User Interaction Meet 2024

Technical Session – V
Open EO data - Applications

Utilization of RS Data for Generating Solar Energy Potential Maps

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NATIONAL INSTITUTE OF SOLAR ENERGY (NISE)

(An Autonomous Institute of Ministry of New & Renewable Energy, Govt. of India)

VARIOUS LABORATORIES

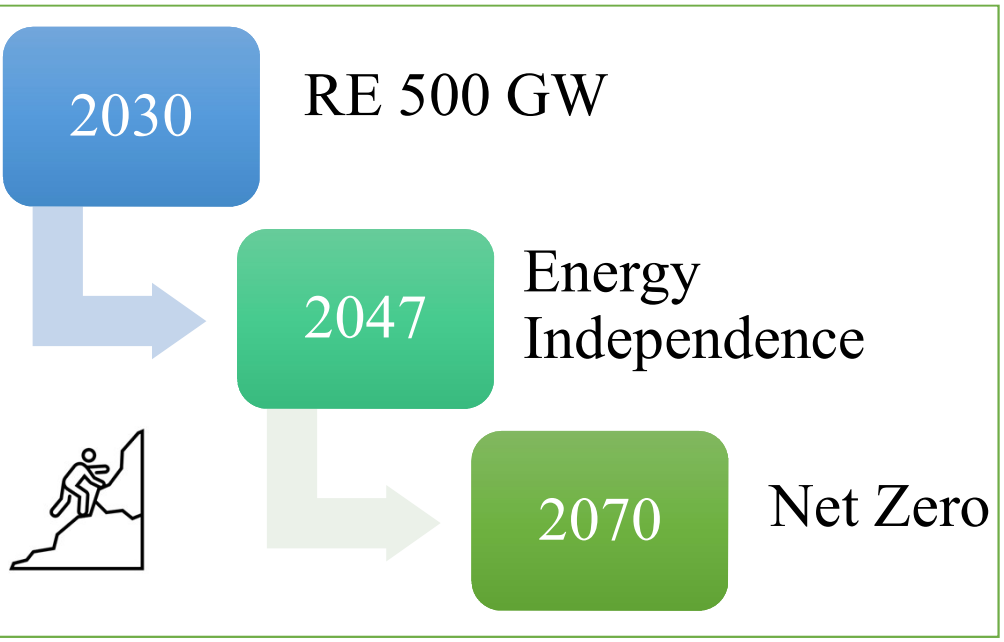
- PV module testing (Indoor & Outdoor)
- Solar cell Characterization lab
- Inverter Testing lab
- Battery Testing lab
- PV Lighting system testing lab
- Solar Water Pump Testing facility
- Computation & Simulation lab
- Solar Radiation Calibration Laboratory
- Testing of Solar thermal System and components (indoor & outdoor)

SOLAR ENERGY LANDSCAPE

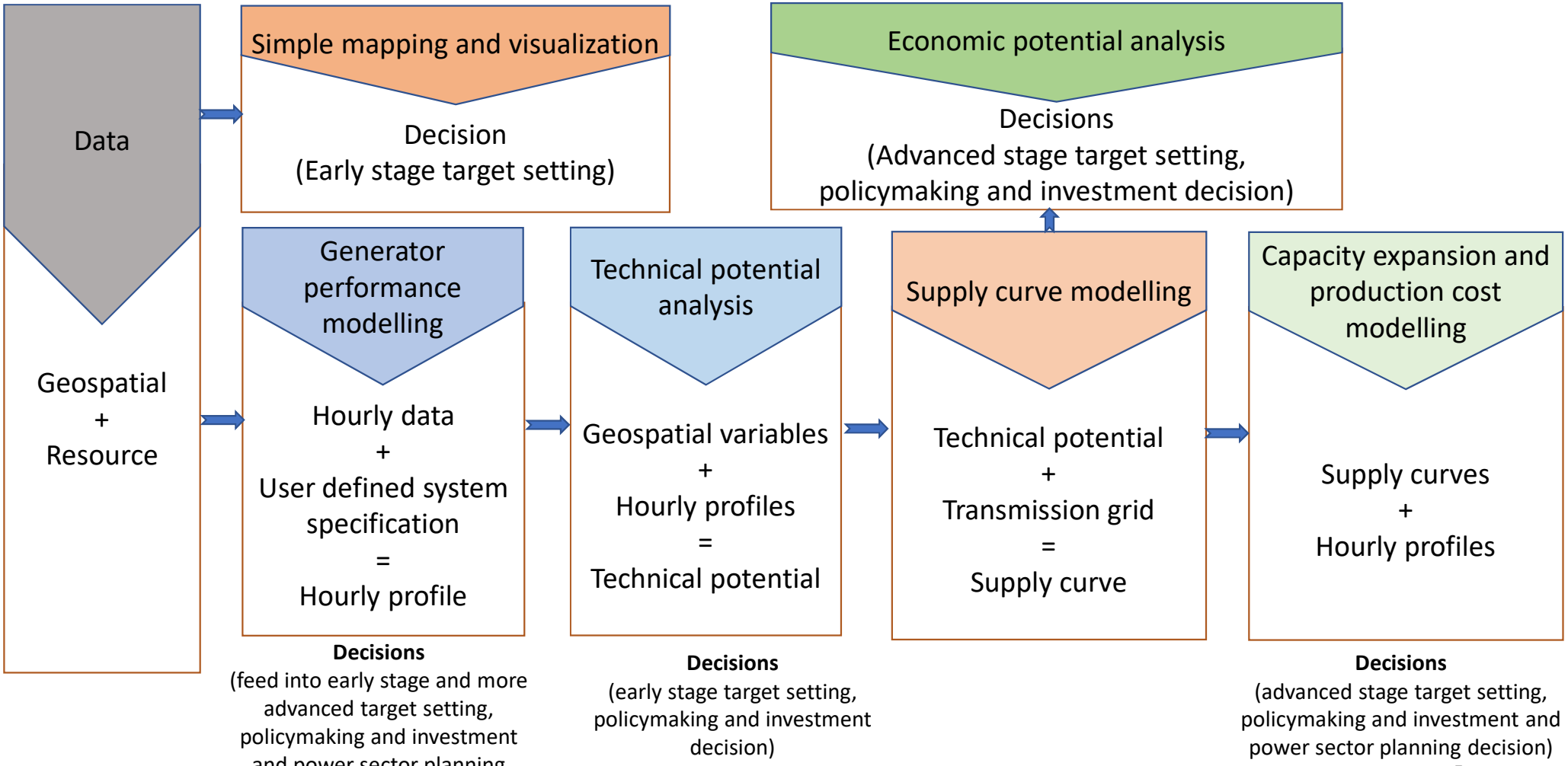
Total Installed Capacity [431.95 GW]

Thermal	242.56 GW
Hydro	46.93 GW
Wind	44.97 GW
Bio	10.84 GW
Small Hydro	4.99 GW
Nuclear	4.48 GW
Solar	74.31 GW

Ground Mount	57.81 GW
Rooftop	11 GW
Off grid	2.80 GW
Hybrid	2.57 GW



DATA AND DECISION MAKING



Decisions
(feed into early stage and more advanced target setting, policymaking and investment and power sector planning decision)

Decisions
(early stage target setting, policymaking and investment decision)

Decisions
(advanced stage target setting, policymaking and investment and power sector planning decision)

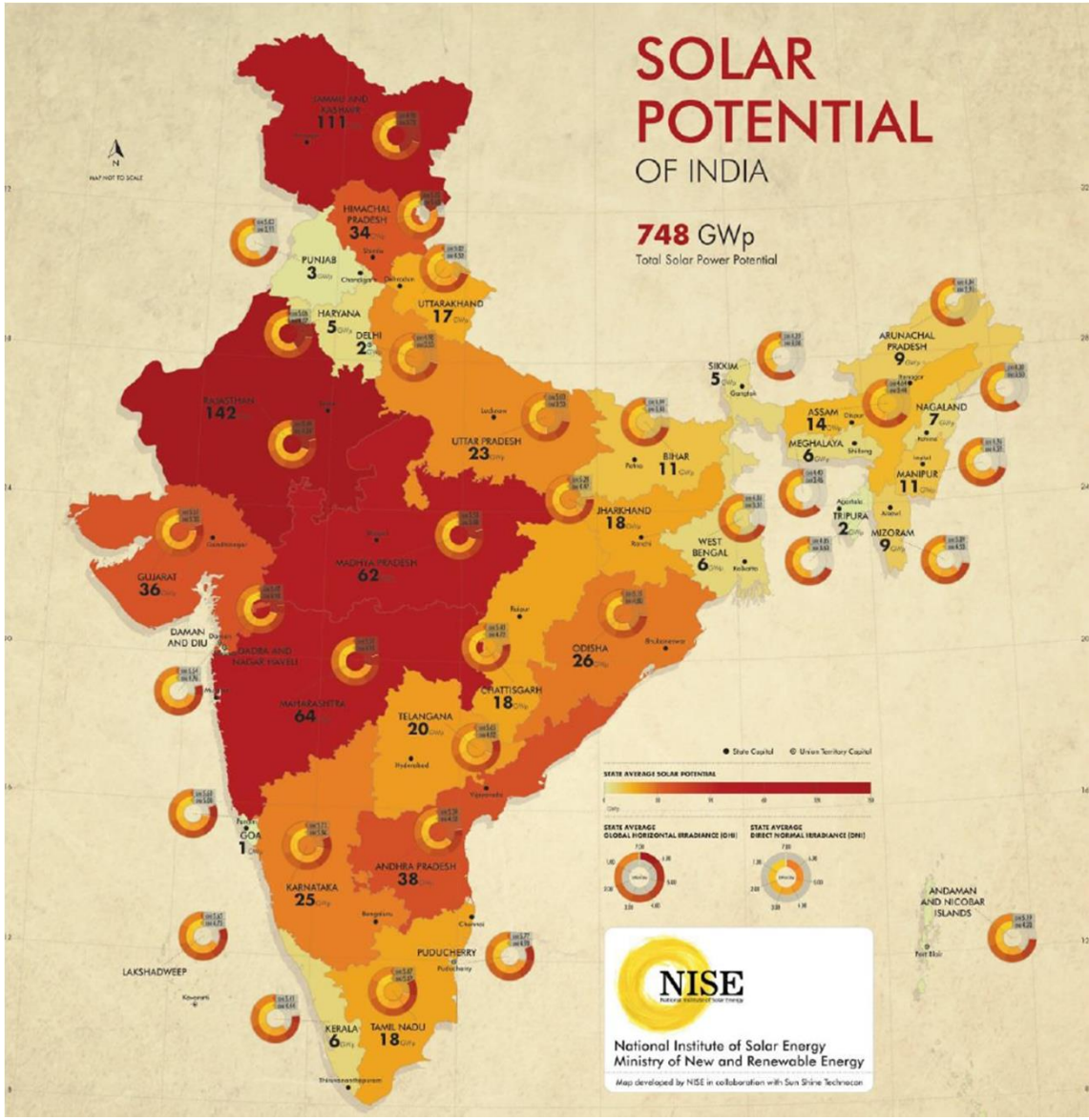
SOLAR POTENTIAL (2014)

706.15 GWp Ground Mount

\+

42.83 GWp Rooftop

→ 748.98 GWp Total Potential



SOLAR POTENTIAL ASSESSMENT : ASSUMPTIONS 2014

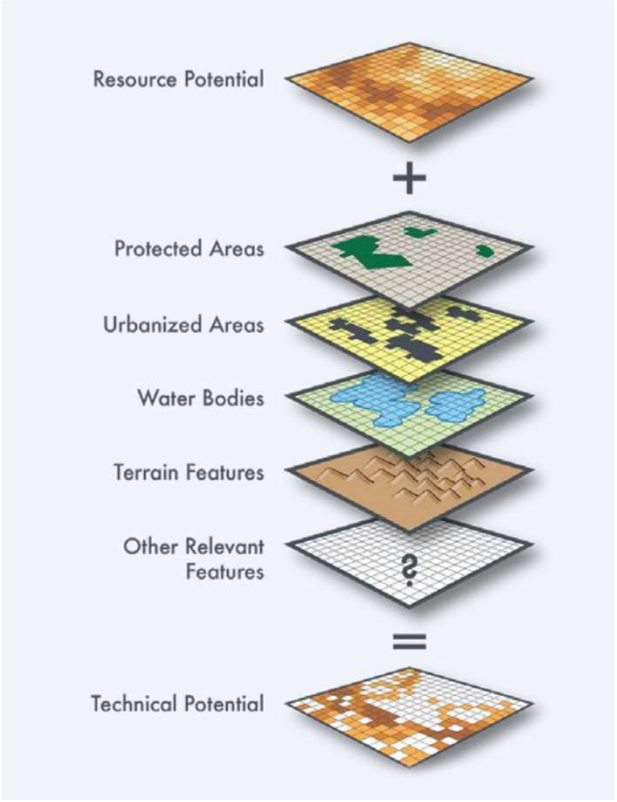
- NISE made certain assumptions and approximations to estimate the solar potential of the country .
- **Ground Mount**
  - 3% of the wasteland [as per Wasteland Atlas of India 2010]
  - 15 % Solar photovoltaic (SPV) module efficiency
  - 1 km^2 of wasteland could accommodate a 50 MWp SPV power plant
- **Rooftop Solar**
  - Urban data from the Census of India 2011, provided by the Ministry of Home Affairs.

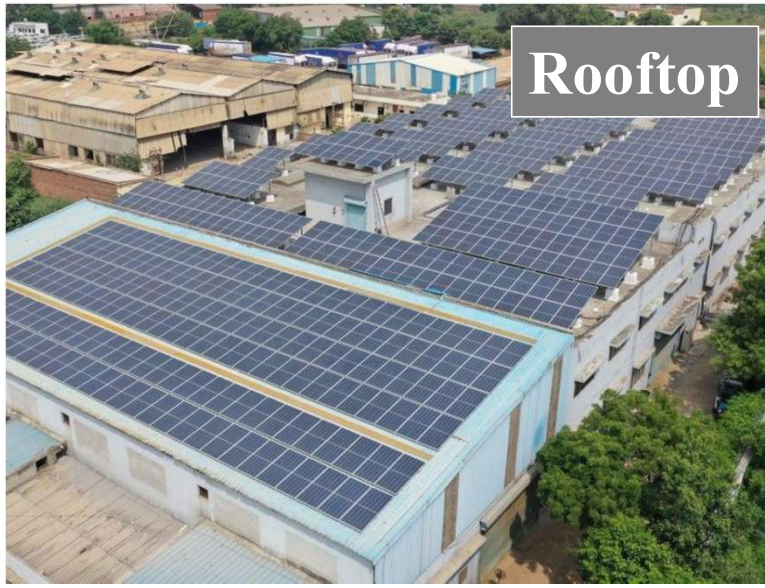
Category	X (%)	Y (kWp)
Factory, Workshop, Workshed etc.	20	50
Hospital, Dispensary etc.	2	100
Hotel, Lodge, Guest house etc.	20	10
Place of worship	2	50
School, College	10	50
Shop, Office	25	1
Other non-residential (power plant, cinema hall etc.)	10	10
Residential	20	1

RS DATA BASED POTENTIAL ASSESSMENT

- Achievable energy capacity and generation of a particular technology given the resource potential, system performance, topographic limitations, environmental constraints, and land use constraints

Resource availability	Weather and climate	Land use/ land cover	Terrain and terrain features
Digital surface mapping	Shading	Bathymetry	Water body characteristics
Road network	Electrical infrastructure	Other constraints e.g. protected areas	





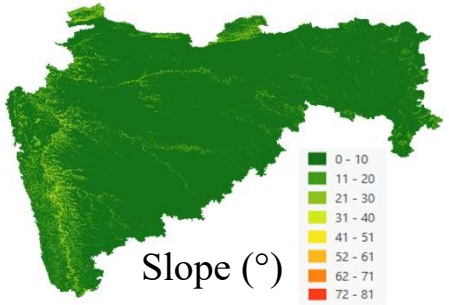
ONGOING SOLAR POTENTIAL ASSESSMENT

POTENTIAL ASSESSMENT: NEW EMERGING APPLICATIONS

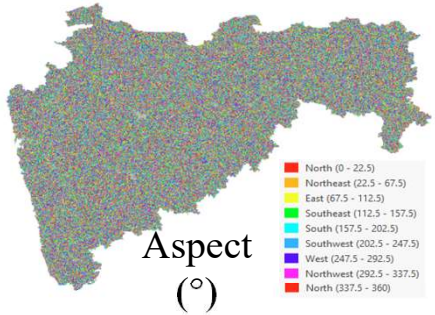
CASE STUDY: GROUND MOUNTED SPV ASSESSMENT

Solar Potential Assessment

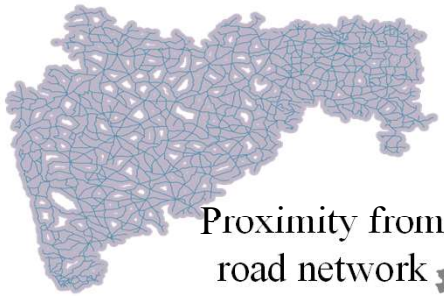
Land Use Land Cover	Wasteland
Proximity from road network	10 km
Proximity from transmission line	10 km
Slope	≤ 10 degree
Aspect	Southeast to Southwest
Technological parameters – Module wattage	545 W
Technological parameters – Efficiency	21 %
Technological parameters – Module area	2.6 m^2
Technological parameters – Shadow analysis	21st December

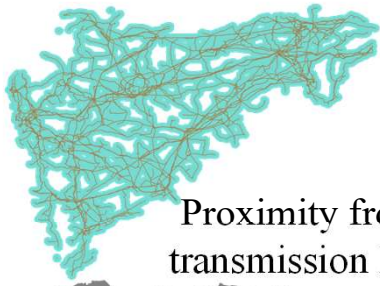


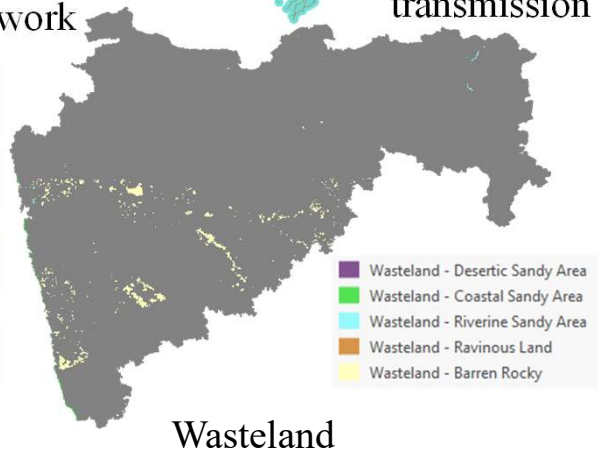
Slope (°)



Aspect (°)


Proximity from road network


Proximity from transmission line



Wasteland

Note: NRSC provided the Digital elevation and LULC datasets

THANK YOU

Sincerely appreciate your time and attention.

If you have any further questions or would like to connect, please feel free to reach out to us.

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