

# High RE in Southern India

## Impact on transmission network

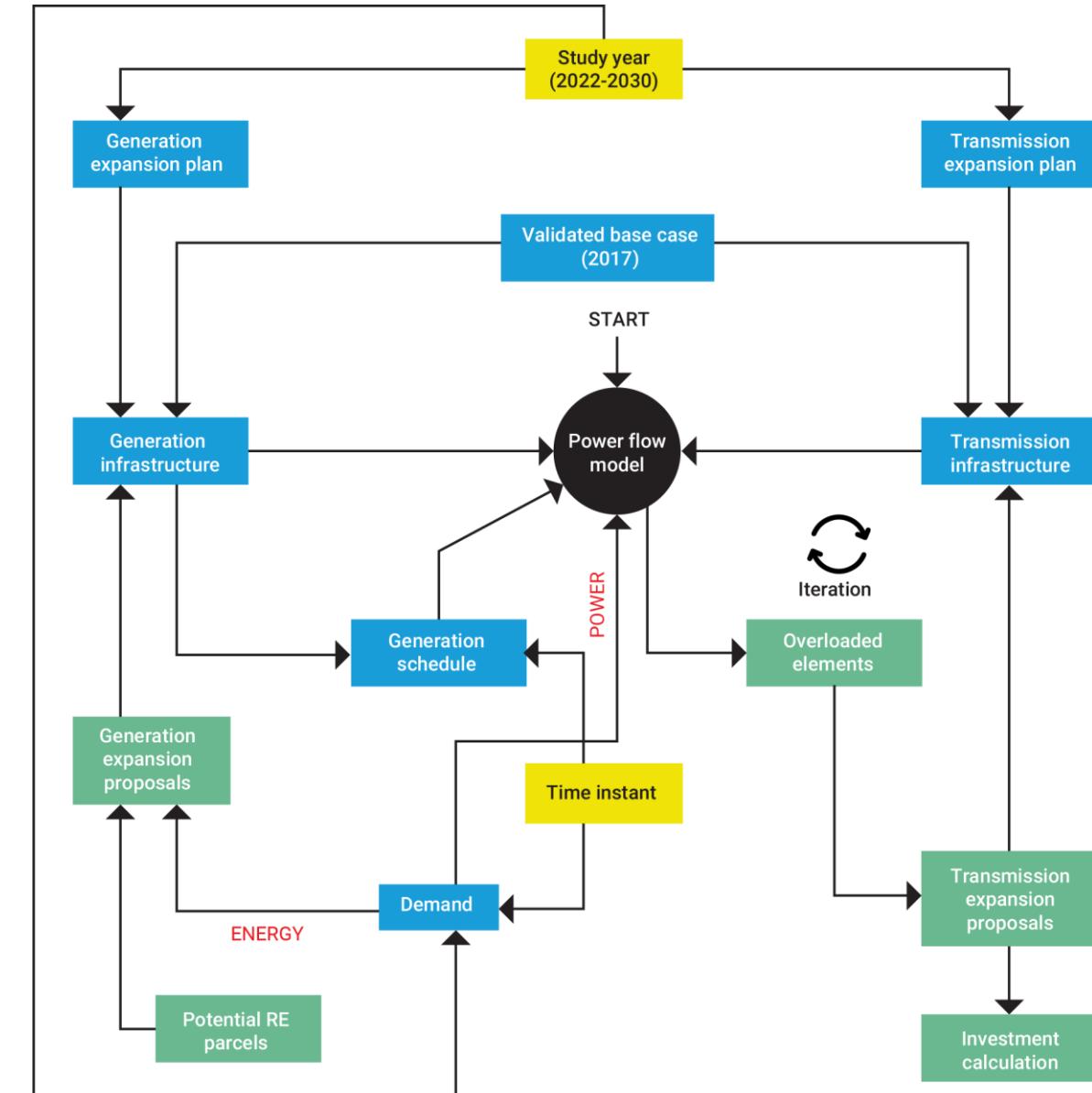
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Milind R | 19 Jan 2021

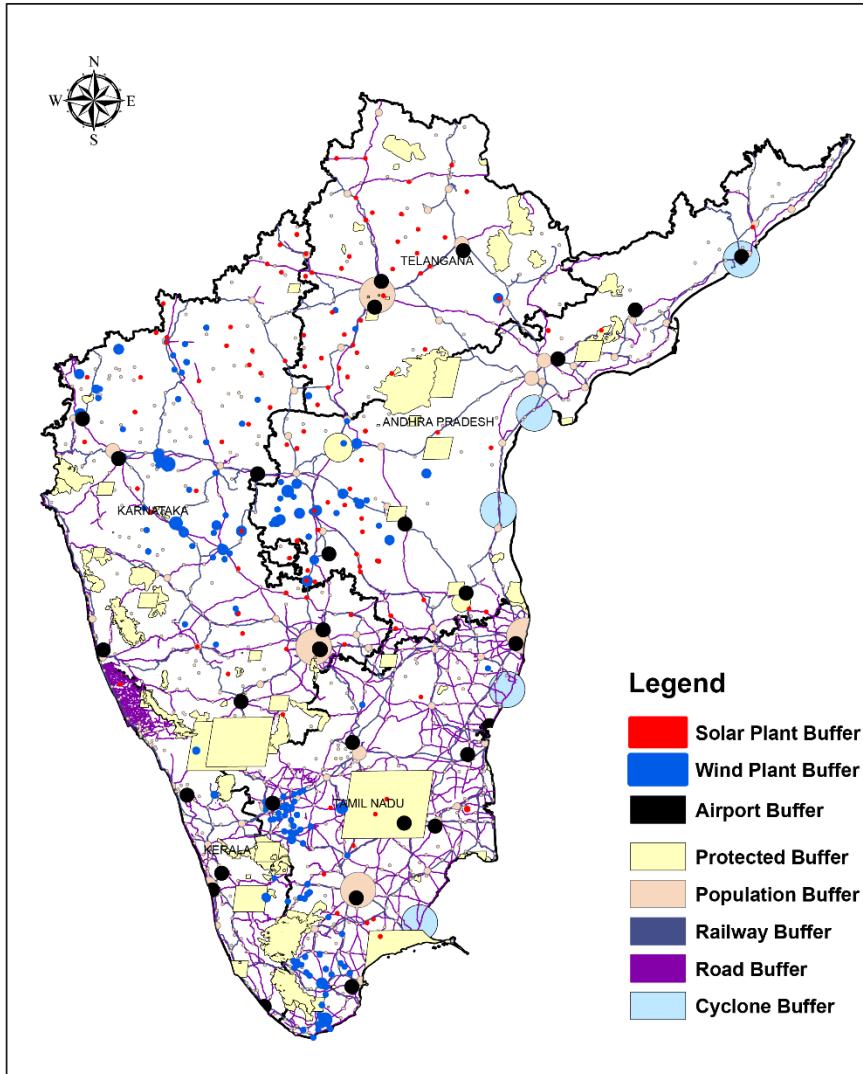
# Objective and Methodology

Assess the feasibility of achieving high RE shares for Southern Region(SR) states by 2030, through:

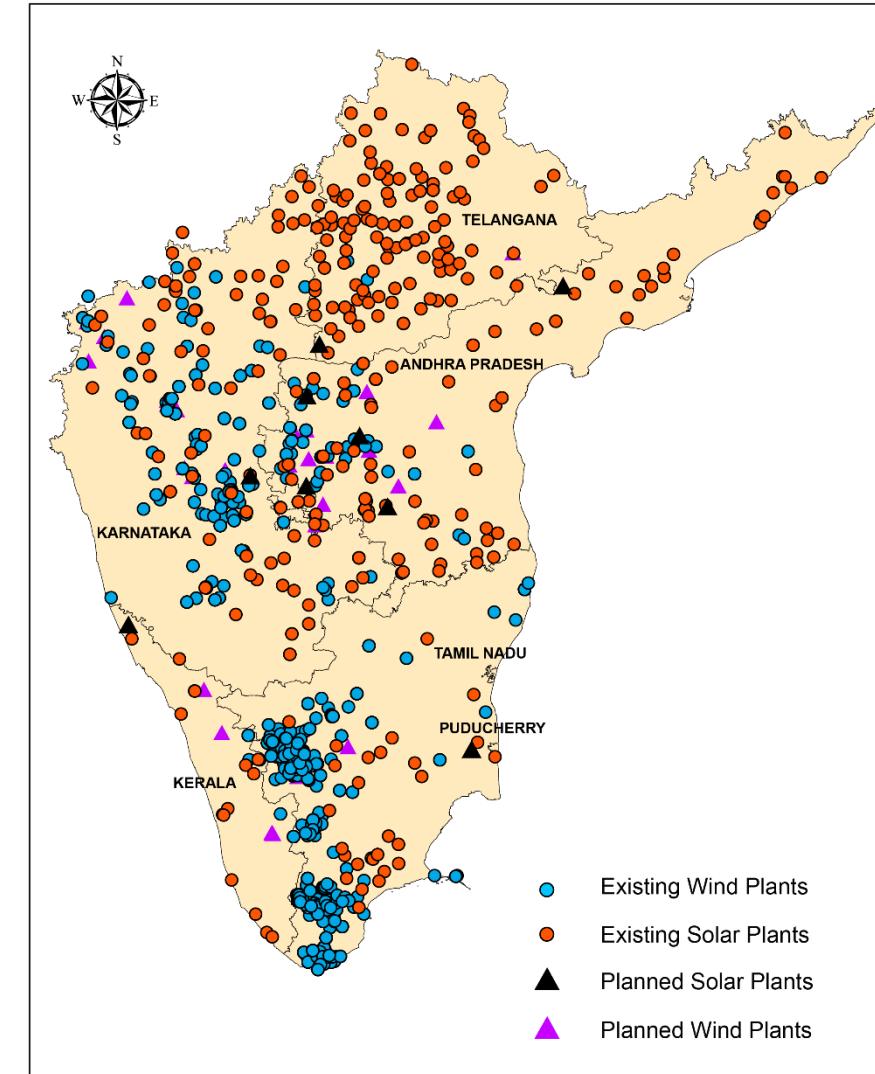
- GIS-based mapping of current and future RE zones
- Steady-state power flow studies for SR
- Identification of transmission strengthening requirements



# Geospatial analysis

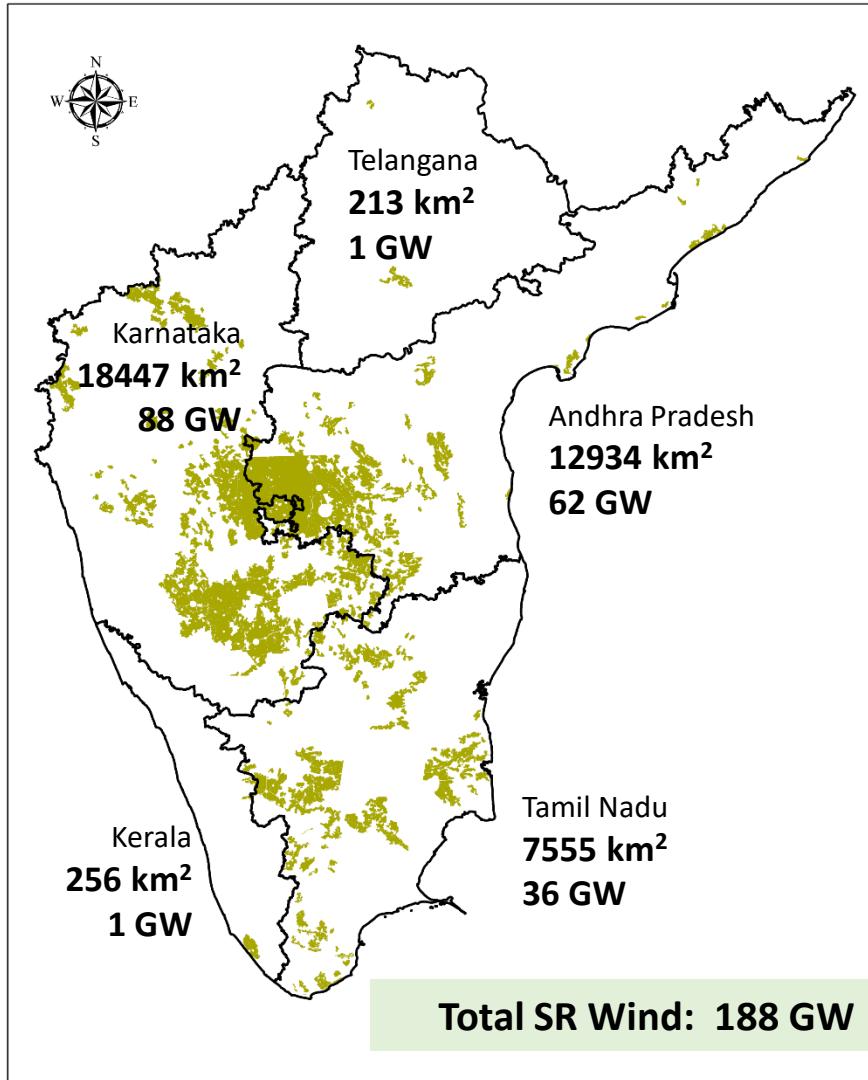


**Unsuitable Area**



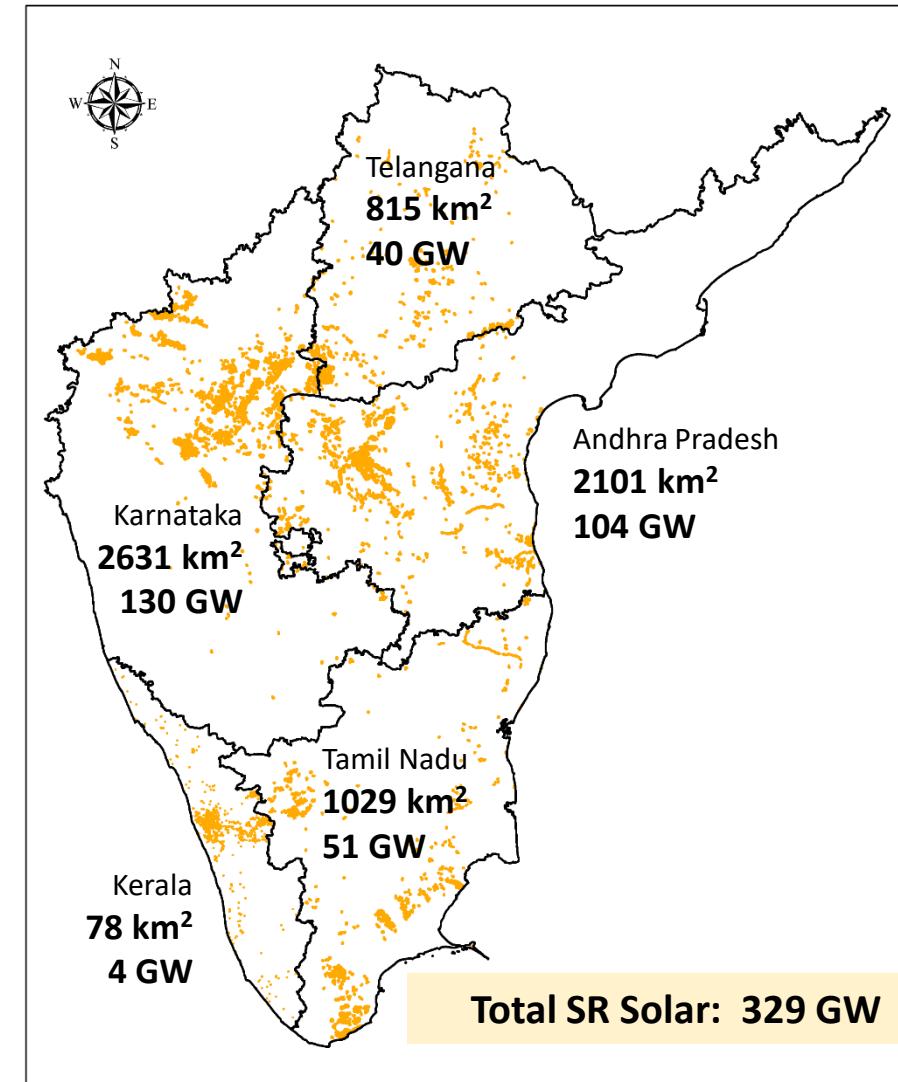
**Existing and Planned RE Plants**

# Proposed sites for RE expansion



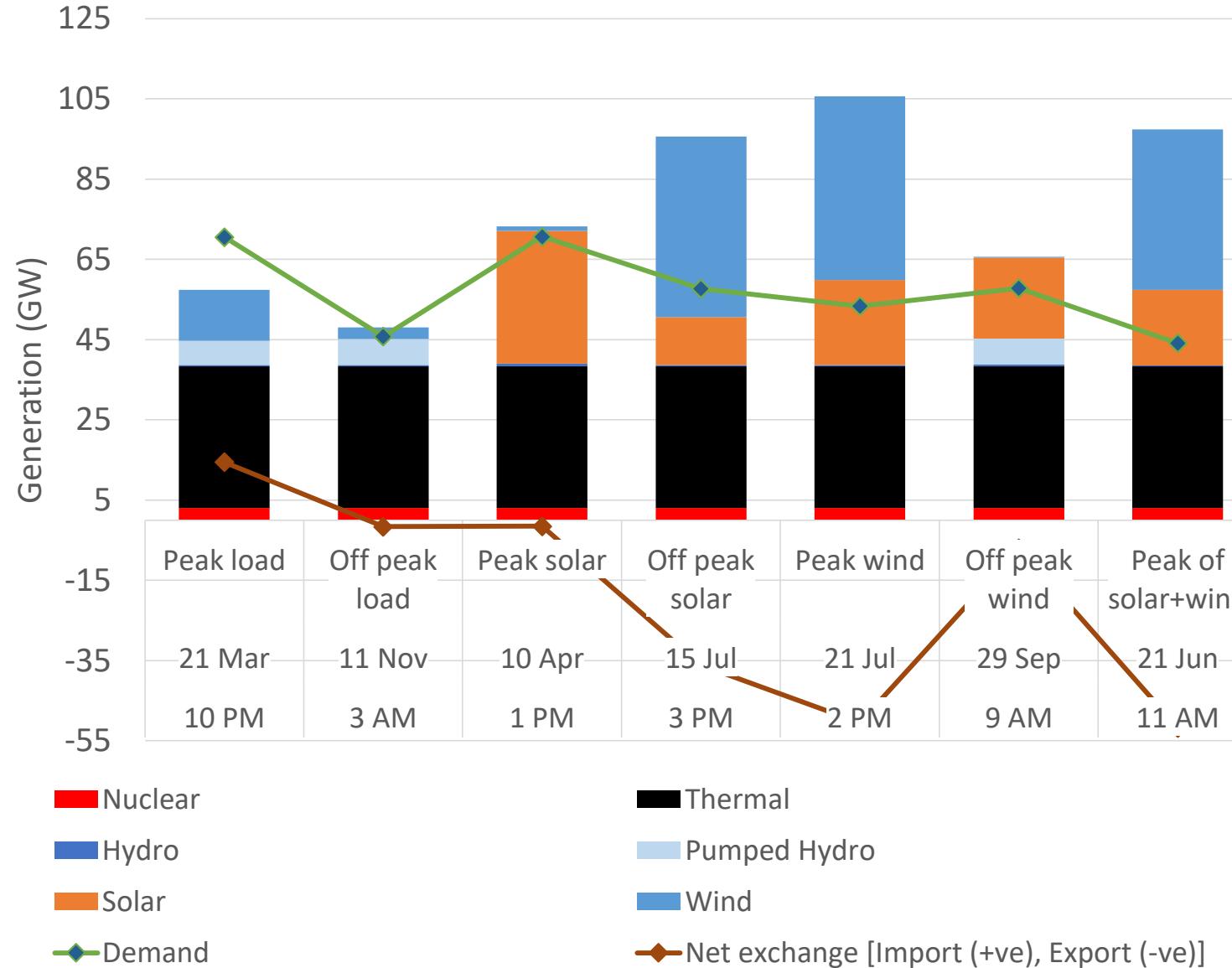
Wind Parcels

Parcel capacity  
>50 MW size



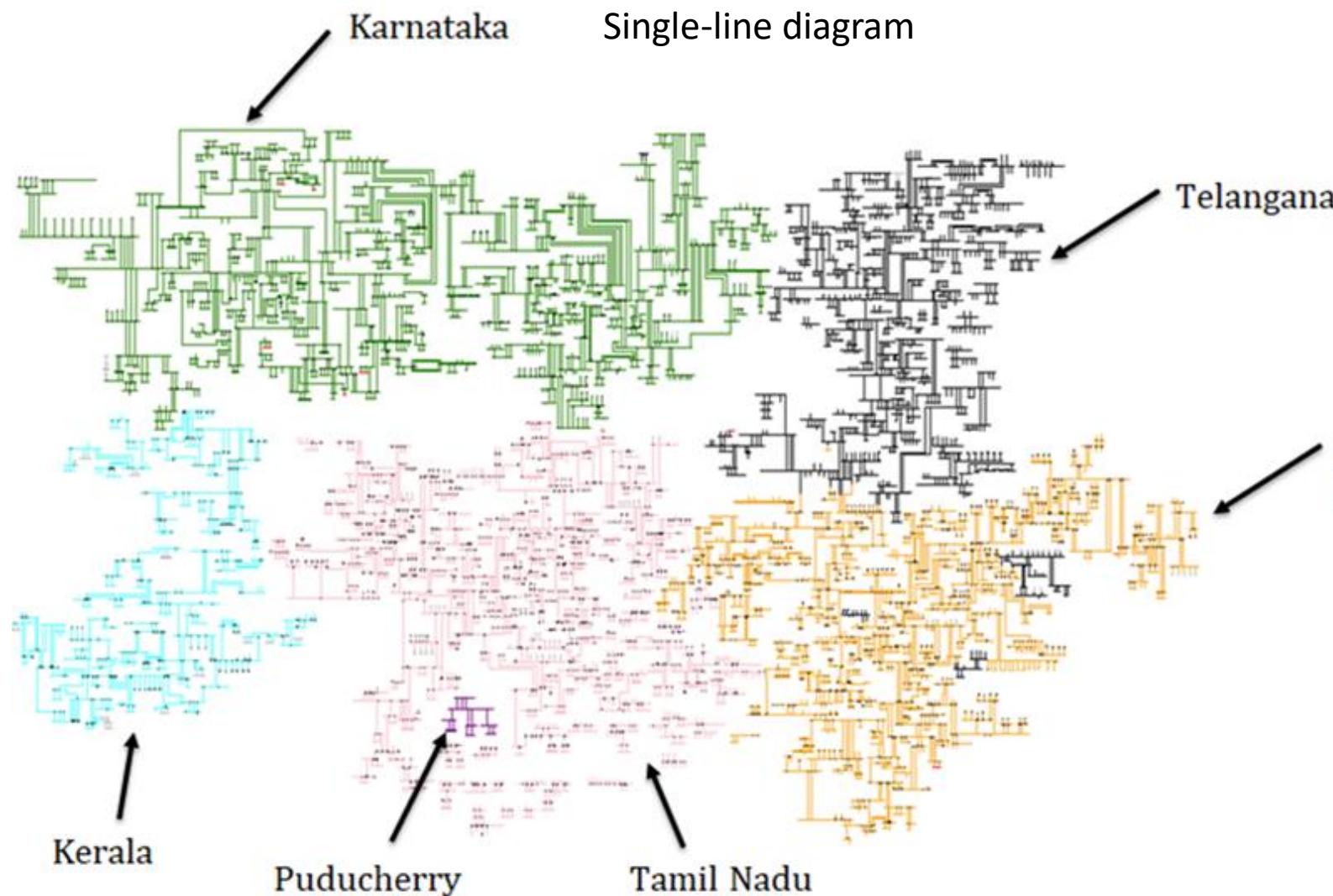
Solar Parcels

# Demand-supply Balance – 2030

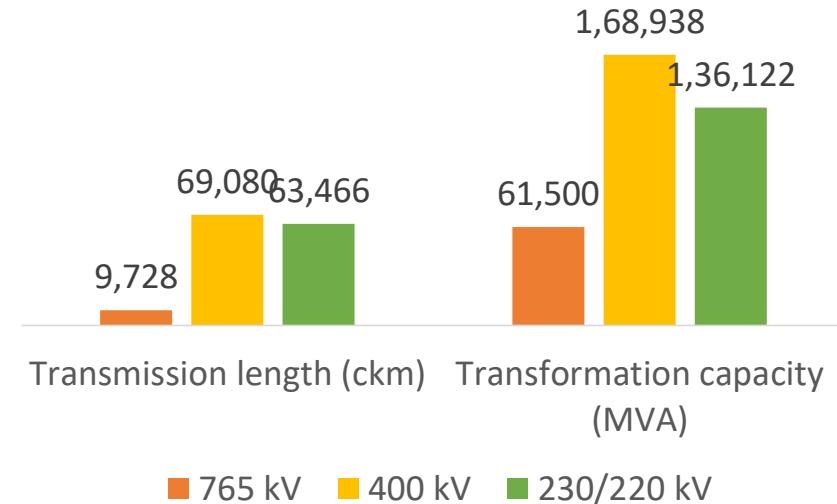


	Solar (GW)		Wind (GW)	
	Planned	CSTEP Proposed	Planned	CSTEP Proposed
AP	5.4	0.0	9.2	0.0
KA	5.7	8.0	4.9	5.5
KL	1.9	2.6	0.4	1.2
PD	0.9	0.0	0.2	0.0
TN	8.2	10.6	11.7	11.6
TS	4.5	13.2	3.6	0.0
All	26.5	34.4	30.1	18.3

# Transmission network



SR grid capacity - 2030

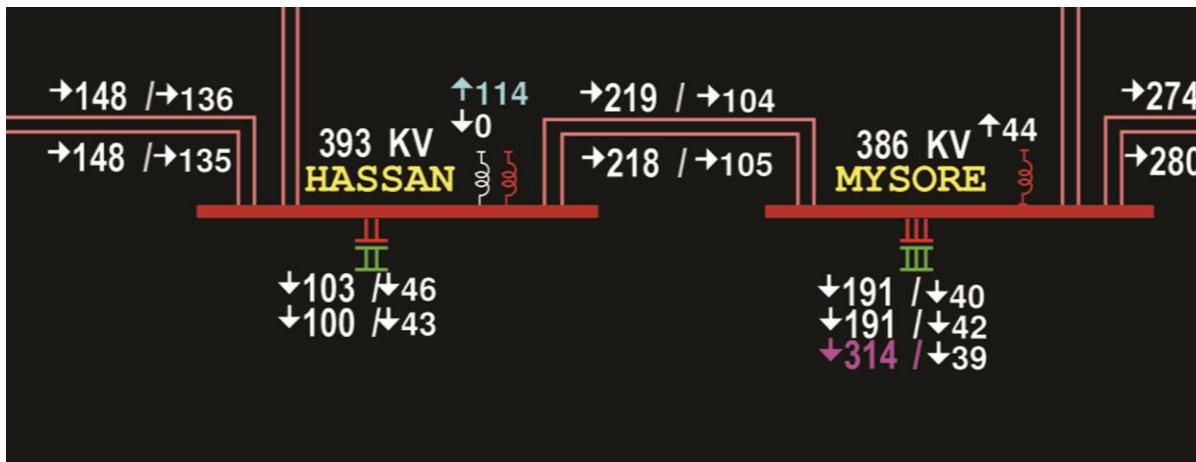


Number of substations

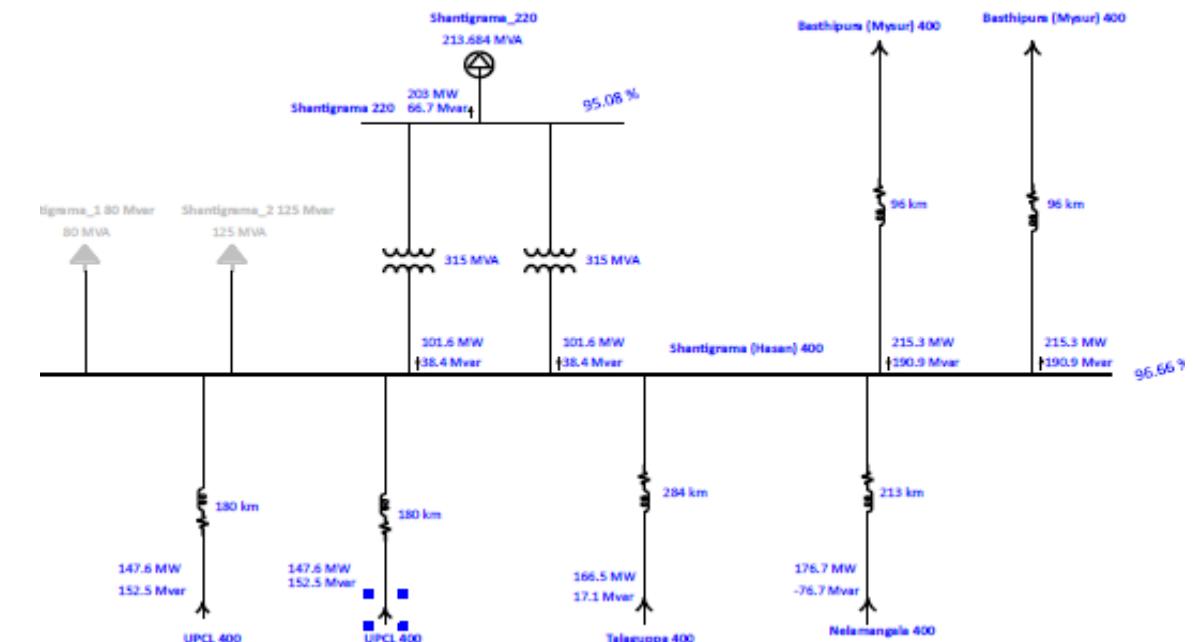
Voltage Level	KA	TN	TS	KL	AP	PD
765 kV	4	6	3	0	6	0
400 kV	34	56	28	11	41	1
220/230 kV	132	130	89	42	98	3

# Network Validation

SCADA snapshot



CSTEP grid model



# Network Strengthening

State	Overloaded Substations		Overloaded Transmission lines	
	400 kV & above	220/230 kV	400 kV & above	220/230 kV
Andhra Pradesh	-	23	-	6
Karnataka	1	24	1	3
Kerala	-	4	-	-
Tamilnadu	7	35	-	7
Telangana	-	16	-	2
Puduchery	-	-	-	-

Grid Element	Unit	Capacity addition proposed			Cost (INR Crore)
		765 kV	400 kV	220/230 kV	
Transmission line	ckm	130	3,276	1,858	6,303
Transformation capacity	MVA	3,000	1,200	17,620	2,557
<b>Total cost</b>					<b>8,860</b>

# Summary

- With current targets for 2030, SR will act as power exporter
- Inter-regional transmission corridor to other regions needs enhancement
- Significant intra-regional overloading seen
- RE must-run and role of storage need to be looked into

# Transmission Visualisation Portal

- Entire network model uploaded on CSTEP interactive portal
- Can be accessed at <http://darpan.cstep.in/highre/>
- Demo of the portal available at <https://www.youtube.com/watch?v=5eWRG-CaInI&feature=youtu.be>

