

WE CARE ABOUT THE SOCIETY AND THE PLANET

PV Magazine Webinar

'The ecological footprint of modules – why it's becoming more important'

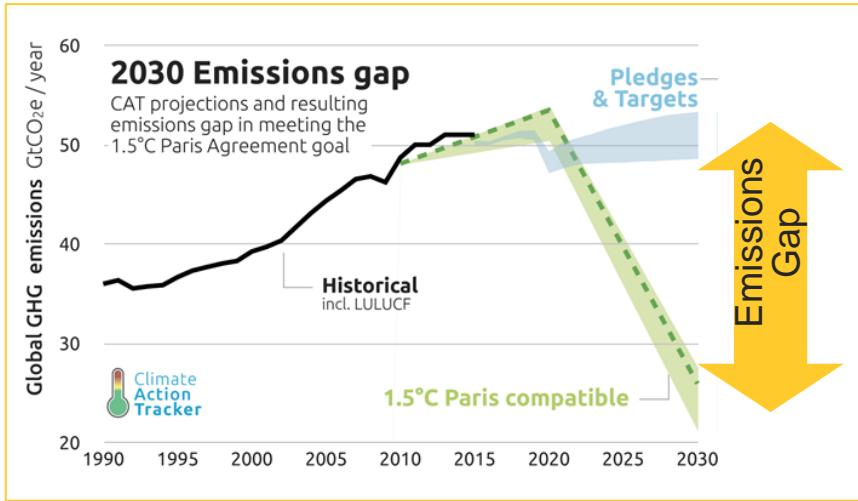
Public

Agnieszka Schulze, CSR Chairperson, REC Group
June 2, 2022

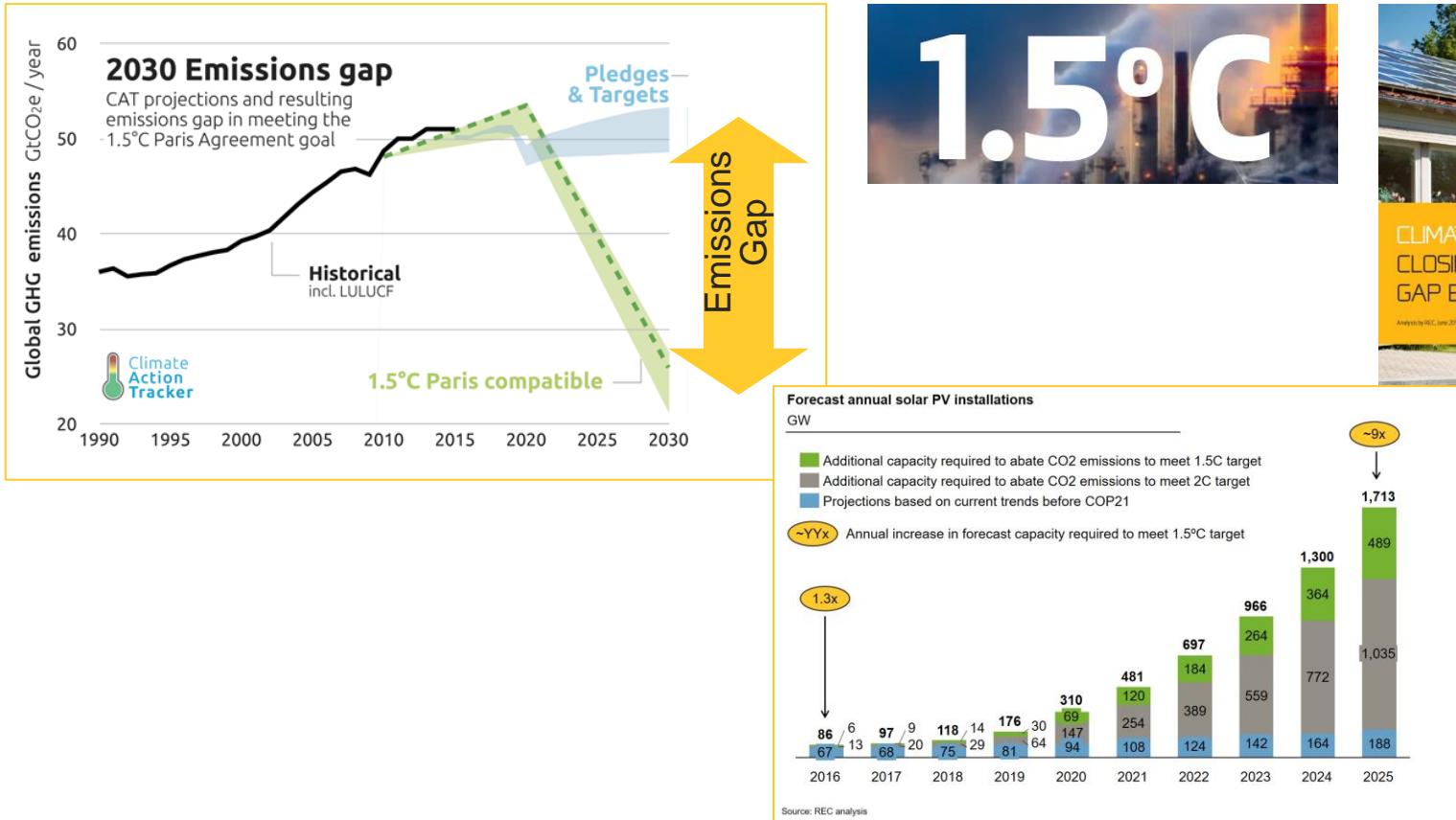


- 1** Why sustainability in PV matters and how REC is caring about People and the Planet
- 2** REC's responsible sourcing & manufacturing
- 3** REC's sustainable products

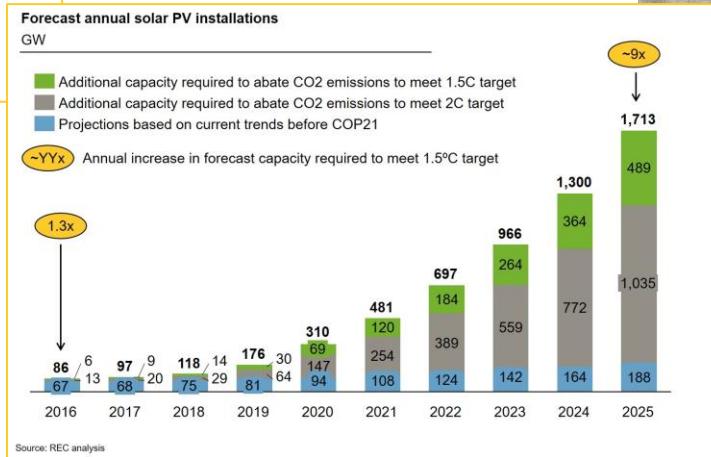
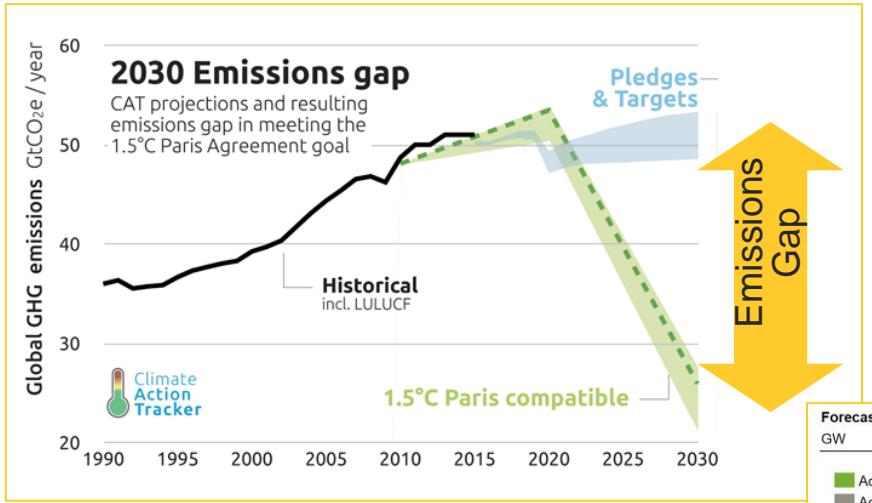
The PV industry's 'job'



The PV industry's 'job'



The PV industry's 'job'



500-600 GW PV p.a.
1.2-1.5 bn panels p.a.

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.

A photograph of two industrial smokestacks emitting thick, white smoke against a dark, cloudy sky. A thick yellow diagonal line runs from the top left of the slide area towards the bottom right, separating the text from the image.

Every g of CO₂ matters

1.5°C

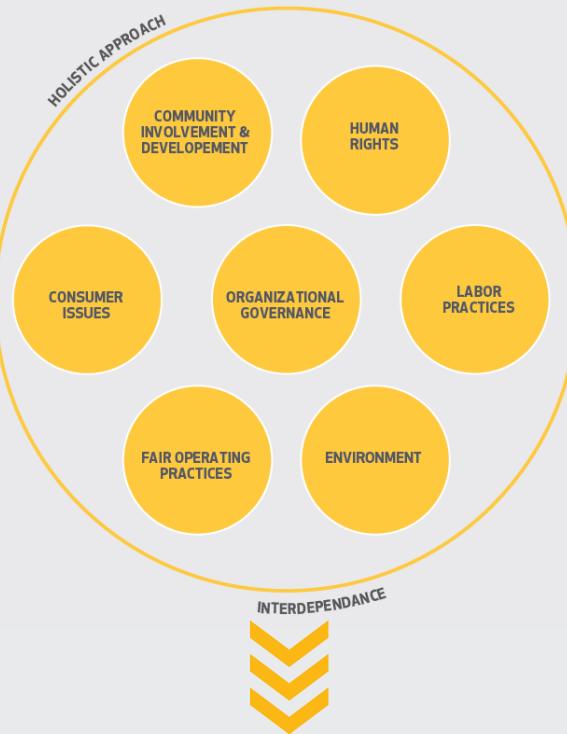
Our mission



That's why since our foundation in Norway 25 years ago, REC has sought to combine high-efficiency innovations with sustainable manufacturing and equitable work practices, delivering positive outcomes for everyone.



REC Group reports holistically on CSR according to ISO 26000



Driven by the REC CSR
Steering Committee

RECONSTRUCT
RENEWABLES
EMPOWERING
COMMUNITIES



REC at a glimpse – 25 years of commitment to solar



>43M SOLAR PANELS
produced and sold



17.5M PEOPLE
Powered at home



~1,500
employees globally



NORWAY & SINGAPORE
Manufacturing facilities



~1.5 GW
2022 solar panel
production capacity



CONSISTENT HIGH QUALITY
4 million panels manufactured each year;
<400 from return from the field (PPM: <100)

Winner of multiple third-party awards



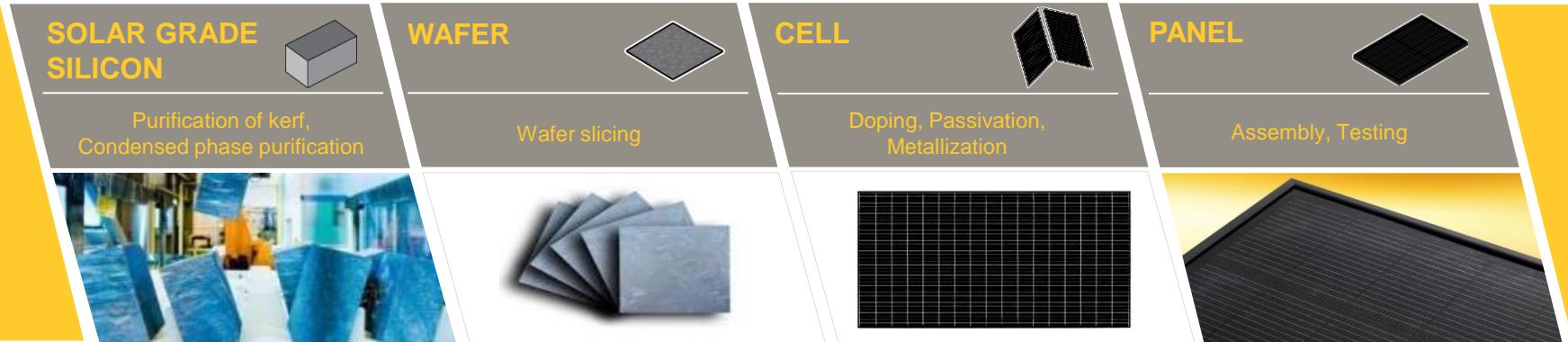
REC's industry strength has been recognized by multiple awards worldwide

• 2022 Intersolar Award for REC Alpha Pure

- 2020 Intersolar Award for REC Alpha
- Best Solar Panel by Solar Review for REC Alpha
- PV Module Tech Award by Solar Quarter India for REC Alpha
- Top Performer Awards by PVEL (DNV GL) for 6 years in a row
- Solar+Power Award for REC TwinPeak 2 Series
- Made in Singapore Award for REC TwinPeak 2 Series
- Norwegian Climate Business of the Year Award for New Silicon Production Methods
- 2015 Intersolar Award for REC TwinPeak Series
- Singapore 1,000 Net Profit Growth Excellence Award
- IAIR Awards for Corporate Sustainability and Solar Energy Solutions
- Frost and Sullivan Best Practices Award for Customer Value Enhancement
- Solar Industry Award for Module Manufacturing Innovation



Strength throughout the value chain



- International, pioneering solar energy company with Scandinavian heritage
- Founded in Norway in 1996
- Industry pioneer with 25 years of experience
- >43 million panels manufactured, amounting to >12 GW (at end 2021)

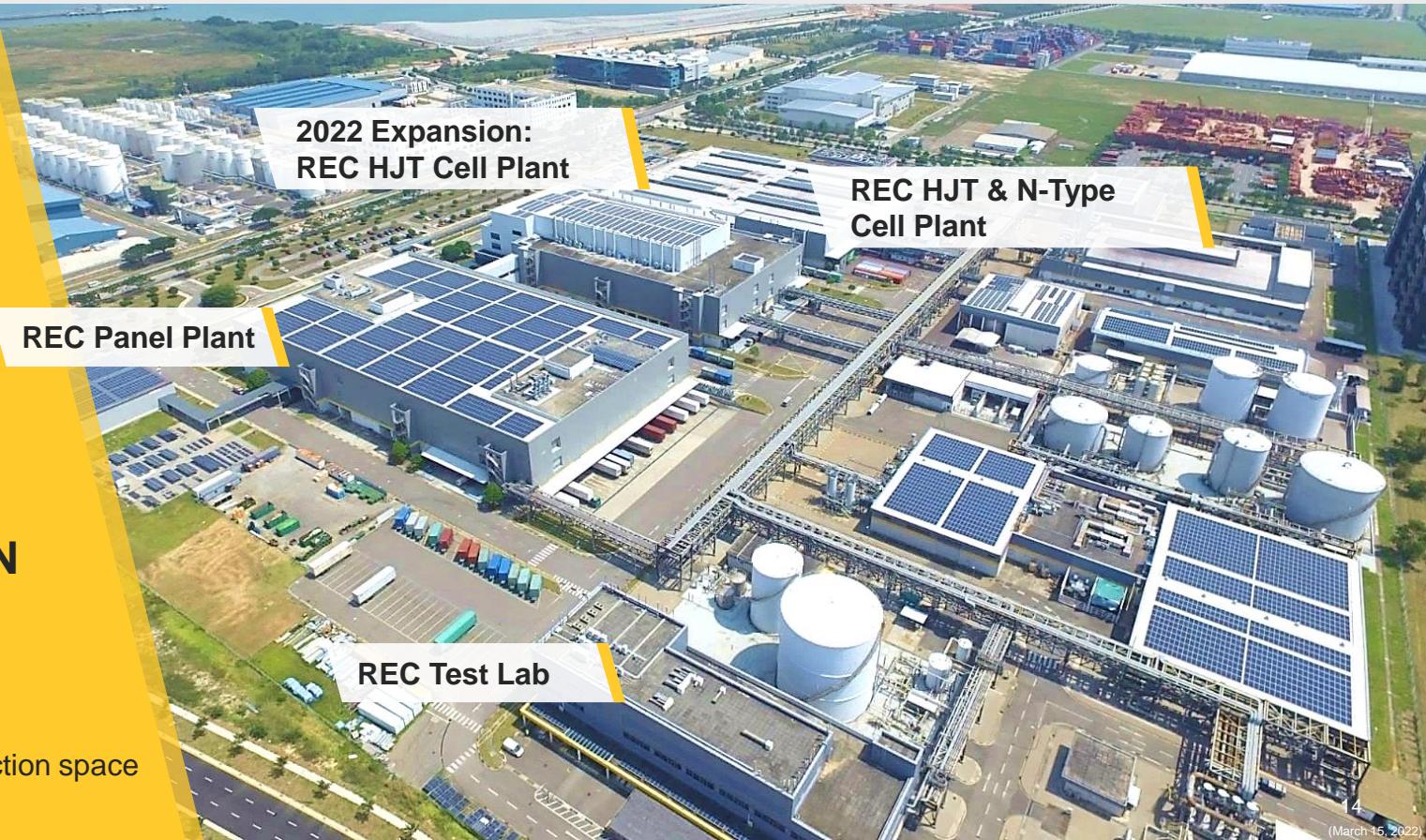
REC production facility in Singapore



REC PANEL PRODUCTION CAPACITY

1.5 GW

151,000 m² of production space



REC production facility in Kristiansand, Norway

Annual output: 8,000 tons



REC production facility in Herøya, Norway

Annual output: 5,500 tons





2

REC's responsible sourcing & manufacturing

REC's responsible sourcing

CSR & HSE validation during supplier audit & suppliers' declaration



Supplier CSR & HSE audits



SWOT analysis

Crown ASQ Audit
R&D Roadmap

- Clear R&D roadmap available.
- 1500V **backsheet** is ready for mass production.
- Crown is developing new products based on customer requirement.
- Crown is also ready to provide cut backsheet and cover strip.

Crown ASQ Audit
SWOT – from Sourcing

 REC

Great customer base (A, GCL, Petro etc) and good market in Africa - 10	Threats
An increased competition - RGC could provide good element to the market	1. Most Chinese module makers use Hi-Cube technology, RGC has no enough technology to compete with them #193 comment - 10
RGC's bottleneck has ridge pressure is relating with RGC's production plan in China to develop PETG	2. PETG comment continue to prove the quality
PETG's bottleneck has been removed to do its road realization comparing with PETG and PET	



Regional SQE Manager
auditing at Ribbon Supplier

REC's responsible sourcing

CSR & HSE validation during supplier audit & suppliers' declaration



Supplier CSR & HSE audits



SWOT analysis



Supplier annual CSR declaration

Supplier annual CSR declaration

Labour

11. Does your company provide all the rights and benefits that a worker is entitled to under the laws and regulations applicable to its jurisdiction, including without limitation wages, rest hours, overtime pay and benefits, employment allowances, social security benefits, leave entitlement, medical benefits, etc?	Yes
12. Does your company pay the salaries and other benefits to its employees on time?	Yes
13. Does your company employ any child labour?	No
14. Does your company subject any of its workers to involuntary servitude including forced labour or slavery?	No
15. Does your company discriminate its employees with respect to race, gender or ethnic origins?	No
16. Does your company encounter any labour protest, strikes or unrest in the past year?	No



REC's responsible sourcing

CSR & HSE validation during supplier audit & suppliers' declaration



Supplier CSR & HSE audits



SWOT analysis



Supplier annual CSR declaration



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Supplier CSR activities



EVA Supplier

Resource to care for employees' mental well-being (i.e. workshop, care kits, psychological counselling)

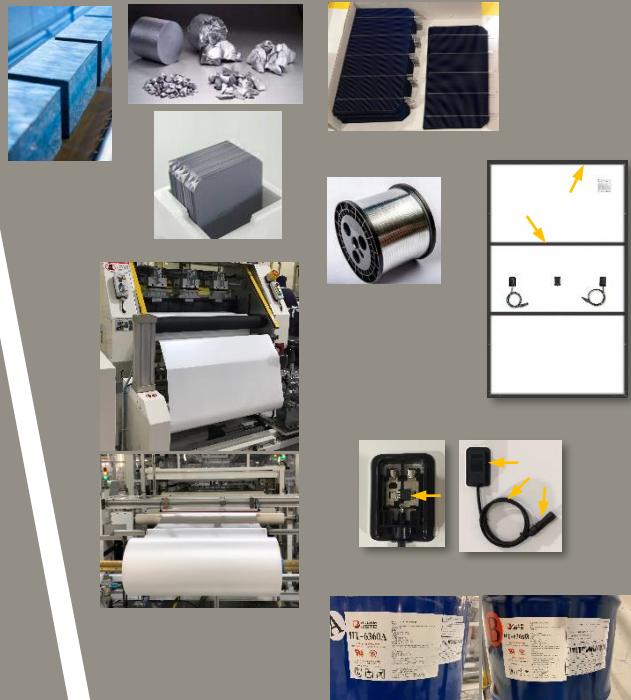
REC's responsible sourcing

Continuously improving traceability systems



Traceability Systems

Where are the materials from?



REC solar panels made in Singapore





Water

Water Saving & Recycling Programs

- **290,320 m³** water saved/year – equivalent to annual water usage of ~5,000 people



Energy

Energy Saving Initiatives

Clean Solar Power Generation

- **3,100 t CO₂** emissions saved/year



Waste

Non-hazardous Waste

Hazardous Waste

Modules and Kerf Recycling

- **19,000 modules** sent for recycling



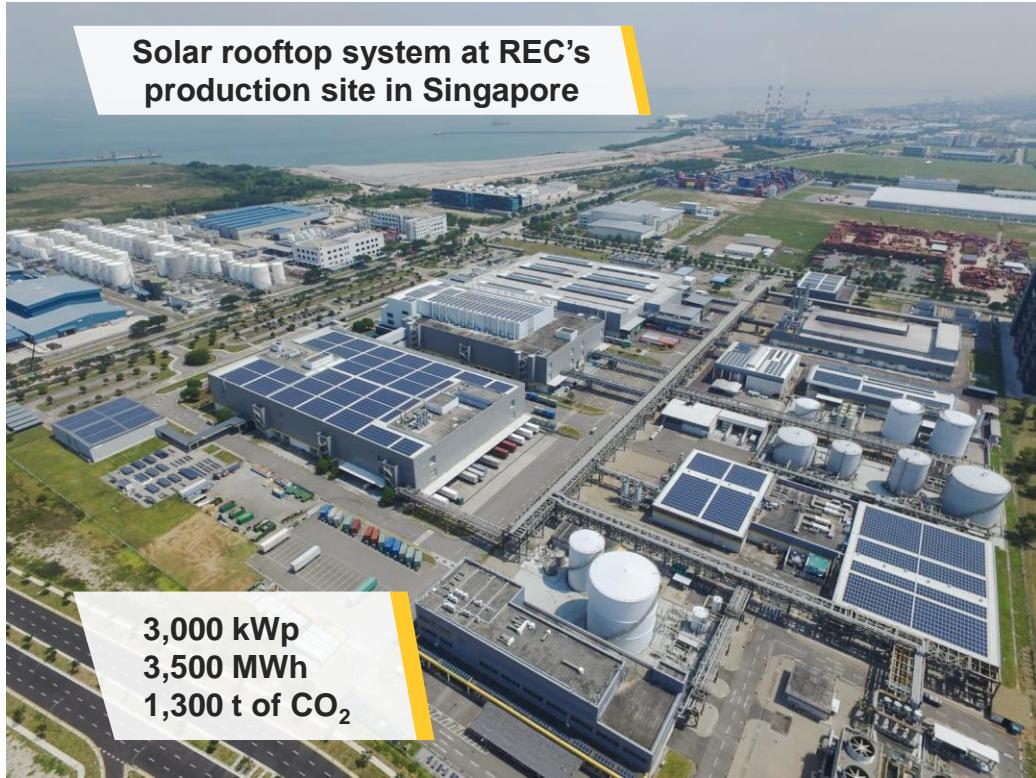
SOLAR'S MOST TRUSTED

REC

Just few examples of REC's savings initiatives



Solar rooftop system at REC's production site in Singapore



3,000 kWp
3,500 MWh
1,300 t of CO₂

Chiller optimization

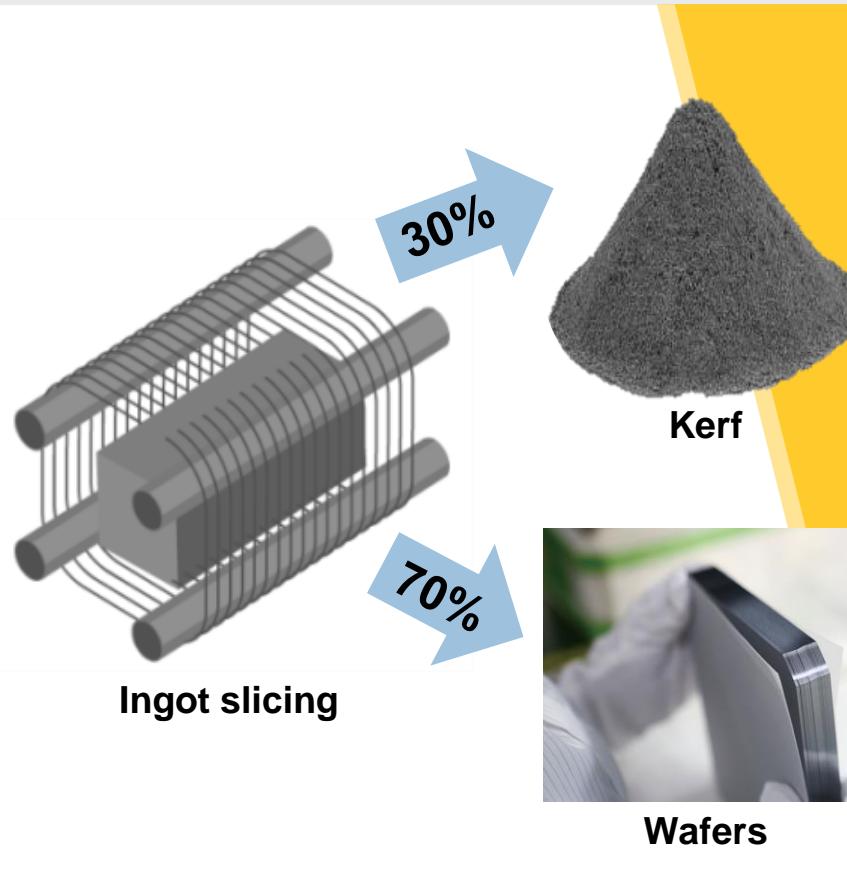
2,190 MWh savings p.a.
= 876 t of CO₂

RO reject water recycling

148,920 m³ savings p.a.
= usage of 2,649 people

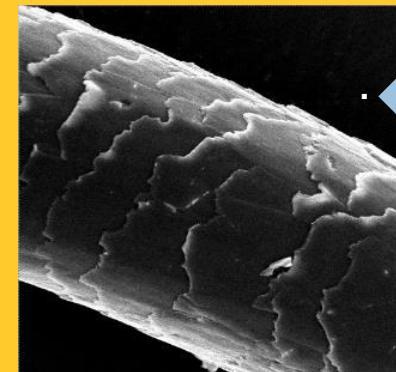
Wafering produces high amounts of waste

REC E2M upcycles the 30% of polysilicon that is otherwise lost

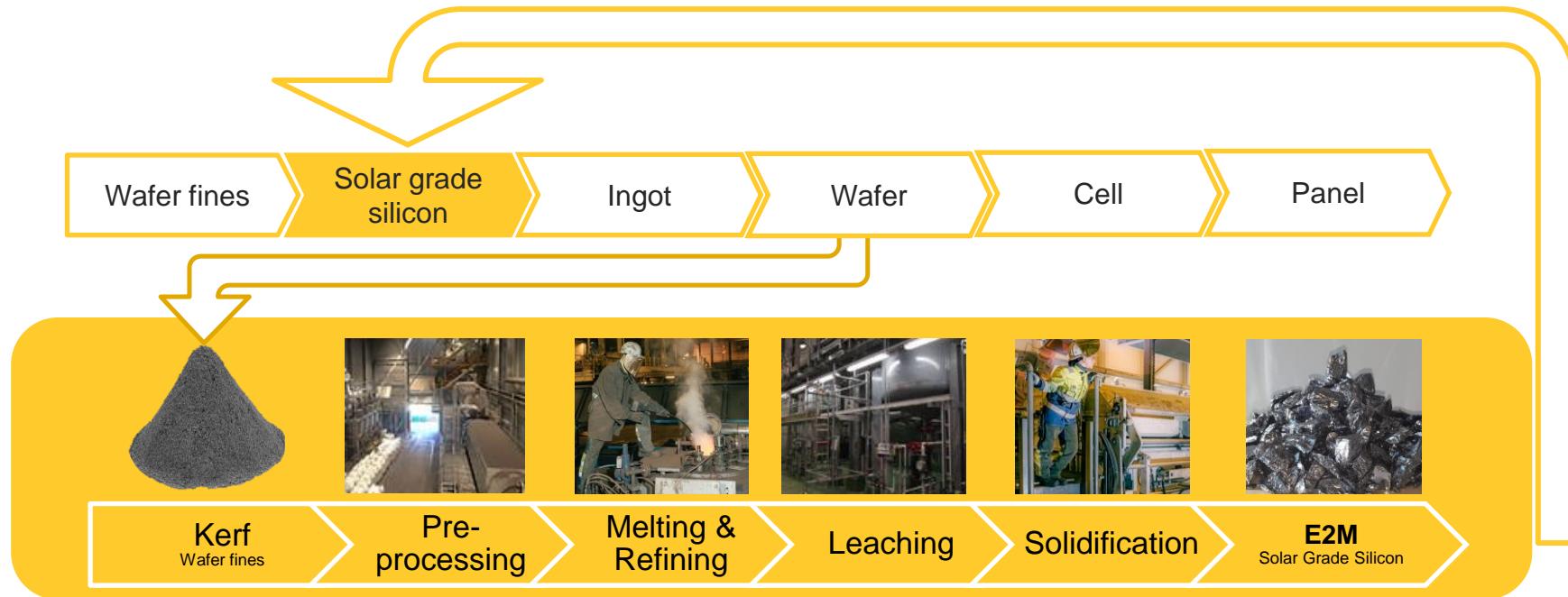


Kerf is:

- Fines from diamond wafer cutting
- Consists of tiny flakes, $<0.1 \mu\text{m}$ thick
 - 1g contains over 100 trillion particles
- Usually washed away after cutting



REC E2M turns industry waste into a resource, reducing extraction of raw materials

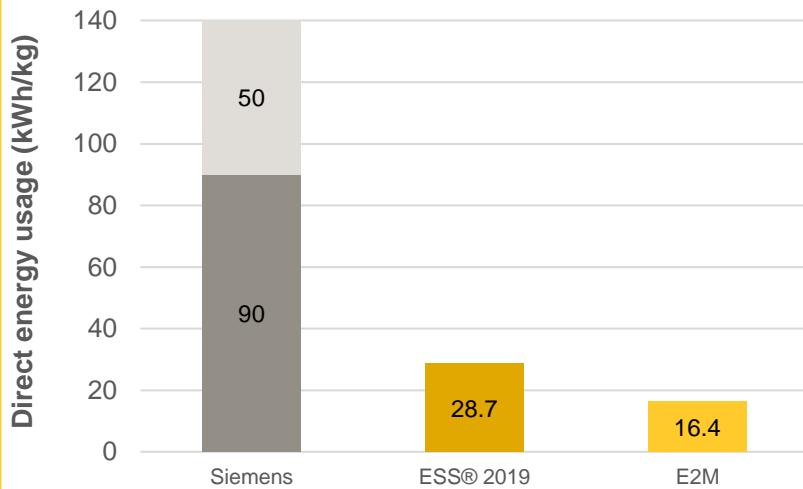


- Process innovations in REC E2M:
 - Kerf preconditioning
 - Melting processes
 - Unique equipment developed in-house or with vendors
- Only non-gas phase solar grade silicon with purity compatible with 100% mix
- High purity ensures no loss in solar efficiency

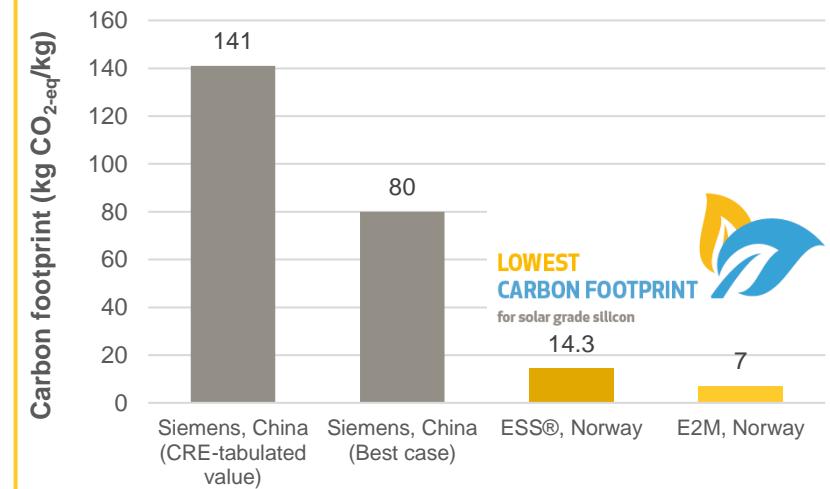
REC E2M silicon minimizes energy consumption and carbon footprint...



>85% lower Energy Consumption



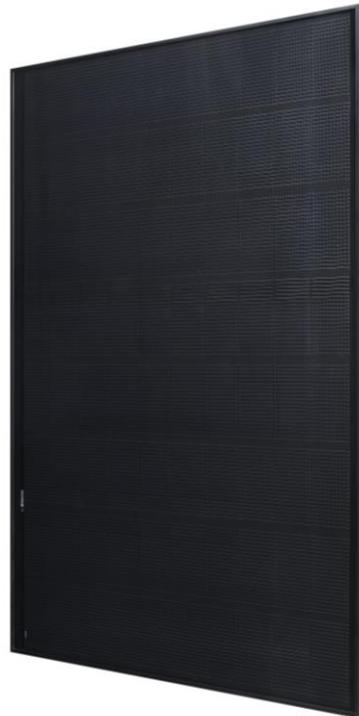
95% lower carbon footprint



...and reduces the need of quartz and as such polluting mining.

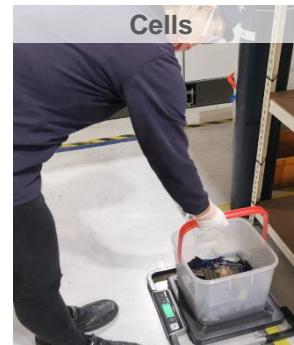
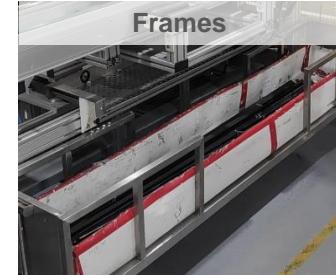
REC's Waste Management

Closely monitored, accounted daily and sent for recycling



**19,000 modules
sent for recycling p.a.**

**< 0.5% of the
production**



Recycling of REC scrapped modules



Scrapped Panels
collected from REC



Recycling of REC scrapped modules



Scrapped Panels
collected from REC



Frame dismantled



Aluminum

Recycling of REC scrapped modules



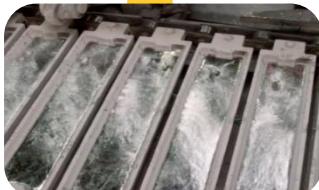
Scrapped Panels
collected from REC



Frame dismantled



Junction box removed



Aluminum

Copper

Recycling of REC scrapped modules



Scrapped Panels
collected from REC



Frame dismantled



Junction box removed



Crushing of laminates



Aluminum

Copper

Recycling of REC scrapped modules

