

# **Investor Day Presentation**

JW Marriott, Essex House, New York City

May 18, 2015





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### Agenda Today



#### **Strategy Overview**

**Module Business** 

Lunch Break

**Energy Business** 

YieldCo Opportunity and Guidance

**Closing Remarks** 



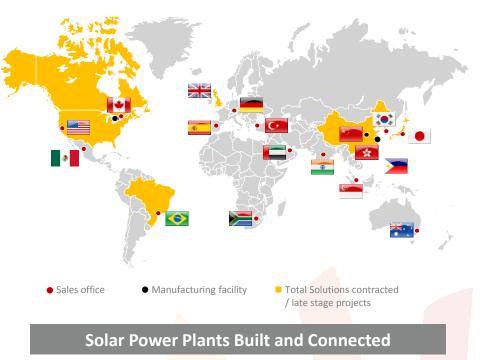
#### **Company Overview**

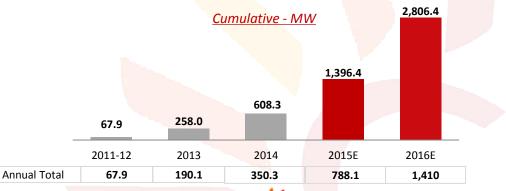
- 🗩 Founded in Ontario, 2001
- ∠ Listed on NASDAQ (CSIQ) in 2006
- Over 8,000 employees globally
- Presence in 18 countries / territories
- > 10 GW of solar modules shipped cumulatively
- > 1.4GW solar power plants developed, built and connected (incl. Recurrent)
- Yield Co expected to be launched in the quarters ahead
- Y Top 3 solar company by revenue and profits in 2014\*

#### Highlights

- ⅔ 2014 Revenue: \$3.0 Billion
- ⅔ 2014 Shipments: 3.1 GW
- ⅔ 2014 Net Income: \$240 Million
- 2015 Shipment Guidance: 4.0 4.3 GW







\*Source: Factset, company analysis

### **Presenters Today**

|          | Name / Title   | Work Experience  |
|----------|--|--|
| -        | <b>Dr. Shawn Qu</b><br>Chairman, President & CEO (Director)          | <ul> <li>Director &amp; VP at Photowatt International S.A.</li> <li>Research scientist at Ontario Power Generation Corp.</li> </ul>  |
| <b>B</b> | <b>Michael Potter</b><br>SVP and Chief Financial Officer             | <ul> <li>Corporate Vice President and CFO of Lattice Semiconductor Corp.</li> <li>Senior Vice President and CFO of STATS ChipPAC</li> </ul>  |
| P        | <b>Yan Zhuang</b><br>SVP and Chief Commercial Officer                | <ul> <li>Head of Asia of Hands-on Mobile, Inc.</li> <li>Asia Pacific regional director of marketing planning and consumer insight at<br/>Motorola Inc.</li> </ul>  |
|          | <b>Guoqiang Xing</b><br>VP Technology                                | <ul> <li>Chief Technology Officer at Hareon Solar Technology Co. Ltd</li> <li>Research &amp; Development Senior Director at JA Solar</li> </ul>  |
| C        | <b>Colin Parkin</b><br>VP Global Energy Business and GM Canada       | <ul> <li>Automation Tooling Systems (ATS)</li> <li>Founder and President, Integrated Manufacturing Technologies</li> </ul>   |
| <b>B</b> | Josh Goldstein (Recurrent Energy)<br>SVP Finance and Capital Markets | <ul> <li>Director and VP of Project Finance at Recurrent Energy</li> <li>Public power banker at Morgan Stanley</li> <li>Board Member, DeRose &amp; Appelbaum, Bay Area provider of real estate services</li> </ul> |
|          | <b>Ed Job</b><br>Director of Investor Relations                      | <ul> <li>IR Consultant</li> <li>Principal in the Strategy Practice at DiamondCluster International, now PwC</li> <li>Senior Manager in the Strategy Consulting division at Arthur D. Little</li> </ul>             |
|          |  |  |

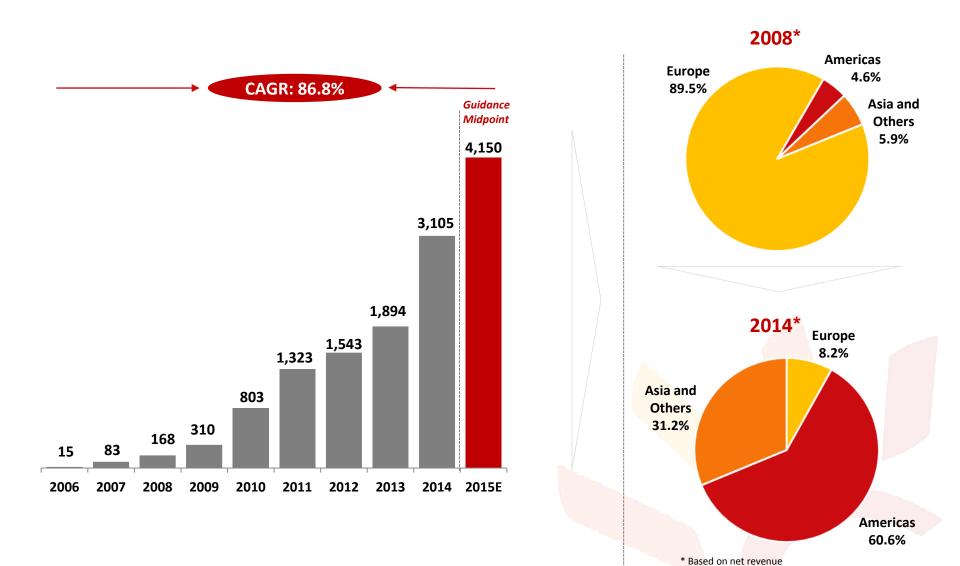
CanadianSolar

- We grew our PV module shipments at over 87% per year while broadly expanding our geographic footprint, and reducing dependence on European markets
- We leveraged our global brand, quality and effective sales force to consistently expand our market share
- We differentiated our business model by successfully growing our downstream, total solutions business
- We ended 2014 among the top-3 solar U.S.-listed solar energy companies by revenue and profitability, with one of the strongest balance sheets
- We built an industry leading project development platform that positions us to launch our own YieldCo

Since our IPO we have emerged as a strong global leader of the solar revolution.



#### We Grew Shipments and Broadened Our Geographic Footprint...



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Make The Difference

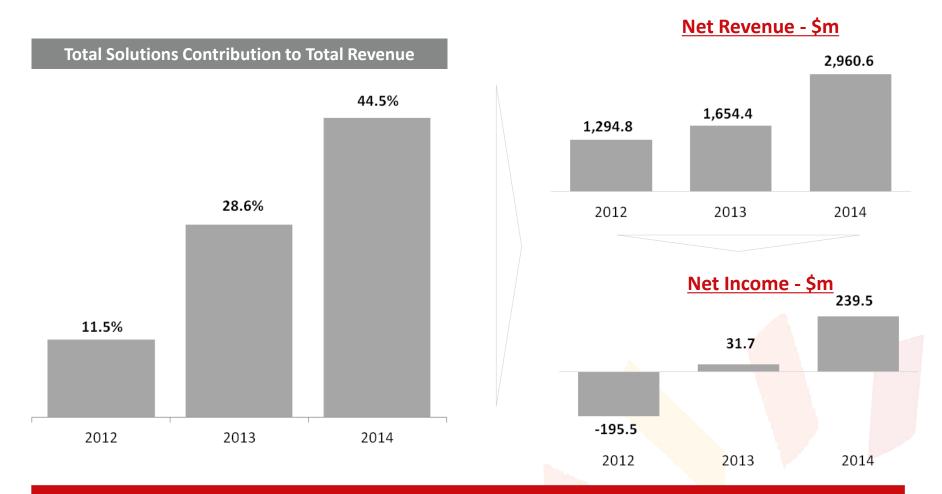
#### We Consistently Expanded Our PV Module Market Share

|                  | 2009           | 2010           | 2011           | 2012           | 2013                       | 2014           | Q4 2014                |
|------------------|----------------|----------------|----------------|----------------|----------------------------|----------------|------------------------|
| 1 <sup>st</sup>  | First Solar    | Suntech        | Suntech        | Yingli         | Yingli                     | Trina Solar    | Trina Solar            |
| 2 <sup>nd</sup>  | Suntech        | First Solar    | First Solar    | Suntech        | Trina Solar                | Yingli         | Canadian Solar         |
| 3rd              | Sharp          | Sharp          | Yingli         | Trina Solar    | Canadian Solar             | Canadian Solar | JA Solar               |
| 4 <sup>th</sup>  | Yingli         | Yingli         | Trina Solar    | Canadian Solar | Sharp                      | Jinko Solar    | Yingli                 |
| 5 <sup>th</sup>  | SunPower       | Trina Solar    | Canadian Solar | First Solar    | Jinko Solar                | JA Solar       | Jinko Solar            |
| 6 <sup>th</sup>  | Kyocera        | Canadian Solar | Sharp          | Sharp          | Renesola                   | Sharp          | First Solar            |
| 7 <sup>th</sup>  | Trina Solar    | Hanwha Solar   | SunPower       | JA Solar       | First Solar                | Renesola       | Rene <mark>sola</mark> |
| 8 <sup>th</sup>  | Canadian Solar | Kyocera        | Jinko Solar    | Jinko Solar    | Hanwha S <mark>olar</mark> | First Solar    | Hanwha Solar           |
| 9 <sup>th</sup>  | Hanwha Solar   | SunPower       | Hanwha Solar   | SunPower       | Kyocera                    | Hanwha Solar   | Sharp                  |
| 10 <sup>th</sup> | Solar World    | Solar World    | Kyocera        | Hanwha Solar   | JA Solar                   | Kyocera        | Kyocera                |

Source: Company issued press releases, analyst reports, Canadian Solar analysis Note: Based on Module MW shipment recognized under GAAP



#### We Differentiated our Business Model by Moving Downstream

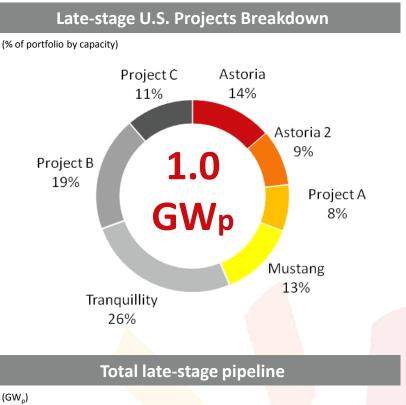


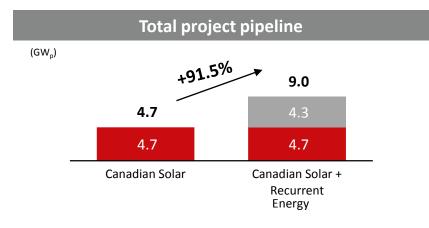
We ended 2014 among the top-3 US-listed solar energy companies by revenue and profitability, with one of the strongest balance sheets.

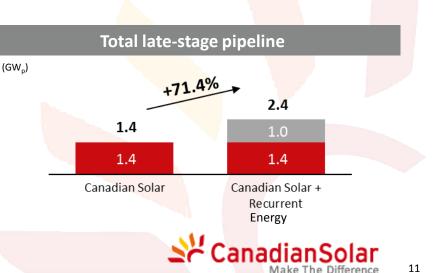


## We Built a World Leading Platform to Support Our YieldCo Launch

- Acquired Recurrent Energy for \$265M, transaction closed March 30, 2015
- \$2B to be invested to complete 1.0GWDC prior to end of 2016
- Core asset base to support launch of CSIQ YieldCo.
- Approximately 2,000 American jobs to be created in the next two years







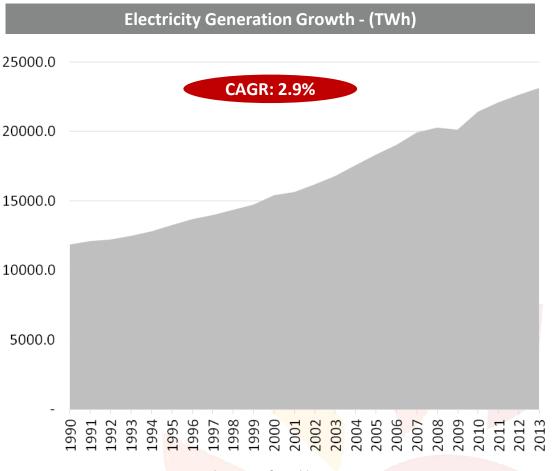
#### **Macro-environment Driving Solar Adoption is Favorable**

- → Period Provide A P
- Renewable energy additions already surpasses conventional energy, and solar is expected to be the fastest growing source of electricity
- Global annual PV installation to break through 50GW in 2015, and near term demand is forecast to be healthy
- We believe we are at the very early stages of solar adoption, and see significant upside in demand for solar PV over the next 15 years



## **Demand for Electricity is not going out of Fashion**

- Electricity consumption is expected to grow in line with GDP
- Aging fleet of coal and nuclear assets are expected to be decommissioned
- Environmental compliance is expected to force cost of conventional sources of electricity higher
- Cost of solar energy is expected to continue to decline as technology improves and economies of scale from widespread adoption prevail

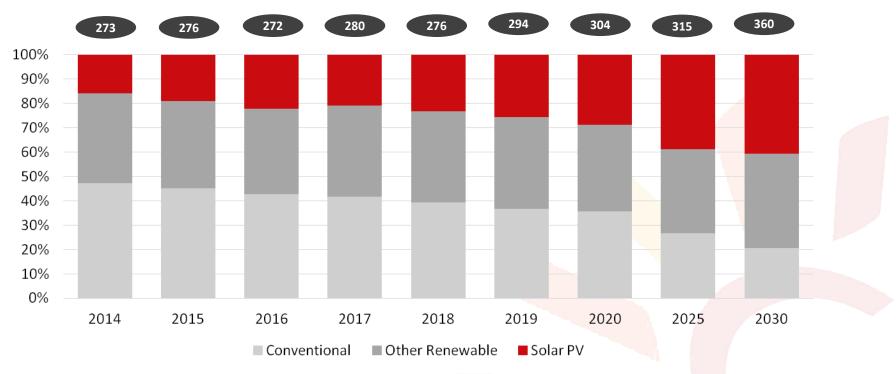


Source: BP 2014 Statistical Review of World Energy



### **Renewable Energy Additions Already Surpasses Conventional Energy**

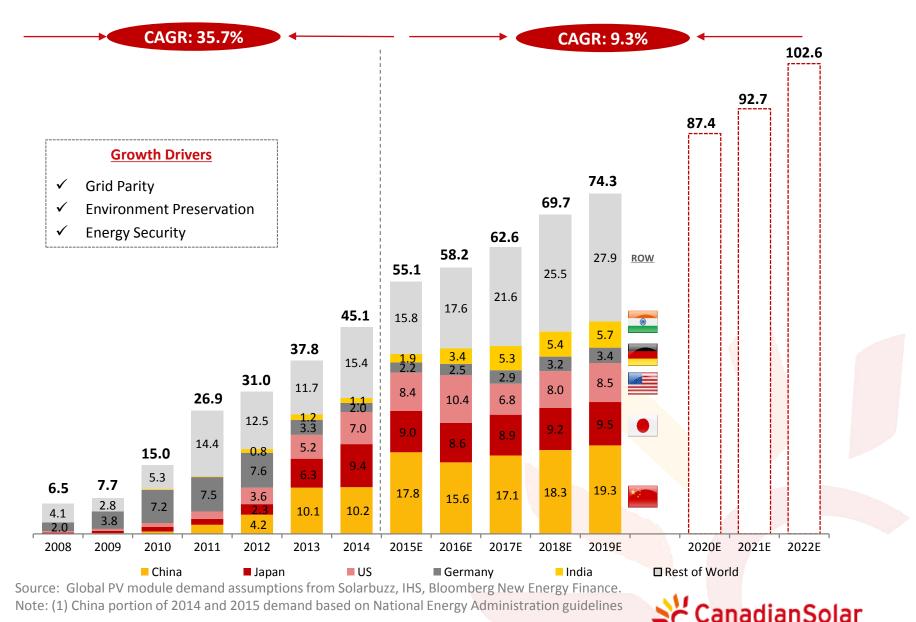
- In 2014, solar PV and other renewable energy capacity additions surpassed conventional energy for the first time, and solar PV is expected to dominate.
- ✓ Over the next 20 years the solar industry is expected to generate over \$5 trillion of cumulative revenue.



#### **Global Capacity Additions - GW**

Source: Bloomberg New Energy Finance, Deutsche Bank

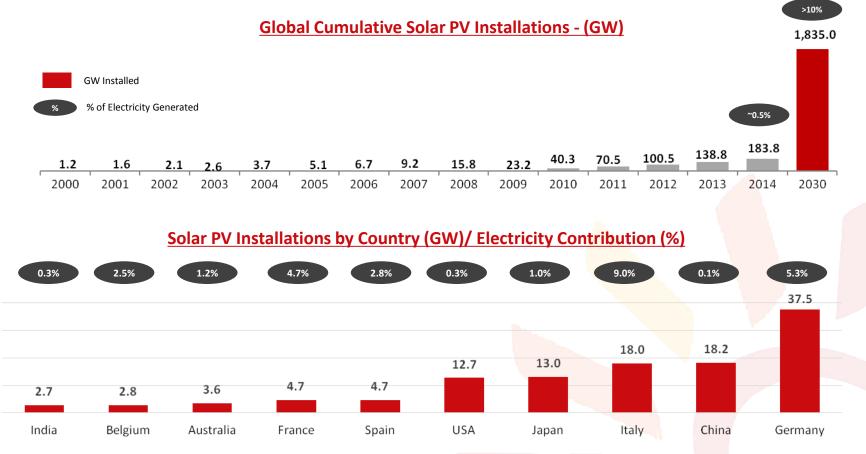
### **Global Annual PV Installation to Break through 50GW in 2015**



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#### We Are at the Very Early Stages of Solar Adoption

- Solar energy will grow from less than 1% of global electricity generation today to >10% by 2030.
- ✤ In Italy today, solar generates 9% of total electricity, compared to just 0.1% in China



Source: EPIA, Bloomberg New Energy Finance, Canadian Solar Analysis.

#### **Strategic Imperatives**

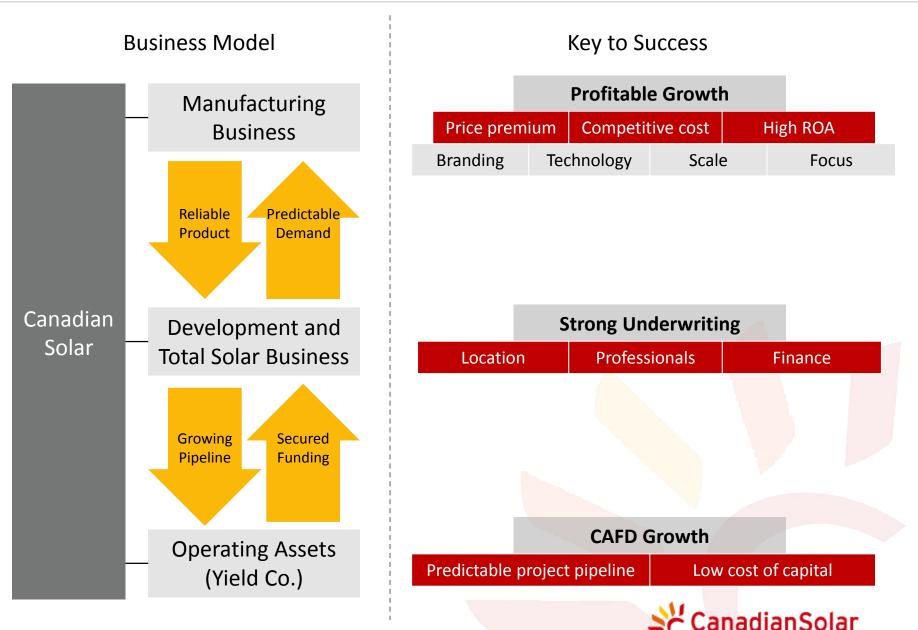
| Differentiation | <ul> <li>Leverage existing downstream expertise to expand utility scale project opportunity and capturing value through the launch of a YieldCo</li> <li>Expand residential and commercial system kits and turn key solutions</li> </ul> |
|-----------------|--|
| Cost            | <ul> <li>Continuously reduce manufacturing cost to remain competitive</li> </ul>   |
| Scale           | <ul> <li>Expand capacity selectively in a cost-efficient manner to remain among top 5 suppliers to leverage scale and target 10% market share</li> <li>Develop local manufacturing partnerships in key markets</li> </ul>                |
| Technology      | <ul> <li>Focus research and development effort on achieving solar cell efficiency<br/>improvements and on the introduction of new technologies</li> </ul>  |

Canadian Solar aims to maintain profitability and to be the global leader in the manufacture and sale of solar module products and the development, ownership and operations of solar power plants.



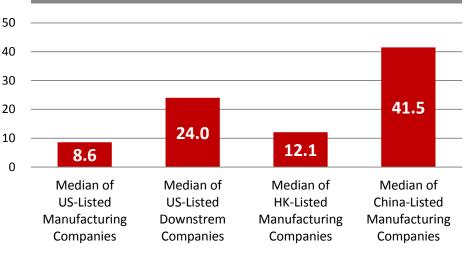
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## **Strategic Positioning**



#### Value Discovery in the Solar Sector

 Value disparity between North American and Asian stock markets out of normal range

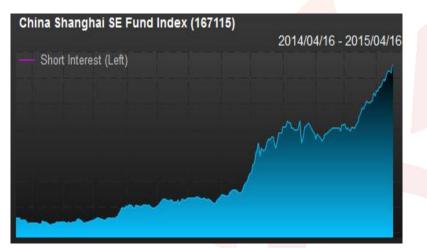


#### P/E Ratio Comparison of Certain Solar Companies

Source: Deutsche Bank, March 23, 2015



Source: Factset April 17, 2015





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**Technology and Cost Roadmaps** 

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Q & A

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**Closing Remarks** 



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#### The PV Learning Curve and Cost Reduction Backdrop

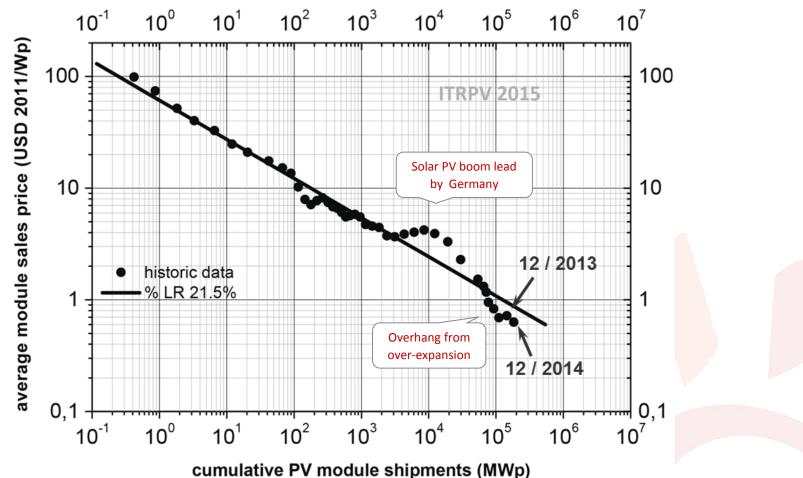
- Historically, module price decreases by 21.5% for every doubling in cumulative module shipment
- Cell efficiency/module power improvement and manufacturing efficiency are critical to support future cost reduction
- At Canadian Solar, we have been able to increase cell efficiency at 0.5% absolute per year over the past 5 years through internal efforts, in line with industry learning curve
- Module power output for our mainstream product (CSP6), has increased by an average of 6.8W per year in the past 5 years

Canadian Solar R&D has a track record of success scaling innovative technologies that deliver cost competitive solar energy solutions



## **PV Learning Curve: Moore's Law in Photovoltaics**

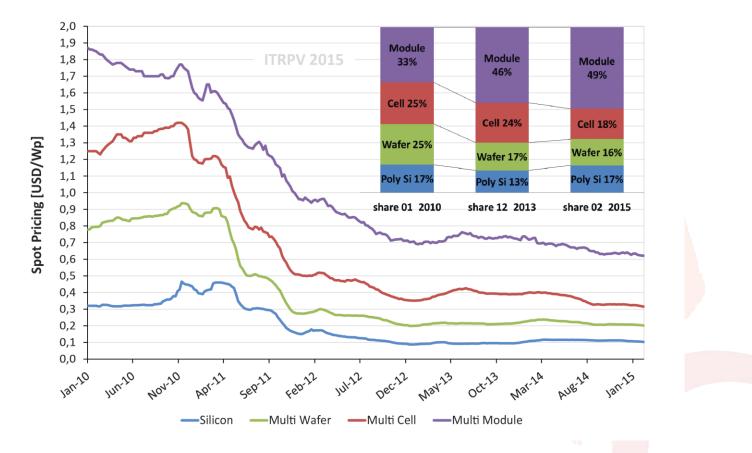
Module price has decreased by 21.5% for every doubling in cumulative module shipment



Note: measurement starts circa 1960's and goes until Q1 2015 when cumulative modules shipments are estimated by ITRPV to be 184GW

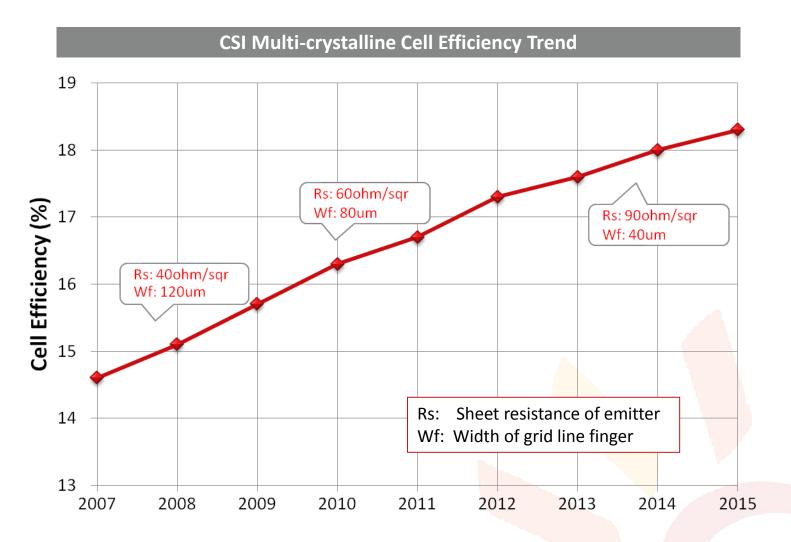
#### **Module Price and Cost Reduction is Slowing Down**

- Since 2012 module price and cost reduction is back to the learning curve norm
- Module power/cell efficiency improvement and manufacturing efficiency are critical to support future cost reduction



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#### **Canadian Solar Multi Cell Efficiency Progress**

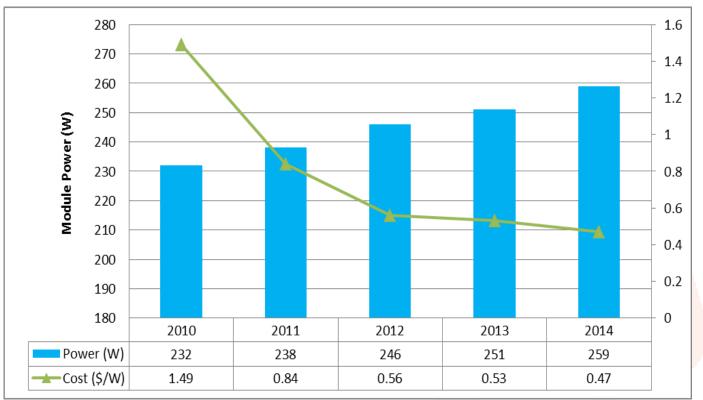


Cell efficiency improved at a rate of 0.5% (absolute) each year



#### **Canadian Solar Module Power Output and Cost Trend**

CS6P-P (60 cells) Power and Cost Trend



Mainstream CS6P-P module , each year's Q4 data

Annual power increase averaged 6.8W per year in the past 5 years

In-house module cost decreased steadily



#### **Strong R&D Capabilities and Portfolio of Technologies**

- → Dedicated research labs for cells and modules
- PV Reliability Test and Analyses Lab is accredited as test witness lab for TUV Rheinland, CSA and VDE
- Recently launched competitive high-efficiency cell technology: ONYX
- Portfolio of high efficiency technologies such as n-type technology, being evaluated for potential future launch with efficiency targeted to exceed 22% by 2017

#### **R&D Mission:**

To make company's solar products more powerful, reliable, affordable and easy-to-use.

## R&D Objective:

To develop and improve ready-for-production technologies in wafers, cells and modules to increase product efficiency while reducing cost; and continuously enhance technical strength in PV systems and energy solutions.



## **Research & Development Capabilities**

| Areas of Focus                                   | Description   |             |  |
|--|---|-------------|--|
| Solar Cell Research and<br>Development           | <ul> <li>Develop high efficiency and cost competitive new cell t</li> <li>Owns one dedicated research production line for cell R</li> </ul>                                     | 0           |  |
| Solar Module Research<br>and Development         | <ul> <li>Focused on the innovation of solar modules</li> <li>Owns one dedicated research production line for modu</li> </ul>  | ıle R&D     |  |
| PV Product and System<br>Technology Development  | <ul> <li>Develop high quality and low cost off-grid products: hyl system, energy storage, solar pump, and PV+ diesel</li> <li>System technology development</li> </ul>          | brid        |  |
| Photovoltaic Reliability<br>Testing and Analysis | <ul> <li>Fully compliant with ISO/IEC 17025, IEC 61215/61730<br/>/61701/62804, UL1703/1741 standards</li> <li>Test witness lab: TUV Rheinland, CSA and VDE certifica</li> </ul> | tion bodies |  |

#### First PV manufacturer to obtain auto industry's stringent ISO TS16949 accreditation for product quality control









## Solar Cell: ONYX I (Black Silicon)

- ✤ 0.4% cell efficiency and 4 watts module power gain over baseline by 2015 Q4
- अ Production roll out begun in 2015 Q1
- 💥 Ramp up as future multi baseline
- ✤ Increase market competitiveness
- Pleasing aesthetics

|          | Voc(mV) | lsc(A) | FF(%) | Efficiency |
|----------|---------|--------|-------|------------|
| Baseline | 632.2   | 8.707  | 79.46 | 18.00%     |
| ONYX I   | 633.1   | 8.812  | 79.88 | 18.31%     |



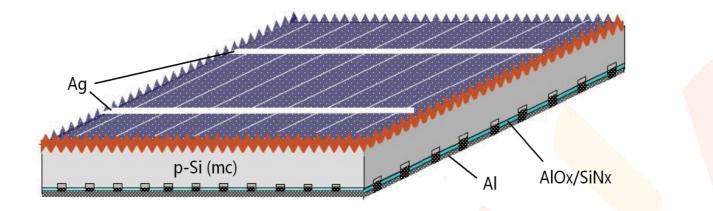
#### Over 3 years in-house R&D, self-owned IPs

World 1<sup>st</sup> and the only one in mass production with similar technologies



## Solar Cell: ONYX II

- अ ONYX II enhances back side passivation and increases cell efficiency to 19%
- Low Light Induced Degradation (LID), and Potential Induced Degradation (PID) resistant
- Production roll out begin in 2015 Q3, will gradually ramp up to 400MW



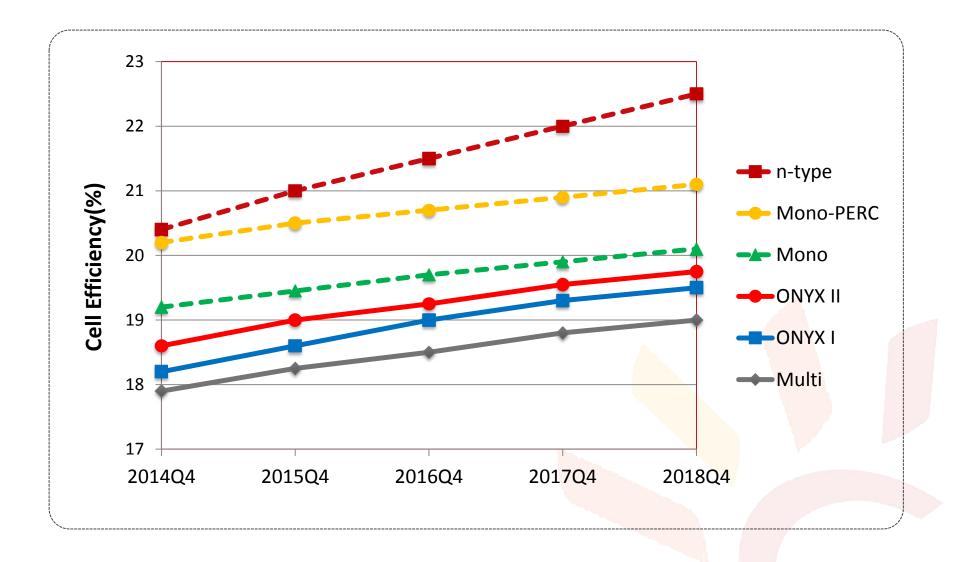


- 🗩 LID Free & PID Free
- Excellent Temperature Coefficient: (-0.22/ °C vs. -0.47/ °C conventional)
- Bifacial module: higher front side efficiency plus back side contribution, expected to lower LCOE by 16%
- ✤ Targeting production cell efficiency at 22.0% and module power output at 310W (CS6P type, single side)
- अ Trial production expected in 2016





#### **Cell Efficiency Roadmap**





### World Class Solar Module Portfolio

- We have a broad portfolio of modules addressing all segments of the market, residential, commercial and utility-scale
- Our modules have the highest PVUSA Testing Conditions (PTC) rating among our peers
- We have developed innovative cell and module designs to meet the ever growing needs of our customers
  - Double glass modules with up to 30 year warranty
  - > First to launch a mass produced module with 4-busbar cells
- № 100% of our in-house produced cells are PID resistant



#### **Canadian Solar Modules Rank Highest on PTC Rating**

| STC Rating   | <b>PTC Rating</b>  |
|--|--|
| (Standard Test Condition)  | (PVUSA Test Condition)   |
| Module performance is<br>rated at 25°C cell<br>temperature – Name plate<br>power | Required by the California<br>Energy Commission, a more<br>realistic measure of module<br>performance around<br>module's nominal operating<br>cell temperature (NOCT),<br>which is about 45 °C |

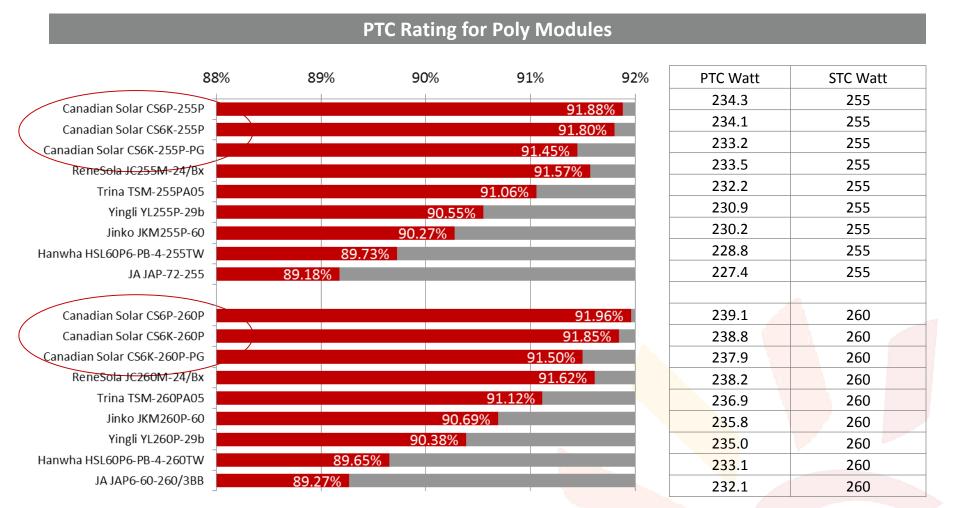
Higher PTC Rating means module with the same name plate power being able to generate more power at realistic operation conditions

Canadian Solar modules ranked highest PTC Rating among all the P-type modules independently tested to meet the California Energy Commission requirements



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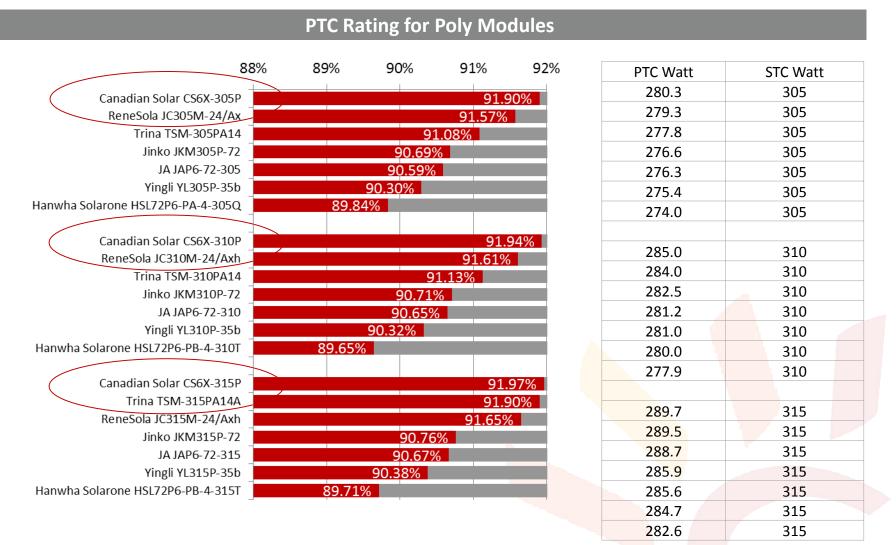
## California Solar Initiative Module PTC Rating (CS6P-P, 60 Cells)



Source: <u>http://www.gosolarcalifornia.ca.gov/equipment/pv\_modules.php</u> Updated as of April 1, 2015



## California Solar Initiative Module PTC Rating (CS6X-P, 72 Cells)



#### Source: http://www.gosolarcalifornia.ca.gov/equipment/pv\_modules.php Updated as of April 1, 2015



#### **Diamond Modules:**

Heat strengthened glass as backsheet, robust for sea/waterside/desert applications

अ Ready for 1500V systems, saving BOS cost

≥ 30 year power performance warranty

#### **Quartech Modules:**

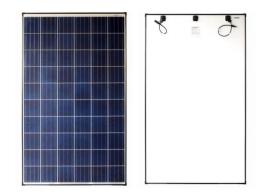
Section 2015 Four-busbar cell technology improving module reliability and conversion efficiency

अ¥1st to launch volume production

#### **PID Resistant Modules:**

Self-made cells are 100% PID resistant by the end of 2014

अPassed qualification test by 3rd parties (VDE, TUV SUD, Franuhofer ISE , PI Berlin, PVEL)







## **Module Power Output Forecast**

|                 |       | 2014Q4 |       | 2015Q4 |       | 2016Q4 |       | 2017Q4 |       | 2018Q4 |       |
|-----------------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|
|                 |       | Eff    | Power |
| Research Cell & | Multi | 18.5%  | 270   | 19.0%  | 280   | 19.5%  | 288   | 20.0%  | 295   | 20.5%  | 300   |
| Module          | Mono  | 20.5%  | 280   | 21.0%  | 290   | 22.0%  | 300   | 23.0%  | 320   | 24.0%  | 340   |

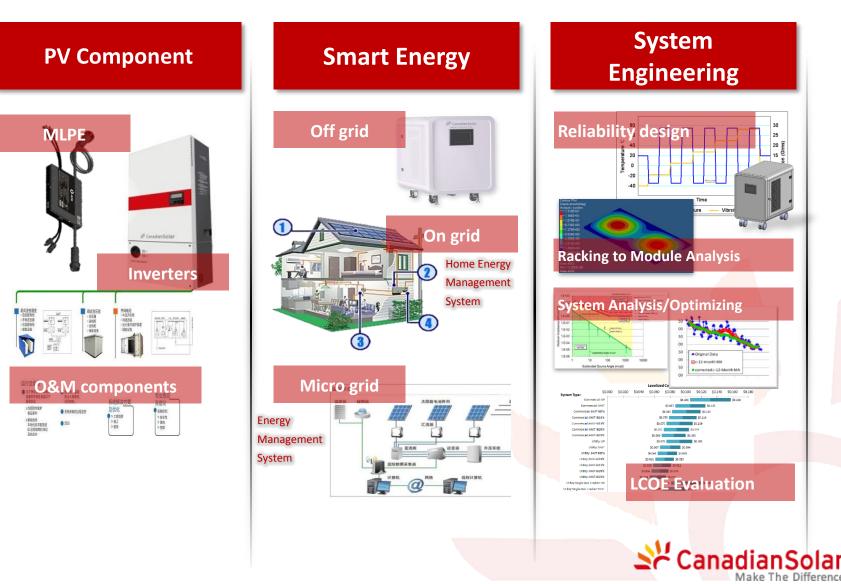
#### **Volume Manufacturing**

|               | Multi     | 17.9% | 260 | 18.2% | 266 | 18.6% | 272 | 18.8% | 275 | 19.0% | 279 |
|---------------|-----------|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|
|               | ΟΝΥΧ Ι    | 18.1% | 263 | 18.5% | 269 | 18.8% | 274 | 19.3% | 281 | 19.5% | 284 |
| Manufacturing | ONYX II   | 19.0% | 273 | 19.3% | 277 | 19.6% | 282 | 20.0% | 285 | 20.3% | 290 |
| Entitlement   | Mono      | 19.2% | 270 | 19.5% | 275 | 19.8% | 282 | 20.1% | 285 | 20.4% | 290 |
|               | Mono PERC | 20.2% | 283 | 20.5% | 289 | 20.7% | 294 | 20.9% | 298 | 21.0% | 300 |
|               | N-type    |       |     |       |     | 21.5% | 304 | 22.0% | 312 | 22.5% | 320 |



## **Centre for PV Product and System Technology Development**

#### **Objective: to continuously enhance technical strength in PV systems and energy solutions**



- SI is a global leader in the manufacturing of PV products, with 3.8GW of module capacity, with industry leading cost, technology and product quality
- ✓ Our new cell plant in Funing is equipped to produce Onyx I and II solar cells, with cell conversion efficiency expected to reach 19% by the end of 2015, and 20% by 2017
- We will continue to prudently expand our production capacity to increase our market share to maintain our position as a Tier 1 supplier of solar PV products
- We will also continue to implement cost reduction measures to maintain our competitive edge

Canadian Solar has steadily improved to the top-3 position in market share with competitive cost and distinguished product quality



## **Canadian Solar Manufacturing Footprint**

| Country | Location          | Products            | Capacities – MW* |  |  |
|---------|-------------------|---------------------|------------------|--|--|
| Canada  | Guelph, ON        | Module              | 500              |  |  |
|         | Luovang Honan     | Wafer               | 280              |  |  |
|         | Luoyang, Henan    | Module <sup>1</sup> | 500              |  |  |
| China   | Changshu, Jiangsu | Wodule              | 2,800            |  |  |
|         | Suzhou, Jiangsu   | Cells               | 1,500            |  |  |
|         | Funing, Jiangsu   | Cens                | 400 <sup>1</sup> |  |  |

## "Reverse Pyramid" capacity structure: Wafer: 280MW, Cell 1,900MW, Module 3,800MW

1- All capacities as of Q2 2015, except Funing which will reach 400MW in September 2015; module capacity does not include OEM relationships



## Newest Funing Manufacturing Site – Production Start Today, May 18, 2015

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The brief of FN plant :

#### 1, Product:

ONYX I, ONYX II

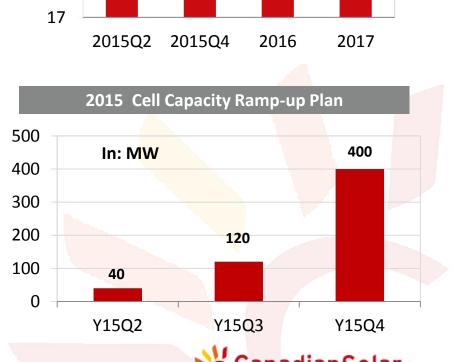
#### 2, Capacity:

Phase I: 400MW in Y2015

Phase II, III: up to 1600MW

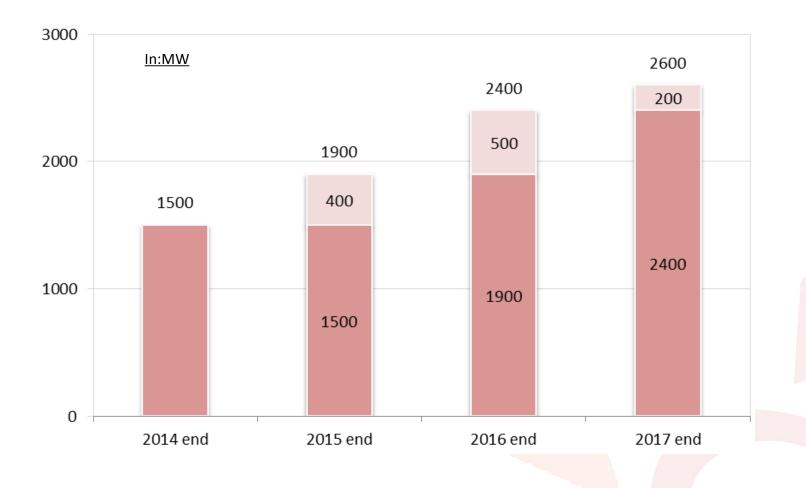
## 20 In:% 20 19.5 18.3

## Onyx Cell Efficiency Roadmap



## **Canadian Solar Cell Capacity Expansion Roadmap**

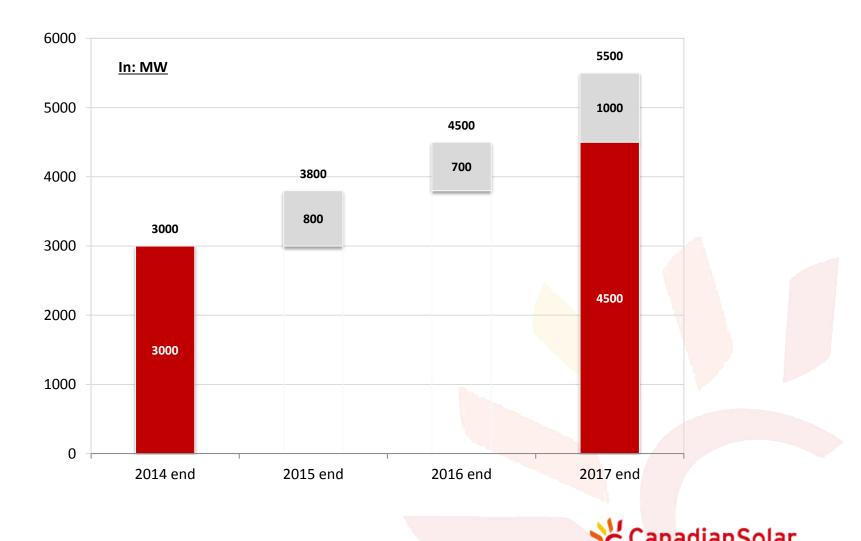
Cell Capacity Expansion Roadmap



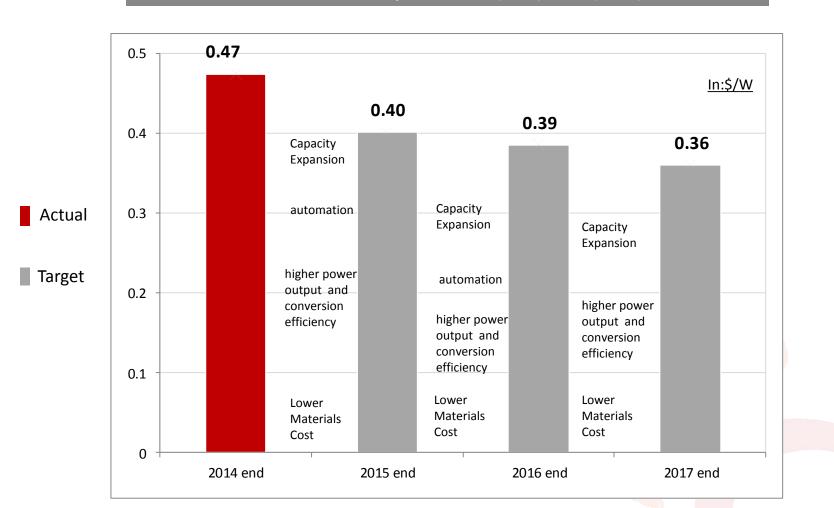


## **Canadian Solar Module Capacity Expansion Roadmap**

Module Capacity Expansion Roadmap



## **Canadian Solar Cost Reduction Roadmap**



Cost Reduction Roadmap for Module(6P-P) & Cell(P156) In CN



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**Sales and Marketing** 

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**Energy Business** 

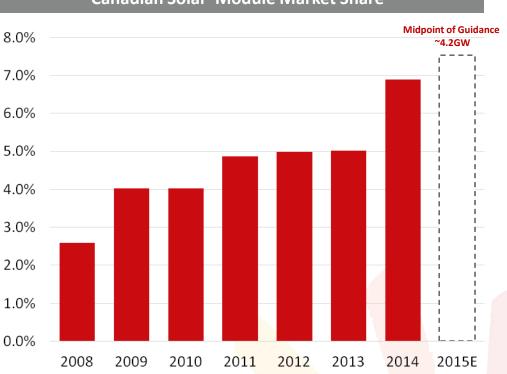
YieldCo Opportunity and Guidance

**Closing Remarks** 



🗩 Strong brand

- 💥 Bankability
- \mu Global footprint
- \mu Quality and Energy yield
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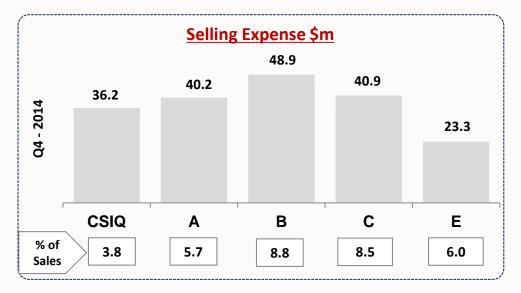
Canadian Solar Module Market Share

Source: IHS, Canadian Solar Analysis



## **Best In-Class Sales Operations Management**

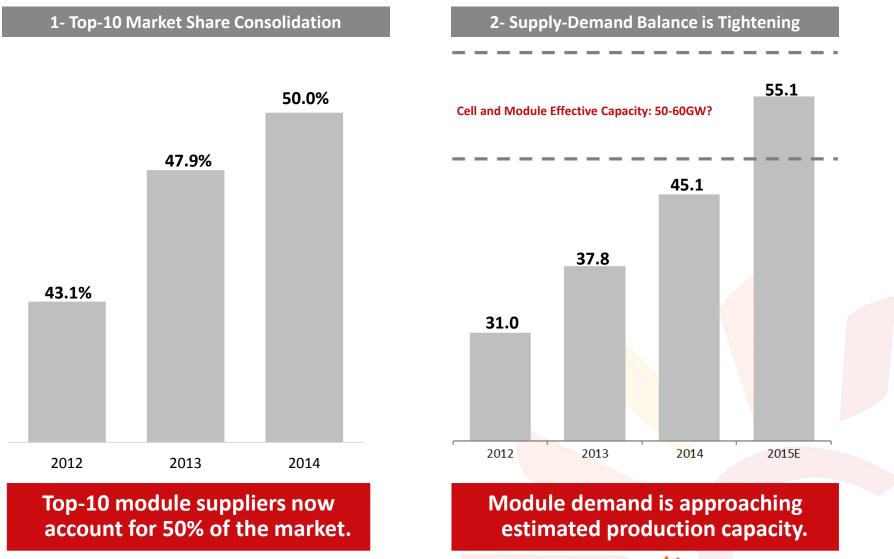
- Industry leading sales operations management:
  - Fast payment cycle
  - Low inventory
  - Low selling expense
- Close to zero bad-debt in 2014
- Highest ASP among all China based manufacturers in 2014.



| Q4 2014                     | CSIQ | Α   | В   | G  | С    | F  | E   |
|-----------------------------|------|-----|-----|----|------|----|-----|
| Receivable<br>Days          | 42   | 75  | 113 | 60 | 97   | NA | 39  |
| Payable<br>Days             | 93   | 108 | 164 | 89 | 189  | NA | 132 |
| Inventory<br>Days           | 51   | 61  | 66  | 60 | 67   | NA | 102 |
| Cash<br>Conversion<br>Cycle | 0    | 28  | 15  | 31 | (25) | NA | 9   |



## **Industry Structure is Changing**

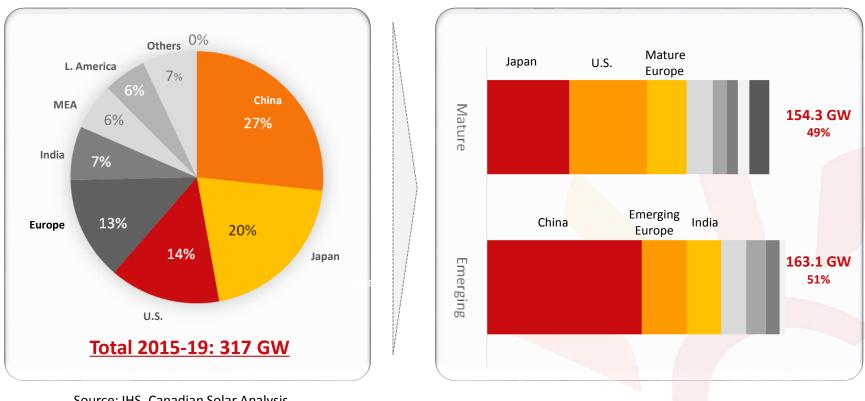


Source: Global PV module demand assumptions from Solarbuzz, IHS, Canadian Solar analysis



## The 2015-19 Opportunity in Regional Markets is Large

- Mature markets: diminishing government incentives, grid-parity and evolving storage solutions will drive growth of distributed generation and self consumption.
- Emerging markets: utility-scale business, and hybrid micro-grid targeting on reducing diesel consumption will drive growth and create high margin opportunities for IPPs
- U.S., Japan, Europe, China and India remain core markets for Canadian Solar in the foreseeable future



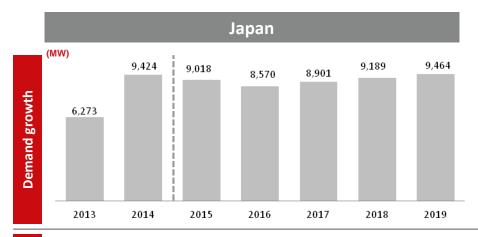
Source: IHS, Canadian Solar Analysis

## Solar PV Demand to Remain Robust in the US and Japan

(MW)

5,196

2013



- Second largest PV market in 2015-19 at 45 GW
- Utility-scale market driven by attractive FIT tariffs
- DG residential and commercial markets attractive over the long-term as utility-scale fades out
- Third largest market in 2015-19 at 42 GW

2015

8.404

6.992

2014

 Residential and commercial DG solar to grow fast driven by socket-parity, third-party owned business models and falling cost of capital

2016

**United States** 

10,397

- In 2014 Japan represented 25% of our shipments
- Established residential system kits and commercial turnkey solutions business
  - Estimated 8.4% market share
- Largest foreign PV module brand in Japan
  - 605 MWp project pipeline

**Market update** 

**CSIQ** position

- Completed 162 MWp of projects in US in 2013-14
- Key module supplier to local utility companies and private solar developers
- 1.0GWp project pipeline
- Over 100MW signed DoD module supply deals



8,518

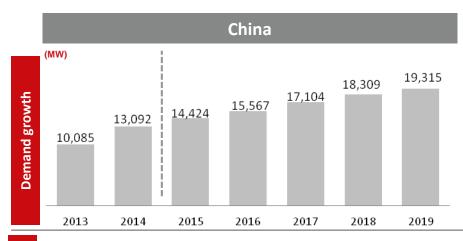
2019

7.992

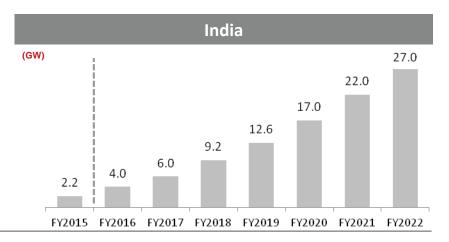
2018

6,839

## Positive Developments Driving Growth in the China and India



- Plans to decentralize power industry in terms of financing, regulation and electricity distribution
- Emerging residential and small commercial solar DG will sustain future growth.



- Positive progress in India's solar environment with with target instalations of 100GW by 2022.
- Confidence level is rising and the market is becoming much more dynamic.
- Canadian Solar has been aggressive in utility scale build to own project development; plan to connect 320MW by end of 2015.
- We shipped 200MW of modules in 2014 and plan to at least double this volume in 2015, but with tight control on payment risks.

#### Customers / partners







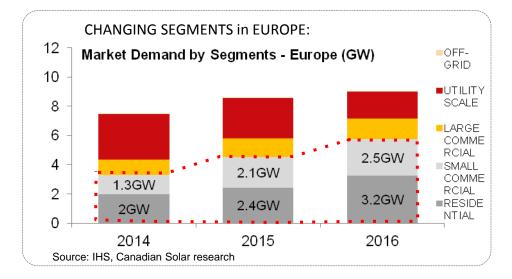
- We have been the market share leader in India (excluding First Solar) with completed sales of >0.5 GW to date in India
- Exploring a deeper presence in India including utility scale, large rooftop projects and local manufacturing.



Source: IHS, company information.

**Market update** 

## **Direct Sales and Solutions Opportunity in Europe is Attractive**









- Turnkey EPC Solutions/ IPP for diesel displacement (off/weak grid) in emerging markets.
  - Market size: 600GW diesel facilities around the world and minimum 100GW can be replaced with solar.
  - Margin potential is high EPC alone carries 30-40% gross margin so currency risk is not a big concern.
  - Demand is solid, less government involvement,
  - ➤ Large: Mining 5-20MW,
  - Mid size 1: 0.5-5MW: Islands, Off/weak grid commercial/industry.
  - Mid Size 2: Public facilities such as school, hospital, jails and telecom (not desirable given payment risks, government).
  - Small size: villages, off grid agriculture



## **Key Markets Trends**

#### Mature Markets

- Reduced government incentives, retail grid-parity, together with rising utility prices will drive most mature markets into self consumption mode
- Less room for intermediaries therefore direct channel is now dominating
- Digital B2C platforms become critical to lower the cost of end customer acquisition
- Strong demand for low cost, customized energy storage and management system
- Section 2.1. Comportunity for IPP<sup>1</sup> and/or turnkey solutions in Commercial/Industrial rooftop
- Utility-scale still present, albeit supported by grid-parity PPAs<sup>2</sup>

#### **Emerging Markets**

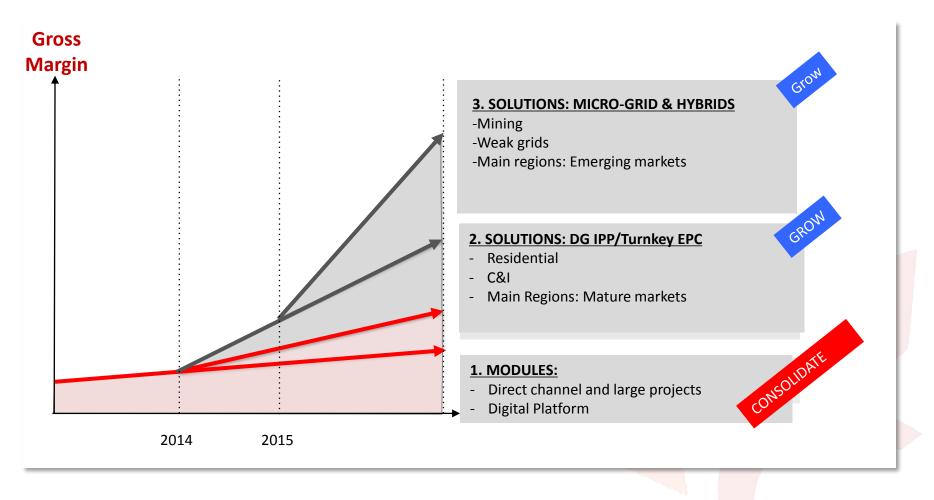
- Demand for modules driven by utility-scale build-out
  - More and more new markets will launch grid-parity PPA bidding for solar PV
  - > Volume driver with low- to mid-teen gross margin.
- Off/weak grid and diesel displacement presents an attractive opportunity
  - Demand is high
  - Plenty of margin
  - Bank financing may become available
  - Need bankable market makers

1. Independent Power Producers; 2. Power Purchase Agreement



## **Total Solutions Opportunity in Mature and Emerging Markets**

# *"Capture the present from modules business while building the future with solutions business"*

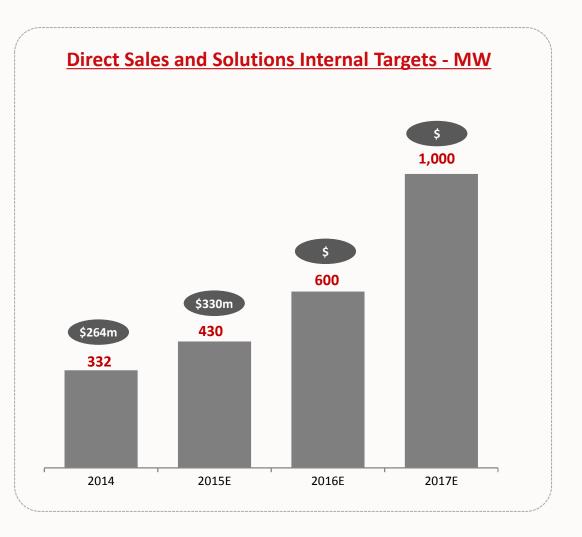




## We Plan to Grow Direct Sales and Solutions Business....

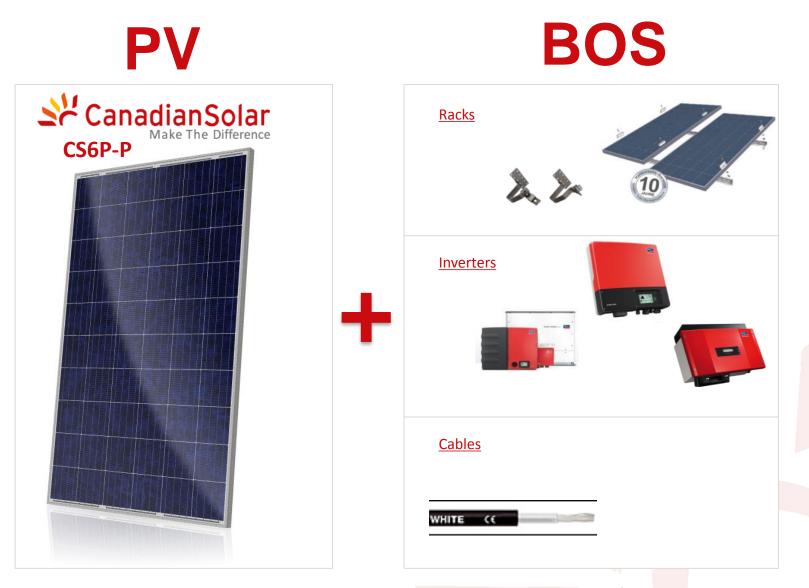
#### **Solutions Sales**

- Direct sales at premium pricing of modules and balance of systems (BOS)
- Digital channel sales of modules and BOS
- → EPC Turnkey for commercial DG
- 💥 Micro-grid



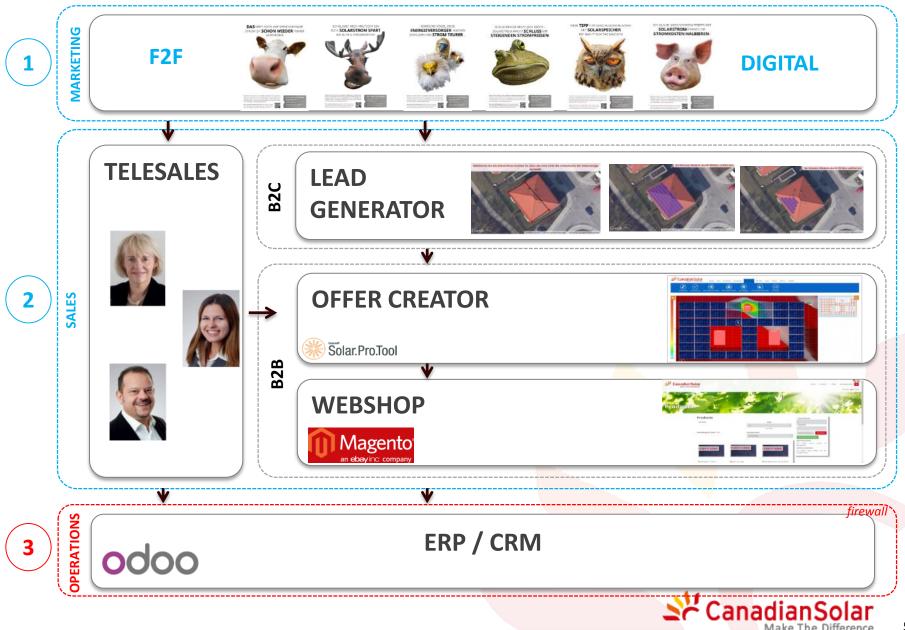


## The Direct Sales Channel Offers the Entire Bundle





## **B2C: Digital Channel for Mature Markets (Residential DG)**



## We have an Established Position in Japan Direct Sales and Solutions









**Market Entry:** 

2009

# 2014 Revenue: **\$97m**



## **Turnkey Solution Case Study – IKEA Australia**

- PV Project: 3.6 MW Roof-Top PV Projects for IKEA Australia
- City, State, Country: Logan (QLD), Rhodes (NSW), Marsden Park (NSW), Springvale (VIC) and Richmond (VIC), Australia
- Application Type: Solar Power Generation Systems, multi-states nation-wide deployment
- Installation Type: Large Commercial Rooftop PV
- **Total System Size:** 7 projects, total 3.6 MW
- Annual System Output: 4,658 MWh/year
- CO2 Emission: 4,742 metric Tons
- System Activated: August 2014
- Module Type: CS6X-P and CS6P-P
- Owned By: IKEA Australia Pty Ltd
- Developed By: Canadian Solar (Australia) Pty Ltd
- Constructed By: Canadian Solar (Australia) in conjunction with Lamco Solutions, Smart Commercial Solar and CSA Services



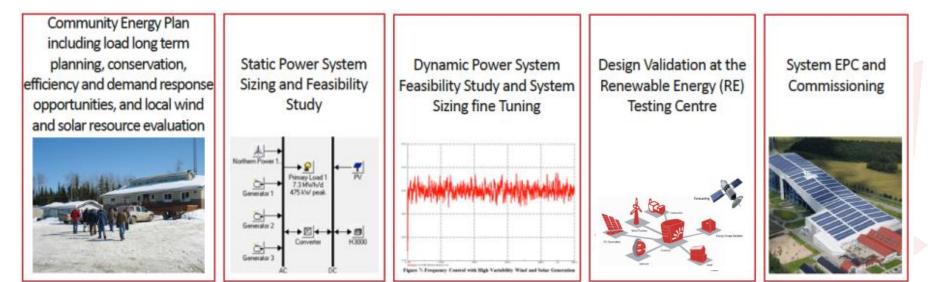
»We have a long-term approach to sustainability, globally our ambition is to switch to renewable energy to become energy independent by 2020, and we're well on the way. For an installation of this size, installing solar systems on to the roofs of our stores and warehouses here in Australia is a considerable undertaking and each of our sites' has had its challenges. It's important to us and our business to ensure we have efficient, reliable high quality product together with a competitive offer, expert knowledge and experience.«

Richard Wilson Sustainability Manager IKEA Australia



## **Micro-grid One-Stop Shop Service**





## Agenda Today

**Strategy Overview** 

**Module Business** 

**Technology and Cost Roadmaps** 

Sales and Marketing

Q & A

Lunch Break

**Energy Business** 

YieldCo Opportunity and Guidance

**Closing Remarks** 



## Agenda Today

**Strategy Overview** 

**Module Business** 

**Technology and Cost Roadmaps** 

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Q & A

**Lunch Break** 

**Energy Business** 

YieldCo Opportunity and Guidance

**Closing Remarks** 



**Strategy Overview** 

**Module Business** 

Lunch Break

**Energy Business** 

**Global Energy Business** 

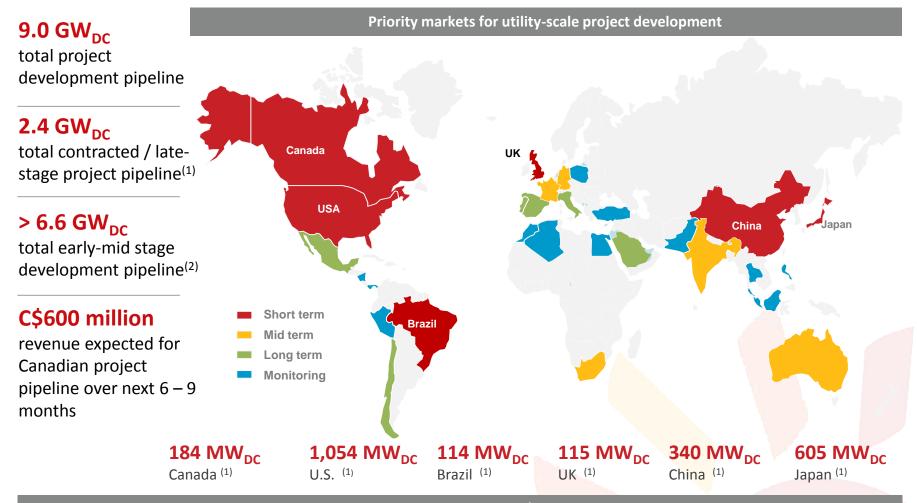
**US : Recurrent Energy** 

YieldCo Opportunity and Guidance

**Closing Remarks** 



## **Industry Leading Globally Diversified Pipeline**



Canadian Solar has a globally diversified pipeline of contracted / late stage projects in low risk geographies

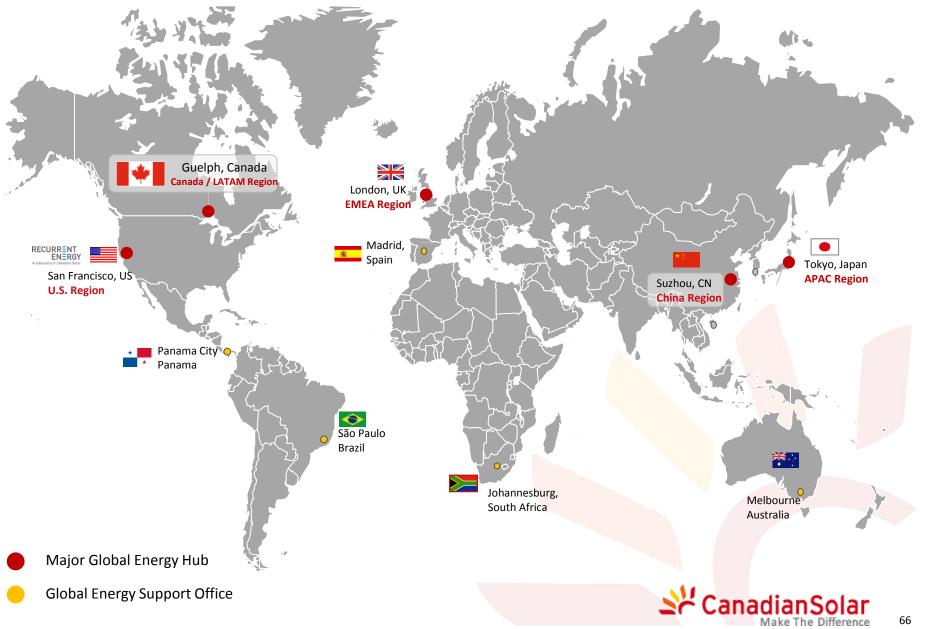
Source: Company information as of May 18, 2015

Note: (1) Late-stage project and EPC contract pipeline, nearly all projects have an energy off-take agreement and are expected to be built within the next 2-3 years. Some projects may not reach completion due to failure to secure permits or grid connection, among other risk factors.

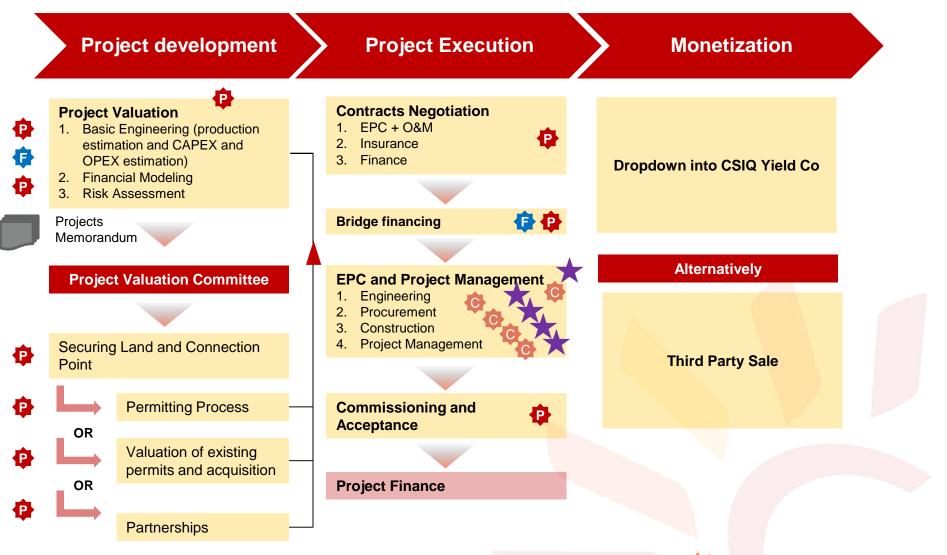
(2) Early to mid-stage of development: includes projects under assessment for co-development and acquisition, as well as projects being self-developed where the land has been identified or secured, and an energy off-take agreement is in place or there is a reasonable probability that it can be secured.



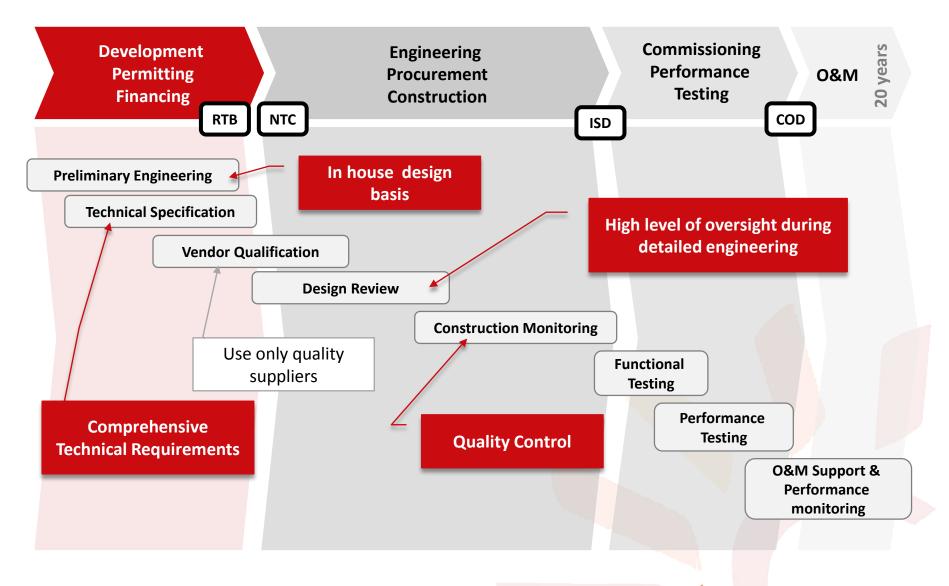
## **Global Energy Business Footprint**



## **Our Core Processes**



## **Engineering Oversight during Project Life Cycle**





## **Achieving Lower LCOE Through Learning and Innovation**



Lessons Learned and Root Cause Analysis

Monitor Performance of Project Under O&M Contract

Maintain Detail Project Cost Models

Projects Evaluation and Sponsorship

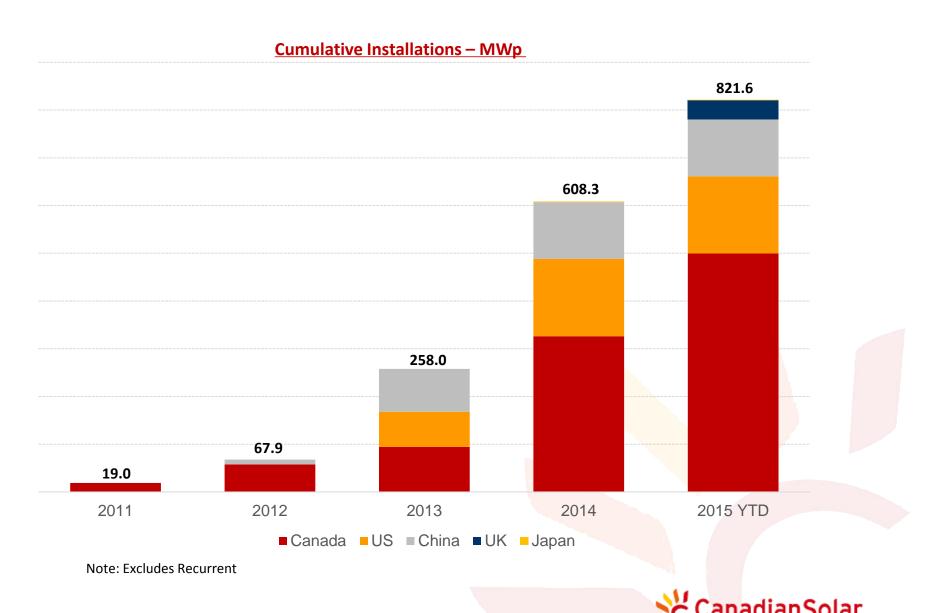
Market and Technology Intelligence

**Evaluate New Suppliers And Technologies** 

Assess 'Make Vs Buy' To Maintain Competitive Advantage



### We have an Industry Leading Track Record Delivering Utility Scale Power Plants





#### 24 DEVELOPER PROJECTS IN OPERATION<sup>1</sup> 310.4 MW DC 6 ENGINEERING, PROCUREMENT & CONSTRUCTION PROJECTS IN OPERATION 189 MW DC

| Year              | # of<br>projects | MW DC |  |  |
|-------------------|------------------|-------|--|--|
| 2011              | 2                | 19.0  |  |  |
| 2012              | 4                | 38.9  |  |  |
| 2013              | 3                | 36.4  |  |  |
| 2014              | 17               | 232.0 |  |  |
| 2015<br>(to date) | 4                | 173.1 |  |  |
| Total             | 30               | 499.4 |  |  |



1. Projects are not owned by Canadian Solar and not eligible for YieldCo.



## Samsung Phase I – Haldimand, Ontario













#### **Thunder Bay, Ontario**





Thunder Bay, Ontario Canada CSI Role: 8.5 MW DC EPC Solution and O&M Provider Owner: Skypower LTD (FWFN) Construction Finance: Minsheng Bank Project Debt : Deutsche Bank Status: Completed December 2011



Thunder Bay, Ontario Canada CSI Role: 10.8 MW DC EPC Solution and O&M Provider Owner: Skypower LTD (FWFN) Construction Finance: Minsheng Bank Project Debt : Deutsche Bank Status: Completed March 2012



74



## 26 U.S PROJECTS IN OPERATION<sup>1</sup> 161.8 MW



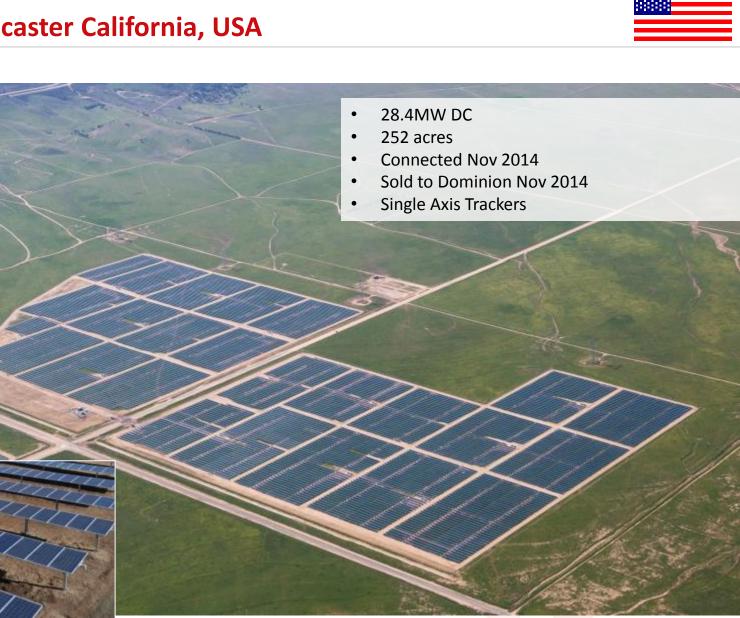
| Connected | # of<br>Projects | MW DC |
|-----------|------------------|-------|
| 2013      | 15               | 73.7  |
| 2014      | 11               | 88.1  |
| Total     | 26               | 161.8 |



1. Projects are not owned by Canadian Solar and not eligible for YieldCo. Does not include Recurrent Energy.



75







# 23 DEVELOPER PROJECTS IN OPERATION<sup>1,2</sup> 99 MW DC

| Year  | # of projects | MW DC |
|-------|---------------|-------|
| 2012  | 1             | 10.0  |
| 2013  | 20            | 80.0  |
| 2014  | 4             | 29.0  |
| Total | 25            | 119.0 |



- Includes 30MW of Golden Sun projects that are counted as one project, 5MW of which is in process of grid-connection; Also includes a 15MW project that was only partially connected to the grid in December of 2014
- 2. All self-developed projects are owned by Canadian Solar; 17 projects built under the Golden Sun program





# 40.2 MW DC

| Project     | MW DC |
|-------------|-------|
| Moat Farm   | 4.6   |
| Coombe      | 7.4   |
| Hoplass     | 10.3  |
| Church Farm | 17.9  |
| Total       | 40.2  |

1. Projects are owned by Canadian Solar and eligible for YieldCo.





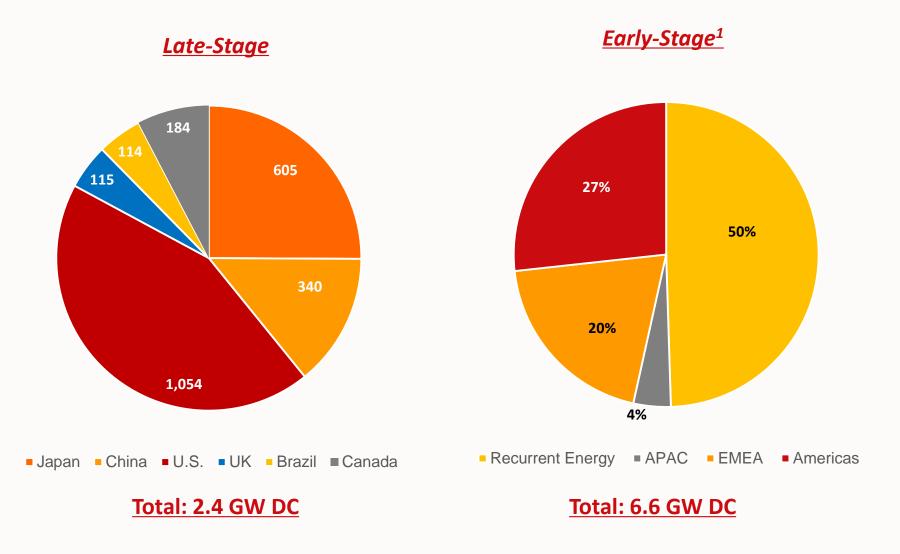
### Moat Farm – Nottinghamshire, UK







## **The Regional Breakdown of our Project Pipeline**



1. Excludes China, India and Pakistan MOUs



# The Utility Scale Project Opportunity in Canada

# \*

#### **Market Environment**

- LRP 140 MW 2016 and 140 MW 2017
- FIT program running out
- Transition to RFP system and then a cap and trade market
- No future local content requirement

#### **Active Pipeline COD Schedule\***

| Canadian Solar developed                         | MW <sub>DC</sub> | Status          | Expected COD |
|--|------------------|-----------------|--------------|
| Alfred   | 14.1             | Engineering     | 2015 Q4      |
| Illumination LP                                  | 14.0             | In Construction | 2015 Q4      |
| Beam Light LP                                    | 14.0             | In Construction | 2015 Q4      |
| Earth Light LP                                   | 14.1             | Engineering     | 2015 Q4      |
| Lunar Light LP                                   | 14.0             | In Construction | 2015 Q2      |
| Aria LP  | 14.8             | In Construction | 2015 Q4      |
| Total CSIQ Developed (SALE in 2015)              | 85.0             |                 |              |
| 3 <sup>rd</sup> Party Developed (EPC)            | MW <sub>DC</sub> | Status          | Expected COD |
| Samsung Phase I                                  | 133.6            | In Construction | 2015 Q2      |
| Samsung Phase II                                 | 141.0            | In Construction | 2015 Q3      |
| Total EPC Projects                               | 274.6            |                 |              |
| EPC MW Recognized into Revenue in Prior Quarters | 175.4            |                 |              |
| Total Project Backlog                            | 184.2            |                 |              |

\* As of May 18<sup>th</sup> 2015

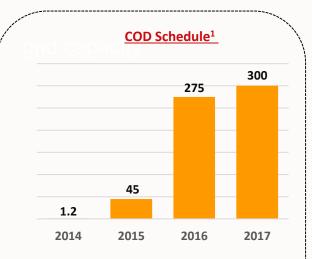


# The Utility Scale Project Opportunity in Japan

#### Market Environment

- In 5 utility areas (Hokkaido, Tohoku, Shikoku, Kyushu and Okinawa) grid capacity is saturated.
- For newly approved projects in the above regions, developers need to bear curtailment risk or add storage.
- Kansai region has room to accept solar , but grid capacity in Tokyo and Chubu areas approach saturation.
- No major impact in our pipeline: In Kyushu we have 95 MW, only one 2 MW project is affected. In Tohoku, around 124 MW can potentially be exposed to risk of unlimited curtailment.
- <sup>+</sup> The current FIT stands at ¥29 per kWh, which is equivalent to ~\$0.24 per kWh, and remains the highest in the world.
- TEPCO announced that they are increasing grid capacity in Fukushima; 5 nuclear power plants to be demolished (which can free-up grid capacity)./

#### **Canadian Solar Position**



- Weighted average FIT for the entire pipeline ¥36.2/kWh
- ~90 MW at NTP/RTB

1. Actual results may differ materially from current expectations. The forecasted COD schedule is subject to change without notice



# The Utility Scale Project Opportunity in China

#### **Market Environment**

- The current FIT ranges from at RMB0.90 to RMB1.0 per kWh, which is equivalent to ~\$0.15 per kWh.
- The government has set targets for solar PV installations to reach a cumulative total of 70 GW by 2017, and 100 GW by 2020
- Cumulative installations reached ~35GW in March 2015, implying ~65GW has yet to be installed to reach the 2020 target
- There is a possibility China will increase solar installation targets when the next
   5 year plan is published



Our Late-Stage Pipeline: **340MW** 

#### **Canadian Solar Position**

- Canadian Solar has approximately 85 MW connected to the grid in China and generating electricity
- Canadian solar expects to connect 320 MW in 2015
- We have approximately 65 MW in construction in China today, with the balance in late stages of permitting

#### **Challenges**

- FIT payment delays of up to 2 years
- High curtailment in the west part of the country

1. One 15MW project is partially connected, and one 5MW Golden Sun project is pending grid-connection.



# The Utility-Scale Project Opportunity in the UK



#### Market Environment

- The UK government introduced the ROC in 2002, FiT in 2010 and CfD in 2014.
- The current ROC ranges from at £0.113 to £0.120 per kWh, which is equivalent to ~\$0.177 per kWh. Current FIT ranges from at £0.114 to £0.118 per kWh (~\$0.176 per kWh).
- The government has set targets for solar PV installations to reach a cumulative total of 20GW by 2020. <sup>(1)</sup>
- Cumulative installations reached 5.7GW in March 2015 <sup>(2)</sup>, implying a demand of ~3.3GW range per year to reach the 2020 target.
- Overall, Solar PV capacity at the end of 2014 stood at 5.1GW, an increase of 79% compared to 2013 year end. <sup>(3)</sup>
- Deutsche Bank estimates \$1.71 per watt to build utility scale plant by 2017. Currently \$2.00. <sup>(4)</sup>



Our Late-Stage Pipeline: 114.9MW

#### **Canadian Solar Position**

- Canadian Solar has 40.2 MW connected to the grid in the UK and generating electricity.
- Canadian Solar will connect to the grid in Q2 2015 6.16 MW and is expecting to connect additionally 46.5 MW in Q3 2015 and 62.2 MW in Q4 2015.
- In addition to the 40.2MW connected in Q1, Canadian Solar expects to connect a total of 114.86MW by 2015 close.

#### **Challenges**

- ROC program for large utility projects (>5MW) no longer in existence.
- CfD program for large utility projects challenging because of the low strike price. (Low Project IRR)
- UK new government policy actually unpredictable.

(4) Source: Deutsche Bank



<sup>(1)</sup> https://www.gov.uk/government/uploads/system/uploads/attachment\_data/file/255182/UK\_Renewable\_Energy\_Roadmap - 5\_November - FINAL\_DOCUMENT\_FOR\_PUBLICATIO\_\_\_port

<sup>(2) &</sup>lt;u>https://www.gov.uk/government/statistics/solar-photovoltaics-deployment</u>

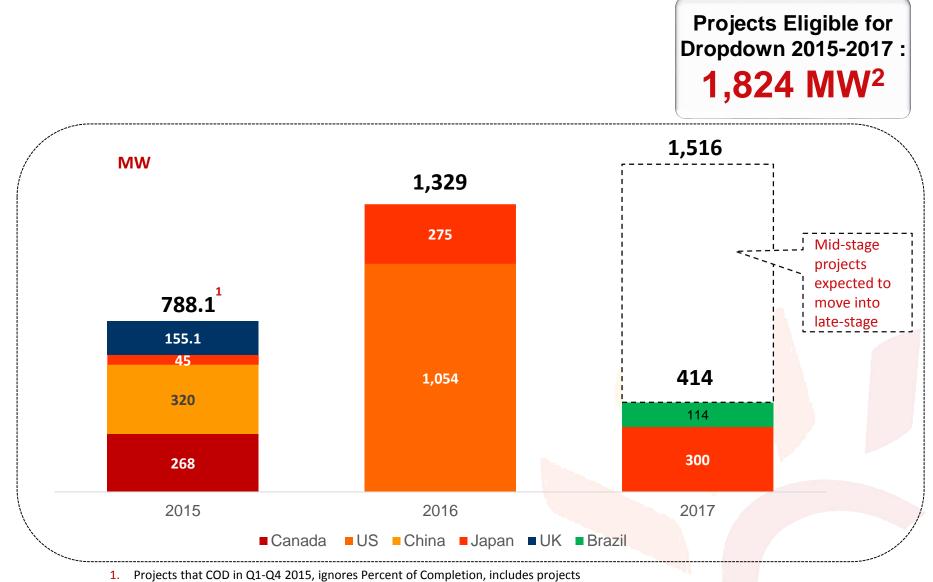
<sup>(3)</sup> https://www.gov.uk/government/statistics/solar-photovoltaics-deployment

### **Selected Latin America Opportunities**

| Brazil | <ul> <li>26% of total LATAM market by 2019</li> <li>Remarkable irradiation values</li> <li>Two tenders are scheduled for 2015 and regional tender is expected</li> <li>Challenges: Limited PPA prices, cumbersome tax system, grid quality concerns, local content requirement, currency risk</li> </ul> |
|--------|--|
| Mexico | <ul> <li>Over 14% of total LATAM market by 2019</li> <li>Outstanding irradiation values</li> <li>Structure reforms may bring a positive impact</li> <li>Challenges – Mexico: Grid quality concerns, New "Energy Reform" causing delays, legal framework under development</li> </ul>                     |



#### **Canadian Solar Late-Stage Project COD schedule**



- that we have agreed to sell to third parties
- 2. Excludes mid-stage projects that will move into late-stage





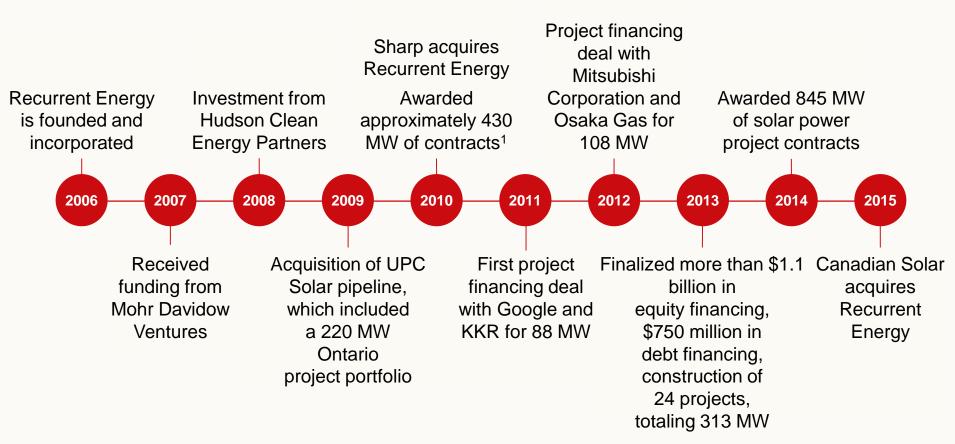
A subsidiary of Canadian Solar

Leading Solar Project Developer Transforming Our World To Sustainably Meet Its Energy Needs With Clean Electricity

4.0

# **Recurrent Energy History**





<sup>1</sup> Contracts include Power Purchase Agreements ("PPAs"), Interconnection Agreements ("IAs"), land purchase agreements, Module Supply Agreements ("MSAs"), Engineering Procurement and Construction ("EPC") agreements, Operation and Maintenance ("O&M") agreements, project debt and equity agreements and Management Service agreements ("MASAs")



#### **Capabilities – An Integrated Team Approach**



#### **In-House Core Competencies**

| Policy   | Development<br><sup>8</sup> Origination   | Finance  | EPC  | O&M, Asset   |
|--|---|--|--|--|
| <ul> <li>Advocates with political officials</li> <li>Identifies policy driven market opportunities and risk</li> </ul> | <ul> <li>&amp; Origination</li> <li>Site Acquisitions</li> <li>Permitting</li> <li>Entitlements</li> <li>interconnection</li> <li>M&amp;A</li> <li>Power Marketing<br/>(PPAs and<br/>structured)</li> </ul> | <ul> <li>Debt</li> <li>Equity</li> <li>Tax Equity</li> <li>Credit/LCs</li> <li>Corporate</li> <li>Mezzanine</li> </ul> | <ul> <li>Directly manages contractors, throughout development and construction process</li> <li>Procures equipment directly</li> </ul> | <ul> <li>Management</li> <li>Works with 3<sup>rd</sup> party providers</li> <li>Directly manages operating portfolio</li> <li>Currently manages 312 MWp of projects</li> </ul> |



### Leading Off-takers, Counterparties & Partners







59 projects totaling more than 680MWp developed and/or sold

More than **\$4B** in project finance secured to date

More than **1.5 GWp** of contracts won



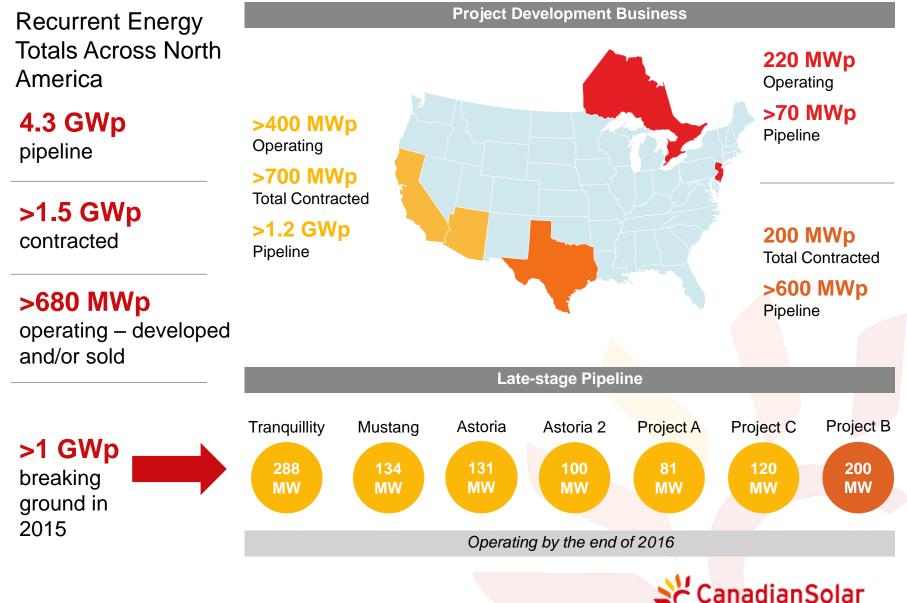






# **Market Leader Across North America**





Project C | 120 MWp Rosamond, CA Project B | 200 MWp • West Texas

# RE Mustang | 134 MWp Lemoore, CA

Recurrent Energy's **1.0 GW** late-stage pipeline is one of the largest solar project portfolios scheduled to be built by the end of 2016

#### Project A | 81 MWp California City, CA



RE Astoria 1 and 2 | 231 MWp Rosamond, CA

Images are artist renderings of the solar projects



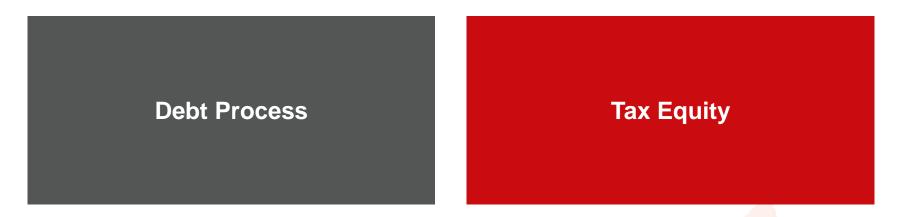
| Tax<br>Equity     | Monetizes the ITC and Modified Accelerated Cost Recovery System (MACRS) depreciation, which can not be efficiently used by developers |
|-------------------|---|
| Debt              | Robust market of banks, institutions and public bonds;<br>30-45 active lenders  |
| Sponsor<br>Equity | Contributed to project by the developer   |



#### Late-Stage Pipeline Financing Update



# Financings for six of the seven projects in the late-stage portfolio are in process







RECURRENT ENERGY A subsidiary of Canadian Solar

# Continued growth for Solar is expected, despite 10% ITC, in TX and CA in 2018-2020.



- Long-term growth driven by California carbon reduction policies and consumer interest
- Near-term procurement driven by satisfying remaining current RPS and municipal demand
- Long-term growth driven by load growth and coal retirements
- Near-term procurement driven by an increase in customer and municipal demand
- Storage-friendly policies in 2013-14 created near-term
- Will leverage experience in PV market to expand into storage and other complementary technologies

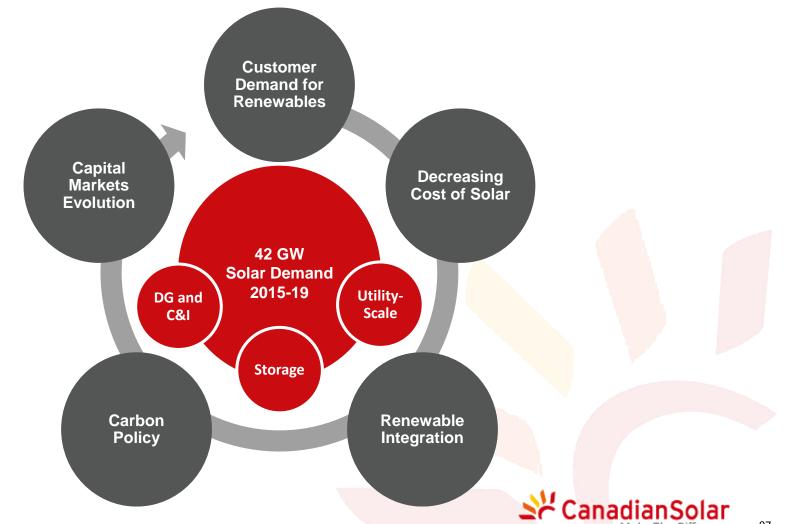
procurement demand



### **Transformation Drives Market Opportunity**

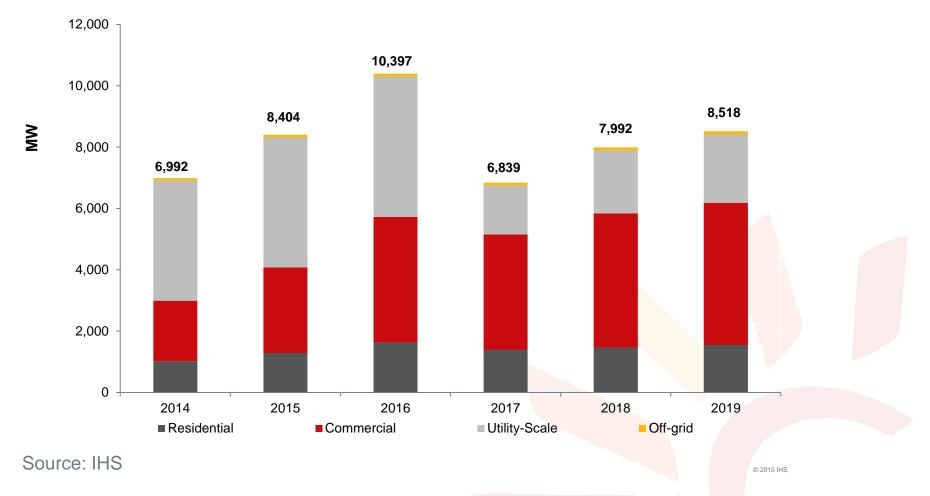


Macro Customer, Policy, and Cost Trends will drive clean energy transformation and demand in the U.S.









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**Strategy Overview** 

**Module Business** 

Lunch Break

**Energy Business** 

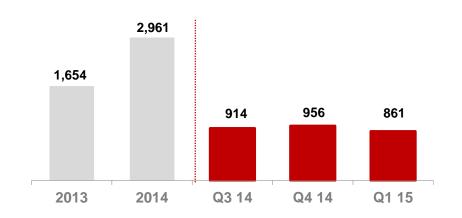
YieldCo Opportunity and Guidance

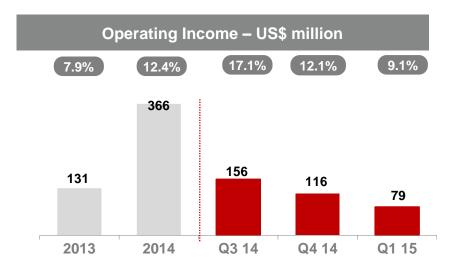
**Closing Remarks** 

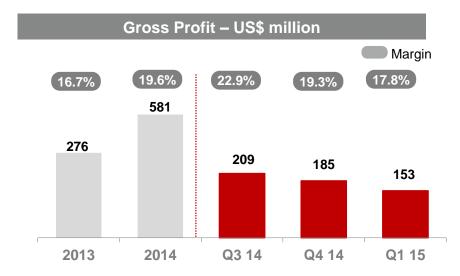


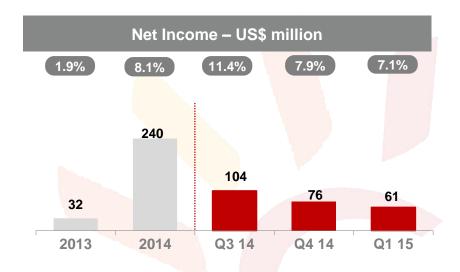
#### **Income Statement Summary**

**Revenue – US\$ million** 



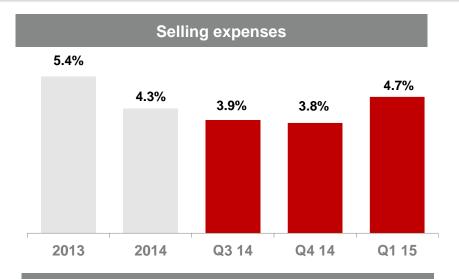






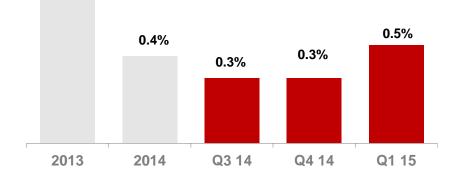
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### **Operating Expenses as % of Net Revenue**



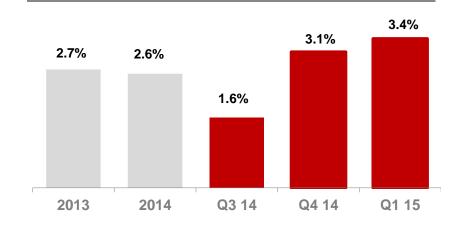
**Research & development expenses** 

0.7%

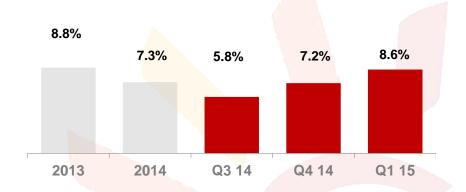


Source: Company filings Note: Percentages are of the total net revenue in the corresponding period.

**General & administrative expenses** 

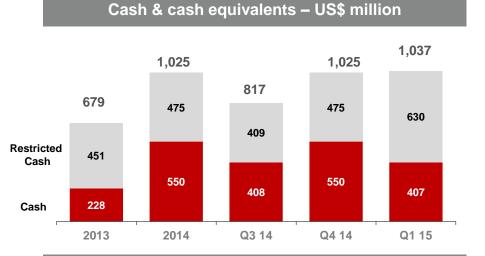


**Total operating expenses** 

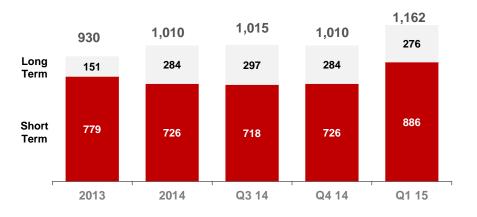


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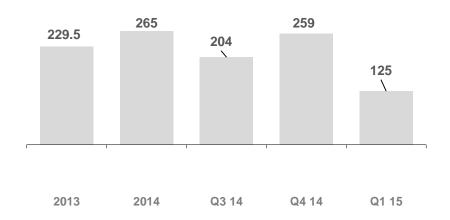
#### **Selected Balance Sheet & Cash Flow Items**



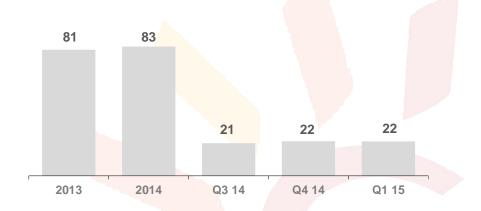
Total debt – US\$ million



Cash flow from operations – US\$ million(1)



Depreciation & amortization – US\$ million



Source: Company filings Note: (1) Working capital calculated as total current assets less total current liabilities (2) Including US\$150 million in aggregate principal amount of 4.25% convertible senior notes due 2019

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#### Guidance

|                     | Q1 2015                  | Q2 2015                  | FY2014    | FY2015                  | ΥοΥ Δ%              |
|---------------------|--------------------------|--------------------------|-----------|-------------------------|---------------------|
| Module<br>shipments | 1,000 MW –<br>1,030 MW   | 950 MW –<br>1,000 MW     | 3.1 GW    | 4.0 GW – 4.3 GW         | +33.1%              |
| Revenue             | \$ 725 m to<br>\$ 775 m  | \$ 570 m to<br>\$ 620 m  | \$2.96 bn | \$2.8 bn to<br>\$3.0 bn | Flat <sup>(2)</sup> |
| Gross<br>margin     | 16% – 18% <sup>(1)</sup> | 13% – 15% <sup>(1)</sup> | 19.6%     | NA                      | NA                  |

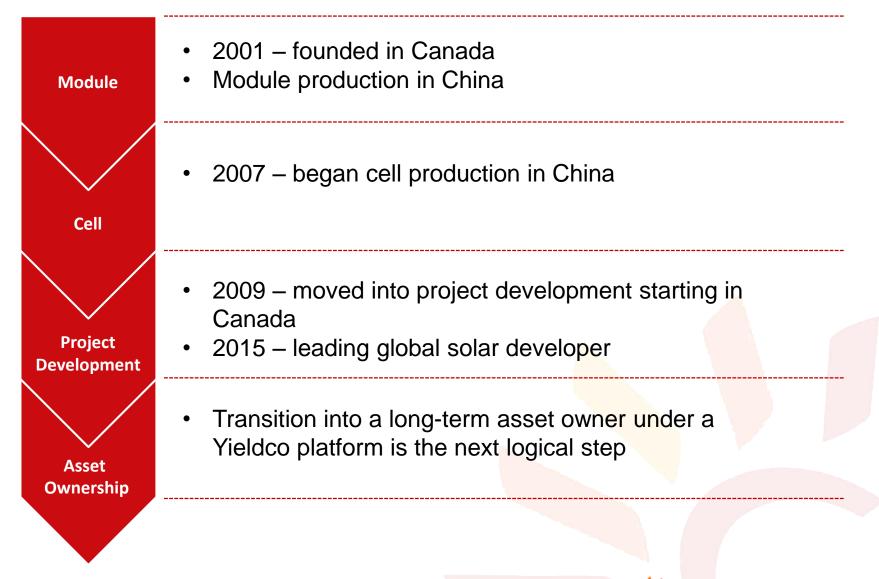
1-Includes module business and project business

2-Absent change in energy business model from build to sell, to build and operate, revenue for

2015 would be higher by over \$1.0 billion.



#### **Evolution of our Business**





## Why Launch a Yieldco?

#### **Build-to-Sell**

- Trade long term cash flow for shorter term profit
- → Recycles equity faster
- Higher revenue and EPS under GAAP

#### <u>Yieldco</u>

- Cash from sale of projects to Yieldco plus recurring cash flow from dividends and IDRs drives greater retained value
- Look-through value of Energy business enhanced by Yieldco
- Capture more total value for shareholders
- ✓ Competitive cost of capital

We do not control many parts of the timing of a potential Yield Co launch, especially regulatory reviews, project development and construction including permitting.



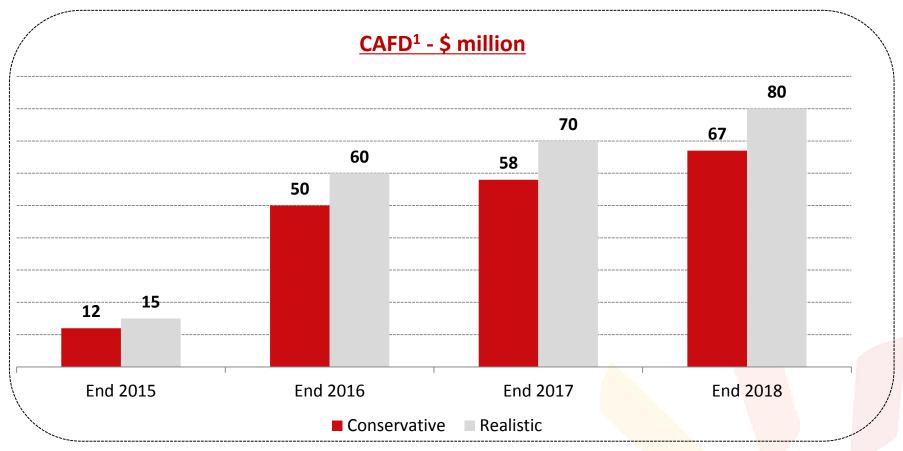
### **Effect of Change in Business Model – Build to Hold**



- Projects that would have been sold are now being kept, which results in a reduction of an estimated \$1 Billion in revenue in 2015
- Because we are not selling projects at NTP cash burden to build the projects increases:
  - > No deposits, or milestone payments
- We are responsible for all financing, e.g., tax equity, construction loans
- Projects are now fixed assets, instead of current assets
- Depending on timing of Yieldco launch and other opportunities may require additional capital



# **Cash Available For Distribution (CAFD) : Preliminary Estimates**



- > These CAFD estimates are internal modeling numbers and represent the run rate at end of each year.
- Assume only late-stage projects from OECD+ countries are included USA, Japan, UK and Canada
- Assumes a more conservative COD schedule than planned to allow for risk
- > Does not include project acquisitions or partnerships under consideration that are potentially accretive
- > May not be the actual numbers used in any Yieldco offering should one be launched.

1. Cash available for distribution after assumed project level financing and tax equity





# THANK YOU!