



Renewable Energy Sector Profile



Overview - India



4th largest installed capacity of wind power in the world



6th largest installed capacity of solar power in the world



Ranked 2nd in the "Renewable Energy Country Attractiveness Index 2017"



The International Energy Agency's World Energy Outlook projects a growth of renewable energy supply to 4,550 GW in 2040 on a global basis



About 4.96 million household size biogas plants have been installed in India



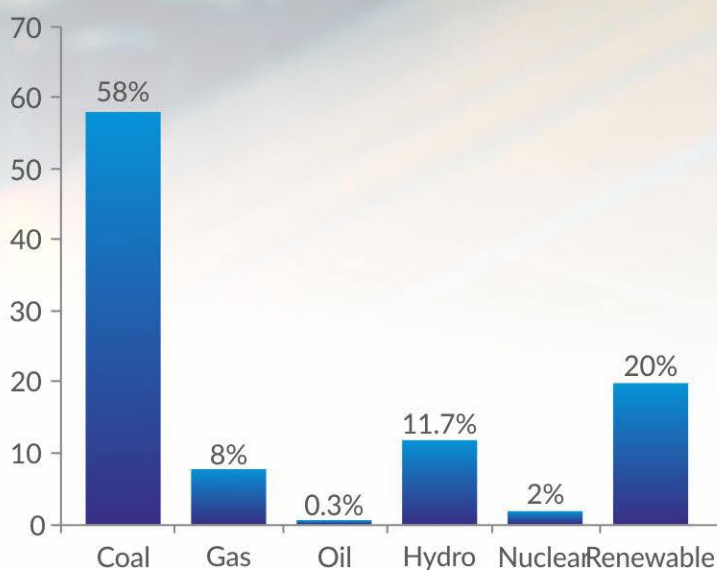
India has a record 11 GW of combined wind and solar capacity

Source: Invest in India

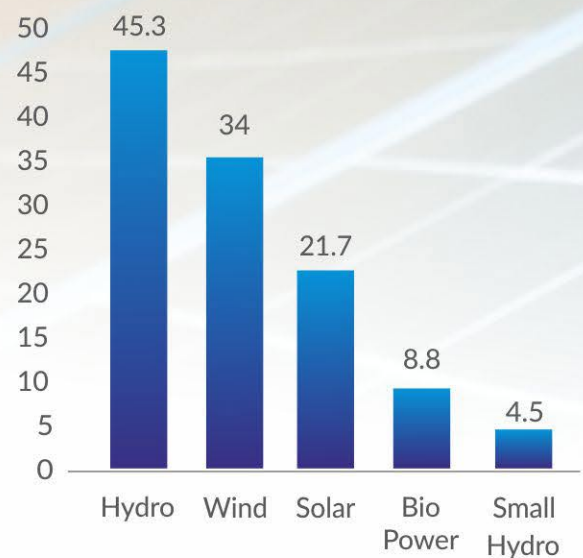
Renewable Energy - India Scenario (1/2)

As on 31st March 2018, total installed power capacity from renewable energy sources (excluding Hydro Power) was 114.32 GW, accounting for ~20% of the total installed power capacity

Break - up of installed power generation capacity in 2018

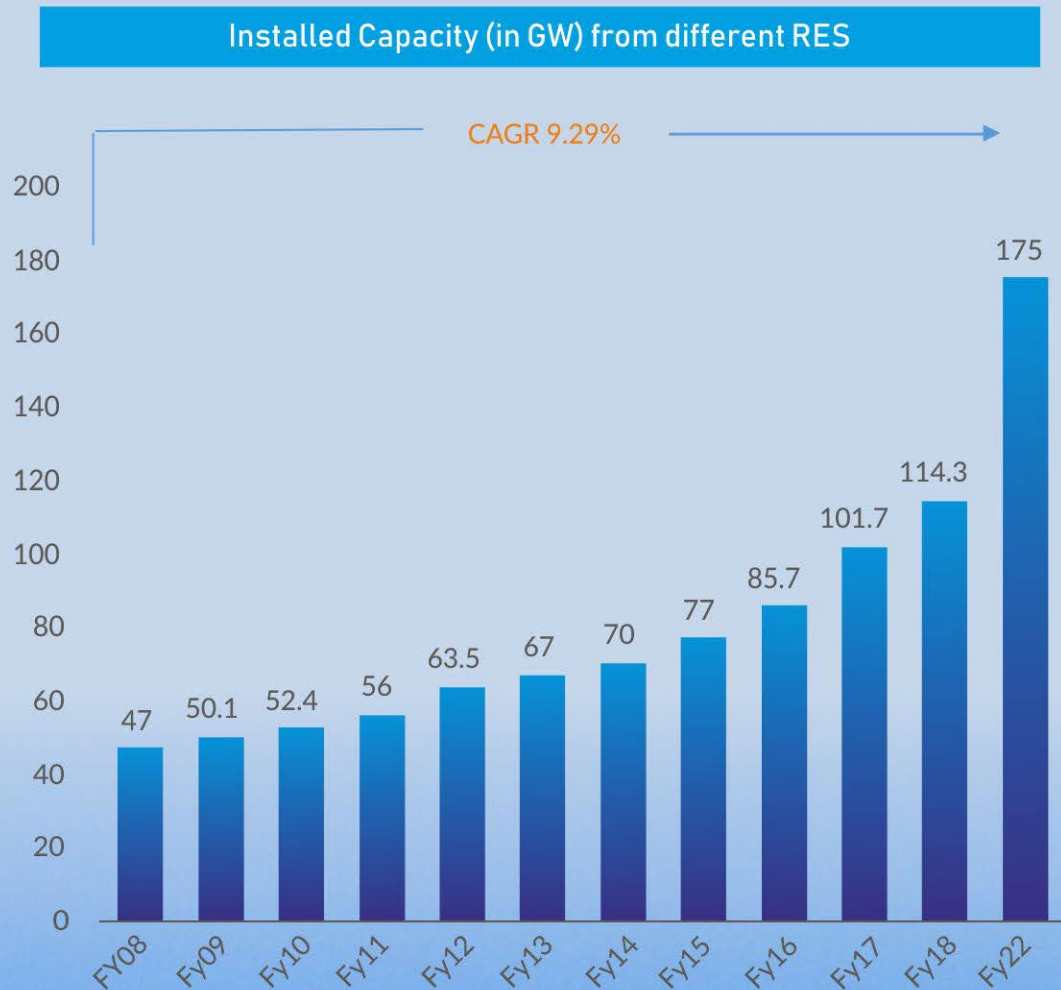


Installed capacity of renewable energy (in GW) in 2018



Source: Ministry of Power; Ministry of New and Renewable Energy, Government of India

Renewable Energy - India Scenario (2/2)



Source: India Brand equity Foundation

Growth Drivers

RENEWABLE ENERGY FINANCING: IREDA to raise bonds worth USD 366.2 million

PROPOSED SOLAR CITIES: Power demand is met only by Solar energy

GOVERNMENT COMMITMENTS: 24*7 eco friendly & affordable Power

Industry Trends in India



100 Smart City projects

Provision for rooftop Solar & 10% renewable energy mandatory



Upgradation & Modernization

Upgradation of water mills & micro hydro projects



Solar Pumps

100,000 Solar pumps required for Agriculture



Green Energy Corridor

Green energy corridor is being set up



New Solar Parks Sanctioned

34 Solar parks of Capacity 20,000MW



DEMU Train

Solar powered Local trains are launched in India

Source: Invest in India, Government of India

Advantage India

Robust Demand

- Low per capita energy and electricity consumption
- The electricity consumption is projected to reach 15,280 Twh in 2040 from the 4926 Twh in 2012

Increasing Investments

- Non - conventional energy received FDI inflow of USD 6.39 billion between April 2000 and March 2018
- With government's ambitious green energy targets, the sector has become quite attractive for both foreign and domestic investors

Competitive Advantage

- 300 days of sunshine is an enabler to harness the solar power available. Hydro power potential is being explored in the north - eastern states of the country
- Setup and financing costs for solar parks have come down significantly in the past two years

Source: India Brand Equity Foundation

Major Investors



This list is Indicative

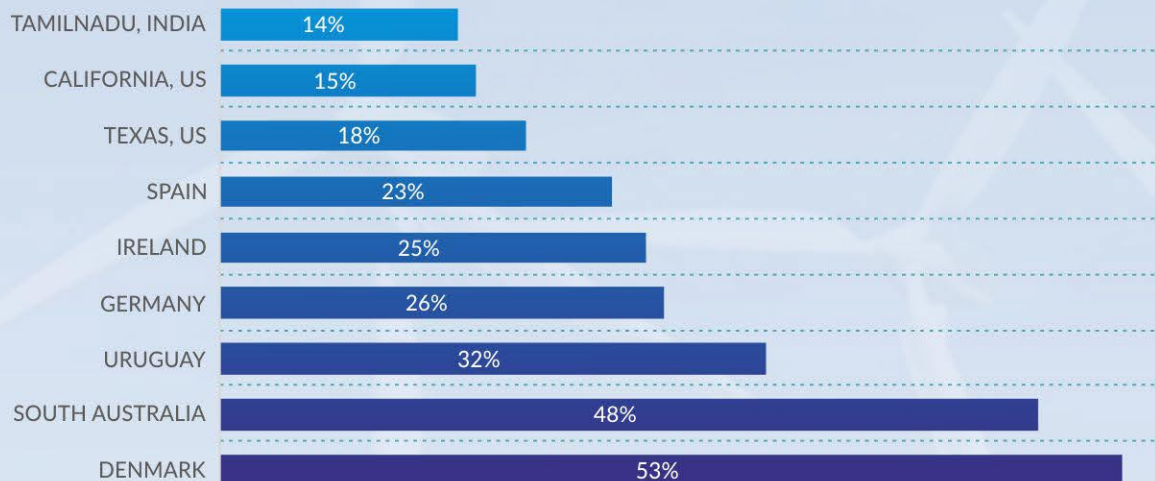
Tamil Nadu Renewable Energy Sector Overview



Overview (1/2)

- Leader in Renewable energy sector among all other states with a total installed capacity of 11,113MW as on Mar 2018
- Ranks 9th globally in terms of Renewable Power Output

Tn Is One Among The Top Nine Markets Globally To Have Large Share Of Renewable Power Generation

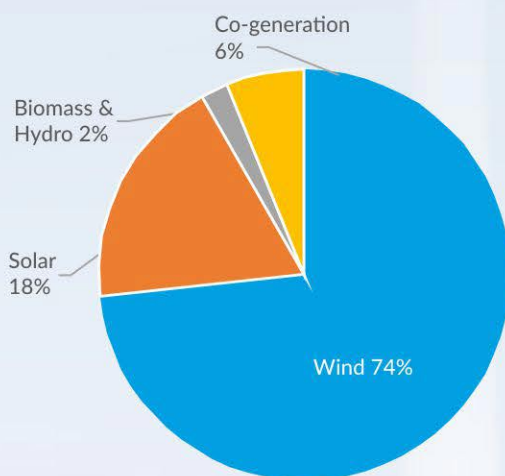


Due to extensive use of Renewable energy, TN has reduced about 5,406 Million tonnes of Carbon emission (by reducing the use of hard coal)

Source : Investing in Tamilnadu, TOI

Overview (2/2)

Total Renewable Energy Capacity of TN Stands at 11,112.71 MW



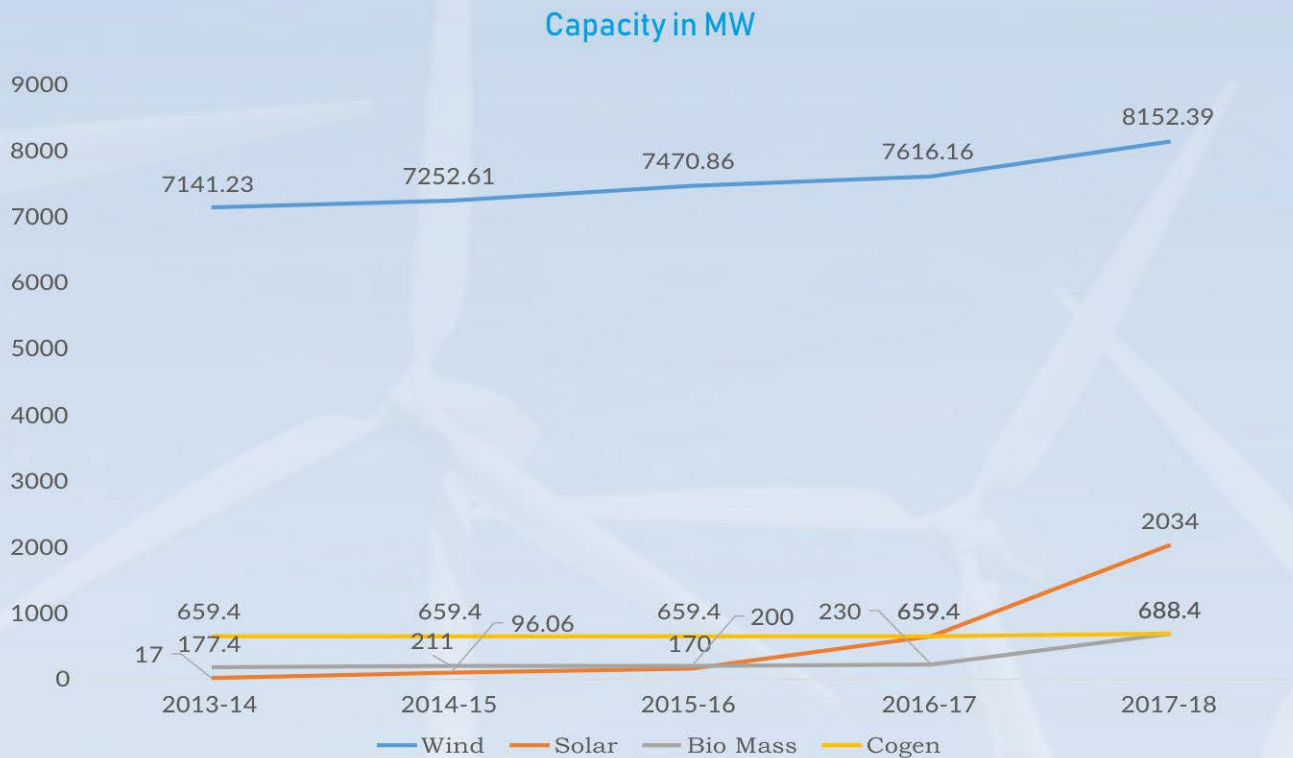
RENEWABLE ENERGY SOURCES INSTALLED CAPACITY

| S.No | Renewable energy Sources | Capacity in MW |
|-------|--------------------------|----------------|
| 1 | Wind | 8,152.39 |
| 2 | Solar | 2,034.25 |
| 3 | Biomass - Combustion | 237.67 |
| 4 | Co - Generation | 688.40 |
| Total | | 11,112.71 |

Tamil Nadu Vision 2023 envisages an investment of US\$ 39.6 billion to expand generation capacity by 30,000 MW

Source : India Brand equity Foundation

Year on Year consistent growth in Renewable energy Capacity



Source: Energy Policy Note 2018 - 19

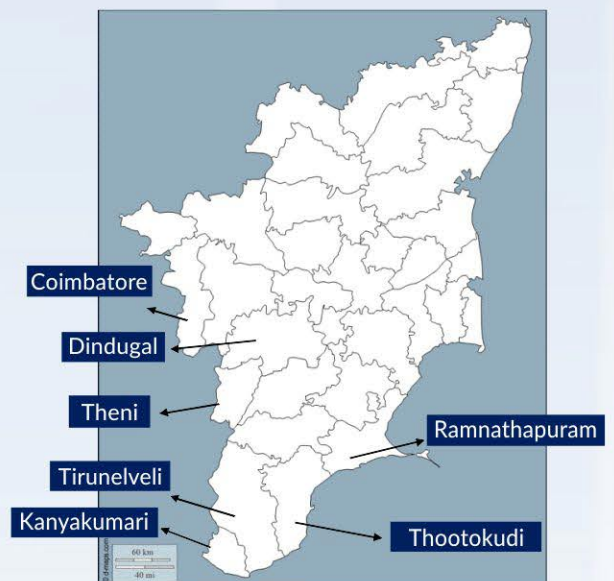
Wind Power in Tamil Nadu

The State has harnessed around 13,000 million units of wind energy during the year 2017 - 18

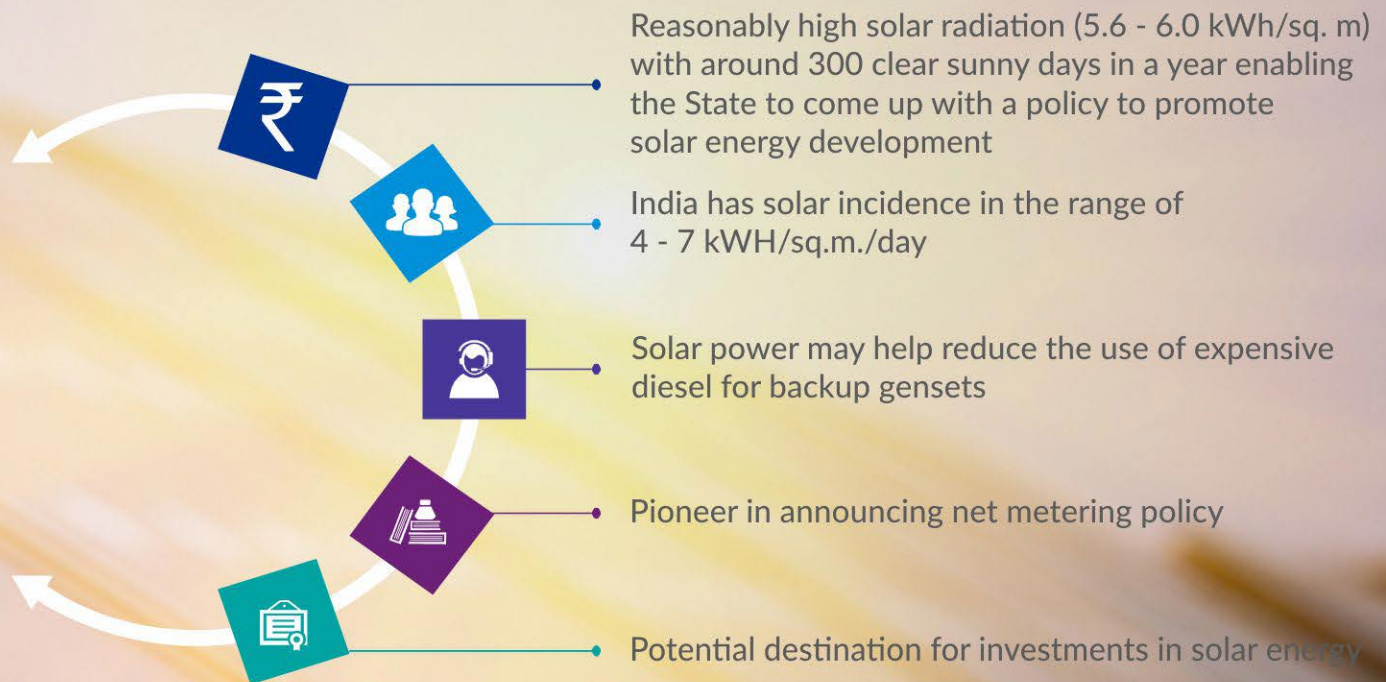
Tamil Nadu is endowed with four prominent passes having high wind potential, due to the tunneling effect during south West Monsoon

| S.No | Districts | Annual avg. wind Speed (Km/Hr) |
|------|---|--------------------------------|
| 1 | Palghat Pass, Coimbatore, Erode | 18-22 |
| 2 | Shencottah Pass, Tirunelveli, Tuticorin | 18-22 |
| 3 | Aralvoimozhi Pass, Kanyakumari | 19-25 |
| 4 | Kambam Pass, Dindigul district | 19-25 |

Tamil Nadu has an installed capacity of 8152 MW as on MAR 2018



Solar energy (1/2)



Source : India Brand equity Foundation, TEDA, Energy Policy Note 2018

Solar energy (2/2)

- The state's total solar installed capacity is 2034 MW, as on Mar 2018
- Most number of solar projects with a capacity of 2,000 MW (2018)

SOLAR POLICY & SCHEMES IN TN

Tamil Nadu Solar Energy Policy 2012

Net metering, Exemption of payment of electricity tax, Tax Concessions, Exemption from demand cut

Chief Minister's Solar Powered Green House Scheme:

3 lakh houses were built with solar powered lighting systems over a period of 5 years for benefit of poor in rural areas

Energization of Street Lights through Solar Power:

The State Govt. has decided to energise 1 lakh street lights in villages over a period of 5 years

Source : TEDA, Energy Policy Note 2018

Cogen Raw material Availability in Tamilnadu



The raw material for power generation using cogeneration plants is bagasse which is generated from sugar factories



3rd largest sugar producer in India with 43 factories and it accounts for about 10% of the total production



There are 29 plants in the State that together account for the capacity of 659 MW of cogen power capacity



This capacity is spread across the State in the delta region, Districts of Erode, Coimbatore, Tirunelveli etc.

Upcoming Co-generation Projects

Planned for establishment of 12 Co - Generation Plants with as estimated cost of INR 1241.15 crore

Co - Generation plants have a total capacity of 183 MW

Source : Energy Policy Note 2018

TEDA - Accolades

Installed Solar roof tops for a cumulative capacity of 24.60 MW

Utility Power Plants for a cumulative capacity of 312 MW

Declared as the Procurement agency for renewable energy



2nd highest number of solar home lighting systems across the country



3rd Highest number of Solar Power packs across the country



ENERTIA Award For being top investment and Infra excellent State in Sustainable energy & Power



Best Nodal agency Award For the year 2016

Source : Energy Policy Note 2018

Major Players



Investment Opportunities



Investment Opportunities (1/2)

#1

Tidal Projects at
Commercial Scale

#2

Development of
Solar PV
manufacturing
Capabilities

#3

Construction of
Solar and
Wind parks in
large Scales

#4

Offshore Wind
energy projects

#5

Development of
Wind - Solar Hybrid
installations
and Biomass
projects

Investment Opportunities (2/2)

SOLAR ENERGY

- Manufacturing core products - Ingots & Wafers
- Manufacturing Cells and Modules
- Manufacturing BoS Utility Grid
- Installation & Support
- Training, consulting and IT
- Power Plant Developer

WIND ENERGY

- Machinery Suppliers
- Original Equipment Manufacturing
- Component Manufacturing
- Trading Opportunities
- IT & Training and Support Services
- Power Plant Developer

BIOMASS ENERGY

- Feedstock producers & processors
- Biofuel companies
- Equipment Manufacturers & Technology suppliers
- Transport services
- Power Producers

Government Support



Key initiatives by the Government of Tamil Nadu

| | |
|--|---|
| Hon'ble CM's Solar Powered Green House Scheme | Under this Scheme, 300,000 houses were constructed during the period of 2011 - 16 |
| Cm's Solar Rooftop Capital Incentive Scheme | A capital Subsidy of INR 20,000 per kW of installation over and above the Government of India's 30% subsidy |
| Bio Energy | The main objective is to optimally use the vast Bio mass resource for Power through Biomass Gasifier and Plants |
| Wind Solar Hybrid System | <ul style="list-style-type: none">▪ A way to offset the Seasonality of the power Sources▪ The cost of this Hybrid is 40% - 50% cheaper than pure Solar Systems |
| Wind Energy | The State has the installed wind capacity of 8152.39 MW which is approximately 36% of the country's total installed Wind Capacity |

Source : TEDA, Energy Policy Note 2018



Planned Infrastructure facilities

50 Mw Solar park
in Kayathur in
250 Acres of land

Wind Solar Hybrid
Power Plant Establishing
a 10MW Grid Connection
to the plant

Solar Irrigation
Pumps to farmers

Establishment
of 500MW Solar Park

Solar Village in
Villupuram District

Source : Energy Policy Note 2018



Existing Renewable Energy Systems

1

10 Kw Solar Power System at a Child Hospital



2

10 Kw Solar Power System at a Corporation School in Chennai



3

10 Kw Solar Power System each at four colleges in Chennai



4

330 Kw at BDO/ Panchayat union offices in various districts



5

69 Kw Solar Power Systems at buildings of transport departments in various districts



6

330 Kw at a prison complex





Government Support to Investors Industrial Policy 2014

| Category | Investment Range (INR crores) (Area wise) | | |
|---------------|--|--|--|
| | A Districts (Chennai, Tiruvallur, Kancheepuram) | B Districts (Other than A & C) | C Districts (Southern districts) |
| Mega Projects | Above 500 - 1500 and creating an employment of 300 in 3 years | Above 350 - 1000 and creating an employment of 200 in 4 years | Above 200 - 500 and creating an employment of 100 in 4 years |
| Super Mega A | Above 1500 - 3000 and creating an employment of 400 in 5 years | Above 1000 - 2000 and creating an employment of 300 in 5 years | Above 500 - 1500 and creating an employment of 250 in 5 years |
| Super Mega B | Above 3000 - 5000 and creating an employment of 600 in 6 years | Above 2000 - 4000 and creating an employment of 400 in 6 years | Above 1500 - 3000 and creating an employment of 350 in 6 years |
| Ultra Mega | Above 5000 and creating an employment of 700 in 7 years | Above 4000 and creating an employment of 600 in 7 years | Above 3000 and creating an employment of 500 in 7 years |

"Southern Districts" means the Districts of Theni, Dindigul, Madurai, Sivagangai, Ramanathapuram, Virudhunagar, Tirunelveli, Thoothukudi and Kanniyakumari

Standard Incentives

Capital Subsidy

- Subsidy ranging from INR 30 Lakhs to INR 2.25 crores
- 50% additional subsidy for industries set up in SIPCOT Industrial Parks (other than Southern districts)
- For investments made in B & C category districts, an additional 10% & 25% subsidy for industries located outside the SIPCOT Industrial Parks

Stamp duty concession

- 50% to industries located in SIPCOT parks in A & B districts and 100% in the case of Southern Districts

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Environmental Promotion Infrastructure Subsidy

- Subsidy of INR 30 lakhs or 25% of Capital cost whichever is less
- Apart from the above, Industries adopting Zero Effluent or Waste Water Discharge, Clean Development Mechanism and Emissions Trading Mechanism will be given a higher amount of subsidy

Electricity tax exemption

- Period of exemption depends upon the quantum of investment and the employment criteria prescribed

Incentives for Industrial Promotion in Southern Districts

- Higher fiscal benefits
- SIPCOT will allot lands at 50% of the cost in its existing and new industrial parks
- SIPCOT will acquire & allot Land for new ventures in case SIPCOT Industrial parks are not available
- 50% exemption from Stamp Duty for land privately purchased by investors;
100% exemption in case of units in SIPCOT Industrial Parks
- 25% additional back ended capital subsidy; linked to investment and employment in the case of industries located outside SIPCOT Industrial Parks

Investment Promotion Facilitators – KeyContacts

Principal Secretary to Government, Energy Department

Secretariat, Chennai - 600009

Phone: 91-44-25671496

Website: www.tneb.in

TN Industrial Guidance and Export Promotion Bureau

19-A, Rukmini Lakshmipathy Road,
Egmore, Chennai-600 008

Phone: 91-44-2855 3118

Website: www.investingintamilnadu.com

Tamil Nadu Energy Development Agency (TEDA)

E.V.K Sampath Maaligai, 5th floor,
No.68, College Road, Nungambakkam,
Chennai-600 006

Phone: 91-44-28224830, 28236592

E-mail: info@teda.in

Website: www.teda.in

Tamil Nadu Industrial Development Corporation Limited (TIDCO)

19-A, Rukmini Lakshmipathy Road,
Egmore, Chennai-600 008

Phone: 91-44-2855 4421

E-mail: cmd.tidco@nic.in

Website: www.tidco.com

State Industries Promotion Corporation of Tamil Nadu (SIPCOT)

19-A, Rukmini Lakshmipathy Road,
Egmore, Chennai-600 008

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E-mail: sipcot@md3.vsnl.net.in

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Tamil Nadu Urban Infrastructure Financial Services Ltd.

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Raja Muthaipuram, Ramakrishna Nagar.

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