

**AIVC symposium “Quality ventilation is the
key to achieving low energy healthy buildings”
27 & 28 March 2019, Dublin**

NEW TRENDS IN VENTILATION SYSTEMS - STANDARDISATION AND SPECIFICATIONS ISSUES

Standardisation

XVIII	:	Weapons, weight, length, ... <i>Unify – High level</i>
XIX – XX	:	Industries. <i>Interoperability, costs</i>
1950'	:	Consumers. <i>Quality</i>
1985	:	European « New approach » - Essential requirements. (Construction Products + ...)
(1987), 2000, 2008, 2015	:	ISO 9 000
1996, 2004, 2015	:	ISO 14 000
2002, 2010, 2018	:	EPBD + associated standards

Products-methods -> systems-processes



European standardisation

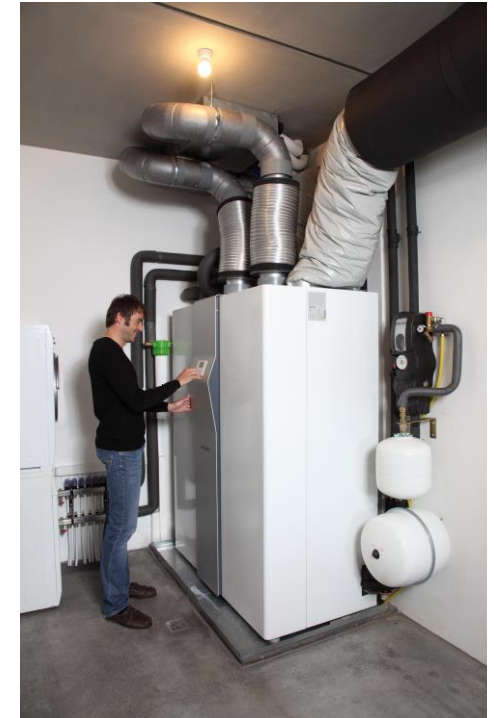
Product standards : industry + consumers + market regulation + ...

Ventilation products : almost all components for all types of ventilation have now their own testing standard ready – which does not mean used – including complex products (multifunctional).

Still missing for complex products : test with « real use » (conventional) scenario as for hot water tank or seasonal COP for instance.

These tests should come in the next years as this type of information is needed for calculation and « real » comparison.

Routes for complex products : Simulation ? Emulation (building/users) ?



Test standards more connected to real use.
Not only test method on a single point but in real life use.
Dieselgate. Dyson vs Europe.

Dyson wins five-year legal battle over EU energy labelling laws (The Independent, 2018 November 8th)

The electricals giant began its case against the EU in 2013, when it challenged labelling laws on the basis that efficiency tests carried out on empty machines **do not reflect conditions as close as possible to real-life use.**

The company argued that products should be tested in real-world conditions because vacuum cleaners using bags and filters can become clogged, leading in some cases to a loss of suction and meaning a consumer could buy an A-rated machine that drops to G-grade efficiency as it is used in the home. Dyson is famous for its bagless vacuum cleaner.

The spokeswoman said that **lab tests for energy labels do not reflect “real use”**, and said the EU labelling system “flagrantly discriminated against a specific technology” – Dyson’s patented cyclone.

Some manufacturers have actively exploited the regulation by using low motor power when in the test state, but then using technology to increase motor power automatically when the machine fills with dust – thus appearing more efficient,” she added.

“This defeat software allows them to circumvent the spirit of the regulation, which the European Court considers to be acceptable because it complies with the letter of the law.

“In these days of Dieselgate, it is essential consumers can trust what manufacturers say about their products. But the Commission endorsed a measure that allowed Dyson competitors to game the system.

Test standards more connected to real use.
Not only test method on a single point but in real life use.

Current work on :

EN 13141-7, EN 13141-8 (test standards for heat recovery ventilation units)
and EN 13142 (harmonised standard)

For the efficiency of ventilation units with heat recovery :

Several impacts to be taken into account from the measured value to the corrected value:

Internal and external leakages

Indoor and outdoor mixing

Air flow sensitivity (wind)

+ proposed disbalance, filter clean/dirty (Q, P disbalance, noise, ...), ...

European standardisation (ventilation products)

Product approach : Ecodesign, existing test standards

Extended product approach : Ecodesign, some multifunctional products

System approach : EPBD, EPBD standards (EN 16798 series)

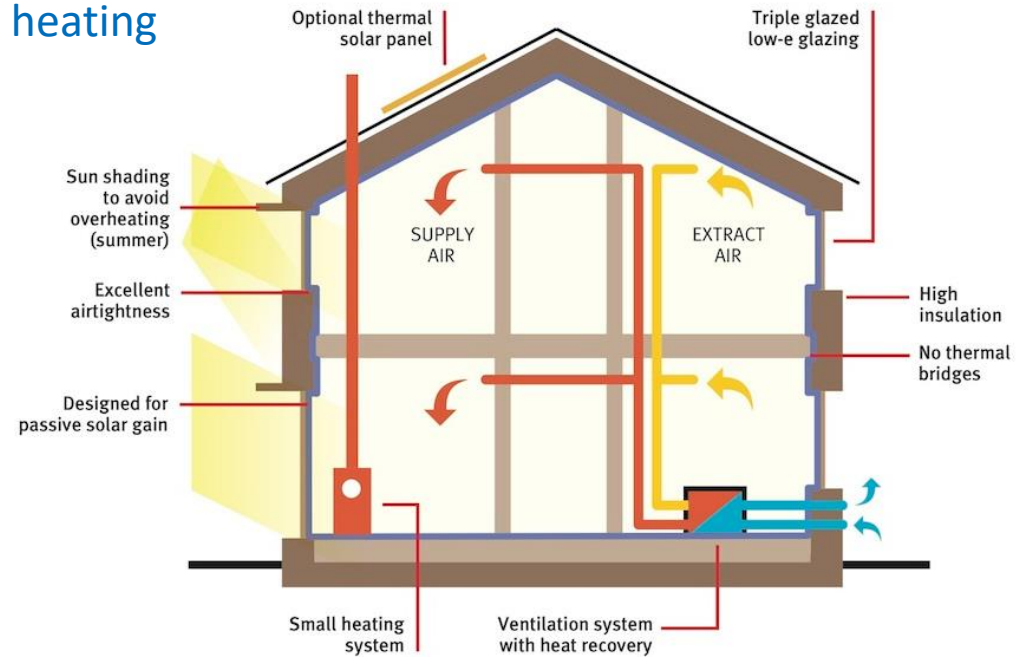
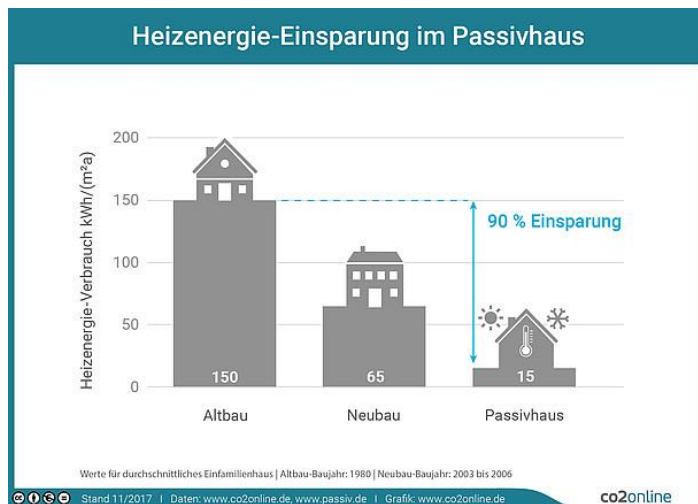
From heuristic to holistic, simple to complex, global.

EPBD standards allow to chose the levels of calculation (single value, BIN, hourly).

Labels specifications have the same different approaches

Passivhaus

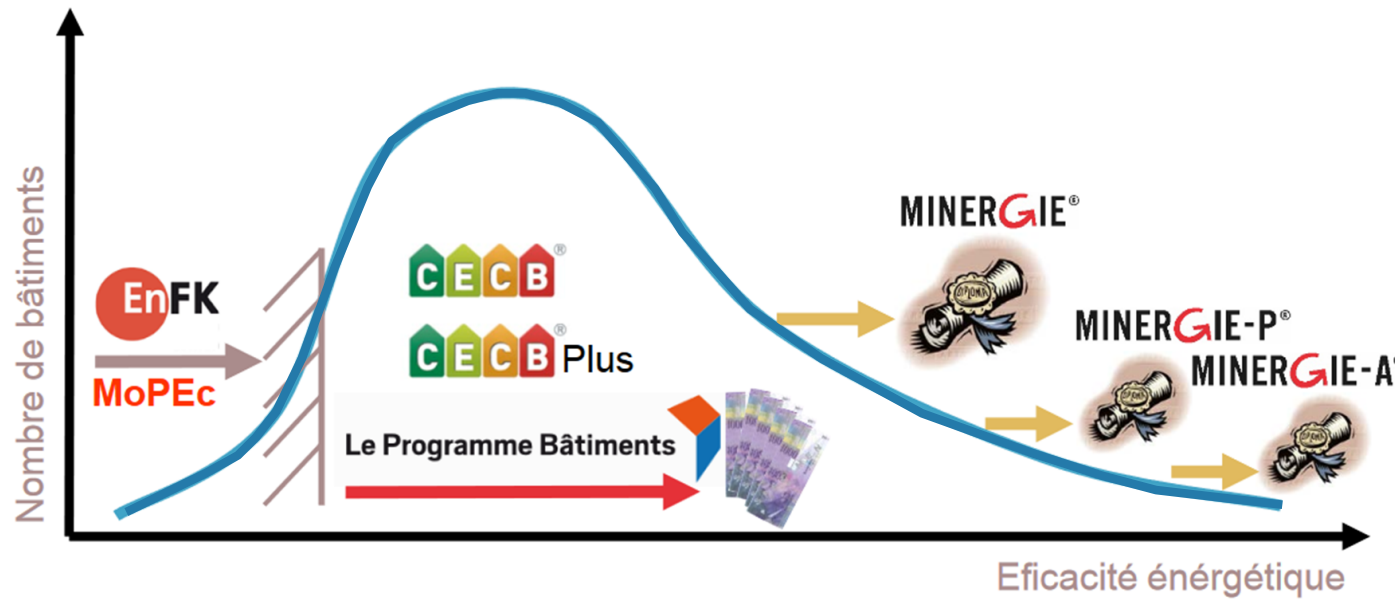
Descriptive, focusing first on building and heating
Voluntary label



Minergie

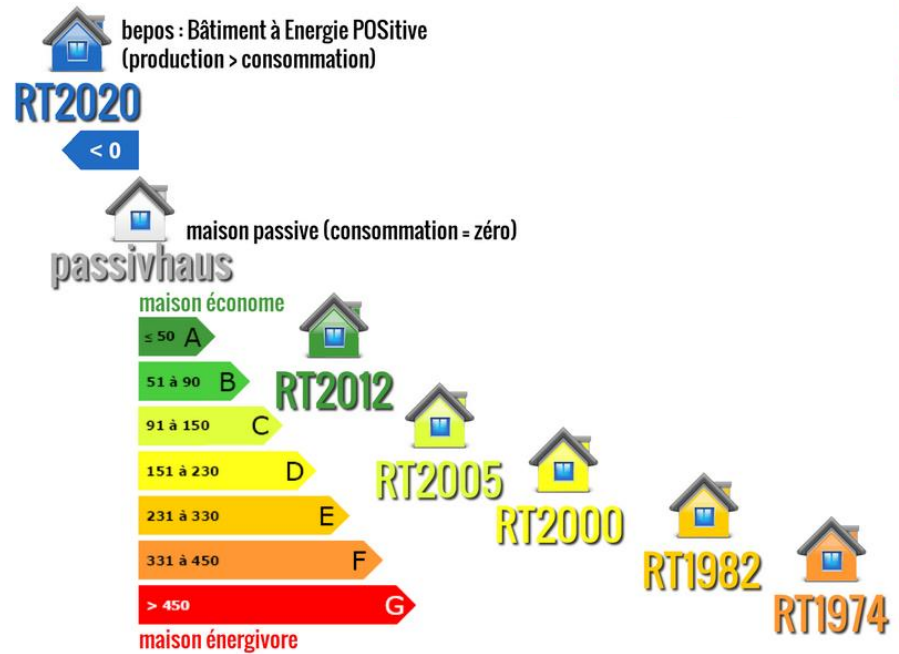
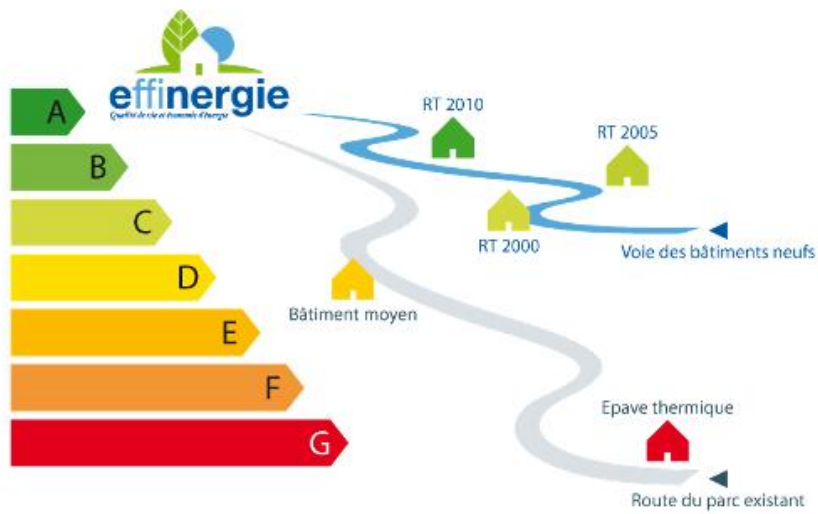
Semi descriptive, focusing on global result
Voluntary label (5 000 certifications / year)

How to increase ?



Effinergie
 focusing on global result
 Official label, aiming at massification
 > 910 000 homes in January 2019

Source : Rouch energies



Air tightness issue

Passivhaus	:	n50 = 0,6	52 cm ² for 100 m ²	Tested
Minergie P	:	n50 = 0,8	69 cm ² for 100 m ²	Tested
Effinergie	:	Q4 = 0,4	103 cm ² for 100 m ²	Tested

These levels need special care in the construction process.
Frequently raised in the reviews and presentations as an hurdle.

Trend : the tests increase the levels :

The measured values are often 30% under the requirement after a certain period of learning.

Track for regulations ?

Mechanical ventilation is required :

Passivhaus : Supply and exhaust with heat recovery compulsory
minimum 75 % efficiency

Minergie P : Supply and exhaust with or without heat recovery, with or
without heat pump
Mechanical exhaust only with or without heat pump
Centralized or decentralized systems (room/room)
Automatic windows

Effinergie : Full DCV (Hygro B)
Supply and exhaust with heat recovery with minimum
75 % efficiency
The airtightness of ducting shall be measured.

One size fits all ?

Overheating
Orientation
Sun protection

...

But also
ventilation :
building size,
surroundings,
owner/tenant,

...



Example in France (about a NZEB school, 2017) :

When a teacher is complaining about too low temperature on Monday mornings, the architect's answer is « In the « passiv+ » the occupants are part of the heating of the building. All of us are small radiators, so, on Monday mornings, the temperature is not high because of week-end and empty building » ...

Not a very good answer ... but can be true :

the occupants can have a large impact on the final result (comfort, energy) and they should be aware of it.

But, for massification, systems should help users and handle most of issues.

Educated user or/and Building management system to provide good level of confort and energy efficiency.

Still missing :

- How the occupants use their ventilation system ?
- What do the occupants want from their ventilation system ?
- Which level of control from the occupants to the system ?
- Which level of information from the system to the occupants ?
- Who is a standard occupant ? Which deviation ?

These questions are really crucial for manufacturers, prescribers, users themselves to propose what is necessary and sufficient for mass products.

How to increase awareness of occupants to their ventilation system ?
How can we modelize the user behaviour ? (can we ?)

European project ?

EPBD 2010 (2018)

Article 9

Nearly zero-energy buildings

1. Member States shall ensure that:

- (a) by 31 December 2020, all new buildings are nearly zero- energy buildings; and
- (b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings.

Member States shall draw up national plans for increasing the number of nearly zero-energy buildings. These national plans may include targets differentiated according to the category of building.

EPBD

National Regulations,
Passivhaus, Minergie, Effinergie, ...

Clear trend on low energy buildings, even « positive energy » buildings.
Involves high level of airtightness of the building as a must.

Ventilation is needed, with good products, good system design, good installation,
handing over and good maintenance.

YES : “Quality ventilation is the key to achieving low energy healthy buildings”

YES : “Educated user is the key for healthy life in a low energy building”



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