



SOLAR'S MOST TRUSTED



# REC GROUP CSR REPORT 2022

TIME TO SWITCH TO MORE  
RESPONSIBLE SOLAR ENERGY

# INTRODUCTION

## We care about people and the planet

**As a global innovator in solar technology with 25 years of experience in the industry, REC Group cares about people and the planet. We work to empower people all over the world through clean solar energy, and to make a positive impact on the planet, on people and on communities through a robust Environment, Social and Governance (ESG) strategy.**

The positive impact of clean energy is more important than ever. Despite emissions reduction pledges made by countries around the world either at or following the 2021 COP26 Conference in Glasgow, there is still a huge emissions gap between now and 2030 if we are to keep to the maximum 1.5°C temperature increase agreed at COP21 in Paris in 2015. Solar energy has a major role to play in ramping up renewable energy worldwide, as REC has been emphasizing for a number of years: in our COP21 study 'Climate Change: Closing the Emissions Gap by Going Solar' published in 2016, it was estimated that an additional PV capacity of between 500 and 600 GW per year would be required to 2025 in order to abate CO<sub>2</sub> emissions enough to meet the 1.5°C target. As the 2022 United Nations Emissions Gap Report states, we are far off our emissions reduction targets, and system-wide transformation is needed. It is clear that everyone has to accelerate engagement, including REC Group.

Since its foundation, REC has aimed to empower people with clean, affordable solar energy while upholding responsible, sustainable business practices. Thanks to its high-efficiency products and eco-cautious manufacturing, REC is already contributing 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'. These goals set out parameters which are of importance especially for the power and energy industries.

Considering the urgency of mitigating climate change, REC is committed to further accelerating its efforts on Corporate Social Responsibility (CSR). However, our understanding of CSR has a much wider reach than clean energy. We focus on every aspect of our value chain, with governance structures to uphold ethical supply chains and fair operating practices, do our best for employees, protect and preserve the environment, and support local communities.

In this CSR report 2022, REC presents a comprehensive and transparent overview of our activities and results for 2021. The report is structured according to the core subjects defined in standard ISO 26000, which provides holistic guidance for CSR reporting. Our activities and reporting are driven by a dedicated CSR Steering Committee representing a wide variety of our corporate departments.

**“At REC, we believe that as the solar industry grows in importance, so does our responsibility to be good corporate citizens, as well as more sustainable.”**



Jan Enno Bicker, CEO at REC Group

<sup>1</sup> Source: <https://www.unep.org/resources/emissions-gap-report-2022>

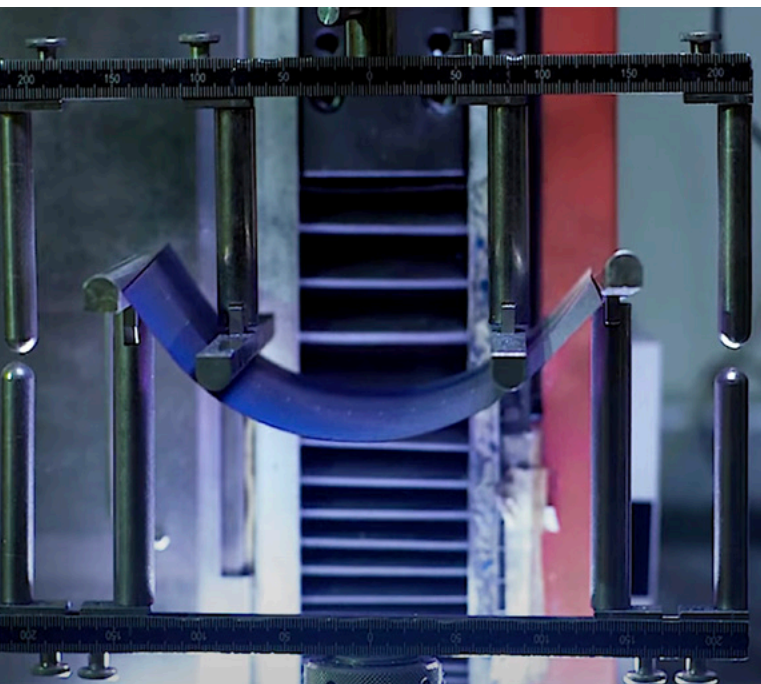
# WHO WE ARE

Founded and headquartered in Norway with production sites in Singapore and Norway, REC is a pioneering solar energy company – and a true advocate for global energy transitions.

By the end of 2021, REC had delivered a total installed capacity of 12 GW since the company's foundation in 1996. This translates to 15.6 TWh of clean solar energy per year, enough to meet the energy needs of over 18.5 million people around the world. Every year, REC solar panels save 11 million tons of CO<sub>2</sub> emissions.



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



## 25 years of driving innovation and manufacturing excellence

In 2021, REC reached its landmark 25-year anniversary in the solar industry – which means 25 years of innovation, 25 years in which REC has worked assiduously to increase efficiency and long-lasting performance, but also to reduce its own resource consumption. REC produces reliable, high-efficient solar panels based on innovative technologies, backed by the comprehensive REC ProTrust warranty package. Our solar panels have won multiple industry awards over the history of the company. We have won the prestigious Intersolar Award no fewer than three times – the one and only active solar panel manufacturer to have achieved this. Our premium Alpha and Alpha Pure solar panels based on advanced heterojunction cell technology continue this strong tradition.





### We define quality more broadly

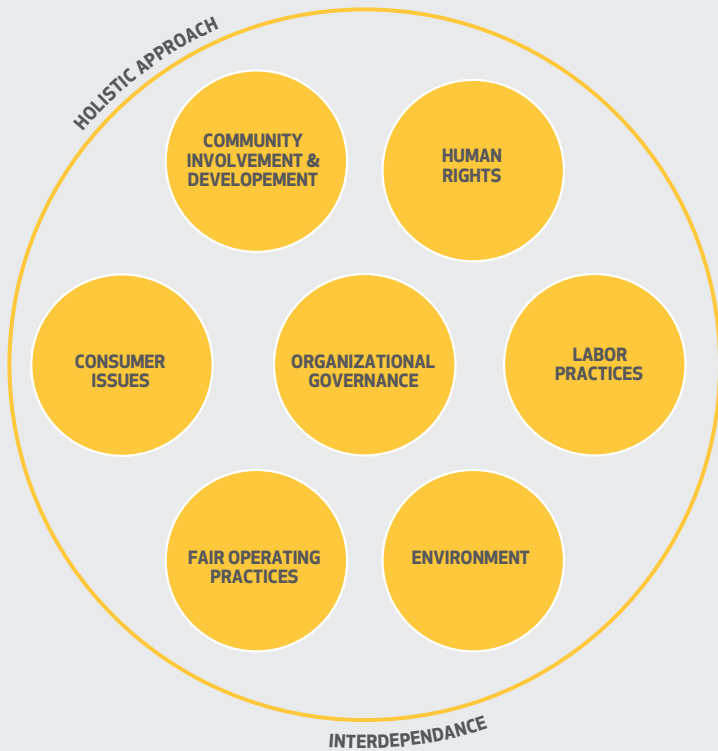
While we understand that global energy transitions can only happen with bold innovations that raise output efficiency, our focus on sustainability and quality embraces not only product technology, but also the entire value chain, from sourcing and manufacturing through to disposal of solar panels at the end of their service life. For REC, sustainability also means designing products which are here for the long-term, with a service life of 25 years and more. As such, we have a very low claims rate of well below 100ppm, which is also well below industry average.

Sustainability is key to our Code of Conduct, and our entire senior management is committed to upholding these principles in all business activities. In line with its wider social responsibility, REC makes extra effort to minimize the environmental impact of products through their entire service life, from production to disposal.

Leading the solar industry towards a more sustainable future, the latest iterations of the Alpha Series, the REC Alpha Pure and REC Alpha Pure-R, are lead-free and RoHS compliant for less environmental impact. In addition, many of REC's solar panels have also been independently confirmed as Low Carbon Footprint (LCF) products and/or have received Environmental Product Declarations (EPDs).

Under its new owner of Reliance Industries Limited, a Fortune Global 500® company, REC will continue to make the solar industry even more sustainable throughout the entire value chain. Together, we have huge expansion plans in India, Singapore and other locations and will follow our mission to bridge the green energy divide worldwide – for a better tomorrow for us and the next generations.

# ISO 26000 AND ORGANIZATIONAL GOVERNANCE



## Social Responsibility Core Subjects

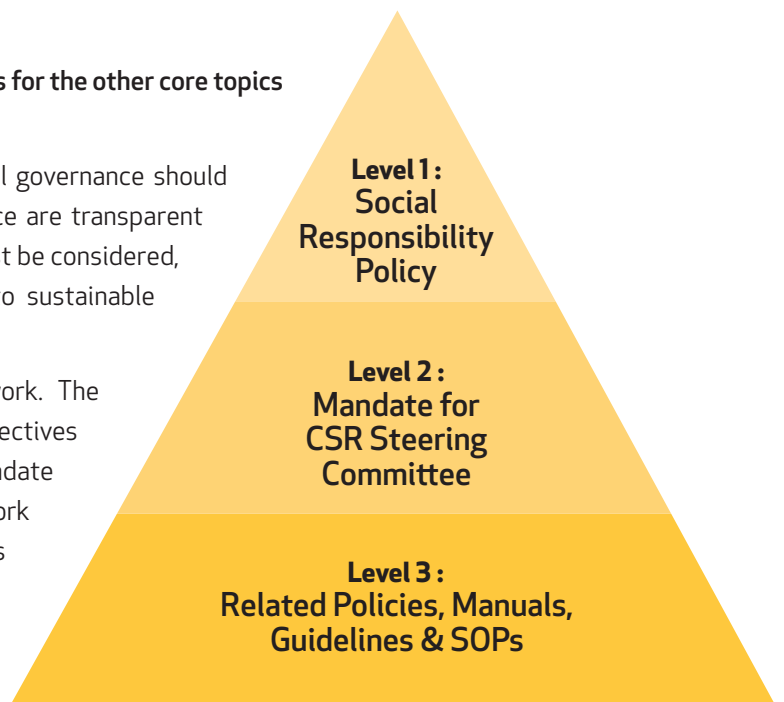
ISO 26000 is an international framework of standards that provide companies with guidance on how to operate in a socially responsible way. REC reports on its own Corporate Social Responsibility in alignment with the core subjects defined in the ISO 26000 standard.

## Organizational Governance at REC

**Good governance ensures that policies and procedures for the other core topics are implemented effectively.**

According to the ISO 26000 definition, organizational governance should ensure that decision-making and management practice are transparent and ethical. The interests of multiple stakeholders must be considered, not just shareholders, and attention must be paid to sustainable development.

REC has defined a three-level governance framework. The overarching Social Responsibility policy sets out objectives and practices for REC's activities. This defines the mandate for the CSR Steering Committee, whose members work out specific policies and action plans, such as guidelines for community projects, or our Code of Conduct. REC continuously reviews this framework and updates it as needed.



**REC CSR Steering Committee**

**Chia Wai Leng, HR**



**Jon Tsan, Customer Quality Assurance**



**Alice, HR & Training**



**Tan Teck Cheng, QA & HSE**



**Birgit Harbauer, Legal & HR**



**Desmond Goh, HSE**



**Trude Nysæter, Sustainability REC Norway**



**Tan En Hui, Facilities**



**Agnieszka Schulze, PR & CSR chairperson**



# REC GROUP CSR FACTS

Key Results 2021

## HUMAN RIGHTS

**0**

tolerance policy towards human right violations

**29**

supplier audits

**0**

violations identified of CSR or HSE principles (including human rights and labor practices)

## LABOR PRACTICES

**1**

HSE incidents

Continued **COVID-19 Safe** Management measures

**100%**

committed to Diversity and Equality

**39%**

of female employees (up 9 percentage points)

**17**

new recruits over age 45

## FAIR OPERATING PRACTICES

**0**

non-compliance identified with REC's Trade Controls Policy

**0**

non-compliance identified with REC's Fair Advertising and Promotion guidelines

**100%**

re-certification of employees on Code of Conduct and Anti-Corruption

## CONSUMER ISSUES

**12 GW**

overall installed REC solar panels

**15.6TWH**

generated clean solar energy per year

**18.5M**

people empowered with solar energy

**11M**

tons avoided CO<sub>2</sub> emissions per year

**833**

installers trained

**72 PPM**

claims rate

**84%**

claims closed within 14 days

**TOP PERFORMER AWARD**

by PVEL for half-cut cell technology

**3**

new Environmental Product Declarations (EPD)

**INTERSOLAR AWARD**

for REC Alpha Pure solar panel

ENVIRONMENT

**SAVING RESOURCES, INCREASING CIRCULARITY**

at REC's production sites in Singapore and Norway

**129,236 M<sup>3</sup>**

of water saved per year (equivalent to consumption of ~2,225 people)

**761 M<sup>3</sup>/MW**

of total process water usage in Singapore (-38% vs 2020)

**0.2 M<sup>3</sup>/KG SILICON**

of waste water generation in Norway

**106 MWH/MW**

of total energy consumption in Singapore (-28% vs 2020)

**52 KWH/KG SILICON**

of total energy consumption in Norway

**2,610 MWH**

of generated clean solar energy from own rooftop installation in Singapore

**2,900 T CO<sub>2</sub>**

saved through own clean solar power generation

**28,765 MODULES**

sent for recycling (0.5% of total production)

**100%**

recycling rate of scrap modules in Singapore

**6-7 CO<sub>2</sub>-eq /KG**

**SILICON EST.** thanks to Kerf upcycling innovation in Norway

**4.78 T/MW**

of waste generated in Singapore (-30% vs 2020)

**0.9 KG/ KG SILICON**

of waste generated in Norway

COMMUNITY INVOLVEMENT AND DEVELOPMENT

**116**

communities empowered with clean solar energy by donating REC solar panels

**SUPPORT UNIVERSITIES AND POLYTECHNICS**

in developing and harnessing young talents for the cleantech economy



# HUMAN RIGHTS

Efficiencies in production and sourcing are key to module prices. However, REC also pays close attention to the conditions under which employees work, also at our upstream suppliers.



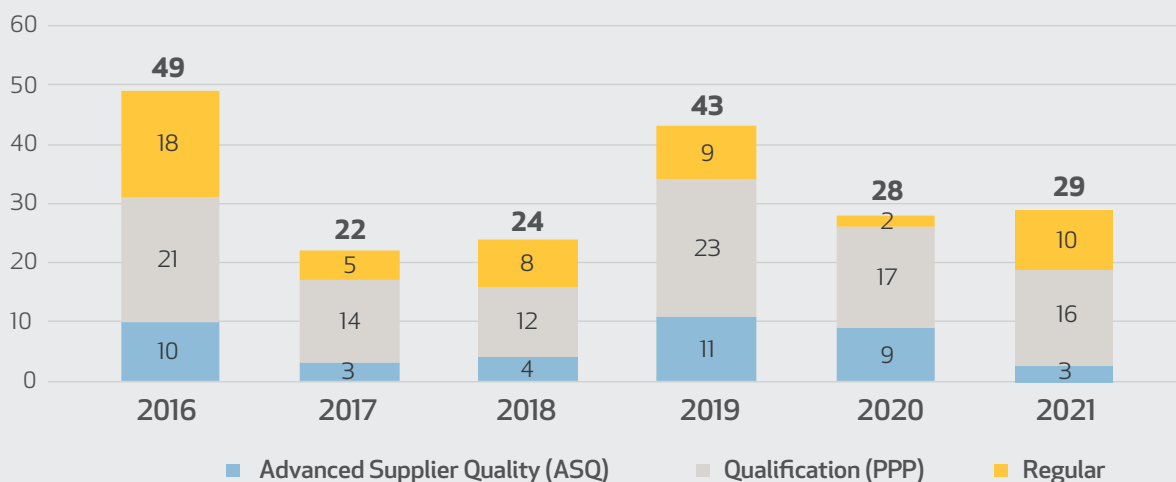
To be globally competitive, any manufacturer has to keep a keen eye on costs. For REC, this never means exploitation of employees. Human rights violations are however an issue in many manufacturing industries worldwide, including solar. REC abstains from any business activities that might compromise human rights, or which involve child labor, prison labor or forced labor. We manufacture in Singapore and in Norway. Both countries have strict human rights laws, which REC of course follows.

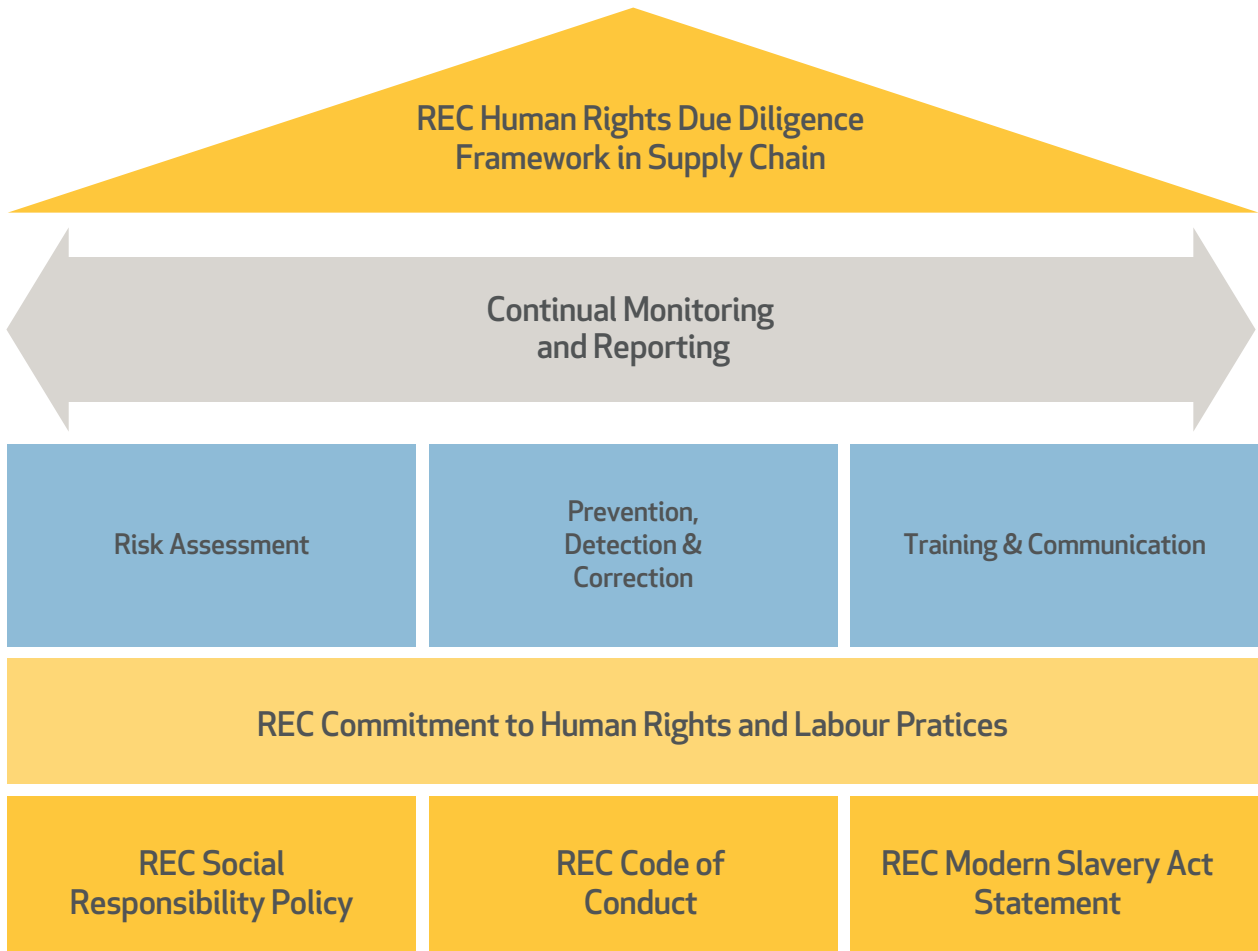
## Supplier audits

We also expect high standards from our upstream suppliers and undertake regular audits. These audits examine labor practices, working conditions and HSE management systems, as well as observance of human

rights standards. REC conducted 29 supplier audits in 2021 (28 audits in 2020). Three new suppliers were audited, as well as 16 major changes of materials. The audits revealed no deviation from our high standards.

Number of Supplier Audits on CSR & HSE





We continuously monitor new policies, and regularly review our own audit checklist to ensure the scope remains fully aligned with changes in regulatory frameworks. We positively welcome stricter rules to ensure high standards for all manufacturers.

Moving forward, REC is working on a new framework for conducting due diligence checks of human rights

compliance on identified supply chain of concern. This new framework will be built on three main pillars:

1. Risk Assessment;
2. Prevention, Detection & Correction;
3. Training & Communication.



# LABOR PRACTICES

With three strong pillars defining labor practices, REC has a consistent commitment to employee welfare, learning and development. Each of the pillars is driven by a common set of KPIs, enabling year-on-year comparisons of metrics for continuity and focus.



## Responsible HR Management Practices

The company is committed to diversity and equality, irrespective of gender, age or qualification. 17 of our new hires in 2021 were in the 45-plus age group. We also re-employed four people who passed retirement age. Reflecting REC's commitment to promoting diversity in the workforce, the percentage of women in REC's workforce continues to grow in huge steps – up from 30% in 2020 to 39% in 2021. Various initiatives for female professionals continue to encourage professional development and close collaboration, with growing numbers of women being promoted to more senior roles: in 2021, there were 89 promotions for men, and 58 for women.

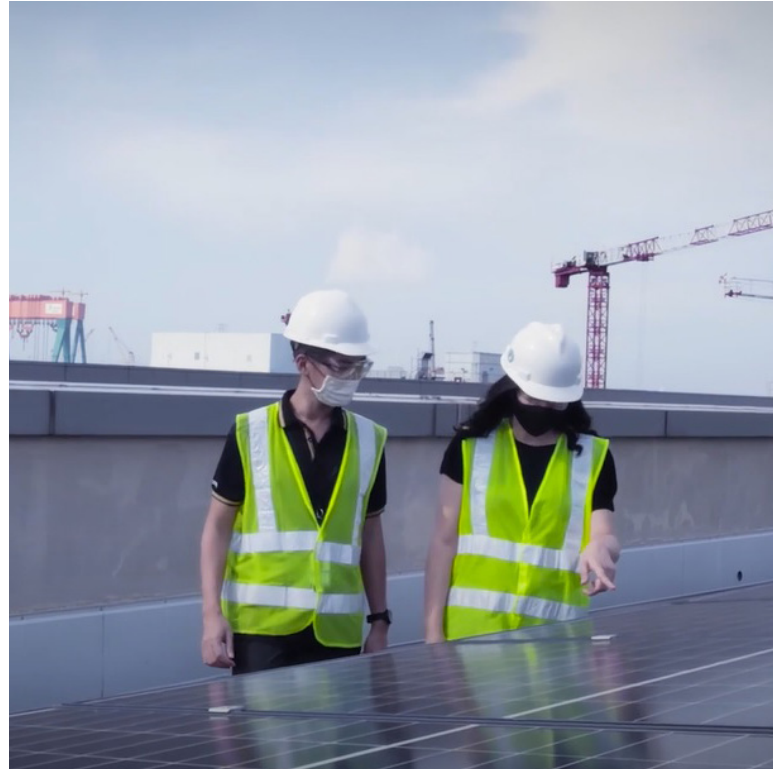
We work to empower people and recognize talents – for example with our 'CEO Excellence Awards' for employees. In addition, we are committed to developing new talent for the solar industry and offer a pathway to new entrants. To achieve this, REC has stepped up collaboration with universities and polytechnics, offering combined work-study programs to degree and diploma students. We awarded scholarships and prizes, and also offered 14 internships and two SGIS scholars, while continuing our internal programs to re-skill and re-train employees.



## Responsible Workplace

REC's objective is to improve the quality of employees' working lives. We do this through consistent standards and policies that require long-term commitment. Most importantly, in accordance with our 'zero accident' policy, we take every measure to keep employees safe and healthy. In 2021, the Health Matters initiative was launched to raise individual focus on health. The employee focus is reflected in our retention rate: 35% of the workforce has been with REC for eight years or more.

Safety during the pandemic has been exemplary. Measures to prevent infections were put in place rapidly, such as offered health screenings. The REC@ Home initiative continues to enable employees to work from home while still collaborating effectively with colleagues. Apart from this, 15 health webinars have been offered on various issues, e.g. Women's Health, Family Togetherness in Difficult Times, and Keeping Your Brain Healthy and Productive.



## Making CSR a shared commitment for employees

In 2021, REC conducted a CSR survey among employees. An overwhelming majority of 98% indicated that it was important for their organization to be socially responsible, and 76% said that they would volunteer their time to CSR initiatives. In line with REC's role as a global advocate on sustainability, we consistently engage employees with CSR activities that reflect

their own commitment. We also encourage eco-friendly practices at facilities that go well beyond standards mandated by local regulations. Initiatives in 2021 included the elimination of polystyrene boxes and straws for take-away food, more paper and can recycling, and a 'lights-off' campaign to save on office lighting.



# ENVIRONMENT

## WATER, ENERGY AND WASTE



### Water

Water Saving & Recycling Programs

- **129,236 m<sup>3</sup>** water saved/year - equivalent to annual water usage of ~2,225 people



### Energy

Energy Saving Initiatives  
Clean Solar Power Generation

- **2,900 t** CO<sub>2</sub> emissions saved/year



### Waste

Non-hazardous Waste  
Hazardous Waste  
Modules and Kerf Recycling

- **28,765 modules** sent for recycling



## Water savings & recycling programs

REC is committed to responsible use of the water required for production (process water). We have put measures in place to continuously reduce our consumption, and also to treat as much water as possible for reuse.

**In Singapore, total process water consumption for 2021 was 761 m<sup>3</sup> per MW, down from 1,223 m<sup>3</sup> per MW in 2020 (-38%).**

- We continue to recycle water through Reverse Osmosis (RO) treatment technology.
- At the end of 2020 we also introduced RO Reject Recycling for mono/HJT production. As a result, 129,236 m<sup>3</sup> of water was saved during 2021.



- We also continued to treat wastewater. Having completed pilot testing for non-HF wastewater recycling in 2020, we are working toward full implementation. Wastewater treatment is projected to save 131,400 m<sup>3</sup> per year.
- Rainwater harvesting is another way in which we save water. 50% of sitewide trenches at the Singapore plant are interconnected, and rainwater is harvested and pumped to cooling towers after filtration. To connect the remaining trenches, we are first modifying storm drains, and rainwater harvesting is set to begin after completion of this project in 2023. This project is expected to save 10,000 m<sup>3</sup> of water per year.

For our production sites in Norway, wastewater generation in 2021 increased to 1,150,000 m<sup>3</sup> from 429,000 m<sup>3</sup> in 2020 following the ramp-up of the new production lines for the innovative silicon kerf recycling process technology.

Reverse Osmosis (RO) reject water recycling in Singapore

## Energy savings

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

### Singapore

Electricity consumption at our Singapore production site was 106 MWh per MW in 2021, compared to 148 MWh in 2020 (-28%). The following measures at our Singapore plant resulted in significant energy and emissions savings:

- **Optimizing supply of chilled water**

Energy savings: **2,190 MWh per year**

CO<sub>2</sub> emission reduction: **876 tons per year**

- **Cold shutdown of non-running module lines & laminators**

Energy savings: **1,860 MWh per year**

CO<sub>2</sub> emission reduction: **744 tons per year**

- **Relocation of wafer lab tools**

Energy savings: **154 MWh per year**

CO<sub>2</sub> emission reduction: **61.6 tons per year**

- **Reduction of oxidizer heater temperature**

Energy savings: **153 MWh per year**

CO<sub>2</sub> emission reduction: **61.2 tons per year**

### Norway

Following very low production volumes in 2020 owing to the restructuring of silicon production to innovative kerf recycling technology (see page 17), production in the Norway plants was ramped up in 2021. The Norway plants report on energy consumption in terms of consumption per kg of silicon, which is why there is a substantial decrease from 2020 (with lower production volumes) to 2021.

**Total specific electricity consumption in 2021 was 52 kWh per kg silicon, compared to 132 kWh per kg silicon in 2020 (-61%).**

### PV installation at REC in Singapore

REC generates energy through our own rooftop solar installations, reducing our electricity consumption and our own carbon footprint. To date, around 3,000 kWp solar panel systems have been installed at our production site in Singapore. In 2021, the rooftop installation at our Singapore factory reduced our emissions by approx. 1,190 t of CO<sub>2</sub>.



Chiller optimization at REC in Singapore



REC in Norway



REC in Singapore

### Waste Reduction Program

We differentiate and separate waste to recycling as much reusable material as possible.

### Non-hazardous waste

Non-hazardous recyclables include glass, metal, aluminum, paper, wood and plastics. REC closely monitors and accounts daily recyclable waste along the full production chain. In 2021, we achieved an average recycling rate of recyclable materials of 58.3 percent in Singapore. The total non-hazardous waste in 2021 was 3.72 tons per MW production output, compared to 4.22 tons per MW in 2020 (-12%).

In Norway, REC takes most of its side streams into production. Of the amounts not taken back, over 90% is sold as new products, such as Solarite, which can be used as liming agents and fertilizers and serves to clean drainage water from roadwork landfill sites. Like at our Singapore production site, metal, aluminum, paper, wood and plastics are sent to recycling. In 2021, REC in Norway generated 3,212 tons of non-hazardous waste in total, compared to 1,795 tons in 2020 due to the ramp-up of production in 2021.

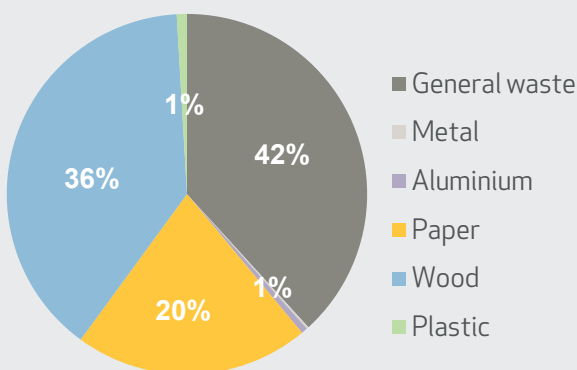
### Hazardous waste

The largest category of non-recyclable waste at our production site in Singapore is Hydrogen Fluoride (HF) sludge, a by-product of cell production which is sent for landfill. Our focus here is on efforts to continue to reduce this waste or recycle it. In order to do this, REC continues with three initiatives and collaboration with third parties.

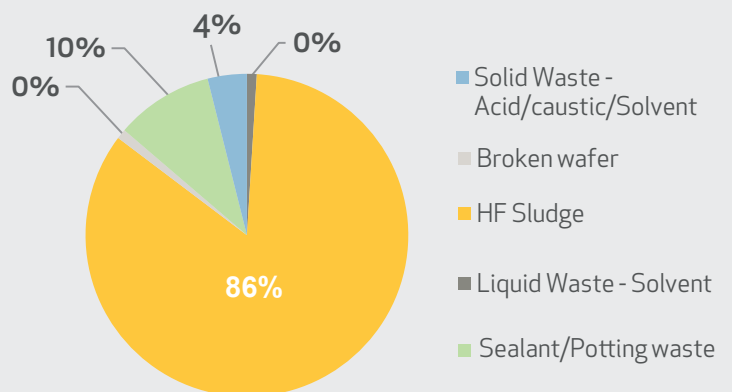
Among the successful measures, we completed a program to scale back chemical (lime) dosage in treatment lines, which directly reduces sludge volume. We are further optimizing HF treatment by exploring options to use a new polymer in the flocculation process. A study is underway on new treatment technologies to recover HF from HF wastewater and re-use it in production or sell it as raw material. Pilot testing is ongoing, and the plant is due to be set up at the Singapore site in late 2022.

In 2021, 0.91 tons per MW of HF sludge was generated, compared to 2.35 tons per MW in 2020 (-61%). The total generated hazardous waste in 2021 was 1.06 tons per MW in Singapore, versus 2.57 tons per MW in 2020 (-59%), while in Norway it was an absolute value of 4.3 tons, compared to 2.8 tons in 2020 due to the ramp-up of production in 2021.

Non-hazardous waste Singapore



Hazardous waste Singapore



# ENVIRONMENT MODULE AND SILICON RECYCLING

Since 2014, the year after the REC recycling program for scrap solar modules was launched, REC has achieved a recycling rate of 100%. Based on REC's manufacturing excellence, the scrap rate is low, averaging out at 0.5% of production. In 2021, 28,765 solar modules were sent for recycling.

REC retrieves the following materials from module recycling:

- aluminum (from frame)
- silver (from the cell)
- copper (from cables, connections and ribbons)

Recycling requirements differ from country to country. REC acts in accordance with local regulations in its key markets. In Europe for instance, we partner in the "take-e-away" program, which offers businesses easy solutions for WEEE.



## Huge step to more circularity

A low carbon footprint (LCF) solar panel is vital for project developers to secure deals. In France, for example, developers must offer LCF solar panels in order to be eligible to bid for public tenders. The carbon footprint of solar modules is defined especially in terms of silicon production. This is the most energy intensive step of manufacturing solar panels and has the greatest environmental impact. As such, circular and low carbon footprint production of solar grade silicon is set to become a key differentiator for solar panel brands.

REC's polysilicon already has the world's lowest carbon footprint, putting the company in pole position. However, REC is committed to doing even more. REC is the first and to date only solar panel manufacturer worldwide to embark on the next big innovation to further reduce energy consumption and carbon footprint: Kerf Upcycling



### Kerf upcycling for the circular economy

A problem with the production of wafers from solar silicon is the low-quality by-product. During the standard wafer slicing process, around 30% of the silicon remains as “waste”, or kerf. “Kerf” is defined as the very fine material, generated during wafer sawing. For more than 20 years, the industry has tried to find a way to upcycle the kerf back to solar grade silicon in full scale, without success until now. REC has invented a unique kerf processing technology which makes it possible to fully upgrade this otherwise low-value silicon material to a quality level which can be easily reused in wafer and solar panel production. Compared to the conventional Siemens process used by the majority of the industry players, mainly in China, we calculated that we can

drastically reduce energy consumption and carbon footprint by at least 80%. Considering the huge amount of kerf generated in silicon production worldwide (more than 200,000 tons a year), this recycling is not only an important innovation for REC, but also for the entire solar industry.

REC took this unique kerf processing method into production in 2020: the new line was installed, and by the end of the year we had begun mass production with this important new technology. Based on the new process, REC is able to reduce direct electricity consumption per kg silicon significantly, translating into estimated reduced emissions of 6-7 CO<sub>2-eq</sub>/kg silicon. A full lifecycle analysis is to be performed in 2023.

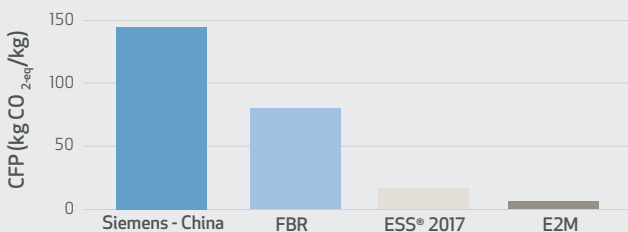
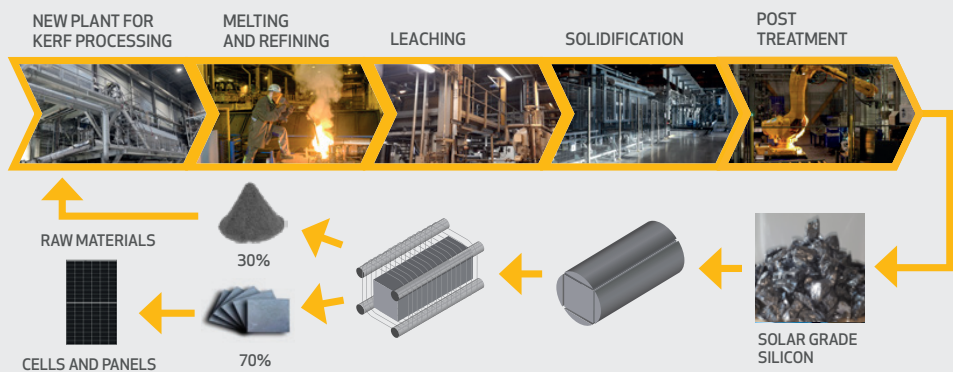
### Other positive impacts of kerf upcycling

We plan to receive 20,000 to 23,000 tons of wet kerf (waste) from wafer producers per year and upcycle it in our production line. This means 24,000 tons less quartz will be needed overall per year, reducing the negative impact of mining, including energy and water consumption.

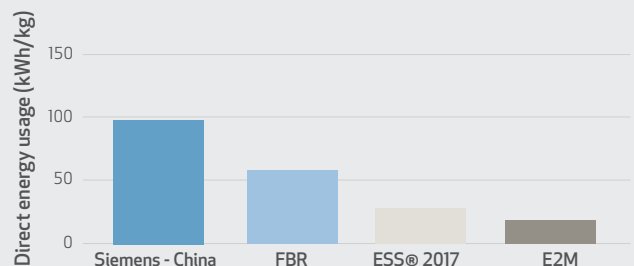
of the wet kerf is water. Before the kerf can be put into our kerf upcycling process, the water has to be taken out in big ‘dryers’. As most wafer production is in China, this means at present, approximately 10,000 tons of water is being transported from China to Norway per year, which in itself causes emissions. We plan for a pre-drying before the transportation of the kerf to Norway.

The challenge we are still working on is that up to 50%

### REC's New E2M Process



96% lower carbon footprint



85% lower energy consumption

# FAIR OPERATING PRACTICES

We also convey our values in international relationships.

## Trade control policy

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

We examine possible transactions or partnerships with regard to sanctions as published by the US (OFAC), the UN and the EU as well as other countries (e.g. UK). We operate a Trade Controls Policy which is strictly followed. Sanctioned countries are listed, updated and communicated periodically within REC in our policy. Our Trade Control Policy is reviewed twice annually with regard to any updates to the list of sanctioned countries.

We absolutely refrain without any exception from dealings with “red category countries” according to our Policy, which were for 2021: Cuba, Iran, North Korea, Sudan, Crimea Region of Ukraine, and Syria. For all other sanctioned countries (for example Afghanistan, Lebanon, and Venezuela), we have installed an Approval Committee headed by the CEO, CFO and Chief Legal Officer, which would have to approve deals in such countries, and only after clearance by a third-party screening (e.g. Designated Person Lists). Such approvals are granted only in exceptional cases.

## Employee training

In order to ensure that all our employees understand and follow REC’s fair operating practices, management undertakes regular mandatory trainings, such as Re-certification on Code of Conduct and Anti-Corruption or on the California Sexual Harassment and Abusive law. In 2020, all trainings achieved a 100% completion rate. Re-certification takes place every two years, and is next due in summer 2022.

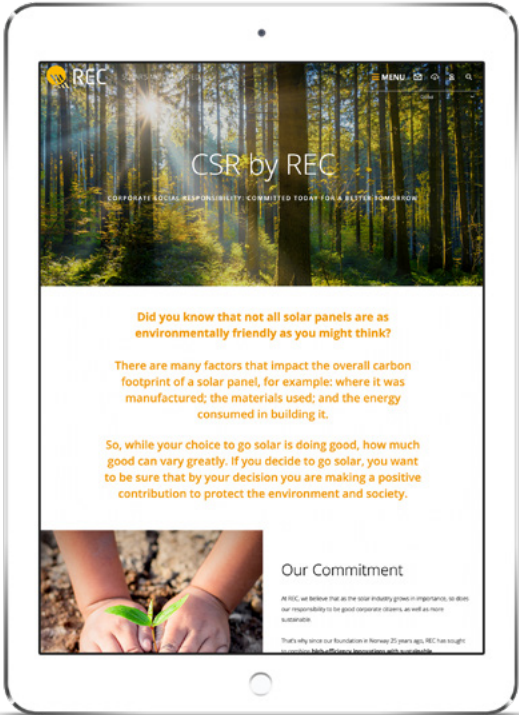
## Fair advertising & promotion

On the sales side, we implemented standards and policies for advertising and promotion in May 2021 and continue to develop these policies. They serve as guidelines to prevent unfair competition and unfair sales promotion. In 2021, there were no deviations from our guidelines.

**REC respects and takes confidentiality obligations and intellectual property right seriously, both internally and externally.**



# CONSUMER ISSUES



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

The ISO 26000 standard encourages organizations to take responsibility toward consumers, for example by promoting sustainable consumption and protecting health and safety. In a bid to communicate CSR efforts more transparently, in 2021, REC launched a dedicated CSR website with insights into our various initiatives and results, and also began publishing this CSR report. These channels make it easier for B2B customers and consumers to judge REC products on their CSR record.

In line with REC’s mission to empower consumers with clean solar energy and drive global energy transitions, we are continuously expanding our channel network and solar footprint: Up to the end of 2021, 12 GW of REC solar panels had been installed, empowering 18.5 million people in communities worldwide with 15.6 TWh of clean solar energy, and mitigating 11 million tons of CO<sub>2</sub> emissions per year.

## Growing together

This is driven by continually expanding our network of partners and installers, and our solar footprint, as much as possible considering our production capacity. As a responsible partner, REC onboards only customers which we can also serve. With our Customer Management System, we focus on fair and long-term relationships with partners and clients, applying standards and policies such as fair and factual marketing, the REC Code of Conduct and strict rules on protecting customer data. Our business relations with our partners and installers are based on the approach ‘Growing Together’. As such, the education through the REC Solar Professional Program is a key pillar. In 2021, we trained an additional 833 solar professionals on how to best install REC solar panels to the benefit of the consumers, and continue to expand this network. We also operate clear procedures on social responsibility – also paying attention to the credibility of suppliers and project developers in terms of their CSR balance sheet.





## High product quality for sustainable customer satisfaction

Keeping customers satisfied is also a big part of the ISO 26000 standard around consumer issues. This has always been the foundation of our business. Our products meet consistently high standards both on technology innovation and manufacturing quality for long-lasting performance to the benefit of consumers.

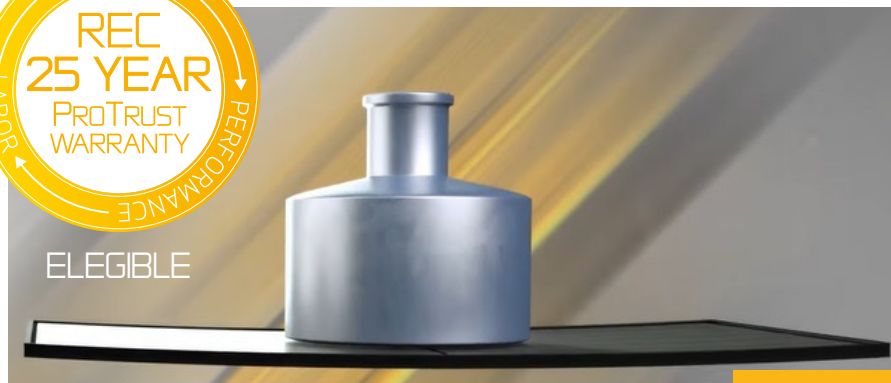
In 2021, REC continued to secure a low cumulative claims rate of well below 100 parts per million (ppm), making REC a reliable partner for solar professionals and project developers of residential, commercial and utility installations. In the exceptional case that solar

panels need to be returned, we are committed to keeping claims process cycle times short, in order to minimize the impact for our customers and consumers. In 2021, we again achieved our target of closing more than 80% of all claims within 14 days of receipt.

The quality of REC products is confirmed by nine external certifications of ISO IEC and other standards, thereby giving customers extra assurance of REC's manufacturing excellence. Among other standards, REC solar panels are certified to withstand snow loads of up to 7,000 Pa and wind loads of up to 4,000 Pa.

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	 

To give our installers and consumers long-term peace of mind, our high quality products are backed by our comprehensive REC ProTrust warranty, which offers up to 25-year coverage on product, labor and performance, subject to conditions. For its premium Alpha solar panels, REC is guaranteeing at least 92% of the nameplate power in year 25, a testament to the high long-term performance of its products.

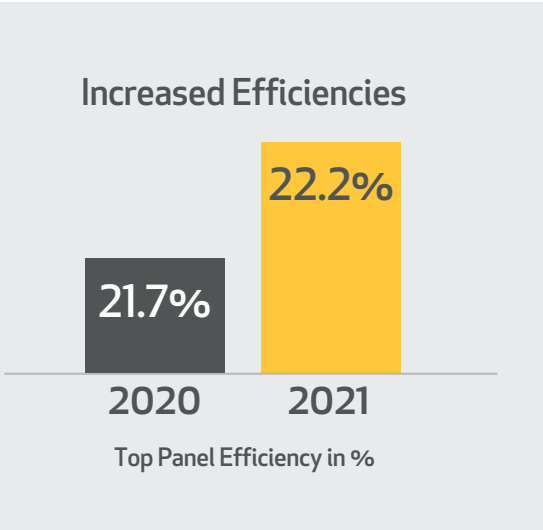


### Innovation and awards

With three product innovations launched in 2021 alone, REC continued its proven record of excellence in technology innovation and manufacturing quality to the benefit of consumers. The REC Alpha Pure solar panel testifies to our continued efforts to lessen environmental impact. It has higher power output than its predecessor but is lead-free and RoHS compliant. REC also launched the REC TwinPeak 4, the fourth generation of REC’s highly successful solar panels, and REC rounded out the year with the launch of the REC N-Peak 2, the second generation of its series of high power density solar panels with mono n-type cell technology. Overall, REC increased its top panel efficiency to 22.2% in 2021.

The stream of innovation continues into 2022, with the REC Alpha Pure-R – also lead-free – marking another advancement of the multiple award-winning Alpha Series.

Technology leadership is also reflected in award wins and excellent scorecard rankings for REC products, giving our customers the certainty that they are choosing a reliable product with long-term efficiency and performance. The REC Alpha series has so far reaped multiple awards, including a prestigious 2020 Intersolar Award. For the sixth year running, REC’s half-cut technology was named ‘Top Performer 2021’ in the annual PV Module Reliability Scorecard by PVEL-DNV GL, the world’s largest independent expert & certification body for renewable energy.



6 consecutive years

3 product innovations in 2021 only



### Benefit to our customers' business

In 2021, EPD Norway approved and published Environmental Product Declarations (EPDs) for solar grade silicon and for multicrystalline silicon blocks made by REC. With an EPD for solar grade silicon, authorities, developers and individual customers can objectively assess their choice of solar PV product with respect to its embedded carbon footprint. REC in fact boasts

the lowest carbon footprint in the world for solar grade silicon. Our customers – mainly project developers and installers – can therefore present a compelling business case for public and private sector tenders with solar panels that have impeccable credentials on sustainability.

### Benefit to people and the environment

In 25 years of innovation, REC has gained the trust of consumers and won a reputation as a leader on sustainability. All REC's initiatives translate into products that benefit people and the environment, with solar panels that have a certified low carbon footprint or are lead-free.

Released into the environment, lead can make its way into soil, ground water, and also food. A typical solar panel today still contains approx. 24 g of lead. This does not seem much – but the total soon mounts up. In 2020, around 400 million solar panels were produced worldwide, and together, they will eventually add around 10,000 tons of lead to the ecosystem.

This is why innovations such as the REC Alpha Pure are

so important. The panel is lead free (RoHS compliant), meaning it adds no lead to the ecosystem at disposal.

Many of REC's solar panels are independently confirmed as Low Carbon Footprint (LCF) products by Certisolis, with a highly beneficial impact on the environment. This owes much to REC's innovative use of 100% recycled silicon kerf in its Norwegian production, powered by hydro energy, which ensures solar grade silicon is manufactured with an extremely low carbon footprint. In 2022, we expect that more than 250 GW of solar PV panels will be installed worldwide. If all of them would have a lower carbon footprint of 100 kg CO<sub>2-eq</sub>/kWp less, the world could save 25 Mt of CO<sub>2-eq</sub> in just one year. This is the equivalent to 6.7 coal-fired power plants in the US<sup>2</sup>.



<sup>2</sup>EPA GHG equivalencies calculator

# COMMUNITY INVOLVEMENT & DEVELOPMENT

REC remains committed to empowering people worldwide with clean solar energy and education. Guidelines for community involvement are defined as part of REC's CSR framework, and REC is proud to support a range of projects and initiatives around the world.

## Australia

To assist in recovery from Australia's Black Summer Bushfires in 2019-2020, REC in 2020 began providing solar panels to non-profit community groups, giving schools, sporting clubs, community hubs and emergency services access to approximately 50 x 6.5kw fully installed systems complete with REC Alpha Series panels, inverters and racking. This project was completed in 2021, and provided solar installations to 15 community groups in total.



**"We've been really fortunate in that REConstruct has donated an amazing solar panel system to our school. We will hopefully work towards zero emissions, which is the goal not just of our school but also of our community as there is no doubt the bushfires were caused by climate change."**

Clifton Creek Primary School

## India

REC partnered again with the NGO Global Himalaya Expedition (GHE) to bring solar power to rural medical centers in the Himalayan region of India. REC Alpha and TwinPeak solar panels now provide two centers with

24/7 energy access, enabling better critical healthcare, a reduction in infant mortality, and higher immunization due to proper transportation of vaccine for almost 100 villages. This project was completed in 2021.



Pre and post solar PV installation for comparison

## Singapore

To provide people with development opportunities, REC increased its participation and collaboration with universities, offering scholarships as an easier access path into further education for more people and provided 14 internship positions in REC. Going by the results of a CSR survey of REC employees at the end of 2021, community involvement is set to remain strong:



In partnership with other sponsors, REC donated a 10.2 kW solar system of 30 REC Alpha solar panels to The Living Room, a women’s shelter which provides housing, food and outreach to over 1,200 women and children each year. The new solar system will save The Living Room in excess of \$150,000 over the life of the solar system.

REC people stated that ‘giving back to communities’ is the most important aspect of CSR for them. Based on these results, REC management is initiating the ‘Year of CSR Employee Engagement’ for 2022 and empowers REC employees to contribute in local community programs themselves.

## USA

In the aftermath of Hurricane Maria, REC collaborated with the Honnold Foundation in the Adjuntas Micro Grid Project and provided a 220 kW solar panel installation to power 17 small businesses, backed up by 12 days of battery storage. This project was completed in 2021.



Also in the US, REC offered a Native American Solar Education scholarship. This aims to increase Native American Indian representation in the clean energy industry by paying tuition fees for solar training.





# CONCLUSION AND OUTLOOK

There are two key objectives for REC. The first concerns the need to limit the global temperature increase to 1.5° C. This is more urgent than ever. To accelerate its own engagement, REC will continue to increase the power density of its solar panels, enabling our customers and consumers to mitigate as much emission volume as possible. We will also strengthen our focus on the entire solar value chain, from production to end of service life, and take every step to reduce resource consumption in alignment with the United Nations Sustainable Development Goal (SDG) 12, which aims for responsible production & consumption.



The second objective is to maintain ethical sourcing through all our supply chains. REC plans to adapt its comprehensive CSR and HSE supply chain framework from Singapore to Norway to ensure and prove ethical sourcing of silicon for its innovative kerf recycling production. REC also intends to expand its internal Code of Conduct training for employees to ensure that every employee understands the importance of ethical sourcing.

In line with the results of the internal CSR employee survey, we will empower our own employees to contribute more ambitiously. We are stepping up measures to raise awareness on and better understanding of CSR and by encouraging Employee Engagement Initiatives via a dedicated CSR platform.





REC GROUP  
CSR REPORT 2022

