The French Electricity Market In the European Union

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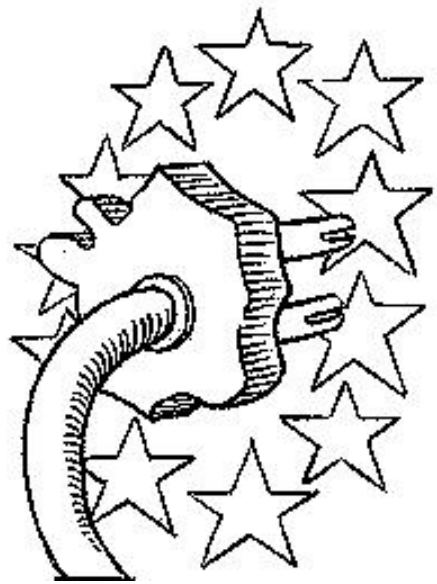


PART 1 : THE EUROPEAN ELECTRICITY MARKET

M. Boiteux 's parabole *(Chevalier, 2004)*

The planet is represented by a spaceship where everything is rare and essential...
Mutual aid and solidarity are necessary...

What would happen if only 1 of the 5 occupants absorbed 80 % of the resources and made itself responsible for ¾ of pollution?

... and at the same time, 1 would have nothing to eat and 2 hardly enough to survive ?

It would be a scandal ...

This is the situation of the earth !

EQUATION OF JOHANNESBOURG

➔ In 2020…

- ✓ **8 bn inhabitants (*60% living in cities*)**
- ✓ **need to build 3 000 GW in the next 20 years (*50% in developing countries*)**

⇔ **Need to double current electricity generation capacities in the next 20 years** ***(Source : International Energy Agency, 2005)***

➔ Equation of Johannesburg

How to reconcile the energy needs of the planet, the protection of the environment and the economic development of almost 3 billion people who live with less than 2 $ per day?

➔ New environment…

- ✓ Growth of the electricity demand
- ✓ Need for capacities (generation and transmission)
- ✓ Question of the financing of these capacities
- ✓ New environmental constraints

EUROPEAN UNION

➔ EU in 2005

✓Population in 2005

UE (15) = 380 M citizens
UE (25) = 450 M citizens

US = 289 M citizens
China = 1.283 bn citizens

✓GDP per capita in PPS in 2005

UE (15) = 23 400
UE (25) = 19 500

US = 30 148

Source : European Commission (2006)

Table 2: Energy Consumption and Carbon Emissions in EU Countries, 2002									
	Energy Consumption								Carbon Dioxide Emissions (Million Metric Tons)
		Percentage of Total							
	Total*	Oil	Natural Gas	Coal	Nuclear	Hydro	Other	Net Imports	
Austria	1.4	39.6	21.5	11.2	0.0	25.8	1.8	0.2	70.5
Belgium	2.7	46.9	21.1	13.3	17.1	0.1	0.6	1.0	146.3
Cyprus	0.1	98.7	0.0	1.3	0.0	0.0	0.0	0.0	8.31
Czech Republic	1.6	22.6	21.6	43.4	12.8	1.6	0.4	-2.1	103.6
Denmark	0.8	49.4	24.5	18.4	0.0	0.0	8.6	-0.9	54.9
Estonia	1.6	68.8	27.4	6.5	0.0	0.0	0.1	-2.7	12.1
Finland	1.2	35.9	13.2	13.0	17.6	8.8	8.2	3.3	54.3
France	11.0	37.4	15.2	4.9	39.0	5.6	0.4	-2.4	407.3
Germany	14.3	39.8	22.1	23.4	11.1	1.6	1.9	0.1	838.3
Greece	1.4	62.2	5.7	28.6	0.0	2.0	0.7	0.9	104.4
Hungary	1.1	28.1	45.0	12.6	12.7	0.2	0.1	1.4	56.1
Ireland	0.6	60.0	25.5	12.1	0.0	1.5	0.7	0.3	45.1
Italy	7.6	50.4	33.3	6.9	0.0	5.3	1.9	2.3	448.7
Latvia	0.2	48.8	31.4	0.8	0.0	16.2	0.0	2.9	9.8
Lithuania	0.4	46.1	22.8	0.7	33.5	2.0	0.0	-4.9	20.2
Luxembourg	0.2	62.5	27.4	2.2	0.0	0.6	0.5	6.8	10.33
Malta	0.04	100	0.0	0.0	0.0	0.0	0.0	0.0	2.77
Netherlands	3.9	48.1	40.1	9.1	0.9	0.1	1.2	1.4	256.2
Poland	3.3	23.0	13.3	63.5	0.0	0.6	0.3	-0.7	268.4
Portugal	1.1	65.5	11.1	13.6	0.0	7.2	1.9	0.6	67.0
Slovakia	0.8	19.2	32.5	19.7	24.2	6.3	0.0	-1.8	38.8
Slovenia	0.3	33.5	12.1	27.9	17.6	11.2	0.2	-2.5	16.7
Spain	5.9	53.8	14.1	15.5	10.4	3.9	2.0	0.3	341.5
Sweden	2.2	31.6	1.5	4.1	29.6	30.0	2.4	0.8	54.8
United Kingdom	9.6	35.6	37.0	15.0	10.9	0.5	0.7	0.3	552.8
Total/Average	73.3	40.2	22.4	15.6	13.0	3.9	1.3	3.5	3,989.2
United States	97.6	39.3	23.7	22.8	8.3	2.6	3.1	0.1	5,749.4

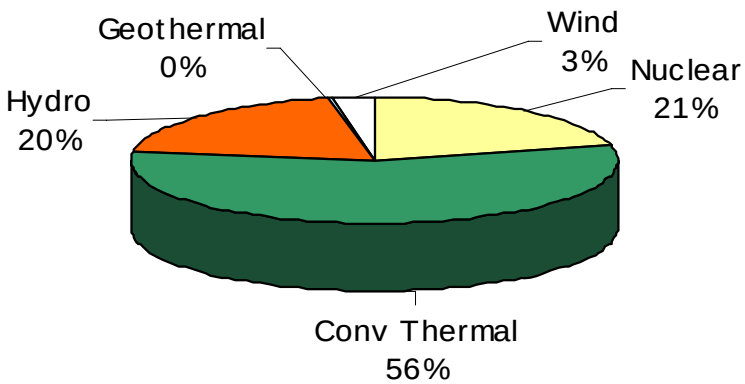
** Total Quadrillion Btu*
Source: Energy Information Administration
Note: Percentages may not add up to 100% due to independent rounding.

Source: EIA, 2005.

ELECTRICITY GENERATION

Electricity Generation In EU 15 (2004)

Electricity Generation capacity (2003, GW)



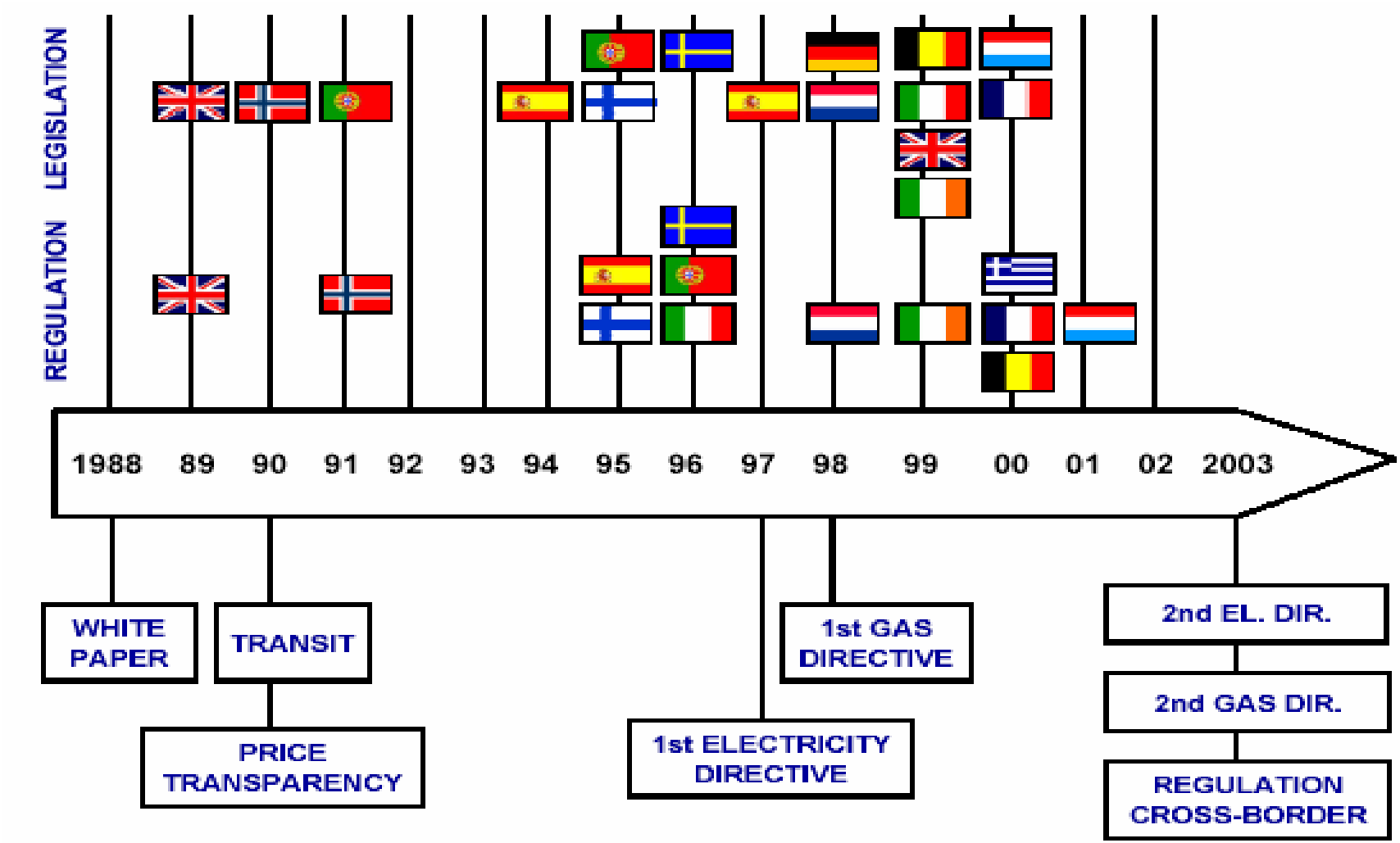
! Significant differences in the EU

➔End of the overcapacity phase

➔Absence of a European energy policy (*in terms of a centralized planning of the capacities…)*

Source: European Commission, 2005.

EU DIRECTIVES



Source : CEER (2004)

PRINCIPLES OF LIBERALIZATION

➔ 3 European Directives :

✓Unbundling : accounting => managerial => legal,
✓Independent authority for regulation,
✓Competition on generation and supply,
✓Market opening : 2004 for professionals and 2007 for all consumers.

➔ These 2 directives adopted in 2003 represent a major step towards the completion of the internal market for electricity and gas in the EU.

FUTURE IN 2030

Increase of electricity consumption : + 1.5 % / year over 2001-2030

Over the period 2000-2030 for EU 15
650 GW new capacities are required ≈ € 600 bn
200 GW before 2010

Source : IEA – World Energy Investment Outlook 2004

Towards a European vision ?

Loyola de Palacio : ***«Europe should start to build a power station every week or every 15 days to avoid the risks of breakdown»…***

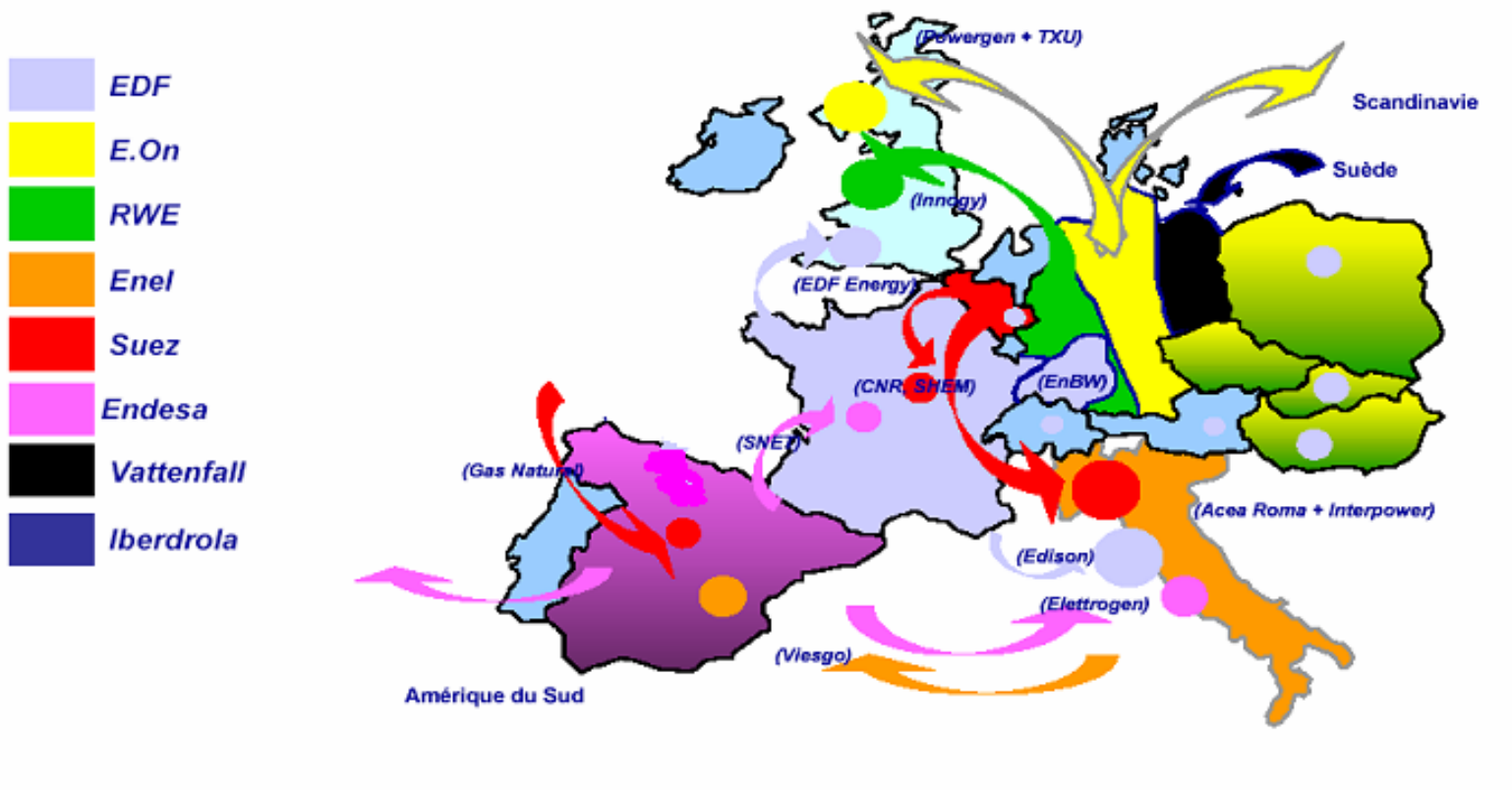
« It is necessary to set up a European total plan of forecast to correct the failures of the market»…

TRANSFORMATION OF ELECTRICITY INDUSTRIES

In this « mosaic » of markets in Europe, problems arising from the opening to competition are still being debated:

- ✓ Uncertainty on prices which results in problems of investment. Does the price give the good signal of investment at the right moment?
- ✓ Can new strategies make it possible to limit the competitive game?
  - ➔ The need for regulation ?
- ✓ The multiplication of the actors complicates the management of the system.
  - ➔ Security of the system ?
- ✓ Are the public services compatible with competition?
- ✓ New environmental constraints

AREAS OF INFLUENCES



Source : Roulet Commission (2004)

At the European level:

➔ **Electricity industry is significantly different from the context of the 90's**

✓***New rules of the game with the transformation of industries and the inescapable movement of opening to competition***

✓***Electricity firms are very active in Europe***

✓***High heterogeneity among European countries***

✓***Construction of a certain European vision on energy, in order to manage regulation, environment and security of supply.***

✓ ***Financing new capacities in Europe***

✓ ***Need for coherence with the constraints of sustainable development***

✓ ***Creation of a new market : emission permits since 2005*-Climate change and European Trading Scheme: CO_2 has a price**

➔ ***Increasingly complex, very risky environment***

and with many uncertainties

PART 2 : THE FRENCH ELECTRICITY MARKET

Key Figures in 2005:

✓**Total area :** 550 000 km2

✓ **Population :** 59.9 M

✓ **GDP per capita in PPS :** 28 300

Source: Eurostat, 2006.

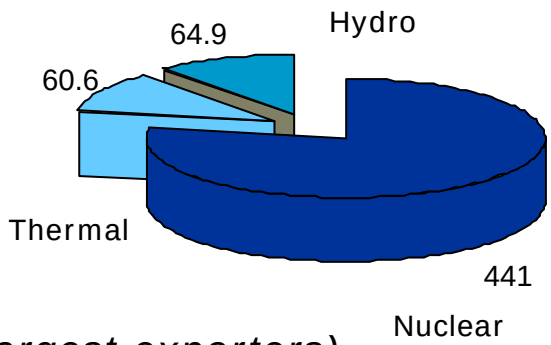
ELECTRICITY MARKET

➔ Supply and Demand in 2005

Source: DGEMP(2005)

- **Generation in 2005: 572 TWh.**

- 78% from nuclear,
- 11% from hydro or wind power
- 11% from classical thermal.

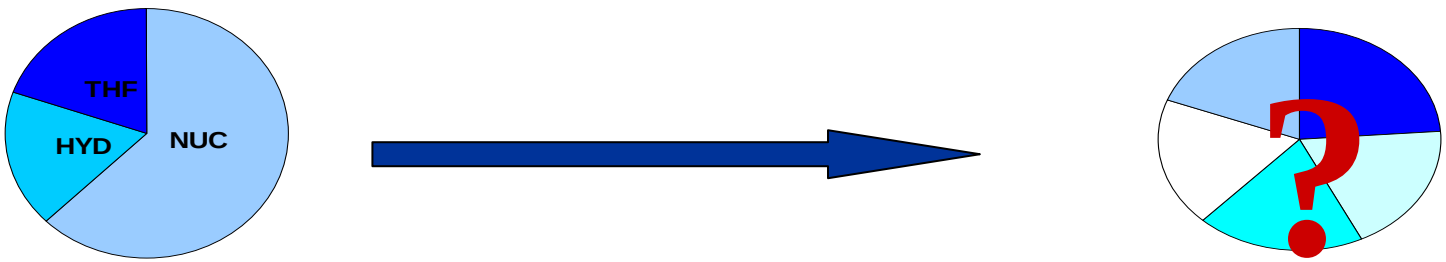


- **Interior Consumption in 2005: 480 TWh.**

- **Exportation in 2005: 62 TWh** *(among the largest exporters)*

- **3.5 M of industrial customers and 30 M of private customers**

➔ **2nd-largest electricity market, consumer and generator in the EU behind Germany**



What would the electricity mix for France be?

FUTURE IN 2010

✓Scenario on Supply – Demand in 2010

- ***Scenario DGEMP* (French Energy Department)**
Consumption in 2010: 540 TWh

- ***Scenario RTE* (Transmission Operator)**
Consumption in 2010: 510 TWh

✓Equilibrium Supply – Demand in 2010

- no problem in « off peak »
- small deficit in « peak » (4 to 6 GW in 2010 according RTE, 2005).

ELECTRIC AND GAS DIRECTIVES

EUROPEAN DIRECTIVES

Electric Directive

February 1997

Transposition in national law before February 1999

French Law February 2000

Gas Directive

August 1998

Transposition in national law before August 2000

French Law January 2003
Impact Gas & Electricity

IMPORTANT DATES IN FRANCE

- **June 2002 : market opening to competition 30%** (above 16 Gwh) .
- **January 2003 : market opening to competition 34% (800 eligible consumers -** above 7 Gwh).
- **July 2004 : non household market fully opened = the size of the market doubled** (65% , 3.5 M consumers).
- **July 2007 : market fully opened.**

COMPETITION IN THE FRENCH MARKET

Major tools have been set up

✓Unbundling *(generation, supply, transmission and distribution)*,

✓ Creation of the Electricity Transmission Network *(Reseau de Transport d'Electricité, RTE)* in Jul. 2000 and an Independent Regulator *(Commission de Regulation de l'Energie -CRE)*

✓ The Powernext electricity trading market was launched in France in Nov. 2001 *(Powernext auctions standard hourly contracts for physical delivery of electricity to business customers under responsibility of the RTE and guaranteed by Clearnet, a subsidiary of the Euronext stock exchange)*,

✓ Mechanisms to implement competition *(European offers launched by RTE to buy electricity for compensation, adjustment market created in April 2003 …)*,

✓ Wholesale market:

- Free buying for resale *(confirmed by the law in January 2003)*,
- Since Nov 2001, a new power exchange *(mainly for day ahead market)*.

PROGRAMMING OF INVESTMENTS (PPI)

Multi annual programming of the investments of electricity generation (PPI)

1) Energy Objective
2) Protection of the environment Objective

- ➔ The French law (February 2000) : if the requirements in terms of generation are not reached (if capacities not built by actors of market), the government can launch official biddings.
- ➔ Obligation of alert of the RTE as regards security of supply to allow the State to launch biddings in time in order to avoid any shortage.

➔ **The French government did not give up all its prerogatives as regards investments**

The PPI lays down objectives of development in terms of primary renewable energies and techniques of generation.

The share of renewable energy in the national consumption should increase from 15 to 21 % to 2010.

« Loi d'Orientation sur l'énergie »

➔ **The energy law has 4 goals :**

- **Energy independence and the security of supply;**
- **Protection of the environment;**
- **Energy at low cost for households and industries;**
- **Social and territorial cohesion.**

➔ **4 means to achieve these goals:**

- **To control the demand;**
- **To diversify the French energy mix ;**
- **To take care of the development of the grid (and storage capacities of sufficient gases and oil);**
- **To develop research on energies.**

PUBLIC SERVICES COST

Cost in 2002: € 1.46 Bil

Cost in 2004 : € 1.735 Bil (+19%)

72%: Purchase obligations (*for example, regulated price for wind power = 83,8 €/MWh)*

2002 : 3 €/MWh

2003: 3,3 €/MWh

2004 : 4.5 €/MWh

➔ **In 2006 : around 6 €/MWh** *(average : 5% of the bill of a houshold)*

Source : CRE 2004

EUROPEAN UNION AND KYOTO

« Development that meets the needs of the present generations without compromising the ability of future generations to meet their own needs » Bruntland Commission 1987

➔Objectives of reduction in the protocol of Kyoto: The developed countries, were individually committed reducing their gas emissions, the total reduction having to reach 5.2 % at horizon 2008-2012 compared to the levels of 1990.

➔The EU will have to reduce its gas emissions by 8 % compared to 1990

➔The EU adopted on October 13, 2003 the directive 2003/87 which creates a mechanism of exchanges of quotas of emission for the European companies.

➔The project will apply initially to the period 2005-2007, then to the period fixed by the protocol of Kyoto (2008-2012). This project covers 46 % of the CO_2 emissions of the EU.

NATIONAL ALLOCATION PLAN

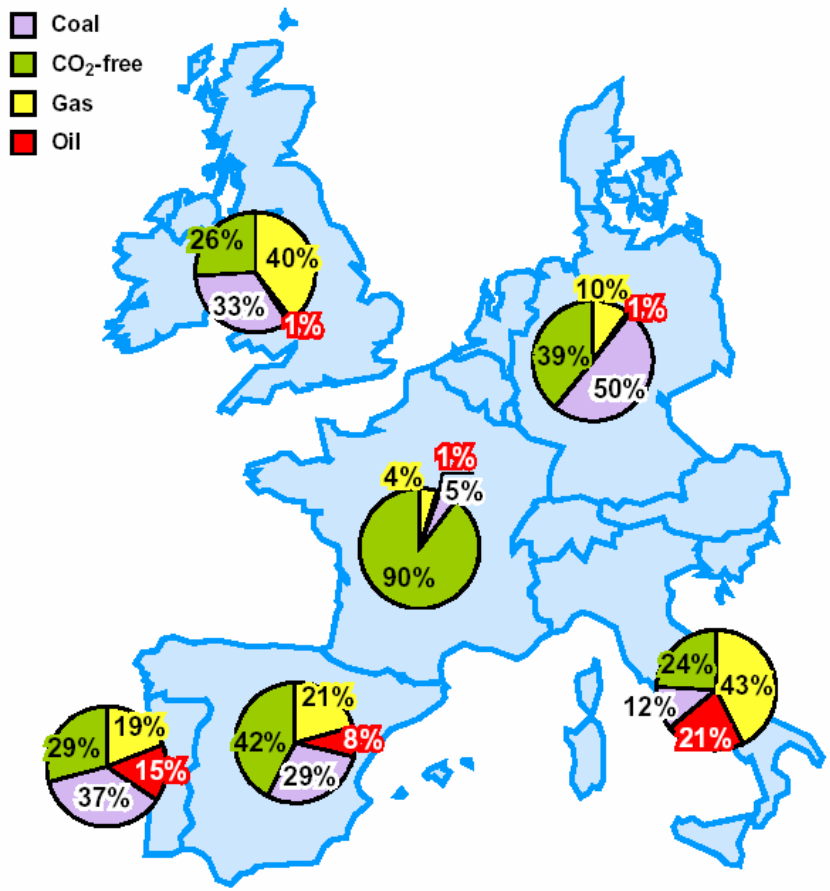
This plan is to help France to apply the European legislation on CO_2 .

This plan relates to 1.300 sites in the first period in France

Nuclear power is of primary importance for the respect of France 's committments regarding CO_2 emission.

EnR are mandatory to meet Kyoto demands.

Figure 11 - Fuel mix in Power Production in 2004



THE GROUP EDF

Major changes for Electricité de France (EDF):

- ✓From EPIC (public entity) to SA (public limited company)
- ✓EDF capital opening (up to 30%) in 2005
(Source of income, Reassure European Commission, Access to capital markets)
- ✓End of « *principe de spécialité* »
- ✓EDF public service obligations confirmed
- ✓ Competition !

	2004
Employees	117 249
Number of customers in France	31 million
Number of customers outside France	20 million
Power output	Nearly 470 TWh
International assets	Installed capacity 32,700 MW

THE GROUP EDF

	Ouverture légale juillet 2004	Marché éligible (TWh)
Allemagne	100%	490
Royaume-Uni	100%	335
France	68%	295
Italie	78%	233
Espagne	100%	205
Suède	100%	135
Pays-Bas	100%	105
Finlande	100%	77
Belgique	84%	63
Autriche	100%	55
Portugal	100%	40
Danemark	100%	33
Grèce	62%	31
Irlande	65%	14
Luxembourg	87%	5

Source : CRE (à partir de données de la Commission européenne et des autorités de régulation)

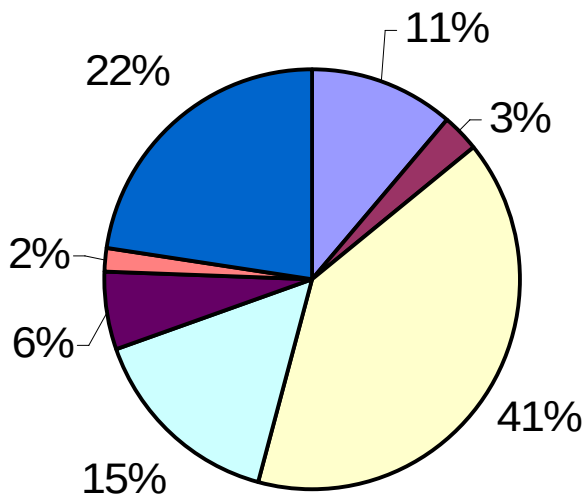
Since July 2004,
with 68% of the market
open to competition,
that is 295 TWh,
the French market
has been
the 3rd most important
European market open
to competition.

THE GROUP EDF

EDF competitors control 20% of the electricity generated in France

Other operators: 110 TWh in 2004

(total generation in France: 572TWh)



- EDF - shared power plants
- EDF - Tricastin power plant
- Virtual Power Plants 42 TWh
- Suez-CNR
- Endesa-SNET
- Suez-SHEM
- Mandatory offtakes by EDF

THE GROUP EDF

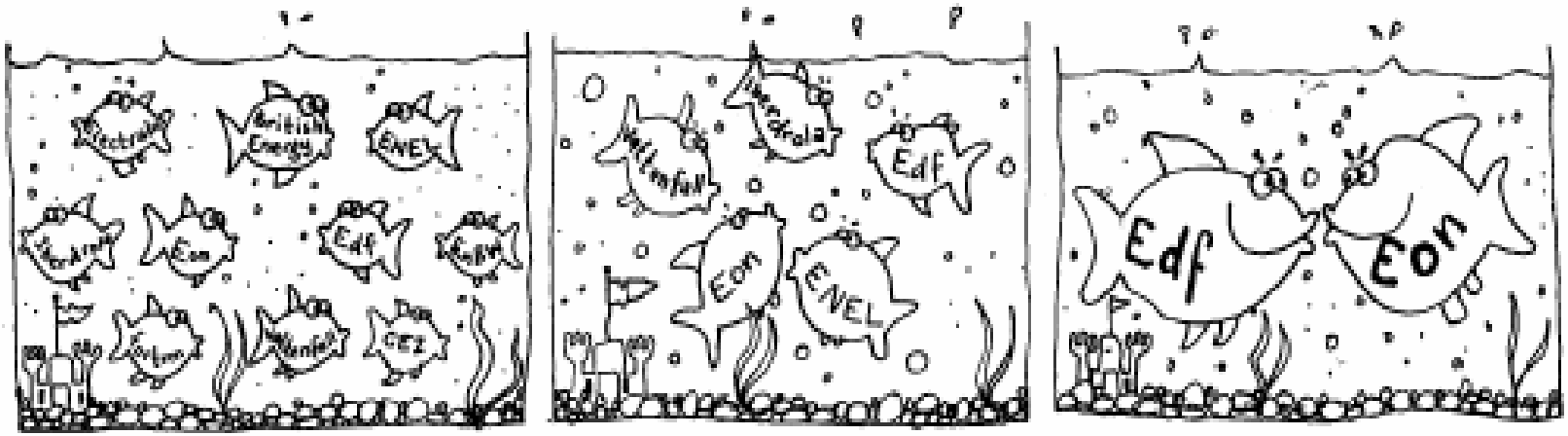
✓**The French electric utility EDF is often :**

- accused by its competitors and the European Commission of being protected in its home market
- and at the same time, accused of using its dominance to follow an aggressive strategy outside France buying assets in Europe.

✓The EDF Group covers all the energy activities in more than 20 countries : energy management (generation, trading, and optimisation), transmission, distribution, supply, energy services and development

⇒ **EDF is facing a strong "demand of reciprocity"**

EDF



Big fish, small pond

Mario MONTI, has "*made it clear that it would be difficult for EDF to win approval for new acquisitions elsewhere in the EU if it carried on with this stance [of not liberalizing the French energy market]*"

CONCLUSION

New risks appear in this uncertain and complex environment ….

- ✓**Marker risks**
- ✓**Regulation risks**
- ✓**Environmental constraints**

⇔ **Between a short term logic and a long term logic**

- ✓**For the States (and EU ?)**
- ✓ **For actors (shareholders, customers, politicians….**
- ✓ **For Firms**

Challenge : To manage the transition and be caught between these two logics

Thank you for your attention

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