

Franco – Thai Seminar on  
“The Technological and Infrastructural Challenges of Building a Low-carbon Economy”  
8 – 9 October 2009

## The economic and financial implications of building a low carbon economy: French perspective

Norbert LADOUX



# Salient features of carbon emissions

---

- One ton of carbon emitted in Thailand affects climate the same way than one ton emitted in France (climate change is a global change)
- It takes a long time to reduce CO<sub>2</sub> concentration in the atmosphere consequently,
  - There is an important time lag between efforts and improvement of the environment
  - To make future generations better off, emissions must be cut today
- Carbon is not the only GHG

# Consequences for the environmental policy (worldwide perspective)

---

- If emissions are **not** made costly everywhere in the world,
  - There is a possible delocalization of emissions (carbon leakage)
  - The same world level of emissions could be reached at a lower overall cost (efficiency loss)
- If GHG emissions other than CO2 emissions are **not all** made costly, there exists a more efficient way to mitigate climate change
- Building a low carbon economy will affect income redistribution,
  - Between present and future generations (today costs of mitigation will produce environmental benefits tomorrow)
  - Between different countries (Poor and rich countries, producers and non producers of fossil fuels)
  - Between different categories of households of the same country (“rich” and “poor” for instance)

# Is there carbon leakage?

- **Short run:** delocalization of whole factories is not possible, carbon leakage is limited but possible:
  - OECD/IEA (2008) study on the consequences on aluminium production and trade of the European Trading Scheme (ETS) introduced in 2005 in EU: there is no clear evidence of carbon leakage for this industry)
  - Dupaigne and Portier (Mimeo, Univ. of Toulouse 2009) analyses the evolution of international exchanges of high carbon content products: results show a possible effect of ETS on delocalization of French industries
- **Long run:** Delocalization of whole factories or whole industries is theoretically possible but high carbon prices have been experienced too recently for having yet conclusive studies

# Overall cost of mitigation

(source of data: US-DOE)

- Today China is responsible for 21.5% of world CO<sub>2</sub> emissions, US 20.2%, EU 13.8%, India 5.3%
- Between 1990 and 2006, CO<sub>2</sub> emissions have been multiplied by more than 2.5 in China, less than 1.2 in US, 1.03 in EU, 2.2 in India
- Consider the actual growth rate of GDP for these different countries, imagine that only EU would have a positive carbon price then, calculate the carbon price that would maintain world emissions to their 1990 level in the coming years

# Short run vs long run

---

- **Short run:** Cutting CO<sub>2</sub> emissions is costly from the welfare point of view (very slow improvement of the environment, present generation is worse off)
- **Long run:** Future climate change highly depends on present decisions
- **Consequences:**
  - In poor countries, there are very few incentives to cut emissions
  - In rich countries environmentalists put pressure on the government but public acceptability of environmental policies is often very low

# Positive carbon price, income redistribution and social inequalities

- High carbon prices affect different households differently, they can have sometimes **non-desirable impacts** on the distribution of income and inequalities
- Cremer, Gahavari and Ladoux (*JPubE* 1998, *JEEM* forthcoming 2009) study the case of an energy tax in France:
  - The optimal energy tax must take into account not only the damages resulting from pollution but also the redistributive impact of the tax (in France energy tax favors the rich at the detriment of the poor)
  - The optimal energy tax could be 1/3 of the Pigouvian tax (that takes only damages into account)
- Rocard report (2009, [http://www.developpementDurable.gouv.fr/IMG/pdf/Rapport\\_Rocard\\_cle59dbc3.pdf](http://www.developpementDurable.gouv.fr/IMG/pdf/Rapport_Rocard_cle59dbc3.pdf)) mentions differentiated impacts of energy taxes on households' purchase power (ex: For a given type of household, domestic heating represents 8.5% of the budget if oil is used and 3.5% if gas is used)

- Efficiency requires a positive carbon price everywhere and for everybody, it also requires a positive price for all GHG
- Public acceptability is a major obstacle to the implementation of climate policies
- Redistributive impacts of climate policies could be numerous and significant
- It cannot be ignored that short and long run impacts of climate policies are not the same

# The French climate policy

---

- Since 2005 France participates in the European Trading scheme (EU ETS): a multi-country, multi-sector Greenhouse Gas Emission Trading System, the largest in the world
- At the beginning of 2010: A carbon tax will be implemented for the first time (announcement made by the French President Nicolas Sarkozy in September 2009)
- **Remark:** There are two different instruments but the carbon price must be unique, the implementation of the carbon tax in 2010 will have to take this into account

# The French carbon tax

- A €17 per ton of CO<sub>2</sub> tax will be introduced in January 2010 (approximately the actual carbon price on the EU marketable permit market)
- The total tax levy will be unchanged:
  - Households: a lump sum will be given or deduced from income tax (€60 per adult person living in rural zone, €45 for others + in any case €10 per dependant)
  - Firms: An old government's project to suppress the "*taxe professionnelle*" (a tax that affects investment incentives) could be implemented in 2010 and considered as compensating the firms sufficiently

# Public acceptability of a carbon tax in France

---

- Opinion polls about carbon tax in France tell us that a large majority is against the tax (65% to 75%)
- Main reasons of oppositions are:
  - A new tax added to many others
  - The tax is costly for households (limited substitution possibilities at least in the short run, ex. gasoline)
  - The tax is often much more costly for the “poor” than for the “rich” (the tax is regressive from the redistributive point of view)

# How to increase acceptability of a tax?

---

- Two ideas have been developed in the economic literature:
  - Increasing economic efficiency by appropriately recycling environmental tax revenue (**double dividend**)
  - To design the tax schedule in such a way that a political support can be found (**political sustainability** of environmental taxes)

# Double dividend hypothesis

---

- There is a double dividend when, using the revenue of an environmental tax to cut other existing taxes, allows to increase the efficiency of the economy
- There is a first dividend because environment is improved, there would be a second dividend because increasing efficiency increases social welfare

# What are the taxes that can be cut?

---

- The taxes that distort the most the households' behavior
- The Rocard report mentions several possibilities,
  - Income tax (but low income people do not pay income tax)
  - VAT (not efficient from the equity point of view)
  - Social contributions (not compatible with the actual deficit)
- But there are many other possibilities

# Is there a double dividend?

- The answer of the theoretical literature is generally no
- The answer of the empirical literature is less uniform partly because they use different measures of the second dividend (impact on GDP, on social welfare, on employment,...)
- The Rocard report mentions some studies showing a positive long run impact on GDP growth in France (between 0.2% and 1%) but,
  - It is recognized that GDP is not necessarily the good indicator (this is not necessarily a good proxy of the social welfare)
  - Households' compensation is lump sum (no reduction of a distortive tax), then the second dividend would result from the suppression of the "*taxe professionnelle*", a decision taken independently of the climate policy

- Revenue recycling is used here to find the political support needed to implement environmental taxes (see the paper by Cremer, De Donder and Gahvari, ITPF 2004 for a theoretical approach)
- **Remark:** It is not always possible to find the political support by cutting existing taxes, often it would be necessary to give direct compensations to the most affected households or firms but this is an inefficient way to proceed, refunds must be lump sum (in order to avoid disturbances of the price signal)

# Political support and efficiency: the French tax

---

- The French carbon tax illustrates the efforts to reach acceptability,
  - The total levy for households is unchanged (lump sum transfers)
  - The tax level is lower than the Rocard report's proposal (€32 per/t of CO<sub>2</sub>)
- But also the difficulties to reach acceptability,
  - The refund rule is not perfectly neutral
  - Some exemptions are still possible (ex: the Minister in charge of agriculture has called for a large exemption)

# An other obstacle to efficiency: strong opposition to certain technologies

---

- The introduction of a carbon price cannot be fully efficient if there are restrictions on technological choices made by firms
- The nuclear case is the main example but some opposition to renewable energies are emerging and could increase with increasing use
- The role of nuclear energy in France helps to understand what is the challenge at the world level

# Nuclear: what is the challenge?

- Fossil energies represent 80% of the world primary energy consumption, nuclear 6% only (42% in France)



**Source:** International Energy Agency, World Energy Outlook 2005.

- Now there are few countries having climate policies, these policies will not be efficient enough without the participation of many other countries
- Redistributive impacts of climate policies must be considered carefully because they can generate strong opposition against environmental policy measures
- Public acceptability of policy instruments must be reached without distorting the price signal because such distortions increase the cost of reducing emissions
- Reducing only CO<sub>2</sub> emissions makes the overall cost of mitigating climate change higher
- Restrictions on the use of nuclear energy in many countries increase the cost of mitigating climate change