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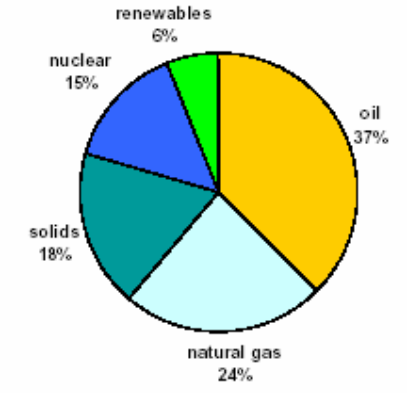
European Energy Security

With 450 million inhabitants, the European Union is the second largest primary energy consumer in the world after the United States, accounting for 17% of global consumption. At the same time, EU member states are comparatively poor in primary energy resources – EU oil and natural gas production account for less than 5% and 12% of respective global production, and the EU is currently import dependent for 50% of its energy. Nor is this current share sustainable – EU member states possess only 0.6% and 2% of proven global oil and natural gas reserves respectively. Already the largest global importer of primary energy resources, the EU is projected to be 70% import dependent by 2030.[i] As primary energy resources are unequally distributed in favor of increasingly unstable regions, the EU faces an enormous challenge in meeting the rising demands of its constituent populations and industries for secure, clean and affordable energy.

Current Sources of EU Energy

According to the European Commission, the EU's current energy import dependency stands at roughly 50%. Imports of oil and natural gas account for nearly all of this dependency. The remaining 50% of demand is covered by indigenously produced energy, including oil and natural gas (from the North Sea and the Adriatic), solid fuels (mostly coal from Northern Europe), nuclear power and renewables (mostly concentrated in Scandinavia). The latest available data on the overall energy mix of the EU for is shown in figure 1.

Figure 1: Contribution of energy sources to EU 25 energy consumption, 2004.



source: European Commission {COM(2006) 105 final}

Accounting for 37% of total energy consumption, oil is clearly the most important fuel and is predominantly used for transport, industry and in households and holds a

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particular symbolic political importance for "Western governments". Import dependency currently stands at 81 %, with the major suppliers being the Middle East (31%), the former USSR (30.8%) and Africa (14%).

Natural gas is the second most important fuel, accounting for 24% of energy consumption, with an import dependence of 54%. Current indigenous supply is dominated by the United Kingdom, the Netherlands, Denmark and Italy. Imports originate from, in order of volume, Russia (40%), Algeria (30%), and Norway (25%). As an efficient, relatively clean fuel, natural gas became an increasingly crucial input into the EU's energy mix during 1990s, mostly used in power generation, households and industry.

Coal and lignite are the third most important fuel sources, accounting for 18%. Even with significant subsidies provided for German and Polish coal, import dependence currently stands at 35.4%. The most important countries of origin are South Africa, Australia and the United States.

Nuclear energy currently accounts for 15% of energy consumption. Of the major nuclear players, Germany, Sweden and Denmark are currently phasing out existing nuclear power stations, while Britain, France and Finland have recently committed to major investment in new power stations as a means of strengthening security of supply. Though nuclear power is often considered an endogenous energy source, EU member states are already 98% import dependent for uranium.

Finally, 6% of the EU's energy mix is provided for by endogenously produced renewable energy sources (RES). The key technologies utilized are biomass/waste (60%), hydroelectric (25%) and wind (10%). Wind is the fastest growing sector, as it produces less carbon outputs than biomass/waste, and possibilities for hydroelectric generation have nearly all been exploited already.

Future Risks to Energy Security

The European Commission projects that EU energy consumption will increase by 15% from 2000 to 2030. This is based upon estimates of an average 2% GDP growth per annum and diminishing energy demand after 2020 reflecting low population growth. As a result of increasing energy demand and diminishing endogenous resources, this increase in demand will mostly be covered by imports of oil and natural gas, thus raising EU import dependency to 70% by 2030. The projected development of the EU's energy mix is shown below:

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Figure 2: Share of energy sources in total energy consumption (%) 2000-2030.

	1990	2000	2010	2020	2030
Solid fuels	27.8	18.5	15.8	13.8	15.5
Oil	38.3	38.4	36.9	35.5	33.8
Gas	16.7	22.8	25.5	28.1	27.3
Nuclear	12.7	14.4	13.7	12.1	11.1
Renewables	4.4	5.8	7.9	10.4	12.2

source: European Commission {COM(2006) 105 final}

The risk involved in this increasing dependence on natural gas was starkly illustrated in January 2006. As previously noted, Russian natural gas accounts for 30% of EU imports. In addition, the majority of natural gas produced in the Central Asian republics surrounding the Caspian Sea is transported to the EU through Russian pipelines. When the directors of the Russian state-owned energy company Gazprom turned off gas supplies to Ukraine over the disputed level of gas price subsidies, some EU member states experienced a 40% decrease in gas deliveries and were forced to tap into their strategic reserves. Though supplies resumed within a week, this incident raised questions about the security of Russian and Caspian Sea gas supplies to the EU in the future. The Kremlin's increasing consolidation of Gazprom's control over Russia's abundant energy resources and infrastructure raises the possibility of future Russian governments utilizing gas supply as a tool of foreign policy. Given current disagreements between the EU and Russia on Ukraine, Belarus, Georgia and Moldova, this is a possibility that must obviously be taken seriously. Nor does this possibility apply purely to Russia. Increased reliance on supplies from North African states like Algeria diminishes the EU's ability to promote human rights, as envisioned in the Barcelona Process.[ii]

Coming at a time when oil prices are at record highs and relations with major producers like Iran are strained, this incident has illustrated that EU access to energy imports is less secure than previously acknowledged. As dependency on natural gas from unstable sources increases, EU member states will have to make further provisions to insulate their economies from potentially more frequent supply shocks.

Current Short-term Provisions for Energy Security

European Union countries have a long history of attempting to ensure energy security, starting with the founding Coal and Steel Community in 1950 and Euratom in 1957.[iii] Following the oil shock of 1973-4, the European community states joined with the United States and Japan in establishing the International Energy Agency (IEA).

Membership of the IEA requires a commitment for each state to hold reserves equivalent to 90 days based upon the previous year's consumption. In addition, the IEA maintains stockpiles of oil in order to implement Coordinated Emergency Response Measures (CERM) in the case of a severe threat to oil supplies, such as during the 1990-1 Gulf War. EU supplies of solid fuel and oil, therefore, are regulated at a European and international level and can be assumed to be relatively secure.

Provisions for security of supply in natural gas and electricity capacity, however, remain underdeveloped. Until the 1990's, gas and electricity provision remained the exclusive domain of the member states, who favored state-owned providers charged with holding sufficient reserves to ensure security of supply. In the mid-1990s, significant efforts were made to liberalize electricity and gas markets at a European level in order to maximize cross-country competition and so reduce energy costs for industry and households (see directive 96/92/EC for electricity; directive 98/30 for gas). Progress so far remains limited, however, with most member states favoring consolidation of former state owned enterprises into national champions. Examples include the German government's approval of the acquisition of Ruhrgas by the country's largest energy company Eon, and the French government's February 25th frustration of the Italian company ENEL's bid for Suez in favor of a merger with the former state company Gaz de France. There is also continued underinvestment in interconnectivity between national electricity and gas pipeline grids. This not only inhibits the creation of a single market for electricity and gas, but also prevents effective "solidarity" in the event of a supply shock. An example of this was the blackout that struck all of Italy during a heat wave in September 2003, which revealed chronic underinvestment and lack of co-ordination between the national grids of Italy and her Alpine neighbors. Finally, some experts have expressed concern that in the absence of a truly integrated European gas market, liberalization has inadvertently led to competing companies "free riding" on the strategic reserves of former state monopolies in order to ensure competitive pricing, with the end result that reserves will not be maintained at sufficient levels.

Longer Term Strategies for Energy Security

Following the temporary gas supply shock instigated by Russia in January 2006, the debate over a coordinated EU energy policy has gathered pace. In particular, the majority of member states are interested in making the EU's Common Foreign and Security Policy more affective as regards Russia, in order to maximize the costs to Russia of using energy supply as a tool of foreign policy. The European Commission, however, saw the opportunity to pursue other energy agenda simultaneously and in March 2006 launched a Green Paper on "A European Strategy for Sustainable, Competitive and Secure Energy." The key recommendations of the paper are as follows:

- Consolidation of the internal energy market by mid-2007: this will require the creation of unified electricity and gas grids, divestiture of veto-enabling government share-holding in strategic companies, and encouragement of

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cross-border investment in energy infrastructure to enable the emergence of European, rather than national providers.

- Establishment of a European Energy Supply Observatory to co-ordinate strategic reserves and to implement common standards in order to facilitate exchange of information and solidarity.
- Establishment of a European Energy Review to ensure diversity of the energy mix and minimize competition for third party resources.
- An integrated approach to tackling climate change, including an EU-wide emissions trading initiative, a common framework for energy taxation and EU wide promotion of RES development and clean carbon technology. Concrete goals include boosting RES usage by 15% and biofuel usage by 8% by 2015.
- Establishment of a strategic energy technology plan to encourage jointly-funded research into energy efficiency, with the aim of using 20% less energy overall by 2020.
- A coherent external energy policy to increase European bargaining power with the EU's main energy providers and Russia in particular.

At the March European Council Summit, European leaders declared themselves broadly in favor of these recommendations, while reaffirming national sovereignty over energy matters and rejecting Commission coordination of national energy mixes. On the basis of past performance, however, it would be unrealistic to expect that the Commission's recommendations will be implemented in the near future. Evidence for this is provided by the slow pace of liberalization in gas and electricity markets since the 1990's, the lack of implementation of measures suggested by the Commission's last energy Green Paper published in 2000 and the fact that member states are far from fulfilling their obligations under the Kyoto protocols to have RES account for 12% of energy consumption by 2010.

Therefore, in addition to negotiating a more unified energy policy, EU member states will seek to ensure their own security of supply. States will pursue this security through both diversification of their natural gas supplies and increased investment in domestic energy production. Concrete measures will include:

- Investing in natural gas production in Central Asia and constructing new gas pipelines that bypass Russia through Azerbaijan to ensure security of supply.
- Development of the natural gas potential of North African States and the construction of new pipelines under the Mediterranean.
- Decreasing reliance on pipelines as the dominant means of gas transportation through the construction of new port facilities in the Italy, the Netherlands and the United Kingdom able to receive delivery of tanker transported liquefied natural gas (LNG) from the Middle East.
- Renewed investment in nuclear power stations by Britain, France, Finland and the Baltic states.
- Further investment in clean carbon technology and carbon sequestration by coal-rich states like Germany and Poland, in order to increase the usage of solid fuels without increasing carbon emissions.
- Increased investment in RES, especially wind farms, geothermal energy and biofuel production by the Scandinavian states, and especially Sweden, which

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has declared its intention to become the world's first oil-free economy by 2020.

Given the pre-existence of Europe based global energy companies and the continued protectionist sentiments of member states as regards energy policy, these measures are likely to be enacted more swiftly then any putative EU-wide measures.

Summary

The decision by Gazprom to cut off gas supplies to the Ukraine in January 2006 heightened the awareness in EU member states of their increasing dependence on imported natural gas. The European Commission has used the event to push for further liberalization of gas and electricity markets and coordination of national energy strategies, and the member states have proven partially receptive. Large obstacles to liberalization remain, including chronic underinvestment in the connectivity between national grids, and the preference of EU governments to promote national champions at the expense of more efficient cross-border mergers. In conclusion, though member states are rhetorically supportive of an EU energy policy, they are likely to concentrate upon the diversification of individual natural gas supplies, and the promotion of viable domestic alternatives prior to implementing common measures to ensure energy "solidarity".

[i] Data drawn from European Commission {COM(2006) 105 final} and the International Energy Agency's *World Energy Outlook* 2004.

[ii] The Barcelona Process, also known as the "Euro-Mediterranean Process," was initiated in 1995 and is designed to manage relations between the European Union and ten of its southern neighbours (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Palestinian Authority, Syria, Tunisia and Turkey). There are three main objectives to the Process: 1) to establish a sphere of peace and security in the Mediterranean; 2) to establish a free trade area between the EU and these 10 Mediterranean states; 3) to encourage development and democratisation through exchange programs.

[iii] EURATOM was inaugurated by the adoption of the Treaty establishing the European Atomic Energy Community. The Treaty granted the Commission supranational regulatory authority over three areas of nuclear policy: 1) radiation protection; 2) supply of nuclear fissile materials; 3) nuclear safeguards.

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