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Whitepaper on

State Energy Efficiency Action Plan for Puducherry

Background

India's rapid economic expansion and urbanization have paved the way for a huge increase in energy demand. As the nation continues to evolve and urban areas expand, the need for energy to power industries, transportation, and households has grown steadily. This burgeoning demand poses a complex challenge, as it requires a delicate balance between providing access to affordable and reliable energy for all while addressing environmental sustainability and energy security. In response to these challenges, India, in its updated Nationally Determined Contribution submitted during the 26th session of the Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC) in Glasgow, United Kingdom in 2021, unveiled a strategic framework for climate action. This framework, symbolized by the "Panchamrit" (five nectar) elements, signifies India's resolute commitment to achieve net-zero emissions by 2070 and secure 50% of its energy from renewable sources by 2030.

It is imperative to recognize the pivotal role that States and Union Territories (UTs) play in effecting a transition to low-carbon development pathways. To facilitate this vital transition, the Bureau of Energy Efficiency, operating under the aegis of the Ministry of Power, Government of India, has embarked on the development of State Energy Efficiency Action Plan (SEEAP). These plans are tailored to meet the distinctive requirements of each state, ensuring that resource allocation aligns with the state's sustainable development objectives. The SEEAP project aims to contribute to India's national targets and provide a comprehensive roadmap for enhancing energy efficiency across the U.T. and the country.

For Puducherry, SEEAP was developed by the Confederation of Indian Industry (CII), under the guidelines of Bureau of Energy Efficiency, Ministry of Power, GOI, in consultation with the State Designated Agency viz. Renewable Energy Agency Puducherry (REAP) with inputs & suggestions from various government departments and sector experts.

Identification of the focus sectors

The objective of this plan is to ensure that resource allocation aligns seamlessly with the specific requirements of the state, thereby fostering progress towards achieving state-specific goals related to sustainable development. Identifying the focus sectors or areas assumes a pivotal role in this process, primarily because certain sectors within a U.T. exhibit higher energy consumption, necessitating targeted interventions to enhance energy efficiency and promote sustainable practices.

The process of identifying focus sectors for Puducherry’s energy efficiency initiatives followed a comprehensive methodology. This involved several key steps, including analyzing the UT's energy consumption patterns to identify sectors with significant energy use, emissions from different sectors, Gross State Value Addition (GSVA) analysis of the sectors contributing most to 's economy, while policy gap analysis helped identify challenges and areas requiring targeted interventions. Stakeholder input and feedback, including insights from government agencies, played a crucial role in shaping the selection of focus sectors. Furthermore, alignment with the State/U.T. government's vision and long-

term development goals ensured that the chosen sectors were in accord with the UT's strategic direction.

Based on the above parameters, Transport, Industry, Building, Agriculture and Fisheries are the identified focus sectors for Puducherry.

Proposed Strategies with Implementation Methodology

This chapter discusses the proposed strategies outlined in the action plan for the identified focus sector along with their potential impact in terms of energy efficiency and emission reduction. These proposed strategies are stated below with actionable measures and implementation methodology.

1. Transport

Puducherry has a significant number of two-wheelers, followed by cars and commercial vehicles. As per the latest statistics, the U.T. has over 13 lakhs registered vehicles, out of which 83% are two-wheelers, 1% are three wheelers, 14% are four – wheelers, and the remaining 3% are commercial vehicles. The most commonly used fuel for vehicles in Puducherry is petrol, followed by diesel and CNG (compressed natural gas). The U.T. also has a few electric vehicle charging stations in major cities.

By increasing the adoption of electric vehicles, Puducherry can reduce its carbon footprint and improve air quality. Additionally, the U.T. has set a target of achieving 100% electrification of the public transport system by 2030, and increasing the electrification of road transport will be crucial in achieving this goal.

Strategy: Conversion of vehicle fleet into EVs by setting UT's more aggressive target

This strategy proposes converting 1.76 lakh vehicles in the U.T. to electric vehicles by FY 2031 under moderate scenario and 2.64 lakh vehicles in the ambitious scenario.

Implementing Agency: DISCOMs, Transport Department, SDA -REAP, PSUs and private sector.

Actionable Measures

1. Develop charging infrastructure for induction charging on greenfield highway projects, urban centers, and tourist destinations.
2. Develop a comprehensive Electric Vehicle (EV) charging infrastructure plan, with specific targets for the number of charging stations to be installed across the U.T.
3. Allocate subsidies for electric buses. For example, the U.T can consider a subsidy model similar to Bihar, which provides ₹10,000 per kWh of battery capacity subsidy, subject to a maximum of ₹25 lakh per vehicle.
4. Offer subsidies to other segments such as electric tractors, e-cycles, and strong hybrids. For example, Haryana, provides subsidies for electric tractors and other alternative fuel vehicles.
5. Encourage vehicle retrofitting by providing incentives for retrofit kits. For instance, in Rajasthan, 15% of the retrofit kit cost (including taxes) is reimbursed, up to ₹10,000 per vehicle.

6. Implement a plan to electrify UT's public transport fleet. Electrify the U.T. government's fleet of vehicles, following the lead of Himachal Pradesh, which has announced electrification of all its official vehicles.
7. Promote electric bus procurement and the creation of charging infrastructure at bus depots.
8. Encourage battery swapping and leasing programs for electric two-wheelers and three-wheelers.
9. Launch public awareness campaigns about the benefits of electric vehicles and the environmental impact of electrified road transport, following the model of Delhi's "Switch Delhi" campaign.
10. Conduct workshops and training programs for mechanics and service centers to support EV maintenance.
11. Develop a dedicated electric vehicle information portal with comprehensive resources for potential buyers.

Implementation Methodology:

1. Create a regulatory framework for safety standards, emissions, and quality control for electric vehicles.
2. Identify priority areas for charging station deployment, considering factors like traffic volume, distance, etc.
3. Work with the Department of Industries to attract EV manufacturers to set up operations in the U.T.
4. Provide training for drivers and mechanics in electric vehicle maintenance.
5. Partner with existing electric two-wheeler and three-wheeler manufacturers and startups to pilot battery swapping and leasing programs.
6. Design and launch an extensive awareness campaign to promote the benefits of electric vehicles.
7. Establish key performance indicators (KPIs) to measure the progress of electrification efforts.

Strategy: Facilitating adequate public transport infrastructure

Puducherry has an extensive public transportation system that includes buses, trains, and auto-rickshaws. The U.T. owned Puducherry Road Transport Corporation (PRTC) operates buses that connect various cities and towns within the U.T., as well as neighbouring states. PRTC has a fleet of over 140 buses and operates over 55 routes across the U.T. There has been a decline in ridership which can be attributed to the lack of investment in new buses, resulting in a decrease in the frequency of buses and the quality of service provided to the passengers. Hence, this strategy aims to optimize fuel utilization and reduce carbon emissions by encouraging the adoption of fuel-efficient buses, hybrid technologies, and alternative fuels through fleet modernization, route optimization, fuel management, and integrated model of transport.

Implementing Agency: Department of Transport, Puducherry Road Transport Corporation (PRTC), U.T. Pollution Control Board, Urban Development Authorities and Municipal Corporations

Actionable Measures

1. Conduct a comprehensive assessment of the current public transport bus fleet's energy consumption, identifying energy-intensive routes.

2. Gradually replace older, less energy-efficient buses with newer models that comply with energy conservation standards and adopting hybrid or electric buses where feasible.
3. Implement measures to ensure optimal fuel usage, such as fuel-efficient driving practices, fuel quality monitoring, and exploring the use of cleaner alternative fuels.
4. Establish necessary infrastructure, such as charging or refuelling stations for electric, hybrid, or alternative fuel buses.

Implementation Methodology:

1. Form a renewable energy integration task force comprising experts, government officials, and industry representatives.
2. Establish schemes like feed-in tariffs, tax incentives, grants, and low-interest loans to encourage investment.
3. Provide streamlined permit processes for solar installations at charging stations.
4. Establish partnerships with battery manufacturers and suppliers to ensure a steady supply of storage solutions.
5. Allocate a budget for grid modernization and smart grid infrastructure development.
6. Pilot grid modernization projects in select areas before scaling up in the U.T.

Strategy: Ethanol Blending Programme

Under this strategy, it is proposed to ensure the mixing of ethanol in motor spirit (petrol) in a fixed ratio to offset a part of the energy consumed by petrol and bring about reduction in emissions. In the proposed strategy and in line with the country's target of 20% blending of ethanol blending in petrol by 2025, a 20% blending target is suggested in the moderate scenario and a 25% blending target is suggested in the ambitious scenario by 2031.

Implementing Agency: MoPNG, Transport Department, Oil Marketing Companies (OMCs), Department of Industries

Actionable Measures

1. Encourage the establishment of ethanol production units, including distilleries and ethanol extraction facilities, and provide incentives for their setup.
2. Upgrade fuel dispensing stations to accommodate ethanol-blended fuels (E5, E10, etc.).
3. Develop and enforce regulations and standards for ethanol production, quality, and blending percentages.
4. Ease storage, movement, and permit norms for industrial fuel-grade ethanol.
5. Promote the use of biodiesel and Compressed Biogas (CBG) in the UT's public transport buses.

Implementation Methodology:

1. Develop a framework for ethanol procurement agreements between the U.T. government and ethanol producers.

2. Invite competitive bidding from ethanol producers and select suppliers based on price, quality, and capacity.
3. Invest in the development and expansion of storage facilities, pipelines, and transportation infrastructure.
4. Draft and pass regulations to govern ethanol production, quality, and blending standards for the U.T.

2. Industry

Puducherry has a diverse and growing industrial sector that contributes significantly to the UTs economy. The U.T. is known for its focus on industrial development and has implemented various policies and initiatives to attract investments and promote industrial growth. Manufacturing is a key sector in Puducherry, contributing significantly to the UT's GDP. The U.T. has a strong presence in industries such as chemical, plastic, rubber, automobile, paper, and pharmaceuticals.

Strategy: Deepening of BEE's PAT Scheme

Deepening of PAT scheme involves identification of new DCs in existing sectors. The deepening of the PAT scheme can help Puducherry achieve its energy efficiency and emission reduction targets by incentivizing industries to adopt energy-efficient practices and technologies. Puducherry, being one of the leading industrialized UTs in India, can benefit significantly from the deepening of the PAT scheme Through deepening of PAT can further unlock its potential for energy savings and emission reductions. This can not only contribute to meeting the UT's climate change goals but also lead to cost savings for the industries involved. Therefore, the deepening of the PAT scheme can be an effective tool for sustainable industrial development in Puducherry.

Implementing Agency: Bureau of Energy Efficiency (BEE), Department of Industries, Renewable Energy Agency Puducherry, (REAP).

Actionable Measures

1. Promote the adoption of high-efficiency electric motors and variable speed drives to enhance industrial energy efficiency. Encourage industries to use variable frequency drives (VFDs) along with high-efficiency motors.
2. Phase out inefficient motors and minimize energy consumption in industries by providing financial incentives, such as subsidies or rebates, to industries that replace older, less efficient motors with IE class 3 or above motors and VFDs.
3. Encourage industries to adopt Energy Management Systems (EnMS) for continuous energy monitoring, management, and optimization.
4. Encourage the use of Energy Service Companies (ESCOs) and performance contracts, where ESCOs provide energy-efficient solutions and are compensated based on energy savings achieved.
5. Provide incentives for businesses that supply low-carbon products to government agencies and other organizations.

6. Implement electric heating technologies, such as induction heating and resistance heating, in industrial processes. For example, replacing conventional steelmaking processes with electric arc furnaces powered by clean electricity from renewable sources.
7. Collaborate with industries to facilitate the transition from FO to cleaner and more efficient liquefied natural gas (LNG) for industrial boilers by offering technical assistance, financial incentives, and guidance on fuel switch planning.

Strategy: Widening of BEE's PAT Scheme

By bringing more industries under the PAT scheme, the U.T. can ensure that a larger number of energy-intensive industries are actively working towards improving their energy efficiency. This can help reduce the overall energy consumption of the U.T. and reduce its carbon footprint. Sectors like pharmaceutical, Rubber, Plastics, Automobile, Paper etc. are considered under the scope of this strategy based on energy consumption patterns of the industries, their contribution to the UT's economy, and their potential for energy efficiency improvements.

Implementing Agency: Bureau of Energy Efficiency (BEE), Department of Industries, Renewable Energy Agency Puducherry, (REAP).

Actionable Measures

1. Organize workshops focused on technology interventions for energy conservation in manufacturing sectors to educate MSMEs on the latest energy-efficient practices and technologies.
2. Feasibility Study of new probable sectors (Rubber, Plastics, Pharma, Automobile, Pulp and Paper) to be included in the PAT scheme.
3. Provide technical assistance to help MSMEs transition from inefficient to efficient motors, upgrade their technology in boilers, and implement other Energy Conservation Measures (ECMs).
4. Organize capacity building and technical training programs that offer BEE Energy Auditor Courses to train local experts within the U.T. in energy efficiency practices.

Implementation Methodology:

1. Conduct baseline energy audits for industries to assess their current energy consumption, identify inefficiencies, and understand energy-saving opportunities.
2. Continuously monitor and evaluate the impact of energy efficiency measures, using key performance indicators to track energy savings and carbon emissions reduction.
3. Require MSMEs to provide regular reports on their energy consumption and energy-saving initiatives.
4. Periodically review the program's effectiveness, making improvements based on lessons learned and industry advancements.
5. Implementing a green rating system that evaluates energy efficiency and other parameters and promotes sustainable practices in the industrial sector. By incentivizing and recognizing industries that adopt environmentally friendly practices, the U.T. can foster a culture of sustainability and promote the adoption of greener technologies and practices.

3. Residential & Commercial Buildings

With Puducherry rapidly growing population and urbanization trends, there has been a substantial increase in the construction of residential and commercial buildings in the U.T.

In FY2020, the residential sector in Puducherry accounted for 16% of the total electrical consumption, with nearly 0.16 MTOE consumed, and the commercial sector's consumption was 3.16 %. This underscores the need for enhancing energy efficiency in residential as well as commercial buildings to reduce energy consumption and promote sustainable living.

Strategy: Energy Efficiency Labelling for Residential & Commercial Buildings

In the recent amendment to the Energy Conservation (EC) Act in 2022, a unified code called the "Energy Conservation and Sustainable Building Code" (ECSBC) has been introduced. This new code will include both commercial and residential buildings. Until the implementation of ECSBC in State/UT, the existing Energy Conservation Building Code (ECBC) and Eco-Niwas Samhita (ENS) will be referred to as ECSBC.

Recognizing the substantial energy consumption by the residential sector and commercial sector and its significant impact on the total electrical consumption, the star-labelling programme for all single and multiple-dwelling residential and commercial units has been initiated by the Bureau of Energy Efficiency (BEE). It is a step forward from Eco Niwas Samhita 2018 launched by Ministry of Power in 2018. There is no minimum requirement for the area or connected load (kW) for a building dwelling unit to be covered under this labelling programme. This label is applicable for existing and new buildings.

Implementing Agency: Bureau of Energy Efficiency, Department of Town and Country Planning, Puducherry – Housing Board

Actionable Items

1. Collaborate with BEE to establish a network of accredited energy auditors and professionals. Provide training and certification opportunities to ensure a qualified workforce.
2. Introduce a rebate program for homeowners who obtain BEE's Energy Efficiency Labelling certification.
3. Offer incentives to builders who construct energy-efficient residential buildings. Incentives could include reduced permit fees, faster approval processes, or recognition for their sustainable construction practices.
4. Establish a dedicated financing program that provides affordable loans for homeowners looking to improve the energy efficiency of their homes. Offer financial mechanisms, such as low-interest rates and flexible repayment options.

5. Encourage local government departments to undertake energy efficiency upgrades in their residential buildings as demonstration projects. Share success stories and cost savings to inspire homeowners to follow suit.
6. Develop and distribute educational materials and online resources about BEE's Energy Efficiency Labelling and its benefits in the local language.
7. Create a user-friendly online platform where homeowners can calculate potential savings and access information about energy-efficient products and services.
8. Conduct regular workshops on capacity building and training sessions in collaboration with local authorities and educational institutions.
9. Offer these workshops to builders, architects, and homeowners to educate them on energy-efficient building practices and the significance of BEE's Energy Efficiency Labelling.

Implementing Methodology:

1. Establish a program for residential and commercial energy audits and assessments, either government-led or in partnership with certified energy auditors.
2. Collaborate with financial institutions to provide low-interest loans for energy-efficient upgrades.
3. Develop and regularly update a directory of energy-efficient materials and technologies, ensuring it remains a valuable resource for stakeholders.

Strategy: Replacement Program for inefficient appliances

With the growth in the number of appliances units in Puducherry due to urbanization, there is a need to accelerate the ambition of Minimum Energy Performance Standards (MEPS) and expand the scope of the BEE's Standards & Labelling program. This will help to drive the adoption of energy-efficient RAC units and reduce the energy consumption and carbon footprint of the U.T. Additionally, the acceleration of S&L program can help to create awareness among consumers about the benefits of energy-efficient appliances and incentivize manufacturers to innovate and develop more efficient products.

Implementing Agency: Bureau of Energy Efficiency (BEE), Renewable Energy Agency Puducherry, (REAP), U.T. Electricity Regulatory Commission, Housing and Urban Development Department, Puducherry.

Actionable Items

1. Introduce financial incentives, such as rebates or tax credits, for the purchase and installation of energy-efficient cooling systems.
2. To incorporate the latest energy-efficient materials and technologies.
3. Provide subsidies and financial incentives to consumers and businesses for the installation of heat pumps for space cooling and hot water supply.
4. Demand aggregation model to incentivize the use of star-rated appliances in domestic settings by offering bulk purchase discounts.

5. Scrap to Energy Efficient Appliances (SEA) Policy, encouraging the responsible disposal of old appliances.

Implementing Methodology:

1. Design and launch the appliance exchange scheme, specifying the eligibility criteria for participating consumers.
2. Set up an online platform or physical exchange centers where consumers can register and participate in the selection and procurement of energy efficient appliances.
3. Collaborate with retail associations to encourage participation in the replacement program.

Strategy: Promotion of Green Building Ratings

To further advance the adoption of green and net-zero building practices in the commercial building sector, it is essential to promote the Green Building Rating system. These interventions will contribute significantly to the UT's goal of reducing energy consumption and fostering a more sustainable built environment.

Implementing Agency: Certification Body, REAP, Department of Country and Town Planning

Actionable Items

1. Develop and maintain an Energy Conservation Building Code (ECBC) compliance portal.
2. Initiate pilot projects to showcase the benefits of Net Zero (Energy) Rating. Select an initial set of 20 buildings as case studies to demonstrate the feasibility and advantages of higher energy efficiency standards.
3. Enforce a mandatory minimum set point of 24°C for air conditioners in all government buildings.
4. Mandatory cool roofing for all the government, government-owned, non-residential, and commercial buildings irrespective of site area/built up area.

Implementing Methodology:

1. Conduct training programs and capacity-building initiatives to empower professionals and workers with the skills and knowledge needed for green building construction.
2. Collaborate with academic institutions, industry experts, and vocational training centers to
3. Promote recognized green building certification programs.
4. Encourage builders to seek green building certification by offering subsidies or rebates for certification fees.
5. Recognize and celebrate green building achievements through awards and recognition programs.

4. Agriculture

Puducherry is one of the agricultural U.T. in India, with a diverse range of crops being grown in different regions. The UT's economy is largely dependent on agriculture and fisheries, with

approximately. About 45% of the total population depends directly or indirectly on farming and contributes less than 2% of the GSDP of the Government of Puducherry. Improving energy efficiency in these sectors is crucial for achieving sustainable development and reducing greenhouse gas emissions.

Strategy: Transition of conventional agricultural pumps to solar powered pumps

Transitioning from diesel pumps to solar-powered pumps can significantly help in energy conservation in Puducherry.

Implementing Agency: Bureau of Energy Efficiency (BEE), Renewable Energy Agency Puducherry, (REAP), Department of Agriculture, Puducherry

Actionable Items

1. Greater outreach to relevant stakeholders for effective implementation of PM KUSUM Yojana.
2. Launch a subsidy program modelled after Gujarat's "Suryashakti Kisan Yojana," which provides farmers with a 60% subsidy on solar pump installations. This program can significantly reduce the financial burden on farmers in Puducherry.
3. Establish a comprehensive training program in skill development for installers and technicians. This training should encompass installation, operation, and maintenance of solar pump systems.
4. Engage local agricultural extension officers and village panchayats, following Maharashtra's "Mukhyamantri Saur Krishi Pump Yojana," to facilitate grassroots-level awareness and information sharing.
5. Promote the creation of solar pump procurement cooperatives which allows farmers to collectively purchase high-quality solar pumps.
6. Capacity building of Panchayat/Block level officials about the program.

Implementing Methodology:

1. Conduct a feasibility study to identify areas to determine suitable locations for the establishment of solar agriculture feeders.
2. Collaborate with cooperative banks and rural banks to provide specialized loan schemes with low-interest rates.

Strategy: Replacement of inefficient pumps with BEE 5 Star Rated Pumps along with smart control panel

This strategy will focus on the agriculture sector targeting inefficient agricultural pumps. It will cover the replacement of existing inefficient pumps with BEE 5-star rated pumps and smart control panels in agricultural fields and related irrigation systems. In the moderate scenario, by FY 2031, 30% of the inefficient electric-powered pumps are proposed to be replaced with BEE 5 Star rated pumps and 50% in the ambitious scenario.

Implementing Agency: Bureau of Energy Efficiency (BEE), Electricity Department, REAP, EESL

Actionable Items

1. Launch awareness campaigns targeting farmers to inform them about the benefits of energy-efficient pumps and smart control panels.
2. Development of a phase-wise plan to implement Demand Side Management (DSM) scheme for replacing existing inefficient pumps through Energy Service Companies (ESCOs).
3. Provide guidance on the installation and integration of smart control panels.
4. Collaborate with financial institutions to offer low-interest loans designed for farmers to facilitate pump replacements.
5. Offer incentives such as additional subsidies or rebates for early adopters who comply with the mandate.

Implementing Methodology:

1. Conduct a thorough survey to identify inefficient agricultural pumps and their distribution across the U.T. Categorize pumps based on their energy efficiency and operational condition.
2. Gradually introduce mandatory compliance for the replacement of inefficient pumps with BEE 5 Star Rated Pumps and smart control panels for specific agricultural applications.
3. Establish a network of technical experts to assist farmers in selecting the right pump sizes and types according to their specific irrigation needs.

5. Fisheries

The fisheries sector is an important contributor to the economy of the U.T. of Puducherry, located on the south-eastern coast of India. The U.T. has a long coastline of around 30 km and making it well-suited for fishery activities. The fisheries sector in Puducherry comprises both inland and marine fisheries, including capture and culture fisheries. The marine fisheries are dominated by traditional, small-scale fishing operations using non-motorized boats, while the inland fisheries are largely based on freshwater aquaculture. However, the fisheries sector in Puducherry faces several challenges, including overfishing, habitat destruction, and unsustainable fishing practices. In addition, the sector is also highly energy-intensive, with significant energy consumption involved in activities such as fishing, processing, transportation, and storage.

Strategy: Energy efficiency across value chain of fisheries

Improving energy efficiency across all value chains in the fisheries sector can lead to significant environmental and economic benefits, including reduced greenhouse gas emissions, decreased energy consumption, and cost savings for fishers and processors. In the processing and packaging stages, energy is mainly consumed for cooling, freezing, and drying of fish products. The transportation and distribution of fish and fish products also require significant energy input, mainly in the form of fuel for vehicles and refrigeration systems. Overall, improving energy efficiency across all value chains in the fisheries sector in the U.T. can bring numerous benefits, including reduced greenhouse gas emissions, cost savings for fishers and processors, and increased competitiveness in the global market.

Implementing Agency: Department of Fisheries, REAP

Actionable Items

1. Provide skill development programs to fishermen and fishery workers, educating them on energy-efficient practices, equipment usage, and maintenance.
2. Encourage the use of Phase Changer Material (PCM) technology in coolers and freezers to improve energy efficiency in cold storage and transportation.
3. Promote the adoption of energy-efficient aerators in aquaculture and fish farming.
4. Support the installation of solar PV systems for fishery and cold storage facilities to reduce energy consumption.
5. Encourage the use of efficient ammonia or CO_2 brine systems in cold storage.
6. Promote the use of evaporative condensers for cooling to improve efficiency.
7. Advocate for low-charge ammonia refrigeration systems to reduce environmental impact.
8. Implement mobile chilling solutions for reefer trucks to maintain the cold chain efficiently.
9. Support the use of PCM materials for reefer transport to reduce energy consumption during transportation.
10. Promote the use of variable frequency drive solutions for refrigeration systems to optimize energy usage.
11. Encourage the adoption of electronic level control for refrigeration systems.
12. Implement Internet of Things (IoT) technology for better control and monitoring of refrigeration systems.
13. Provide subsidies to encourage fishermen and fishery enterprises to adopt solar-powered boats, refrigeration systems, and other equipment.
14. Promote the upgrading of traditional fishing vessels with efficient and eco-friendly engines.
15. Advocate for the installation of fuel-efficient engines to reduce fuel consumption by up to 30% and decrease emissions.

Implementing Methodology:

1. Conduct a baseline energy audit to identify current energy consumption patterns in high marine and inland fishing areas.
2. Prioritize specific segments of the value chain, such as fishing vessels, fish storage, and transportation, based on their potential for energy savings.
3. Collaborate with the Marine Products Export Development Authority (MPEDA) to develop and implement skill development programs for fishermen, educating them on energy-efficient practices, equipment usage, and maintenance.
4. Leverage the "Blue Revolution", Central Sector scheme, to provide training and capacity building.
5. Establish a monitoring and evaluation framework to assess the impact of Pradhan Mantri Matsya Sampada Yojana at U.T. level.

Financing Mechanism

Financial mechanisms are structured systems put in place to facilitate the funding and implementation of energy-efficient measures in buildings and industries. These mechanisms encompass a range of financial tools, including loans, grants, subsidies, tax incentives, and other instruments, aimed at providing essential financial support for energy efficiency initiatives.

To achieve energy efficiency targets and significant cost savings, U.T. must implement a diverse set of energy efficiency policies and programs. To secure the necessary funding for these initiatives, the Bureau of Energy Efficiency (BEE) has introduced several financial mechanisms that U.T. can leverage for implementation. A notable program under the National Action Plan on Climate Change is the 'National Mission for Enhanced Energy Efficiency (NMEEE).' Within this framework, the following financial mechanisms have been initiated:

1. Energy Efficiency Financing Platform: Under the National Mission for Enhanced Energy Efficiency, this platform facilitates interactions between financial institutions and project developers. It serves as a crucial interface for the effective execution of energy efficiency projects, streamlining the flow of financial resources.
2. Framework for Energy Economic Development: This framework is designed to simplify the financing of energy efficiency projects through diverse fiscal instruments. It enhances stakeholder convenience by implementing schemes such as the 'Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE)' and the 'Venture Capital Fund for Energy Efficiency (VCFEE).
3. PRGFEE (Partial Risk Guarantee Fund for Energy Efficiency): PRGFEE addresses credit risks and transaction structuring barriers. It engages financial institutions and strengthens their capacity to finance energy efficiency projects on a commercially sustainable basis. The guarantee period extends up to a maximum of 5 years, with the Government of India allocating approximately INR 312 crores for PRGFEE.
4. VCFEE (Venture Capital Fund for Energy Efficiency): VCFEE offers risk capital support for energy efficiency investments in new technologies, products, and services. The Government of India has approved around INR 210 crores to bolster VCFEE.
5. Revolving Funds: These financial tools are designed to support sustainable development projects across various sectors, such as agriculture, small businesses, and community infrastructure. Revolving funds offer loans at favorable interest rates and are intended to support these sectors. Repayments from these loans replenish the fund, ensuring a continuous cycle of financing for new borrowers.
6. Green Bonds: Green bonds are financial instruments specifically crafted to fund projects and initiatives with environmental benefits. They are typically issued by governments, municipalities, corporations, or other entities to raise capital for endeavors that promote sustainability, renewable energy, energy efficiency, climate change mitigation, and other environmentally friendly goals.
7. Soft Loans: Also known as concessionary or subsidized loans, soft loans are financial instruments provided under more favorable terms compared to standard commercial loans. These loans typically feature lower interest rates, longer repayment periods, and flexible terms. Governments,

international financial institutions, or development agencies often offer soft loans to support specific objectives such as economic development, social welfare, or sustainability.

Summary

The "State Energy Efficiency Action Plan" report for Puducherry provides a roadmap for the U.T. to achieve its energy efficiency goals. It outlines opportunities for energy savings and greenhouse gas emissions reductions across multiple sectors, including industry, buildings, transportation, and agriculture. The proposed strategies are designed to help the U.T. to allocate resources to meet its targets in line with the NDCs. To successfully implement the action plan, it is essential to create a task force or working group comprising representatives from government, industry, NGOs, energy experts, and other stakeholders. This group should establish priorities, timelines, and progress monitoring. Adequate funding, including grants, loans, and public-private partnerships, must also be secured to support the plan. Additionally, innovative financing mechanisms, such as energy efficiency bonds, can be used to attract private investment in energy efficiency projects.

Considering this projection, the action plan identifies Transport, Industry, Building, Agriculture & Fisheries as the key focus sectors. It further analyses sector-specific strategies to achieve energy savings. In the moderate scenario, the implementation of this plan is expected to result in a reduction of 0.270 Mtoe in total energy consumption by FY 2031. In the ambitious scenario, the reduction is projected to be 0.501 Mtoe. Additionally, this plan aims to generate awareness at a mass level and create a market potential of approximately Rs. 19 crores in the energy efficiency sector. Furthermore, it is anticipated to contribute to a reduction of 0.147 $MtCO_2$ in the moderate scenario and 0.247 $MtCO_2$ in the ambitious scenario in terms of CO_2 emissions by FY 2031.

Bureau of Energy Efficiency

Ministry of Power, Govt. of India 4th Floor, Sewa Bhawan, R. K. Puram, New Delhi - 110066
(INDIA) T: +91 11 26766700 | F : +91 11 26178352 Email: admin@beenet.in |
www.beeindia.gov.in