

CLIMATE CHANGE

Costs of impacts and lines of adaptation

Highlights of the French Government interministerial working group conclusions

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Climate Change Adaptation: Approach in France

2001 : Creation of ONERC (National Observatory for the impacts of Global warming) :

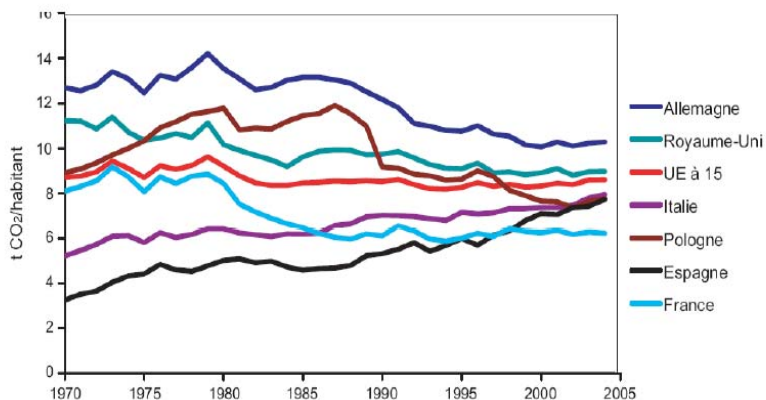
- reporting to the Prime Minister

-to bring public authorities and elected officials the necessary bases for strategic choices and for steering political decisions

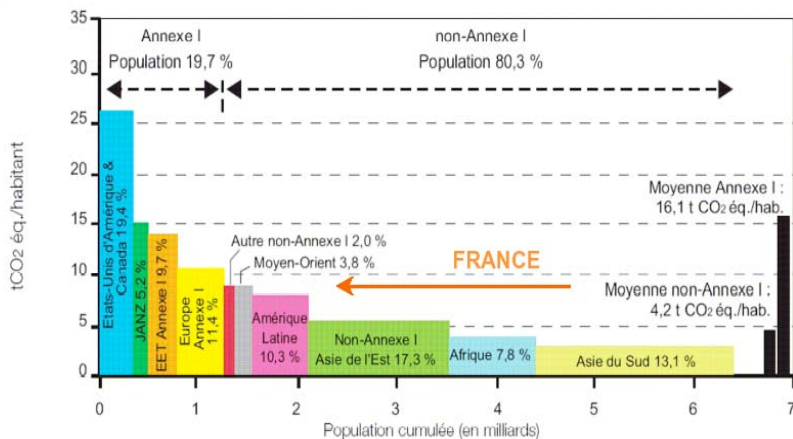
✓ 2004 : coordination and publication of the “ Plan Climat “ for France, updated in 2006 and 2009

✓ 2006 : Development of the National Strategy of Adaptation validated by the government and the Parliament

per capital CO2 power related emissions in the EU



regional distribution of per capita GHG emissions



France's ambition

A. « Factor 4 » : four-fold reduction of GHG emissions by 2050

- Legally binding target
- France's commitment reiterated on 24 september 2007 in New-York

A. Engagement on the only possible path to growth : sustainable, low carbon growth

- Breakthrough programs in the construction, transportation, renewable energies ...
- Operational, time-framed measures (2008, 2010, 2012, 2020, ...)

Showing that sustainable growth is possible

A. Creation of a Ministry for Ecology, Sustainable Development and Spatial Planning

- brings together ecology, transportation, energy, construction, land-use planning
- all departments geared towards sustainable development : transportation alternatives, positive energy buildings, urban ecology
- the right tools for a change

B. « Grenelle de l'environnement » : a conference of stakeholders

- An open and constructive debate between central government, NGOs, local authorities, business and unions
- An « ecological new deal », to show that another kind of growth is possible



- A. GRENELLE refers to social agreements signed after three days of multipartite , intense negociations in May 1968 following long social demonstrations and strikes
- B. Stakeholders : government, employers and employees unions representatives
- C. Results : +25% minimum salary increase and +10% for average salaries. Local elected group of union representatives recognized
- D. Agreements signed at the Ministry of Labor located RUE de GRENELLE in Paris



A democratic process

A. Workshops

- Energy management and fighting climate change (Sir Nicholas Stern et M. Jean Jouzel)
- Protecting biodiversity and natural resources
- Developing a healthy environment
- Adopting sustainable production and consumption behaviour
- Constructing ecologically-responsible democracy : institutions and governance
- Promoting ecologically-responsible development methods that boost competitiveness and create jobs

→ 350 active participants, 50 meetings

A democratic process

A. Public debate

- Meetings in French provinces
- Internet
- Consultation with scientific and institutional bodies
- Consultation with Parliament



- Meetings in 19 cities : more than 15 000 participants
- 14 000 comments online, and 350 000 visits to the web site

A democratic process

A. Round table discussions

- Fighting climate change
- Protecting and managing biodiversity and natural environments
- Protecting health and the environment whilst promoting economic growth
- Developing ecologically-responsible democracy



- Statement of conclusions by the French President
- ... in the presence of Al Gore et the president of the European Commission

Climate Change Adaptation: Approach in France

- ✓ **2007 : set up of an interministerial working group on “impacts of climate change , adaptation and associated costs”**
- ✓ **2009 September : Report to the Prime minister and Parliament and publication of the working group results**

The interministerial Group:

Objectives

The goal was not to get a complete estimation of the global costs , but to obtain the best description possible of the impacts of climate change and to provide some elements of costs for the impacts by sector.

- ✓ **Ten thematic groups**
 - ✦ *Agriculture*
 - ✦ *Forest*
 - ✦ *Water resources*
 - ✦ *Natural hazards and Insurances*
 - ✦ *Energy*
 - ✦ *Health*
 - ✦ *Tourism*
 - ✦ *Transport Infrastructures*
 - ✦ *Biodiversity*
 - ✦ *Territories*

The interministerial Group

✓ **Composition:**

- *directions of the ministries (Ecology, agriculture, health, finances) which drive the thematic groups*
- *Departments of ministries , associated organisations , associated research entities, private sector*
- *Coordination by DGEC (General Directorate for Energy and Climate) and ONERC*

✓ **Working Process**

- ✓ - *Cycle of sectorial meetings and regular plenary sessions for the global coordination*
 - *Methodological support by DGEC and scientists*
 - *Summer 2008 : First report : Common assumptions , quantitative identification of impacts*
 - *Summer 2009 : Second report : quantitative analysis of impacts and costs, identified adaptation lines for each sector*

Methodological Framework

✓ **Choice of common assumptions**

- *Scenario A2 (pessimistic) and B2 (optimistic) of IPCC, Arpège-Météo France climate Model*
- *Horizon 2030, 2050 and 2100*
- *Sea level increase : +1m by 2100*
- *Current French socio economic situation*
- *Spontaneous Adaptation of actors*

✓ **Methodology**

- *Scientific literature review*
- *Statistical Evaluations (eg : relation temperature/electricity consumption*
- *Repetition of 'significant events(eg : valorisation of feedback of the 2003 heat wave*
- *Utilisation of models (eg : variation of agro yields)*
- *Method of cost of replacement (eg : impact of sea level increase)*

✓ **Limits**

- *Uncertainties due to models*
- *Economic development not taken into account (prospective studies to 2100 not available in France)*
- *Non exhaustive and limited due to time constraint*

Some examples of impacts

✓ Energy : decrease of electricity consumption (-3% by 2100)

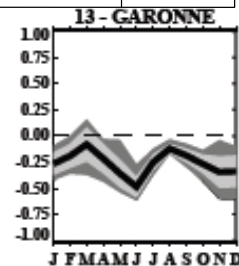
- Decrease of winter consumption >> increase in summer
- Structure of demand varies by season
- High disparity across country

Variation of electricity consumption	Strasbourg 2090	Agen 2090	Lille 2090
Variation versus current situation	-6%	+4%	-3%

✓ Water Resources

Significant modification of water flows and their seasonality

- The most affected are the areas which are already exposed
- More severe and earlier low water levels
- Snow areas and glaciers will regress
- **POTENTIAL DEFICIT of 2 Billion m3 vs 14 Billion m3**



D'après BOE, 2007

Some example of impacts

✓ Forest sector

- Sustained Increase until 2050, risk of negative effects of climate change beyond
- The loss due to the multiplication of extreme events and pathologies may prevent from growth gains

✓ Agricultural sector

- Positive impact on large scale crops (wheat -maize) for a limited global warm which might be cancelled by climate variability. Heat wave like in 2003 may create a **300 Million Euro loss in 2100**
- Very variable impact depending on territories for viticulture

✓ Natural Hazards: coastal flooding

- For the coastal region south west Méditerranée Languedoc Roussillon, **140 000 apartments and 10 000 enterprises would be impacted**
- Several tens B Euros for the 21st century (in the range of **30 to 40 Billion Euros**)

- ✓ **Natural hazards : Clay shrinkage and swelling**
 - Average annual damage multiplied by 3 to 6
 - **Potential cost from 600 to 1 300 millions euro/yr**
- ✓ **Transport Infrastructures**
 - 2 B € of the National A road is below the 1m level
 - Secondary road network potentially very exposed
 - The 2003 canicule didnt generate general disorders impacting the perrnity of the roads and large transport network infrastructures but there is no experience of repititive canicules.
 - Because of non existing historical data the infrastructures of ports, railways and navigation networks have not been studied.
- ✓ **Buildings**
 - Experts recommended that adaption should consider in priority:
 - - episodic floods (slow, rapid and urban swelling)
 - - Wind effects
 - - Urban heat waves and remediation means.

Identified adaptation lines

- ✓ **Reinforcement of knowledge and understanding of impacts, their localisation by region and the measurement and tracking systems)**
- ✓ **Natural hazards related to climate change should be taken into account in all the planning and development projects**
- ✓ **Diversify the crops systems allowing “evasion”,” avoidance “and “tolerance” to be combined**
- ✓ **Development of building and infrastructures robust to Climate Change**
- ✓ **Development of strategies to fall back in case of sea level increase**
- ✓ **Revision of technical references : past trends are not enough for calibration**

Some key messages

- ✓ *The impacts of climate change will probably cost several **Billions millions Euros per year** , and the regions and individuals will not be affected in the same way*
- ✓ *An organised adaptation will allow to reduce costs some times very significantly*
- ✓ *Need to improve knowledge on impacts and adaptation measures*
- ✓ *Need to better inform and sensitize all actors*
- ✓ *Adaptation must focus on reducing inequality versus risks: limit transfer of vulnerability and redistributive effects*
- ✓ *Include socio - economic parameters which can have significant effects beyond climate change (eg: demographic growth on water and buildings)*

Conclusion and recommendations

Future Thematic studies to focus on:

- *Urbanism and air , harbour , navigation and railways transport sectors*
- *Maritime and fishing sectors*
- *Impacts on the activities of services and industry sectors*
- *Education and information*
- *Integration of overseas areas*
- *Impacts of climate change on cultural heritage*

A need to improve knowledge

- *On climate change (rain falls, sea level rise , gravitational hazards...)*
- *On the way to characterize uncertainty*
- *On the way to characterize non goods impacts*
- *On the quantification of costs of impacts and on impact models*
- *On the way to take into account the sectorial interactions*

A need to have territorial data to develop existing work to different scales



- A. GRENELLE 1 framework LAW adopted on July 23 rd 2009 with an quasi unanimous consensus by the 2 chambers: 53 articles covering all the recommendations from the conference stakeholders
- B. GRENELLE 2 operational LAW adopted on May 15th. 2010 will be followed by 140 decrees which will be legal base for implementation of the nation commitments:

Perspectives

- ✓ **National Plan of Adaptation**
 - *Kick off December 2009*
 - *Concertations during year 2010*
 - *The regions will be consulted on national work*
 - *The National Plan will be finalized in 2011 with the identification of pertinent measures at national level*
 - *Peridiocal reviews planned*
- ✓ **Territorial deployment**
 - *Consistant with PCET (Plan Climat Energie Territoriaux) and SRCAE (Schema Régionaux Climat Air Energie)*
 - *Adaptation of methodologies and recommendations identified during the interministerial work program*

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THANK YOU