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The issue of energy security appeared in the year 2000 and, after having been concealed or confined to circles of experts for too long, it has now become a subject for debate in Europe's official circles and the media. Several events helped to bring about this increased awareness:

1. The rise in oil prices, which went from $20 a barrel at the beginning of 2000 to a current average of $60 a barrel, after having peaked at $ 70 in early 2006.

2. The attack on the French supertanker *Limburg* off the coast of Yemen in 2003 highlighted the threat of terrorist attacks on the main arteries of energy transit.

3. A growing energy dependency on countries or areas deemed to be "at risk" (e.g. Venezuela, Russia, the Caucasus, Nigeria, the Middle East, etc.).

4. The problem of climate change emphasises the link between energy security, sustainability and competitiveness[1].

5. The exhaustion of the oil supply:

- Due to exhaustion of reserves or the temporary interruption of the supply;
- Due to the use of energy as a political weapon (e.g. Russia-Ukraine, Russia-Georgia, Venezuela-United States, etc.);
- As a consequence of attacks on transport networks (e.g. attacks on oil pipelines in Iraq), refineries or oil installations (successful or frustrated attacks in Riyadh and in eastern Saudi Arabia);
- As a result of natural disasters (such as Hurricane Katrina's devastation of New Orleans, which forced several refineries to close down);
- As a consequence of an electricity blackout, such as the one that affected California in 2003.

6. The uncontrolled consumption of oil, especially in developed countries, has awoken fears of the exhaustion of oil reserves. At present, 16% of the world's population consumes 70% of the oil

1. Document from the European Commission and the High Representative for the Common Foreign and Security Policy before the European Council, S160/2006.

produced. On average, four barrels are consumed per inhabitant per year, though this average changes to 11 barrels for a French citizen, 20 for an American and 1.5 for a Chinese[2]. How many "Saudi Arabias" would have to be invented if all the Chinese and the Indians began consuming oil like the Americans?

Even so, the EU began examining the problem of energy security a long time before the attack on the Limburg in 2003, the power blackout in that same year or the Russia-Ukraine crisis in 2006. As far back as 2001, the EU published a Green Book on the European Strategy for the Security of Energy Supply, prompted by alarm in the EU at the rise in rates of consumption, dependence and concentration, as well as by the effects of unbridled energy consumption on global warming.

A Brief Summary of the EU's Green Book

The European Union is consuming an increasing amount of energy, and importing more and more energy products. As a result, dependency on external energy is continually growing. The dizzying rise in the price of oil (the price of crude has tripled since March 1999, a fact that could undermine the recovery of the European economy) highlights, once again, the structural weaknesses in the European Union's energy supply. Specifically, these are: Europe's growing rate of energy dependency, the role of oil as the price guide for energy and the disappointing results of policies for control of consumption. Without an active energy policy, the European Union will be unable to free itself from this growing energy dependency.

If nothing is done to modify these trends, within a period of 20 to 30 years, around 70% of the EU's energy needs will be met by imported products, compared with 50% at present. This dependence is reflected in all sectors of the economy. Transport, the internal sector and electricity are all generally powered by hydrocarbons and are at the mercy of erratic fluctuations in international prices. The EU's enlargement will serve to accentuate these trends. The consequences of this dependence are significant in economic terms: in 1999, they represented a cost of 240,000 million € that is, 6% of total imports and 1.2% of the GNP. In geopolitical terms, 45% of oil imports come from the Middle East, while 40% of natural gas imports come from Russia. Currently, the European Union still does not have the necessary means to influence the international market.

In the long term, the European Union's energy supply security strategy should aim to guarantee the physical and continued availability of energy products on the market, at a price that is affordable for all consumers (both private individuals and industry), while at the same time respecting environmental concerns and the requirements for sustainable development as stipulated in the European Union Treaty (articles 2 and 6).

Security of supply does not mean maximising energy autonomy or minimising dependence, but rather reducing the risks associated with same. The objectives that should be aimed for include achieving a balance and diversification among the different sources of supply (in terms of

2. *Institut français du Pétrole,* "Face à une demande pétrolière en croissance, les réserves de pétrole peuvent-elles suivre ?" *Pétrole et gaz arabes,* 1 October, 2006, P.39.

products and geographical regions) and successfully encouraging the oil-producing countries to join the World Trade Organisation.

During the coming decade, investment in energy (which covers both the replacement of outdated infrastructures and the meeting of growing energy needs) will force European economies to come to a decision over the different energy products that will determine the next 30 years, owing to the inertia of energy systems.

The European Union's energy options are determined by the world context and by the Union's possible enlargement to 30 Member States with differentiated energy structures; but above all, the EU's possibilities are determined by the energy markets' new frame of reference: the liberalisation of the sector and environmental concerns.

The environmental concerns, which are now widely shared by public opinion owing to the damage caused by the energy chain (both damage of accidental origin, such as oil spills, nuclear accidents, methane leaks, and damage linked with pollutant emissions), have highlighted the disadvantages of fossil fuels and the problems involved with nuclear energy. The fight against climate change, meanwhile, represents a challenge and a long-term struggle for the international community. The objectives set down in the Kyoto Protocol are no more than the first steps. Though the European Union stabilised its greenhouse gas emissions in the year 2000, since then, they have been increasing, both in the Union and in the rest of the world.

Meanwhile, the establishing of an internal energy market means that demand for energy now occupies a new place and a new role. New tensions are arising for which our societies will have to find viable compromises: the fall in the price of electricity works against policies for controlling the growing demand and the fight against climate change; the competition introduced by the internal market has altered the conditions of competition for the different energy sectors (coal, nuclear energy, natural gas, oil and renewable energies).

At present, the Member States are interdependent in terms of both the fight against climate change and the development of the internal energy market. Energy policy has taken on a new dimension within the European Union, despite the fact that this situation has not yet resulted in the creation of new Union powers. In this respect, new ways should be found of tackling the subject of Europe's energy policy other than through the internal market, harmonisation, the environment and a fiscal approach. The European Union should possess greater control over its energy destiny; the crisis in oil prices that has developed since 1999 means that this situation is an urgent one.

This debate should be approached while bearing in mind that current energy consumption can be broken down as follows: 41% is covered by oil, 22% by natural gas, 16% by solid fuels (coal, lignite and peat), 15% by nuclear energy and 6% by renewable energies. If no action is taken, by the year 2030, energy consumption will still be based on fossil fuels: 38% will be covered by oil, 29% by natural gas, 19% by solid fuels, a mere 6% by nuclear energy and 8% by renewable energies.

The Green Book goes on to sketch out, in broad terms, a long-term energy strategy:

- The Union must rebalance its supply policy through clear actions to encourage a demand policy. Though the EU has little room for manoeuvring with respect to the growth in supply, the panorama seems to be more promising with regard to demand.
- With respect to demand, the Green Book issues a call for a real change in consumer behaviour; it focuses on the possible use of tax instruments to orient demand toward a more controlled consumption that has less impact on the environment. It promotes the idea of fiscal or parafiscal deductions for penalising the environmental impact of different energies. The transport and construction sectors should also be the object of an active policy of energy saving and diversification in favour of non-polluting energies.

As for supply, priority should be given to the fight against global warming. The development of new and renewable energies (including biofuels) is the key to change. Doubling their contribution to energy consumption from 6% to 12% and raising their use for electricity production from 14% to 22% is an objective that should be reached by 2010. Such an ambitious objective could only be supported by financial measures (e.g. state aid, tax incentives or financial support). One of the other options that should be explored is for profitable energies (oil, gas, nuclear energy) to finance the development of renewable energies that have not benefited, as conventional energies have, from different types of aid and support.

In the medium-term, the use of nuclear energy should also be considered. This debate would include such important points as the decision by most Member States to turn their backs on nuclear power, the fight against global warming, security of supply and sustainable development. Independently of the conclusions that may result from this debate, active research should be continued into waste management technologies and the practical application of nuclear energy in optimum security conditions.

In the case of hydrocarbons (imports of which are steadily growing) a stronger strategic reserve mechanism should be devised, as well as new import routes. Any technological progress will strengthen the effects of this new approach to energy strategy.

A European Strategy for Sustainable, Competitive and Secure Energy

As a result of Member States' reactions to the Green Book, the Council called on the European Commission to prioritise the actions to be taken more clearly, and to provide elements for establishing a foreign relations strategy within the area of energy. In response to this request, in 2006, the Commission published the document "A European Strategy for Sustainable, Competitive and Secure Energy"[3].

On the subject of foreign policy, the Commission's document sets a major challenge for the EU: to design a clear, coherent foreign policy in the area of energy, and with a dual objective:

3. European Commission, "A European Strategy for Sustainable, Competitive and Secure Energy", March 2006 (doc. 7070/06 (COM 2006) (end of 105).

a) To strengthen the EU's collective security with respect to energy.

b) To effectively counteract any possible strategies implemented by major foreign energy suppliers to influence the market base.

Such foreign policy objectives cannot be achieved without a prior condition: a coherent internal policy in the area of energy.

Building the internal energy market

For the EU, the establishing of an internal energy market (a decision made by the Barcelona European Council in March 2002) should produce an internal market that is more open, and which creates greater solidarity between the Member States, particularly in the sectors of oil, gas and electricity. Even so, the Commission observed the opening-up of the internal energy market has not been completed, while energy dependency is increasing and the available resources for action continue to be inadequate.

1. The integration of the markets has not been completed, neither for oil nor gas. This is because, on the one hand, the energy sector is still to a great extent a captive national market, and on the other hand, because the large energy companies tend to maintain control over the entire energy chain, while competition, in contrast, demands the "separation of energy activities" (known as "ownership unbundling"). As a consequence, a clear community framework should be established in order to guarantee the external security of the energy supply in a way that is compatible with the functioning of the internal market.

2. Over-dependency on foreign supply is dangerous. The Commission claims that if no action is taken, by 2030 the proportion of oil imported into the EU could reach 90%, while gas figures could be as high as 70%. This huge dependency involves a threefold risk, given the instability of the exporting countries, the excessive concentration of supply in a small number of exporting countries and the vulnerability of sectors that are over-dependent on oil (98% of transport, for example, depends on oil).

Inadequate resources for action

There are several danger areas in this respect:

a) In the event of a crisis, the Commission has no power over the use of security reserves. Organisation in this area is effectively fragmented: some states possess a reserve agency, while in others the reserves are in the hands of the oil companies. Such practices not only lead to a competitive imbalance, but also uncertainty with respect to the effective mobilisation of reserves in the event of a crisis.

What is going on with the framework of the International Energy Agency (IEA)? The Commission claims that it has not proved satisfactory. In the first place, the IEA's crisis mechanism (the provision of reserves in the event of interrupted supply) requires unanimous agreement by the

26 members. Furthermore, the mechanism links the administration of the EU's oil reserves with that of numerous foreign partners (particularly the United States) whose priorities are not necessarily the same as those of the EU.

b) The supply of gas presents another problem. At present, no community framework exists to guarantee the security of the gas supply. The gas market has been left in the hands of the European gas industry. Nevertheless, the Commission points out that no assurance exists that gas suppliers will give strategic priority to security of supply[4].

All these factors (incomplete internal market, over-dependency on imports, inadequate resources for action) are justification for the drafting of a European Community Energy Code that would have the following objectives: strengthening mutual trust and support between the Member States on this issue, managing supply security and the security of infrastructures and, in short, encouraging market stability. The Commission believes that this would require the harmonising of national reserve systems through the creation of a public reserve organisation, as well as drafting a common strategy for the coordinated use of reserves, defining a general policy on security of supply (particularly through long-term import contracts, which would require the establishing of a dialogue on energy with the exporting countries) and, finally, creating a European observation system to monitor the supply of hydrocarbons.

The threats to energy security

Such threats are diverse in nature: an imbalance between supply and demand, the absence or insufficiency of investment, terrorist attacks and a lack of ecological sustainability.

The outlook for energy

The work of reference for this subject is the *World Energy Outlook* by the International Energy Agency. The Reference Scenario (monitoring of current trends) in *World Energy Outlook 2006* highlights several key factors:

a) Global demand for oil could reach 99 million barrels per day (mb/d) by 2015 and 116 million by 2030, compared with 85 million in 2005. However, it is unlikely that oil production could exceed a rate of 100 to 110 mb/d. While future tension in the energy markets is not inevitable, it is at least highly probable;

b) The main proportion of the required oil supply will probably be covered by a small number of countries, in particular the Gulf States, and especially Saudi Arabia.

4. European Commission, "The internal energy market: Strengthening the security of supply", Directorate-General for Energy and Transport, Memorandum 2002, http://www.europa.eu

Table 1. Net energy imports by region			
	2004	2015	2030
OECD	**1.657**	**2.123**	**2.444**
Coal	113	117	98
Oil	1,272	1,569	1,712
Gas	272	436	634
Transition economies	**-492**	**-641**	**-745**
Coal	-27	-39	-46
Oil	-345	-476	-541
Gas	-120	-126	-158
Developing countries	**-1.228**	**-1.549**	**-1.776**
Coal	-70	-71	-45
Oil	-1,007	-1,168	-1,256
Gas	-152	-310	-476

Source: *World Energy Outlook* ©OECD/IEA, 2006, Table 2.2, page 74. * Reference Scenario.

Table 2. Net oil imports by region (mb/d)					
	Alternative Scenario			Reference Scenario	
	2005	2015	2030	2015	2030
OECD	**27.6**	**30.9**	**30.5**	**32.7**	**35.7**
North America	11.1	12.1	11.9	13.0	15.0
Europe	8.8	11.0	10.8	11.5	12.2
Pacific	7.7	7.9	7.8	8.2	8.5
Developing Asia	**7.1**	**11.7**	**17.8**	**13.0**	**21.7**
China	3.0	5.6	9.6	6.3	11.8
India	1.8	2.7	4.1	3.8	5.2
Rest of developing Asia	2.3	3.3	4.1	3.8	5.2
European Union	**10.9**	**12.2**	**11.7**	**12.7**	**13,0**

Source : *World Energy Outlook* ©OECD/IEA, 2006, Table 7.5, page 181.

The two tables above forecast a greater dependency on oil imports by 2030, a dependency that will reach 65% for OECD countries as a whole, while for the EU it will reach up to 92%; this would be equivalent to net imports of 35.7 mb/d for OECD countries and 13 million for EU countries.

Now, a high percentage of these imports would be covered by the OPEC nations (Organization of the Petroleum Exporting Countries), and particularly the Gulf States; their market share for oil would go from 40% to 48% in 2030, with 56.3 mb/d (34 for Saudi Arabia, which would be producing 15 mb/d in 2030 compared to 9 mb/d in 2006). The result would be greater influence over the market for these countries.

This merely serves to verify a situation that already exists, and which will become more consolidated in the future, especially "if the demand for oil shows a limited price-elasticity"[5], or rather, that an increase in price would only have a limited effect on demand. This means, generally speaking, that guaranteeing large exports, such as those of Saudi Arabia, is an essential element in the world energy security strategy.

5. Interview with Claude Mandil, Executive Director of the IEA, *Pétrole et gas arabes*, 16 November, 2006, P. 8.

The colossal investment required

The financing costs necessary to place supplementary amounts of oil on the market would be on a Pharaonic scale. The IEA has calculated that the sum needed to create or maintain energy supply infrastructures will reach $20,192 billion (2005 dollar prices) in the coming 25 years. These figures are not only mind-boggling, when they are broken down they are also puzzling: developing countries will effectively have to pay out the most, 52% of the total (i.e. $10,515 billion), compared with 35% for OECD countries (i.e. $7,289 billion) and only $1.85 billion for transition economies, of which $1,195 billion corresponds to Russia.

Table 3. Investments in energy supply 2005-2030*
(in billions of $ 2005)

	Coal	Oil	Gas	Electricity	Total
OECD	**156**	**1,149**	**1,744**	**4,240**	**7,289**
North America	80	856	1,189	1,979	4,104
Europe	34	246	417	1,680	2,376
Pacific	42	47	139	582	809
Transition economies	**33**	**639**	**589**	**590**	**1,850**
Russia	15	478	440	263	1,195
Developing countries	**330**	**2,223**	**1516**	**6,446**	**10,515**
Developing Asia	298	662	457	4,847	6,264
China	*238*	*351*	*124*	*3,007*	*3,720*
India	*38*	*48*	*55*	*967*	*1,108*
Indonesia	*13*	*49*	*86*	*187*	*335*
Middle East	1	698	381	396	1,476
Africa	20	485	413	484	1,402
Latin America	12	378	265	719	1,374
Brasil	*1*	*138*	*48*	*252*	*439*
Interregional transportation	45	256	76	-	376
World mundial	**563**	**4,266**	**3,925**	**11,276**	**20,192**

Source: *World Energy Outlook* ©OECD/IEA, 2006, Table 2.3, page 77. * Reference Scenario.

Table 4. Dependence on oil imports * (%)

	1980	1990	2004	2010	2015	2030
OECD	**59**	**53**	**56**	**60**	**62**	**65**
North America	32	31	42	45	46	49
United States	41	46	64	66	69	74
Europe	82	67	58	69	75	80
Pacific	92	90	93	91	93	95
Japan	100	100	100	100	100	100
Korea	100	100	100	100	100	100
Developing Asia	**-2**	**6**	**48**	**63**	**63**	**73**
China	-9	-16	46	63	63	77
India	69	44	69	77	77	87
European Union	**-**	**-**	**79**	**89**	**89**	**92**

Source: *World Energy Outlook* ©OECD/IEA, 2006, Table 3.4, page 101. * Reference Scenario.

The breakdown of the spending required highlights the predominant importance of the electricity sector ($11,276 billion), i.e. 55.8% of the total, compared with 21.1% ($4,266 billion) for oil and 19.4% ($3,925 billion) for gas. Coal ($563,000 million) and biofuels ($161,000 million) come much further down on the list.

In view of the size of the investment required, the IEA believes that the reference trend scenario is unsustainable, both in respect to the mobilisation of financial resources and to the threat that it represents for the ecosystem.

Ecological threats

In an article on the IEA's "Energy Outlook for 2006", the *Financial Times* dubbed it "An unsustainable Outlook"[6]. Claude Mandil, the Executive Director of the IEA, shares this concern. As a result, the IEA strongly recommends alternative policies that will act on $C0_2$ emissions, and which would have a bearing on both demand and supply. With respect to demand, the IEA places emphasis upon energy efficiency, new technologies in the automobile sector and policies that foster a reduction in the consumption of polluting energies. As for supply, it champions another energy mix that emphasises the re-launching of nuclear energy, which is, the IEA claims, less polluting (though no mention is made of nuclear waste).

All these proposals are aimed at reducing $C0_2$ emissions, but even in the alternative scenario that the IEA appears to be supporting (a reduction of energy consumption), the 2030 forecast for $C0_2$ emissions is still very high. Thus, the IEA has proposed to public administrations that they invest in $C0_2$ capturing and storing technologies, which constitute a very promising solution in the fight against the "greenhouse effect", according to the experts.

Re-nationalisation of Oil Fields, Terrorist Threats and Organised Crime

"If a ship that cost us less than $1,000 has succeeded in destroying an oil tanker of that size, imagine the magnitude of the danger threatening the West's trade artery ..."[7]. This extract, taken from an Al Qaeda communiqué following the attack on the French supertanker *Limburg* off the coast of Yemen, starkly demonstrates the threat that terrorism represents to the energy trade. One can understand, therefore, the interest being paid to energy security not only by Western governments but also by NATO[8] in order to "stabilise" the areas in which energy interests are concentrated, as well as to "guarantee" the main energy flows and strengthen military and security cooperation with exporting countries.

Terrorism is a very real threat, but it is not the only one. In some African and South American countries, criminal activity is disrupting the operations of large companies (local mafias re-routing oil

6. *Financial Times*, 20 October, 2006.
7. BRICET des VALLONS, Georges-Henri, "La question de la sécurisation pétrolière" *Géostratégiques,* no. 9, October 2005, P. 21.
8. Report by VAN GENNIP, Jos, *Energy security,* Nato Parliamentary Assembly, 064 ESC 06 E / www.nato-pa.int.

pipelines, murders, destruction of infrastructure, etc.). And while piracy continues to wreak havoc on the high seas and in the straits, the sabotaging of oil pipelines, such as in Iraq, has also become a common phenomenon. When the defeated Iraqi army set fire to the Kuwaiti oil wells in 1991, it was a further illustration of the threats endangering the energy supply.

Western countries also tend to view policies of re-nationalisation of oil or renegotiation of contracts (as in the cases of Bolivia and Venezuela), and even the return of nationalism ("resource nationalism"), as in the case of Russia, as a threat.

Maritime disasters, or when an oil tanker simply runs aground in a strait or at the mouth of the port, would combine a terrorist threat with an ecological one. In the same way, the location of strategic reserves could also be the objective of malicious acts, or even a terrorist attack. Given this huge range of real threats, no importing state is free from danger.

Admittedly, countries can adopt protective measures, which range from what Bricet des Vallons calls the "offshorisation" of production to reduce the vulnerability of terrestrial sites, to the construction of attack-proof gas pipelines, such as the Tunnel Bomb Killer (the TBK is a kind of pipeline comprised of eight layers of galvanised steel). Other measures include the Container Security Initiative, the International Ship and Port Facility Security, monitoring by air or satellite and the introduction of alternative routes for gas and oil transportation (such as the Bakú-Ceyhan and Bakú-Supsa oil pipelines, routed so as to avoid passing through Russian territory). Finally, another extreme, highly dangerous measure (as we have witnessed in Iraq) is the use of military means to take control of a producing country.

The European Geopolitics of Energy

On the energy supply map, Russia, Algeria and the countries of the Arab-Persian Gulf are the main partners with whom the EU has to establish an open and reciprocally beneficial dialogue. The EU represents 15% of world energy consumption, but it can only achieve any influence over the energy markets by means of diplomacy. For example, the EU could encourage its oil companies to become more involved in oil-producing countries, particularly in the Gulf States; it could also foster investment in these countries and guarantee that oil-producing countries benefit from Europe's technological advances.

With respect to gas, the EU is extremely interested in proposing a solid long-term association to Algeria and (particularly) Russia that would include contractual clauses involving payment to ensure security of supply[9]. An official Commission document claims that this association would guarantee security and predictability for both parties and would smooth the way for the long-term investments that would be needed to increase supply capacity. It would also encourage "fair and reciprocal access to markets and infrastructure including in particular third party access to pipelines"[10].

9. Proposal from a report by Henri Revol and Jacques Valade, "*La sécurité d'approvisionnement en énergie de l'UE*" French Senate, ordinary session, 2000-2001 Rapport d'information no. 218, presented 7 February, 2001.
10. "A European Strategy for Sustainable, Competitive and Secure Energy" Com (2006) end of 105.

Thanks to the progress made in geophysics and computers, the EU can help to improve the success rate for prospecting (through improvements in subsoil analysis), thereby providing the mining companies with more accurate forecasting of possible discoveries, the quality of the reserves, existing volumes, the nature of the hydrocarbons, etc. European technology can also improve the secondary and tertiary recovery of existing oil through the injection of oil or steam into wells, as well as facilitating access to oil and gas that is difficult to extract[11].

The EU and Russia: the Challenge of Gas

Russia is not a great producer of oil. It is calculated that the country possesses approximately 6% of the world's oil reserves, though prospecting is advancing at speed and Russia expects to be exporting 11 mb/d by 2030. Russia is, however, particularly rich in gas; it is calculated that the country's gas reserves total 47.8 trillion (thousand billion) cubic metres of gas[12], and that its current production stands at 616,500 million m^3. Even so, despite the abundance of its energy resources, Russia's GDP is lower than those of Belgium and Holland. The oil and gas sectors represent approximately a quarter of the country's GDP, though they only employ 1% of the population.

The EU currently imports half of the energy products that it consumes (73% of oil and 44% of gas). By 2030, these percentages are forecast to rise to 92% and 81%, respectively. Gas imports, particularly, are expected to rise from 180,000 million cubic metres in 2005 to 650,000 million in 2030. In view of this, Russia, which is already an oil exporting country, is clearly set to become a major actor in the gas sector. Even now, approximately 20% of the oil and over 35% of the gas consumed by the EU comes from Russia. While these percentages represent the European Union average, contrasting situations exist behind them: Slovakia, Estonia, Finland, Latvia and Lithuania all depend 100% on Russian gas; this is not the case for Romania (29%), France (26%) and Italy (29%)[13].

This predominant proportion of Russian gas in EU imports will increase in the coming years. Besides, this will cause deep concern in EU countries, for a number of reasons:

- Russia and the EU do not share the same views on the administration of energy resources. For Russia, energy is a source of power and the very basis of sovereignty. Its rulers believe that it should be employed, first and foremost, to further the economic and strategic interests of the Russian state. In contrast, the EU would prefer the removal of any political barriers that might limit access to oil and gas resources. These two opposing strategies[14] are known as the "Open Door" approach and the "Flags" strategy, in which energy is used for strategic ambitions[15]. One key question arises from these contrasting views: who should control the industrial chain (the extraction, transport, refining and distribution of oil and gas)?
- Russia appears to be fluctuating between these two models. On the one hand, it needs western capital to modernise its oil and gas-producing infrastructure, exploit new oil and gas fields and build new

11. Institut français du Pétrole, "Face à une demande en croissance, les réserves du pétrole peuvent-elles suivre ?" PGA, 1 October, 2006, P. 42-44.
12. *L'Echo*, 9 November, 2006.
13. *El País*, 24 November, 2006.
14. BOCHKAREV, Danila, "La diplomatie des pipelines". LOUVAIN, October - November 2006, 165, P. 26
15. LIZIN, Anne-Marie, Gazprom, stratégie de la Russie, Brussels: ed. Luc Pire, 2006.

oil and gas pipelines. As a result, the country should opt for openness, given that the investment required is enormous. Gazprom, in particular, has been forced to seek overseas financing to modernise its 152,000 km of gas pipelines that have become obsolete, to finance the construction of Blue Stream, which will pipe natural gas to Turkey, as well as the Yamal-Europe Pipeline, which runs through Belarus and Poland and the North European Gas Pipeline which, from 2010 onwards, will serve Germany, avoiding the expensive piping (transit rights) through other countries. It is estimated that Gazprom will have to invest $11,000 million in the gas sector annually to meet its commitments.

On the other hand, Russia wants to maintain as much control possible over its energy resources. Russian leaders have declared many times that Russia does not want to turn into a "banana republic", but instead that it is a sovereign actor that aims to defend its vital national interests. As a consequence, one can understand Russia's reluctance to rush into signing any legal agreements that it considers too constricting, such as the "Transit Protocol" that is linked to the "Energy Charter", "which, in its present form, authorises foreign companies to have access to the Russian gas pipeline network"[16]. This "energy nationalism" is also expressed through Russia's preoccupation with diversifying its export markets. By opening up to China and India, and even to Japan and the United States, Russia is attempting to gain greater room for manoeuvring. The country's "cooperation" with Muslim republics already constitutes a central axis of its regional politics.

The Muslim republics have unwillingly agreed to this, as they have no other choice: their gas is piped through Russian territory, and it is Russia that unilaterally sets the price at the border. The recent replacement of Alexander Riazanov, Deputy Director of Gazprom and head of the ex-Soviet countries, by an ex-KGB head, Valeri Gôlubev, is quite a revealing choice with respect to Gazprom's new policy towards these countries. Being well aware of its strengths, those of energy and geography, Russia has clearly opted for the path of increased nationalism, for which energy appears to be the central hub. This nationalist attitude is problematic for the EU. The Union is afraid that the transit infrastructures will group together in cartels, leaving the EU at the mercy of political blackmail (as the Russia-Ukraine and Russia-Georgia crises clearly highlighted in 2006). Consequently, one of the central points in the EU-Russia negotiations is how to reconcile the interests of both parties and to reach an agreement on ground rules that are acceptable to everyone.

Even so, and independently of the result of these negotiations, one thing is certain: Russia does not have the money with which to carry out its ambitions. Gazprom lacks the resources to finance all its projects. Specialists estimate that the amount of investment necessary for Russia's energy development will total approximately $715,000 million between 2003 and 2020[17]. Gazprom can no longer satisfy European demand with its own production alone, and it has even been forced to purchase gas reserves in Central Asia (particularly in Kazakhstan, Turkmenistan and Uzbekistan) to meet its commitments to foreign importers.

16. BOCHKAREV, Danila, art. cit. p. 29 (s); VAN GENNIP, Jos (speaker) Energy security, NATO Parliamentary Assembly, 4 April, 2006, P. 5.
17. CLEUNTINX, Christian, The EU-Russia Energy Dialogue, DG for Energy & Transport, European Commission, 2003.

Europe and the Arab-Persian Gulf (Arab countries + Iran)

To say that the Middle East is going to play an even more important role in the EU's oil imports is simply stating the obvious; as it is there that the largest reserves are concentrated. At present, the region produces around 28% of the world's oil. By 2030, that figure is set to rise to 43%, with 50 mb/d; that is, an increase of 74%. As for Middle East gas production, it should at least triple during the next 25 years.

Saudi Arabia stands head and shoulders above the rest with its huge reserves (262,000 million barrels) and a production rate that could reach 15 or 16 millions of b/d by 2030, compared with 9.2 mb/d in July 2006. Oil-rich Saudi Arabia is the swing producer *par excellence*. Furthermore, it also possesses gas reserves. These are believed to total 6.7 trillion cubic metres (a conservative estimate), and though they are, admittedly, much smaller than those of Iran (28 trillion m^3) and Russia (48 trillion m^3), they are sufficient to enable production to rise from 80,000 million in 2006 to 155,000 million in 2030. Nevertheless, it is Iran that possesses the largest gas reserves in the Middle East. This means that two Middle Eastern countries will be largely dominating the energy stage: Saudi Arabia with its oil and Iran with its gas. But this does not mean that other Gulf countries' reserves are of little significance. On the contrary, Kuwait has larger oil reserves than those of Russia (99,000 million barrels compared to Russia's 60,000-69,000). The same applies to the United Arab Emirates, which possesses reserves totalling 97,000 million barrels, or rather, more than the United States and Canada put together (27,200 million). Meanwhile, Qatar's gas production is also becoming increasingly important.

The Arab Middle East is, therefore, a sponge soaked in oil and gas. And if we add the North African Arab countries to the equation, it is plain to see that the Arab world has an extremely important economic and political lever in its hands. Furthermore, just like in Russia, national companies have a monopoly on energy resources; this is the case, at least, with Kuwait and Saudi Arabia. But the energy market will not be able to stay closed for much longer: many countries are starting to open up to foreign participation, even if it only means the exchange of oil producing technology.

Much to the EU's regret, this openness is still hesitant. But the fact is, unlike other producers, the Gulf countries currently possess a financial cushion ($400,000 million) that is sufficient for investing in new production capacities without having to be rushed into signing agreements with international companies that would limit their room for manoeuvring and, of course, their profits.

The diversification of the export markets of the Middle East countries and, to a lesser extent, those of North Africa, reinforces their autonomy still further, placing them in a position of strength in relation to Western companies. This diversification will become stronger in the future and estimates for 2030 suggest that Asia will be the main export market for the Middle East's energy products, ahead of the EU and the United States.

18. GNESOTTO, Nicole and GREVI, Giovanni, The New Global Puzzle: What World for the EU in 2025? Paris: European Union Institute for Security Studies, 2006, P. 59.
19. Al Qaeda has threatened several times to attack the oil infrastructures of exporting countries: http://www.iags.org/oil transport.html
20. VAN GENNIP, Jos, from the above-mentioned report, P. 11.

In terms of energy security, Middle Eastern countries are perceived as a source of concern. The war in Iraq is turning into a nightmare; the country is devastated, fragmented and exhausted. The US is in a tight spot and right now, there seems to be no viable exit strategy from the crisis. None of the strategies that are under discussion (which are, basically, "stay the course" or "cut and run") are risk-free. Given this situation, Iraq's future in terms of energy is uncertain. The case of Iran, meanwhile, raises other concerns. This country is rich in energy resources and could even become an important transit country, but the nuclear issue has poisoned its relations with the West. As a result, in order to break out of its isolation and to achieve the investment it needs, Iran has turned towards Asia. It is possible that the EU will have to pay for the cost of the confrontation by becoming leapfrogged by India and China in the Iranian market.

All the other Gulf nations enjoy good relations with the EU and the US in terms of energy security, and this stability provides a relatively calming effect. However, they are not completely safe from knock-on effects of the Iraq crisis or possible negative impact deriving from the confrontation between Iran and the West. These countries have important Shiite minorities (the Shiites have just taken power in Bahrain's parliament), who are concentrated in the oil-producing areas (the east coast of Saudi Arabia), and there is always the danger that Iran will use them in a deliberate strategy to destabilise the Gulf and to reaffirm Iran's role as an actor in the region. Thus it is clear that in terms of energy security, it is not so much resource nationalism[18] that would be a problem for the EU here, but regional destabilisation, the closure of the Strait of Hormuz as a consequence of a blockade or the destruction of an oil tanker[19] and the interruption of supply. The danger is a very real one. One only has to observe the dizzying increase in the cost of insuring an oil tanker, which has gone from $150,000 to over $450,000 per voyage, without counting the insurance for the cargo, which is covered by another insurance policy[20].

What kind of Alliance for Europe with the Oil and Gas Producing Countries?

Let me say it once again: the economic growth sustained by developed countries and the spectacular emergence of the new Asian Tiger economies, particularly China and India, bring with them fears of an explosion in the demand for energy, in particular gas and oil. This is a worrying prospect, and not only because of the exhaustible, non-renewable nature of fossil fuels but, and particularly, because of the environmental effects of such unbridled consumption. Thus the consumer states are attempting to reduce their level of dependence by reducing their demand, and especially by improving energy efficiency. The GDP of EU countries has increased by 155% during the past 20 years, with a 25% increase in energy use. The same has occurred in the United States.

The idea is a commendable one, but the rates of energy consumption (especially gas and oil) are so high (America's 300 million inhabitants consume 25% of the world's oil production) that even an annual

growth in demand for energy limited to 1% would result in a colossal demand and, therefore, in a huge oil bill. And that is without considering the fact that it is by no means guaranteed that such a demand could be satisfied.

In fact, strangulation is already taking place in terms of production (instability), prices (volatility), refining (insufficient investment, accidents, natural disasters) and distribution (infrastructures requiring modernisation or construction). Let us not forget that the IEA has estimated that between now and 2030, $20 billion will be required to guarantee world demand, especially that of developing countries and emerging economies.

Nevertheless, energy security is not limited to the mobilisation of new financiers; it also requires a permanent dialogue with the producing countries. This particularly affects the EU. Europe's dependence on Russia makes it vulnerable to the whims of the Russian regime, which could interrupt its supply whenever it chooses, or refuse to open up its gas market and transport infrastructures to its competitors. The EU is obliged to try and guarantee its gas supply, while at the same time avoiding becoming the victim of possible blackmail. The task is not an easy one, given that the EU has limited possibilities for diversifying its gas imports. Even so, the EU is still the main destination for Russian gas, and this hard fact should lead Russia to behave in a more conciliatory fashion when it comes to opening up its market to foreign investment, and to stop practising what the Spanish newspaper, *El País* (November 8th, 2006), has called "disgraceful neo-imperialism".

Oil imports are the EU's other Achilles heel. The proportion of oil in the energy system (currently 40%) will continue to be predominant, particularly because of its ever-increasing importance to the transport sector. To guarantee its oil security, the EU has pledged to increase its efforts in the areas of energy efficiency, diversification of supply resources, exploitation of non-conventional oilfields (deep sea oil, heavy fuels, bituminous schists, etc.) and the utilisation of secondary and tertiary recovery (enhanced recovery). But all these projects must be based on a mutually beneficial dialogue with the producing countries, in particular with the Arab countries, which possess most of the planet's known reserves. These countries are undergoing a period of instability of an endogenous and exogenous origin, and as an actor, the EU is not coherent and proactive enough to be able to contribute to the stabilisation of these countries. However, it can help to guarantee production (investment), access routes (joint control) and the transport infrastructure.

To this end, an important association has been created, in the form of the countries of the Gulf Cooperation Council (GCC). The EU must finalise (and without it being subjected to too many alterations) the Free Trade Agreement with the GCC countries, discussions on which have been going on since 1989. Once this has been concluded, the agreement will enable the EU to take a step closer to accessing these countries' energy markets. The EU-GCC association is even more necessary, given that these countries are being called on to play a central role in the energy supply for the coming 20 years. As a

consequence, they are being closely wooed by China and India, two countries that will have to import 90% of their oil needs by 2030. Therefore, it is foreseeable that these Asian countries will attempt to deploy a diplomacy based on dialogue and energy cooperation with the Gulf countries, which are expected to look favourably upon this approach, as well as on the fact that neither India nor China has been a colonial power.

The EU, therefore, will have to face competition with Asian countries on all levels in the Gulf region; the growth of Chinese trade in these countries is already evolving in a spectacular fashion. It was by no means a coincidence that the highest-profile overseas trips made by the king of Saudi Arabia in 2006 were to China and India. Europe does not pay sufficient attention to the Saudi Kingdom out of a fear of a confrontation with European public opinion, which only perceives Arabia in terms of its "conservative, retrograde Wahhabism".

With its 260,000 million barrels of known reserves, Saudi Arabia holds the key to world energy security. This country could raise its production to 15 mb/d in just a few years, an achievement that is beyond any other country. In 2006, there were 90 oil wells operating in the kingdom– double the number that there were in 2004.

Europe cannot afford to ignore this situation. Nevertheless, in Saudi Arabia and in the Gulf, the EU also has to deal with the massive presence of the Americans; they consider the region to be their private hunting ground, and the Europeans cannot afford to risk overshadowing them. At the same time, the Gulf countries would like stronger ties with Europe, so as to escape from the United States' embrace, an embrace that is considered to be too asphyxiating and embarrassing. In the words of Abdelaziz Sager, an expert on the Gulf States: "Arab countries in the region do not see any practical or viable alternative to their basic reliance on the physical and diplomatic power of the US as the guarantor of stability and security. At the same time, they are deeply worried and concerned by the US policy and behaviour in the region and beyond, which undermines the credibility of such an alliance, and generates embarrassment to many local governments facing pressure from internal public opinion"[21].

Given this problematic relationship between the United States and the Gulf countries, the EU finds itself in an uncomfortable position. It cannot ignore the Gulf countries and postpone the signing of an agreement of association that would favour its interests, but neither does it want to upset its North American ally by applying an over-proactive policy.

Conclusion

Oil and gas represents and will continue to represent (at least for the next 25 years) indispensable energy resources for the functioning of globalised economies. Nevertheless, from now on, the market for these energies will become an integrated one, because the security of oil and gas is a "collective global asset". Nowadays, the EU countries depend no less on oil from Venezuela, Nigeria and Saudi Arabia than the United

21. SAGAR, Abdelaziz, "Energy Shapes New Security Architecture", Journal of Middle Eastern Geopolitics, Globe Home, Rome, October 2006, P. 63.

States, China and Japan do, in the sense that, in an integrated market, "all the consumers depend 100% on a world oil market that is supplied by all the producers"[22].

Thus, no importing country has its "own" supplier, which means that any problem that an exporting country (A) has with another country (B) will never result in the interruption of the supply to country (B), but rather in an increase in prices for all consumer importers. Consequently, the use of oil as a political weapon, in particular through an embargo, such as the one declared by the Arab oil-producing countries in 1973 against the United States and Holland, does not have too much impact on the countries in question, and only results in an increase in the price of the barrel. In an integrated oil market, oil is only effective as a weapon if used for a prolonged period, and if carried out jointly by many exporters.

And so, we need no longer fear an extended embargo, given the fact that the seller is just as keen on selling as the buyer is on buying. This is also true for gas exporters: Russia can turn off the gas tap to the Ukraine but, since Russian gas pipelines run through Ukrainian territory, Ukraine also possesses a retaliatory weapon. It is an inescapable fact, which the newspaper, *El País,* expressed thus on 8 November 2006: "Exerting too much pressure on its natural allies could end up backfiring on Russia"[23].

One final observation: when America decided to invade Iraq, I wrote that it was a war that stank of oil. By that I did not mean it was for the purpose of gaining access to Middle Eastern oil, but rather a way of guaranteeing the supply: a political dialogue with Saddam Hussein would have guaranteed this access without any problem. But what I really wanted to emphasise was that the United States, through its control of Iraq, was above all attempting to open up the Iraqi oil market to enable foreign companies to gain the rights to exploitation and production. This, Washington thought, would have the effect of breaking OPEC's monopoly on the setting of oil prices through the quota system, and thus limiting the natural control of Gulf countries over the international oil market and, as a consequence, facilitating access (as competitive as possible) for American and foreign companies to the oil in the Middle East, and the rest of the world[24].

Thus oil security does not only signify access to a regular supply, but also the opening-up of the sector to competition and the "de-cartelisation" of producing countries. This is the cornerstone of western liberal doctrine on the subject. It is worth asking whether that oil security should involve giving sanctuary to Saudi Arabia and the Gulf countries. "Yes", the Americans reply. In fact, the protection of the "Saudi ally and the moderate Gulf States" continues to be at the core of America's military planning in the region. It is here that US and European concerns converge, and this explains the reiterated calls to preserve security in the Gulf region.

22. NOEL, Pierre, "Les Etats-Unis et la sécurité pétrolière mondiale", Ramsès 2005, Paris, Dunod, P. 174.
23. *El País*, 8 November, 2006, P. 12
24. NOEL, Pierre, op. cit., P.48.