

## Energy Prices and Development

Oil and gas prices have risen to record levels during recent years, and they are expected to rise further in the years to come. The International Energy Agency (IEA) forecasts annual increases of 1.6 percent until 2030. This rise is having severe economic impacts on developing countries, many of which are highly dependent on oil and gas imports.

World Bank studies show that the poorest countries suffer the most from oil price shocks such as the one that occurred between 2001 and 2005. An oil price rise of US\$ 10 per barrel can cost poor net oil importing countries in Sub-Saharan Africa up to 1.5 per cent of their GDP.

The costs of power, transportation, cooking fuels, heating and production in small and large enterprises increase along with the oil price. Although this is true for both developed and developing countries, the latter are hit particularly hard since their industries are usually extremely energy-intensive and they are especially dependent on oil and gas for power generation. Rising oil prices slow down economic activity and limit access to motorised transport, electricity and clean and efficient cooking fuels, such as liquefied petroleum gas (LPG).

As a result, oil price increases have the potential to further exacerbate poverty. Even in oil-exporting countries it is typically only a small fraction of the population that profits from the additional export earnings.

### Challenges

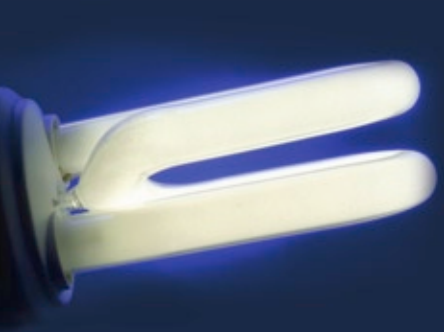
Therefore, it is key for developing countries to reduce their dependence on imported fossil fuels that makes them so vulnerable to oil price shocks. This can be done by promoting the use of alternative energy sources, such as renewable energies, and increasing energy efficiency and energy conservation on both the supply and the demand side. It is vital to strike a good balance between both approaches. This requires a major change in energy policy. In numerous cases, win-win solutions are possible that contribute to poverty reduction, reduce economic vulnerability, save costs and are beneficial for human health and the environment.

### Strategies

GTZ, mainly on behalf of the German Ministry for Economic Cooperation and Development (BMZ), offers a wide range of advisory and capacity building services to foster the use of renewable energies and to promote energy efficiency – both on the project level and through the creation of an enabling environment. Power production, industry and transport are important starting points to reduce a country's dependency on oil.



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In many cases, improving access to electricity is less costly with decentralised renewable energies, such as wind, solar photovoltaics, biomass, small hydro-power etc., as compared to grid extension and diesel generators, particularly in rural areas. Where biofuels are used as an energy source, the rural population, including small-scale farmers, can significantly benefit from the cultivation of the crops used for biofuels production.

GTZ also has extensive experience with energy efficiency and energy conservation in power generation, in small and large industrial enterprises (supply side). The same is true for the demand side, where GTZ offers assistance in promoting the use of energy-efficient domestic appliances and energy efficiency in buildings (i.e. by rehabilitation of existing structures and energy-efficient design of newly constructed houses).

### Promotion of Renewable Energies

Electricity generation in Tunisia is almost entirely based on natural gas (89%) and oil (10%). Covering the continuously growing demand for electricity with additional thermal power plants would necessitate further fossil fuel imports. These already constitute 10% of all imports and are partly responsible for Tunisia's considerable trade deficit. On behalf

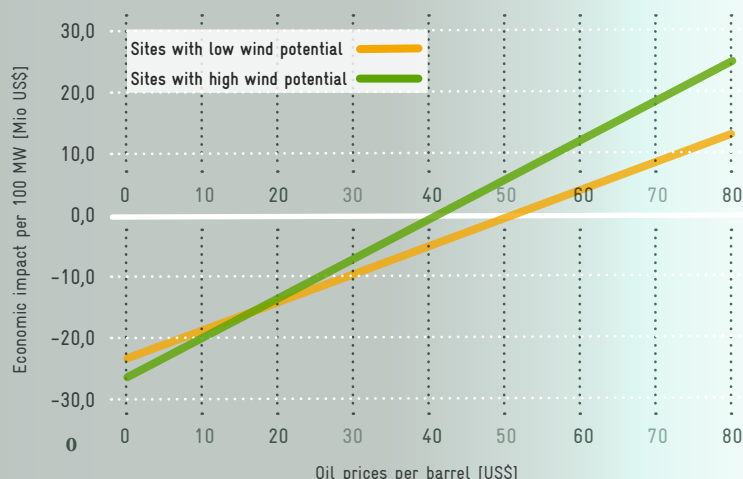
of the German Federal Ministry for Economic Cooperation and Development (BMZ), GTZ works in partnership with the National Energy Management Agency (ANME) to promote energy efficiency and the use of renewable energies through policy advice, technical support and organisational development interventions.

As far as renewables are concerned, the agency focuses on the use of wind, biogas and solar water heaters. GTZ's activities aim at creating an enabling environment for renewable energy development and improve ANME's cooperation with relevant government institutions, the private sector and energy consumers, particularly in the field of wind energy. GTZ provides advice on renewable energy development planning and policy instruments for the promotion of renewable energies. It supports ANME, the national power utility STEG and the private sector to develop grid-connected wind-based power generation, e.g. by assisting the tendering process for wind parks and by helping the Tunisian government to attract private investment in wind power projects.

Project calculations show that the development of wind energy has net economic benefits if the oil price is higher than US\$ 42–49 per barrel, depending on the sites where the systems are installed and on the respective tariffs (see figure 1).



Figure 1: Economic impact of wind energy development in Tunisia





These benefits arise from the net savings in oil and gas imports (avoided fuel imports minus costs of wind-based power generation). A 100 MW increase in wind power capacity entails estimated economic benefits of between US\$ 0.7 and 3.6 million annually, if the oil price is higher than 50 US\$ per barrel (average for second quarter 2005: US\$ 55). If the national objective to increase the overall capacity from 20 MW in 2003 to 300 MW by 2011 will be met, the overall benefits will be correspondingly higher.

### Promotion of Energy Efficiency

The energy sectors of the Central American states are heavily dependent on imported petroleum products that make up 80% of commercial energy consumption. In spite of the economic burden costly hydrocarbon imports place on the economies of countries such as Guatemala, Honduras and El Salvador, oil and petroleum products were used in an inefficient and polluting way for many years, and there is still scope for improvement.

On behalf of BMZ, GTZ worked closely with the UN Economic Commission for Latin America and the Caribbean (ECLAC) to promote market reform and improve regional cooperation in the field of energy efficiency in the residential, transport and industrial sectors from the late 1980s until mid-2005.

Two recently completed GTZ projects promoted the efficient supply and use of petroleum products and attempted to reduce their environmental impact in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.

GTZ worked with oil and petroleum companies and with the national institutions responsible for the formulation and implementation of energy policies, environmental standards and safety rules of the six countries represented in the Central American Cooperation Committee on Hydrocarbons (CCHAC). Project staff provided advice and training on the design and implementation of energy efficiency laws and regulations, on the safe and environment-friendly handling of petroleum products, and on ways to promote the use of clean and efficient energy carriers such as natural gas and LPG. National authorities were assisted in transforming their role from institutions that are directly involved in the import,

processing and distribution of petroleum to take over responsibility for planning and regulation of the sector. In addition, GTZ assisted them in improving data collection and prepared studies about the regional supply situation and specific petroleum-related problems that were discussed with CCHAC members.

The project has helped the Central American governments improve their negotiating position on the international oil and gas markets and diversify their sources of petroleum supply. This has led to considerable savings in acquisition and transportation costs. It has also contributed to the closure of antiquated and inefficient refineries, to a reduction of petroleum-related energy intensity and the adoption of best practices as well as modern legislation for the handling, use and disposal of petroleum products.

The project has further helped reduce the risk of environmental and health hazards and achieve estimated import savings amounting to 500 million US\$ between 1986 and 1997 only. In El Salvador, for example, project activities such as a study of the petroleum market and comparative price studies have led to the renegotiation of profit margins between the government and petroleum companies. These negotiations have resulted in annual cost savings of US\$ 20 million and related benefits for consumers and the country's trade balance.

### International Fuel Prices Study

Fuel taxation is a highly controversial political issue and often faces strong resistance from the public – both in industrial and developing countries. However, fuel taxation is not only crucial for creating a sound financial basis for transport infrastructure investment. It is also an effective way to promote energy efficiency and energy conservation by providing incentives to save on fuels: by using fuel-efficient vehicle technology, by making use of fuel-saving driving techniques (“eco driving”), by switching to alternative fuels (e.g. biofuels) or by avoiding unnecessary traffic altogether.

Since 1991 GTZ on behalf of BMZ regularly compiles a comprehensive international fuel price survey to provide partner countries with comparative data on fuel pricing



policies in more than 170 countries. GTZ's time-series data, by now covering a period of 13 years, shows that some countries are on the right track, with fuel taxes rising smoothly but steadily to adequate levels. In other countries fuel prices are still below production costs, i.e. fuel is subsidised (see figure 2 below). In some extreme cases total subsidies amount to 10 per cent and more of the overall government budget.

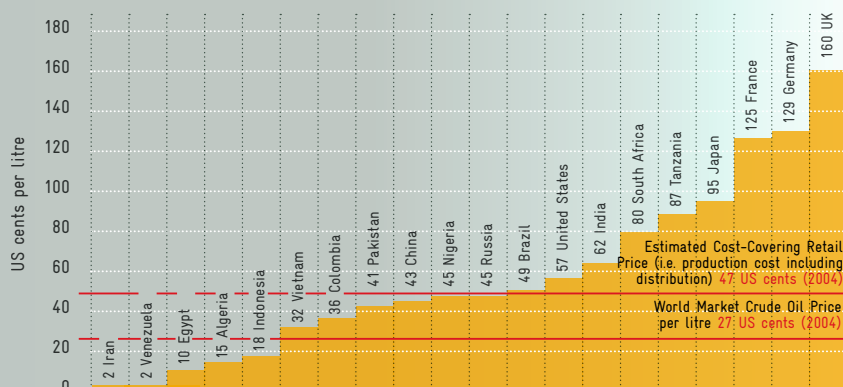
When crude oil prices increase and fuel prices are not adjusted accordingly, the impact on national budgets can be immense. Estimates show that in such cases a rise of the price for crude oil from 50 to 60 US\$ per barrel can cost governments 1 to 2 per cent of the national budget.

GTZ's fuel price survey creates awareness of these issues and supports partner countries in designing appropriate fuel price policies. An electronic version of the survey is available at [www.gtz.de/fuelprices](http://www.gtz.de/fuelprices).

## Lessons learnt

Due to the significant economic growth in a number of developed and developing countries, the depletion of world oil and gas reserves is gradually progressing. As a result, the prices for crude oil and natural gas are expected to rise further in the future. This situation is unsustainable, particularly for net oilimporting developing countries. A sustainable strategy for reducing their dependence on imported fossil fuels encompasses a combination of energy conservation, energy efficiency and the development of renewable energies. This requires a dramatic change in energy policy. In many countries of the world, energy prices are highly distorted. GTZ's energy policy advisory services raise awareness about the need for a rationalisation of energy prices. Only awareness about the impact of fossil fuel dependence and the subsidisation of oil and gas will bring about the energy policy choices that are necessary for a sustainable development of the energy sector and the economy as a whole.

Figure 2: Retail prices of Diesel as of November 2004 (selected countries)



Source: GTZ Fuel Prices Survey 2005, the complete data set for 172 countries (both Diesel and Gasoline) is available at: [www.gtz.de/fuelprices](http://www.gtz.de/fuelprices)



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