



# **ECO design directive, what impact on the gas appliance market?**

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DGC



- ECO design background and philosophy
- ECO design EU implementation plans
- ECO boiler model
- ECO boiler model evaluation
- Conclusion: What now?

**EU Objectives → ENERGY SAVING!**

**Reducing consumption of all appliances using energy**

**Method:**

**A → Removing low energy efficiency appliances from the market**

**B → Direct product competition: Letting the end user choosing his fuel and technology**

## PRODUCTS COVERED

Personal computers (desktops and laptops) & computer monitors / Imaging equipment (copiers, faxes, printers, scanners, multifunctional devices) / Televisions / Battery chargers and external power supplies / Lighting / Aircond and ventilation (residential) / Electric motors (1- 150kW), water pumps, circulators in buildings, ventilation fans (non-residential) / Commercial refrigeration (display cabinets and vending machines) / Domestic refrigeration / Domestic dishwashers and washing machines / Solid fuel small combustion installation / Laundry Dryers Vacuum cleaners / Central heating products using hot air to distribute heat / Domestic and commercial ovens (electric, gas, microwave) / Domestic and commercial hobs and grills / Professional washing machines, dryers and dishwashers / Non-tertiary coffee machines (LOT xx...)

and .....

### **LOT 1 & LOT2**

Boilers and combi-boilers (gas/oil/electric)/ Water heaters

# Energy



Road transport, inner circle: cars ca. 60%  
 Outside EuP-directive scope

In EuP-scope



25 % of EU energy balance!



Water Heaters (incl. boiler water heating)

**Heating highest energy use!**



Other EuP (dotted= scope future studies)

Impact corresponds to circle surface [PJ]

# ECO DESIGN MAY REVOLUTIONATE THE MARKET !!!!

Gas  
boilers



mCHP



Fuel oil boilers



Solar energy

Electrical boilers



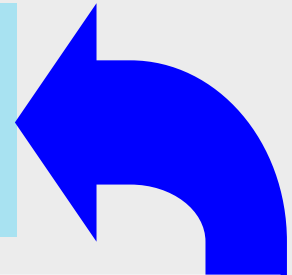
El. Heat pumps

*Different technologies and fuels for the first time directly compared under a EU labelling scheme*

*How many gas boilers users will chose another appliance?*

## IN PRACTISE, WHAT IS ECO DESIGN LOT1?

- 1 Minimum requirements for appliances efficiency and NOx emissions.
- 2 Labeling system to inform the end user.



### Objectives:

**A → Removing low energy efficiency appliances from the market**

**B → Direct product competition: Letting the end user choosing his fuel and technology**



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# ECO design EU implementation plans (*Seen from EU perspective*)

## Planning Ecodesign & Labelling

25 03 2010



# ECO design EU implementation plans

- 
- 2009 June
- **Consultation forum** (stakeholders + ms)
  - Small expert group (to look at the model)  
(DGC representing marcogaz)
- 2010 April
- 2010 October?
- **The model is finalized** (in principle...)
  - Member states are consulted
- 2011 April
- Publication in the OJ
- 2012
- EU implementation and not National / One year transition period**

# ECO design EU implementation plans (2)

2010 April

The model is finalized (in principle...)

## EU will work on the detail of the implementation

- Who is responsible for the labeling (manufacturer, installer?) etc
- How in practise it will be organized
- Specific points

EU consultation with individual MS and possibly with stakeholders.

MS are in principle the ones to decide for the future of ECO design → **it is still possible to be involved via MS (eg. ENS)**

2011 April

2012

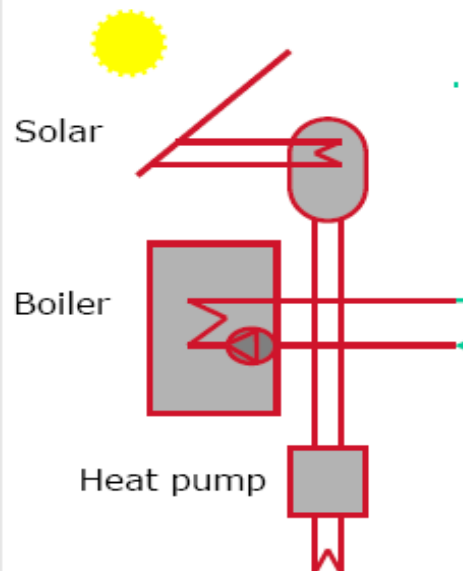


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## System approach

Definition: Your Product, your choice... [2]



For EU CH boilers = appliances heating water →

- CH boiler
- Heat pumps
- Solar heating
- mCHP (to be confirmed)

+ any combination of such appliances

## EU INTENTIONS / EXPECTED RESULTS (EU):

- 1 Labelling system plan
- 2 Minimum efficiency requirements

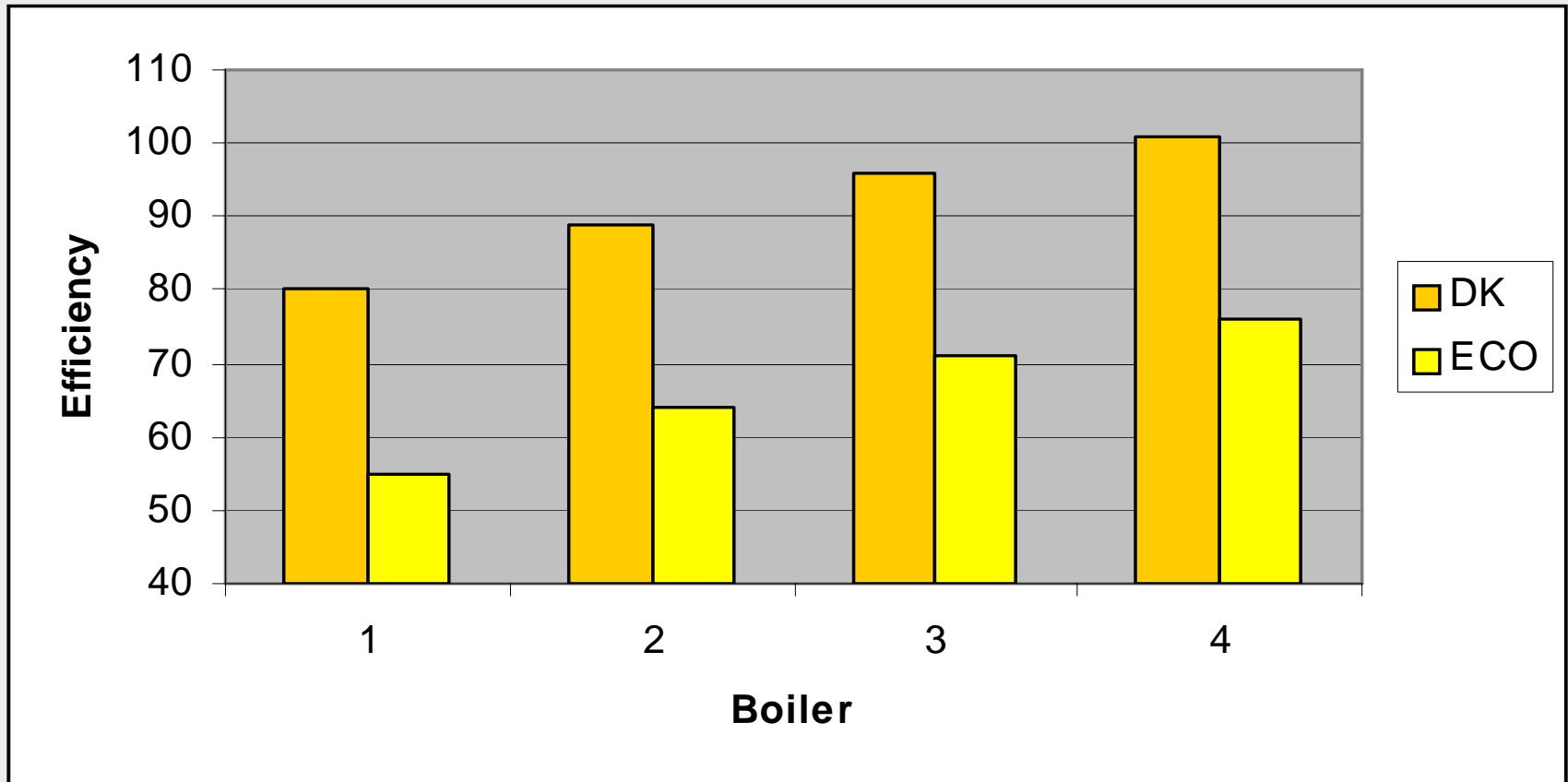
Class	Limit		
A+++	>120%	Vertical El. GSHP	Best Gas Abs. HP
A++	>104%	Gas-fired Abs. HP	Hor. El. GSHP
A+	>88%	Best Condens. + Solar	Vent. Air HP
A	>80%	Best Condens.	Outside Air HP
B	>72%	Avg. Condens.	Outside Air HP
C	>64%	Best LT	Low Condens.
D	>56%	Avg. LT	Best atmo. + Solar
E	>48%	Low-end LT	Best atmo.
F	>40%	Avg. resistance	Electric res. + Solar
G	<40%	Low-end atmospheric	Electric resistance

**Minimum efficiency 2013**

**Minimum efficiency 2009**

**Specific efficiency** → ECO boiler model





- The results are given on **PCS and not PCI** so this introduces a difference of 10% compared to the actual usage.



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## Model evaluation, a costly and difficult task...

VHK (EU consultant)

Model v01a  
Model v01b  
Model v01c  
Model v01d  
Model v02  
Model v03  
Model v03b  
Model v03b2  
Model v04a  
Model v04b

Bugs  
Bugs  
Bugs  
Bugs  
Bugs

### Final version?

Comments until 31 May 2010

→ probably another version will be prepared.....

# Excel sheet (1)

**GENERAL INPUTS (conditions)**

Fit for purpose

Reduced setback (=Y) or full sb (=N)

Radiator (with setb.)   
 Floorheat (24h)

**INPUTS HEAT GENERATORS**

solar        
 heat pump

**fossil**

<b>FOS</b>	Y
FOSOUT	N
AFM air fuel mixer	4 next generation
Tminret (in oC)	30
fosfrac back-up of HP	0,2
modulating ?	Y

**micro-chp**

<b>CHP</b>	N
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**electric**

**Test**

	Pfos	Tfos	eta
	kW	oC	%
eta4	20,0	70	88,0%
eta3	6,0	70	87,0%
eta2	21,3	38	94,0%
eta1	6,5	35	97,0%
eta0	3,3	28	90,0%

Pstby (kW)

Pign (kW)

fossb (W electric)

# Excel sheet (2)

**ECOBOILER DATA REPORT** Brand: \_\_\_\_\_

<u>OUTPUTS</u>	<u>Pmax</u>	<u>kW</u>	<u>efficiency %</u>	<u>Average</u>	<u>Warmer</u>
Average		20,0	Rad full setback	82%	81%
Warmer		20,0	Floorheat (24/24h)	81%	79%
Colder		20,0			

**GENERAL INPUTS (conditions)** *Fit for purpose*

Reduced setback (=Y) or full sb (=N)  *Reduced?*

Radator (with setb.)

Floorheat (24h)

**INPUTS HEAT GENERATORS**

*general inputs*

control	9 -mod.ctrl. +satellites
pump	1. vsd&pm
pump timer	<5 min
buffer	N
open protocol	Y

**eff. effect**

@50%	@25%
-2%	-7%

**setback saving**

Tcontrol	pump	est. % saved
5,0%	1,5%	6%

*average climate only*

## GAS INDUSTRY CONCERN

- **1 Minimum requirements** for appliances efficiency and NOx emissions.

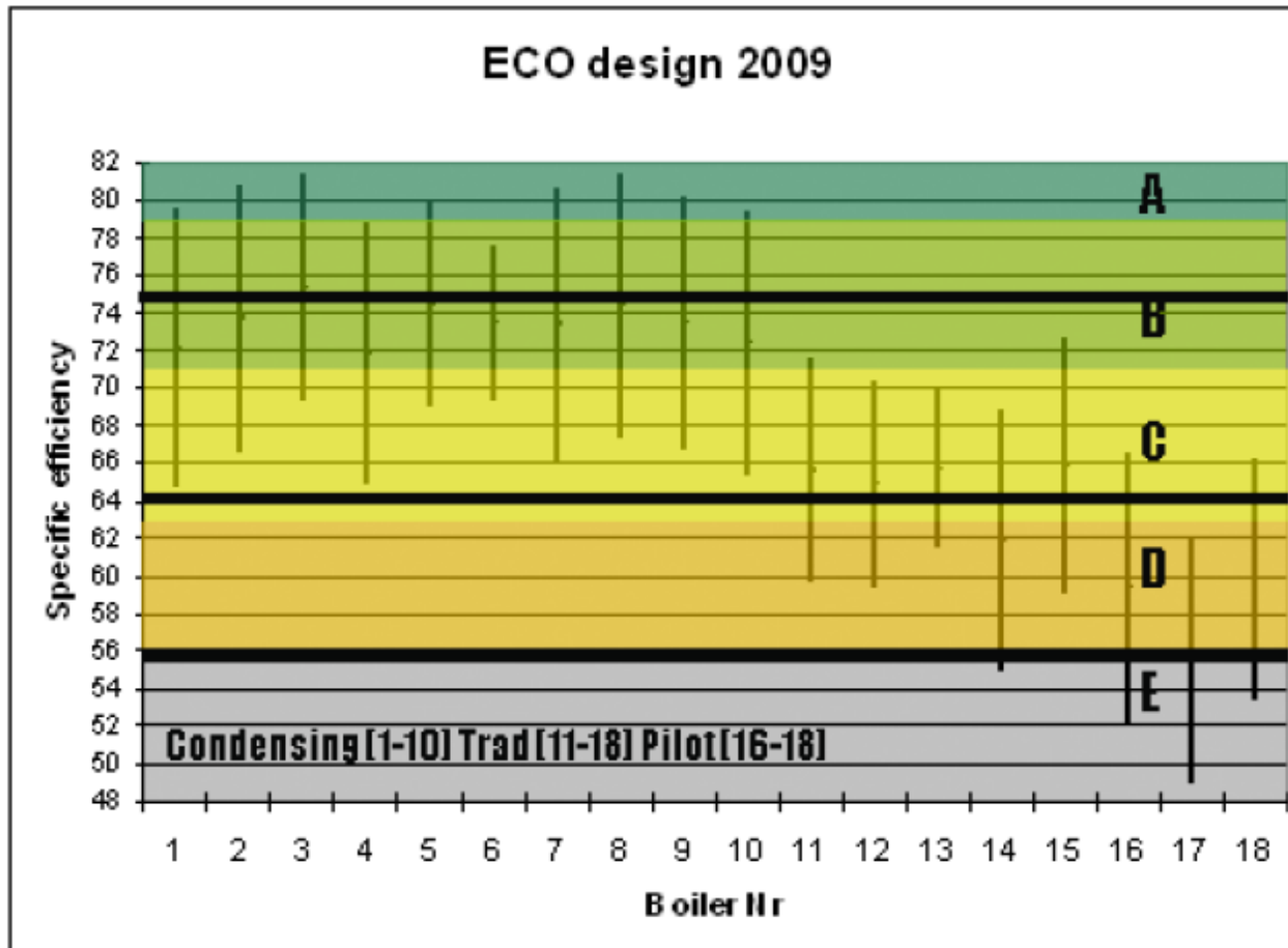
How are present gas technologies performing compared to the given limits? (what technologies will be banned from the market?)

- **2 Labeling system** to inform the end user.

→ How are present gas technologies performing compared to our competitors? (are we in a fair competition with those?)



# Overall results on 18 boilers



## ECO BOILER model 2010 (quick evaluation)

- Results in line with 2009 evaluation ??
- **Non condensing boilers banned from the market in 2013/2015?**
- Exception for boilers lower than 10 kW
- **"A" level can be achieved with best condensing technology**
- **"A+, A++, A+++" reserved to new technology & renewable**
- **mCHP + GHP are the best products to compete with EHP**
- NOx limit can be a barrier to GHP

## GAS INDUSTRY CONCERN: results

- **2 Labeling system** to inform the end user.
  - How are present gas technologies performing compared to our competitors? (are we in a fair competition with those?)
  - WE HAVE SOME CONCERN HERE

## Are efficiencies value of EHP correct?

- Model results are **VERY depending on parameters** that are not very well documented (brine temperature, radiators over-sizing factor, etc) and **depending on installation & climate**.
- EHP input parameters are 16, manufacturers will be allowed to interpolate and extrapolate from 4 or so measurements to determine the parameters not measured. Will they chose the points to be measured so to get the best results?
- **Third part certification** seems to be abandoned → manufacturers will make the measurement for their appliance if they want
- **Market surveillance** is left to the member states.....
- EI efficiency tolerances (10%??)

<u>efficiency %</u>	Average
Rad full setback	70%
Floorheat (24/24h)	135%

## Questions:

1 Are value given by the model correct?

2 Base case for labeling: radiator?  
Floor heating?

Knowing this product is mostly sold in replacement of CH boilers (so radiator system mainly) a label based on floor heating would bring an unfair advantage to this technology and this will mislead the end user.

## What to do now? (at EU level)

- 1 Assessing the final model → GERG
- 2 Following the implementing measure and work actively for getting our points taken into account → MARCOGAZ

## What to do now? (Assessing the final model → GERG)

- 1 Assessing the final model for gas boilers as soon as we know it is final
  - 2 Assessing the other technologies (mCHP, HP, solar + gas) and check if we are on a fair competition basis. (Even if the model is finalized we believe there is room for correcting from obvious mistakes that may remain)
- A proposal is sent to GERG to get funds for a DGC/GdFsuez Collaboration work

## What to do now? (Following the implementing measure - MARCOGAZ)

- 1 Prepare a **position paper** that includes our points such as:
  - Arguing for **higher limits for the NOx** emissions of eg. Gas heat pumps
  - Arguing for the **3th party certification** and market surveillance
  - Following closely the proposal for the **implementation** (label given by whom? On which basis? making sure it is fair and feasible)
  - **Primary energy factor** -> still in low heating value

## 2 Follow up work

- Help the EU to **prepare a mandate** to CEN including (Modelling, NOx, MCHP)
- Still un-clarities **about interactions with EPBD** (Energy Performances of Buildings)

## What do now? / long term

### Standards

The model will have to be implemented in a CEN standard (mandate)

- Testing method for CH boiler: Ok (maybe)
- Testing method for mCHP & GHP: to be developed

### Test & calculations

- Possible validation of model to be done
- mCHP, GHP laboratory testing capacity building (reproducibility issue)
- NO<sub>x</sub> measurement (CR1404) problem for low level



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## Conclusion (1)

### Gas boilers:

- We have boiler efficiencies in phase with the value we have given so far except for the influence of over-sizing
- We can achieve A with best condensing
  
- Still we will need to explain to the gas customer why efficiency is now 25% lower.....
- Still need to check the latest version of the model (work with TI; support of ENS)

## Conclusion (2)

### El. Heat pumps →

The heat pump industry has been very aggressively working for models (too?) favourable to their products.

- The absence of third part certification, market surveillance and high flexibility in the test method, may lead to market distortions and unfair competition with gas boilers and other products.
- Implementation details of labelling ? (floor heating / radiators)
- **It is therefore very important that Marcogaz follows and participates in the implementing measures discussions (and shares opinion with the other interested stakeholders (EHI, COGEN but also the NGO's))**

## Conclusion (3)

### Other products →

Because we had limited resources we made the choice to concentrate on gas boilers and collaborate with other stakeholders.

→ mCHP → with but COGEN

→ GHP → with ROBUR

+ Good relation with EHI during stakeholders meetings with EU

## Overall impact of ECO design directive on the market: How is the heating market in 5 years from now?

- It is impossible to know at this stage what will be the impact of the ECO design on the market. **REVOLUTION OR FLOP?**
- However the ECOdesign can influence very much the market and the trend we see in the development of **increasing shares for the EHP**
- We shall not only fight for fair models for a fair competition we shall also **make sure to have new competitive gas products on the market.**
- The efficiency of the appliance is important, the CO<sub>2</sub> impact can be as important or more and this is not taken into account in the ECOdesign.

## Lack of new gas technologies on the market...

GHP and mCHP are technologies able to compete with EHP, but those technologies are not mature. We urgently need to:

- 1) Find solutions to get gas/solar heating systems at competitive prices
- 2) Accelerate the integration of the new gas technologies on the market

## CO2 emissions; a way to counterbalance ECO design effects

- In the competition of Gas appliances with Electrical appliances, the CO2 emissions may bring a positive advantage to the gas appliances, we need to check ASAP if this the case and under which conditions (for which appliances and in which countries).
- See the IGU project “Efficiency indicators”

# WILL LOT1 end in GARBAGE CAN?

- OpenTherm Proposal for T-controls in EUP L
- PA\_29\_EuP lot 1 - EHI comments further to
- Personal view of Jean on status.JPG
- ReportECOboilermodelshort\_V02.pdf
- Robur Document Jan.pdf



**NO!: ECO DESIGN WILL BE IMPLEMENTED.....**

**→ STRONG POLITICAL PRESSURE**

- Lets continue to be involved, try to be proactive and use the opportunities that are given by the ECO design.
- ECO design will accelerate the need we have of new gas technologies: CH boilers market will decline. ECO design can help us to get those new technologies quicker on the market.