

Energy roadmap 2050, a future with energy

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PURPOSE: to present the Commission's Energy Roadmap 2050.

BACKGROUND: the EU is committed to reducing greenhouse gas emissions to 80-95% below 1990 levels by 2050 in the context of necessary reductions by developed countries as a group. The Commission analysed the implications of this in its "[Roadmap for moving to a competitive low-carbon economy in 2050](#)". The "[Roadmap to a Single European Transport Area](#)" focussed on solutions for the transport sector and on creating a Single European Transport Area.

The EU policies and measures to achieve the [Energy 2020](#) goals and the Energy 2020 strategy are ambitious: by 2020, at least 20 % reduction in greenhouse gas emissions compared to 1990 (30% if international conditions are right); saving of 20 % of EU energy consumption compared to projections for 2020; 20 % share of renewable energies in EU energy consumption, 10% share in transport. These measures will continue to deliver beyond 2020 helping to reduce emissions by about 40% by 2050. They will, however, **still be insufficient** to achieve the EU's 2050 decarbonisation objective as only less than half of the decarbonisation goal will be achieved in 2050. This creates **uncertainty among investors**, governments and citizens. Today, **there is inadequate direction as to what should follow the 2020 agenda**.

The Roadmap does not replace national, regional and local efforts to modernise energy supply, but seeks to develop a **long-term European technology-neutral framework** in which these policies will be more effective. It argues that a European approach to the energy challenge will increase security and solidarity and lower costs by providing a market for new products and services. The Commission estimates **potential cost savings of around 25%** for some stakeholders if there were a more European approach for efficient use of renewable energy.

CONTENT: in this Energy Roadmap 2050, the Commission **explores the challenges posed by delivering the EU's decarbonisation objective** while at the same time ensuring security of energy supply and competitiveness. **The scenarios in this Roadmap** all imply major changes in carbon prices, technology and networks. A number of scenarios examined how to achieve an 80% reduction in greenhouse gas emissions implying some 85% decline of energy-related CO₂ emissions including from transport. The Commission has also analysed Member States' and stakeholders' scenarios and views.

The Energy Roadmap 2050 shows that **decarbonisation is feasible**. Whichever scenario is chosen, a number of "no regret" options emerge which can bring down emissions effectively and in an economically viable way. Furthermore, **the overall system costs of transforming the energy system are similar in all scenarios**. A common EU approach can help keep costs down.

To achieve this new energy system, ten conditions must be met:

1. **Energy 2020**: the immediate priority is to implement fully the EU's Energy 2020 strategy. All existing legislation needs to be applied, and the proposals currently in discussion, notably on energy efficiency, infrastructure, safety and international cooperation, need to be adopted swiftly. The path towards a new energy system also has a social dimension. The Commission will continue to encourage social dialogue and social partners' involvement to help a fair transition and an efficient management of change.

2. **Energy efficiency:** the energy system and society as a whole need to be dramatically more energy efficient. The co-benefits of achieving energy efficiency in a wider resource efficiency agenda should contribute to meeting the goals in a faster and cost-efficient manner.
3. **Renewable energy sources:** particular attention should continue to be given to the development of renewable energy. Their rate of development, impact in the market and rapidly growing share in energy demand call for a modernisation of the policy framework. The EU's 20% renewable energy target has so far proven an efficient driver in development of the renewable energy in the EU and timely consideration should be given to options for 2030 milestones.
4. **Research and innovation:** higher public and private investments in R&D and technological innovation are crucial in speeding-up the commercialisation of all low-carbon solutions.
5. **Internal energy market:** the EU is committed to a fully integrated market by 2014. There are regulatory and structural shortcomings that need to be addressed. Well-designed market structure instruments and new ways of cooperation are required for the internal energy market to deliver its full potential as new investments are coming into the energy market and the energy mix is changing.
6. **Energy prices need to better reflect costs,** notably of the new investments needed throughout the energy system. The earlier prices reflect costs, the easier the transformation will be in the long run. Special attention should be paid for the most vulnerable groups, for which coping with the energy system transformation will be challenging. Specific measures should be defined at national and local levels to avoid energy poverty.
7. **New infrastructure:** a new sense of urgency and collective responsibility must be brought to bear on the development of new energy infrastructure and storage capacities across Europe and with neighbours.
8. **Safety and security:** there will be no compromise on safety and security for either traditional or new energy sources. The EU must continue to strengthen the safety and security framework and lead international efforts in this field.
9. **International aspects:** a broader and more coordinated EU approach to international energy relations must become the norm, including redoubling work to strengthen international climate action.
10. **Investment:** Member States and investors need concrete milestones. The Low carbon economy roadmap has already indicated greenhouse gas emission milestones. The next step is to define the 2030 policy framework, reasonably foreseeable and the focus of most current investors.

The Commission will carry out discussions with other EU institutions, Member States and stakeholders on the basis of this Roadmap. It will update it regularly, reassessing what is necessary in the light of progress and changes.

On the basis of the Roadmap, the Commission will continue to bring forward initiatives, starting with comprehensive proposals on the internal market, renewable energy and nuclear safety next year.