

## Energy Co2 : Energy Profiles

### Natural Gas Energy Profile: Russia's Riches

**Natural gas may be the cleanest fossil fuel, but burning it for energy still adds carbon dioxide to the atmosphere. For Russia, the world's most important producer, gas resources are a ticket back to geopolitical power.**



#### Picture Gallery (click the image to start)

The most important facts about natural gas at a glance (Photo: Reuters)

It's invisible, tasteless, and odorless, but natural gas is one of the world's most important energy sources. The world's gas resources were formed millions of years ago from remains of marine organisms trapped in sea-floor sediments. As a fossil fuel, it is not a renewable resource; it cannot be replaced once it is gone. At the current rate of production, the world's proven reserves will last another 60 years.

#### Worldwide Importance

More than one fifth of all energy consumed worldwide comes from natural gas. The OECD predicts that the share of natural gas in the world energy market will increase only slightly, from 21 to 22 percent, by 2030. The demand for electricity from gas, however, will increase significantly. While natural gas ranks third behind coal and nuclear power as a source for electricity, it will bypass nuclear power in the coming years, and account for about one fifth of all electricity produced worldwide by 2015.

Liquefied petroleum gas (LPG), or autogas, is distilled from natural gas, and is used by around four million European consumers to fuel their cars. Other important LPG markets include Australia, India, Korea, and Turkey. According to the Armenian transport ministry, 20 to 30 percent of all vehicles in the Central Asian republic use liquefied gas. In Brazil and India, LPG is commonly used as a cooking fuel in many poor and urban households.

With rising oil prices, a number of oil companies have ventured into what is called gas-to-liquid processing, whereby natural gas is transformed into a liquid fuel that can be stored and burned in conventional gasoline-powered cars. This could provide a cleaner alternative to oil-based fuels.

#### Global Resources

Natural gas is usually produced as a byproduct when excavating oil or sourced from special gas fields. Firms used to burn off this excess gas, but with rising demand and prices for natural gas, the huge flames that are often seen in the world's oil fields and on offshore platforms could soon be a thing of the past.

Gas can be found in many places around the world, but since it is difficult to transport, production sites tended to be close to consumers. Pipelines have changed this, but they are only economically viable when producing countries like Russia are located next to consumers like the European Union.

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With nearly one fifth of worldwide production capacity, Russia is the world's most important source of natural gas. At the current rate of production, its resources, the largest worldwide, will last for another 70 years. In 2004, Russia's gas monopoly Gazprom sold 31 billion US dollars worth of gas. The company controls about 16 percent of the world's gas reserves and supplies one fourth of all the gas that the European Union consumes.

Gazprom's pricing policy has been a source for much debate and anxiety in the EU. Politicians and businessmen fear that Europe's dependency on Russian gas could make it susceptible to blackmailing and political pressure. The company's importance for Russia became even clearer when its chairman, Dmitry Medvedev, was elected as Russia's president in March 2008.

Pipelines, however, make little sense for countries far away from the major gas markets in Europe, North America, or Asia. While Iran and Qatar have the world's second- and third-biggest gas resources – together over 30 percent of proven world reserves – they only account for about 5 percent of total global production capacity.

While oil and gas prices were low, compressing gas into a liquid form and shipping it with special tankers was too costly. The construction of new super tankers and soaring energy prices, however, have made liquefied natural gas (LNG) a viable alternative for many markets, and an interesting business for countries like Qatar. Islands like Japan, for example, without domestic gas resources have been relying on LNG for years. With U.S. natural gas reserves dwindling, demand is growing elsewhere, too.

### **Energy Output and Environmental Impact**

Natural gas is mostly used for electricity production, mainly because of its high efficiency and relatively low pollution. The most advanced gas power plants, combined cycle generation units, capture heat energy that is normally wasted, and use it to generate more electricity. Such plants can reach energy efficiency levels of up to 60 percent, making them twice as efficient as power plants run on coal or

gas.

Such plants also emit significantly less carbon dioxide and other pollutants, because natural gas is the cleanest of all fossil fuels. Composed primarily of methane, burning it produces mostly carbon dioxide and water vapor. Sulfur and nitrogen, components that make burning coal and oil so harmful, only appear in minor concentrations. When burnt, natural gas also emits almost 30- percent less carbon dioxide per unit of energy released than oil, and around 45 percent less than coal.

On the downside, gas contains less energy than an equivalent amount of oil. If used to run cars, more gas is needed than gasoline. Cars using liquefied petroleum gas , for example, usually consume 10 to 20 percent more than cars using gasoline. But with a liter of gasoline being about twice as expensive as a liter of LPG, motorists still get a good deal. Autogas is also a cleaner fuel than gasoline and produces about 20 percent less CO2 emissions.

Another problem is the relatively high monetary and environmental costs of drilling of holes for exploration and extraction of natural gas. A planned gas pipeline from the Amazon basin to the Atlantic coast in Peru will destroy large patches of rainforest, pollute local rivers, and destroy local native communities. Another future pipeline that would link Russia and Germany and run under the Baltic Sea would cross several marine conservation areas and disturb the seabed, environmentalists fear.

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