Whitepaper On
State Energy Efficiency Action Plan

Himachal Pradesh

Background

The increasing demand for energy puts a strain on the country's resources and has negative environmental impacts. Therefore, it is necessary to separate the country's economic growth from its energy demand. This objective is also reflected in India's Intended Nationally Determined Contribution submitted before the Paris Climate Conference, where the government emphasized energy conservation as a crucial mitigation strategy.

During the 26th session of the Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2021, the Government of India presented India's climate action plan, which included five essential elements known as Panchamrit. These elements include the target of achieving net zero emissions by 2070 and obtaining 50% of the country's energy from renewable resources by 2030.

The focus of this project was to develop strategies aimed at improving the energy efficiency of energy-intensive sectors within the state. This action plan aligns with the Nationally Determined Contributions (NDCs), also known as Panchamrit. For Himachal Pradesh, the action plan identifies key sectors and evaluates the potential for energy conservation and efficiency improvements in the region.

The State Energy Efficiency Action Plan sets both short-term goals to be achieved by FY 2026 and long-term goals to be achieved by FY 2031, with the objective of achieving significant energy efficiency improvements by 2031. The implementation of the proposed action plan is expected to result in estimated energy savings of 0.20 million tonnes of oil equivalent (Mtoe) in a moderate scenario and 0.39 Mtoe in an ambitious scenario for Himachal Pradesh.

Identification of the focus sectors

To facilitate the transition towards low-carbon development pathways, each state or union territory (UT) plays a crucial role. The Bureau of Energy Efficiency, under the guidance of the Ministry of Power in consultation with State Designated Agency, various stakeholders from different sector of the state and know ledge partner ASSOCHAM has developed state-specific energy efficiency action plan to ensure that resource allocation aligns with the state's requirements and aids in achieving state-specific goals related to sustainable development.

Identifying the focus sectors or areas is important because certain sectors within a state tend to consume a significant portion of energy. To determine the focus sectors for Himachal Pradesh, a comprehensive study was conducted, considering various parameters such as energy consumption patterns, emissions, Gross State Value Addition (GSVA), gap analysis in respective sectors, potential for energy efficiency and emission reduction, planned efforts by the state in prioritized sectors, State Designated Agency (Directorate of Energy), and inputs from stakeholders.

Based on the Total Final Energy Consumption (TFEC) in the state and its sectoral distribution, the following sectors have been identified as the focus sectors for devising energy efficiency strategies in Himachal Pradesh referring the fiscal year 2020 as a base year. Industries, Buildings, Transport and Agriculture are the identified focus sector for the state.

By targeting these focus sectors and implementing energy efficiency measures, the state aims to optimize energy consumption, reduce emissions, and contribute to sustainable development goals.

Proposed Strategies with Implementation Methodology

The chapter discuss 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 their actionable items and implementation methodology.

1. Industry Sector

The state of Himachal Pradesh has witnessed a significant growth in the industrial sector in past few years. There are about 44,056 small scale enterprises, 466 medium scale enterprises and 138 large scale enterprises established till FY 2017. Some of the prominent and leading sectors in the state are pharmaceuticals sector, textile sector, cement sector and food processing sector. There are about 15 identified designated consumers (DCs), out of which 6 DCs are from cement sector, 7 DCs are from textile sectors, 1 DC from paper sector and 1 DC from the DISCOM sector. The proposed strategies for the industrial sector are:

Deeping and Widening of Perform, Achieve and Trade (PAT) Scheme.

In this strategy, it is suggested that the state should enhance coverage of energy consumption in PAT industries (DCs) by Deeping and Widening of the PAT scheme in the state. In this it would imply notifying more industries as designated consumers under the current PAT sectors by lowering the threshold limit for eligibility (TOE/annum), as well as the inclusion of new sectors such as Pharmaceuticals, food processing, etc.

Implementing Agency: Bureau of Energy Efficiency, Directorate of Energy (DoE)

Actionable Items:

a. Partial Risk Guarantee program to encourage implementation of latest energy efficient technologies in the sectors.
b. Capacity building of energy managers and auditors in PAT DCs and probable sectors for compliance with scheme and new technologies.
c. Mandatory standardized energy audits in every three years for all units that have energy consumption below PAT threshold, in all notified PAT sectors, excluding MSMEs.
d. Development of mechanisms for B2B interaction with global technology suppliers.

Implementation Methodology:

a. Identification of potential sectors
b. Setting energy targets
c. Implementation of energy efficiency measures
d. Monitoring and verification
e. Trading of energy saving certificates

Energy Efficiency Interventions for MSME Clusters.

The strategy is proposed for the Small and Medium Enterprises (SME) sector, which consist of MSMEs in identified prominent sectors such as light engineering, food processing, Handloom and Handicraft and pharmaceuticals. A PAT-like scheme is proposed under this strategy for the unorganized and small industries sectors, which would not meet the threshold energy consumption under the conventional PAT scheme. The strategy would involve the implementation of energy efficient technologies and new

& innovative decarbonization technologies in the market to enable SMEs to meet their energy saving targets.

Implementing Agency: Bureau of Energy Efficiency, Directorate of Energy (DoE)

Actionable Items:

a. Carrying out of energy and resource mapping studies MSME cluster.
b. Implementation of demonstration projects on energy efficient technologies in SME cluster.
c. Workshop on technology interventions for energy conservations in MSMEs
d. Periodic standardized energy audits for MSMEs on load basis and reimbursement of energy audit cost with maximum cap.
e. Issuance of directives for implementation of ISO 50001, Energy Management System in organisations on load basis.
f. Sector-specific policy development for financial assistance on implementation of ECMs suggested in energy audit.

Implementation Methodology:

a. Identification of energy intensive MSME clusters
b. Conduct energy audits in the selected clusters.
c. Implementation of energy efficient interventions
d. Monitoring and verification

Considering the implementation of the mentioned strategies in the industry sector, it is estimated that approximately 0.027 Mtoe energy savings can be saved under the moderate scenario and 0.053 Mtoe under the ambitious scenario.

2. Building Sector

Out of the total population of Himachal Pradesh, approximately 10% of the population resides in urban areas. Directorate of Energy has prepared and amended the Energy Conservation Building Code (ECBC) for the state. The commercial sector supports the urbanisation in the state, but it only caters 19% of the total electricity consumption. On the other hand, the domestic sector holds 81% of the electricity consumption. The suggested strategies for the building sectors are:

Effective Implementation of ECSBC

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 encompass both commercial and residential buildings. Until the implementation of ECSBC in states, the existing Energy Conservation Building Code (ECBC) and Eco-Niwas Samhita for Buildings (ENS) will be referred to as ECSBC. To achieve energy savings in the building sector, it is proposed to effectively implement the Energy Conservation and Sustainable Building Code (ECSBC) by increasing the number of ECBC and ENS compliant buildings in the state.

Implementing Agency: Bureau of Energy Efficiency, Directorate of Energy (DoE), Public Works Department (PWD), Town & Country Planning (TCP)

Actionable Items:

a. Setting up of effective enforcement plan with ULBs and SDA as monitoring agencies
b. Development and maintenance of ECSBC compliance portal, directory of energy efficient materials/technologies.
c. Market Outreach for ECBC compliant products, radio jingles, social media awareness.
d. Pilot projects for Super ECBC buildings as case studies (initial 20 buildings)
e. Home energy auditor training, compliance structure and incentive on energy savings for first few residential projects
f. Periodic upgradation of PWD schedule of rates to incorporate latest energy efficient materials and technologies.
g. Inclusion of curriculum on energy efficiency in building, in universities and schools

Implementing Methodology:

a. Establishing guidelines
b. Awareness and training programs
c. Code adoption
d. Compliance and enforcement
e. Performance evaluation
f. Incentives and recognition

Replacement Program for inefficient (below than 3-star rated) appliances:

The strategy has been proposed for the complete building sector, covering both commercial and domestic buildings. The electricity consumption pattern varies greatly between urban and rural areas. This is due to the variation in type and number of appliances being used by urban and rural residents.

Implementing Agency: DISCOMs, ESCOs, Directorate of Energy (DoE)

Actionable Items:

a. Development of state-specific implementation models and identification of relevant agencies
b. Issuance of directive to government office and building in the state to replace all existing inefficient appliances with BEE 5-star rated appliance.
c. Phase-wise plan for replacement of existing inefficient appliances (lower than 3 Star Rated) with BEE 5-star rated appliances in all buildings, through DSM schemes.
d. Workshops & Campaigns on behavioural change interventions for energy conservation

Implementation Methodology:

a. Identification of inefficient appliances
b. Selection and procurement of energy efficient appliances
c. Distribution and installation of the appliances
d. Disposal of the old appliances
e. Monitoring and Evaluation

Promotion of BEE Star Rating and Shunya Rating of Buildings

The Star Rating and Shunya Rating of buildings is currently at a voluntary stage which is used as a benchmarking system for buildings to classify them in terms of 'Star-Rating' & 'Shunya Rating' on the

basis of their energy performance. It is proposed that to promote Star Rating & Shunya Rating in all government & commercial buildings and conduct an assessment for their energy performance along with the ECBC Compliance process.

Implementing Agency: BEE, Directorate of Energy (DoE)

Actionable Items:

a. Issuance of directives to all government departments to conduct energy audits and target to achieve BEE Star Rating for their buildings.
b. Periodic energy audits for commercial buildings on load basis and incentives on achieving specific level of star rating for buildings.
c. Capacity Building of Architects & Building Professionals and Developers
d. Market Outreach for Star & Shunya Rating by Radio Jingles, Social Media Awareness
e. Mandatory minimum set point of 24 degrees for air conditioners in all government buildings
f. Transformation of iconic government buildings to Net-Zero energy buildings

Implementation Methodology:

a. Identification for the eligible buildings
b. Awareness Campaigns
c. Compliance and Enforcement
d. Incentives and recognition
e. Performance evaluation

By implementing the strategies in the building sector, it is estimated that approximately 0.014 Mtoe in energy savings can be achieved under the moderate scenario. Under the ambitious scenario, the estimated energy savings increase to approximately 0.019 Mtoe. These savings signify the potential reduction in energy consumption and improved energy efficiency resulting from the implementation of energy conservation measures and the promotion of sustainable building practices.

3. Transport Sector

In 2020, the state witnessed a total of 18.71 lakhs vehicles registered, marking a 7.12% increase compared to the previous year. With the continuous growth of the sector, energy consumption has also surged, leading the state to implement multiple policies to address this issue. In 2022, the state introduced its electric vehicle (EV) policy, offering incentives for transitioning to EVs and promoting infrastructure development throughout the region. Currently, Himachal Road Transport Corporation owns about 275 electric vehicles in the categories of buses, three wheelers, and taxis. The following are the suggested strategies for the transportation sector:

Infrastructure Development for EV charging stations and Incentives to Consumers for quick transition to EVs

This strategy suggests a plan to convert newly registered vehicles in the state to electric vehicles until the fiscal year 2031. The conversion targets are based on two different scenario trajectories: the moderate scenario and the ambitious scenario. These targets align with the guidelines outlined in the Himachal Pradesh EV Policy of 2022. The focus of the conversion efforts is primarily on two-wheelers, as they have the highest number of registered vehicles and, therefore, represent a significant portion of the overall vehicle in the fleet.

Implementing Agency: HPSEBL, Department of Transport, PSUs, and private sector

Actionable Items:

a. Establishment of regulatory mechanism to develop EV charging infrastructure.
b. Pilot projects on battery swapping stations.
c. Pilot projects on hydrogen fuel cell vehicles (HCVs)

Implementation Methodology:

a. Identification of target areas
b. Selection of charging technologies
c. Procurement and installation of charging stations
d. Operations and maintenance
e. Incentives to consumers
f. Awareness campaign
g. Monitoring and evaluation

Ethanol Blending Program

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 2031, a 10% blending target is suggested in the moderate scenario and a 20% blending target is suggested in the ambitious scenario.

Implementing Agency: Department of Transport, Oil Marketing Companies

Actionable Items:

a. Financial Assistance on Biofuel production plants

Implementation Methodology:

a. Policy and regulatory framework
b. Production of Ethanol
c. Procurement and Storage
d. Blending of ethanol
e. Distribution and Marketing
f. Awareness Campaigns
g. Monitoring and verification

Promotion of Standard and Labelling program of tyres for fuel efficiency in Vehicles

In this strategy the Bureau of Energy Efficiency has implemented a standard and labelling program for tyres to promote fuel efficiency in vehicles. It can be an effective way to encourage the adoption of more fuel-efficient tyres by consumers.

Actionable Items:

a. Awareness Campaigns
b. Capacity Building of Tyre Manufactures and Vehicles OEMs

By implementing all these above-mentioned strategies, it is estimated that significant energy savings can be achieved. Under the moderate scenario, approximately 0.159 Mtoe can be saved, while the ambitious scenario has the potential to save around 0.318 Mtoe. These savings indicate the reduced energy consumption resulting from the transition to electric vehicles, contributing to a more sustainable and efficient transportation sector.

4. Agriculture Sector

Agriculture is the main occupation in the state of Himachal Pradesh and the sector holds a contribution of 13.62% in the states GSDP. In the year 2020, there were about 6,908 pump connections and the state has also implemented PM KUSUM Scheme. Following are the strategies proposed for the agriculture sector:

Transition of conventional diesel pumps to solar powered pumps:

By FY2024, the Agriculture sector intends to implement a strategy that involves shifting from traditional diesel pumps to solar-powered pumps. This approach aligns with the nation's objective of replacing diesel with renewable energy sources within the agricultural domain, ultimately aiming to eliminate diesel usage entirely by FY2024. This transition is imperative to decrease the sector's reliance on fossil fuels and embrace a more sustainable and ecologically conscious energy alternative.

Implementing Agency: Department of Agriculture, Department of Horticulture and Directorate of Energy (DoE)

Actionable Items:

a. Greater outreach to relevant stakeholders
b. Capacity Building of Panchayat/Block Level officials

Implementation Methodology:

a. Access feasibility
b. Awareness and training programs
c. Financial incentives and support
d. Vendor selection and procurement
e. Installation and commissioning
f. Monitoring and mechanism
g. Evaluation and impact assessment

Replacement of inefficient (non-star rated) pumps with BEE 5 Star Rated Pumps along with smart control panel

This strategy aims to reduce energy consumption and increase the efficiency of the pumps used in irrigation. The implementation period for this strategy is long-term, until FY2031. During this period, two scenarios have been proposed. The first scenario is the moderate scenario, which aims to replace 50% of the inefficient electric-powered pumps with BEE Star rated pumps by FY2031. This scenario aims to achieve significant energy savings and improve the efficiency of pumps used in irrigation.

Implementing Agency: Department of Agriculture, Department of Horticulture and Directorate of Energy (DoE)

Actionable Items:

Development of a phase-wise plan to implement Demand Side Management (DSM) scheme for replacing existing inefficient pumps through Energy Service Companies (ESCOs).

Implementation Methodology:

a. Energy audit and assessment
b. Identification of suitable pumps
c. Financial analysis
d. Incentives and support
e. Vendor selection and procurement
f. Installation and commissioning
g. Awareness and training
h. Monitoring and performance
i. Maintenance and support
j. Reporting and impact assessments

Considering the implementation of the mentioned strategies in the agriculture sector, it is estimated that approximately 0.006 Mtoe energy savings can be saved under the moderate scenario and 0.008 Mtoe under the ambitious scenario.

Financing Mechanism

In the context of energy efficiency, a financial mechanism is a system put in place to provide financing for the implementation of energy efficiency measures. These mechanisms can include loans, grants, subsidies, tax incentives, and other financial tools that provide financial support for energy efficiency measures.

To achieve the targets and the cost savings, the state must implement various energy efficiency policies, schemes, and programmes, so to support the funding, the Bureau of Energy Efficiency has introduced various financing mechanism which the states can consider for the implementation. The Bureau of Energy Efficiency has started a programme named 'The National Mission for Enhanced Energy Efficiency (NMEEE)' under the National Action Plan on Climate Change.

Energy Efficiency Financing Platform:
The Bureau of Energy Efficiency has started this financing initiative under the National Mission for Enhanced Energy Efficiency, the initiative aims to provide a platform to interact with Financial Institutions and project developers for implementation of energy efficiency projects.

Framework for Energy Economic Development:

The financing initiative was taken to ease the financing of energy efficiency projects through different fiscal instruments, the aim is to provide ease to stakeholders by implementation of schemes such as Partial Risk Guarantee Fund for Energy Efficiency (PRGFEE), Venture Capital Fund for Energy Efficiency (VCFEE).

PRGFEE – Partial Risk Guarantee Fund for Energy Efficiency - "Addressing the credit risks and barriers to structuring the transactions Engaging financial institutions and building their capacity to finance EE projects on a commercially sustainable basis, it has a guarantee Period of Up to a maximum of 5 years. The Government of India has approved about INR 312 crores for PRGFEE.

VCFEE – Venture Capital Fund for Energy Efficiency - The VCFEE provides risk capital support to EE investments in new technologies, goods, and services. The Government of India has approved about INR 210 crores for PRGFEE.

Revolving Funds: Revolving funds are a financial tool that can be used to support sustainable development projects in various sectors, including agriculture, small business, and community infrastructure. These funds are given at a low-interest rate and are intended to support these sectors. The repayment of these loans is used to replenish the fund, enabling it to provide more loans to new borrowers.

Green Bonds: Green bonds are a type of financial instrument that are specifically designed to finance projects and initiatives with environmental benefits. They are typically issued by governments, municipalities, corporations, or other entities to raise capital for projects that promote sustainability, renewable energy, energy efficiency, climate change mitigation and other environmental friendly initiatives.

Soft Loans: Soft loans, also known as concessionary loans or subsidized loans, are loans that are provided on more favourable terms compared to standard commercial loans. These loans typically have lower interest rates, longer repayment periods, and more flexible terms and conditions. Soft loans are often offered by governments, international financial institutions, or development agencies to support specific objectives such as economic development, social welfare, or sustainability.

Summary

Through extensive research and collaboration with various stakeholders and the Directorate of Energy (DoE), ASSOCHAM in consultation with Bureau of Energy Efficiency and in association with Directorate of Energy (DoE) has developed a comprehensive State Energy Efficiency Action Plan for the state of Himachal Pradesh. This plan recognizes the necessity, potential, and opportunities for energy efficiency within the state. The action plan outlines a detailed roadmap for implementing these strategies, while also emphasizing the importance of monitoring their implementation through involvement from multiple stakeholders. By projecting the state's total final energy consumption (TFEC) based on energy consumption and economic growth, it is estimated that Himachal Pradesh's TFEC will reach 4.90 Mtoe by FY 2031.

In light of this projection, the action plan identifies Industry, Buildings, Transport, and Agriculture 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 0.20 Mtoe in total energy consumption by FY 2031. In the ambitious scenario, the reduction is projected to be 0.39 Mtoe. Additionally, this plan aims to generate awareness at a mass level and create a market potential of approximately Rs. 719 Crore in the energy efficiency sector. Furthermore, it is anticipated to contribute to a reduction of 0.63 $MtCO_2$ in the moderate scenario and 1.22 $MtCO_2$ in the ambitious scenario in terms of CO_2 emissions by FY 2031.