INDIA AND SOLAR ENERGY

Vineet Mittal – Vice Chairman – Welspun Renewables Energy

Hannover Messe - April 2015

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ELECTRICITY HAS DIRECT POSITIVE IMPACT

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Contributes to enhanced livelihood, economic growth leading to a smarter nation

Renewable, especially solar energy is the key enabler for the emerging wave of inclusive growth in India

Current situation

- Deficit in peak power (~3%) and energy (~9%)
- ~30% population without electricity access
- High growth induced environmental load

Growth needs

- Need for high growth – GDP to grow @7-8% per annum
- Need for energy security and access to be balanced with environmental aspects, social aspirations and global commitments

Constraints

- High dependence on coal
- Adverse cost benefit impact of long distance transmission line combined with low average consumption of target areas

Way forward

- >300 day/ year sunny days
- Proactive government focusing on solar (100 GW by 2022)
- Large capacity on-grid solar for security (grid parity)
- Distributed generation for energy access

Proactive measures of the government of India will help in achieving balance amongst economic growth, environmental needs, social equity, energy access and security.

SOLAR ENERGY AS AN ENABLER

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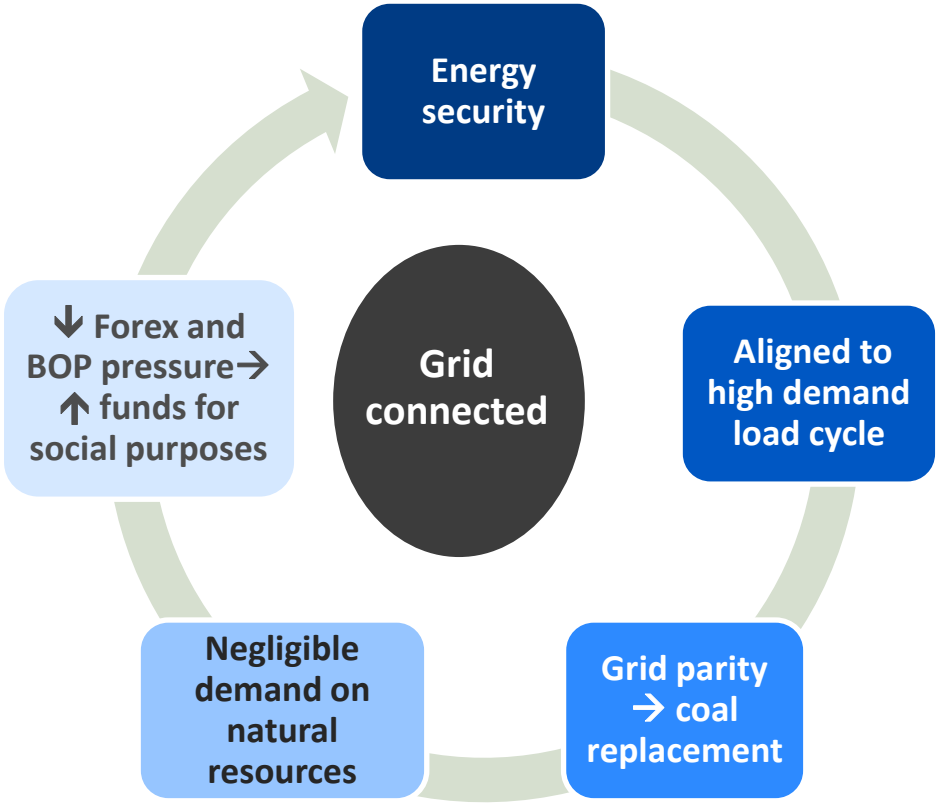

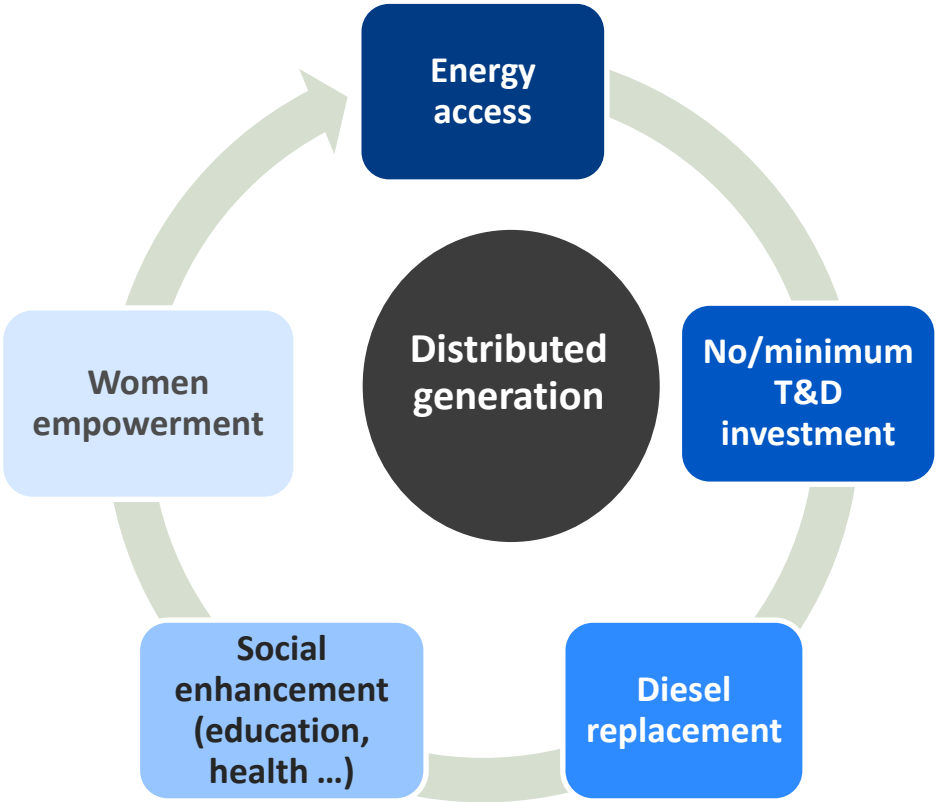

Solar energy can enable high level integrated development through

- Faster energy access and security
- Empowering rural women by reducing adverse impact of fossil and forest fuel, improvement in health and providing productive economic avenues
- Fosters local economic development through micro and small enterprises in short term
- Mitigate adverse environmental damages by reducing dependence on firewood and other biofuels

POWER SITUATION IN INDIA

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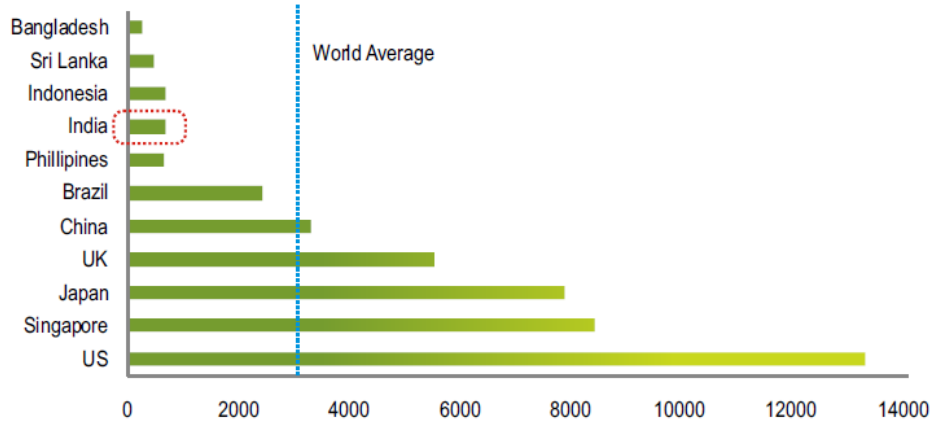
Despite low per capita consumption of electricity, India continues to face power deficit

- Average per capita consumption of electricity is ~900 Kwh compared with ~2,800 Kwh world average
- About 300 million of the country's 1.2 billion people do not have access to the grid
- With a GDP growth rate of ~7%, electricity demand growth expected to be ~9%
- India's peak power deficit ~ 3%; Energy shortage ~ 5%
- Deficits have mainly been driven by Inadequate capacity addition, Fuel shortages, T&D issues

Electricity Consumption per Capita (Kwh per person)



Source: CEA & ICF Analysis, World Bank

ENERGY SECURITY & CLIMATE RISK IN INDIA

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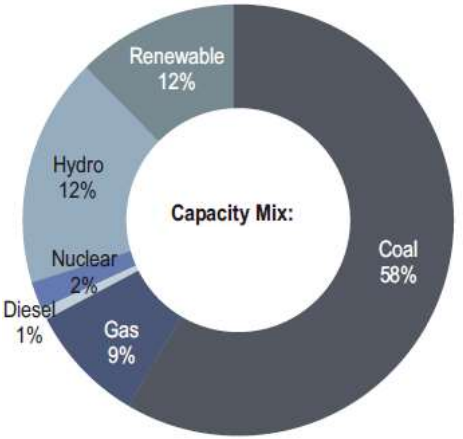
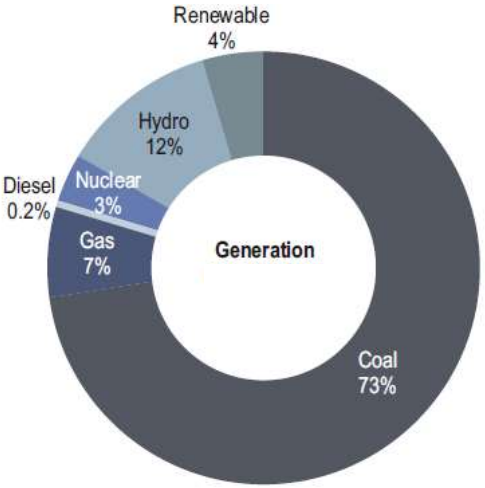
Climate Risk, project/ generation characteristics and small relative capacity – indicate favourable prospects for Renewable Energy

- Conventional power generation is not best suited due to long gestation period, environment and social concerns
- India among top countries in the world exposed to climate change vulnerability risk*
- Increasing import of oil, gas and coal reduces energy security and puts significant stress budget and balance of trade.

- Investment in renewable energy is an imperative for India.
- Renewable capacity
  - ~12% capacity and ~4.7% generation now
  - Can reach ~30% generation share (e.g. Germany)
- Short gestation period of solar and wind projects enables rapid scale up and quick addressal of deficits

Capacity & Generation Mix





Reducing the emission intensity of GDP while achieving energy security can only be achieved through greater focus on energy efficiency and renewable energy.

Renewable Energy does not have high dependence on fuel, water and causes no soil/air pollution. Mitigates CO_2

Source: CEA (Mar 2013), Climate Change Vulnerability Index (Maplecroft Global Risk Analytics)

HUGE POTENTIAL FOR SOLAR – 100 GW IS A BEGINNING

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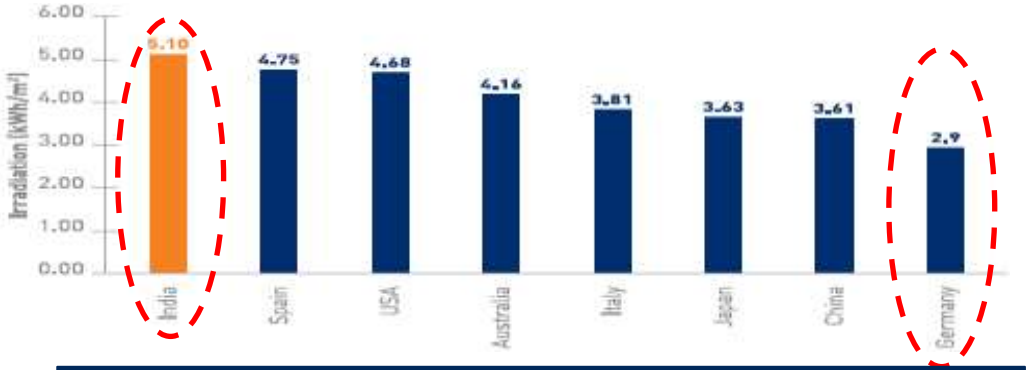
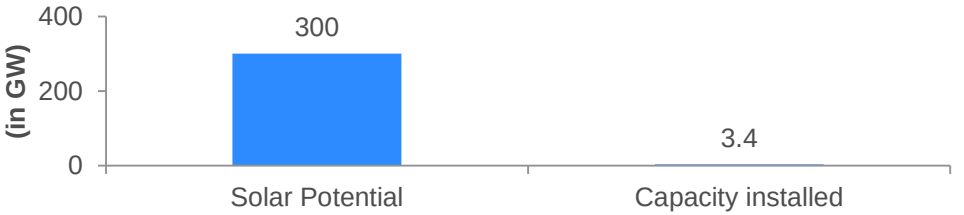
Annual capacity additions set to take off

- With more than 300 days of sunshine, India ranks among the highest irradiation receiving countries in the world
- Sufficient space to generate 100's of GW of solar power
- Rural and remote energy access can be addressed through distributed solar – mini/ micro grids
- Generation aligned with peak demand from commercial and industrial sector
- Current installed capacity barely scratched surface compared to potential
- Proximity to Grid parity
- Solar has the potential to become the backbone of the country's energy supply in the long term.
- With renewed Government policy and vision, annual solar installations in India expected to surpass Germany

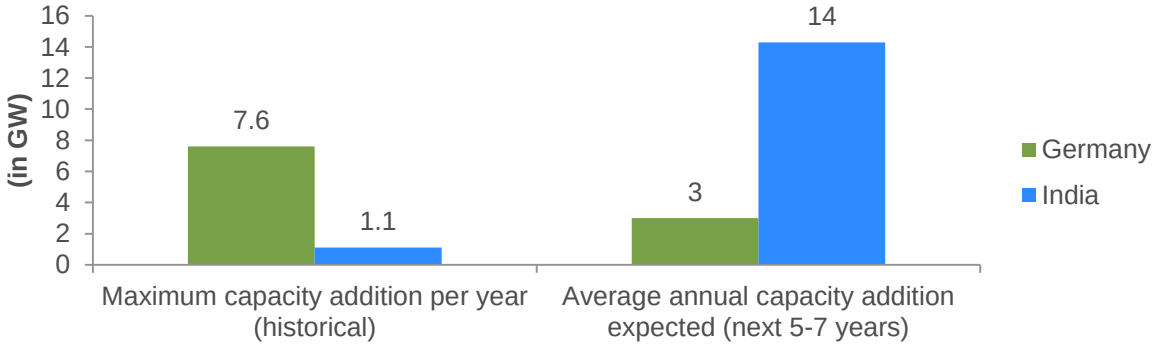
Average solar irradiation in India is ~2x Germany



Solar installed capacity barely 1% of potential



Average annual capacity addition expected to be 4-5x Germany's



Source: RETS, NASA, MNRE, EPIA

KEY GROWTH ENABLERS FOR SOLAR IN INDIA

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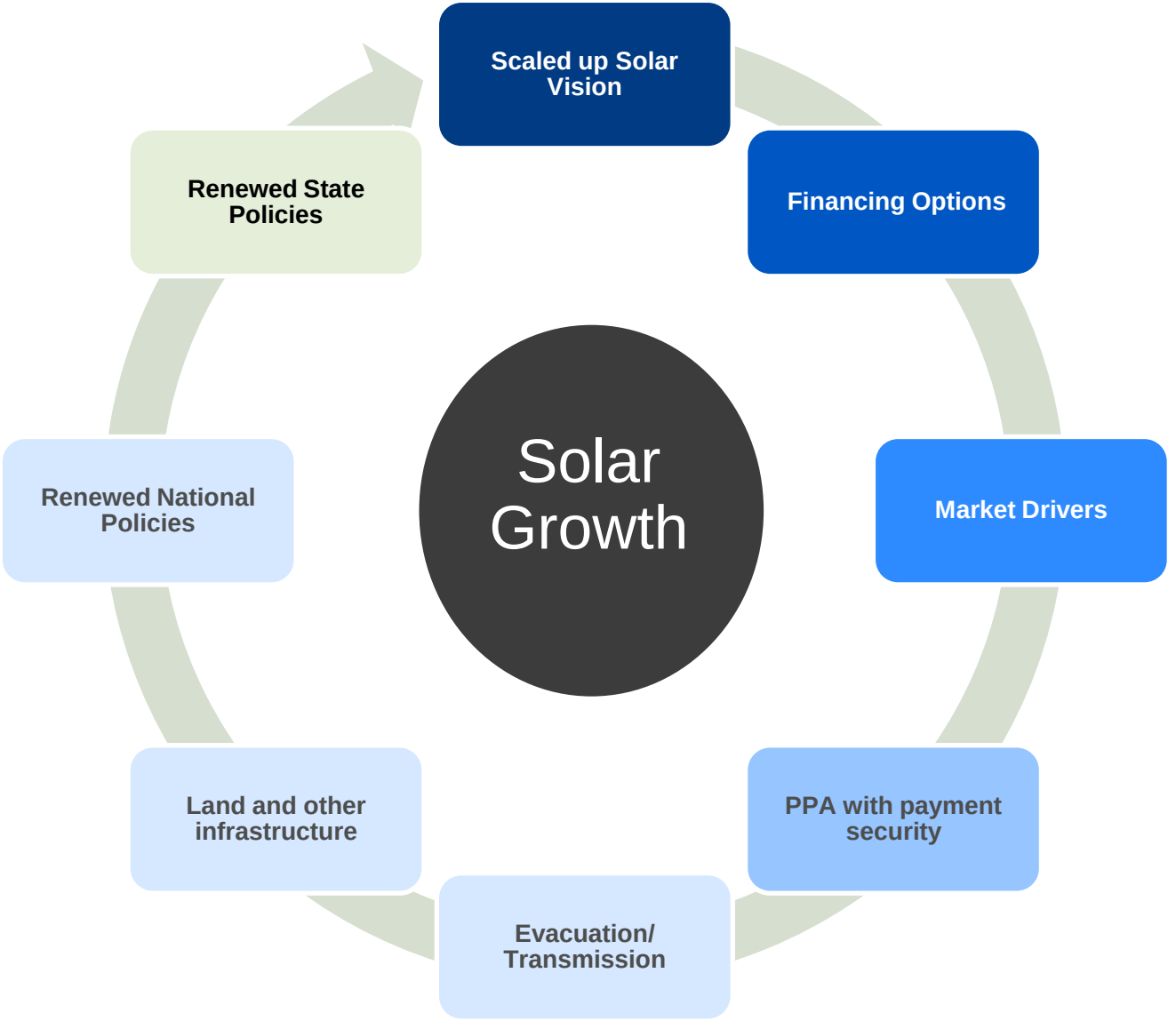

SOLAR ENERGY, GEARED FOR GROWTH

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Scaled up Solar vision

- Government plans to grow solar to a cumulative 100GW by 2022, with following tentative breakup:
  - 40 GW: Grid Connected
  - 40 GW: Rooftop and distributed
  - 20 GW: Large Scale projects/ Solar parks
- Various state governments have already tendered out 6000 MW+ of capacity in last 6 months
- 213 companies have committed to setting up total RE capacity of 266 GW over next 5 years

Financing Options

- 100% Foreign Direct Investment (FDI) in renewable energy allowed
- Sources of debt financing:
  - Financial institutions e.g. PFC, REC, IREDA, IFCI
  - Domestic Scheduled commercial Banks, NBFCs
  - Exim Banks, Multilateral agencies
- 30 Indian banks and Financial Institutions have committed to finance 70 GW of green energy, to the tune of USD 57 billion
- India's 1st Green Bond raised USD 160 mln recently
- Longer term financing under RBI's 5/25 scheme
- Emerging opportunities: Securitisation, INVIT, Yieldco
- Under discussion: Separate sectoral limit, RE priority sector status

Market Drivers

- National Solar mission, State RPOs major driver for solar capacity
- Solar RPOs enforced on State utilities
- Solar power procurement is largely undertaken through a tariff based competitive bidding process.
- Feed-in-Tariff (FIT) Regime being considered in selective manner
- Solar power has already reached partial grid parity (in select states, esp. for commercial/ industrial customers)
- Gradual shift from policy driven incentive based projects to parity driven projects expected

PPA with payment security

- Central Government/ State sourced solar projects offer long term bankable PPA for 20 – 25 years
- Counterparties
  - NVVN/ SECI
  - State Electricity Boards/ Utilities
- Payment Security offered through
  - Letter of Credit
  - Escrow Mechanism
  - MNRE schemes
- Under consideration - Insurance products, solar guarantee fund

Source: Ministry of Renewable Energy (MNRE), Media Articles; Note: RPO : Renewable Purchase Obligation; RE: Renewable Energy, SECI: Solar Energy Corporation of India, INVIT: Infrastructure Investment Trust

SOLAR ENERGY, GEARED FOR GROWTH

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Evacuation / Transmission

- Proposed high capacity transmission systems (Green energy corridor)
  - Will evacuate renewable power from RE rich states to load centres
  - Make pockets of RE generation grid interactive
  - Reduce evacuation losses
  - Foster reliable forecasting of renewable energy based generation
  - Allow Grid scale energy storage & its management
  - Require a capital outlay of ~USD 7 billion

Land and other infrastructure

- Solar Park Scheme
  - 25 solar parks: 500 MW to 1000 MW; Nodal agency: SECI
  - Land for 16 parks/ 11,000 MW already identified
  - MP, AP, Rajasthan, U.P, Gujarat, Telangana, KN, J&K
  - Financial support by Government of India
  - Developed in collaboration with the State Govt.
  - Allocation of land, transmission and evacuation lines, access roads, availability of water and others
  - Aimed to attract project developers, meet SPO, generate employment

Renewed national policies

- Work in progress policy initiates by Government of India
  - Amendment to Electricity Act – Renewable Energy Act
  - Deemed generation status for renewables and stiff penalties for not meeting RPO/ SPO
  - Dollar linked PPA to attract long term low cost foreign capital into the sector
  - Priority Sector Status for RE
- Special Schemes
  - One lakh solar pumps for farmers
  - Solar power plants on canals
  - Measures to give priority for domestic manufacturing/ R&D

Renewed state policies

- E.g. Government of Andhra Pradesh recently released new solar and wind power policies
  - Deemed approvals for renewable energy projects such as, PPP status, land use conversion, industry status and environment related approvals.
  - Clear and short timeframes to provide key approvals such as power evacuation and open access, with deeming provisions for applications not disposed of within a specified time period.
  - 100 % banking of electricity throughout the year;
  - Deemed 'must run' status for the purposes of scheduling of power to the grid;
  - Exemption of various charges to promote green growth

Source: Ministry of Renewable Energy (MNRE), Media Articles; Note: SPO: Solar Power Obligation

VARIOUS INCENTIVES AVAILABLE TO RENEWABLE ENERGY PROJECTS IN INDIA

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Tax Incentives	
Income tax Holiday	100% for 10 consecutive years - MAT @ 20% to apply
Accelerated depreciation	Accelerated depreciation @ 80% on solar assets Additional depreciation @ 20% on new plant/machinery in the 1st year
Deemed export benefits	Available to specified goods manufactured and not actually exported • Advance authorization from Directorate General of Foreign Trade • Deemed export drawbacks • Exemption/return of Terminal Excise Duty
Service tax based on negative list	Certain services are exempted from service tax • Services of transmission or distribution of electricity by an electricity utility
Customs and Excise	Various duty concessions and exemptions to RE Sector
Reduced VAT	Certain States allow reduced VAT rates (5%) on RE projects
Additional one-time allowance	Available @15% in Budget 2014 on new plant and machinery
Tax-free Grants	Grants received from the holding company engaged in generation, distribution or transmission of power

Non -Tax Incentives	
Feed-in-tariffs	• When renewable generators sell to state utilities under the MoU route • Rates decided by the CERC and the SERC
Rebates	• Available on the manufacturing of solar and wind components • Targeted at specific types of renewable energy technology • Include subsidies and rebates on capital expenditures
Favourable land policies	• By various state governments for renewable development • Reduce capital costs and favour ease of land allocation
Government R&D programmes	• Improve renewable energy technologies • Lead to growing performance, importance and reducing costs

PAN INDIA PORTFOLIO - ENABLING SUSTAINABLE GROWTH

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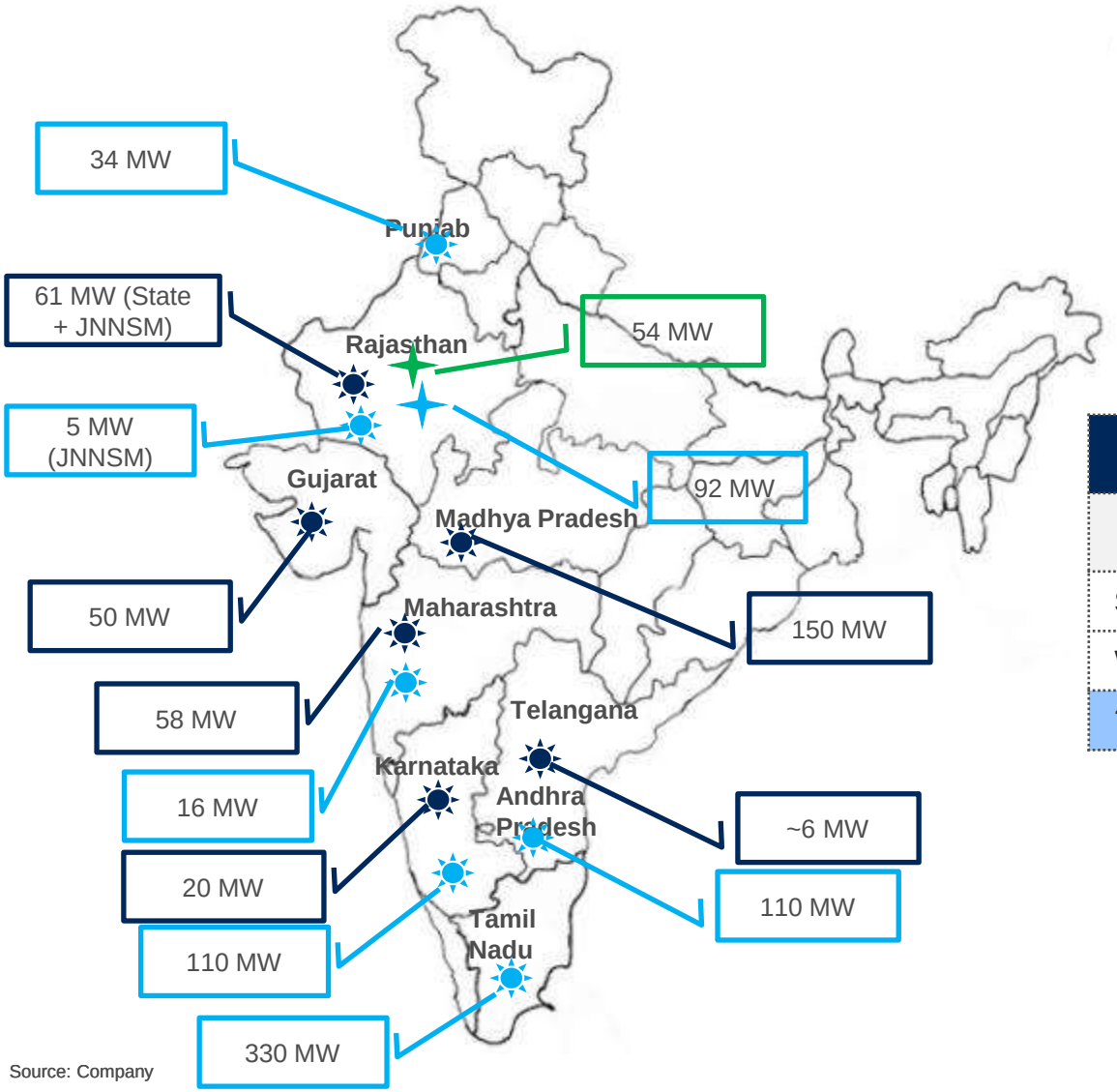

Source: Company

>1 GW Renewable Portfolio in various stages of development			
	Operational	Under Construction	Total
Solar	344 MW	605 MW	949 MW
Wind	54 MW	92 MW	146 MW
Total	***328 MW***	***767 MW***	***1095 MW***

Operational Wind
Operational Solar
Under Construction Wind
Under Construction Solar

*As of 2 June 2014, Andhra Pradesh has been bifurcated into Telangana and Andhra Pradesh;

WELSPUN ENERGY – INCLUSIVE GROWTH FOCUSED

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Healthcare

- Medical Centers in association with Matrusparsh Hospital, Anjar
- Free Check-up and medicine
- Health & Hygiene Campaign
- Cattle health care
- Pulse Polio Camp

Education

- Teacher training
- Solarizing schools and institutions
- Educational toolkits to children
- Vocational training
- Computer Awareness Programs

Women Empowerment

- Technical Training
- Stitching and handwork
- Market access

OPPORTUNITIES FOR INDO - GERMAN COLLABORATION IN INDIA'S SOLAR GROWTH

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Investment

- **Long term debt/ equity financing for central/ state government/ private companies involved in solar value chain**

- KfW financing for Maharashtra State Utility's Solar PPP project developed by Welspun
- Proposed equity Investment by DEG in Welspun Renewables

EPC(M)

- **Engineering Design**
- **Systems Integration**
- **Execution Planning, Commissioning**
- **Quality Management**

- Welspun collaborated with Conergy for its solar plant in Gujarat

Skill Development

- **R&D**
- **Engineering/ Technical training**

- GIZ has been collaborating extensively in India with different institutions for carrying out knowledge sharing and skill enhancement.

Equipment

- **Inverters**
- **Storage Solutions**
- **System Monitoring**

- European players such as Bonfiglioli, ABB have gained 1st mover advantage – both of whom Welspun has partnered with

Grid Management

- **Technologies to improve grid security and efficiency**
- **Smart Grid**

- Potential applications - Government of India's 100 Smart cities program, Green Corridor program

Analytics, O&M

- **Yield Analytics**
- **Forecasting**
- **Preventive maintenance**
- **Technical plant management**
  - **Fault management**
  - **Data and information management**
  - **Engineering and consulting**
  - **System maintenance**

- Potential applications – Solar Parks, State Utilities, IPPs
- Welspun procures SCADA solution from German company – IPLON

THANK YOU