Energy Efficiency Policy Toolkit

International Energy Agency

INTERNATIONAL ENERGY AGENCY

The IEA examines the full spectrum of energy issues including oil, gas and coal supply and demand, renewable energy technologies, electricity markets, energy efficiency, access to energy, demand side management and much more. Through its work, the IEA advocates policies that will enhance the reliability, affordability and sustainability of energy in its 32 Member countries, 13 Association countries and beyond.

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Background to the Energy Efficiency Policy Toolkit

To accelerate action on energy efficiency, the IEA created the **Policy Packages for Energy Efficiency** in 2022 to support governments in designing and implementing effective energy efficiency measures by combining policies across three core pillars: regulation, information, and incentives.

The IEA then developed an **Energy Efficiency Policy Toolkit** that integrates the Policy Package for Energy Efficiency, with concrete examples for each end-use sector. The Toolkit shares strategic principles to guide policy makers to enhance and expand their energy efficiency policies and programmes.

Building on this foundation, the **Energy Efficiency Policy Toolkit,** updated on the occasion of the 10th Annual Global Conference on Energy Efficiency in Brussels, has evolved into an interactive, online tool. This updated version enhances usability and policy impact by incorporating a wide range of **case studies**, offering practical insights into the successful implementation of energy efficiency policies across diverse national and sectoral contexts.

10 strategic principles

Based on the IEA's analysis of best practices and the work of the Global Commission for Urgent Action on Energy Efficiency, the following strategic principles can help guide policymakers to enhance and expand their energy efficiency policies and programmes, and to accelerate energy efficiency gains through new and stronger policy.

1. Prioritise cross-cutting energy efficiency action for its economic, social and environmental benefits.

2. Act to unlock efficiency's job creation potential.

3. Create greater demand for energy efficiency solutions.

4. Focus on finance in the wider context of scaling up action.

5. Leverage digital innovation to enhance system-wide efficiency.

6. Lead by example in the public sector.

7. Engage all parts of society.

8. Leverage behavioural insights for more effective policy.

9. Strengthen international collaboration.

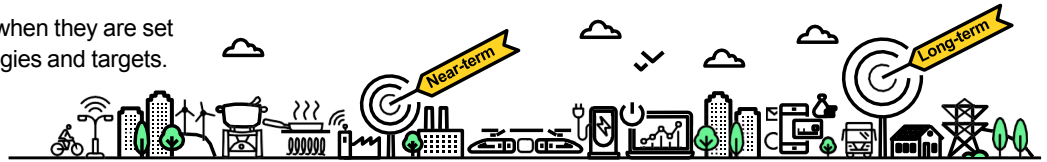
10. Raise global energy efficiency ambition.

Policy Packages for Energy Efficiency

In all sectors the greatest efficiency gains are achieved by a package of policies that combine three main types of mechanisms: Regulation, information and incentives. Careful design and implementation will deliver efficiency's full potential to enhance energy security, create jobs, improve living standards, cut energy bills and reduce emissions to ensure fair, inclusive energy transitions.

Targets

Policies are more effective when they are set in the context of clear strategies and targets.

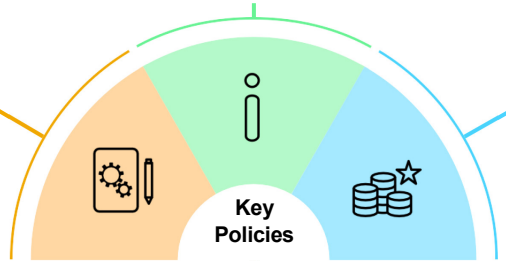


Essential elements

Regulation is essential to exclude the worst performing equipment and practices from the market, to drive average efficiency levels up, and to set rules for measurement of performance.

Information helps people make more efficient choices in what they buy and how they use energy.

Incentives make efficient options more attractive and speed up the upgrade and replacement of appliances, buildings and vehicles. They also encourage the use of new technologies and practices.



Implementation is as important as policy design.

Ensure that the **resources** are in place to put policies into action.

Address **vital elements** such as capacity building, enforcement, and monitoring.

It is important to continually assess **policies and programmes** so as to keep up to date with technology developments.

Financing Energy Efficiency

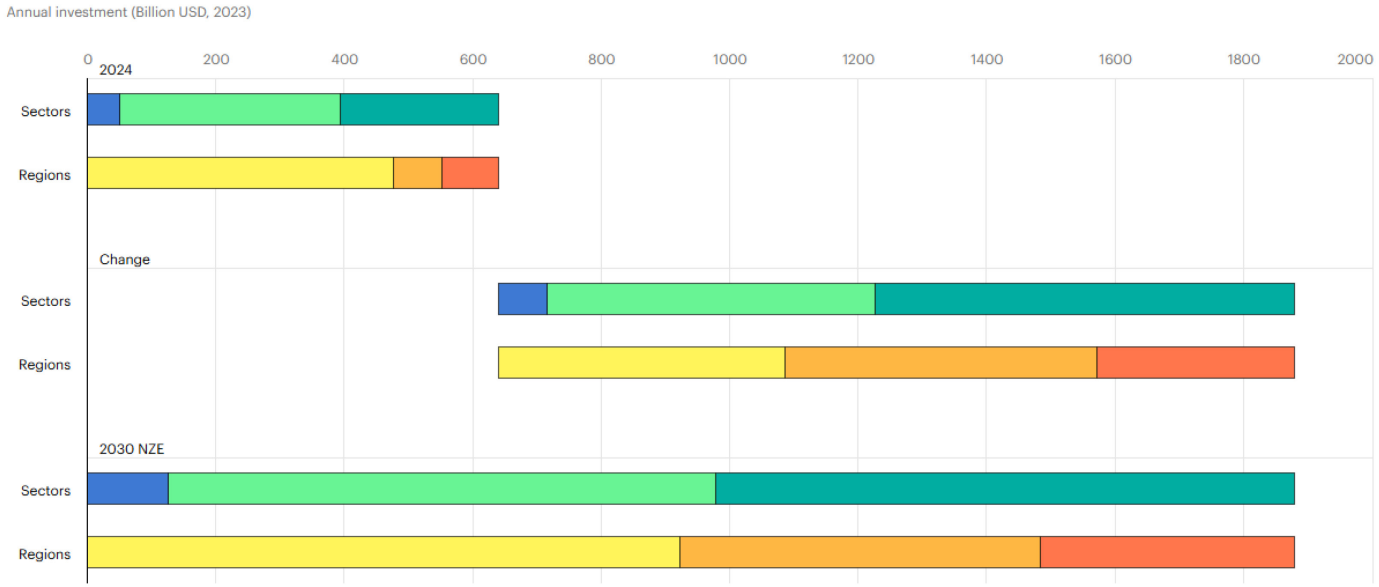
Energy Investment

Global energy investment continues to grow despite a challenging geopolitical environment. According to the IEA's World Energy Investment 2026 report, total spending is expected to reach USD 3.4 trillion in 2026, a 5% increase from 2025. Clean energy investment is projected to remain around USD 2.2 trillion, representing nearly two-thirds of total energy spending and continuing to outpace fossil fuels. Investment in electricity systems such as grids, storage, and electrification, is increasingly driven by energy security concerns and rising electricity demand. Energy efficiency also remains essential to strengthening system resilience, reducing costs for consumers and businesses, and lowering greenhouse gas emissions. Accelerating the uptake of efficient technologies across buildings, industry, and transport is therefore critical to maximising the benefits of the global energy transition.

Investment patterns, however, remain uneven. China, the United States, and the European Union continue to attract the bulk of clean-energy capital, while many emerging and developing economies face persistent barriers, including higher financing costs and limited access to affordable capital. As a result, efficiency investment in these economies is growing far more slowly than in advanced economies and China. The IEA stresses the need to mobilise more finance, reduce investment risks, and expand suitable financing instruments to support the deployment of energy-efficient technologies and infrastructure.

Households are the main investors in energy efficiency, more so than any other clean energy technology, accounting for 60% of all spending. This includes 70% of investments in buildings and half of all spending in the transport sector. In the industrial sector, the corporate sector accounts for around 60% of spending, with governments making up the rest. Between 50-60% of all efficiency investment spending is usually sourced from household savings or business equity, with debt finance making up the remainder. Financing solutions capable of supporting a large number of households are therefore particularly important to scale up investment in buildings and transport.

Energy investment in end use sectors



Source: IEA analysis based on data from World Energy Investment 2024 and World Energy Outlook 2024.
Notes: 2024 values are estimated. NZE = Net Zero Emissions by 2050 Scenario; EMDEs = emerging markets and developing economies. An energy efficiency investment is defined as the incremental spending on new energy-efficient equipment or the full cost of refurbishments that reduce energy use. The intention is to capture spending that leads to reduced energy consumption.

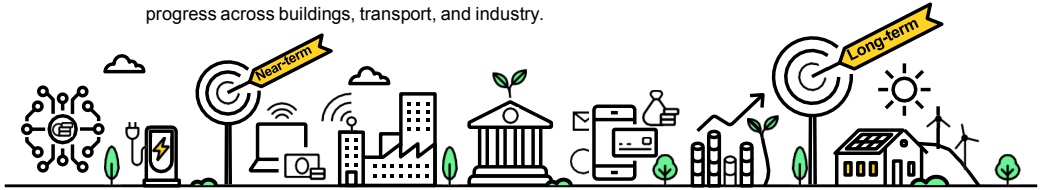
Policy Package – Financing Energy Efficiency

Immediate opportunities

Growth in energy efficiency investment is lower than it needs to be, but enacting the right policies delivers social and economic benefits promptly, such as doubling the number of energy efficiency related jobs by 2030.

Policy can drive increased energy efficiency related investment and stronger action from the private sector. Although efficiency spending is increasing, it remains uneven, making stronger policies and improved access to affordable finance essential to accelerate progress across buildings, transport, and industry.

Achieving the goal of doubling global energy efficiency progress will require a larger share of total energy investment to be directed toward energy efficiency.



REGULATION

- **Long-term strategies, targets and planning** emphasise government commitments to sustained change, attracting private investment.
- **Energy market structures** can facilitate the participation of private actors, including energy service providers, supporting investment over time.
- **Strong policy and governance frameworks** including transparency regulations, Minimum Energy Performance Standards and ESG (Environmental, Social and Governance), can attract international investment and ensure the long-term flow of capital.
- **Utility regulation** can spur investment and enable innovative financing approaches e.g. where outlay is recouped through energy bills.

INFORMATION

- **Training programmes and technical assistance** for financial institutions and project developers help improve understanding of business models, risks and opportunities.
- **Policies and digital tools** enhancing data availability and quality, including energy performance certificates, help to improve financiers' understanding, and to verify energy savings and payback periods.
- **Development of standardised contract templates and terms** help create trust, reduce transaction costs and simplify replication.
- **Dedicated information campaigns** raise awareness of preferential funding opportunities, and how to access them.

INCENTIVES

- **Streamlined and digitised administrative processes** for energy efficiency projects, including permits, licences or subsidies and one-stop shops reduce barriers to investment.
- **Public funding** can support de-risking mechanisms, like guarantee funds or risk-sharing facilities, helping to attract private capital.
- **Coordination platforms** and matchmaking services between project developers and private investors can improve access to funding.
- **Policies promoting innovative mechanisms** such as bulk procurement, on-bill financing and leasing models can achieve scale and amplify actions.
- **Energy subsidy reform** helps phase out poorly targeted fossil fuel subsidies while boosting direct support for energy efficiency measures, including for vulnerable groups.

Buildings

The Buildings Policy Package

Buildings account for about 30% of final energy consumption globally and more than half of electricity consumption. Doubling the global annual energy intensity improvement by 2030 would require buildings to become more efficient rapidly. An **integrated policy approach** combining regulation, information and incentives is the most effective way to achieve this goal.

Regulatory standards such as building energy codes are among the most effective policies to not only boost energy performance and reduce emissions, but also to improve occupants' health, comfort and productivity – while enhancing climate resilience and mitigating energy price fluctuations. Buildings built after a code is introduced can use up to 50% less energy.

Information instruments such as energy performance certificates provide transparency about a building's energy use, allowing consumers to make better-informed decisions. They can also help deliver insights to governments on a country's building stock, which in turn can inform new policy including regulatory updates to the building energy code. Other information tools include campaigns to raise awareness and acceptance among stakeholders and one-stop-shops that facilitate easy access to grants and other incentives, alongside guidance and quality assurance.

Incentives such as retrofit grants can promote efficient technologies by lowering the upfront cost of the investment, making an energy efficiency upgrade more accessible and affordable. Grants can direct investments from stakeholders towards specific energy efficiency measures and motivate them to exceed minimum standards by reducing the upfront costs, adopting innovative technologies, and engaging in best practices. Incentives can promote the most efficient technologies or target a specific subset of the population that needs the support the most.

MORE INFORMATION

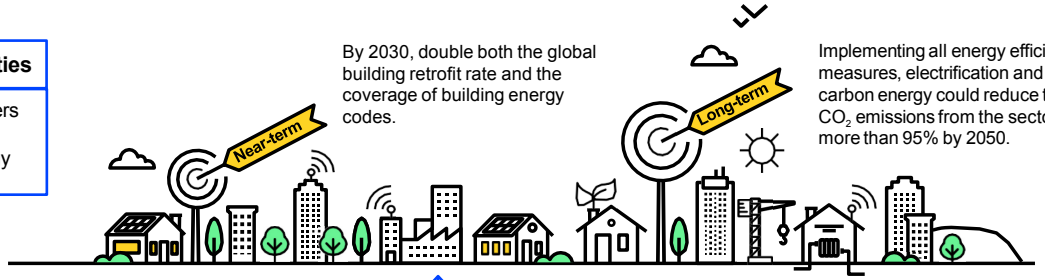
This toolkit provides an overview of the most important elements of each policy instrument, but you can find more by exploring additional resources.

- IEA Overview on Buildings
- IEA Working Group on Building Energy Codes
- IEA Efficient Grid-Interactive Buildings
- GlobalABC Roadmap for Buildings and Construction 2020-2050

Policy Package – Buildings Energy Efficiency

Immediate opportunities

Replacing fossil fuel boilers with high efficiency heat pumps can reduce energy use by up to 75%.



REGULATION

- **Targets for energy efficiency** in buildings, including for renovation rates, fosters market growth and facilitates long-term investment decisions.
- **Building energy codes** for new and existing buildings accelerate the transition to zero-carcan cost-effectively bon-ready buildings. It is important that they are regularly updated to increase coverage and stringency.
- **Minimum energy efficiency requirements** for existing buildings help guarantee performance and accelerate the process of renovation through instruments such as the standardisation of processes.
- **Regulations** can ensure that buildings are equipped with smart interactive technologies and can become demand response ready.

INFORMATION

- **Information on building performance** allows consumers to identify the most efficient options when buying or renovating buildings. Examples include energy performance certificates, disclosure programmes, one-stop shops for upgrades and renovation passports.
- **Smart interactive technologies** can show real-time energy performance, help adjust occupants' behaviour and optimise energy use based on signals from the grid.
- **Training and education programmes** for building sector workers are important to ensure a suitably skilled work force.
- **Public awareness campaigns** designed to include behavioural insights encourage low-cost actions, such as thermostat adjustment and use of smart technologies.

INCENTIVES

- **Financial incentives** such as green mortgages, energy performance-based preferential loans and tax rebates and grants can motivate consumers and developers to increase investment in energy efficient solutions.
- **Expedited administrative procedures**, including accelerated permitting, targeted at high performing new build or retrofit projects, encourage the implementation of energy efficient measures.
- **Award** and recognition programmes encourage the development of highly energy efficient buildings.

Building Energy Codes

WHAT THEY ARE

Building energy codes are a regulatory instrument in the buildings policy package. They set minimum requirements for energy use in buildings. They may set requirements for the overall energy efficiency of an entire building (performance-based codes) or for individual building components such as insulation, lighting systems, or heating and cooling systems (prescriptive codes). They may include both types of requirements to provide flexibility to the market. Only buildings compliant with the energy code are allowed to be built.

To get buildings on track for a net-zero emissions future, building energy codes should include not only energy efficiency requirements, but also requirements around on-site renewable energy production, embodied carbon, energy management and the integration of smart appliances and equipment to enable demand response. Building energy codes should be applied to both new buildings and existing buildings undergoing major renovations. They can also set deadlines for energy efficiency upgrades. They improve the efficiency of buildings and help industry prepare for, and adapt to, market changes. As of 2023, there were around 80 building energy codes in place across the world, with only 40% of new buildings constructed globally covered by requirements for energy efficiency.

HOW TO IMPLEMENT

Specific steps to implement building energy codes vary by country and should be adapted to the regulatory context. The most common implementation steps include:

1. **Assessment and planning**: Analyse the current state of energy use in buildings, identify opportunities for improvement in energy efficiency in different building types and climate conditions, and develop a strategic plan for implementing building energy codes.
2. **Code development**: Establish a task force with stakeholders from government, industry, and academia to discuss the code design. Consider aligning with international standards (e.g. International Energy Conservation Code) or existing successful codes in other countries. Then the actual drafting of the building energy code can commence, including specific requirements for construction and operation. Specify the scope, including building types, geographic areas, and the time frame. Lastly, establish mechanisms for compliance with the building energy code, including penalties for non-compliance.
3. **Public consultation**: Solicit input from industry professionals, builders, architects, and the general public to gather feedback on the proposed regulation.

4. **Approval and adoption**: Present the regulation to relevant authorities for approval and adopt the building energy code through legislative or regulatory means.
5. **Training and education**: Provide training programmes for architects, builders, contractors, code officials, enforcement personnel and other stakeholders. Raise awareness about the new building energy code and its requirements.
6. **Updates and revisions**: Regularly review and update the building energy code based on your monitoring efforts to incorporate technological advancements and industry best practices. Consider amendments based on lessons learned from implementation.
7. **Collaboration**: Foster collaboration between government agencies, industry experts and advocacy groups to support implementation.

HOW TO MONITOR

Setting up a monitoring and evaluation (M&E) system may include some of the following common steps:

- Identify key performance indicators (KPIs) and set measurable objectives for building energy codes, such as compliance rates, energy savings and wider socio-economic impacts.
- Determine data sources and collection methods. Collect data on energy consumption, building characteristics, and other relevant parameters, taking into account a variety of design and renovation practices, as well as climatic conditions.
- Establish a baseline for energy consumption and building characteristics (preferably before the regulation is developed).
- Develop a reporting system. Regularly publish results on the KPIs and areas for improvement.
- Implement regular audits and inspections focusing on compliance with the building energy code.

Energy Performance Certificates

WHAT THEY ARE

Energy Performance Certificates (EPCs) are an information instrument in the buildings policy package. EPCs are usually documents that inform on the energy performance of a building and its energy demand, indicating how efficient – and often how environmentally-friendly – a building is. EPCs can differ, but some of the key elements may include:

- **Energy Efficiency Rating**: A scale of several energy classes, for example from A (most efficient) to G (least efficient), visually represented, often as a color-coded bar chart.
- **Current and Potential Ratings**: Display the building's current state and its potential efficiency rating after recommended improvements.
- **Property Details**: Basic information about the property, including size and evaluation date.
- **Recommendations**: Specific, cost-effective advice on improving the property's energy efficiency, such as the addition of insulation, heating system upgrades, and the use of renewable energy.
- **Estimated Energy Use**: Projection of energy consumption and costs based on standard usage patterns, identifying potential savings.
- **Carbon Emissions**: Information on the building's carbon dioxide emissions, emphasising its environmental impact.

HOW TO IMPLEMENT

Implementing an EPC programme involves several steps to ensure it effectively encourages improvements in buildings. These may include:

1. **Legislative framework**: Set the scope, objectives and requirements, including which buildings need an EPC, under what circumstances (e.g., sale, rent, construction), and the validity period of certificates.
2. **Standards**: Develop a methodology to assess energy performance and calculate the efficiency rating. This should include guidelines on the evaluation process, data collection and calculation methods.
3. **Training and accreditation**: Set up a system to train and accredit assessors who carry out energy performance evaluations. Certified and competent assessors are crucial to the credibility of EPCs.
4. **Certification process**: Implement a process for issuing EPCs, including property inspections, data analysis, and the creation of the certificate with recommendations for efficiency improvements.
5. **Data collection and registry**: Establish a database to record and manage EPC information to facilitate the tracking of energy performance across the building stock and support policy analysis.
6. **Quality control and enforcement**: Put mechanisms in place to ensure the quality of EPCs, such as random checks or audits. Also, define penalties for non-compliance to enforce the requirements.
7. **Public engagement**: Launch initiatives to raise awareness among property owners, buyers, tenants and the general public about the importance of energy efficiency and the role of EPCs in promoting it.
8. **Updates and revisions**: Regularly review the effectiveness and update standards, trainings and methods to reflect technological advancements, changes in energy prices and other relevant factors.

HOW TO MONITOR

Monitoring the effects of EPCs is crucial to evaluate their impact on improving building energy efficiency, influencing real estate markets, and contributing to environmental goals. To track these effects, a comprehensive approach to data collection and analysis is needed. This may include the following elements:

- Collect data on the distribution of energy efficiency ratings across the building stock to understand the current state of buildings.
- Require regular updates to EPCs and track changes in buildings' ratings, especially after renovations or efficiency improvements.
- Track the implementation of energy efficiency recommendations provided in EPCs (for example, through building energy passports), such as insulation upgrades, heating system replacements, or the installation of renewable energy sources.
- Monitor energy consumption data (for example, with smart meters) before and after the implementation of EPC recommendations to measure energy savings.
- Compare actual energy savings (and/or reductions in greenhouse gas emissions) with estimated building energy performance made in EPCs to assess the accuracy of assessments and the effectiveness of recommended measures.
- Collect data on why recommendations are not implemented, such as financial constraints, regulatory barriers, or lack of awareness.
- Collect data to analyse the impacts of EPC ratings on property values, sales prices and rental rates to see how efficiency influences real estate market dynamics.

Energy Retrofit Grants

WHAT THEY ARE

Retrofit grants are an incentive in the buildings policy package. Grants can reduce upfront costs for energy efficiency technologies and make them more attractive and financially viable for consumers, builders and developers. This can help create a market pull, supporting stakeholders in implementing energy efficiency measures to comply with regulations to achieve higher levels of building energy performance.

Grants usually provide payment before the retrofit happens and cover part of the costs, such as adding insulation, upgrading heating or cooling systems, or installing solar PV. Grants may include requirements to improve the overall energy performance of the buildings (typically based on a theoretical assessment of the measures) and are sometimes linked to energy performance certification programmes. In addition to traditional grants, there are also market mechanisms that reward improved performance or pay-for-performance instruments.

HOW TO IMPLEMENT

The process depends on the depth of the retrofit, eligible measures, grant size and country context. Common implementation steps are:

1. **Objectives**: Identify goals, such as reducing energy consumption and emissions, or supporting vulnerable households. They should be specific, measurable, achievable, relevant and time-bound.
2. **Target audience**: Determine the recipients of the grant, which can include homeowners (or specific groups based on income, dwelling type, household size, etc.) and businesses. Tailor the programme to the specific needs of the target audience.
3. **Design**: Outline the eligibility criteria, application process and compliance process. Provide clear guidelines to ensure potential participants understand how to qualify and apply. Make the process simple, preferably accessible online or through physical forms, where owners can submit details about the building and the retrofit project. **Performance criteria**: Define criteria that projects must meet to qualify for the grant, including the types of retrofits eligible, the energy savings required, a method to determine these savings (e.g. theoretical or metered data) and any relevant certification standards.
4. **Budget**: Establish a clear budget for the grant, identify funding sources and secure the funds. This can involve government funds, private investments, or public-private partnerships.
5. **Administrative capacity**: Establish a team or designate an agency responsible for administering the program. This includes processing applications, disbursing incentives and monitoring compliance.
6. **Raising awareness**: Provide information about the programme to the target audience. Use websites, social media, press releases and community events to promote the programme and its benefits.
7. **Monitoring and evaluation**: Develop mechanisms to monitor the progress and evaluate its impact on energy efficiency. This involves tracking participation rates, energy savings and cost-effectiveness.

HOW TO MONITOR

Monitoring and evaluation (M&E) of grant programmes for energy-efficient building retrofits are critical for assessing the effectiveness, impact, and efficiency of these initiatives. This process involves collecting, analysing and using data to track programme progress against its objectives and to inform future policy and programme design. Key steps include establishing clear metrics and indicators for success, such as energy savings, cost-effectiveness and participant satisfaction. Data is gathered through methods like metering, surveys and audits.

It is important that the process includes comparing pre- and post-retrofit energy use to quantify savings and determine if the programme met its goals. Measuring actual savings is important, as estimated savings risk being higher than reality if measures were not adequately implemented. This process helps identify best practices, areas for improvement, and supports data-driven decision-making to enhance the performance of energy efficiency programmes. It could also be beneficial (from the point of maximising energy savings) to provide larger grants to the achieved improvements in energy performance beyond what is required in the building regulations and/or link the grant to a Pay-for-Performance (P4P) scheme.

Appliance

The Appliance Policy Package

Appliances represent 45% of electricity demand in buildings and are responsible for almost 3 gigatons (Gt) of CO_2 emissions. Doubling the global annual energy intensity improvement by 2030 would require appliances to become 30% to 40% more efficient. An **integrated policy approach** combining regulation, information and incentives is the most effective way to achieve this goal.

Regulations such as minimum energy performance standards (MEPS) can ensure that the least efficient equipment is not sold on the market. MEPS also encourage suppliers to increase the efficiency of the appliances they produce, accelerating the improvement of efficiency on the market. In countries where standards and labelling programmes have been implemented, appliances are now typically consuming 30% less energy than they would have otherwise

Information instruments such as appliance energy labels are important tools to collect data for market analysis, providing an evidence base for the implementation of other programmes, such as minimum energy performance standards and incentives. They also provide valuable information for consumers when they are making purchase decisions and for retailers when they are selecting products to offer in their stores.

Incentives such as rebate and loan programmes can lower the upfront costs of investing in appliances and can persuade consumers to buy more efficient products, while motivating technology suppliers to innovate and produce high efficiency alternatives. By offering incentives, policy makers can accelerate the transition to highly efficient appliances.

MORE INFORMATION

This toolkit provides an overview of the most important elements of each policy instrument, but you can find more by exploring additional resources.

- IEA Appliance Energy Efficiency Policy online training
- IEA TCEP for Appliances and Equipment
- United for Efficiency (U4E) Energy Efficient Appliances
- IEA Energy Efficiency 2024
- IEA 4E TCP Annual Report 2024
- IEA & 4E Programme Achievements
- CLASP World's Best MEPS

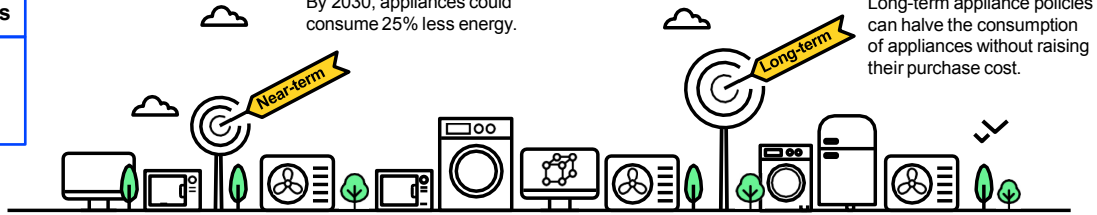
Policy Package – Appliance Energy Efficiency

Immediate opportunities

In most cases, it is possible to buy appliances that are twice as efficient as those typically purchased.

By 2030, appliances could consume 25% less energy.

Long-term appliance policies can halve the consumption of appliances without raising their purchase cost.



REGULATION

- **Minimum Energy Performance Standards** exclude the least efficient products from the market. They should be in line with international best practices, while reflecting local circumstances; and be regularly updated. Regulations are essential for moving the market towards the best available technology in line with achieving net zero targets.
- **Regulation** can ensure that new appliances are demand response ready in order to offer flexibility to the end-user and the overall system, and reduce peak demand.
- **Regulating the import and performance of used appliances** can help avoid inefficient appliances entering the market.

INFORMATION

- **Comparative labels** help consumers, to identify the most efficient appliances and encourage purchases based on lifetime costs. Ensuring labels are appropriately displayed is also key.
- **High Efficiency Performance Specifications** identify the best performing products and are often used as the basis for labels and incentives.
- **Education and capacity building** encourage industry and retailers to produce and supply more efficient products.
- **Consumer information campaigns** help people make informed decisions. These are most effective when based on behavioural insights and targeted strategies.

INCENTIVES

- **Rebates, grants and other financial offers** motivate consumers to buy highly efficient appliances. These could come directly from governments or schemes such as energy efficiency obligations.
- **Finance or taxation measures** on sales and imports can encourage manufacturers to produce appliances that are more efficient.
- **Dynamic electricity pricing** helps incentivise flexible demand.
- **Product lists** help companies and households identify efficient products which are eligible for loans, tax reductions, or other financial incentives.
- **Awards** promote the most efficient appliances and equipment.

Minimum Energy Performance Standards

WHAT THEY ARE

Minimum energy performance standards (MEPS) are a regulatory instrument in the appliance policy package. They set a minimum efficiency threshold for appliances or other energy-consuming equipment to overcome barriers to improved efficiency, such as potentially higher purchase prices or product availability, and provide a level playing field in competitive markets. Equipment that does not comply with these minimum requirements is not allowed to be sold on the market.

Depending on the lifetime of a product and possible policies to incentivise early replacement, such as financial rewards, the stock turnover induced by MEPS happens over a longer or shorter time period. MEPS effectively limit the products on the market to new equipment that is more energy efficient. Less efficient equipment will not enter the stock or leave the stock gradually as it is replaced. MEPS are among the longest standing energy efficiency policy instruments and often very cost-effective in improving the energy efficiency of products on the market. As of 2024, over 128 countries representing 97% of world electricity consumption have MEPS in place for at least some appliances.

HOW TO IMPLEMENT

The implementation of MEPS requires technical expertise to set up a Quality Infrastructure System adjusted to local requirements. This contains a regulatory framework (standards and technical regulations), institutions (standardisation, accreditation and certification bodies, as well as market surveillance and enforcement) and a dedicated infrastructure such as local or regional laboratories. The implementation usually follows this process:

1. **Technical assessment**: Using energy demand analysis and market data, identify target products based on the potential impact of energy efficiency regulation. Priorities are assigned based on energy consumption and savings potential.
2. **Development of technical standards**: Develop standards which define and specify the testing procedures and conditions to determine the efficiency of a product. These can be based on international standards (such as ISO or IEC standards) to facilitate trade and simplify the implementation process.
3. **Technical regulation:** Issue technical regulation that defines minimum energy efficiency performance thresholds and legislative acts that prohibit manufacturers and importers to put equipment on the market that does not comply with the regulation. These acts define the scope, the obligations, the implementation timeline, the conformity assessment procedures and other relevant requirements.
4. **Implementation period**: Identify the date the regulation will come into force. To give market actors more time to adapt, policymakers can implement the regulation at first with a less stringent threshold and increase stringency at specified dates.

5. **Compliance and enforcement**: Set up compliance and enforcement frameworks to ensure that products comply with the requirements, based on three pillars:
   - Conformity assessment procedures define the process for suppliers to ensure their product complies with the regulation. They can include product testing, performance declaration and product registration.
   - Market surveillance by the responsible authorities to monitor registered products, verify declarations and screen the market for non-registered products.
   - Enforcement by the authorities, including issuing of penalties for non-compliance and to deter further non-compliance.
6. **Continuous updates**: Once the system is functioning and the number of non-compliant products is under control, continue to expand the scope and stringency of the standards with regular updates to keep up with market and technology developments.

HOW TO MONITOR

To update the policy and to ensure compliance and enforcement, the programmes should be periodically evaluated, ideally by independent researchers. Evaluation should be transparent. Objectives, indicators and methods for data collection and analysis should be clear in advance. Analysis should include indicators on target achievement (e.g. all new devices sold have at least the regulated minimum energy performance), impacts (e.g. the energy consumption of the given equipment is reduced by x% per year; household energy savings; reduced additional cost to consumers), and process (e.g. number of faulty energy performance certificates; number of complaints by manufacturers; cost of market surveillance). The impact evaluation should carefully define a baseline of equipment that would have been sold without the regulation and compare it with the volume of equipment actually sold. Manufacturers may be required to report their annual sales by efficiency level..

Energy Labelling for Appliances

WHAT THEY ARE

Labelling programmes are an information instrument in the appliance policy package. They provide information for consumers to promote purchasing decisions towards a more energy-efficient product or appliance.

Generally, two types of labels can be distinguished. Comparative labels, which are often mandatory, have a classification scale to enable consumers to compare the energy performance of different products and are generally found on all products of the same type. Endorsement labels, which are voluntary, are found only on best-in-class models or those exceeding a certain efficiency level. These two types of labels can also complement each other.

There are different designs of labels, but it is essential to ensure that the label is understandable to the target consumer and therefore that it reflects relevant local norms. Provided there is a product registration system put in place, or that sales are reported according to energy performance, energy efficiency labels, particularly mandatory ones, are also an important tool to collect data for market analysis, providing information for the implementation of other programmes, such as minimum energy performance standards or purchase incentives. Today, 113 countries have a labelling scheme for appliances in place.

HOW TO IMPLEMENT

The implementation of labels requires a Quality Infrastructure System adjusted to local requirements. This contains a regulatory framework (standards and technical regulations for the labelling scheme), institutions (standardisation, accreditation and certification bodies, inspectors) and dedicated infrastructure such as local or regional laboratories. The implementation usually follows this process:

1. **Technical assessment**: Using energy demand analysis and market data, identify target products based on the potential impact of a labelling scheme. Assign priorities based on energy consumption and savings potential.
2. **Technical standards**: Develop standards which define and specify the testing procedures and conditions to determine the efficiency of a product. These can be based on recognised international standards (such as ISO or IEC standards) to facilitate the trades and simplifies the implementation process. It can be useful to consult behavioural experts to ensure the policy has its intended effects.
3. **Technical regulations and legislative acts:** Issue regulations which mandate the labelling of specific products. They define the scope, the obligations, the implementation timeline, the conformity assessment procedures and other relevant requirements.
4. **Implementation period**: Identify the date the regulation will come into force. To give market actors more time to adapt, policymakers can set an implementation period.

5. **Compliance and enforcement**: Set up frameworks to ensure that products comply with the requirements, based on three pillars:
    - Conformity assessment procedures define the steps for manufacturers and importers to ensure their product complies with the regulation. They can include product testing, performance declaration and product registration.
    - Market surveillance by the authorities to monitor products, verify declarations and screen the market for non-registered products. For labelling schemes, this includes verifying that products are labelled accordingly and checking the information provided in the labels is consistent with testing reports.
    - Enforcement by the authorities, including issuing of penalties for non-compliance and to deter further non-compliance.
6. **Continuous updates**: Once the system functions and the labels are recognised by the public, add appliances/products to increase the coverage. Follow the priorities in the technical assessments. For products with a label, rescale to avoid the concentration of products in the top classes, aligned with the revision of MEPS.

HOW TO MONITOR

To update the policy and to ensure compliance, the programme should be periodically evaluated in an independent and transparent way. Objectives, indicators and methods for data collection and analysis should be clear in advance. Analysis should include indicators on target achievement (e.g. new devices have at least the regulated minimum energy performance), impacts (e.g. the energy consumption is reduced by x% per year; household energy savings), and process (e.g. number of faulty energy performance certificates; number of complaints by manufacturers; cost of market surveillance). The evaluation should define a baseline of equipment that would have been sold without the regulation and compare it with the equipment sold. Manufacturers may need to report annually their sales by efficiency level.

Loans and Rebates for Appliances

WHAT THEY ARE

Loans and rebates are incentives in the appliance policy package. These incentives lower the upfront investment costs of appliances and are used to persuade consumers to buy more efficient products and motivates suppliers to produce them. Incentives also drive innovation and the adoption of new technology and practices.

Rebates and loans are regularly combined in one policy instrument to reduce upfront costs and offer financial support. These incentives encourage consumers and manufacturers to invest in and develop energy-efficient appliances. Rebates reduce upfront costs, but they can be expensive and require careful design. Low-cost loans provide funding upfront and are available for highly efficient or best-in-class models. In many cases, the eligibility criteria include scrapping an old but functioning appliance.

HOW TO IMPLEMENT

The implementation of a loan or rebate requires a coordinated approach between several stakeholders, often involving several steps in the design phase. The implementation usually follows this process:

1. **Technical assessment and definition**: It is necessary to select the technology to be incentivised, based in energy efficiency levels in the market and possible new energy efficiency regulation being implemented for a specific appliance. It is important to define the scrapping process for the inefficient appliance when required in the eligibility for the loan.
2. **Financial mechanism**: The fund and investment must be allocated, and the main actors involved in the repayment mechanism (potentially through the electricity bill) and the governance of the programme must be identified, generally involving the ministry of energy, the ministry of economy, an energy utility, and a national development bank, as well as manufacturers associations, marketers and retail stores. Loans are designed establishing fixed rates and payments.
3. **Final consumers:** Retail stores could play a key role in guiding customers and determining their eligibility, while delivering new efficient appliances and selling those that meet low-energy consumption requirements. They can also take care of collecting the old, less efficient appliances and transporting them to scrapping centres.

HOW TO MONITOR

Evaluation is an important process to understand what effects the rebate/loan had, for whom and why. Evaluation also allows the design of a rebate-loan scheme to be adapted based on consumer needs. Rebate and loan schemes should be periodically evaluated, optimally by independent researchers.

It is important to consider assessing whether the correct products are incentivised, as well as to determine the suitability of compulsory versus voluntary measures, ensure that MEPS and labels are appropriately calibrated with the rebate/loan, and embed policy within broader frameworks or climate change commitments.

Evaluation should be transparent. Objectives, indicators and methods for data collection and analysis should be clear in advance. Analysis should include indicators on target achievement (e.g. the number of consumers benefitting from the rebate/loan), impacts (e.g. the energy consumption of the given equipment is reduced by x% per year, household energy savings, upfront and lifecycle cost savings to the consumer), and process (e.g. satisfaction with the application process).

The impact evaluation should carefully define a baseline of equipment, that would have been sold without the incentive and compare with the actually sold ones. Moreover, rebates must also address challenges such as the potential that certain groups benefit more than others. Certain participants might have also bought the same efficient product without the incentive. Emphasis should be placed on the replacement of outdated yet functioning appliances while directing benefits to specific demographics, such as low-income households.

Industry

The Industry Policy Package

Industry accounts for 37% of final energy consumption globally. Doubling global energy intensity improvement by 2030 would require the decoupling of production from energy demand and raising the share of electricity in energy use from 23% in 2022 to 30% in 2030. An **integrated policy approach** combining regulation, information and incentives is the most effective way to achieve this goal.

Regulations such as minimum energy performance standards for motors increase the efficiency of industrial processes by requiring new motors to use less energy per unit of output. This also drives the innovation of more efficient technologies. The alignment of international standards can contribute to the strengthening and enforcement of regulation for industrial efficiency and accelerate global progress.

Information instruments such as industry energy efficiency networks can accelerate energy efficiency progress by facilitating knowledge exchange and the sharing of best practices. They can also work in conjunction with other government policies to boost uptake by supporting the dissemination of information on incentives and available funding to industry. Governments should consult local and national industry representatives and associations and profit from the insights of local industrial experts to determine the most effective information instrument for their country.

Incentives such as facilitating access to finance and energy efficiency obligation schemes can be effective tools for encouraging private sector stakeholders to advance energy efficiency priorities. Obligated parties often achieve savings of more than 100% of the target within the first 10 years. Incentives can also encourage companies to invest in the most efficient technologies and practices.

MORE INFORMATION

This toolkit provides an overview of the most important elements of each policy instrument, but you can find more by exploring additional resources.

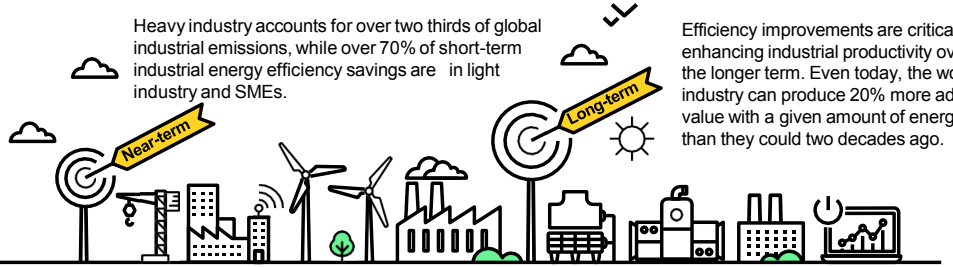
- IEA Energy Efficiency 2024
- IEA Energy Efficiency Progress Tracker
- IEA Industry Overview
- IEA Energy Technology Perspectives 2024
- Regulatory Assistance Project Costs and Benefits of Energy Efficiency Obligation Schemes

Policy Package – Industry Energy Efficiency

Immediate opportunities

Implementing better energy management practices has been shown to deliver savings up to 15% in the first 1-2 years, with little or no capital investment.

Heavy industry accounts for over two thirds of global industrial emissions, while over 70% of short-term industrial energy efficiency savings are in light industry and SMEs.



Efficiency improvements are critical to enhancing industrial productivity over the longer term. Even today, the world's industry can produce 20% more added value with a given amount of energy than they could two decades ago.

REGULATION

- **Minimum Energy Performance Standards** for key equipment, such as motors and pumps, can drive up overall industrial efficiency levels.
- **Regulation** extends beyond technology to target areas such as research and development, energy auditing, mandatory consumption reporting, energy management systems, and upskilling of the workforce. Incorporating life cycle impacts into regulation helps promote material efficient choices at the design stage.
- **Regulatory instruments** yield best results when they are rooted in a good understanding of local context and include ambitious, regularly updated, standards.
- **Regulations to ensure demand side response capabilities** help provide flexibility to the grid.

INFORMATION

- **Benchmarking, indicators and other forms of detailed data** allow governments to track the progress of policies and allow industries to compare their energy performance with that of their peers.
- **Digital technologies** enable industries to track energy use in real time and help ensure flexible demand side response, resulting in energy optimisation and cost saving opportunities.
- **Sharing information on energy efficiency best practice** through targeted information and industry networking activities helps industries raise ambition and improve energy performance.

INCENTIVES

- **Incentives** such as preferential finance, links to carbon trading, obligations and tax based measures can motivate crucial energy efficient decisions at the process design and equipment selection stage, supporting industry's transition to near zero emission technologies.
- **Free or subsidised energy audits**, often targeted at SMEs and other sectors of strategic importance, can help rapidly increase energy efficiency.
- **Policies to foster Energy Service Companies** provide industry with access to significant external energy expertise and attractive structured financial packages.
- **Incentives for the reuse and recycling** of materials reduce the need for higher-emission primary materials production.

Minimum Energy Performance Standards

WHAT THEY ARE

Minimum Energy Performance Standards (MEPS) for industrial electric motors are a regulatory instrument in the industry policy package. They set requirements for a minimum level of energy efficiency that electric motors must meet to be sold in a particular jurisdiction.

MEPS typically specify minimum efficiency levels for electric motors based on their size, type and application. Motors meeting or exceeding the specified efficiency levels are considered compliant, and non-compliant models are not allowed to be sold on the market. Efficiency is usually measured as a ratio of the motor's output power (mechanical power delivered to the load) to its input power (electrical power consumed).

MEPS for electric motors are often based on international standards for efficiency classes, such as IEC, NEMA, and GB. MEPS can help countries to meet their energy efficiency and carbon dioxide emissions targets. These standards not only foster an overall enhancement in motor efficiency but also facilitate comparability of efficiency levels among manufacturers for motor users.

MEPS for industrial electric motors have been implemented in 62 countries, encompassing over half of the global industrial motor fleet as of 2022.

HOW TO IMPLEMENT

The successful implementation of MEPS for industrial electric motors relies on a multi-faceted approach encompassing leadership, technical enhancements, effective communication, compliance monitoring, and supportive enforcement mechanisms.

This often involves several steps:

1. **Stakeholder engagement**: Before establishing MEPS, proactively engage stakeholders through workshops involving motor suppliers, users and authorities to ensure the MEPS are relevant to the specific market context. These workshops serve as platforms for gathering input and support for subsequent actions. It can be useful to consult behavioural experts in the design phase to ensure the policy has its intended effects.
2. **Technical aspects**: Develop and refine motor test methods and testing capacity, ensuring accurate measurement and assessment of energy performance. These technical enhancements are essential to underpin the efficacy of MEPS regulations.
3. **Development and publication**: Draft the legislation and present it to authorities for approval. Adopt the MEPS through legislative or regulatory means.

4. **Raising awareness**: Develop effective communication strategies which ensure widespread awareness and understanding of the new standards. Create a comprehensive communication campaign targeting both market stakeholders and end-users. This campaign is useful to not only prepare the market for the required changes but also to educate users and buyers on the efficiency gains from MEPS-compliant motors.

HOW TO MONITOR

Monitoring the compliance of motors with MEPS is essential to assess the effectiveness of the policy. Standardised testing procedures based on the MEPS parameters (i.e. power factor, temperature, and energy consumption) can increase compliance.

Monitoring those parameters is essential to evaluate the impact of energy performance. Technical assistance programmes and labelling initiatives can also increase the effectiveness of a monitoring and evaluation system, providing support to stakeholders to comply with the regulation.

From a market perspective, the availability, delivery and price of motors can be barriers to rapid market turnover. These factors should also be taken into account during the evaluation phase. The government can also assess the investment capacity of stakeholders to help determine whether potential subsidies are also needed to enable the phaseout of inefficient motors.

Industrial Energy Efficiency Networks

WHAT THEY ARE

Industrial Energy Efficiency Networks (EENs) are an information instrument in the industry policy package. EENs differ in structure, but they generally consist of a group of energy managers from different industrial sites that meets regularly to share knowledge and experience on improving energy efficiency in the industrial sector.

EENs can operate solely to share information between peers, or they can include elements such as energy reporting and the setting of energy saving targets. These networks act to guide industries in becoming more efficient, in line with government policies, and to improve government insight into industry for more effective policy development.

There are over 1 000 Industrial Energy Efficiency Networks worldwide, and this number is growing as governments seek to expand their policies and industries seek to reduce costs, energy use and emissions.

To establish an EEN, the government must form a network structure to identify and to remove the different barriers to increase industrial energy efficiency. This involves a programme to design, co-ordinate and manage the network.

Maintaining government control over the network, which can be managed either internally or through an external body, ensures alignment of goals between government policy and the network participants and ensures that government has access to the network for feedback on policy and to gather data and information on industrial energy consumption.

HOW TO IMPLEMENT

An EEN may take several forms, but successful EENs report the following components:

- Industry expert(s) facilitate the exchange.
- Membership is built around energy consumption size/profile.
- Members make a concrete commitment to improving energy efficiency and emissions reductions, often supported by their registration to an energy management standard or process.
- Special working groups or focus areas are created to share experiences and challenges on energy efficient design, specific technologies, process improvements and utilities.
- Tools and standardised guidelines are provided to lower implementation and transaction costs and to ensure a high quality of energy savings.
- Knowledge sharing opportunities and/or training are offered for network members and for the staff in the participating companies.

HOW TO MONITOR

Ongoing monitoring, targeting and evaluation are essential elements to the operation of an Industrial EEN, both at the individual member level and at the overall network governance level. Therefore, a defined methodology, in line with the policy objectives, must be determined when the EEN is established. It should be reviewed and updated regularly.

Within the EEN, the members must agree to:

- An initial energy review/audit for each site taking part in the EEN
- The setting of short term (one year) and longer energy efficiency targets (five to 10 years)
- Annual reporting, monitoring and benchmarking
- Annual energy efficiency target review.

Typically, information and data gathered in the process of monitoring and evaluation is then collated and analysed by the network operator and compiled into a published annual report.

Back to industry overview

Energy Efficiency Obligation Schemes

WHAT THEY ARE

Energy Efficiency Obligation schemes (EEOs) are a regulatory instrument, often combined with an incentive element, in the industry policy package. An EEO scheme is a mechanism that requires "Obligated Parties" to meet energy or emissions savings targets within their customer portfolio. Obligated Parties may be energy utilities, retail energy sales companies, energy distributors, transport fuel distributors and/or transport fuel retailers.

EEOs are market-based instruments that do not prescribe the measures to be deployed by Obligated Parties to achieve their set targets (within certain limits). Within some EEO schemes, "white certificates" (also called "energy savings certificates") are documents certifying that a certain reduction of energy or emissions consumption has been attained. White certificates are generally tradable between over- and under-performers and combined with an obligation to achieve a certain target of energy or emissions savings.

They are in use in 31 countries, with the number of schemes growing steadily over the past 20 years.

HOW TO IMPLEMENT

The main components of an EEO scheme include an adequate legal framework, scheme administration (institutional structures and capacity, operational methodologies) and obligated party delivery models (delivery mechanisms, funding/financing products, methodologies, organisational strategies). EEO structures vary widely from one jurisdiction to another and can be adapted to local circumstances.

The most effective EEOs are simple, have sufficient administrative capacity to effectively manage the scheme, set obligations at appropriate levels, and provide the legal/regulatory flexibility for the scheme to evolve over time. The costs are borne by the utility, which also bears the risk from operations and potentially missed targets. This can make EEOs a low-risk and low-cost tool for governments.

EEOs also incentivise utilities or industries to discover the lower cost route to energy efficiency and can incentivise them to bring energy efficiency to specific sectors or subsectors, such as SMEs or vulnerable households. It can be useful to consult behavioural experts in the design phase to ensure the policy has its intended effects.

EEOs are adaptable tools in terms of scope, fuel, and target setting – however, it is important to know what the objective is (e.g. reducing emissions, lowering energy consumption, minimising peak demand, etc.) to target the scheme appropriately.

EEOs require a strong framework. Not prescribing which actions must be undertaken to meet the energy savings targets could risk Obligated Parties choosing to implement only the cheapest and easiest projects, such as lighting, and avoid more complex projects with a longer time horizon such as retrofits. However, to avoid this, policymakers can design the EEO scheme to ring-fence or target projects requiring a specified proportion of energy savings to be achieved from certain types of energy savings/or sectors.

HOW TO MONITOR

One of the most important elements for a successful EEO is having a robust monitoring and verification framework in place. Policymakers will need to be able to evaluate whether the energy saving measures were actually undertaken as reported.

Calculations of energy savings are often done through estimations based on a pre-agreed formula rather than on measured data as it is simpler and cheaper to administrate. Monitoring and evaluation methods are specific to the EEO framework in question and need to be designed as an integrated part of the policy for each measure.

Transport

The Vehicle Policy Package

Private cars and vans were responsible for more than 25% of global oil use and around 10% of energy-related CO_2-emissions in 2023. Doubling global annual energy intensity improvement by 2030 would require the efficiency of cars to improve by 5% each year. An **integrated policy approach** combining regulation, information and incentives is the most effective way to achieve this goal.

Regulations such as fuel economy standards and heavy-duty vehicle standards encourage manufacturers to introduce more efficient vehicles, thereby significantly reducing greenhouse gas emissions. Countries with regulations and/or efficiency-based purchase incentives in place improve efficiency on average 60% faster than countries without such policies.

Information tools such as vehicle labels help inform consumers of a vehicle's fuel economy and running cost savings. Labels can illustrate the benefits of choosing more efficient vehicles, while also increasing transparency about real-world fuel use. Another information tool is to promote fuel-efficient driving through training programmes.

Incentives such as electric vehicle subsidies can drive the market towards more efficient and less polluting vehicles. Government support for EV purchases can be transitional and evolve with the development of the technology and markets. As the technology matures and EV prices become more competitive with their conventional counterparts, subsidies can be adapted and redirected in order to increase access to vehicles and improve their affordability, targeting groups where adoption is slower. Financial incentives may also be combined with disincentives for high-emitting vehicles by adding emission-based taxes or fees.

MORE INFORMATION

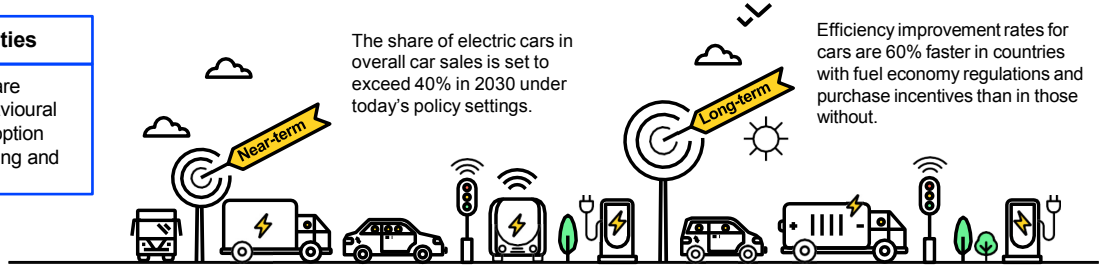
This toolkit provides an overview of the most important elements of each policy instrument, but we encourage policymakers to explore additional resources available for more in-depth information.

- IEA Global EV Outlook 2025
- IEA Policies to promote electric vehicle deployment
- IEA Global EV Policy Explorer
- IEA Policy Toolbox for Industrial Decarbonisation

Policy Package – Vehicle Energy Efficiency

Immediate opportunities

Significant fuel savings are achievable through behavioural actions including the adoption of best practices for driving and vehicle maintenance.



The share of electric cars in overall car sales is set to exceed 40% in 2030 under today's policy settings.

Efficiency improvement rates for cars are 60% faster in countries with fuel economy regulations and purchase incentives than in those without.

REGULATION

- **Vehicle fuel economy standards** result in greatly reduced fuel use provided they are kept up to date, well monitored and properly enforced.
- **Regulating the import and export of used vehicles** can help improve fleet fuel economy and ensure road safety and air quality benefits.
- **Regulatory and market signals**, such as through stringent standards and target setting, help bring electric vehicles to the market, by providing an impetus for manufacturers to develop these technologies.
- **Regulation** can also help ensure the required infrastructure, such as standardised charging, is in place.

INFORMATION

- **Information campaigns** on carsharing practices and more fuel-efficient driving help people take informed action relating to energy and cost savings. Campaigns are more effective when based on behavioural insights and targeted strategies.
- **Labels inform consumers**, identifying the most efficient vehicles allowing people to choose vehicles that cost less to run. Labels for new and used vehicles help ensure benefits for all vehicle purchasers.

INCENTIVES

- **Incentives** can reduce vehicle costs at point of purchase, such as through grants or lower registration fees. They can also reduce on-going costs, through for example free parking and exemptions from congestion tolls.
- **Government grants** for strategic charging infrastructure, such as charging stations in homes and workplaces or fast charging along expressways, encourage the adoption of electric vehicles reflecting that purchase decisions are influenced by the availability of infrastructure.
- **Vehicle taxation and duties**, can be structured to incentivise the purchase of more efficient vehicles.
- **Incentives** can facilitate the early adoption of electric vehicles and could be phased out as uptake grows.

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Fuel Economy Standards

WHAT THEY ARE

Fuel economy standards are a regulatory instrument in the vehicle policy package. They regulate the efficiency of new vehicles by, in simplest terms, defining annual corporate average standards, or targets, for fuel economy (miles per gallon or kilometre/litre) or greenhouse gas (GHG/CO_2) emissions (in grammes per mile/kilometre). There are different designs, but in general they define a standard for every auto manufacturer, for every year that the regulation applies. In some countries, flexibility mechanisms are offered, such as credits for manufacturers that over comply which can be used in future years or traded with manufacturers that underachieve.

Fuel economy standards have increasingly included provisions to facilitate the uptake of EVs (including battery electric and plug-in hybrid) and fuel-cell vehicles. Fuel economy standards help facilitate the development of advanced technologies and can greatly reduce fuel use, enhance energy security, and reduce emissions. Standards help increase regulatory certainty for manufacturers and can be most appropriate in countries with large markets and vehicle manufacturing facilities.

Currently, fuel economy or GHG/ CO_2 emission standards for new cars exist in over 40 countries, covering more than 80% of new passenger vehicle sales worldwide.

HOW TO IMPLEMENT

Implementation typically involves the following key elements:

1. **Identification of the government agency and legislative** requirements for setting and implementing the standards.
2. **Agreement on the design of the standard**, including the metric – fuel economy or CO_2/ GHG emissions; how and whether vehicle attributes such as weight are considered in setting the standard, its stringency and target years. For trucks, **a market assessment** is key to understand the contribution from different truck categories.
3. **Consensus on test procedures** and **associated protocols** to inform standard setting and monitoring and evaluation.
4. **Agreement on flexibility mechanisms,** such as allowing manufacturers to bank and trade credits and the approach to facilitate adoption of electric and other alternative vehicle as well as whether niche or small-scale manufacturers are exempted.
5. **Setting of penalties for non-compliance.**

For cars, standards can be set as a single value or as a function of vehicle attribute such as footprint or mass. The stringency of the standards can depend on the policy context, wider considerations (e.g. technology costs) and dynamics with key stakeholders. Engagement with stakeholders (especially auto manufacturers) is key throughout the design process. It can be useful to consult consumer groups as well.

It is important to highlight that fuel economy standards present opportunities for both consumers, in terms of fuel cost savings and for manufacturers, in terms of enhancing their competitiveness.

Regulations should, however, allow for the standards to become increasingly stringent over time, with manufacturers needing a two-to-three-year lead-time to prepare for shorter-term targets.

HOW TO MONITOR

A monitoring, evaluation and review process will need to be put into place when standards are implemented, allowing for them to become more stringent over time. Relevant test procedures should be used to verify, monitor and evaluate the implementation of the standards, with monitoring requirements depending on the standard approach. A key part of this will be establishing data-sharing protocols and identifying the legal requirements and entities with responsibility for ensuring compliance. Standards also need to be reviewed and revised on a regular basis to ensure their effectiveness and consistency with ongoing policy developments.

Back to vehicle overview

Energy Labelling for Vehicles

WHAT THEY ARE

Energy labelling for vehicles is an information instrument in the vehicle policy package. Labels inform consumers, helping them to identify the most efficient vehicles. They can cover new and used vehicles, facilitating benefits for all vehicle purchasers.

Labels can use different formats including on the vehicles in car show rooms and online. Increasingly, electric vehicles feature labels with metrics that also include the driving range of the vehicle. National comparison sites can also help potential buyers identify the most fuel-efficient vehicles by category, enabling consumers to compare makes and models and the identify the best-performing vehicles.

In addition to information on fuel economy, labels can also include information on CO_2 and air pollutant emissions, as well as on fuel cost savings – with the latter allowing people to choose vehicles that cost less to run. Over 35 countries across the world have vehicle efficiency labels in place today.

HOW TO IMPLEMENT

Implementation often covers four key steps:

1. **A regulatory framework** which empowers the relevant government bodies and agencies to introduce and enforce the programme.
2. **Programme design,** including decisions on which vehicles will feature the label – for example, whether the label will cover second-hand vehicles as well as new ones, and how and when electric vehicles might be captured. Data collection is a key aspect of the design, including on the real-world fuel economy of the vehicles. It can be useful to consult behavioural experts in the design phase to ensure the policy has its intended effects.
3. **Design of the label,** including decisions on information to be incorporated and the label's positioning and placement. Key metrics include fuel economy savings and associated financial benefits. In the label design, it is important to not overcomplicate the message. Other opportunities for additional information, including online, can be provided.
4. **Awareness raising** to ensure that consumers are informed about the label through outreach programmes. Reflecting the importance of the internet in purchase decisions, user-friendly websites which provide additional information are an essential component of outreach. For labels displayed in car showrooms, training on the use of the label – especially for showroom or sales staff – is necessary.

HOW TO MONITOR

A robust monitoring and evaluation framework is important maintain consumer engagement with and trust in the label. In terms of monitoring, it is important to have the mechanisms in place to ensure credibility in the fuel economy value and associated protocols for monitoring this. This can involve the real-world testing of vehicles to ensure the label corresponds with the experience of the consumer, as well as showroom visits or advertisement inspections to verify whether the label is correctly displayed and contains the necessary information.

To evaluate the effectiveness of the labelling programme on energy efficiency improvement, it is crucial to measure consumer behaviour and expectations through regular market research and surveys to track awareness of fuel economy and identify motivations in purchasing decisions. This information can inform potential adaptations to labels to include additional or revised information. Accurate monitoring and evaluation will help capture the outcomes of the policy and help improve the effectiveness of vehicle labelling programmes.

Electric Passenger Vehicle Subsidies

WHAT THEY ARE

Subsidies for passenger EVs are an incentive in the vehicle policy package. They play a key role in accelerating electric car sales, particularly for early adopters, and are in place in many markets. They can accelerate EV adoption by reducing the price gap between EVs and vehicles with internal combustion engines (ICEs). Subsidies usually take the form of discounts or rebates. They can also be implemented as tax reductions through income tax credits.

Discounts and rebates are the most commonly used incentives to lower the purchase price of EVs. They can be fixed direct discounts that are deducted from the cost of the vehicle at the point of sale, or rebates/refunds that are assigned once the vehicle has been purchased.

Subsidies have been implemented in most major EV markets, with different levels of incentives and requirements on eligibility, increasing the EV adoption. Additionally, different subsidy levels can help consumers opt for more efficient or affordable models among the EVs.

HOW TO IMPLEMENT

The main components of EV grants are the design, allocation of funds, and compliance requirements. The structure of the grant should be adapted to local market conditions, considering the price gap versus incumbent technologies, the average market prices and the target group.

Implementation often follows several steps:

1. **Market analysis**: To identify the models offered, their fuel efficiency, their model cost and the main price differences between EVs and ICEs.
2. **Setting target groups**: Based on the market analysis and characteristics of the local market, target groups can be defined. This can include assigning benefits to private or company cars, different types of vehicles, and used or new models. In some regions capturing different vehicle modes, including two and three-wheelers, can contribute to increasing affordability and access to clean energy technologies. It can be useful to consult behavioural experts in the design phase to ensure the policy has its intended effects.
3. **Definition of the scheme**: Benefits should be set to achieve price parity or to reduce the price gap between available EVs and their ICE counterparts. Funds should be assigned based on sales targets. A price cap for eligible models should be set to limit the benefit to only affordable models and provide price signals to manufacturers. Different subsidy levels can be used, based on factors such as income, vehicle type or battery capacity. Programme designs should give certainty to both manufacturers and customers by setting a fixed period accompanied by specific targets that trigger adjustments.

4. **Adjustment period**: Once the scheme is implemented, it should be revised and updated as the market evolves. This includes adapting the benefit to market conditions, reducing the price cap and including new target groups.

When selecting the subsidy to be implemented, direct discounts or rebates are usually preferable, as they have an immediate impact on the price of the vehicle, making it easy for the buyer to factor them into their decision-making. In contrast, income tax credits are received at the end of the fiscal year and only for those liable to pay, disproportionately benefitting higher-income households. This must be considered during the design stage and be paired with eligibility criteria to avoid leaving anyone behind. Tax exemptions can complement selected subsidies in countries with high VAT or import duties, while the exemption of registration fees can also contribute to the reduction the overall costs.

HOW TO MONITOR

Incentive programmes should be constantly monitored and evaluated based on specific targets and desired outcomes. The success of the programme should be based on the achievement of the sales targets initially set. Failure to reach the targets should trigger an evaluation of the programme and an adaptation of the incentives. As the targets are achieved, subsidies need to be progressively adjusted and eventually phased out. Based on available funding, these incentives can be redirected to specific groups in order to increase access to these technologies and reach other segments of the market.

Policy Package – Energy Efficient Cities

National policy makers play an important role in accelerating urban energy transitions. Cities connect directly with communities and people to enhance implementation and better inform policy. National and city-level alignment in energy efficiency policy is a key dimension of clean energy transitions. Energy efficient cities can use digital tools to make smarter, better-informed decisions and improve quality of life for all.

REGULATION

- **National governments help create the environment** for cities to take action through setting an overall vision including plans and targets.
- **Local regulations and codes** incorporating solutions such as smart data and metering help unlock system-wide efficiencies.
- **Planning** is most effective when integrated and cross sectoral, taking a long-term view.
- **International standards and benchmarks** are important for enabling seamless communication across technologies and applications, critical for efficient urban energy systems.
- **National action that facilitates business models** for clean urban energy services, such as Public Private Partnerships and energy service companies (ESCOs), unlock new sources of finance.

INFORMATION

- **National initiatives can be used to build energy efficiency capacity in cities** through creating training opportunities and partnerships, informed by international best practices.
- **Digitalisation creates new sources of data** e.g. on air quality, energy consumption and traffic. Analysis and communication of this data can improve the operation of urban energy systems.
- **Digital solutions for energy efficiency in cities,** require open, transparent access to data, with privacy protected. National governments can facilitate this by developing guidelines and mechanisms to enable data use and sharing across sectors and levels of government.
- **Sharing information on energy efficiency best practices** and proven cost effective technologies can help cities better understand and implement efficiency opportunities to improve performance.

INCENTIVES

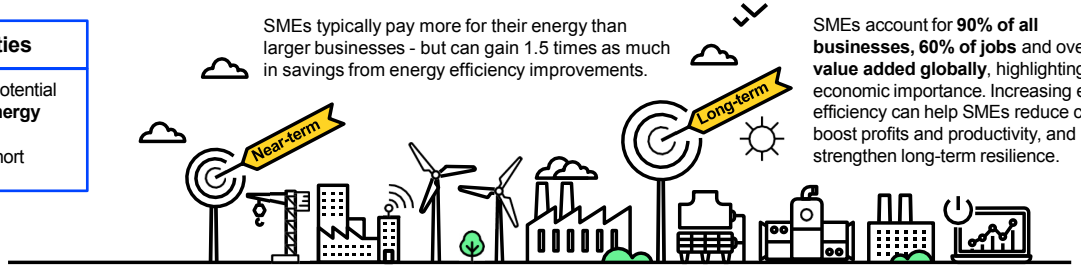
- **Investing in city level action and enabling funding to flow** from the national to local level, through targeted funding models, can give the best returns on investment and accelerate inclusive clean energy transitions.
- **National governments can use their influence to leverage international programmes** aimed at cities, for example by creating innovation areas to attract digital and clean energy technology talent.
- **Seed funding and complementary finance from national governments**, can mobilise and help scale up private capital for investment in energy efficient cities.
- **Green procurement**, for example through the incorporation of energy efficiency performance criteria into municipal tenders, mobilises the purchase power of public bodies, acting as a major driver for market deployment of efficient products.

Policy Package – Small and Medium Enterprises

Immediate opportunities

An average SME has the potential to save up to **30% of its energy bill** through proven energy efficiency measures with short payback times.

SMEs typically pay more for their energy than larger businesses - but can gain 1.5 times as much in savings from energy efficiency improvements.



SMEs account for **90% of all businesses, 60% of jobs** and over **50% value added globally**, highlighting their economic importance. Increasing energy efficiency can help SMEs reduce costs, boost profits and productivity, and strengthen long-term resilience.

REGULATION

- **Building energy codes for commercial buildings** set efficiency requirements for new and/or existing buildings, embedding efficient use of energy in SME operations and reducing long-term running costs.
- **Minimum Energy Performance Standards** raise the overall quality of products on the market and guide users toward more efficient, reliable technologies. For SMEs, this delivers more efficient operations, lower energy bills, and more reliable equipment.
- **Regulating energy efficiency related services**, such as audits, installations, and energy management, helps ensure SMEs receive reliable, effective efficiency support. **Including SME-specific actions i**n these regulatory areas and in **national energy plans** accelerates energy-efficiency progress for SMEs

INFORMATION

- **Creating sector-specific technical guidance materials**, accompanied by **capacity-building** and **advisory support services**, allows SMEs to compare their energy performance with that of their peers and provides the support SMEs may need to implement energy efficiency measures.
- **Approved energy technology lists**, often linked to incentives such as audits or finance, allow SMEs to easily compare and select high-performing, energy-efficient products.
- **Sharing information on energy efficiency best practice by partnering with trusted intermediaries** such as business associations, networks and service providers helps raise awareness and break down barriers to energy efficiency implementation in SMEs.

INCENTIVES

- **Partnering with lending institutions** to integrate financial support with administrative and technical assistance enhances SMEs' capacity to invest in energy efficiency and facilitates effective implementation.
- **Policies to foster Energy Service Companies** expand SMEs' access to specialised external energy expertise and to financial arrangements structured to support efficiency investments.
- **Free or subsidised energy audits** targeted at SMEs can help rapidly increase energy efficiency.
- **Support for digitalisation and AI** to adopt smart metering, smart controls, and AI-based management systems that provide real-time visibility, enable flexible demand response, and unlock efficiency and cost-saving opportunities with minimal time and resource investment.

Policy Package – Clean Efficient Cooking

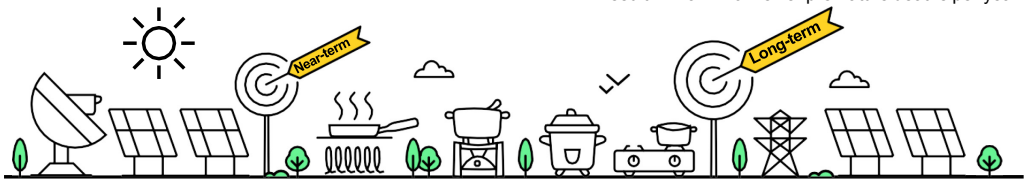
Immediate opportunities

A successful strategy to achieve clean cooking goals needs to consider all available technologies and fuels.

For rural communities, replacing traditional stoves with improved solid fuel stoves is an important first step to better population health.

By 2030, around 75% of the global population could have access to clean cooking under today's policy settings.

Globally, long-term policies prioritise electrical cooking appliances to reach climate goals. By 2050 reduced indoor air pollution due to clean cooking will result in 2.3 million fewer premature deaths per year.



REGULATION

- **Strong government regulation** of energy markets can help ensure clean energy supplies are available for consumers.
- **Minimum Energy Performance Standards** for clean cooking stoves and other cooking equipment remove the least efficient products from the market.
- **Targeted subsidies for the most vulnerable consumers** can help ensure equal access to clean cooking, such as efficient LPG or electric cooking.
- **Building codes and obligations on landlords** can ensure adequate ventilation and other health and safety requirements are met.

INFORMATION

- **Consumer information campaigns** help people make more informed decisions. They are most effective when based on behavioural insights and targeted strategies.
- **Local information provision** through field offices in rural areas and advisory centres can improve the standing of programmes among the local population.
- **Demonstrations** highlighting traditional dishes successfully cooked using new technologies can help transform perceptions.
- **Labelling and certification** help consumers to identify the most energy-efficient clean cooking technologies. This can create a market for efficient technologies and provides motivation for manufacturers to improve the efficiency of their products.

INCENTIVES

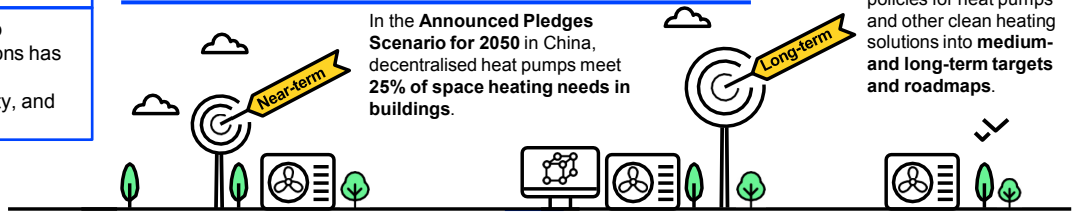
- **Measures such as rebates, grants and tax reductions** motivate consumers to choose efficient clean cooking appliances.
- **Appliance replacement programmes** encourage households to replace their old, inefficient cooking stoves with more efficient models including induction stoves.
- **Clean cooking initiatives** can be included in carbon credit and offset schemes.
- **Restructuring energy tariffs**, including those for electricity, to include provisions favouring clean cooking can incentivise consumers to switch from traditional biomass and other fossil fuels.

Immediate opportunities

The expansion of heat pump manufacturing and installations has the potential to reduce CO_2 emissions, improve air quality, and generate employment.

Policy Package – Heat Pumps for Buildings

In the **Announced Pledges Scenario for 2050** in China, decentralised heat pumps meet **25% of space heating needs in buildings**.



Incorporate favourable policies for heat pumps and other clean heating solutions into **medium- and long-term targets and roadmaps**.

REGULATION

- Introduce stringent **Minimum Energy Performance Standards (MEPS)** to ensure that heating solutions including heat pumps adhere to high-efficiency requirements.
- Mandate that new heat pumps are equipped with **connected controls**, providing flexibility to end-users and the overall energy system, contributing to reducing peak demand.
- Establish **regulations, including building codes,** facilitating the integration of heat pumps. This includes adjustments related to thermal performance, and building permissions, as well as refining decision-making protocols in multi-owner buildings.
- Introduce **long-term policy support and regulatory certainty** with transparency on upcoming changes and providing opportunities for industry input.

INFORMATION

- Harmonise **labels** to inform consumers about the energy efficiency of heating solutions.
- Promote **consumer information campaigns,** informed by behavioural insights, to empower individuals to make informed decisions.
- Create **one-stop-shop platforms** for supporting consumers in the uptake of heating equipment.
- Promote upskilling through accreditation for heat pump specialists and the integration of **heat pump content into educational curricula** at all levels.
- Provide **criteria to define clean heat** and improve heat pumps **market data collection** and data accessibility to inform policy decision-making.

INCENTIVES

- Introduce **rebates, grants and other financial offers** to motivate consumers to buy highly efficient heat pumps.
- Introduce **finance or taxation benefits** to encourage manufacturers to scale up heat pump production.
- Establish **well-designed procurement processes** to increase the market share of heat pumps and drive innovation.
- **Adjust the price of electricity** to make the operating costs of heat pumps more favourable.
- Offer **dynamic electricity pricing** to help incentivise flexible demand and new business models.

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