



The Benefits of Energy Efficiency

Introduction

Energy efficiency (EE) improvements have the potential to produce benefits at all levels of the economy and society:

- at the **individual** level (individuals, households and enterprises);
- at the **sectoral** level (by economic sector such as transport, residential, industrial sectors);
- at the **national** level (including macro-economic benefits and benefits to national budgets); and
- at the **international** level (reflecting the international public good of these benefits).

All these aspects were explored in detail by the OECD and International Energy Agency in a recent study, as summarised in the diagram below:

INDIVIDUAL LEVEL

- Health and well-being impacts
- Poverty alleviation: energy affordability and access
- Increased disposable income

NATIONAL LEVEL

- Job creation
- Lower energy-related public expenditure
- Energy security
- Macroeconomic effects

SECTORAL LEVEL

- Industrial productivity and competitiveness
- Energy provider/infrastructure benefits
- Increased asset values

INTERNATIONAL LEVEL

- Reduced greenhouse gas emissions
- Moderating energy prices
- Natural resource management
- Development goals

This factsheet provides summary information regarding the potential benefits of EE improvements in the context of the European Union. It is written for the benefit and usage of decision-makers across a variety of public, private and civil society institutions, but particularly for public sector authorities delivering EE projects.

Why Energy Efficiency?

EE is at the heart of the EU's transition to a resource-efficient economy and the Europe 2020 strategy for smart, sustainable and inclusive growth. The strategy includes three complementary energy and climate headline targets by 2020, namely: to lower greenhouse gas emissions by 20% relative to 1990, to generate 20% of primary energy from renewable sources and to achieve 20% primary energy savings relative to the 2007 projections for 2020.



Role of the Public Sector in Energy Efficiency

The European Commission's "Energy Efficiency Plan 2011", adopted in March 2011, outlines a more prominent role for the public sector in the promotion of EE measures. It highlights the opportunities for EE in public procurement, the refurbishment of public buildings and EE measures involving cities and communities. Steering public spending towards energy efficient products, transport modes, buildings, works and services can help to reduce expenditure by public authorities on energy and offers improved value for money. Stimulating demand in this way could lead to a more rapid development and distribution of energy efficient products and services, as well as the acceleration of innovation across the EE sector.

Financial Savings from Energy Efficiency

EE is one of the lowest-cost measures available to reduce carbon emissions and could save EU consumers an estimated EUR 78 billion annually by 2020. The EU has significant fossil-fuel powered generating capacity that will have to be replaced within the next 10-20 years if energy consumption remains unchanged. Reducing energy consump-

tion therefore eases the pressure on replacing rapidly ageing power generation, transmission and delivery infrastructure.

Economic Benefits from Energy Efficiency

There are significant economic benefits associated with achieving the 20% target on the reduction of primary energy use. Investment in EE can spur economic growth by creating wide-ranging business and employment opportunities such as by:

Creating jobs - The implementation of EE measures is usually a labour-intensive activity at the local level, which cannot be easily relocated or outsourced. The investments will create demand for a range of skills as well as developing expertise for the implementation of new technologies. This demand for EE work requires increased output from the construction sector, which in turn can generate demand for intermediate work across the economy, thus boosting labour demand.

Generating revenues - EE investments in general, and refurbishment investments in particular, can be expected to bring in public revenues through a number of channels in the short term (e.g. value added tax from goods, corporate taxes,

property taxes, income taxes, social security contributions and avoided costs of unemployment), all of which should offset the reduced revenues from taxes on energy consumption in the medium to long term.

Encouraging research and innovation - EE technology in many areas is still in its infancy. Therefore there are huge opportunities for further innovation. By promoting EE measures, public authorities can encourage the private sector to propose new methods and technologies which can then be utilised on future projects.

Increasing competitiveness - By lowering energy costs and reducing the exposure to the risks stemming from volatile energy prices, companies can become profitable and operate their businesses more efficiently.

Improving companies' corporate image - By positioning themselves at the forefront of efforts to develop Europe's green economy, companies that engage in EE activities can achieve significant intangible benefits associated with a positive awareness of their brand.

Other Benefits of Energy Efficiency

In addition to the financial and economic benefits related to EE outlined above, there are other benefits, which, while they might not be specifically attributable to EE improvements in buildings, are typically associated with or especially pronounced in EE measures targeted at Europe's housing stock, e.g.:

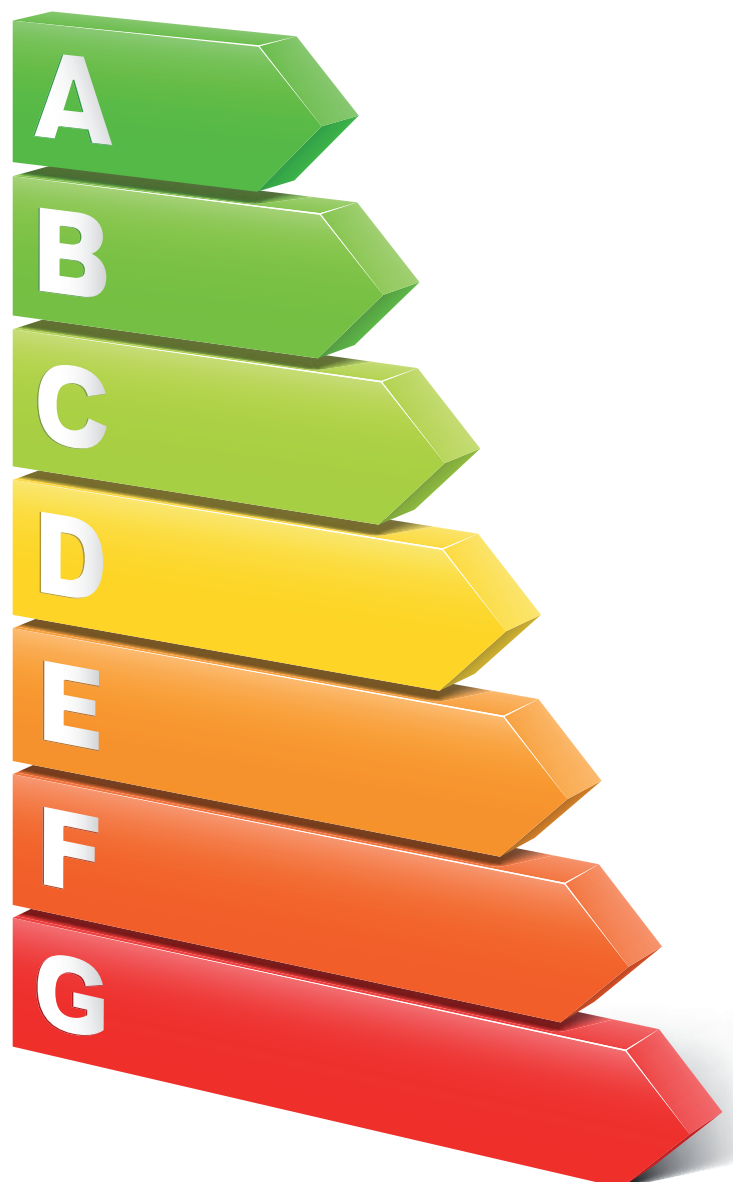
More efficient buildings - Energy consumption in residential and commercial buildings represents approximately 40% of total final energy use, and is responsible for 36% of the European Union's total CO₂ emissions. Therefore, applying available EE technologies and methods to residential and commercial buildings would have a substantial impact on energy usage and carbon emissions in Europe. As a result, the Energy Performance of Buildings Directive (EPBD) requires Member States to establish minimum levels of energy performance for new buildings and buildings undergoing major renovation.

Adapting to climate change - EE measures contribute to the overall resilience to climate change as they play a safeguarding role against adverse/extreme weather events. Thus, EE improvements may be considered as part of a strategy to pursue and expand the scope of climate change adaptation measures.

Increased energy security - At a time of rising and volatile oil and natural gas prices, Europe is the largest importer of energy worldwide. The EU currently imports approximately

50% of its energy. This ratio may increase to 70% in 2030 if no further measures are taken. Energy savings, which reduce primary energy consumption and decrease the need for energy imports, are thus imperative in increasing the security of energy supply given the future scarcity of fossil fuels and in limiting the impact of energy price shocks.

Alleviating energy poverty - Energy poverty is defined as the difficulty or inability to ensure adequate heating in the dwelling or to access other essential energy services at a reasonable price. Low-income households in Europe are likely to occupy less efficient older buildings, which are expensive to heat (or cool) and which place pressure on limited household income. Energy poverty is a significant problem across Europe which will become more acute with rising energy prices and fuel bills. By reducing fuel bills, EE interventions in social housing can mitigate many of the issues associated with inequality and social exclusion.



Improving quality of the building stock and property values - EE improvements in existing buildings can have other positive effects which eventually increase property values, such as higher building quality, better noise and moisture insulation and lower maintenance costs.

Improved health and well-being - EE measures targeted at buildings can also improve indoor air quality, with corresponding health benefits, particularly in respect of problems such as asthma. A UK study on a social housing refurbishment project noted positive improvements to health and well-being, alongside EE gains. Apart from influencing residential well-being, from a public health point of view such measures also reduce public health expenditure.



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