TATA POWER SOLAR SYSTEMS LTD.
THE TURNAROUND STORY
Ashish Khanna
CEO & MD
“The greatest danger in times of turbulence is not the turbulence—it is to act with yesterday’s logic.”

-Peter Drucker
THE TATA BP SOLAR LEGACY

MANUFACTURING FOCUS: COST + MARGIN MODEL

1989 - 2008

1989
BP: 51%
Tata: 49%

1990
Rented Single Room Lab cum Office

1991
• Commercial production with 2 MW module capacity
• Initial rate of 9 modules/day

1995
• New manufacturing unit constructed
• Cell and Module line capacities increased to 15 and 13 MW

2007
• Cell capacity increased to 52MW, India’s largest

2009
• Cell line capacity increased to 84 MW
• Over 104* Million USD in exports revenue
• Cost + Margin Model

2012

Tata Power Solar, a wholly owned subsidiary of Tata Power

CAPTIVE GLOBAL CUSTOMER BASE OF BP SOLAR

* At 1 USD = INR 48
THE TATA BP SOLAR LEGACY

- Revenue & profitability drop due to Chinese competition and the global recession
- Global trend of giants such as GE and Siemens exiting the solar industry
- Direct customer interaction was limited due to business model and scope

**FINANCIAL RESULTS (2009-11)**

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Sales ($, mn)</th>
<th>PAT ($, mn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 09</td>
<td>228</td>
<td>12.0</td>
</tr>
<tr>
<td>FY 10</td>
<td>215</td>
<td>5.9</td>
</tr>
<tr>
<td>FY 11</td>
<td>203</td>
<td>2.9</td>
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</tbody>
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TO DOMINATE THE ENTIRE BUSINESS SPECTRUM
2012 - 2015

**Cells & Modules**
- Upgraded manufacturing capacities and technologies
- 180 MW of cell and 200 MW of module capacity
- Challenge of limited market reach – module sales fluctuation

**Solar Products**
- Expansion into solar products – Lighting, Pumps, and Solar Thermal
- Predominately subsidy driven businesses

**EPC**
- Solar EPC Market: efforts limited small scale projects of 5-10 MW
- Commences custom rooftop / ground mount systems

- Attempted to enter every segment of the solar business
- This led to mounting losses and depletion of cash reserves
FINANCIALS 2012-15

- Large mix of bought out items – issues in quality and high cost of customer service
- Uncertain off-take of modules following BP Solar exit
- Competition from Chinese products
- Business Network (Distributors and Channel Partners) issues

FINANCIAL RESULTS (2012-15)

- Revenue (INR, bn)
  - FY 12: 9.3
  - FY 13: 5.1
  - FY 14: 11.0*
  - FY 15: 8.7

- Profit After Tax (INR, mn)
  - FY 12: -186
  - FY 13: -827
  - FY 14: -1268
  - FY 15: -1143

* One-time impact of National Solar Mission outlay
A NEW STRATEGY: 2015 Onwards

- Manufacturing Technology Upgradation
- Changing Product & Service Mix and shutting down some businesses
- Utilizing EPC Strength
- Manpower Reorientation & Reskilling
- Innovation
- Business Processes and Excellence
Continuous Investment In Technology for Manufacturing Backbone

Module efficiency
- IBC-BJ: 21%
- MWT-HIT: 20%
- PERC: 19%
- BC-HIT: 18%
- TIPS: 17%
- Industry Standard: 16%

Material quality
- PERC: 14%
- MWT-PERC: 15%

Cell technology Upgrades
- 2008: 156mm Square Monocrystalline Si
- 2010: 156.74mm Square Multi
- 2016: 156.76mm Square Multi
- 2018: 156.76mm Square Black Multi

PERC: Passivated Emitter and Rear Cell
MWT: Metal Wrap Through
IBC-BJ: Interdigitated Back Contact – Back Junction
HJT: Hetero Junction Technology

Product Evolution
- Module with cut cell design upto 100W
- 60 cell module design upto 250W
- 72 cell module design upto 330W
- 72 cell module design upto 360W
- Triple black module

Adapted from Preu et al., EU-PVSEC 2009
MANUFACTURING TECHNOLOGY UPGRADATION (Contd)

Cell Manufacturing Capacity (MW)

TPSSL is the First Indian Company to have Shipped 1GW of Modules Worldwide

Module Manufacturing Capacity (MW)

Over 1 GW module shipped worldwide

YEAR 91 92 93 94 95 96 97 98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17
CHANGING PRODUCT & SERVICE MIX
and shutting down some businesses

Businesses Shut Down

Large Utility Scale Projects

Resulting Product & Service Mix

International Business

O&M Services

Solar Rooftops

Solar Water Pumps
BUILDING EPC STRENGTH

- Procurement Might
- Execution Agility
- Engineering Optimizations
FOCUS ON INNOVATION

LASER Projects

Learn • Manufacturing Defect Reduction and Productivity Improvement
Apply • EPC Project Cycle Time Reduction and Speed Up Execution
Share • Work Force Engagement
Enjoy Reflect

Drone based Rooftop System Design

Automated Cleaning- CleanBot

Dual & Single Axis Trackers
BUSINESS PROCESSES AND EXCELLENCE

Robust Business Processes

- Systematic Approach
- Integration between Processes
- Learning & Feedback
- Process Deployment

Business Excellence Focal Themes

- Culture of Collaboration
- Fast Paced People Capability Building
- Active Cost Management Through Value Engineering and Agile SCM
- Process Standardization & Simplification
- Formation of Innovation Council
THE NEW STRATEGY: 2015 Onwards

- Manufacturing Technology Upgradation
- Changing Product & Service Mix and shutting down some businesses
- Utilizing EPC Strength
- Manpower Reorientation & Reskilling
- Innovation
- Business Processes and Excellence
THE TURNAROUND

Net Sales (INR, bn) vs. PAT (INR, bn)

- FY 09: 11.5
- FY 10: 9.8
- FY 11: 9.1
- FY 12: 9.3
- FY 13: 5.0
- FY 14: 11.0
- FY 15: 8.7
- FY 16: 14.9
- FY 17: 22.6
- FY 18: 27.5

Revenue, in bn INR

FY 09: 0.6
FY 10: 0.3
FY 11: 0.1
FY 12: -0.2
FY 13: -0.8
FY 14: -1.3
FY 15: -1.1
FY 16: 0.8
FY 17: 1.0
FY 18: -1.5

PAT, in bn INR
THE TURNAROUND (Contd.)

**Net Sales (INR, bn)**

- FY 14: 11.0
- FY 15: 8.7
- FY 16: 14.9
- FY 17: 22.6
- FY 18: 27.5

**EBITDA (INR, mn)**

- FY 14: 19
- FY 15: 10
- FY 16: 799
- FY 17: 1448
- FY 18: 2350

**PAT (%)**

- FY 14: -11.5%
- FY 15: -13.1%
- FY 16: -1.8%
- FY 17: 3.4%
- FY 18: 3.7%

**Fixed Assets Turnover**

- FY 14: 4.5
- FY 15: 4.6
- FY 16: 9.6
- FY 17: 7.4
- FY 18: 16

**ROE (%)**

- FY 14: 24%
- FY 15: 24%
- FY 16: -13%
- FY 17: -106%
- FY 18: -63%
TPSSL PORTFOLIO TODAY

Utility Scale Projects
Over 2200 MW of projects commissioned or under execution

Cell & Module Manufacturing
One of India’s largest integrated cell and module manufacturing facility
- 300 MW of cell manufacturing & 400 MW of module manufacturing capacity

Water pumps
10,000 pumps installed across India
- 25,000 acres of farmland irrigated

Rooftop Projects
260 MW projects commissioned
- Solutions for industrial, commercial, institutional and residential customers

Operation & maintenance
1500 + MW O&M portfolio
- 30 + utility projects under our O&M portfolio
MARQUEE PROJECTS

ONE OF INDIA’S LARGEST SOLAR PROJECTS WITH INDIA MADE CELLS & MODULES - 100 MW NTPC, Anantapur, Andhra Pradesh

WORLD’S LARGEST ROOFTOP SYSTEM*- 12 MW at Amritsar, Punjab, India

INDIA’S LARGEST CARPORT INSTALLATION- 2.7MW, Cochin International Airport, Kerala, India

WORLD’S LARGEST ROOFTOP SYSTEM ON CRICKET STADIUM- 820 KW at Mumbai, Maharashtra, India

* On multiple roofs on a single premise
AWARDS AND RECOGNITION

SOLAR PV EPC COMPANY OF THE YEAR UTILITY SCALE AWARD
Gold Award Winner 2018

OUTSTANDING CONTRIBUTION TO INDUSTRY DEVELOPMENT
India Solar Week Leadership Awards 2018

INFRASTRUCTURE PROJECT AWARD
Dun & Bradstreet Everest Infra Awards 2017

PLATINUM AWARD FOR HEALTHY WORKPLACE
Arogya World - Healthy workplace in India Awards 2017

IMC RAMKRISHNA BAJAJ NATIONAL QUALITY AWARD
Business Excellence Manufacturing Category 2017

THE INTERNATIONAL SAFETY AWARD
The British Safety Council London 2017

PERFORMANCE EXCELLENCE AWARD, NTPC, MANDSAUR
Confederation of Indian Industry Solar Plants Category, 2018

RATED TIER-I MODULE MANUFACTURER
Bloomberg New Energy Finance 2016

EXCELLENCE IN COMMISSIONING FOR NTPC, ANANTAPUR
India Solar Week Excellence Awards 2017
Thank You!

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