

The German Government's Energy Concept – the path to the energy of the future

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The way to the energy concept 2010/2011

- With the Adoption of the **Energy Concept 2010** Germany made the fundamental decision to cover the future energy supply from renewable sources. This concept also included the lifetime extension of nuclear power plants (but no new nuclear power plants!)
- **The 2011 modification of the 2010 decisions:**
As a result of the nuclear meltdown at Fukushima in March 2011 the role assigned to nuclear power in the energy concept was reassessed. As a consequence
 - the seven oldest nuclear power plants plus the one at Krümmel were shut down permanently with a capacity of 8.9 GW and
 - a decision was taken to phase out operation of the remaining nine nuclear power plants with a capacity of 12.7 GW step-by-step by the year 2022 at latest.

The present German energy concept

- **The decisions on both the energy concept of 2010**
(with the exception of the passage on nuclear power)

and

- **the transformation of the energy system of 2011**
(including the accelerated phase out of nuclear power
and additional policies regarding energy efficiency,
renewables and infrastructure)
- **describe the Federal Government's current energy
policy.**

The rationale behind the German energy policy

- Ambitious climate protection is the decisive driving force for the transformation of the energy supply. It sends important signals encouraging investments in innovations and technological progress.
- Further on: In light of the economic and political developments taking place around the world, a "business as usual" approach would present much greater risks than the new ways.
- Energy prices have been rising, as our oil, gas and coal reserves have been dwindling and the number of energy exporters providing reliable energy supplies has been shrinking.

The strategic elements of the German energy policy

The two crucial strategic elements of the German energy policy are energy efficiency and renewable energies:

- The first step toward achieving and safeguarding an affordable, environmentally friendly and reliable energy supply is to reduce the energy consumption by increasing energy efficiency.
- In a next step, we must move to meet our remaining energy needs primarily via renewable energies.

That approach will give us a technological edge, will enhance the attractiveness of our industrial sectors and will protect our leadership in the key markets of the future..

The concept's political character

The concept is longterm, comprehensive & concrete:

- 1. Time Horizon is 2050**
- 2. Concrete targets on climate, renewable energy & energy consumption by sectors**
- 3. Activities in all relevant sectors**
- 4. Comprises more than 100 single measures, especially in the field of renewable energy, power grids, energy efficiency, building renovation and conventional power plants**
- 5. Reliable framework conditions for all stakeholders**

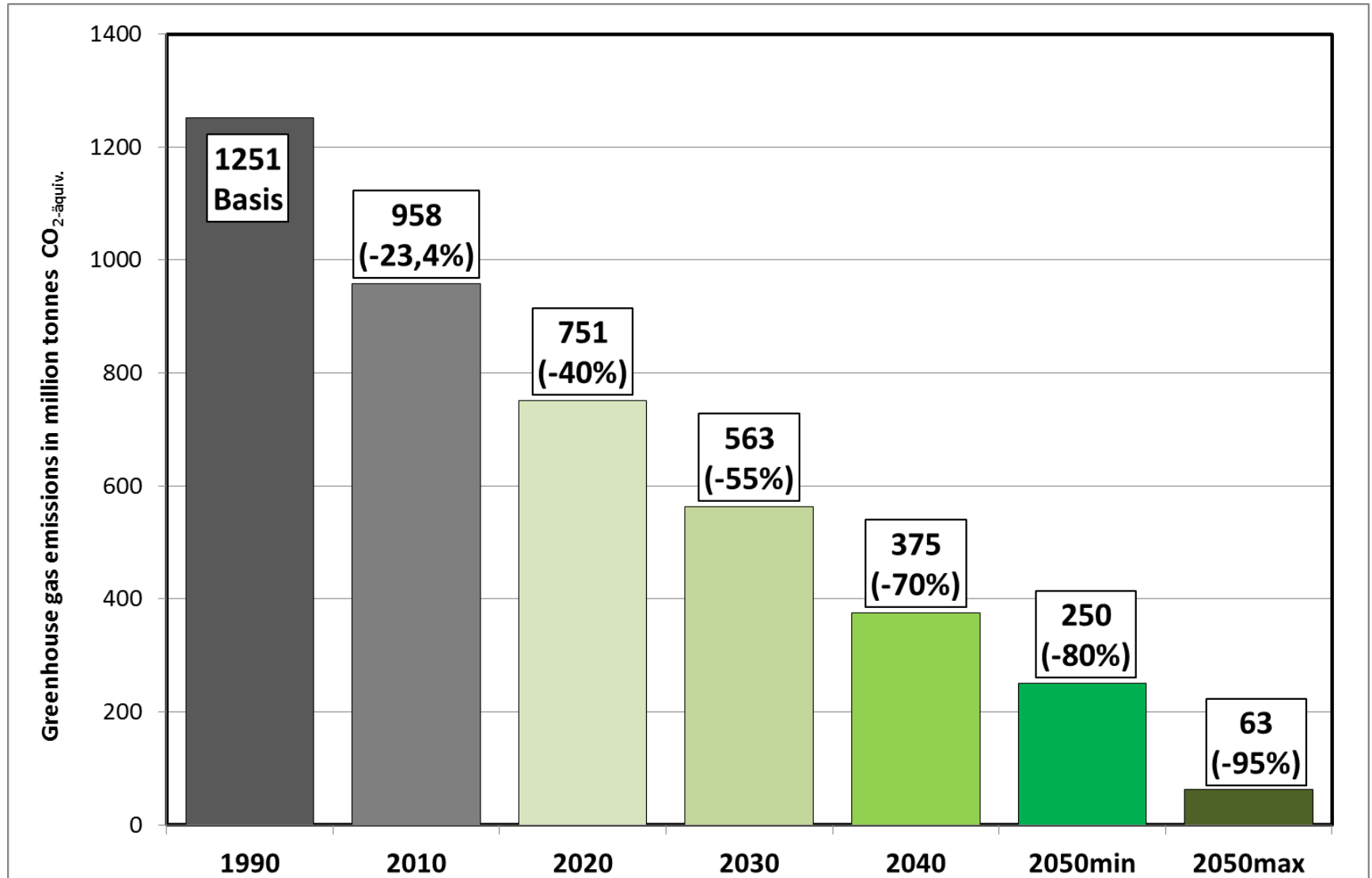
German energy policy targets up to 2050

| | Green-house gas emissions | Share of renewable Energies | | Energy consumption | | | |
|-----------|---------------------------|--------------------------------|------------------|------------------------------|---------------------------|-----------------------------|-------------------|
| | | Gross final energy consumption | Power generation | Primary energy ¹⁾ | Final energy in transport | Space heating ²⁾ | Power consumption |
| 2020 | -40% | 18% | 35% | -20% | -10% | -20% | -10% |
| 2030 | -55% | 30% | 50% | | | | |
| 2040 | -70% | 45% | 65% | | | | |
| 2050 | -80% up to -95% | 60% | 80% | -50% | -40% | -80% | -25% |
| base year | 1990% | | | 2008 | 2005 | 2008 | 2008 |

1) The reduction of the primary energy consumption calls for an annual average gain in **energy productivity of 2.1 %**, based on final energy consumption.

2) The building **renovation rate will need to double** from the present less than 1 % a year to 2 % of the total building stock. **In 2050 the building stock should be almost climate-neutral.**

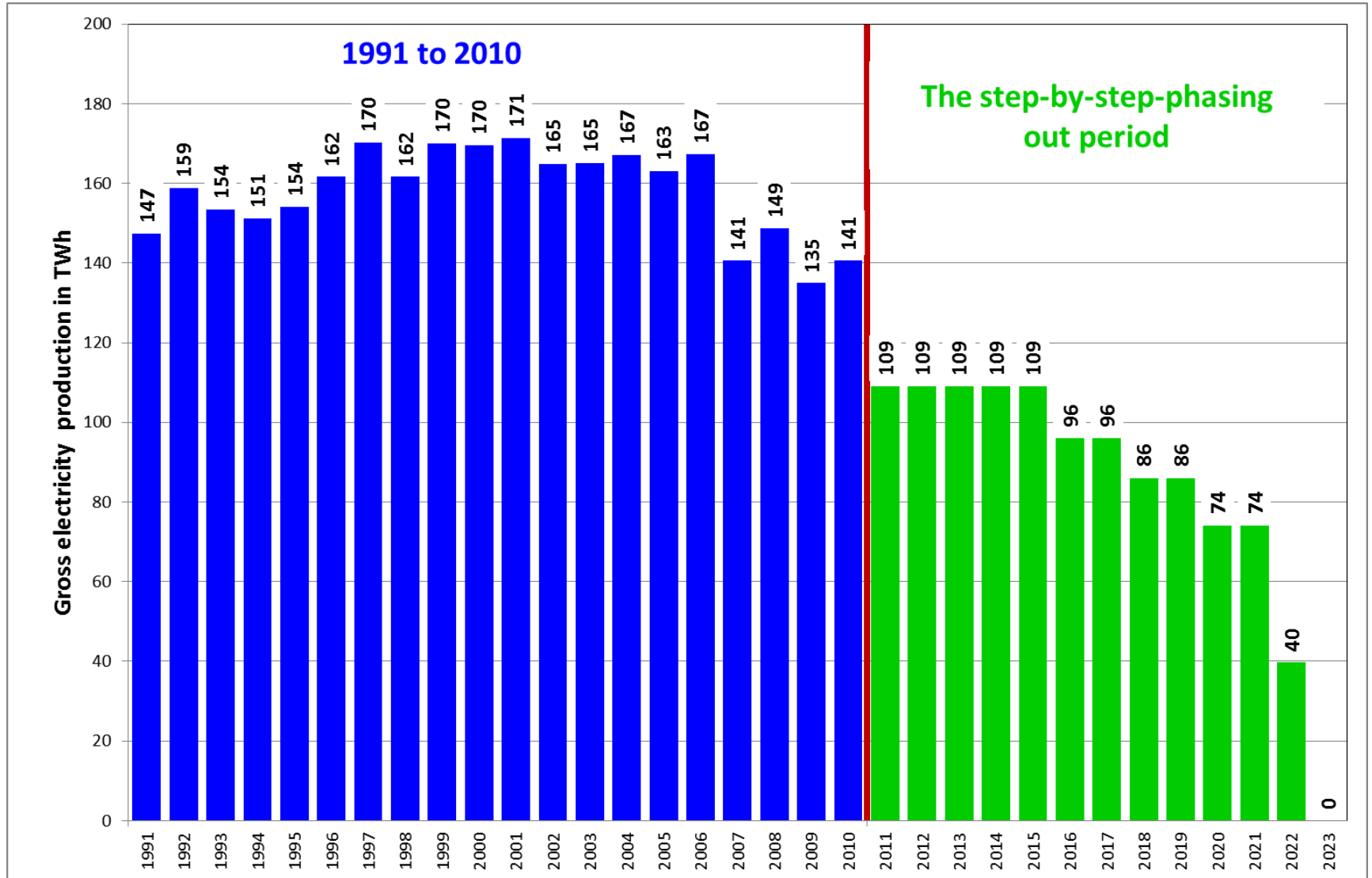
The targets regarding greenhouse gas emissions in Germany up to 2050



The centrepieces of the transformation of the German energy system

- Thirteenth Act amending the Atomic Energy Act: determination of the final dates for the shutdown of remaining nuclear power stations
- Renewable Energy Sources Act (EEG): continuing the dynamic expansion of renewables, making them more cost-efficient and improving market and system integration,
- Energy Industry Act. includes provisions governing the remuneration of the operator of new power plants
- Grid Expansion Acceleration Act: Create the prerequisites for a quicker expansion of new grids .
- Amended act for establishing a special "Energy and Climate Fund": mainly financed by auction revenues.
- Subsidies via KfW and tax reductions (under consideration) for renovation of existing buildings.
- Combined Heat & Power Act: Promoting construction/modernisation of CHP systems and construction of new heating networks.

The path of phasing out the nuclear power in Germany



The dimension of nuclear discussions in Germany

The dimension of carbon emissions

- Nuclear is a low-carbon energy source
- Alternatives exist – in perspective at comparable costs

The dimension of public and political acceptance

- Perceptions of damage level and probability of occurrence
- Treatment of nuclear waste
- Nuclear as a domestic resource of energy

The political decision in Germany: Phase-out of nuclear power generation within a decade

- Nuclear is a high-risk option
- Nuclear is not a robust option in a zero-carbon portfolio
- Zero-carbon alternatives exist, are affordable and will trigger innovation and competitive advantages

Transforming the energy system – the short-term perspective

Substitution of nuclear power

- Using existing reserves of the system (energy & capacity)
- Expansion of renewable energies (energy & some capacity)
- Expansion of combined heat and power (energy & capacity)
- Expansion of low-carbon (natural gas) generation assets (energy & capacity)
- Demand side management (energy & capacity)
- Less electricity exports but no significant net imports

Initiation of infrastructure adjustments with long lead-times

- Transmission grids (wind energy, North-South links, European integration (to limit storage needs))
- Distribution grids (decentral power generation, electric mobility)
- Storage strategy (intra-day, workday/weekend, inter-seasonal, long-term/energy security)

Transforming the energy system – the longer-term perspective

Phase-in of renewable energies in power generation

- 16 % in 2010, contribution increased by 1...2 percentage points annually during the least decade and will be
- 35...40% in 2020, 80+% in 2050
- Most significant contribution from wind power (onshore & offshore)

Phase-in of renewable energies in other sectors (biofuels, solar heat, geothermal energy)

Strong increase in energy efficiency

- Buildings (doubling the renovation rate and intensity)
- Transport (efficient vehicles, transformation to electric mobility)
- ('traditional') electric appliances (benchmarks)

The co-benefits of German energy and climate protection policy

- Both the expansion of renewable energies and the enhancement of energy efficiency will create an increasing demand for new technologies and stimulate a huge amount of investments.
- This will lead to the development of new products, new technologies and new export opportunities.
- German businesses are well positioned in these fields today. They will enjoy considerable opportunities for growth in future.
- The renewable energies sector already employs about 370,000 people. By 2030, the number of people employed in the industry could rise further to more than half a million.

A last word: The preconditions for a successful transformation of our energy system

Germany is about to tackle large-scale changes to its energy supply – a task for the decades to come. It can only be accomplished if there is the broadest possible support from society for these changes and the demands they place on all of us.

We must rise to this challenge together:

- government at federal, Länder and local level,
- industry and trade unions,
- environmental and consumer associations and
- the public as a whole.



Thanks for listening
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