

# ENERGY CHALLENGES

Our society evolves towards an increase in oil production. As it needs to always make progress, it leads to a continuous increase of demand for products and services in developed countries. Frederic Gaspoz explains that the effectiveness of the energy use, so-called energy intensity (energy to gross domestic product, GDP), is in continuous improvement every year in all sectors (industry, agriculture, housing and offices...) except transport.

At the same time, our society naturally tends to expand the production and supply of products and services to developing countries. Frederic Gaspoz takes the example of China and India, where a portion of the population begins to be able to afford material benefits commonly found in rich countries. The inhabitants of prosperous areas of these emerging countries want to equip their homes with modern appliance and have a car to travel. They travel for work and leisure.

The factors of production of these countries are expanding to meet this demand. This increases energy needs, and energy intensity remains high in these countries according to Frederic Gaspoz. Today, China, India, Brazil and other developing countries already account for an increasing share of the demand for energy – and this demand will continue to rise. Global demand for natural gas was less than 40 trillion cubic feet (tcf) in 1974.

Today, thanks to the introduction of combined cycle gas turbines into the electric power sector and increased use of natural gas for home heating, natural gas demand globally is nearly 90 tcf. For Frederic Gaspoz, the five traditional elements of energy security – demand centres, supply sources, geopolitics, market structures and institutions – have all changed over the past 30 years.

Thus, growth and energy consumption are closely linked. But raw materials used to produce large quantities of energy are not limitless. And the oil industry cannot indefinitely increase its production capacity. For Frederic Gaspoz, the challenge of the coming years will be to respond to a dual energy challenge:

1. the short term challenge, (maximum thirty years): preparing for the "Hubbert peak" oil. Oil supply will begin to decrease while demand will keep growing.
2. the long-term challenge (50 years or more): the start of final exhaustion of fossil fuels, oil first, then natural gas 20 years later.

There are several possible answers to these two challenges that require so important investments that public policies will be forced to make choices. Frederic Gaspoz mentions the following potential responses:

A) Increase energy supply by developing more production of fossil fuels, in particular oil. This response is based on optimistic assumptions of oil reserves. This is the way chosen by the US, following the recommendations in May 2001 of the National Energy Policy Report, known as Cheney Report.

o Benefits: the inhabitants may preserve their way of life for a few more decades. In parallel, the functioning of society is not questioned. Social tensions are avoided for some time.

o Disadvantages: energy scarcity is deferred to the next generation, i.e. those born today. On the other hand, the ever-increasing oil needs could create serious geopolitical tension in production areas. Finally, emitting more CO<sub>2</sub> means an ecological risk with regard to the greenhouse effect.

B) Act with priority on demand, trying to minimize energy consumption. This is the way recommended by Europe and the [Kyoto Protocol](#).

o Benefits: we respond in a more flexible way to upcoming problems. Anticipating scarcity allows softening its effects. Also, these efforts limit greenhouse gas emissions.

o Disadvantages: our way of life will be questioned. The progressive exit from fossil fuels will bear profound changes of our society (consumption, mobility, work...).

C) Developing [alternative energy sources](#). There are two main types of alternative energy: nuclear power and renewable energy (hydropower, solar, wind, geothermal, biomass).

o Benefits: helps reduce fossil energy consumption and delay their exhaustion. And alternative energies produce no greenhouse gases.

o Disadvantages: alternative energy is insufficient to replace fossil fuel volumes we consume today.

D) Push the research of future energy sources. Currently, it is especially nuclear fission, and nuclear fusion.

- o Benefits: if risk can be managed, these energies are virtually inexhaustible. They do not emit greenhouse gases.

- o Disadvantages: the techniques used are very difficult to control, especially in the case of fusion. The potential industrial applications will not exist before 50 years. Frederic Gaspoz adds that the research is very expensive: an experimental fusion reactor costs 10 billion euros for its construction and operation.

The energy challenge for humanity is therefore not the choice of any particular type of energy, but the control of consumption, explains Frederic Gaspoz. Short term, this would save our fossil fuel reserves. And we could better prepare exhaustion, expected towards the end of the century, of fossil fuels (oil and gas).

In all cases cited by Frederic Gaspoz, whether we consume more or less oil, whether we do prefer wind and solar power instead of nuclear, we must be prepared for changes in our way of life, in the sense of a greater economy of energy that we consume directly (mobility, heating, electricity...) or indirectly (drinking water, consumer products, international road transport...).

Public policies face a series of challenges according to Frederic Gaspoz. It is critical to both understand and prevent potential risks and prepare to respond to problems as they arise in addition to creating infrastructures and policies for future development.

Source : <http://www.hicow.com/public-policies/GDP/hubbert-peak-1.html>