

Overall indicators of energy efficiency and market analysis

Grenoble, January 2006

Why energy efficiency indicators

- **To monitor** energy efficiency / CO₂ targets set up by governments or international organisations (EU Commission, UNFCCC); targets expressed:

- in volume of savings (GWh, Mtoe, MtCO₂ saved per year for a given year)

- as ratios (e.g. , % of savings, % of renewables in energy consumption, gross electricity consumption)

- As yearly variation (%/year) : target of energy intensity increase , of energy efficiency improvement

Example of official targets: French energy efficiency and climate change strategies (2005)

reduce GHG émissions by **3% yearly** to reach the **factor 4 by 2050** (and Kyoto targets in the middle term)

reduce energy intensity by **2% yearly** in 2015

21% of renewable electricity in gross electricity consumption

50% increase of renewable heat

The Energy Service Directive (ESD)



The content

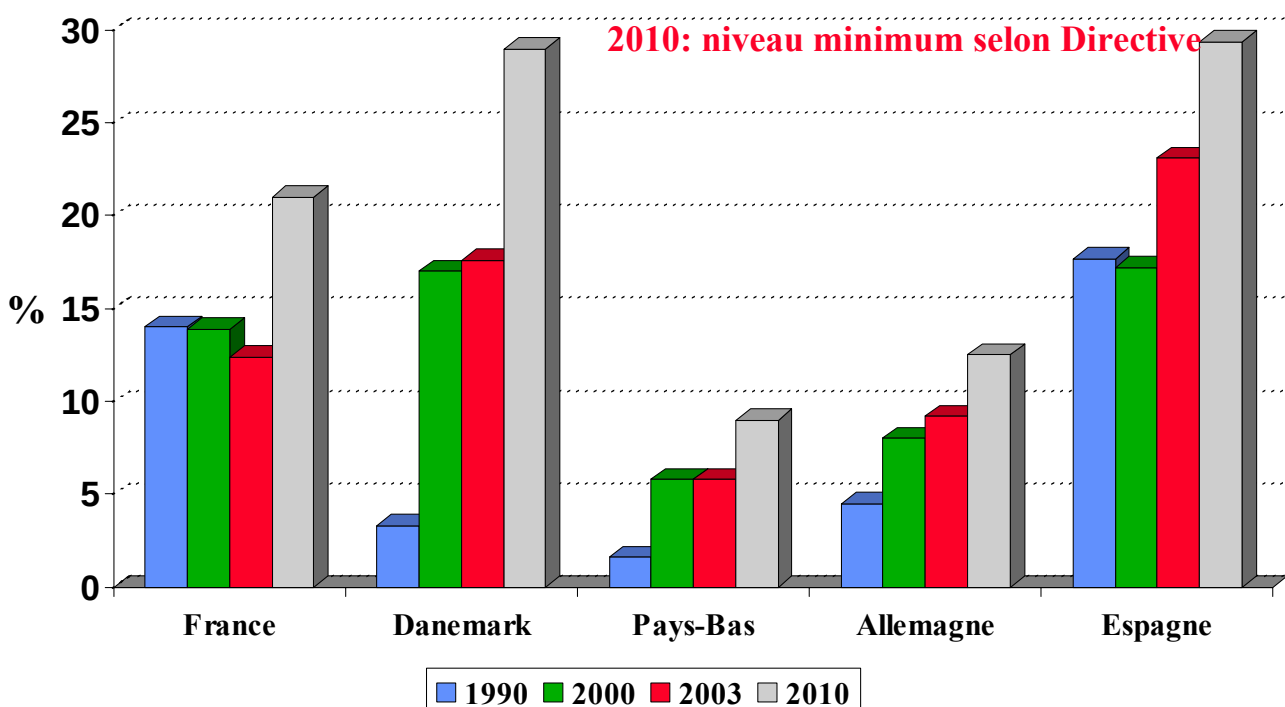
- Objective: to increase energy efficiency and to transform & grow the market for energy services
- **National mandatory energy savings target of 1% each year for a 6 year period**
- Scope: All end-use sectors, except:
 - energy intensive industries and aviation and foreign shipping
- Sub-target on the public sector (1.5%)
- Obligations on distributors/retailers to be involved in promoting energy services to customers

Obligation of reporting with the use of indicators

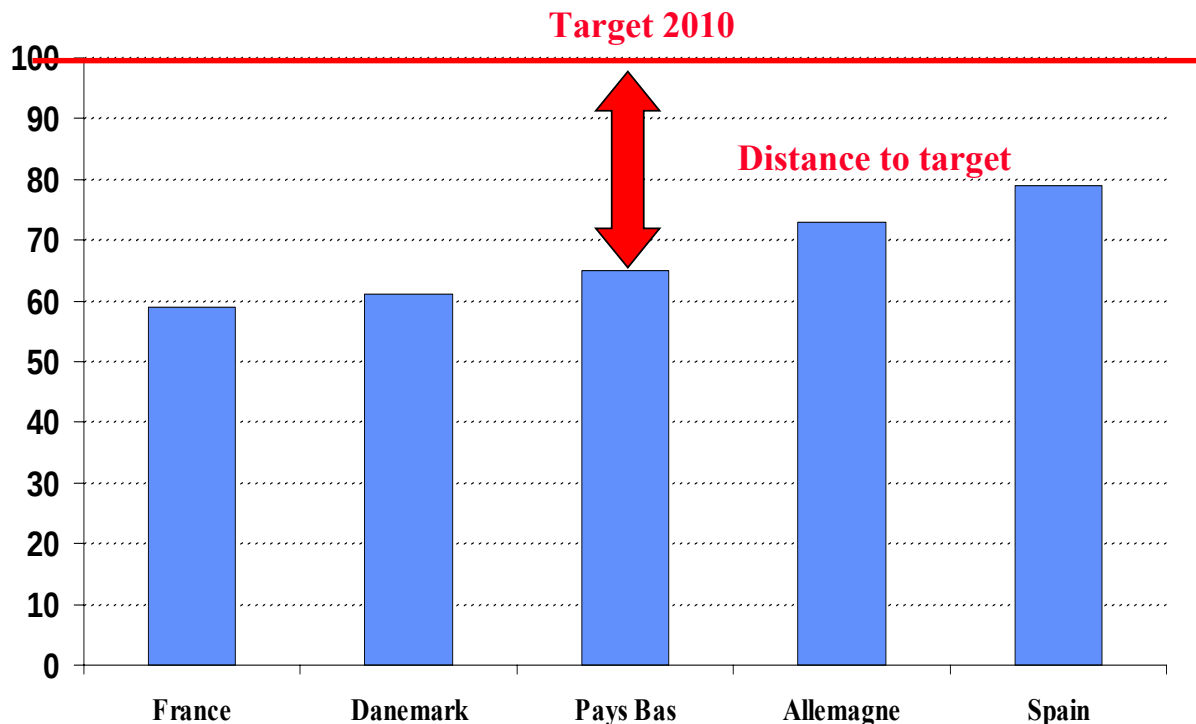
EU Decision 280/2004/CE (article 1)

- To perform the GHGs inventory.
- To carried out a report on demonstrable progress on KP commitment
- **Article 7 : Values of the indicators of the priority list , on a yearly basis (table II- 1; II-2 ; II-3 of annexe II)**

Share of renewables in the electricity production



Share of renewables in the electricity production in 2003: distance to target



Why energy efficiency indicators (cont'd)

- ⌚ To **evaluate** energy/CO₂ policy measures so as to improve the **planning** of future actions
- ⌚ To **compare** the countries progress and performance in energy efficiency and assess potential for reduction (energy efficiency improvement/ CO₂ abatement)
- ⌚ To feed bottom-up demand **forecasting** models/
 - Indicators = input variables of energy demand models
 - Good understanding of past trends improve the forecasts

Different types of energy efficiency indicators depending on their role

- Indicators to monitor trends in energy efficiency and CO2 abatement by country: descriptive and explanatory indicators

Indicators to compare the energy efficiency “performance” level of a country with other countries

Diffusion indicators to measure the diffusion of efficient technologies and practices

Energy efficiency indicators: several types depending on their units

- Economic ratios : energy intensities, carbon intensity
=> monetary indicators
- Technico-economic ratios : unit consumption or emissions => physical indicators
- Energy/CO2 savings (Mtoe, TWh, MtCO2)
- Index of progress

Descriptive indicators

- ↳ Describe overall “energy efficiency trends”
- ↳ Calculated from official statistics , as a direct ratio energy consumption/ macro-economic variable
 - Rather simple to calculate
 - Description of trends in index or annual growth rate
 - Limited interpretation
- ↳ Encompass the most simple intensities or unit consumption/emission

Explanatory indicators

- ↳ Go in more details (eg end-uses, transport modes,sub-sector)
- ↳ Aim at explaining trends with descriptive indicators,
 - Imply some calculations procedures
 - More complex and difficult to understand
 - Often combined with descriptive indicator to provide an interpretation
 - Can be based on estimates or surveys
- ↳ Encompass more complex intensities or unit consumption as well as energy/CO2 savings indicators as well as index of progress

Comparison indicators

Adjusted indicators from quantifiable differences in

- Price difference for all monetary indicators
- Climate
- Industry structure (share of industrial branches in industrial activity)
- Economic structure

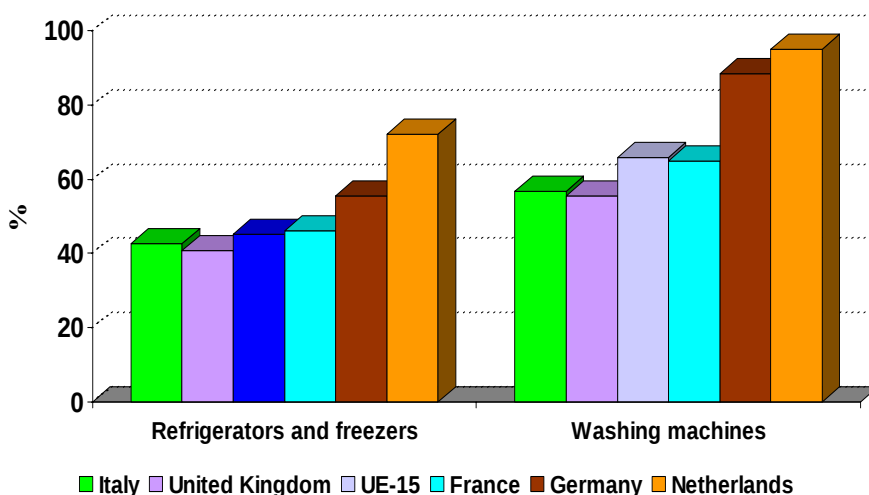
↳ EU average taken as reference

Benchmark/target indicators : calculated for each country with the countries characteristics and the energy performance of “target countries” or benchmark values (eg the EU-15 performance for the NMC's)

↳ Can show the potential of savings

Example of diffusion indicators

Market shares of appliances labelled A (2003)



Indicators used to explain the trends observed in energy efficiency or to estimate savings (CFL, condensing boilers...)

Three types:

•Efficient equipment

•Renewables

•Efficient practices (combined rail road freight traffic)

Why many indicators

- ⌚ In the **ODYSSEE** project : **about 200 indicators** and number is increasing
- ⌚ Each indicator **answer to a specific question** : depending on the question, one or several indicators can be considered
- ⌚ **Energy efficiency has different meaning and frontiers** (economic efficiency versus technical efficiency)
- ⌚ Several indicators often necessary to cope with possible **data gaps** (alternative indicators)
- ⌚ **Interpretation** provided by comparing several indicators

Indicators for cars: : 3 ratios per car, per pkm, per 100km

