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Sustainable Energy Transformation Tamil Nadu (SET)

SET aims to facilitate higher clean energy deployment in the State by working with stakeholders in order to find sustainable and equitable solutions. SET is a collaborative initiative by Auroville Consulting (AVC), Citizen Consumer and civic Action Group (CAG), the World Resources Institute India (WRI).

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Clean Energy Access for Tamil Nadu's MSMEs

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Purpose

This paper highlights the importance of clean energy access for Tamil Nadu's MSME sector and lists some regulatory interventions that are required.

Key messages

- (i) Energy accounted for 92% of Tamil Nadu's CO2 emissions in 2018.
- (ii) Public electricity generation is responsible for 56% or energy related emissions.
- (iii) In 2020, 75% of the state's electricity demand was sourced from coal.
- (iv) The industrial sector accounts for ~ 34% of the state's electricity demand.
- (v) As per TNERC tariff order (Order No.8 of 2021) 85% of electricity in FY 2026-27 is expected to come from thermal power.
- (vi) Electricity demand will increase by 20%, of which 88% will be sourced from thermal generation, mostly from TANGEDO-owned coal plants.

- (vii) MSMEs, especially export-oriented enterprises, will have to find alternative electricity sourcing options that are cost effective and carbon neutral to stay competitive.
- (viii) This will require a clear, fair and predictable regulatory framework for rooftop solar and Green Open Access.

- Textiles
- Ceramics
- Basic metals (CBAM 2021)

Other countries or regions that consider introducing similar mechanisms include: Canada, United Kingdom, United States, Japan and South Korea.

Background

Global: In the face of the global climate crisis there is an increasing commitment to decarbonise the global economy. This is highlighted by a shift towards renewable energy sources, the energy transition. Energy transition is the process of reducing reliance on fossil fuel across the economy and moving toward greater use of cleaner energy sources such as renewables.

Today, about 20 percent of the energy consumed by industries is electricity (McKinsey 2020). As the prices of renewable energy, in particular wind and solar, are the least cost energy available, industries will benefit from cost-savings and GHG-emission-reduction by sourcing their electrical energy demand from renewable energy. The financial and environmental benefits of using clean electricity instead of fossil fuels for commercial and industrial enterprises are increasing. In parallel, countries, including those in the European Union, are introducing legislative measures to accelerate the decarbonisation of its economies.

In January 2021, the European Union (EU) introduced a Carbon Border Adjustment Mechanism (CBAM). CBAM is part of the EU's efforts to reduce greenhouse gas emissions and achieve climate neutrality by 2050. It will put restrictions at the borders on goods produced with carbon and Greenhouse gas emissions (GHG) (CBAM 2021). CBAM is a policy that imposes a carbon price on imported goods from countries without equivalent carbon pricing or emissions reduction policies. The goal of this mechanism is to level the playing field for domestic producers within the EU, who would otherwise be at a competitive disadvantage to foreign producers who are not subject to similar carbon costs.

While the carbon price will be levied from 2026 onwards, the reporting of emissions on imported goods has started in January 2023. CBAM is initially focusing on some key sectors only, but is expected to expand over time. Sectors for which CBAM applies include:

- Iron and steel
- Cement
- Chemicals
- Aluminium
- Paper
- Glass
- Fertilizers
- Pulp and paper

India: India stepped up its climate ambitions with the more recent Nationally Determined Contributions (NDCs) declared at the COP26 and COP27 events. This includes the goal of reaching net-zero by the year 2070. More specifically as per Ministry of Environment Forest and Climate Change (2022) the new commitments include, but are not limited to:

- Reduce Emissions Intensity of its GDP by 45 percent by 2030, from the 2005 level;
- Achieve about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, with the help of transfer of technology and low-cost international finance including from Green Climate Fund (GCF).
- Create an additional carbon sink of 2.5 to 3 billion tonnes of CO2 equivalent through additional forest and tree cover by 2030.
- Build capacities, create a domestic framework and international architecture for quick diffusion of cutting-edge climate technology in India and for joint collaborative R&D for such future technologies.

The EU is a key export market for India, it is India's third largest trading partner. India's exports to the EU were worth EUR 46.20 billion in 2021 (Eurostat 2021). Compliance of Indian companies with the EU CBAM will require monitoring, calculating and disclosure of the GHG emissions embedded in the products covered under CBAM.

Of particular importance to India are the exports of aluminium, iron, and steel. The total exports from India to the European Union of base metals and minerals, including iron, steel and aluminium, accounted for approximately 10.4 percent of all exports in 2020 (European Commission 2022). The United Nations Conference on Trade and Development forecasts that India will lose USD 1-1.7 billion in exports of energy-intensive products such as steel and aluminium (UNCTAD 2021).

Tamil Nadu: Tamil Nadu has the second largest state economy in India. The Tamil Nadu Government has set a goal of becoming a USD 1 trillion economy by 2030. The state has a diversified manufacturing sector and features among the leaders in several industries like automobiles and auto components, engineering, pharmaceuticals, garments, textiles, leather, chemicals, plastics, etc. It ranks first among the states in terms of the number of factories and industrial workers. In FY2021-22 manufacturing contributed 33% of the Gross State Domestic Product (GSDP) (PRS 2022).

The role of Micro, Small and Medium enterprises (MSMEs) in the economic and social development of the country is well established. Tamil Nadu has the third-largest number of MSMEs in the country with a share of 8% or about five million enterprises (MSME Department 2022). MSMEs form an important and growing segment of the state's industrial sector, contributing 12.09% to the GSDP. However the growth of the state's MSME sector has been severely impacted by Covid and has been stagnant (Financial Express 2022).

As Tamil Nadu aspires to be a leading export state in India at a time when more countries are proposing Carbon Border Adjustment Mechanism (CBAM) decarbonisation will become an imperative for export-oriented industries to stay competitive. For the exported goods from Tamil Nadu to be compliant with regulations (Economic Laws and Practice 2022), it is important to decarbonise the production. The decarbonization will also be paramount for the MSME sector, which forms the backbone of the state's industry. Creating an enabling environment for the MSME sector to decarbonise will require, amongst other things access to affordable and clean energy.

In December 2022 Tamil Nadu launched its own Climate Change Mission. Its goals include the development of strategies to cut emissions by using green and renewable energy. This complements an earlier announcement by the State Government, that it aims to add an additional 20 GW of solar energy by the year 2030.

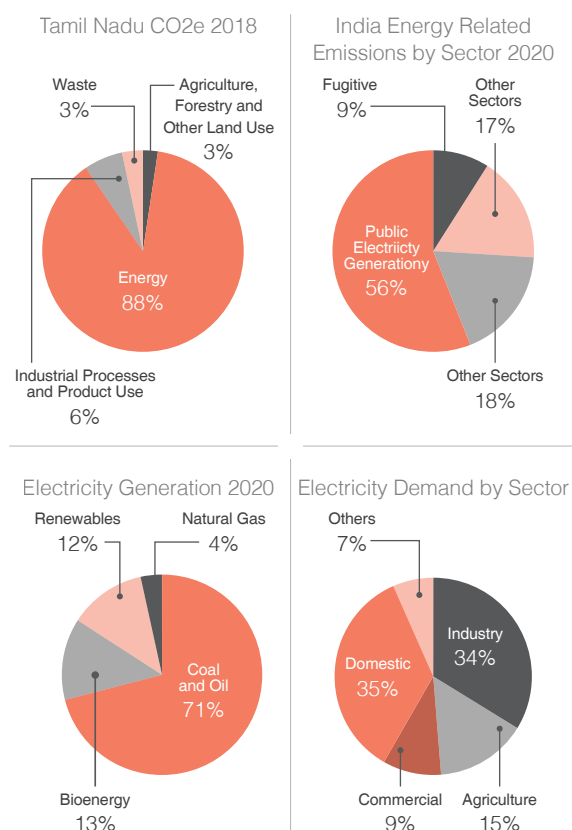
Tamil Nadu's Power Sector

In 2020, fossil fuels, with a 75% share, account for most of Tamil Nadu's primary energy sources (refer to Figure 2). In 2020 the total energy demand of Tamil Nadu was 290 TWh (TNSEC 2020). The transport and industry sectors combined accounted for 60% of the demand (refer to Figure 3).

Of the total electricity generation in Tamil Nadu, renewable energy constitutes 22% while coal power plants constitute the lion's share with 75% (refer to Figure 4). Concerning the electricity demand, the industry and domestic sector combined account for 70% of the demand (refer to Figure 1). The electricity sector alone accounts for 66.37% of the total coal requirement in the state (see Figure 1). Relying on coal and petroleum products not only contributes to deteriorating air quality and greenhouse gas emissions, but it creates a dependence on imports to meet the State's energy needs.

As much as 30% of the total coal requirement of Tamil Nadu comes from imports (Energy Department of Tamil Nadu 2022 & 2023). Therefore, decarbonising the power sector can reduce the state's dependency on coal considerably. To address the triple concerns of human health, global warming, and energy supply security a transition to renewable sources of energy is required.

Figure 1 Tamil Nadu Energy Stats 2020



Source: TNSEC (2020) TANGEDCO (2022, Indian GHG Platform (2018)

Tamil Nadu's Power Sector - Contradicting long-term trajectory

There are contradicting announcements about the state's long-term trajectory in regards increasing the share of renewables. The State Government's target of 20 GW of solar, or the recent RPO announcement by the Ministry of Power of achieving a renewable energy share of 43% by 2029 are not reflected in the 2022 electricity tariff order (TNERC 2022). As per this tariff order, TANGEDCO's energy procurement plan indicates that 88% of the increase in energy demand will be met from thermal power, a majority of which is expected to be sourced from TANGEDCO's own coal power plants. This clearly indicates that MSME's that have a need to reduce their carbon footprint cannot achieve this if they rely on electricity sourced from the public grid without a clear and predictable carbon reduction trajectory.

Table 1 TANGEDCO's power procurement plan (FY 2022-23 to FY 2026-27)

Source	FY 2022-23 (MU)	FY 2026-27 (MU)	Share FY 2026-27	Change in MU	Change in %
Renewables	15,720	18,322	15%	2,602	12%
Thermal	83,706	1,03,216	85%	19,510	88%
Total	99,426	1,21,538	100%	22,112	100%

Note: Excludes short term and others (Open Access, Power Exchange)
Source: TNERC 2022

Location attractiveness

The cost of energy can be considered as an important element for the location attractiveness of a state. Access to affordable energy is essential for MSMEs to compete on national and international markets. Increasingly so, access to clean and affordable energy is required for a state to be an attractive location for industries. The table below indicates the average billing rate (ABR) and the energy and demand charges levied on industrial HT consumers in selected states of India. The states of Gujarat and Andhra Pradesh offer more competing tariff rates than Tamil Nadu. What may be noted is that Tamil Nadu levies the highest demand charges. Demand charges are meant to cover the fixed cost of the DISCOM and can be considered as grid access and availability charges.

Table 2 Comparison of HT power costs by selected states

State	ABR *(INR/kWh)	Energy charges (INR/kWh)	Fixed Charges (INR/kVa)
Gujarat	*	4.30	475
Tamil Nadu	8.96	6.75	550
Rajasthan	9.11	6.30	270
Andhra	9.43	7.00	475
Maharashtra	9.46	6.89	454
Karnataka	10.18	8.9	315

*ABR- Average billing rate was not available

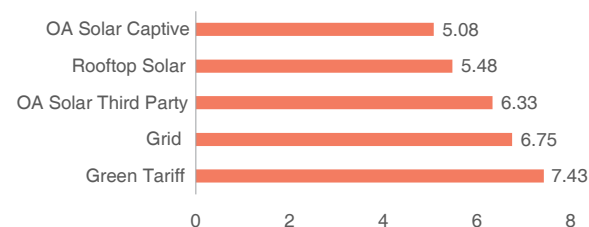
Clean energy procurement options for MSMEs

MSME's in Tamil Nadu have several procurement options for clean electricity. These are:

- Green tariff electricity
- Behind-the-meter renewable energy (RE) (e.g. rooftop solar)
- Open Access (OA)
- Green Open Access (GOA)

A comparison of the landed cost of these clean energy procurement options indicates that Open Access Solar Captive and Rooftop Solar are the most cost-attractive options for MSMEs in Tamil Nadu (refer to Figure 2).

Figure 2 Comparison of average landed cost of HT Industry (INR/kWh)



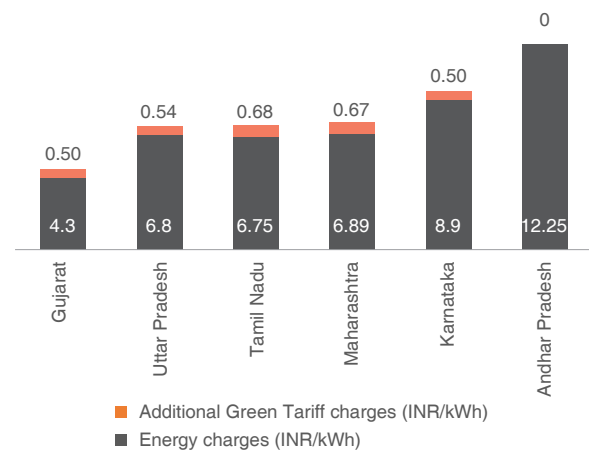
Note: Landed cost of rooftop solar includes network charges and 18% GST levied on the network charges.

Green Tariff: The 2022 electricity tariff order introduced an option whereby consumers can procure green energy from TANGEDCO (TNERC 2022). However, this green tariff option is available only to HT

consumers. A premium of 10% of the regular tariff is levied. The exact registration administration, issuance or renewable energy certificates process has yet to be defined by TANGEDCO.

Presently five states – Andhra Pradesh, Gujarat, Karnataka, Maharashtra, Tamil Nadu and Uttar Pradesh – have introduced Green Tariffs. With the exception of Andhra Pradesh all states levy a premium on the respective consumer tariffs. Andhra Pradesh introduced a new consumer category ‘Green Power Tariff’. Under this category, consumers pay energy charges of 12.25 INR/kWh and no fixed charges are levied. Gujarat offers the lowest cost Green Tariff for HT industry consumers of 4.80 INR/kWh.

Figure 3 Comparison of Green Tariffs for HT Industry of selected states



Summary: The current design of the Green Tariff in Tamil Nadu is unlikely to find much demand as the per unit cost is higher compared to other clean energy procurement options (rooftop solar and Open Access). The Green Tariff is restricted to HT consumers only. The tariff does not provide a viable clean energy procurement option for MSMEs.

Behind the meter RE/Rooftop solar: The Generic Tariff Order for Grid Interactive PV Solar Energy Generating Systems (TNERC 2021) permits solar net feed-in for all consumer categories. Rooftop solar is therefore a clean energy procurement option for all MSME's regardless of their sanctioned load or the supply voltage.

Additionally, the order introduced network charges on the gross generation of solar energy with the argument that this will help DISCOM to better recover its fixed costs. The prosumer pays a certain amount for every unit of solar energy generated, irrespective of whether this energy is self-consumed or exported to the grid. The network charges as of January 2023 for various categories of solar PV systems are shown below.

Table 3 Solar feed-in tariff and network charges

Category	Solar feed-in tariff (INR/kWh)	Network charges (INR/kWh)
Non-domestic, 1-10 kW	3.61	1.27
Non – domestic 11- 150 kW	3.37	1.27
Non – domestic 151 - 999 kW	3.10	0.83

Source: TNERC 2022

Note: TANGEDCO collects 18% GST on the network charges

It can be argued that network costs are already recovered from the prosumers in the form of fixed or demand charges. Additionally, the network charges, a new cost component, were introduced after fixation of the feed-in tariffs. This new cost component increases the cost of solar energy generation, which is not reflected in the net feed-in tariff. As of December 2022, Tamil Nadu had a cumulative rooftop solar energy capacity of 369 MW (MNRE 2022). This represents 10% of the rooftop solar energy target as per Tamil Nadu Solar Energy Policy 2019. While there was 108% growth in installed rooftop solar capacity from March 2020 to March 2021 there was only 13% growth from March 2021 to December 2022. It is quite likely that the network charges that were introduced at the end of 2021 are responsible for the dramatic slow-down of rooftop solar capacity addition in the state.

Table 4 Installed Rooftop Solar Capacity in Tamil Nadu (MW)

Date	Rooftop Solar (MW)
Mar-20	156
Sep-20	247
Mar-21	325
Dec-22	368

Sources: MNRE 2020, MNRE 202

Comparing the estimated landed cost per unit of electricity we find that rooftop solar, captive generation and third party open-access are lower than the Green Tariff offered by TANGEDCO and even the regular HT tariff II (industries).

However, it can be expected that MSMEs that have customer pressures to decarbonize their manufacturing processes will not have sufficient rooftop or land area available to produce all its electricity demand from solar energy only. Open access is available only for HT consumers with a minimum connected load of 1MW. Therefore a good number of MSME's are left only with the option to procure electricity from the utility under the green tariff at a higher cost or purchase carbon credits in the market. Both options will affect the price competitiveness of these MSMEs.

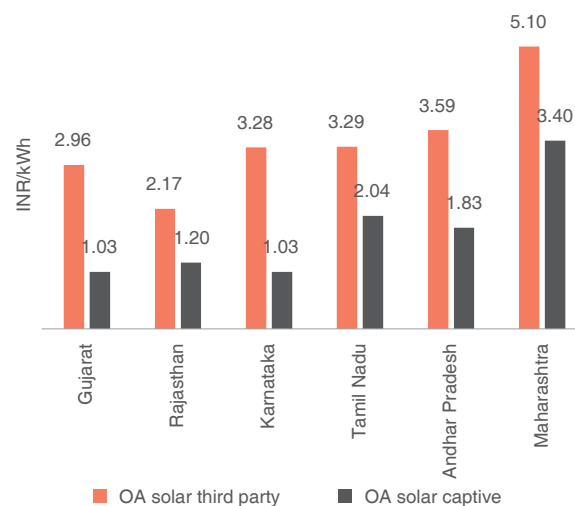
This clearly indicates that MSME's that have a need to reduce their carbon footprint will not be able to do so in the present regulatory environment when they cannot generate their own solar energy under fair conditions or purchase renewable energy through the open access facility.

Summary: While rooftop solar is one of the most attractive clean energy procurement option for MSMEs in Tamil Nadu, network charges levied on the solar energy gross generation substantially reduce the attractiveness of this clean energy procurement option. Withdrawal of the network charges and permitting all MSMEs irrespective of connected load and voltage level of their grid connection the Open Access route will provide a much needed clean energy procurement option.

Open Access (Third party, group captive, and captive):

As of February 2023, Open Access is available only to HT consumers with a sanctioned load greater than 1MW. Open Access allows an entity to procure power from the open market. Generally, a buyer and seller enter into a power purchase agreement, facilitated by a trader for a margin. Large consumers may also purchase electricity from power exchanges that facilitate trading of electricity, or choose the option of captive generation. To compensate the Discom for the use of the network and for deemed revenue reduction, open access charges are levied. These include point of connection (PoC) charges, transmission charges, wheeling charges, cross subsidy charges, State Load Dispatch Centre (SLDC) charges, banking charges etc. Additionally transmission and distribution losses will be accounted for. Renewables attract certain discounted rates on some of the Open Access Charges (wheeling charges, cross subsidy charges). Gujarat, Rajasthan and Karnataka are among the states with the lowest cumulative Open Access charges for solar energy in the country (refer to Figure 4).

Figure 4 Comparison of Open Access charges by selected states (INR/kWh)



Source: IEX landed cost calculator

Cross-subsidy surcharges is a fee added to the electricity bill of certain customers categories to cover the cost of providing electricity at a discounted or subsidized cost to other consumer categories (domestic, agriculture etc.). The cross-subsidy surcharges levied on open access electricity in FY 2022-23 stood at 1.79 INR/kWh for industrial consumers and 2.33 INR/kWh for commercial consumers. For consumers

under the captive open access category no cross-subsidy surcharges are levied. Discounts on cross-subsidy surcharges are offered for the procurement of renewable energy (30% discount for solar and 40% for wind). There is however a declining trend in discounts offered to RE and this trend is expected to continue in the near future.

Table 5 Cross subsidy surcharges(CSS) FY 2022-23

Consumer category	OA conventional	OA captive/group captive	OA third party	
			OA solar	OA wind
HT Industrial (INR/kWh)	1.79	0.00	1.25	1.07
HT Commercial (INR/kWh)	2.33	0.00	1.63	1.40

Source: TNERC 2022

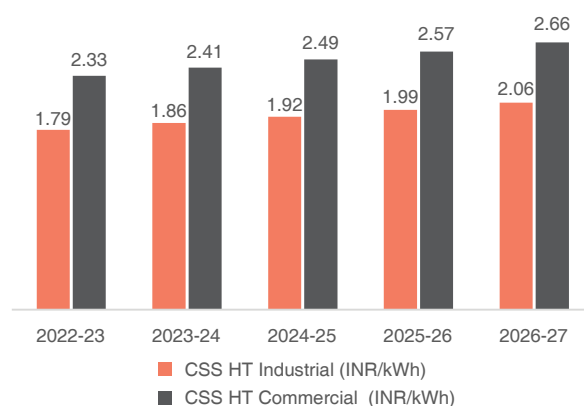
The Electricity Act (MoP 2003) and the National Tariff Policy (MoP 2006) call for a gradual reduction of cross subsidy surcharges.

Electricity Act 2003, Section 38: “Provided further that such surcharge and cross subsidies shall be progressively reduced [***] in the manner as may be specified by the Central Commission”.

National Tariff Policy 2006: “For achieving the objective that the tariff progressively reflects the cost of supply of electricity, the SERC would notify roadmap within six months with a target that latest by the end of year 2010-2011 tariffs are within $\pm 20\%$ of the average cost of supply. The road map would also have intermediate milestones, based on the approach of a gradual reduction in cross subsidy”.

As per the 2022 Tariff Order (TNERC 2022) no reduction in cross-subsidy surcharges is being envisioned in the near future (refer to figure 3). In the absence of a mid- or long-term strategy of reducing and phasing out cross-subsidy surcharges on third party open access while simultaneously phasing out the discounts for renewables the procurement cost of clean energy via the open access route is expected to increase for MSMEs in Tamil Nadu.

Figure 6 Approved Cross Subsidy Surcharges



Source: TNERC 2022

Table 6 Comparison of cross subsidy surcharge of selected states

Cross Subsidy Surcharge Industrial Consumers	OA Third Party Solar	OA Captive Solar
Rajasthan	0.00	0.00
Tamil Nadu	1.25	0.00
Gujarat	1.50	0.00
Maharashtra	1.70	0.00
Andhra Pradesh	1.76	0.00
Karnataka	1.95	0.00

Source: TNERC 2022, IEX landed cost calculator

Wheeling charges

Wheeling charges refer to the fees that are charged by DISCOMS to Open Access consumers for using the distribution grid for the transport (wheeling) of electricity. These charges are intended to recover the costs associated with maintaining and operating the distribution network.

The wheeling charges of conventional energy Open Access are 0.96 INR/kWh (TNERC 2022). For Open Access solar energy 50% of the conventional wheeling charges are levied. Some states do not provide any discount on wheeling charges for renewables. Compared with the wheeling charges on solar of other states, Tamil Nadu’s wheeling charges are on the higher end (refer to Table 7).

Table 7 Comparison of OA solar wheeling charges of selected states

OA Solar wheeling charges	Wheeling charges (INR/kWh)	% of conventional OA
Karnataka	0.14	50%
Madhya Pradesh	0.17	100%
Gujarat	0.18	100%
Rajasthan	0.23	50%
Tamil Nadu	0.48	50%
Maharashtra	0.55	100%
Andhra Pradesh	0.81	100%

Source: TNERC 2022, IEX landed cost calculator

The Tamil Nadu Solar Energy Policy 2019 states that “Wheeling of energy will be permitted only, during the generation of electricity and will be adjusted slot/block to slot/block and excess energy fed into grid shall be treated as infirm power under sale to DISCOM category only. The excess energy will be paid at the rate as determined by TNERC from time to time.” However this policy provision has not yet been implemented as of today.

In its Order on procurement of solar power and related Issues (Order No. 9 of 2020 dated 16-10-2020), TNERC decided not to amend the existing energy accounting procedure (TNERC 2020). If however wheeling of energy on the proposed slot/block-to-slot/block basis would get implemented in the future, there would be significant increase in the energy that needs to be banked for future use, thereby increasing the cost of open access solar energy.

Banking

Electricity banking was introduced by the state of Tamil Nadu in 1986 (Appellate Tribunal for Electricity, 2021). This was done primarily to promote captive wind energy generation through wheeling in the state. When over a specific time interval the energy produced is higher than the energy that can be consumed, the surplus energy can be supplied to or banked with the Discom. The units of energy banked with the Discom can be withdrawn at a later time when the consumer has need for the same. The Discom in turn levies banking charges on the units of electricity banked.

As of February 2023 banking charges are 15% for solar energy and 14% for wind energy. Banking charges were 2% in 1986, escalated to 5% in 2001, and remained at 5% till 2009 (Prayas 2022). The banking settlement period in Tamil Nadu is based on the financial year and is from April to March. The unutilized energy (at the end of the banking settlement period) can be encashed at 75% of the applicable wind and solar energy tariffs.

Table 8 Comparison of OA banking charges by state

OA Solar	Banking charges
Gujarat	1.5 INR/kWh
Tamil Nadu	15%
Andhra Pradesh	no
Karnataka	no
Rajasthan	10%
Maharashtra	2%

Source: CEEW 2022

Banking has become a contentious topic in the recent past. TANGEDCO has consistently requested that the banking facility for wind and solar power be withdrawn, citing that they have to bear losses because of the energy banking facilities. In 2018 TNERC attempted to stop the banking facility for wind energy entirely. However the order was quashed by the Appellate Tribunal for Electricity. Some states in India have a monthly banking period, or do not allow the withdrawal of banked energy during peak demand hours.

Summary: *In the absence of an affordable Green Tariff for MSMEs rooftop solar energy and renewable energy procurement via the Open Access route are the two most viable clean energy sourcing strategies. However, with the need of having a sanctioned load of 1 MW or greater, the Open Access route is only available for a small segment of the MSMEs. The competing interests of TANGEDCO and the open access consumers, the differential treatment across energy generation technologies and consumer categories, have contributed to policy uncertainty that may have impacted investment in the open access market.*

With the potential challenges of having sufficient rooftop or land space, the high cost of clean energy under the Green Tariff, the lack of a decarbonization trajectory for grid power and the restrictions on the open access facility, MSME's in Tamil Nadu have very limited options to develop a mid- or long-term

decarbonisation strategy. This is where the recent notification by the Ministry of Power on 'Green Open Access' becomes a potential game changer.

Green Open Access: The Green Open Access Rules, 2022 were notified by the Ministry of Power in June 2022. The Rules represent an attempt to bring uniformity in the open access regulations. The objective is to promote generation, purchase and consumption of green energy including the energy from waste-to-energy plants through Open Access. While the purchase of power via the Open Access route was already available previously the Green Open Access Rules reduced the minimum load requirement for consumer to be eligible for open access from 1 MW to 100 kW. This allows now MSME's to avail the Green Open Access option. While the Tamil Nadu Electricity Regulatory Commission has not yet introduces Green Open Access Regulations for Tamil Nadu, this is expected soon. Some of the key features of the Green Open Access Rules are listed in the table below:

Table 9 Key features of Green Open Access Rules

Key Feature	Description
Eligibility criteria	Consumers with a load of 100 kW and above.
Energy sources	Wind, solar, biomass, waste to energy, hydro, energy storage etc.
Banking period	Banking of unutilized electricity up to 10% of total consumption from renewable projects to be allowed and settlement to happen monthly.
Capacity limitation	No capacity limit for the installation of power plants for captive use.
Approvals and nodal agency	A single window clearance mechanism with a central nodal agency is proposed. All applications for green open access to be approved within 15 days.
Open access charges	<p>Transmission, wheeling, cross subsidy surcharge (CSS) and standby charges (if applicable) shall be the only charges that will be levied on green energy open access consumers.</p> <p>The rules stipulate limiting the cross-subsidy surcharge (CSS). Additional Surcharge (AS) will not be applicable for green energy open access consumers, if fixed charges are paid by consumer.</p> <p>CSS and AS shall not be applicable if (i) power produced from a waste-to-energy plant is supplied to the OA consumer and/or (ii) green energy is utilized for production of green hydrogen and green ammonia</p>

Source: MOP 2022

Summary: *Open Access as introduced by the Electricity Act, 2003 was meant to promote competition in the market by providing a choice of suppliers to the consumers. By introducing provisions to limit the increase of cross-subsidy surcharge as well as the removal of additional surcharge, the Green Open Access Rules incentivise consumers to procure clean energy while attempting to address the issues that have hindered the growth of open access in India*

previously. While it reduces the eligibility criteria from 1MW to 100 kW of sanctioned load, many of the micro and small industries will still not be eligible under the Green Open Access Rules.

Conclusions & Recommendations:

Recommended policy and regulatory changes that are expected to foster a sustainable development of the MSME sector in Tamil Nadu are listed below:

Green Tariff

The current design of the Green Tariff does not reflect the variable nature and the cost of renewable energy. Instead of charging a premium for the Green Tariff, the Green Energy Tariff could be designed facilitate grid integration of renewable energy.

Recommendation: Design Green Tariffs to facilitate grid integration of renewables

Instead of charging a premium on top and over the regular tariffs to arrive at green tariffs, green tariff structures may be designed to incentivise consumers to shift loads to peak renewable energy generation hours. For example a 'Green Solar Tariff' maybe offered from 10:00 am to 3:00 pm at a cost, which is lower than the standard. Considering that the state has plans to add 20 GW of distributed solar energy by 2030, an increasingly high volume of low-cost solar energy will be available during sunshine hours.

This should be reflected in lower energy tariffs during the hours when there is ample solar energy injected in the grid. Such an approach would (i) create a solar energy sponge that shifts loads and reduces the need for grid balancing services such as energy storage, and (ii) it would makes the Green Tariff a viable clean energy procurement option for MSMEs. (iii) Further this will allow the large number of micro enterprises that are so vital for the state's economy to procure affordable and clean power.

Rooftop Solar

Rooftop solar in Tamil Nadu has seen a series of regulatory changes in the recent past and this may have contributed to investor uncertainty. The introduction of network charges on the solar gross generation maybe a major contributor to the fact that the state has seen hardly any rooftop solar capacity addition during the year 2022.

Recommendation: Remove network charges

If network charges are levied on the ground that the grid provides voltage and frequency support to solar PV systems, it would need to be applicable to all grid-connected solar PV systems (or all grid-connected generation systems). In this case operators of gross feed-in systems (including the bigger systems) would also need to pay network charges and the network charges will need to be included in the LCOE (levelized cost of energy) calculation by which feed-in tariffs are fixed. This will result in an increase in solar energy (net)-feed-in tariffs.

If network charges are levied on the ground of providing grid access, then the proposed network charges represent a 'double network charge'. The current tariff payable by consumers in Tamil Nadu consists of fixed (INR/per service connection) or a demand charge (INR per kW / KVA), and energy charges (INR per kWh). Energy charges are meant to cover TANGEDCO's variable costs of procurement and delivery of energy. Fixed charges are meant to cover fixed costs including costs relating to the operation and maintenance of the distribution and transmission network. Fixed network costs will have to be covered by fixed network charges and the point being raised here is that this is already being done through the fixed charges payable by consumers.

Network charges on consumer solar energy seems to be a discriminatory practice and is probably the main cause of the state not meeting its' rooftop solar energy target of 3,600 MW by 2023.

Green Open Access

Green Open Access presents a potential game changer in the ability of MSMEs in Tamil Nadu to access affordable, clean energy. Access to affordable and clean energy ensures the state's MSMEs sector stays competitive at both the national and the international level. Clear, forward looking and fair Green Open Access rules will need to be formulated. Tamil Nadu has seen its share of litigation related to its Open Access regulations in the recent past. Particularly the energy banking and the wheeling charges have been a point of contention. Therefore the enactment of Green Open Access regulations for Tamil Nadu will need to find a balance between the guidelines provided by the Ministry of Power through the Green Open Access rules, the state's wider socio-economic and environmental ambitions and the financial health of TANGEDCO.

Recommendation: Aling Open Access and Green Open Access Regulations

There will be a need to introduce a higher degree of uniformity between the Open Access and Green Open Access regulations pertaining to duration of open access, application process, open access charges and energy banking.

Recommendation: Rationalize Open Access charges

Currently there are various open access charges being levied. The formulation of the Green Open Access and/ or Open Access regulations provides an opportunity to the review the current charges and possibly rationalise and simplify the same. This will it make the Green Open Access option more accessible to MSMEs. For example, the wheeling charges and additional charges could be combined into a single charge that reflects the actual cost of the services provided by the grid operator and should factor in the already levied demand charges.

Recommendation: Phase out cross-subsidy surcharges

A 5-year strategy of phasing out cross-subsidy surcharges as well as discounts offered for renewables on wheeling and other open access charges maybe developed.

Recommendation: Permit banking on a monthly basis

As per the Green Open Access Rules 2022, energy banking is proposed to be permitted on a monthly basis. Banking charges should be cost reflective and could be determined on the basis of the merit dispatch order during the time of withdrawal. Such an approach with implicitly need to include a ToD (time-of-the-day) component and could eventually incentivise energy storage.

Recommendation: Introduce dedicated wheeling charges for distributed renewable energy generation

Wheeling charges for distributed renewable energy generators that are interconnected at the distribution network maybe introduced. Such wheeling charges will need to be lower and shall value the avoided distribution and transmission losses and capacity cost. Such an approach will promote smaller distributed renewable energy generators that are more aligned with the power demand of MSMEs.

References

- 1) Appellate Tribunal for Electricity. 2021. APPEAL NO. 191 OF 2018. Available at: https://aptel.gov.in/sites/default/files/Jud2021/A.Nos.%20191,%20195,%20265%20of%202018%20&%20406%20of%2019_28.01.21.pdf (accessed on 23rd January 2023).
- 2) Auroville Consulting (2022). Pathways to Decarbonisation. Modelling Tamil Nadu's Power Sector Decarbonization. Sustainable Energy Transformation Series. Available at: <https://www.aurovilleconsulting.com/pathways-to-decarbonisation-modelling-tamil-nadus-power-sector-decarbonisation/> (accessed on 16th January 2023)
- 3) CBAM (2021). Carbon Border Adjustment Mechanism. Available at: https://ec.europa.eu/taxation_customs/green-taxation-0/carbon-border-adjustment-mechanism_en (accessed on: 15th January 2023)
- 4) CEEW. 2022. Waivers on open access charges for solar/wind. Available at: <https://www.ceew.in/cef/shared/CEEW-CEF-RE-Open-Access-waivers.pdf> (accessed on 29th January 2023).
- 5) Economic Laws and Practice (2022). The EU Carbon Border Adjustment Mechanism – Implications for India. Available at: <https://www.mondaq.com/india/international-trade-investment/1166146/the-eu-carbon-border-adjustment-mechanism-implications-for-india> (accessed on: 15th January 2023).
- 6) Energy Balance (2019). India Energy Dashboards of NITI Aayog. Available at: <https://niti.gov.in/edm/#balance> (accessed on: 15th January 2023).
- 7) Energy Department of Tamil Nadu (2021). Demand No.14, Policy Note 2020-21. Available at: https://cms.tn.gov.in/sites/default/files/documents/energy_e_pn_2020_2021.pdf (accessed on 16th January 2023)
- 8) Energy Department of Tamil Nadu (2022). Demand No.14, Policy Note 2021-22. Available at: http://cms.tn.gov.in/sites/default/files/documents/energy_e_pn_2021_22.pdf (accessed on 16th January 2023)
- 9) Energy Department of Tamil Nadu (2023). Demand No.14, Policy Note 2022-23. Available at: http://cms.tn.gov.in/sites/default/files/documents/energy_e_pn_2022_23_0.pdf (accessed on 16th January 2023)
- 10) European Commission. 2022. European Union, Trade in Goods with India. Available at: https://webgate.ec.europa.eu/isdb_results/factsheets/country/details_india_en.pdf (accessed on 23rd January 2023).
- 11) Eurostat. 2021. India-EU trade in goods: €0.9 billion deficit in 2020. Available at: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/edn-20210508-1> (accessed on 23rd January 2023).
- 12) Financial Express. 2022. Tamil Nadu's MSMEs' Share in GSDP witnessed maximum decline, sector wise growth stagnant: RBI. Available at: <https://www.financialexpress.com/industry/sme/msme-eodb-tamil-nadu-msmes-share-in-gsdp-witnessed-maximum-decline-sector-wise-growth-stagnant-rbi-data/2688535/> (accessed on 23rd January 2023)
- 13) Industries Department (2022). Demand No. 27. Major Industries- Tamil Nadu. Available at: https://cms.tn.gov.in/sites/default/files/documents/ind_major_e_pn_2022_23.pdf (accessed on: 15th January 2023).
- 14) Ministry of Power (MoP). 2003. Electricity Act. Available at: <https://cercind.gov.in/Act-with-amendment.pdf> (accessed on 22nd January 2023).
- 15) Ministry of Power (MoP). 2006. Tariff Policy. Available at: https://cea.nic.in/wp-content/uploads/legal_affairs/2020/09/Tariff%20policy.pdf (accessed on 21st January 2023).
- 16) Ministry of Power (MoP). 2022. Green Open Access Rules. Available at: https://greenopenaccess.in/assets/files/Green%20Energy%20Open%20Access_rules.pdf (accessed on: 15th January 2023).
- 17) MNRE. 2020. State-wise installed capacity of grid Interactive renewable power as on 30.09.2020. Available at: <https://mnre.gov.in/the-ministry/physical-progress> (accessed on 29 January 2023).
- 18) MNRE. 2022. State-wise installed capacity of grid Interactive renewable power as on 31.12.2022. Available at: https://mnre.gov.in/img/documents/uploads/file_s-1673341299172.pdf (accessed on 29 January 2023).
- 19) Ministry of Environment, Forest and Climate Change (MoEFCC). 2022 India's Long-Term Low-Carbon Development Strategy available at: https://unfccc.int/sites/default/files/resource/India_LTLEDS.pdf (accessed on 20th January 2023)
- 20) McKinsey. 2020. Plugging in. What electrification can do for industries. Available at: <https://www.mckinsey.com/industries/electric-power-and-natural-gas/our-insights/plugging-in-what-electrification-can-do-for-industry>. (accessed on: 15th January 2023).

