



VEF 
**VIRTUAL
SERIES**



VEF VIRTUAL SERIES PRODUCTS TRACK POLICY BRIEF

The VEF Virtual Series is an initiative launched by the United Nations Industrial Development Organization (UNIDO) in partnership with the Food and Agriculture Organization (FAO), United Nations Environment Programme (UNEP) and Sustainable Energy for All (SEforALL).

Assembled in anticipation of the Vienna Energy Forum 2021, the VEF Virtual Series was designed as a platform for discussion with the aim of providing recommendations and action-oriented solutions to assist countries in aligning their COVID-19 recovery efforts with

inclusive and sustainable industrial development. It produced eight virtual sessions per track, gathering selected representatives from the private sector, academia, think tanks, non-governmental organisations (NGOs), civil society organisations (CSOs), governments and international organisations.

Guided by the theme “Accelerating Energy Transition,” the 2020/2021 edition of the series explored the pathways that stimulate demand and promote economic recovery in three end-use sectors: Food Systems, Industry and Products.

The VEF Virtual Series culminates with the launch of three Policy Briefs that address the needs of developing countries and emerging economies, and unlock opportunities to pursue the energy nexus with each end-use sector. This Products Track Policy Brief provides the findings and recommendations of over 120 leading experts that contributed to the VEF Virtual Series, representing different sectors, institutions and geographies.

EXECUTIVE SUMMARY

Energy-efficient products present an excellent, and proven, opportunity for countries to support their economic development and energy security, achieve climate targets, support the alleviation of poverty, and improve important social issues such as gender balance and youth engagement at the same time.

However, many challenges remain to fully realise the readily available benefits of energy efficiency (EE). During the discussions at the Vienna Energy Forum (VEF) Virtual Series, the topics around EE ranged widely. However, an overarching set of topics emerged that centred on the challenges of progressing EE in developing countries, unlocking the greatest EE opportunities and some key recommendations.

KEY FINDINGS AND RECOMMENDATIONS



Lack of awareness and information

Key enabling areas of government have shown a lack of awareness or willingness to engage. Information is often unavailable about the market, technologies, usage patterns, the large savings available and more.



Limited capability and resourcing

A lack of capability exists at several levels, from policy development to technical implementation, market surveillance, enforcement and more. Institutional capability must go beyond policy into the ability to set up a robust structure for the implementation of policies through appropriately resourced and focused strategic market transformation programmes.



Affordability and limited finance

Finance was mentioned often, from EE appliances being more expensive at the point of sale than less efficient appliances to the need for funds for running programmes, collecting information and providing incentives. Affordability in developing communities can be a key barrier.

Innovative solutions and technologies also emerged to help overcome barriers, as well as examples of solutions that have proven successful:



Digitalisation technologies provide a suite of tools to gather information, provide information, control systems, support payments, increase inclusion, provide transparency and more.



International engagement works to support institutional, technical and policy capacity through an integrated, inclusive approach.



Innovative finance opportunities and business models such as offering Energy-as-a-Service reduces the cost of entry of higher performance products effectively.

INTRODUCTION

Key areas for action are the buildings and appliances (energy-using products in buildings) sectors, which accounted for 30% of global final energy demand and the related greenhouse gas (GHG) emissions in 2017 and have increased by 20% since 2000¹. These sectors are key to achieving the objectives of the Paris Agreement and the individual actions of countries outlined in their Nationally Determined Contributions (NDCs). Usually, this involves targets for EE and renewable energy for the 2030 and 2050 time horizons.

A variety of tried-and-trusted tools, approaches and affordable technologies exist to significantly reduce energy demand and emissions from buildings, lighting, appliances, electrical equipment and transport. In the built environment, more aggressive appliance EE policies combined with building design policies can reduce the energy intensity of residential buildings by 40% and commercial buildings by 50%².

The types of tools and policies that have proven successful include minimum and higher energy performance standards (MEPS and HEPS) in the cooling sector (air conditioners/heat pumps, refrigerators, freezers, as well as natural and passive cooling options). In terms of the building envelope, building energy codes and design requirements that minimise thermal gains, include passive cooling, improve movement flows, or include strong insulation components reduce energy demand and work in tandem with highly efficient appliances to reduce overall energy demand and their related emissions.

Innovative tools and strategies are emerging in the areas of finance and digitalisation that present strong opportunities for demand reduction. Innovative policies are required to capitalise on the new opportunities.

With the size of the opportunity in mind, and considering the availability of options and tools, the VEF Virtual Series focused on discussions that looked to answer questions including:

- Why are many countries not more actively implementing EE policies and supporting effective environments for EE deployment?
- What are effective actions that can be taken by countries starting from a low base to kick-start EE progress and leapfrog technologies?
 - What levers can be pulled to support countries effectively?

Policy discussion and recommendations arising from the VEF Virtual Series to provide solutions for the questions above include:

- Support policy capacity building to develop a cross-government integrated policy approach on energy and EE.
- When looking at policy options, local and regional adaptation is essential. This is particularly salient when considering the regional adaptation of MEPS of appliances and products.
- How can EE be introduced in COVID-19 recovery plans to support developing countries' recovery?
 - Support economic recovery through proven, sustainable, locally adapted 'home-grown' market-based solutions alongside innovative enabling finance.
 - Support economic recovery through Green Public Procurement, with measures such as having energy performance requirements in all government procurement.

1 IEA (2018). Market Report Series: Energy Efficiency 2018.

2 IEA (2019). Perspectives on the Energy Transition: The role of energy efficiency.

- Support local industry, capacity building or importing expertise that assists the development of an industry.
- International engagement and finance can play key enabling roles. However, stable, predictable regulatory environments increase project bankability and thus ensure the utilisation and effectiveness of EE solutions.
- Support innovating thinking that capitalises on the advantages of digital technologies (e.g., Ghana EE App). Digital technologies provide some of the best potential for innovation and generating alternative business models for eco-efficient products.
- Harmonise policies, regulations and standards for easier, faster widespread adoption, or develop regional blocks for more efficient implementation, thereby improving economies of scale and spreading the market transformation costs (e.g., the U4E model regulations). Build regional networks for information exchange and capacity support.
- Support the implementation of the Energy-as-a-Service model, effectively and with low emissions.
- Support technical capacity including testing, surveillance and enforcement. Using regional approaches enables shared capacity among countries. Intelligence-sharing agreements can also be useful (e.g., testing reports shared with officials of a region). Countries do not have to start from zero. Tools have been developed using existing experience to support action.
- Basic market monitoring and verification methods can be effective with sufficient local/regional capacity and international technical and funding support to help establish and maintain them. Ensure agreements are in place to use the infrastructure (ideally through integrated product market transformation programmes).

RESEARCH SUMMARY AND RESULTS

The global building stock is expected to nearly double from 223 billion m² of floor area currently to 415 billion m² of floor area in 2050. Energy consuming products and energy demand will increase accordingly, with the growth expected to be much higher in developing countries with high cooling demand. Figure 1 illustrates the growth of energy demand in households between 2015 and 2018 and the impact of EE.

Residential energy intensity per square meter has been increasing by over 80% since 2000, and non-residential buildings' energy demand growth is outpacing residential demand growth³. This demand is expected to continue to increase with population growth, economic development and the influence of climate change. This is especially the case as 860 million people without access to modern energy services around the world look to acquire them in the coming decades.

³ IEA (2018). Energy Efficiency 2018: Analysis and Outlook to 2040.

Increasing incomes in emerging and developing countries, such as those in Africa and Asia, are identified as one of the main drivers behind the increase in energy demand. With increasing incomes, fewer people live in the same household, while residential houses exhibit a higher floor area.

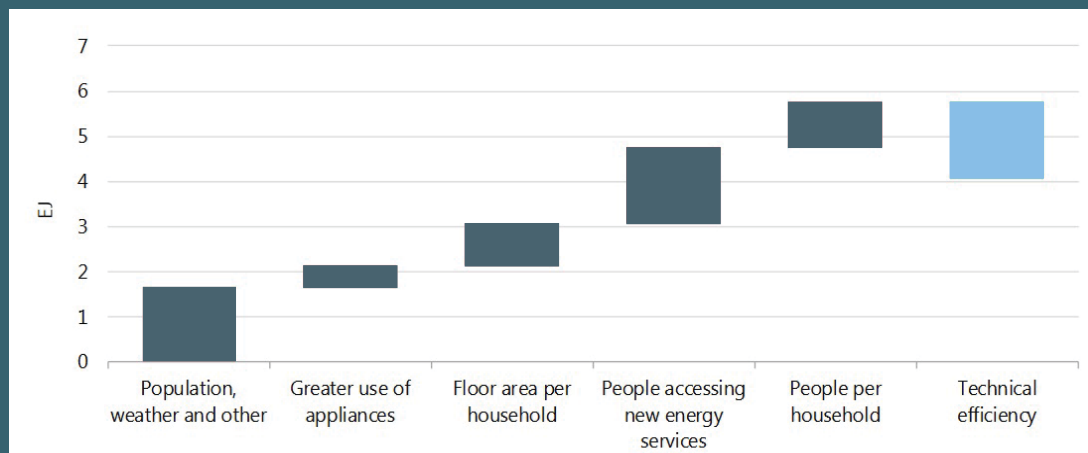


Figure 1 - Drivers of residential building energy demand growth and the impact of EE from 2015 to 2018 (IEA, 2019⁴).

Through the application of energy-efficient measures within buildings and appliances, it has been possible to save a cumulative 14 exajoules (EJ) of energy between 2000 and 2017⁵. However, the application of measures has been uneven across countries and sectors, with countries that have not implemented policies like MEPS at risk of becoming dumping markets for the worst performing products. Two thirds of countries do not have mandatory building codes in place⁶. For the buildings sector, support programmes are needed for the implementation of effective building codes, providing for the construction of passive-energy houses (PEH) and zero-energy buildings (ZEB), as well as to improve energy management in buildings. Developing countries in particular are concerned with the affordability of appliances decreasing or harm-

ing local industry through implementation of MEPS. It is at the same time important to educate, finance and include local industry in the market transformation process.

Capturing the benefits of EE is not just a good opportunity but a necessity for most countries to achieve their climate targets. Some 40% of the GHG savings required to meet the Paris Agreement targets need to come from EE improvements. Further, EE provides multiple co-benefits that will support countries' recovery from COVID-19, improved strength of electricity markets and more.

Supporting EE in developing countries is about generating an enabling environment that builds political will and supports entrepreneurs, market development and consumer trust. This includes:

EE policy and Green Procurement

Encourage cross-government understanding of EE, its significant benefits and the need to develop targets, policies and programmes that are supported by and across all relevant government agencies. This includes ensuring that the appropriate eco-efficient policies are effectively targeted at the local economy, that they are socially and gender-inclusive and that they enable local industry, etc. Examples include LED lighting programmes, building and appliance MEPS, Green Public Procurement of higher performance products, financial supports and incentives, etc.

- **Implementation and enforcement:** Policy and resource support for relevant agencies to enforce policies is essential because policies are often developed but not enforced.

4 IEA (2019). Energy Efficiency 2019.

5 IEA (2018). Energy Efficiency 2018: Analysis and Outlook to 2040.

6 GlobalABC (2019). Global Status Report 2019.

Finance

Provide smart and sustainable finance options for developing markets to introduce efficient technologies at scale, support industry modernisation, etc. This framework must be built on a sustainable basis, rather than via subsidies. The measures should focus on zero-sum games, such as feebate schemes, carbon taxes, etc., redirecting the savings to the local consumer and economy.

Communication and Education

Create market awareness with consumers that understand the benefits of EE, producers that aim to modernise and policy makers that promote an enabling environment.

Innovation and demonstration

Support the use of innovative product market transformation mechanisms and technologies such as digital technology. Digital technologies enable greater access to information and education, greater control of energy systems and more and better data. Digital technology can generate big EE wins, and it supports the competitive and flexible growth of modern industry, infrastructure and transport.

Improved compliance infrastructure

Support the continued development of EE governance architecture including internationally harmonised EE standards programmes, product certification and registration, infrastructure for testing EE performance, and monitoring, verification and enforcement (MVE) strategies and programmes.

Achieving EE objectives and thereby climate objectives and the related co-benefits are directly linked to UN Sustainable Development Goal 7 (SDG 7) to “Ensure access to

affordable, reliable, sustainable and modern energy for all.” This can only be achieved by creating a market that can provide options for all income levels.

CONCLUSIONS

Energy-efficient products are essential for countries to meet their climate targets and their associated social and economic benefits such as economic development and energy security, as well as to support the alleviation of poverty.

While there are several critical barriers to the wider adoption of energy-efficient products, there are proven strategies, market tools and affordable technologies that can support countries to implement EE more widely.

A range of policy options have been successfully applied

in different countries and regions, but the key is to develop a sustainable enabling environment for a market transformation to much more energy-efficient products. During the VEF Virtual Series, more than 100 experts from around the world expressed wide-ranging opinions on the subject of energy-efficient products. Some important patterns emerged highlighting the barriers to energy-efficient products, as well as some of the main areas of opportunity.

The key barriers include:



Lack of awareness and information

Key enabling areas of government have shown a lack of awareness or willingness to engage. Information is often unavailable about the market, technologies, usage patterns, the large savings available and more.



Limited capability and resourcing

A lack of capability exists at several levels, from policy development to technical implementation, market surveillance, enforcement and more. Institutional capability is essential, extending beyond policy into the ability to set up a robust structure for the implementation of policies through appropriately resourced, focused and strategic market transformation programmes.



Affordability and limited finance

Finance was mentioned often, ranging from EE appliances being more expensive to the need for funds for running programmes, collecting information and providing incentives.

- In developing countries, affordability can be a key barrier. Even though efficiency provides long-term cost reductions, there is a higher initial cost of entry, especially at the earlier stages before the more efficient products become the norm.
- Dumping of obsolete and inefficient products on markets with no or low energy-efficient appliance policies or programme capacities (usually developing countries) can also be a key barrier. Regional and international cooperation is essential in supporting anti-dumping regulations and in applying extended producer responsibility requirements to prevent dumping.

Some key areas of opportunity/recommendation include:



Implementation of MEPS, HEPS and labelling programmes

These are relatively easy and inexpensive market-facing policy tools that not only benefit each country but, when they are added up regionally, can improve the entire global market for affordable, newer, more efficient technology.



New financial mechanisms and incentives

These include the Energy-as-a-Service model, coupling finance for refrigerant transition under the Montreal Protocol with finance for EE for cooling products, and Green Public/Institutional Procurement as standard practices.



Digitalisation

Digitalisation provides a number of new tools for better control of products and the flow of market information and finance, allowing new business models. Digital control systems integrated with efficient technologies can double energy savings in many cases.



Regional cooperation programmes

These can accelerate the implementation of effective EE product policies and their many related economic, environmental and social benefits through harmonised international standards, market monitoring and regulatory enforcement.



Contextualising policies, services and financing to the right audience

Ensure that what is developed and offered is relevant for the respective market. Energy-efficient product policies can also significantly improve the availability of reliable modern energy access for hundreds of millions of people.

POLICY RECOMMENDATIONS

- Establish and maintain **policy/regulatory environments for successful market transformation**, including investment in Energy-as-a-Service, Green Public Procurement and Energy Service Companies (ESCOs). Dedicated, sustained programmes for market transformation work need relatively very low funding and typically take five to ten years to fully transform national markets. Funding for programmes typically ranges from \$1 million to \$2 million per year per product sector, with the resulting recurring annual economic savings for all consumers, including business and government, an order or two of magnitude greater.
- **Set up cross-government consultation and cooperation** for an effective integrated EE policy framework. For example, building energy codes should state clearly that passive design approaches that reduce energy needs must be combined with the installation of higher-performance, eco-efficient appliances and heating/cooling products.
- **Assess policy options** with a view to ensuring affordability, from remediation of access barriers to information/education about lower life-cycle costs, and ensure local industry is able to adapt.
- Support the development of **local higher-performance product capacity and businesses** to improve economic development, increase employment and enable climate change target actions.
- Join with neighbouring countries and regions to **develop and implement regional programmes** for more efficient products that can encompass a much larger market demand, making them more affordable and attractive as an investment for consumers and institutional procurers, e.g., the Association of Southeast Asian Nations (ASEAN), the Common Market for Eastern and Southern Africa (COMESA), Australia-New Zealand and the European Union.
- Work together at regional and international levels to **significantly reduce the cost**

of **EE product policy design and implementation**, thereby accelerating the deployment of affordable eco-efficient products for everyone.

- Do not start from zero. International initiatives and organisations have implemented **knowledge exchange and support programmes** that provide information, funding and programme experience to support developing countries. Examples of this include the Super-efficient Equipment and Appliance Deployment Initiative⁷ and United for Efficiency⁸.
- **Include EE in information and communications technology (ICT)**, the Internet of Things, 5G and the rest of our digital world in product policy because the demand for information technology and services is increasing rapidly.
- **Incorporate digital systems into electrical product policies** to support more EE. If efficient Internet of Things and digital networks are introduced, products can generate even more energy savings with smart device management. For example, switching to LED lighting typically can reduce electricity consumption by 50% in the buildings and commercial sectors, but smart lighting can increase savings even further – to 70% or more.
- Encourage the use of **eco-efficient and smartly connected products** to ensure the optimal management of the electrical grid. Energy-efficient and smart appliances can and should be the best allies of power grid stability and reliability and of decentralised, 100% renewable energy power networks.

As well as specific EE action, it is important to consider the current global context for delivering development policies and supporting inclusive growth. As such, the following considerations are relevant for policy discussions and consideration at global fora:

- **Avoiding short-term trade-offs** between sustainability and economic growth is important. We must integrate sustainable approaches to energy supply and energy demand into COVID-19 responses. There is a small window to ensure that COVID-19 responses are resilient and integrate ambitious climate action. The economic stimulus packages being deployed over the next 6 to 18 months must be strongly influential if the internationally agreed aim of limiting global warming to well below 1.5°C is to be met. By including energy-efficient cooling in COVID-19 recovery packages, for example, governments can achieve many of the goals of their short-term stimulus objectives like creating jobs while also meeting their environmental commitments.
- By setting ambitious priorities, forging coalitions and designing effective policies, it is possible to change the energy matrix into a sustainable, climate-friendly one in a generation. The choice of new technologies and the implementation of new solutions can only be achieved as part of well-defined priorities and targets, anchored in the **need for change, political will and the commitment of the various stakeholders**, not least the energy industry itself. We need to make our societies more resilient. We need green jobs, new investments and sustainable growth. We also need investors to demand that companies reveal their transition plans to

⁷ <https://superefficient.org/>

⁸ <https://united4efficiency.org/>

reach net-zero emissions.

- **Adaptability and flexibility are key.** The responses of different countries to the energy and climate challenges of our time differ according to their resource base, their access to finance and capital, their experience with new technologies, and the security of their energy supply. The need for a planned, inclusive, strategic systems approach to the sustainable energy transition is less obvious to many countries.
- The changes needed in the energy sector involve new technology and business models, new policy measures to foster EE, and new energy carriers and technology shifts. All countries require **consistent policies and a stable investment climate** to see steady development of lasting markets for environmentally friendly products and services, but not all can provide these to investors. Supporting developing and emerging economies to establish and maintain energy programmes that help in the fight against climate change while lifting people out of energy poverty at the same time is a key opportunity. Making climate-friendly energy technologies a priority in development assistance programmes is simply common sense.
- It is clear that sustainability cannot be achieved at the country level alone. The rest of the world needs to travel in the same sustainable energy direction as the leading countries and regions. While significant improvements can and are undoubtedly being made in some places in EE, **efforts must be ramped up and sustained at the global level** to ensure the energy sector transition actually occurs. Every international financial decision must take into account environmental and social impacts, proactively supporting climate compatible investment.
- The VEF makes a vigorous call to governments, the private sector and civil society to make climate-friendly, low-carbon, energy-efficient products a priority. **Only a few countries have explicitly highlighted all the required aspects of sustainable energy in their NDCs; even fewer have put EE measures in their stimulus packages.** It is essential to let everyone know about the great opportunity we have and take advantage of the many good approaches that are available to bring about change.
- The VEF is working with the government of the United Kingdom, among others, to shine the global spotlight on EE at COP26 through the Energy Transition Campaign with a dedicated 'Product Efficiency Call to Action'.

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ABBREVIATIONS

ASEAN	Association of Southeast Asian Nations
COMESA	Common Market for Eastern and Southern Africa
EE	Energy efficiency
EJ	Exajoule
ESCO	Energy service company
GHG	Greenhouse gas
HEPS	Higher energy performance standards
ICT	Information and communications technology
MEPS	Minimum energy performance standards
MVE	Monitoring, verification and enforcement
NDCs	Nationally Determined Contributions
PEH	Passive-energy houses
ZEB	Zero-energy buildings

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