

# Shale Gas has become an Increasingly Important Source of Natural Gas

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### Perspective

#### Advantages

#### What is shist gas?

Until now, fossil fuels have been relatively abundant in meeting the needs of consuming countries. But now the number of requesting countries is increasing while the usual resources are running out. This situation generates multiple international tensions and leads to rising prices, threats of supply disruption, as well as many dangers that compromise peace. Faced with this danger, the United States, since the early 1990s, have sought new resources on their territory by exploiting a gas present in their subsoil and which today ensures their energy independence. Seeing this, the European Union, relayed by almost all European countries (Germany, the Netherlands, Switzerland, Austria, Poland ...) decided to follow their example by prospecting the basement.

# **Technical Description**

These new resources are generating greed among large companies interested in the environment. This gas is more complicated to extract than the previous ones insofar as it is trapped in rock that must be exploded. This gas is most often very deep (2000 to 3000 m) and to recover it must dig horizontal deep vertical wells (each well can be exploited 15 times in a row or 15 explosions at the same place), try to seal the trapped gas in his impurities on the surface where he is retired before being sent into the pipelines. If, most often, the toxic waste is purified (when possible!!!), it also happens that, for economy, they are rejected very closely. To dig wells and blow up rock, large amounts of water are used at very high pressures. Added to this is a secret chemical cocktail containing 596 different chemicals, most of which are not recyclable.

# Shale Gas: Advantages and Disadvantages

Presented as above, the exploitation of shale gas is "obviously" a "progress Technological advances make it possible to use a potential resource up to Present unexploitable. This is what humanity has been doing since the "Neolithic Revolution"!

But then, why this outcry, and why the temporary suspension of exploration permits? Let's eliminate from the outset the NIMBY reflex (Not In My BackYard, "not in my backlog"), reflex favoring personal comfort in the general interest and try to look at the advantages and disadvantages of this shale gas exploitation. This part is very difficult if we want to remain objective, not to minimize the advantages (what some do) or disadvantages (what others do). We will linger more about the geological and environmental aspects (which concern the planet). Only on the political and economic side, of which, however, we cannot every citizen, and in particular every teacher of SVT who may be invited to answer questions from students in the regions concerned. Advantages of the use of gas, moreover local, vis-à-vis the global environment in kilowatt hours, natural gas produces less CO<sub>2</sub> than coal or oil. The following figures can be quoted: the production of a megajoule of energy (1 MJ  $\approx$  0.3 kWh) obtained by burning methane produces 55 g of CO<sub>2</sub>. The same amount the energy obtained by burning oil produces 70 g of CO<sub>2</sub>; and 110 g burning coal. After using fossil fuels, use gas and other fuels it's less bad for the climate. And even if we develop a lot renewable energies, of solar or wind type (official trend displayed in France), They are not permanent (night, days without wind ...). Gas is the most versatile energy: a gas turbine can take a field of wind turbines in a few minutes. It takes a few hours for a coalfired power plant, and even more for a power plant nuclear. and, if one is optimistic, one can also think that this natural gas can ensure the energy transition necessarily long enough before the advent of technology and renewable energies.

In addition, the transport of gas from distant countries consumes energy (15% to 20%). (self-consumption) and therefore produces  $CO_2$ . Produce and consume locally is much better for the environment, a guarantee of (more) sustainable development. What this is true for fruits and vegetables but also for gas! ".

# "Moral and Citizens" Advantage

The Westerner is used to meeting his needs, to use, in part, resources by exploiting and polluting distant countries. It would be a lot more "moral" than those who "benefit" from a resource also suffer from the disadvantages. It would be normal that users are also polluted! The polluter pays slogan is perfectly valid. But we must not forget that polluters upstream, there are certainly profiteers (those who benefit economically and / or financially) but also users-consumers.

In addition to the "polluter pays" slogan, we should also invent four other slogans "profitpayer", "user-payer", "profiteur polluted" and "Polluted user"; the ideal being of course that there is no more polluter. Moreover, if industrial companies are obliged to respect the environment some rich countries (legislation not always very restrictive), companies can spontaneously neglect the environment in poor countries. For the health of on the planet, it would be much better to exploit shale gas in France (environment more or less respected) than in the Niger Delta (totally sacrificed environment).

# Political, Economic, Financial Advantages

This exploitation could contribute to the energy independence of the producing countries, of which, potentially, France (to date, 98% of the gas consumed in France is imported). This would help to reduce the imbalance of their balance of payments. He would certainly enrich oil and gas companies, moderately become gas, a bit of local communities where sites would be established (royalties), and finally In fact, for the latter, the imported gas comes from long-term contracts for the price is indexed to the price of oil while there is a European wholesale market on which prices are significantly lower today. Another aspect, this exploitation reduces unemployment in the regions concerned. The reserves of shale gas are enormous: we speak (in order of magnitude) of a amount of conventional gas reserves globally In France, local reserves would be equivalent to several decades of consumption. This would prolong our "energy comfort" for many years.

#### Disadvantages

#### Disadvantages of the global environment

Although it releases less  $CO_2$  than a coal plant, a gas plant produces greenhouse gases ( $CO_2$ , etc.) and contributes to global warming by bias. And then, faced with the announced shortage of fossil resources, "we" began to look for and renewable resources and energy savings to achieve. New resources Fossil fuels, if pessimistic, may delay this research.

# Disadvantages of the local and regional environment

Even if pseudo-ecologists and other NIMBY shoot everything (sometimes badly) wood to denounce shale gas and thus discredit their cause, the disadvantages the local and regional environment are important to varying degrees. We can state three main disadvantages. The dense network of wells and the potential degradation of ecosystems and landscapes, sometimes called landscape mosaics Vertical wells followed by horizontal drilling will not work these shale gas cover only a few square kilometers at the maximum around each well. Typically, fully exploit a horizontal layer, it would require a well every 0.5 to 4 km. We can expect drilling spacing with the development of the technology. Each borehole occupies an area of approximately one hectare (10,000 m<sup>2</sup>) the drilling period. After the drilling period and throughout the operating period, each wellhead occupies several tens of m<sup>2</sup> (the equivalent of one barn) in the center of a "reserved" area of about 1/3 hectare. A whole network of the tracks will have to connect all these wells together during the drilling period to allow passing machines and trucks, and after, during the operation phase, if the gas is evacuated by tanks. If the gas is removed by pipeline, it is a whole network of pipelines. Build to connect all these wells first to each other and then to an evacuation center on the national grid.