Eurovent certification programmes for HVAC products with verified performances

Rehva Annual Conference 2015

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Sylvain Courtey
s.courtey@eurovent-certification.com

6 reference certification marks & 4 departments

EUROVENT CERTIFIED PERFORMANCE

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CSTBat

EU Ecolabel www.ecolabel.eu

Comfort

Ventilation

Refrigeration

Thermodynamics

The Eurovent Certified Performance mark (ECP)

- Voluntary third party certification programmes
- Covers all HVAC&R fields: Heating, Ventilation, Air-conditioning and Refrigeration
- Mark recognized in all Europe and beyond
- **Accreditation** according to ISO 17065 by COFRAC (accreditation n°5-0517, international recognition EA/IAF)
  - ➢ Proof for **independency** and **competence**
- Continuous verification process:
  - Tests performed by independent and accredited laboratories
  - Factory audits
  - Check of selection tools

The Eurovent Certified Performance mark – Key figures

- 19 certification programmes in activity
- 269 certified manufacturers
- 320 certified tradenames
- +50 000 certified references
- +80 experts participating to our compliance committees
- 12 European independent laboratories
- 20 years of experience
- +1300 tests / year
- + 160 factory audits / year
- +100 check software / year

Eurovent Certified Performance Certification Programmes

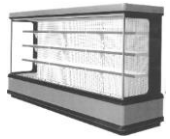
Air-conditioners

Fan coil units

Filters

Chilled Beams

Refrigerated Display Cabinets



Condensers

Chillers & Heat-Pumps

Dry-coolers

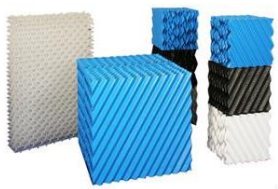
Air Handling Units

Rooftops

Air to air heat exchangers

Cooling towers

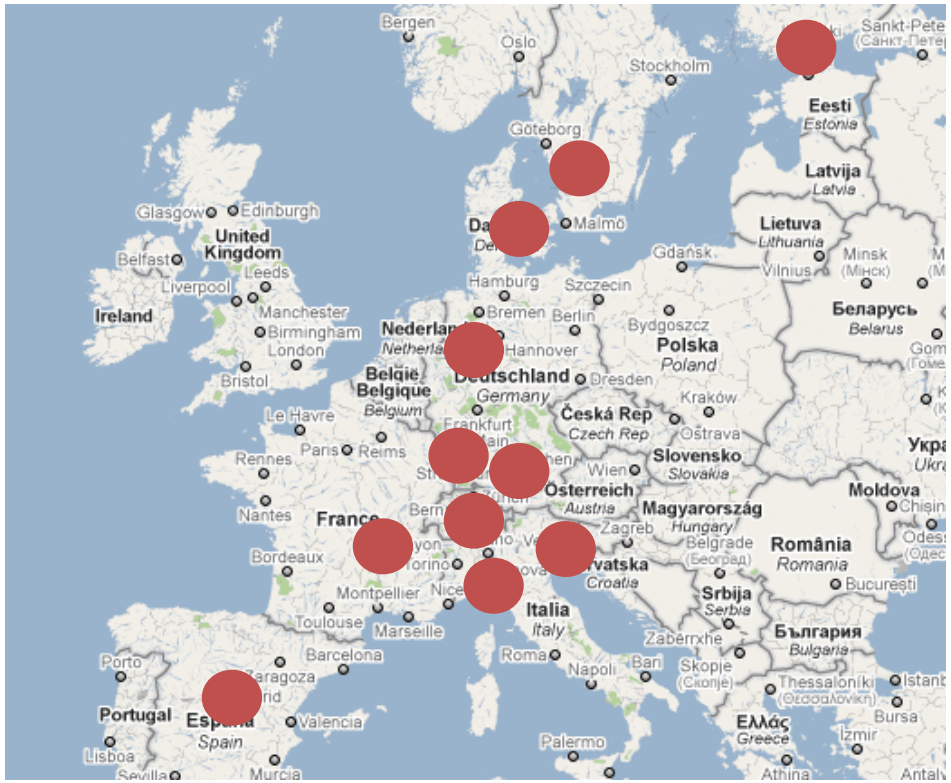
Drift eliminators



VRF

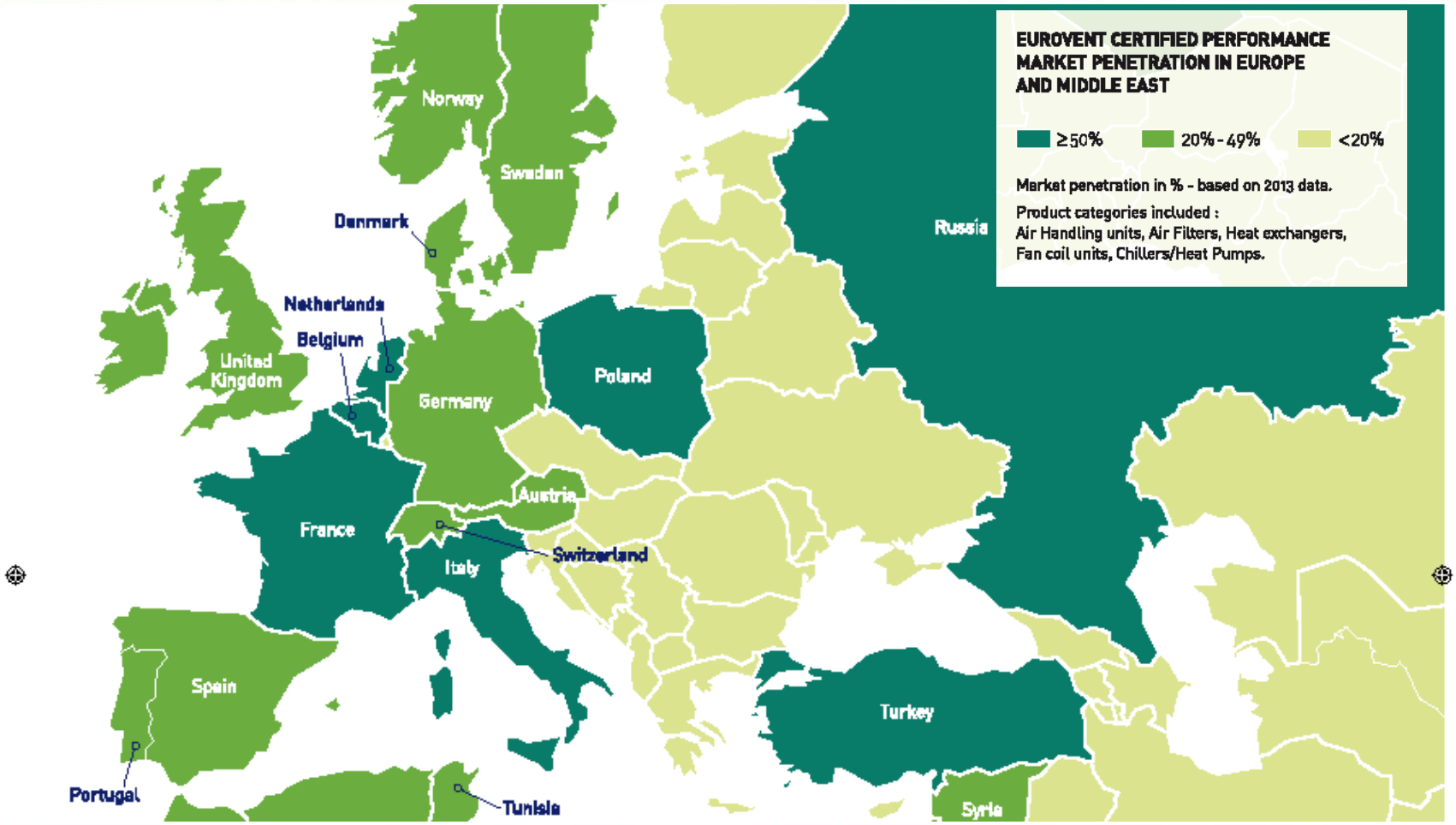
Partnerships with 12 Independent laboratories

CEIS	Madrid	Spain
CETIAT	Lyon	France
DMT	Essen	Germany
HTA	Luzern	Switzerland
IMQ	Amaro	Italy
IMQ	Milan	Italy
SP	Boras	Sweden
TÜV-NORD	Essen	Germany
TÜV-SÜD	Munich	Germany
VTT	Espoo	Finland
WSP	Stuttgart	Germany
DTI	Taastrup	Denmark



EUROVENT CERTIFIED PERFORMANCE

A well recognized certification mark in Europe …

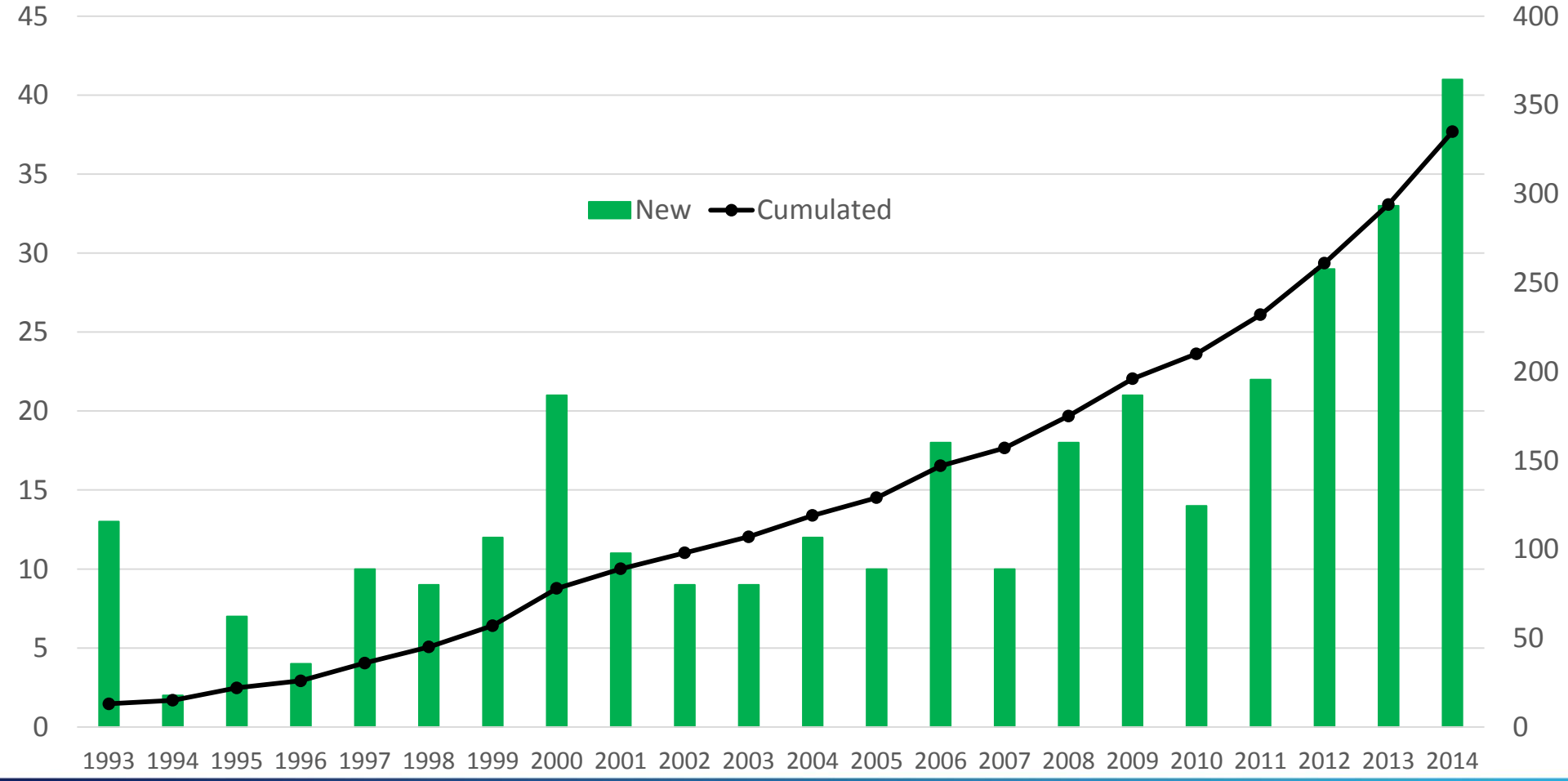


EUROVENT CERTIFIED PERFORMANCE

… and beyond

EUROVENT CERTIFIED PERFORMANCE

A constant growth during 20 years



How does it work?

Declaration lists
Product ranges (and models)
+ Technical characteristics & Performances
or Selection software

Selection on-site & visit of the
Production place

After study of the list
Selection
Random selection of models
No. of tests based on lifetime of models
or Selection software

Performance data registered from
Software outputs

Delivery, verification of testing object
Testing in an independent laboratory

Comparison declared vs. measured data
If necessary: correction of catalogues or software

File rejected

Review, Approval, certificate and
Publication of data
www.eurovent-certification.com & www.certiflash.com

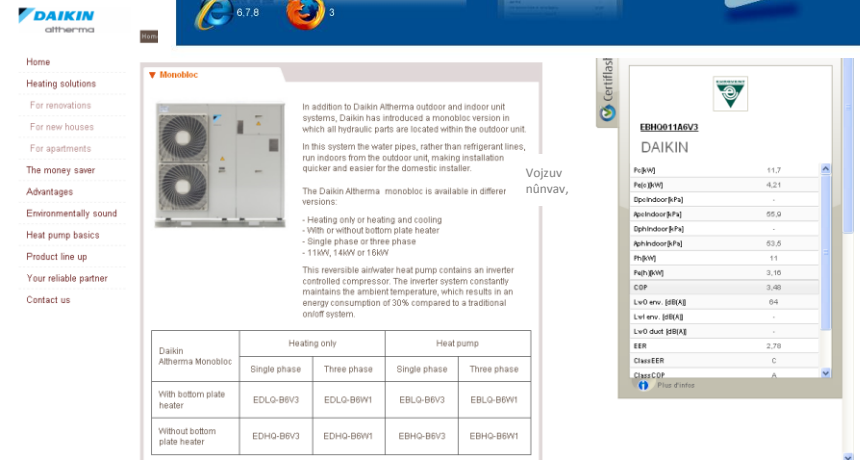
ECP website: www.eurovent-certification.com

- A true European database of certified performances for HVAC&R components, products and systems.

EUROVENT CERTIFIED PERFORMANCE

Certiflash
www.certiflash.com

- pop-up from search engines
- on manufacturer websites
- Mobile app



Eurovent Certita CERTIFICATION

European certified performances database: Examples of uses

- Parterships with software editors in France (Edibatec, Clé@ association):
  - Automatic transfers of the certified performances **database for EPBD** application in France (RT 2012)
  - Main products covered: heat-pumps, chillers, rooftops, air conditioners

- Upcoming in 2015/2016:
  New partnerships with large institutional organisations in France in order to build **white certificate databases** based on the ECP database.

A challenging regulation background

Year	Regulation	Topic
2002	Labelling	Air conditionners <12kW
2002	EPBD	Buildings
2010	EPBD	Buildings (recast)
2013	Ecodesign	Fans
2013	Ecodesign	Air conditioners <12kW
2013	Labelling	Air Conditioners <12kW
2015	Ecodesign	Space heater & Combination heaters
2015	Ecodesign	Water heaters
2015	Labelling	Space heater & Combination heaters
2016	Ecodesign	Residential & Non-res. Ventilation units
2016	Labelling	Residential Ventilation units
2016?	Ecodesign	Air conditioning units (Chillers, VRF, Rooftops, Fan Coils?)
2018	Ecodesign	Local space heater
2018	Labelling	Local space heater
?	Ecodesign	Fans (recast)

A challenging regulation background

Year	Regulation	Topic
2002	RoHS	Restriction Of the use of Hazardous Substances in electrical and electronic equipments
2004	EMCD	Electro Magnetic Compatibility Directive
2006	F-gas	Fluorinated Gases regulation
2006	MD	Machinery Directive
2006	LVD	Low Voltage Directive
2008	WEEE	Waste Electronic and Electrical Equipment
2011	CPR	Construction Product Regulation
2011	RoHS2	Restriction Of the use of Hazardous Substances in electrical and electronic equipments (recast)
2014	LVD2	Low Voltage Directive (recast)
2014	EMCD2	Electro Magnetic Compatibility Directive (recast)
2014	F-gas2	Fluorinated Gases regulation (recast)
?	WEEE2	Waste Electronic and Electrical Equipment (recast)

A challenging standardization background

- EU mandates to CEN (Ecodesign, EPBD, …)
  Ex: M/495
- Nominal performance -> Seasonal performances
  (Ex: EN 14825)
- Multi-source units (gas, electricity, solar, …)
- Multi-applications units (space heating, space cooling, water heating, ventilation, …)

Overview of energy efficiency regulation and certification

	Product			Energy performances		
				MEPS		Description
Res.	AC<12kW	✓ 2002 2013	✗	✓ 2013	✓ 1995	(S)EER, (S)COP
Res.	Vent. units	✓ 2016	✗	✓ 2016	✓ 2015	SEC
Res.	Heat Pumps	✓ 2015	✗	✓ 2015	✓ 1995 (HP)	η_s
Non Res.	Chillers	✗	✓ 2004	✓ 2016?	✓ 1995	(S)EER, (S)COP, ESEER
Non Res.	Fans	✗	✗	✓ 2013	✗	η
Non Res.	VRF	✗	?	✓ 2016?	✓ 2013	(S)EER, (S)COP
Non Res.	Rooftops	✗	✓ 2010	✓ 2016?	✓ 2007	(S)EER, (S)COP
Non Res.	AC>12kW	✗	?	✓ 2016?	✓ 1995	(S)EER, (S)COP
Non Res.	AHU	✗	✓ 2008	✓ 2016	✓ 2007	f(V,η,Δp,f)
Non Res.	Fan Coils	✗	✓ 2011	✗	✓ 1995	FCEER, FCCOP
Non Res.	Air Filters	✗	✓ 2012	✗	✓ 2007	An. En. Cons
Non Res.	HEx	✗	✓ 2005	✗	✓ 2001	R

Overview of energy efficiency regulation and certification

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Res.	AC<12kW	2002		2013	1995	(S)EER, (S)COP
	Vent. units	2016		2016	2015	SEC
	Heat Pumps	2015		2015	1995 (HP)	η_s
Non Res.	Chillers		2004	2016?	1995	(S)EER, (S)COP, ESEER
	Fans			2013		η
	VRF			2016?	2013	(S)EER, (S)COP
	Rooftops			2016?		(S)EER, (S)COP
	AC>12kW			2016?	1995	(S)EER, (S)COP
	AHU		2008	2016	2007	f(V,η,Δp,f)
	Fan Coils			2011	1995	FCEER, FCCOP
	Air Filters			2013	2007	An. En. Cons
	HEx		2005		2001	R

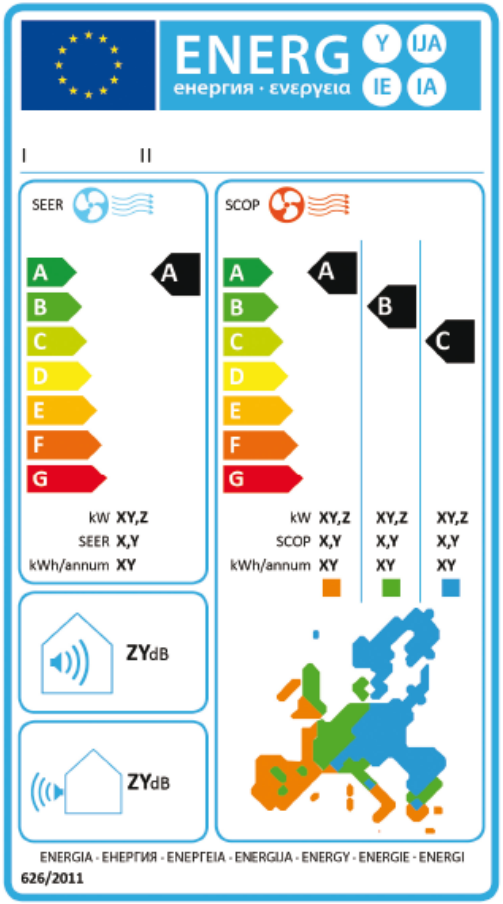
Residential products: Complementarity beween market surveillance and voluntary certification

Non Residential products with high energy saving potentials:
EU MEPS (push) and voluntary labels (pull)
(Exception with Fans)

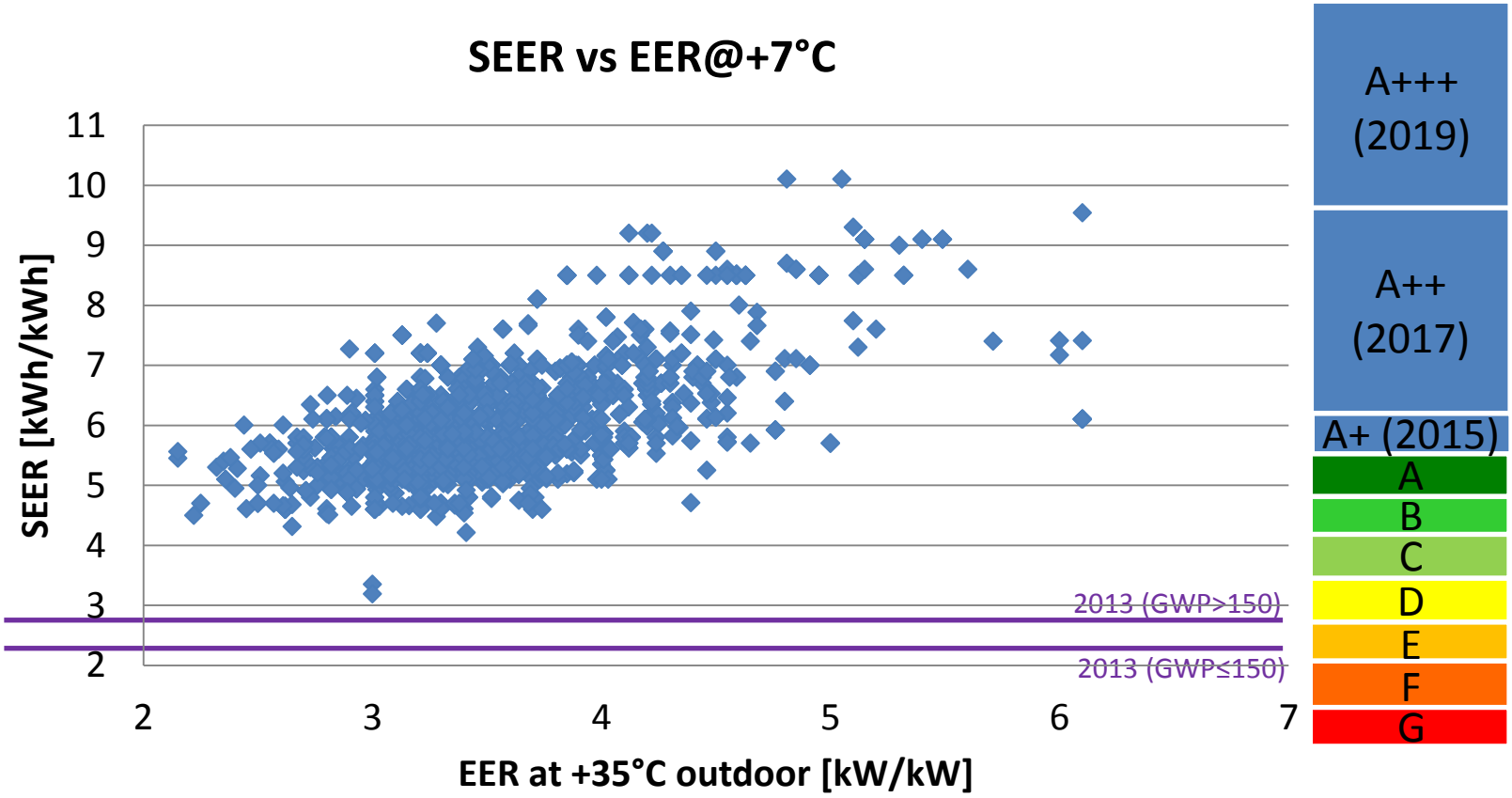
Other Non Residential products: only voluntary certification (driven by the market)

EU energy label for residential Air Conditioners

- Scope
  - For cooling only and reversible residential AC up to 12 kW
- Time frame
  - Commission Delegated Regulation (EU) No 626/2011 supplementing Directive 2010/30/EU published on 4 May 2011
  - Label to be applied from **1st January 2013**
- Key facts
  - Based on seasonal efficiencies (SEER & SCOP)
  - Efficiency in heating mode (SCOP) depends on the climate (warm, average or cold)

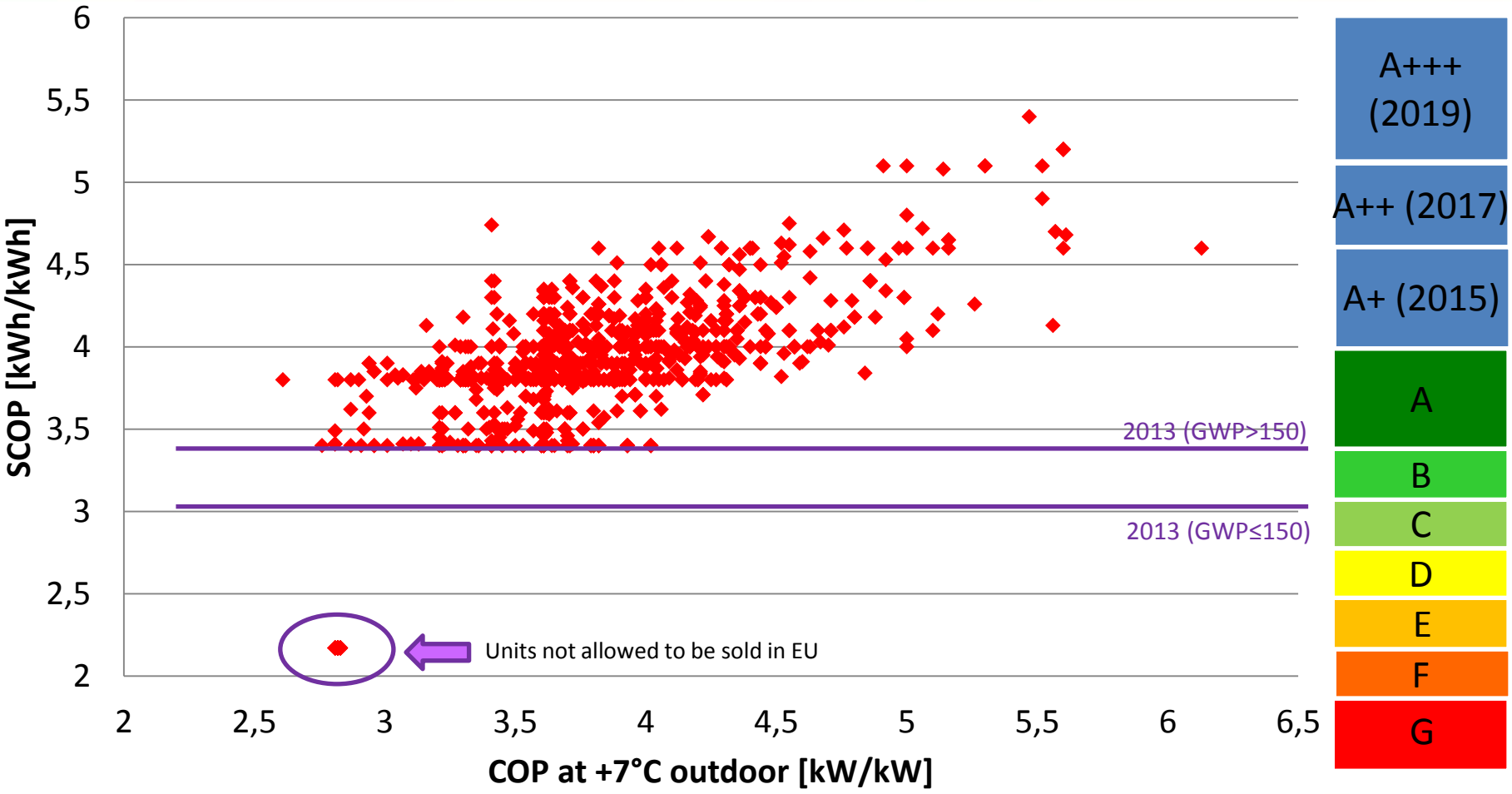


EU energy label for residential Air Conditioners



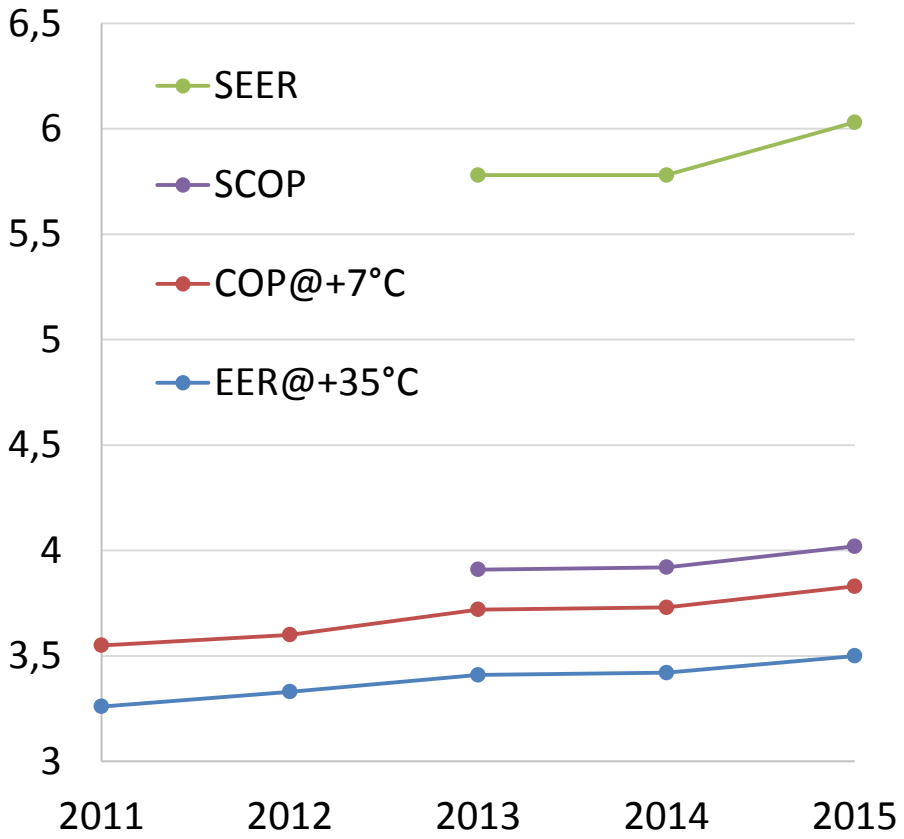
EU energy label for residential Air Conditioners

SCOP vs COP@+7°C



Eurovent Certita CERTIFICATION

Evolution of the energy efficiency of certified residential Air Conditioners

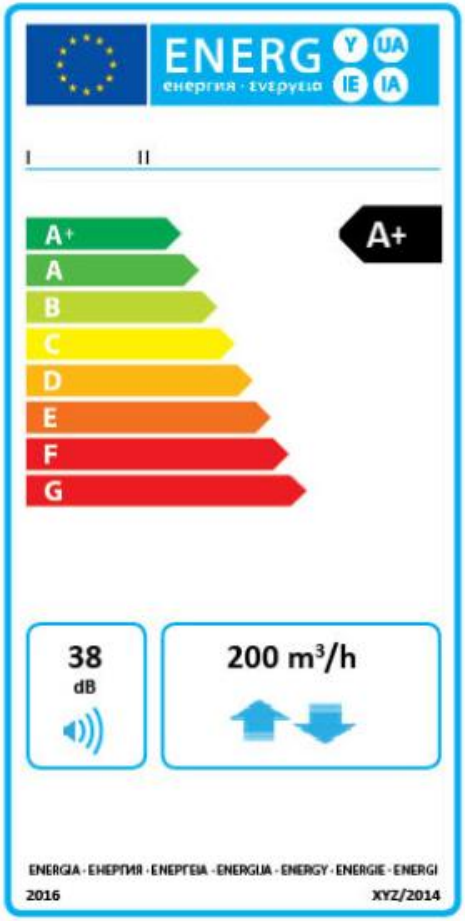


EU energy label for residential ventilation units

January 2016:

European energy label based on SEC (*Specific Energy Consumption*) classes

Classification from 1 January 2016	
SEC class	***SEC in kWh/a.m²***
A+ (most efficient)	SEC<-42
A	-42≤SEC<-34
B	-34≤SEC<-26
C	-26≤SEC<-23
D	-23≤SEC<-20
E	-20≤SEC<-10
F	-10≤SEC<0
G (least efficient)	0≤SEC



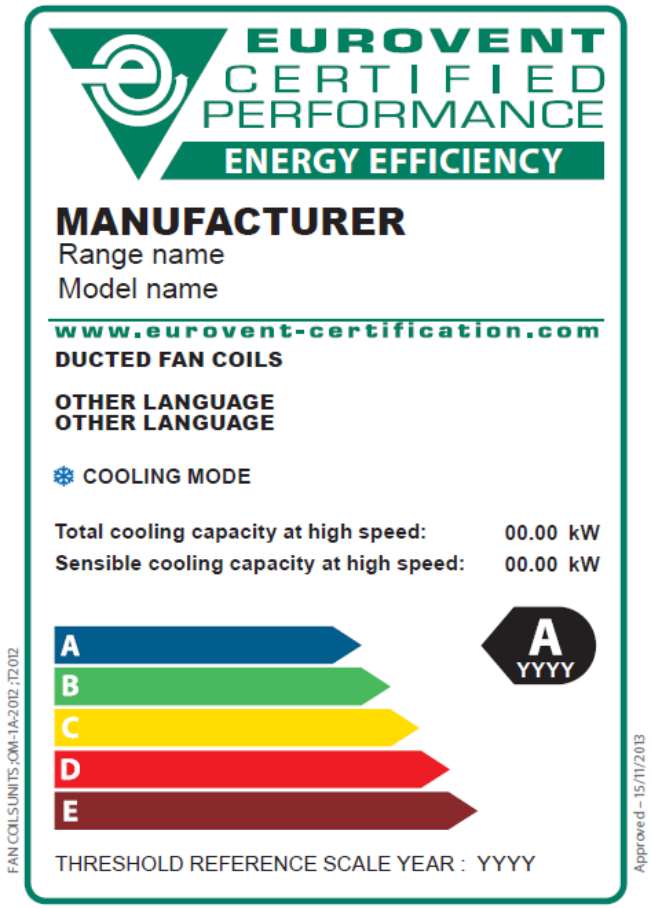
ECP energy label for fan coil units

- Available since 2011
- First energy label for FCU in the world!
- Weighted average of performance of low, medium and high speeds

$$FCEER = \frac{5\% \cdot Pc_{high} + 30\% \cdot Pc_{med} + 65\% \cdot Pc_{low}}{5\% \cdot Pe(c)_{high} + 30\% \cdot Pe(c)_{med} + 65\% \cdot Pe(c)_{low}}$$

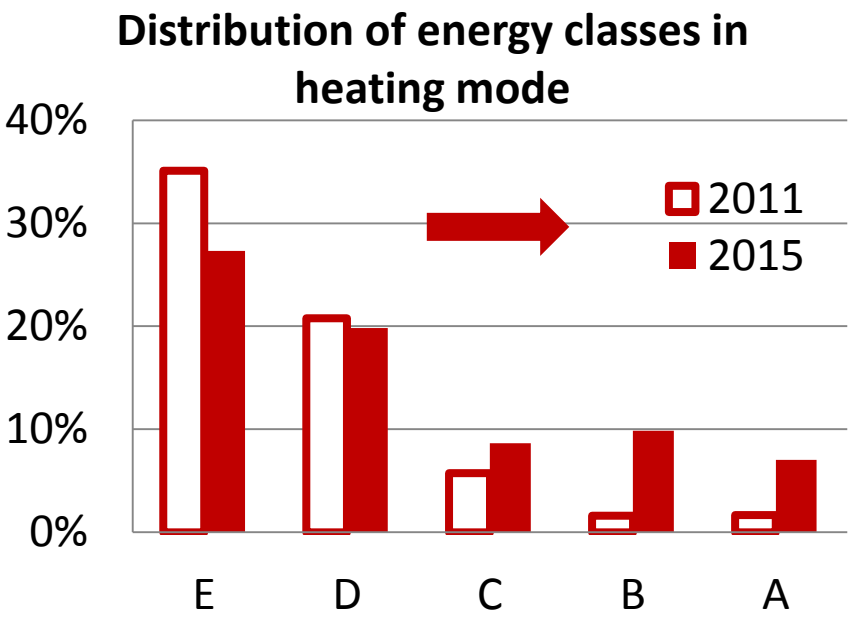
$$FCCOP = \frac{5\% \cdot Ph_{high} + 25\% \cdot Ph_{med} + 70\% \cdot Ph_{low}}{5\% \cdot Pe(h)_{high} + 25\% \cdot Pe(h)_{med} + 70\% \cdot Pe(h)_{low}}$$

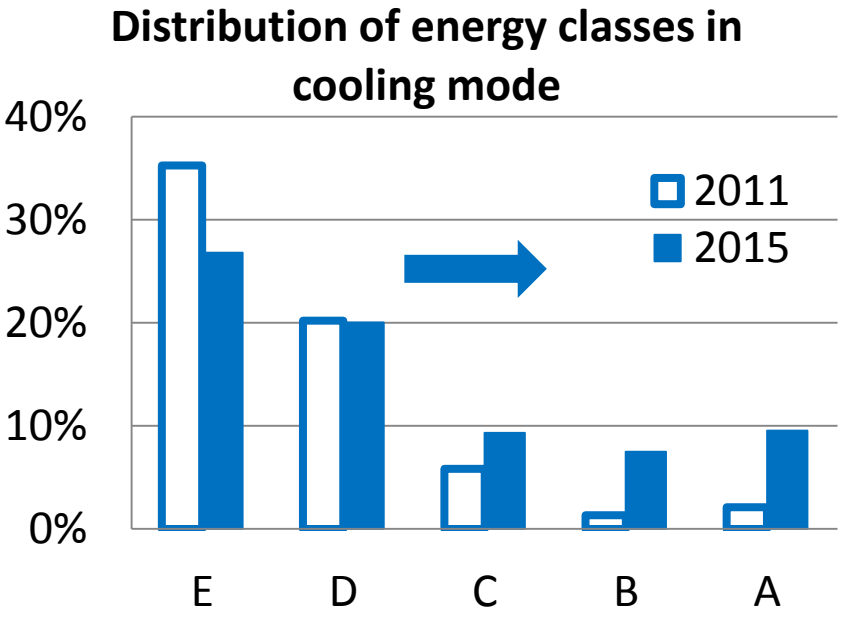
- Consider both **sensible** and **latent** capacities
- Certified data available at: www.eurovent-certification.com



ECP energy label for fan coil units

Evolution after 4 years of implementation (2011 – 2015)





Energy efficiencies are moving from DE to ABC

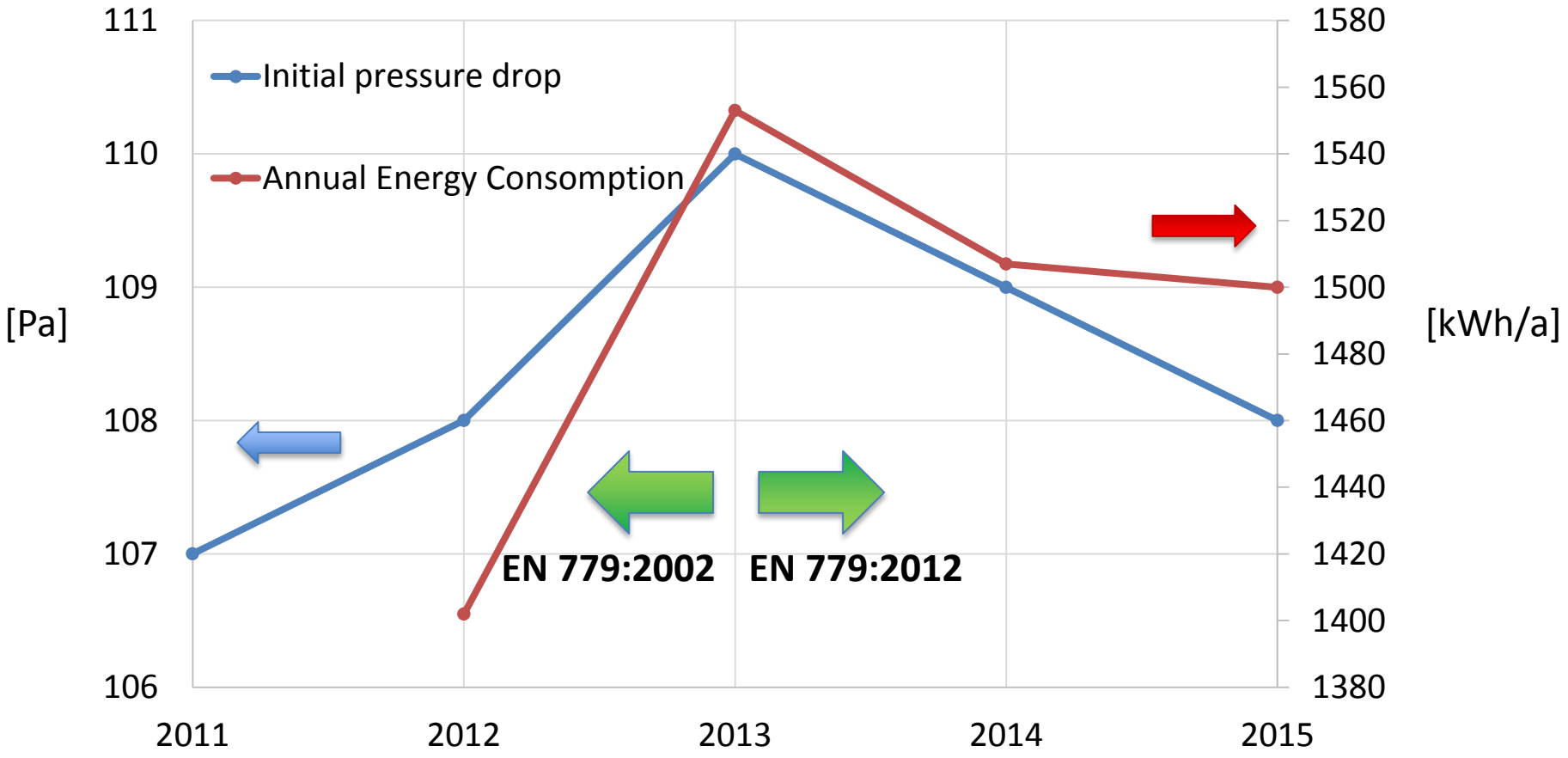
ECP energy label for air filters

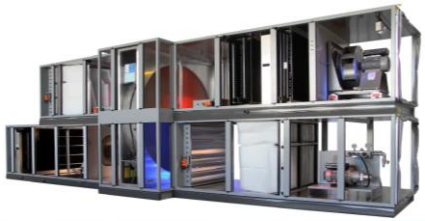
- Available since 2011
- First energy label for air filters in the world!
- Based on average pressure drop measured during an EN779 test
- Estimated annual energy consumption in kWh/year is given

$$W = \frac{q_V \cdot \overline{\Delta p} \cdot t}{\eta \cdot 1000}$$

Where qv = 0.944 m³/s ; t = 6000 h and η = 0.50

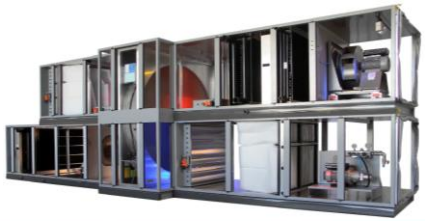
Evolution of the energy efficiency
Example for F7 Bag filters rated at 3400 m³/h





ECP energy label for air handling units

- Interrelationships to evaluate the energy efficiency of AHU are complex and even depend on climate conditions
- One single letter to represent balanced effects of:
  - Air velocity in the fan section (V)
  - Heat recovery efficiency and pressure drop (η, Δp)
  - Fan efficiency (f)



ECP energy label for air handling units

- Three classifications for three subgroup of products:
  - Design outdoor temperature < 9°C (HRS will significantly save energy)
  - Design outdoor T > 9°C : ↳
  - Single extract units : ↑
- Six classes from A+ to E:

Class	Air velocity (m/s)	HRS Efficiency (%)	HRS Pressure drop (Pa)	NG_{ref}
A+	1.4	83	250	64
A	1.6	78	230	62 (ErP Fan)
B	1.8	73	210	60
C	2.0	68	190	57
D	2.2	63	170	52 (ErP Vent)
E	-	-	-	-

ECP energy label
New requirements

By 2016 all ECP energy labels will fulfill the following requirements:

1. The energy classes shall be A+, A, B, C, D and E:
   -> No A++, A+++, etc. are authorized
2. The population in each class during the 1st year of implementation shall be:
   1. A+ < 1%
   2. A < 5%
   3. B <15%
   4. C < 30%
   5. D+E > 50%
3. As soon as A+ > 5% and A > 15% new criteria shall be chosen in order to adapt the classification to the market acc. to 2.

Where certified data can be used?

Local tax incentives

National implementation of EPBD

Building energy labels

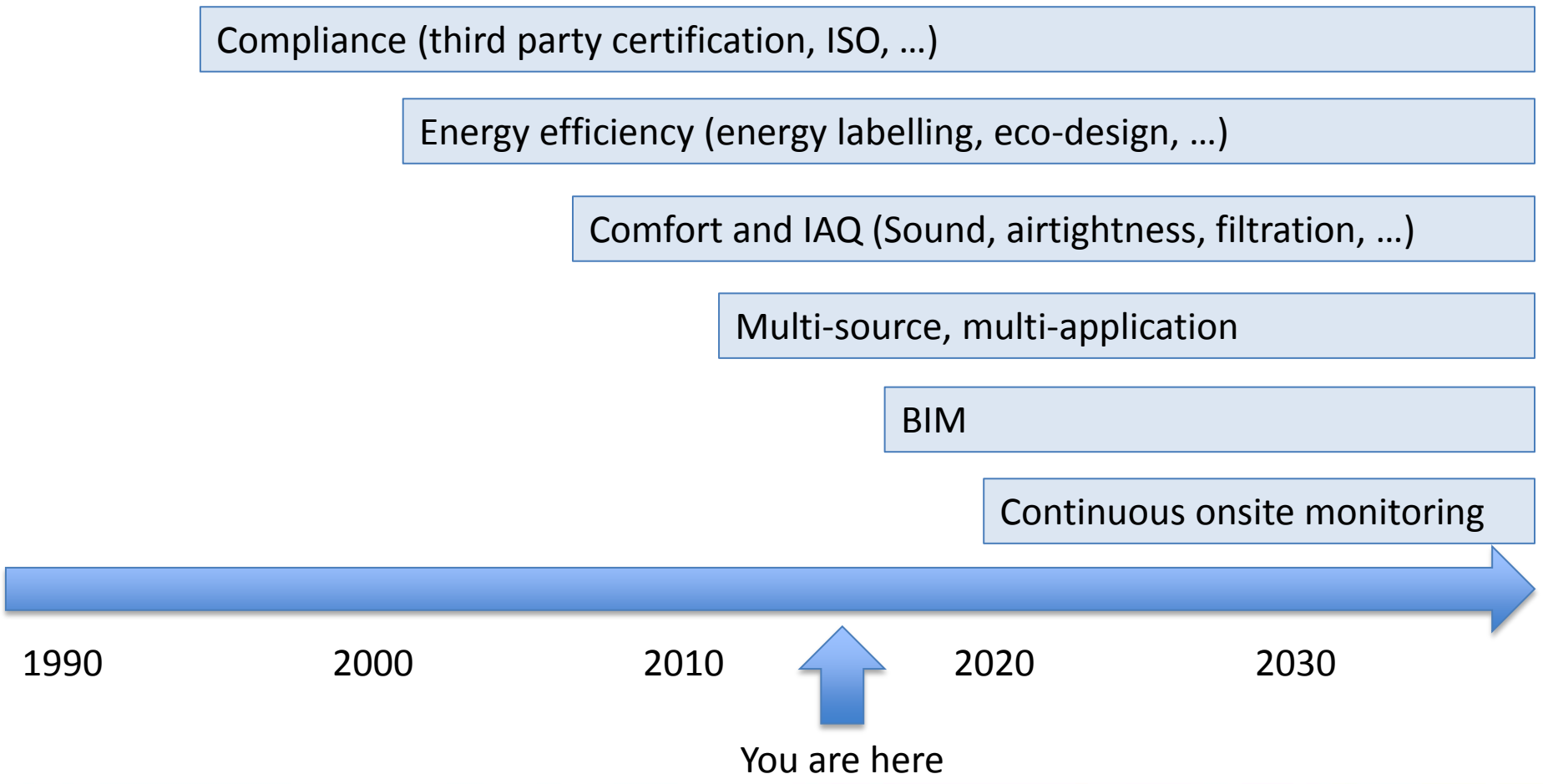
Green public procurements

White certificates

Conclusions

- Challenging environment for HVAC manufacturers (regulation, standardization)
- Mandatory regulation and voluntary certification are complementary:
  - Regulation pushes the market
  - Certification pulls the market
- Certified performance databases exist and can be used for the end-users and the national authorities

Past, Current and Future Trends of the European HVAC market



Thank you for your attention

Any question?