Challenges and implications with a label for boilers encompassing cross-cutting technologies

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Energy markets in transformation

Governing forces

- Energy price development
- Policies
- Technological development



Challenges

Security of supply

- Generation of electricity with low carbon footprint
- Renewable electricity Wind- and hydro power, PV
- Nuclear and Carbon capture and storage (CCS)



Challenges

Road transport

- Plug-in hybrid cars
- Bio fuels





20-20-20 by 2020

- Energy from renewable energy sources
  20 % renewable energy in EU as a whole

- Reduction of emissions
  20 % reduction of green house gas emissions

- Energy efficiency
  20 % improved efficiency



Political tools available and under development

- Addressing the use of renewable energy
  - RES-Directive

- Addressing energy efficiency
  - energy performance of buildings Directive
  - energy labelling Directive
  - ECO-Design Directive
  - ECO-labelling Directive

- Addressing GHG-emissions
  - Kyoto
  - Emissions trading system



Overall aim

- Impose more energy efficient products
- Extend energy labelling scheme
- Improve customer information
- **Ban inefficient products from the European market**



Energy using products Directive

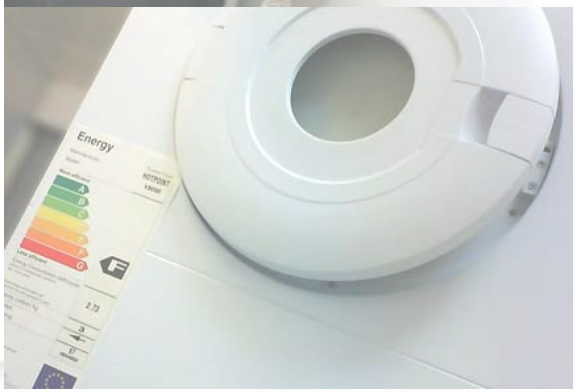
Framework Directive for setting of energy efficiency criteria requirements

Examples of prioritised product groups

Boilers
Water heaters
Computers
Imaging equipment
Televisions
Stand-by
Battery charges
Residential room conditioners
Domestic freezers
Dishwashers/washing machines
Laundry dryers
Vacuum cleaners







Energy related products Directive

- Lot 1 boilers
  Oil-, gas- and electric boilers, heat pumps, solar thermal and combinations thereof
- Lot 2 Water heaters
- Lot 10
  Room air-conditioners (RAC), Local air-conditioners (LAC), Comfort fans

http://ec.europa.eu/energy/efficiency/ecodesign/eco_design_en.htm







Implications of a cross technology label

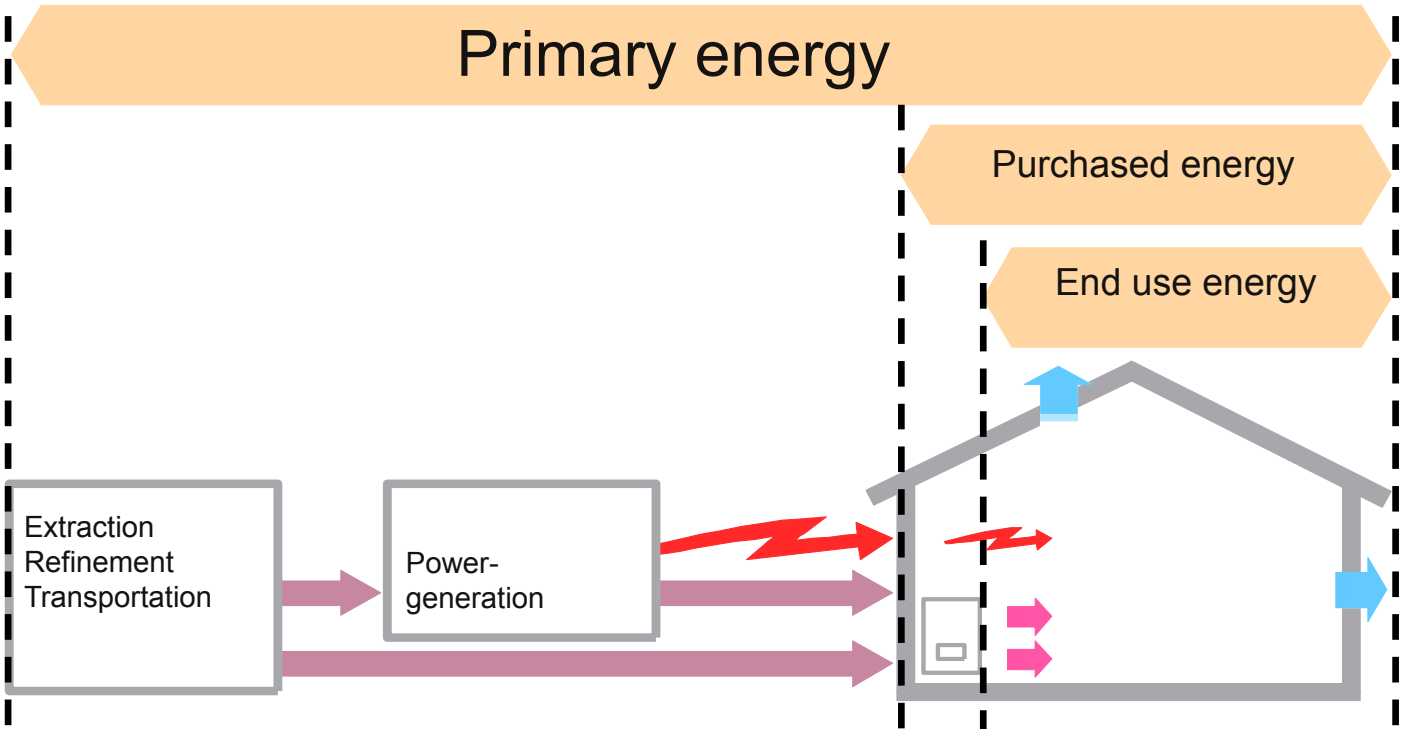
- Improved consumer information
  Enables straight forward performance comparisons
- Systems approach necessary
  Definition of system boundaries
- Primary energy efficiency
- Annual performance rating







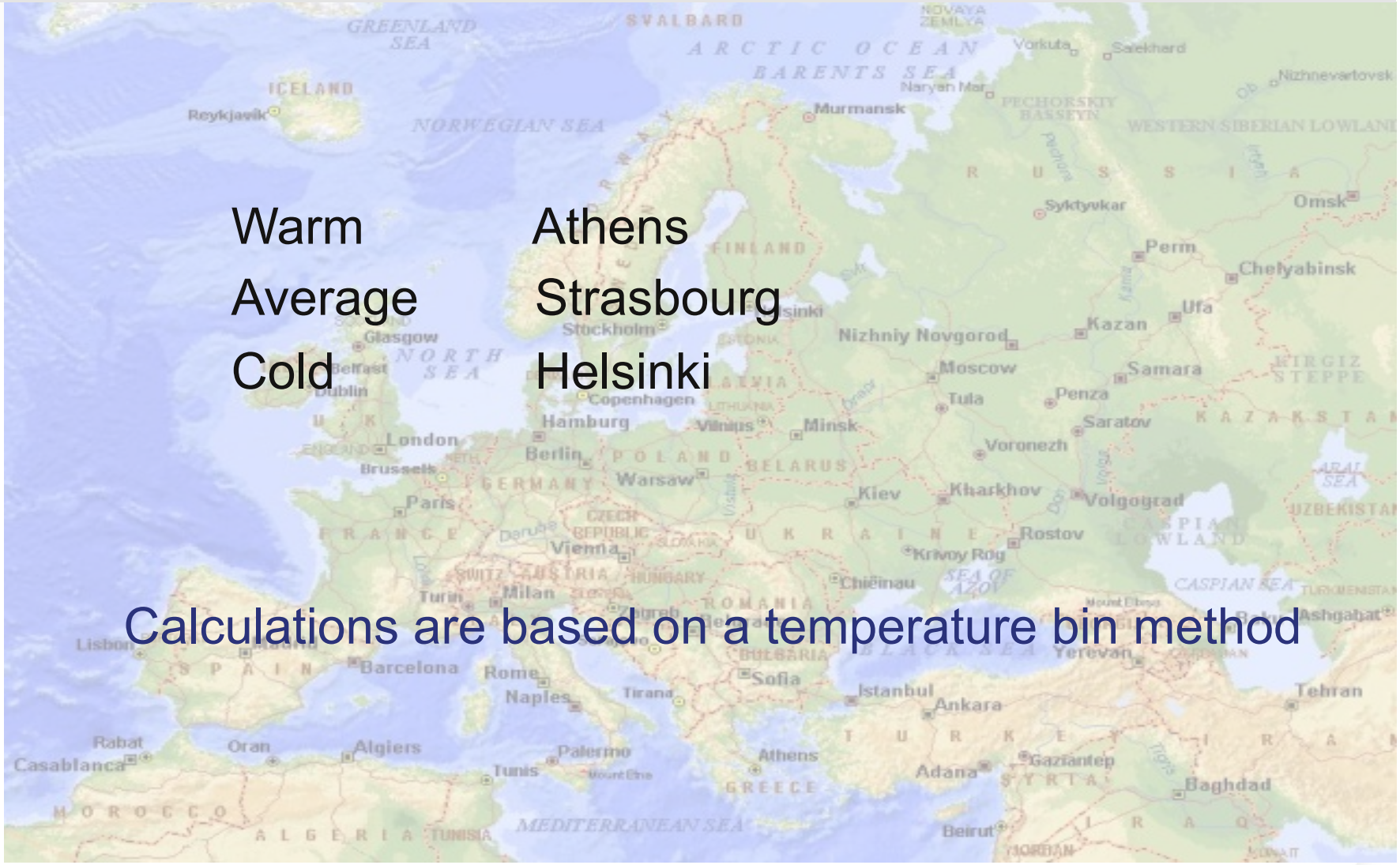
Primary energy efficiency – System boundaries



Main parameters considered for performance calculation

- Primary energy factor (electricity)
- Three climate zones
- Performance at various operating conditions
- Two heat distribution systems (radiators, underfloor heating)
- Does not address green house gas emissions

Three climate zones



Energy efficiency requirements

Table 1: Seasonal space heating energy efficiency classes of heaters, with the exception of low-temperature heat pumps and heat pump space heaters forlow-temperature application

Seasonal space heating energy efficiency class	Seasonal space heating energy efficiency η_s in %
A^{+++}	$\eta_s \geq 150$
A^{++}	$125 \leq \eta_s < 150$
A^{+}	$98 \leq \eta_s < 125$
A	$90 \leq \eta_s < 98$
B	$82 \leq \eta_s < 90$
C	$75 \leq \eta_s < 82$
D	$36 \leq \eta_s < 75$
E	$34 \leq \eta_s < 36$
F	$30 \leq \eta_s < 34$
G	$\eta_s < 30$

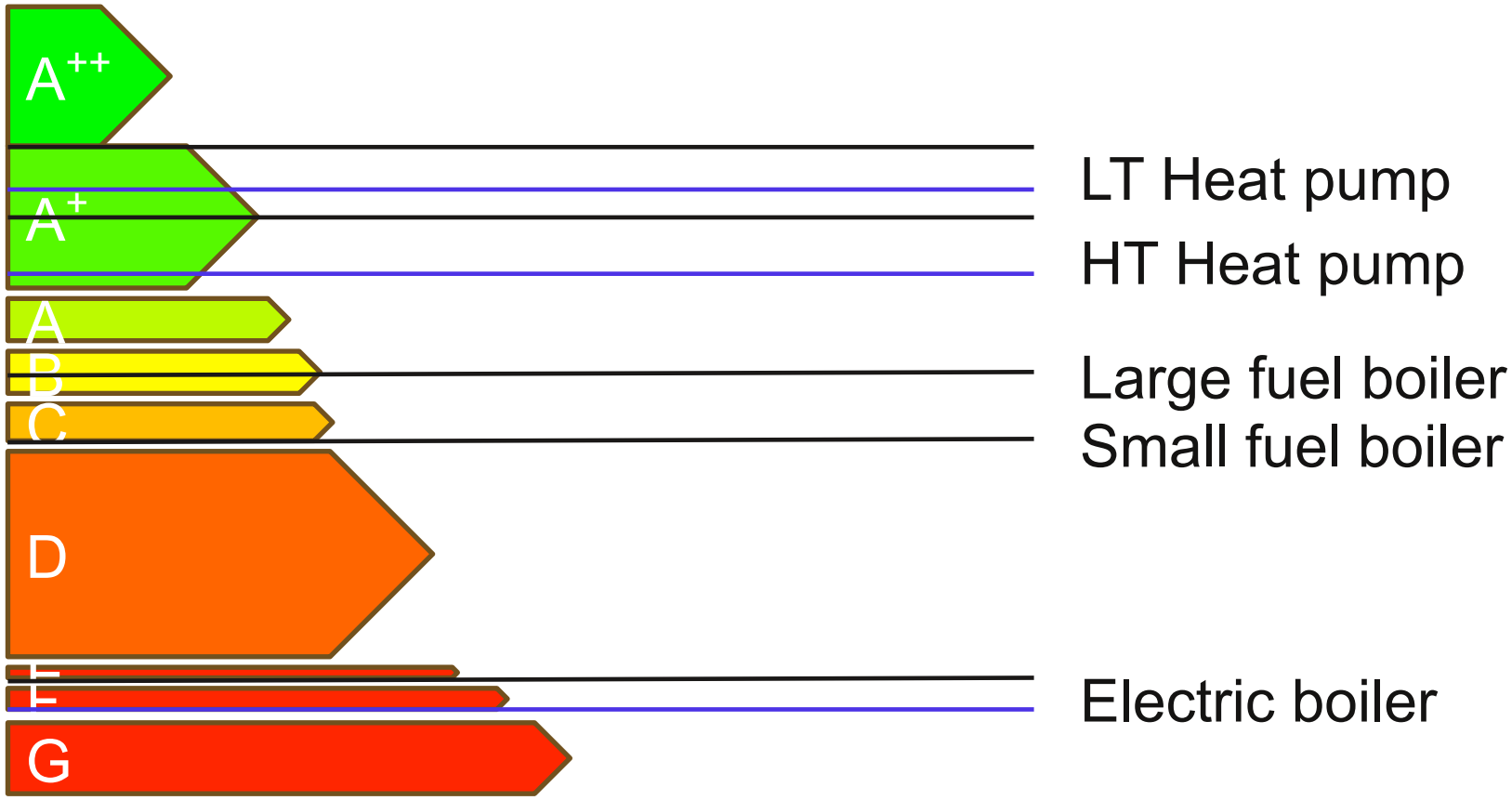
Ecodesign minimum efficiency requirements

Commission final proposal

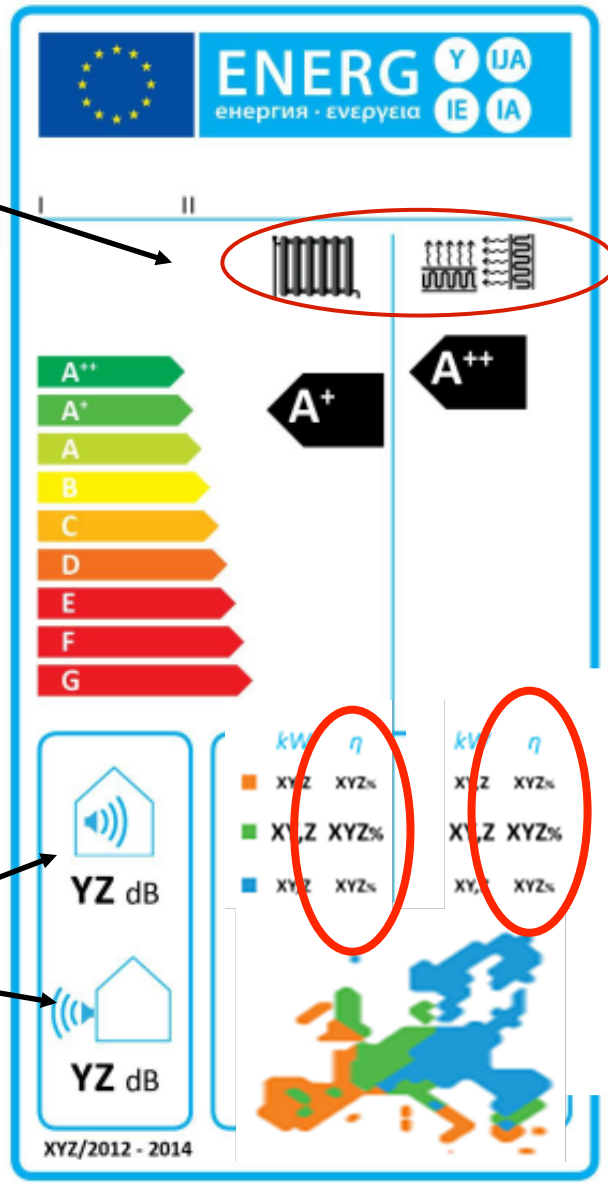
Type of boiler	2 years after into force	4 years after into force
Large fuel boiler (>10 kW)	86 %	86 %
Small fuel boiler (<10 kW)	75 %	75 %
Electric boiler	30 %	36 %
High temp heat pump	100 % (SCOP=2,5)	110 % (SCOP=2,75)
Low temp heat pump	115 % (SCOP=2,875)	125 % (SCOP=3,125)

Ecodesign minimum efficiency requirements

2 years after into force 4 years after into force



Different temperature levels



Climate zones in Europe

Sound power level

Challenges

- Compact heat exchangers <5%
- Compressors 10-20%
- Electronic expansion valves ?
- Refrigerants !?

