



RECSiLICON

PARETO SECURITIES
Power and Renewable
Energy Conference
January 17, 2019

Mr. Tore Torvund, REC Silicon CEO



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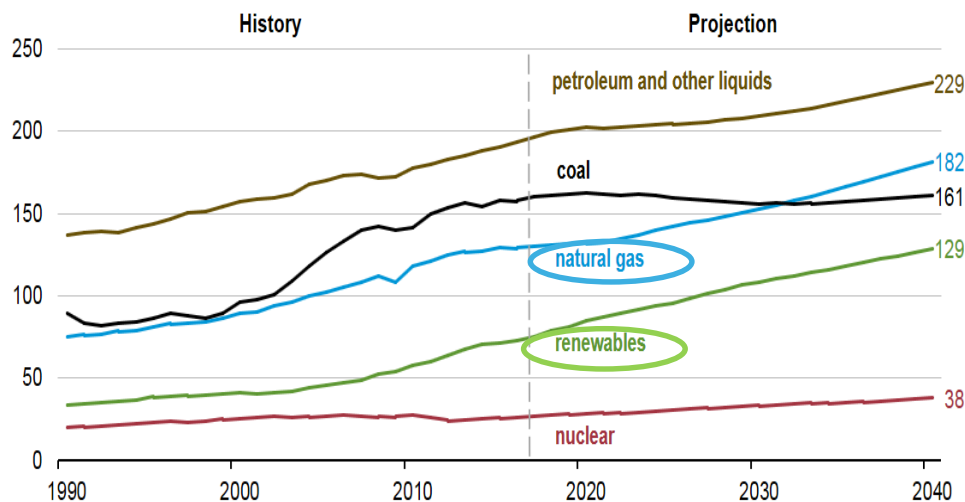
INDUSTRY
TRENDS

Renewables and Natural Gas are the Fastest Growing Energy Source on a Global Basis...

Electricity is the world's fastest growing form of end use energy consumption

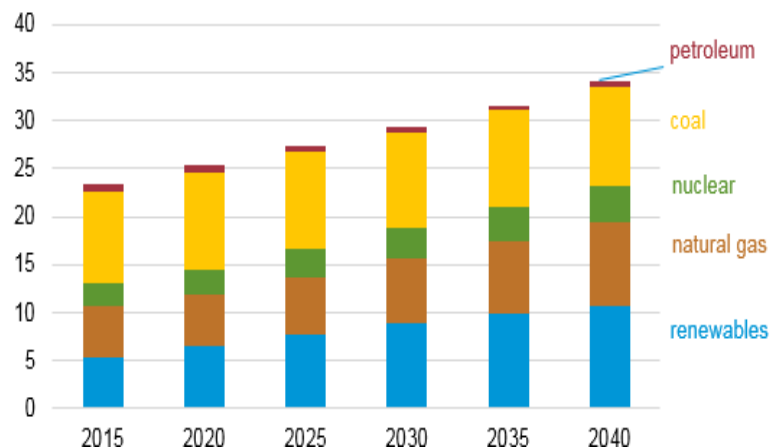
Will grow 45% from 2015-2040

IEO2018 Reference case
world energy consumption by energy source
quadrillion Btu



Source: EIA, International Energy Outlook 2018

Figure 6. World net electricity generation by energy source
trillion kilowatthours



Source: International Energy Outlook 2017

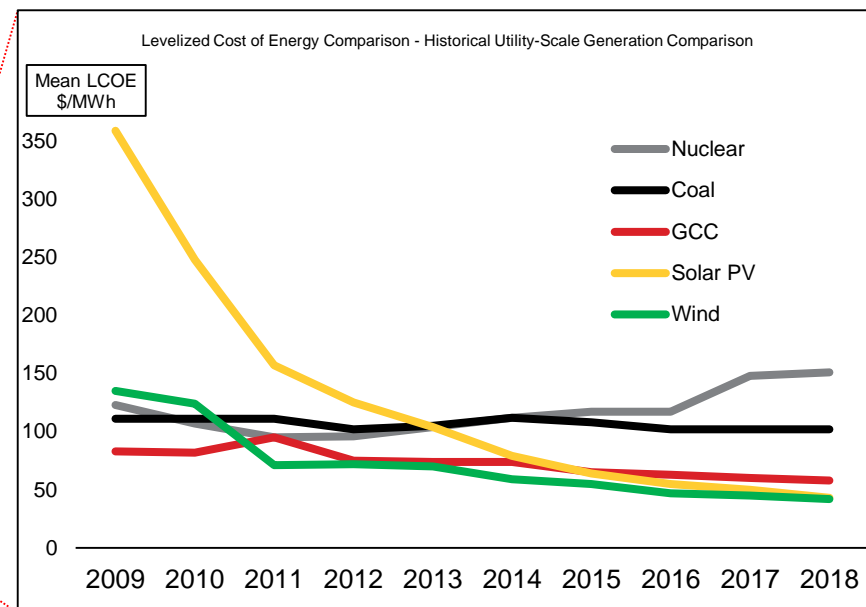
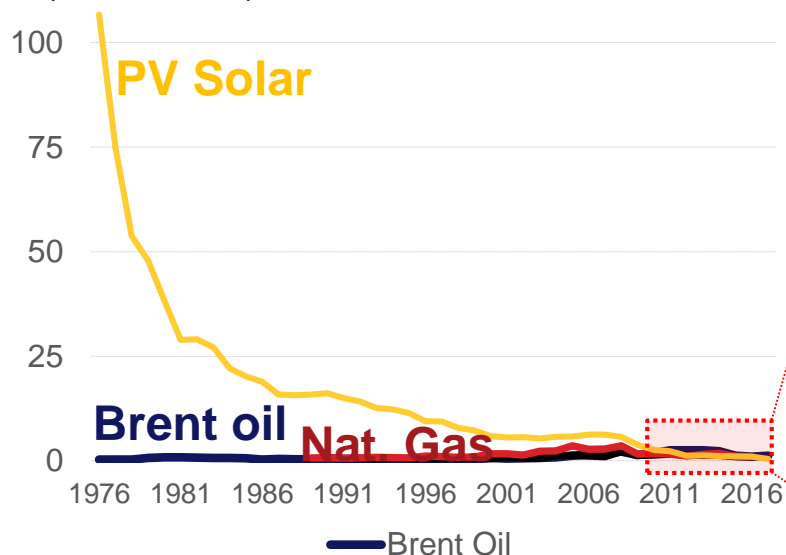
Why is The Energy Transition Gathering Pace?

PV module prices fell 92% over the past 10 years, rapidly closing the cost gap to conventional fuels.

Manufacturing processes allow for continuous cost improvement...

... and after 30 years, PV is becoming a viable alternative.

Proportion of 2016 prices.

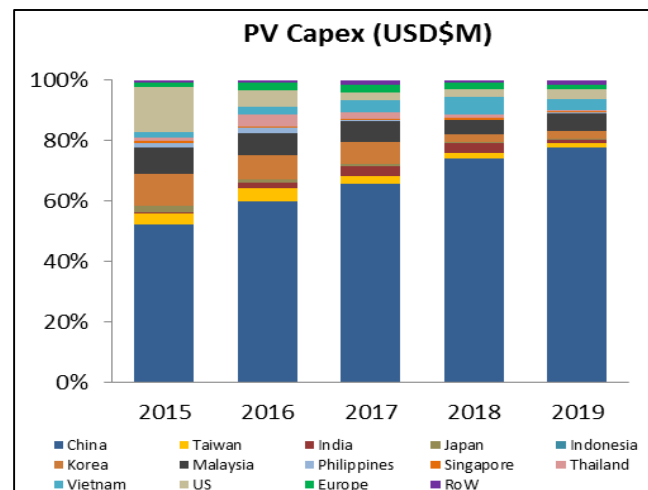


<https://pv-magazine-usa.com/2018/11/09/lazards-lazards-lcoe-whos-the-cheapest-energy/>

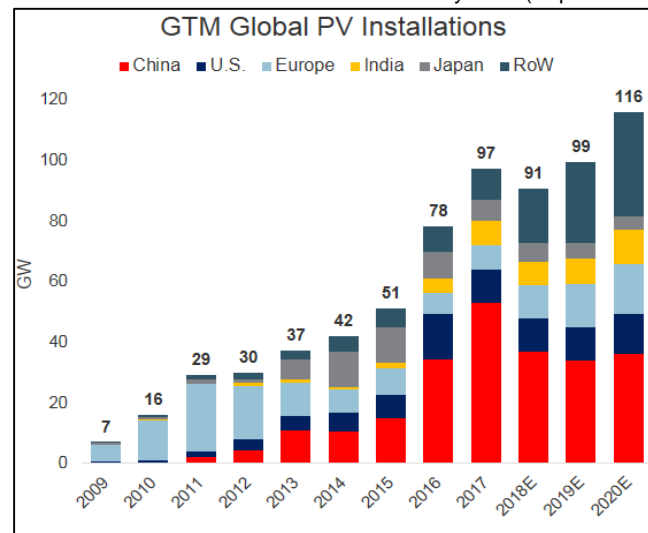
China Has Become the Largest PV Manufacturer and the Largest Market for PV Installations

China sees 3 benefits for investing in renewables

- › Economic opportunity
 - Reduced import of oil and gas
 - Leading in the fastest growing energy industry
- › Energy security
 - Less dependent on the traditional energy market
- › Cleaner Air
 - Reducing smog



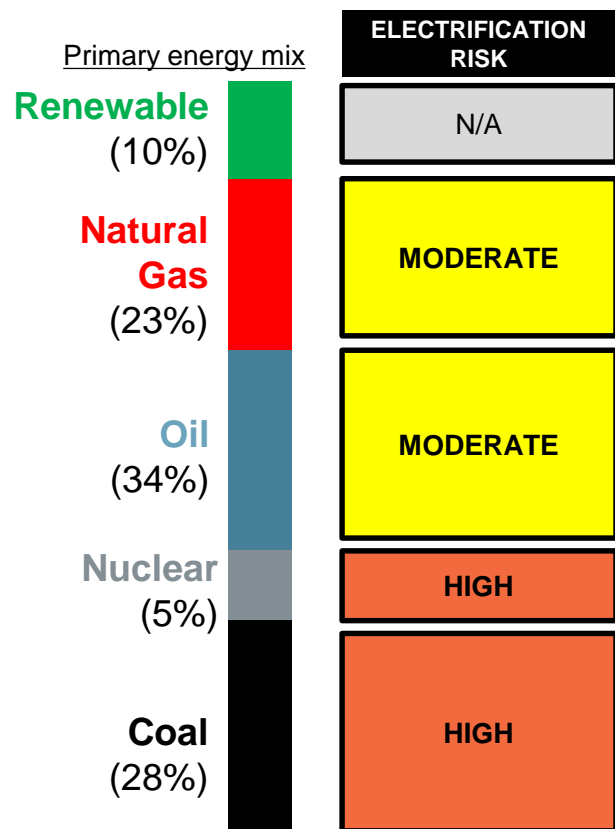
PV-Tech : Solar Media Market Research May 2018 (Report 2018/9)



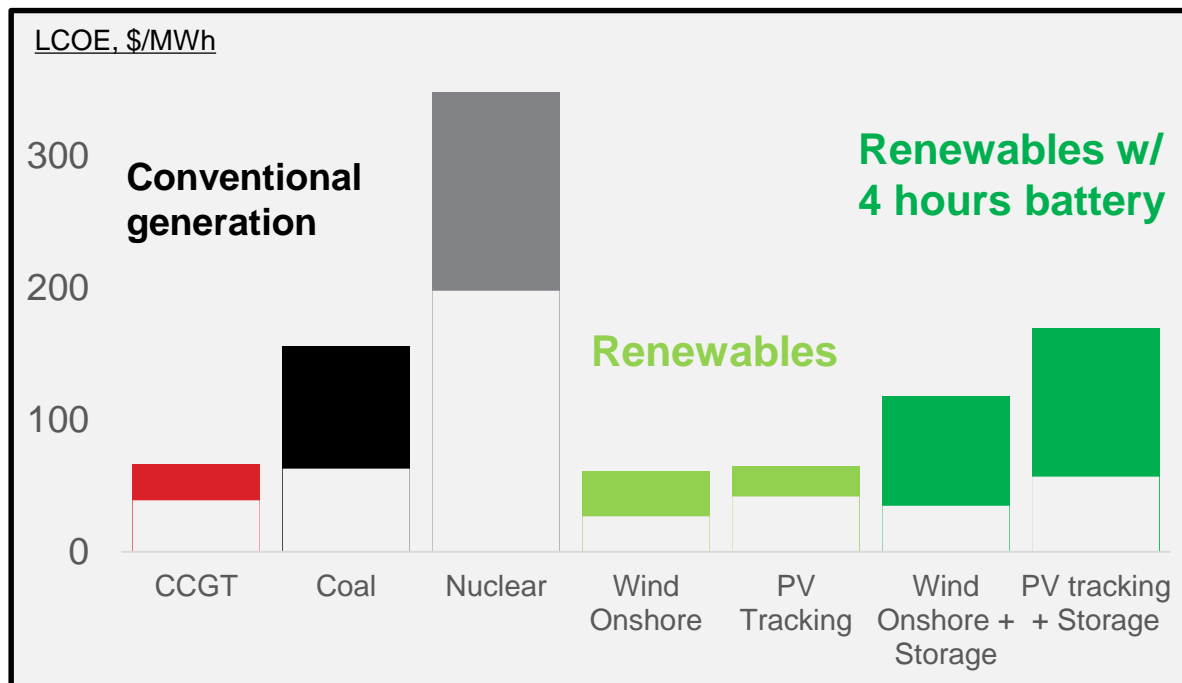
Source: GTM PV Pulse, December 2018

What is Preventing The Energy Transition From Gathering Pace? *Lack of Storage Capabilities at Competitive Prices*

Certain fuels remain competitive due to renewables' storage and energy density limitations.



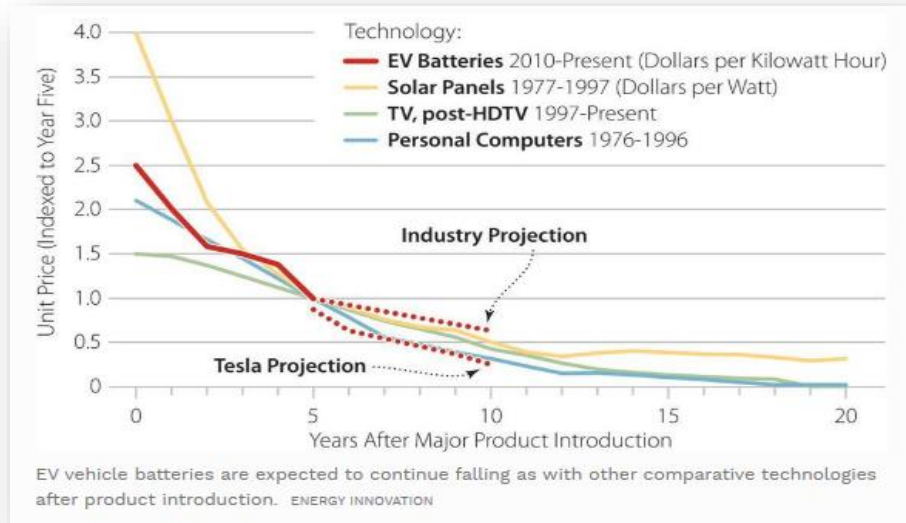
If we don't account for the storage issue, renewable alternatives are **already cost competitive**.



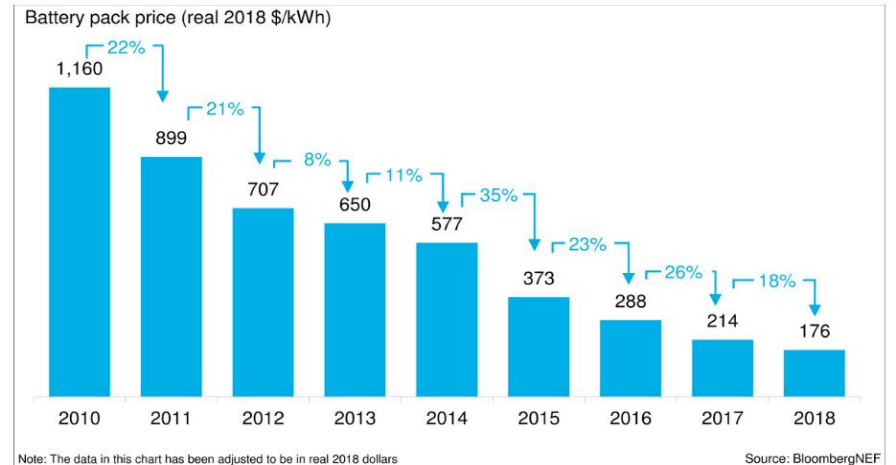
Source: Bloomberg 2H 2018 US LCOE Update, Nov. 19, 2018

Renewable Energy Requires Low Cost Storage Capabilities

- › The Cost of Batteries follow the same trend as PV
- › EV is driving the manufacturing capacity
 - Reducing cost
- › Further cost reduction due to:
 - Higher efficiency (use of Silane)
 - Increased market

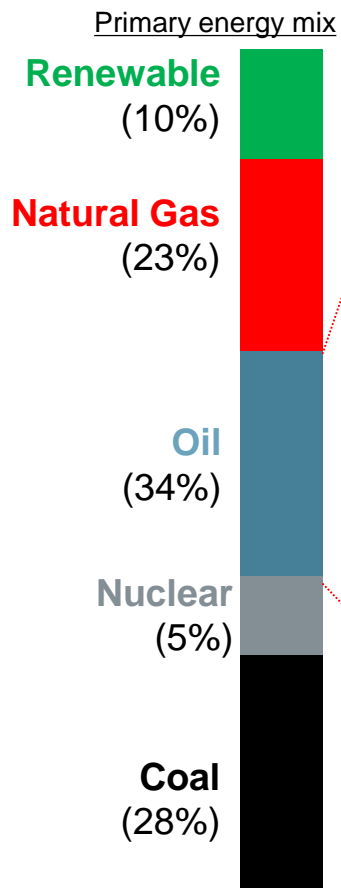


Source: <https://www.forbes.com/sites/energyinnovation/2018/05/30/chinas-all-in-on-electric-vehicles-heres-how-that-will-accelerate-sales-in-other-nations/#d9ef110e5c1e>



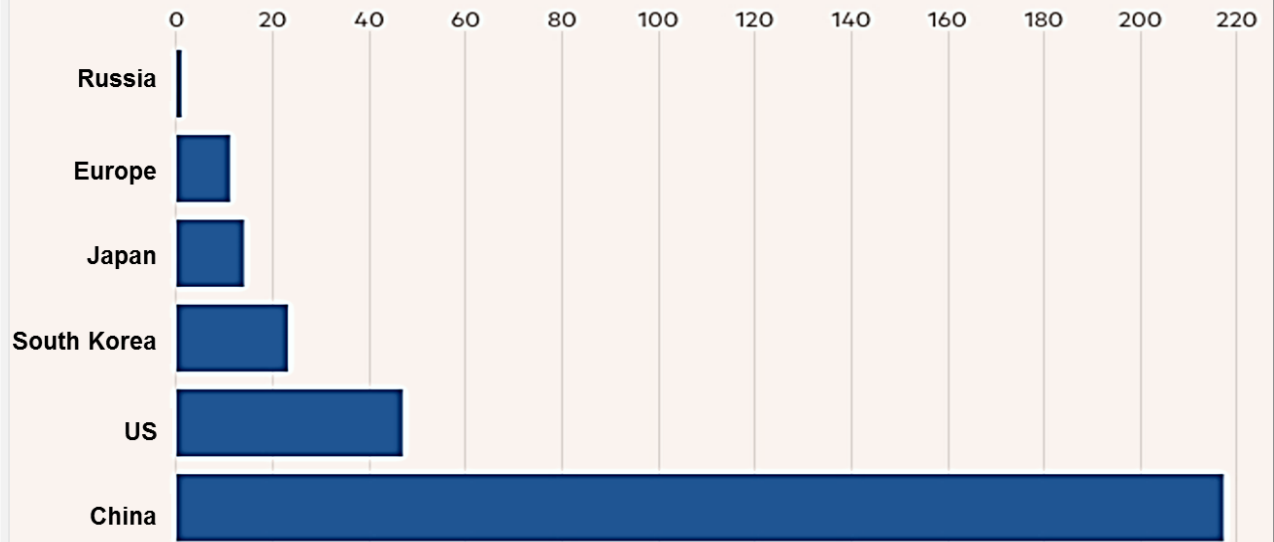
China in the Lead Concerning the Battery Investment...

...but the US and the EU have also committed large funds to develop battery technology



China Dominates Global Battery Production

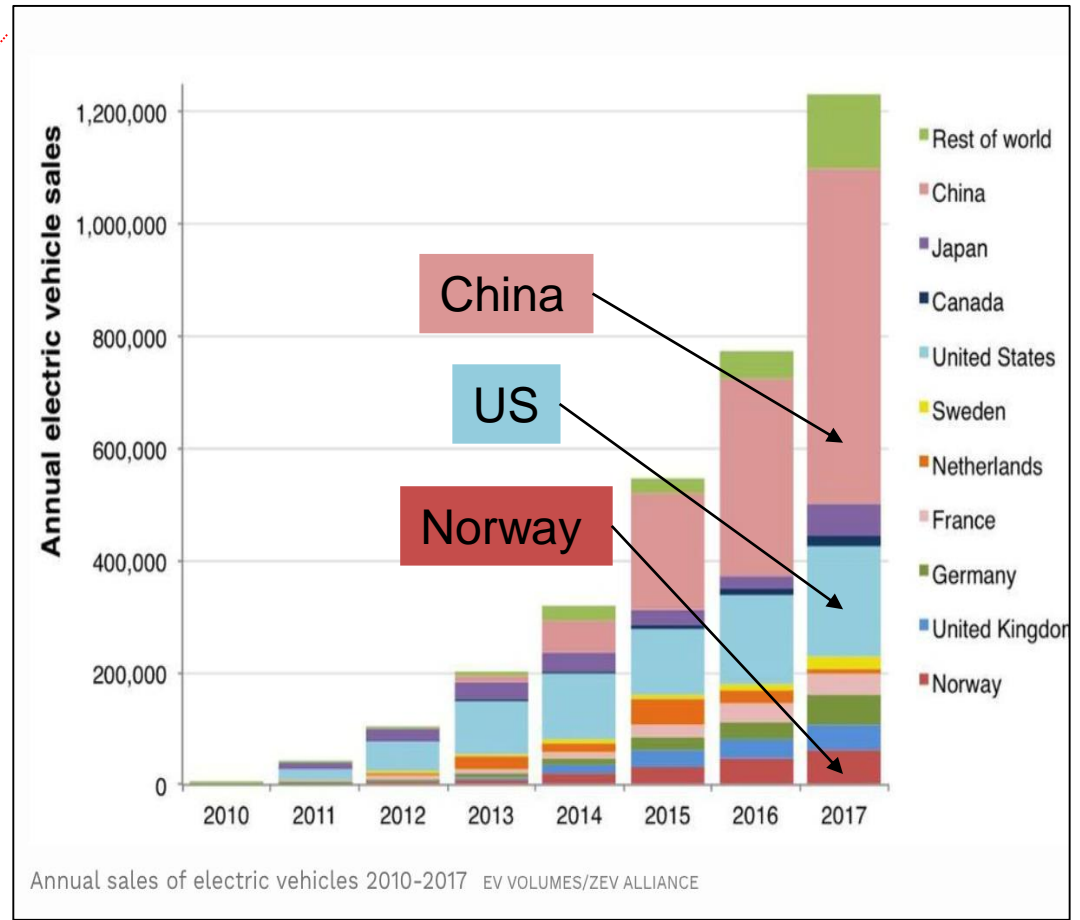
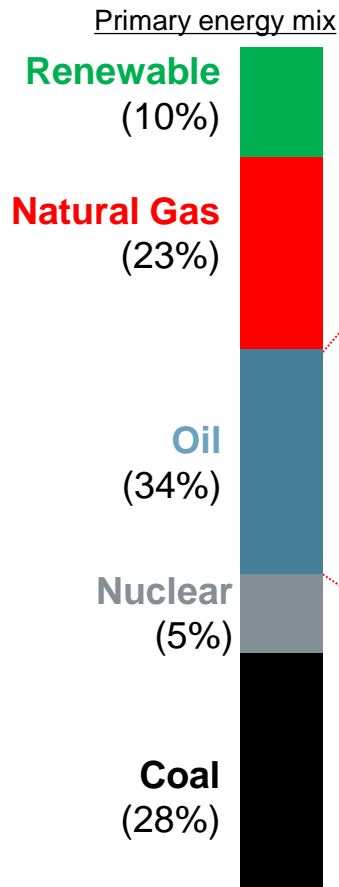
Planned and existing battery cell production (Gwh)



Source: Bloomberg
© FT

China Leads the Race in an Ambitious Electrical Vehicle plan...

...but the US and EU also have ambitions to be a player in the transformation



Source: Forbes article May 30, 2018

The background image shows an industrial facility, likely a refinery or chemical plant, at dusk. The sky is a mix of blue and orange. In the foreground, there are large white structural beams and a yellow safety railing. The REC SiLICON logo is in the top left corner.

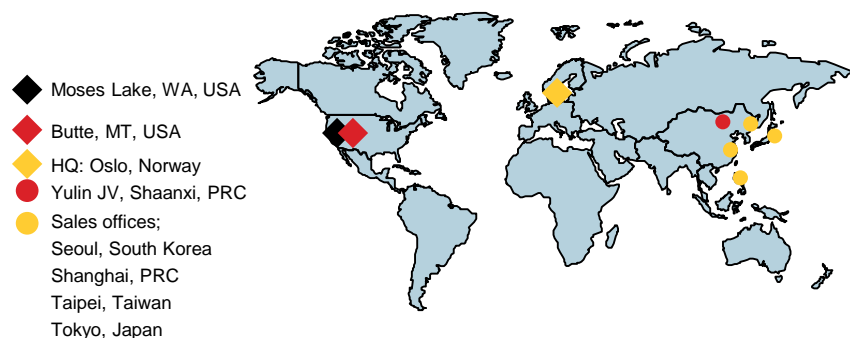
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**REC SILICON'S TECHNOLOGY IS OFFERING
HIGH QUALITY, LOW COST MATERIAL FOR
THE RENEWABLE INDUSTRY**

REC Silicon Has Manufacturing Capacity Both in the US and China, the Two Major Markets for Renewable Investments

Global leader in the silicon industry

- Two U.S. based plants in Moses Lake, Washington and Butte, Montana, capable of supplying ~22,000 MT high-performance polysilicon
- Present in China through a JV with Chinese partner since 2014
- Listed on the Oslo Stock Exchange under the ticker REC



Two modern manufacturing plants and one JV



Moses Lake, Washington (USA)

- Constructed in 1984
- The largest granular polysilicon production plant in the world

Products

- ✓ Polysilicon
- ✓ Fluidized Bed Reactor ("FBR")



Butte, Montana (USA)

- Constructed in 1998 (acquired 75% in 2009 and remaining 25% in 2015)
- World's largest supplier of silane gas and other specialty gases

- ✓ Polysilicon (Siemens)
- ✓ Silane gas



Joint Venture, Yulin (China)

- Started up in December 2017
- 15% ownership
- REC only international player with presence in China

- ✓ Polysilicon
- ✓ FBR
- ✓ Polysilicon
- ✓ Siemens
- ✓ Silane gas



REC Silicon is serving the Semiconductor and Renewable Energy market



The Semiconductor Market is Stable...

...but the PV (Solar) Market is Challenging Due to the China/US Trade War

(USD million)	Q3 2018		Q2 2018		YTD 2018	
	Revenues	EBITDA	Revenues	EBITDA	Revenues	EBITDA
Solar Materials (Moses Lake)	6.2	(9.9)	20.4	(15.9)	59.3	(17.4)
Semiconductor Materials (Butte)	37.6	9.3	38.6	14.4	113.9	41.2
Other	-	(5.4)	-	(8.1)	-	(24.4)
Eliminations	-	-	(0.0)	(0.0)	(0.9)	(0.5)
REC Silicon Group	43.7	(6.1)	58.9	(9.6)	172.3	(1.1)

A photograph of a large industrial facility, likely a refinery or chemical plant, at night. The scene is illuminated by numerous yellow and white lights, highlighting the complex network of pipes, metal structures, and tall distillation columns. The sky is a deep blue. A yellow diagonal line runs across the bottom of the image, separating the photograph from the white text area.

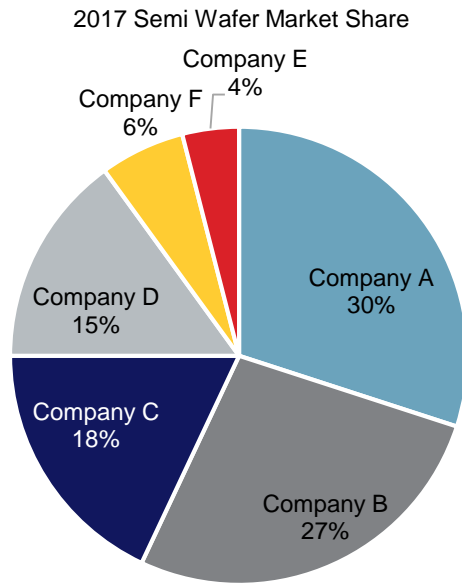
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REC's
COMPETITIVE
ADVANTAGES

Contracts With the Top 4 Semiconductor Companies

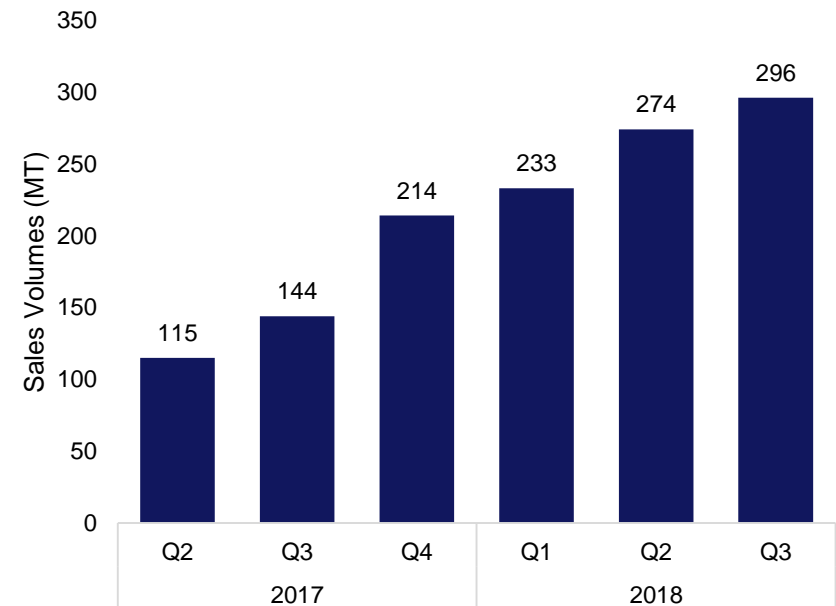
- **Quality requirement create barriers for new suppliers/entrants**
- **Long-term supply relationship**
- **REC produces the highest purity polysilicon for the FZ industry**

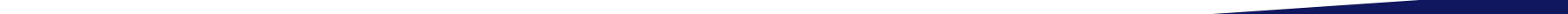
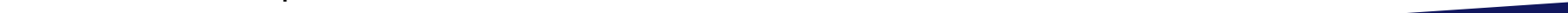
Top 4 Silicon Wafer Companies Have 90% Market Share



Sources: Market Analysis Data

REC Silicon Semiconductor Polysilicon Sales



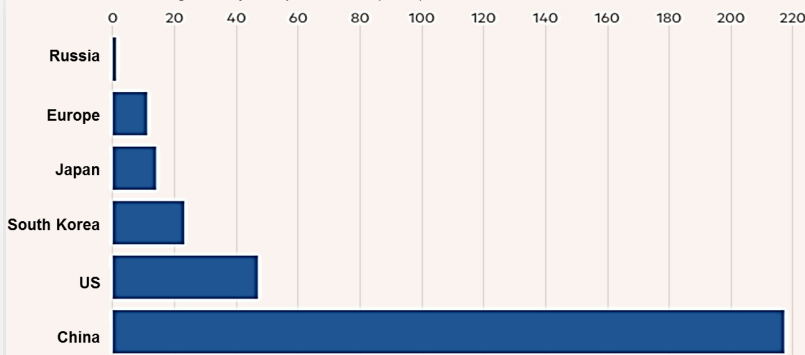


Batteries: Attractive Opportunity for the Silicon Gas Market

- › Increased battery capacity and improved **recharging speed** by adding Silicon gas in the Anodes
- › Market could exceed 100,000 MT within the next 5-10 years
- › Strong focus in China, the US and EU to build a battery industry

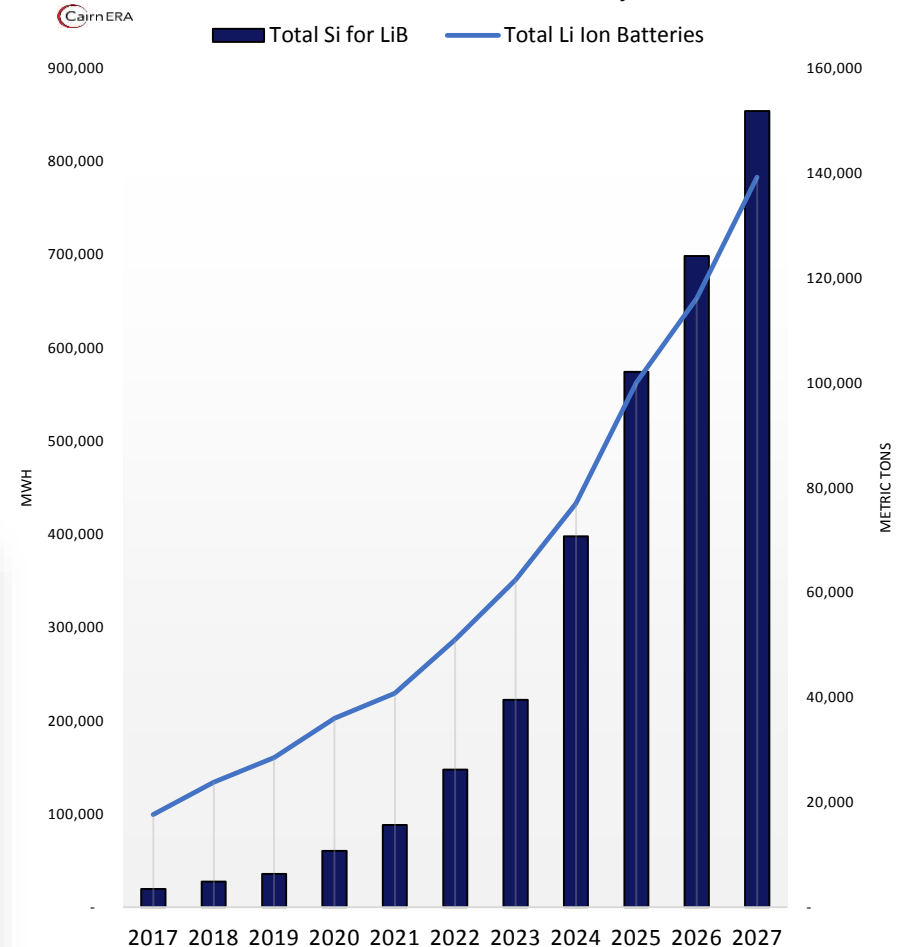
China Dominates Global Battery Production

Planned and existing battery cell production (Gwh)



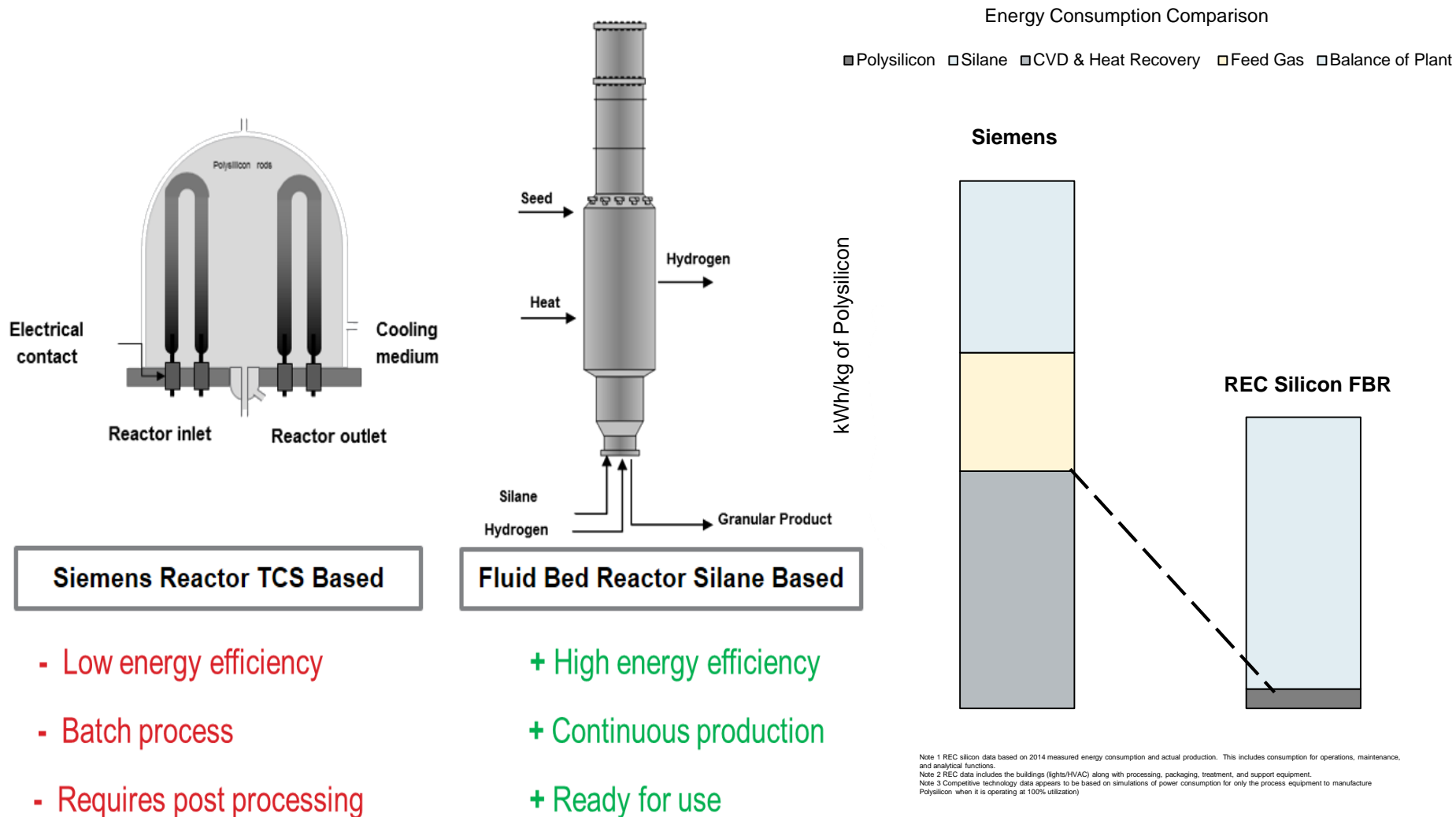
Source: Bloomberg
© FT

Global Growth Forecast of Li Ion Battery Market and Silicon for LiB Industry



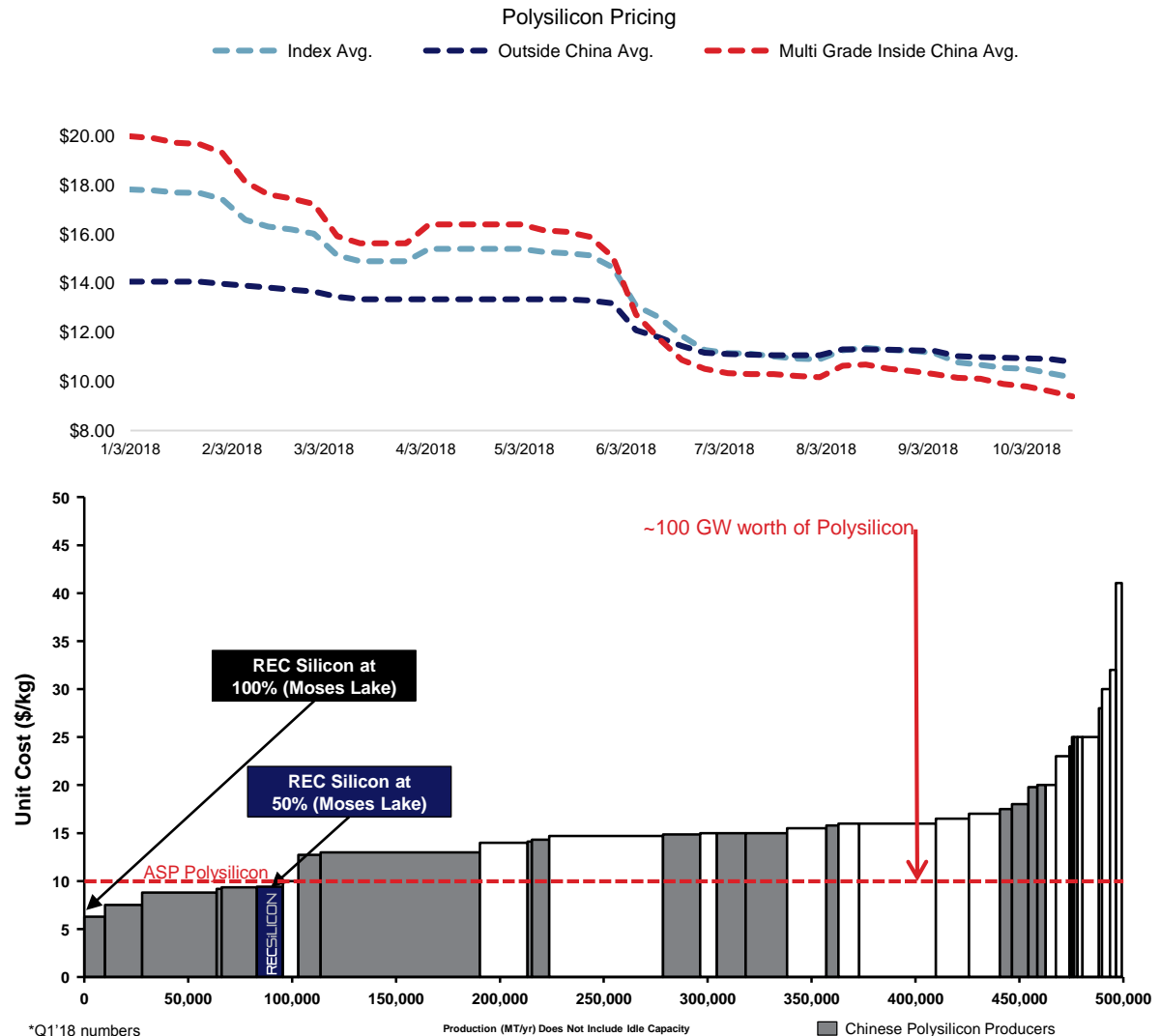
REC's FBR Technology

~50% Energy Reduction Over Competitors Technology



FBR: Lowest Cost Polysilicon Production in the Industry

- Polysilicon ASP below cash cost for the industry
- Curtailment and postponement of new capacity
- REC to sell below market price due to trade war



A photograph of a large industrial facility, likely a chemical or petrochemical plant, at night. The scene is illuminated by warm yellow lights. In the foreground, two large, vertical, cylindrical storage tanks are visible, each with a yellow safety cage around it. To the left of the tanks is a blue industrial building with a door and some signage. The background is filled with a complex network of pipes, structural steel beams, and multiple levels of walkways or platforms. The overall atmosphere is industrial and busy.

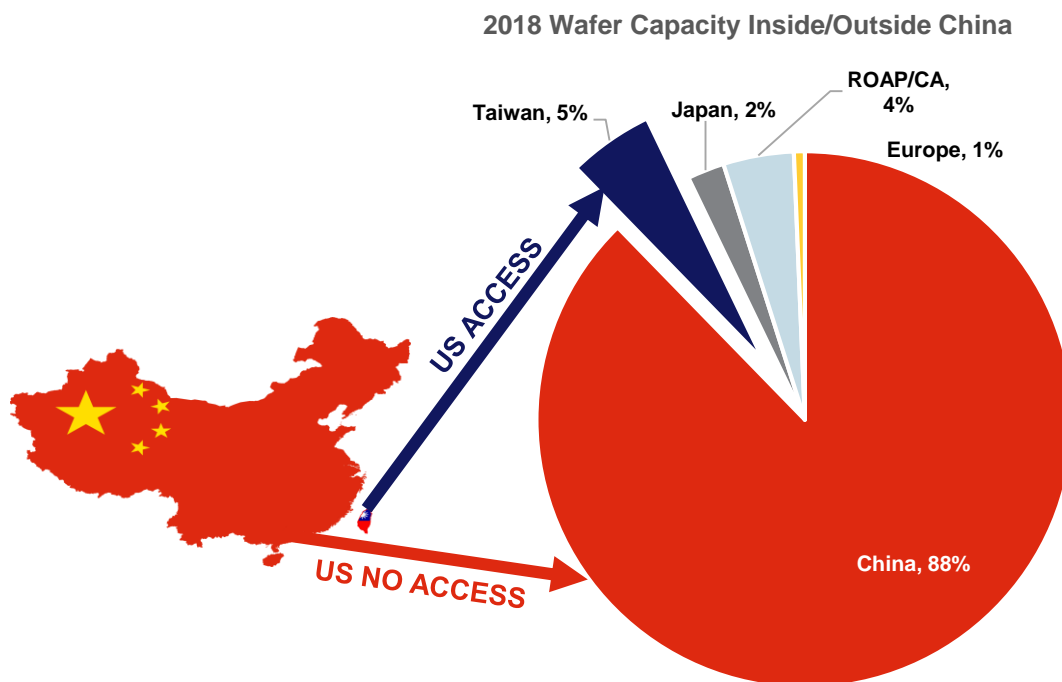
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SHORT TERM
UPSIDE FOR REC
SILICON

China / US Trade Discussions Finalized on March 1, 2019

Polysilicon Industry Arguments

- › Polysilicon is strategically important for US Semi, PV and LiBs, market
 - Creates security risk for US if China dominates
- › Access to the Chinese market will create ~1,900 high paying manufacturing jobs in the US and reduce the trade deficit
- › US polysilicon industry (Wacker, Hemlock and REC Silicon), in close dialog with USTR



Source: I.H.S. PV Market Supply China Tracker Q2 2018 Issued July 9, 2018
Includes: Mono, Multi, Semi

Yulin JV Represents REC's Investment in China

› 2014 Yulin JV Agreement:

- Received \$198M for Technology Transfer

› 2018 Framework Agreement:

- Yulin JV Shareholding:
 - SNF ~85%, REC Silicon ~15%
- 2021 REC has the option to:
 - Buy back ~34% Equity Interest from SNF

› JV Operational Status Q3 2018:

- ~3000 MT Granular Polysilicon Produced
- Solar Grade Quality

› Siemens Reactor Status:

- Siemens Reactors Operational
- Commercial CZ Production Per Plan
- FZ Production Trials Underway



Yulin JV Signing Ceremony February 2014



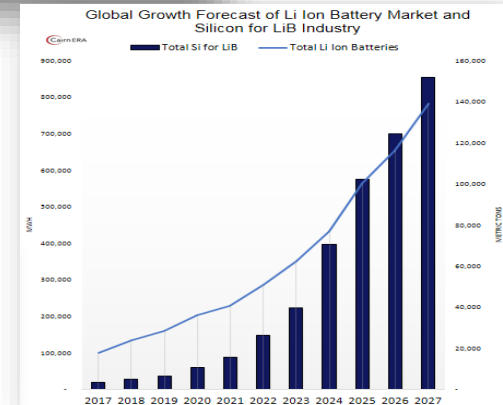


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WHY INVEST IN
REC SILICON

Potential Triggers for REC Silicon ASA

- › Trade War resolution
 - Substantial increase in revenue with 100% FBR utilization, higher ASP and lower cash cost
- › The battery market
 - Substantial increase in demand for silane
- › Increased ownership in Yulin JV
 - From 15% to 49%
 - Will be in a good negotiation position



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Thank You!
