Sustainable refrigeration and European legislation – Eco-design and Eco-labelling

Rio +20 and sustainable refrigeration

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European climate and energy objectives

Europe 2020 targets

20% CO_2 emission reductions compared to 1990 (30% if post-Kyoto-target)

20% increase in energy efficiency (compared to „business as usual“)

20% share of renewable energies

Political and regulatory framework:

European Climate Change Programme (ECCP) to implement the Kyoto Protocol

2008 European Climate and Energy package

Long-term strategy:

Roadmap for moving to a competitive low-carbon economy in 2050

http://ec.europa.eu/climateaction/
http://ec.europa.eu/energy/index_en.htm

Towards sustainable product policy: EU legislation on Eco-design

Ecodesign Directive:

Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products

The Ecodesign Directive provides an EU wide framework for **improving the environmental performance** of energy related products (ERPs) through ecodesign. Implementing measures are adopted for each product group.

→No disparate national legislation building up obstacles to internal trade

→ Enhance product quality and environmental protection

Example: Eco-design requirements for air conditioners and comfort fans (206/2012/EU)

Applicable from 2013/2014 onwards

Energy and noise:

Requirements for

- minimum energy efficiency,
- maximum power consumption in off-mode and standby mode,
- maximum sound power level.

Refrigerants: No specific regulation on refrigerants but bonus leading to lower minimum energy efficiency requirements for appliances using refrigerants with low GWP.

Requirements for minimum energy efficiency

	Double duct air conditioners		Single duct air conditioners	
	EER_{rated}	COP_{rated}	EER_{rated}	COP_{rated}
If GWP of refrigerant > 150	2,40	2,36	2,40	1,80
If GWP of refrigerant ≤ 150	2,16	2,12	2,16	1,62

How can consumers chose sustainable products? – The role of eco-labels

- Accurate and scientifically based information and guidance on products to the consumer.

- Promotion of products with a reduced environmental impact compared to other products in the same product group.

Eco-labels are usually applied to non-food and non-medical products. Examples:

http://ec.europa.eu/environment/ecolabel/eu-ecolabel-for-consumers.html

Towards sustainable product policy: EU legislation on Eco-labelling

Eco-labelling was introduced in the EU in 1992

Regulation (EC) No 1980/2000: Eco-label award scheme
The EC eco-label may be awarded to a product possessing characteristics which enable it to contribute significantly to improvements in relation to key environmental aspects.

Rules are laid out in **Regulation (EC) No 66/2010**

Eco-label criteria are established by product group and are of limited validity.

Examples:
Eco-label for refrigerators (Decision 2004/40/EC)
Eco-label for heat pumps (Decision 2007/742/EC)

→ **Producer responsibility**

→ **Voluntary scheme:** Manufacturers, retailers and service provides who meet the criteria for their product group can apply for the eco-label. In case the eco-label is awarded, they may use it to promote their products within the EU.

Example – Eco-label for heat pumps: Criteria

Life Cycle Step	Criterion	Expectations
Manufacturing	Safety of the product	• Taking into account the tolerances specified in Directive 2005/618/EC, the heat pump and the heat pump system shall not contain: Cd, Pb, Hg, Cr VI, or the flame retardants (i.e. PBB or PBDE) as listed in Article 4 of Directive 2002/95/EC.
Use	User instructions for correct environmental use	• A comprehensive manual for installation, maintenance, and for operating the heat pump shall be provided. • An 'information fiche for customers' will be available at point of sale to provide appropriate advice to consumers about the heat pump. • Suitable training for installers in Member States where the product is marketed shall be ensured. It shall include information relevant for sizing and installing the heat pump and completing the information fiche for consumers.
Use	Performance criteria	• The sound power level(s) shall be tested and stated in dB(A) on the information fiche. • The efficiency of the heat pump unit shall exceed the minimum requirements of the coefficient of performance (COP) and the primary energy ratio (PER) as defined in Commission Decision 2007/742/EC. • If the heat pump is reversible and can cool, the efficiency of the heat pump unit shall exceed the minimum requirements of the energy efficiency ratio (EER) in cooling mode as defined in Commission Decision 2007/742/EC.
Use	Limitation of the use of substances harmful to the environment	• Global Warming Potential (GWP) for the refrigerant: GWP $\leq$ 2000 (100 yrs). • If GWP < 150 (100 yrs), then the COP and the PER in heating mode and the EER in cooling mode shall be reduced by 15%. • The secondary refrigerant, brine or additives must not be substances classified as environmentally hazardous or constituting a health hazard as defined in Directive 67/548/EEC and its amendments.
End of life	Durability	• The availability of spare parts shall be ensured for a period of 10 years from the date of sale.

Towards sustainable product policy: Other EU legislation

Examples in the context of sustainable refrigeration and air conditioning:

F-Gas Regulation (EC) No 842/2006: Prevention of emissions of fluorinated substances through e.g. leakage control, training of technicians, labelling. Promotion of recycling, reclamation and/or proper destruction of fluorinated gases.

WEEE Directive (recast): Reduce wasteful consumption of natural resources and prevent pollution during production, use and at end of life of waste electrical and electronic equipment.

Directive 2010/30/EU: Mandatory labelling and standard product information on the consumption of energy and other resources by energy-related products.

BUT:
Legislation is only as good as its implementation and enforcement ...

... producers, distributors and consumers are required to make efforts and to develop innovative concepts.

Thank you very much for your attention.

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How to quantify the environmental performance of refrigeration and air conditioning equipment ?

Examples for existing indicators/ approaches:

The **Total Equivalent Warming Impact (TEWI)** reflects the contribution of equipment and systems to global warming:

- Direct emissions of refrigerants,
- Indirect emissions through energy use.

The **Life Cycle-Climate Performance (LCCP)** indicator reflects the ”cradle to grave“ climate impact of equipment and systems.

- Direct emissions of refrigerants,
- Indirect emissions through energy use,
- Energy use for the manufacturing of materials including refrigerants,
- Energy consumption for transportation,
- Energy consumption for recycling/ disposal at end of life.

PROBLEM : No established methodology for calculations

→ Comparison of different products is hardly possible.