



RECSiLICON



THIRD QUARTER
2019

PRESENTATION

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Agenda

Q3 Financial Results

Financial Review

Market Outlook

Silicon Gas & EG Polysilicon

China Tariff Update

Moses Lake's Future

Yulin JV

Short-Term Business Plan

Q&A

Highlights

Revenues: \$36.4M
EBITDA Loss: (\$ 5.6M)

September 30, 2019 cash balance of \$46.2M

- Cash increase of \$7.8M
- Cash inflows from operations \$9.0M
 - Working capital decrease of \$17.4M

Silicon gas sales

- Sales volume of 860MT (vs. guidance of 900MT)
- (0.5%) Silane gas price decrease vs. Q2'19

Semiconductor segment polysilicon sales

- Sales volume of 194MT (decrease of 44.8% vs. Q2'19)
- 10.7% Semiconductor grade polysilicon price decrease vs. Q2'19

Shutdown of Moses Lake FBR facility

- Curtailment of FBR production on May 15, 2019
- Workforce reduction announced on July 15, 2019
 - \$2.2M reorganization costs
- Long-term shutdown until significant positive developments in solar grade polysilicon markets occur

Plan initiated to investigate the sale of the Butte, Montana plant

- Will be sold only if an acceptable bid is received
- Proceeds will be used to retire debt, provide a buffer for contingent liabilities, and prepare to restart FBR

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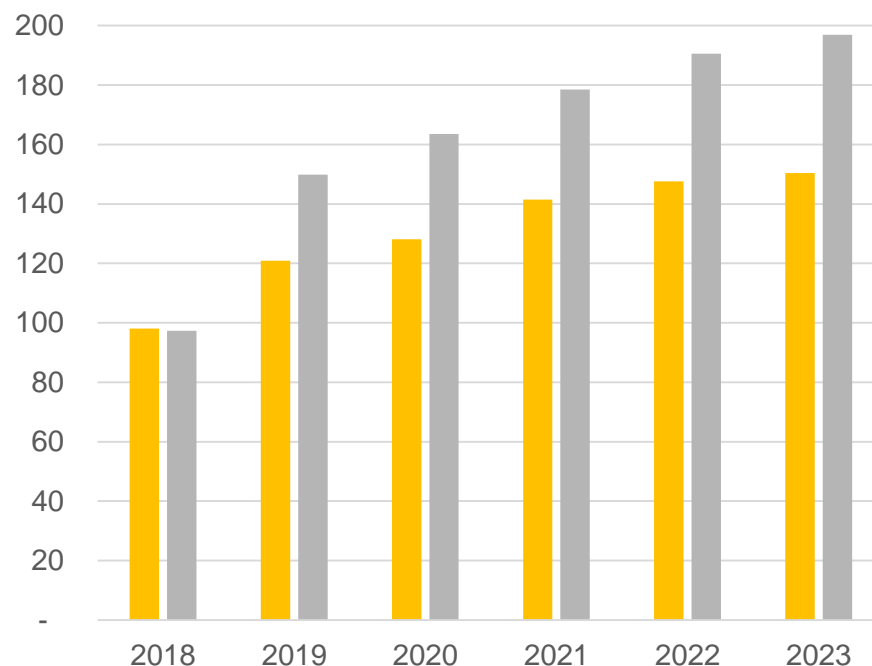
PV Market Outlook

Global PV Module Demand Forecast: 2019 - 2025

- › 2019 global demand forecasted approximately 118GW
 - China forecast 2019 ~30GW
 - US forecast 2019 ~15GW
 - EU forecast 2019 ~23GW
 - ROW forecast 2019 ~50GW
- › 2020 global demand expected to be approximately 131GW

2018 - 2025 Global Module Demand, Unit: GW

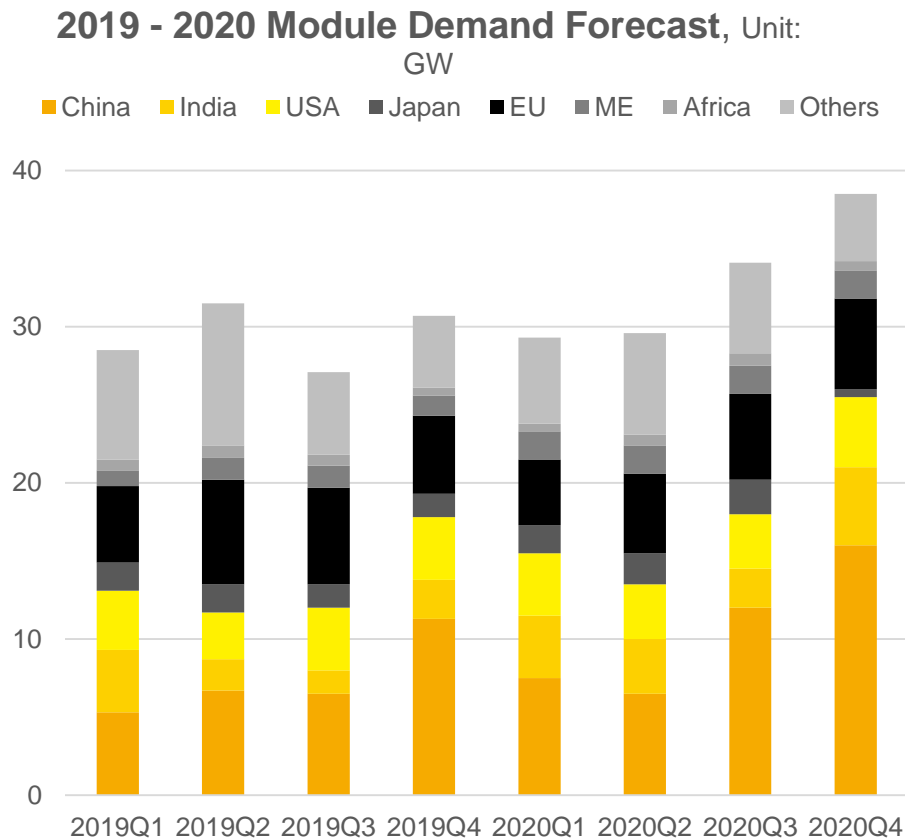
■ Expected ■ Optimistic



Source: PV Infolink - Database October 2019

Quarterly Installation Estimates: 2019 – 2020

- › Total forecast in 2019 Q4 is approximately 30GW
 - China forecast 2019Q4 ~11GW
 - US forecast 2019Q4 ~4GW
 - EU forecast 2019Q4 ~5GW
 - ROW forecast 2019Q4 ~10GW



Source: PV Infolink - Database October 2019

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FINANCIAL REVIEW

Summary of Segments

(USD million)	Q3 2019		2019 YTD		2018	
	Revenues	EBITDA	Revenues	EBITDA	Revenues	EBITDA
Semiconductor Materials	29.7	8.2	96.7	32.5	152.9	52.2
Solar Materials	6.6	(6.1)	31.7	(22.8)	69.2	(26.6)
Other	0.0	(7.7)	0.0	(19.6)	-	(30.0)
Eliminations	-	-	0.0	0.0	(0.9)	(0.5)
REC Silicon Group	36.4	(5.6)	128.4	(9.9)	221.2	(4.9)

› Implementation of IFRS 16 – Leases

- Effective date January 1, 2019
- Increased EBITDA equal to lease payments classified as finance leases
- Recognition of interest expense (imputed)
- Right of use assets depreciated over lease term

(USD million)	EBITDA Impact (IFRS 16 Leases)	
	Q3 2019	2019
Semiconductor Materials	1.2	4.2
Solar Materials	1.8	5.5
Other	0.0	0.0
Eliminations	-	-
Total Impact of IFRS 16	3.1	9.7

Key Financial Results – Semiconductor Materials

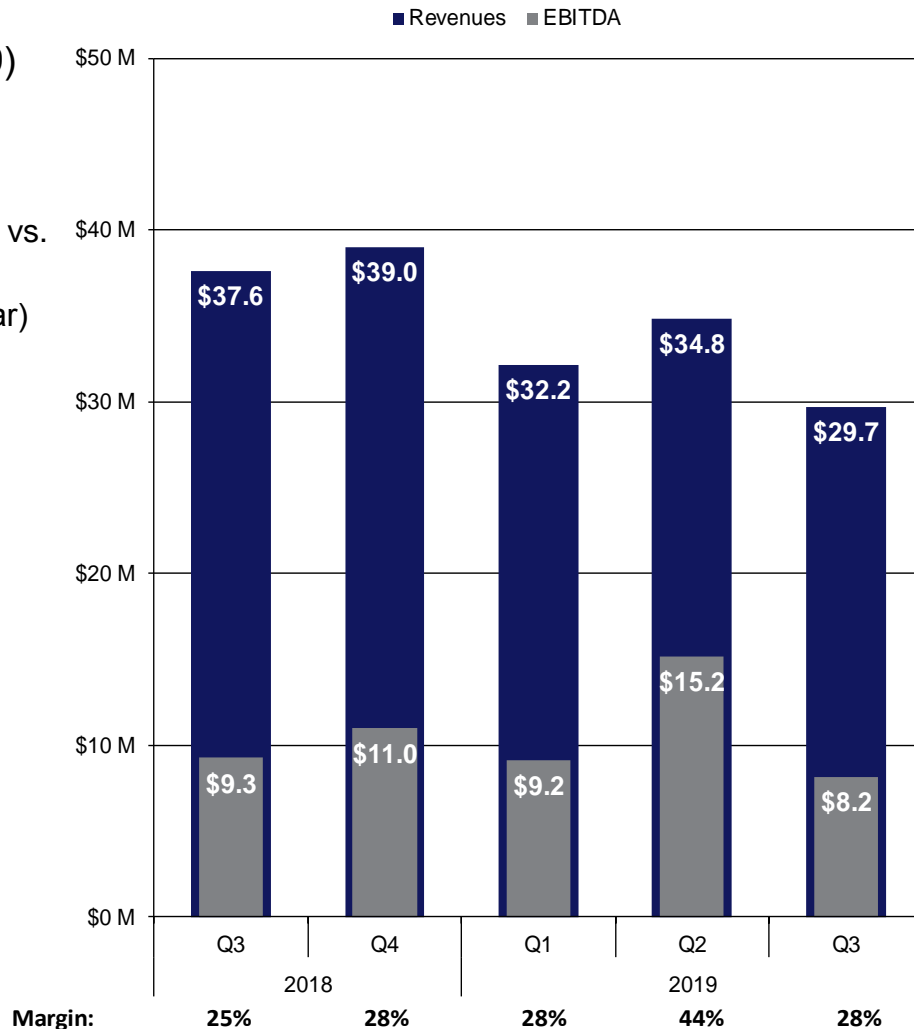
Revenues: \$29.7M (14.6% decrease vs. Q2'19)

- › Polysilicon sales volumes 194MT (44.8% decrease vs. Q2'19)
 - Semiconductor grade volumes 142MT (29.0% decrease vs. Q2'19)
 - 3.2% Average price increase vs. Q2'19 (low mix of solar)
 - 10.7% Semiconductor grade price decrease vs. Q2'19
- › Silicon gas sales volumes 860MT (3.1% increase vs. Q2'19)
 - 0.5% Silane price decrease vs. Q2'19

EBITDA Contribution of \$8.2M

Compared to Q2'19 EBITDA contribution of \$15.2M

- › Higher electricity costs (Q3'19 average ~\$37/MW)
- › Production interruption due to equipment failure
- › Lower silane and polysilicon prices
- › Lower sales of float zone (FZ) grade polysilicon



Key Financial Results – Solar Materials and Other

Solar Materials

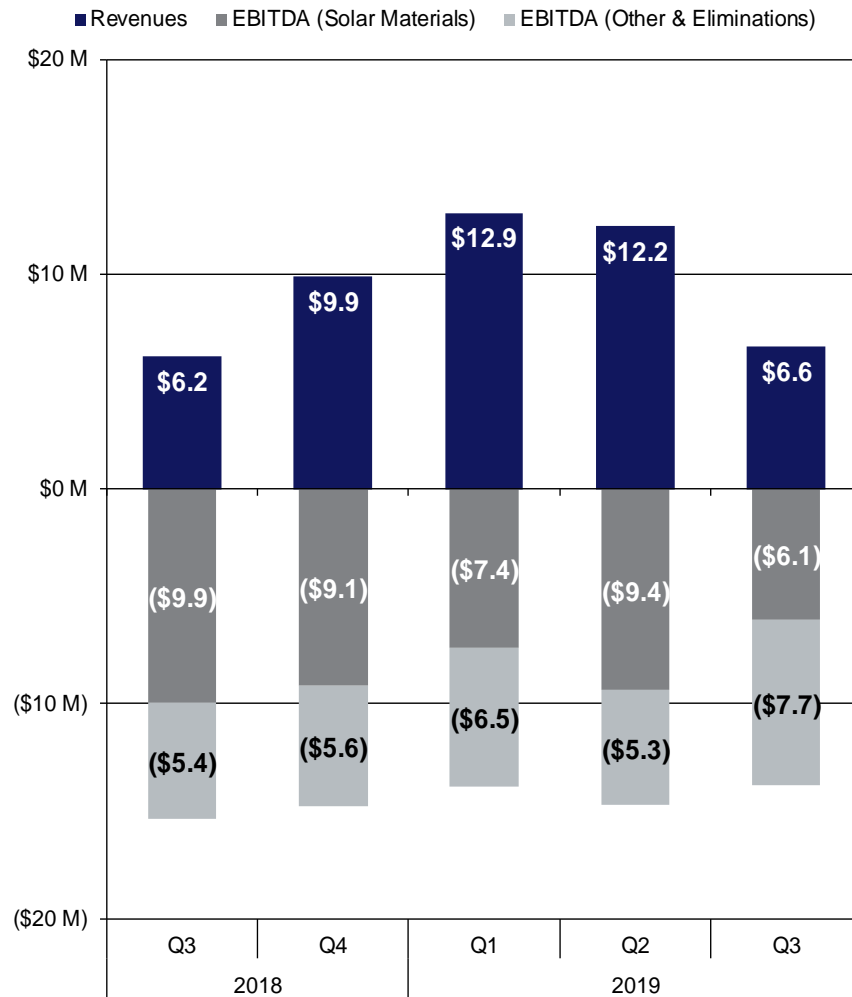
Revenues: \$6.6M (45.8% decrease vs. Q2'19)

EBITDA Contribution: (\$6.1M) Loss

- › Polysilicon sales volumes 961MT (44.7% decrease vs. Q2'19)
 - (8.7%) Average price decrease vs. Q2'19 (Low Mix of Prime)
 - (3.2%) Prime grade solar price decrease vs. Q2'19
- › Net expense while FBR is not in operation
 - Expect approximately \$5M per quarter net cost

Other and Eliminations

- › Net cost: (\$7.7M) (compared to \$5.3M in Q2'19)
 - Includes \$2.2M Reorganization Costs



Cash Flows

Cash inflows from operating activities \$9.0M

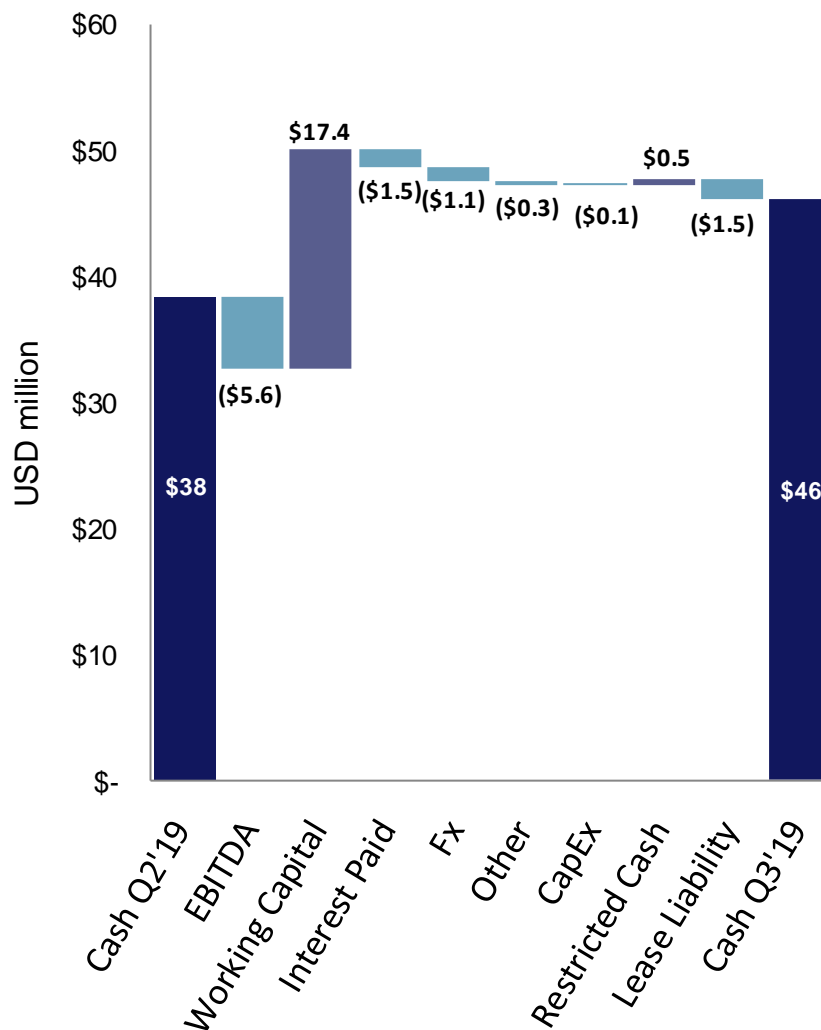
- › EBITDA loss of (\$5.6M)
- › Working capital decrease \$17.4M
 - Decrease in inventories \$7.4M
 - Increase in receivables \$8.0M
 - Decrease in payables \$2.0M
- › Interest paid (\$1.5M)
- › Currency loss of (\$1.1M) (stronger USD vs. NOK)
- › Other (\$0.2M)

Cash inflows from investing activities \$0.4M

- › Capex (\$0.1M)
- › Decrease in restricted cash \$0.5M

Cash outflows from financing activities (\$1.6M)

- › Payment of lease liabilities (\$1.5M)



Debt

Nominal debt - \$182.3M

- › Decrease of \$2.7M in Q3'19
 - \$1.2M Increase in Lease Liabilities (IFRS 16)
 - \$1.5M Due to stronger USD relative to NOK

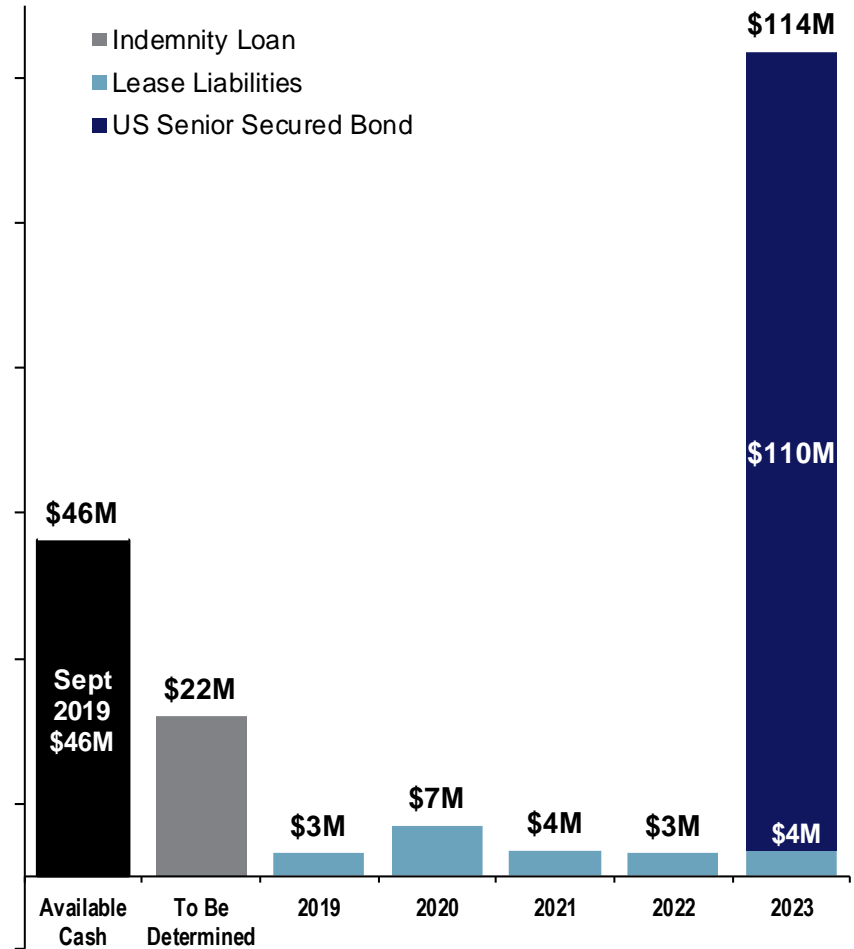
Nominal net debt - \$136.1M

- › Decrease of \$10.5M in Q3'19
 - Increase in cash of \$7.8M
 - Decrease in nominal debt of \$2.7M

Contingent Liabilities

- › Reassessment of tax - \$28.2M
- › Indemnity loan - \$22.0M
- › 2012 Property tax appeal - \$7.7M

USD Million





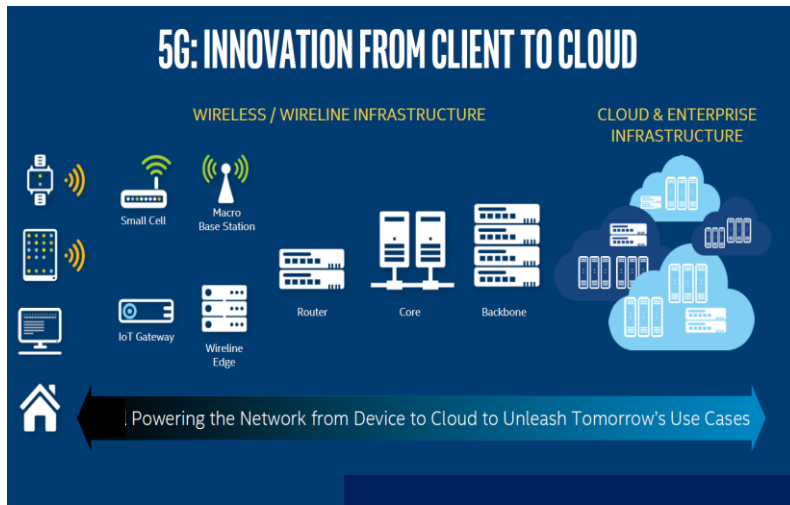
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**SILICON GAS &
EG POLYSILICON**

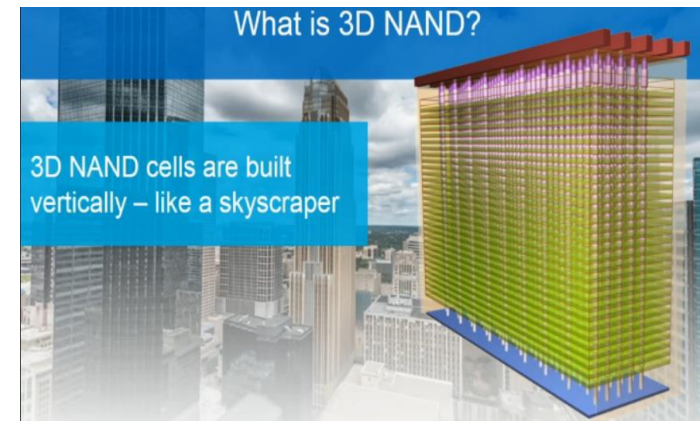
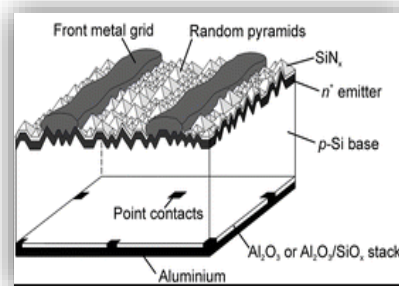
Macro Drivers for Semiconductor Industry

...aligned with the future trends

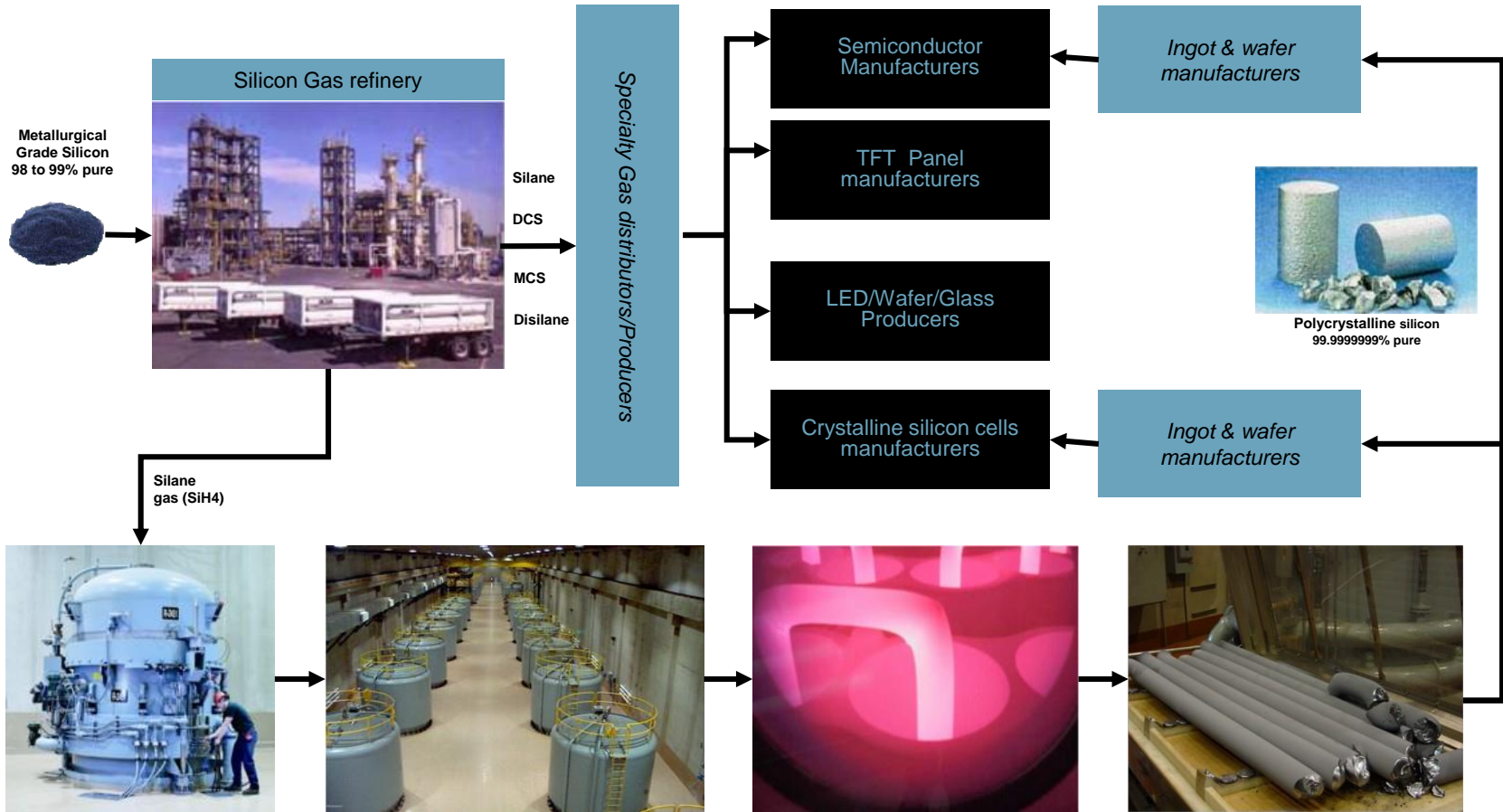
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- > Internet of Things (IOT)
- > 5G
- > Display/Flex Display
- > PV/Renewable Energy
- > Auto
 - > Increasing content
 - > EV/Autonomous



Value Creation at REC Silicon



Siemens reactor - based polycrystalline silicon deposition process

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Silicon Gases

Silicon Gases in REC Silicon's Portfolio

› Silane (SiH_4) Applications

- Thin Film Transistor (TFT)
- Semiconductor Devices
- Photovoltaic (PV)

› Dichlorosilane (DCS) (SiCl_2H_2) Applications

- Semiconductor Devices
- Ceramics
- Advanced Material/Gas Precursor

› Monochlorosilane (MCS) (SiH_3Cl) Applications

- Semiconductor Devices
- Advanced Material/Gas Precursor

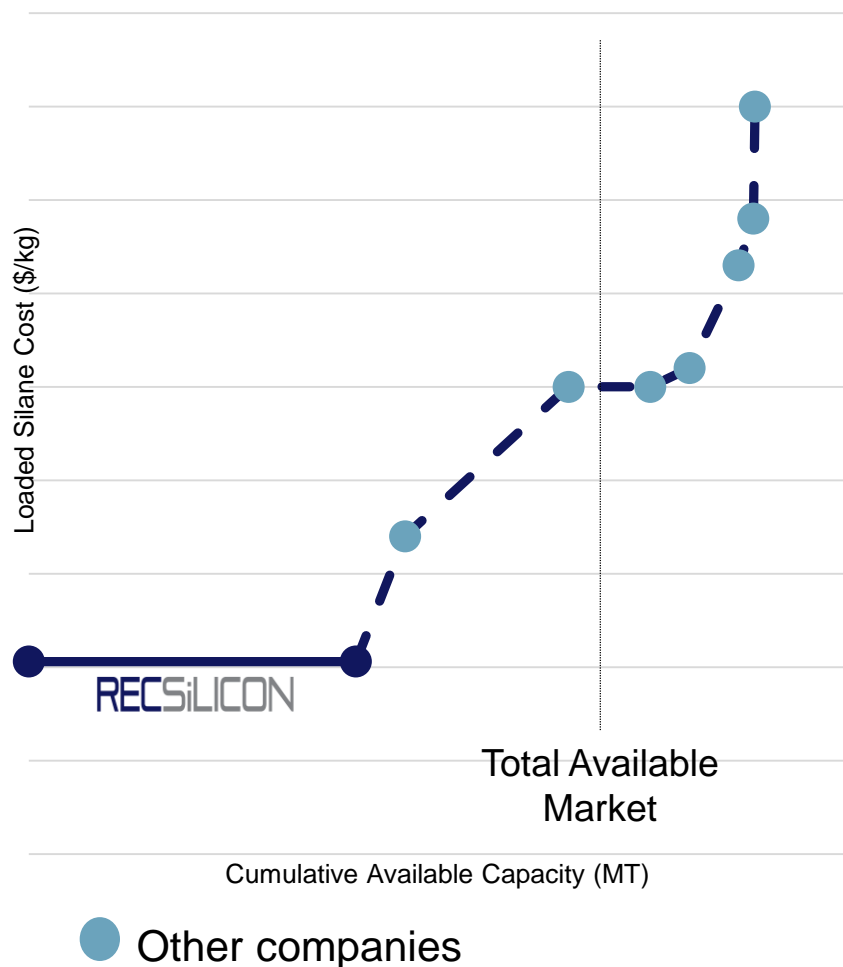
› DiSilane (Si_2H_6) Applications

- Semiconductor Devices



Dominant Cost Advantage and Market Share

Global Silane Supply Stack



- › Largest producer and distributor of Silane Gas
 - Unmatched experience and safety record
 - Recognized product quality and reliability
 - ~70% Semiconductor market share

- › Infrastructure to protect market share
 - Large module fleet
 - Secure distribution channels

- › Available capacity to support market growth

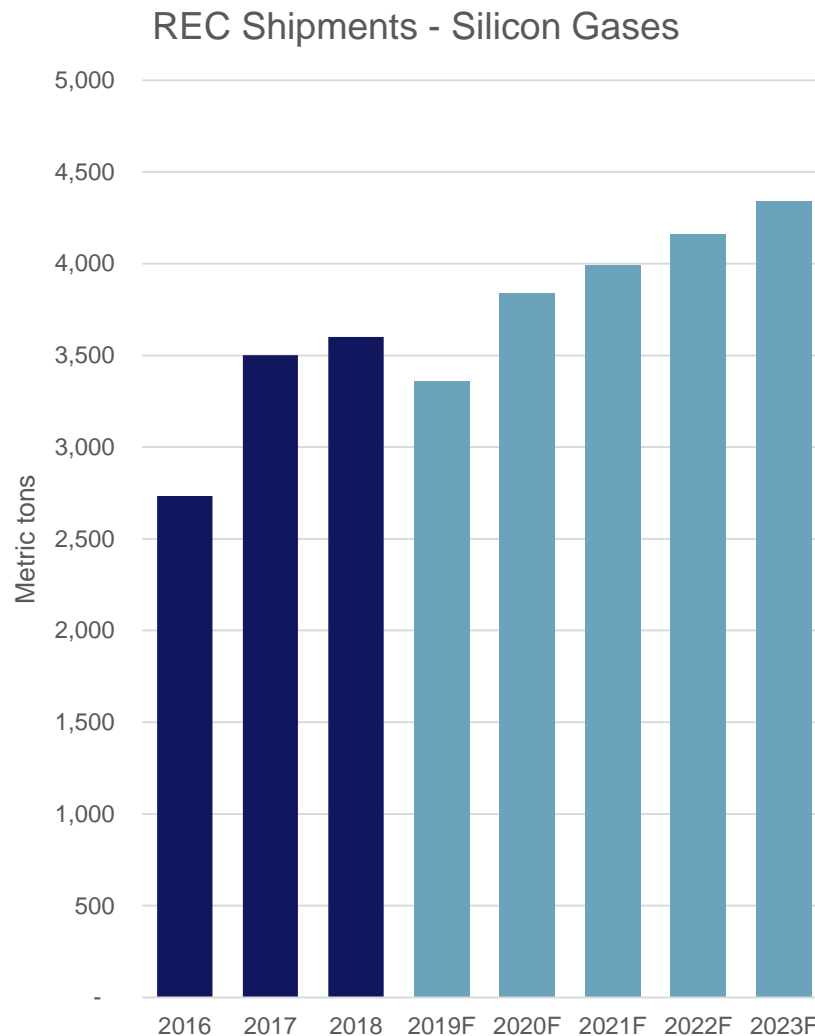
Silicon Gas Sales Follow Trends in End Markets

- › 2019 Silicon Gas sales lower than forecasted
 - Inventory control
 - Short term demand uncertainty

- › Strong future demand growth
 - Driven by mega trends
 - 5G
 - IoT
 - Autonomous and EV

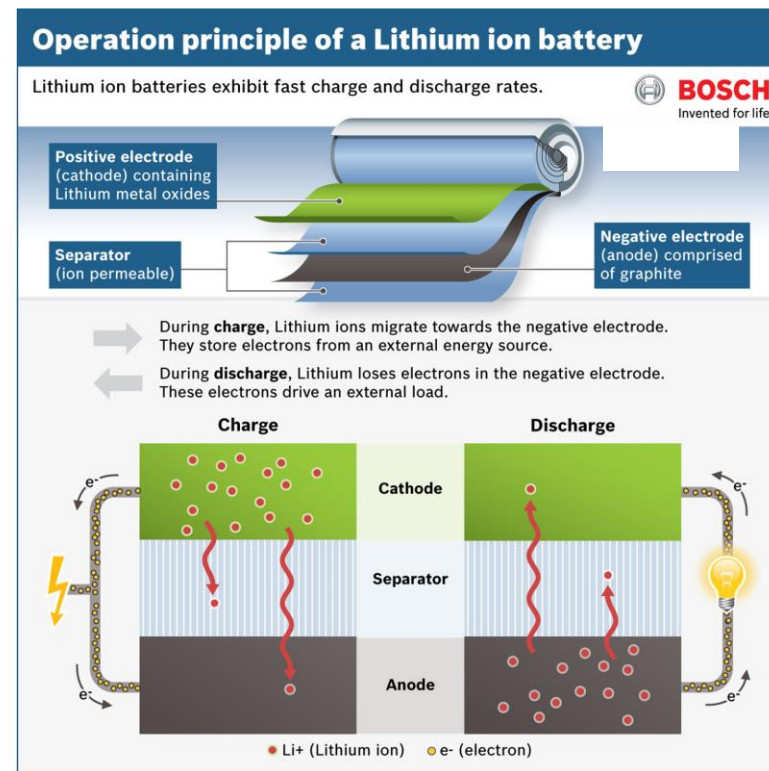
- › Global Semiconductor production capacity
 - Taiwan, South Korea, Japan = 60%
 - China = 12%

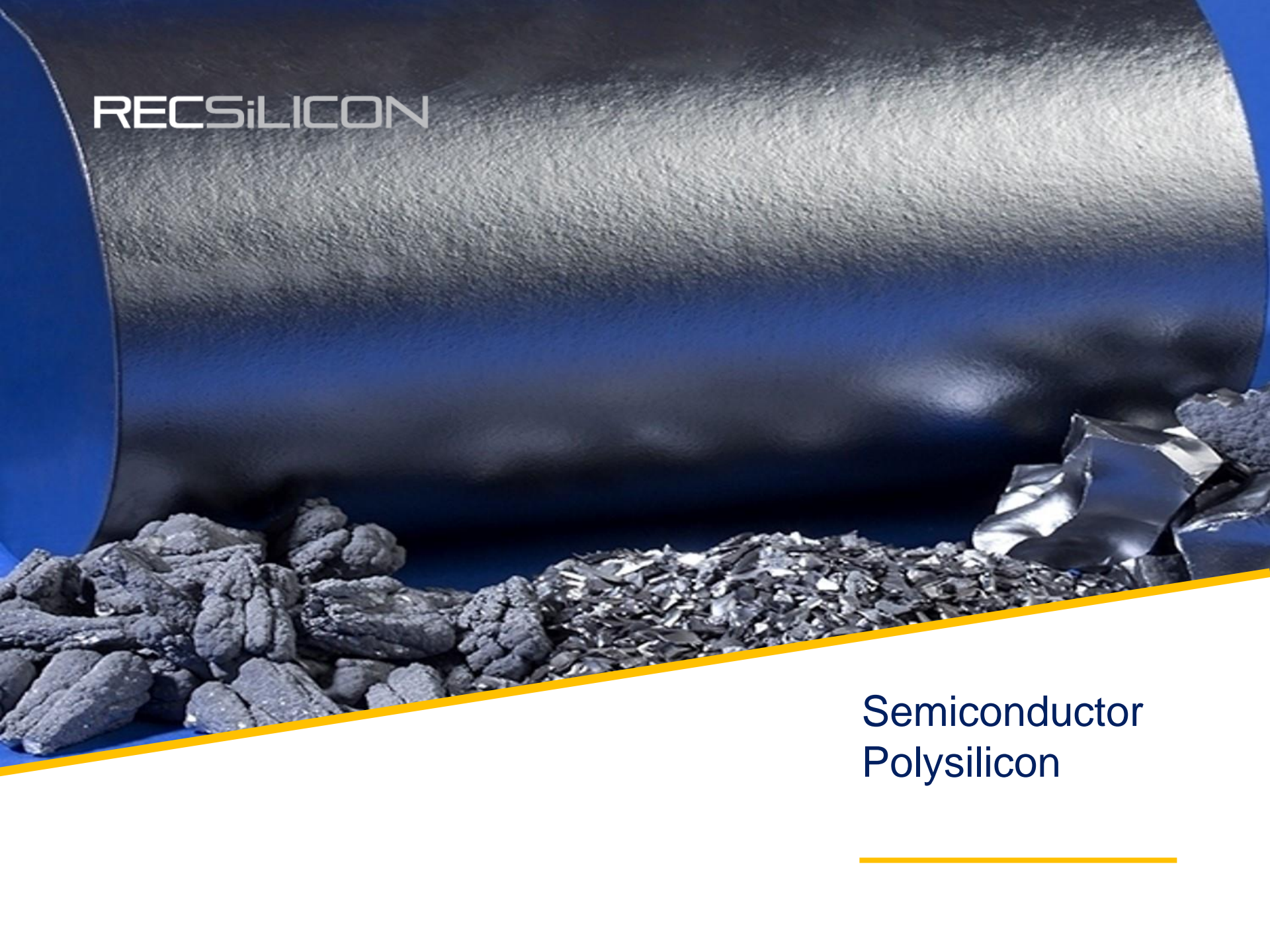
- › Accelerated growth in advanced Silicon Gases
 - MCS, DCS, DiSilane
 - Used with advanced technology



Silicon Anode Increases Li Battery Capacity ~30%

- › Study and application focused on increasing Si content
 - Increase energy density
 - Increase charging speed
- › Significant optimism around Silane as silicon source
- › Small but growing volumes of Silane being supplied now
 - Start Ups/Pilots
 - R&D
- › Available Silane capacity an advantage
 - Allows for compression of adoption timeline and ramp up





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Semiconductor
Polysilicon

Overview of Polysilicon Quality

- › Float Zone (FZ)
 - Power IC/Discrete application
 - Most stringent quality requirements
 - Highest resistivity available
 - Lowest intrinsic impurities
 - Tight tolerance physical properties
- › Electronic Grade (EG)
 - Semiconductor application
 - Highest CZ quality
 - < 5 ppba
 - Low bulk and surface impurities
- › Photovoltaic Grade (Mono)
 - Mono PV application
 - Standard grade CZ
 - <10ppba metallic
 - Low bulk impurities
- › Photovoltaic Grade (Multi)
 - Multi PV application
 - Lower grade CZ
 - <50ppba metallic
 - Higher impurity level

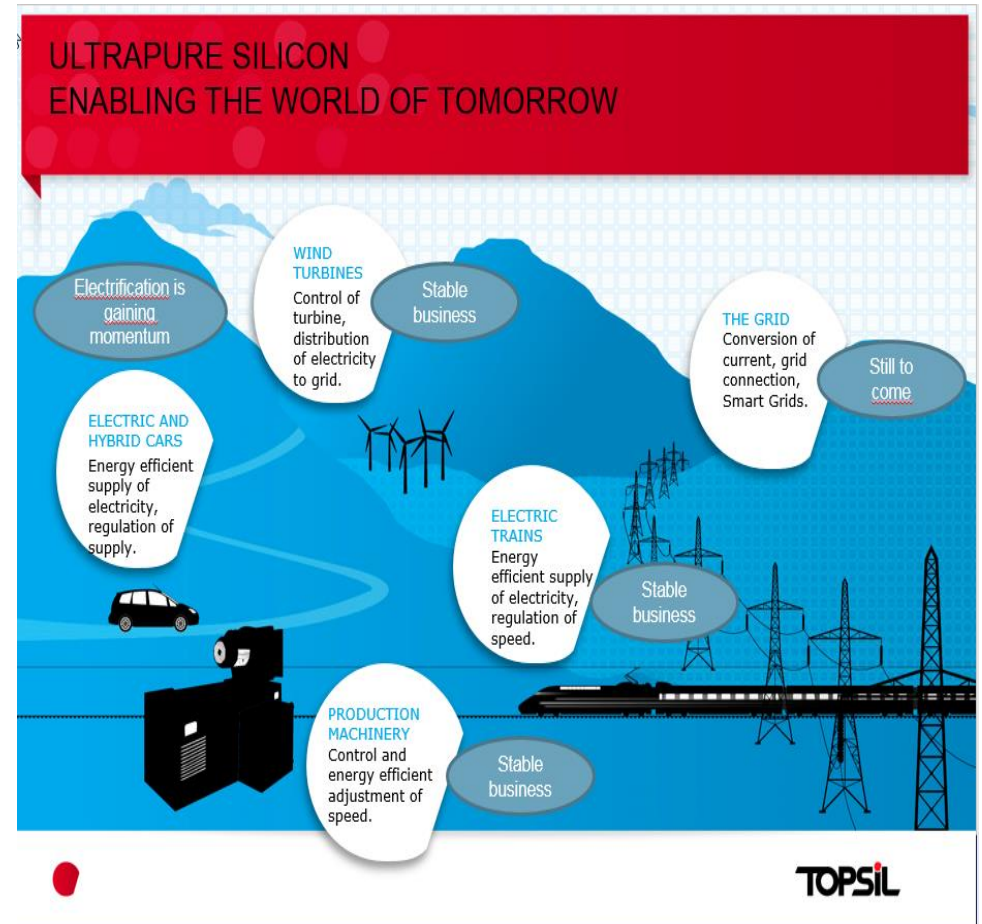


Float Zone Polysilicon

Most advanced and pure polysilicon manufactured

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- › Primary and preferential product produced in Butte
 - REC is one of two FZ producers
- › Applications
 - High voltage grid
 - Renewable energy
 - High speed trains
 - Electric vehicles
- › Market attributes
 - Contracts
 - Ownership relationships
 - Long term supply relationships



Source: Topsil

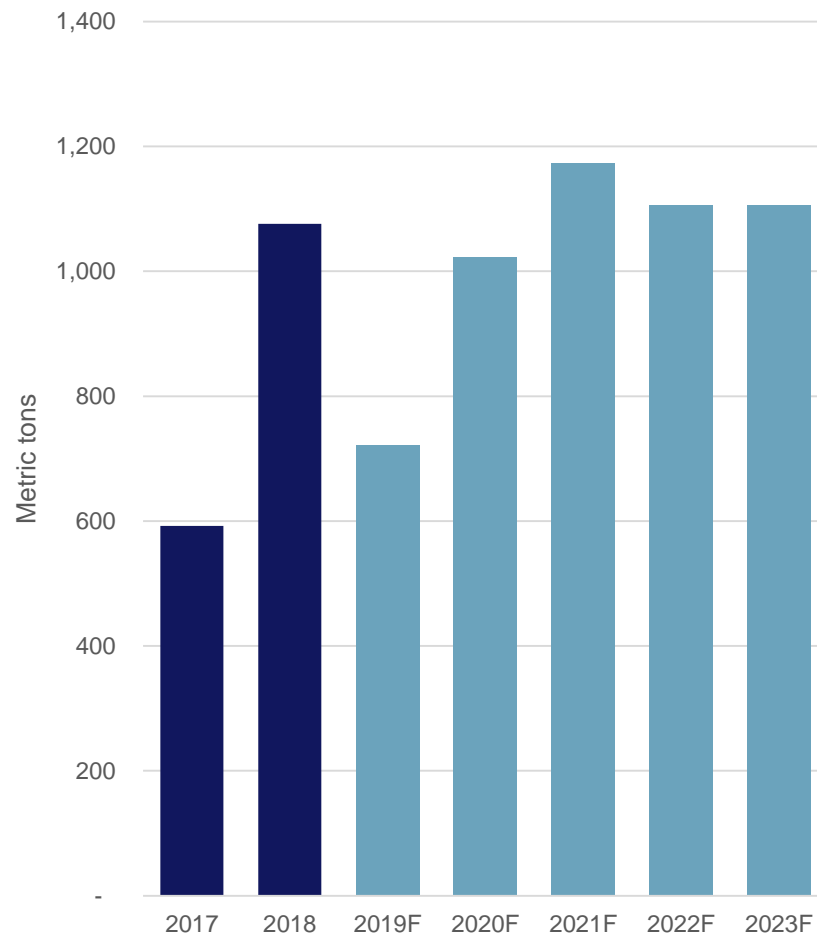
Electronic Grade Polysilicon

- › Top 5 Wafer Companies are 90% of production
 - China is <5% of demand

- › Semiconductor market
 - Demand weakness for semi wafers
 - Demand recovery forecasted H2/2020

- › Focus on high end Float Zone polysilicon
 - 2 Producers globally of Float Zone
 - Product Mix is optimized for highest value creation including volume trade offs

REC Shipments - Semiconductor Polysilicon








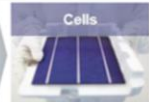


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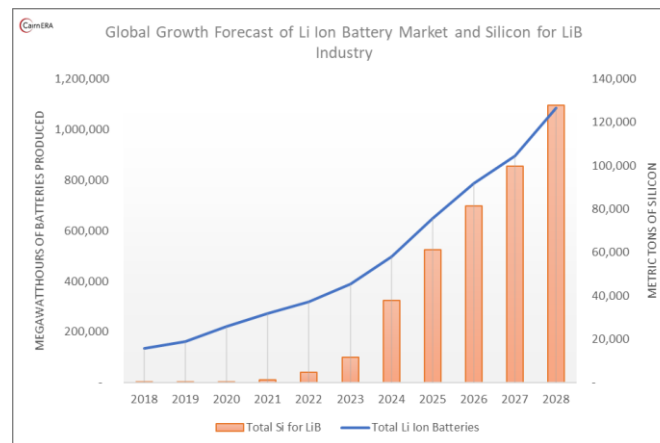
Moses Lake Options

Different Paths to Create Business Opportunities for Moses Lake

- › Reopening of the China market for US polysilicon
- › The establishment of a PV value chain outside of China with considerably lower CO₂ footprint
- › Pursue and optimize opportunities for REC's silane for the silicon anode market for LI Batteries



U.S. Market Share	6%	11%	0%	1%	3%	13%
						



Source: Cairn ERA

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China Tariff Update

Phase One Trade Agreement announced on October 11th 2019

- › “Phase One Trade Agreement” to be signed at APEC November 16-17, 2019 in Santiago
 - China purchase of US products a major part
 - Potential opportunity for US polysilicon

- › Start of normalization of China trade relations creates path forward to end longstanding Chinese trade embargo on US polysilicon



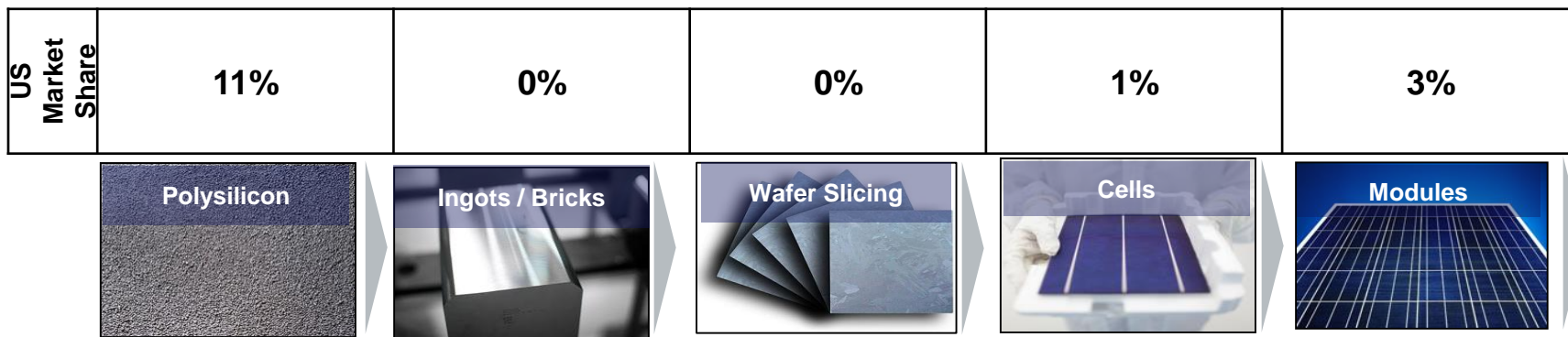
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A Non-Chinese PV Value Chain

The PV Manufacturing Value Chain

China has almost a Monopoly except within Polysilicon and Solar Module capacity



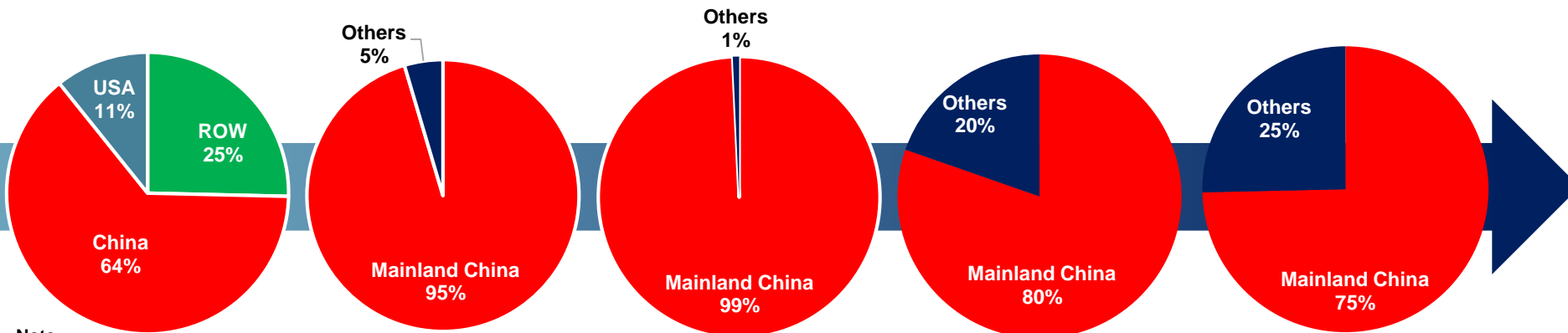
PV Grade Polysilicon Capacity

Solar Ingot Capacity

Solar Wafer Capacity

Solar Cell Capacity

Solar Module Capacity



Note:

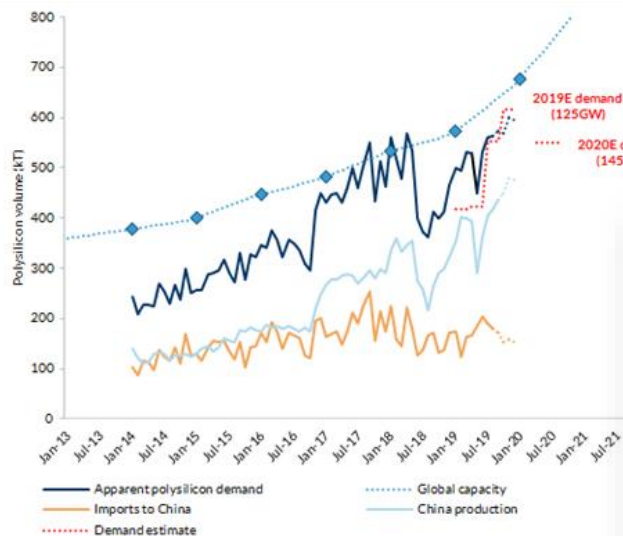
- All figures based on 2019
- "Others" consists of mainly South Korea, Taiwan, India, Vietnam, Malaysia

Sources:

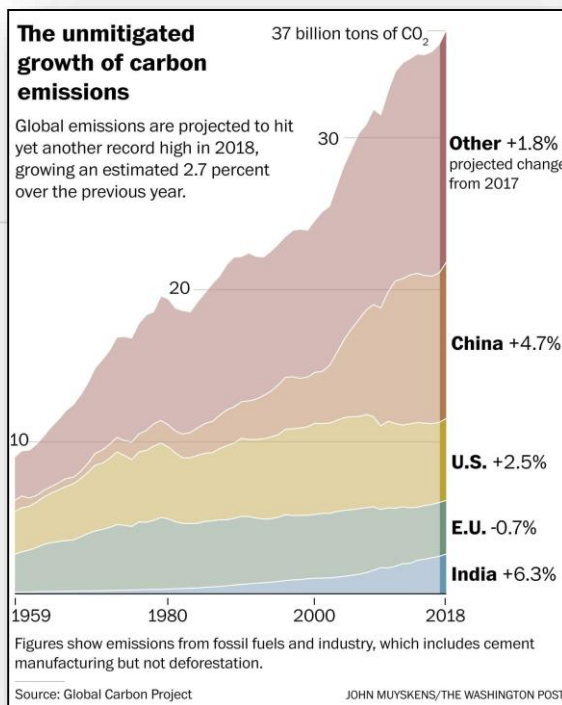
Polysilicon: PV Infolink - Database dated April 23, 2019
 Ingot, Wafer, Cell, and Module: BNEF, REC Silicon Data Base, Bloomberg

REC Silicon has lowest Carbon Footprint

- China's PV Value Chain is based on Coal Fired Power – generating the highest CO₂ in the industry
- REC Silicon has the lowest CO₂ footprint due to FBR technology

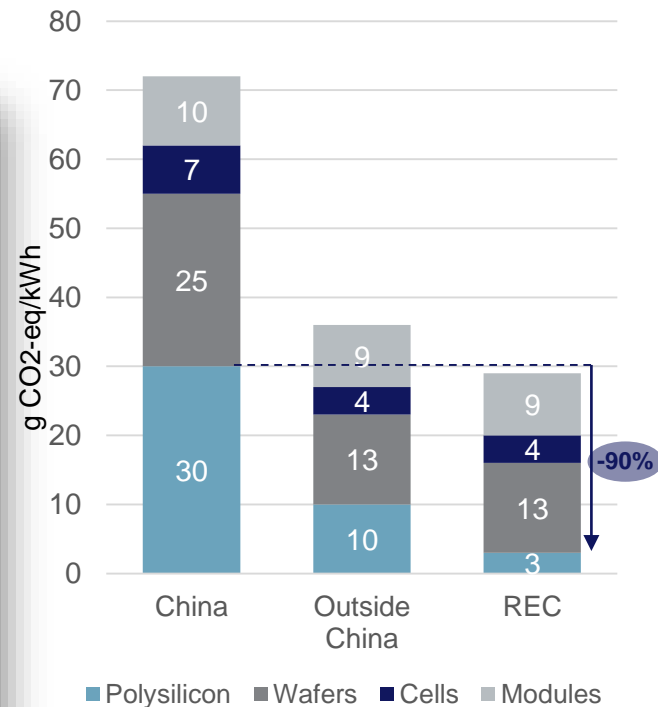


Source: Kepler Cheuvreux



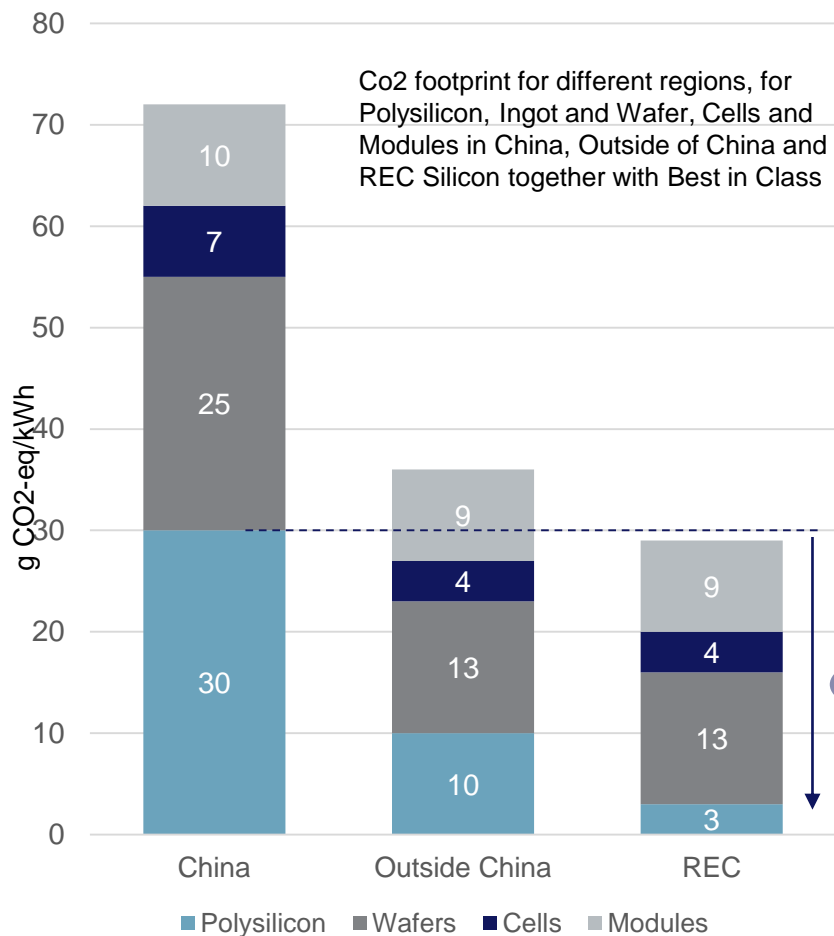
Figures show emissions from fossil fuels and industry, which includes cement manufacturing but not deforestation.
Source: Global Carbon Project JOHN MUYSKENS/THE WASHINGTON POST

Co2 footprint for different regions, for Polysilicon, Ingot and Wafer, Cells and Modules in China, Outside of China and REC Silicon together with Best in Class



Source: Solar Energy 105 (2014)

REC Silicon has lowest Carbon Footprint



Source: Solar Energy 105 (2014)

- › China's PV value chain uses coal generated power
 - Generates the highest CO₂ footprint in the industry

- › REC Silicon has the lowest CO₂ footprint
 - Superior FBR technology

US Tariffs on Imported PV Cells/Modules has tripled US Module capacity in 2 years

U.S. Market Share		~15 GW	No Capacity	1.0 GW	From 2GW to 6GW since tariff was implemented	14-16 GW
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201	0%	0%	0%	2.5GW without Tariff then 25%	25% Tariff
301				25%	25%
AD/CVD	~140%			~30%	~30%

- > Section 201: All non-U.S. manufactured cells and modules (certain cell technologies exempt from tariff)
- > Section 301: China manufactured cells and modules
- > AD/CVD: China manufactured MGS, cells and modules

Sources:
REC Silicon Data Base, Bloomberg



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Silicon Anode
Battery
Opportunities

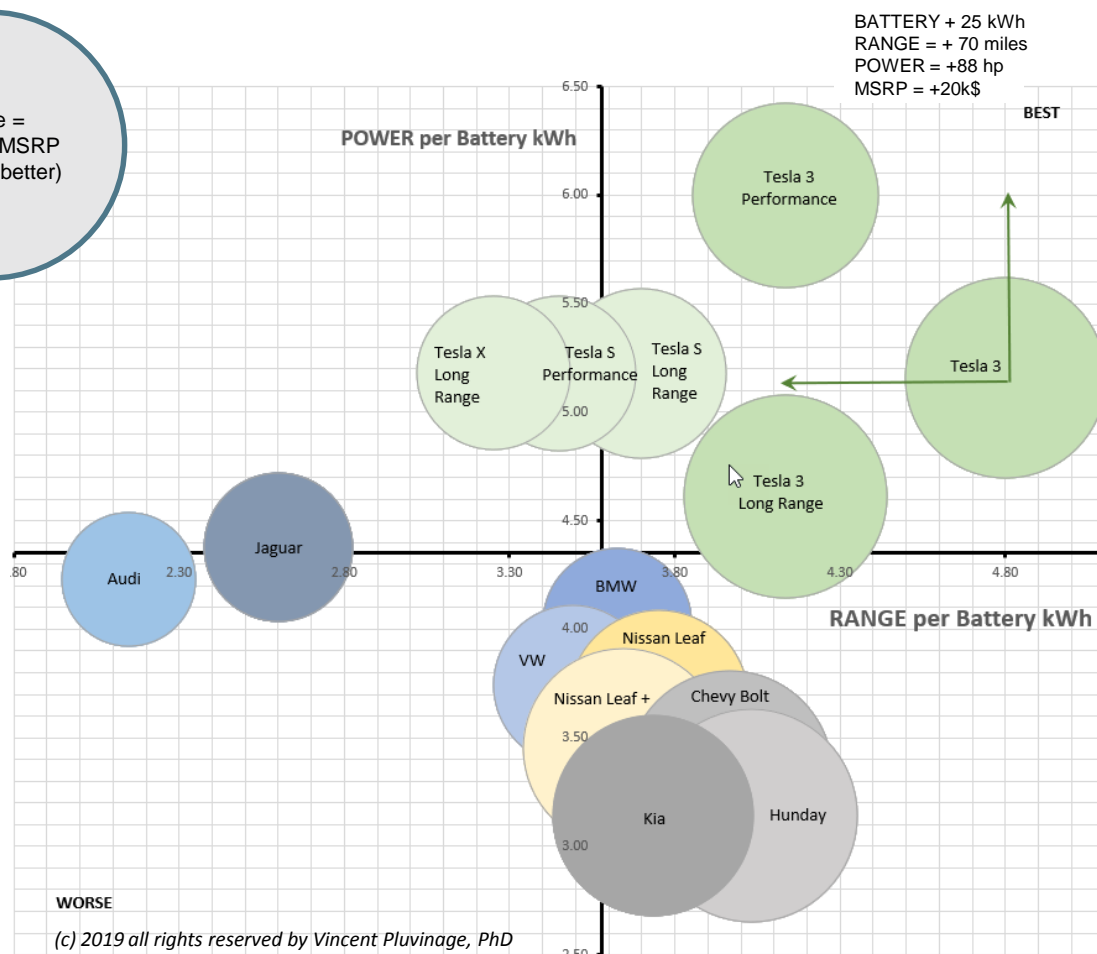
Silicon Battery Anodes Increase Performance by ~30%

› Tesla Competitive Advantages

- More range per battery kWh
- More power per batter kWh

› Tesla is the only company known to use the SiO₂ mixed with graphite in the Battery Anode

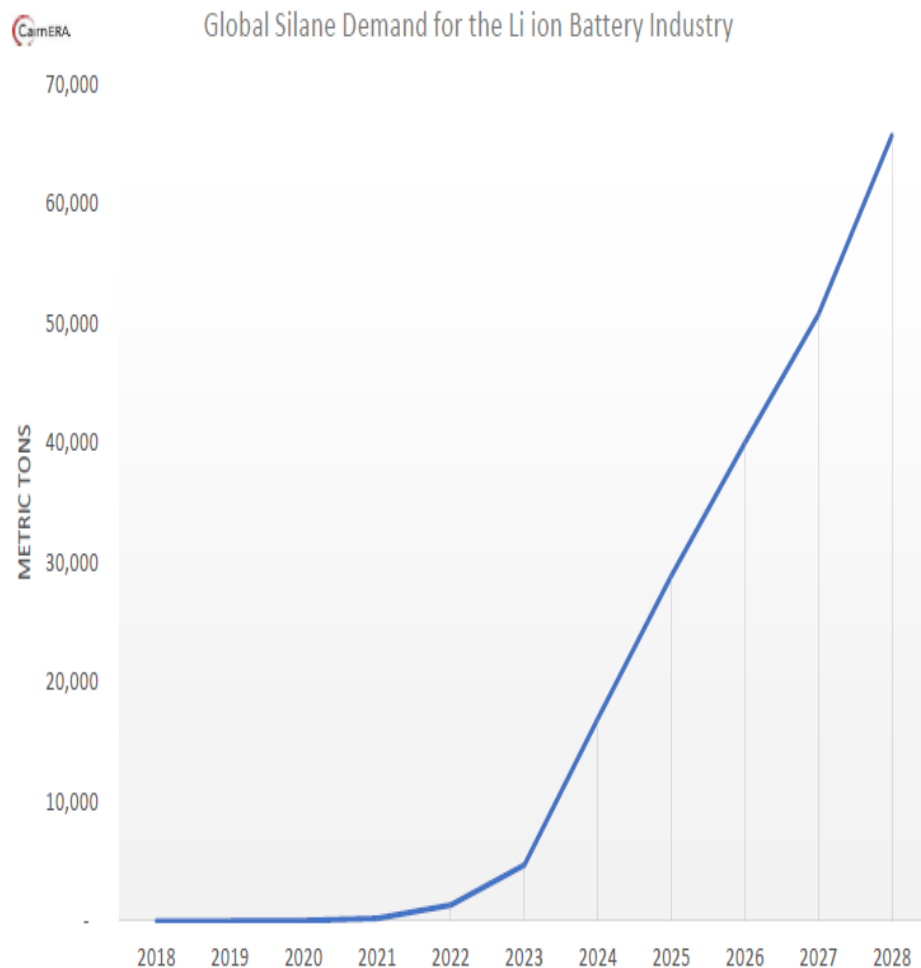
Value =
RANGE/MSRP
(larger = better)



Elon Musk: “Our cells should be called nickel-graphite, because primarily the cathode is nickel and the anode side is graphite with silicon oxide...the main determinants on the cost of the cell are the price of the nickel and the cost of the synthetic graphite with silicon oxide coating”

Extensive R&D to increase the content of Silicon in the Battery Anode

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- › Around 30 R&D companies
 - Mostly located in the US
 - Substantial financial resources
- › Silane is considered as the most efficient source
 - Purest Silicon
 - Gas Phase
- › Interest in co-locating with REC's manufacturing facilities
 - Cost advantage

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Yulin JV Update



Yulin, China – REC Silicon Presence in Primary Market 2019

Plant characteristics

- › Construction completed in 2018
- › Large scale silicon manufacturing facility with
 - 19,000 MT FBR-B granular Polysilicon
 - 300MT Siemens semiconductor grade Polysilicon
 - 500MT Silane Gas loading



Positioned to capitalize on growing PV industry

- › Located in principal market – China
- › FBR-B is semiconductor grade capable which is optimal for monocrystalline PV applications
- › Current REC ownership of 15%, option to increase exposure to 49% from January 2021

Near Term Outlook

- › Q3 Production of 1,350MT
- › High purity FBR production underway
- › Siemens FZ and CZ qualifications underway
- › ~12MT Silane Loaded for PV qualification



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Business Plan

Why Divest Butte?

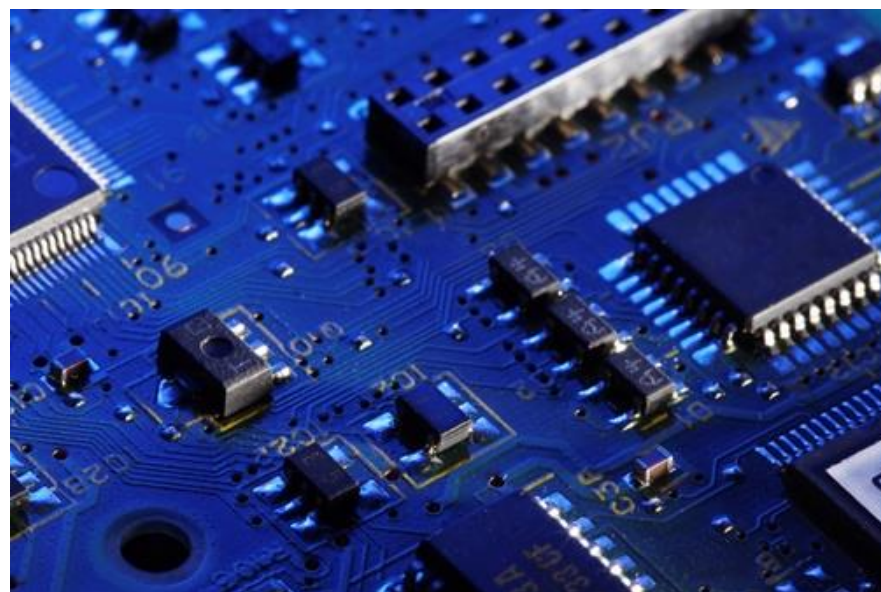
- › REC Silicon will divest Butte if an acceptable offer is received
- › Leading arguments for a possible divestment:
 - Semiconductor is not the core business for REC's investors
 - Butte's silane gas and semiconductor grade polysilicon businesses operate in mature and niche markets
 - Interesting growth opportunities both in silicon gas and polysilicon
 - Divestment of Butte will strengthen REC's balance sheet



Butte Attractive due to Semiconductor Market Exposure

2019

- › Semiconductor market is mature, translating into steady financial results that can be shown historically
- › REC's good reputation in the marketplace is a positive selling point
- › Semiconductor market is worldwide
 - Demand for silicon gases outside of China is expected to remain steady, even if trade issues continue



Butte Divestment will provide Opportunities for REC Silicon

- › Strengthen Balance Sheet
 - REC will be a debt-free company
- › Facilitate REC's active participation in establishment of PV value chain outside of China
- › Capacity to support commercialization of Silicon Li battery anode
- › Increase ownership in the Yulin JV
- › Finalize the investment in RX 25/26 to produce EG FBR quality



Short Term Business Plan for REC Silicon

- › Prepare divestment of the Butte facility if an acceptable offer is received
 - ROTH Capital Partners has been engaged as advisors

- › Continue to operate stable and profitable Butte facility
 - Annual EBITDA contribution of USD ~40-50M
 - Minimal capex requirements to maintain facility

- › Moses Lake FBR production curtailed on May 15, 2019
 - Preserve option value at minimal cost



The future for REC Silicon

Silane-based Polysilicon Company serving the fast-growing PV sector Globally

- › REC is the leading company using highly efficient FBR technology
- › REC is the leading company which produces silane as feed stock for the polysilicon process
- › REC's Silane is experiencing growing interest from the fast-emerging Silicon Anode industry
 - Moses Lake Silane capacity is 25,000 MT/year
- › REC has production capacity in the two biggest PV markets, China and the US

Moses Lake, WA



Yulin, China



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February 14, 2020

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