

# ***The French approach on public acceptance issues***

## ***What we did in the last years***

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# **A G E N D A**

***I - The basic facts.***

***II - A pending problem ... or a solution being found: the nuclear wastes issues.***

***III - Some contributions... just in case.***

# ***1 – The basic facts***

# *French people and nuclear : The key figures*

- ▶ **15%**     **Against**
- ▶ **35%**     **In favour**
- ▶ **50%**     **Hesitating**

**but :**

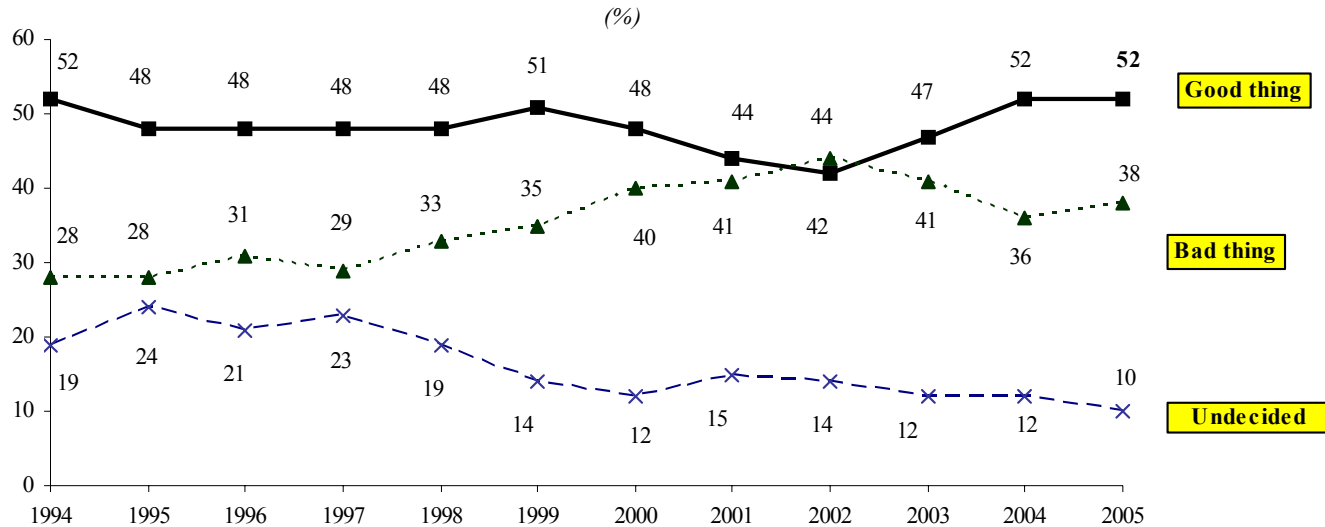
**70% nuclear to be kept**

# *The decisions we made in France within Areva (2001)*

- 1. To study public opinion seriously.**
- 2. To communicate directly to both business and the public. To promote « dedramatizers » to feed the process (not only self-serving).**
- 3. To provoke debate instead of simply accepting it.**
- 4. To make a clean break with our habit of saying "it's cheaper and it's not all that dangerous" (even if your communication is based on real facts).**
- 5. To deal with communication on nuclear issues ourselves.**
- 6. To set progress targets. To stop being passive.**

# In your opinion, was it a good thing or a bad thing to opt for nuclear to generate three-quarters of France's electricity?

- Changes in opinion between 1994 and 2005 -



Source: CREDOC - OBSERVATOIRE DE L'ENERGIE, Enquêtes " Conditions de vie et Aspirations des Français ".

**2002/2004: + 12%**

**Established reasons for the change :**

- ▶ **35%**     ***Expansion of nuclear outside Europe***
- ▶ **65%**     ***Israel / Iraq / the Caucasus***
- ▶ **65%**     ***Advantages of nuclear***
- ▶ **70%**     ***Oil spillages***
- ▶ **85%**     ***Greenhouse effect***

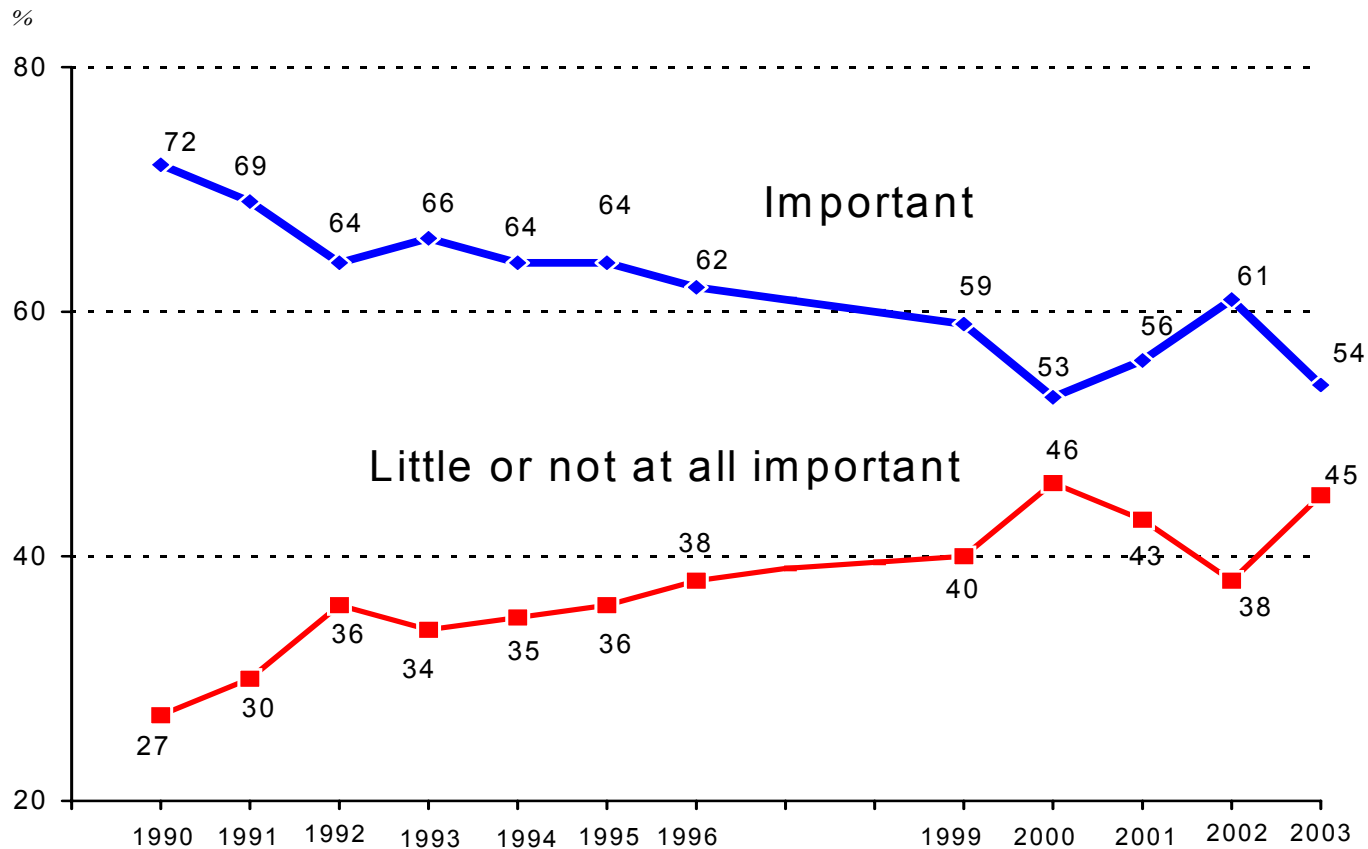
# *A long story.... with Middle East*

- A long series of events that started nine centuries ago;
- An acute sensitivity to the tensions between Israel and Palestinians;
  - ..... that was reinforced by many negotiations, sometimes very difficult, with Algeria;
- The French people are therefore very sensitive to Middle East not only the elits, but all the citizens.

**First reason for support : national independence**



# Nuclear Power Plant Safety: Opinion on the importance of the risk of a severe accident in a French nuclear power plant (1/4)

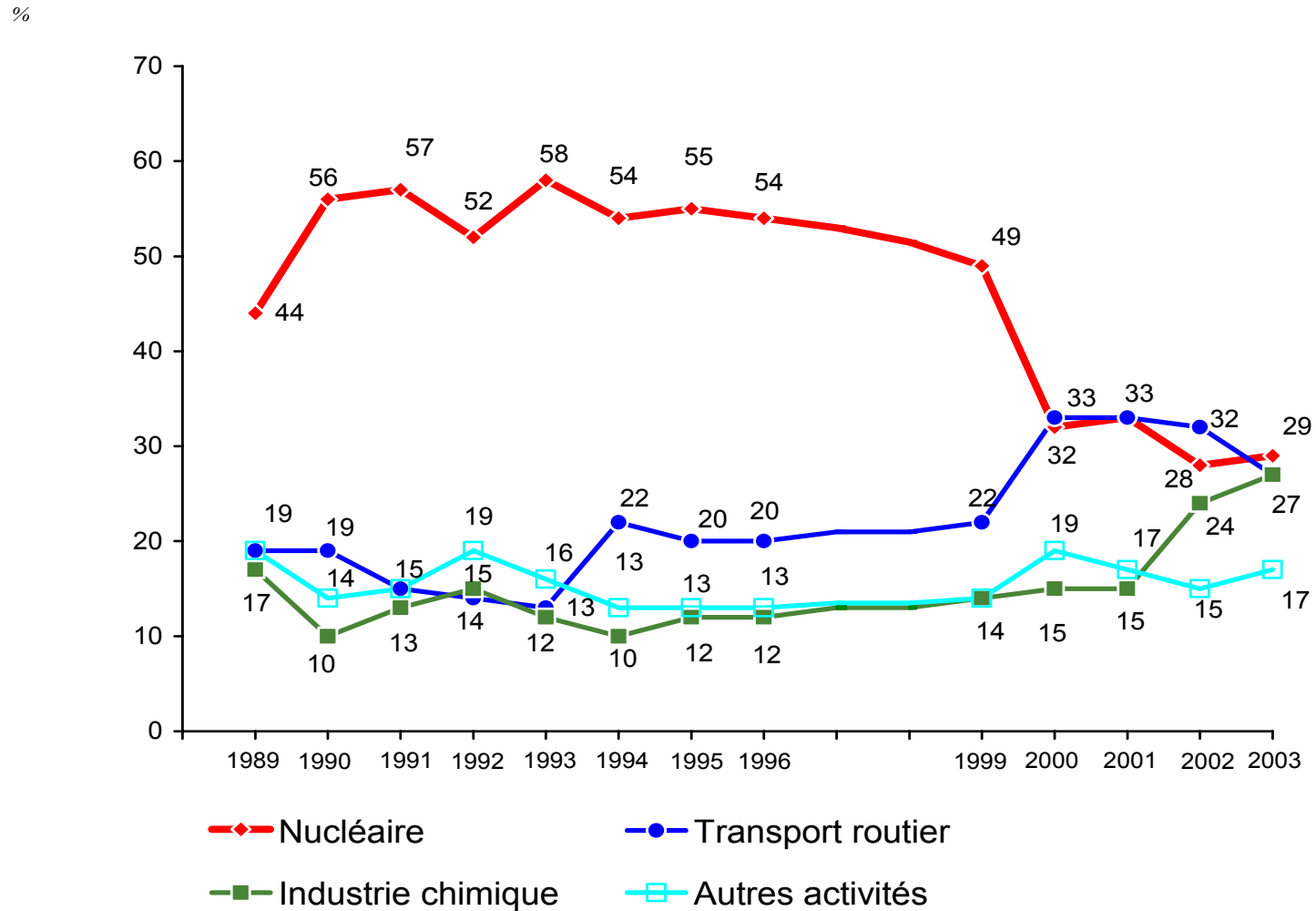


Source: CREDOC, surveys "Conditions de vie et Aspirations des Français"

# Nuclear power plant safety (2/4)

	En %	Certainly true	Probably true	Possibly true	Probably false	Certainly false
- The risk of severe accident in a nuclear power plant has dropped considerably in the past 15 years.		24	33	25	12	6
- New reactors are designed to prevent radioactivity spreading more than 5 km, even in the event of core meltdown.		8	25	39	18	10
- According to French law, nuclear power plant operators must inform the public of the slightest incident occurring on a nuclear site. -		30	29	24	12	5

# Activity in which the severe accident risk is highest (3/4)



Source : CREDOC, Enquêtes « Conditions de vie et Aspirations des Français ».

# Decision on the EPR: public support (4/4)

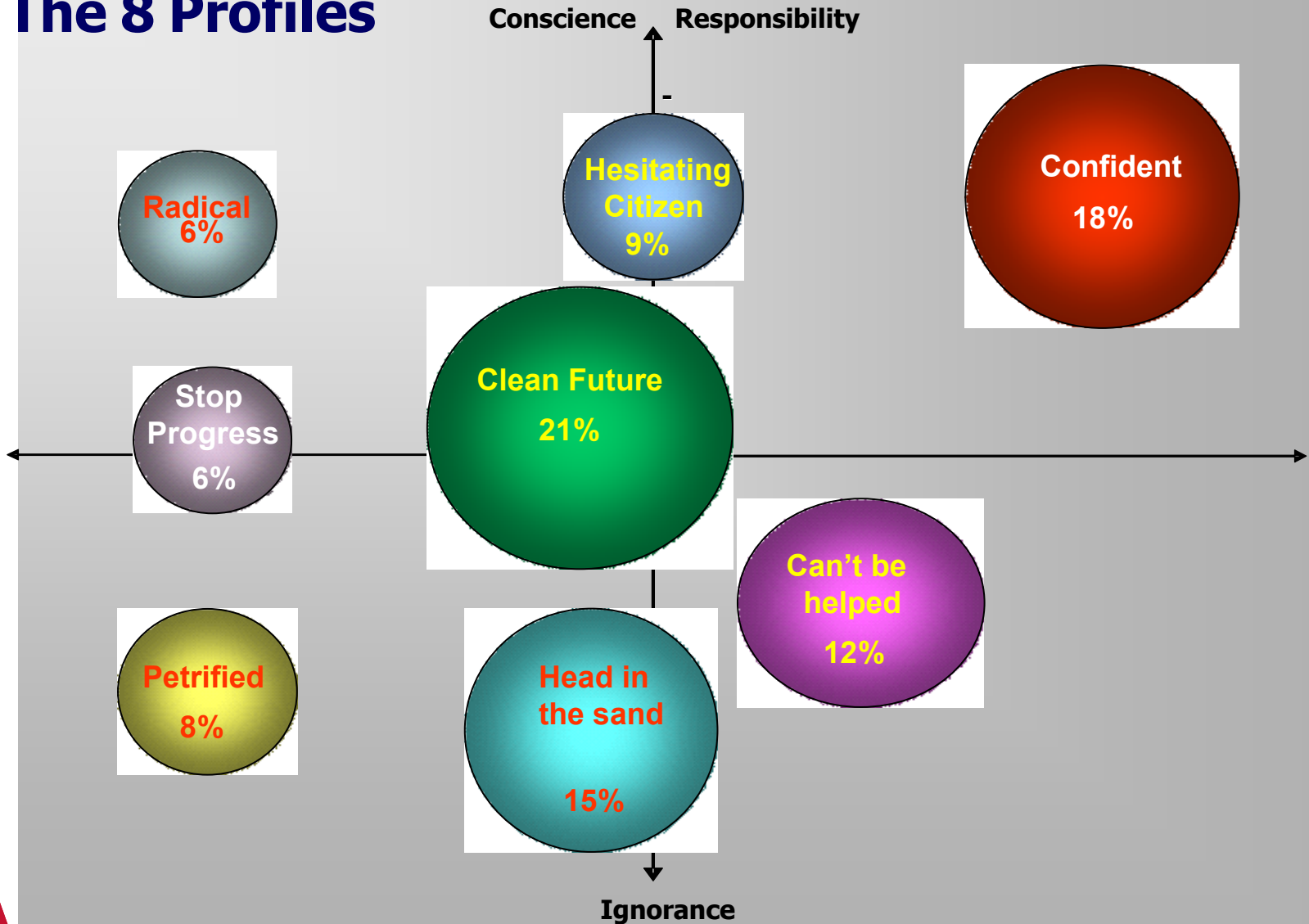
» Which of the following statements best reflects your opinion ?

	2003	2002
%		
- We should shut down all nuclear power plants in operation as soon as possible.	10	11
- We should leave existing nuclear power plants in service for the rest of their scheduled lifetime, but we should not build any new plants.	<u>35</u>	<b>47</b>
- We should maintain the production capacity of existing nuclear power plants, and to do this, we should build new plants as old ones are shut down.	40	33
- New nuclear power plants should be built to meet the country's growing demand for energy.	14	9
	<b>54</b>	<u>42</u>

# The acknowledgment of a complementarity : Renewables and nuclear

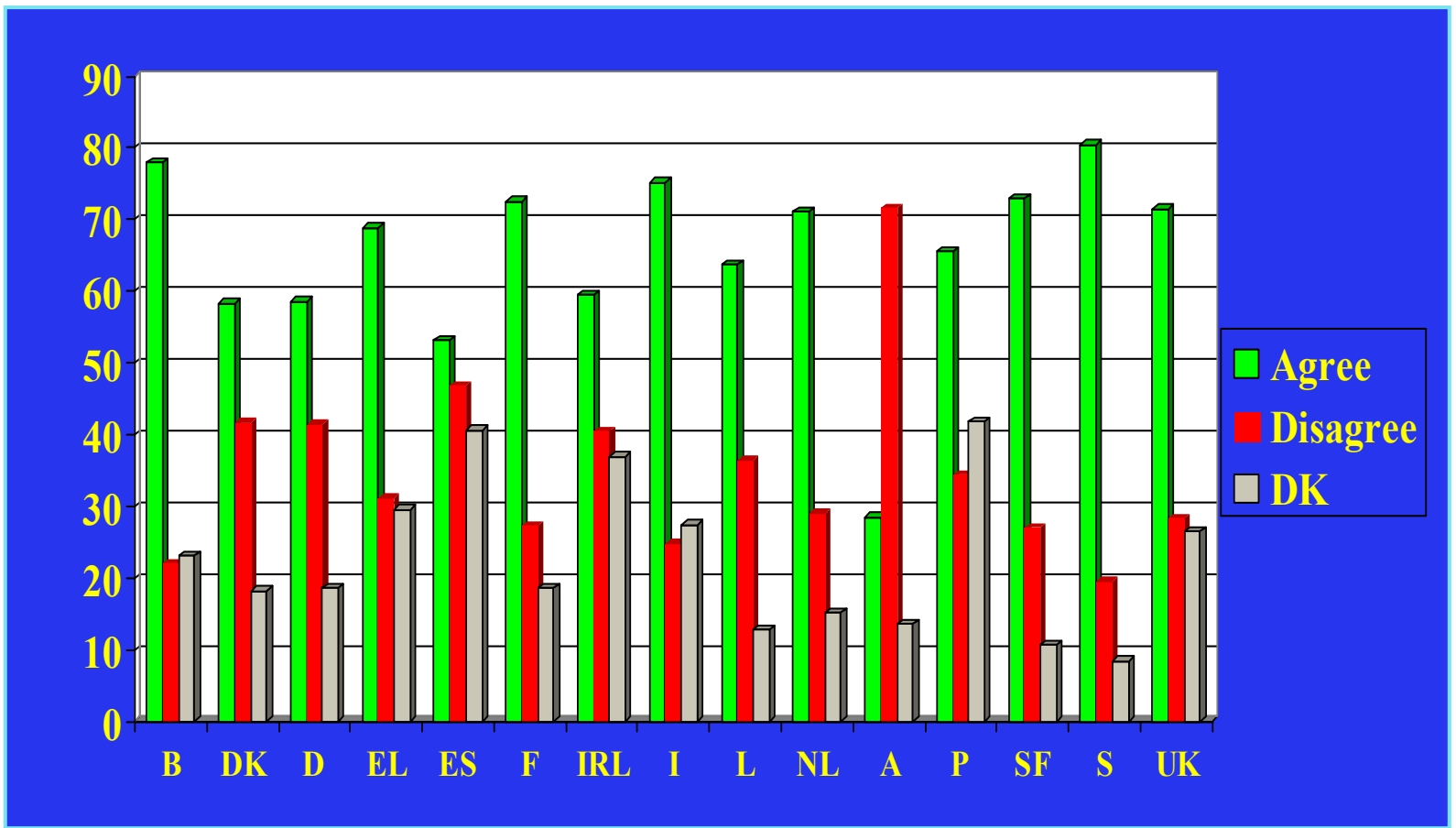
En %	Certainly true	Probably true	Possibly true	Probably false	Certainly false
	- In France given the meteorological conditions, wind energy can only provide a small share of the energy required	25	34	20	14
- By definition, energy sources whose supply is irregular such as solar and wind energy cannot provide energy continuously.	23	27	21	18	11
- Unfortunately solar energy is not competitive for generating large quantities of electricity.	26	28	21	16	9

# The 8 Profiles



***II – A pending problem... or a solution  
being found :  
the nuclear wastes issues***

# The european case : If all wastes can be safely managed, nuclear power should remain an option



*Eurobarometer, 2002*



# *Lessons from the past in France*

- ▶ **The level of knowledge is not correlated to the educational level.**
- ▶ **From 1990 to 2003 two thirds of the population were persuaded in France : they were not told the truth.**
- ▶ **Even if there has been a law voted on this matter(1991), only 10% were aware of it.**
- ▶ **Less than 20% of the people have the scientific background for appropriating the key data of this file.**

# *The French legal context*

- ▶ **A law voted unanimously (minus one vote) in Parliament in 1991, with reassessment scheduled for 2006; a clear democratic framework.**
- ▶ **Two independent commissions, one parliamentary (French parliamentary office for the evaluation of scientific and technical choices), the other (the French National Evaluation Commission) comprising experts who worked for 15 years and published regular reports.**
- ▶ **Three axes: positioning/transmutation, deep geological disposal, near-surface disposal.**
- ▶ **A law currently being put before Parliament by the Government, after lengthy public debate.**

# ***A law for the management of radioactive waste and materials***

**The law is based on three principles:**

- ◆ **To reduce the volume of waste generated, nuclear fuel from electric power plants is treated so that it can be recycled for use in other plants.**
- ◆ **Unrecycled waste will be put into surface interim storage until it has cooled sufficiently.**
- ◆ **When it is taken out of interim storage, high level, long-lived waste will be placed in a reversible deep disposal facility.**

# ***Communication that was for years unaware of public perception***

## **Three points that were unknown or ignored:**

- 1** > 1000 years: a period of time that is pure speculation for 90% of people.
- 2** Burial = Basic fears (mythology/religious belief)  
physical reality = we need to protect ourselves  
in the imagination = the rape of Mother Earth
- 3** Radioactivity = *A many-headed, evil, indestructible and insidious monster!*

# ***Centuries-safe packaging already exists for long-lived waste***

- ▶ **Current interim storage facilities have been validated without exception (40 years)**
- ▶ **Only water flowing on the outside can cause damage; no water = **no danger****
- ▶ **A satisfactory solution has already been found for interim storage over a period of 1000 to 1500 years**

# *The alternative to sub-surface interim storage – deep disposal*

- ◆ This is a real possibility: 2 acceptable solutions.
  
- ◆ It alters the public's perception of waste:
  - The feeling of having no way out is not so strong,
  - Those who say there is no solution lose most of their credibility.

# Treatment and mining resources

In 40 years, a PWR in the N4 series operating in self-generation recycle mode accumulates:

~ **6000 t of depleted uranium**

~ **10 t of plutonium**

A fast reactor operating in self-generation mode only could run independently on 12 tons of plutonium.

**It would therefore consume around one ton of depleted uranium /year.**

***So it is not the availability of uranium  
limits the “sustainability” of nuclear***

# *The results of treatment*

- ◆ by recycling plutonium: **12%** savings in natural uranium
- ◆ by recycling reprocessed uranium, **10%** savings in natural uranium
- ◆ in all **22%** of natural uranium, **< 6% of the cost of one kWhe , <3% of the selling price**

*a ratio seldom seen in industry!*

If it was economical, dual recycling would save **around 5 %** more

Creating a stock of uranium and plutonium  
for Generation IV reactors

*Means preparing for the future*



# Reprocessing and wastes

- ▶ **6%** of the cost of one kWh = **22%** more resources
- ▶ **50** years of residues = **5000** years of resources
- ▶ **2** solutions already exist for waste
- ▶ Communication aimed at **everyone**, not simply specialists
- ▶ **40-year** reduction in interim storage time

## ***III – Some contributions.... just in case***

- ▶ **To study public opinions in a very detailed way, specially « hesitating people » : their uncertainties, their questions, their expectations.**

**To use best trademark territory technologies drawn from high value consumers goods businesses.**

- ▶ **To use also the best technologies for understanding waste problems :**
  - **Researchers very well aware of anthropology and psychanalysis;**
  - **A research program with no time limit for each interviewed.**
- ▶ **Technologies implemented by AREVA, in cooperation with EDF.**

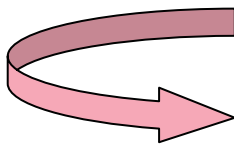
# Possible approach to non-proliferation issues

- ▶ Due to the investment required, used fuel treatment will be limited to just a few countries: G10?, G12?

Several combinations of scenarios between sub-surface interim storage and deep disposal

- ▶ When a fast reactor is developed (2035? 2040?), will actinide transmutation *in situ* mean anything, and at what price? In any case, advanced treatment will be possible!
- ▶ Is it feasible to envisage reactors that require fresh reloads every 10 to 15 years, or even reactors with 30-year fuel cycles, for countries where the situation needs to be handled carefully?

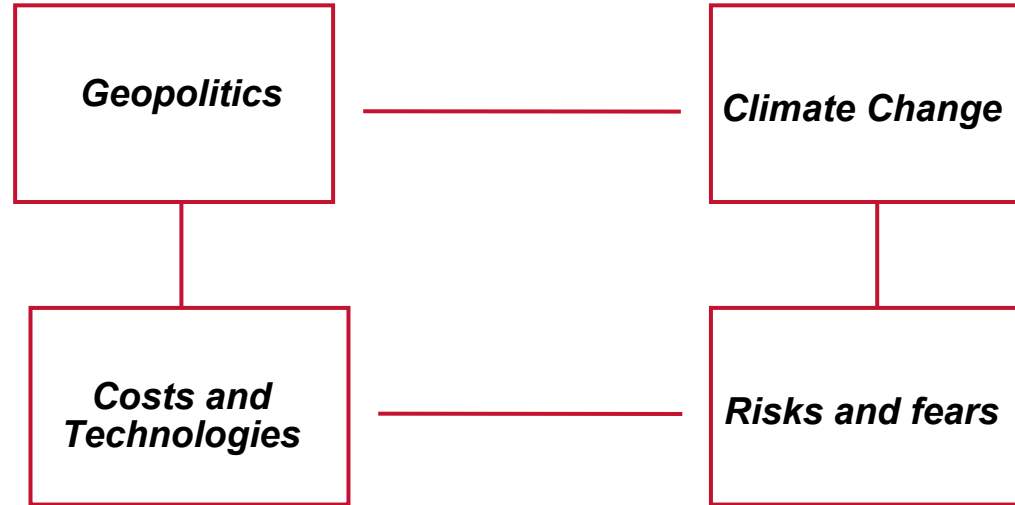
- ▶ **Opponents will always tell you that you're wrong or you're lying, knowingly or unknowingly.**
  
- ▶ **This problem is sometimes seen as political, sometimes put down to public opinion, and even a result of media self-interest.**



***Too many passionate feelings surround the issue of nuclear power to simply list its benefits and drawbacks.***

# *Global expertise is necessary*

*There is a real clustering of expertise:*



*Day after day you have to try to reduce it.  
This is specially relevant for business people.*

# *Warming of the planet is a serious challenge*

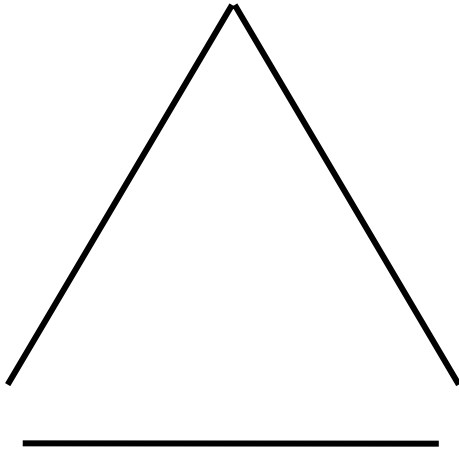
- ▶ **Is nuclear option is a requirement, an option, a luxury...?**

You have to judge it, and then to communicate.

- ▶ **But you cannot communicate without addressing the whole energy issue.**

# *The two key triangles*

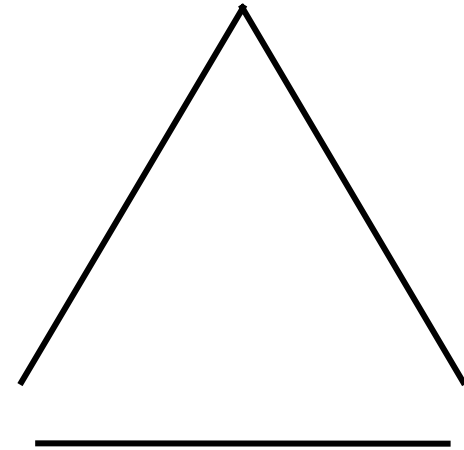
**REASSURE**



**CONVINCE**

**SURPRISE AND SEDUCE**

**EXPLAIN**



**LISTEN**

**ALLOW TO THINK IT OVER**

*To implement them,  
you need to know equally nuclear, energy and modernity as well.*



# ***Confusions to clarify on renewables***

**We have partly been taken for a ride by the European Commission regarding electricity.**

**The real challenges seem above all to be:**

- 1. The water heating through the solar energy (+ thermal pump) and biomasse use.**
- 2. Oil alternatives (bio-fuels and tar sand, which is improved by nuclear).**
- 3. Wind power as an additional source, when there is a peak in demand, or in relation to hydro-electricity.**
- 4. .... Communication, just as with energy savings.**

**Renewables are not only for electricity !**

# ***Economic considerations are no longer just speculations***

- ▶ **An additional 1% growth in worldwide oil and gas production has led to a 60% increase in the price of these.**
- ▶ **Every \$10 extra per barrel leads to a 0.3% drop in European economic growth.**
- ▶ **The cost of electricity is brought down by the marginal cost of generating electricity using gas turbines.**
- ▶ **1000 TWh between gas and nuclear for Europe by 2025-2030:**
  - ◆ **€12 billion reduction in costs**
  - ◆ **€27 billion reduction in imports**
  - ◆ **€8 billion in external costs if carbon = €80 per metric ton**

# ***The highly radioactive wastes issue : a political choice***

**In the case of France (with reprocessing in la Hague) :**

- ◆ **Either you want a solution for only the next one thousand or two thousand years and you have it with la Hague ;**
- ◆ **Or you want a solution for more than that, and you can implement retrievable storage within impermeable clays ... which doesn't exclude : you aim at transmutation by 2050.**