

ENERGY EFFICIENCY IS PROFITABLE IN MANY WAYS

# The EnergySavingFund for Germany



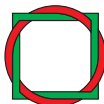
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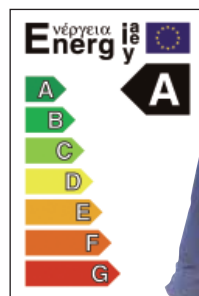
# ENERGY EFFICIENCY IS PROFITABLE IN MANY WAYS

# 1

**E**nergy policy faces great challenges: energy prices are driving upwards, the reliable supply of energy causes problems and many types of the current energy production contribute to climate change. Renewable energies can be a loophole. What is left aside time and again are the huge potentials of an efficient energy use, which can be tapped fast and at low costs:

- Today, the most efficient cooling and freezing devices only use one third of energy as devices used ten years ago.
- Without large extra costs, “low-energy houses” only require 20% of the heating energy of a new traditional building, due to a better insulation and an efficient ventilation and heating system.
- Efficient circulation pumps in heating systems, together with an optimised heating circuit, can save up to 90% of electricity and additionally heat.

If efforts to fully use the existing potentials by an Energy-SavingFund started today, more than **10%** of today’s end-use energy consumption (75 billions kWh electricity and 102 billions kWh heat) could be saved until 2015, thus realising a **profit** for consumers, business and the national economy. Beyond these pure cost effects, there are further positive effects: increasing investments in efficient technology will provide new jobs, the problems of a reliable energy supply can be reduced and climate protection will benefit as well. This is a classic **win-win-win** situation.



## WHY ARE THE POTENTIALS OF ENERGY EFFICIENCY NOT FULLY USED?

# 2

Implementing energy saving measures often fails because, at the first glance, consumers face too many obstacles. An example:

What will happen in a one-family house in winter, when the heating system does not work due to a broken circulation pump? Usually, the heating installer who originally delivered and installed the heating system, is contacted. The installer will remove the pump and take it to the wholesaler. The wholesaler is going to recommend a new pump which is especially well-priced and immediately available. After the new pump has been installed, the heating system works again. The house owner did not spend too much money and everybody is satisfied. But where is the catch in this story?

Usually the cheapest pump is an inefficient one. Below the line, the house owner will lose money, since the lower price of this pump compared to the price for an energy-efficient pump, has to be charged up against the much higher costs of energy consumption during the operating period of this pump. On top of that, optimising of the heating circuit on the occasion could effect considerable additional cost savings. However, the house owner usually does not know about this.

Usually, the heating installer will not automatically offer the efficient but expensive pump. Maybe he does not think about it or does not know enough about its advantages. Maybe he assumes that the customer will only look at the price anyway, or he wants to avoid any time consuming advise on the new pump. The same applies for convincing the customer that it will be reasonable optimising the heating circuit when changing the pump. In most cases, the customer himself will not bother comparing the technical options of pumps for his heating system. He will neither compare the real costs nor decide for the pump with the lowest life-cycle costs. Finally, he is not informed about the options of optimising heating control and circulation.

The market launch of energy-efficient products fails because

- energy-efficient technology seem too expensive at the first glance,
- house owners and tenants are often not well informed about the advantages,
- many installers of heating systems do not advise the customers in a sufficient way, due to different reasons,
- there are no financial and initiating incentives to develop energy-efficient products and to support their market launch.

## HOW CAN THE POTENTIAL OF ENERGY EFFICIENCY BE TAPPED?

# 3

Generally, one policy instrument is not sufficient to overcome these barriers — be it regulations, advice or subsidies. In many cases the existing instruments fail since only the **combination of different instruments** can overcome the barriers. For example, highly efficient pumps require temporary financial support to attract attention. These subsidies have to be accompanied by training courses, information campaigns and agreements with the manufacturers in order to make the advantages of the more efficient technology transparent.

Only through combining these instruments the required broad effect can be achieved and the new technology can be successful on the market. Existing central and decentralized approaches such as rebate programmes and campaigns would be strengthened. For the coordination and control of these tasks we suggest to establish the **EnergySavingFund**.

This independent organisation “Energy-SavingFund” has important **advantages** compared to conventional instruments:

- The fund generates synergies within the supporting programmes as well as between these programmes and other policy instruments.
- The Fund initiates innovations by putting out energy saving programmes to tender thus helping the best ideas for an efficient and effective implementation to break through.
- The effective, reliable and transparent implementation of the ambitious aims requires the financial and organisational independency of the Fund from particular interests.

Only this conception will allow the important break through of energy efficiency.

The success of such conceptions is demonstrated by already existing institutions in Germany and in other countries: examples are the proKlima Fund in Hanover or the Electricity Saving Fund in Denmark, which successfully implemented modernisation of heating systems and energy saving measures in public administrations.

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## HOW DOES THE ENERGY SAVING FUND WORK?

# 4

The EnergySavingFund supports the private, commercial and public energy consumers to save energy, not by cutting back convenience, but by the efficient use of end-use energy (end-use energy efficiency).

For this purpose the Fund puts concrete **energy saving programmes** out to tender, specified for the target groups. These programmes are implemented in the most effective way by those stakeholders who are best qualified. The Fund is responsible for the central start-up financing, the coordination and control of these activities.

Such a programme can be, for instance, the promotion of energy-efficient refrigerators and freezers in private households. Another programme promotes the modernisation of ventilation systems in offices. The concept of the Wuppertal Institute proposes a catalogue of twelve energy saving programmes (see the following page 5).

Furthermore, the Fund organises **ideas competitions**, thus initiating search processes, which will identify and promote the best concepts for the broad implementation of energy saving measures

For this purpose, the **organisation has to be very slim**: The core team of the Fund consists of two managing directors and a staff of about 20 to 25 persons in the administration for data processing, public relations and for managing the programmes.

We suggest to install the Energy-SavingFund as an independent centralized organisation in terms of a **foundation under public law**, thus making sure that the tasks, the financing and the targets will remain transparent.

The Fund closely cooperates with the German Energy Agency (dena) and the KfW group, the German promotional bank. Competences and ideas of local stakeholders, as for example energy agencies, energy service providers and organisations for energy advising are closely involved especially in the calls for the programmes.

## 12 ENERGY SAVING PROGRAMMES FOR THE FUND

# 5

The Wuppertal Institute suggests **a portfolio of 12 Energy Saving Programmes** for the initial period of the EnergySavingFund. The suggested programme portfolio includes

Programme packages for cross-cutting technology for saving energy and heat in the **industrial, commercial, service and public sector**:

- a programme for optimising pumps in industry, commerce and services
- a programme for the energy-related modernisation of air ventilating installations,
- a programme for supporting sensor technology and advice for energy-efficient lighting systems.

Programme packages with measures for saving electricity and heat in **residential buildings**:

- one programme each for optimising heating systems and for the installation of highly efficient circulation pumps in one- and two family buildings, as well as in multifamily residences and non-residential buildings,
- a programme for the energy-related renovation of the existing buildings,
- A programme for the replacement of electric storage heating devices by an efficient condensing boiler technology.

Programme packages for energy-saving **household appliances**:

- One bonus programme each for energy-efficient refrigerators and freezers devices and for energy-efficient tumblers.

Three **special programme packages** for public administrations, Energy Service Companies (ESCOs) as well as for testing and developing a system of flatrate reimbursements for achieved end-use energy savings.

## WHICH RESULTS CAN BE ACHIEVED?

# 6

The programmes of the EnergySavingFund contribute to saving energy costs, providing new jobs and achieving climate protection effects:

- The expenses for the measures financed by the Fund benefit the **customers**, who **reduce their energy costs**. By means of a programme for optimising the heating system, for example, the annual energy bill of a four-person household can be reduced by about 170 EUR (see calculation on page 8).
- The national economic benefit, too, would be huge: by means of the suggested programmes the Fund could achieve end-use energy savings of about 12% compared to the baseline after a period of 10 years. This corresponds to energy savings for the national economy amounting to 73.3 billion EUR. In return, the Fund has to be provided with 1.0 to 1.3 billion EUR yearly. The customers themselves would spend additional 2.0 to 6.0 billions EUR per year for energy efficiency technology, in total about 37.0 billions EUR during the 10-years period. In the end, the customers possess 36.3 billions EUR net more than they had before.
- The attainable cost savings of the consumers and the investments in energy efficiency additionally **stimulate economic growth and the job market** (see details on page 7).
- Energy savings extensively contribute to the **reduction in carbon dioxide emissions**, in total up to 72 Mio t CO<sub>2</sub>-equivalents per year until 2015 or about 1.1 billion t CO<sub>2</sub>-equivalents until 2030, thus helping to fulfil the German climate protection commitments which otherwise could only be achieved with high economic costs.

## HOW MANY JOBS WILL BE NEWLY CREATED OR SAFEGUARDED?

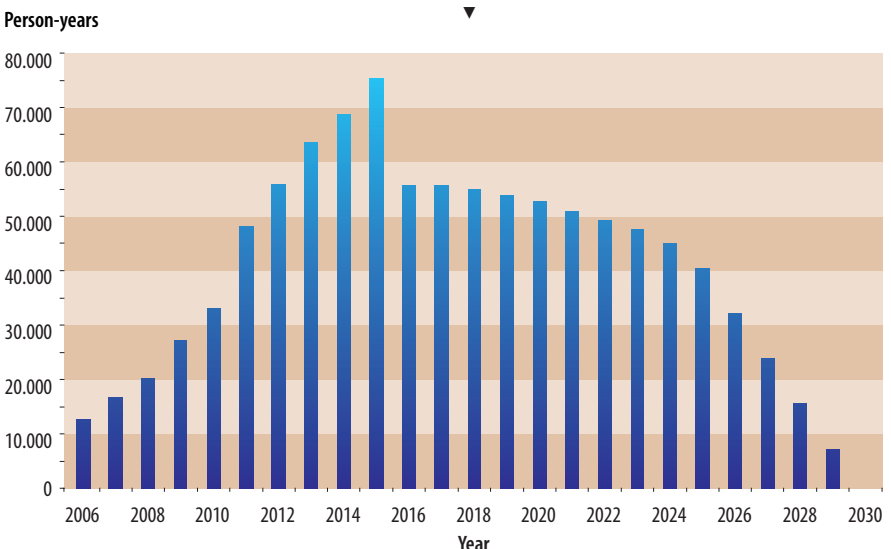
# 7

Altogether, the programmes of the EnergySavingFund have a **positive net impact on employment amounting to about 1 Mio person-years until 2030**, with a maximum of 75,000 person-years in 2015. Thus, these programmes will be able to safeguard or newly create tenths of thousands of full-time jobs.

Even after expiry of the proposed programmes of the EnergySavingFund, the development of net employment will remain positive in every year of the period under consideration until 2030. The basic reason is that the **import of fossil energy can be significantly reduced** when energy is saved.

On average, **each saved Petajoule (PJ) of end-use energy provides additional new jobs amounting to about 103 person-years**. Sectors such as handcraft or engineering will directly profit from energy savings. Furthermore, reduced energy costs for consumers and industry will stimulate consumption, thus having impacts on the job market, especially in the retail industry as well as in the hotel and catering industry.

Development of the net employment impact in sum of all 12 efficiency programmes of the EnergySaving-Fund (in person-years).





## HOW IS THE FUND FINANCED?

# 8

In principle, there are several possible forms of financing the work of the fund. On the whole, pre-financing of energy efficiency activities by **the Fund will pay off**:

The average contribution to such a Fund of less than 0.1 Cent per kWh — for instance from the **energy tax** on

electricity, natural gas and fuel — will be sufficient, to finance the activities of the EnergySavingFund and to significantly reduce the energy bills in industry, commerce and in households. Taking the necessary capital for the Fund from the revenues of fuel and electricity taxes will be the most realistic solution at present.

**Net benefit of a typical 4-person household from participating in a programme optimising the heating system and installing a „factor 4“ circulation pump – while assuming that the fund is financed through a share of an energy tax of less than 0.1 Cent per kWh on average (interest rate 4 %)**



Rise in the annual electricity bill caused by an energy tax of less than 0.1 Cent per kWh on average	- 7.70 Euro
Rise of the annual bill for heat energy caused by an energy tax of less than 0.1 Cent per kWh on average	- 24.00 Euro
Annuity of the extra costs caused by investing in the new pump and optimising the heating system	- 79.85 Euro
Annuity of the received subsidy for investing in the new pump and optimising the heating system	+ 31.97 Euro
Reduction of energy costs in the first year by taking part in the programme	+ 248.72 Euro
<b>Net benefit of the private household in the first year</b>	<b>+ 169.14 Euro</b>

## FURTHER INFORMATION

# 9

The **concept for the EnergySavingFund (ESF) in Germany** was developed by the Wuppertal Institute for Climate, Environment and Energy on behalf of Hans Boeckler Foundation, and in close cooperation with

- the University of Flensburg (Prof. Dr. Olav Hohmeyer),
- the University of Frankfurt /M. (Dr. Markus Pöcker / Prof. Dr. Georg Hermes),
- triple innova (Dr. Holger Wallbaum).

In addition, numerous experts from science and practice have rendered their expert opinion. Ifeu Institute for Energy and Environmental Research, Heidelberg, contributed substantially to the research questions on how to finance such a fund.

The final study can be ordered from Hans Boeckler Foundation. In addition, the attachments of the final report and all working papers are available at:  
[www.wuppertal.org/Projekte/fg2/3216.html](http://www.wuppertal.org/Projekte/fg2/3216.html)

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