SolarCity Corp

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Duke Investment Club
Session Agenda

I. Investment Thesis
II. Industry Overview
III. Company Analysis
IV. Valuation
V. Appendix
Investment Thesis
SolarCity (NASDAQ: SCTY)

With its recent acquisition of advanced solar manufacturer Silevo and launch of the MyPower program, SolarCity has transformed itself into a vertically integrated solar energy company, which is poised to capture even greater market share and solidify itself as a leader in the solar industry.

- Silevo acquisition provides higher efficiency and lower manufacturing costs
- MyPower program triggers soaring demand for solar energy and panels at low cost
- Low market penetration leaves significant room for future growth
- Long term energy contracts provide steady, high-quality revenue streams

**CATALYSTS**

**RISKS**

- Income Tax Credit to be reduced from 30% to 10% in 2017
- Cost competitiveness relies on economies of scale
- Negative EBITDA across the solar industry

**Recommendation: BUY**

Current Price: $51.51  
Target: $74.31
Industry Overview
Solar Electricity 101

1. Solar panels turn photons from the sun into DC electricity.

2. The inverter turns DC current into alternating current (AC) for use in your home.

3. Any excess power can be sold back onto the grid.
Solar Panels 101 – Terminology

EQUATIONS

Energy = Power * Time

Joules (J) = Watt (w) * second (s)

KWh = 1000W * 3600s = 3,600,000 J

MEASURE OF ELECTRICITY COST

$/KWh

MEASURE OF SOLAR PANEL COST

$/W
Solar Panels 101 – Efficiency

Photovoltaic Device: Efficiency/Cost

Source: The Lewis Group, Company reports, DOE, Green Econometrics research
“Cost Curve”: Solar Electricity vs. National Grid

**SOLAR ELECTRICITY**
- Solar Electricity Free
- One upfront cost: manufacturing cost and installation cost
- “Mortgage”
- 20 yrs, $100/month....

**NATIONAL GRID**
- Natural Gas is the primary source of electricity in US
- Cost ($/kwh) increases 3-4% year over year
Industry Overview

MACROECONOMIC CONDITIONS

- Cumulative installed solar capacity: 15,900 MW (Q2 2014)
  - Average nuclear power plant: 900 MW
  - 53% of all new electric capacity installed has come from solar
- Most important metric to measure panel price: $/W
  - US: around $1/W
  - China: around $0.5/W
- US government imposes high tariff on solar panels exported from China
  - Obama’s Green Dilemma

VALUE CHAIN SOLAR INDUSTRY

- Only few companies are “vertically integrated”
- New value chain participants: Solar Storage
  - Ability to provide cost effective storage
  - Requires new technologies

Sources: Bloomberg New Energy Finance
Major Players

**Real Goods Solar**
- Provide multiple renewable Energy options
- Focus on design and engineering of panels
- Market Share >4%

**Verengo Solar**
- Residential solar specialist
- Market Share 20%

**Vivint Solar**
- Design, Installation, Monitoring
- Only limited financing options compared to SCTY
- Market Share >10%

**REC Solar**
- Focus on photovoltaic
- Design and installation for commercial business
- Market Share >5%
Company Analysis
Company Overview

**BUSINESS MODEL**
- Originally: Solar Installer
- Is now vertically integrated
- Customers in 15 states
- Highest market share in solar industry
- Rapid growth in a quickly expanding industry

**PERFORMANCE**

**ENERGY PRODUCTS**
- SolarLease
  - Lease solar panel system
  - Pay by the month
  - No upfront payment
- Power Purchase Agreement (PPA)
  - Lease solar panel system
  - Pay by kWh
  - Purchase system any time after 5 years
- MyPower – loan program
  - Does not charge customers an upfront cost
  - Customer owns hardware on the roof
  - Term of 20 years with interest rate set as low as 4.5%, includes 30-year warranty

**MARKET SHARE**

Source: GTM Research
SolarCity 1.0 – Asset-light, Rapid Business Expansion

**ASSET-LIGHT BUSINESS MODEL**

- Panel Installer founded in 2006
  - Panels manufactured by other major solar manufacturing companies
- Unprecedented leasing option with **no upfront cost**
  - Very successful and innovative; flexible cost case

**CO-FOUNDERS: TWO BROTHERS AND A COUSIN**

**Lyndon Rive**
- CEO
- Phenomenal corporate leadership
- From 2 to 6,000 employees

**Elon Musk**
- Chairman of SolarCity
- Vision: sustainable energy and interplanetary exploration

**Peter Rive**
- CTO
- Climate change concerns
- Very technologically capable
SolarCity 2.0 – Acquisition-Driven Cost Minimization

Complete Vertical Integration

6/17/2014
$200 mn in stock & cash
- Catalyst #1

8/13/2013
$120 mn in stock & cash
- Industry-leading marketing and sales organization

- Simplified solar array installations

10/09/2013
$158 mn in stock
- Leading provider of PV mounting systems in US

- Will acquire anything that lowers Cost per Watt

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Catalyst 1: SolarCity Acquires Silevo

On June 16th, 2014, Silevo entered into a definitive agreement to be acquired by Solar City

Click here for more information
Introducing the TRIEX Tunneling Junction Cell

HIGH EFFICIENCY, LOW COST
Why Acquire Silevo?

Low manufacturing cost
- Copper electrode metallization
- Simple 6 core production steps

Higher Efficiency at High Temperature
- Crystalline-amorphous hybrid nature
- Low temperature coefficient
- 77°F = 25°C

Proven Scalability
- 26.4% when leveraging cells’ bifacial nature

High Efficiency
- Copper electrode metallization
- Simple 6 core production steps

Relationship with state of NY enables Giga-factory
- Originally initiated by Silevo
- 1-gigawatt factory within next 2 yrs
- Aimed at meeting soaring demand

Experienced Management to Join SolarCity
- Brings decades of solar engineering experience
- CEO Zheng Xu, CTO Jianming Fu, VP Product Engineering Ben Heng, and EVP Christopher Beitel
Technology Profile

**SOLAR MODULES**

- Photovoltaic cells that convert sunlight into direct current electricity
- Unique TRIEX tunneling junction cell design results in high efficiency (24%) and low cost

**SOFTWARE**

- System design automation
- Energy production forecasting
- Utility rate tariff database
- Energy usage evaluations
- Logistics and resource management
- Customer account management

**MOUNTING HARDWARE**

- Faster installation
- Lower cycle time
- Superior aesthetics
- ZepSolar

**GRID CONTROL SYSTEMS**

- Real time energy monitoring
- Fleet control of solar systems to manage voltage, power quality, and remote diagnostics
- Peak load and solar intermittency management
Market Penetration Still Low

- One million customer target by mid-2018 implies 70% compounded annual growth from end of 2013
- Historical compounded annual growth in cumulative customers of 102% since 2009

<table>
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<th>Range of Potential Customers</th>
<th>250,000</th>
<th>500,000</th>
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<td>/Total Single Family Housing Units in 15 Markets</td>
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<td>40,521,461</td>
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<td>=Implied Single-Family Market Penetration</td>
<td>0.6%</td>
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<td>Potential Cumulative Residential MW Deployed</td>
<td>1500 MW</td>
<td>3000 MW</td>
<td>6000 MW</td>
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- Approximately 200,000 new single-family homes built per year in 15 markets over last 5 years
- Outpacing annual new solar installations
- Market penetration poised to remain low and provide further opportunity
Contracted Customer Payments Remaining at $3.3B and Growing

- Estimated nominal contract payments remaining of $3.3 billion offer 20 years of revenue visibility
- Cumulative customers: 141,034
- Cumulative energy contracts booked: 128,933
Market Share Leadership Growth

- Market share in 2013 was larger than next fifteen competitors combined
Revenue Stream

- High margin revenue stream from long term contracts
- Each customer provides visible cash flow stream, similar to household utility bill payment

### Cumulative Net Loss Rate

<table>
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<th>Year</th>
<th>Cumulative Net Loss Rate</th>
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<td>Year 1</td>
<td>0.0%</td>
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<tr>
<td>Year 2</td>
<td>0.5%</td>
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<td>Year 3</td>
<td>1.0%</td>
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<tr>
<td>Year 4</td>
<td>1.5%</td>
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### High Quality Energy Payments

- Consistent, predictable annuity cash flow stream
- Long-term contracts of at least 20 years
- High FICO scores (average is over 750)

### Predictable Rate of Return

- System production and degradation consistently outpacing forecasts
- Low ongoing maintenance and capital costs
- Higher utility rates increase customer contract value and bolster renewals
Risks and Mitigations

**MYPOWER AND MANUFACTURING**
- New Gigafactory in Buffalo, NY to meet soaring demand
- Will there be soaring demand for solar panels?
- Uncertainty about MyPower popularity
- Income Tax Credit down to 10% from 30% in 2017

**COST DEVELOPMENT**
- Although technology advances, production costs remain significantly higher than China’s
- Cost competitiveness relies on economies of scale

**VALUATION RISK**
- CEO’s Valuation method
  - Uses “retained value” method
  - Aggressive assumptions
    - E.g. default risk almost 0
- CEO just sold 100,000 SCTY shares
  - Our main concern

**FINANCIALS**
- Negative EBITDA
  - Waiting for crossing of the cost curve

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<table>
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<th>Years</th>
<th>Millions</th>
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<td>2009</td>
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<td>2010</td>
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<td>2011</td>
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<td>2012</td>
<td>-150</td>
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<td>2013</td>
<td>-100</td>
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<td>2014</td>
<td>-50</td>
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Retained Value

- Neither DCF nor comparables can adequately determine a valuation
- Retained value by discounting total value of contracts per year, before discounting each of those values again to get a present value of the retained value

Residential Lifetime Customer Present Value

- Contracted customer payments
  - Operating lease revenue over life of contract
  - Price of energy contract
  - Annual solar production
  - Net of annual operations and maintenance expenses
- Renewal: assumes 90% of contract price at time of renewal
- ITC and depreciation
  - Investment tax credit at 30%

Upfront Investment cost (~$3.00/W)

- G&A: fixed overhead expenses covering payroll, facilities
- Sales: variable sales commissions and marketing and lead generation costs
- Installation cost: capitalized variable costs to install leased solar systems
## SolarCity - Retained Value Projection
**Fiscal Year Ends December 31, 2014**

### Assumptions

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<td><strong>Revenue Per Watt</strong></td>
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<td><strong>Cost per Watt</strong></td>
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<td><strong>Lease/PPA</strong></td>
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<td>New MW Deployed Under Lease</td>
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<td>262</td>
<td>509</td>
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<td>Retained Value per Watt</td>
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<td><strong>Loan (MyPower)</strong></td>
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<td>New MW Deployed Under Loan</td>
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<td>New MW Booked Under Contract</td>
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<td>11</td>
<td>278</td>
<td>260</td>
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<td>Retained Value per Watt</td>
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<td><strong>Discounted Retained Value</strong></td>
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<td><strong>WACC Calculation</strong></td>
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<td>Beta</td>
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<td>Market Risk Premium</td>
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<td>Risk-Free Rate</td>
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<td>Cost of Equity</td>
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<td>Tax Rate</td>
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<td>After-Tax Cost of Debt</td>
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<td><strong>WACC</strong></td>
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<td><strong>Sum of Parts Valuation</strong></td>
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<td>DCF of Project CF</td>
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<td>Retained Value at end of 2016</td>
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<td>Retained Value Discounted to PV</td>
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<td>Terminal Value based on 2017 Value Creation</td>
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<td>TV based on 2017 Value Creation</td>
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<td><strong>Net Cash</strong></td>
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<td><strong>Price Per Share</strong></td>
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<td><strong>Terminal Multiple</strong></td>
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<td>$74.31</td>
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<td><strong>Terminals Multiple</strong></td>
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<td>$78.14</td>
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<td>$88.84</td>
<td>$94.93</td>
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Appendix I: Notes

- Planning to create a Silicon Valley research facility and pilot plant
- Chinese supply at Low $0.50 per watt
- Our cost advantages compared to overseas come from installation labor, settings, wiring due to few panels to be installed
- Panel CAPEX at $0.35 – 0.40 per watt
- Buffalo NY area, Niagara Falls, hydropower – to lower production costs
- Use partnerships to fund the CAPEX
Appendix II: Performance

1 YEAR

30 45 60 75 90 105
0 15 30 45 60 75 90 105
10/17/13 12/17/13 2/17/14 4/17/14 6/17/14 8/17/14 10/17/14

3 YEAR

105 90 75 60 45 30 15 0
12/14/12 2/14/13 4/14/13 6/14/13 8/14/13 10/14/13 12/14/13 2/14/14 4/14/14 6/14/14 8/14/14 10/14/14
Appendix III. Partnership with Tesla

Revenue from Super-Chargers Solar Panels

Home Energy Storage Battery Packs