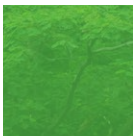
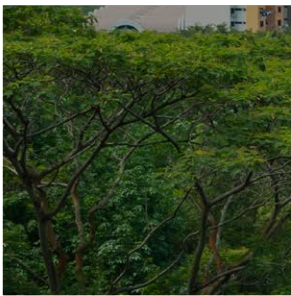


STATES LEADING THE CHANGE

The Significance of Energy
Efficiency Policies



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Key points

- **Energy Efficiency as a Cornerstone for Energy Transition:** Energy efficiency is crucial for ensuring energy security and fostering economic growth while mitigating environmental impact. It complements renewable energy as a demand-side resource, reducing fuel imports and bolstering energy independence.
- **State-Level Policy Significance:** State-level policies are key to implementing nationwide energy and climate strategies, given the diverse energy and development needs and challenges across various Indian states. These policies can be instrumental in achieving the Sustainable Development Goals (SDGs) 7, 12, and 13.
- **Policymaker's Role:** Policymakers play a pivotal role in creating a conducive environment that stimulates demand for energy efficient goods and services, ensures the availability of budgetary resources, facilitates private sector investment and fosters supporting institutions, among others.
- **Energy Efficiency Initiatives by States:** High-energy-consuming states, like Maharashtra and Karnataka, have proactively notified integrated energy conservation policies with energy-saving targets to promote efficiency initiatives across key sectors. Notably, these states have also performed commendably in the annual State Energy Efficiency Index (SEEI).
- **Policy Design:** A holistic, forward-looking and performance-based policy design should address socio-economic and demographic contexts, enable investments, create jobs and stimulate innovation. Furthermore, it should ensure a policy's foundational attributes, such as clarity, completeness, consistency, effectiveness, efficiency, adaptability and sustainability.
- **Model for a State-Level Policy:** This policy brief presents a model for a forward-looking state-level energy efficiency and conservation policy in the context of the Indian landscape, with a focus on short-term effectiveness and long-term sustainability.
- **Implementation:** Successful policy implementation hinges on meticulous consideration of several factors. Aligning the policy with state-level action plans, establishing well-defined timelines, and accounting for enabling factors like availability of resources, stakeholder engagement, digital interface, public awareness and political will are pivotal to translating policies into tangible outcomes.

1. Introduction

1.1 The Energy Challenge for India

India, as the world's third-largest energy consumer, has seen its energy demand triple in three decades due to rapid urbanisation and industrialisation. While the energy intensity of GDP has improved at an average rate of 3% per year during this time, 80% of the current demand is still met by coal, oil, and solid biomass¹. Without intervention, India's energy demand in buildings, industry, transport, and agriculture could increase 3.5 times to 1,788 Mtoe, in 2047 from 2022 levels as depicted in Figure 1. While meeting the growing energy demand is vital for economic growth, it must be balanced with the awareness that India is ranked among the top most vulnerable countries to the effects of climate change³. With 75% of its districts being extreme event hotspots and 40% showing notable weather pattern shifts, the stakes are high for the country⁴.

The current energy challenges underscore the imperative for a fundamental shift in how energy is produced and consumed. Embracing a 'Lean, Mean, Green' philosophy, which focuses on reducing the demand, improving efficiency, and reducing environmental impact of energy sources could aid India in its dual goals of becoming energy-sufficient and independent by 2047⁵ and the Nationally Determined Contribution (NDC) of reducing emission intensity of GDP by 45% below 2005 levels by 2030. Energy efficiency, alongside renewable energy, constitutes a complementary strategy to steer India's stride towards economic growth and emission reduction.

India's progress toward achieving its 2030 target of sourcing 50% of power from renewables is promising. Strong indicators suggest that the country is poised to surpass this ambitious goal. The share of renewables in the installed electricity generation capacity is currently at 43%. Nearly all the states have notified renewable energy policies, demonstrating a commendable commitment to fostering green energy production. Concurrently, the widespread adoption of electric vehicle policies across the Indian states signifies a shift toward sustainable transportation.

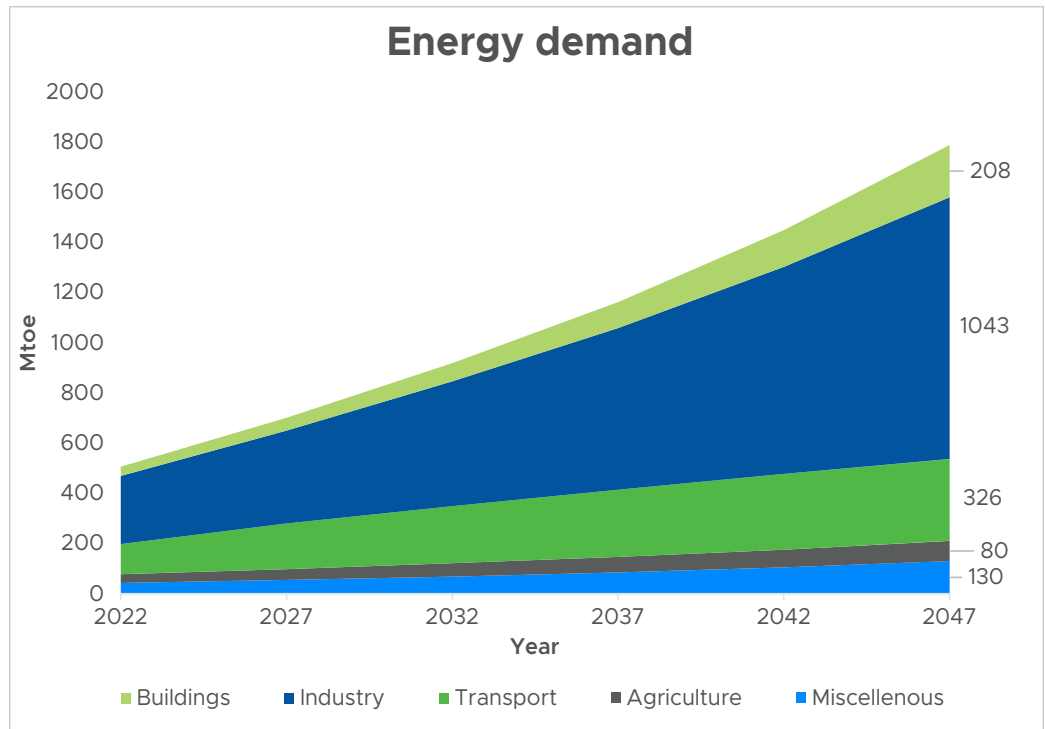


Figure 1: Energy Demand Projection

Source: India Energy Security Scenario, 2047, NITI Aayog

Note: Only demand from buildings, industry, transport, agriculture and miscellaneous is considered under “Least Effort” scenario

However, India’s growth ambitions also hinge on the optimal utilisation of end-use energy. Energy efficiency, often called the ‘first fuel’, is the cheapest, fastest, and cleanest way to address the looming energy crisis, support the transition to net-zero emissions, and achieve energy security and economic prosperity.

A behavioural shift towards energy efficient practices, driven by demand side management (DSM), is imperative to chart the course on optimal energy use. This aligns with India’s Mission on Lifestyle for Environment (Mission LiFE), introduced by the Honourable Prime Minister, Shri Narendra Modi, at COP26 in Glasgow on 1 November 2021, with an aim to encourage at least one billion Indians and global citizens in individual and collective environmental actions from 2022 to 2028.

1.2 Policy-making in Energy

The Indian Constitution’s federal framework divides legislative powers into the Union, State, and Concurrent Lists. While the Constitution doesn’t directly address energy efficiency or energy conservation, the division offers insights into potential governance. While electricity and its associated taxation fall under concurrent jurisdiction, sectors pivotal to energy consumption, like buildings, transportation, agriculture, and most industries, are under the jurisdiction of the state.

The significance of states in energy conservation is further underlined by the creation of a two-tier institutional structure for promoting energy efficiency in India under the Energy Conservation Act of 2001. The Bureau of Energy Efficiency (BEE) and State Designated Agencies (SDAs) serve as the nodal agencies at the national and state levels, respectively, to promote and implement energy efficiency programmes and policies. The 2022 amendment to the Act further empowered state governments to become active drivers in India’s energy transition by increasing their powers to amend building codes, create budgets leverage dedicated funds, and set energy consumption standards.

Holistic, forward-looking, and performance-based EE/EC policies are crucial for India’s energy future

BEE has actively executed various initiatives since its inception, including the development of Energy Conservation Building Codes for commercial buildings, EcoNiwas Samhita for residential buildings, the Standards and Labelling Programme, the Perform, Achieve and Trade (PAT) scheme, National Energy Conservation Awards and many more, with SDAs playing a crucial role in successfully implementing these programmes.

However, India's energy goals and complementing policies are currently predominantly defined at the national level. State-level policymaking has been characterised by a sector-specific approach, focusing on standalone measures. Given that energy is an interplay of several sectors, including industry, buildings, transportation and agriculture, this approach may address immediate concerns but overlook the broader implications and potential synergies of a more integrated approach towards sustainable energy transition. Moreover, while national policies provide a broad framework, state-level policies often determine the on-ground implementation and effectiveness. To truly address the complexities of energy consumption and management and accelerate decarbonisation, state-level policies should be tailored to encompass a wide range of factors, including technological advancements, consumer behaviour, sector-specific barriers, and renewable energy integration.

Considering India's unique challenges and opportunities, this policy brief presents suggestions for a comprehensive model for a state-level energy efficiency and conservation (EE/EC) policy. The aim is to guide states in formulating holistic, forward-looking and performance-based policies that address immediate concerns and consider a range of long-term interconnected goals.

2. Current Landscape

The top ten states that significantly contribute to the nation's prosperity account for about 71 per cent of the GDP⁶ and over 68 per cent of the Total Final Energy Consumption (TFEC)⁷. The states that are pivotal in generating national income—Maharashtra, Tamil Nadu, Gujarat, Uttar Pradesh, and Karnataka—are also the highest energy consumers. Together, they represent close to 43 per cent of the country's TFEC and 52 per cent of the GDP.

Promisingly, some of the highest energy-consuming states in India have initiated policy actions to improve energy efficiency and conservation*. Maharashtra and Karnataka, among the top five energy consumers, have proactively launched integrated State-level Energy Conservation policies. These policies outline energy savings targets and recommend energy efficiency measures across key state sectors, with SDAs acting as nodal agencies for policy implementation. Notably, Maharashtra is currently updating its policy, demonstrating their continued commitment to energy efficiency. In states like Andhra Pradesh and Uttar Pradesh, energy efficiency/energy conservation policies are presently at various stages of development. Other states, such as Rajasthan, have integrated energy efficiency within a broader draft State Energy Policy.

While these policies are still in different stages of development and subject to extended timelines, such proactive initiatives indicate a positive shift towards integrated and decentralized policymaking on EE/EC. Some key features of these policies are detailed in the sections below. Uttar Pradesh has been excluded from this as their draft EE/EC policy is not available in the public domain.

It is worthwhile mentioning that although they are often used interchangeably in policy formulation, energy conservation and energy efficiency are different concepts. Energy efficiency refers to using less energy for the same output or a higher amount of output per unit of energy. Energy conservation, on the other hand, refers to any activity that reduces energy use and consumption. Understanding this distinction is crucial for crafting and implementing energy efficiency and conservation policies.

* Details pertaining to both notified and draft policies can be found in the attached annexure.

Maharashtra was the first to notify a State Energy Conservation Policy in 2017

2.1 Maharashtra - trailblazer ready for round two

Maharashtra was the first state in India to notify a State Energy Conservation Policy in 2017 for a period of five years. The state government recognised the need for a policy to incentivise energy-efficient technologies, enabling them to spread rapidly across all sectors. The policy targeted 1,000 MW of energy savings through energy-efficient programmes in various sectors, including street lights and water supply, residential, business, industrial, and agriculture.

The policy was heavily focused on assigning budgets to activities and highlighting financial incentives for different consumer segments to implement energy efficiency projects. This was a key feature of the policy. Additionally, the policy provided dedicated support for implementing projects in energy service company (ESCO) mode, recognising it as a promising area for raising capital that could be further invested and for job creation.

The time period for the policy expired in 2022, and the second edition of the State Energy Conservation Policy is currently under draft. The 2022 draft edition of the policy delves more into specific programmes and schemes in various sectors, identifying sub-sectors and outlining activities under the sub-sectors in a more detailed form. For instance, rather than a broad category for the building sector, the policy divides programmes for buildings into different segments based on their functions. These include energy conservation projects in residential cooperative housing societies, commercial buildings, and industries, religious places, government schools and so on. Additionally, each segment addresses specific aspects such as requisite financial assistance, project selection and objectives, eligibility criteria, projected budgets and expected savings.

2.2 Karnataka - accountability in check

The Karnataka government's 'Karnataka Energy Conservation and Energy Efficiency Policy 2022-2027' is India's only active state-level energy efficiency policy. The policy aims to promote energy efficiency programmes and ensure energy security within the state. The policy envisions an energy saving of 744 million units (MU) across five sectors: domestic, commercial, industrial, agricultural, and municipal. This is nearly equivalent to the power generated by a solar power plant of 100 MW over 5 years or shutting down a large coal power plant (1 GW capacity) for about 2.5 months. Each sector has clearly identified targets and an estimated funding requirement of INR 372 crore. The policy covers many factors, including energy efficiency measures, financial mechanisms, and institutional capacity.

A key feature of the policy is its comprehensive delineation of roles and responsibilities for the nodal agency i.e. Karnataka Renewable Energy Development Limited (KREDL), key stakeholders, state-level entities, and departments. Notably, the Government of Karnataka has established a high-level committee to oversee the implementation of energy conservation and energy efficiency projects, programmes, schemes, and activities within the state.

The policy also details a framework for evaluation, monitoring, and verification, as well as a governance framework and enforcement mechanism. It suggests potential sources of funding and possible business models for energy conservation measures to propel energy efficient projects.

2.3 Andhra Pradesh - brewing enablers for market transformation

Earlier this year, Andhra Pradesh released the 'Draft Andhra Pradesh Energy Efficiency and Energy Conservation Policy 2023-2028' for stakeholder comments. The policy aims to harness the potential of energy efficiency and energy conservation in Andhra Pradesh and

Karnataka is currently the only state with an active Energy Efficiency policy

position it as a pioneering state in the large-scale deployment of energy efficiency measures across various sectors. The policy promotes reducing the final energy consumption in buildings, industry, agriculture, and transport sectors.

The policy takes a precise approach by focusing on specific consumer segments: energy-intensive sectors, consumer segments paying below the average cost of electricity supply, sectors heavily reliant on government subsidies, sectors ripe for technology-driven interventions and commercialisation, and sectors projected for substantial growth during the policy period. Additionally, the policy emphasises curbing energy demand for heating and cooling, harnessing local energy resources, and ensuring thermal comfort. It also addresses sectors with ample potential for energy conservation or energy efficiency improvements, thereby contributing to the broader objectives of the policy.

Notably, the Andhra Pradesh policy considers the supply side of energy efficiency, outlining incentives, including capital subsidies, SGST reimbursements, power tariff subsidies as notified from time to time, etc., for manufacturing of energy efficient and allied equipment.

2.4 Rajasthan - integrated approach to managing energy

Rajasthan's Energy Policy 2050, currently in the draft stage, aims to promote the transformations within the energy sector, recognise associated risks and opportunities, and facilitate informed decision-making across the energy value chain. It integrates the objectives related to renewable energy, energy efficiency and access.

This policy serves to align the roles and responsibilities of stakeholders, and create a conducive environment for investment in sustainable sectors, signalling the state's commitment to growth. Moreover, it extends its vision to include emerging clean energy prospects in industry, transport, buildings, and agriculture, ensuring they receive due policy attention. Essentially, the Energy Policy 2050 acts as a guiding framework for state policymakers to facilitate the development of tailored programmes and schemes that align with the long-term objective of Rajasthan to transition to a low-carbon, integrated, and resilient energy system by 2050.

EE/EC policies drafted/notified by the states are a welcome move to foster an environment conducive to the advancement of energy efficiency. However, as state level EE/EC policymaking evolves, it is crucial to reimagine policy design to ensure policies are impactful, inclusive and lead into meaningful action.

3. Reimagining state EE/EC policies

3.1 Foundations of a holistic state EE/EC policy

In the face of rapid change and pervasive uncertainty, states must embark on the development of energy efficiency and conservation policies, that are holistic, forward-looking and performance-based. This entails an imperative exploration of plausible future energy and climate scenarios and their potential impacts on policymaking. Transcending traditional policy boundaries and understanding how different factors can converge in unexpected ways is crucial. Strategic foresight method offers a solution by considering multiple potential futures to shape resilient policies⁸. This approach ensures policies are anticipatory, future-ready and adaptable to challenges and opportunities.

We suggest a model for a holistic, forward-looking and performance-based EE/EC policy that integrates various facets in a concerted manner. At the foundational level, a robust policy design framework should address several fundamental questions to ensure the policy's clarity, completeness, consistency, effectiveness, efficiency, adaptability and sustainability. However, these criteria, as shown in Figure 2 are neither limited nor exhaustive, and may

Strategic Foresight Methods:

- **Horizon scanning:** Investigating current signals of change in the energy sector and predicting their future implications. This foundational step involves comprehensive research, consultations with energy experts, and a review of future-oriented literature.

- **Megatrends analysis:** Delving into significant ongoing shifts in the energy landscape, especially at the crossroads of various policy areas, to understand their intricate and far-reaching future impacts on energy efficiency and conservation.

- **Scenario based planning:** Crafting diverse narratives or visualisations of potential future energy landscapes to discern their present-day policy implications, ensuring readiness for various energy conservation outcomes.

- **Visioning and back-casting:** Picturing an optimal future state of energy security and sufficiency, then retracing steps to determine necessary actions to achieve that state.

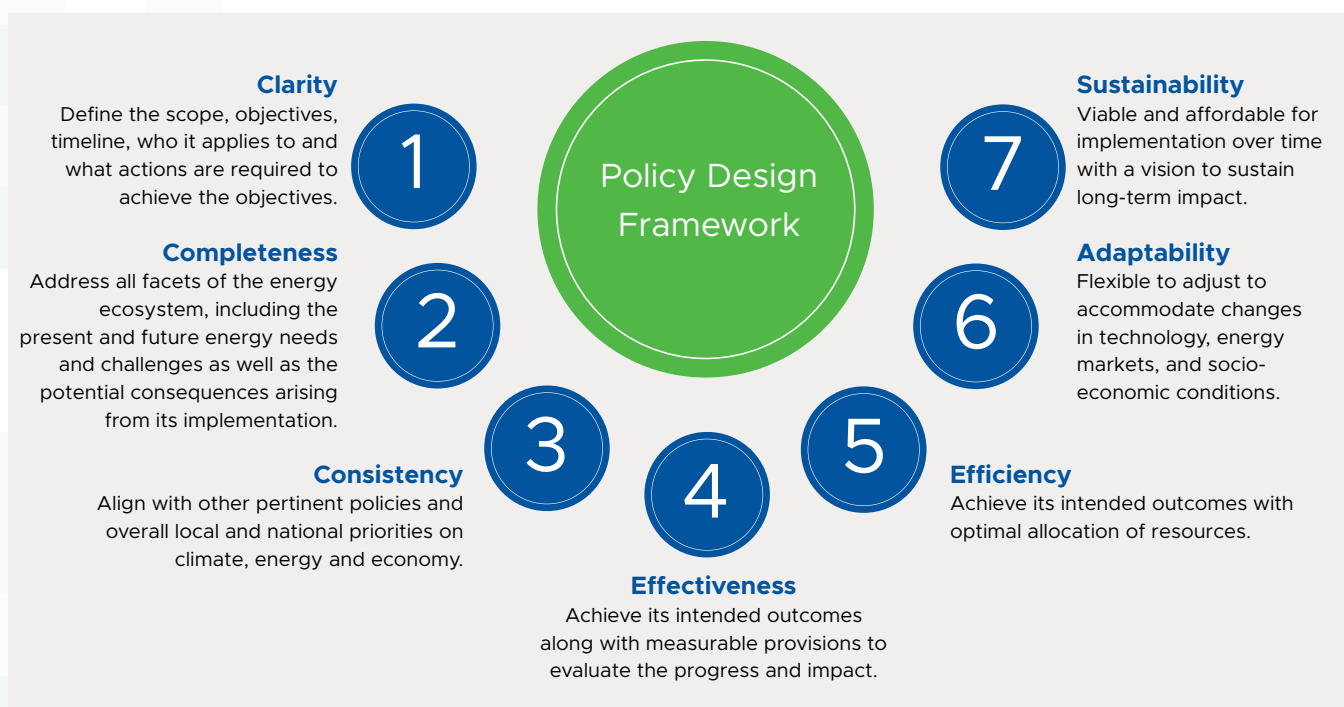


Figure 2: Policy design framework

be tailored to suit the unique context of each state.

The framework’s relevance to state EE/EC policies can be discerned through the guidance questions posed below, which serve as a barometer for policymakers to determine alignment with overarching objectives, adaptability, and potential for tangible results. These questions not only assess the policy’s depth and breadth but also highlight areas that might need further attention.

Table 1: Policy Design Considerations

Dimension	Questions
Clarity	<ul style="list-style-type: none"> • Is the policy coherent, concise, and easy to understand for all stakeholder groups? • Are there any supplementary resources (materials) available to facilitate understanding of complex terminologies? • Are policy objectives specific, measurable, achievable, relevant, and time-bound (SMART)? • Are the targeted areas for energy efficiency promotion and adoption clearly defined and communicated?
Completeness	<ul style="list-style-type: none"> • Does the policy holistically address all pertinent aspects of energy efficiency? • Does the policy outline regulatory provisions, incentives (upstream, midstream, downstream), capacity building and awareness initiatives to achieve its objectives? • Is there a robust governance structure in place to drive seamless policy implementation? • Does the policy identify the requisite resources, including financing options, needed for implementation?
Consistency	<ul style="list-style-type: none"> • Does the policy align with existing government policies and initiatives on socio-economic development, sustainability, etc.? • Does the policy align with overall national goals on climate action, energy security, emission reductions, etc.? • Are mechanisms in place to address potential conflicts or overlap with other policies? • Does the policy consider the needs of different stakeholders, including businesses, end-users, and government agencies?
Effectiveness	<ul style="list-style-type: none"> • Are periodic measurable targets established in the policy to assess its effectiveness in achieving objectives? • Is there a mechanism for periodic evaluations of the policy's outcomes? • Does the policy have mechanisms to ensure efficient allocation of resources?
Efficiency	<ul style="list-style-type: none"> • Does the policy identify means to minimise administrative and compliance costs for implementation? • Are there non-fiscal incentives to encourage cost-effective energy efficiency measures?
Adaptability	<ul style="list-style-type: none"> • Are there provisions to update the policy in response to emerging technologies, insights, and market dynamics? • Are there provisions for policy revisions based on stakeholder feedback? • Are there mechanisms to accommodate unforeseen situations to maintain the policy's relevance?
Sustainability	<ul style="list-style-type: none"> • Does the policy promote research and innovation in energy efficiency technologies and services? • Does the policy identify and address local concerns of the state? • Will the policy remain affordable and beneficial to implement over time? • Will the policy secure the long-term sustainability of energy conservation efforts?

Accounting for the above fundamental questions as applicable, in EE/EC policies, will ensure a robust foundation for policy design. However, for policies to be holistic, forward-looking and performance-based, it is imperative to delve into supplementary factors such as socio-economic context, investment, job creation, innovation and consumer behaviour. Some of these factors are expounded in the next page.

Forward-looking EE/EC policy should address state's socio-economic context including economic and gender inclusivity

3.2 Addressing socio-economic and demographic context

EE/EC policies should be rooted in a deep understanding of the state's diverse intra-state socio-economic landscape and demographic context to tailor solutions to the unique needs and challenges of its population. It involves considering geographical factors, promoting economic inclusivity, fostering community engagement, and integrating gender-responsive elements in policy design.

For instance, in Uttar Pradesh, an agrarian economy, policy focus may be on the development of energy-efficient cold chain infrastructure, especially climate-friendly cold storage, to align with the broader goals of sustainability, food security, and efficient resource utilisation. Rajasthan's hot and dry climate entails a pronounced need for energy efficient space-cooling solutions, while in colder Uttarakhand, the emphasis should be on the design, construction, and operation of residential buildings which resist heat loss and promote heat gain to enhance indoor thermal comfort while optimising energy use.

Economic inclusivity is paramount, ensuring that benefits and opportunities are accessible to all socio-economic strata, especially the most vulnerable. In urban-centric states like Maharashtra, tiered incentives for adopting energy-efficient appliances such as ceiling fans or retrofitting buildings can ensure that benefits penetrate all socio-economic strata, from upscale neighbourhoods to urban slums.

Engaging local communities in the policy-development process is essential to incorporate their unique needs and insights, fostering ownership and collaboration. In regions with significant tribal communities, understanding their traditional energy-saving practices and integrating them into modern policies can yield more sustainable and accepted solutions.

Forward-looking policies should actively promote gender inclusivity, promoting opportunities for men and women, alike, in the energy sector and addressing the specific energy needs of women. This includes considering the different experiences of men and women when formulating energy efficiency policies. For example, policies could include provisions for upskilling women in the energy sector and supporting women-owned businesses in the supply chain of energy-efficient products and services. As women often manage household energy consumption, particularly cooking, their specific needs should be taken into consideration in policymaking. Electrification of cooking stoves initiatives, as seen in the case of Jharkhand⁹, are vital in such contexts. States with high female literacy rates, like Kerala could pioneer gender-specific energy surveys to grasp the diverse gender requirements, consumption habits and challenges fostering more gender-responsive energy solutions.

Enabling investment, market transformation and job creation are integral to a holistic EE/EC policy

3.3 Enabling Investments, Market Transformation and Job Creation

Enabling investment and job creation is integral to a just energy transition and must be incorporated into EE/EC policies. However, there is often a gap between investment commitments and clarity on resultant job growth. While investment can catalyse the industry's growth, understanding its translation into resultant jobs is crucial for addressing workforce readiness and skills shifts and offsetting job losses in traditional sectors with new opportunities.

For instance, if the proposed investment under the EE/EC policies are channelled into promoting energy-efficient appliance manufacturing, it would naturally lead to job creation in manufacturing units, local supply chains, and after-sales services which in turn would have a positive impact on the local economy. This can lead to a market transformation for energy efficient technologies.

Leveraging private investments is imperative to amplify the reach and impact of policies. While public investments lay the groundwork, they cannot fully cover the vast financial demands of our energy and climate goals. Private sector involvement is crucial to bridge this gap. Policy-induced public investments often attract private capital, signalling sector viability. For private sector engagement, policies must go beyond allocating funds. They should offer a clear framework, guidelines, and innovative business models. The ESCO model is a prime example. Such models distribute financial risks, foster private sector efficiency, and ensure energy policies lead to actionable projects.

3.4 Advancing Demand Side-Management and Demand Response

EE/EC policy must endeavour to catalyse a behavioural shift among consumers to make a lasting impact. While infrastructure and systems lay the foundation, it's the end-user's behaviour that ensures greater adoption and sustained positive change. EE policies should not just provide solutions but actively encourage energy-efficient behaviour among consumers. DSM and Demand Response (DR) can play a crucial role in enhancing energy flexibility. While regulations may exist to promote DSM, it is imperative for state-level EE/EC policies to prioritise and promote these initiatives to foster a resilient energy ecosystem.

DSM optimises consumer behaviour and energy consumption patterns, making energy demand more adaptable to price fluctuations, peak demand times, and environmental considerations, offering financial benefits, to both consumers and Distribution Companies (DISCOMs). DSM yields several other benefits in the form of avoidance of infrastructure addition, improved peak load management, reduced reliance on expensive power sources during peak periods, and reduction of potential subsidies or incentives for end users.

DR, an integral part of DSM, enables consumers to adjust their electricity usage based on price signals and grid conditions. State level EE/EC policies can encourage the adoption of energy-efficient technologies, promote smart grid integration, endorse time-of-use pricing, and enhance public awareness. Smart meters and data analytics can play a key role in making DR programmes work and help consumers make informed energy choices.

3.5 Fostering Technological Innovation and Systems Thinking

A state-level EE/EC policy is pivotal in steering the direction of design thinking, process and technological innovation through research and development (R&D) within the energy sector.

Innovation is crucial in enhancing energy efficiency across multiple sectors. Breakthroughs in areas such as advanced building materials, smart grids, energy storage, and the Internet of Things (IoT) are revolutionising how we manage and conserve energy. The emphasis on integrative design is leading to systemic changes, ensuring individual components work together for more energy efficient outcomes in buildings and industries. This systems-based approach can lead to exponential energy savings, often at a reduced or even neutral cost. Furthermore, advancements in energy management systems, efficient lighting, and transportation contribute significantly to reduced energy use. Thus, policy emphasis and continuous investment in R&D are fundamental, driving the momentum towards innovative solutions and practices for an energy efficient future.

State EE/EC policies should catalyse a behavioral shift among consumers towards energy efficiency adoption

4. From Paper to Practice: Implementation of Policy

Policies often encounter significant roadblocks when it comes to moving from the drafting and notification stages to successful implementation, even when they are meticulously developed with careful considerations. It's imperative to understand that while the framework offers a robust foundation, the real efficacy lies in its execution. To enhance the potential of transitioning a well-crafted policy into tangible actions, it is crucial to account for several factors. These may include alignment with state-level action plans, importance of well-defined timelines, and other external factors such as availability of resources, stakeholder engagement, digital interface, public awareness and political will. A few important factors are discussed below.

Alignment of EE/EC policies with state-level action plans ensures consistency, transparency and avoids duplication of efforts

Defined timelines foster accountability, predictability and stakeholder trust

4.1 Alignment with state-level action plans on climate change

Guided by BEE, states are progressing with their individual State Energy Efficiency Action Plans (SEEAP). Additionally, many states have comprehensive climate action plans encompassing energy efficiency. Therefore, state-level policies meant to offer overarching guidance for energy efficiency should align seamlessly with these evolving action plans.

Alignment is a fundamental necessity for several reasons. First, action plans outline specific measures towards goals, while policies set the foundational direction and reasoning. This alignment ensures consistency, credibility, and stakeholder engagement. Second, alignment with state-level action plans guarantees that state-level policies are tailored to the unique needs and priorities of each state. Third, alignment promotes interdepartmental coordination to synchronize efforts and resources for effective policy implementation. This prevents duplication of efforts, budgetary overlaps, while promoting scalable initiatives and optimal resource allocation.

4.2 Timelines for policymaking and implementation

Timelines for policymaking and implementation are essential for ensuring that policies are effectively translated into tangible results. They provide structure, clarity, and direction and foster accountability, instilling a sense of urgency and responsibility among implementers.

Timelines also facilitate optimal resource allocation and promote systematic and timely task completion. Such clarity in timelines not only signifies commitment but also bolsters stakeholder trust, including that of the public, investors, and global partners. Given that many policies involve collaboration across multiple entities, timelines are critical to synchronise efforts, minimise redundancy and ensure cohesion. For those impacted by these policies, defined timelines offer predictability, enabling better planning and adaptation.

While only a handful of states have initiated energy efficiency and conservation policies, the process has often been protracted, with many policies lingering in draft stages for extended periods. State action in facilitating policy progression, from drafting to implementing, should be more prompt. The same issue with extended timelines has also been seen in the context of the SEEAPs. Initiated in August 2021, these are still in progress across various states, underscoring the need for more efficient policy progression at the state level.

4.3 Critical External Enablers for Implementation

External enabling factors play a crucial role in the successful implementation of energy efficiency policies at the state level. These factors can create a conducive environment for the policy to thrive and achieve its intended outcomes. Some key enabling conditions include:

- **Availability of resources:** Without the necessary funds, workforce, tools, and infrastructure, even the most well-intentioned policies will falter. Forward-looking policies should actively seek out and harness existing and prospective funding channels. State funds, especially those targeting energy savings and climate goals such as the State Climate Fund and State Energy Conservation Fund can be operated in revolving investment fund mode to raise capital and ensure sustainability. Additionally, facilitating streamlined access to private and blended finance for in-state energy projects can promote successful policy execution.

- **Stakeholder engagement and inter-departmental collaboration:** Collaboration with key stakeholders, including businesses, non-governmental organisations, and community groups, can leverage valuable insights, resources, and support for energy efficiency initiatives. Furthermore, streamlined coordination among departments, including SDAs, finance, environment and climate change, and the state-level steering committee on energy transition, is crucial for effective implementation.

- **Digital interface:** Advanced technologies can play a key role in bolstering successful implementation of EE/EC policies. Dynamic digital platforms offer streamlined solutions for facilitating, implementing, and monitoring energy-saving interventions, contributing to their overall effectiveness.

- **Public awareness and communication:** A well-informed public can drive the adoption and success of energy efficiency policies. Clear, concise, and accessible communication can help to build public awareness and understanding of EE/EC policies, promote stakeholder buy-in, and facilitate compliance. Policymakers should deploy diverse communication channels and tailored messaging to reach different target audiences.

- **Political will:** Political will is crucial to prioritising energy efficiency. As sustainable development and climate action goals resonate at state and local levels, leaders drive effective decision-making, and government action. It ensures that policies are prioritised, adequately funded, and effectively enforced. Without political support, policies may languish, lack resources, or face opposition, hindering their success.

External enablers, such as availability of resources, stakeholder engagement, digital interface and public awareness, are crucial for successful policy implementation

4.4 Measuring impact

To ensure effective ground-level action, a structured approach to monitoring and evaluating energy efficiency and conservation policies with decentralised responsibilities is essential.

- **Robust Monitoring and Evaluation (M&E) Framework:** To achieve effective EE/EC policy implementation, a robust M&E framework is indispensable. This entails continuously tracking the policy's progress in real-time, accounting for both its intended results and unintended outcomes, both positive and negative. Successful policy implementation calls for ready strategies to swiftly address negative consequences, if any.

Decentralisation stimulates policy innovation

- **Data Collection and Communication:** Data collection, an essential aspect of M&E, requires careful consideration of both its methodology and frequency. Once data is collected, timely and transparent communication is paramount, as this can significantly influence the trajectory of the policy's implementation. Hence, it's imperative to clearly delineate responsibilities among stakeholders for the collection, analysis, and dissemination of this data, with the SDA playing a coordinating and facilitating role to ensure that policy implementation remains on the desired path.

 - **Decentralised Implementation:** It is important to decentralise EE/EC policy execution to local governments for successful implementation. Local or city-level governments, being in close proximity to local communities, understand the ground realities and can offer insights and craft tailored solutions specific to their unique needs and challenges. Decentralisation will stimulate policy innovation at grass-root level and foster collaboration among local stakeholders, enabling responsive outcomes for each area.
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5. Conclusion

As India continues its journey towards meeting its ambitious energy and climate objectives, the significance of state-level EE/EC policies becomes increasingly evident. These policies are not just vital components of the nation's environmental stewardship but also powerful catalysts for multifaceted progress. As we reflect on the importance of these policies, it becomes evident that adopting a holistic, forward-looking and performance-based approach is essential.

Comprehensiveness in policy design ensures that no aspect of energy efficiency is overlooked. By targeting policies at an eco-system covering all key sectors from industry and transportation to agriculture and residential areas, states can optimise the impact of their efforts. This holistic approach allows for the reduction of energy demand across diverse sectors, contributing significantly to India's energy and climate objectives.

Secondly, inclusivity is crucial for ensuring that energy efficiency policies are holistic and benefit all sections of society. Beyond the immediate benefits of reduced energy consumption, these policies have the potential to drive socio-economic growth. By promoting energy-efficient technologies and practices, they can spur innovation and create jobs in sectors ranging from manufacturing to services. In doing so, states can not only enhance energy security but also enhance social well-being and equity.

Thirdly, a performance-based approach emphasises accountability and drives tangible results. By setting clear targets, monitoring progress, and offering performance-based incentives for energy-savings, states can create a culture of efficiency and innovation.

With the impacts of climate change becoming more apparent every day, the need for complete, effective, efficient and sustainable energy efficiency policies cannot be overstated. The benefits of these policies, both immediate and long-term, have the potential to transform India, setting it on a path to not only meet but exceed its energy and climate goals. With the right policies and unwavering commitment, India stands poised to set a global standard in energy efficiency and conservation.

Annexure

The table below shows the salient features of select notified and draft State EE/EC policies.

State Policy	Key Features
Karnataka Energy Conservation and Energy Efficiency Policy 2022-2027	<ul style="list-style-type: none"> • Sector Identification and Targets: Integrated approach covering all sectors with specific energy-saving targets outlined. Aims for total energy savings of 744 MU. • Implementation Strategy and EE/EC Measures: Preference for energy-efficient machinery, mandated adoption of energy-efficient technologies, and public awareness enhancement. • Financing: Estimated budget of INR 372 crore with multiple potential contribution channels. • Monitoring and Evaluation: High-Level Committee and Karnataka Renewable Energy Development Limited (KREDL) to oversee and facilitate implementation.
Maharashtra (1) State Energy Conservation Policy 2017-22	<ul style="list-style-type: none"> • Sector Identification and Targets: To achieve energy-savings target of 1000 MW in various sectors (street lights and water supply, residential sector, business sector, industrial sector, agriculture sector) during the period from FY 2017-18 to FY 2021-22 and reduce carbon emission through that. • Implementation Strategy and EE/EC Measures: Holistic approach including mandatory energy audits, incentives for green building construction, smart meter deployment, backing for ESCO-led efficiency projects and inclusion of energy efficiency in education. • Financing: The estimated fund to achieve the target during the policy period was approx. ₹ 807.63 crores. • Monitoring and Evaluation: No clear framework is provided for monitoring and evaluation.
Andhra Pradesh Energy Efficiency and Energy Conservation Policy 2023-2028 (Draft)	<ul style="list-style-type: none"> • Sector Identification and Targets: Focus on consumer sectors including Domestic, Industry & Commercial, Agriculture, Municipality and Transport but no absolute targets mentioned. Particular emphasis is given to reducing energy demand in heating and cooling. Action plan provided. Total energy saving potential of 17,678 MU mentioned. • Implementation Strategy and EE/EC Measures: Prioritisation of energy-efficient equipment in public procurements and promoting manufacturing within the state. • Financing: It seeks to attract investments, devise innovative financing strategies, and address market barriers to efficiency. State Level Steering Committee (SLSC) ensures budget allocations but no specified monetary value for EE/EC budget. • Monitoring and Evaluation: Defined roles for Energy Conservation Cells, Andhra Pradesh State Energy Efficiency Development Corporation (APSEEDCO), Technical Committee and the SLSC. SLSC strategies, monitors, and reviews policy implementation. The importance of data collection and recognition of top performers is highlighted.
Rajasthan (Energy Policy 2050 - Draft)	<ul style="list-style-type: none"> • Sector Identification and Targets: Encompasses all sectors: power, natural gas and refined liquids, transport, industry, building, and agriculture. The state aims to achieve a net-zero economy through this policy; some sector-level targets are mentioned for loss reduction and achieving benchmarks. • Implementation strategy and EE/EC measures: Strong emphasis on building and industrial sectors. There is an incentive programme designed to encourage and support energy efficiency initiatives for adoption energy-efficient practices, technologies, or behaviour. Emphasis on implementing renewable energy sources and energy efficiency measures. • Financing: This policy does not specifically outline any investments aimed at enhancing energy efficiency. • Monitoring and evaluation: Energy Transition Committee chaired by the chief secretary, will steer the implementation of this policy.



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