The Myth of Effective Competition in European Power Markets

“A single European energy market has not been achieved”
EU Commissioner for Competition, Mario Monti

Introduction

Between 1915 and 1925, Henry Ford, as a consequence of his de facto monopoly in car manufacturing in the USA, was able to state about his Ford T model: “Any customer can have a car painted any colour that he wants so long as it is black”.

Henry Ford was able to exercise substantial market power at the customers’ expense as a consequence of his dominant position. But Mr. Ford’s potential for abusing his dominant position was small compared to that of the European vertically integrated power companies of 2004. Mr. Ford did not own the infrastructure - the roads - necessary to transport his products. The European power companies own the energy related infrastructure.

Imagine a market for cars in Europe in which each country or region has one large manufacturer of cars. The same regional car manufacturer monopolies also own the roads needed to transport the cars and decides the requirements for allowing other car types
access to the roads. Through a fully owned subsidiary, the car manufacturer is also responsible for buying cars on behalf of the consumers at prices agreed within the vertically integrated car company. Finally, only a small amount of cars from other regions are allowed to enter the monopoly’s roads, and the decision about increasing the share of “foreign” cars is predominantly made at the regional monopoly’s discretion.

It is difficult to imagine such a market. Nevertheless, the above is the current competitive situation in most European electricity and gas markets. Few would argue that effective competition would be possible in such a market. Still, many are trying hard to create the illusion that effective competition in the European power markets can happen or is happening in such an environment.

2. Effective Competition in the Conventional Power Market is a Precondition for Competition in Renewable Electricity

Some organisations and actors from the conventional power sector are increasingly calling for more competition in the European market for renewable electricity. However, effective competition in the conventional power market is a precondition for creating an undistorted and well-functioning market for renewable electricity. Unless the current distortions in the emerging Internal Electricity Market are overcome there will be no effective Internal Renewable Electricity Market for renewables to compete in.

"Much work still has to be done to deal with the dominant and even monopolistic positions of the incumbent operators and investments will be needed to guarantee the interoperability of grids and networks, interconnection and an adequate level of capabilities and infrastructure."

Loyola de Palacio, European Commission Vice-President responsible for energy and transport, 13 October 2004

For an electricity or gas monopoly, any challenge to access its infrastructure would result in a loss of market share. Iincumbent European energy oligopolies, gradually recognising that their position is threatened by liberalisation and new entrants, seek to focus attention on creating competition where is hurts the least: In the small, but growing, segment of the market for renewable electricity – the only segment of electricity generation where the conventional power sector does not hold a dominant position and the only segment of the power market where third party access has ever been achieved to a limited extent in a few countries.

Although it is not a requirement of the Directive on Renewables (Directive 2001/77), Member States are encouraged by the Community to develop frameworks for renewables that are least distortive to competition. Consequently the Community approach is to establish competition at two levels: In the generation market for conventional fuels and, separately, in the market for renewable energy[1].

Nevertheless, it is clear that electricity from renewable energy sources is, and will remain, closely related to the markets for conventional power in Europe. Effective competition in renewable electricity is therefore impossible without effective competition in the conventional power market.

3. Liberalising European Electricity and Gas Markets

Energy has been an integral part of European co-operation since the 1950s. Two of the three founding Treaties focuses on the promotion of particular energy sources: The European Coal and Steel Community (ECSC), signed in 1951 and the Euratom Treaty (ET) signed in Rome on 25 March 1957 together with the Treaty Establishing the European Economic Community (EEC). The ECSC came into force in 1952 with a

[1] Strategy Paper – Medium Term Vision for the Internal Electricity Market, European Commission; 1 March 2004

fifty-year operational life to promote and protect the use of coal. The Euratom Treaty has been in force since 1958 and has no expiry date.

Before the 1980s, electricity generation, distribution, grid expansion and selling were undertaken by national, vertically integrated monopolies that were granted exclusive rights. In the 1990s, the European Commission challenged the existence of such monopolies as being contrary to the Treaty's rules on the free movement of goods. This eventually resulted in the adoption in 1996 of the first electricity Directive and the first Directive on gas in 1998.

Following the adoption of the 1997 Treaty of Amsterdam, the European Union bases its energy policy on three core principles, namely[2]:

- Environmental protection – which is integrated in both energy production and energy use to maintain ecological and geophysical balances in nature.
- Security of Supply – which aims to minimise risks and impacts of possible supply disruption.
- Competitive energy systems - to ensure low cost energy for producers and consumers.

The Three Benchmarking Reports: Competition Not Effective

Since 2001, the Commission has monitored the development of market opening through the Benchmarking Reports on the Implementation of the Internal Electricity and Gas Markets. One of the most important conclusions of both the first and the second Benchmarking reports was that the way market opening is undertaken in the Member States was leading to significant distortions of competition, a lack of a 'level plying field' between companies from different countries of origin, and that this patchwork approach was failing to lead to the development of a competitive, integrated internal market[3].

A third Benchmarking report[4] was published by the European Commission in March 2004. Its conclusions on the outlook for future effective competition in electricity are similar:

"It is becoming clear that the main problem for electricity in the coming years will be the issue of market dominance at national level and the inadequate level of interconnection between Member States."

The status is even worse when it comes to gas, according to the Commission:

"Competition in the gas sector remains somewhat behind than that for electricity. A key barrier is the continuing dominance of the existing companies in their Member State or, in some cases, specific region."

---

[2] Energy in Europe, Economic Foundations for Energy Policy, The Shared Analysis Project, December 1999, European Commission, ISBN 92-828-7529-6, page 8.

[3] "EU Energy Law, vol. 1, The Internal Energy Market"; Christopher W. Jones, 2004; ISBN 90 776 4401 6.

[4] Third Benchmarking Report on the implementation of the internal electricity and gas market; European Commission; 1 March 2004.

As a result of continued distortions to competition in electricity and gas, two new Directives on common rules for the Internal Electricity and Gas markets[5], known as the Second Liberalisation Package, was adopted and entered into force in 2003.

A fourth Benchmarking report will be published in December 2004 and the conclusions are not expected to differ significantly from its three predecessors, regarding the degree of effective competition in the electricity and gas markets.

The Commissioner Responsible for Competition: The Current Level of Competition is not Encouraging

According to the Gas and Electricity Directives, from 1 July 2004 all business consumers and from 1 July 2007 all household consumers should be free to choose their supplier of electricity. However, Member States' track record in transposing the Directives has been rather poor. As a consequence, the European Commission announced on 13 October 2004 that it has commenced infringement proceedings against 18 out of 25 Member States that have failed to correctly transpose the Second Liberalisation Package.

The lack of effective competition in the electricity and gas markets is also noted by the Directorate General for Competition. As one of his last duties as EU Commissioner for Competition, Mario Monti took stock of the state of power and gas competition in a speech on 21 September 2004[6]. His verdict: "the current level of competition is not encouraging".

"In most national markets, customer switching rates are modest, substantial barriers remain for new entrants, market structures are highly concentrated and, last but not least, a single European energy market has not been achieved," Mr. Monti said.

Commissioner Monti in particular warned against falling into the trap of too prudent an antitrust policy because of overestimation of the security of supply, arguments that utilities use when justifying the ongoing vertical integration of the sector. In the past years, large energy companies have reduced their risks by participating in upstream projects such as gas exploration and by binding downstream customers through long-term contracts on the provision of electricity. "Such practices (…) lead to foreclosure and rigidity in the market, thereby endangering the liberalisation process."

Freedom to Choose Supplier does not Guarantee Competition

The main goal of introducing EU legislation to liberalise electricity and gas markets was to increase competition in the different areas of the sector and to create a level playing field between generators. Although market liberalisation is expected to give all consumers the ability to choose their energy supplier by mid 2007 and while the number of consumers that are free to choose their supplier increases, there is considerable doubt as to whether the market opening will also lead to a real choice of

[5] Directive 2003/54/EC of the European Parliament and the Council of 26 June 2003 concerning common rules for the internal electricity market; Official Journal L 176, 15/07/2003 and Directive 2003/55/EC of the European Parliament and the Council of 26 June 2003 concerning common rules for the internal gas market; Official Journal L 176, 15/07/2003

[6] Mario Monti Keynote Speech Energy Day; Energy Liberalisation: moving towards real market opening; 21 October 2004

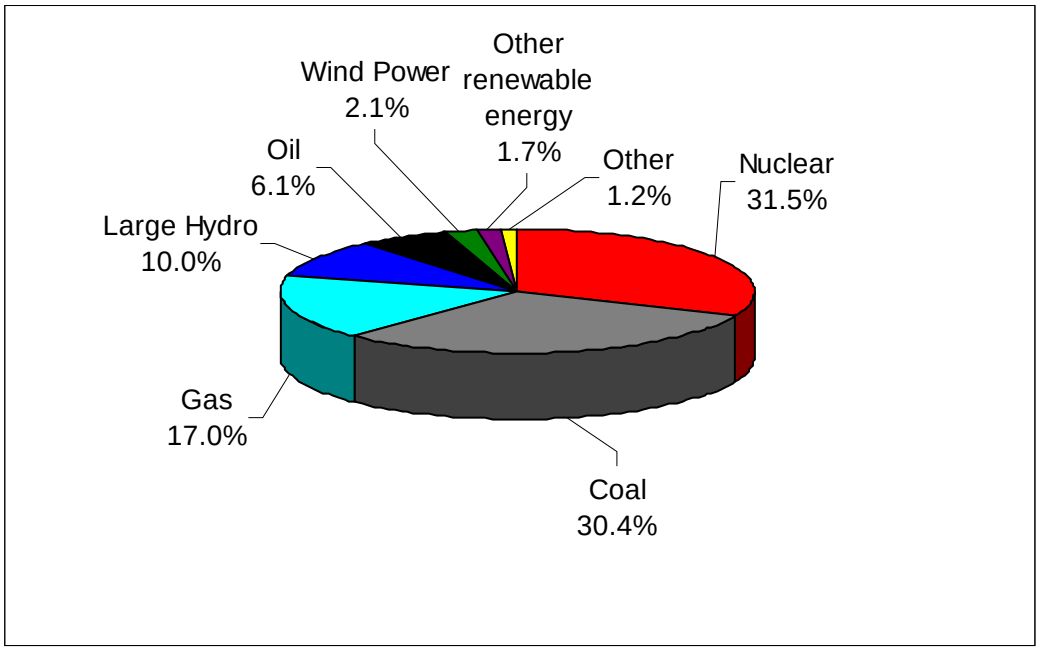
supplier. Giving consumers the freedom to choose supplier does not necessarily guarantee effective competition. 90 years ago, Mr. Henry Ford allowed the American consumer to "have his car painted any colour that he wanted so long as it was black". Europe must escape a similar situation in electricity and gas where consumers continue to be free to choose any supplier they want as long as it is the incumbent monopoly.

In all but five of the 25 Member States the three largest utilities own above two thirds of the electricity generation capacity[7]. The figures even understate concentration as they do not take into account a very high degree of cross ownership, e.g. in Germany and Italy. The level of dominance is even increasing as rules and practises continue to support the incumbent European generators and technologies and are encouraged by some Member States as utilities are built up to become national champions or are becoming part of a handful of European utility oligopolies.

4. Competition Still Far From Effective in the Conventional Power Market

New renewables (excluding large hydro) account for some 4% of EU-25 electricity production, including 2.1% wind power. The remaining 95% of the European power supply is based on predominantly nuclear, coal, gas, large hydro and oil.

EU-25 Electricity Production Mix 2002[8]



[7] Third Benchmarking Report on the implementation of the internal electricity and gas market; European Commission; 1 March 2004.
[8] Compiled by EWEA using data from the European Commission, COM(2004)366; Eurostat; IEA World Energy Outlook 2004; EWEA

As illustrated in the previous sections, competition in the overall European markets for conventional electricity and gas is far from effective. Looking at the individual electricity generation technologies in more detail reveals further distortions.

The distortions in the gas market described above, has an obvious negative impact on the effectiveness of competition in the 17% of the electricity market that is generated by gas. Moreover, for historic reasons, the price of gas follows the oil prices (that in turn are controlled by a few oil producing countries, not market forces) rather than being determined by the laws of supply and demand for gas.

Following the European Coal and Steel Community's expiry in 2002 a specific fund was established to facilitate the continued use of coal through a dedicated research and development programme. As will be discussed in Chapter 7, the subsidies for European coal, representing more than 30% of EU power production, is a major source of electricity market distortion. In 1999 alone, the average subsidy per coal worker in Germany was €70,000 and in Spain €60,000.

Euratom

Also the 31.5% of EU power supplied by nuclear power leaves much to be desired in terms of effective competition. The nuclear technology has its own Treaty, the Euratom Treaty, which singles out one energy source –one industry sector - that is treated differently from all other sectors in the Community. Through the Euratom Treaty the nuclear sector is shielded from Internal Market rules including rules on State Aid and competition. Research in nuclear is treated separately from any other research programme based on Article 166 in the EC Treaty. Furthermore, there is no real consultation with the European Parliament on matters relating to Euratom and loans for nuclear power can be granted without consulting the European Parliament.

The Euratom Treaty is not time limited and continues to support the development of nuclear power through a research and development programme and loan facility and gives the EU a limited regulatory oversight function through the setting of standards for worker and public protection.

The preamble for Euratom is unambiguous in its support to the technology. It states:

- *Recognising that nuclear energy represents an essential resource for the development and invigoration of industry.*

And

- *Resolved to create the conditions necessary for the development of a powerful nuclear industry.*

This translates into a number of specific activities that either offer direct financial support or that shelter nuclear technology from paying the full environmental costs, some of these are outlined below.

Research and Development: The major mechanism for EU funded research and development is through the Framework programmes. The level of funding for nuclear, fission and fusion, research has remained relatively constant in recent programs, while conventional energy has seen a decline of 20%.

Special loan facility: Since 1977 around €3.2 billion worth of financial support for nuclear power has been awarded by Euratom's nuclear loan facility. This facility is exclusively for nuclear technology and has granted 92 separate loans in 7 European countries. The use of the loan facility is an important support for nuclear power, as the technology's large upfront costs and long construction times makes it more than difficult to attract investment on normal market terms.

Waste Management Funds: Analysis undertaken for Directorate General for the Environment suggest that most nuclear utilities are not putting aside sufficient funds to pay for future management activities for high level radioactive waste. Were utilities required to set aside sufficient funds it would entail an additional charge to nuclear electricity of 0.3€c/kWh[9].

Furthermore, utilities in Europe have a different approach to the management of their waste management funds and as the European Commission notes in a document reviewing this issue, "*this situation [lack of uniformity of decommissioning policies] could lead to distortion and discrimination between now competing nuclear electricity producers from different Member States. Decommissioning costs are clearly seen as part of the electricity production costs. They may not be cross-subsidised from the transmission activity nor be directly subsidised via state aid.*"[10]

Despite this claim the British Government used the Euratom Treaty as part of its justification to the EU for its € 6 billion restructuring package, which will largely pay for nuclear waste management[11]. In September 2004, the proposal for State Aid was approved by the European Commission[12]. The acceptance of this proposal may see other nuclear utilities seeking State Aid for their waste liabilities. Already, Electricité de France and the French government are said to be discussing transfer of the utility's liability for final waste management. EdF are said to want to transfer responsibility for waste management and decommissioning to the State before the end of 2004 in preparation for a change in ownership structure of the company. EdF claim that this is necessary to enable them to operate in a liberalised electricity market as "their competitors do not all bear liability for final waste management[13]".

Nuclear Insurance: Article 98 of Euratom requires that Member States take all necessary insurance measures to facilitate insurance contracts covering nuclear risk. However, utilities are not liable for the full financial implications of a nuclear accident as their liability is restricted. If they were it would probably not be possible to find an insurer to cover the risk in the insurance market. Current nuclear insurance

---

[9] Environmentally harmful support measures in EU Member States, Report for DG Environment, January 2003, B.A. Leurs and R.C.N. Wit (CE, Delft) In cooperation with: G.A. Harder, A. Koomen, F.H.J. Kiliaan (Ernst & Young Rotterdam) G. Schmidt (Öko Institut, Darmstadt, Germany), page 145,

[10] Nuclear Safety and the Environment, Decommissioning of nuclear installations in the European Union. Supporting document for the preparation of an EC Communication on the subject of decommissioning nuclear installations in the EU, EUR 18860 1998, page 30

[11] STATE AID —UNITED KINGDOM Invitation to submit comments pursuant to Article 88(2)of the EC Treaty, concerning aid C 52/03 (ex NN 45/03)—Restructuring aid in favour of British Energy plc Official Journal of the European Communities (2003/C 180/03)

[12] Commission approves restructuring of British Energy, IP/04/1125, 22 September 2004

[13] EDF seeks transfer of waste liability to French state: Nuclear Fuel 1st March 2004

has a three tiesr system, whereby one part is covered by the operator, another partly by the State in which the facility is located and partly by international convention. However, these three tiers do not cover the full cost of an accident and there is a fixed ceiling for nuclear damage. In February 2004 it was agreed that the current minimum ceiling should be increased from $350 million to $1.5 billion[14]. A nuclear operator will be required to have $700million minimal liability cover, the nation State will cover a minimum of $500 million and the public funds from the international tier will cover $300 million[15]. However, even this increase in costs both allows restrictions on the level of insurance that a utility is required to take out in the event of an accident and the total compensation that can be claimed following a nuclear accident. Were a nuclear generator required to fully cover through insurance the risk of a nuclear accident it would significantly increase the cost of generating nuclear electricity. How much it would increase depends on a number of variables, including the probabilistic risk of an off-site release of radiation, the location of a plant and its vicinity to urban populations and the local meteorological conditions. A number of studies have been undertaken to assess the extent of this additional cost. These conclude:

France: If there were no limit on nuclear liabilities in place and a operator had to cover the full cost of a worst cost scenario accident it would increase the insurance premiums to 5 c€/kWh, thus increasing the cost of generation by around 300%[16].

Germany: Ewers and Rennings (1992) has estimated the total damage of a reactor meltdown in Germany at 5,469 billion EUR. Given a probability of 1 meltdown per 33,000 reactor years and 0% discount rate, this leads to external costs of 22 c€/kWh. [17]

Price Setting in the wholesale Market

Another major source of distortion in the European power market is (dys)functioning of the wholesale power market as pointed out by IFIEC Europe[18]:

" As the consolidation of the electricity supply industry has intensified, only a small number of players remain and, together, constitute a de facto oligopoly. As trading on the wholesale market has been taken over by the powerful incumbents themselves, independent traders have abandoned Europe.

Managerial unbundling between the TSO's and their parent companies controlling generation and supply has not materialized in most Member States. This is one

---

[14] Nuclear Liability Rules Revised to Increase Compensation, 12th February 2004, International Atomic Energy Agency, staff report.

[15] Revised Nuclear Third Party Liability Conventions improve Victims' rights to compensation. Nuclear Energy Agency, Press Communiqué, 10th February 2004

[16] Environmentally harmful support measures in EU Member States, Report for DG Environment, CE, Solutions for Environment, Economy and Technology, January 2003, page 132

17 Ewers H-J and K Rennings 1995. Economics of Nuclear Risk – A German study, in O Homyer and R Ottinger (eds), Social Cost of Energy, Present Status and Future Trends, Springer-Verlag, Berlin 150-166

18 An analysis of the current dysfunctioning of the wholesale market in major parts of the EU; IFIEC Europe; 29 September 2004.

reason why access to the grid is still not possible under reasonable economic conditions."

Based on observations from large energy consumers, the IFIEC Europe concludes that many power producers refuse to negotiate prices. Instead they impose offers based on prices resulting from transactions on the wholesale trading markets – markets that are themselves fully dominated by the trading arms of the same power producers.

Unlike the case for traditional commodity markets, the trading departments of the big electricity producers are the major players on both sides of the wholesale market: purchase and sales, since they act simultaneously as purchasers on behalf of the consumer and as sellers of their own production. The electricity price has become disconnected from fundamentals such as cost variations of primary fuel, significant shifts in demand/supply balance, etc. In addition, independent power traders have abandoned Europe, claims the IFIEC.

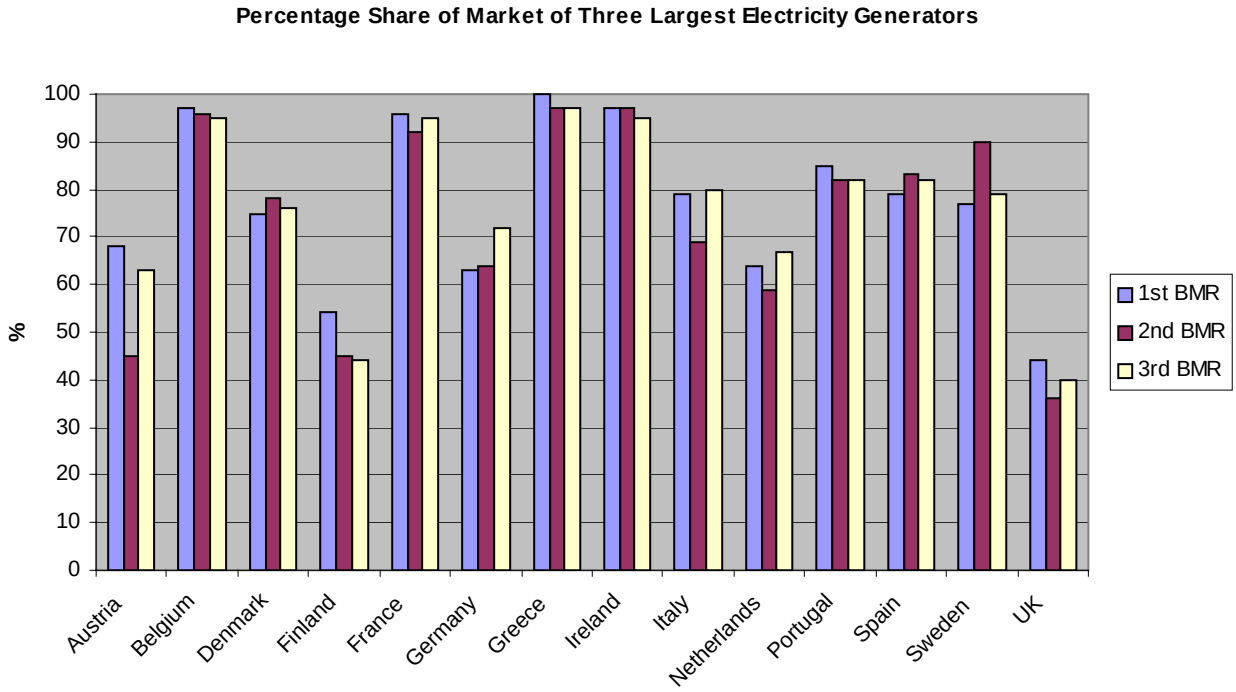
5. Dominant Players – Market Concentration

Market Concentration: As mentioned above, market concentration continues to be one of the main barriers to effective competition in the European power markets. Analysis of merger and acquisition activity in recent years further suggests that the problem has been increasing throughout the liberalisation process. In EU-15 in the last years, the percentage share of the three largest generators in Member States has increased.

In addition the ownership of grids by utilities continues, known as vertical integration, gives vertically integrated utilities a competitive advantage over other generation companies, especially new entrants to the market.

As can be seen in the graph below where 12 of the 14 EU-15 Member States was surveyed – in the European Commission's Benchmarking report- the top three utilities control more than two thirds of the market. Furthermore, and of far greater concern, the average share of the generation market of the three largest utilities in each Member States is now 76%, up from the previous benchmarking report analysis of 73%[19].

[19] DG TREN Draft Working Paper Third benchmarking report on the implementation of the internal electricity and gas market, Commission Of The European Communities, Brussels, 01.03.2004



Source: European Commission Benchmarking Reports[20]:

Moreover, as stressed by Commissioner for Competition, Mr. Mario Monti[21], from a competition perspective, power and gas markets are unlike other sectors

"Market power can already be present where parties have market shares which would not be problematic in other sectors of the economy. (…) These markets [power and gas, ed.] indeed have a particular structure which facilitates both collusive behaviour and the exercise of market power".

In other words, due to the specific nature of the power market, concentration becomes a barrier to effective competition at lower concentration levels than for other sectors in the economy.

The increasing national market share of the major utilities is driven by a larger trend of the concentration of the European market as a whole, whereby large private and State owned utilities are acquiring other companies across a whole range of utility services and thus the creation of utility oligopolies. Although the rate of international mergers and acquitions in the European energy market slowed in 2002 and 2003, there is still considerable activity. Between 2000-2003 the seven major European utilities – Electricité de France, Eon, RWE, Vattenfall, Enel, Endesa, Suez/Electrabel, have invested €80 billion in mergers and acquisitions in Europe[22].

[20] http://europa.eu.int/comm/energy/electricity/benchmarking/index_en.htm
[21] Mario Monti Keynote Speech Energy Day; Energy Liberalisation: moving towards real market opening; 21 October 2004
[22] 2002 Results of the Electricité de France Group, March 2003

The increased dominance of these large pan European vertically integrated companies is also increasing the desire by Government to establish and maintain 'national champions', which are larger national utilities developed to fend off takeovers. In Austria, Verbund that controls half of the country's generation capacity, along with the fine provincial generating capacity, is protected through the Constitutional Act of 1947, which requires 51% State ownership in these companies and thus increased political control. This protection has to date included the protection of the domestic market from foreign competitors[23]. The most notable example in recent years of building up a national champion is the merger of Eon and Ruhrgas in Germany, which was approved by the German Government in July 2002. This €10.4 billion merger was approved by the Ministry of Economics on 'national champion' grounds against the advise of the Federal German Cartel Office[24].

The European Commission has recognised the problems that market concentration is causing and will submit a report in 2005 on the current shortcoming in the market and may have to consider further measures '*if these drawback, notably the maintenance of dominant positions and non-competitive structures is not removed*[25]'. To date, the main mechanism put forward by the European Commission and Council to address market concentration is to introduce measures to increase electricity flow between countries and specifically a requirement that the volume of interconnection capacity equates to 10% of the installed production capacity by 2005. By increasing interconnection, the dominance of national champions can be reduced and further competition can be introduced by electricity import. Another approach aired by the Commission is to force large utilities to sell off some of their generation capacity[26].

A specific threat associated with the development of ever-larger power oligopolies is the constant demand for electricity, coupled with the cost and complexity of its storage, making the market particularly susceptible to price manipulation. Consequently, there are fears that the increasing influence in the market of these larger utilities may continue to impact upon electricity prices and the creation of a level playing field between generators.

6. Third Party Access and Unbundling

The continued high levels of market concentration in the power sector, and the distortions to competition must, until alleviated, be compensated for by fair, extremely transparent and coherent rules for third party access, that takes into account the nature of the technologies.

One of the objectives of the original EU legislation on electricity market liberalisation was that the rules for introducing new generating capacity should be based on "*objective, transparent and non-discriminatory criteria*".[27] However, it was

[23] Austria's Liberalisation experiment: a mixed bad: Alexander Samide and Klára Székffy, Raiffeisen Investment. European Electricity Review 2004, Platts

[24] Global Energy Regulation, Nera Consulting, July 2002. http://www.nera.com

[25] ibid

[26] In praise of enforced plant divestment. John Bower, Senior Research Fellow, Oxford Institute for Energy Studies, Platts, European Electricity Review 2003.

[27] Directive 96/92/EC of the European Parliament and of the Council of 19 December 1996 concerning common rules for the internal market in electricity Official Journal L 027, 30/01/1997 P. 0020 – 0029, Article 4.

recognised when revising the Directive in 2001 that there were "*important shortcomings and possibilities for improving the functioning of the market remain, notably in ensuring a level playing field in generation*".[28]

For renewables, the only challenger ever to have made inroads into the monopoly power market, "objective, transparent and non-discriminatory criteria" are lacking in all but a few Member States. The small inroads that wind power has made into a few European power markets over the past two decades can be expanded upon and replicated by other new renewable technologies. But it requires that the existing frameworks and market rules, favouring incumbent generators and technologies, are changed.

Infrastructure Investments

The entire European infrastructure, as well as investments in capacity, were charged directly to electricity consumers by monopolies and depreciated over a few years. That gives new entrants and technologies a competitive disadvantage. New renewable investments have to compete with existing generators that has already been depreciated and paid for by European tax-payers and consumers. New entry into the power market is thus impeded by the obvious fact that it is cheaper to shovel more coal into an existing power plant than to build a new wind turbine.

As a result of the historic development of the power sector, infrastructure in the form of gas and electricity grids never had to be included in the project costs of new capacity. But the infrastructure is now owned by the incumbent oligopolies that have large potentials for benefiting economically from cross-subsidies. Due to the structural changes, as a result of liberalisation, new renewable energy plant in many Member States have to pay for new infrastructure and finance these through project costs – a situation unprecedented in the European power history. This, regardless that new grids benefit not only renewables but the entire operation of the infrastructure.

The electricity market Directive requires that the economic advantages of generation that are connected directly to the low voltage distribution grid be recognised. However, in a number of areas, additional costs can and are placed on renewable energy and other distributed generators, this includes lack of appropriate and transparent network charges, disproportionally high balancing payments and disproportionately high administrative charges, especially given the size of facilities.

Inadequate Unbundling

The revised electricity market Directive required to be adopted by Member States in July 2004, requires legal unbundling of the vertically integrated utilities. However, it was not possible for Member States to agree on full ownership unbundling, leaving new entrants at the mercy of its oligopoly competitor and stifle competition and innovation.

Utilities are investing in companies to vertically integrate. Analysis from PriceWaterhouseCoopers, suggests that vertical integration was the largest single

---

[28] Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and repealing Directive 96/92/EC - Statements made with regard to decommissioning and waste management activities *Official Journal L 176, 15/07/2003 P. 0037 – 0056,* Recital 2.

motivating factor in the top forty global mergers and acquisitions in the energy sector in 2003[29]. The revised electricity market Directive has increased the separation between parts of the electricity industry, as it now requires legal separation between the Transmission System and Distribution System Operators from generation and supply activities. However, this unbundling requirement seems inadequate, and six Member States have actually opted for separate ownership requirements for TSOs.

There is some evidence already that increased unbundling goes hand in hand with increased competition between generators. In those countries with a requirement for ownership unbundling, the market share for generation of the three largest utilities is 66%, while in the remaining Member States, those with legal or management unbundling, the share is 84%. In addition to vertical integration with grid operators, re-integration of utilities is occurring between generation and supply companies. In recent years this trend has been particularly clear in Austria and the UK.

7. Energy Subsidies

No electricity generating technology in history has been developed, introduced and become competitive without initial support.

> *Direct and Indirect financial support ("subsidies") to promote energy supply and access has historically tended to skew the playing field against renewable energy[30].*

Historically, many local or national Governments wholly or partially owned energy companies This State support to energy companies in the past has not always been clearly documented and therefore it is not possible to fully assess[31] the support for the well established industries, such as oil, natural gas and fission nuclear power during their development phase.

Global subsidies

The UNDP World Energy Assessment in 2000[32] stated that in the mid-1990s governments worldwide were subsidizing fossil fuel and nuclear power by around $250-300 billion. A recent assessement of global annual energy subsidies in 1995-1998[33] put the total at $244 billion, of which 3.7% (billion) was for renewables, resulting in $235 billion for other energy sources

---

[29] Power Deals 2003 Annual Report: Mergers and Acquisitions Activities within the Global Electricity and Gas Market, PriceWaterhouseCoopers

[30] Removing Subsidies: Levelling the Playing Field for Renewable Energy Technologies: Thematic Background Paper, Bonn International Conference on Renewables, Jonathan Pershing and Jim Mackenzie, World Resources Institution, March 2004. http://www.renewables2004.de/pdf/tbp/TBP04-LevelField.pdf

[31] Energy Subsidies in the European Union: A brief overview: European Environment Agency, 1/2004, ISBN 92-9167-689-6

[32] World Energy Assessment: Energy and the Challenge of Sustainability (New York United Nations Development Programmes, 2000)

[33] Andre de Moor, quoted in 26

RD&D Budgets in IEA Countries by Technology[34]						
	Budget	**Shares in**	**Budget**	**Shares in**	**Budget**	**Shares in**
	by Technology	**Energy**	**by Technology**	**Energy**	**by Technology**	**Energy**
	1974-2002	**RD&D**	**1974-1986**	**RD&D**	**1987-2002**	**RD&D**
	(million US$)	**1974-2002**	**(million US$)**	**1974-1986**	**(million US$)**	**1987-2002**
Nuclear Fission	137 529	47,3%	84 866	53,6%	52 663	39,7%
Fossil Fuels	36 842	12,7%	20 559	13,0%	16 284	12,3%
Nuclear Fission	30 562	10,5%	15 948	10,1%	14 615	11,0%
"Other Technologies	29 212	10,0%	10 599	6,7%	18 613	14,0%
Renewable Energy	23 550	8,1%	13 317	8,4%	10 234	7,7%
Solar Heating & Cooling	3 024	1,0%	2 140	1,4%	885	0,7%
Solar Photo-Electric	6 354	2,2%	2 717	1,7%	3 636	2,7%
Solar Thermal-Electric	2 555	0,9%	1 889	1,2%	666	0,5%
Wind	2 910	1,0%	1 445	0,9%	1 465	1,1%
Ocean	754	0,3%	626	0,4%	128	0,1%
Biomass	3 578	1,2%	1 495	0,9%	2 083	1,6%
Geothermal	4 088	1,4%	2 867	1,8%	1 221	0,9%
Large Hydro (>10 MW)	93	0,0%	0	0,0%	93	0,1%
Small Hydro (<10 MW)	49	0,0%	0,18	0,0%	49	0,0%
Conservation	23 479	8,1%	8 607	5,4%	14 872	11,2%
Power & Storage Technology	9 844	3,4%	4 344	2,7%	5 500	4,1%
Total All Energy	291 020	**100,0%**	**158 240**	**100,0%**	**132 781**	**100,0%**

In 1997, the World Bank estimated that annual fossil fuel subsidies was $58 billion in the OECD and the 20 biggest countries outside the OECD[35]

Research and Development (R&D)

R&D funding can make the crucial difference as to whether a technology becomes commercially viable, particularly at the early stage of development.

- Over the last three decades 92% of all R& D funding – ($267 billion) has been spent on non renewables, largely fossil fuels and nuclear technologies, compared to 8% ($23 billion) for all renewable technologies.

- In1974-2002 R&D funding for nuclear fission and fusion was $168 billion, 7.3 times bigger than for renewables. $68 billion of the nuclear funds has been spent since 1987.

[34] IEA: "Renewable Energy, Market&Policy Trends in IEA Countries", OECD/IEA 2004
[35] 26 ibid

- Over the last three decades, for every $1 spent on renewables, R&D, $10 has been spent on other energy sources, largely fossil fuesl and nuclear technology.

R&D in Europe

The European Commission has estimated that between 1974 and 1998 Member States granted approximately $55 billion in Research and Development assistance for nuclear technology from their national budgets[36]. The objective of this research was *"to promote nuclear energy pursuant to the Euratom Treaty"*

Coal subsidies

In Germany, Government financial support for coal mining absorbs almost 30% of all subsidies for trade and industry and since 1980 around €100 billion has been paid to this sector[37].

In other EU Member States, the coal sector continues to receive considerable financial support and between 1994-2002 a total of €50 billion were allocated from the Governments in France, Germany, Portugal, Spain and the UK[3839].

State Aid is given both to subsidise production and for measures to assist with the closure of mining operation, and in 1999 the average subsidy per worker in Germany was €70 000 and in Spain was €60 000[40].

At the June 2002 EU's Energy Council meeting agreed that the subsidies for the coal sector should be phased out by 2010, which would enable funds to be allocated to different energy sources[41]. However, it is likely that the State Aid will continue to some degree after this date.

Between 1991 and 2002, nearly € 13 billion was allocated by Member States for research and development to different supply side options. Nuclear power, fusion and fission, from received about two thirds of the total (fusion received 40% and fission 25%), while renewable technology were allocated about 28%, with the remaining

---

[36] European Commission Staff Working Paper, December 2002*, Inventory Of Public Aid Granted To Different Energy Sources*.
http://europa.eu.int/comm/dgs/energy_transport/state_aid/energy_en.htm, page 94

[37] Reduction of Coal Subsidies – the results of model-based analysis- A Background Paper, Federal Environment Agency, June 2004.

[38] Report from the Commission on the application of the Community rules for State aid to the Coal Industry in 2001, COM (2002) 176 final/2. 2nd July 2002.

[39] Commission Staff Working Paper. The market for solid fuels in the Community in 2002 and 2003. SEC ("004) 692, 1st June 2004

[40] Report from the European Commission on the Application of the Community Rules for State Aid to the Coal Industry in 1998 and 1999, cited in the Gothenburg European Council declaration on Sustainable Development 15-16th June 2001

[41] 2433rd Council Meeting – Industry and energy, Luxembourg 6 and 7th June 2002, 6311/02 (Presse 164), page 23.

going to coal (3%), oil and gas (4%)[42]. As the level of Research and Development funding has decreased significantly in the last decade consequently, the mature technologies have benefited from considerable more past funding than future technologies are likely to receive.

The European Commission has estimated that between 1974 and 1998 Member States granted approximately $60 billion in research and development assistance for nuclear technology from their national budgets[43][44]. The EU, through the Framework Programmes also allocates funding, and the percentages to the different supply options are very similar to that awarded by Member States: Nuclear Fusion (42%); Nuclear Fission (25%): Renewables (21%): Oil and Gas (8%); Coal (3%)[45]. The continued level of funding for nuclear technology has raised concerns and the new Commissioner for Energy in his written answers to the European Parliament called for an increase in funding in some areas, including renewables: *'EU support for research and technological development in new and renewable energy should also be strengthened[46]'*.

European subsidies

A 2001 European Parliament report 'Energy Subsidies in the European Union' summarised the amount of energy subsidies in EU and Member States

- Solid Fuels >€12, 000 million pa
- Oil and Gas >€10,000 million pa
- Nuclear >€2,600 million pa
- Renewable >€2,400 million pa

The report also gave tentative estimates of subsidies and other kinds of support as:

- Fossil fuels >€70,000 million pa
- Nuclear >€10,000 million pa
- Renewable >€4,000 million pa

This year, the European Environment Agency, assessed direct and indirect energy subsidies by Member States and the EU Institutions for 2001 across the EU 15. The report estimated that total subsidies were €29.2 billion of which €23.9 billion was for fossil fuels and nuclear, and €5.3 billion for renewables

The fossil fuel sector - coal, oil and gas - receive three quarter of all energy subsidies, primarily through the direct State Aid given to the coal sector and preferential tax rates for gas and oil exploration. The nuclear sector, according the EEA receives approximately 7%, but the paper notes that this does not include the State support for

---

[42] International Energy Agency: Review of Energy Policies in IEA Countries, December 2003.
[43] Energy Policies in IEA Countries, 2003 Review, International Energy Agency, Annex B
[44] European Commission Staff Working Paper, December 2002, *Inventory Of Public Aid Granted To Different Energy Sources*.
http://europa.eu.int/comm/dgs/energy_transport/state_aid/energy_en.htm, page 94
[45] Frans Oosterhuis, Institute for Environmental Studies, Vrije Universiteit, Amsterdam, draft report for the European Parliament's DG for Research, July 2001. *Energy Subsidies in the European Union*. Page 14
[46] European Parliament Hearings Answers To Questionnaire For Commissioner Designate Mr László Kovács (Energy) Part B – Specific Questions, September 2004.

liability insurance. Furthermore, with no new reactor construction programmes being undertaken in 2001, less financial support will have been allocated than in other years.

Nuclear energy decommissioning costs

The noted decline in funding for the nuclear sector may change in the coming years and decades as reactors are closed. The oldest reactor fleet in the EU operates in the UK. To avoid bankruptcy in 2003, of the private nuclear operator British Energy, the British Government put forward a restructuring and €6 billion funding package. This funding was primarily for decommissioning and waste management activities. In September 2004, the proposal for State Aid was approved the European Commission[47]. The acceptance of this proposal may see other nuclear utilities seeking State Aid for their waste liabilities.

Renewable support

The Parliament report has indicated that support for reneables is €2.4 billion Eurelectric data suggests that the cost of support across the EU for renewable electricity in 2001 was €3.3 billion[48].

8. External Costs

The externalities of energy generation are largely environmental and social, and are the hidden costs of production not accounted for in the pricing Electricity production causes damage to the environment, through emissions, waste production or damage by the construction and operation of facilities. These costs are external as they are paid by third parties or by future generations

The European Commission has restated its position that the external costs of energy should be included into the price of electricity and energy: *'Member States need to create a level playing field in the energy sector, by including external societal benefit/costs in their energy policy framework'*[49].

In 1991 the EU and United States launched ExternE[50], a joint project to assess the economic costs of different externalities from the production and use of energy.

In July 2001 the European Commission issued a press release on the findings of the study. this concluded the "*cost of producing electricity from coal or oil would double and the cost of electricity production from gas would increase by 30% if external costs such as damage to the environment and to health were taken into account. It is*

[47] Commission approves restructuring of British Energy, IP/04/1125, 22 September 2004
[48] A Quantitative Assessment of Direct Support Schemes for Renewables 1st Edition Working Group Renewables & Distributed Generation January 2004 Ref: 2003-030-0741, table 4 page 22.
[49] Communication From The Commission To The Council And The European Parliament The share of renewable energy in the EU. Commission Report in accordance with Article 3 of Directive 2001/77/EC, evaluation of the effect of legislative instruments and other Community policies on the development of the contribution of renewable energy sources in the EU and proposals for concrete actions, SEC (2004) 547, COM (2004) 366, 26th May 2004
[50] http://externe.jrc.es/overview.html

estimated that these costs amount up to 1-2 % of the EU's Gross Domestic Product (GDP), …They have to be covered by society at large, since they are not included in the bills which electricity consumers pay"[51].

Within the ExternE research to date a range of environmental costs have been allocated to different energy sources. This can be seen in the table below.

External Environmental Costs Associated with Energy Production

Technology	External Cost Range (€cents/kWh)
Coal/Lignite	2-15.0
Oil	3-11
Gas	1-4
Nuclear	0.2-0.7
Biomass	0.2-3.0
Hydro	0-1
Wind	0-0.25

The report has been criticised for failing to consider the full environmental impact of climate change or some impacts of nuclear power. For example the report states that the "*reliable values of accident, high level wastes impacts, nuclear proliferation and impacts of terrorism have not been developed in ExternE. These omissions may well be significant and therefore should be clearly noted in any assessment*[52]".

. Analysis in Germany has suggested that the environmental costs of energy are greater than the more obvious direct support given to renewable energy.[53] It is estimated that the total saved external costs of renewable energy installed in Europe in the period 2000 to 2010 is up to more than € 320 billion.[54]

Conclusion

Effective competition in the European power markets is just a myth: there is no real competition on more than 90% of the EU electricity market, and unless the current distortions in the emerging Internal Electricity Market are overcome, there will be no effective Internal Renewable Electricity Market for Renewables to compete in.

While other players in the conventional European Power sector ask for competition amongst renewable energy producers, it should be recalled that effective competition in the more than 90% of the market that is based on conventional electricity is a far cry from reality. This briefing shows that effective competition in conventional power is currently a myth

---

[51] European Commission: 20th July 2001, *New Research Reveals The Real Costs Of Electricity In Europe*. http://europa.eu.int/comm/research/press/2001/pr2007en.html

[52] ExternE: 1998 update; Aggregation *of Externalities*, page 497, Volume 7.

[53] Wolfram Krewitt, Joachim Nitsch German Aerospace Center (DLR) Institute of Technical Thermodynamics, System Analysis and Technology Assessment Stuttgart, Germany Workshop on Long Term Energy Prospects and the Role of Renewable Energies Brussels, European Parliament 18th March 2004, *Forecast Scenarios for the Potential Role of Renewable Energies*

[54] EREC: "Renewable Energy target for Europe: 20%by2020"

Some organisations and actors from the conventional power sector are increasingly calling for more competition in the European market for renewable electricity. However, effective competition in the conventional power market is a precondition for creating an undistorted and well-functioning market for renewable electricity.

The conventional power sector should practice at home what many of them preach for renewables. It seems premature to call for competition in the renewables power segment at a time of non-competition in conventional power. Renewable Energy technologies could already be competitive if they had gotten the same attention in terms of R&D funding, subsidies, building up of monopolistic structures while taking external costs into account. Applying the 'polluter pays' principle alone would go a long way to level the currently non-level playing field.

Text and Analysis: C. Kjaer and O. Schäfer

EREC
European Renewable Energy Council
Renewable Energy House
26, rue du Trône
B-1000 Brussels
T : +32 2 546 1933
F : +32 2 546 1947
E: erec@erec-renewables.org
I: www.erec-renewables.org