

**PRIME MINISTER AWARD (2013 – 14) WINNER**



**WORLD'S FIRST  
1 MW CANAL TOP SOLAR PV  
PROJECT**

A new direction to green and clean energy

**M PRASANNA KUMAR**  
Managing Director (GSECL)

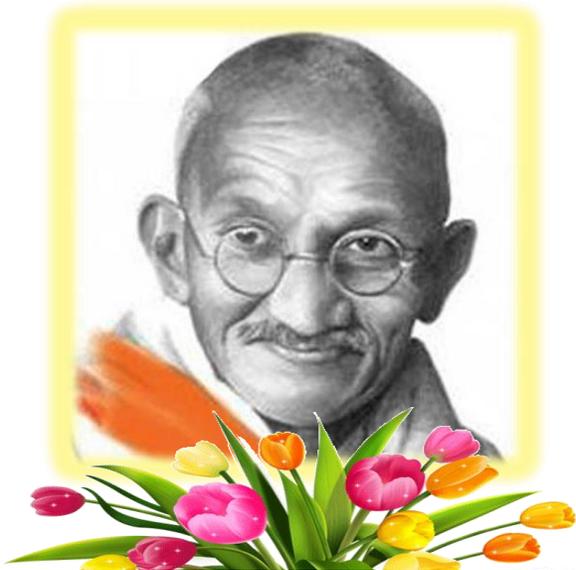
26<sup>TH</sup> AUGUST 2022



**GUJARAT STATE ELECTRICITY CORPORATION LTD**



# Generation at the Door Step, Energy Independence for the Society



**“A Society must be built in which every village has to be self-sustained and capable of managing its own affairs.”**

**Mahatma Gandhi (Father of the Nation)**

**“My idea is to create a rural-urban connect, where the soul is of a rural bent but with an urban touch”**

**Sh. Narendra Modi (Honorable Prime Minister of India)**



# PRESENTATION OUTLINE

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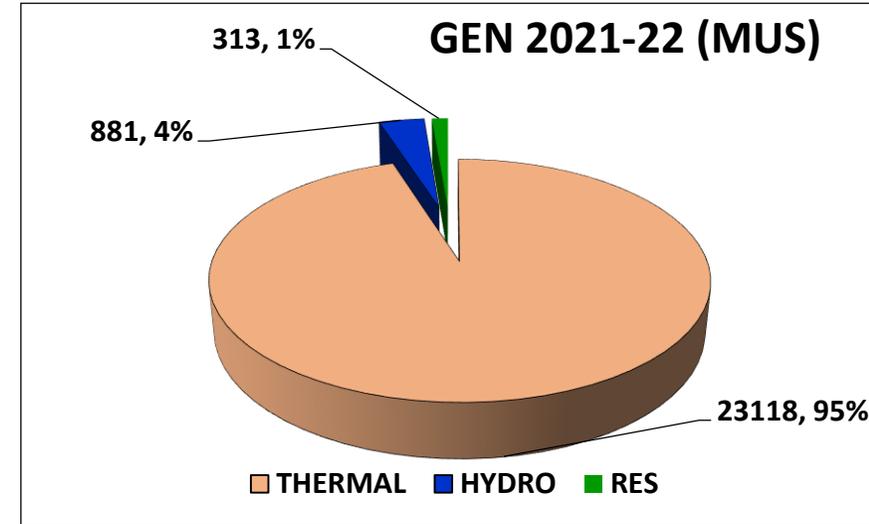
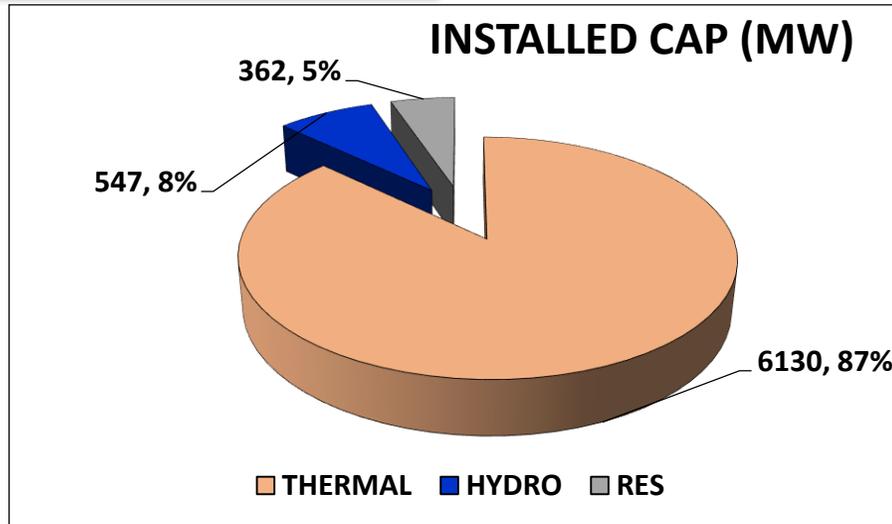
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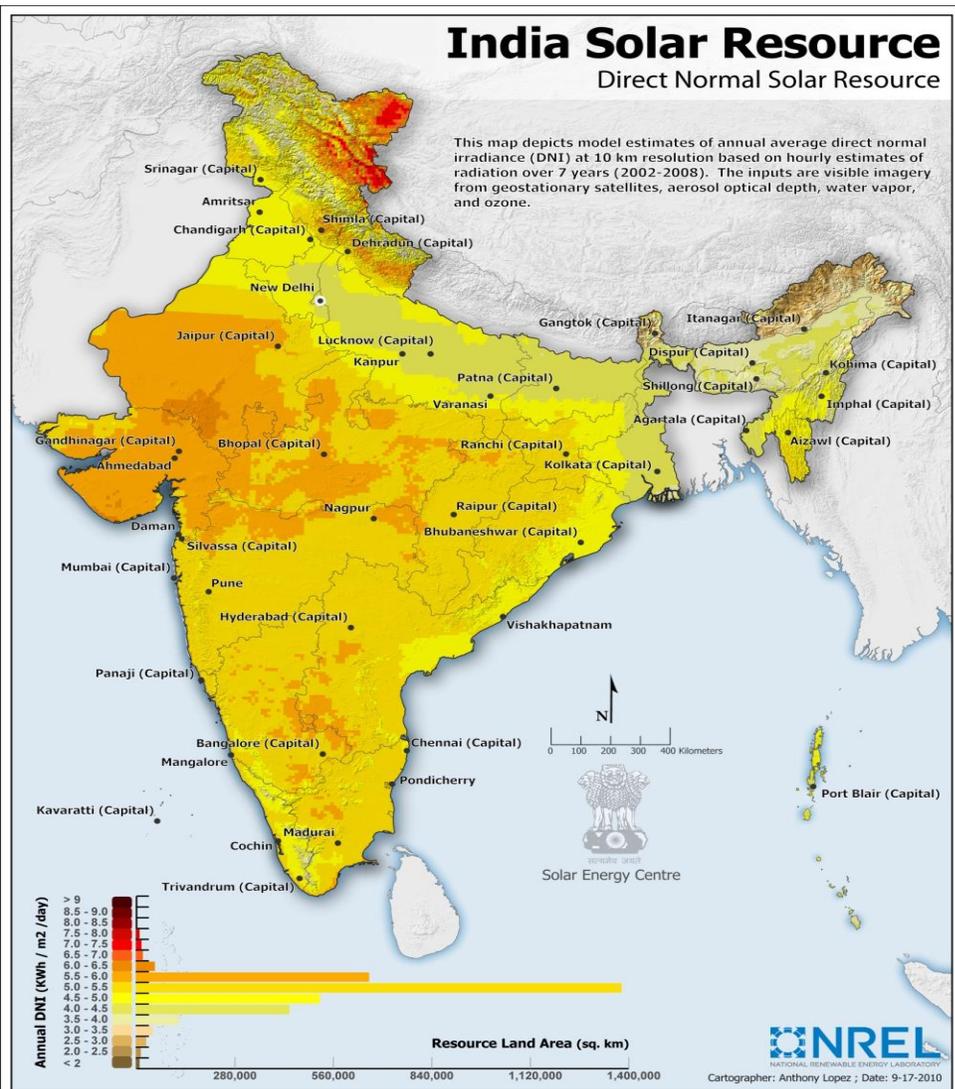
GSECL Growth Plan

## GSECL Profile



- GSECL –Power Generating company of Govt of Gujarat
- Company owns & operates Coal, Lignite, Gas, Hydro & RE (Solar & wind) Power Projects of different fuel/capacity/vintage
- Majority Share - Coal based – Capacity share (66 %) Gen Share (84%)
- The share of GSECL in State Generation is about **20 - 23%**
- 2 x 250 MW Lignite based Bhavnagar Energy Corp Ltd (BECL) merged with GSECL
- The annual turnover during last 02 years was @ **Rs 10000 Crores**

## INDIA'S SOLAR RESOURCE



- Among the various renewable energy resources, solar energy potential is the highest in the country.
- India blessed with huge solar potential
- The states that have the maximum insolation are **GUJARAT** and **RAJASTHAN**.
- In addition, the states of Tamil Nadu, Andhra Pradesh, Madhya Pradesh, Maharashtra and Chhattisgarh also enjoy good insolation levels.

A new direction to green and clean energy by combining



1. Clean and Green power,
2. Huge Carbon Emission reduction
3. Energy Security.
4. Power at doorstops - reduction in Transmission losses
5. Solar Panel cooling effect - Higher Efficiency as compared to ground solar power plants.
6. Land Conservation
7. Reduction in Evaporation loss
8. Reduced photosynthesis & Algae formation by blocking Radiation



- Hon'ble Chief Minister of Gujarat put forth a challenge to the Private Sector for establishing a Solar Power Plant on a Canal
- While the private sector appreciated the idea, However there was a reluctance to come forward.
- GSECL took up the initiative to establish this Pilot path-breaking Project.
- The contract agreement was signed on 9<sup>th</sup> September 2011, and the project was completed in 5½ months.
- Today, this concept is now proven, and replicable in entirety with all its advantages globally.



**ROLES & RESPONSIBILITIES**

**Project Proponent**      **Energy & Petrochemicals Dept. Government of Gujarat**



**Project Owner**      **Gujarat State Electricity Corporation Limited (GSECL)**



**Site (Canal) Owner**      **Sardar Sarovar Narmada Nigam Limited (SSNNL)**



**Power Purchaser**      **Uttar Gujarat Vij Company Limited (UGVCL)**



**Financial Assistance**      **National Bank for Agriculture and Rural Development (NABARD)**



**EPC Contractor**      **M/s Sun Edison Energy India Private Limited**



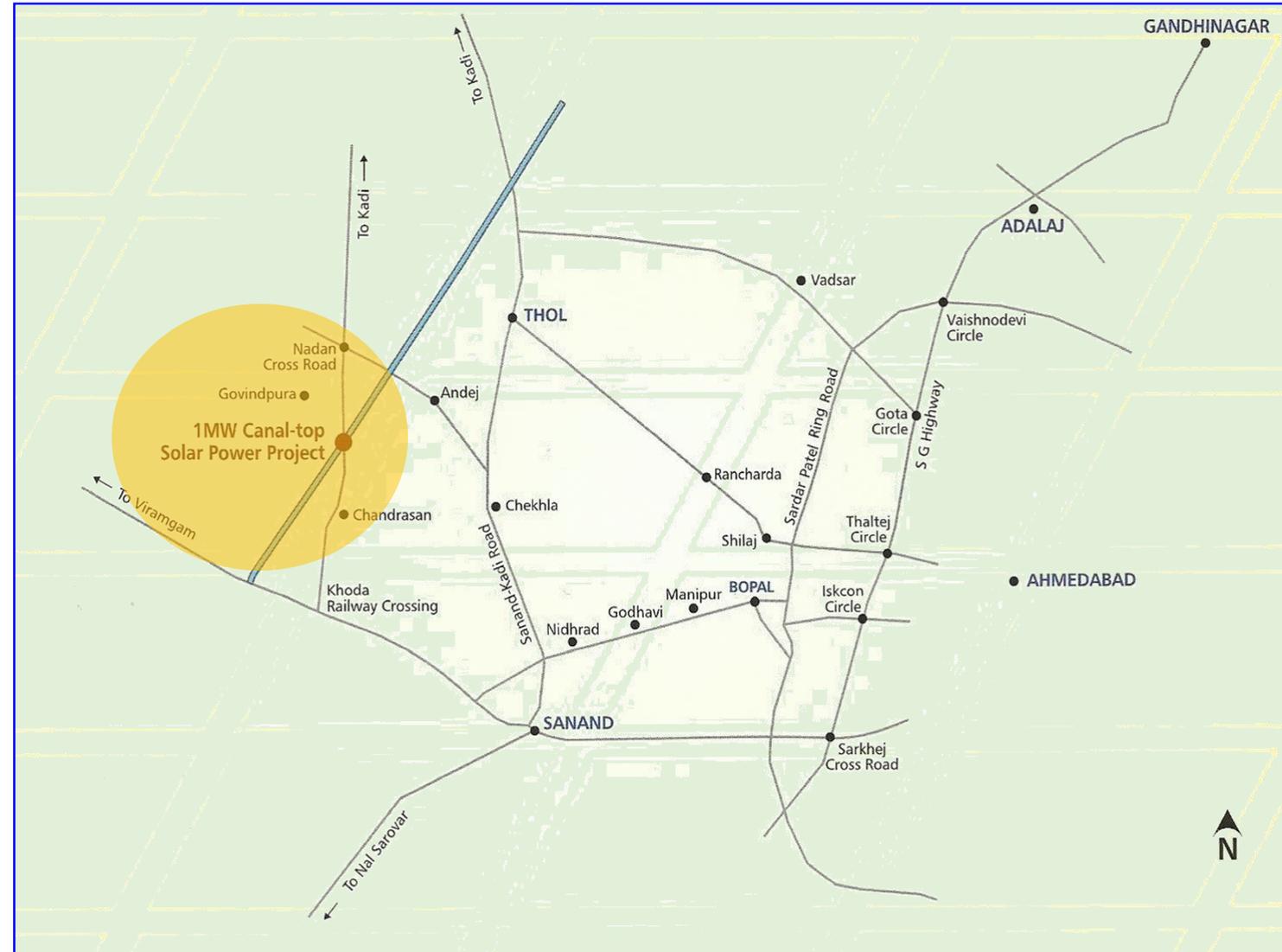
## PROJECT SITE:

### NARMADA BRANCH CANAL

Village : **CHANDRASAN**

Taluka : **KADI**

District : **MEHSANA**



## MAJOR IMPLEMENTATION CHALLENGES

- **Module Mounting Structure – Design & Development**
- **Need to Rope in Expert Manufactures for Rapid Implementation**
- **Lack of Prior Experience of Project Implementation and O&M**



**Installed Capacity****1 MWp****Canal Length used****750 Meters****Nos & Type of Module****Total 3616 Nos / Polycrystalline  
280Wp each  
8 Blocks each of 125 KWp,  
OEM - MEMC (USA)****Nos Of Inverter****4 (OEM – Power One, Italy)****Power Evacuation System****11 KV****Total Project Cost (Rs)****Rs. 17.73 Crores****Compact Sub Station (OEM)****ABB****Foundation Stone Date****Sept - 2011****COD****24.03.2012**

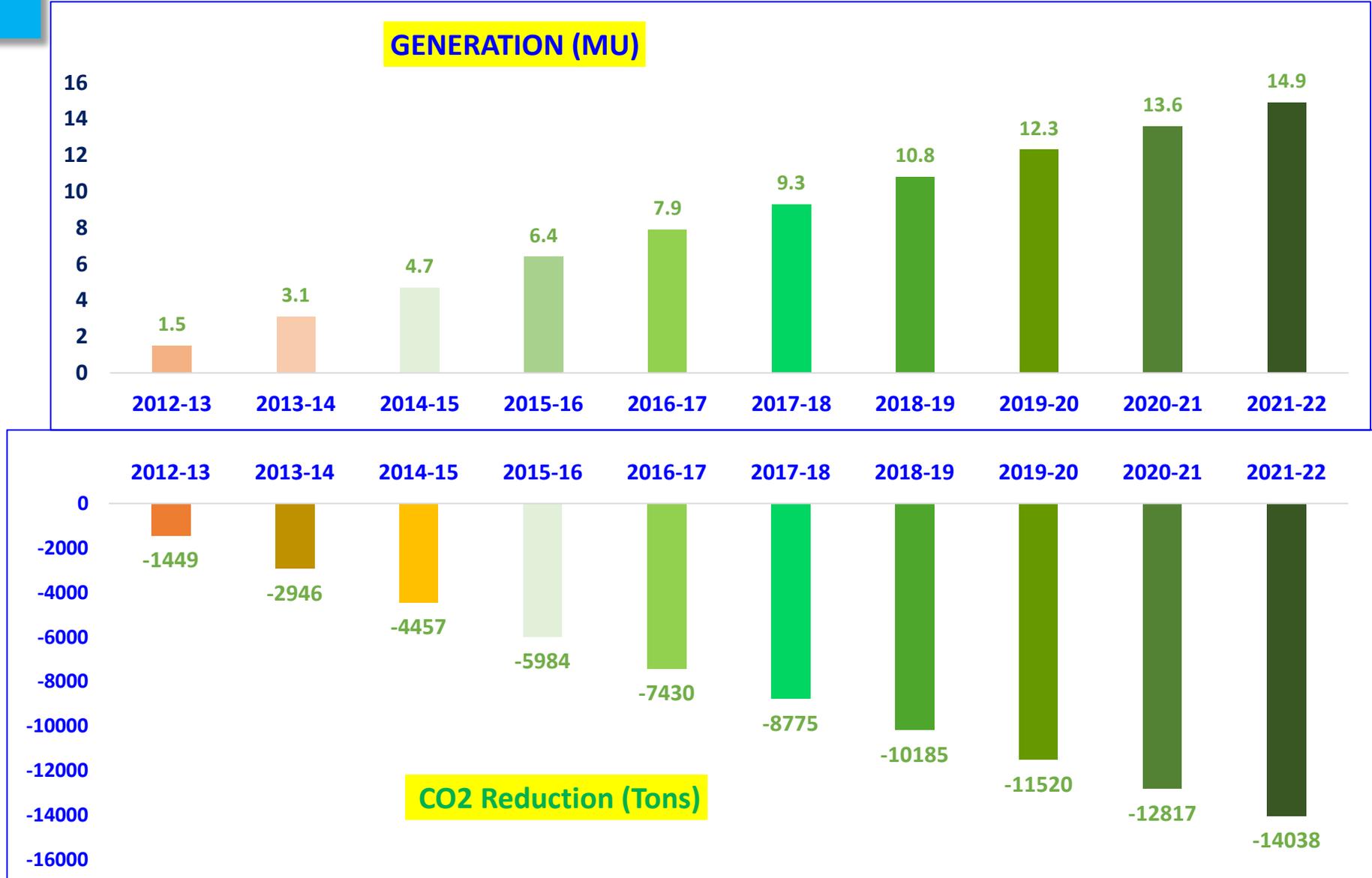


# PROJECT DEVELOPMENT

**PROJECT COMPLETION DATE 24<sup>th</sup> MARCH 2012**



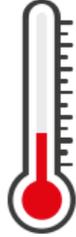
## PERFORMANCE





Ground Installation

50°C



40°C



2.5%



Gain (%)

**ENDURING BENEFITS –  
ENHANCED ENERGY GENERATION  
(COOLING EFFECT)**



Installation Over Water Body (Canal)

PROJECT INAUGURATION (24<sup>TH</sup> APRIL 2012)









PROJECT INAUGURATION (24<sup>TH</sup> APRIL 2012)

# VALUABLE INSIGHTS SIGNIFANCE & SUSTAINABILITY

- Green energy generation at the door step of farmers.
- Grid strengthening by generation at remote consumption Centres.
- Increased Reliability of power.
- Reduction of 12,80,000 Kg CO<sub>2</sub> per year
- Alternate development for the most precious and finite resource, Land.
- Saving of water by reduction in evaporation (Approx. 9 million Ltr per year).
- Reduction in silting of canal (from banks)
- Reduction in transmission and distribution losses.
- Sustainable alternative for densely populated countries.
- Retardation in growth of algae
- Total Generation of 1.49 crores unit since inception (till FY 2022) & performing satisfactorily

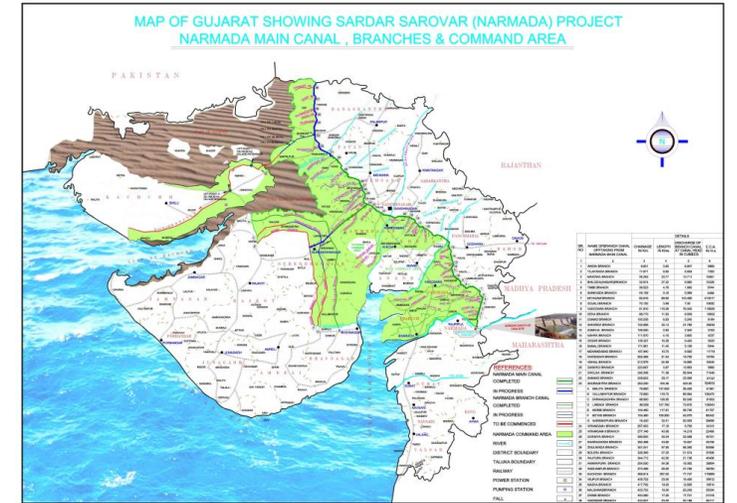


# AWARDS RECEIVED

<b>NAME OF AWARD</b>	<b>CATEGORY</b>
<b>Prime Minister's Award -2013-14</b>	<b>For Excellence in public Administration - For Outstanding Initiative</b>
<b>Global Solar EPC Award -2014</b>	<b>Finalist in the category of Project Innovation: Utility Scale for outstanding Contribution towards development of Solar Energy.</b>
<b>7<sup>th</sup> India Power Award - 2014</b>	<b>For valued Contribution to Energy Sector</b>
<b>India Tech Excellence Award - 2012</b>	<b>For Green Power initiative</b>

# REPLICATION POTENTIAL

- 458 km of open Main Canal in Gujarat alone!
- Including sub-branches:
  - 20,000 km already built
  - Final aim: 85,000 km
- Canals in any direction can be used: East-West, North-South, etc.
- No restriction in water flow.



# NATIONAL POLICY FOR CANAL TOP & CANAL BANK SOLAR PROJECTS

- After success of 1 MW Canal top PV project at Sanand and 10 MW at Vadodara in Gujarat, Ministry of New and Renewable Energy (MNRE), Government of India has initiated Canal-top Solar Policy on 5<sup>th</sup> Dec. 2014.
- As per Canal-top Solar Policy, total 100 MW solar PV projects shall be installed in 12<sup>th</sup> plan period (Year 2014-15) with an estimated cost of USD 150.72 Million (INR 975 Cr.) with central financial assistance of up to USD 35.24 Million (INR 228 Cr.).
- Out of 100 MW projects, 50 MW shall be on canal top and balance 50 MW on canal bank.
- Central financial assistance is available up to USD 0.46 Million (INR 3 Cr.)/ MW for canal top and USD 0.23 Million (INR 1.5 Cr.)/MW.

# CANAL TOP & CANAL BANK PROJECTS REPLICATED, AFTER SUCCESS OF 1 MW CHANDRASAN PROJECT

NO	STATE	DISTT	CAP (MW)	TYPE
1	ANDHRA PRADESH	WEST GODAVARI	1.0	CANAL TOP
2			5.0	CANAL BANK
3	WEST BENGAL	UTTAR DINAJPUR	10.0	CANAL BANK
4	UTTAR PRADESH	LALIT PUR	5.9	CANAL TOP
5	KERELA	KANNUR	3.0	CANAL TOP
6	PUNJAB	PATIALA	7.5	CANAL TOP
7		SANGRUR	10.0	CANAL TOP
8		LUDHIANA	2.5	CANAL TOP
9	KARNATAKA	BAGALKOT	10.0	CANAL TOP
10	GUJARAT	VADODARA	35.0	CANAL TOP
11	UTTRAKHAND	DEHRADHUN	19.0	CANAL BANK
12	JHARKHAND	RANCHI	2.0	CANAL TOP
13	RAJASTHAN	HANUMANGARH	2.0	CANAL TOP
14	MAHARASHTRA	JALGAON	7.5	CANAL TOP
	<b>TOTAL</b>		<b>120.4</b>	

# GSECL GROWTH PLAN



- **Aggressive Renewable Capacity Addition – Planning to add about 7500 MW RE Capacity in next 05 years**
  - - Major Share of 3325 MW at Khavda Hybrid RE Park
  - - Govt Wasteland Solar PV Projects – 2500 MW
  - - Floating Solar Development – 500 MW +
  - - Wind Energy Development – 200 MW +
  - First GENCO to award Solar with battery storage
  - - Green Hydrogen Projects Development
- **R & M of Existing Conventional Coal Based Plant - role as Balancing Power Provider likely to increase in future**
  - - Energy Efficiency R & M for Efficiency Improvement
  - - Flexible Operation (40%) for increasing RE Integration

THANK YOU

