

Nearly Zero Energy buildings in France

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Nearly zero energy buildings

■ Regulation for new buildings

Shared goals between French regulation and EPDB

- ✓ Improving **new** buildings energy efficiency through making NZEB mandatory since 2012
- ✓ Along with paying attention to a balanced energy mix frame
- ✓ Restricting air conditioning use
- ✓ Stimulating renewable energies resort

✓ Legislative background

Objectives set by the Energy Performance for Buildings European Directive and by two structuring national laws:

- ✓ EPBD 2010: Spread of Near Zero Energy Buildings »=> 2012 thermal regulation, « RT 2012 »
- ✓ 3rd August 2009 Law (« Grenelle I ») : defining France environmental objectives, field by field
- ✓ 12th July 2010 Law (« Grenelle II ») : stating practical measures from Grenelle I general objectives

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■ Three performance requirements...

- Requirement of minimum energy demand of building : « bioclimatic demand » threshold:

$$B_{bio} < B_{bio_{max}}$$

3 uses (heating, cooling et lighting)

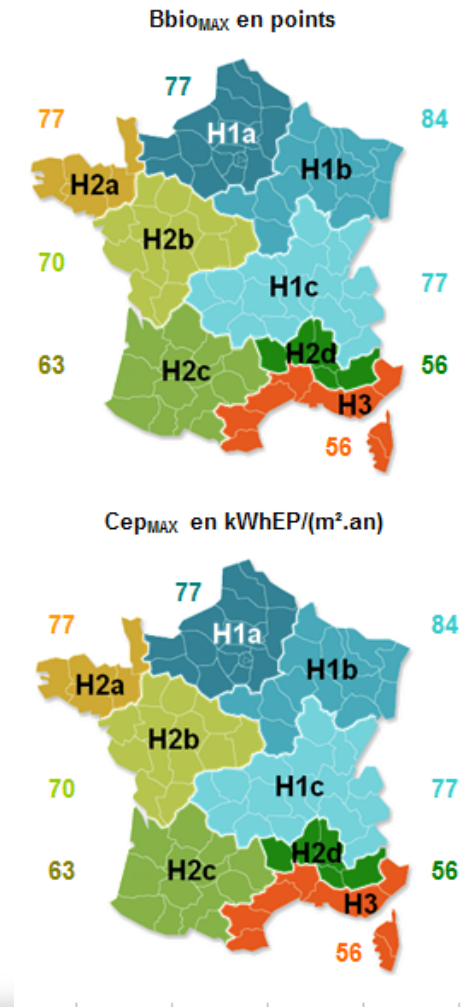
- Requirement of maximum energy consumption :

$$C_{pe} < C_{pe_{max}}$$

Requirement of maximum primary energy consumption
(mean value goal of 50 kWh_{pe}/(m².year))

5 uses taken into account (heating, domestic hot water, cooling, lighting, other uses (ventilation, pumps))

- Requirement for summer confort : « Tic < Tic_{ref} »



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■ ...Along with a couple of mean requirements

- **Renewable energies** integration :
 - Mandatory for individual houses
- **Lighting Optimisation** :
 - Provision for lighting control in corridors, shared indoor areas and car parks
- Guaranteeing **application quality** :
 - Thermal bridges treatment
 - Airtightness treatment



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Renewables

- Renewable energy definition in the Energy Code

L.211-2 « Renewable energy sources are wind, solar, geothermal, aerothermal, hydrothermal, marine and hydraulic energies, along with the energy derived from biomass, tip gas, water treatment plant gas and biogas. »

- Mandatory requirements :
 - For individual houses, compulsory resort to renewable energies
 - For collective housing, no obligation: due to complex application leading to excessive cost



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■ Integration in the regulatory calculation methodology

- The amount of renewable energy in the calculation method depends on each kind of renewable
- By and large it is taken into account in the energy balance as followed:
 - By decreasing the energy needs (thermal solar)
Corresponding to a zero primary energy factor
 - In the calculation of the energy consumption (geothermal)
Taking the heat-pump efficiency into account (COP)
 - By subtracting primary electricity production to energy consumptions (photovoltaic panels)

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■ Integration in the regulatory method

District heating including renewables and biomass:

- The thresholds are adapted (district heating, biomass)

$$M_{eGES} = \frac{M_{eGESchaud} + M_{eGESfroid}}{2}$$

où :

❖ 10 to 30 % less for heating networks, depending on greenhouse gas emission

❖ 30 % less for wood

Contenu CO ₂ des réseaux de chaleur en g/kWh				
	Contenu CO ₂ ≤ 50	50 ≤ contenu CO ₂ ≤ 100	100 ≤ contenu CO ₂ ≤ 150	Contenu CO ₂ ≥ 150
M _{eGESchaud}	0,3	0,2	0,1	0
Contenu CO ₂ des réseaux de froid en g/kWh				
	Contenu CO ₂ ≤ 50	50 ≤ contenu CO ₂ ≤ 100	100 ≤ contenu CO ₂ ≤ 150	Contenu CO ₂ ≥ 150
M _{eGESfroid}	0,3	0,2	0,1	0

- In the 2012 Thermal Regulation, only district heating allow resource sharing at the district scale

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■ Regulation evolutions prospect

- Considering to spread the mandatory resort to renewable energies, depending on the cost-optimality
- Towards sharing renewable sources at the district scale, or more
- These topics will be addressed in the next regulation development



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■ Future steps of thermal regulation in France

In the current bill « Transition énergétique » (being examined by the Parliament) , several provisions are planned:

- In new public buildings energy production should exceed energy consumption
- In the calculations renewables should be considered at the level of the district : on site, nearby, and even distant
- CO₂ is going to be taken into account in the future calculations (probably in 2018)

A wide reflexion among the stakeholders has just been launched in order to provide an « environmental label » of the building (energy, CO₂, waste, water)



Thank you for your attention