



# Energy renovation of buildings

## Executive summary

**B**uildings account for one-fourth of greenhouse gas emissions in France, half of total energy consumption, and over €15 billion in gas and oil imports annually. While new construction is energy-efficient, most existing buildings have high energy consumption levels, and the building stock renewal rate is only 0.1% per year<sup>1</sup>.

Renovation of existing buildings is not imposed by climate change alone.

The preservation of the built environment, the country's trade balance and national debt, employment and social

benefits, comfort, poverty and precarious housing conditions, and a great many other factors are all impacted by energy-efficiency renovation.

This notwithstanding, French legislation and regulations make little mention of energy renovation of existing buildings, and in particular single-family homes and small buildings. Energy improvement measures are rarely undertaken spontaneously: an estimated 10,000 per year upgrading units to energy classes A or B<sup>2</sup>. The State disburses about €1 billion<sup>3</sup> in subsidies for energy renovation annually, but the efficacy of this aid is subject to debate.

### KEY PRINCIPLES

Public action in this domain must be thoroughly rethought, in order to determine a fair and balanced articulation of the following principles:

- **Long-term visibility for actors in the field and a stable public policy framework.** The buildings sector operates over long time frames, for investment, construction work, revision of regulations. All actors – professionals, industrial companies, property owners, tenants, etc. – must have the capacity to anticipate and prepare for changes.
- **Finding the best level of investment.** Building refurbishment should be guided by an optimal ratio of costs to benefits, in order to avoid excess investment in certain buildings. But once the ratio is determined, the investment should be fully and not just partially exploited.
- **Reducing energy needs for heating buildings.** Thermal losses in buildings are determined above all by the energy performance of

the building envelope (walls, roof, doors and windows, ventilation, etc.). The global renovation project should follow the principle of reducing energy needs. To achieve a high level of energy performance, active and passive systems must be addressed in a coordinated manner.

### PROPOSALS

Based on these principles, we propose a comprehensive cross-sectoral program outlined in six proposals that should be pursued jointly to attain the objective.

#### 1. 2013 – 2050: Renovation of existing building stock via a progressive compliance timetable

A strong, long-term and massive impetus for energy improvements must be built on two inseparable components: regulatory signals that guide owners' thinking and decision-making, and an energy upgrade reflex for all building improvements. Our proposal is to institute regulatory compliance requirements for housing units that change ownership, starting with the least

energy-efficient units (allowing five years between adoption of the regulations and the first year of application), and then progressively applying the requirements to more energy-efficient housing, so that after a few decades, in 2050, all housing stock has been upgraded to the highest achievable level (Class B or C of the current Diagnostic de Performance Énergétique or DPE scale).

Renovation work could of course be carried out in stages. The aim of this program is to encourage home owners to anticipate the deadline for compliance. With 3 million energy conservation measures taken each year, heating energy consumption for households could start a steep decline.

#### 2. Update energy performance regulations for existing buildings

Current regulations are not stringent enough.

We propose to bolster these requirements, and extend them to all types of housing (single-family homes, condominiums, privately and publicly owned multifamily dwellings,

1- New construction constitutes 1% of building stock, but only 10% of new buildings replace an older building that is demolished.

2- Data from Effinergie BBC Renovation.

3- Figures as of October 2012.

institutional properties, subsidized housing). We have drawn up criteria specifying the scope of application of these energy performance regulations (energy characteristics of the property, sale, energy audit, etc.).

### 3. Reallocating public funds and triggering stable long-term funding mechanisms

Financial aid must be allocated to make up for the fact that energy retrofitting is imperative for the community, but not cost-effective for property owners at current energy price levels.

Currently France devotes about €1 billion in public funds to finance refurbishment measures that at present constitute a windfall benefit for owners, or have little impact on building energy performance.

We believe that public subsidies should be redeployed to trigger broader funding mechanisms for projects with confirmed environmental benefits, not those that are already in themselves profitable for property owners.

### 4. Structuring service offers and bringing construction trades up to speed

Property owners will automatically consider energy-efficiency improvements when attractive service offers are made by artisans and professionals in building trades (plumbers, heating specialists, electricians, roofers, carpenters, etc.). To spare individual property owners, who often lack the time and necessary qualifications, the task of supervising improvement projects, artisans should form groups of skilled trades to offer packages comprising all the work to be done, with a single interlocutor for the customer.

After appropriate training these groups will be qualified and certified, to provide assurance to consumers.

Public funding will be limited to projects employing these groups of artisans. If subsidies are granted, random post-retrofit inspections will be conducted to verify that the builders'

work complies with best practices and to ascertain actual building performance.

To prevent abuses we propose that an observatory be created to track the costs of materials and techniques employed. A major communication campaign aimed at consumers must be undertaken to build an image for the trade of "energy-efficiency renovator" in the eyes of the general public.

### 5. Accompanying households

As with other national causes, we suggest that a massive campaign be deployed to inform and teach the public. Consumers also need a single contact point for information and financial aid, offering the same services everywhere in France.

Specific measures must be devised to address the issues of buildings occupied by energy-poor residents (owners or tenants), instead of using these situations as an excuse for inaction.

An "Energy Renovation Passport" for housing units will be created to reinforce the DPE mechanism. This document, established by qualified professionals, will enumerate predetermined combinations of energy improvement tasks to be carried out, and register work done stage by stage, creating a building record to facilitate future work.

This document will follow the building throughout its life.

### 6. Adopting tools for measurement, statistics and analysis

It is difficult to cross-analyze building energy performance and occupants' socioeconomic characteristics using currently available statistical data on housing stock; this impedes the development of targeted and efficient policies. We propose to remedy this situation by creating the appropriate measurement tools, or by combining existing tools to obtain the full range of data needed to track the impacts of the plan and implement changes if necessary.

## EXPECTED BENEFITS

We have evaluated the macro impact of our program in light of the current context, i.e. in the absence of a strong and long-term public policy framework.

Given the program's time frame (37 years) and the principle of systematic energy improvements, the investments required for the desired transformation can be spread out over the entire period. The total cost (investment + energy bills + maintenance) comes to €40 billion per year for households (single-family homes). Our proposals induce an added cost of about €1 billion per year between 2025 and 2030, and engender savings from 2030 to 2050.

For the single-family-home sector, and up to 2050, we estimate the following savings for households and for the community as a whole:

- 115 TWh in energy savings.
- a significantly lower percentage of households forced to restrict their energy consumption (23% in 2010, 29% in our reference scenario, 1% in 2050 under the TSP scenario).
- sharp reduction in CO2 emissions (25Mt).
- lower household energy bills in 2050 (+25% in the reference scenario, -10% under the TSP scenario).
- 30,000 jobs created in direct and indirect employment over 15 years and maintained for the period 2030-2050.

### AUTHORSHIP AND CONTACTS FOR FURTHER INFORMATION

The analysis given here was conducted between September 2012 and May 2013; it is the fruit of collaborative thinking.

Brice Mallié coordinated the elaboration of these proposals, with assistance from Pauline Lehoux and Laure Haffner, project aides. Jean-Marc Jancovici and Cédric Ringenbach, respectively chairman and director of The Shift Project, were closely involved in this work.

To communicate with this team or obtain more information on this report, please contact Cédric Ringenbach - Tel.: + 33 (0)6 07 13 52 96  
Brice Mallié - Tel.: + 33 (0) 6 23 04 09 70  
Communication/Information - [communication@theshiftproject.org](mailto:communication@theshiftproject.org) -  
Tel. : + 33 (0)1 76 21 10 20