

**238 Marcy Street**  
**HDC Work Session Application**  
**March 2021**

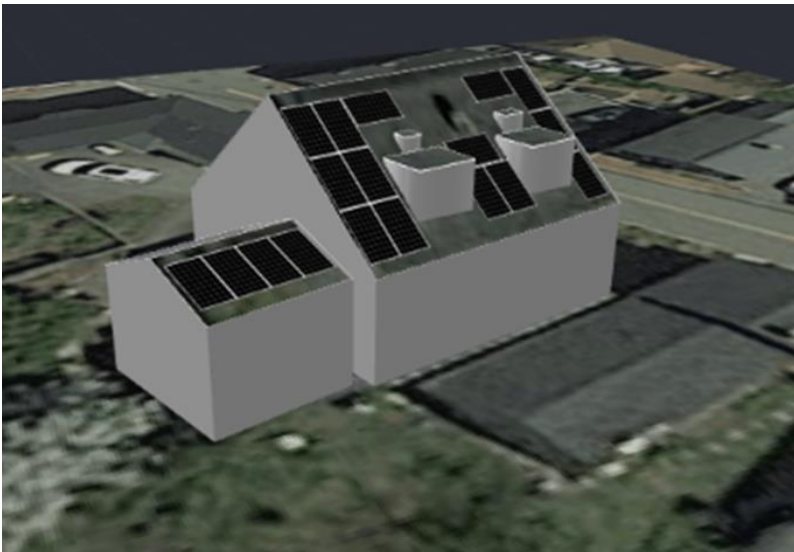
This application is to install 18 60-cell solar panels on the south roof of 238 Marcy Street. This project will generate 6.6 kilowatts, roughly 75% of the building's current annual electrical power. The proposed solar panels are REC Alpha Black Series 370s, which are constructed from non-glossy materials with a full-black matte finish and hidden wiring preferred by designers where glossy panels are considered inappropriate.

**Contextual Map from Portsmouth 3D Map**  
*Building Site Highlighted in Yellow*



**Proposed Layout Design**

West building extension not drawn to size (roughly 15 feet lower in height)



### **Similar Uses in the South End Neighborhood**

There are currently relatively few buildings in Portsmouth's historic district with solar panels installed. Within 600 feet of 238 Marcy Street, there is one building with solar panels located at 44 Pickering Street facing South Mill Street. The proposed project would use solar panels of a similar design as those at 44 Pickering Street, including a black matte finish.

### **44 Pickering Street**



### **View of 238 Marcy South Roof from Various Locations**

The solar panel installation would not be visible from street views along Marcy and Gates Street and partially visible from the street along Manning Street and Meeting House Hill. From the South Meeting House, the view of the installation is partially obstructed at street level due to the presence of other buildings. The 2<sup>nd</sup> floor of the South Meeting House is currently used as a film studio and the view of the proposed solar installation would be blocked by heavy curtains within the Meeting House used to keep light from entering the studio space. The solar installation would be fully visible from the Meeting House clock tower which is inaccessible to the general public.

**West view from Marcy Street**  
*Solar installation not visible from street*



**North view from 2<sup>nd</sup> floor of Meeting House**  
*Solar installation partially visible but blocked from interior view due to presence of heavy curtains*



**North View from clock tower of Meeting House**  
*Solar installation visible but view is inaccessible*



**Northeast street view from corner of Manning St & Meeting House Hill**  
*Solar installation partially visible*



**South view from Gates Street**

*Solar installation not visible*

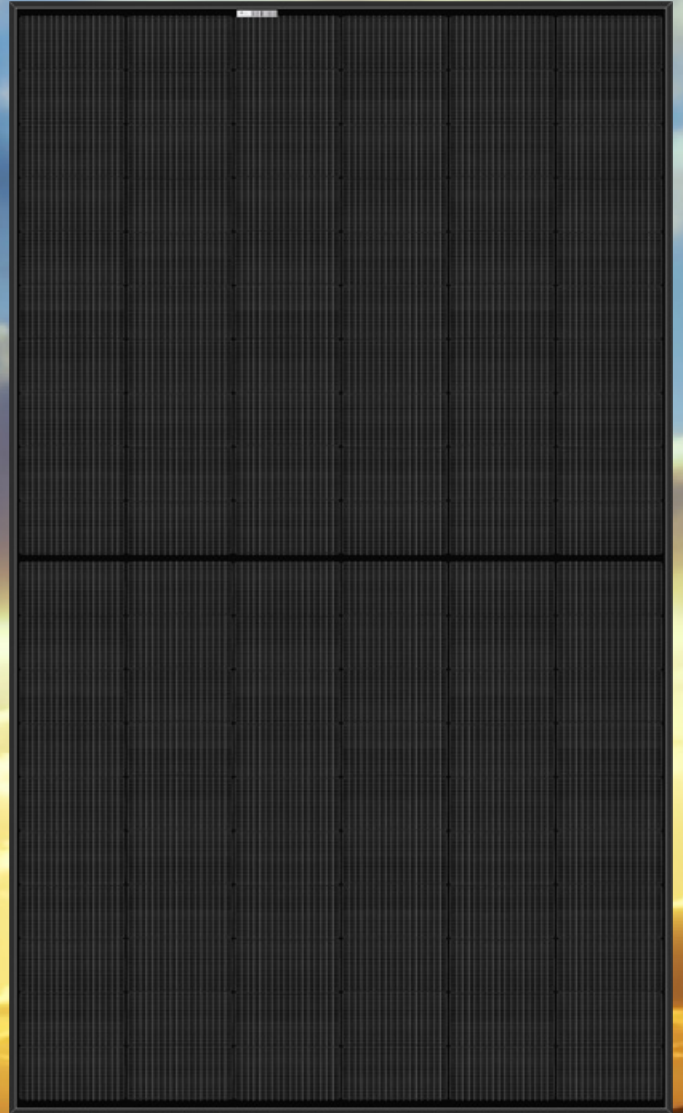


**East street view from Manning St**

*Solar installation not visible*



SOLAR'S MOST TRUSTED



# REC ALPHA BLACK SERIES

375  
WP  
POWER



ELIGIBLE



EXPERIENCE



PERFORMANCE

The REC Alpha Black Series is a revolutionary hybrid solar panel which unites the leading cell technologies to create a powerful and reliable 60-cell panel:

- High power density maximizes energy generation from limited spaces - up to 19.9 W/ft<sup>2</sup>
- The most advanced cell structure for high efficiency performance
- Over 20% more power than conventional panels
- More savings from your roof



### Heterojunction cells

- Combine the best of crystalline and thin-film technologies
- Highly efficient bifacial cell architecture for high performance

### N-type technology = more power

- No LID protects panel from initial power loss
- You get the power you pay for

### Unique Advanced Cell Connections

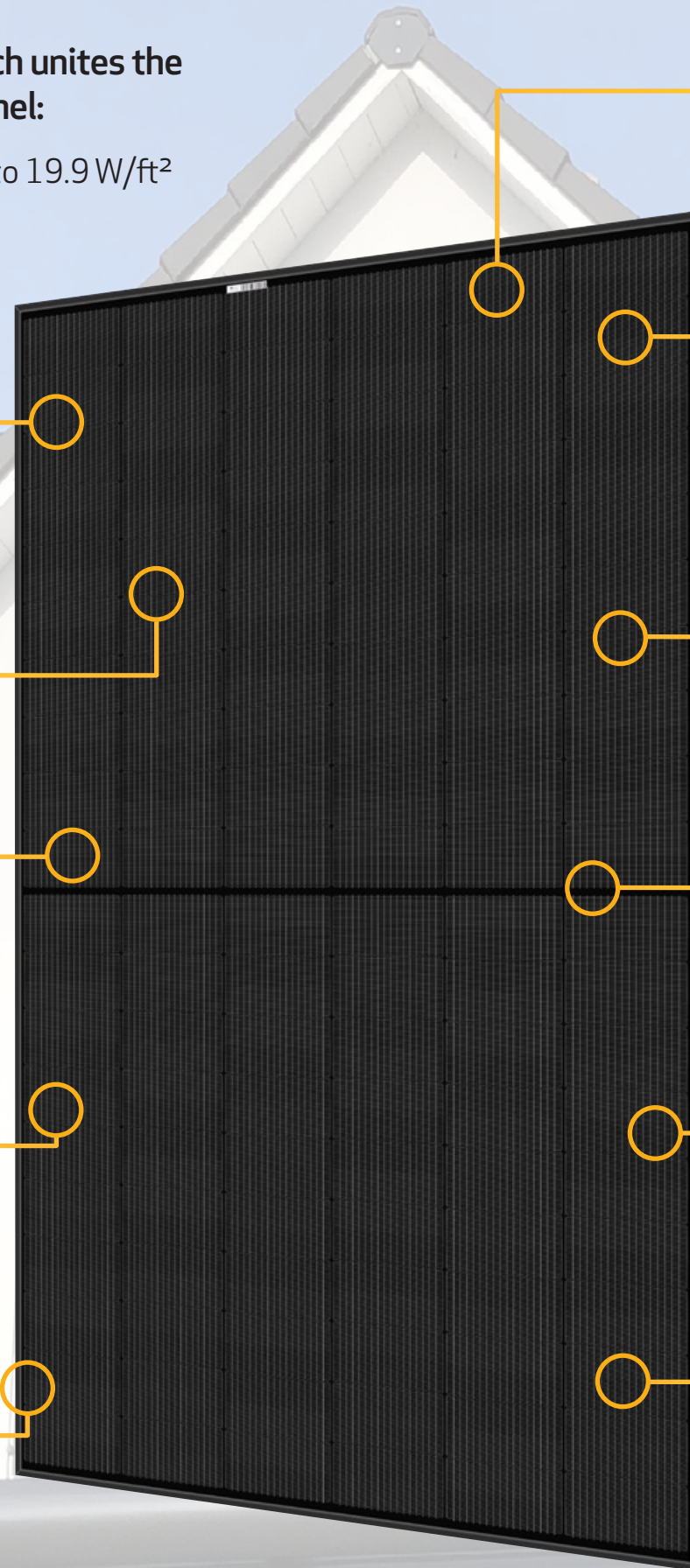
- Eliminates invasive soldering for better build quality
- Reduces thermal stress on the cells for long-term durability
- Great aesthetics

### Higher light transmission

- Special anti-reflective glass increases light transmission for higher power
- Inherently bifacial cells can produce energy from both sides of the panel

### Guaranteed better durability

- Super-strong frame withstands up to 146 lbs/sq ft
- Better protection against harsh weather
- Improves cell life for long-lasting high power



### Stunning appearance

- Full-black design for a seamless appearance on your roof
- Practically-invisible connections for the best choice for your home

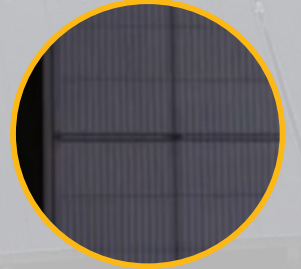


### High power density of 19.9 W/ft<sup>2</sup>

- High power density on a 60-cell panel
- Pack in more power in limited or restricted spaces
- Generate more clean energy

### Higher efficiency at the hottest times

- Leading temperature coefficient for more production when the sun shines strongest
- Better performance in hot climates



### REC's iconic Twin Design

- Reduces internal resistance for more power and reliability
- Improved output when shaded

### Environmentally-friendly

- Energy-efficient manufacturing processes minimize carbon footprint
- Colossal 81% reduced lead content, only 0.02% by weight



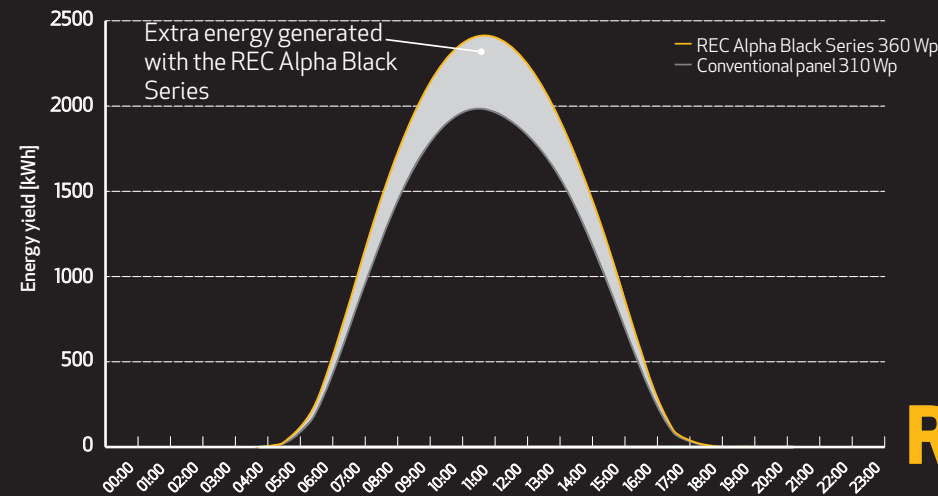
### Exceptional quality

- Made in REC's state of the art, energy efficient facility in Singapore
- Highly automated production improves efficiency and reliability
- Consistently one of the lowest warranty claims rate in solar

# GREATER YIELDS FROM DAWN TO DUSK

The REC Alpha Black Series packs in more energy than ever before. With no LID, a leading temperature coefficient and its high power density, it is ideal for increasing energy yields and making the most of available rooftop space.

Average Daily Energy Production Comparison Over One Year

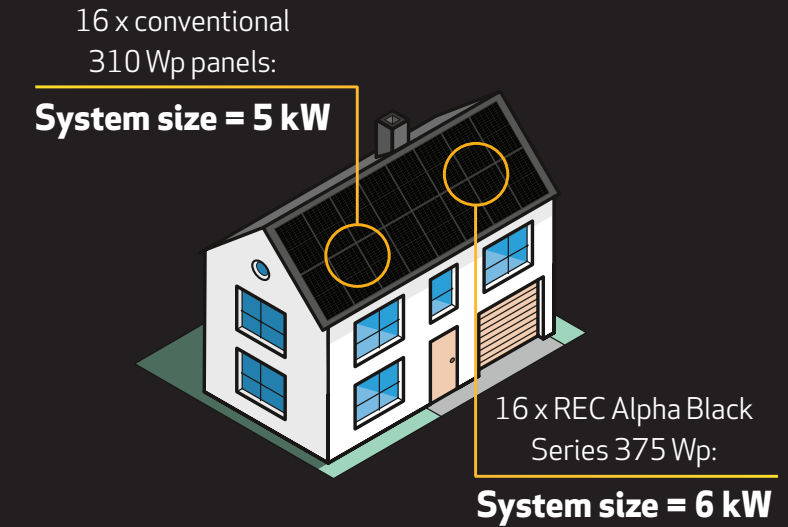


Calculations based on simulation results for full calendar year, based on an 8 kW system in Palm Springs, CA, USA. Peak REC Alpha Black Series energy yield difference at midday: +21%, with an overall greater annual yield of 1.7%. Performance may vary dependent on location.

# +20% MORE WITH THE REC ALPHA BLACK!

# MAXIMIZE SYSTEM POWER FOR MAXIMUM SAVINGS

Optimum use of rooftop space is key to a good solar installation. The REC Alpha Black Series allows you to pack in as much power generation as possible, generating more energy and more savings on your bills.



The comparison is clear: even in a regular residential installation, the REC Alpha Black Series gives you 1 kW more power than conventional panels for more energy and more savings.

# 15% MORE WARRANTED POWER AFTER 25 YEARS

REC's consistently low claims rate justifies outstanding warranty terms. Our warranty offering reflects this leadership and supports our premium product quality.



Exclusively offered by REC Certified Solar Professionals, the REC ProTrust Warranty gives enhanced product and labor coverage\*, ensuring peace of mind and a lifetime of high power generation:

- 25 years performance warranty
- 25 years product warranty
- Up to 25 year labor warranty\*

# MAKE MAJOR REDUCTIONS TO YOUR CO<sub>2</sub> FOOTPRINT

A 6 kW REC Alpha Black Series installation generates over 7,200 kWh of clean energy per year, cutting the CO<sub>2</sub> emissions of a home by 4.7 tons per year\*, equivalent to:

**84** trees planted and grown over 10 years

CO<sub>2</sub> sequestered by **6 acres** of forest per year

**1.8 tons** of waste recycled instead of entering landfill

**12,500 miles** in a family car

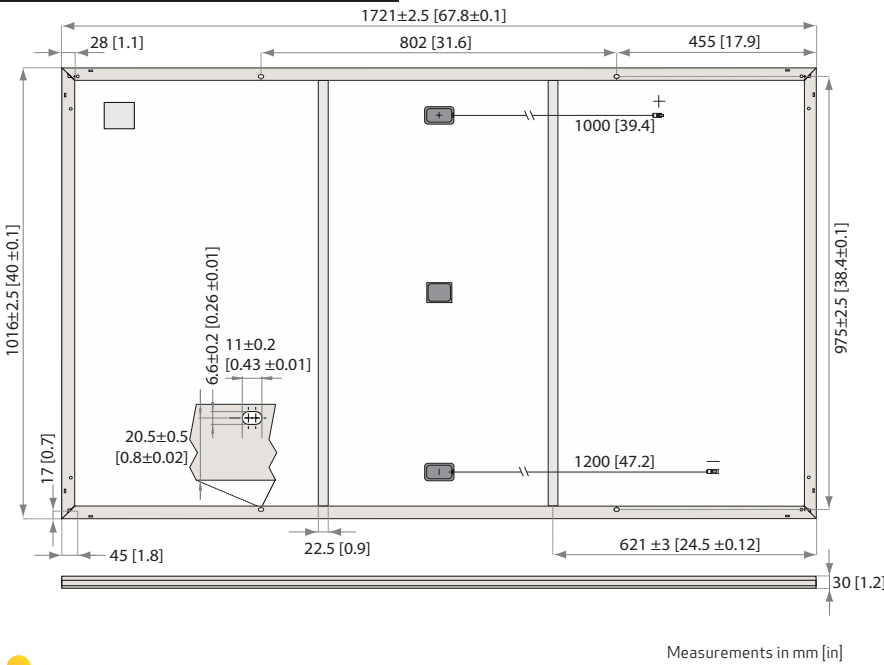
Charging a phone **650,000** times

**2.5 tons** of coal burnt for power



\*Conditions apply. See [www.recgroup.com/protrust](http://www.recgroup.com/protrust) for more details

\*Values may vary dependent on location



Measurements in mm [in]

## CERTIFICATIONS

IEC 61215:2016, IEC 61730:2016, UL 1703, UL 61730	
IEC 62804	PID
IEC 61701	Salt Mist
IEC 62716	Ammonia Resistance
UL 1703	Fire Type Class 2
IEC 62782	Dynamic Mechanical Load
IEC 61215-2:2016	Hailstone (35mm)
AS4040.2 NCC 2016	Cyclic Wind Load
ISO 14001:2004, ISO 9001:2015, OHSAS 18001:2007, IEC 62941	



## WARRANTY

	Standard		REC ProTrust
	No	Yes	Yes
Installed by an REC Certified Solar Professional			
System Size	All	≤25 kW	25-500 kW
Product Warranty (yrs)	20	25	25
Power Warranty (yrs)	25	25	25
Labor Warranty (yrs)	0	25	10
Power in Year 1	98%	98%	98%
Annual Degradation	0.25%	0.25%	0.25%
Power in Year 25	92%	92%	92%

See warranty documents for details. Conditions apply.

## MAXIMUM RATINGS

Operational temperature:	-40 ... +85°C
Maximum system voltage:	1000 V
Design load (+): snow	4666 Pa (97.5 lbs/sq ft)*
Maximum test load (+):	7000 Pa (146 lbs/sq ft)*
Design load (-): wind	2666 Pa (55.6 lbs/sq ft)*
Maximum test load (-):	4000 Pa (83.5 lbs/sq ft)*
Max series fuse rating:	25 A
Max reverse current:	25 A

\* Calculated using a safety factor of 1.5  
\* See installation manual for mounting instructions

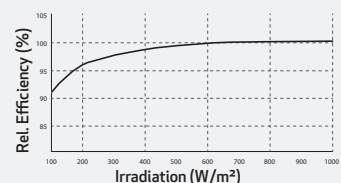
## TEMPERATURE RATINGS\*

Nominal Module Operating Temperature:	44°C (±2°C)
Temperature coefficient of P <sub>MAX</sub> :	-0.26 %/°C
Temperature coefficient of V <sub>OC</sub> :	-0.24 %/°C
Temperature coefficient of I <sub>SC</sub> :	0.04 %/°C

\* The temperature coefficients stated are linear values

## LOW LIGHT BEHAVIOUR

Typical low irradiance performance of module at STC:



## GENERAL DATA

Cell type:	120 half-cut bifacial cells with REC heterojunction cell technology 6 strings of 20 cells in series	Connectors:	Stäubli MC4PV-KBT4/KST4, 12AWG (4mm <sup>2</sup> ) in accordance with IEC 62852 IP68 only when connected
Glass:	0.13 in (3.2 mm) solar glass with anti-reflection surface treatment	Cable:	12AWG (4mm <sup>2</sup> ) PV wire, 39+47 in (1+1.2m) in accordance with EN 50618
Backsheet:	Highly resistant polymeric construction	Dimensions:	678x40x1.2 in (1721x1016x30mm)
Frame:	Anodized aluminum	Weight:	43 lbs (19.5 kg)
Junction box:	3-part, 3 bypass diodes, IP67 rated in accordance with IEC 62790	Origin:	Made in Singapore

## ELECTRICAL DATA

### Product Code\*: RECxxxAA Black

	355	360	365	370	375
Power Output - P <sub>MAX</sub> (Wp)	355	360	365	370	375
Watt Class Sorting - (W)	-0/+5	-0/+5	-0/+5	-0/+5	-0/+5
Nominal Power Voltage - V <sub>MPP</sub> (V)	36.4	36.7	37.1	37.4	37.8
Nominal Power Current - I <sub>MPP</sub> (A)	9.77	9.82	9.85	9.90	9.94
Open Circuit Voltage - V <sub>OC</sub> (V)	43.6	43.9	44.0	44.1	44.2
Short Circuit Current - I <sub>SC</sub> (A)	10.47	10.49	10.52	10.55	10.58
Power Density (W/sq ft)	18.9	19.1	19.4	19.7	19.9
Panel Efficiency (%)	20.3	20.6	20.9	21.2	21.4
Power Output - P <sub>MAX</sub> (Wp)	271	274	278	282	286
Nominal Power Voltage - V <sub>MPP</sub> (V)	34.3	34.6	35.0	35.2	35.6
Nominal Power Current - I <sub>MPP</sub> (A)	7.89	7.93	7.96	8.00	8.03
Open Circuit Voltage - V <sub>OC</sub> (V)	41.1	41.4	41.5	41.6	41.6
Short Circuit Current - I <sub>SC</sub> (A)	8.46	8.47	8.50	8.52	8.55

Values at standard test conditions (STC: air mass AM 1.5, irradiance 10.75 W/sq ft (1000 W/m<sup>2</sup>), temperature 77°F (25°C), based on a production spread with a tolerance of P<sub>MAX</sub>, V<sub>OC</sub> & I<sub>SC</sub> ±3% within one watt class. Nominal module operating temperature (NMOT: air mass AM 1.5, irradiance 800 W/m<sup>2</sup>, temperature 68°F (20°C), windspeed 3.3 ft/s (1 m/s). \* Where xxx indicates the nominal power class (P<sub>MAX</sub>) at STC above. Bifaciality coefficient of up to P<sub>MAX</sub> ~ 4%.

REC Group is an international pioneering solar energy company dedicated to empowering consumers with clean, affordable solar power in order to facilitate global energy transitions. Committed to quality and innovation, REC offers photovoltaic modules with leading high quality, backed by an exceptional low warranty claims rate of less than 100ppm. Founded in Norway in 1996, REC employs 2,000 people and has an annual solar panel capacity of 1.8 GW. With over 10 GW installed worldwide, REC is empowering more than 16 million people with clean solar energy. REC Group is a Bluestar Elkem company with headquarters in Norway, operational headquarters in Singapore, and regional bases in North America, Europe, and Asia-Pacific.

