clean energy industry. For the second year, we have collaborated with Solar Energy International (SEI) to award solar training tuition fees to Native American students. In addition, REC donated 33 Alpha Pure 400Wp solar panels to SEI to power the next phase of SEI's lab curriculum for trainees in the solar industry.

By donating 66 TwinPeak 4 Black 365Wp Panels, REC also continued our support of Native Renewables in 2022. This women-founded non-profit helps to scale workforce development training and installation capacity and advance its mission to increase off-grid energy access and strengthen sovereignty across the Navajo and Hopi nations.

In 2017 and 2020, Santa Rosa in Northern California was devastated by wildfires. As the community moves on in recovery from these disasters, the Santa Rosa Fire Department continues to work with residents to help prevent as well as prepare for the threat of other future wildfires. In May 2022, REC sponsored a fundraiser for the Santa Rosa Firefighters Association to assist their work with residents to rebuild and prevent further wildfires.



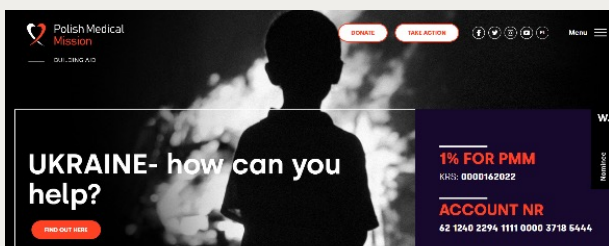


## Australia

House of Hope is a live-in facility for women seeking drug and alcohol support in Victoria, Australia. Due for completion in September 2023, the non-profit facility will provide eight rooms, including two family rooms for women to stay with their children for six months or longer. The Australian Women in Solar Energy (AWISE) have led the initiative to provide a rooftop solar system to the facility. In partnership, REC has supplied 85 TwinPeak 4 370Wp solar panels to help save around AU\$1,000 per month on electricity bills and supply the majority of the daytime electricity required by House of Hope.

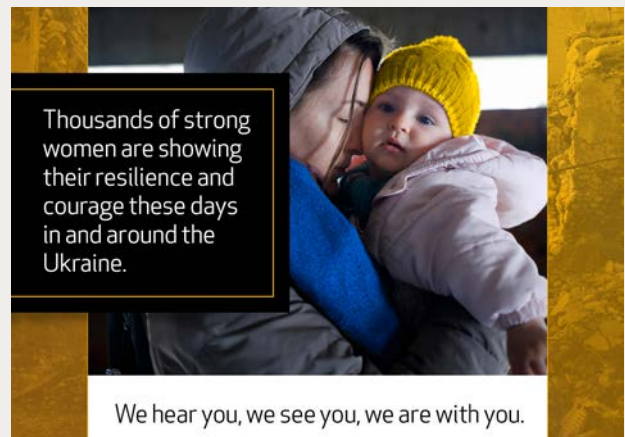
## Ukraine

REC stood strong with Ukrainian refugees and paid honour to Ukrainian woman during International Women's Day 2022. We donated EUR 10,000 to two Polish Non-Government Organisations taking care of refugees who had fled the war, Polish Medical Mission (PMM) and the Polish Red Cross (PKC). In addition, REC employees in Germany collected material donations to ship to refugee centers at the Polish border.



### Polish Medical Mission (PMM)

Since 1999, the PMM has been helping victims of wars, disasters and calamities. The activities of the PMM are based on the work of volunteer doctors, paramedics, nurses, physiotherapists, psychologists and medical analysts. PPM has been actively taking care of refugees at the Poland Ukraine border and have set up medical transports within Ukraine.



### Polish Red Cross (PCK)

PCK has been actively supporting refugees at the Poland Ukraine boarder with temporary accommodation, field beds, sleeping bags, blankets, food, personal hygiene products.

# GOVERNANCE

## ORGANIZATIONAL GOVERNANCE AT REC

REC has defined a three-level governance framework:

The overarching Social Responsibility policy sets objectives and practices for REC's activities. This defines the mandate for the ESG Steering Committee, whose members represent various REC departments and work out specific policies and action plans, such as guidelines for community projects and our Code of Conduct. REC continuously reviews this framework and updates as it is required.



### REC ESG Steering Committee



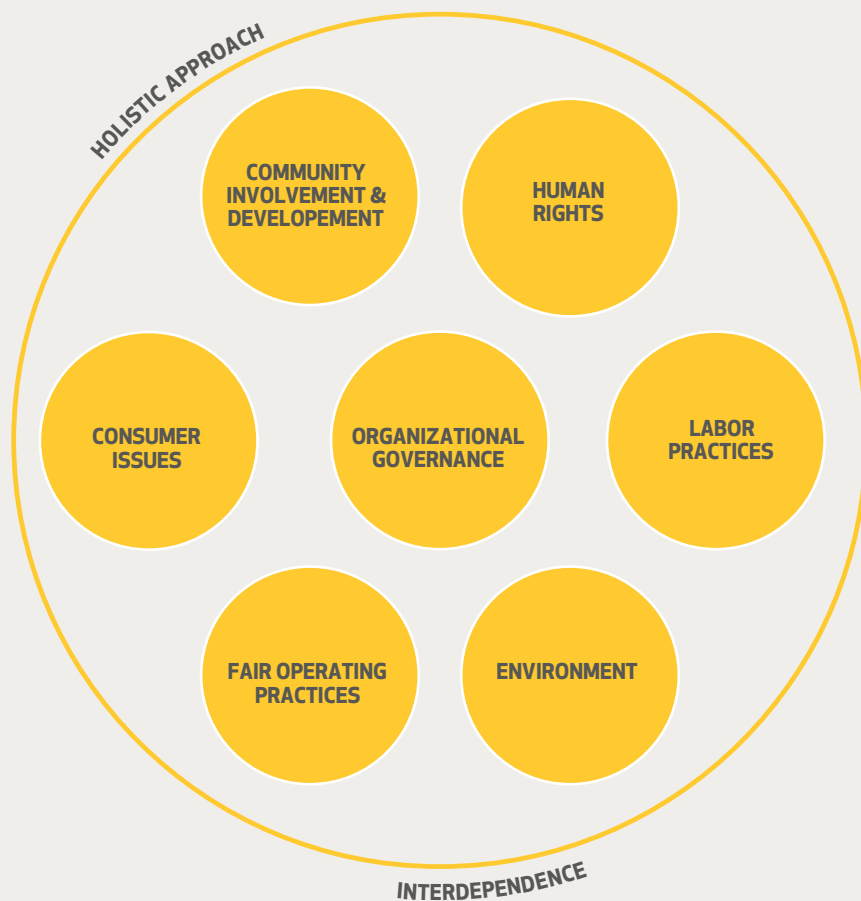


## ISO 26000

**REC's organizational governance ensures that policies and procedures under the ISO 26000 core topics are implemented effectively.**

Adhering to the ISO 26000 standard, organizational governance should ensure that decision-making and management practices are transparent and ethical.

We take the interests of multiple stakeholders into consideration and not just our shareholders. Most of all, attention is paid to sustainable development.



## FAIR OPERATING PRACTICES

### Trade Control Policy

We do not conduct business with countries, organizations or persons subject to sanctions or selective sanctions.

We examine possible transactions or partnerships concerning sanctions published by the US (OFAC), the United Nations and the European Union, and others such as the United Kingdom. We operate a Trade Controls Policy, which is strictly followed and reviewed on a regular basis with regard to sanctioned countries. Sanctioned countries are listed, updated and communicated within REC through our policy.

We refrain without any exception from dealings with 'red category countries' according to our Trade Control Policy. We have installed an Approval Committee, headed by the Chief Executive Officer, Chief Financial Officer and Chief Legal Officer, which must approve deals in such countries only after clearance by a third-party screening (e.g. Designated Person Lists). Such approvals are granted only in exceptional cases.





### Employee training

To ensure our employees understand and follow REC's fair operating practices, REC management undertakes regular mandatory training such as Re-certification on the Code of Conduct and Anti-Corruption or the California Sexual Harassment and Abusive law. In 2022, the Code of Conduct and Anti-Corruption Policy training

was completed for all new employees and re-certification (conducted every two years) achieved a 100 per cent completion rate. Policies updated in 2022 included 'Anti-Corruption, Competition, and Whistleblower Policies' and 'Anti Counterfeit and Retention of Title Guidelines'.

### Fair advertising & promotion

As part of our sales, our advertising and promotional policies serve as guidelines to prevent unfair competition and unfair sales promotion. In 2022, there were no deviations from our guidelines.

REC respects and takes confidentiality obligations and intellectual property rights seriously, both internal and external.



# CONCLUSIONS AND OUTLOOK

We are proud of the efforts our teams across the globe have made to improve our ESG responsibilities, but we know there's more to do. We also can't do it alone, so improving our customer partnerships, research, innovation, and supply chain transparency will be crucial to meet our goals.

To accelerate our sustainability efforts, REC plans to continue increasing the power density of our solar panels to allow consumers to mitigate the maximum CO<sub>2</sub> emissions possible. We will also strengthen our focus on the entire solar value chain through our audit process.



Throughout 2023, we aim to create and execute a global educational marketing campaign highlighting how installers and consumers can choose solar panels more responsibly and why it matters to pay attention to where they come from and how they have been manufactured and look beyond power and price.

While solar is an incremental contributor to reduce emissions and limit temperature increase to 1.5°C, it needs on average more than 1 billion of solar panels per year to achieve this. As the solar industry races to new levels of growth, it is important to make sure that

today's solutions do not become tomorrow's problem. Within REC's 2023 campaign, we will highlight water and energy consumption and waste management as part of the solar panel manufacturing process and how to minimize these.

Increasing power densities, reducing our resource consumption, increasing the longevity of solar panels and the circularity of the materials, as well as ethical sourcing for solar panels will stay at REC's top focus. This is our responsibility to the people and planet we serve.





SOLAR'S MOST TRUSTED

COMMITTED TODAY  
FOR A BETTER TOMORROW

[www.recgroup.com/csr](http://www.recgroup.com/csr)