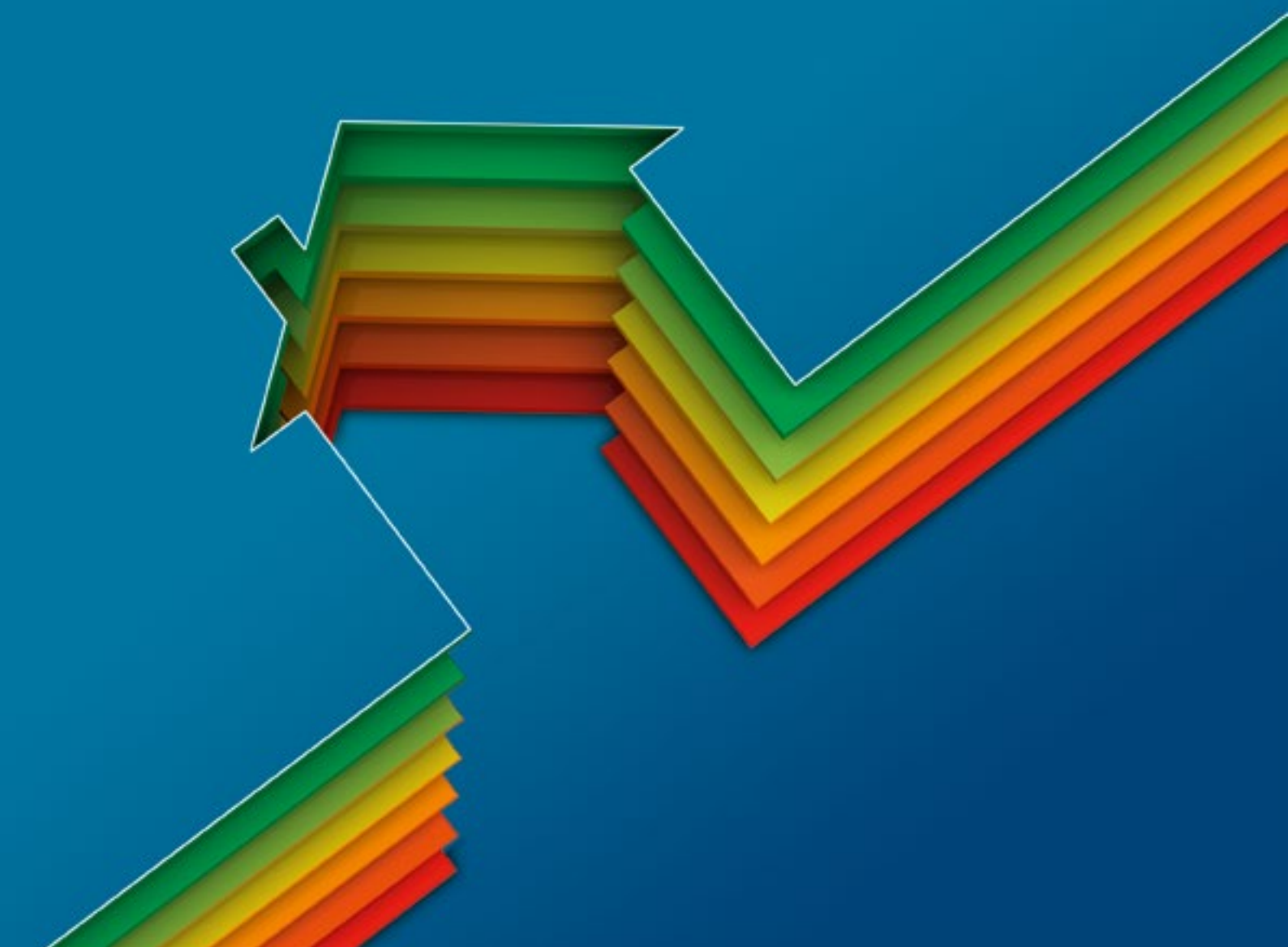
Federal Ministry
for Economic Affairs
and Energy

Energy Efficiency Strategy for Buildings

Methods for achieving a virtually climate-neutral building stock
– Short version –



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Introduction

With the German Federal Government's decisions on energy and climate policy of September 2010 and June 2011, Germany is embarking on a course towards a safe, efficient and clean future for energy supply.

Renewable energy is a central pillar of future energy supply. Energy efficiency is the second pillar of Germany's energy transition because the cleanest and cheapest energy is energy that is not in fact used.

With its National Action Plan on Energy Efficiency (NAPE), the Federal Government launched a comprehensive action package in December 2014. NAPE is an essential building block of the Federal Government's efficiency strategy in the present legislative term. It is instrumental for achieving the targets of the energy concept through energy efficiency.

With the Climate Action Programme 2020, the Federal Government launched a comprehensive action package in December 2014 in order to achieve the interim target for 2020, i.e. reducing greenhouse gas emissions by 40 percent compared to the 1990 level.

Buildings have a key role to play when it comes to meeting the targets of energy and climate policy because this sector accounts for around 35 percent of final energy consumption and around one third of greenhouse gas emissions in Germany. To this end, the Federal Government has set the ambitious goal of achieving a virtually climate-neutral building stock by 2050. This means that primary energy demand will have to be cut by around 80 percent against the 2008 level. In order to achieve this, demand for heating and cooling energy will have to be reduced significantly through suitable efficiency measures and an increasing share of renewable energy that covers remaining demand.

However, the Federal Government's climate protection goals can only be achieved if environment-friendly and climate-friendly building, energy-efficient neighbourhood and urban development, living and building issues as well as demographic change, along with energy efficiency and the use of renewable energy in the building and housing sector go hand in hand. This is the purpose of the "Energy Efficiency Strategy for Buildings" and of the "climate-friendly building and living" strategies to be developed within the scope of the Climate Action Plan 2050. The results of the "Alliance for Affordable Living and Building" (Bündnis für bezahlbares Wohnen und Bauen) and of the Energy Efficiency Strategy for Buildings will be considered here and additional options identified that can help to reduce emissions further. The "climate-friendly building and living strategy" is thus to become an important pillar of national energy and climate policy especially with a view to the goal of achieving a virtually climate-neutral building stock by 2050.

Today's large number of refugees is posing huge challenges for Germany. There is no doubt that this will raise demand for affordable housing even further. The challenge is to meet the needs of society as a whole. Rent hikes and serious bottlenecks on housing markets are frequently seen in many densely populated areas as well as large cities and university cities. Low-income households, but increasingly also households with middle incomes, are finding it difficult to find affordable housing. This translates into a demand for some 350,000 to 400,000 new homes. The current challenges do not justify compromising on the energy standards pursuant to the Energy Saving Ordinance (EnEV) and the Renewable Energies Heat Act (EEWärmeG). What is needed is affordable housing for all that meets high energy quality demands. Modern living space featuring a high level of energy efficiency must be available to all citizens including households with low and medium incomes. This applies to those who already live here and to those who are now coming and will stay here. Otherwise living space would be built which in just a few years would have to be seen to be outdated in terms of energy efficiency and therefore be less attractive. Especially low-income households often benefit from high energy efficiency levels which mean low heating costs.

The Energy Efficiency Strategy for Buildings is the strategy paper for the energy transition in the buildings sector and addresses both technical and energy aspects as well as first approaches or economic and, in the longer term, social interests of this area. It also deals with overarching aspects of energy policy, such as issues related to interaction between electricity and heat.

The Energy Efficiency Strategy for Buildings explores ways of achieving the goals of energy and climate policy in the buildings sector and covers both existing and new buildings. The Energy Efficiency Strategy for Buildings is thereby an important contribution for the development of approaches towards a climate-neutral building stock by 2050. It is based on the goal of achieving a virtually climate-neutral building stock by 2050 in line with the Federal Government's energy concept. This means that by the year 2050 primary energy demand of buildings will have to be reduced by 80 percent against the 2008 level through a combination of energy savings and the use of renewable energies. The building strategy maps the current state of knowledge and therefore cannot finally forecast developments by 2050. It is hence important that the Energy Efficiency Strategy for Buildings be dynamically adapted to new, even sector-spanning, results as part of monitoring efforts in conjunction with the energy transition. The Energy Efficiency Strategy for Buildings is embedded in the political overall context, most notably the debate on building and housing policy and the Climate Action Plan 2050. In view of its long-term horizon until 2050, it can address the current, short-term need for action to a limited extent only.

The Energy Efficiency Strategy for Buildings also triggers the discussion regarding digitisation and also involves important stakeholders. The Energy Efficiency Strategy for Buildings, for its part, is embedded in the European Union's energy efficiency policy.

Core aspects of the Energy Efficiency Strategy for Buildings – energy and climate goals: the buildings sector scenario

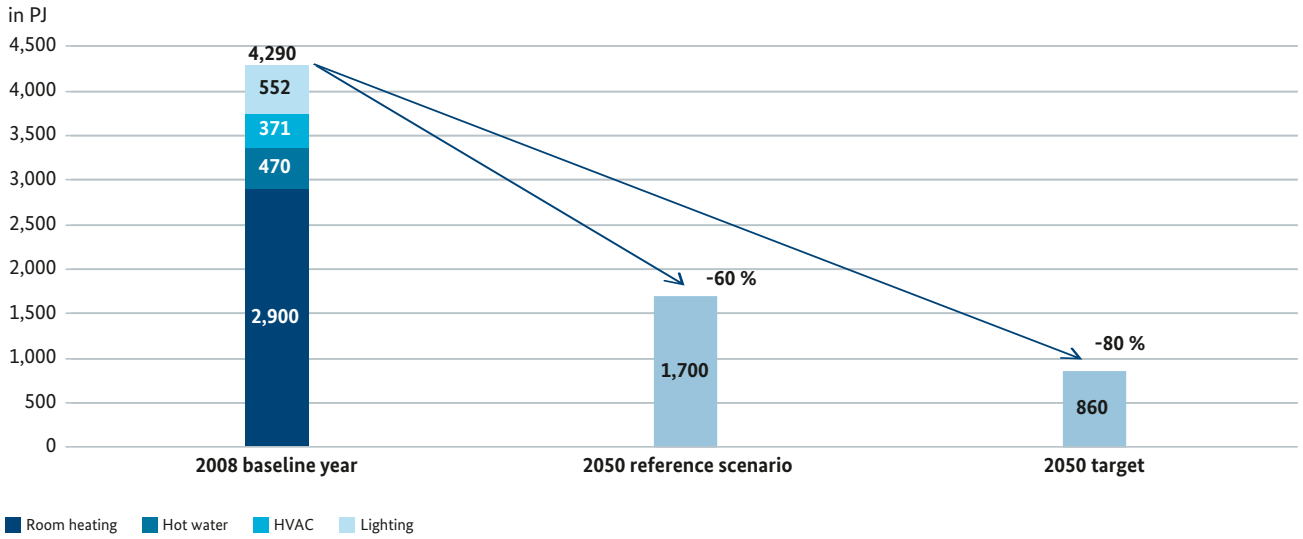
Current target achievement gap

The goal of achieving a virtually climate-neutral building stock by the year 2050 is ambitious, but not impossible. An expert reference scenario (Prognos et al. 2015) commissioned by the Federal Ministry for Economic Affairs and Energy forecasts that by the year 2050 primary energy demand will decrease by around 60 percent (against the year 2008) on the basis of the measures that have been adopted and introduced. In the reference scenario, these measures can increase energy efficiency by approximately 30 percent and the share of renewable energies to around 45 percent. Under the assumptions made here and according to the current state of knowledge, the gap to achieving a climate-neutral building stock by the year 2050 totals around 20 percent (approx. 800 PJ).

Discussion of a possible target corridor/ assumptions

In order to close the gap that will remain according to the current state of knowledge, it will be necessary to increase energy efficiency in order to reduce final energy consumption and to increase the share of renewable energies. Technical, economic and other potential exists for both pathways. In the run-up to the Energy Efficiency Strategy for Buildings, a research consortium was commissioned to model a virtually climate-neutral building stock by the year 2050 under certain specific assumptions and on the basis of the current state of the art and knowledge. This means that the scenarios commissioned are not an optimisation exercise under aspects of economic efficiency that covers all sectors. As a next step, the scenarios will then have to be

Figure 1: Primary energy demand resulting from the reference scenario and comparison with the target value in 2050



Source: Beuth University of Applied Sciences, Institute for Energy and Environmental Research 2015, Prognos et al. 2015

put into a general economic perspective. Due to interdependencies and use competition between the electricity, buildings, industry and transport sectors, it is possible that a scenario that leads to lower costs in the buildings sector may nevertheless lead to higher costs for the economy as a whole.

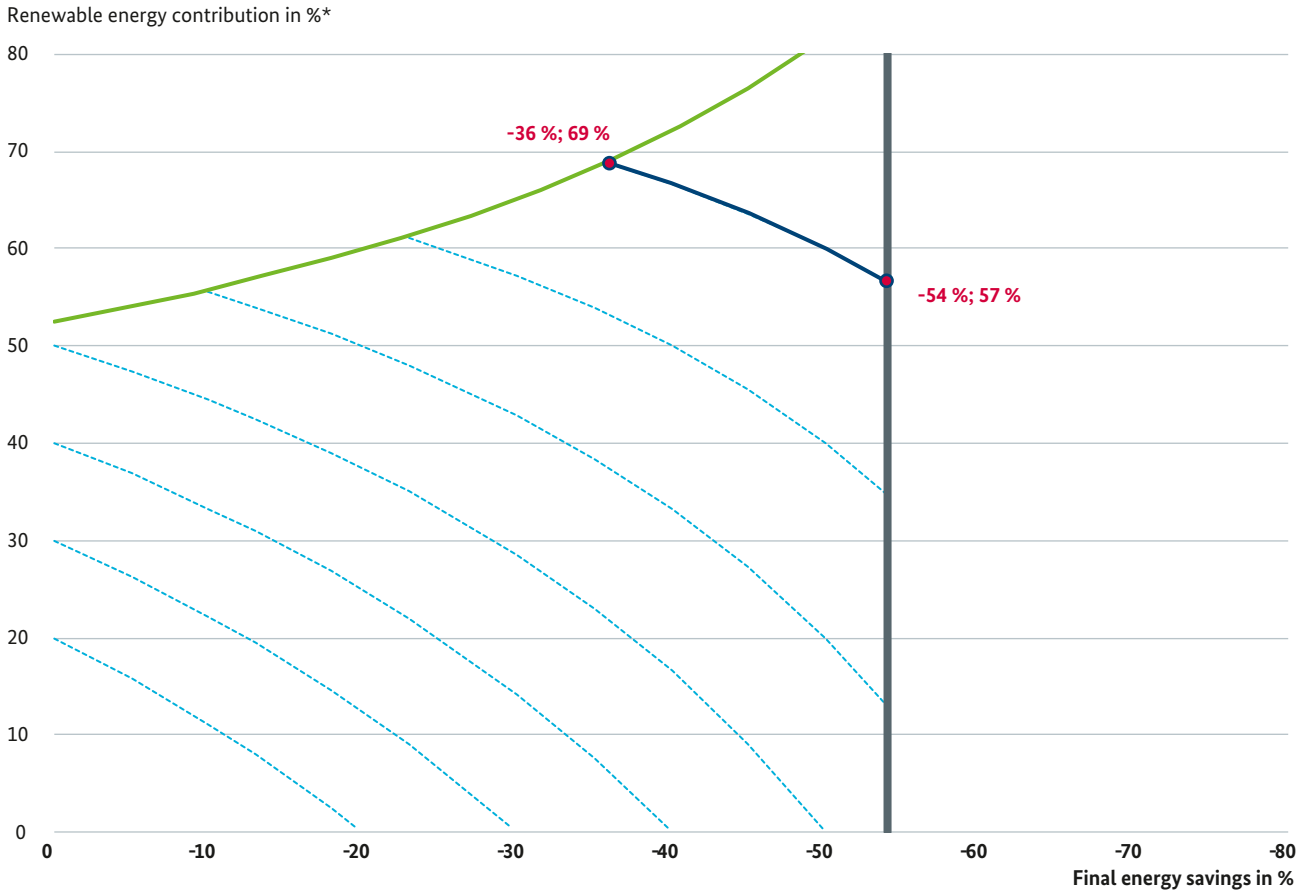
However, the results do consider infrastructure decisions as well as derived upper and lower limits regarding the use of different technologies and energy sources (Prognos et al. 2015). The scenarios considered show a forecast as to what the road to virtual climate neutrality of the buildings sector could look like under the assumptions made, and they also illustrate the challenges for building engineering and the possibilities of the buildings sector from today's perspective.

The scenarios ultimately show that a reduction in primary energy demand of German building stock in the order of 80 percent compared to the 2008 level is generally possible. At the same time, there are technical and economic restrictions and potential limits, for instance, for the use of renewable energies, so that there is a limit to the degree to which energy savings or increases in the share of renewable energies can be scaled up. These restrictions (calculated by the researchers) show the boundaries that define the corridor of possible paths for achieving the targets. In view of the existing restrictions, maximum energy savings of -54 percent could be achieved throughout the entire building stock by reducing primary energy demand by around 80 percent from today's perspective if the goal of the energy concept is met. The corresponding share of renewable energies in the buildings sector would then total around 57 percent. In the case of lower efficiency gains, the contribution by renewable energies could be increased to a maximum of 69 percent. The target of an 80 percent reduction in primary energy demand by the year 2050 could therefore be achieved within a corridor with two boundary areas that can be represented by two target paths as follows:

- **The "energy efficiency" target scenario**
  This scenario relies on an increase in energy efficiency through energy savings up to the maximum value of -54 percent that can be achieved from today's perspective and subsequently covers the remaining target achievement gap by using renewable energies with a share of at least 57 percent.

- **The "renewable energies" target scenario**
  This scenario primarily relies on the development of renewable energies up to the maximum potential limit of 69 percent in final energy consumption that can be achieved from today's perspective and subsequently covers the remaining target achievement gap by increasing energy efficiency through energy savings of at least -36 percent.

Figure 2: Result of the target corridor considering the restrictions modelled in the fields of renewable energies and energy efficiency/energy savings, Prognos et al. 2015
Reducing primary energy demand by 80 % compared to 2008 – corridor remaining due to the two restrictions



* The renewable energy contribution expresses the contribution towards a decarbonisation of the general energy supply.

Source: own diagram

The two target scenarios show that the **"energy efficiency" target scenario** will translate into a significantly lower electricity demand (413 PJ) in 2050 compared to today's level (2008: 506 PJ) so that the need to adapt the development paths for renewable energies in electricity generation is probably low. It should, however, be noted that the scenario could lead to higher nominal investment and use costs, at least for residential buildings (by an estimated 24 bn euros in 2050 compared to the reference forecast).

In contrast to this, the **"renewable energies" target scenario** leads to an expected slightly higher electricity demand in 2050 (approx. 524 PJ) which, when compared to the "energy efficiency" target scenario, would require adaptation of the development paths for renewable energies for electricity generation and influence the availability of renewable energies and the costs of decarbonisation in other sectors, but this scenario will probably lead to a moderate increase only in costs for residential buildings.

Analysis of the starting situation

Germany already boasts a wide range of tools for increasing energy efficiency and strengthening renewable energies on the heat market. With the immediate actions under the National Action Plan on Energy Efficiency adopted on 3 December 2014, additional immediate actions and more longer-term work processes to boost energy efficiency were triggered in a number of sectors including the buildings sector. This already means a major step towards achieving the energy policy target of the virtually climate-neutral building stock, i.e. reducing primary energy demand by around 80 percent against the level of 2008.

The established tools can be broken down into four categories as follows:

- **Information and consulting** (such as “on-site consulting” and “energy consulting for SMEs”, “energy consulting for municipalities”),
- **Incentives through Funding** (such as CO_2 building renovation programme – KfW programmes – and Market Incentive Programme (MAP))
- **Demand action** (such as the Energy Savings Ordinance (EnEV) and the Renewable Energies Heat Act (EEWärmeG) as well as
- **Research** (such as “EnOB – Energy-Optimised Building” and “EnEff:Energy-Efficient District Heating and Cooling Supply”).

Success stories are already visible in the buildings sector:

The energy consumption trend in buildings has been declining since 2008. The long-term trend since 2008 shows an average reduction in final energy consumption by more than 2 percent per annum against the 2008 level. Since 2008, the building-related final energy consumption of residential buildings has been declining by around 15 percent, compared to close to 11 percent in the industry and business, trade and services sectors. Industrial buildings are the only area where consumption has been rising by close to 6 percent since 2008, even though it fell by close to 2 percent against the previous year.

The share of renewable energies in final energy consumption is growing. In 2012, this share already totalled close to 14 percent in residential buildings and in the industry and business, trade and services sectors. Forecasts suggest that this share could increase to more than 19 percent by the year 2020. For the period from 2012 to 2020, heat supply from biogenic energy sources is set to increase by a good 12 TWh. Furthermore, the number of installed heat pumps will probably continue to increase, with the number of newly installed units per annum likely to stabilise at the average level of recent years. Heat supplies from environmental sources could increase to almost 16 TWh in 2020. The forecasts also suggest a further increase in the use of solar energy.

Discussion of technical and economic potential limits for efficiency measures

Significant efficiency potential exists in the buildings. This potential can be exploited by suitable measures, such as insulation of the building envelope, installation of efficient windows and other facade components, air-tight construction of buildings as well as the use of highly efficient technical systems or efficient light and lighting systems. However, both technical and economic limits exist in this context:

Technical limits are due to the fact that there is a limit to the degree to which the energy quality, for instance, of exterior walls or windows, can be improved. The same applies to possible increases in the efficiency of technical installations. Possible increases in efficiency must therefore be considered to be limited from today's perspective.

Economic limits are due to the fact that initial efficiency gains are possible at a relatively low cost especially when renovating existing buildings but that additional efficiency hikes often require significantly higher costs per kilowatt hour of final energy saved. This is the case, for instance, with listed buildings where additional legal requirements must be considered when renovation work is planned.

The experts concluded from these restrictions that the potential limit for lowering final energy demand through efficiency measures is likely to total a maximum of 54 percent from today's perspective. The evaluation of the results must be discussed with all stakeholders also in light of the Climate Action Programme 2050.

Discussion of potential limits for renewable energies

Buildings offer considerable potential for the use of renewable energies. This potential can be exploited by using sustainable biomass, environmental heat as well as solar and photovoltaic energy. However, these uses too have their technical and economic limits:

Competition for use with other growth sectors must be expected, especially for biomass, such as the transport sector as a potential competitor for liquid biomass. At the same time, it is assumed that no major quantities of wood will be imported as fuel from other countries. Solar thermal energy will experience competition for use due to the limited roof space available for installation of solar panels. Technical/economic limits will result, for instance, from the possible use of low-temperature systems which require, above all, heat pumps for their efficient operation which cannot always be retrofitted in existing buildings (for instance, underfloor heating).

All in all, the total potential for renewable energies which, from today's perspective, could be used in buildings in the year 2050 can be assumed to range between around 1,400 and 1,800 PJ (Prognos et al. 2015). This corresponds to 40 to 50 percent of present energy consumption by buildings. Furthermore, there is also a limit to the increase in potential for electricity from renewable sources in Germany by the year 2050. It should, however, be noted that these assumptions are subject to considerable uncertainty due to the long forecasting period of 35 years until the year 2050.

However, if this limit were reached, this would lead to a need to adjust the development paths for renewable energies in electricity generation and would impact the availability of renewable energies and the costs of decarbonisation in other sectors. Competition for the use of biomass by industrial (solid biomass for high-temperature processes) and the transport (liquid biomass for mobility) sectors also deserves special mention in this context.

Due to interdependencies and competition for use between the electricity, buildings, industry and transport[1] sectors, it is possible that a scenario that leads to lower costs in the buildings sector could nevertheless lead to higher costs for the economy as a whole.

2 With regard to biomass, no major competition for use between buildings and the transport sector is to be expected because buildings use mainly solid biomass.

Measures as a contribution towards target achievement

NAPE measures: In December 2014, the Cabinet adopted first key points of the Energy Efficiency Strategy for Buildings within the scope of the National Action Plan on Energy Efficiency. The immediate actions to increase energy efficiency and to strengthen the use of renewable energies adopted there were expected to yield energy savings of up to 390 to 460 PJ by the year 2020. However, buildings account for only a part of these savings. The NAPE measures were not yet considered in the reference scenario and must hence be seen in addition.

Further actions and options: The Energy Efficiency Strategy for Buildings also contains proposals for the further development of existing actions in order to reduce final energy consumption in buildings and to speed up the deployment of new facilities for renewable energy. The strategy also identifies further possible options which are at first to be discussed in their fundamentals. With regard to development efforts, the Federal Government focuses on measures to increase the effectiveness of existing actions. The measures mentioned in the Energy Efficiency Strategy for Buildings should be understood as a first basis for more in-depth discussions. To this effect, the Federal Government will initiate a discussion process which will also include public consultation regarding the action options identified in the efficiency strategy.

All the proposals and actions will be implemented within the scope of the applicable budgets of the respective ministries in charge.

Building-specific renovation roadmaps

The majority of renovation measures in buildings are not carried out as a comprehensive full-scale project. Building owners often lack the capital and the knowledge for what "the best way" is for their building. Furthermore, building owners are often unaware of the opportunities offered by sensibly combining repair, modernisation and renovation measures. This is where the voluntary building-specific renovation roadmap comes into play as a scheme that was adopted together with NAPE in order to offer building owners a reliable strategy for a holistic assessment and an energy-efficient renovation programme for their buildings spanning a period of several years. Besides purely energy-related issues, the determination of the renovation concept is to focus on the specific building owner's options and to identify possible funding and/or support offers.

Further development and expansion of energy consulting/information offers

The tailored communication of energy efficiency expertise in the form of energy consulting as well as a stringent information system are an important building block on the way to the energy transition in existing buildings. Although various information and consultancy offers are already available to building owners and users, these offers still require better coordination. The aim is to create a holistic, stringently phased information and consulting system that meets with the specific needs and options of owners of residential and non-residential buildings. The development of a voluntary standardised building-specific renovation roadmap as a result of an energy consulting effort is a central starting point for integrated consulting and information.

Regional renovation networks involving, in particular, local stakeholders such as skilled craftsmen, consultants, planners/designers, consumer protection associations, etc. can give a substantial boost to investment in energy-efficient renovation. The tasks of these networks can, for instance, include regional networking and dissemination, qualification of craftsmen, planners/designers and other stakeholders as well as quality assurance through further training and feedback on quality on conclusion of a project. The question as to what extent and under which conditions networking can be implemented must be answered together with the federal state administrations.

Public funding for investment in ambitious building renovation and new building projects

The existing promotional measures by the Federal Government for building renovation and the construction of energy-efficient new residential and non-residential buildings (KfW programmes as part of the CO_2 building renovation programme) as well as the use of renewable energies through the market incentive programme have already triggered substantial investment in recent years and thereby have done much to boost both energy efficiency and the share of renewable energies in final energy consumption. As part of a determined further-development exercise, existing promotional and support instruments should be integrated further and the effectiveness of the promotional funds and instruments already in place should be improved further. This also includes combining efficiency measures with the installation of new generators to win heat from renewable sources. Other options that are being examined include the further development of the "Efficiency House Plus" standard for all building types with a view to renewable energy. In conjunction with funding for individual measures, better incentives could be created for particularly innovative efficiency measures. Finally it should be examined whether the combination of the heat and electricity sectors can be strengthened through upgraded support and promotional schemes for heat storage systems as well as IT interfaces with a view to the efficiency targets on the heat market.

Public funding for energy-efficient urban and neighbourhood renovation

The "Energy efficient urban refurbishment" KfW programme supports the development of energy concepts for urban and neighbourhood renovation. The programme triggers energy-efficient investment in neighbourhoods.

With a focus on implementing the concepts, a sensible approach would be investment based on existing urban development concepts and/or reconciled with the aims of urban development and the housing sector. To a certain extent, climate protection aspects are also considered within the scope of the integrated urban development support concepts which are a precondition for public funding and the basis for the resultant urban development investment. The development of integrated concepts must also consider social aspects in order to ensure affordable living

space. Several programmes run by the Federal Government (including, for instance, CO_2 building renovation programmes), the federal states and the municipalities are available for implementation. The aim is to make these programmes better known and/or to coordinate these programmes better.

The "renewable energies in low-temperature heat grids" showcase

Low-temperature heat grids are already operative at flow temperatures that can be effectively achieved from renewable sources, i.e. solar or geothermal energy. These heat grids also enable the effective use of seasonal large-scale heat storages. The heat can be used directly via heat exchangers and in conjunction with low-temperature heating systems, or the heat can be increased to the desired level using heat pumps. Although such low-temperature heat grids as integrated concepts enable highly efficient solutions, they are so far only rarely used in Germany. The main obstacles here are the high degree of capital lockup and long refinancing periods as well as the lack of experience with the development of such projects. Funding of major pilot projects, for instance, as part of existing sponsoring competitions which are used, for instance, as part of the "Showcases for intelligent grids – digital agenda for the energy transition" (Schaufenster intelligente Netze – Digitale Agenda für die Energiewende) is a good way of testing and demonstrating the viability of such innovative overall concepts even for wide-spread practical implementation.

Energy-saving legislation for buildings

The standards of the Energy Saving Act (EnEG)/Energy Saving Ordinance (EnEV) and the Renewable Energies Heat Act (EEWärmeG) are key elements for achieving the Federal Government's energy efficiency and climate targets. The further development of the two sets of rules to form a harmonised system is a major component when it comes to achieving the goal of a virtually climate-neutral building stock. Energy legislation will retain its important steering effect. This will also require continuous further development in a manner that also considers future developments of the state of the art and economic efficiency.

From 2019, new public-sector buildings and from 2021, all new buildings will be built as nearly-zero energy buildings. Pursuant to the Energy Saving Act, the nearly-zero energy building standard – i.e. the minimum requirements for new buildings which are technically and economically feasible – will be introduced by the end of 2016 in order to transpose the provisions of the EU's Energy Performance of Buildings Directive.

The energy-related requirements for buildings and technical equipment as well as the requirements regarding the use of renewable energies are continuously being examined and, if economically sensible, adapted as required. Examples include the revision of sectoral exceptions from existing obligations to replace obsolescent, inefficient heating boilers and examining whether replacement obligations are to be expanded to include further systems and components relevant for energy efficiency in as far as this is economically viable. In the case of non-residential buildings, specific requirements for individual systems, such as lighting, air conditioning or control systems, as well as the obligations to have technical equipment inspected are under scrutiny.

The aim of the further development of energy-saving legislation is a harmonised regulatory system of energy requirements for new and existing buildings as well as the use of renewable energies for heating. The completed expert appraisal regarding harmonisation of the Renewable Energies Heat Act (EEWärmeG) and the Energy Saving Act (EnEG)/Energy Saving Ordinance (EnEV) identifies the options for structural re-design of the Energy Saving Ordinance and the Renewable Energies Heat Act. This will be discussed in more detail with the federal states. In this context, it is vital to leave sufficient freedom for investment promotion measures for ambitious building renovation and new construction projects.

Targeted technology support and accelerated transfer to practical applications

In order to achieve targets in the buildings sector, energy demand of buildings must be significantly reduced and renewable energies must be developed and integrated further into the heat supply regime by the year 2050. What is needed most here are affordable, highly efficient technologies and energy innovation. With a view to supporting the energy transition in buildings, energy research will tackle new challenges in the years to come. Besides technology development, the focus will increasingly be on system optimisation and a faster transfer of results to practical applications.

After a broad-based consultation process in the "Research Network – Energy in Buildings and Districts" and the "National Platform – City of the Future", the Federal Government will launch a cross-ministry research initiative on "Solar Buildings/Energy-Efficient Cities" in 2016.

In order to support the Energy Efficiency Strategy for Buildings, we will launch the promotional initiative on "Innovative Projects for a virtually Climate-neutral Building Stock 2050 ("EnEff.Gebäude2050") which was decided upon with the NAPE implementation. The initiative aims to show how innovations which are already available today but not yet very widespread can significantly reduce primary energy consumption in buildings. The new initiative thus supplements existing promotional activities and closes the gap between research support and broad assistance for energy innovation in buildings.

Next steps

Besides the actions described earlier in this document, which include primarily the further development of existing tools, other ideas and approaches must first be discussed in order to achieve the targets for the buildings sector. The Energy Efficiency Strategy for Buildings therefore triggers discussion processes for further options.

Using new possibilities opened up by digitisation: The development of digitisation is also becoming increasingly important for the energy transition. Digitisation can also make an important contribution towards a virtually climate-neutral building stock. The key prerequisite for this are user acceptance as well as warranting data protection and data security.

This includes automation systems in non-residential buildings, better consideration and control of energy efficiency measures during the planning and construction phases as well as installation of digital applications for building use, especially so-called smart home technologies. A host of applications for further data interfaces are conceivable on the basis of building automation systems, connecting individual components and uses in a building to each other. This also includes external control techniques. A group of different buildings on a property, in a neighbourhood or urban district can communicate by digital means, for instance, as part of integrated power supply management for a complete property. Smart control of power supply for a quarter or larger user groups, for instance, opens up energy saving potential. Savings can be achieved through targeted control, for instance, of the heating or air conditioning system of individual buildings or flats as a function of user presence or based on use profiles.

Digitisation can also lead to improved and easier design and management of the coupling of the electricity and heat sectors.

Energy-related aspects of tenancy law: The boundary conditions laid down in tenancy law influence the willingness of landlords to invest and of tenants to accept energy efficiency driven renovation projects in existing buildings. There are two points where tenancy law could be modernised to this effect: the distribution of rent level surveys differentiated according to energy aspects in as far as energy-related factors are found to be a relevant feature of housing quality on the housing market and further development of the system of increasing rent in response to modernisation projects.

Energy-related aspects of social law: The provision of affordable housing has always been one of the key challenges of housing policy. The Federal Government is therefore examining ways of supplementing housing benefits with a scheme of differentiated maximum amounts depending on the energy performance of buildings. Furthermore, an amendment to Volumes II and XII of the Social Security Code is also being discussed. The purpose of this is to determine the minimum subsistence needs for housing and heating as part of the basic cover for jobseekers pursuant to Volume II of the Social Security Code (SBG II) and of social assistance pursuant to Volume XII of the Social Security Code (SBG XII) on the basis of an overall concept (gross rent including heating costs). Research projects have already been commissioned in this area.

Additional market activation: Market-orientated models have become increasingly important in the debate on boosting energy efficiency in recent years. The debate is especially driven by the EU's Energy Efficiency Directive which was adopted at the end of 2012 and whose Article 7 provides for the introduction of such an instrument as one transposition option. Although the Federal Government opted for a different approach in the transposition of Article 7 of the EU's Energy Efficiency Directive, it nevertheless continues to examine the extent to which such a system could help to achieve the target of a virtually climate-neutral building stock. The pros and cons of such a system should be weighed in a discussion process, also with a view

to the cost of living and distribution effects. The different concrete implementation options must also be considered for this purpose.

Outlook

The proposals and actions presented in this document will boost energy efficiency further and increase the use of renewable energies. Whether the target of a virtually climate-neutral building stock by 2050 will be reached depends on how economic conditions as well as the future housing and energy policy will develop. The specification of further concrete details and the updating of the Energy Efficiency Strategy for Buildings will have an important steering function on the way to a virtually climate-neutral building stock.

The actions and processes mentioned above are just a selection. The experts additionally submitted a number of more far-reaching proposals. If it is found in future, especially as part of the monitoring exercise, that it will not be possible to close the gap to achieving the 80-percent target, the existing and other additionally proposed actions will have to be assessed, developed further and re-adjusted, when necessary. This also includes the examination of tax incentive instruments.

The Energy Efficiency Strategy for Buildings must provide investors with sufficient planning security, but in view of the uncertainties that result from a horizon extending up to 2050, it must also be sufficiently flexible in order to respond to new technical developments and challenges. The Energy Efficiency Strategy for Buildings is hence understood to be a “learning” strategy that should be developed further as needed and on the basis of new results and changed overall conditions.

Monitoring

The Energy Efficiency Strategy for Buildings will be updated and developed further as an element of the Climate Action Plan 2050. Dynamic support for the Energy Efficiency Strategy for Buildings calls for its ongoing evaluation, for instance, with regard to the actions and instruments as well as target achievement. The Energy Efficiency Strategy for Buildings is therefore part of the “Energy of the Future” (Energie der Zukunft) monitoring process which addresses the implementation of the energy transition as a whole. The expert commission accompanying the monitoring process will additionally perform an independent assessment and unbiased monitoring of the Energy Efficiency Strategy for Buildings.

The strategy must provide investors with sufficient planning security and ensure that the long-term target corridor will be reliably achieved, but in view of the uncertainties that result from a horizon extending up to 2050, it must also be sufficiently flexible in order to respond to new technical developments and challenges. The strategy underlines this with its largely technology-open approach, providing for generally equal weighting of energy efficiency and renewable energies whilst at the same time respecting the need for economic efficiency and interactions with other sectors.

Next actions

With the “Energy Transition Platform for Buildings”, the Federal Government brings together relevant stakeholders from business and industry, civil society and the scientific community along with representatives of the federal states to discuss issues related to the energy transition in the buildings sector. With the adoption of the Energy Efficiency Strategy for Buildings, the platform for buildings will increasingly address implementation issues. A made-to-measure working structure for the platform will be set up to this effect. We will pay special attention to the activities of the energy transition platform for energy in this context.

The Federal Government will initiate a discussion process which will also include public consultation regarding the action options identified in the efficiency strategy. Without the federal states, we will be unable to manage the energy transition in buildings. The central and federal state government working group was set up in spring 2015 for this purpose. According to the Cabinet decision, we will continue to work with the federal states.

The Federal Government also considers it important that the process of implementing the Energy Efficiency Strategy for Buildings be harmonised with the other initiatives for implementing the energy concept, such as the National Action Plan on Energy Efficiency, the Electricity Market Law, the Climate Action Programme 2020, the “Alliance for Affordable Living and Building” as well as the “Research Network – Energy in Buildings and Districts”.

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