

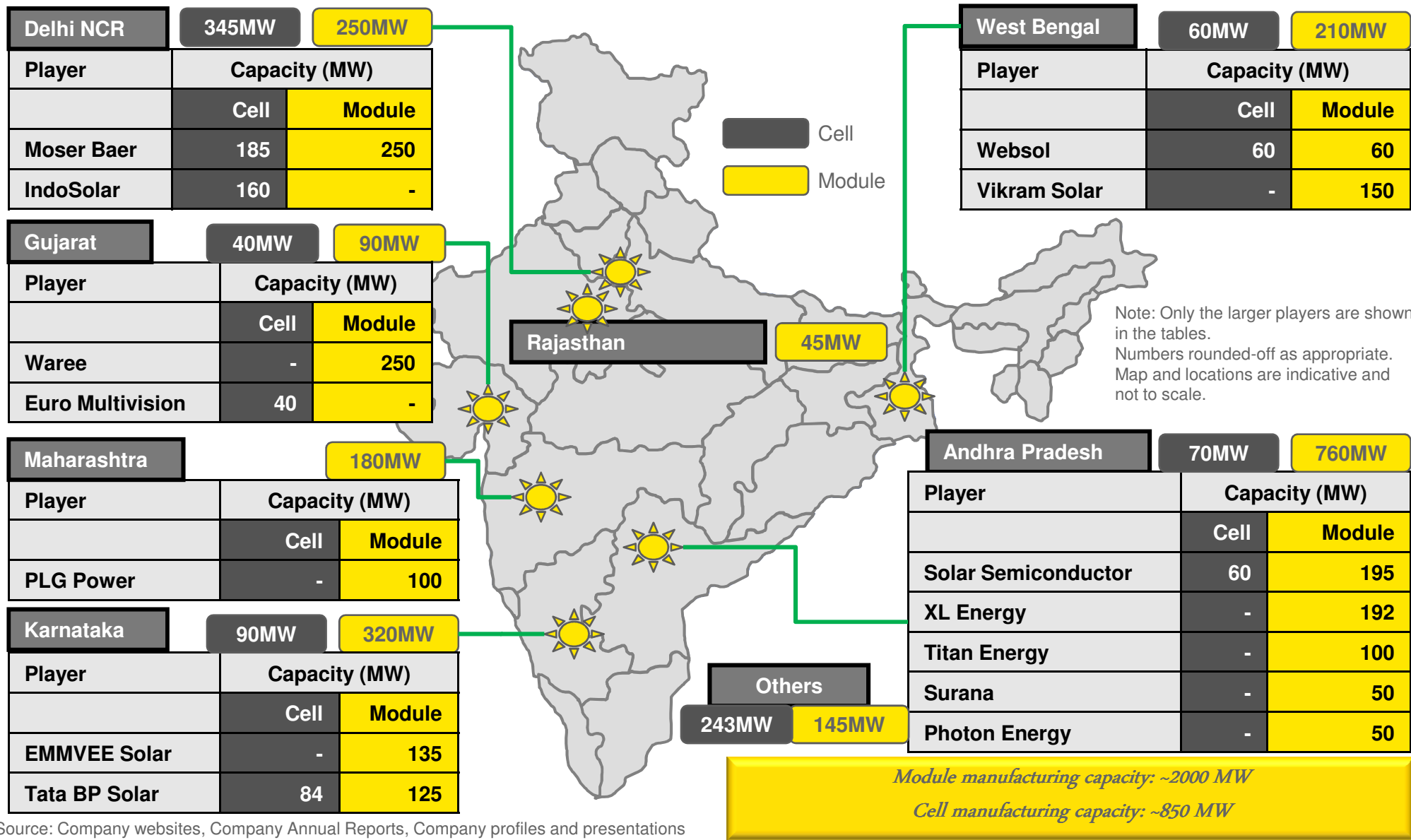
Solar manufacturing in India:

A perspective

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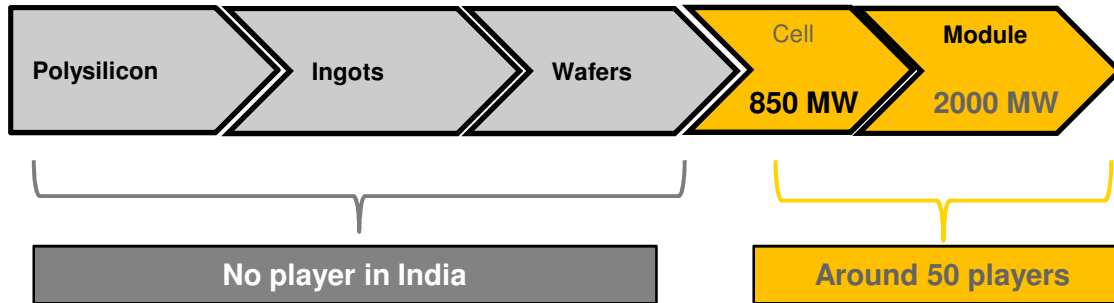
Solar Manufacturing : Landscape



Source: Company websites, Company Annual Reports, Company profiles and presentations

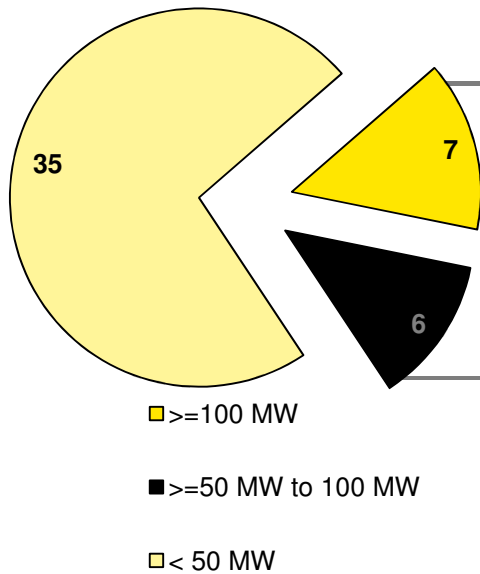
Manufacturing landscape: The Skew

Indian Solar Manufacturing Landscape

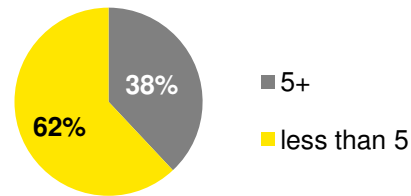


- ▶ 70~ 75% of the value not captured
- ▶ Competitive pricing ?
- ▶ Quality Subcomponents
- ▶ Fragmented operations
 - ▶ ~ 33 of 48 module manufacturers are <50 MW
 - ▶ 6 out of 10 have ~ 5 yrs of operation experience
- ▶ Market focus
 - ▶ ~ 75% capacity in EOU/SEZ
 - ▶ Low capacity utilization.

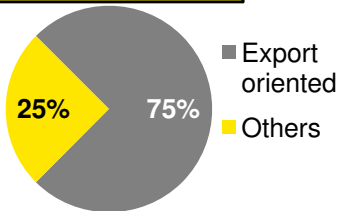
Module Manufacturing Players Size-wise split



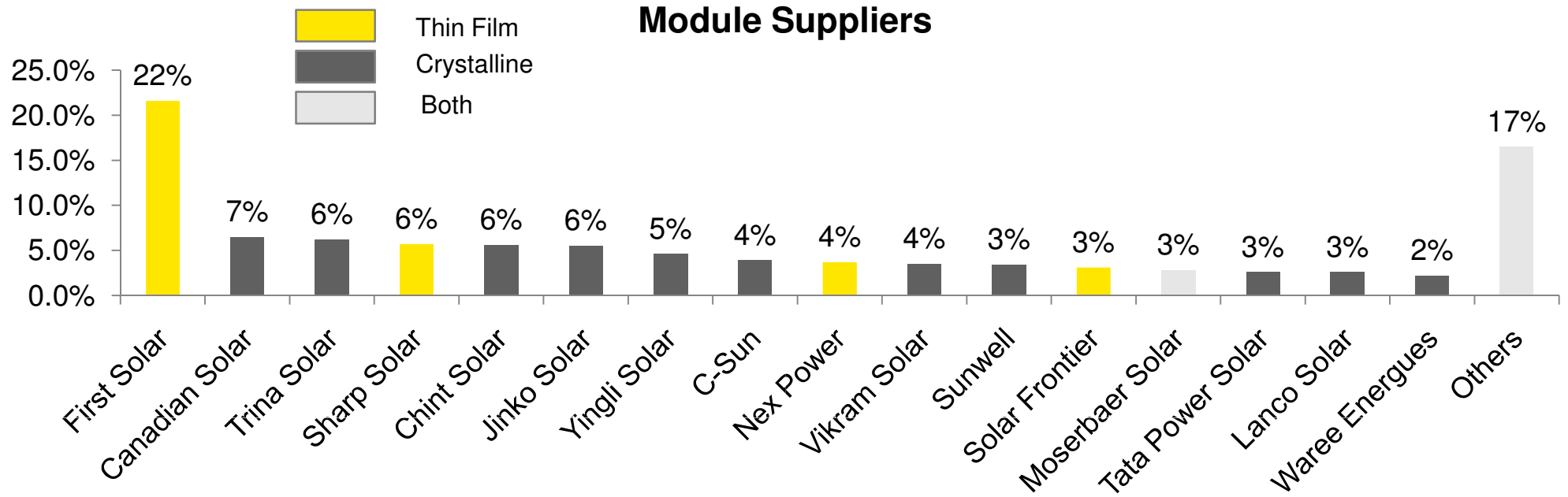
Experience (years)



Market Focus



Skew outcome: ~ 80% installations imported



▶ First solar has the highest market share in the module market~22%

▶ 5 out of 10 suppliers are Chinese

▶ Vikram solar is the only Indian manufacturer to feature in the top 10

▶ ~18% market is catered by the domestic manufacturers.

Case Study 1: South Africa Renewable Energy Independent Power Producer Procurement Programme (REIPPP)

- ▶ Structured, multiple bid submission windows accommodating multiple projects totalling 6925 MW
- ▶ Bid process based on
 - ▶ Price/tariff (evaluation score weighting of 70%)
 - ▶ Economic Development commitment (30%)
- ▶ Economic Development commitments include
 - ▶ Local content
 - ▶ South African ownership, incl. local communities
 - ▶ Job creation
 - ▶ Socio economic development in local communities
- ▶ 20 yr PPA with Eskom, terms non negotiable, consultations during design phase
- ▶ Small Project Programme: <5 MW, 200 MW total

Phase	Size	Particulars
Window 1 (1415 MW)	28 projects, capex \$5.75bn	<ul style="list-style-type: none"> ▶ 18 PV projects (631 MW) ▶ 8 Wind projects (634 MW) ▶ 2 CSP projects (150 MW)
Window 2 (1044 MW)	19 projects, capex \$3.5 bn	<ul style="list-style-type: none"> ▶ 9 PV projects (417 MW) ▶ 7 Wind projects (562 MW) ▶ 1 CSP project (50 MW) ▶ 2 Small Hydro (14.3 MW)
Window 3 (1165 MW)	Bid submission date Oct 2013	

Source: Respective websites, Secondary sources

The Outcome

Visible, consistent and effective government support crucial

▶ Results of bid windows 1 & 2: Published Dept of Energy

	W1 Avg bid price \$/kWh \$1 : R8	W2 Avg bid price \$/kWh \$1 : R8	W1 Local Content %	W2 Local content %	W1 Jobs indicated construction	W1 Jobs indicated operations	W2 Jobs indicated construction	W2 Jobs indicated operations
Photo-voltaics	\$0.34	\$0.20	28.5%	47.5%	10.386 (632 MW)	221 (632 MW)	4.557 (417 MW)	194 (417 MW)
CSP	\$0.33	\$0.31	21.0%	36.5%	1.165 (150 MW)	70 (150 MW)	662 (50 MW)	50 (50 MW)
Wind	\$0.14	\$0.11	21.7%	36.7%	1.869 (634 MW)	128 (634 MW)	1.579 (562 MW)	65 (562 MW)
Small Hydro	-	\$0.12	-	66.7%	-	-	261 (14 MW)	7 (14 MW)

Source: Respective websites, Secondary sources

Case Study 2 Virginia Clean Energy Manufacturing Incentive Grant (CEMIG) Program /Solar Photovoltaic Manufacturing Incentive Grant (SMIG) Program (till 2013)

What

- ▶ Grant given to manufacturers of solar photovoltaic panels in Virginia. Program expanded in 2013 to include other renewable energy manufacturers as well.

How much

- ▶ Years 1 and 2 - \$0.75/watt
- ▶ Years 3 and 4 - \$0.50/watt
- ▶ Years 5 and 6 - \$0.25/watt

Maximum of \$4.5million / year

- ▶ CEMIG is based on the expected ROI of business and is decided on a case-to case basis, subject to maximum of \$ 9mn per entity.

Eligibility

- ▶ Capital investment of more than \$50 million in Virginia on or after July 1, 2011
- ▶ Creation of 200 or more new full-time jobs on or after July 1, 2011

Solar Manufacturing : The Perspective

Manufacturing policy

- ▶ Consistent & end goal focused policy
 - ▶ SIPS
- ▶ Complimentary fiscal /Tax incentives
 - ▶ Differential custom and excise duties on components than fully assembled ; Denmark & Germany

Procurement cycle

- ▶ Time bound & reliable flag posts
 - ▶ Lower tariff Vs domestic manufacturing
 - ▶ Evaluation criterion
- ▶ Complimentary financial/ fiscal incentives
 - ▶ Soft loans for projects with x% local content; Denmark & Germany
 - ▶ AD benefits only on locally manufactured cell/module
 - ▶ Favorable allocation: Canada, US, Brazil

Reviving existing units

- ▶ The positive NFE requirement at EOU/SEZ units
- ▶ Manufacturing hubs
 - ▶ Upstream & downstream end to end-systems
 - ▶ Sub components & ancillaries

R&D, HR

- ▶ R&D on Efficiency improvements;
 - ▶ ‘Hyphen’ manufacturing to localize content; Auto sector
- ▶ Prioritize manpower training to reduce costs

Thank You

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