REC: A Commitment to the Production of Clean Energy

REC maintains a leading position in the renewable energy industry through continuous development and implementation of innovations that promote product improvements, cost reductions and diminished environmental impact. The introduction of several new technologies currently under development will further enhance REC's position as a leader in the efficient production of clean solar energy.

MEETING A GLOBAL CHALLENGE

The use of fossil fuels is threatening to change life as we know it. Understandably, climate change has emerged as a serious priority for us all.

Rising temperatures are changing landscapes, threatening wildlife and altering weather patterns. The United Nations Framework Convention on Climate Change has estimated that the average global temperature increased by 0.74° C/1.33°F in the past century. If the level of greenhouse gas emissions continues to climb at current rates, the average temperature will rise by 1.8°C to 4.0°C (3.2° F to 7.2°F) by 2100.

As *The Stern Review* on the Economics of Climate Change reported in 2006, the energy sector accounts for 65 percent of greenhouse gas emissions. The electricity generation industry alone accounts for one-fourth of all such emissions. The rate of future development and deployment of cleaner energy technologies will determine to a large extent whether climate change will remain manageable.

SMART ENERGY FOR A CLEANER FUTURE

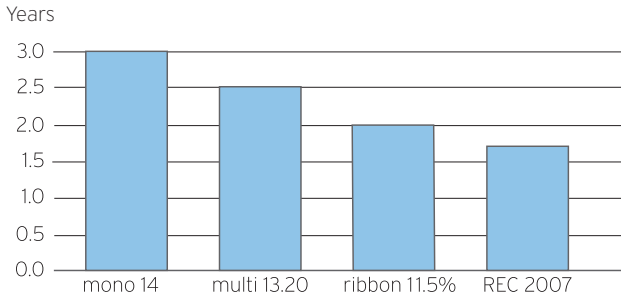
Toward an Energy Payback Time of One Year

It takes energy to make energy. "Energy payback time" refers to the time it takes for a PV module to generate the same amount of energy required for its manufacture.

REC provides competitive solar energy solutions to meet the need for clean renewable energy. The greatest contribution REC can make in the effort to combat global warming is reducing the cost of solar energy, and, in particular, reducing the amount of time it takes a solar module to produce the same amount of energy used for its manufacture.

Clearly, technological advances are delivering much-needed improvements. European solar industry production data gathered by Alsema and Wild-Scholten at Utrecht University and The Energy Research Centre of the Netherlands in 2005 showed that typical energy payback times of solar systems placed in Southern Europe range between 1.7 and 2.7 years. Thirty years ago, solar energy systems required 20-30 years of operation to generate the energy that went into their production.

In 2007, REC asked Utrecht University to do a similar analysis for each of REC's four production units – silicon, wafer, cell and module. The results showed record-low carbon footprints compared to any other PV technology. In addition, the analysis revealed that the energy payback time for solar systems with modules made by REC in 2007 was lower than for other crystalline silicon-based modules according to all previously published data. With the next-generation silicon plant up and running at Moses Lake, Washington, REC expects the energy payback time to drop to 1.0 years.

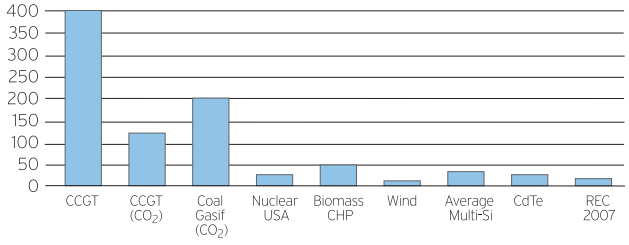


Energy payback time (in years) of solar systems for the three main silicon-based PV technologies in 2005 compared to REC 2007. The solar systems are assumed installed in Southern Europe, with about 1700 sun hours per year.

Innovative Technologies Lead to a Lower Carbon Footprint

REC's low carbon footprint is the result of the high energy efficiency of its manufacturing processes, which exceed the industry average. Precisely monitored, large-scale production and extensive use of hydroelectric power contribute to REC's ongoing efforts to reduce its carbon footprint.

A "carbon footprint" represents the amount of greenhouse gases produced by a given human activity. A carbon footprint is measured in units of carbon dioxide and typically given in tons of CO_2-equivalent (CO_2-eq) per year or per product unit.



Life-cycle GHG emissions (g/CO_2 equiv/kWh)

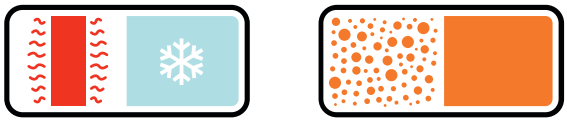
Life-cycle greenhouse gas emissions per kWh for different technologies currently being considered in the work to lower emissions of greenhouse gases. CCGT = Combined Cycle Gas Turbine; (CO_2) implies a power plant with carbon sequestration and storage; CHP = Combined Heat and Power; CdTe = PV power made from Cadmium Telluride modules. Most data is from 2005 production.

1. Fluidized Bed Reactor

FLUIDIZED BED REACTOR (FBR) – A technology applied by REC to the deposition of silicon from gas phase using a reactor where solid particles (silicon) are "floating" and growing in an upward gas flow (typically silane) inside a chamber.

SIEMENS REACTOR – Conventional reactor used for deposition of silane or trichlorosilane on long silicon rods. Used by most manufacturers of polysilicon.

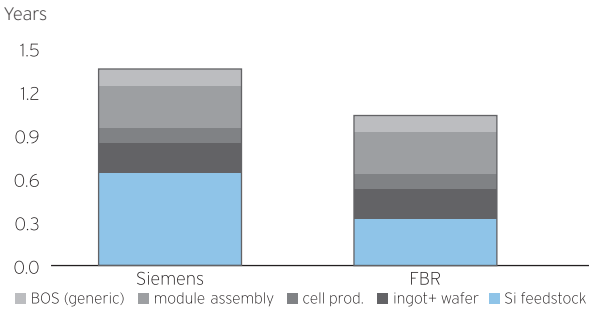
REC's decision to deploy its new fluidized bed reactor (FBR) to its silicon production process will generate substantial power savings compared to the older, more commonly used Siemens technologies.



The Siemens process heats the silicon growing rods to approximately 500°C/900°F higher than the surrounding cooling walls and maintains this substantial temperature difference for several days. From an energy efficiency perspective, this is comparable to replacing the door of a freezer with an extremely hot cooking plate and turning both appliances on maximum power. The FBR process attains greater energy efficiency by maintaining a much more balanced temperature between the chamber walls and the silicon growing beads.

2. Ingot Crystallization

Since 2001, REC has developed and used crystallization furnaces that crystallize more than 1,000 kg per cycle instead of the more conventional 250-300 kg. Though difficult to develop, the larger scale process currently provides REC with both cost and energy advantages compared to the competition. In addition, improving ingot quality is a vital part of improving multicrystalline cell efficiency.



Energy payback time for a PV system made by REC with modules using Siemens- or FBR-type feedstock. The different colors represent the contributions from the silicon, wafer, cell, module and balance-of-system share of the total system.

3. Wafer Thickness

REC has made substantial advances in its use of thinner wire for the production of thinner wafers. REC's effort toward achieving more efficient use of its polysilicon stock resulted in significant progress by reducing wafer thickness from 180 to 160 µm, and reducing wire thickness.

4. Cell and Module Efficiency

REC has increased its cell and module technology development efforts to reduce the cost of solar energy through production of solar cells with higher conversion efficiency and less costly processing. Increased cell efficiency will also contribute to a reduction of energy consumption throughout the value chain. Efforts to increase cell efficiency above 16 percent began in 2007. When fully implemented, REC anticipates its multicrystalline cells will achieve efficiency greater than 18 percent.

Conclusion

Unlike many other solar companies, REC locates most of its production facilities in areas that use hydroelectric power, significantly reducing its carbon footprint. With the introduction of the FBR process, new ingot crystallization furnaces, thinner wafers, higher cell efficiency and less use of glass and aluminum in each module, REC expects to further lower its carbon footprint and reduce energy payback time to less than one year, bringing the PV industry to a new level of environmental excellence.

REC expects significant cost reductions to advance the company's mission to deliver cost-competitive solar electricity – without government incentives – in nearly every part of the world where favorable solar conditions ensure a good return on capital.

About REC

REC is the leading vertically integrated player in the solar energy industry. REC Silicon and REC Wafer are among the world's largest producers of polysilicon and wafers for solar applications. REC Solar is a rapidly growing manufacturer of solar cells and modules, and are also engaging in project development activities in selected segments of the PV market. REC Group had revenues of NOK 8 191 million and an operating profit of NOK 2 529 million in 2008. About 2 500 employees work in REC's worldwide organization.

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