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   c) CSIQ vs. Comparable Companies – Metrics
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   a) Risk Overview

7. **Q/A**
Introduction
Company Overview

Business Description

- Company operates in 3 segments:
  1. **Module Segment**: Design, develop, and manufacture solar modules and specialty solar products (14.8% GM)
  2. **Energy Development Segment**: Develop, build, and sell solar power projects - consists of project development, evaluations, systems design, engineering, project coordination and facilitating financing (19.7% GM)
  3. **Electricity Generation Segment**: Generate and sell electricity to local or national grids or other purchasers (41.8% GM)

CSIQ Revenue by Segment

- Module Segment: 73.19%
- Energy Dev. Segment: 25.94%
- Electricity Gen. Segment: 0.88%

3. **Electricity Generation Segment**: Generate and sell electricity to local or national grids or other purchasers (41.8% GM)

CSIQ Revenue by Segment

- Module Segment
- Energy Dev. Segment
- Electricity Gen. Segment

Stock Chart

- May 11 – Q1 Earnings
- June 24 – Tornado in China
- Aug’18 – Q2 Earnings
- Nov’9 – US Election
- Nov’21 – Q3 Earnings

Q/A
Segment Overview

<table>
<thead>
<tr>
<th>Modules</th>
<th>Energy Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 14.8% gross margin, up from 12.5% (2013)</td>
<td>• 19.7% gross margin, but decreasing YoY</td>
</tr>
<tr>
<td>• Modules produced in China</td>
<td>• CSIQ develops projects primarily in Japan, US, China, Brazil, and UK</td>
</tr>
<tr>
<td>• Solar modules sold via (1) contracts to distributors, (2) systems integrators, installers/EPC companies and project developers, and through (3) OEM/tolling manufacturing arrangements.</td>
<td>• Includes EPC (Engineering, Procurement, and Construction) and O&amp;M (Operations and Maintenance) Services</td>
</tr>
<tr>
<td>• Module segment supplies part of the solar modules used in energy dev. segment.</td>
<td>• O&amp;M services provided primarily to the North American market</td>
</tr>
</tbody>
</table>

**Energy Generation**

• 41.8% gross margin (2015); only 0.9% of revenue but increasing rapidly from 0.1% in 2014
• 4Q 2014, CSIQ began to operate certain solar projects in China for the purpose of generating income from the sale of electricity
• CSIQ plans to expand segment by increasing the number of solar projects held and operated, either by retaining developed solar projects or acquiring solar projects
• Of aggregate capacity of 398.1 MWp: 308.8 MWp are from solar power projects that CSIQ built, and 89.3 MWp are operating solar power projects acquired from third parties
Important Developments/Yieldco

Explanation of Yieldco

• A Yieldco is a company that is formed to own operating assets to produce a predictable cash flow, primarily through long term contracts. Similar to REITs, Yieldcos pay a major portion of their earnings in dividends, which is a valuable source of funding for parent company.

  1. Advantage of Yieldco: Separation of stable and less volatile operating assets from volatile activities such as development and R&D can lower cost of capital. Also protects investors against regulatory changes.

  2. CSIQ vs Comp: Many competitors in the market have their own Yieldcos. First Solar and SunPower owns 8point3 Energy Partners; SunEdison owns TerraForm Power etc.

Recurrent Acquisition

• CSIQ acquired Recurrent Energy for $265 million cash in March 2015.
• Revenue opportunity in its build-and-sell business model – estimated $2.3 billion.
  • Strengthens CSIQ position in the North American market.
  • Strategic solar power plant ownership and operation model.

CSIQ YieldCo

• Plans to create a Japanese Yieldco with CSIQ Japanese assets to IPO in Japan.
  • Provides advantages and considered a strategic move to unlock more value in the company.
  • Quantitatively applied in the model using comparative P/FFO analysis.
Important Developments - Sold Projects

Build and Sell Business Model

- Canadian Solar expanding business model to incorporate the "build-and-sell" strategy, whereby the company generates revenues through the sales of solar power plants.
  1. **Build Projects**: Canadian Solar utilizes its supplying and manufacturing capacities to develop solar power projects in areas such as the United States and China.
  2. **Sell Majority Share of Project at Higher Value**: CSIQ then sells these assets to another company at higher value.
  3. **Develop more Projects**: Reinvests in expansion of more solar power plants.

Recent Sold Projects

- **Jan 2017**: sold two solar power plants in Jiangsu Province to Shenzhen Energy Nanjing Holding Co. for $32.2 million.
- **July 2016**: sold plants in Funing Country, China to Create Technology & Science for $32.8 million.
- **2015**: sold “Little Creek” to BlueEarth Renewable Solutions for $48 million.

Future Late Stage Pipeline

<table>
<thead>
<tr>
<th>Late-stage Pipeline</th>
<th>Gross MW (DC)</th>
<th>Net(^{(1)}) MW (DC)</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astoria 1</td>
<td>130.8</td>
<td>130.8</td>
<td>CA</td>
</tr>
<tr>
<td>Astoria 2</td>
<td>100.0</td>
<td>100.0</td>
<td>CA</td>
</tr>
<tr>
<td>Barren Ridge</td>
<td>78.0</td>
<td>62.4</td>
<td>CA</td>
</tr>
<tr>
<td>Mustang</td>
<td>134.4</td>
<td>114.2</td>
<td>CA</td>
</tr>
<tr>
<td>Tranquillity</td>
<td>257.7</td>
<td>126.3</td>
<td>CA</td>
</tr>
<tr>
<td>Roserock</td>
<td>212.1</td>
<td>103.9</td>
<td>TX</td>
</tr>
<tr>
<td>Garland</td>
<td>272.1</td>
<td>133.3</td>
<td>CA</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,185.1</strong></td>
<td><strong>770.9</strong></td>
<td></td>
</tr>
</tbody>
</table>
Key Business Features
Vertical Integration

Economies of Scale

- Canadian Solar has utility scale projects that are 100MW+ and such large system size scales can lower associated costs per Watt DC due to economies of scale. Provides advantages over small-scale producers.
- Using 2016 data, larger scale utility scale projects would cost about 18% less than a typical system.

Canadian Solar Projects

- Canadian Solar has a diverse solar project pipeline totaling 10.3 GWp.
- Existing Utility Scale Projects:
  - GRSP, Canada: 100MW
  - Wuhu Sanshan, China: 100MW
  - Solarpark Meuro, Germany: 70MW

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</tbody>
</table>

Model application: U.S. utility-scale fixed-tilt PV system cost reduction from economies of scale (2016 USD/Wdc)
Buyer/Supplier Analysis

<table>
<thead>
<tr>
<th>Buyers</th>
<th>Suppliers</th>
</tr>
</thead>
</table>
| • **Module Segment**  
  • Distributors, system integrators, project developers, installers  
  • Top 5 buyers comprised 26.8% 2015 net module revenues |
| | • Long-term supply agreements with silicon and wafer suppliers  
  • GCL-Poly Energy Holdings Ltd.  
  • Yichang CSG Polysilicon Co.  
  • Motech Industries  
  • Neo Solar  
  • Tongwei Solar Co.  
  • Mildly exposed to price of silicon |
| • **Energy Generation Segment**  
  • Grid operators, state and private power companies, public utilities  
  • Purchased through PPAs |

• **Energy Development Segment**  
  • Project development- real asset holding companies  
  • EPC Services- own projects or third party solar projects  
  • O&M Services- self-owned and third party solar projects in Canada and the U.S.

*Source: Canadian Solar Form 20-F FY2015*
Pipeline Overview

Late Stage Pipeline
• 2.0 GW of solar development
• Expected to be completed in the next 2-4 years
• Projects are mainly located in U.S. (940MW), Japan (597MW), and Brazil (390MW)

Early Stage Pipeline
• 8.3 GWp of solar development
• Lack a timetable
• Projects that are being planned for co-development, or are in early stages of development
• Sometimes have signed energy agreements or secured land

Pipeline Developments
• In 2015/2016 390MW of Brazilian projects were added to the late stage pipeline via a contract with the Brazilian government for energy development
• Almost all of U.S. late stage pipeline came from the Recurrent acquisition
• Japanese projects were added to late stage pipeline in 2014 and some are going to be held to be sold to the Japanese Yieldco
• The company recently added Mexican, Indian, and African projects to their late stage pipeline
Industry Considerations
Industry Overview

Description

• Solar industry comprised of the design, manufacture, installation, operation, and maintenance of solar energy products for residential, commercial, and utility-scale applications.

• Global solar market projected to have a 15.22% CAGR through 2020 fueled by:
  • Government-driven environmental initiatives
  • Grid parity
  • Improved grid integration capabilities

• Highly competitive industry in which there is little variation in product but potentially great variation in operating efficiency and profitability.

Solar’s contribution to total energy generation in key markets <5%
Industry Overview

Growth Drivers

- Declining average selling prices (ASPs)
- Paris Climate Treaty Intended Nationally Determined Contributions (INDCs) leading to national renewable energy targets
- Financial incentives
  - Subsidies, tax incentives and exemptions
- Emerging market adoption
  - China, India, Brazil

Product and Services Segmentation

- Module manufacturers
- Module manufacturers + installation and maintenance
  - Residential and large-scale projects
- Within larger firms, recent shift towards energy generation
  - Retention of solar assets in order to generate revenue from sale of energy

Recent Trends & Expectations

Drivers

- **Paris Climate Treaty**
  - **Goal:** Prevent a 2 degree Celsius temperature increase before the end of century
  - Nationally Determined Contributions (NDC)
  - Aggressive INDCs by China, India, Japan, and Brazil, 4 of CSIQ’s key markets.

- **Grid-parity with traditional energy sources**
  - Solar approaching price equality with coal
  - Attractive option for energy generation if necessary systems are in place

- **Subsidy phase-out and shift to PPA model**
  - Decreasing ASPs reduce the necessity for subsidization
  - Shift to PPA model outside of US market

---

<table>
<thead>
<tr>
<th>Units</th>
<th>Coal</th>
<th>Gas Combined Cycle</th>
<th>Solar PV Rooftop Residential</th>
<th>Solar PV Utility Scale(a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Investment/KW of Capacity(b)</td>
<td>$/W</td>
<td>$3.00</td>
<td>$1.006</td>
<td>$2.00</td>
</tr>
<tr>
<td>Total Capital Investment</td>
<td>$/mm</td>
<td>$1,800</td>
<td>$704</td>
<td>$6,380</td>
</tr>
<tr>
<td>Facility Output</td>
<td>MW</td>
<td>600</td>
<td>700</td>
<td>3199</td>
</tr>
<tr>
<td>Capacity Factor</td>
<td>%</td>
<td>95%</td>
<td>80%</td>
<td>80%</td>
</tr>
<tr>
<td>Effective Facility Output</td>
<td>MW</td>
<td>558</td>
<td>558</td>
<td>558</td>
</tr>
<tr>
<td>MWhs/Year Produced(c)</td>
<td>GWhs/yr</td>
<td>4,888</td>
<td>4,888</td>
<td>4,888</td>
</tr>
<tr>
<td>Levelized Cost of Energy</td>
<td>$/MWh</td>
<td>$50</td>
<td>$48</td>
<td>$138</td>
</tr>
<tr>
<td>Total Cost of Energy Produced</td>
<td>$/mm/yr</td>
<td>$290(2)</td>
<td>$234</td>
<td>$673</td>
</tr>
<tr>
<td>CO₂ Equivalent Emissions</td>
<td>Tons/MWh</td>
<td>0.92</td>
<td>0.51</td>
<td>—</td>
</tr>
<tr>
<td>Carbon Emitted</td>
<td>mm Tons/yr</td>
<td>4.51</td>
<td>2.50</td>
<td>—</td>
</tr>
<tr>
<td>Difference in Carbon Emissions</td>
<td>mm Tons/yr</td>
<td>—</td>
<td>2.01</td>
<td>4.51</td>
</tr>
<tr>
<td>vs. Coal</td>
<td>—</td>
<td>—</td>
<td>4.51</td>
<td>2.50</td>
</tr>
<tr>
<td>vs. Gas</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Difference in Total Energy Cost</td>
<td>$/mm/yr</td>
<td>—</td>
<td>($62)</td>
<td>$377</td>
</tr>
<tr>
<td>vs. Coal</td>
<td>—</td>
<td>—</td>
<td>$377</td>
<td>$439</td>
</tr>
<tr>
<td>vs. Gas</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Implied Abatement Cost/(Saving)</td>
<td>$/Ton</td>
<td>—</td>
<td>($31)</td>
<td>$84</td>
</tr>
</tbody>
</table>

Source: Lazard's Levelized Cost of Energy Analysis 10.0

Utility-scale solar provides energy cost savings compared to coal.
### Recent Trends & Expectations

<table>
<thead>
<tr>
<th>Subsidy Reductions</th>
<th>PPA Model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U.S.:</strong> Reduction in the solar ITC from 30% to 22% by 2021</td>
<td>• Public utility, government, or other entity purchases energy from an offtaker at a price locked in for some period of time</td>
</tr>
<tr>
<td><strong>China:</strong> 20% decrease in solar FiT to kick in 2H 2017</td>
<td>• Extremely competitive space:</td>
</tr>
<tr>
<td>• Greater impact on small/medium companies</td>
<td>• Competition for buyers</td>
</tr>
<tr>
<td><strong>Japan:</strong> 11% reduction in FiT for 2016 with further step-downs expected through 2018</td>
<td>• Competition against other energy generating methods</td>
</tr>
<tr>
<td><strong>Germany:</strong> replacement of FiT with competitive bidding model</td>
<td>• Price/MW dropping steadily across the industry</td>
</tr>
<tr>
<td>• Result in lower prices for energy producers</td>
<td>• Current PPA terms range from 15-20 years, but the consensus is that the length of these agreements will shrink in the coming years</td>
</tr>
<tr>
<td></td>
<td>• Less stable long-term income for energy producers</td>
</tr>
</tbody>
</table>
Recent Trends & Expectations

Falling ASPs

ASPs both for individual modules and for large-scale projects are dropping.

Source: Lawrence Berkeley National Laboratory “Utility Scale Solar 2015” Report; Lazard’s Levelized Cost of Energy Analysis 10.0
Regional Overview

<table>
<thead>
<tr>
<th>United States</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Goal of reducing emissions levels by 26% by 2030 compared to 2005 levels</td>
<td>• Target of non-fossil fuel energy consumption of 15% of total energy consumption</td>
</tr>
<tr>
<td>• Solar Investment Tax Credit: 30% credit for solar systems on residential/commercial properties</td>
<td>• FiT guaranteeing the purchase of electricity produced by solar installations</td>
</tr>
<tr>
<td>• Currently a 30% tax credit, steps down to 26% in 2020 and 22% in 2021</td>
<td>• FiT for ground-mounted PV reduced by 20% ~ expected to hurt small/medium solar companies</td>
</tr>
<tr>
<td>• Variety of state-level tax incentives</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>South America</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Brazil and Chile both have emissions reduction targets; Brazil specifically mentions diversifying away from hydropower and increasing renewables’ contribution to energy generation to 23% of total</td>
<td></td>
</tr>
<tr>
<td>• VAT exemptions for solar energy products</td>
<td></td>
</tr>
<tr>
<td>• Net-metering credits</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>India</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Solar Mission initiative to expand solar capacity to 100 GW by 2022</td>
<td></td>
</tr>
<tr>
<td>• Plans to build 25 solar parks each of a rough capacity of 500 MW</td>
<td></td>
</tr>
<tr>
<td>• Construction began 2014/2015, expected completion by 2020</td>
<td></td>
</tr>
<tr>
<td>• State-by-state incentives for solar projects that sell energy generated to government or third party</td>
<td></td>
</tr>
</tbody>
</table>
## Regional Overview

<table>
<thead>
<tr>
<th>Japan</th>
<th>Germany</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Goal of reducing emissions by 26% by 2030 compared to 2013 levels</td>
<td>• European Union-wide goal to reduce emissions by 40% by 2030 compared to 1990 levels</td>
<td>• Reduce greenhouse gas emissions by 28% by 2030 compared to 2005 levels and increase the share of renewables as a percent of total energy to 23%</td>
</tr>
<tr>
<td>• Renewable energy target of 24% ~ 7% of this meant for solar</td>
<td>• Solar FiTs decreasing rapidly in Germany for residential PV systems and utility-scale systems</td>
<td>• Variety of state-level FiTs, some of which were not renewed after their expirations at the end of 2016</td>
</tr>
<tr>
<td>• FiT plan similar to China’s</td>
<td>• New systems &gt;10 MW will no longer receive subsidization</td>
<td>• Renewable Energy Certificates and low-interest loans for solar asset purchases.</td>
</tr>
<tr>
<td>• Rate reduction of 11% in 2016</td>
<td>• European Union-wide goal to reduce emissions by 40% by 2030 compared to 1990 levels</td>
<td>• Province-level subsidies, including net-metering, credit for micro-generation sent to the grid, and rebates for watts of solar power installed</td>
</tr>
<tr>
<td>• Further reductions planned for 2017 and 2018</td>
<td>• Solar FiTs decreasing rapidly in Germany for residential PV systems and utility-scale systems</td>
<td>• Variety of state-level FiTs, some of which were not renewed after their expirations at the end of 2016</td>
</tr>
<tr>
<td>• Goal of $121/MW by 2020</td>
<td>• New systems &gt;10 MW will no longer receive subsidization</td>
<td>• Renewable Energy Certificates and low-interest loans for solar asset purchases.</td>
</tr>
</tbody>
</table>

**Canada**

- Goal of reducing greenhouse gas emissions by 30% by 2030 below 2005 levels
- Province-level subsidies, including net-metering, credit for micro-generation sent to the grid, and rebates for watts of solar power installed
- Accelerated depreciation of solar assets at federal level

**Germany**

- European Union-wide goal to reduce emissions by 40% by 2030 compared to 1990 levels
- Solar FiTs decreasing rapidly in Germany for residential PV systems and utility-scale systems
  - New systems >10 MW will no longer receive subsidization

**Australia**

- Reduce greenhouse gas emissions by 28% by 2030 compared to 2005 levels and increase the share of renewables as a percent of total energy to 23%
- Variety of state-level FiTs, some of which were not renewed after their expirations at the end of 2016
- Renewable Energy Certificates and low-interest loans for solar asset purchases.
CSIQ vs. Comparables

Business Models
• Large solar panel manufacturers (CSIQ, FSLR, JKS) are vertically-integrated, produce panels, and offer “O&M” services
• JKS and CSIQ work in the energy generation area
  • CSIQ MGMT has placed an increased emphasis on building this segment out

2016 Shipment Guidance - Modules

<table>
<thead>
<tr>
<th>Company</th>
<th>2016 Guidance Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>JinkoSolar</td>
<td>6.6GW to 6.7GW</td>
</tr>
<tr>
<td>Trina Solar</td>
<td>6.3GW to 6.6GW</td>
</tr>
<tr>
<td>Canadian Solar</td>
<td>5.1GW to 5.2GW</td>
</tr>
<tr>
<td>JA Solar</td>
<td>4.9GW to 5.0GW</td>
</tr>
<tr>
<td>Hanwha Q CELLS</td>
<td>4.8GW to 5.0GW</td>
</tr>
<tr>
<td>First Solar</td>
<td>2.8GW to 2.9GW</td>
</tr>
</tbody>
</table>

Source: https://www.pv-tech.org/editors-blog/top-5-solar-module-manufacturers-in-2016

Solar Company Returns vs ACWI Returns TTM
**Technology Overview**

### C-Si Technology
- Lab conversion efficiency of 21.3%
- Most established technology ~85% of the industry uses this and it has been used for decades
- Built from doped crystalline silicon wafers
- Well tested, theoretical peak efficiency is 29% and efficiency is improving about .5% a year

### CSIQ Modules
- C-Si Modules
- Power per module 270-295W
- Production capacity of 4.33 GW which is increasing
- Production cost per watt ~$.40 in 2016, expected to drop to $.25 by 2020

### Thin Film CdTe Technology
- Lab conversion efficiency of 22.1%
- Built from Cadmium Telluride using thin film deposition, utilizes < 10% of the material of C-Si, but costs are comparable
- Cheaper installation costs
- More future development potential, but won’t significantly surpass C-Si until ~2025

### CSIQ Systems Development
- Utilizing black silicon technology to improve solar efficiency
- Developing 4 and 5 bus-bar modules to improve system efficiency and increase power per module
- Started mass production of Passive emitter rear contact cells (PERC) in March 2016
Variant Perception
# Market Perception Summary

## Pressure on Module Segment
- Analysts worried about rapidly declining ASPs (from $1.34 in ‘11 to $0.58 in ’15)
  - End of year 2016 ASPs were below $0.40 per watt
- Street views module segment as unattractive due to fierce competition and undifferentiated nature of modules (many module producers out of business recently)

## Solar Energy is not Economical
- Historical module prices and thus costs to create economical projects still perceived as too high
- Coal, nuclear and various non-renewable sources of energy still viewed as
- Cost per watt used to be >$4 as recently as 2011 for modules (relative to $0.50 now)
- PPAs historically significantly more expensive than traditional forms of energy generation so relied heavily on subsidies

## Mixed Feelings about YieldCo
- YieldCo potentially understood as a vehicle that can unlock value, but also hesitation from (i) SunEdison case and (ii) CSIQ’s “unsuccessful” U.S. YieldCo IPO
- CSIQ did not end up creating a U.S. YieldCo, which was viewed as a “lost opportunity” → essentially destroyed value since expectation was that YieldCo would go though

## Financial Position
- EBIT margin took 530 bps hit from 2014 to 2015, which augmented fears about long-term profitability in intensely competitive space
- Investors concerned about subpar cash flows in 2015 and early 2016 and increasing leverage (Debt/EBITDA of ~7x)
Pressure on Module Segment (I)

- Clearly a commoditized space with significant competition – **only** vertically integrated players with economies of scale can operate profitably in this market
  - Explains why **small** producers have struggled to stay alive while CSIQ, FSLR have remained competitive
  - Also significant technological barriers that prevent additional entry in the short-term
- Vertical integration a distinct advantage due to lower cell and wafer costs, which represent ≈60% of total manufacturing costs
  - Cost savings expected to come as a result of leveraging diamond wiresaw method
- If we continue to see declining ASPs we expect two things to happen:
  1. Demand should pick up
  2. Producers with less favorable cost structures will succumb to intensifying margin pressure

Pressure on Module Segment (II)

- CSIQ (and other large, integrated peers) are shifting towards the **energy development segment**
- Energy development segment is experiencing high growth because growth of solar is happening at the utility-scale where it is far more economical
  - Also more legitimate value-add in this segment
- Energy development segment carries higher margins and some potential for recurring revenue through follow-on maintenance
### YieldCo Remains Opportunity to Unlock Value

- CSIQ did not force a YieldCo IPO due to unfavorable conditions in the equity markets (especially crucial for YieldCos to raise max. amount of capital due to nature of operations) → **appropriate move by management**

- Now pursuing Japanese YieldCo, which has the potential to unlock significant value
  - Japanese assets represent over 25% of total late-stage projects*, so impact would be significant

- BIG views Japanese YieldCo as a “test-run” that can be referenced to re-introduce U.S. YieldCo to investors
  - U.S. assets represent almost 50% of total late-stage projects* – joint impact would be very significant

### “Solar Energy is not Economical”

- While this used to be true, considerable leaps in efficiency and increased competition have driven down the prices of solar modules and projects significantly
  - ASPs per watt have decreased from $4.23/watt in 2008 to $0.58/watt IN 2015 (>85% decrease in 7 years with further price reductions anticipated)

- Extremely viable alternative to traditional sources of energy (unsubsidized)
  - Cheaper than coal and in line with total energy costs of gas

- PPAs have dropped from $60+ per MWh to ≈$40 per MWh in the last two years alone

- December 2015 extension of 30% ITC through 2019 contains a “start construction” rather than “placed in service deadline”

**Bottom Line:** Solar energy is a clear alternative to non-renewable energy sources and nuclear energy.
Levelized Cost of Energy – NPV of unit-cost of electricity over the lifetime of a generating asset. Can be thought of as a proxy for the average price an asset needs to generate to break even over its lifetime.
### BIG Discrete Nonconformities - Quantitative

<table>
<thead>
<tr>
<th>Financial Position (I)</th>
<th>Financial Position (II)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CSIQ income statement in 2015 should be adjusted for various one-time expenses/normalized for revenue mixes:</td>
<td></td>
</tr>
<tr>
<td>o LDK Arbitration Case - $20.8mm add-back</td>
<td></td>
</tr>
<tr>
<td>o Terminated YieldCo launch - $10.8mm</td>
<td></td>
</tr>
<tr>
<td>o Lower contribution from energy development segment, which carries higher margins than module segment</td>
<td></td>
</tr>
<tr>
<td>• Cash flows in 2016 hurt by reclassification of Recurrent assets from PP&amp;E to Current Project Assets (sharp spike in current assets)</td>
<td></td>
</tr>
<tr>
<td>o We believe this should be normalized if you want an undistorted reflection of the performance of the core business</td>
<td></td>
</tr>
<tr>
<td>• Net Debt/EBITDA seems extremely high at ≈7x, but majority of liabilities are current liabilities that are constantly being refinanced</td>
<td></td>
</tr>
<tr>
<td>o Working capital loans for the construction of solar project assets</td>
<td></td>
</tr>
<tr>
<td>o More aggressive monetization of project assets in 2017 should significantly help drive down Debt/EBITDA</td>
<td></td>
</tr>
</tbody>
</table>
Financial Review
Model – Strategies & Key Assumptions

Key Assumptions

- **Average Selling Price for modules**
  - Forecast a decrease in ASP/module due to current oversupply of modules, with a stabilization in the back-end years
  - Conservative, base, and optimistic reflect the decrease in ASPs through 2020

- **Manufacturing Costs**
  - Management guided a 0.25 cent manufacturing cost per module by 2020
  - Due to technological advances, specifically 4 and 5 bus-bar modules and mass production of PERC cells
  - This is reflected in year on year reductions in manufacturing costs in the base and optimistic cases held constant in the conservative case.
Pipeline Examination

<table>
<thead>
<tr>
<th>Systems Built (MW)</th>
<th>Conservative</th>
<th>Base</th>
<th>Optimistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>750</td>
<td>370</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>804</td>
<td>600</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>804</td>
<td>949</td>
<td>1119</td>
</tr>
</tbody>
</table>

- **Conservative**
  - Current late stage pipeline is sold off
  - No new contracts or early stage developments

- **Base**
  - Current late stage pipeline is sold off with slight transition from early stage
  - Late stage pipeline shrinks to ~1-1.5 GW

- **Bull**
  - Current late stage pipeline is sold off and pipeline continues to operate as in past years
  - Late stage pipeline maintains size, slight expansion based
CSIQ vs. Comparable Companies – Metrics

### Takeaways
- Solar industry as a whole is depressed due to unfavorable market conditions in the next fiscal year
- 8x forward earnings multiple is not reflective of the expected growth of CSIQ in the long-run
- We believe that a 18 forward P/E and a 17 forward EV/EBITDA are justified once the industry recovers from pricing pressure and a lack of demand in 2017

*Trina Solar is now private.*
## Valuation – Outcome Weighing

### P/E

<table>
<thead>
<tr>
<th>EPS</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>22</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.47</td>
<td>-57%</td>
<td>-51%</td>
<td>-45%</td>
<td>-39%</td>
<td>-33%</td>
</tr>
<tr>
<td>0.42</td>
<td>-29%</td>
<td>-19%</td>
<td>-9%</td>
<td>1%</td>
<td>11%</td>
</tr>
<tr>
<td>0.70</td>
<td>-1%</td>
<td>13%</td>
<td>27%</td>
<td>41%</td>
<td>55%</td>
</tr>
<tr>
<td>0.97</td>
<td>13%</td>
<td>29%</td>
<td>45%</td>
<td>61%</td>
<td>77%</td>
</tr>
<tr>
<td>1.11</td>
<td>26%</td>
<td>44%</td>
<td>62%</td>
<td>80%</td>
<td>99%</td>
</tr>
</tbody>
</table>

### EV/EBITDA

<table>
<thead>
<tr>
<th>EBITDA</th>
<th>13</th>
<th>15</th>
<th>17</th>
<th>19</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td>145,285</td>
<td>-33%</td>
<td>-22%</td>
<td>-12%</td>
<td>-1%</td>
<td>9%</td>
</tr>
<tr>
<td>167,307</td>
<td>-22%</td>
<td>-10%</td>
<td>2%</td>
<td>14%</td>
<td>25%</td>
</tr>
<tr>
<td>189,328</td>
<td>-12%</td>
<td>1%</td>
<td>15%</td>
<td>28%</td>
<td>42%</td>
</tr>
<tr>
<td>200,339</td>
<td>-7%</td>
<td>7%</td>
<td>22%</td>
<td>36%</td>
<td>50%</td>
</tr>
<tr>
<td>211,349</td>
<td>-2%</td>
<td>13%</td>
<td>28%</td>
<td>43%</td>
<td>59%</td>
</tr>
</tbody>
</table>

### Cases and Price Targets

<table>
<thead>
<tr>
<th>Bear</th>
<th>Base</th>
<th>Bull</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.72</td>
<td>16.63</td>
<td>20.39</td>
</tr>
<tr>
<td>-15%</td>
<td>21%</td>
<td>48%</td>
</tr>
</tbody>
</table>
Recommendation

We recommend a buy and suggest a 6% position. Summary of reasoning:

- We believe that the solar industry is trading at unsustainable low valuations due to pressure on the module segment and uncertainty regarding the future adoption of solar energy.

- In the long-run, solar energy and other renewable forms of energy generation will become the norm and solar energy is already more economical than traditional energy sources (without subsidies) – the street is discounting this vast long-term growth potential with its depressed multiples (5x earnings or 7x EBITDA).
  - Current low valuations offer an excellent entry point into an industry that is poised to grow rapidly in the long-run.

- Among all companies in the space, Canadian Solar is best positioned to take advantage of challenging economics in the module segment due to its industry-leading manufacturing costs and increasing focus on vertical integration.

- YieldCos in Japan and the U.S. could unlock significant value and serve as a sustainable pipeline for CSIQ to monetize its increasingly important energy development segment.

Schedule for Future Due Diligence:

- Rapidly declining ASPs with no sign of stabilization will cause us to reconsider ASP assumptions in the model.

- We will monitor the monetization of project assets and the split between systems sold and dropped down to the energy generation segment closely.
Risks
Overview of Risks

**Political Risk**
- Phasing-out of financial incentives for renewable energy could materially impact the affordability of solar power products across the industry.
- Has occurred in the U.S., China, Germany, and other well-developed solar markets.
- Further price pressure resulting from cut subsidies will pare back number of competitors CSIQ has to contend with.

**Commodity Risk – Energy Prices**
- Risk of low oil prices de-incentivizing the utilization of solar.
  - Extremely low prices unsustainable for most oil companies to still profit off of.
  - LCOE for solar dropping quickly enough that soon it will be cheaper than oil and profitable for the most efficiently-operating solar firms.

**Chinese Predatory Pricing**
- Previously, Chinese government subsidy on production of solar modules have flooded the market, leading to much lower MSPs in the world since 2011.
  - Small-mid size companies that can’t produce lower than MSP eliminated.
  - Risk of more tax credits/subsidized production and oversupply of modules.

**Technological Risk**
- CSIQ has no truly proprietary technology, while their tech is industry leading another company can always catch up in terms of panel efficiency and installation costs.
  - CSIQ’s vertical integration defends against this pretty well.
Appendix

1. CSIQ Leadership
2. Abbreviated Income Statement – Most Pessimistic
3. Abbreviated Income Statement – Neutral
4. Abbreviated Income Statement – Most Optimistic
5. Abbreviated Balance Sheet – Most Pessimistic
6. Abbreviated Balance Sheet – Neutral
7. Abbreviated Balance Sheet – Most Optimistic
CSIQ Leadership

- **Dr. Shawn Qu** – Chairman and CEO
  - Founder, president, and CEO since company founding in 2001
  - Led company through 2006 public listing and helped CSIQ become a leading module manufacturer
- **Mr. Guangchun Zhang** – COO
  - Began working in Dec’ 2012
  - Previously a SVP for R&D and industrialization of manufacturing technology at Suntech Power
- **Mr. Huifeng Chang** – SVP and CFO
  - Joined the company in 2016
  - Heavy exposure to the Chinese markets in previous roles working in S&T at CICC & as CEO of HK asset manager

**Key Takeaways**

- Leader with a clear vision at the top
- Lots of experience conducting business with China; MGMT team primarily comprised of people who studied in China, and/or worked there/with Chinese companies
- Vast knowledge of solar energy through experiences in academia and at other firms
PPA Declines from 2009 to 2015

![Graph showing PPA declines from 2009 to 2015. The graph indicates a decrease in PPA prices across the years, with specific data points for each year.](image-url)