

AT A GLANCE – ENERGY EFFICIENCY NR. 1

An introduction to Energy efficiency and the status quo in the European Union

By definition, energy efficiency refers to measures whose implementation results in the same or better performance with less energy consumption. According to the laws of economics, scarcity of energy makes it necessary to relate the input to the output in order to maximize the respective benefit. This means that with a fixed energy input the maximum output is aimed at, or with a fixed output the energy input is minimized.

An illustrative example of this is the use of energy-saving lamps, which is now mandatory. Whereas conventional incandescent lamps convert electrical energy into desired lighting and undesired heat, the energy requirement for efficient light sources is reduced due to lower heat losses for the same lighting. However, this simple, obvious and at the same time economically sensible change had to be brought about through a law. The principle of voluntariness would not have worked here because energy-saving lamps consume less energy but are more expensive to buy. This contradiction is often encountered when it comes to energy efficiency. Our society is not willing and



used to look beyond investment returns of 3 to 5 years. We have been used to think short term. In this case, it is only legal compulsion that leads to the desired goal.

The EU directive on energy efficiency allows member states to set concrete targets for final energy consumption, energy intensity or primary energy consumption.

However, final energy consumption only covers two-thirds of the energy sources consumed in the EU, as it does not take into account losses during energy production and transportation. On the other hand, energy intensity - i.e. consumption in relation to gross domestic product - is also influenced by energy-independent factors such as productivity. Ideally, energy efficiency targets are measured in terms of primary energy consumption. Primary energy consumption measures the energy supplied to the system. For example, production in coal-fired power plants is measured by the use of coal as an energy source. Since the efficiency of such plants accounts for only 30 to 40 percent, it becomes clear which part of the supplied energy is lost through heat, namely: 60 to 70 percent. If the waste heat from these power plants is used as district heating, there is a significant efficiency gain. Therefore, with energy efficiency measures substantial cost savings can be achieved, while at the same time also reducing the emission of climate-damaging substances. The result is a classic win-win situation.

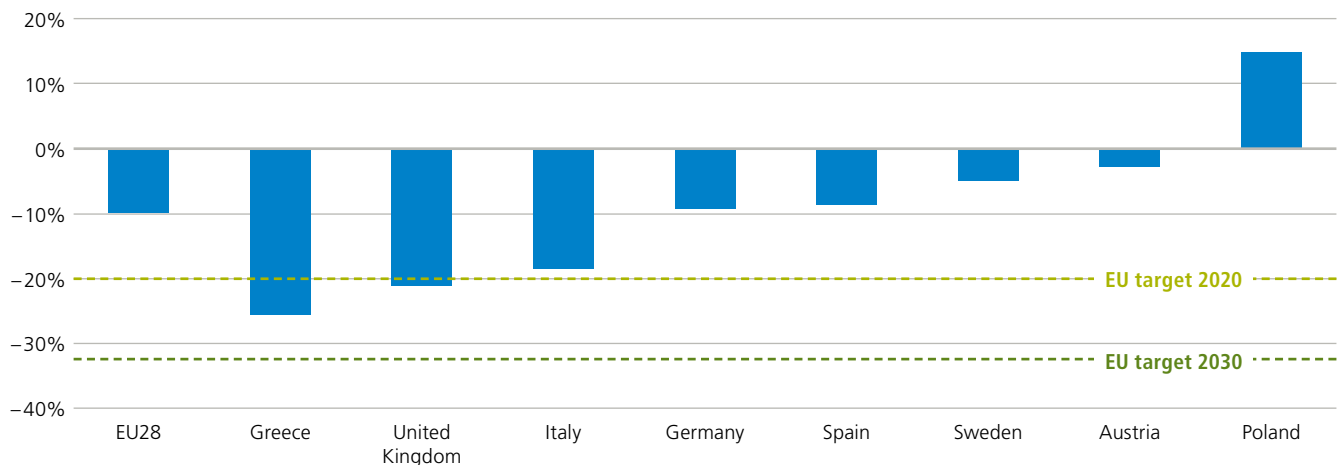
The strategy of the European Union

Energy efficiency is an important cornerstone of the energy system transformation, and most stakeholders agree on this. In the public debate, however, the main interest is focused on the expansion of renewable energies. The IEA, for example, estimates that under the existing policy two-thirds of the potential lying in efficiency is not being exploited.¹ Specially formulated targets are not being met by the majority of member states. Figure 1 on the next page shows that the EU target of a 20% reduction in primary energy consumption will be missed significantly. The total reduction of the EU member states (EU28) amounts to only 10%.

¹ IEA (2019)

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Figure 1:
Efficiency gains in relation to primary energy consumption in 2018 of EU member states concerning respective targets²



Under the slogan “energy efficiency first”, the European Commission is trying to accelerate the efforts of the member states. The aim is to establish energy efficiency as an independent energy source, so to speak.³ In addition to the binding target – to reduce primary energy consumption by 32.5 percent by 2030 – numerous support measures are offered and educational work is carried out. The

potential to reduce CO₂ emissions cost-effectively makes economic sense and is also essential for achieving climate targets. In addition, it also makes an important contribution to the framework conditions for energy system transformation, where the focus is on the security of supply and affordable access to energy.

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² Eurostat (2020), ³ EC (2020)