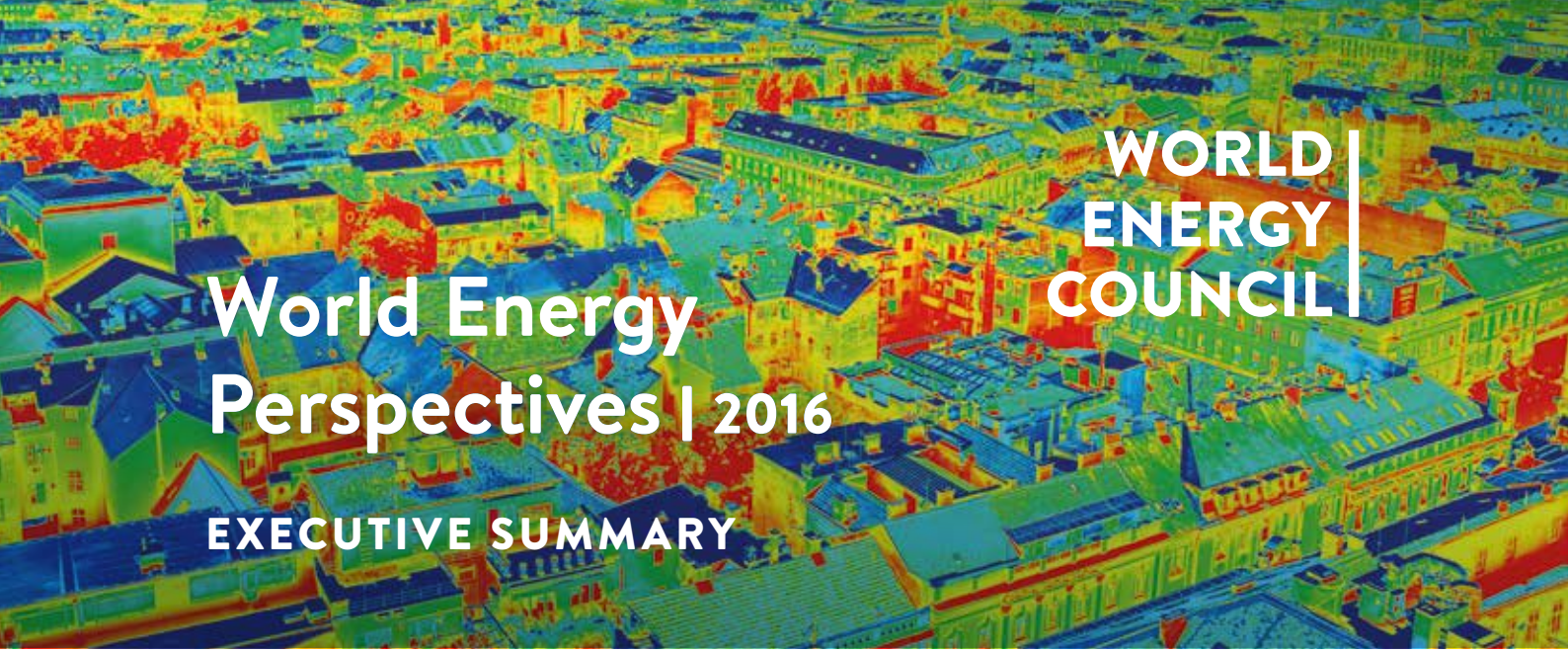

World Energy Perspectives | 2016

EXECUTIVE SUMMARY

WORLD ENERGY COUNCIL

ENERGY EFFICIENCY: A STRAIGHT PATH TOWARDS ENERGY SUSTAINABILITY

The research conducted by the World Energy Council together with ADEME since 1992 concludes that energy efficiency continues to improve all over the world but despite the significant advances, much more can and should be done to improve the efficiency of energy production and use. Energy Efficiency policies play a fundamental role in supporting the transition towards sustainable energy.

KEY FINDINGS

1 **ENERGY PRODUCTIVITY IS IMPROVING IN MOST COUNTRIES AND REGIONS.** Energy consumption per unit GDP (primary energy intensity) is decreasing in 80% of the surveyed countries and most regions, mainly due to the combination of a number of factors, including high energy prices until 2014 and other economic factors, successful energy efficiency programmes, expanding GHG emissions abatement regulations and the transformation of economic activities with a growing share of services in the GDP in countries around the world.

2 **LARGE DISPARITIES BETWEEN COUNTRIES.** There are large differences between the regions and countries, both in terms of industrial and household energy use. Europe has the lowest primary energy intensity per unit GDP at Purchasing Power Parity (PPP), followed closely by Latin America and OECD Asia, while China uses twice the amount of energy per unit GDP compared to Europe. Oil producing countries, on the other hand, have in general low energy prices which attract energy intensive industries and hold back the deployment of efficient equipment and best practices. In the household sector, the average consumption of electricity varies significantly between countries depending on different factors, mainly the number of electrical appliances in the household, and ranges from 1,000 kWh/household in India to 8,000 kWh in North America, 2,000 kWh in Italy and 4,000 kWh in Japan.

3 **GLOBAL CO_2 EMISSIONS HAVE INCREASED BY 51% SINCE 1990** but the main sources have changed. In Europe, CO_2 emissions have dropped by 22% between 1990 and 2014, while strong economic growth in China and India resulted in tripling of their CO_2 emissions. However, per capita emissions are still significantly higher in the developed countries with nearly 16 t CO_2 per year in North America compared to 2 t CO_2 in India and 6 t CO_2 in China.

4 **SIGNIFICANT ACHIEVEMENTS DESPITE GLOBAL ECONOMIC CRISIS.** In most regions, annual improvement rate of energy efficiency has slowed down from 1.6% between 2000 and 2008 to 1.3% in the following years. Despite this, the energy efficiency improvements over the last 15 years saved the world 3.1 Gtoe of energy and 7 Gt of CO_2, which corresponds to 23% of global energy consumption and 21% of global CO_2 emissions in 2015.

5 **PRICE SIGNALS ARE KEY BUT ALONE ARE NOT ENOUGH TO IMPROVE EFFICIENCY.** Analysis of the country specific policies and measures around the world indicates that clear and targeted policies are required to reinforce the role of energy prices in market economies. These policies would support a wider deployment of energy efficient equipment and services which would drive consumer choice towards the most efficient and cost effective solutions.

ENERGY EFFICIENCY POLICIES AND MEASURES

Introduction of energy efficiency policies and measures has been growing fast around the world. The increasing number of countries with an energy efficiency law signifies a strengthening and consolidation of the institutional commitment to energy efficiency. Energy efficiency policy measures (P&Ms) implemented by public stakeholders include a combination of regulations, financial and fiscal instruments and information. Pv&Ms are usually adapted for the different economic activities and end-uses. The target areas include, for instance, phasing out and replacement programmes for old and inefficient stocks.

The Minimum Energy Performance Standards (MEPS) set the minimum performance criteria to be achieved by new appliances or buildings and efficiency labels guide consumers towards more energy efficient appliances and buildings and motivate manufacturers to supply energy efficient products. However, labels alone are not sufficient to transform the market, they are just the first step and need to be complemented with MEPS to remove inefficient equipment or introduce best practices. The improvement effect of labels and MEPS is linked to the quantity of equipment which is replaced or the amount of investment in new equipment.

MULTIPLE BENEFITS OF ENERGY EFFICIENCY

The main strategic benefits of improving energy efficiency are to enhance security of supply and reduce CO_2 emissions. In addition, there are associated benefits, including job creation, productivity improvement and energy access.

INTERNATIONAL LABELLING OF ELECTRIC MOTORS

Industrial electric motors and electric motor-driven systems (EMDS) consume almost half of the total electricity and account for 70% of the total electricity consumption in the industry. The cost-effective potential to improve energy efficiency of motor systems is roughly 20% to 30%, and such improvement would reduce the total global electricity demand by about 10–15% per year. There are many policies and measures to increase the efficiency of new motors, in particular through their better labelling. The IEC (International Electrotechnical Commission) has put in place four energy efficiency classes for electric motors (with IE4 corresponding to the highest efficiency).

THE WAY FORWARD – RECOMMENDATIONS FOR FUTURE

The role of energy efficiency is well-understood and appreciated by the global community. The potential for energy efficiency improvement is huge and moreover, it can be realised quickly. On the path to energy sustainability, efficiency must come first, as it is the cheapest and readily available "fuel source".

The report suggests that the following considerations will help advance energy efficiency improvements:

- **Energy prices** should closely reflect the real cost of supply. The countries should set deadlines for a gradual energy pricing reform.
- Consumers need to be **better informed**. It is necessary to simplify messages on energy efficiency to reach the majority of consumers.
- **New technologies**, including smart meters and billing offer attractive benefits and their wide introduction should be supported by policies.
- **Innovative financing tools** need to be widely introduced to reduce the public spending on financial and fiscal incentives.
- **Control over implementation** and evaluation of policies and measures are fundamental to the policies success.
- **Regulations** must be regularly reviewed and strengthened if necessary, and labelling and MEPS should be regularly revised and upgraded.
- The development of **international** or **multi-national standards** can help enhance international and regional cooperation, in addition to regional testing and harmonisation of equipment testing standards and facilities. International energy fora should be used to exchange experiences to benchmark policies and identify best practices.

ABOUT THIS REPORT

This is the 8th report in the series of triennial reports produced by the Council together with ADEME and it is the most comprehensive global publication in the area of energy efficiency policies. Drawing on the experiences and lessons from the research conducted in more than 95 countries around the world, the report Energy Efficiency: A Straight Path towards Energy Sustainability presents and evaluates different approaches to energy efficiency policies adopted in these countries and helps identify policies which work well and those which do not.

It benefits from the information available in the two online databases. Both databases are free of charge and can be accessed at www.worldenergy.org/data

The report has been produced together with the Council's Project Partner ADEME, France, technical support by Enerdata and contributions from the members of the Knowledge Network and the Council's member committees around the world.

WORLD ENERGY COUNCIL

The World Energy Council is the principal impartial network of energy leaders and practitioners promoting an affordable, stable and environmentally sensitive energy system for the greatest benefit of all.

Formed in 1923, the Council is the UN-accredited global energy body, representing the entire energy spectrum, with over 3,000 member organisations in over 90 countries, drawn from governments, private and state corporations, academia, NGOs and energy stakeholders.

We inform global, regional and national energy strategies by hosting high-level events, including the World Energy Congress, and publishing authoritative studies, and working through our extensive member network to facilitate the world's energy policy dialogue.

Further details at **www.worldenergy.org** and **@WECouncil**

The full report can be accessed at **www.worldenergy.org/publications**

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