Achieving Lower LCOE for Equivalent Capex:
Pairing Premium Technology with Streamlined EPC/O&M Strategies

Andrew Gilhooly, Business Development Manager, Large Scale Solar Conference, Sydney, April 2017
SunPower

Over 30 Years of Experience

- Founded in 1985, Silicon Valley
- Publicly traded NASDAQ (SPWR)
- Strategic Investment by Total – 10th largest global energy company
- Innovation platform: >750 patents
- $2.7B revenue (non GAAP) in 2016
- Global footprint, homes to power plants, vertically integrated
- >7,000 employees
- >7GW solar deployed, >3GW Power Plants deployed
- >1.8GW Power Plants under O&M Control

1 Fortune 500, March 2016
SunPower® Oasis™ Power Plant

Over 3 GW of Oasis™ systems operating, in construction or under contract

The world’s first modular, pre-engineered power plant solution

Oasis 2.0MW Power Block

Tracker

Inverter

eBOS

TMAC

SCADA
Next Generation SunPower® Oasis™ Power Plant

- 15 years worth of closed loop learning

- Form Factor maximises steelwork amortization
  - provides significantly lower onsite labour

- Lower onsite electrical labour
  - Factory Prefabricated DC Harnesses
  - No combiner boxes, no cable tray, no trenching

- Enhanced Land Utilisation
  - Unganged rows, inline motors, 10deg slope tol

- Maximised Yield
  - Innovative Performance Series module with longest warranty
  - Eliminates problematic backtracking

- Lowest O&M Costs
  - Zero batteries, robotic cleaning, easy access

- Compressed Feasibility Design Optimisation
  - Drone scanning & rapid BOM & yield sims
Combined Oasis™ Design Advantage (GEO™ + TRACKER DESIGN)

Every 4 hectares of usable land enables another 3MWp of power

<table>
<thead>
<tr>
<th></th>
<th>CONVENTIONAL TRACKER</th>
<th>SUNPOWER® OASIS™</th>
<th>SUNPOWER® OASIS™</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>315W Module, 50.2 MWp</td>
<td>P-Series, 64.7 MWp</td>
<td>P-Series, 81.0 MWp</td>
</tr>
<tr>
<td>150 HECTARES</td>
<td></td>
<td></td>
<td>174 HECTARES</td>
</tr>
<tr>
<td></td>
<td>50MW Competitor</td>
<td>65MW Oasis</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>+16% more land</td>
</tr>
<tr>
<td>Year 1 Production</td>
<td>91,613 MWh</td>
<td>119,667 MWh</td>
<td>149,908 MWh</td>
</tr>
<tr>
<td>25 Year Production</td>
<td>2,107,876 MWh</td>
<td>2,818,868 MWh</td>
<td>3,531,235 MWh</td>
</tr>
</tbody>
</table>

* Layout optimization in the SunPower GEO™ platform
† Assumes 20 module string, 18 row tracker with 2 modules per row with 50 degree tilt
‡ Polysilicon based generic module with 0.7% annual degradation; P-Series modules 0.5% annual degradation; E-Series modules 0.25% annual degradation
§ Production estimate based on SunPower PVSim for Eastern Oregon

Enhanced slope tolerance unlocks more land

+34% energy
+67% energy
Recent Australian Examples

**Clare Solar Farm 130MW DC**
- achieved 156MW DC (+20%)
- Unlocked dual agricultural land use

**QLD Site 2MW DC**
- achieved 2MW DC compared to <1MW with other un-ganged tracker

High level mechanical and electrical BOM
Leading power plant products based on 3GW+ of development, finance, EPC and O&M experience
Closed loop learning, continuous innovation and cost reduction fed back into product development
Highly bankable power plant solution – industry leading warranties, utmost energy assurance, backed by Total

Full Vertical Integration, Single Point Accountability
Oasis™ Components Offering

PV modules

Tracker

Integrated DC harness

Station Hub

AC Station

Inverter & MVT

DC cable management

“Tracker +”
Reliability/Bankability

Product Sources of Power Deficits
Solar Power Plants 2014 – Q1 2015

Causes of Defects
Solar Power Plants 2014-Q2015

- Product Defects: 9%
- Installation Faults: 55%
- Documentation & Planning: 25%

SunPower can address 96% of product failure causes

SunPower can address the Top 3 causes of plant defects

Construction
Construction Efficiencies

- Lower part count – ~60% fewer piles, lower tonnage
- DFA/poka yoke jigs for maximum productivity
- Less pile rework
- Less land clearing/grubbing/fill
- No AC Motors, control cabling or Batteries
- Plug and play prefabricated BOS
Shorter site mobilization = reduced project management costs

Site mobilization timeline can be reduced by 15% to 30% with Oasis™

- Lower components count + Lower man-hr requirements = shorter site mobilization
- A 33 MWp project could take 6 month with a generic tracker but would take 4-5 months with Oasis™

**Diagram:**

- **Generic Tracker:**
  - Civil Works
  - Power Block Assembly
  - Commissioning
  - 6 months

- **Oasis™:**
  - Civil Works
  - Power Block Assembly
  - Commissioning
  - 4-5 months

- Reduced / no grading
- Reduced trenching
- Reduced roads
- ~60% fewer piles
- Streamlined DC installation
- “Snap-on” module attached
- Self-commissioning trackers
- Built-in string monitoring
Use 200mL of water per panel cleaned

Higher labor productivity with robots lowers cost

2 people, 4 robots clean 5MWdc in 10hrs

75% savings compared to competitive solutions1

up to 60% lower cost than manual cleaners in developed markets

10x faster, scalable2

Easy access, unlock dual land functionality

Secondary revenue streams

1) Note: Based on experience with robotic cleaning at actual SunPower® sites, compared to data tracked by subcontracted manual cleaners utilized at a SunPower® project.
2) Note: Represents cleaners using manual brushes on thin-film array, as referenced in presentation by competitive module manufacturer.
Optimised Yield
SUNPOWER® Performance Series Panels

Increased Active Area

Robust Connection

Low Resistance

Shingled cells provide flexible and redundant electrical connections

SunPower® P Series 17% efficiency 350W

25 year full wrap warranty
Parallel Circuit Delivers Better Performance

SunPower® P-Series parallel circuit architecture → better current redistribution under partial shading

POWER IN

POWER OUT

POWER IN

POWER OUT

2.8% more kWh/kWp

Performance Comparison for West Texas Site

<table>
<thead>
<tr>
<th>Yield Category</th>
<th>Unlinked 2m Tracker</th>
<th>Oasis 3P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline Yield</td>
<td>2,100</td>
<td>2,100</td>
</tr>
<tr>
<td>P-Series Module Yield Improvement</td>
<td>+ 0.8%</td>
<td></td>
</tr>
<tr>
<td>GCR - Yield Improvement</td>
<td>+ 1.0%</td>
<td></td>
</tr>
<tr>
<td>Tracker - Yield Improvement</td>
<td>+ 0.5%</td>
<td></td>
</tr>
<tr>
<td>Soiling Improvement</td>
<td>+ 0.3%</td>
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<tr>
<td>Total Year 1 Yield Improvement</td>
<td>2.8%</td>
<td></td>
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<tr>
<td>Final Yield</td>
<td>2,100</td>
<td>2,159</td>
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</table>
Quantifying the Value
Walking the Value – Recent 300MWp Project

SunPower® Oasis™ - Delivering More Value
## Walking the Value – Recent 300MWp Project

### SunPower® Oasis™ - Delivering More Value

<table>
<thead>
<tr>
<th>All in USD</th>
<th>SunPower® Oasis™ - Delivering More Value</th>
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<tbody>
<tr>
<td></td>
<td>Quantified savings:</td>
</tr>
<tr>
<td></td>
<td>• ~60% fewer piles and steelwork/MW</td>
</tr>
<tr>
<td></td>
<td>• Enhanced benefit for unsuitable/rocky soil</td>
</tr>
<tr>
<td></td>
<td>• Zero dampers, batteries and combiner boxes</td>
</tr>
<tr>
<td></td>
<td>• Time saving for prefabricated DC harness (no cutting/crimping)</td>
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<td>• Higher land efficiency, less clearing, grubbing, grading per MWp</td>
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<thead>
<tr>
<th>Conventional System Price</th>
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<tr>
<td>Construction</td>
<td>$0.042</td>
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<tr>
<td>O&amp;M</td>
<td>$0.006</td>
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<tr>
<td>Financing</td>
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<td>Competitive System Price</td>
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<td>Performance</td>
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Quantified Yield Boost:
- 2.6% more kWh/kWp
  - Soil/shading, tracker accuracy, no backtracking
  - Superior degradation -0.5% vs -0.6%
- NPV Oasis AUD173M vs Competitor $168M
  - Equates to AUD0.042/MWp advantage
- Assumptions:
  - 13 year Offtake
  - $75/MWh
  - 3% escalator
  - WACC 9%
Walking the Value – Recent 300MWp Project

All in USD

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O&M Saving:
- $0.006/Wp saving on O&M PM/CM
- NPV approach over asset life
- <50% cleaning cost with Robots
- <50% mowing cost with unimpeded vehicular access
- Zero annual battery replacement
- No failures of factory fabricated DC BOS or combiner boxes

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<table>
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<td>SunPower Value Delivered</td>
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SunPower® Oasis™ - Delivering More Value

All in USD

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Walking the Value – Recent 300MWp Project

**All in USD**

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<td>Performance</td>
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<tr>
<td>O&amp;M</td>
<td></td>
</tr>
<tr>
<td>SunPower Value Delivered</td>
<td>$0.115</td>
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<tr>
<td>SunPower System Price + Value to Owner</td>
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SunPower® Oasis™

When technology is designed to work together, it works better.

### LCOE
- Oasis GEO™
- Tracker Shape
- ±60° Rotation
- 99% Aperture Efficiency
- Unlinked Tracker
- Robotic Cleaning
- P-Series shade performance

### SIMPLICITY
- Electromechanical Integration
- Fewer Parts
- Reduced Construction Risk
- Preconfigured Electrical
- No Tracker Batteries
- The ROCC
- P-Series Reliable Design

### ONE PROVEN PARTNER
- 30 Years in Solar
- 17 Yrs in Power Plants
- 3GW of Oasis
- 99% Availability
- Most Patents in Solar
- Highest R&D Investment
- Backed by Total

Oasis delivers up to 67% more energy than conventional solar

SunPower can address 96% of product failure causes

SunPower offers 1 partner with unsurpassed experience and innovation
Thank You

Let’s change the way our world is powered