Towards a European Strategy for the Security of Energy Supply

The green paper published by the European Commission sets an important agenda for the development of a long-term energy strategy for Europe. Only with the participation of all interest groups throughout society will it be possible to arrive at a consistent and **sustainable energy policy**.

Siemens welcomes all attempts to find long-term, workable solutions to the question of energy supply in Europe and to associated economic, ecological and social issues. As one of the world's largest companies in the field of energy technology we are actively engaged in the development of a sustainable energy supply. This response to the green paper is intended as a contribution to this debate.

Use of **efficient technologies throughout the energy chain**, from the recovery of resources, through energy generation and its distribution to energy application, can play a significant role in improving the security of supply and improving environmental protection.

1) Fundamental principles

A **sustainable energy supply** is an absolute prerequisite for safeguarding the very basis of our existence in the long term. The EU's increasing dependence on energy imports and climate problems represent major challenges for European energy policy.

Requirements to be met by future European energy policy:

- We require **clear boundary conditions**, which are capable of accommodating all three sides of the strategic triangle: supply security, competitiveness and sustainability.
- A high level of supply security presupposes a **balanced energy mix** without arbitrary discrimination against specific energy conversion technologies. The concept of sustainable development requires us to keep all options open if we are to guarantee future generations at least the same level of choice.
- To **reduce energy intensity**, it is necessary to increase energy efficiency, above all in the transportation, buildings and power generation sectors. This requires efficiency-enhancing technologies and efficient markets.
- **CO_2 emissions must be reduced**. Use of CO_2-free technologies, a switch to lower carbon fuels, greater energy efficiency and reduced energy consumption all help to achieve this goal. Key political measures include voluntary commitments by individual countries and industries, and international agreements.
- **Government backing** is needed to speed up the development of new energy conversion technologies to the point of commercial viability. However, abuse of subsidies and distortion of competition, for example through cross-subsidies, must be avoided.
- Further development of the necessary **pipeline infrastructure for natural gas**. A secure transportation network is needed to safeguard supplies from countries outside Europe. For this purpose, it is necessary to create the requisite political framework through international cooperation agreements.

2) Energy mix and power generation

European energy policy must **offer all energy sources perspectives** which are appropriate to their technical and economic potential in each case. The EU's energy policy objectives – security of supply, cost-effectiveness, environmental compatibility and resources conservation – can be achieved only on the basis of a **balanced energy mix** using fossil, nuclear and renewable resources. This must also remain the basis of Europe's future energy supply.

A large proportion of primary energy is consumed by the power generation sector which accounts for an increasing share of energy supplies. The upward trend in electricity consumption exceeds that for total energy consumption. Economically and ecologically superior applications powered by electricity will continue to replace processes which hitherto relied on the direct consumption of fuels. Increased use of electricity is certainly helping to reduce the consumption of primary energy in this context. At the same time, demand for electricity is growing, particularly in the information and communications technology sector.

3) Energy conversion technologies

We are firmly convinced of the long-term need to keep **all of our energy technology options** open. None of these options should be arbitrarily excluded. It takes decades to launch new energy conversion technologies on the market, and **diversification reduces risks**.

New energy forms such as solar power, hydrogen (generated without CO_2 emissions to fuel vehicles, for example), or an advanced form of nuclear technology can play a crucial role in solving the world's energy and environmental problems in the medium and long term. The research, development and application of new technologies must therefore be selectively promoted and intensified.

Technology and cost-effectiveness are barriers to more extensive use of renewable energies in the foreseeable future, however. For instance, weather-related factors (wind speed and insolation) often restrict generating time so additional reserve generating capacity has to be maintained. Moreover, certain energy conversion technologies are sometimes even considered to have an adverse environmental impact in acoustic or aesthetic terms.

These fundamental **problems associated with increased use of renewable** energy forms clearly demonstrate that we **must not neglect** the efficient utilization and further development of modern fossil energy sources and existing CO_2-free technologies in the coming decades if we are to meet soaring global demand for energy without undue adverse environmental and health effects.

New energy forms are already providing a practical adjunct to electricity generation, however. Greater use of renewable energy sources will help to solve the challenge of global energy supply, particularly in the long term. In our view, therefore, European programs to develop and launch these alternative technologies, flanked by intensive efforts on the part of industry, are both expedient and essential.

4) Energy saving and energy efficiency

A central approach in our efforts to reduce dependency on imported energy is to reduce energy consumption or **improve energy efficiency**. There are various methods of approaching this target. Further reductions can be made in energy intensity across the economy as a whole by increasing the efficiency of the technologies developed to generate, distribute and utilize energy. The transportation, buildings and power generation sectors all offer major potential in this respect.

These developments are driven by competition surrounding innovative technologies. **Technical progress** in the past has already led to a **continuous improvement in energy efficiency** resulting in energy savings. This includes the continued upgrading of old power plants as well as other political and environmental considerations which support the replacement of old plants by new state-of-the-art plants. Intelligent load management systems can also have a significant impact on reducing energy consumption.

Energy conservation is **not automatically** the same as **using less electricity**, however. On the contrary, electricity is an innovative energy form, increased consumption of which, in intelligent control systems, for example, can help to optimize industrial processes, thus contributing to a reduction in overall energy consumption. Moreover, electricity is the only energy source that can be generated from nuclear energy or renewable energy sources without CO_2 emissions. There should therefore be no restrictions on electricity use under European energy policy.

Crucial leverage can also be obtained through **popular education**. A long-term information campaign can convince people of the need to adopt a more environmentally sensitive approach to energy use.

There is further major potential for reducing energy use in old buildings. Buildings account for around 40% of energy consumption throughout Europe. This percentage could be slashed by reducing energy consumption particularly in old buildings. Building renovation measures based on insulation and state-of-the-art control technology for air-conditioning and heating systems could prevent the annual release of 430 million tons of CO_2 throughout the EU.

Siemens will continue to play a part in decoupling economic growth from primary energy use. The prerequisites for this are a foresighted energy policy, functioning competition and the necessary investment climate for a modernized economy.

5) Single market and grids

We endorse efforts to improve the **transparency and efficiency** of energy markets through energy policy reforms. Our endeavors should be directed toward opening up comparable markets in all countries in order to limit the existing distortion of competition. We should step up our efforts to advance the cause of liberalization under the rules of best practice in order to exploit the advantages of the different approaches.

High-capacity power distribution grids are a must for ensuring future diversification in the power supply landscape. They are needed for integration of small, distributed energy generating systems, which can help to cut transmission losses. In addition to these, large, centralized generating facilities will still be needed for efficient coverage of base-load requirements and for grid stabilization purposes.

The use of natural gas for power generation will increase sharply over the next few years. We must safeguard our access to this resource from countries outside Europe by establishing a reliable transportation network. This requires the requisite political framework based on international cooperation agreements.

The transportation sector can likewise help to stabilize the energy supply situation. An **integrated transportation policy** that is worthy of the name is needed to correct the imbalance between increasing road traffic and declining rail traffic. The use of hydrogen (produced without CO_2 emissions) in the transportation sector can further reduce our dependency on oil imports while also cutting CO_2 emissions.

6) Subsidies and taxation

The goal of sustainable energy supplies for the EU as a whole presupposes long-term political stability. We appeal for a balance between the statutory framework and economic policy instruments to help protect business, social and ecological interests.

New and promising energy conversion technologies such as clean coal technology, highly efficient combined-cycle (gas and steam) power plants, and technologies to convert energy from renewable and nuclear energy sources, must show clear advantages over existing technologies if they are to penetrate the market quickly and convincingly. These advantages include lower generating costs, low investment and high availability. The future development of distributed generating facilities such as small power plants for the cogeneration of heat and power, for example, should also be seen against this backdrop. These developments require endorsement under an EU-wide energy policy, particularly in the context of increasingly liberalized energy markets. New, distributed technologies, such as fuel cells, should also receive support during the trial phase to help them become established on the market.

Subsidies should be on a reducing basis, in principle, and ultimately limited in order to avoid knock-on effects. There must be stronger incentives to **reduce costs and advance technological developments** to bring alternative energies to the point of commercial viability sooner.

We are in favor of environmental policy based on the "polluter pays" principle. At the same time, however, it is important to protect the principles of consistency and equality of opportunity to prevent distorted incentives and distortion of competition between various locations.

Prices do not currently reflect the cost of environmental pollution and any chance of exerting control is distorted by the enormous range of exemptions. Taxation can be used as a control mechanism, however, if tax rates are linked to CO_2 emissions, irrespective of the particular energy source.

At any rate, all energy policy measures should be **internationally coordinated**, so that they do not restrict the competitiveness of national companies in the global market or weaken a particular location.

7) Climate policy and CO_2 emissions

Siemens acknowledges its commitment to climate protection. This is an integral aspect of efforts to develop a sustainable economy. To be globally effective, however, climate protection requires all regions to play their part. Attempts by individual countries or regions to go it alone will do nothing to meet the global challenge and would sharply distort international competition. With state-of-the-art technology, however, it is possible to reduce CO_2 emissions around the world.

The fastest and most cost-effective way of cutting emissions from fossil-fired power plants is to replace or upgrade existing older coal-fired power plants. The EU could reduce its CO_2 emissions by almost 20% simply by upgrading all of its coal-fired power plants to state-of-the-art technology.

Fossil-based power generation technologies offer yet further potential for increased efficiency. For example, cogeneration of heat and power (CHP), which produces heat ad power at a high overall efficiency, is likely to make a significant contribution to reducing CO_2 emissions. In principle, all technologies based on fossil fuels, waste, biomass and nuclear energy can be used for cogeneration. On the one hand, well-developed technologies are already available while, on the other hand, there are new technologies in the pipeline for this particular application, such as fuel cells, for example. The potential of CHP is limited,

however, because of the limited correlation between demand for power and heat. In addition to increasing energy efficiency, **CO_2 emissions** must be **reduced in the long term** by switching to low-carbon or carbon-free energy sources ("decarbonization"). Appropriate fiscal incentives could help to support this switch.

Voluntary commitments on the part of the industry have also proven to be an effective instrument. For example, a commitment entered into by the European automobile industry will lead to a significant reduction in fleet consumption. The climate protection agreement concluded between the Federal Government and German industry is also likely to be on target . Even German industry's initial commitment of 1995 has successfully reduced its CO_2 emissions by a significant amount.

8) Global perspective

Siemens stands by its commitment to **sustainable development**. We are taking on the global challenges of energy policy and are constructively involved in the debate on potential solutions.

Global energy consumption will **double** by the middle of this century, primarily due to burgeoning demand in the world's developing countries. Global energy and environmental problems will continue to increase particularly as a result of a doubling of CO_2 emissions. The only way for us to solve the major challenges we are facing is through technological progress and continuing improvements in energy efficiency based on the responsible actions of the international Commonwealth of Nations.

If we are to ensure effective cooperation between the industrial and the developing or newly industrializing countries we must agree global boundary conditions. We therefore support application of the **Kyoto mechanisms**, for instance the establishment of emissions trading. This will help us to reconcile the development of secure energy supplies in the developing and newly industrializing countries with the demands of global climate protection.

A secure and sustainable energy supply demands continuous **technical progress**. Innovative products and system solutions from Siemens are continuing to reduce **energy intensity**. And so Siemens, an acknowledged leader in the field, is making a considerable contribution to sustainable development.