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**Regulatory and policy dialogue addressing barriers to improve energy efficiency**

### **Regulatory and policy dialogue addressing barriers to improve energy efficiency**

#### **Background paper on overcoming barriers to investing in energy efficiency – a policy analysis**

#### **Note by the Secretariat**

## **I. Introduction**

1. A number of legislative, policy, economic, and financial barriers need to be overcome to significantly improve energy efficiency. Naming energy efficiency as “the first fuel” has not yet been converted into adequate investment that would make possible achieving the energy efficiency goal of the Sustainable Energy for All (SE4All) initiative of the United Nations Secretary General and corresponding target of the Sustainable Development Goal on energy (SDG 7). The shared goals of the SE4All initiative and SDG 7 is to ensure access to affordable, reliable, sustainable and modern energy for all, which includes doubling the global rate of improvement of energy efficiency by 2030. In most countries of the United Nations Economic Commission for Europe (ECE) region, energy efficiency is still largely equity funded or linked to grants and subsidies. Local commercial banks in many countries are providing financing through credit lines offered by international financial institutions and/or national central bank funds targeted at sustainable energy. Bond financing of energy efficiency is an emerging opportunity for energy efficiency. National energy efficiency funds, particularly those set as a revolving fund, is another option. Exploring which financing strategies work best, how governments can improve their bankability and scope to expand private financing of energy efficiency and which policies and legislation have been proven to deliver results remain a critical and ongoing task.

2. This background paper describes an approach to policy analysis to overcome barriers to investing in energy efficiency.

## **II. Objective of the policy analysis**

3. The objective of the policy analysis is to provide information on policies and measures in the ECE region that help to overcome barriers to increasing investment and financing flows to energy efficiency projects, with particular attention given to commercial energy efficiency projects and private financing. An emphasis in the analysis is on the transferability of successful measures in selected countries to other member States of ECE. Particular attention needs to be given to the reasons why energy efficiency improvement is lagging behind what is necessary to achieve climate goals and sustainable development goals, including in developed countries, such as member states of the European Union. The analysis includes investigating policies and actions that increase the bankability of energy efficiency and analyze energy efficiency finance options in the region. It will also explore the necessary conditions for increasing the bankability of energy efficiency projects. In addition, the analysis will result in recommendations for ECE member States to implement appropriate policy measures to support increased investment in energy efficiency.

4. The outcomes of this policy analysis are expected to serve as an important input to the Energy Ministerial Conference and the Eighth Forum on Energy for Sustainable Development hosted by Kazakhstan in June 2017 in Astana in the framework of the EXPO-2017 “Future Energy”.

## **III. Topics and methodology for the policy analysis**

5. The following topics will be addressed in selected ECE sub-regions including Western and Central Europe; South-Eastern and Eastern Europe; the Caucasus; and Central Asia.

(a) Identifying barriers that prevent energy efficiency investments from occurring such as political, regulatory, economic and social issues;

(b) Defining successful policies and actions that help overcome barriers to financing energy efficiency in the context of achieving sustainable development and climate goals;

(c) Recommending ways to increase the financial flows for energy efficiency and identifying potential pilot projects with scale-up potential;

(d) Mapping the roles of stakeholders such as governments, financial institutions, businesses and project developers in promoting and implementing energy efficiency investments.

6. The methodology for this analysis will involve research of existing financial instruments including sector-specific publications, surveys and interviews with selected policy makers, financial institutions, project developers and other key stakeholders. Publications such as those by the International Energy Agency (IEA), the World Bank, the European Bank for Reconstruction and Development (EBRD), the United Nations Environment Programme (UNEP), the European Commission’s Joint Research Centre (JRC), the International Partnership for Energy Efficiency Cooperation (IPEEC) and the Copenhagen Centre on Energy Efficiency (C2E2) will be considered. The existing network of experts and policy makers from the ECE region will be consulted for the survey. The resulting analysis will include conclusions on the measures to support overcoming barriers as well as recommending how financial flows for energy efficiency can be increased.

7. The analysis will be based also on a structured framework of best practices in policies to promote energy efficiency for climate change mitigation and sustainable development presented in ECE publication “Best Policy Practices for Promoting Energy Efficiency”<sup>1</sup> (ECE/ENERGY/100). This menu of options for policy-makers has been further developed by identifying additional high impact policies and measures that have proven their effectiveness in countries and groups of countries of the ECE region and beyond. These best practices have been identified after the publication has been issued in line with the activities outlined in the Work Plan of the Group of Experts on Energy Efficiency for 2016–2017. They are presented in the Annex to this document.

## IV. Proposed activities

8. Under the policy analysis, the following activities are proposed.

- (a) Developing a survey on barriers and policies to overcome them. Distribution of the survey. Processing and analysis of survey results;
- (b) Conducting a desk study of existing materials and publications;
- (c) Conducting interviews with representatives of ECE member States, international, financial and academic organizations. Consolidating key issues and outcomes of interviews;
- (d) Mapping the roles of stakeholders in promoting and implementing energy efficiency investments;
- (e) Developing conclusions and recommendations.

9. Significant amount of preparatory work has been accomplished at the ECE through a number of projects focusing on promoting energy efficiency investments for climate change mitigation and sustainable development in countries of South-East and Eastern Europe, the Caucasus, and Central Asia. This previous work will serve as a foundation for this in-depth and updated analysis.

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<sup>1</sup> <http://www.unece.org/index.php?id=41058>

## Annex

### Best practices in energy efficiency: high impact policies and measures

#### I. Introduction

1. The structure of the policy options presented in this Annex is consistent with the principles of policy selection attributes presented in the ECE publication “Best Policy Practices for Promoting Energy Efficiency” (ECE/ENERGY/100). It aims at providing additional exemplars of successful high impact policies and measures to policy makers that they can use in developing energy efficiency policies and programmes in their countries.

Table 1  
Cross-Sectoral Policies: Governance

	<i>Policy Attributes</i>			
<b>Policy / measure</b>	Significant economic energy demand reductions and significant multiple benefits	Complementarity, synergies and integration attributes	Political alignment, governance and accountability attributes	Marketability and market impact
<b>National Strategies, Plans and Targets</b>	Periodic analysis of policies, targets and costs ensure consistent national strategies and measurable outcomes.	Integrated national plans are an effective way to create an effective suite of policies, and regular review ensures best outcome for applied resources.	A national framework requires effective governance to select appropriate policies according to the state of the economy.	The exemplars shown below are considered best practice and therefore have effective market impact. Still, a greater role for effective marketing design would be an improvement.
<p><b>Bulgaria</b> has adopted a National Energy Efficiency Action Plan (NEEAP) to halve its primary energy intensity relative to 2005 by 2020, going beyond the targets required by the European Union. Various stakeholders are involved in the Bulgarian strategy as energy agencies exist at the national as well as local level. Among other things, the strategy includes voluntary agreements and government guaranteed financial hedging for energy efficiency investments.  <a href="http://www.mi.government.bg/files/useruploads/files/epsp/23_energy_strategy2020%D0%95ng_.pdf">http://www.mi.government.bg/files/useruploads/files/epsp/23_energy_strategy2020%D0%95ng_.pdf</a></p> <p><b>Denmark.</b> The Danish NEEAP has comprehensive sectoral coverage and sets a target of becoming independent of fossil fuels by 2050. The centrepiece of the NEEAP is the Danish Energy Agency (DEA), which links the country strategy with the regional activities of the DEA. As such, the DEA has multiple roles including: a) sharing information with consumers; b) receiving reports from companies on savings; c) organizing the market for energy obligations; and d) coordinating government and research activities.  <a href="https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_en_denmark.pdf">https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_en_denmark.pdf</a></p> <p><b>Croatia.</b> The national energy efficiency programme was managed by United Nations Development Programme (UNDP). It was launched in 2005 with funding from the</p>				

	<p>Global Environmental Facility (GEF) and was designed to remove barriers to energy efficiency in Croatia. In 2011-2012 it helped to reduce the Government's energy costs by USD 20 million, while greenhouse gas emissions have been cut by 12 percent in more than 8,400 involved buildings. Between 2006 and 2010 1,069 energy audits in 1,346 buildings were conducted, stimulating a new thriving industry. Many public authorities and institutions committed to implementing systematic energy management, while UNDP has also created a web-based Energy Management Information System, which covers 8,400 public buildings.</p> <p><a href="http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/Development_stories_from_Europe_and_Central_Asia_Volume_III.html">http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/Development_stories_from_Europe_and_Central_Asia_Volume_III.html</a></p>			
<b>Energy Efficiency Operational Agencies</b>	The effectiveness of an energy efficiency operational agency is core to meeting the technicalities of suiting energy efficiency policies to the needs of the economy. It ensures that policies are well-designed and deliver economic benefits.	An energy efficiency agency works alongside other central, regional, and local policy agencies to enable an effective integration with other policy priorities. How it relates to other local or national agencies is flexible.	An energy efficiency agency works alongside other central, regional, and local agents to enable an effective implementation at all levels of society.	Energy efficiency agencies undertake market analysis and design programmes that effectively motivate and transform markets to deliver energy efficiency outcomes
<p><b>Chile.</b> The <b>Chilean Energy Efficiency Agency</b> is an independent, non-profit institution, which is funded by the public and private sectors to initiate and implement energy efficiency policies. The agency is part of the national framework created to reduce dependency on gas imports and mitigate weather risks on hydropower. Energy efficiency is a core element of the National Energy Efficiency Programme, and Chile aims to reduce 2020 projected energy demand by 12 percent solely through improved energy efficiency.</p> <p><a href="http://ccap.org/assets/CCAP-Booklet_Chile.pdf">http://ccap.org/assets/CCAP-Booklet_Chile.pdf</a></p>				
<b>Coordination Mechanisms</b>	In order to achieve scale of impact and utilize diverse resources, successful policies should work across different levels of society as well as regions.	Coordination mechanisms are designed to integrate and coordinate efforts by different players in order to maximize the impact from each player in society	Utilizing the role that regional or local government can play in a formal structure is key to facilitating and coordinating policies with other institutions.	The market impact of coordination is key to utilize energy efficiency synergies across markets or polities.
<p><b>European Union and China.</b> In recent years, the collaboration between the EU and China has deepened through the <b>EU-China Energy Dialogue</b>. A Cooperation Framework in the Construction Sector was concluded in 2009 between the European Commission and the Chinese Ministry of Housing and Urban-Rural Development. Joint workshops and other collaborative activities are being undertaken, particularly in relation to building regulations. Information and experiences on passive housing technology, energy labelling schemes and regulatory codes is also shared.</p> <p><a href="http://ec.europa.eu/energy/en/topics/international-cooperation/china">http://ec.europa.eu/energy/en/topics/international-cooperation/china</a></p>				

	<p><b>European Union.</b> The European Energy Network is a voluntary network of twenty-four independent energy agencies that aims to strengthen cooperation between agencies on issues relevant to sustainable energy. The key characteristics of member agencies are responsibilities to plan, manage or review national research, as well as development, demonstration or dissemination programmes in the fields of energy efficiency and renewable energy in their respective countries. As a whole, the network is a forum for the conception and implementation of common projects within the framework for EU-funded programmes. Ministries are not part of the network.</p> <p><a href="http://enr-network.org/about-enr/">http://enr-network.org/about-enr/</a></p>			
<b>Public Sector Energy Efficiency Cities and Regions</b>	Governance at the sub-national level has significant potential in implementing energy efficiency policies.	Municipalities operate utilities, lead city planning social and economic development as well as implementing national or federal policies.	Regional or local government can empower and enable the commitment and policies of central government and coordinate and support citizen-motivated action. Local taxes can be used to fund policies unique to the municipality.	Municipalities and regional government often lead or motivate change in markets in their jurisdictions, and can add their significant resources to enable market activities.
<p><b>Finland.</b> Its energy efficiency policies that address public buildings are good examples of good practice, and are regarded to have improved the most out of all countries since the first NEEAPs were set. Among its measures there are energy audits, energy management systems, minimum energy performance standards for public buildings and a funding scheme.</p> <p><a href="http://www.energy-efficiency-watch.org/fileadmin/eew_documents/Documents/EEW2/Finland.pdf">http://www.energy-efficiency-watch.org/fileadmin/eew_documents/Documents/EEW2/Finland.pdf</a></p> <p><b>The Netherlands.</b> The general objective of the Dutch <b>Sustainable Public Procurement</b> (SPP) policy, planned for 3 years (2014 - 2017), is to reach ambitious sustainability targets by making public purchasers add social and environmental selection criteria for 45 product groups in case of purchasing. This policy is intended to leverage the benefits of Government leading by example. As a result, all procured products and services from these 45 product groups now meet minimum performance standards, and in many cases exceed the thresholds.</p> <p><a href="http://www.energy-efficiency-watch.org/fileadmin/eew_documents/EEW3/Case_Studies_EEW3/Case_Study_Sustainable_Public_Procurement_Final.pdf">http://www.energy-efficiency-watch.org/fileadmin/eew_documents/EEW3/Case_Studies_EEW3/Case_Study_Sustainable_Public_Procurement_Final.pdf</a></p>				

Table 2.  
**Cross-Sectoral Policies: Finance**

	<i>Policy Attributes</i>			
<b>Policy / measure</b>	Significant economic energy demand reductions and significant multiple benefits	Complementarity, synergies and integration attributes	Political alignment, governance and accountability attributes	Marketability and market impact
<b>Government and International Financial Institutions (IFI) Leveraged Loans Funding Dedicated Credit Lines</b>	Government sponsored schemes can attract significant private sector co-funding to loans offered at preferential rates to encourage energy efficiency.	More readily available funding grows the market for energy efficiency and enables implementation of other government energy efficiency policies.	These policies respond to governments' need to grow energy efficiency delivery capability, while maintaining public budget.	Loans are delivered via commercial relationships and marketing efforts of retail banks, developers and ESCOs.
	<p><b>Chile.</b> In cooperation with German KfW, a credit line was set up in 2008 which finances energy efficiency measures in Chilean businesses. The line is open to a variety of sectors and can be used for investments such as energy efficient machinery and buildings. The credit is distributed among commercial banks and provided at a preferential fixed interest rate with payment terms between two and twelve years. The credit line supports businesses with up to USD 33 million per year.</p> <p><a href="http://ccap.org/assets/CCAP-Booklet_Chile.pdf">http://ccap.org/assets/CCAP-Booklet_Chile.pdf</a></p>			
<b>Public-Private Finance Including ESCO (See also “Utilities – ESCO” in next section)</b>	Financial capacity with guaranteed returns to reduce uncertainty is key to overcoming barriers to implementation and scale of energy efficiency policies.	By integrating technical and financial risks, uncertainty is reduced and discontinuities between consumers, service providers and financiers are removed.	The ability to leverage private funds is a key to maintaining low public budgets while enabling sound energy efficiency investments.	Novel forms of financing can be daunting to consumers and so effective communication is absolutely key.
	<p><b>Bulgaria. Energy Efficiency and Renewable Sources Fund (EERSF)</b> is the result of a public-private partnership, which now has the combined capacity of a lending institution, a credit guarantee facility and a consulting company. It provides technical assistance to Bulgarian private and public institutions in developing energy efficiency projects and supports their financing directly or by acting as the guarantor in lieu of other financing institutions.</p> <p><a href="http://www.measures-odyssee-mure.eu/public/mure_pdf/general/BG15.PDF">http://www.measures-odyssee-mure.eu/public/mure_pdf/general/BG15.PDF</a>  <a href="http://elibrary.worldbank.org/doi/pdf/10.1596/9781464800207_Ch19">http://elibrary.worldbank.org/doi/pdf/10.1596/9781464800207_Ch19</a>  <a href="http://ccap.org/assets/CCAP-Booklet_Bulgaria.pdf">http://ccap.org/assets/CCAP-Booklet_Bulgaria.pdf</a></p> <p><b>European Union.</b> The European Energy Efficiency Fund is a public-private partnership dedicated to provide funding for energy efficiency measures and renewable energy sources for member states of the European Union. Specifically, it supports municipal, local, regional authorities and public and private entities</p>			

	<p>acting on behalf of those authorities in their efforts to increase energy efficiency and uptake of renewable sources of energy.  <a href="http://www.eeef.eu">http://www.eeef.eu</a></p> <p><b>United Kingdom.</b> The UK Green Investment Bank was created in 2012 to generate private funds for the financing of private sector investments in energy efficiency and environmental preservation more generally. In addition to its financing functions, it publishes a number of market reports to highlight opportunities and accelerate investment.  <a href="http://www.greeninvestmentbank.com/">http://www.greeninvestmentbank.com/</a></p>			
<b>Fund Guarantees and Risk Sharing for Energy Efficiency</b>	Financiers offer underwriting for the perceived risks in energy efficiency investments at a wholesale level to mitigate commercial bank risks to scale up energy efficiency.	By supporting risk mitigation with local banks, risk sharing facilities complement local financial service providers rather than compete with them.	Governments can support and enable existing service providers and avoid competing or distorting financial services operators while still offering leveraged financial support.	Banks receive strong signal of support as well as financial mitigation solutions for risk, enabling them to more easily fund energy efficiency.
	<p><b>India.</b> The Partial Risk Sharing Facility for Energy Efficiency (PRSSEE) is a USD 43 million project funded by Global Environment Facility (GEF) and a Clean Technology Fund (CTF) and is implemented by the Government of India and the World Bank. It aims to support enterprises and energy service companies to mobilize finance for investments in energy efficiency.  <a href="https://www.thegef.org/gef/node/11126">https://www.thegef.org/gef/node/11126</a></p>			
<b>Fiscal Policies (Tax Incentives and Rebates)</b>	It can be difficult to discern direct impacts of tax incentives from other policy instruments, but they generally reduce up-front investment costs for firms investing in energy efficiency.	Good design of fiscal incentives can ensure synergies between the different policy priorities in a country.	This can be a reliable way of motivating change where governments have a preference for centrally motivating desired actions by fiscal incentives.	Market players receive tangible monetary tax and incentive signals.

		<p>investors of EUR 796 million.</p> <p><a href="http://www.oecd-ilibrary.org/environment/lessons-from-15-years-of-experience-with-the-dutch-tax-allowance-for-energy-investments-for-firms_5k47zw350q8v-en">http://www.oecd-ilibrary.org/environment/lessons-from-15-years-of-experience-with-the-dutch-tax-allowance-for-energy-investments-for-firms_5k47zw350q8v-en</a></p> <p><b>United Kingdom.</b> The Enhanced Capital Allowances (ECA) scheme encourages businesses to invest in energy saving plant or machinery specified on the Energy Technology List (ETL), managed by the Carbon Trust on behalf of Government. It gives businesses a first year 100% tax allowance on designated energy efficient equipment investments. This relief is normally given at a rate of 18% a year on a reducing balance basis, which spreads the benefit over a number of years.</p> <p><a href="https://www.gov.uk/government/publications/enhanced-capital-allowance-scheme-for-energy-saving-technologies">https://www.gov.uk/government/publications/enhanced-capital-allowance-scheme-for-energy-saving-technologies</a></p>		
<b>Government Grants</b>	Typically grants are best applied to demonstrate, leverage funds, or initiate market transformation programmes. Ideally grants will have a defined exit strategy so they do not permanently displace private funds, or designed to crowd-in loan funding over time.	Good design of grants can ensure synergies between the different policy priorities in a country. Grants can be tailored to needs and phased in and out to balance and synergize with other policy priorities.	Grants are perceived by consumers as a tangible signal and are usually a welcome offer from government.	Consumers and market players receive tangible monetary tax and incentive signals.
		<p><b>Finland.</b> Public Funding Agency for Technology and Innovation (TEKES) is the main public financing and expert organization for research and technological development in Finland. It primarily funds industrial R&amp;D projects as well as those of research institutes and universities with an annual budget of EUR 450 million. Funding is either done in the form of a grant or a low-interest loan, depending on the stage and nature of the proposed project.</p> <p><a href="http://www.unep.fr/scp/marrakech/taskforces/pdf/MTFSustBuildingConstrucion_BestPolicePractices.pdf">http://www.unep.fr/scp/marrakech/taskforces/pdf/MTFSustBuildingConstrucion_BestPolicePractices.pdf</a></p>		
<b>International Climate Finance and Carbon Finance</b>	As energy efficiency is one of the primary ways to minimizing GHG emissions, climate fund initiatives are keen to fund energy efficiency	Linking carbon funds and energy efficiency financing makes sense as energy efficiency makes the single largest contribution to GHG mitigation.	Governments may see this as an effective way to recycle carbon revenues, and gain extra GHG reductions.	Uncertainty over global carbon prices means that markets cannot expect durable flow of carbon finance.

	programmes.			
<p><b>European Union. Joint European Support for Sustainable Investment in City Areas</b> (JESSICA) provides a range of financial tools to support sustainable urban renewable projects. The programme is developed by the European Commission, European Investment Bank and the Council of Europe Development Bank. JESSICA is the framework which allows EU member states to use parts of their structural fund allocations to invest in, among other things, energy efficiency and infrastructure projects. The funds are recycled and so returns from investments are continuously reinvested in new urban development projects.</p> <p><a href="http://ec.europa.eu/regional_policy/en/funding/special-support-instruments/jessica/">http://ec.europa.eu/regional_policy/en/funding/special-support-instruments/jessica/</a></p>				

Table 3.  
**Policies for Utilities**

	<i>Policy Attributes</i>			
<b>Policy / measure</b>	Significant economic energy demand reductions and significant multiple benefits	Complementarity, synergies and integration attributes	Political alignment, governance and accountability attributes	Marketability and market impact
<b>Utilities – Cost Reflective and Energy Price Subsidy Reform</b>	Restoring fundamental market dynamics motivates more rational investment as well as reduces strain on public budgets.	There is no more effective motivator for economic investments in energy efficiency, renewable energy and conventional supply-side investments than dynamic cost-reflective prices.	Governments need to choose to reduce complexity and allow price to allocate resources. Governments can decide to reallocate subsidies to targeted social measures.	The impact of cost reflective pricing is universal.
<b>Canada.</b> In 2014 the province of Nova Scotia created the legislation necessary for the formation of <b>EfficiencyOne</b> , the first electricity efficiency utility company and holder of the Efficiency Nova Scotia franchise. EfficiencyOne sells energy that is saved by means of cost-effective energy efficiency to the private electricity utility company, Nova Scotia Power. As such, the energy savings of EfficiencyOne compete directly with other sources of electricity supply. EfficiencyOne has achieved energy savings at USD 0.03/kWh, significantly less than the provincial electricity price of USD 0.12/kWh, and in 2014 it reduced provincial electricity load by 7% and saved end-consumers a total of USD 89 million. <a href="http://www.efficiencyone.ca">http://www.efficiencyone.ca</a>				
<b>France.</b> The French overseas development agency and export credit agency no longer supports investments made in coal-fired power station that are not equipped with carbon capture and storage (CCS) technology. Support for cleaner fuels continues. <a href="http://www.odi.org/comment/10095-g20-subsidies-fossil-fuel-production-leaders-laggards">http://www.odi.org/comment/10095-g20-subsidies-fossil-fuel-production-leaders-laggards</a>				
<b>Energy Efficiency Regulatory Mandate</b>	Energy efficiency regulations can “pull” the market towards more efficient products by better informing consumers, and promote sustainable competitiveness of manufacturers.	With direct customer relationships, technical and financial capacity utilities are often the ablest to deliver energy efficiency and do it in a way that minimizes other resource costs.	Utilities are often best placed to implement a political decision to advance energy efficiency. Utilities have an integrated technical, financial and marketing capability that may not be available elsewhere.	Utility led programmes impact across entire customer classes in an economy and can send powerful motivations with smarter tariffs and demand-side management activities.
<b>United States, Massachusetts.</b> The <b>Mass Save</b> programme is funded largely through ratepayer funds and is administered by both gas and electricity utilities in Massachusetts. It coordinates with the state government through the Massachusetts Department of Energy Resources to provide energy efficiency services and				

	<p>incentives to help residential and commercial clients to identify energy efficiency opportunities. The 2013-2015 plan invested USD 2.2 billion in energy efficiency projects with a forecast return of over USD 8 billion over the average 12 year lifetime of the project.</p> <p><a href="http://www.masssave.com/">http://www.masssave.com/</a></p>			
<b>Utilities - ESCOs</b>	ESCOs that utilize market opportunities to employ their expertise in energy efficiency can create pressures for traditional utilities to compete more energy efficiently.	ESCO programmes are often integrated in state utility regulatory systems and can increase market competition.	Effective ESCOs requires a legislative space created by the government.	Combination of utility marketing, customer relationship and entrepreneurial ESCO behaviour works.
	<p><b>India. Energy Efficiency Services Limited</b> was created in 2009 as a joint venture between National Thermal Power Corporation Limited, Power Finance Corporation Limited, Rural Electrification Corporation Limited and POWERGRID to streamline energy efficiency projects. The company is effectively an ESCO and spearheads market-oriented policies of the National Mission for Enhanced Energy Efficiency. It is noteworthy because it is the first ESCO in South Asia and also offers consultancy services in various sectors, such as demand-side management and Clean Development Mechanisms.</p> <p><a href="http://www.eeslindia.org">http://www.eeslindia.org</a></p>			
<b>Utilities – White Certificates</b>	The effectiveness of white certificates as energy efficiency instruments can vary across countries. There are methodological difficulties in discerning the effects from other instruments, however.	Can initiate diverse operational outcomes depending on cost effective potentials. Potential to be integrated with other policies, such as those focused on energy poverty.	Can fit the political desire to motivate utilities to deliver energy efficiency when no other incentives exist.	Variable implementations as these schemes rely on utilities being motivated to step beyond their traditional roles.
	<p><b>Denmark.</b> The Danish <b>energy efficiency obligation</b> (EEO), white certificate, is a great model on how to design an EEO that encourages cost-effective savings, effectively includes third parties and contains a solid verification and measurement system. Whereas the French scheme is effective in improving efficiency in the residential sector and the Italian scheme is effective in improving efficiency in the industrial sector, the Danish scheme does better in the trade and industrial sectors. This shows the adaptability of EEOs as an effective policy instrument.</p> <p><a href="https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_en_denmark.pdf">https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_en_denmark.pdf</a></p>			

**Table 4**  
**Policies for Households: Home and Appliances**

<b>Policy / measure</b>	<i>Policy Attributes</i>			
	Significant economic energy demand reductions and significant multiple benefits	Complementarity, synergies and integration attributes	Political alignment, governance and accountability attributes	Marketability and market impact
<b>Existing homes insulation / weatherization</b>  Includes a wide array of technology options: double glazing, draught sealing, insulation, heating and cooling options, shading, low emissivity coatings for ‘cool roofs’, lighting and appliance replacement and disposal etc.	Greater energy efficiency in households generally exceeds energy cost reductions, providing strong returns to government. This is especially true in certain countries, such as Estonia.	Energy efficiency policies can deliver a range of wellbeing, social and health outcomes, including addressing energy poverty.	Opportunity to offer direct social benefit. Can be used to redirect energy subsidies for improved social outcomes, and offers a delivery path for diverse government priorities.	Can develop new product and supplier activities as well as delivering diverse new services.

**Spain.** The need to transpose Directive 2010/31/EU relating to energy efficiency in buildings into the Spanish legal system made it necessary to modify regulation of thermal installations in buildings (RITE). As a result, the Spanish **Royal Decree 238/2013** incorporates the EU Directive on RITE, setting minimum energy efficiency requirements in new and existing buildings as well as a procedure for the periodic inspection of boilers and air conditioning systems.  
[http://www.buildup.eu/sites/default/files/content/Royal%20Decree%20238\\_2013%20update%20Thermal%20Building%20Regulations.pdf](http://www.buildup.eu/sites/default/files/content/Royal%20Decree%20238_2013%20update%20Thermal%20Building%20Regulations.pdf)

**United Kingdom.** The **Energy Company Obligation** (ECO) is the dominant measure for facilitating retrofit household energy efficiency measures. Specifically, the largest element of the ECO, the **Carbon Emissions Reduction Obligation (CERO)** targets wall insulations. Initially CERO focused on costly improvements, such as hard walls, but has later incorporated cheaper improvements, such as hollow walls, in order to ease pressure on consumer bills although thereby also reducing the stringency of the obligation. The ECO contains special elements to alleviate fuel poverty (Affordable Warmth) open for qualifying households.  
<https://www.iea.org/publications/freepublications/publication/MediumTermEnergyefficiencyMarketReport2015.pdf>

**Estonia.** Compared to other industrialised countries, most buildings in Estonia are energy inefficient. As such, the government has introduced a series of instruments to facilitate the renovation of residential buildings. Most of these instruments are provided through the state fund **KredEx** in the form of a renovation loan and a reconstruction grant. The renovation loan is a long-term and has a low interest rate and is offered to apartment associations, building associations or any community of more than three apartments built before 1993. The reconstruction grant is open to any association of apartments and can provide up to 35% of total project costs.  
<http://www.kredex.ee/en/>

**Bulgaria.** Within a project of Bulgarian Ministry of Regional Development and Public Works and UNDP, launched in 2007, fifty multi-family buildings were

	<p>renovated to demonstrate the benefits of home energy efficiency improvements. Energy savings amounted to between 40 and 60 percent, which translated into a total annual savings of nearly 8.5 million kWh, as well as a 6,700-ton reduction in CO<sub>2</sub> emissions. The project has altered the Government's backing scaled-up renovations with the funding of European Union structural funds. The project won the EU's 2011 Sustainable Energy Europe Awards competition.</p> <p><a href="http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/Development_stories_from_Europe_and_Central_Asia_Volume_III.html">http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/Development_stories_from_Europe_and_Central_Asia_Volume_III.html</a></p> <p><b>Republic of Moldova.</b> “The Better Business for Clean Energy” project, started in 2011 with the UNDP-European Union partnership, had an initial priority to demonstrate the potential of biomass. Over two years, the project helped to install modern biomass heating systems in 130 schools, health facilities and community centres in rural areas, and let over 37,000 people benefit directly from the improved heating in the buildings. Additionally, heating costs have fallen by at least 30 percent. Overall, the biomass production increased 10 times, raising to 160,000 tons of fuel production per year.</p> <p><a href="http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/Development_stories_from_Europe_and_Central_Asia_Volume_III.html">http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/Development_stories_from_Europe_and_Central_Asia_Volume_III.html</a>.</p>			
<b>New and existing homes and buildings Minimum energy performance standards (MEPS) via Building Codes</b>	Greater energy efficiency in households generally exceeds energy cost reductions, providing strong returns to government.	Energy efficiency policies can deliver a range of wellbeing, social and health outcomes, including addressing energy poverty.	Opportunity to offer direct social benefit. Can be used to redirect energy subsidies for improved social outcomes, and offers a delivery path for diverse government priorities.	Can develop new product and supplier activities as well as delivering diverse new services.
<b>Denmark.</b> Minimum energy performance standards (MEPS) for buildings in Denmark are at a relatively high level and keep being regularly tightened and can be considered as an example of good practice. . Furthermore, future standards are defined well in advance making the transition easier. MEPS in Denmark are generally complemented with stricter, voluntary standards.				<a href="https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_da_denmark.pdf">https://ec.europa.eu/energy/sites/ener/files/documents/2014_neeap_da_denmark.pdf</a>
<b>Uzbekistan.</b> The project “Promoting Energy Efficiency in Public Buildings in Uzbekistan” (EEPB) was implemented by UNDP and the State Committee for Architecture and Construction of Uzbekistan from 2009 to 2015. Its major accomplishments include the revision and enforcement of building energy codes; conduct of energy audits and certification; implementation of new educational standards in the construction field; and development of national policies. As a result, publicly financed new and renovated buildings now consume 25 to 50 percent less energy for heating than buildings built before this project. Efficiency improvements now are expected to yield nearly 36 million tons of avoided CO <sub>2</sub> emissions over the buildings’ lifetimes, which exceeds the initial targets by about 20 times.				<a href="http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/energy-efficiency-in-public-buildings-in-uzbekistan.html">http://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/energy-efficiency-in-public-buildings-in-uzbekistan.html</a>
<b>Energy Efficiency Certification of Buildings</b>	Widespread application of certification labels can have significant impact on consumer purchase behaviour.	Can be integrated with rental quality or environmental programmes to address persisting	Ideal where governments wish to motivate consumers to demand and grow the market for energy efficient homes.	Offers consumers and suppliers confidence in market offerings.

		information gaps.		
<b>Singapore.</b> The certification scheme <b>Energy Smart</b> is used to rate and certify the energy performance of commercial buildings. It was originally developed by the Energy Sustainability Unit (ESU) at the National University of Singapore and the National Environment Agency of Singapore to target offices, hotels and shopping malls. 25% of the best buildings in each category are certified as smart, and each year an award is given to the most energy efficient building. The scheme is voluntary and most commercial enterprises participate because it can be used as part of their branding strategies.  <a href="https://www.iea.org/publications/freepublications/publication/buildings_certification.pdf">https://www.iea.org/publications/freepublications/publication/buildings_certification.pdf</a>				
<b>Denmark.</b> The European Council for an Energy Efficient Economy has established that it is advice on energy efficiency improvements, rather than solely ratings and certifications, that primarily mobilize markets to achieve energy savings measures. As a result, the Danish Energy Agency has developed <b>Energy Policy Toolkits</b> that aim to strike a balance between the specificity of recommendations and the costs of producing recommendations, thereby seeking to reach a cost-optimal solution in their energy efficiency recommendations.  <a href="http://www.ens.dk/en/policy/Global-cooperation/information-materials/general-information-policies-tools/toolkits">http://www.ens.dk/en/policy/Global-cooperation/information-materials/general-information-policies-tools/toolkits</a>				
<b>MEPS, Standards and labelling for household appliances</b>	Standards and Labelling programmes have shown widespread global impact and have more than halved the energy consumption of some appliances.	Use of international standardization ensures alignment and access to global appliance markets for local industry.	Regulatory action is measurable and deliberate. Programmes have been assessed at providing up to 17:1 return on government investments.	A regulated ‘level playing field’ offers consumers and suppliers confidence to invest in higher efficiency products.
<b>Chile.</b> In cooperation with Collaborative Labelling and Appliance Standards Program (CLASP) and the Lawrence Berkeley National Laboratory, Chile has established an energy efficiency standards and labelling programme. The programme requires that International Organization for Standardization (ISO) test procedures are used in the country. Under the programme labelling is mandatory for incandescent and compact fluorescent light bulb and various household appliances, such as refrigerators and air conditioning units.  <a href="http://www.scribd.com/doc/92222448/National-EE-S-L-Program-of-Chile-Review">http://www.scribd.com/doc/92222448/National-EE-S-L-Program-of-Chile-Review</a>				
<b>Endorsement of Highest Efficiency Appliances</b>	A popular tool to promote environmentally preferable consumption and production patterns.	An important complement to MEPS and energy rating labels, creating a strong push-pull market transforming impact.	Work with public partners across the state government is important to ensure successful implementation of strategies, although it has minimal fiscal and political impact for the government itself.	It helps change mind-set of consumers to consider long-term energy costs; Enables market transformation from low efficiency to high efficiency.
<b>United States, Massachusetts.</b> The <b>Leading By Example</b> programme ensures that state-owned facilities will lead energy efficiency improvements on the housing market by improving energy efficiency, reducing greenhouse gas				

	<p>(GHG) emissions, using renewable energy, living in sustainable buildings, and practicing water conservation. Within this programme, they have been tracking progress in improvements with a state portfolio of over 3 000 vehicles and 8 million square metres of buildings, including hospitals, colleges and university campuses, prisons, visitor centres, state parks, roads, tunnels, airports, dams, waste water treatment facilities, etc. The results of the programme include a 22% reduction in GHG emissions through 2014, a 14% improvement in energy intensity (energy used per square metre of the floor area), a 72% reduction in oil consumption, and estimated avoided energy costs of between USD 42 million and USD 59 million compared to business-as-usual in 2014.</p> <p><a href="http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/leading-by-example/">http://www.mass.gov/eea/grants-and-tech-assistance/guidance-technical-assistance/leading-by-example/</a></p>
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Table 5.  
**Policies for transport: Passenger and Freight**

<i>Policy Attributes</i>				
<b>Policy / measure</b>	Significant economic energy demand reductions and significant multiple benefits	Complementarity, synergies and integration attributes	Political alignment, governance and accountability attributes	Marketability and market impact
<b>Fiscal policies (taxation and user charges) for transport</b>	Changes in car purchase habits and in car manufacturing, brought by fiscal incentives, can over the medium term alter the energy efficiency and help reduce energy consumption of both manufacturers and end-users.	Financial incentives or penalties, in combination with sound information, incentivize the purchase of more energy efficient vehicles and so can accelerate the deployment of energy efficient technologies and bring additional positive effects in the field of environmental and road safety issues.	Fiscal incentives can reward decisions to purchase efficient vehicles. The vehicle tax systems of many countries are now based on vehicle CO <sub>2</sub> emissions and consumers respond quickly to such financial incentives.	Effective across entire markets. Can have widespread impact.
	<b>Spain.</b> The Efficient Vehicle Incentives Programme, launched in 2012, facilitates the replacement of older, fuel-intensive vehicles with high efficiency models with lower consumptions and GHG emissions. A direct government aid of EUR 1,500 per vehicle is given for efficient vehicles whose before-VAT cost is EUR 25,000 or for electric, plug-in hybrids whose before-VAT cost is EUR 30,000. The seller of the vehicle is to contribute with a discount which amounts to the same as the government subsidy. The programme has led to avoided emissions of 848,486 tons of CO <sub>2</sub> per year.  <a href="http://www.measures-odyssee-mure.eu/public/mure_pdf/transport/SPA51.PDF">http://www.measures-odyssee-mure.eu/public/mure_pdf/transport/SPA51.PDF</a>  <b>Latvia.</b> Through the price signal of the new car registration tax scheme, linked with the emission output of a car, the Latvian Government aimed to motivate end-users to buy environment-friendly cars and to make car manufacturers penetrate the market with more efficient vehicles. Thus, since 2009, when the new scheme has practically been brought to force, the average CO <sub>2</sub> emissions of new cars decreased by 3.2% in 2013 (147.1 g/km) and by 4.5% in 2014 (140.4 g/km).  <a href="http://www.energy-efficiency-watch.org/fileadmin/eew_documents/EEW3/Case_Studies_EEW3/Case_Study_Car_registration_tax_Latvia_final.pdf">http://www.energy-efficiency-watch.org/fileadmin/eew_documents/EEW3/Case_Studies_EEW3/Case_Study_Car_registration_tax_Latvia_final.pdf</a>			
<b>Public Transport and low energy modes</b>	Policies that provide better coordination of land use and transport planning and establish clear measures towards a more	Energy efficiency and mobility service quality improvements can pay for the necessary maintenance and renovation of	The returns from energy efficiency offset costs and enable governments maintaining	Engaging the many stakeholders that are involved in urban transport through

	efficient energy use both improve conditions for public transport and contribute to energy saving targets.	older public transport systems.	close control of budgets to advance public transport projects.	information is critical to policy success.
<p><b>Finland</b> has implemented a comprehensive policy package for energy efficiency in the transport sector. The goal of the package is to make public transport, walking and cycling more attractive compared to driving. The measures are regulatory as well as informational. On the one hand, it includes vehicle tax rates which are dependent on the car's emissions and the expansion of the public transport system. On the other hand, it includes information campaigns and the inclusion of energy-efficient driving in the curricula of the driver's education. Experts have identified the transport and public sector elements of Finland's NEEAP to be one of the most effective in Europe.</p> <p><a href="http://www.energy-efficiency-watch.org/fileadmin/eew_documents/Documents/EEW2/Finland.pdf">http://www.energy-efficiency-watch.org/fileadmin/eew_documents/Documents/EEW2/Finland.pdf</a></p>				

Table 6.

**Policies for the Business Sector: Industrial and Small and Medium Enterprises**

	<i>Policy Attributes</i>			
<b>Policy / measure</b>	Significant economic energy demand reductions and significant multiple benefits	Complementarity, synergies and integration attributes	Political alignment, governance and accountability attributes	Marketability and market impact
<b>Energy Management Capacity Building</b>	Developing the capability to identify and implement strategic and operation productivity changes in industry is key to unlocking the vast potential across industries.	Other industry development and productivity policies are enhanced by an energy management capability.	Developing the capacity to assist industry develop its productivity is a politically acceptable intervention.	Productivity gains and the development of new skills and service industries is a valuable market stimulus.
<b>The United Kingdom.</b> The CRC Energy Efficiency Scheme was introduced in 2008, and its objective to improve energy efficiency and decrease CO <sub>2</sub> emissions covers about 5,000 organizations, 10% of national emissions. Participating organizations must monitor their emissions and purchase licenses for each tonne of CO <sub>2</sub> emitted, thereby creating incentives for improving energy efficiency. Furthermore, the relative performance of participants is published through a Performance League Table. <a href="https://www.gov.uk/guidance/crc-energy-efficiency-scheme-qualification-and-registration">https://www.gov.uk/guidance/crc-energy-efficiency-scheme-qualification-and-registration</a>				
<b>Commercial Buildings</b>	Energy conservation interventions in new buildings can reduce 20–50 per cent energy consumption (fossil fuel use as well as electricity) by incorporating appropriate design interventions like building envelope, lighting, heating, ventilation and air-conditioning systems.	Knowledge sharing is an essential element in such projects through the provision of valuable platforms for disseminating information and exchanging knowledge.	Enabling environments to facilitate the widespread adoption and application of energy-efficiency measures in buildings can be created through supportive policies and regulatory frameworks.	Policies capitalize on the need for tenants and owners to understand the energy implications of purchase or lease of a commercial building. Analysis shows markets respond to energy efficient buildings with higher rentals and longer tenancies.
<b>India.</b> UNDP is collaborating with the Ministry of Power, Government of India, to implement the UNDP/Global Environment Facility (GEF)/ Bureau of Energy Efficiency (BEE) project “Energy Efficiency Improvements in Commercial Buildings” in recognition and support of the intent of the BEE, Ministry of Power to operationalize the Energy Conservation Building Code (ECBC) across Indian states. This initiative will also enhance the institutional capacities of State Designated Agencies (SDAs) to expand the compliance regime of ECBC and demonstrate model energy efficient commercial buildings in different climatic zones of the country. <a href="http://www.in.undp.org/content/india/en/home/library/environment_energy/implementing-energy-efficiency-in-buildings--a-compendium-of-exp.html">http://www.in.undp.org/content/india/en/home/library/environment_energy/implementing-energy-efficiency-in-buildings--a-compendium-of-exp.html</a>				

<b>Small and Medium Enterprises</b>	An important policy area as SMEs provide greater employment and GDP growth potential than energy intensive industries.	This policy is consistent with developing employment and entrepreneurial businesses.	Potentially a useful economic development enhancement policy.	Productivity gains and the development of new skills and services industries is a valuable market stimulus.
<b>Industry Networks</b>	<p><b>Germany.</b> In 2008 the <b>Federal Ministry for Economics and Technology</b> together with <b>KfW</b> launch a fund in order to promote energy efficiency in small and medium enterprises. The fund performs two functions: it subsidizes up to 80% of independent energy advice given to enterprises and it provides financial support for investments which are expected to save a minimum of 20% compared to average past consumption or will save a minimum of 15% compared to the industry average.</p> <p><a href="http://iepd.iipnetwork.org/policy/energy-advice-smes">http://iepd.iipnetwork.org/policy/energy-advice-smes</a></p>			
<b>Voluntary Agreements</b>	By focusing on large energy-intensive industries, governments can provide them with technical assistance, trainings and workshops in order to share the experience and learn about best practices together.	Improving energy efficiency in industrial companies provides benefits for the companies, such as improved productivity, optimized processes, and new business opportunities. In addition, it contributes to improved energy security and emission reductions.	Governments are creating a supportive environment for productivity gains, while leaving the means to industry experts. <i>'Voluntary, but not without obligations'.</i>	Productivity gains and the development of new industries is a valuable market stimulus.
	<p><b>Sweden.</b> The Swedish <b>programme for improving efficiency in energy intensive industries</b> was introduced in 2004. The programme allows companies to enter into voluntary agreements with the government by improving their energy efficiency significantly and thereby becoming exempted from an energy tax. The programme thus encourages companies to individually undertake measures such as green investments and introducing sophisticated energy management systems. The programme is being phased out in 2017 to cope with new EU regulation but an alternative design is currently underway.</p> <p><a href="http://www.energimyndigheten.se/en/sustainability/companies-and-businesses/the-programme-for-improving-energy-efficiency-in-energy-intensive-industries/">http://www.energimyndigheten.se/en/sustainability/companies-and-businesses/the-programme-for-improving-energy-efficiency-in-energy-intensive-industries/</a></p>			