SUSTAINABLE DEVELOPMENT GOALS

7. AFFORDABLE AND CLEAN ENERGY

7.4 Energy and the Community

7.4.1 Programmes For Local Community To Learn About Importance Of Energy Efficiency And Clean Energy:

1. a. Arranging pledge program for local community people from industry

Chennai Institute of Technology took an initiative to adopt with the pledge of Government of India for the conservation of energy. The institute encouraged industrial people from Gokul Autotech Pvt.Ltd by taking the pledge on energy saving.

- I pledge to use energy more mindfully and take necessary steps to reduce energy usage in my home and office.
- I will devote my time in taking small steps like switching off the extra lights while I am in the room, turning off the appliances like Tv, computer monitors, ACs and cars/Bikes at the traffic signals.
- The efficient utilisation will help me save money and consequently help in fighting climate change.
- I pledge to take responsible actions in doing my part to improve the environment and help contributing to sustainable growth of the planet Earth.

1.b. Educating Students on Renewable Energy

Students are often given lectures, and workshops are conducted to bring awareness about these alternate sources of energy.

2. Training program for other colleges and industry employees

Training program arranged for various colleges and industry technicians to explore the critical topic of energy harvesting through renewable energy sources. The session focused on practical insights into how renewable energy technologies can be integrated to enhance energy efficiency and sustainability across sectors. The workshop aimed to create awareness about how technologies such as solar, wind, and biomass can be harnessed efficiently for energy generation. The hands-on experience on energy harvesting was provided to the participants.

3. Guest Lecture

The guest lecture, titled **"Artificial intelligence for e-Vehicle applications,"** was held on June 21, 2022, at 10 am. It was part of the IEEE Expert Lecture Series organized by the Institution, and the lecture was transported by Dr. M.Venkateshkumar, the Chairman of Professional Activities at IEEE

4. National Level Workshop

The institution has conducted One-day National Level Workshop on **Hybrid energy, focusing on solar, wind, and e-vehicle technologies, October 14, 2022**, organized by the Centre for **New Energy Systems**. This workshop aimed to provide hands-on training and knowledge dissemination about the integration and applications of hybrid energy systems in the context of renewable energy and electric vehicles to the students.

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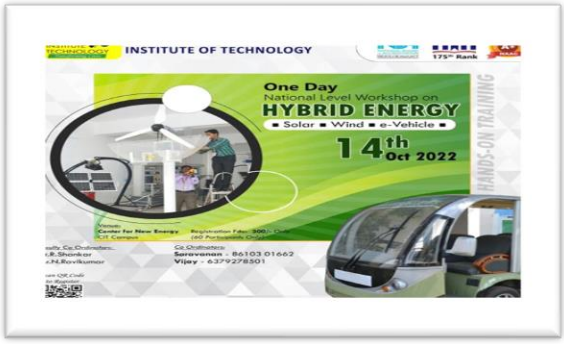
<td> 
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7.4.2 Pledge Towards 100% Renewable Energy

Chennai Institute of Technology took an initiative to adopt with the pledge of Government of India for the conservation of energy. The students and the faculty members are encouraged to save energy and practise the pledge for the same and to internalise the energy saving.

The pledge has been disseminated through notice boards in the departments, corridors and laboratories. Students are encouraged towards energy saving once a week by wearing uniform non-ironed Polo T-shirts to stick to it. Yearly twice the pledge taken by all the communities inside the campus. Aslo the institute encouraged industrial people from GokulAutotech Pvt.Ltd taking the pledge

Students taking Pledge- Energy saving

Industrial Staff from Gokul Autotech Pvt.Ltd taking Pledge – Energy Saving

Sample - Pledge displayed in Notice Board

Pledge

- I pledge to use energy more mindfully and take necessary steps to reduce energy usage in my home and office.
- I will devote my time in taking small steps like switching off the extra lights while I am in the room, turning off the appliances like Tv, computer monitors, ACs and cars/Bikes at the traffic signals.
- The efficient utilisation will help me save money and consequently help in fighting climate change.
- I pledge to take responsible actions in doing my part to improve the environment and help contributing to sustainable growth of the planet Earth.

7.4.3. Energy Efficiency Assessments, Workshops, Research Renewable Energy Options

Chennai Institute of Technology plays a key role in assisting local industries to improve energy efficiency and adopt clean energy solutions. The institute provides **energy audits and efficiency assessments**, helping businesses identify areas of energy wastage and implement cost-effective solutions to optimize consumption. The institution also conducts **workshops and training programs** on energy management, empowering industry professionals with the knowledge to adopt sustainable practices and technologies. Additionally, its **research and development efforts** focus on renewable energy, collaborating with local industries to implement innovative clean energy systems, such as solar and wind power. This comprehensive approach not only supports industries in reducing operational costs but also contributes to a more sustainable and energy-efficient industrial ecosystem, especially in the **SIDCO area**, where the institute's proximity to local businesses facilitates direct collaboration.

i) Energy Efficiency quality audit awareness program

A Energy Efficiency quality audit meet awarness was held at Gokul Auto Tech, by our institute personnel, the team of quality supervisors were get beneficary based on the awarness training program for two days.

ii) Energy Efficiency quality audit

An energy efficiency audit for Gokul Autotech Pvt. Ltd. was conducted on December 1, 2022, by **Dr. M.D. Vijayakumar**, Professor and Head of the Department of Mechanical Engineering, Chennai Institute of Technology. The purpose of this audit was to raise awareness about energy wastage and provide actionable recommendations to reduce energy consumption, optimize efficiency, and lower operational costs for the company.

CHENNAI INSTITUTE OF TECHNOLOGY
(Autonomous)

Energy audit report for Gokul autotech Pvt. Ltd.

Date of Audit : 1-12-2022 and 2 -12-2022
Audit Period : 2 days
Prepared By : Dr. M.D. Vijayakumar

Name of auditor/consulting firm : Dr. M.D. Vijayakumar, Professor & Head
Dept. of Mechanical Engineering
Chennai Institute of Technology, Kundrathr

Contact Information : Mobile: 9994473738
E.Mail: mech@citchennai.net

Total Energy Consumption : 1,10,000 kWh per month.

Energy Cost : 22,00000 INR per month.

Peak Load : 150 kW.

Average Load : 145.83 kW.

Lighting consumption : 8500 kWhr per month

Manufacturing equipments consumption: 99000 kWhr per month

Other systems consumption: 2500 kWhr per month

Energy Efficiency Assessment

This section highlights areas identified as inefficient and provides suggestions for improvement:

The current lighting system uses traditional fluorescent lamps, leading to high energy consumption. The HVAC systems operate without optimal temperature control, causing excess energy use. Air compressors are running longer than necessary due to air leaks.

Renewable Energy Opportunities

In addition to energy efficiency improvements, **Gokul Autotech Pvt. Ltd.** can consider adopting renewable energy solutions:

1. Install solar panels on the factory rooftop to generate electricity, reducing reliance on the grid and lowering energy bills.
2. Evaluate the feasibility of installing small wind turbines on-site to harness wind energy.

3. Consider implementing battery storage systems to store excess energy generated by solar panels for use during peak demand.

Action Plan and Recommendations

Based on the audit findings, the following action plan has been proposed:

1. **Immediate Actions** (0-3 months):
   Replace all lighting with LED bulbs; Conduct a leak survey for compressed air systems and repair leaks.
2. **Short-Term Actions** (3-6 months):
   Install variable speed drives in the compressed air system.
3. **Medium-Term Actions** (6-12 months):
   Initiate feasibility studies for solar panel installation on the factory rooftop.
4. **Long-Term Actions** (1+ years):
   Investigate additional renewable energy sources (e.g., wind energy).

Prepared by
M. D. VIJAYA KUMAR

Verified by
Mr. S. Ganesh

iii) **Energy smart workshop: Unlocking efficiency for a sustainable future**

The "Energy Smart: Unlocking Efficiency for a Sustainable Future" workshop, conducted on August 17, 2022, brought together faculty members from various colleges and industry technicians to explore the critical topic of energy harvesting through renewable energy sources. The session focused on practical insights into how renewable energy technologies can be integrated to enhance energy efficiency and sustainability across sectors. The workshop aimed to create awareness about how technologies such as solar, wind, and biomass can be harnessed efficiently for energy generation. The hands-on experience on energy harvesting was provided to the participants.

iv) Research works contributing to SDG7

1. Efficient implementation of low-power decoders through reversible logic gates with minimal transistor count
2. Optimizing resource allocation in energy enabled multi cluster cognative radio network for hybrid connectivity
3. An improved Energy efficient clustering protocol life time of a WSN based on IoT
4. Kinetic Energy Harvesting:Empowerment Communities through innovative speed breaker power generation.
5. Experimental investigation of the mechanical properties of aluminium 8011/SiC/Graphite Hybrid Composite
6. Optimization of performance and Emission Characteristics of compression ignition engine supplemented with pentanol-Rapessdoil- Diesel Composition
7. Experimental in investigation of performance and Emission characteristics of diesel Engine supplemented with Butanol-Olive oil-Diesel Composition

v) Publications contributing to SDG7

1. Mariraja, R., Harichandran, R., Vijayakumar, R., & Nichelson, A. (2024). Experimental analysis of solar desalination system performance with graphene and graphitic carbon nanopaint-coated solar absorbers. Desalination, 592, 118141.
2. Raman, R., Gor, M., Meenakshi, R., Jayaseelan, G. M., Chaturvedi, A., Taqui, S. N., ... & Kalam, M. A. (2024). Solar energy measurement and monitoring model by using internet of things. Electric Power Components and Systems, 52(10), 1796-1807.
3. Jakeer, S., Rupa, M. L., Reddy, S. R. R., & Rashad, A. M. (2023). Artificial neural network model of non-Darcy MHD Sutterby hybrid nanofluid flow over a curved permeable surface: Solar energy applications. Propulsion and Power Research, 12(3), 410-427.
4. Johnson, J. G., Ramya, G., Sripriya, T., SamuthiraPandi, V., Sudha, K., & Umamaheswari, K. (2023, December). An Intelligent Design of Solar Energy Powered Smart Residence Controlling System Using Novel Power Grid Principles. In 2023 International Conference on Intelligent Technologies for Sustainable Electric and Communications Systems (iTech SECOM) (pp. 397-402). IEEE.
5. Rangasamy, S., Khansadurai, A. M., Venugopal, G., & Udayakumar, A. K. (2023). Graphene-based O-shaped metamaterial absorber design with broad response for solar energy absorption. Optical and Quantum Electronics, 55(1), 90.
6. Partheeban, P., Shiva, M., Vishnupriyan, J., Ponnusamy, R., Kumar, T. S., & Anuradha, B. (2022, December). Solar Energy optimisation using IoT and deep learning-a review. In 2022

International Conference on Data Science, Agents & Artificial Intelligence (ICDSAAI) (Vol. 1, pp. 1-3). IEEE.

vi) Patents contributing to SDG7

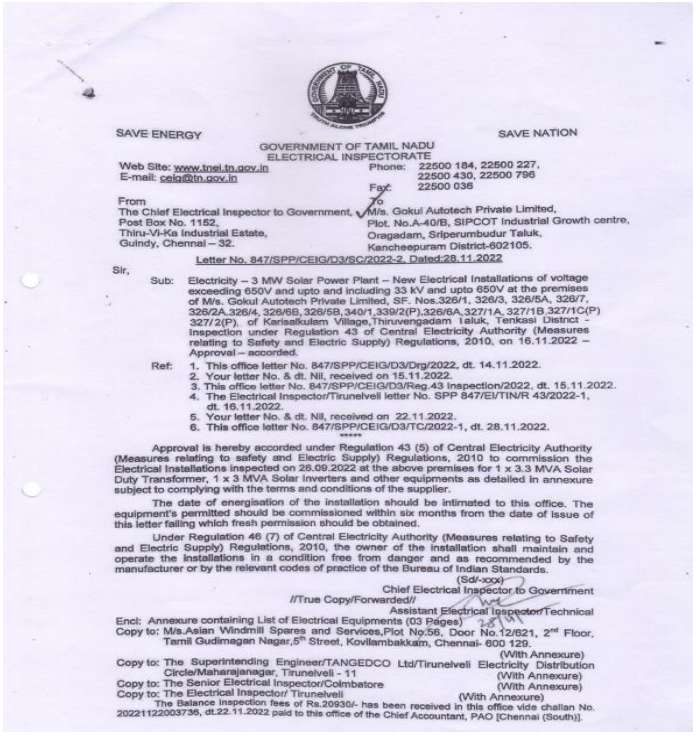
1. Advanced Energy storage system using lithium-sulfer(Li-s)Batteries, 202341080267 A
2. Five Stage constant current charging technique for Lithium-Ion Battery, 202341077563 A
3. Sustainable drive:Solar and wind –Powered EV charging network, 202341073494 A
4. Method of using Waste Plastic oil as fuel on diesel engine, 202341041331 A
5. Electro magnetic energy Absorber, 202341002106 A

7.4.4 Inform and Support Governments In Clean Energy And Energy-Efficient Technology Policy Development

The institute's support for renewable energy aligned remarkably with climate changes, reducing greenhouse gases and cleaner energy contributing towards environmental stewardship, innovation and education goals.

Gokul Autotech Pvt.Ltd

The Chairperson of the Institute also owns Gokul Autotech Pvt. Ltd(GAT). GAT is an industry manufacturer of wide variables of metal die casting. Via Chennai Institute of Technology, GAT maintains close ties with academics, research and development facilities to identify issues that industries face and to discover solutions through a variety of industrial and research projects. Gokul Autotech has a unit of 3MW solar power plant installed in Tenkasi District in adherence with TANGEDCO (Tamil Nadu Generation and Distribution Corporation Limited). This supports the surrounding jurisdictions through the substations. The generation of 3MW power contributing to TANGEDCO plays a vital role in supplying clean, renewable energy towards the state's sustainable goals relying reduction of fossil fuels on the other hand meeting the rising demand for them but also reducing carbon emissions, fostering greener for the community. Through this continuous generation of power, the institutes hold pride in participating in the transition to a cleaner efficient power grid. This highly contributes to the growth of clean energy infrastructure, benefiting not just the power grid but the entire community's well-being. Adhering to the policy regulations, the Institute along with Gokul Autotech will set up systems to track and evaluate the results of divestiture initiatives. To monitor the process and inform stakeholders of the institute's commitment, regular power generation reports will be published. To make sure that from Carbon-Intensive Energy Industries Policy is effective and in line with changing sustainability objectives, the collaborative team with faculties in a rotating roaster will learn, practise industrial exposure and review it regularly.



SAVE ENERGY — SAVE NATION

GOVERNMENT OF TAMIL NADU
ELECTRICAL INSPECTORATE

Web Site: www.tnei.tn.gov.in
E-mail: celg@tn.gov.in
Phone: 22500 184, 22500 227, 22500 430, 22500 799
Fax: 22500 036

From
The Chief Electrical Inspector to Government,
Post Box No. 1152,
Thiru-Vi-Ka Industrial Estate,
Guindy, Chennai – 32.

To
M/s. Gokul Autotech Private Limited,
Plot. No.A-40/B, SIPCOT Industrial Growth centre,
Oragadam, Sriperumbudur Taluk,
Kancheepuram District-602105.

Letter No. 847/SPP/CEIG/D3/SC/2022-2, Dated:28.11.2022

Sir,

Sub: Electricity – 3 MW Solar Power Plant – New Electrical Installations of voltage exceeding 650V and upto and including 33 kV and upto 650V at the premises of M/s. Gokul Autotech Private Limited, SF. Nos.326/1, 326/3, 326/5A, 326/7, 326/2A,326/4, 326/6B, 326/5B,340/1,339/2(P),326/6A,327/1A, 327/1B,327/1C(P) 327/2(P), of Karisalkulam Village,Thiruvengadam Taluk, Tenkasi District - Inspection under Regulation 43 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010, on 16.11.2022 – Approval – accorded.

Ref:
1. This office letter No. 847/SPP/CEIG/D3/Drg/2022, dt. 14.11.2022.
2. Your letter No. & dt. Nil, received on 15.11.2022.
3. This office letter No. 847/SPP/CEIG/D3/Reg.43 inspection/2022, dt. 15.11.2022.
4. The Electrical Inspector/Tirunelveli letter No. SPP 847/EI/TIN/R 43/2022-1, dt. 16.11.2022.
5. Your letter No. & dt. Nil, received on 22.11.2022.
6. This office letter No. 847/SPP/CEIG/D3/TC/2022-1, dt. 28.11.2022.

*****

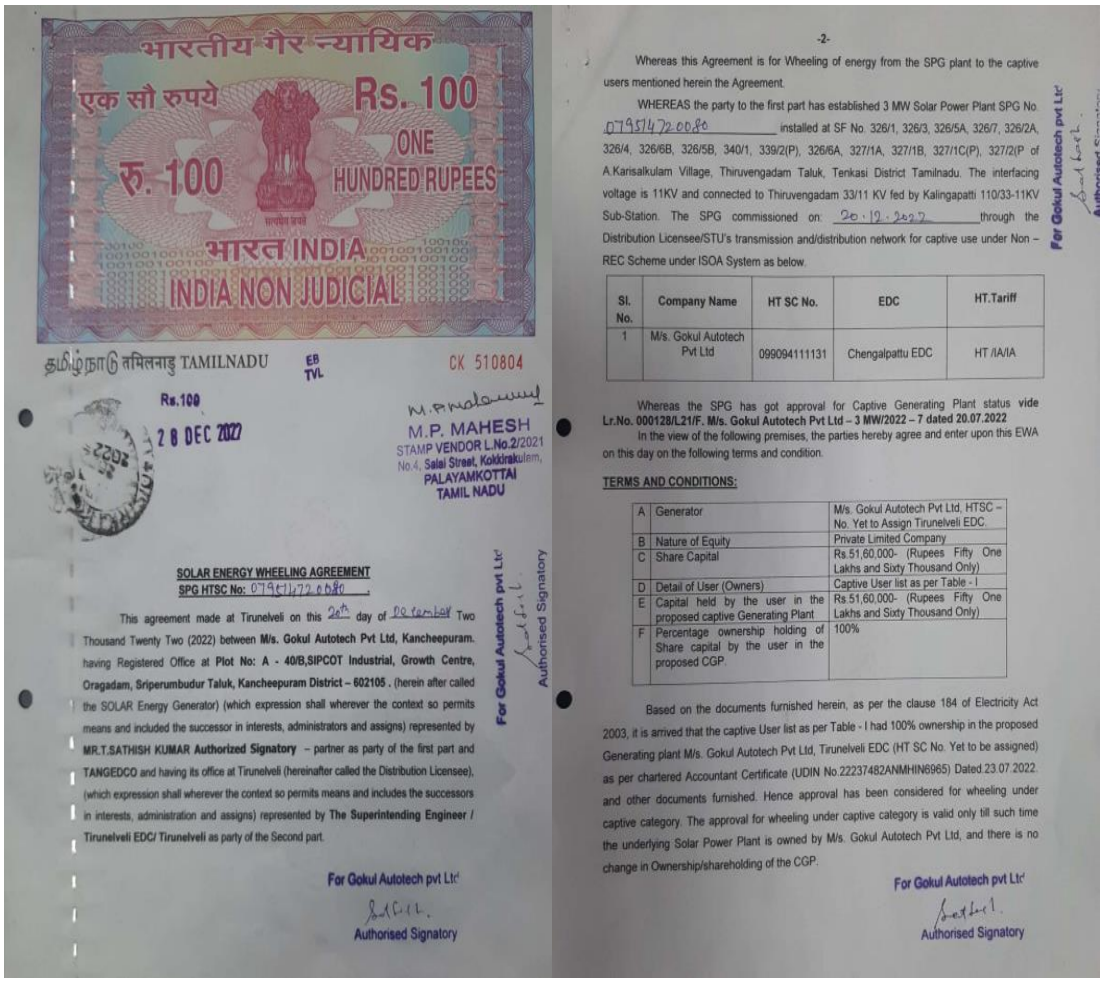
Approval is hereby accorded under Regulation 43 (5) of Central Electricity Authority (Measures relating to safety and Electric Supply) Regulations, 2010 to commission the Electrical Installations inspected on 26.09.2022 at the above premises for 1 x 3.3 MVA Solar Duty Transformer, 1 x 3 MVA Solar Inverters and other equipments as detailed in annexure subject to complying with the terms and conditions of the supplier.

The date of energisation of the installation should be intimated to this office. The equipment's permitted should be commissioned within six months from the date of issue of this letter failing which fresh permission should be obtained.

Under Regulation 46 (7) of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2010, the owner of the installation shall maintain and operate the installations in a condition free from danger and as recommended by the manufacturer or by the relevant codes of practice of the Bureau of Indian Standards.

(Sd/-xxx)
Chief Electrical Inspector to Government
//True Copy/Forwarded//
Assistant Electrical Inspector/Technical

Encl: Annexure containing List of Electrical Equipments (03 Pages)
Copy to: M/s.Asian Windmill Spares and Services,Plot No.56, Door No.12/821, 2nd Floor, Tamil Gudimagan Nagar,5th Street, Kovilambakkam, Chennai- 600 129. (With Annexure)
Copy to: The Superintending Engineer/TANGEDCO Ltd/Tirunelveli Electricity Distribution Circle/Maharajanagar, Tirunelveli - 11 (With Annexure)
Copy to: The Senior Electrical Inspector/Coimbatore (With Annexure)
Copy to: The Electrical Inspector/ Tirunelveli (With Annexure)
The Balance inspection fees of Rs.20930/- has been received in this office vide challan No. 20221122003736, dt.22.11.2022 paid to this office of the Chief Accountant, PAO [Chennai (South)].



भारतीय गैर न्यायिक
एक सौ रुपये
Rs. 100
ONE HUNDRED RUPEES
रु. 100
भारत INDIA
INDIA NON JUDICIAL
தமிழ்நாடு தமிழ்நாடு TAMILNADU
EB TVL
CK 510804
Rs.100
28 DEC 2022
M.P. MAHESH
STAMP VENDOR L.No.2/2021
No.4, Salai Street, Kokkirakulam,
PALAYAMKOTTAI
TAMIL NADU

SOLAR ENERGY WHEELING AGREEMENT
SPG HTSC No: 07951472 0080

This agreement made at Tirunelveli on this 20th day of December Two Thousand Twenty Two (2022) between **M/s. Gokul Autotech Pvt Ltd, Kancheepuram.** having Registered Office at **Plot No: A - 40/B,SIPCOT Industrial, Growth Centre, Oragadam, Sriperumbudur Taluk, Kancheepuram District – 602105** . (herein after called the SOLAR Energy Generator) (which expression shall wherever the context so permits means and included the successor in interests, administrators and assigns) represented by **MR.T.SATHISH KUMAR Authorized Signatory** – partner as party of the first part and **TANGEDCO** and having its office at Tirunelveli (hereinafter called the Distribution Licensee), (which expression shall wherever the context so permits means and includes the successors in interests, administration and assigns) represented by **The Superintending Engineer / Tirunelveli EDC/ Tirunelveli** as party of the Second part.

For Gokul Autotech pvt Ltd
Authorised Signatory

For Gokul Autotech pvt Ltd
Authorised Signatory

-2-

Whereas this Agreement is for Wheeling of energy from the SPG plant to the captive users mentioned herein the Agreement.

WHEREAS the party to the first part has established 3 MW Solar Power Plant SPG No. 07951472 0080 installed at SF No. 326/1, 326/3, 326/5A, 326/7, 326/2A, 326/4, 326/6B, 326/5B, 340/1, 339/2(P), 326/6A, 327/1A, 327/1B, 327/1C(P), 327/2(P of A.Karisalkulam Village, Thiruvengadam Taluk, Tenkasi District Tamilnadu. The interfacing voltage is 11KV and connected to Thiruvengadam 33/11 KV fed by Kalingapatti 110/33-11KV Sub-Station. The SPG commissioned on 20.12.2022 through the Distribution Licensee/STU's transmission and/distribution network for captive use under Non – REC Scheme under ISOA System as below.

Sl. No.	Company Name	HT SC No.	EDC	HT.Tariff
1	M/s. Gokul Autotech Pvt Ltd	099094111131	Chengalpattu EDC	HT /IA/IA

Whereas the SPG has got approval for Captive Generating Plant status **vide Lr.No. 000128/L21/F. M/s. Gokul Autotech Pvt Ltd – 3 MW/2022 – 7 dated 20.07.2022**

In the view of the following premises, the parties hereby agree and enter upon this EWA on this day on the following terms and condition.

TERMS AND CONDITIONS:

A	Generator	M/s. Gokul Autotech Pvt Ltd, HTSC – No. Yet to Assign Tirunelveli EDC.
B	Nature of Equity	Private Limited Company
C	Share Capital	Rs.51,60,000- (Rupees Fifty One Lakhs and Sixty Thousand Only)
D	Detail of User (Owners)	Captive User list as per Table - I
E	Capital held by the user in the proposed captive Generating Plant	Rs.51,60,000- (Rupees Fifty One Lakhs and Sixty Thousand Only)
F	Percentage ownership holding of Share capital by the user in the proposed CGP.	100%

Based on the documents furnished herein, as per the clause 184 of Electricity Act 2003, it is arrived that the captive User list as per Table - I had 100% ownership in the proposed Generating plant M/s. Gokul Autotech Pvt Ltd, Tirunelveli EDC (HT SC No. Yet to be assigned) as per chartered Accountant Certificate (UDIN No.22237482ANMHIN6965) Dated.23.07.2022. and other documents furnished. Hence approval has been considered for wheeling under captive category. The approval for wheeling under captive category is valid only till such time the underlying Solar Power Plant is owned by M/s. Gokul Autotech Pvt Ltd, and there is no change in Ownership/shareholding of the CGP.

For Gokul Autotech pvt Ltd
Authorised Signatory

Contribution of Gokul Autotech Pvt.Ltd to TANGEDCO

7.4.5 Assistance to Low Carbon Innovation

CITIL (Chennai Institute of Technology Incubation Lab) is an initiative by the institution committed to fostering entrepreneurship by providing mentorship, state-of-the-art technology, and specialized COEs for deep tech product development. We help ideas become successful enterprises by offering essential funding and all-encompassing support. The goal of CITIL is to turn creative ideas into profitable, long-lasting businesses. Our dedication is to giving companies the tools they need to succeed in the marketplace. CITIL open the door for the expansion of entrepreneurial initiatives by combining technology, specialized support, and mentorship. Start-up towards Climate Action Plan enhances the process of controlling the greenhouse gas emissions profile. The Plan reflects the dedication and involvement of the institution towards the control of CO_2 emissions encouraging, incubating, step-up and leading entrepreneurial pillars. Festa Solar Pvt. Ltd., deals with energy system integrators was initiated by the institute's CITIL and Gokul Autotech Pvt. Ltd that places time for training the institute's faculties and students. This provides a conduit to empowerment, innovation and triumph in the sustainable transformation journey. Listrik Motors, Quarz Motors and FT Motors Pvt. Ltd. were initiated by the incubated students from the institute which makes them incredibly proud that their entrepreneurial spirit drives advancements towards a greener and more sustainable future.

Start-ups with CITIL

S.No	Information
1.	Startup Name: **Festasolar Pvt Ltd** URL: **https://festasolar.com/home** Incorporation Number/CIN: U70109TN2018PTC125820 Date Established: 15.11.2018 District of Registration: Chennai State Registration Number/DPIIT Recognition Number: DIPP152338 Founder Name: Mr. Sampath Kumar Email address: festasolarchennai@gmail.com Description: **Solar Panels**
2.	Startup name: **Listrik Motors Pvt.Ltd** Incorporation Number/CIN: U74140DL2007PTC160476 Date Established: 28.05.2021 District of Registration: Kanchipuram Founder Name: Mr. Rosario Email address: listrikmotors@gmail.com Description: **E-Bike Mobility**

3.	Startup name: **Quazr Motors Pvt.Ltd** Incorporation Number/CIN: U34300TN2022PTC151997 Date established: 07.05.2022 District of Registration: Chennai State Registration Number/DPIIT Recognition Number: DIPP101644 Founder Name: Mr. Ruban Email address: quazrmotor@gmail.com Description: **E-Bike Precisions**
4.	Startup name: **FT Motors Pvt.Ltd (Sina Mobility)** Incorporation Number/CIN: U34300KA2017PTC107271 Date established: 14.07.2021 District of Registration: Bangalore Founder Name: Mr. Rishabh Email address: sinamobility@gmail.com Description: **Electric Vehicle Autocomponents**