



Ambassade du Danemark  
Colloque Energies d'Avenir

***French renewable energy policies  
and  
« Grenelle de l'Environnement »***

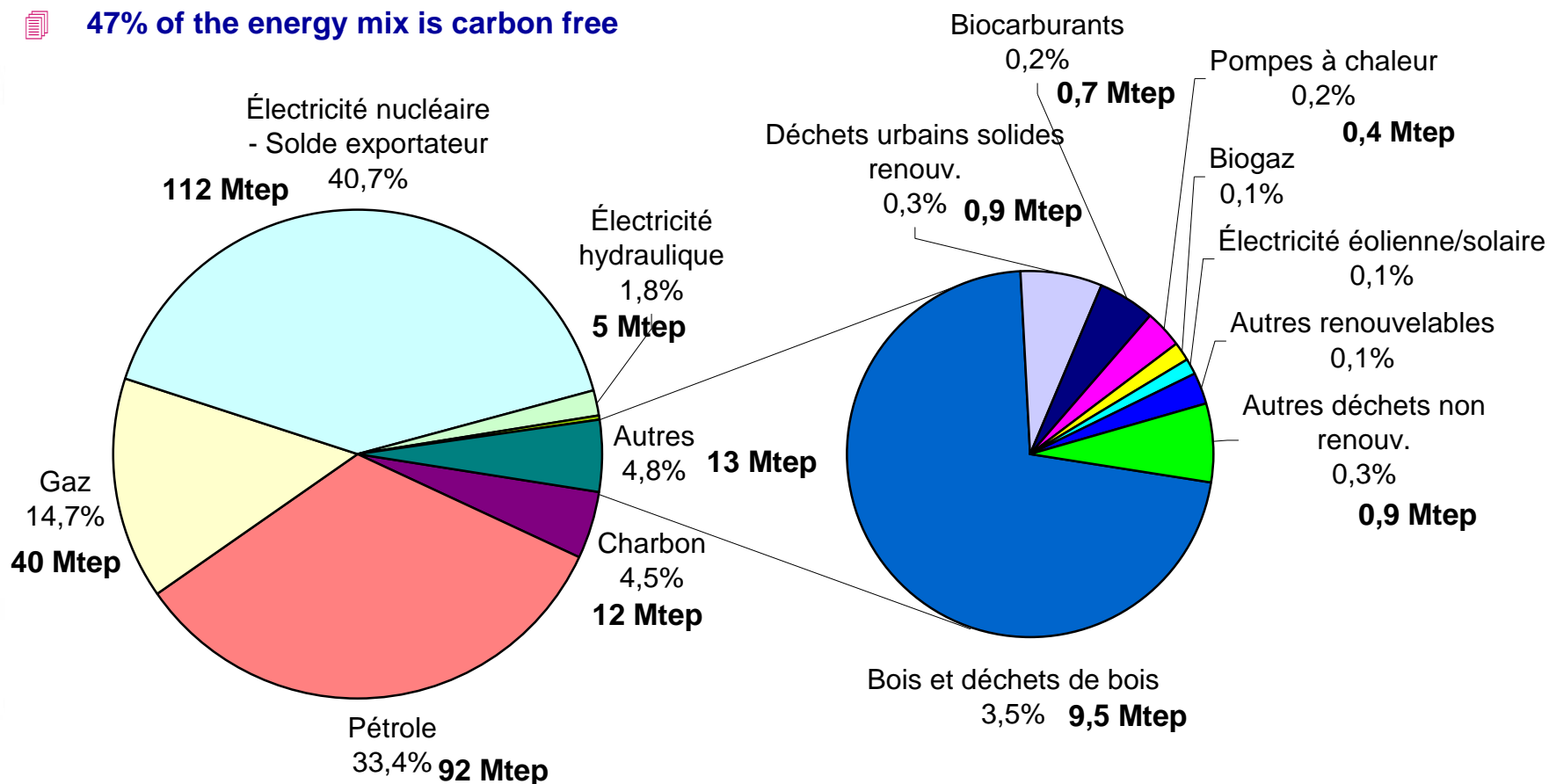
**Jean-Louis Bal**

*ADEME - French Environment and Energy Management Agency*

# France Primary Energy Mix (2006)

📄 No short term significant evolution (275 Mtep)

📄 47% of the energy mix is carbon free



# Since 2005, clear ambitious targets...

13 July 2005 French "POPE" Law on Energy

(Loi de Programme fixant les Orientations de la Politique Énergétique)

## GHG reduction

The "Factor 4 objective"

A 3 % yearly reduction  
to cut by 4 the emissions by 2050

## Final Energy Intensity

- 2% per year (2015)

- 2,5 % per year (2030)

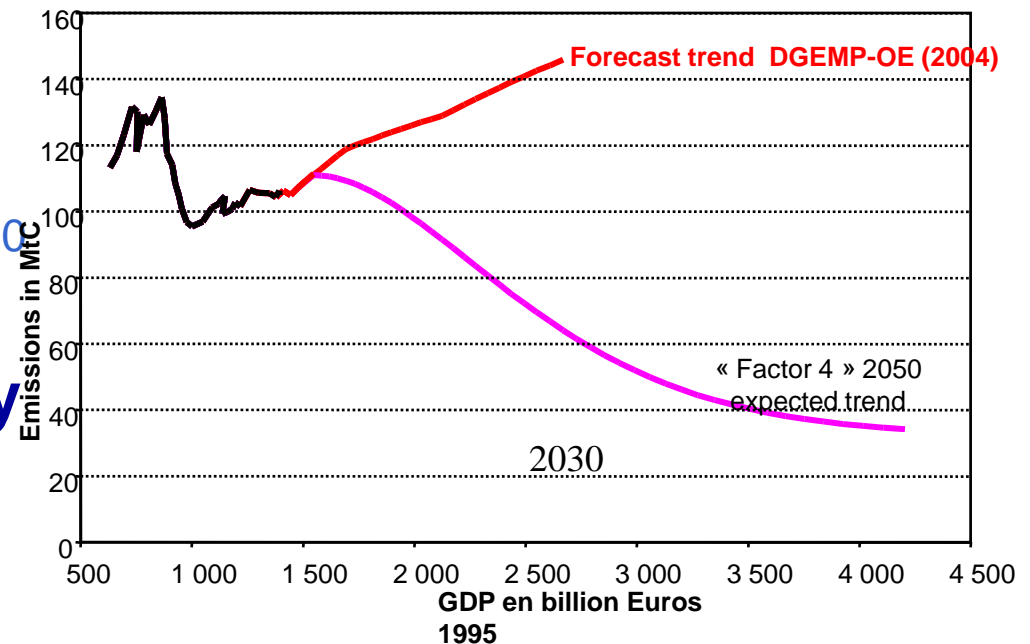
## Renewable Energies 2010 targets

10 % of total primary energy consumption from RES (6,13% in 2006)

21 % of electricity consumption from renewable sources (14 % in 2006)

+ 50 % contribution from thermal renewables compared to 2004  
(meaning + 4Mtoe)

7 % of biofuels in transports (1,75% in 2006)



## *... reinforced by the «Grenelle de l'environnement» conclusions*

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- **“Grenelle” objectives:** A clear national strategy to reinforce France commitment toward sustainable development and “Factor 4”
- **“ Tackle climate changes & energy management”**
  - French position in line with the “3x20 in 2020” European objective
- 📄 **CO2:** -20% in transports and more than 20% reduction in buildings
- 📄 **Additional 20 Mtoe of renewables** by 2020 (from 17 to 37 Mtoe)
- 📄 **Energy Efficiency :**
  - 20% of energy consumptions reduction in service sector buildings
  - 12 % reduction in residential buildings within 5 years and one third by 2020
- ↪ Renewable would then represent 25% of the energy mix
- 📄 **R&D:** Plus 1 G€ over 4 years,  
1 € for nuclear = 1 € for « New Energy Technologies »



## **« Grenelle de l'environnement » action plan for GHG emissions reduction**

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- ☞ Programmes in favour of renewable energies: hydro, wind, biofuels, geothermal, photovoltaic, solar thermal.
- ☞ RES Heating and Cooling Fund
- ☞ Increase renewable energies consumption from 30 to 50 % in overseas departments and communities by 2020.
- ☞ Research for second-generation biofuels development
- ☞ R&D programme for CO2 geologic catching and storage
- ☞ Plan for energy efficient agricultural exploitations
- ☞ Commitment for all ministries and administrations to draw up their carbon balance and improve their energy efficiency by 20%
- ☞ Revision of the public procurement code to make environmental clauses compulsory
- ☞ Consider a « climate-energy » tax on fossil fuels

# ***The building « Grenelle » objective ...***

## **Ambitious programme for new buildings**

- in 2010 : reach the VHEP label level (-20 % compared to 2005 Regulation)
- in 2012 : reach the low consumption building label level (50 kWhpe/m<sup>2</sup>.year adjusted according to geography and altitude)
- in 2020 : buildings to be passive (< 15 kWhpe/m<sup>2</sup>.year) or positive energy ones

## **Launch of an unprecedented thermal refitting programme for existing buildings**

- Energy improvement for every private housing property transfer and study for a refitting obligation (class B or C)
- Refitting of 400 000 public housings per year
- Market exclusion of all obsolete components or technologies
- New public buildings to be conformed to the best energy efficiency standards
- Thermal refitting (-20 %) of all state buildings
- Creation of a thermal refitter branch and launch of a large professional training plan (100 000 professionals to be trained in 10 years)
- Implementation of strong incentive mechanisms in partnership with banks

## **Renewable energies development**

- « bâtiment-soleil » national plan
- 60 000 RE professionals to be trained in 10 years

## *...strengthened by an existing supporting framework*

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### **R&D: technological evolutions and demonstrative buildings**

- PREBAT: a national deployment programme for energy in buildings (15 M€/annually) [www.prebat.net](http://www.prebat.net)  
Creating a virtuous circle: regulation -> R&D -> regulation  
demonstration -> field evaluation -> corrective actions



### **Communication: behaviours and uses modifications**

- Knowledge acquisition, information, communication, training
- Advices in the local « Point Info Énergie »
- Audiovisual communication national campaigns



### **Regulations and incentives: obligations and voluntary implication**

- Thermal regulations (new and existing building) revised every 5 years
- Energy performance diagnostic (DPE)
- Financial instruments (income tax credit, reduced rate loans, zero rate loans, White certificates (CEE), COS exceeding...)
- Integrated photovoltaic electricity feed-in tariff



### **Training : jobs evolution and new professions**

- Professional qualifications (Qualit'EnR, Qualibat)
- New jobs (energy advisors, refitters)
- Global services offers (guarantee of results, financial products...)

## ***Feed in tariffs: a key incentive for renewable electricity***

	Decree	Contract duration	Tariffs
<b>Hydropower</b>	1st March 2007	20 years	<b>6,07 c€/kWh</b> + 0,5 to 2,5 c€/kWh premium for small installations + 0 to 1,68 c€/kWh premium depending on the production regularity
<b>Biogas and methanisation</b>	10 <sup>th</sup> July 2006	15 years	<b>Between 7,5 and 9 c€/kWh</b> depending on the power + 0 to 3 c€/kWh premium for energy efficiency + 2 c€/kWh premium for methanisation
<b>Wind power</b>	10 <sup>th</sup> July 2006	15 years 20 years for off-shore	<b>on-shore: 8,2 c€/kWh</b> during 10 years, then from 2,8 and 8,2 c€/kWh depending on the location <b>off-shore: 13 c€/kWh</b> during 10 years, then from 3 to 13 c€/kWh depending on the location
<b>Photovoltaic</b>	10 <sup>th</sup> July 2006	20 years	<b>30 c€/kWh</b> + <b>25 c€/kWh premium for building integration</b> <u>Corsica, overseas departments and Mayotte: 40 c€/kWh</u> + 15 c€/kWh premium for building integration
<b>Geothermal energy</b>	10 <sup>th</sup> July 2006	15 years	<b>12 c€/kWh</b> + 0 to 3 c€/kWh premium for energy efficiency <u>Overseas departments: 10 c€/kWh</u> + 25 c€/kWh premium for building integration

 A useful tool to structure a field: the BIPV premium example

# ***Tax credits : a very efficient incentive for renewables at home***

Income tax credit launched in 2004

From 40% to 50% for renewables equipments in January 2006

	<b>2004</b>	<b>2005</b>	<b>Increase rate (2004-2005)</b>	<b>2006</b>	<b>Increase rate (2005-2006)</b>
<i>Solar thermal: domestic hot water systems</i>	8 150	14 000	<b>72%</b>	26 200	<b>89%</b>
<i>Solar thermal: combi-systems for hot water and heating</i>	600	1 500	<b>150%</b>	4 100	<b>168%</b>
<i>Solar photovoltaic</i>		450		1 606	<b>156%</b>
<i>Wood - independent heating systems</i>	324 000	409 000	<b>26%</b>	529 000	<b>29%</b>
<i>Wood - boilers</i>	8 800	18 500	<b>100%</b>	28 400	<b>53%</b>
<i>Heat pumps: geothermal and air-water</i>	18 000	27 000	<b>50%</b>	59 150	<b>119%</b>
<i>Heat pumps: air-air</i>		38 225		50 500	<b>32%</b>

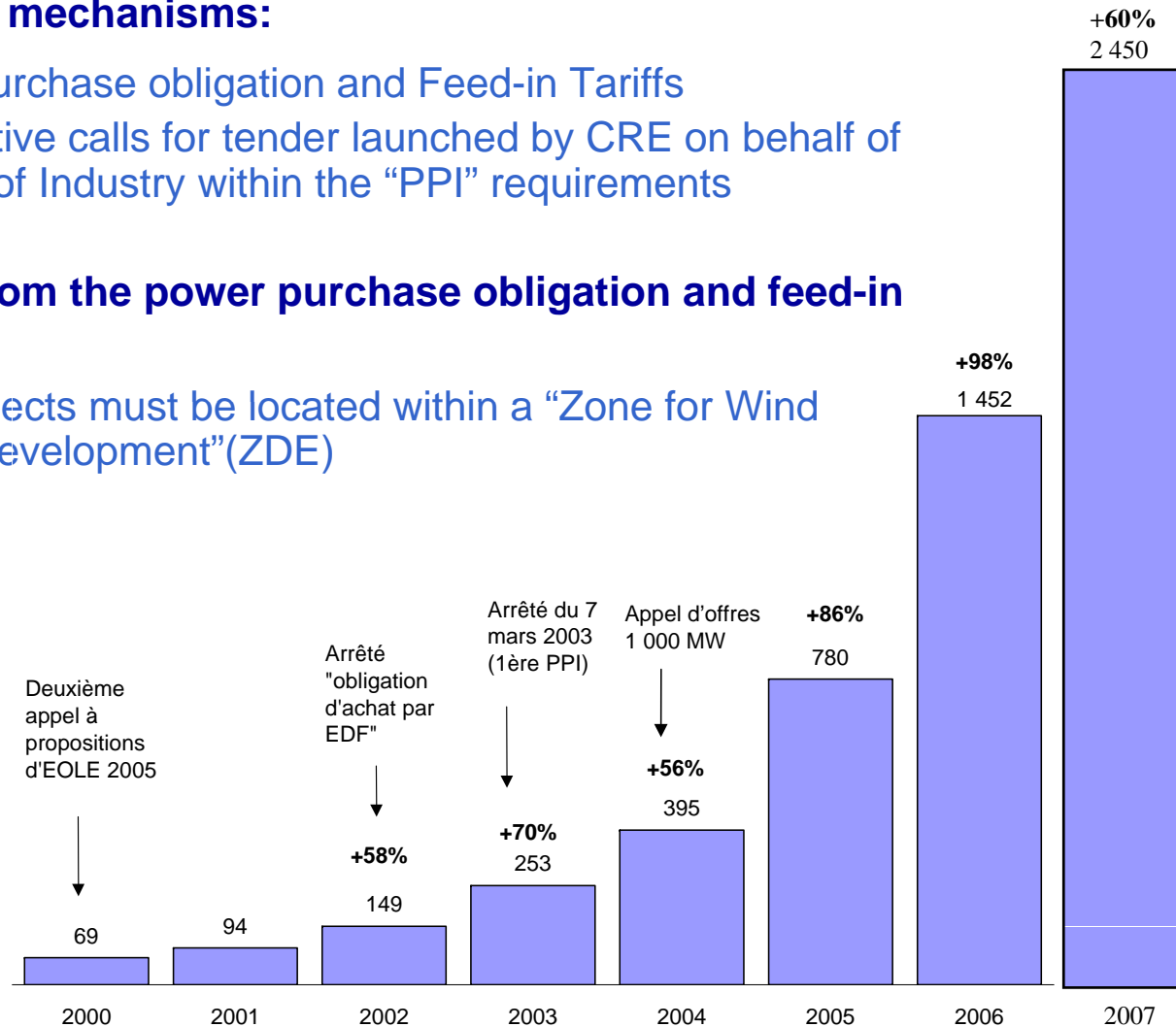
# Wind Power: an increasing market

## Two parallel mechanisms:

- Power purchase obligation and Feed-in Tariffs
- Competitive calls for tender launched by CRE on behalf of Ministry of Industry within the "PPI" requirements

## To benefit from the power purchase obligation and feed-in tariffs:

- New projects must be located within a "Zone for Wind Power Development"(ZDE)



# Hydropower : a stable but a key contribution

☰ A key component of the energy mix to respond to demand variations

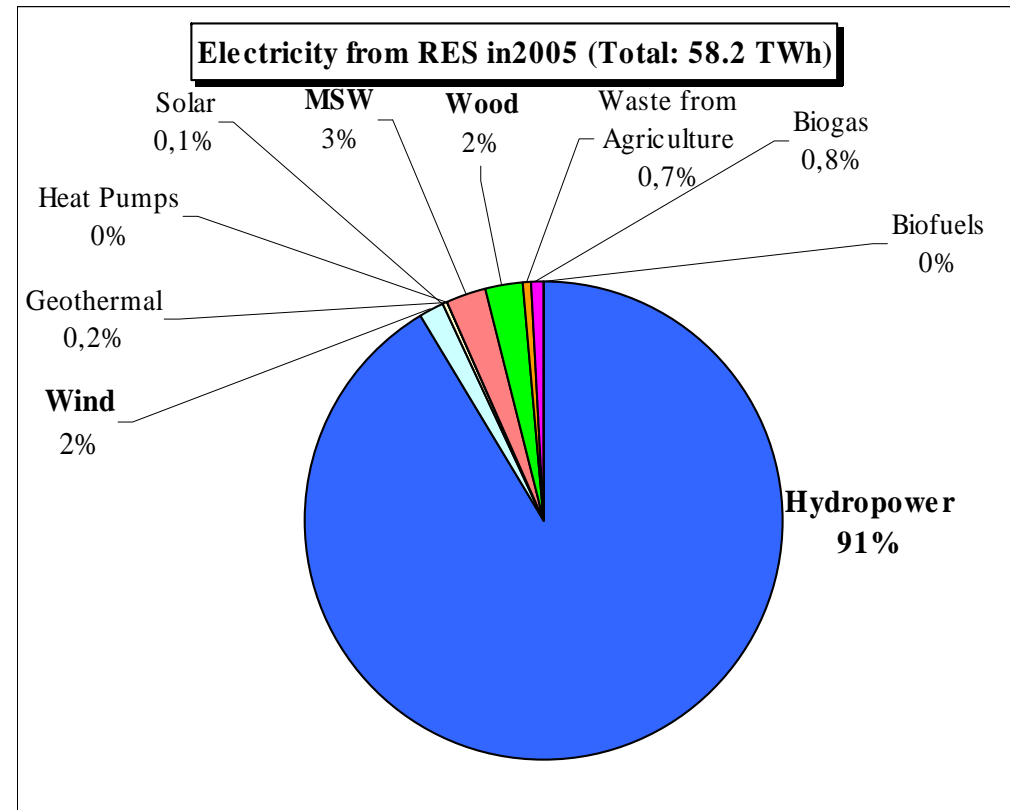
☰ Main development have already been achieved

☰ Ongoing potential studies by river basin

☰ The Pluriannual Programmation of Investment (PPI) for electricity production objectives:

- from 0 to 4 additional TWh in 2010

- from 0 to 7 additional TWh in 2015



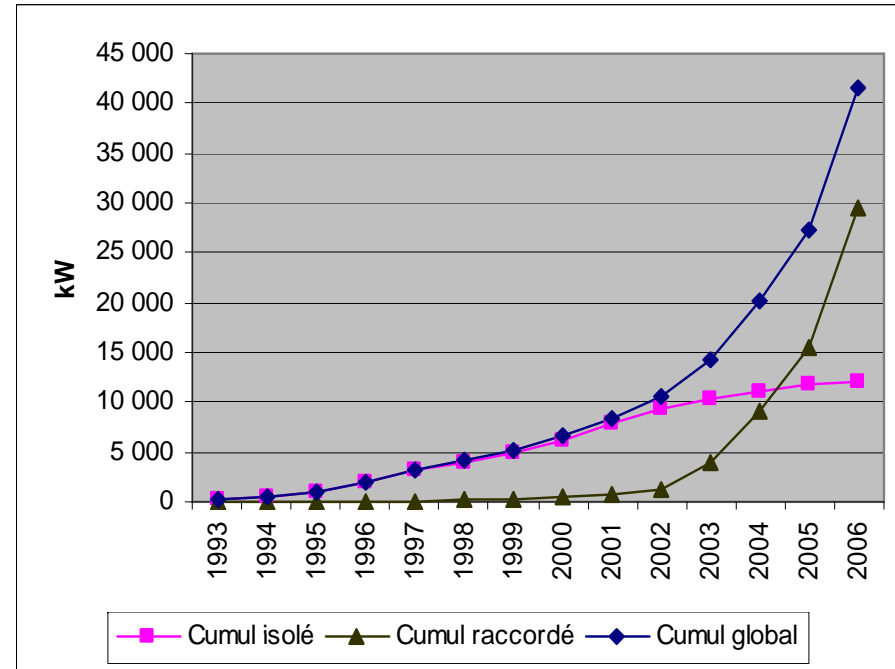
# Photovoltaic: a building integration (BIPV) strategy

## R&D priorities

- Improve cells and modules efficiency
- Solar silicium production cost reduction
- Building integration (Prebat)

## Financing incentives

- Income tax credit and feed-in tariff
- A premium to BIPV



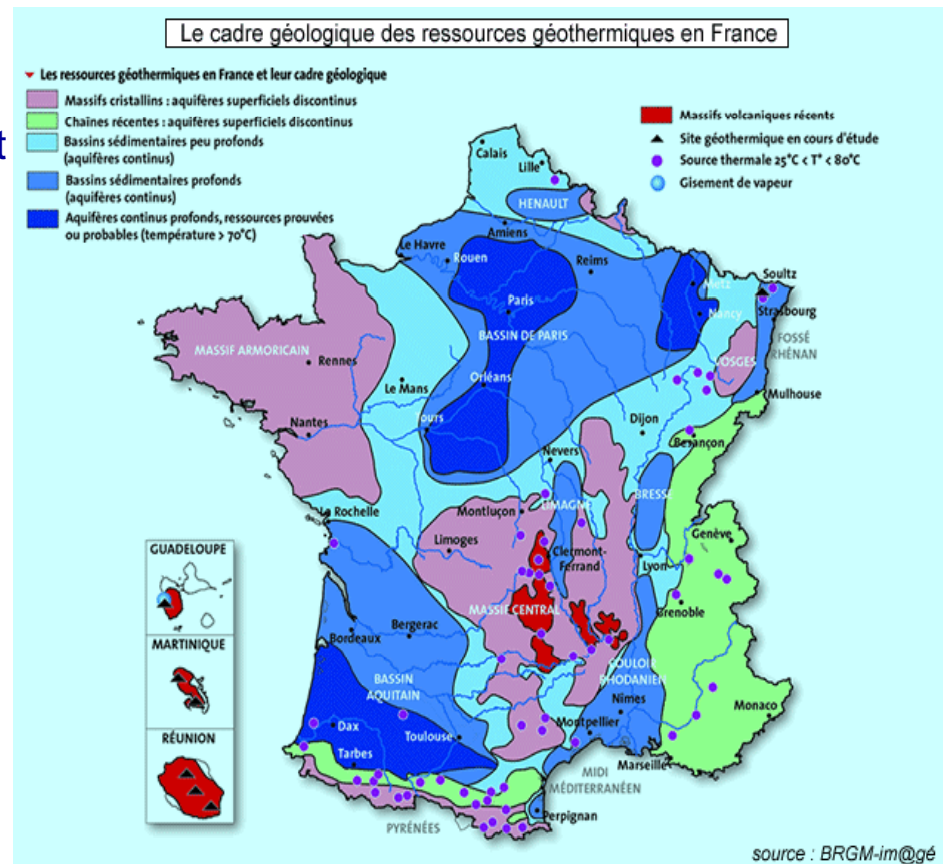
# Geothermal energy heating systems

Paris basin : 31 geothermal installations including 29 district heating producing 130 000 toe/year

A key success factor for the deployment of geothermal energy in France : risk coverage.

Insurance mechanisms for short (geological) and long term (technical) risks coverage

Subsidies schemes reinforced through ADEME in 2007



## Heat pumps: toward a quality approach

<u>Heat pumps sales</u>	2002	2003	2004	2005	Evolution 2005 / 2004
Ground direct exp. / Ground direct cond.	7 700	5 400	6 800	7 800	+ 15%
Ground direct exp. / Water		3 600	4 900	5 400	+ 10%
Brine / Water	4 400	4 700	5 600	12 000	+ 114 %
Water / Water					
Air / Water	4 400	4 700	5 600	12 000	+ 114 %
<small>Source: AFPAC</small> Total	12 100	13 700	17 300	25 200	+ 46 %

☞ Demand is very high but a too fast, uncontrolled development of the market could lead to mistakes and thus to a degradation of the image of heat pumps

☞ Working on a quality approach

- Existing quality charter for drillers and a guarantee fund for water to water heat pump systems (AQUAPAC)

- Work under progress to issue a quality label for machine

- Work under progress to create a quality charter for fitters, defining the quality standards of installations, including training courses, technical documents and sizing tools, paying attention to the case of existing dwellings

# Biomass for heating: developing equipments efficiency

9 Mtoe in 2006

85 % of consumed wood fuel is for single family houses heating (6 millions of households)

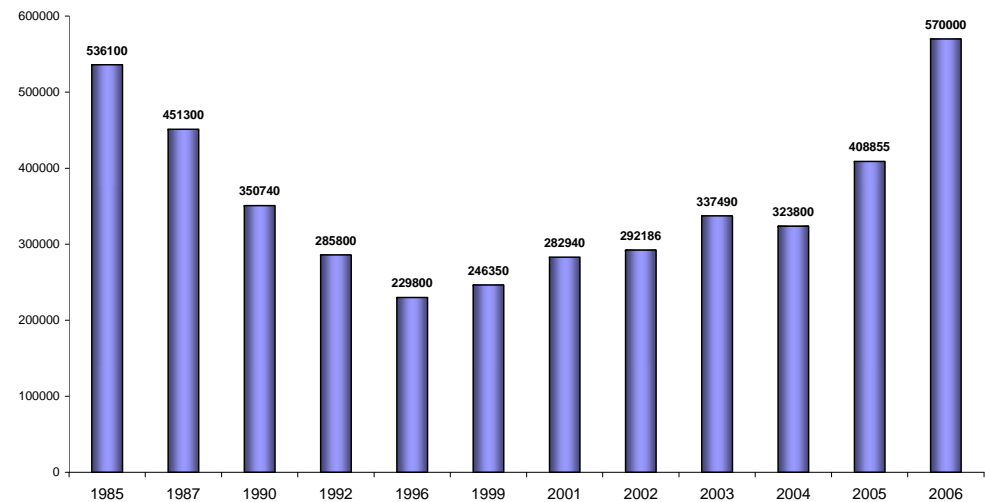
## Promoting the modernization of the devices stock

- Flamme Verte and NF bois de chauffage labels
- Increasing know-how

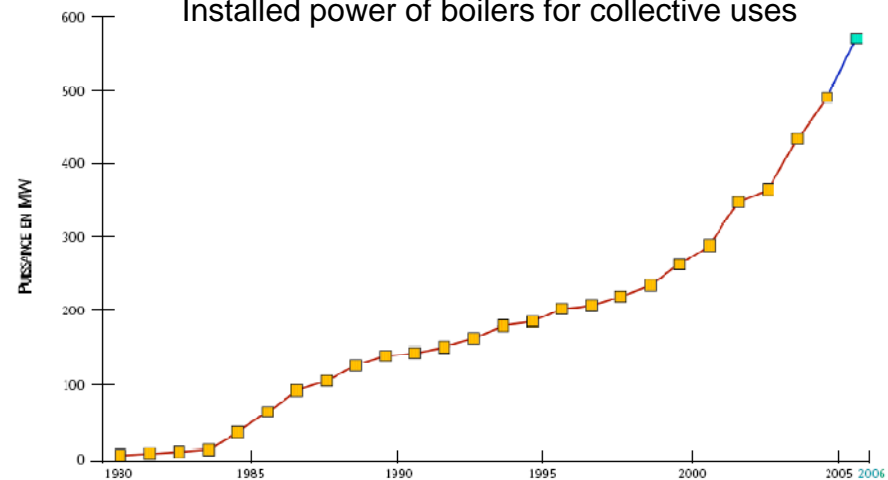


15% of consumed woodfuel is for heating for industry, as well as multifamily and tertiary-sector building

Evolution des ventes annuelles d'appareils de chauffage au bois entre 1985 et 2006 (inserts et foyers fermés, poêles, cheminées, cuisinières)  
ADEME/Alkaest - Carrière consultatin - GMV Conseil



Installed power of boilers for collective uses



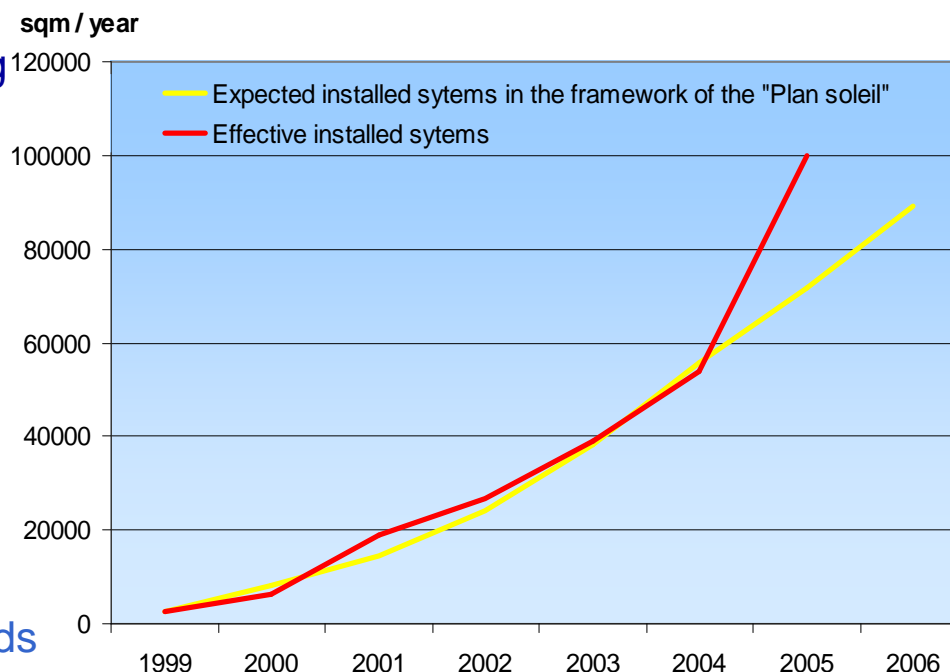
Source ADEME

# Solar thermal : a 35% to 40% increase since 2000

- In 2006, 220 000 m<sup>2</sup> installed in Metropolitan France representing a 80% growth compared to 2005

## Support mechanisms

- Collective installation / Tertiary – ADEME & Local territory Communities in the former “Plan Soleil” now “Plan Face Sud”
- Since 2005 : tax credit instead of subsidies for individual households (50% rate in 2006) and incentives from local communities
- Qualification of installers : 500 end of 2000 and more than 12 000 in 2007
- Manufacturers : 2 in 2000, > 50 in 2007





## ***Not to forget: the need to mobilize all potential public levers***

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### **Financial incentives**

Feed-in tariffs, income tax credit, subsidies for demonstration projects, etc.

### **Awareness raising**

Information campaigns, «espaces info énergie» local information points, best practices promotion, etc.

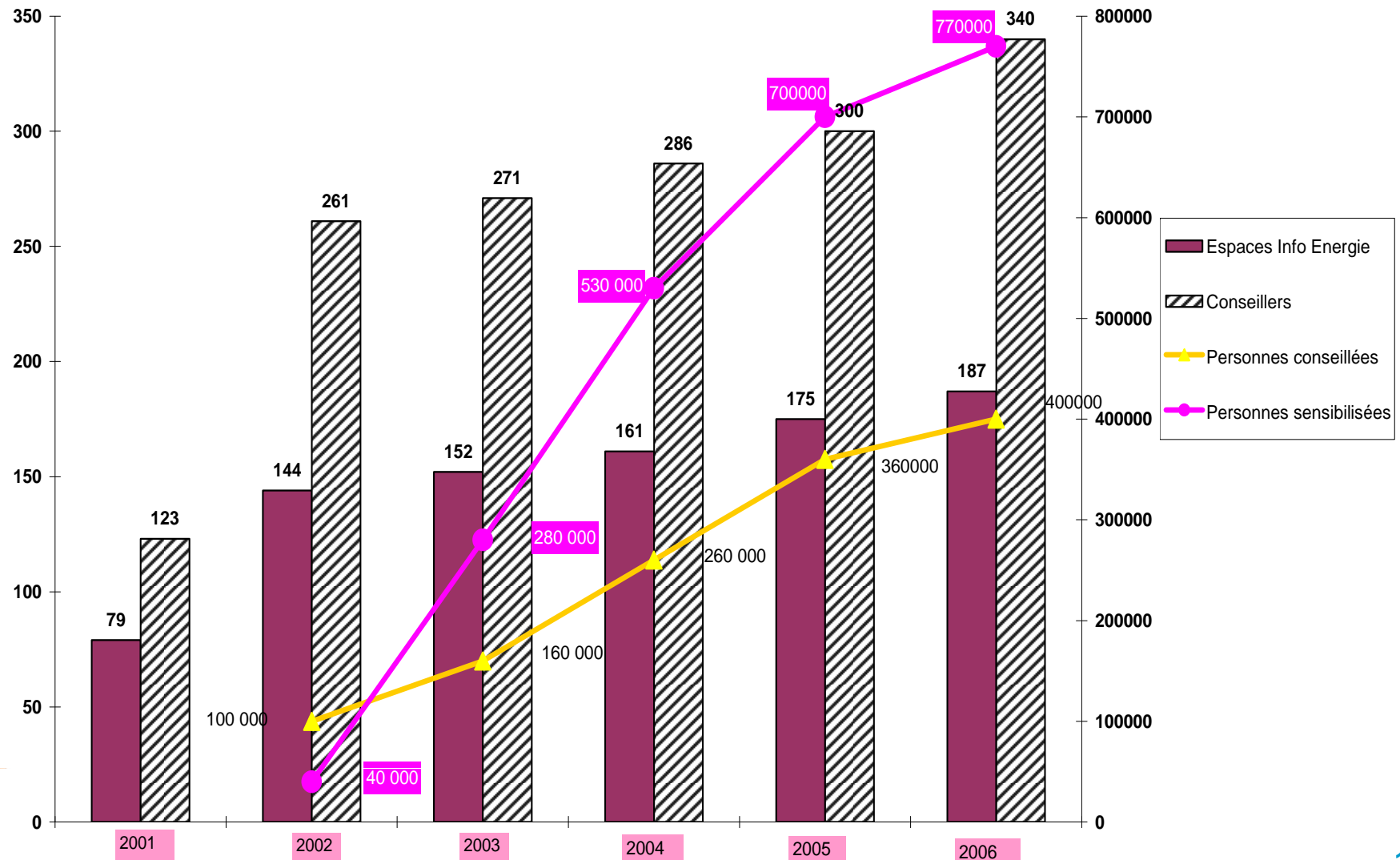
### **Regulations**

Labelling, Thermal regulation for new and existing buildings revised every 5 years, Energy Performance Diagnostics, COS exceeding, etc.

### **Innovative tools** combining constraint and market dynamics

- White certificates
- Co2 emissions quotas

## The «espaces info énergie» local information points experience





## ***R&D : an ambitious and long term strategy***

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### **A need for a technology break**

- Bioenergies, PV, passive housing, ...
- Smart grid, energy storage

### **Existing instruments :**

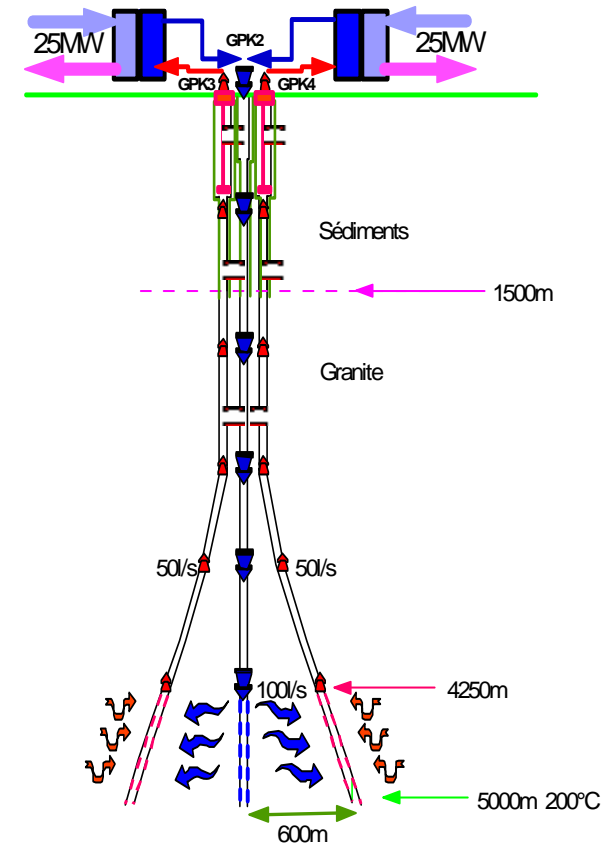
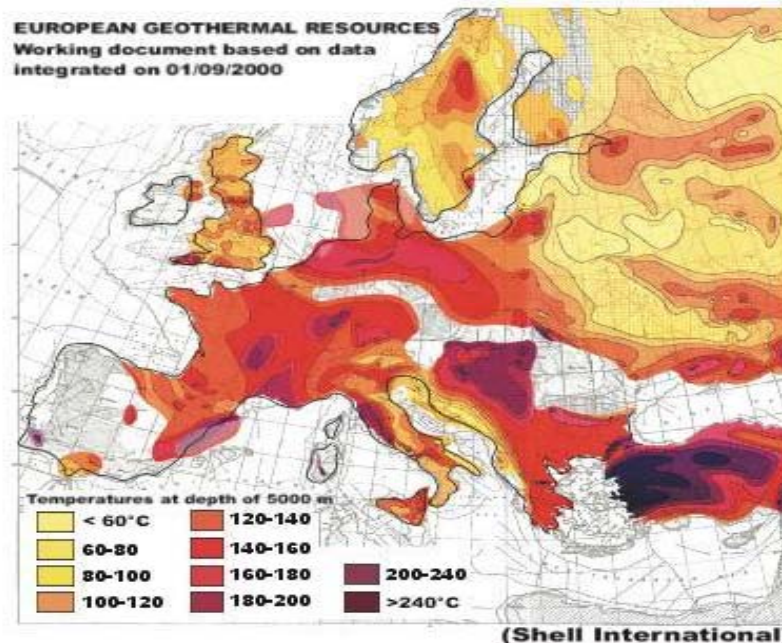
- Competitvity cluster
- Public Research Organisms: CEA, IFP, CNRS, BRGM...
- Public Agencies : ADEME, Oséo, ANR (~100 M€ on New Energies Technologies)

### **Needs of Pilot Plants**

- Marine Currents, Waves and other Ocean Energies
- 2nd generation biofuels plant
- Geothermal plants
- Solar Thermoelectric Plants

# The geothermal energy example: the hot dry rocks Soulz R&D programme

- 📄 Launched in 1987
- 📄 European consortium (EDS, EDF, ENEL, SHELL int., Pfalzwerke) supported by the European Commission, the German and the French Governments (through ADEME support)
- 2001-2004** : Scientific pilot with three 5 000 m drills
- 2004-2008** : Pilot Power Plan (1,5 MW installed)
- 📄 A significant potential



# Conclusions

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- 📄 **The French policy is clearly based on the sustainable development three pillars**
    - environment (renewables, GHG emissions reduction)
    - Social (housings, energy precariousness)
    - Economic (energy supply independence, competitiveness, development of job intensive fields)
  - 📄 **Regulation framework for Grenelle's objectives implementation to be developed in the coming months**
  - 📄 **France's leading role, inviting other countries to set up ambitious policies**
  - 📄 **A major issue for the future France EU Presidency**