



Costs and Potential of Greenhouse Gas Abatement in Germany

Climate protection and economics

German business believes there are many ways in which it can work with government to unleash further potential for reducing greenhouse gases and taking further steps **towards a low-carbon economy**. But this must be achieved through a balance of ecological and economic criteria, include a cost-benefit analysis and be based on **joint action**. We commissioned McKinsey to conduct a study into the “Costs and Potentials of Greenhouse Gas Abatement in Germany” and believe that the findings suggest many different and varied approaches to tackling the issue. We call upon the German government to utilise the findings of the study in its activities and to initiate appropriate measures to improve the level of acceptance of new technologies, so that we will be able to use our innovative technologies in a way which effectively contributes to climate protection.

If the **binding climate and energy targets agreed by the EU** in March 2007 – and which have been made more concrete at national level in Germany through the Meseberg roadmap – are to be implemented, the burden to reduce emissions to the levels agreed (a reduction of greenhouse gases of at least 20%, a share of 20% of renewable energies in the energy mix by 2020) must be divided up more fairly between the EU member states. Germany’s contribution to international efforts to protect our climate should be defined on the basis of **cost optimisation and reduction potential**, which differ according to sector. The study provides an orientation guide for this, based on solid research and presented in the form of a “price list” (costs from decision-makers’ viewpoint).

The “BDI initiative - Business for Climate Protection” hopes the study will lay the **foundation stone for a process** of increased cooperation between the federal government and society. We intend a “**revised edition**” of the study which will evaluate progress made on implementing current findings and update and expand the database on the package of technological levers.

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Methodology and findings of the McKinsey study

- The study commissioned by the “**BDI initiative - Business for Climate Protection**” identifies a wide variety of technological levers for reducing greenhouse gases and calculates their costs from the decision-makers’ viewpoint for various sectors: energy, industry, construction, waste management, agriculture and transport.
- The assessment is based on the viewpoint of decision-makers, i.e. those who would invest in the new technologies (business leaders, homeowners, car-buyers, etc.).
- Using a cross-sector **uniform methodology**, over **300 individual technologies** were assessed with the assistance of experts from over 70 companies and German industrial associations. In order to assess each technological lever’s potential for reducing emissions, a feasible degree of dissemination of each technology (penetration rate) was assumed.
- An essential criterion for selection and assessment of the technological levers for reducing emissions was that they **would restrict neither quality of life nor economic growth**.
- An important finding of the study is that **all sectors in Germany exhibit potential for reducing greenhouse gas emissions**. The types of technological levers and their respective costs **vary dramatically** between the sectors. The total potential for reducing emissions is the result of the application of many different levers – there is no single panacea.
- Assuming Germany sticks to its intention to phase-out nuclear energy, Germany’s total reduction potential based on emissions figures for 2004 is around 100 million tonnes of CO₂ equivalent per year up to **2020**. This corresponds to a **reduction of 25%** of the base year emissions. **By 2030** a figure of **minus 28%** is achievable. But a considerable amount of investment, in some cases very high investment, will be required to reach these targets.
- Germany’s greenhouse gas emissions could be reduced by 26% by 2020 (compared to the base year) if all identifiable levers are utilised, with average costs (from the decision-makers’ viewpoint) of up to €20 per tonne of CO₂ equivalent. A reduction of 31%

becomes achievable if the share of renewable sources in the energy mix is also increased (while adhering to the plan to phase out nuclear energy). This would entail considerably higher average abatement costs in the range of €32 to €175 per tonne of CO₂ equivalent (32: electricity production from renewable energy sources; 175: biofuels).

- Further technological levers do exist, but **significantly higher investments** would be needed to implement them. If all identifiable levers were used, emissions could be reduced by 35% (from 1990 to 2020). The average cost per tonne of greenhouse gases abated would, however, then be around €430 per tonne of CO₂ equivalent.
- **Delaying** the phase-out of nuclear energy would considerably increase the economically viable reduction potential (additional reduction of 90 million tonnes of CO₂ until 2020) and greatly decrease the average abatement costs. A reduction of around **seven percentage points** more over the emissions figure for the base year would then be possible **by 2020**.

Conclusions

- Each individual citizen and each company can make a contribution to reducing greenhouse gases. Government should therefore put itself more in the place of the individual decision-makers. Contrary to conventional climate scenarios **this is the perspective** our study aims to convey to the reader.
- The innovative power and competitiveness of German industry can only be maintained if the profit situation allows us to finance the development of innovative technologies and their large-scale application in order to reduce emissions. And considerable advance investments are needed to pave the way for the technology's widespread use, i.e. there is a great need for the appropriate R&D funding programmes.
- Economically viable measures, attractive incentives and market-driven innovations can make an effective contribution to climate protection in Germany. This is a challenge **which all societal sectors** must take up, and which requires a differentiated approach.

- Currently, there are considerable **barriers** blocking the implementation of the solutions which industry has already made available. Even those technologies which make financial sense and have negative abatement costs do not provide sufficient incentive to the individual decision-makers, be they business leaders or local citizens, if they cannot afford to make the necessary investment. Wide-ranging investment incentives must be made available, although these must not distort or disrupt the market.
- The greatest economic efficiency can be achieved if measures in individual sectors continue to be implemented in harmony with the respective **investment cycles**. A forced shortening of investment cycles would be the wrong approach as that would cause economic advantages to be lost and would destroy national economic capital.
- If meeting higher reduction targets is considered imperative **delaying** the phase-out of nuclear energy is a valid option.
- **CCS** (carbon capture and storage) cannot make a significant contribution until after 2020, when all the legal, economic and technical questions have been resolved.
- With respect to attaining a **global climate protection regime**, the development and use of CCS technologies would provide an option to establish **multilateral talks** with **countries that produce and consume large quantities of coal** (primarily China, India, the United States) on allowing their continued use of coal to generate electricity, as the use of CCS would hugely reduce CO₂ emissions). But its **practicability** must first be proven in Europe (e.g. in Germany) before countries such as China will be persuaded of the technologies' viability. We therefore warmly welcome the EU's intended **promotion of large-scale CCS demonstration power plants**.
- The amount of **biomass** needed to generate energy by 2020 will exceed the amount which can be produced in Germany. The sharp increase in the use of biomass to generate energy will lead to intensified competition with the traditional users of biomass.
- Reducing greenhouse gases creates not only costs, but also **opportunities** for German companies. Implementing greenhouse

gas abatement measures in Germany and **exporting** the respective technologies can have positive effects on both the economy and employment. It is thus essential to accelerate **the dissemination of innovative and efficient technologies**. Therefore, the scope and efficacy of the **CDM** (Clean Development Mechanism) must be expanded.

- And we must pay particular attention to maintaining the **competitiveness** of German companies, particularly those in **energy-intensive industries**. **Germany's status as a production location** can only be maintained if **cost efficiency** becomes the key criterion for the selection of climate protection measures and the form they take. After all, **acceptance of climate protection policy** will depend on what burden will ultimately be imposed on the **final consumers**.