Buildings:
a huge potential for energy savings in France

France's Climate Plan Seminar – 20th November 2017

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2. Overview of buildings in France

The issue of energy in housing/tertiary

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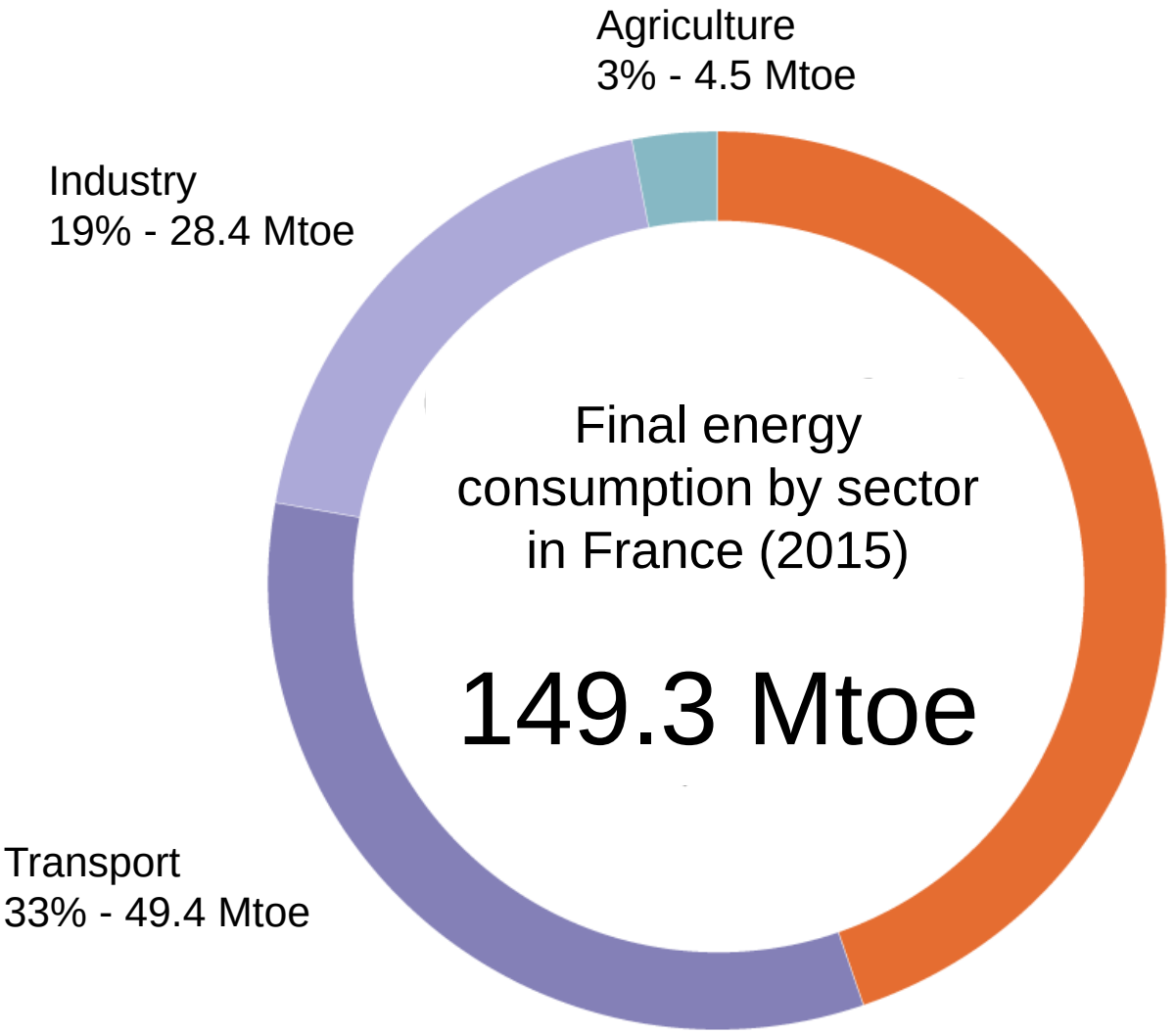
Housing/tertiary : first sector for energy consumption in France

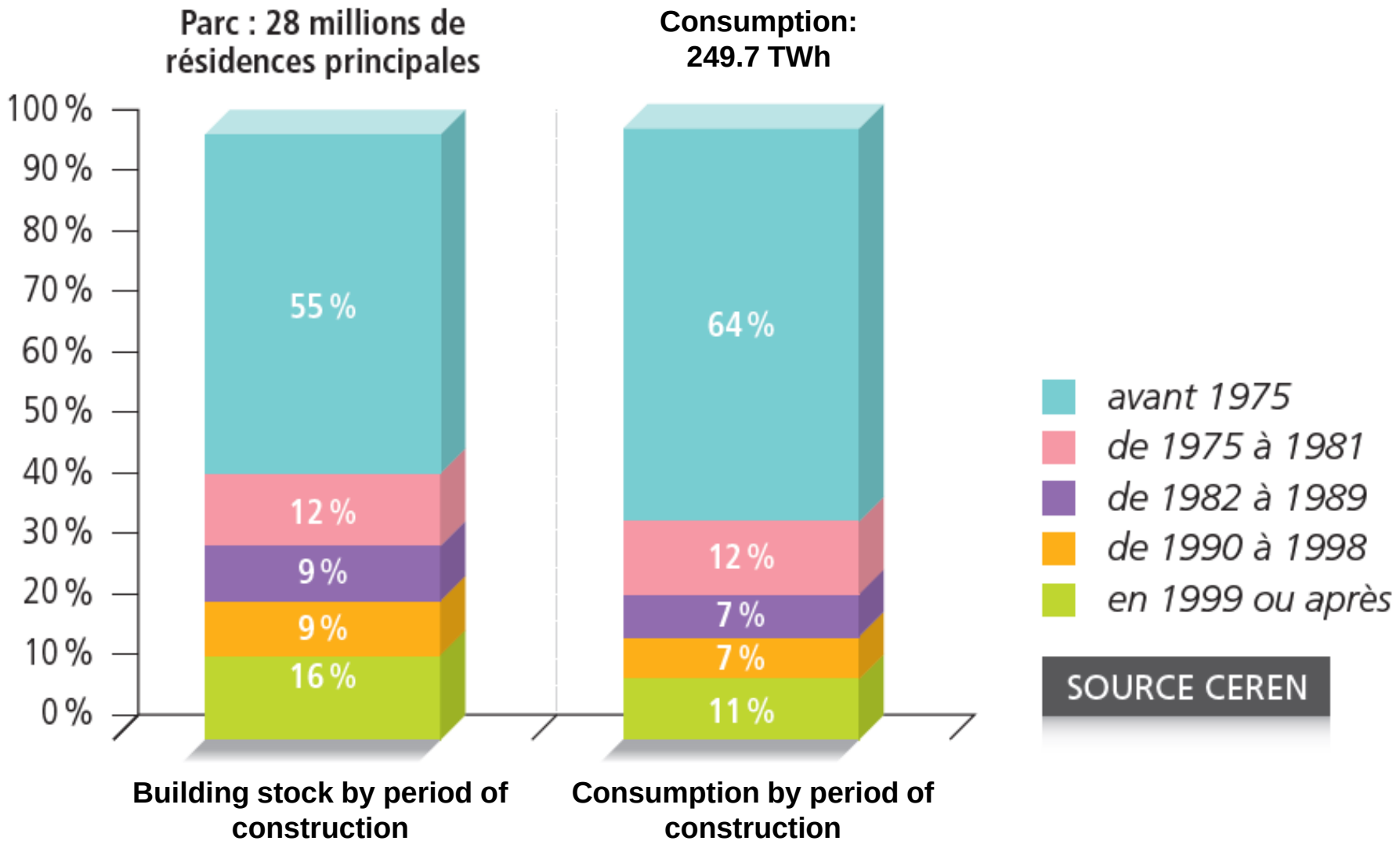


Residential - Tertiary
45% - 67 Mtoe

Source : Ministère de l'Environnement, de l'Énergie et de la Mer

* Consommation corrigée des variations climatiques.

28 millions main housing units,
most are 40+ years old



Heat: 50% of energy consumption of French buildings

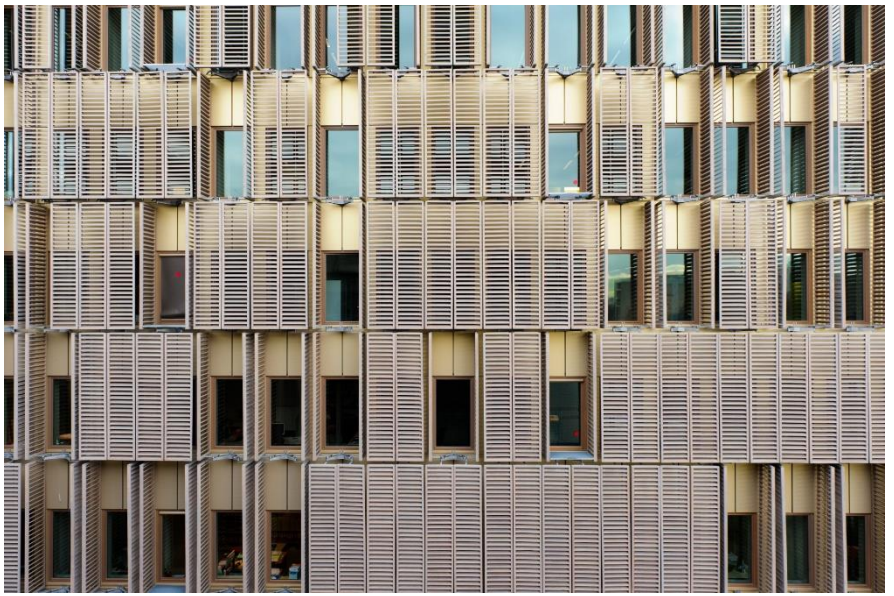
- Can reach 75% depending on building characteristics
- Energy consumption depends a lot on the period of construction :
  - Built before 1948 (10 million units) : 250 kWh/m²/year
  - Built between 1948 and 1975 (10 million units) : **400 to 900 kWh/m²/year**
  - Built after 1975 (10 millions units) : 150 kWh/m²/year
- Energy mix for heat production in buildings : mainly gas, electricity, oil

Building sector is a priority target of the Energy Transition Act (2015)

Combination of two approaches :

Renovation of existing building stock (energy renovation will be made mandatory before 2030)

High energy performances for new constructions (reinforcement of mandatory level of energy efficiency)



2. High energy performances for new constructions

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Mandatory level of energy performance, since 1975

- Since 1975, the « Thermal Regulation » (RT) limits the amount of energy (per m² per year) a new building is allowed to consume
- Efforts mainly focus on the building's envelope (quality of thermal insulation)

Next step : 2020 regulation
Energy and carbon neutrality

Low energy buildings :

- Lower consumption of non-renewable energy
- Development of efficient solutions (insulation, heating systems…)
- Production of renewable energy and exportation towards the network

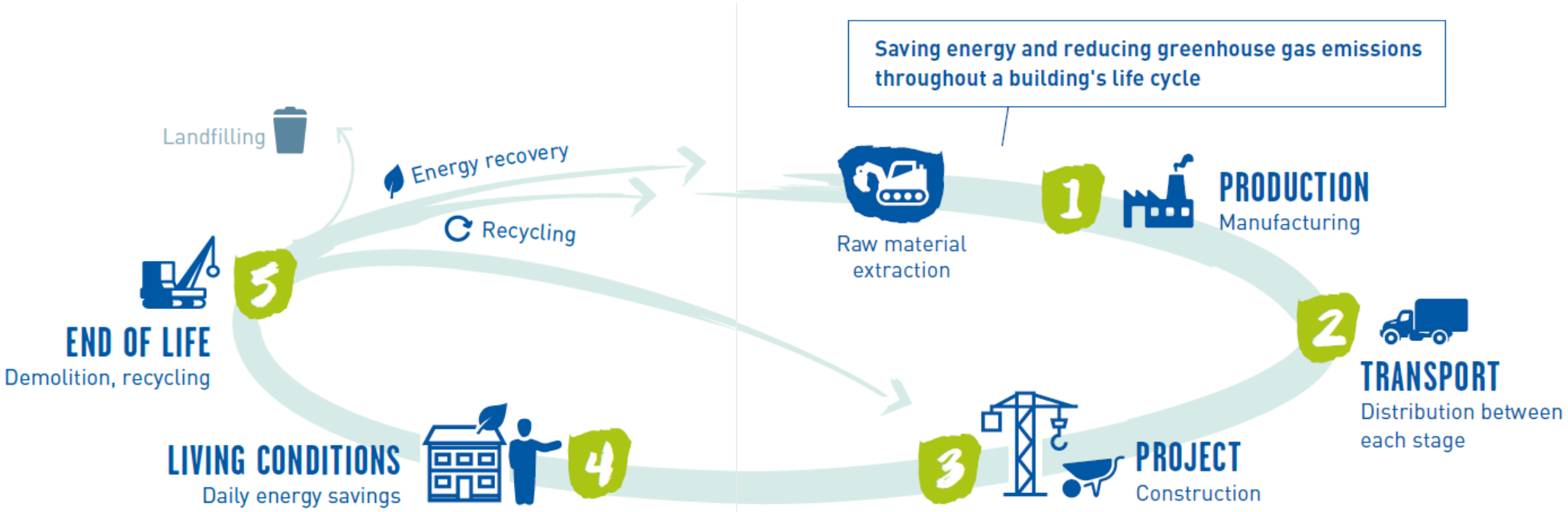
Low carbon buildings :

- Reduction of GHG emissions on the whole life cycle of the building
- Research of optimal balance between the impacts of construction products/devices and energy impacts

A challenge for innovation and skills improvement in the building sector

Lifecycle analysis
Construction sector meets circular economy

- Previous Thermal Regulations only considered the energy consumed by daily usage of the building
- The new regulation will consider the whole cycle, from raw material extraction to demolition and recycling



Involvement of all stakeholders
Technical baseline, experimentation, label

- A **technical baseline** (rules for calculations) has been established on a shared basis with a large panel of stakeholders (public and private)

- *In situ* **experimentations**
  - To assess the technical and economical feasibility of the performance levels (4 levels for energy, 2 for carbon)
  - To help developers anticipate the new regulation

- A **label** to reward the first buildings constructed under the new regulations (before it's mandatory)

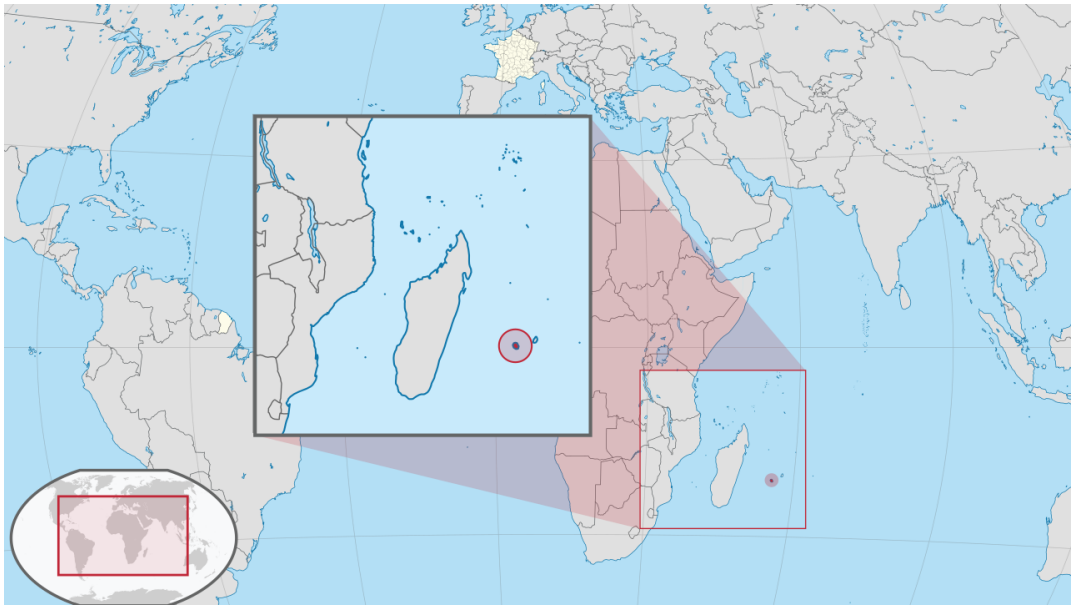
E+ C−
ÉNERGIE POSITIVE & RÉDUCTION CARBONE

- Example -
Positive Energy Lecture Theatre

Lecture Theatre of the University of La Réunion (overseas region)

- **Bioclimatic design**: sunlight protection, natural air ventilation → No need for air conditioning

- Rooftop **solar panels** allow the building to produce 7 times more energy than it consumes



3. Renovation of existing building stock

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The problem : climate can not wait for new buildings to replace the old ones

240 kWh/m²/year

Average energy consumption of existing building stock : (5 times more than constructions built after RT2012)

7 millions

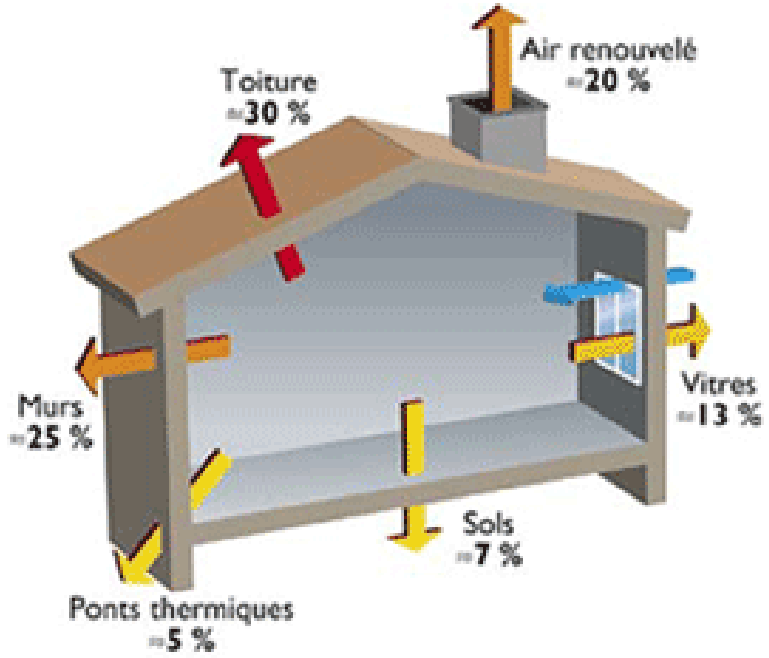
Buildings with very bad thermal insulation

1-2%

Rate of renewal of building stock

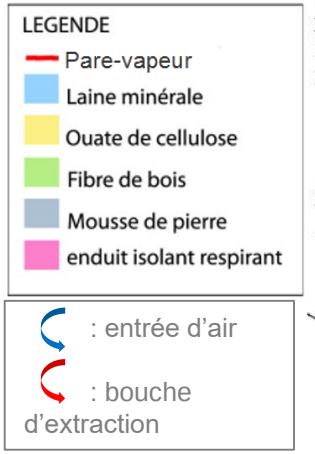
How do we act on old buildings?

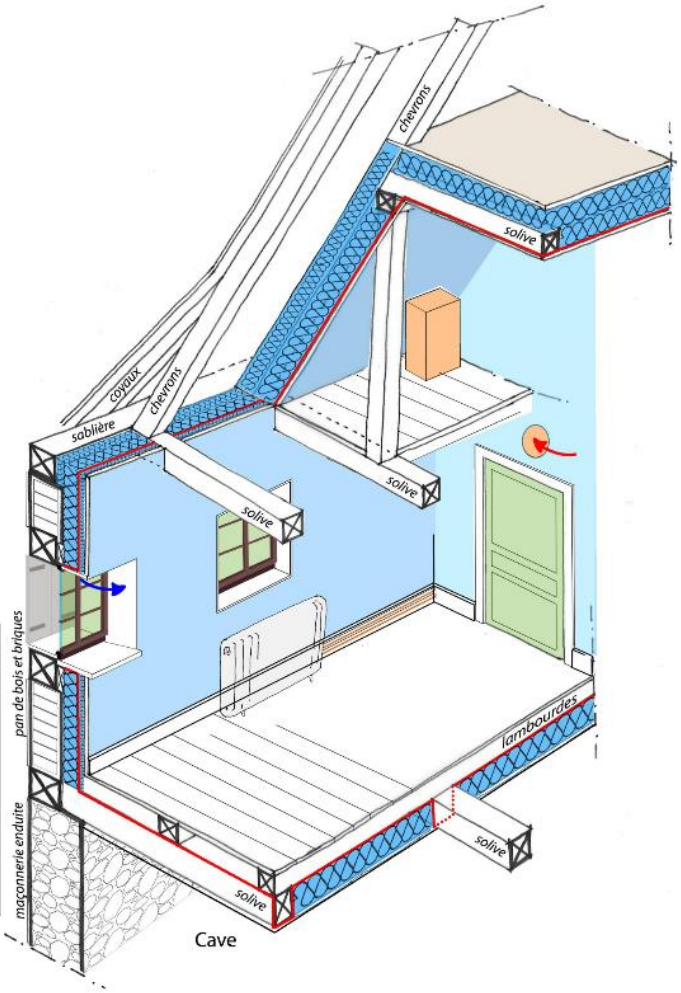
Main technical measure: insulation



Pertes de chaleur d'une maison individuelle non isolée

[Source : Rénover sans se tromper, guide ADEME, 2008]



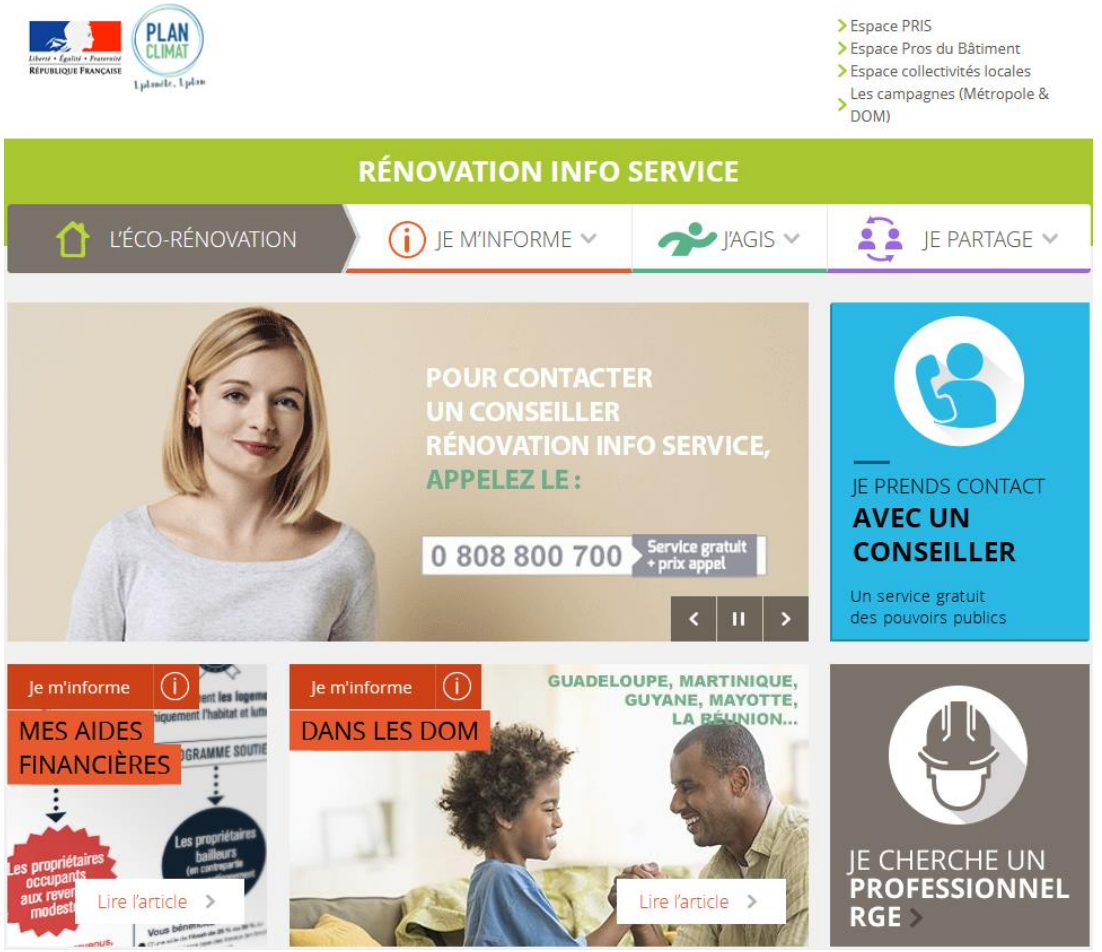


Crédit dessin : DRAC et DREAL Alsace, issus de l'étude habitat ancien en Alsace disponible en ligne

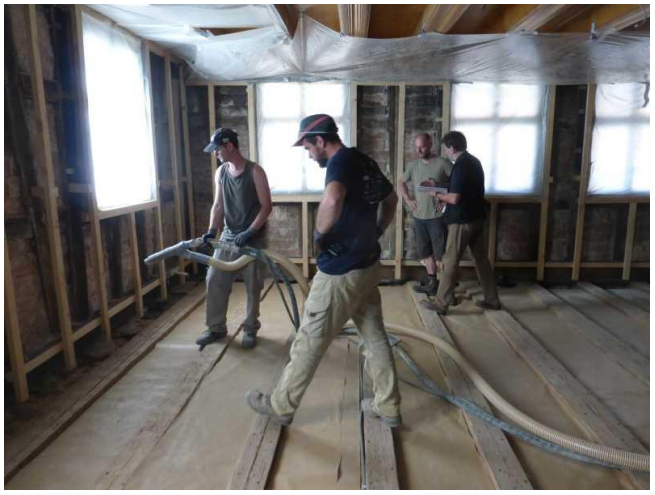
How do we act on old buildings?

Technical and financial support to voluntary action

- **Guidelines and norms** for quality of thermal renovation of old buildings
- **Subsidies / Tax reduction** for thermal insulation, energy efficient systems…
- **“Rénovation Info Service” : hotline and website** for general public
- National and local governments working with their **public developers**



- Example –
A traditional timber-framing house turned into low-energy house



Energy consumption :

- Before : 352 kWhEP/m²/year
- After : 94 kWhEP/m²/year

What has been done :

- Initial diagnosis of the whole building
- Restoration of degraded parts
- Full treatment of thermal envelope
- Installation of wood boiler and heat-recovery ventilation system
- **Cost :** 440 €/m²

4. International cooperation

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Global Alliance for Buildings and Construction

- Launched by France at COP21 with 20 countries (including Japan), 8 major groups and 50 organizations
- International cooperation for construction sector’s contribution to climate action and low-carbon society development
- Official website : **www.globalabc.org**

Contact :

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