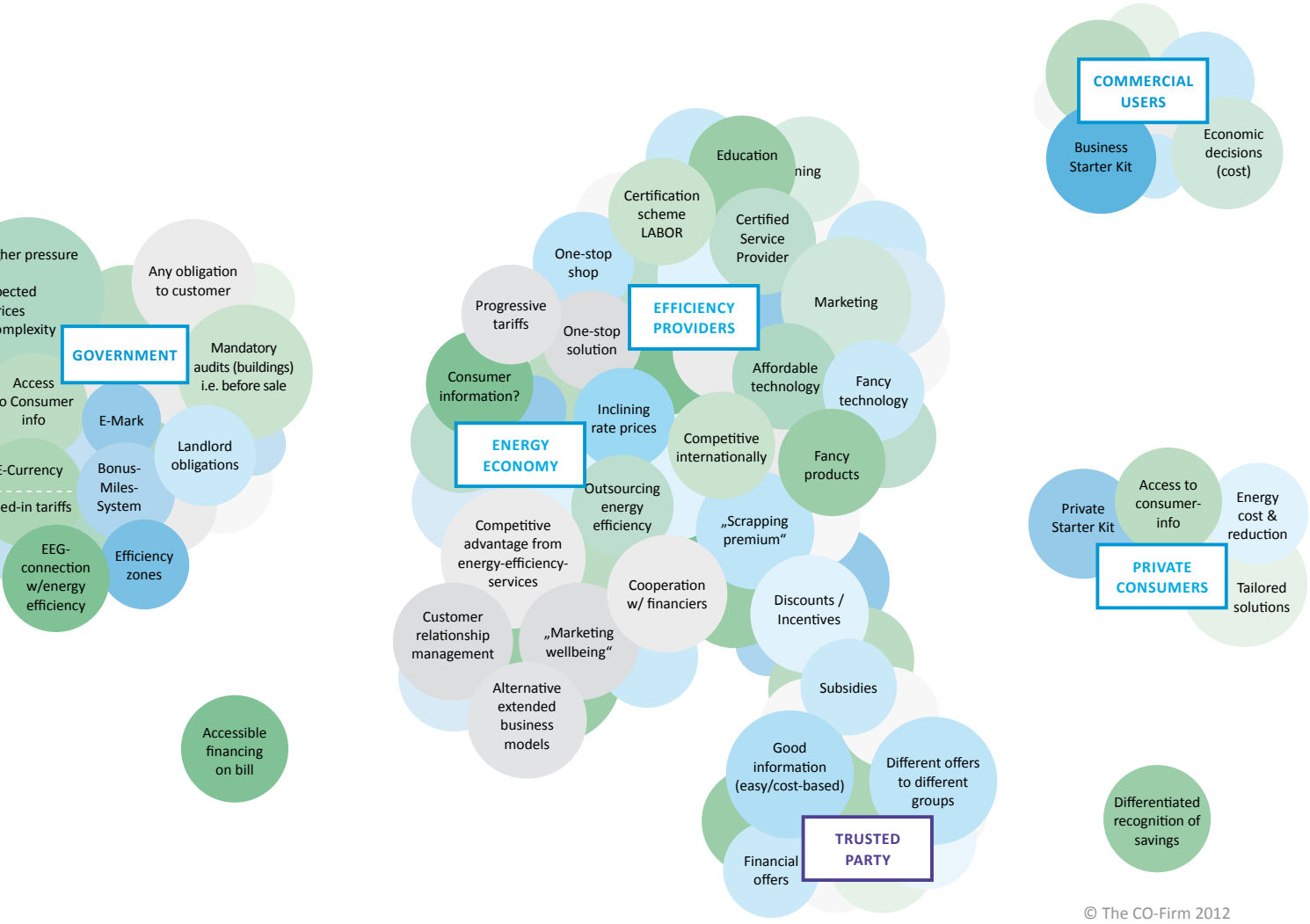
PROPOSED SOLUTION FOR IMPLEMENTATION OF A MARKET-BASED ENERGY EFFICIENCY INCENTIVE SCHEME IN GERMANY



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Description of the model

A study by The CO-Firm GmbH
commissioned by Deutsche Unternehmensinitiative Energieeffizienz e.V. (DENEFF)

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Contents

Brief summary

The challenges posed by the energy transition in Germany can only be overcome in an affordable, fast and conflict-free manner by significantly increasing energy efficiency. The current restructuring of the energy system is generating considerable costs, as generation, network, storage, and reserve capacity needs to be expanded and newly constructed. This may lead to a significant increase in energy prices. Achieving significant improvements in energy efficiency is key to lowering the energy costs per user and reducing system costs: While extension and expansion of capacity and grids cost at least an additional 3.0 EUR-cent per kWh consumed in the future, a premium to fund energy efficiency incentive programs would cost about a "decicent" [1]. Energy efficiency also contributes considerably to other core functions of German energy policy: It increases supply security, boosts the affordability of energy, increases the competitiveness of businesses and products, creates direct and indirect jobs, reduces CO_2 emissions, and can generally be implemented in a conflict-free manner.

The positive effects of energy efficiency are not yet realized to their full extent and at the required speed due to market barriers. To overcome the market barriers and to increase the social benefit, an intelligent political framework is required.

Experiences in other countries and regions demonstrate the positive effects of intelligently designed energy efficiency incentive schemes based on smart policies. In such diverse countries and regions as Great Britain, Flanders (Belgium), and Vermont (USA), energy savings obligations have been used for years to achieve savings targets in the order of 1.5% per year and more. These international experiences reveal that three elements are key to the success of energy efficiency incentive schemes: Defining a binding target, selecting a responsible agent, and ensuring a stable, budget-independent funding.

1 The precise amount depends on previous learning experiences with energy savings, the structure of the measures, and the energy source saved.

The precise configuration of these success factors needs to be adapted to the specific requirements of the German market. This applies particularly to the selection of the responsible agent.

The market-based energy efficiency incentive scheme (MEIS) is one proposal for designing an energy efficiency incentive scheme in Germany. It is based on international experiences, the current German regulatory environment, and positions formulated by key stakeholder groups. The following elements enable the MEIS to specifically address market barriers by an intelligent and dependable framework:

1. A clear target with many different routes to its realization: A target of reducing the final energy consumption by 1.5% compared to the previous years` average appears realistic. How this target is achieved will largely be determined by the market.

2. Tendering for the role of the responsible market agent ("Efficiency Co."), which can be supported by a range of diverse agents in achieving the target: Agents or consortia of agents compete voluntarily (no mandatory obligation) for the role of "Efficiency Co." The bid's winner is the candidate who is best positioned in content knowledge, organization, and reputation to achieve the required savings in the most cost-effective manner. The winning bidder will put further sub-targets with their associated budgets out to tender. Thus, continuous innovation and optimization become inherent to the system.

3. Setting up a stable, budget-independent, and fund-based financing mechanism: The budget of "Efficiency Co." for funding energy efficiency incentive programs is financed using a new efficiency fund. It is derived from a premium, the "efficiency decicent," on the energy bill [2] of energy users. This cost coverage mechanism is sensible and fair because all energy users benefit in two ways: From decreasing system costs and from their own declining consumption. Thus, the lion's share of the investment is made by the beneficiaries, since the "efficiency decicent" finances only program costs. Free-rider effects and excess funding are prevented by the competition for the cheapest kilowatt-hour saved.

This design allows MEIS to realize benefits for society and the economy and to support the energy transition. MEIS lowers costs for consumers and commercial users, boosts markets for suppliers of energy-efficient products and services, and creates fair competition without an efficiency monopoly. Thanks to the resulting innovation and market dynamics, new jobs and additional export opportunities are created. Lower system costs for energy contribute to supply security, energy remains affordable, and prosperity and competitiveness increase.

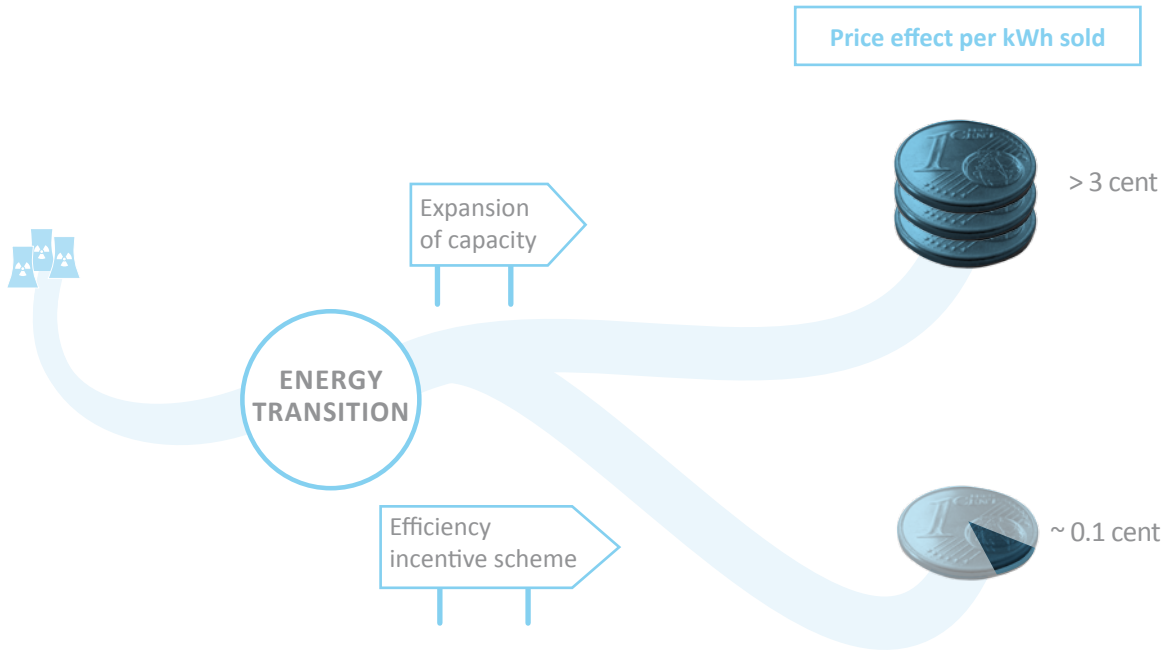
Thus, MEIS is better positioned than alternative policy approaches such as subsidies or regulatory savings requirement. In times of weak state budgets, subsidies limit the potentially ability of market agents to reliably plan ahead. Also, it is not likely that subsidies can realize maximal savings at lowest cost as efficiently as MEIS.

2 This typically applies to electricity and gas. Other models such as incentives or an "efficiency loan" by the German government are also plausible and should be discussed.

Energy transition challenge – Energy efficiency is an essential key

Germany finds itself at the start of the energy transition. The decision in June 2011 to phase out nuclear energy, met with enormous social approval, implies a loss of about 20% of Germany's electricity generation capacity by 2022. This must be replaced in a safe, affordable, and sustainable manner. At the same time, issues such as electro mobility, which increase the demand for electricity, are on the political agenda. Germany, a country poor in energy resources, is reliant on imports of scarce fossil energy sources in the medium term. This dependency further increases with the additional import of electricity and primary energy sources. In short, energy will become scarcer in Germany – and it is highly likely that energy prices will also increase. **We are now faced with the decision on how to manage the loss in capacity till 2022.** Do we want to replace the lost capacity only with new power plants? Or do we rather aim at avoiding the expansion of expensive and – in terms of climate policy – counterproductive generation capacity, grid networks, storage, and reserves? The cost comparison underlines the importance of saving energy: International experience and calculations for Germany show that premiums

Figure 1: Price effects of expanding capacity versus an efficiency incentive scheme



Source: McKinsey (2012): The energy transition in Germany – Claims, reality, and perspectives; Peter Hennicke et al. (2012); The energy transition one year after Fukushima.

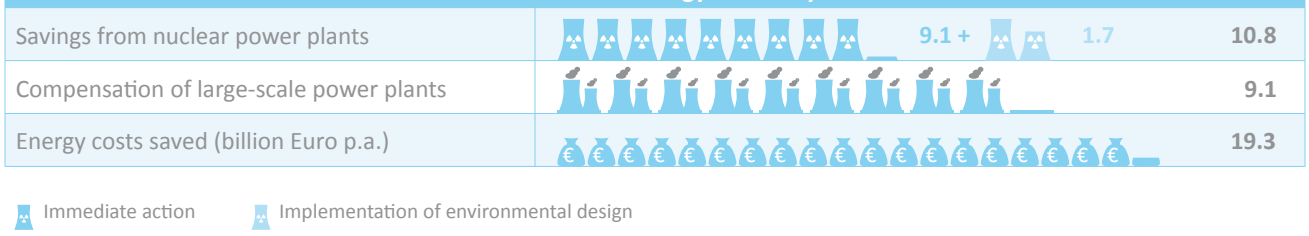
for funding effective energy efficiency incentive programs for the energy user cost about a “decicent” [3] per kWh, while the expansion of capacity increases the price of every kWh delivered by at least 3.0 cent. To realize the phase-out of nuclear energy by 2022, we have to replace the lost capacity in the most economic, fast, and conflict-free manner possible. The key is energy efficiency: Ten nuclear power plants can be “avoided” in Germany by implementing energy efficiency measures for electricity. The CO_2 emissions of additionally required conventional power plants can be compensated by energy efficiency measures for fossil fuels.

3 See Hennicke, Peter et al. (2012): The energy transition one year after Fukushima; DENEFF and Wuppertal Institute (2011): Ten-point immediate action program – cost-effective and fast phase out of nuclear using energy efficiency; Regulatory Assistance Project; The CO-Firm; the precise amount of the “decicent” depends on the scope of learning experiences with energy savings and the composition of the meaures, and the energy source saved.

Sidebar 1: High “quick win” potential with energy efficiency

Ten concrete immediate actions in the areas of electrical efficiency and heat efficiency could, according to a study by DENEFF and the Wuppertal Institute, save at least 68 TWh of electricity each year by 2020 compared to the baseline. This correspondents to the annual production of more than nine nuclear power plants. In addition 155 TWh of heat can be saved by 2020 which compensates for the CO2 emissions of at least nine conventional fossil fuel combustion plants by heat efficiency measures. The study identified efficiency gains that can be realized with a range of quickly and easily implemented efficiency measures. The economically achievable total savings potential is far above the potential that can be realized with the ten concrete immediate actions.

Effects of ten concrete immediate actions in the area of energy efficiency



Source: DENEFF and Wuppertal Institute (2011): Ten point immediate action program – cost-effective and fast phase-out of nuclear using energy efficiency.

An increase in energy efficiency cannot only reduce system costs for energy but can also make a considerable contribution to other core functions of German energy policy:

Increase in supply security: In terms of energy policy, relying on energy imports from potentially unsecure regions is a risk, which requires careful handling. Energy efficiency in the electricity and heat sectors reduces energy consumption and thus the reliance on energy imports and the risk of supply gaps.

Assurance of energy affordability for citizens: In sociopolitical terms, increase in "energy poverty" has to be stopped. Energy efficiency reduces the social system costs for energy and thus cushions energy price increases. At the same time, energy cost savings can help to secure the available income of the energy user. Together with intelligent guidelines for increasing energy efficiency, particularly low-income groups can benefit.

Boosting business competitiveness and technological leadership: Sectors with high energy costs are particularly reliant on cushioning of energy price increases. An improvement in their own energy efficiency reduces the absolute energy costs of their business. With each new measure, the system's energy efficiency increases, further avoiding high expansion and construction costs and thus further reducing energy system costs.Both effects therefore interact to increase the competitiveness of businesses within Germany. This applies particularly to energy intensive businesses. At the same time, the increasing demand for energy efficient products is associated with innovative pressure that can result in the development of highly efficient solutions. This dynamic supports the technological leadership of Germany in international markets and strengthens the exports of the energy efficiency sector.

Job creation: Far more than the construction of new power plants and grids, the labor-intensive energy efficiency growth market creates a number of jobs in the long term across all areas of training and qualification levels. The multiplier effect of each job created in the energy efficiency sector is estimated at a factor three to four, creating additional jobs in other sectors of the economy.[4]

Achieving climate protection targets: A drastic reduction in greenhouse gas emissions is necessary to achieve climate targets and to ensure Germany's contribution to effective climate protection. This is even more relevant after the decision to phase out nuclear energy. Increasing energy efficiency also reduces the use of fossil energy sources and thus makes a considerable contribution to climate protection.

4 See: The Regulatory Assistance Project (RAP) (2011): Rethink and Reframe "Energy Efficiency Obligations"

All these positive effects associated with energy efficiency will help to ensure that the energy transition achieves broad acceptance in the society in the long term: Implementation that is minimally invasive and cost optimized for citizens, the economy, and the environment is essential to ensure that the majority of those involved continue to welcome and support the "energy transition," the enterprise of a century. The widely felt positive effects of an increase in energy efficiency contribute to this.

The European Union (EU) has recognized the key potential of energy efficiency and in 2007 agreed to a non-binding primary energy savings target of 20% by 2020 under the German EU Council Presidency. However, there is currently an implementation gap of 11% in the EU overall and of 12% in Germany.[5] To close this gap, the requirement for energy savings obligations of 1.5% of the final energy consumption of a defined period of time in the member governments as formulated in Article 7 of the EU Energy Efficiency Directive could make an essential contribution.

Nevertheless, independent of possible targets and resolutions by the EU, **it is common sense to create an instrument for Germany that encourages energy efficiency gains using a binding, relative savings target in the order of at least 1.5% per year**[6] **of the final energy supplied to the end user in a defined period of time** in order to adequately address energy policy challenges.

5 See: PRIMES projection and reference scenario for Germany 2020, in: European Commission DG-ENERGY (2009): Energy trends to 2030 – Update 2009. Calculations by DENEFF.

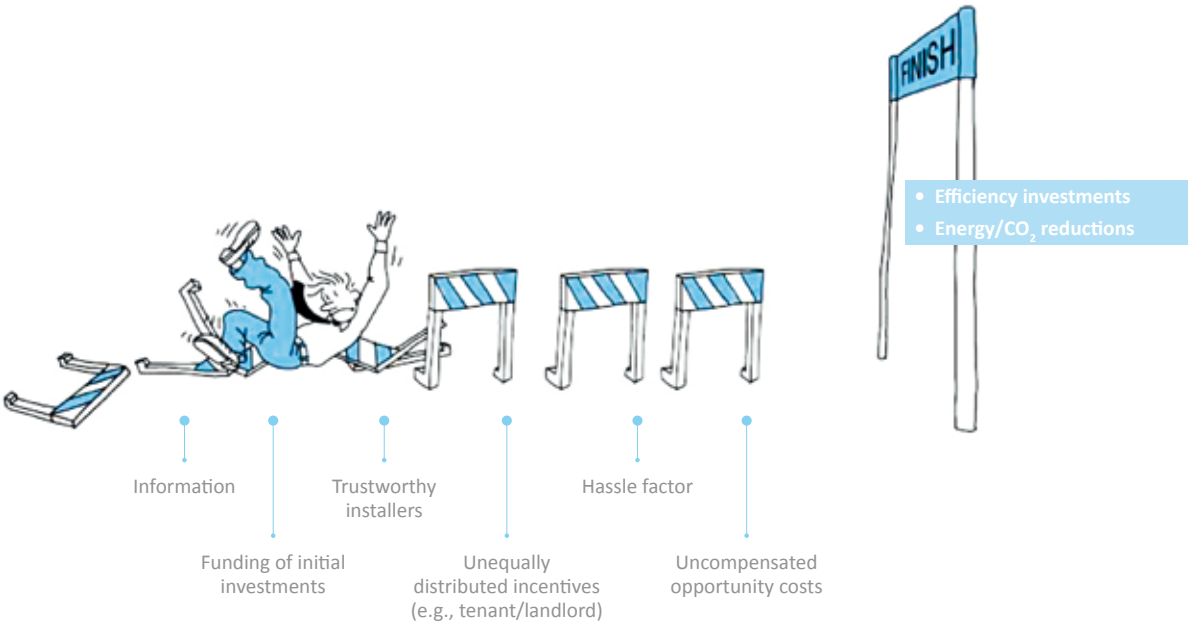
6 Economic growth is not affected by the relative, non-absolute target. The energy savings target corresponds to the sought-after increase in energy productivity.

Market failure requires government intervention – not bureaucracy

"If energy efficiency investments are so economical, why doesn't the market develop them itself?" The reason the economic energy efficiency potential has only been haltingly developed to date is market failure: Despite steadily increasing energy prices, many economic energy efficiency measures have not been implemented. Private and commercial energy users face a whole range of market barriers. These include insufficient knowledge of and lack of transparency regarding opportunities for potential optimization and implementation, difficulty obtaining information about costs and payback times (particularly for complex optimization projects), and a lack of trust in the suppliers of energy efficiency services. To further complicate the matter these market barriers often occur in combination. In addition, those parties that fund and implement the measures do not necessarily benefit from them. A classic example is deep retrofits in rental properties: The house owner who organizes and pays for the optimization currently gains no practical benefit from the reduced energy bills of the tenants. The possible increase in value of the building is usually not sufficient as incentive for implementation of larger scale measures requiring greater investment. Correspondingly, other investment alternatives are often more attractive, and many economic energy efficiency measures are obstructed by private and commercial energy users. Energy efficiency must therefore become convenient and attractive.

Where there are market failures, the common good suffers. In critical cases, intelligent government intervention is needed. Because of these market failures, the many benefits of increasing energy efficiency are currently not realized. In this case, government intervention does not equal a planned economy, but rather fulfills core governmental functions in

Figure 2: Various barriers to economic energy efficiency investments lead to market failure



Source: The Regulatory Assistance Project (RAP) (2011): Rethinking and redesigning energy savings obligations.

Germany's social market economy. A policy-based market incentive instrument, in this case an energy efficiency incentive scheme with a binding target and a responsible agent, ensures that market barriers are reduced or eliminated. Thus, economic investments in energy efficient equipment and plants as well as building and conversion of buildings actually occur.

However, government intervention also involves risks. Excessive bureaucracy leads to inefficiencies as well as high expenses for private and commercial energy users, for example, because of complex application procedures or complicated funding requirements as well as a lack of market orientation and flexibility. The consequences include lost market opportunities, while innovations in the energy efficiency market fall far behind their potential. A funding approach based solely on subsidies delivered by government-controlled programs can cause market distortions and put a strain on government budgets.

The political instrument selected for realizing an energy savings target should **minimize risks associated with government intervention.** It should offer latitude for market-based, efficient solutions and require the least possible level of bureaucracy. This prevents market distortions and creates the proper stimuli for effective and cost-optimized energy efficiency programs.

A range of agents, such as the German Sustainability Council and an expert opinion commissioned by the Federal Ministry of Economics confirm that both a strategic framework that allows for complementing individual energy efficiency measures and new instruments are required.[7]

The current market failure demands government intervention. **The government should create a new, intelligent regulatory framework for increasing energy efficiency and allow the market to manage the rest within this framework.**

7 See: Council for Sustainable Development (2012): The energy transition needs a binding and effective energy efficiency policy – Recommendation of the sustainability council to the government; Fraunhofer, Ecofys, Öko-Institut (2012): Cost/benefit analysis of the introduction of market-oriented instruments to realize final energy savings in Germany; final report to the Federal Ministry of Economics and Technology (BMWi).

Sidebar 2: Analogy – monetary control by the central bank

In an article in the Financial Times Deutschland, Meg Gottstein, Director of the Regulatory Assistance Project (RAP), compares the necessity of political intervention to implement energy savings obligations with the necessity of monetary control by the central bank. She explains that setting up the independent "central bank" by Ludwig Erhard acknowledged the need to control the increase in the volume of money in circulation in relation to the increase in productivity to ensure prosperity and growth. She compares scarce energy units with a currency for energy service providers.

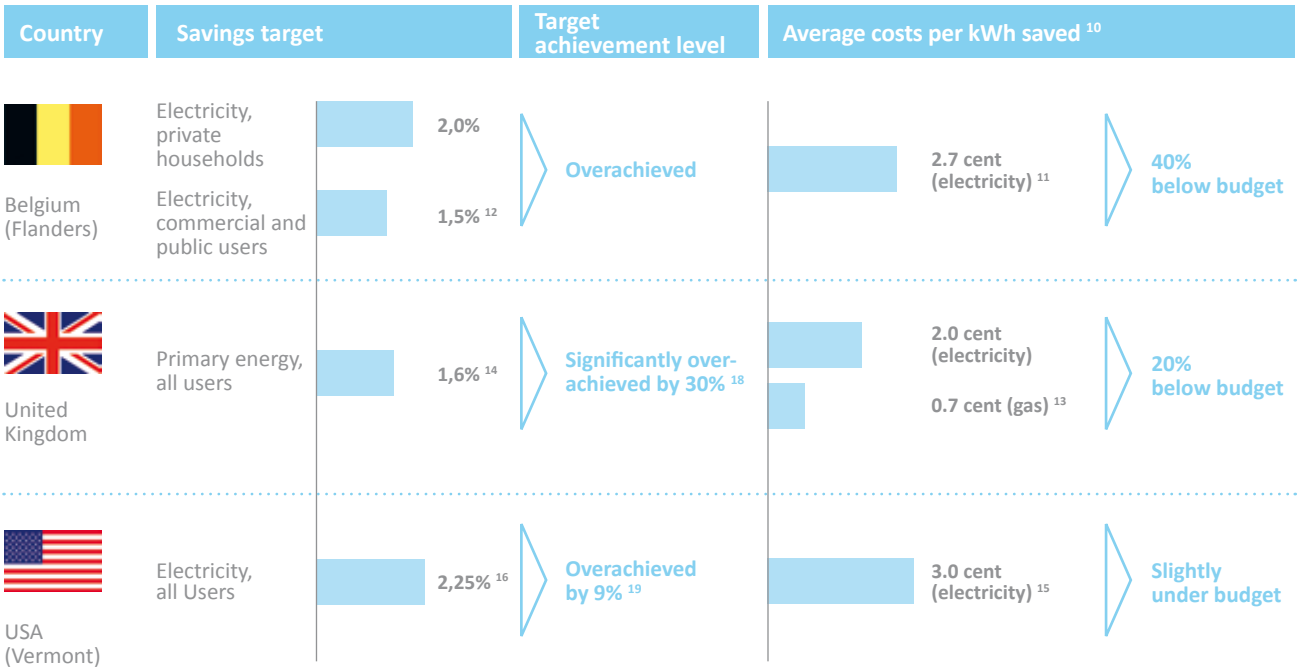
An energy savings target of 1.5% per year (e.g., referring to the previous year's consumption) does not in any way correspond to quantitative limitation of economic growth, but rather to the sought after annual growth in energy productivity. In analogy to monetary control, a responsible agency would also leverage a budget (part of the energy efficiency incentive scheme) to ensure that market barriers are overcome, growth is encouraged and incentives for private investments are put in place – with positive effects on prosperity for all.[8]

8 See: Meg Gottstein in: Financial Times Deutschland (2/29/2012): "What would Ludwig Erhard say?"

Other countries have already created innovative energy efficiency markets by creating intelligent frameworks and selecting suitable agents

Several governments have encountered the problem of market failure in the energy efficiency sector. The realization of energy efficiency potential has been enabled through creation of a regulatory framework. **In such diverse countries and regions as Great Britain, Flanders (Belgium), and Vermont (USA) existing energy savings obligations have been used for years to achieve savings targets in the order of 1.5% per year and more.**

Figure 3: Successes of the energy efficiency models of other countries and regions [9]



Sources: World Energy Council (2008): Energy Efficiency Policies around the World: review and Evaluation; United Kingdom Department of Energy & Climate Change (2011): Energy Consumption in the UK; ACEEE (2012): State Energy Efficiency Policy Database, online: http://www.aceee.org/sector/state-policy/vermont; Efficiency Vermont (2010): Success Stories and Performance und (2009): Annual Report 2008.

9 Different reference years because the material has been drawn from different sources.

10 Indicative; based on assumptions by the World Energy Council for Flanders (Belgium) and Great Britain.

11 According to the World Energy Council, includes one-off costs.

12 2008, based on previous year's consumption.

13 2002-2005; according to World Energy Council, total costs for society

14 Annual, mid 2005 to mid 2008; absolute savings target of 62 TWh or 130 TWh for both periods converted to the annual consumption in 2004 or 2008.

15 2010, based on an annual consideration of the costs and savings of Efficiency Vermont; total social costs; information in euro cents, currency conversion based on average exchange rate for 2010 (Oanda).

16 Annual, 2009-2011; corresponds, according to the ACEEE, to the absolute savings target of 0.36 TWH final energy for the period 2009-2011, focusing on electricity according to Efficiency Vermont.

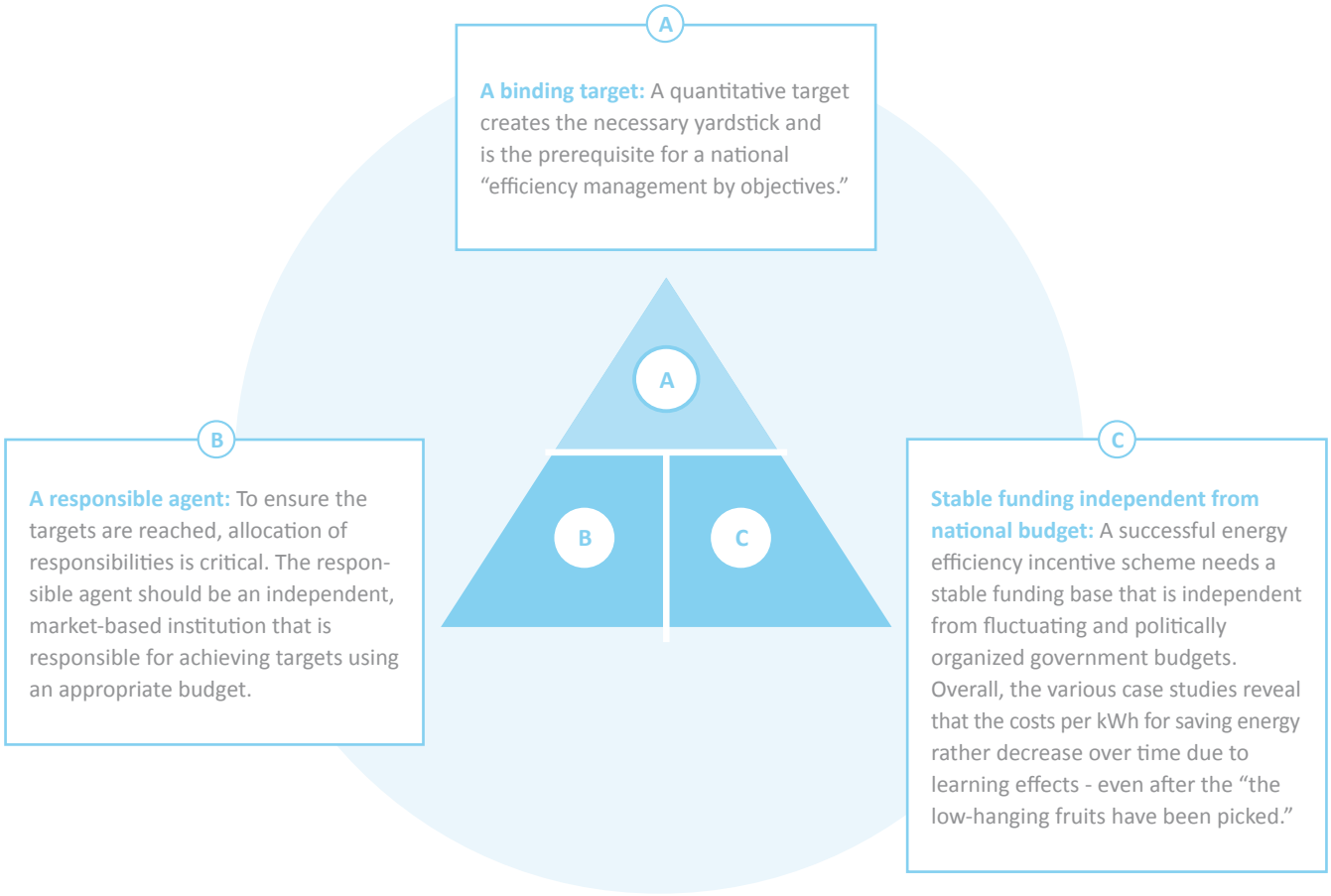
17 Status: 2005

18 2002-2005

19 2008

The successful models for energy savings obligations in other countries and regions are not identical. They teach us, however, that there are three factors needed for success to which special attention must be paid when designing the scheme:

Figure 4: Success factors for models of energy savings obligations



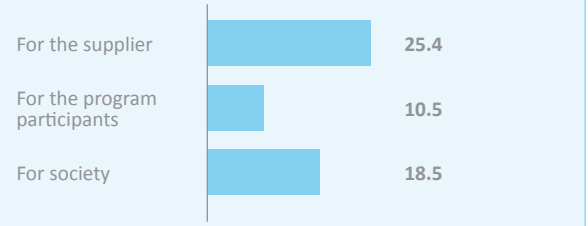
These three success factors enable a market-oriented system of energy savings obligations. In each of the countries and governments studied, different configurations of this system were applied, building on the specific market feaures and the regulatory environment.

For the design of a model for energy savings obligations **in Germany, the following applies: The three success factors must be considered in the system design, but their precise configuration should be determined by the specifics of the German energy market.**

Sidebar 3: The benefits of an energy efficiency program – an example from Texas

Austin Energy is an energy supplier in Texas. The target against which its energy efficiency programs are measured is, amongst others, a reduction in the increase of the peak load by 20%. One of the programs in the portfolio of Austin Energy is the Green Building Program, which aims to increase the energy efficiency of new buildings and existing building stock. In this program a saved kWh costs only 0.78 EUR-cent.[20] The program saved about 16,500 MWh in 2010. The benefit of the program, which Austin Energy determines as a form of capital value [21] for this program, is clearly positive from a number of perspectives:

Capital value of the "Green Building Program" (in million euro) [22]



Source: Austin Energy (2011): DSM Performance Measures – Fiscal Year 2009-2010.

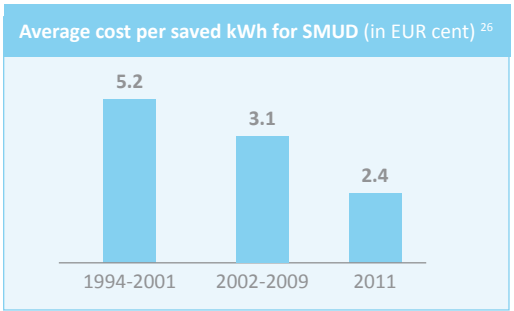
Excursus 4: A Californian municipal utility gains with energy efficiency programs

SMUD

In California all energy suppliers are obliged by law to charge energy users a fee for energy efficiency. The fee is 0.37 cent per kWh [23] of the electricity consumption [24] and is used to fund energy efficiency programs, investments in renewable energies, and research and development. A Californian municipal utility with a large and successful efficiency program portfolio is SMUD (Sacramento Municipal Utility District). The energy efficiency programs have proven profitable for the municipal utility because SMUD buys 50% of its energy – and as expected, generally at higher costs than self-generated energy. The following principle applies: The higher the energy efficiency level achieved, the lower the municipal utility's net costs per purchased kWh.

SMUD undertakes energy efficiency measures alone as well as in cooperation with a number of partners, including consulting engineers, architects and chain stores. The measures are geared towards public, private, and commercial users. The costs of the energy efficiency measures, their savings performance, and their cost effectiveness are monitored by a detailed oversight system. A saved kWh costs SMUD 2.40 cent on average [25]. Over time costs per saved kWh have decreased:

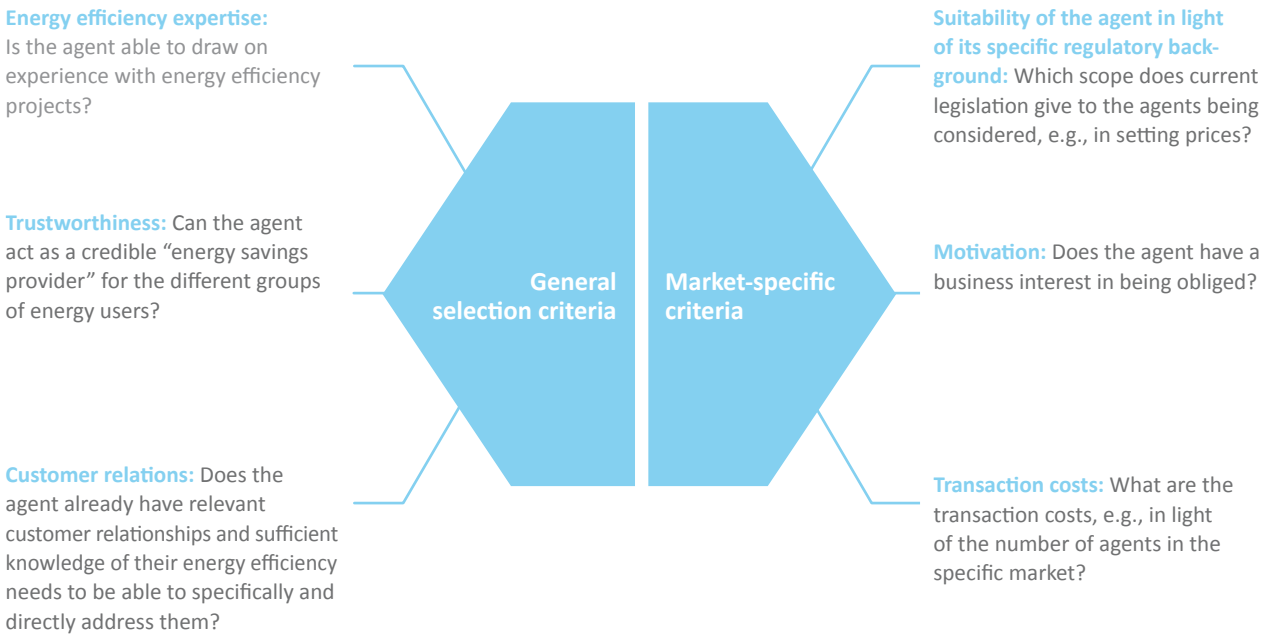
Average cost per saved kWh for SMUD (in EUR cent) [26]



Source: SMUD (2012), ACEEE (2012): Government Energy Efficiency Policy Database; website: http://www.aceee.org/sector/government-policy/california.

Selecting the "correct" responsible agent is critical for success and depends on the particular framework conditions.
The choice of agents of different types across economies has actually already resulted in the creation of innovative efficiency markets. Energy suppliers (e.g., in Great Britain), distribution system operators (e.g., in Denmark) [27], and independent, market-based businesses (e.g., in Vermont) have already been contractually or legally committed. The choice of agent should comply with general and market-specific selection criteria as shown in Figure 5:

Figure 5: General and market-specific criteria for selecting the responsible agent



Source: The CO-Firm, stakeholder Interviews

20 Information in euro cents; currency conversion based on the average exchange rate for 2010 (Oanda)

21 To determine the capital value, in this concrete example the total benefit was first added to the total benefit as the sum of all savings in operation and maintenance of the equipment and plants concerned. All additional costs for the energy efficiency measures, that is, the sum by which the costs of the measures the costs of conventional equipment or plant investment was then subtracted. The remaining funding stream was discounted – with an interest rate of 5% for the public sector and with 7% for the participants in the program.

22 Information in euro; currency conversion based on the average exchange rate for the financial year for Austin Energy 2010 (October 2009-September 2010) (Oanda).

23 Information in euro cents; currency conversion based on the exchange rate for the reference day 4/15/2012 (Oanda)

24 A surcharge is also levied on natural gas, which funds energy efficiency programs and other public programs.

25 Information in EUR-cents; currency conversion based on the average exchange rate for 2010 (Oanda).

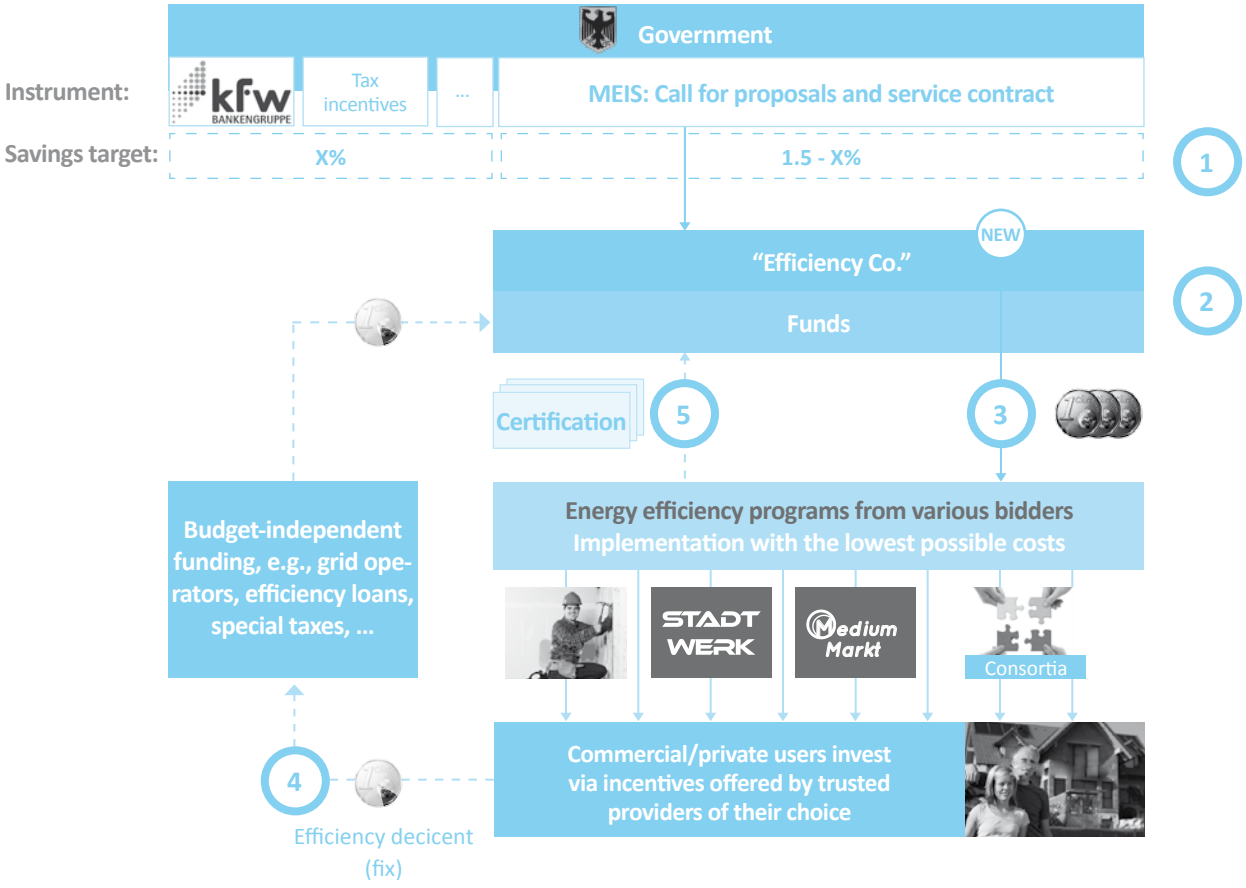
26 For period 1 average exchange rate for 1998-2001 (no details available for 1994-1998), for period 2 average exchange rate for 2002-2009, for 2011 average exchange rate for 2011 (Oanda).

27 Municipal utilities operate the distribution networks in their region in some cases.

Proposing a solution for Germany: The market-based energy efficiency incentive scheme (MEIS)

The central question addressed by this paper is how an intelligent energy efficiency incentive scheme can be developed specifically for Germany in order to promote systematic savings of final energy. Based on analyses of the international examples (and their various configurations), consideration of the framework conditions of the German energy market, and workshops and discussions with key stakeholders (including the energy industry, commercial and private energy users, scientists, and political decision makers), the following proposal for a **market-based energy efficiency incentive scheme (MEIS)** was developed.

Figure 6: Functional logic of the MEIS



Source: DENEFF Workshop, 1/30/2012.

1 Specify a clear target and provide numerous options for realization

Design: The government is obliged to implement a long-term energy savings target, e.g., an average of 1.5% per year based on the consumption of final energy in a defined period delivered to end users (relative target). All existing programs aimed at increasing final energy efficiency can contribute to this. The government will continue to realize part of the target through its own programs such as tax incentives for upgrading the energy efficiency of buildings. The magnitude of the share of the target ("X%") that can be realistically, effectively and efficiently covered by the government must be defined. The remaining share of the savings ("1.5-X%") will be tendered in therms of the amount of kWh to be saved.

Reason: This model combines planning reliability with high flexibility. A binding target for Germany ensures that the indicative targets of the EU and the German energy plan can actually be achieved. It also creates planning security for the economy and for consumers. Responsibility for achieving the target and associated risks remain with the government. Sub-targets are transferred to commercial agents by calls for tender, that is, on a contractual and therefore voluntary basis. The contribution made to achieving the target by government programs will be fully recognized equivalent to the savings put out to tender and achieved by the market. This "mixed calculation" is sensible because government programs such as subsidies from the Kreditanstalt für Wiederaufbau (KfW), future tax incentives or other direct subsiders are usually more appropriate than market-based programs for stimulating measures that require large investments and have long payback periods.

Government assistance could be directed toward extensive and ambitious building weatherization programs. On the other hand, government programs make less sense for initiating or managing fragmented, smaller measures with short payback times. The same applies for programs that are greatly dependent on the environment, e.g., a program for efficient air conditioning units during a very hot summer. Innovative approaches or expansion of novel energy efficiency areas – say, in the agriculture sector – are more easily developed and realized using market-based programs. In all these cases, calls for tender to initiate market-based solutions are appropriate. Here, it is important to note the lessons of past experience: Ideally, the targeted savings should be defined as a mean over a given period, say, three years. This helps to smooth out fluctuations caused by the economy and weather, and allows for learning effects.

2 Tender the role of the responsible market agent ("Efficiency Co.")

Design: The savings quantity that cannot be (cost) effectively addressed by public programs is to be put out to tender by the government as the quantity of kWh to be saved ("1.5-X%"). The tender is awarded to a private-sector agent or a consortium of agents that can plausibly provide the coordination and management of the program and achieve the targets for the lowest costs ("Efficiency Co."). Every three years this role is to be reviewed and potentially put out to tender again.

Reason: This procedure will ensure that the tender and budget are awarded to an agent that in terms of its substance, organization, and reputation is considered most suitable and is highly motivated to achieve the savings in the most cost-effective manner. This new, independent, and private-sector agent is subsequently referred to herein as the "Efficiency Co." This specific actor does not yet exist in Germany, and could develop as in other countries or regions, i.e., Vermont (US). It could also form out of a consortium of several large businesses. "Efficiency Co." will act as a central coordinator and manager and also potentially as a competitive provider of energy efficiency programs.. The contractual commitment of "Efficiency Co." to achieving the targets should be supported by a bonus in case of overachievement and a penalty culminating in cancellation of the contract in case of underachievement. This is a typical market economy tool and also minimizes the risk of excessive bureaucracy.

Sidebar 5: A responsible, non-governmental energy efficiency agent in Vermont

Efficiency Vermont

In Vermont there has been an energy efficiency system in place since 1999 with an independent, non-governmental organization as the responsible agent. In a competitive tender process this provider of efficiency services, Efficiency Vermont, has won an energy savings target and a corresponding budget financed by funds. The funds that finance the energy efficiency programs are raised by a minimal surcharge [28] on the prices of electricity and gas for all energy users. Efficiency Vermont is responsible to the government regulatory board for reaching its targets, and fulfillment has financial incentives – bonuses for overachievements and penalties for failing to reach the target. The success of this arrangement has been considerable: Currently, an annual energy savings target of ~ 2% of the annual electricity consumption is being achieved.

Source: ACEEE (2012): Government Energy Efficiency Policy Database; website: http://www.aceee.org/sector/government-policy/vermont. (last accessed: 5/29/2012); Efficiency Vermont (2008, 2009, 2010, 2011, 2012): Internal Annual Evaluations; Website: http://www.efficiencyvermont.com/for_my_business.aspx.

28 Currently 0.4 to 0.7 EUR cent per kWh, depending on the type of user.

3 Activate numerous actors in order to harness the creativity of the market

Design: "Efficiency Co." in turn invites public tenders itself for annual sub-budgets (the highest offered quantity of energy saved wins) or partial energy savings (the lowest cost offer wins) in particular sectors, e.g., private households or small and medium-sized businesses. The tender is awarded to the most cost-effective and best programs. Many different agents can participate in the tendering process with their ideas and approaches, e.g., energy suppliers, municipal utilities, hardware stores and electronics stores, and more unusual providers such as bonus programs and providers of customer loyalty card systems.

Reason: In this way the system will inherently drive innovation and optimization. Furthermore, the distortion of competition and market power that disadvantage certain provider groups, such as independent energy service providers, small businesses, and sole traders, can be avoided. The aim is to find the most cost-effective kilowatt-hour saved and to harness the creativity of the market in doing so. As an alternative approach, other energy policy targets, such as combating energy poverty, could also be addressed by specifically customizing the tender accordingly – in agreement with the government as the contracting authority for "Efficiency Co."

4 Ensure stable, budget-independent funding

Design: The budget of "Efficiency Co." for initially addressing market barriers is to be financed using a new efficiency fund. The fund is to be raised independent of the budget, for example, by an "efficiency decicent" [29] on the energy bills of energy users or new approaches such as government efficiency loans. The precise financial resources of the fund depend on the quantity of kWh tendered out and the expected costs per kWh saved.

Reason: This cost covering mechanism is particularly sensible and fair because all energy users profit from improvements in energy efficiency. Even if they do not implement any measures themselves, the expansion of capacity, grids, storage, etc., would have entailed significantly higher costs for users in the absence of the program. The financing surcharge cannot increase substantially because this rate is restricted by the contract with the bidder. There is a double benefit if an energy user takes part in one of
the new programs: falling system costs and falling consumption which pays off on the user's own energy bill. True to the principle of implementing the saved kWh as cost effectively as possible, users only bear costs that are absolutely essential as an incentive for the various measures. Incentives can take many forms – for example, a €50 voucher for replacing a used refrigerator with a modern and energy efficient model. With increasing experience in administering energy efficiency programs, the costs also fall over time thanks to learning effects, as demonstrated by international experience.

29 Order of magnitude; dependent on the range of the learning experiences, the composition of the measures, and the energy sources saved.

5 Efficiency evidence must be collected robustly and without bureaucracy

Design: "Efficiency Co." must reach the mandatory targets and demonstrate this robustly. Compliance with the targets should be continuously monitored by "Efficiency Co." using an intelligent and transparent oversight system. The complexity of the evidence for each measure and program will depend on the size and complexity of the measures carried out. For simple standard measures, such as replacing refrigerators or insulating the ceiling on the top floor of buildings, standard catalogues should apply, such as those currently available in various countries. For larger projects, such as energy optimization of an airport terminal, calculations and measurements are to be made by independent experts, as is already the case in most instances. For large energy users, the existing balance group management between grid operators and businesses can be used to facilitate verification procedures. Evidence is recorded by the executing agents and collected and evaluated centrally and electronically by "Efficiency Co.". If required, the program portfolio can be flexibly readjusted. Regular sampling and field trials will monitor the assumptions in the standard catalogue as well as test standards that are used in the large projects. All evidence should be submitted at regular intervals to the government. Savings over the entire lifetime of the measures should be allowed for in the year of implementation or within a three-year period. This is important in order to make measures such as insulating external walls attractive.

Reason: A balance must be struck between ensuring the most accurate evidence of savings and the lowest possible bureaucratic and transaction costs. Too much effort spent recording evidence generates new barriers to implementation while too little monitoring may allow abuse. What is essential is evidence of the professional and correct implementation of additional savings measures and a learning system that can be continuously improved using acquired market knowledge. This will ensure the needs of energy users are specifically and cost-effectively covered. We can draw on international experience [30] when developing measures and existing international protocols [31] when evaluating these measures. The expected expansion of smart grids and applications will increase monitoring precision at little additional expense.

Figure 7: Results from a brainstorming session at the expert workshop: "Trusted Party" is the starting point

30 D. Staniaszek, E. Lees (2012): Determining Energy Savings for Energy Efficiency Obligation Schemes

31 Coordinated calculation methods, e.g., US EPA (2012): State and Local Climate Program; Website: http://epa.gov/governmentlocalclimate/government/activities/MEISuring-savings.html (last accessed: 5/29/2012).

The potential of the MEIS: Competition for the best ideas in an intelligent regulatory framework

The MEIS combines the optimum of two worlds: the necessary government intervention and the power of the market. On the one hand, establishing an effective regulatory framework for the MEIS by policy makers will effectively address many market barriers. On the other hand, the scheme harnesses the creative potential of the market because of the central role played by market dynamics and competition. This will ensure cost effectiveness, flexibility, and innovation. The market side of the scheme reaches the limits of its potential in situations where energy efficiency investments have very long payback periods or where the payback periods cannot even be calculated. Government programs must continue to be used under these circumstances.

The social and economic potential of the MEIS:

Compared to other measures to facilitate the transition to a sustainable energy economy, energy efficiency potentials can be realized quickly and with broad acceptance. They also minimize the construction of additional power plants, storage solutions, grids, CCS solutions, etc.

The expansion of the market for labor-intensive energy efficient products and services creates jobs. This effect has been estimated as being greater than the effect associated with the expansion or construction of grids and power plants, as direct and indirect new jobs are created sustainably across all career sectors. At the same time, it is expected that competitive German efficiency solutions will also find a market abroad. These exports and reduced energy imports will have positive effects on Germany's balance of trade.

Decreasing total costs for the energy system will lower the energy costs for all energy users. This will allow energy poverty to be combated indirectly and directly. Furthermore, active users benefit further from an absolute reduction in their energy bill.

Measures to increase energy efficiency also make a considerable contribution to achieving German energy targets. As was recently identified in an expert report commissioned by the Federal Ministry of Economics and Technology, [32] additional instruments are needed to meet the savings targets set forth in the German energy plan and at the European level. Encouraging energy efficiency using the MEIS can be such an instrument.

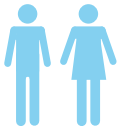
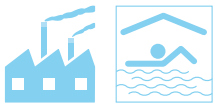
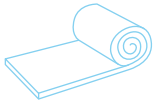
The MEIS enables an increase in energy efficiency with minimal costs – costs that actually decline over time as a result of learning effects. At the same time, the MEIS does not place any additional burdens on government budgets. Existing successful government programs to encourage energy efficiency can be continued as part of the MEIS.

32 Fraunhofer ISI, Ecofys, Öko-Institut (2012): Cost/benefit analysis of the introduction of market-oriented instruments to realize final energy savings in Germany; final report to the Federal Ministry of Economics and Technology (BMWi).

The potential offered by MEIS for users and providers of efficiency solutions thanks to the effective removal of market barriers

A diverse group of agents will benefit directly and indirectly from an increase in energy efficiency in Germany. Figure 8 provides a summary.

Figure 8: Benefits for energy efficiency users and providers in the MEIS

USERS	**Private consumers** 	• Significantly reduced search costs thanks to individually tailored efficiency solutions delivered "free to the door" by trusted providers • Offers for specific target groups such as low-income households • Increasing quality of life thanks to more convenient and new applications • Higher available income thanks to decreasing system costs and consumption (no more "second rent payment" to cover utility costs)
	Commercial and public energy users 	• Significantly reduced time spent searching and evaluating thanks to customized efficiency offers tailored specific to operating requirements • Reduction of costs thanks to decreasing energy costs • Better energy transparency as motivation and basis for further reductions in consumption • Balance-neutral solutions thanks to third-party financing become more attractive • Instrument for employee motivation and marketing
PROVIDERS	**Manufacturers of energy efficiency products** (e.g., heat pumps, insulation, lighting systems, boilers, etc.) 	• Significant growth in competition, but also of the market • Export opportunities for top runner applications • Incentive for further innovation (R&D) • Planning security and growth potential mean the energy efficiency sector will become an industry of the future
	Providers of energy efficiency solutions to the end user (e.g., energy suppliers, businesses, trades, service providers, etc.) 	• Increasing loyalty from existing customers and attracting new customers • Opportunities for new business models and startups • Creation of a common starting position for all efficiency providers (no efficiency monopolies) • Qualification incentives for trades and consultation and development of high-quality training and certification programs

The limitations of the MEIS

The MEIS encourages the realization of efficiency potential by harnessing market forces. By reserving a certain percentage of the energy savings target of 1.5% per year for government programs, the MEIS also enables implementation of measures with long payback times or with payback times that cannot yet be calculated.

Practical challenges for the MEIS include the implementation of purely informative measures or the encouragement of changes in behavior. The MEIS requires evidence of the savings realized, which for purely informative campaigns will be difficult to verify. Likewise, changes in behavior are not only difficult to accomplish via the market, but also their consequences are also not easy to evaluate in the long term. If these programs are to be integrated into a program under the MEIS, corresponding market offers would have to be created and the measurability of their effect ensured.

Different types of political intervention leave opportunities untapped

In the current discussion, two policy alternatives to the market-based energy efficiency incentive scheme in particular are being considered:

Alternative 1: Subsidies

The entire energy savings target is realized using existing and new government subsidy programs. One advantage of this solution typically mentioned is that no interest group is directly burdened or obliged – all taxpayers are asked to pay in accordance with their income or profit. A drawback that must be considered, however, is that there is neither cost competition nor adequate flexibility in this system. A market-based agent can, for example, quickly respond to a hot summer and set up an air conditioning and cooling appliance efficiency program. The market agent is also driven by economic interests and will try to choose the most cost-effective savings measures and keep administrative costs to a minimum. Without market dynamics, innovation fails to materialize. In addition, subsidies almost automatically create market distortions and significantly higher costs per kWh saved, which must in turn be borne by the taxpayer. It is to be expected that because of the reduced reliability of the system and the higher costs for savings compared to the MEIS, possible positive effects on the energy savings on the competitiveness of businesses and the labor market will be reduced and delayed. Thus, the system costs for energy in a subsidy-based scheme will likely remain higher in the long run than in the MEIS. This contribution to the energy transition and to achieving German climate targets will thus be more dearly achieved. Cost-effective and rapidly achievable opportunities in the area of energy efficiency can remain untapped.

Sidebar 6: Does the MEIS make existing subsidy programs unnecessary?

No, because the strength of, for example, the Kreditanstalt für Wiederaufbau CO_2 building efficiency program lies in the support it provides for extensive and high-investment measures with long payback times, which are still not implemented to a sufficient degree without subsidies. The market-based part of the MEIS, on the other hand, supports measures that are certainly economically valuable but which have not yet been implemented because of market barriers.

Alternative 2: Strict regulatory savings targets

In contrast to the intention behind Article 7 of the EU Energy Efficiency Directive, which specifies a relative energy savings target, a strict regulatory energy rationing could be implemented. Energy consumption could either be directly limited at the energy user or at the energy supplier. The advantage is that direct costs for the government are avoided. Unlike subsidies, clear requirements create planning security in both the medium and the long term. Many advantages of the MEIS can also be realized. However, the magnitude of the effects on jobs, exports, and prosperity that can be achieved depends on the specific design of the regulation. However, the mandatory limitation may restrict economic activity, at least in the medium term. In addition, a political intervention using a strict regulatory savings target barely addresses existing market barriers or even worsens them because of excessive regulation and the resulting acceptance problems. Socio-politically, those citizens already affected by energy poverty may, in such a system, even be more restricted in their access to energy.

Summary: Both alternatives are less attractive compared to the MEIS

Compared to these alternatives, the MEIS allows energy efficiency to be increased in Germany within an intelligent and reliable regulatory and budgetary framework. System costs for energy are kept low without acceptance being compromised by individual regulatory requirements and without limiting growth.

Sidebar 7: Learning from the experiences with the EEG levy

Unlike the levy for renewable energy that is part of the Renewable Energy Sources Act (EEG), costs for energy efficiency incentive programs are by definition covered by premiums that form the basis of the MEIS. With the EEG the cost burden for electricity users will continue to increase the more people make use of the feed-in guarantees. The cost coverage mechanism "efficiency decicent" [33] proposed in the MEIS as an add on the energy bill remains the same for each kWh used in the future, independent of the user's participation in energy efficiency measures. The more participants there are, the higher the social benefit of the MEIS. According to international experience, over time the costs per saved kWh will decrease. A fall in the fund volume as a result of decreasing energy consumption is thus compensated. A further difference lies in the fact that while the EEG entitles support over a long period, the energy efficiency fund provides a once-off initial boost to reduce market barriers while the benefit for society will persist.

33 Order of magnitude, dependent amongst other things on the magnitude of the learning experiences, the composition of the measures, and the energy sources saved (e.g., electricity versus gas).

Imprint

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