



# Joint Research Centre

The European Commission's in-house science service

[www.jrc.ec.europa.eu](http://www.jrc.ec.europa.eu)

*Serving society  
Stimulating innovation  
Supporting legislation*





# **EU Eco-design directive**

## **Product categories addressed and expected impacts**

**Verso gli Stati Generali della Green Economy**

**Assemblea Programmatica  
Sviluppo dell'efficienza e del risparmio energetico  
Milano 12 luglio 2012**





# Ecodesign Directive 2009/125/EC

EU's main legal instrument to improve the environmental performance of **energy-related products**

- Revision in 2014
- Exemption for the automotive sector regulated in the type-approval legislation

**Framework Directive** → requirements on product-by-product basis via:

- **Implementing measures**, or
- **Voluntary agreements**

Implementing measures only for products with:

- Significant environmental aspects
- Significant potential for improvement
- Significant trade and sales volume
- (indicative threshold: 200 000 units per year)

**Based on** Life-cycle approach

## Expected impact of 13 adopted implementing measures prepared in the transitional period (2005-2008)

Adopted implementing measures	Estimated savings (annual savings by 2020) in TWh
Standby and off mode losses of electrical and electronic equipment (household and office)	35 ←
Simple set top boxes	6
Domestic lighting	39 ←←←
Tertiary sector lighting	38 ←←
External power supplies	9
Televisions	28
Electric motors	135 ←←←←
Circulators	23
Domestic refrigeration	4
Domestic dishwashers	2
Domestic washing machines	1.5
Fans (driven by motors with an electric input power between 125W and 500kW)	34 ←
Air conditioners and comfort fans (residential)	11
	<p>~ 365TWh</p> <p>More than 12% of the 2009 final electricity consumption in the EU</p>

- «savings» are savings compared to «no ecodesign/energy labelling» scenario
- details are in the impact assessments

Source: [http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/index\\_en.htm](http://ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/product-groups/index_en.htm)



# Motors, Fans and Pumps

## Electric motor regulation 640/2009

MEPs of el. single speed motors of power range between 0.75 and 375 KW

- IE2 levels from 2011
- IE3 levels from 2015 (or IE2 levels if motor combined with VSD)
- IE3 levels from 2017 for all motors

## Fan regulation 327/2011

for fans driven by motors with electric input power between 125 and 500 kW

## Pumps – Regulation under scrutiny until April 2012

Mandates to ESOs (CEN/Cenelec):

- Motors - TC2 working on M/470
- Drives - M/476
- Fans and pumps – approved by Committee 98/34

**Important: 'extended product approach'**

# Eco-Design: Phase out of incandescent lighting



European Commission

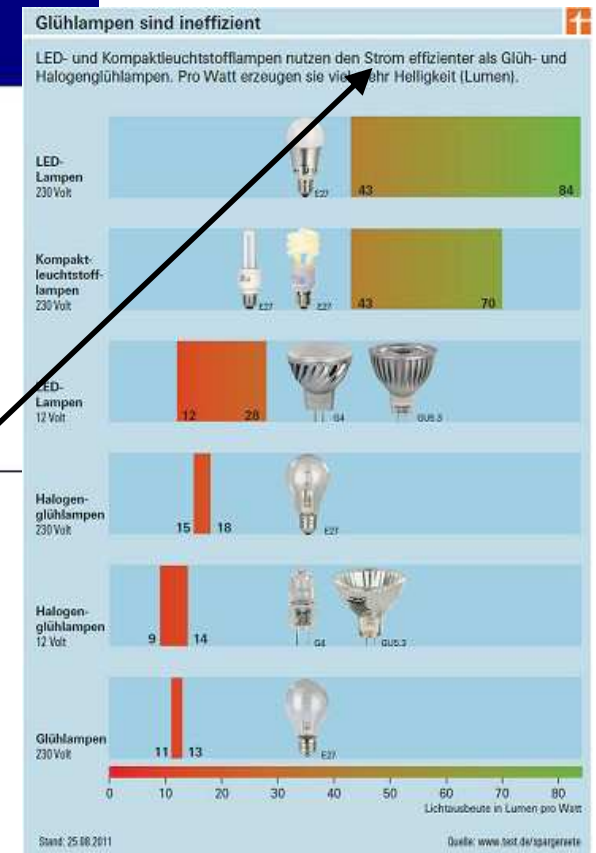
In March 2009 the European Commission adopted the Eco-design Regulation to improve the energy efficiency of household lamps, which envisages the progressive phase-out of incandescent bulbs starting in 2009 and finishing at the end of 2012.

Date	Non-clear lamps			Clear lamps					
	Requirement energy class	Incandescent	All halogen	CFLs	Requirement energy class	Conventional halogen		Halogen C	Halogen B
						≥100 W	≥75 W		
Today	None				None				
Sep-09	A	<b>phased-out</b>			C for ≥100W, E for the rest <sup>1</sup>	<b>phased-out</b>			
Sep-10	A				C for ≥75W				
Sep-11	A				C for ≥60W				
Sep-12	A				C for all				
Sep-13					Second level of functionality requirements				
Review 2014					Review				
Sep-16	A	<b>phased-out</b>			B / C <sup>2</sup>	<b>phased-out</b>			3

**Today the 60 W is phased out !**

JRC supplied data for the phase out.  
Now JRC activity focus on Solid State Lighting (LED), which is very efficient

JRC  
Research  
Centre





European  
Commission

## 10 products considered in priority for implementing measures in the first working plan for the period 2008-2011

Product group	Examples	Estimated (energy) saving potential*
<b>Air-conditioning and ventilation systems</b>	Large air conditioners > 12 kW; Water-cooled air conditioners; Ventilation systems	> 20%
<b>Electric and fossil fuelled Heating equipment</b>	Electric storage heating radiators; Electric heaters for space and soil heating; Gas- and oil-fired dry space heating systems; Heat pumps.	> 20%
<b>Food-preparing equipment</b>	Electric, gas-fired and microwave ovens; Hobs and grills; Coffee machines.	10-30%
<b>Industrial and laboratory furnaces and ovens</b>	Infra-red radiation ovens; Resistance-heated and electrical induction industrial and laboratory furnaces and ovens; Furnace burners.	> 20%
<b>Machine tools</b>	Forming machine tools; Separating machine tools; Physico-chemical process machine tools	max ~ 12% at LLCC
<b>Network, data processing and data storing equipment</b>	IT servers; Network communication equipment; Uninterruptible power supplies; Network stand-by losses for a group of products.	5-30% for products, 80% for systems, networked stand-by and power management
<b>Refrigerating and freezing equipment</b>	Service cabinets; Walk-in cold rooms; Chillers; Ice-makers; Ice-cream and milkshake machines.	10-60%
<b>Sound and imaging equipment</b>	DVD/video players and recorders; Video projectors; Video game consoles; Digital amplifiers and subwoofers for home theatre.	> 20%
<b>Transformers</b>	Distribution transformers; Power transformers; Small transformers	~ 30%
<b>Water-using equipment</b>	Water-cleaning appliances; Irrigation equipment.	Water savings > 40% in industry and agriculture and > 30% in public water supply

Each energy using product group was responsible for more than 1000 PJ/year of primary energy consumed in the EU in 2006 !!

Joint  
Research  
Centre

\* Source: COM(2008) 660





# Outcomes of the study aiming at defining priority energy-related product groups for the second working plan (2012-2014)

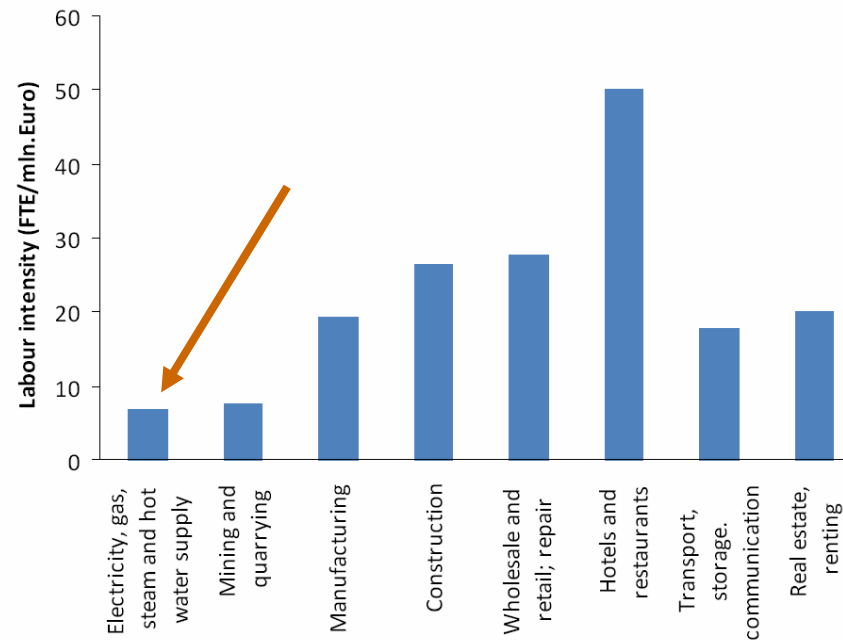
*Saving potential and final ranking (executive summary)*

Product group	Saving potential (PJ/year, 2030)	Energy ranking	Final ranking
Taps and showerheads	885	2	1
Window products for buildings	785	3	2
Positive displacement pumps	270	6	3
Fractional HP motors	258	7	4
Power cables	182	8	5
Servers and data storage equipment	135	11	6
Steam boilers / systems	177	9	7
Heating controls	319	5	8
Lighting controls	610	4	9
Elevators, escalators etc.	57	12	10
Medical equipment	44	14	11
Blowers	43	15	12
Electric kettles	37	17	13
Small fans <125 W	21	21	14
High temperature fans	17	22	15
Point-of-sale / ATM equipment	16	23	16
Clothes ironing products	11	25	17
Non-domestic hot beverage equipment	7	27	18
Traffic lighting	7	28	19
Toilets	5	29	20
Thermal insulation products for buildings	1500	1	21
Detergents	155	10	22

Source: Study for the Amended Eco-design work plan, VHK, December 2011

## Energy Efficiency investments driven by Eco-design directive implementing measures for products considered until 2011 may result in 1.7 million jobs created in 2020 and in significantly reduced energy imports

Economic savings due to eco-design directive implementing measures considered until 2011	€ Billion
Estimated annual gross economic savings by 2020	120
Estimated annual net economic savings (gross savings minus appliance extra costs) by 2020	90



Labour intensities in different sectors in Europe (2007). Source: Eurostat.

- About **20 jobs created** in other sectors **if 7 jobs are destroyed in the power sector** per each million Euro saved on energy consumption
- **Gas imports and coal imports reduced** respectively by 23% and 37% in 2020



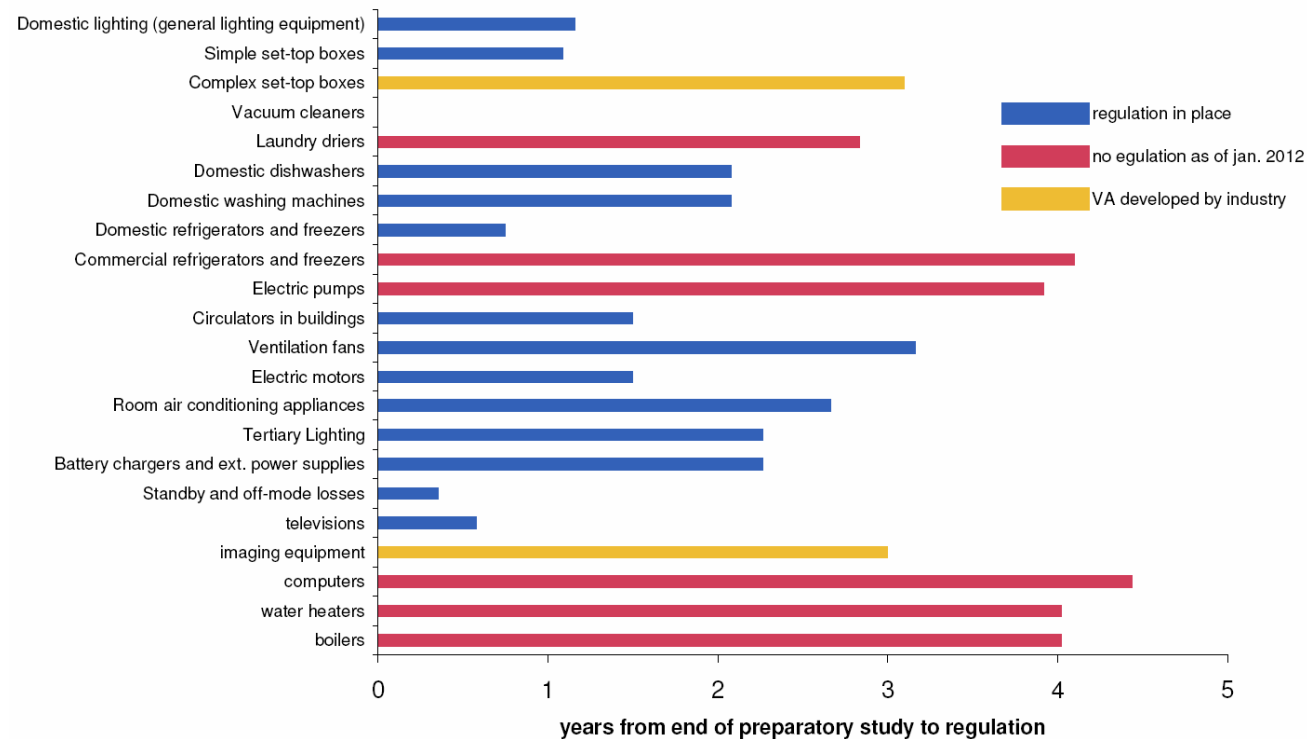
## Rebound effects of energy efficiency policies ...

**The present global financial crisis might determine significant economy-wide rebound effects of energy efficiency policies because of substitution of fuels with other production factors (e.g. capital and labour)**

- The implications of encouraging “win-win” opportunities that reduce capital and labour costs as well as energy costs need to be clearly understood especially under the present special circumstances. Rebound effects might markedly reduce the amount of overall energy savings achieved by energy efficiency policies.
- Policies addressing “general purpose” energy efficient technologies that significantly improve the productivity of energy intensive industries (e.g. electric motors) might generate large economy-wide rebound effects, particularly when these efficient technologies are adopted by producers at an early stage of their development and diffusion\*.
- Economy-wide rebound effects generated by policies focusing on “dedicated” energy efficient technologies are likely to be smaller (e.g. consumer electronic goods)\*.
- Policies combining energy efficiency improvements in final energy uses and a switch from non renewable to renewable energies represent an interesting approach. Rebound effects in the amount of primary energy used might not be necessarily small for these policies.

\*Source: The Rebound Effect: an assessment of the evidence for economy-wide energy savings from improved energy efficiency, UK ERC, October 2007

## Time needed to implement eco-design regulations



**There is the risk that technology progress before measures implementation makes these measures less effective...**

- Up to **2 years** needed for the preparatory studies (PS)
- **1.5 years** needed on average from the PS to a final regulation
- **1 year** between the Regulation becoming final and the first standard coming into effect.
- This implies that for the 12 Regulations in place to date, the time for initiating a study to a standard going into effect was **3.5-4.5 years** on average.



## Conclusions....

Eco-design requirements can **deliver a considerable amount of energy savings**, while **creating new jobs** and **reducing energy imports without deteriorating competitive position of EU appliance manufacturers** (both EU and non-EU manufacturers have to comply with these requirements in the EU market).

The EC and/or Member States must devote sufficient manpower to ensure that measures are put in place in time

Market dynamics and their effects on energy efficiency technology prices must be taken into account

Market monitoring and collection of efficiency and cost data should be improved with the contribution of manufacturers



**Thank you for your attention !**

nicola.labanca@ec.europa.eu

paolo.bertoldi@ec.europa.eu

<http://re.jrc.ec.europa.eu/energyefficiency/>