

BUILD UP SKILLS



January 2013



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Futher information

More details on BUILD UP Skills can be found at www.buildupskills.eu

More details on the IEE programme can be found at <http://ec.europa.eu/intelligentenergy>

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SUMMARY OF THE CURRENT SITUATION

BACKGROUND AND METHODOLOGY

Each of the 30 countries involved in the Build Up Skills (BUS) programme need to make an "inventory" of the building sector and of the policies implemented to improve energy efficiency in this sector as well as the skills levels of on-site construction workers and craftsmen. This should be done using an indicative plan based on the following main themes:

- Characteristics of the construction sector in France.
- National policies and strategies concerning energy in buildings.
- Statistics on the construction and energy sector.
- Current training programmes.
- Skills requirements to meet the goals with respect to sustainable development and energy efficiency up to the year 2020.
- Difficulties and constraints to be taken into account to meet the 2020 goals.

The AFPA has performed this "inventory" using more than one hundred studies and reports that have been submitted by the various bodies sitting on the steering committee.

This inventory was presented to the coordination platform of the project, which brings together the organisations involved in BUS, and it will be presented again during the inter-regional meetings in order to stimulate the debate prior to the development of the "roadmap".

SUMMARY OF THE CONTENTS OF THE REPORT

Characteristics of the construction industry in France/Statistics on the construction and energy sector

The market

The sector is characterised by a significant amount of old stock: of 30 million housing units, 65% were built before 1975. The average replacement rate is 1%.

The sector, which grew strongly in the 2000-2008 period, has experienced a downturn since 2009. Its pre-tax turnover in 2011 came to 129 billion euros, broken down as follows:

	New construction	Renovation/maintenance	Total
Housing	€37 billion	€42 billion	€79 billion
Excluding housing	€21 billion	€29 billion	€50 billion
Total	€58 billion (45%)	€71 billion (55%)	€129 billion (100%)

In the context of this downturn, the market for energy renovation and renewable energy is up about 50% from 2006, and in 2012 reached (source ADEME):

	€billion
Activities on buildings	10.36
Ventilation, heating control systems	0.43
Heating	1.77
Renewable energy (EnR) equipment and installation	5.62

Another indicator confirming this growth: the share of work to improve the energy performance of dwellings (“APEL”) in the overall turnover of the craftsmen’s building share (new and renovation) rose from 8% in the third quarter of 2010 to 10% in the third quarter of 2012 (source: CAPEB, which however notes that “this might run out of steam”).

The companies

The **431,091 companies** in the building sector in 2010 break down as follows, based on their workforce (source: SIRENE):

	Number of companies
With no employees	251,819
With 1 to 9 employees	154,139
Sub-total very small SMEs	405,958
With 10 to 19 employees	16,024
20 employees or more	9,109

Building site staff (BUS target)

- **The 634,273 workers** employed in the building sector in 2010 had the following characteristics (various sources):

Category	Low-skilled workers	42%
	Skilled workers	34%
	Specialist workers and foremen	24%
Main jobs	Mason	28%
	Electrician	13%
	Painter	11%
	Carpenter	11%
	Plumber	6%
	Rofer	5%

Gender	1.6% of the workers are women
Average seniority	7 years (54% have 5 yrs or more seniority)
Average age	36 yrs (30% are under 30)
Type of company	41% work in a company with fewer than 10 employees

- Approximately **246,000 temporary workers** completed at least one temporary assignment in construction in 2010 - with 1.65 million job contracts lasting an average of 2.6 weeks.
- **The 363,000 craftsmen** and heads in companies with fewer than 10 workers have an average age of 43.9.
 - ✓ Most have a **level V qualification**.

People entering the sector

- Approximately 150,000 people enter the building sector each year (estimated by the Comité de filière "métiers du bâtiment" (network committee of building trades). 2009).

Energy consumption

- 44% of national final energy consumption in 2007 was from buildings (which the same year generated nearly a quarter of CO2 emissions).
- **Consumption increased by 42%** (between 1970 and 2007), mainly because of the increase of housing stock, improved comfort and the rise of new, high-consumption needs (appliances, air conditioning, etc.), despite **a decline in average residential unit consumption of 41%** (between 1973 and 2005). This decrease was primarily the result of progress in the field of energy savings and because of thermal regulations set for new housing.

Reducing the sector's overall energy bill will mainly involve the **renovation of existing buildings**, with a target of reducing consumption by 38% in existing stock by the year 2020.

The priority is therefore the **16.1 million dwellings constructed before 1975** with an average consumption of **328 kWh/m²/year** and the 800,000 social housing units (among the 4.2 million to renovate) with a consumption of more than **230kWh/m²/year**, in order to bring these down to **90 to 150 kWh/m²/year**.
- The share of renewable sources in primary energy consumption in 2010 was 8.4%.

National policies and strategies

Objectives

Objectives set by the Grenelle de l'environnement' (environmental forum)

- Renovation of 400,000 dwellings per year and of 800,000 dwellings by 2020.
- Energy renovation of public buildings.
- Generalisation of low-energy buildings (2013), then positive-energy buildings (2020).
- 23% of energy produced from renewable resources in 2020.

Targets set by the first “Conference for an energy transition” (September 2012)

- Upgrade to energy standards every year of:
 - ✓ 500,000 existing dwellings.
 - ✓ 500,000 new dwellings.

Construction "Roadmap" for 2012-2017: four components

- Reorganising the methods of financing energy efficiency.
- Identifying the poorest households and proposing projects tailored to their needs.
- Establishing regional platforms based on a “one-stop shop” approach.
- Organising the training of the workforce and building up its skills.

Measures and programmes

- **Regulatory requirements:** 2012 Thermal regulations (RT 2012), Energy efficiency diagnosis (DPE), Carbon assessment, Energy savings certificate (ESC).
- **Fiscal and financial incentives:** tax credits, ECO zero-interest loans, the “Live better” programme from the national agency for housing (ANAH), local-authority subsidies, etc.
- **Programmes to support the workforce:**
 - ✓ **Innovation:** Programme for research and experimentation in energy for buildings (PREBAT).
 - ✓ **Support:** programmes on Grenelle de l'environnement (environmental forum) trade practices (RAGE), with the goals of:
 - Identifying and developing reliable key technologies in the field of energy performance.
 - Providing methods to evaluate energy performance.
 - Updating the trade practices in force and proposing new rules, especially for insulation work.
 - Revising the standards for initial and continuing training.
 - Disseminating information on a dedicated website

- **Accreditation and certification systems:**
 - ✓ Labels.
 - ✓ Certifications.
 - ✓ “Reconnu Grenelle environnement” [RGE - Recognised by the Grenelle Environnement” (environmental forum)] label.
 - ✓ ...Toward the generalisation of “éco-conditionnalité [‘eco’ cross-compliance]”.
- **Various training initiatives:**
 - ✓ PRAXIBAT®, FEE Bat, etc.

Current training programmes

Organisations involved in training for the building sector

- **Initial training**

With National Education status

40,000 graduates in 2011 (including apprentices)

Apprenticeship

CCCA BTP (103 centres)

67,000 young people in training in 2010/2011

AOCDTF (50 centres)

6,000 young people in apprenticeships (annual average)

UNMFREO

- **C
ontinuing training**

AFPA

(118 campuses)

57,000 adults trained in 2011

GRETA

(200 specialised high schools)

5,200 graduates in 2011

FNCMB

Independent training organisations that may or may not be affiliated with a federation also exist.

Quantitative data on training

	No. of trainees	Average length of training	Spending incurred (million euros)
Craftsmen - technical training (2010)	26,141	18 hrs	15
Workers (2010)	114,442	31 hrs	127

Qualitative data on training programmes

- An abundance of supply (hundreds, even over a thousand) for building craftsmen and workers.
- Unequal treatment of topics, with heating and thermal energy coming first and insulation second.
- Dominance of short-term activity, with a very abundant supply.
- Very many training organisations, of every size, in a very open market.

Training programmes in energy efficiency and renewable energy.

- **FEE Bat:**

A cumulative total of 47,750 students was recorded in September 2012 (a trainee who attended several modules is counted more than once).

Within this total, 19,000 people attended module 1, some of whom then followed other modules.

- **Qualit'EnR:**

The French association for the quality installation of renewable energy systems (Qualit'EnR) manages quality programmes and quality-related regulations (Qualisol, Quali PV, Qualibois and Qualipac).

To facilitate business access to qualifications, Qualit'EnR has organised continuing training and set up a set of measures to ensure the level of skills of installers, with "generic" training standards. Training is provided by nearly **150 training centres** that are approved by Qualit'EnR and by industry heads who have committed to a quality charter managed by Qualit'EnR.

530 trainers were "approved" at end 2011, after several days of mandatory training followed by a written and oral exam (success rate: 59%).

The seven training benchmarks set by Qualit'EnR (at end 2010) included:

- ✓ Individual solar water heaters/3 days (1 in practical training).
- ✓ Combined solar heating/3 days.
- ✓ Independent wood system/2 days (0.5 in practical training).
- ✓ Wood system connected to hydraulic network/3 days (0.5 in practical training).
- ✓ Photovoltaic installation - electrical skills/3 days (1 in practical training).
- ✓ Photovoltaic installation - integration into building construction/2 days (0.5 in practical training).
- ✓ Heat pump installation/5 days (including practical work).

Overall, 45,000 students were trained from 2006 to 2012 (including about 5,000 in 2012 as the report was being written).

■ **PRAXIBAT®:**

The purpose of the PRAXIBAT® programme, initiated by ADEME, is to integrate "learning by doing" into training.

From this perspective, PRAXIBAT® provides all the apprentices "hands-on educational platforms" in the following technological fields:

- ✓ Energy performance of opaque walls - including airtightness.
- ✓ Renewal of air supply (ventilation).
- ✓ Efficient high-performance lighting.
- ✓ Renewable energy (wood energy, solar photovoltaic, heat pumps).

The places intended to host these platforms are those involved in initial or continuing training (technical and vocational schools, CFA building, AFPA centres, public and private continuing training organisations).

The challenge is to cover the country as well as possible with the assistance of the Conseil régionaux [regional councils].

In addition, two educational kits were developed in 2012 (one on opaque wall insulation, the other on ventilation).

■ **The training delivered by professionals in industry:**

Manufacturers and materials suppliers organise training for their products. These courses are very popular. According to the report of the network committee of building trades, these represent (2008 figures - estimate):

- ✓ For the Industrial Technical Centres (CTI), 8 million euros in expenditures on training customers and partners.
- ✓ For the Centres for Industrial Training (CFI), 44 million euros.

Signs of quality recognition

- There are three levels of commitment that are differentiated by the process of verifying the fulfilment of the commitment:
 - ✓ The label or designation is a commitment based on a statement.
 - ✓ The qualification reflects a commitment described in a standard and verified by a third party that may be accredited by the COFRAC.
 - ✓ Certification is the strongest commitment: it is verified by a certification body accredited by the COFRAC, which conducts on-site audits.
- The signs of recognition can pertain to:
 - ✓ The skills of the company (in the form of labels, qualifications or certifications).
 - ✓ The skills of individuals (qualification or certification).
- The "Reconnu Grenelle de l'environnement" [provisional name] label takes into account a set of signs of quality recognition. This is a first step towards the principle of "eco" cross-compliance for energy efficiency work in the building industry (implementation planned for 2014).

Skills requirements to meet the goals with respect to sustainable development and energy efficiency up to the year 2020.

Quantitative data

The estimate of **annual needs** for training in the building industry made in December 2009 in the report of the network committee of building trades gives the following figures:

	Annual training needs in number of participants to train
Entrepreneurs, employees and craftsmen in the sector	130,000
New annual entrants into the sector following retraining	100,000
Sub-total continuing training	230,000
Young people entering the sector each year	50,000
Annual flow linked to the Grenelle (environmental forum) activity supplement	20,000
Sub-total initial training	70,000

Qualitative data

There are two kinds of needs for blue-collar skills:

- **“Transverse” skills:**
 - ✓ Common culture in the global approach to construction.
 - ✓ Know how to work together.
 - ✓ Importance of quality in the work.
 - ✓ Rigorous self-inspection.

Craftsmen also have needs for skills with respect to advising their customers, choosing and developing their positioning, etc..

- **Skills by type of job:**
Examples for masonry jobs and structural works (including roofers-façade specialists):

Ongoing or desired developments	Skills to develop or new skills
<ul style="list-style-type: none"> - Requirements in terms of safety, wall and grout pockets, quality of surfacings. - New materials and construction techniques. - External insulation. - Technique of thin joints (alveolar clay brick). 	<ul style="list-style-type: none"> - Taking into account the phenomena of thermal exchanges in a building. - Taking into account the principles of the migration of water vapour in the walls. - Mastering the estimate of take-off quantities and the measurement tools. - Mastering the techniques for laying insulation. - Mastering the management of air tightness in connection with other trades.

The trainers and instructors

Quantitative data

(Cf. ADEME/CAFOC Nantes study)

In initial training		6,985
O/w	National Education	5,000
	Apprenticeships (estimation)	1,985

In continuing training		5,047
O/w	AFPA	1,217
	GRETA	223
	FCMB	107
	Other certifying training organisations	500
	Non-certifying training organisations	3,000

Total:	12,032
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Note:

The apprentice masters (about 3,700) also need to be taken into account, as well as the tutors.

Qualitative data: the need for trainers

(Cf. ADEME/CAFOC Nantes study)

- **30%** of the trainers who responded to the CAFOC survey say they are "sufficiently informed" about the Grenelle (environmental forum), and only **30%** rate their level of knowledge in the field of energy performance of buildings as "good".
- The **supply of teacher training** is described as very theoretical, hard to determine, poorly developed with respect to "working together" and weak in educational innovation.
- **6 basic recommendations** were identified:
 - ✓ Provide more information about the Grenelle (environmental forum).
 - ✓ Enable trainers to find their own positioning.
 - ✓ Mobilise intermediate-level personnel.
 - ✓ Make the global approach operational.
 - ✓ Developing the technical skills specific to each job.
 - ✓ Identify relevant sources of information.

Needs in pedagogical engineering

The need was evoked (CG Conseil study):

- For changes in pedagogical techniques.
- To promote practical simulations that enable several professions to intervene in a coordinated way on a job site.
- To promote case studies, practical experience, and on-site interventions.

Difficulties and constraints to be taken into account to meet the 2020 goals

These obstacles can be categorised as follows:

Human resources

- The number of qualified trainers is not sufficient.
- Building professions suffer from a lack of attractiveness: shortage of qualified labour.

The market

- Many companies consider the market not mature enough to encourage them to develop skills in the areas of energy renovation and renewable energy, with demand for work hampered by:
 - ✓ The development of the economic situation
 - Budget constraints.
 - A lack of information on the part of developers about regulations and subsidies.
 - The difficulty in co-ownership situations of obtaining agreement for work.
 - A lack of perspective for photovoltaic systems.

Legal and regulatory problems

- The legislation is complex.
- There are numerous texts and standards.
- “The global approach” runs up against obstacles (liability, insurance).

Access to training and to skills development programmes

Many craftsmen and employees have little time to undertake the development of their skills.

The supply of training

- There is a shortage of generally accessible offerings with regard to learning the technical gestures in situations.
- The courses offered are not always suitable for the given groups.
- There is insufficient support for on-the-job professionals after the training.
- The training organisations do not pool their offers and resources enough.

INTRODUCTION

UP TO THE YEAR 2020 FOR THE EUROPEAN UNION

“The horizon 2020” brings together a series of measures designed to promote research, innovation and competitiveness in Europe between 2014 and 2020. Launched in 2003 by the European Commission, the “Intelligent Energy Europe” programme (IEE) provides support for the EU’s energy efficiency policy in order to achieve Europe’s objectives for 2020, which include: reducing emissions of greenhouse gases by 20%, improving energy efficiency by 20% and reaching the 20% level for renewable energy in the EU’s energy consumption.

In this context, the IEE programme has launched a number of special initiatives intended to accelerate progress in these specific areas. The **Build Up Skills initiative** is one of these. It aims to improve the knowledge and skills of craftsmen and on-site construction workers more generally, by familiarising them with the new sustainable energy solutions to be integrated into buildings. Since 2011, funding has allowed the establishment of national platforms to coordinate the work to develop roadmaps for 2020 in most EU Member States. This work has continued in 2012, with the launch of the French project in particular.

To date, **all 27 Member States** and three associated States have implemented the “Build Up Skills” project.

THE IMPORTANCE OF BUILDING UP THE SKILLS OF ON-SITE CONSTRUCTION WORKERS AND CRAFTSMEN

Developing the skills of building workers and craftsmen represents a major challenge for France, both quantitatively and qualitatively. The **commitments made**, in terms of thermal renovation and the development of renewable energy, **imply the need for both mass training and setting ambitious quality goals for training** in the building sector.

From a quantitative point of view, first of all: with **nearly one million workers on construction sites**, France must carry out an unprecedented **mass training** programme. However, the current situation of training in the building sector is far from being up to the challenge, despite the favourable conditions for the application of the FEE Bat system.

From a qualitative point of view: the environmental targets involve setting **quality objectives** for the training so that they permit the **effective implementation of the new thermal regulations** (RT 2012), but also the **steady implementation of “Positive Energy Buildings”** (BEPOS).

THE BUILD UP SKILLS PROJECT IN FRANCE

France has already carried out some work intended to determine the training needs of construction craftsmen and workers at the national, regional and infraregional levels. A number of actions have already been undertaken to train these craftsmen. However, real barriers have been encountered to effectively reaching all of the building craftsmen and on-site construction workers.

This is why **in March 2012 France seized the opportunity created by the call for the Build Up Skills project to engage in further reflection on these issues so as to overcome the remaining obstacles.**

The **consortium** responsible for the project is structured around four organisations that provide **complementary skills**. These are:

- ADEME, which has competencies with respect to energy efficiency, renewable energies and training.
- The CSTB (Scientific and technical building centre) which brings its expertise in the development of skills, technologies and systems in the sector.
- The AFPA (National Association for Adult Vocational Training) with expertise in the continuing training of adults for many years.
- The ALLIANCE VILLES EMPLOI, which contributes, through its expertise and its regional network, to the mobilisation of local actors.

GOALS OF THE BUILD UP SKILLS PROJECT IN FRANCE

The **main goal** of the project is to **draw up a roadmap that will plan and schedule the various actions required up to 2020 to build up the skills of on-site construction workers** in the field of energy efficiency and renewable energy, but also of people seeking jobs in this sector. The roadmap must be approved by the decision-makers in continuing vocational training in the construction sector at the national, regional and local levels. It will address all the different ways of acquiring skills and will also deal with their content, the way they are organised, regulatory issues and the question of funding.

The project also aims to **enhance the dialogue between the different stakeholders** through its participatory and partnership approach. It must make it possible to give innovative experiences and regional and local viewpoints a national dimension. This dialogue is essential to promote understanding and ownership of the long-term challenges and the capacity for innovation. The project will continue without interruption during the implementation of the roadmap, which will then be carried out.

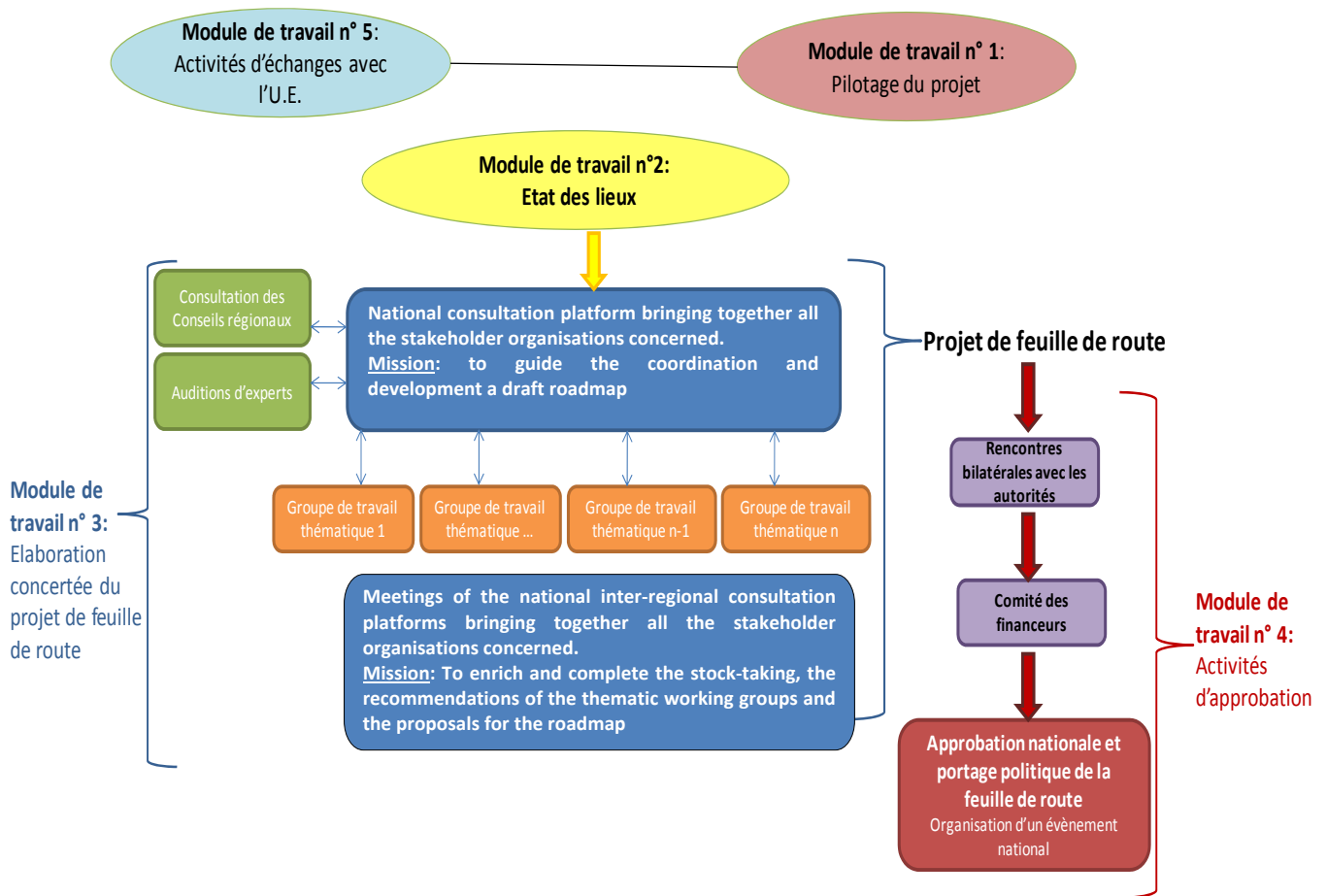
The project capitalises on the many studies and initiatives that have been undertaken in recent years at the national, regional and territorial levels. These studies are summarised in the present status quo.

In addition, exchange activities with other Build Up Skills projects conducted by other Member States are regularly organised by the IEE and provide an opportunity to learn from other national platforms currently in operation (21 in all).

A **second call** for Build Up Skills projects (called "pillar II") will open mid-2013 to fund initiatives to promote the development of the skills of construction workers and craftsmen.

ORGANISATION OF THE WORK PROGRAMME FOR PILLAR I

The work is organised into “work packages”, which include the activities required by the European Commission within the framework of this project. The various work packages are organised as follows:



THE VARIOUS BODIES IN THE BUILD UP SKILLS PROJECT IN FRANCE AND THEIR ROLES

Name of the organisation	Members	Level of representation	Role
Consortium	ADEME National association of local authorities for jobs and training AFPA CSTB	Strategic and technical	Overall organisation and coordination of the project Operational implementation in accordance with the guidelines taken by the steering committee and in coordination with the EACI
Steering committee	Consortium members Trade organisations (FFB, CAPEB, FN SCOP BTP) Ministère de l'Ecologie et du Développement Durable, des Transports et du Logement <ul style="list-style-type: none"> - General commissariat for sustainable development (CGDD) - Direction de l'Habitat, de l'Urbanisme et des Paysages (DHUP) - Plan Bâtiment (Building Plan) Ministère du Travail, de l'Emploi et de la Santé: DGEFP Ministère de l'Education Nationale (French Ministry of Education): GRETA Association of the regions of France (ARF) Pôle Emploi Trade union organisations	Strategic	To orient the work of the project and its various working modules To promote the circulation of information among the partners (best practices, studies, reports, etc.) To organise the mobilisation required to conduct a vast consultation (within the national platform, but also with a view to inter-regional coordination days) To approve the various project deliverables
Consultation platform	Consortium members Members of the steering committee, at a technical level of representation (experts) Constructys - accredited joint collection fund (OPCA) for construction Project management (CNOA, UNSFA, SYNTEC, CICF) CAH, Qualit'EnR, CCCA-BTP, SER, Qualibat, Qualitel As well as: <ul style="list-style-type: none"> - The organisations that sent letters of support - Everyone who has expressed interest in this work 	Technical	Analyse/complete the status-quo work Develop the content of the roadmap Define the thematic working groups Hearings with experts

SCHEDULE FOR PROJECT IMPLEMENTATION

Month (from June 2012 to November 2013)	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
Running the project (work package 1)																		
Meetings of the project steering committee	X				X				X					X				
Status quo (work package 2)																		
Joint drafting of the road map (work package 3)																		
Mobilisation of territorial actors																		
Plenary meetings of the platform					X		X				X		X					
Meetings of the thematic groups						X			X		X							
Organisation of inter-regional days (3*2)								X		X		X						
Approval activities (work package 4)																		
Bilateral meetings																X		
Financing committee meetings																	X	
National day																		X
Exchange of activities in Europe (work package 5)																		

This inventory report is the final deliverable for work package 2.

BACKGROUND AND METHODOLOGY

OBJECTIVE OF THE REPORT

The **overall** objective of this report is to present to the stakeholders of the Build Up Skills project a **factual summary inventory** of all the available information needed to develop the BUS roadmap. This report thus represents a **foundation of basic information** for the work to be carried out in:

- The consultation platform
- The six thematic groups
- The inter-regional meetings (scheduled during the first half of 2013)

European comparison: this report follows the European format requested by the EACI. This thus facilitates comparisons with the other 29 national inventory reports (called the "status quo" reports).

APPROACH AND METHODS FOR COLLECTING AND ANALYSING THE RELEVANT DATA AND INFORMATION

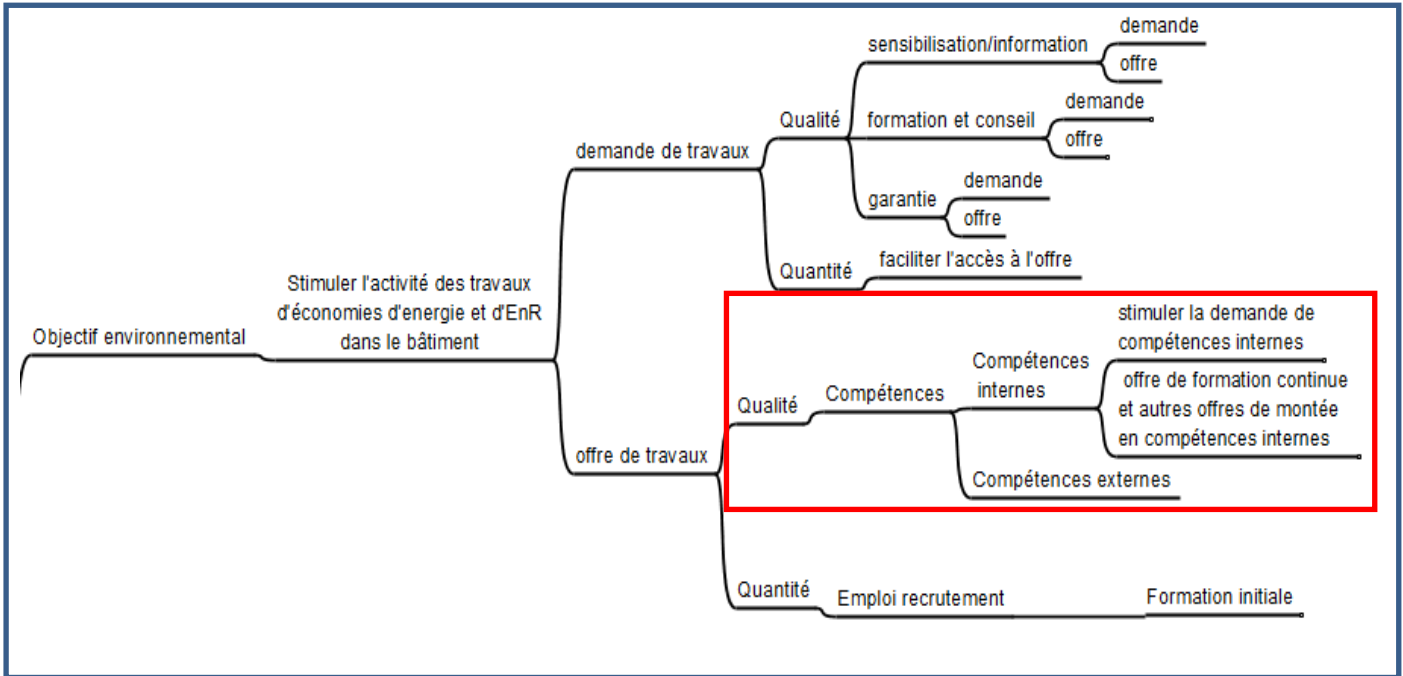
Approach adopted: factual knowledge, overall vision, exhaustive research

Factual knowledge

- In order to remain objective and neutral, this report focuses on the available factual knowledge
- The work to aid decision-making that requires the development of consensual hypotheses will be conducted:
 - ✓ either to build or adapt future-oriented scenarios (consistent with the national debate on the energy transition),
 - ✓ or to develop evaluative judgments (e.g. quantifying skills shortages).

Overall vision

The concern of the roadmap is with building up the skills of blue-collar construction workers. The scope of the inventory, however, is broader and includes all the factors influencing the demand for energy-saving work and the use of energy in buildings.



Scope of the inventory

Scope of the roadmap

Presentation of the scope of the inventory and the roadmap from a functional overview of the types of possible actions (or influences) of public environmental policy.

The reading of this functional presentation (left to right) is: to achieve the environmental objective (3x20 with respect to buildings), it is necessary to stimulate activity involving work on energy savings and renewable energy in the building trade. Likewise, to stimulate work on energy savings and renewable energy in the building trade, it is necessary to influence either the demand for work or the supply, etc.

Exhaustiveness

In France, the number of jobs directly entering into the field of investigation of BUS is very large. The option chosen was to maintain a very broad range of collection to better take into account the work already undertaken by the various stakeholders.

Planning for high-quality technical communications between the stakeholders

The process of developing the inventory is equally essential. It should contribute to the first step of the virtuous circle observed particularly in terms of labour markets as part of the "ADEME ALLIANCE VILLES EMPLOI" "Employment and sustainable development" project. The steps observed were as follows:

- Sharing professional vocabularies and representations.
- Validation of the diagnosis of the initial situation (in the form of an evaluative judgment).
- Sharing economic expectations (and uncertainties about these) through the validation of scenarios of up to 2020.
- Validation of a three-year action plan (the roadmap).

Operational methodology

The information analysed and summarised in this report is the fruit of the following process, which was implemented as part of the inventory process called WP2.

Several phases in the methodology

Collection of documents

Early in the WP2 project, the partners were asked to use a collaborative tool to submit documentation, reports and studies relevant to Build Up Skills. At the end of the project, more than 130 documents had been collected.

During the first month, a technical unit met to define an analytical framework and to prioritise the documents collected to facilitate their use.

The analysis of each document considered relevant to the project led to the drafting of an analytical sheet.

All the analytical sheets written up ultimately served in the drafting of this report.

The database and additional research

To complete the collection of documents and to update the data, additional research was conducted via the Internet on various sites, including institutional and industry sites. All these references are identified in Chapter 12 References, alongside the document collection.

Feedback

Working groups have been meeting regularly throughout the project (technical unit, technical committee), and preliminary results have been reported. When necessary, the partners have provided supplements for missing information or corrections to optimise the quality of our study.

Platform and thematic groups

The results of the platforms and the six thematic groups that met during the first 6 months of the inventory confirmed and in some cases completed our analysis.

The topics covered include:

- The groups concerned and the skills to acquire.
- Pedagogical engineering (Innovative teaching methods, support for the training processes, ongoing training).
- Difficulties and obstacles to accessing education and removing these obstacles.
- The training of trainers and the strategy for training centres.
- The recognition of training: certification, labels, control of training quality, etc.
- Funding for training and its financial engineering.

Hearings with experts

On particular issues or on some very specific questions, hearings took place with the experts and organisations mentioned in this report.

Stakeholders

Below is the list of stakeholders invited to the consultation platform:

ADEME	French Agency for Environment and Energy Management
AFPA	Association for adult vocational training
ANACT	National agency to improve working conditions
ANAH	National housing agency
ANIL	National agency for information about housing
APCMA	Permanent assembly of the job and craftsmen associations
ARCAD	Regional association on construction and sustainable development
ARF	Association of the regions of France
ASDER	Savoy association for the development of renewable energy
Association nationale des CARIF - OREF	National association of centres for the organisation of resources and information on training and Regional job training observatories
AVE	National association of local authorities for jobs and training
C2RP	Regional centre on teaching resources
CAFOC	Academic centre for continuing training

CAH	Club for better housing
CAPEB	Federation of small construction contractors and craftsmen
CCCA-BTP	Committee for consultation and coordination of building and public works apprenticeships
CCI De France	National federation of French chambers of commerce and industry
CCI Drôme	Chamber of commerce and industry of the Drôme
CDPEA	Durable construction and energy efficiency in the Aquitaine
CERC	Regional economic teams in the construction industry
CERIB	Centre for study and research on the cement industry
CERQUAL - QUALITEL	Certification Body of the QUALITEL Association - Association for quality housing
CESE	Economic, social and environmental council
CFDT	French democratic labour confederation
CFE CGC	French executives and managers confederation
CFTC	French confederation of Christian workers
CGDD	General commissariat for sustainable development
CGPME	General confederation of small and medium-sized enterprises
CGT	General labour confederation
CGT FO	General labour confederation - Force Ouvrière
CICF	French chamber of engineering and consulting
CLER	Committee of renewable energy networks
CNOA	National council of architects
Regional Councils	Alsace
	Aquitaine
	Auvergne
	Basse-Normandie
	Bourgogne
	Bretagne
	Centre
	Champagne-Ardenne
	Franche Comté

Regional Councils	Guadeloupe
	Guyane
	Haute-Normandie
	Ile-de-France
	Languedoc-Roussillon
	Limousin
	Lorraine
	Martinique
	Midi-Pyrénées
	Nord Pas-de-Calais
	Pays de la Loire
	Picardie
	Poitou-Charentes
	Provence-Alpes-Côte d'Azur
	Réunion
	Rhône-Alpes
Constructys	Accredited joint collecting fund for construction
Constructys Bretagne	Accredited joint collecting fund for construction - Brittany
Constructys L. R.	Accredited joint collecting fund for construction - Languedoc Roussillon
CSTB	Scientific and technical building centre
CTC	Regional authority for Corsica
DGEFP	General directorate for employment and vocational training
DHUP	Department of housing and urban planning
ECOLUSIS	Centre for training in new building professions
Economie d'Energie SAS	Company developing customised energy programmes
Effinergie	Collective association ensuring a label and the promotion of low-consumption buildings
Energycities	European association of local authorities that are inventing their energy future
ENERPLAN	Union of solar energy professionals
FAF CEA	Insurance fund for the training of crafts business heads
Fédération Ecoconstruire	National federation of bodies involved in vocational training for ecoconstruction
Fédération UROF	National federation of regional unions of training organisations
FFB	French building federation
FFB Nord Pas-de-Calais	French building federation - Nord Pas-de-Calais

FFP	Federation of vocational training
FLAME	Federation of local agencies for energy and climate control
FN SCOP BTP	National federation of building and public works cooperative societies
France Clusters	Skills hub for local production systems
GIMELEC	Grouping of companies that supply electrical and robotic solutions for the energy, building, industry and infrastructure markets
IFPEB	French institute for building energy efficiency
INES	National solar energy institute
Inter CARIF-OREF	National association of the network of centres for coordination, resources and information on training and Regional job training observatories
ISOTOP	Company that designs and develops high-tech composite materials
Maison Commune Emploi Formation	Midi Quercy region job training centre
MDE Job training centres	Bayonne and Pays Basque region
	Ajaccio and surrounding region
	Lens Liévin - Hénin Carvin area
	Perpignan labour market
	Dieppe area
	Bords de Marne
	Greater Nancy
	Lille Lomme Hellemmes
	Greater Nantes
	Meusienne
	Ouest Provence
	Pays de la Déodatie
	Pays du Vermandois
	Petite Camargue Héraultaise
	Plaine Commune
	Saint-Quentin-en-Yvelines
	Sarthe Sud
Maison de l'Emploi et de la Formation	Ardèche Méridionale
	Lyon
Maison de l'Emploi et de la Formation	Saverne
	Pays Voironnais and Sud Grésivaudan
	Calaisis
	Cotentin

	Pays Ouest Creusois
	Pays de Trégor Goëlo
Maison de l'Emploi et des Entreprises	Bords de Marne
Maison de l'Emploi, de l'insertion économique et des entreprises	Bordeaux
Maison de l'Emploi, de l'Insertion et de la Formation	Bassin de Rennes
	Nord Avesnois
Maison de l'Emploi, du Développement, de la Formation et de l'Insertion du	Pays de Redon et Vilaine
Maison du Développement Economique de l'Emploi et de la Formation	Dunkerque
MEDDE DGALN/DHUP	French Ministry for Ecology and Sustainable Development - General department of regional development and housing - Department of urban planning
MEDEF	French business association
Ministère	National Education
NEOPOLIS	Training centre - Chamber of commerce and industry of the Drôme
ONTSBTP	National observatory of works and services related to building and public works
Grenelle building plan	
Pôle Emploi	
Qualibat	Qualification and certification of construction companies
QUALIFELEC	Technical and professional association for the qualification of electrical equipment companies
Qualitel	Association for quality housing

Qualit'EnR Association for the high-quality installation of renewable energy systems

Grenelle network of building/energy platforms

SCOP BTP Nord	Building and public works cooperative societies - Nord
SER	Renewable energy union
Syntec	Federation of trade associations
TEE	Environment employment territorial network
UBS	University of Bretagne Sud
UNICEM	National union of quarries and construction materials industries
UNSFA	National union of French architect associations

CHARACTERISTICS OF THE CONSTRUCTION INDUSTRY IN FRANCE

HISTORICAL BACKGROUND

The building sector¹ is characterised by a significant amount of existing stock (in particular in residential housing, 65% of which was built before 1975, the date of the first thermal regulations for new housing) and exhibits significant inertia (only 1% renewal of the housing stock per year).

It experienced exceptional growth for 8 years, followed by a downturn in 2008 and a sharp decline in activity in 2009.

Growth in the 2000s: after the deep crisis of the 1990s, the construction sector returned to robust growth, outpacing the rest of the French economy. In eight years of almost continuous growth, construction witnessed the creation of more than 150,000 net salaried jobs, with an exceptional level of housing starts in 2006: 436,000 units, representing a 9.7% increase in production.

The effects of the crisis in 2008: construction was in turn hit during the year by the economic and financial crisis, with a sharp slowdown in growth. Building crafts stood up better than the sector as a whole in 2008, but was hit by a decline in activity in the first quarter of 2009. However, salaried employment in the construction sector generally remained steady in 2008, rising slightly (0.9%) between the fourth quarter of 2007 and the fourth quarter of 2008 (1,486,300 jobs end 2008).

2009 saw a strong decline in activity: in construction, the year 2009 ended with an overall fall in activity of nearly 8%, an average that corresponded to contrasting situations in different markets: a sharp decline in housing starts (-16.4%) and in the non-residential new market (only 22.3 million square metres in starts in 2009), and a decline of 2.9% in building renovation and maintenance, despite stimulus measures (zero interest eco-loans). In contrast was a strong acceleration in starts on the social rental segment, due to the impact of the National urban renewal plan (PNRU), the Social cohesion plan (PCS) and a stimulus plan: 80,000 units of social housing were launched in 2009.

Building craftsmen were relatively less affected by the crisis than companies with more than 20 employees, with a 6.5% decline in activity in the last quarter of 2009. **In 2010, activity stabilised before experiencing a slight recovery in 2011** (housing starts up by 21% and building permits by 17.9%), **though this will not continue in 2012.**

¹ Observatoire du BTP. www.metiers-btp.fr



CONTRIBUTION TO THE FRENCH ECONOMY

The building sector consists of 431,091 companies, 98% of which are crafts firms and SMEs. 60% of the salaried and non-salaried personnel work in a company with fewer than 20 employees.²

Workforce segment	Number of companies
Companies with 0 employees	251,819
With auto-entrepreneur status*	46,412
Companies with 1 to 9 employees	154,139
With 10 to 19 employees	16,024
Companies with fewer than 20 employees	421,982
With 20 to 49 employees	7,355
With 50 to 99 employees	1,138
With 100 to 499 employees	522
With 500 to 999 employees	55
Companies with 1,000 employees or more	39
Companies with 20 employees or more	9,109
Total	431,091

* having

revenue at least once in the year - ACOSS

Source:
SIRENE as of 31
December 2010 and
ACOSS
declared non-zero

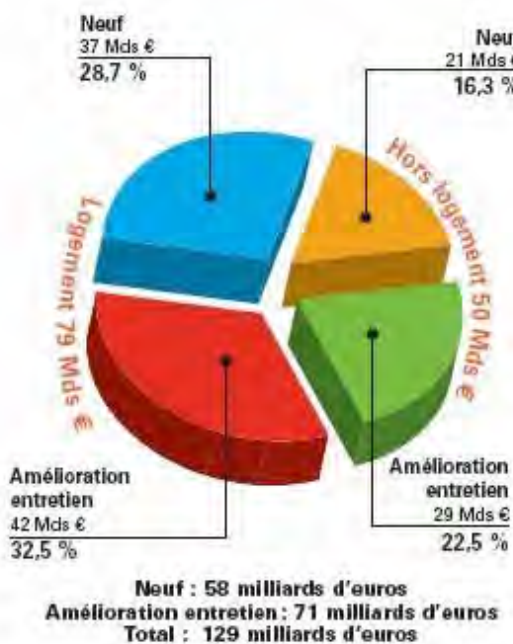
² CAPEB. Chiffres clés 2011. Updated January 2013

With pre-tax revenue of 129 billion euros³, construction, which represents 7% of GDP, plays a significant role in the French economy. This is equivalent to half of industry or twice banking and insurance. One in ten employees works in the construction sector.

Activité sur le marché intérieur

La production

Travaux de bâtiment: 129 milliards d'euros



La construction neuve



The export market for construction represented 7.2 billion euros in 2009, including 4.9 billion for structural works and 2.3 billion for finishing works.

³ FFB. Les indicateurs sociaux du Bâtiment. 2012

ACTORS IN THE SECTOR

Many actors are involved in developing the market for energy performance. They range from public stakeholders that define the objectives, the means and the rules to be followed, to companies that position themselves in the market, and including research laboratories, networks of partners, training organisations, etc.

The public bodies and their offshoots

- CGDD (General Commissariat for sustainable development)
- DHUP (Department of housing, urban planning)
- DGE (Directorate-General for energy and climate)
- The working groups (sector committee, building plan, etc.)
- The local authorities
- ADEME
- AVE (Alliance Villes Emploi)
- The APCM and the CCI

The trade organisations and networks

- Trade organisations (CAPEB, FFB, FNSCOP), their members, etc.
- Trade organisations partners of the sector (CICF, CNOA, SYNAMOB, SYNTEC, UNTEC, UNSFA, etc.)
- Groups of actors (clusters, etc.)
- The associations (ATEE: Energy environment technical association, etc.)

The accredited joint collecting funds

- Constructys
- FAFCEA
- FAF.TT

The qualification organisations

- Qualibat
- Qualif'Elec
- Qualit'EnR

The companies

- Companies in the building trades
- Builders of individual housing who are shifting to renovation
- New entrants targetting subsidised markets that are not clearly attributed to a building trade
- Traders who are strengthening their position as standards setters
- Large DIY brands that offer both materials and insulation

- Marketing networks that offer turnkey renovation work
- Industry networks that are repositioning in promising new fields
- Job brokers who pledge to find the best tariffs for their customers

The technical centres and public laboratories

- CSTB
- ALEC (Local agencies for energy and climate control)
- COSTIC
- CETE (Centre for technical and equipment research)
- CETIAT (Research centre on the aeraulic and heating industries)

Energy suppliers and their partner network

- EDF
- GDF

Training and apprenticeship organisations

- AFPA
- GRETA
- CCCA BTP

(non-exhaustive list)

MARKET TRENDS

The market for energy improvements

As the rate of turnover of housing stock is insufficient to achieve the targets for CO2 reduction in buildings, it is the market for thermal renovation that will be decisive.

In the course of the ADEME/ALLIANCE VILLE EMPLOI “Employment and sustainable development” project (“MDE et DD”), 30 market studies were conducted by the CERC network of the territories covering a population of more than 8 million inhabitants.

These studies show that, boosted by the Grenelle de l’environnement (environmental forum) measures, the construction market connected with energy efficiency and renewable energy should experience strong growth in the years to come.

With more than **20 million dwellings to renovate** over the next thirty years, **this market is one of the most promising in terms of activity.**

The trades most in demand would be:

- Carpenters (in particular for insulation work)
- Heating plumbers (solar thermal)
- Drywall painters (insulation, roofing, walls, opaque walls, exteriors)
- Roofers
- Electricians (solar photovoltaic)

However, the changing economic conditions (the financial crisis and recession in the field of construction) could affect demand for energy efficiency, making predictions somewhat uncertain.

Since 2008, every year ADEME has been conducting an inventory of markets and jobs in the main sectors related to improving energy efficiency and developing renewable energy in France. The study focuses among other things on renovations to existing housing, on the dissemination of energy-efficient household appliances, and on equipment for the production and use of renewable energy. It also estimates sales of energy from renewable sources and energy savings generated by the various measures that have been taken.

- Trends in the markets related to energy efficiency and renewable energy development over the period 2006/2012

	2006	2007	2008	2009	2010	2011 (e)	2012 (p)
Marchés de l'amélioration de l'efficacité énergétique dans le bâtiment résidentiel existant hors EnR							
Total des 3 marchés résidentiels	8 310	9 840	10 470	10 980	11 530	11 990	12 560
Interventions sur le bâti	7 240	8 620	8 940	9 250	9 600	9 950	10 360
Ventilation, régulation du chauffage	310	370	390	380	380	410	430
Chauffage (chaudières condensation)	760	850	1 140	1 350	1 550	1 630	1 770
Marchés des énergies renouvelables (dont EnR liées au bâtiment)							
ENR équipements & installation	3 290	3 470	5 560	5 260	6 210	7 080	5 620
Solaire thermique	450	410	500	430	420	440	430
Photovoltaïque	70	130	300	750	2 890	3 880	2 430
Bois domestique	1 280	1 050	1 180	1 140	1 100	1 080	1 080
Pompes à chaleur	1 490	1 880	3 580	2 940	1 800	1 680	1 680
ENR ventes et maintenance	80	100	170	270	560	1 370	1 870
Solaire thermique (maintenance)	30	30	40	40	50	60	70
Energie d'origine photovoltaïque	0	10	30	100	360	1 140	1 610
Pompes à chaleur (maintenance)	50	60	100	130	150	170	190
Total des 11 marchés en millions d'euros	11 680	13 410	16 200	16 510	18 300	20 440	20 050

En millions d'euros aux prix constants 2011 : marché intérieur et exportations montants arrondis à la dizaine de millions la plus proche : (e) : estimation ; (p) : prévision
 Source: ADEME/In Numeri - November 2012

The trends in the markets related to energy efficiency in the residential sector were positive throughout the period, although there was some slowing from 2009 (growth fell from 9% in 2006-2009 to 4.5% over the period 2009-2012). The markets related to the insulation of opaque walls was boosted by the development of exterior insulation and did better than markets associated with replacing existing openings by more efficient openings. The market for condensing boilers, which was helped by a tax credit and is

now more familiar to households and craftsmen in terms of performance, is continuing to grow.

The markets associated with the development of renewable energy have not grown as steadily. The amount of investment in systems dedicated to the production of electricity (wind, solar photovoltaic) rose sharply until 2008-2010, and then decreased.

With respect to the table, in general, after a peak in 2011, these markets should see a significant decline in investment in 2012.

- Trends in employment related to energy efficiency and renewable energy development over the period 2006/2012

Emplois correspondants (en équivalents temps pleins)

	2006	2007	2008	2009	2010	2011 (e)	2012 (p)
Résidentiel : ensemble correspondants aux trois marchés ci-dessous							
ETP correspondants aux 3 marchés résidentiels	89 030	107 080	111 350	114 360	116 650	119 700	125 210
Interventions sur le bâti	78 440	94 600	96 450	98 250	98 680	100 840	104 870
Ventilation, régulation du chauffage	3 600	4 140	4 280	3 960	4 000	4 190	4 390
Chauffage (chaudières condensation)	6 990	8 340	10 620	12 150	13 970	14 670	15 950
Energies renouvelables (dont EnR liées au bâtiment)							
ENR équipements	30 660	32 360	48 960	47 000	59 420	54 670	43 550
Solaire thermique	3 080	3 130	3 600	3 130	3 000	3 150	3 140
Photovoltaïque	1 390	2 530	5 160	10 160	31 030	27 430	16 360
Bois domestique	12 190	10 180	12 130	11 550	11 200	11 080	11 150
Pompes à chaleur	14 000	16 520	28 070	22 160	14 190	13 010	12 900
ENR ventes et maintenance	730	970	1 290	1 580	2 140	3 080	3 610
Solaire thermique	300	360	430	490	550	620	690
Energie d'origine photovoltaïque	0	0	30	150	520	1 270	1 620
Pompes à chaleur	430	610	830	940	1 070	1 190	1 300
Total des emplois (ETP) correspondant aux 11 m	120 420	140 410	161 600	162 940	178 210	177 450	172 370

Note: Tertiary sector housing and new construction are not covered by this study, except for any renewable energy work they involve.

Source: ADEME/In Numeri - November 2012

Employment directly related to the markets surveyed increased by an annual average of 9.4% between 2006 and 2009, but average growth was only 2.9% per year between 2009 and 2012. Employment, which stabilised at around 310,000 jobs, has remained virtually stable between 2010 and 2012 (Numeri/ADEME estimate).

While employment in activities related to improving the energy efficiency of existing housing continued to grow from 2010 to 2012 (+7.4% in total between 2010 and 2012), employment in activities related to the development of renewable energy (equipment and installation) fell by 22% between 2010 and 2012 and in 2012 is expected to be at a slightly lower level than in 2009. This fall is due to the massive reduction of employment in solar photovoltaic work (estimated at a loss of 14,700 jobs, or - 47%, between 2010 and 2012), wind and heat pumps, while some areas are experiencing mild progress (biogas and collective wood heating).

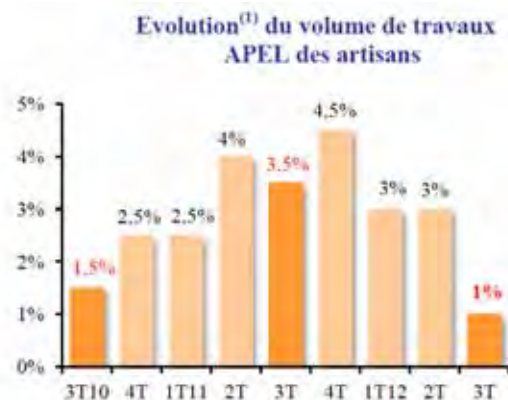
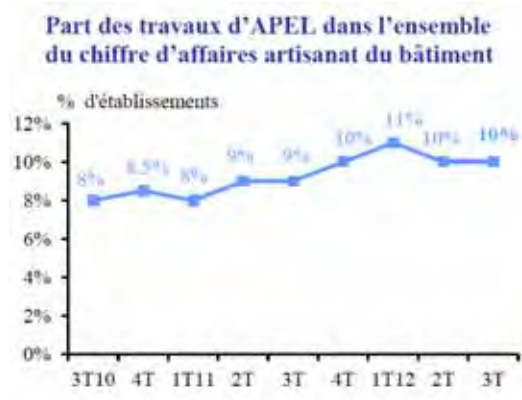
The study by the Observatoire OPEN⁴ on the market for energy renovation gives a detailed view of the results by type of work.

In 2010, in a context of economic crisis, the **market** for energy improvements represented nearly **40% of the work on maintenance and housing improvements, i.e. 10% of the sector's total turnover.**

The market is stabilising around three areas, with a market share of around **30% for the insulation of walls**, just over **40% for the insulation of openings**, and less than **30% for heating improvements.**

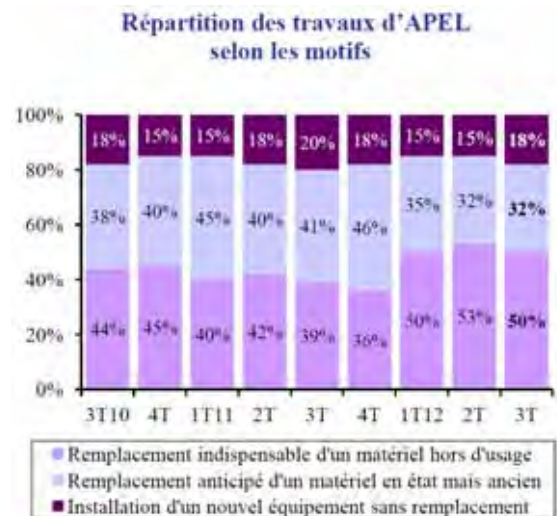
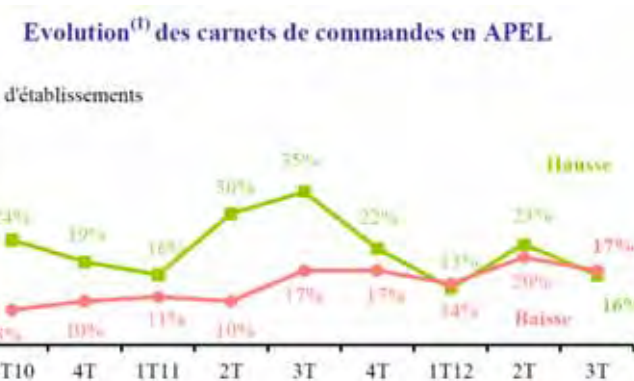
Since 2010 (and up to the third quarter of 2012), and while still experiencing a general slowdown in construction activity, the **market** for energy renovation has been **steadily growing.**

(Cf. note on the economic cycle I+C/CAPEB 3rd quarter 2012)



APEL: Improvement of building energy performance

But a slowdown is to be feared; there has in fact been a slowing of growth in work to improve energy performance in the 3rd quarter of 2012, up only 1% (against 3.5% in the same quarter of the previous year). In addition, in the 3rd quarter, 50% of the improvement work was performed only as a last resort to replace obsolete equipment, and builders' order books are down for this type of work.



⁴ Club de l'Amélioration de l'habitat. OPEN 2011 campaign: 2012 results

The market for maintenance and after-sales service

This is difficult to quantify, but it is **benefitting from a favourable economic situation, with the generalisation of the compulsory annual maintenance** of facilities, the increasing complexity of equipment, the networking of equipment and automation, and the growth of contractual obligations and of the legal liability of firms in the framework of performance commitments.

MAIN FACTORS FOR CHANGE

The regulatory factors

European directives on energy efficiency have established a strict framework for the Member states. **This energy policy could create 1 million new jobs in Europe** directly or indirectly.⁵

In France, the Grenelle de l'environnement (environmental forum) responded to European expectations with a series of regulatory measures (RT2012), incentives (eco-loans, tax credits, etc.) and support programmes (RAGE, building energy platforms, etc.) in order to orient the sector's development towards better control of energy expenditure (see point 4.3) and to achieve the objectives set:

- In the **short term**: 400,000 dwellings to renovate; renovation of all State and public buildings; renovation of all public housing, beginning with those consuming the most energy and generalised low-energy buildings by 2012.
- In the **long term**: in 2020, Bepos and RT2020 or RBR 2020 (2020 Responsible building regulation).

Cécile Duflot, Minister of regional equality and housing, in her presentation on the ecological transition on 20 November 2012 to the France Green Building Council, confirmed the commitment by the French President to renovate 500,000 dwellings per year starting in 2017.

The socio-economic factors

These break down into:

Household behaviour with respect to thermal renovation: 5th study of the Observatoire Open showed households' increasing interest in renovations to improve thermal performance. Despite the sluggish economy, the market grew slightly. The study also stated that "households are increasingly relying on professionals".

The behaviour of craftsmen and companies, who are obliged to collaborate more and more closely between trades, to comply with standards, and to have many more authorisations in order to ensure high-quality service.

"Eco" cross-compliance, combined with financial measures such as tax credits and eco-loans, which require professionals to go through specific qualification procedures (cf.

⁵ French Ministry of Education, CG Conseil. Sustainable development, energy management. Changes and impact on training programmes. 2010 [Sustainable development, energy management. Changes and impact on training programmes.]



signs of quality, “RGE” labels issued to professionals trained in energy efficiency work) in order to position themselves on the eligible work.

Consumer and business expectations about long-term increases in energy prices.

NATIONAL POLICIES AND STRATEGIES CONCERNING ENERGY IN BUILDINGS

In the field of energy

NATIONAL ENERGY POLICIES AND STRATEGIES

Since 2004, France has had a strong climate policy, and a number of measures, usually integrated into other public policies, have been steadily adopted.

In 2004, in response to the Kyoto Protocol, which aimed to reduce emissions of greenhouse gases, and following the national programme to fight climate change, the **first French climate plan** was adopted. It set out various actions to fight against climate change.

The POPE law of 2005 (a framework for energy policy) set numerical targets in terms of energy intensity. **Its target was to reduce greenhouse gas emissions to a quarter** ("Factor 4") between 1990 and 2050. The climate plan is to be updated every 2 years.

In 2007, a broad national dialogue involving all the stakeholders (government, local authorities, employers, trade unions and associations) took place: **the Grenelle de l'environnement (environmental forum)**. It strengthened France's climate policy and set ambitious goals: **to reduce greenhouse gas (GHG) emissions by nearly 23%** from their 2005 levels and to **improve energy efficiency by 17%**. The implementation of the Grenelle de l'environnement (environmental forum) is coordinated by the **Ministry of Ecology**.

In 2008, the **energy-climate** package was adopted by the **European Parliament**. It is based on **the rule of 3 times 20**, which sets targets for 2020:

To reduce energy consumption by 20% compared to the trend scenario.

To reduce GHG emissions by 20% from their 1990 levels.

To increase the share of renewable energy to 20% of total energy consumption.

In 2008, the first **National Plan of action on energy efficiency (PNAEE)** broke down the key policies and measures to be implemented sector by sector in order to achieve the objectives set by Europe for 2020 and the objectives set by the Grenelle de l'environnement (environmental forum).

Under European Directive 2006/32/EC on energy end-use efficiency and energy services, France sent its first PNAEE plan to the European Community in 2008. The second plan was submitted on 17 June 2011.

In August 2009, the implementing act, called the **Grenelle 1 Act**, which confirms the commitments of the Grenelle de l'environnement (environmental forum), was adopted. It formalised the Grenelle de l'environnement (environmental forum) commitments at the legislative level. The reduction of GHG emissions to a quarter was reaffirmed therein. The building sector is the most energy-intensive sector in the country, with nearly 43% of the final energy consumed nationally. It also generates nearly a quarter of French CO₂ emissions.

Faced with this reality, the Grenelle de l'environnement (environmental forum) proposed that buildings be one of the priority projects. **In 2009, the Grenelle building plan (PBG) was created to support tradesmen in the sector in the implementation of the Grenelle de l'environnement (environmental forum) objectives.**

Recommendations and advice were given through the thematic working groups that had been set up (zero rate eco-interest loan, energy performance guarantee, 2020 responsible building regulations, etc.).

In 2011, the proposals of the PBG plan focused on the mobilisation of the stakeholders and territories around energy renovation.

In June 2010, the **Grenelle 2 Act** on the country's environmental commitments was adopted. It provides for the operational implementation of most of the Grenelle de l'environnement (environmental forum) commitments through a variety of mechanisms: regulatory requirements, tax incentives, etc. (see Section 5.3).

A "**Building and urban planning**" project and an "**Energy**" project are among the six major projects implemented by the law.

To meet the targets set by Europe on energy efficiency and the use of renewable resources, the Grenelle de l'environnement (environmental forum) defined the objectives to be achieved and the resources required.

The objectives are divided into **three areas**:

- 1. A plan for the large-scale energy and thermal renovation of existing buildings** was adopted. The aim is **to reduce the energy consumption of the existing stock by 38% by 2020**. For this it is necessary to:
 - Renovate 400,000 housing units per year starting in 2013.
 - Renovate the 800,000 most energy-consuming social housing units by 2020.
 - Undertake work on energy efficiency in public and private tertiary sector buildings between 2012 and 2020.
 - Start the energy renovation of State and public buildings before 2013.
- 2. For new construction**, the measures taken aim to spur the widespread adoption of **low-consumption buildings from 2013** and **positive-energy buildings by 2020**.
- 3.** In order to promote the high uptake of **renewable energy** and reduce long-term dependency on fossil fuels, a **national action plan for the development of renewable energy for 2009-2020** was submitted to the European Commission in **August 2010**. The goal is to have **23% of energy produced from renewable sources in terms of gross final energy consumption by 2020**. Support for renewable electric power and renewable heat are two of the main points of the plan.

At the economic level, there is a dual challenge to be faced:

- Developing high-quality industrial sectors.
- Creating thousands of jobs, particularly in the field of the installation of systems to produce renewable energy.

While targets for the production of renewable energy are set for 2020 at the national level, determining the means of production is largely delegated to the local level.

The various **Finance Acts** shall determine the **funding needed for the Grenelle de l'environnement (environmental forum) commitments**.

Initiated by the Grenelle 2 Act, **the Regional climate, air and energy plans (SRCAE) are reinforcing the regionalisation of climate and energy policies**. The SRCAE have been co-developed by the regions and the State since 2011 and were finalised at end 2012. In particular they set the guidelines necessary to fight against the effects of climate change up to 2020 and 2050.

In 2012, as part of its environmental policy, the French government decided to proceed upstream with an annual consultation on its programme of work. **The first conference for the ecological transition took place in September 2012**.

The "energy transition" is one of the priorities announced during the conference. In terms of the **thermal performance of housing, the objective is to bring one million homes per year up to energy standards (half renovation, half new construction)** by focusing, with respect to renovation, on the 4 million existing homes that are poorly insulated.

To help achieve these objectives, a new plan for the thermal performance of buildings, **"Building Plan 2012-2017"**, is being implemented. **The future roadmap has four components:**

1. **Reorganising the methods of financing energy efficiency.**
2. **Identifying the poorest households and proposing projects tailored to their needs.**
3. **Establishing regional platforms based on "one-stop shop" logic.**
4. **Organising training for construction workers and building up their skills.**

In terms of the **development of renewable energy**, support for the wind and solar sectors has been strengthened. Administrative procedures will be simplified.

SUMMARY OF THE ACTIVITIES PLANNED TO IMPLEMENT THE REVISIONS OF THE EPBD DIRECTIVE AND THE RENEWABLE ENERGY DIRECTIVE

The building sector consumes the most energy of any economic sector in France. The comprehensive plan for thermal renovation set out by the Government will reduce long-term energy spending and the inequalities associated with it, improve consumer purchasing power and contribute to the reduction of CO₂ emissions. It will also help to support the building renovation sector, a key sector for economic recovery and for the development of jobs driven by “green” growth, which by their very nature cannot be relocated.

In this context, it is important that companies performing work that contribute to improving the energy performance of buildings can make the most of their skills.

European directive on energy efficiency repealing Directives 2004/8/EC and 2006/32/EC

The Energy Efficiency Directive was **adopted on 4 October 2012** by the Council of the European Union

Article 13 of the Directive specifies that, “In order to achieve a high level of technical skills, objectivity and reliability, Member States shall ensure that, by 1 January 2014, certification and/or accreditation schemes and/or equivalent qualification schemes, including, where necessary, suitable training programmes, are available for providers of energy services, energy audits, energy managers and installers of energy-related building elements as defined in Article 2(9) of Directive 2010/31/EU.”

How this article will be applied concretely is not known at the time this report is being written.

European Directive 2009/28/EC concerning the promotion of the use of energy from renewable sources

The development of high-quality work is at the heart of Directive 2009/28/EC, which requires Member States to ensure that certification or accreditation schemes are available to installers of small-scale renewable energy equipment by 31 December 2012. It states that each Member State must ensure that the qualifications or certifications are issued by a training programme or training organisation that has been authorised by the Member State or a designated administrative entity.

The National action plan for renewable energy, covering the period 2009-2020 (submitted to the European Commission in August 2010), sets out **the measures that respond to the Directive**. In particular, with regard to the **certification of installers** (Article 14, paragraph 3 of Directive 2009/28/EC), the French document sets out: “France already has a system of qualifications that can be a basis to meet by end 2012 the various requirements of the European Directive, in particular concerning the content and validation of training.” It cites programmes such as Qualit'EnR (a quality charter proposed to installers of renewable energy systems) and Qualibat (a system for the qualification of companies). These two programmes are described in Chapter 7 of this report.

NATIONAL BUILDING CODES AND REGULATIONS, REQUIREMENTS ON RENEWABLE ENERGY IN BUILDINGS, INCENTIVES

Several types of regulatory measures and incentives, labeling, etc., have been adopted in order to promote the achievement of the goals on the energy performance of buildings and the use of renewable energy.

Regulatory requirements

- **RT 2012 for new construction**, which includes three requirements:
 - ✓ The building's energy efficiency,
 - ✓ The building's energy consumption,
 - ✓ Comfort in summertime for buildings without A/C.
- **Thermal regulations on existing buildings**, with smart systems being installed every time there is major renovation work on a building.
- New guidelines on urban planning.
- A system of **energy efficiency diagnostics**, to be used to estimate a building's energy consumption, giving rise to a **mandatory** "energy" label and a "climate" label for the sale or rental of housing.
- A mandatory **carbon assessment** for certain businesses.
- Mandatory energy work in certain office buildings.
- **Labelling of construction materials.**
- Adoption of a **territorial climate-energy plan** (PCET) by end 2012, which must be compatible with the SRCAE for territories with over 50,000 inhabitants.
- **A system of Energy Savings Certificates.** The energy savings certificate system is based on an obligation imposed on energy providers (electricity, gas, heating, cooling, fuel oil and recently fuel for cars), called the "obliged parties", by the public authorities. They are thus encouraged to actively promote energy efficiency among their customers: households, local authorities and business.
- Requirement to purchase green electricity.
- Regular inspection of heating and air conditioning systems.

Easing of regulatory requirements

- Majority requirement for co-ownership groups for energy-saving work.
- COS bonus (land use ratio).

Fiscal and financial incentives

- Tax credits.
- Means-tested zero-interest eco-loan.
- VAT reduction.
- Zero-interest loan, with an amount set based on the level of the building's energy efficiency.
- Temporary exemption from property tax, for the construction of buildings with a BBC-Effinergie label.

Several programmes from various partners in the industry complement these measures:

Financial-type programmes:

- Establishment of **incentives** by local authorities subject to certain conditions.
- Offer of **specific loans** such as the "Dolce Vita energy saving" loan by GDF SUEZ in partnership with SOLFEA Bank, CLIPSOLUTION loans to finance solar systems for heating hot water and electricity, loans from EDF's "blue sky" network, etc.
- Deployment of a **regional programme for energy management** in targeted areas (Corsica, PACA, Brittany, DOM TOM). Developed in partnership with the EDF and ADEME, these programmes focus on the financing of actions to promote energy efficiency and the development of renewable energy.
- Means-tested support for improvements in the energy performance of housing, offered to households through **Anah's "Living better" programme**.

► **Programmes related to research and support for specialist work:**

- Aid for innovation, through the **PREBAT** programme (programme for research and experimentation on energy in buildings, initiated by the Climate 2004 plan and launched in 2006), whose work is contributing to the reduction of GHG emissions.
- Signature in 2011 between the State and various organisations in the world of construction (AQC, CAPEB, FFB, Coprec, CSTB, EDF, GDF Suez, Strategy committee of the Grenelle building plan) of an agreement on better meeting the Grenelle de l'environnement (environmental forum) objectives. It formalises the creation of the **2012 RAGE** programme (Grenelle de l'environnement [environmental forum] trade practices) for a 4-year period.

This programme is funded through the system of energy savings certificates.

The goals of the programme:

- ✓ **To identify and develop the most efficient technologies** in the field of energy performance.
- ✓ To provide all the stakeholders with **methods for the technical evaluation** of energy performance and GHG.
- ✓ **To update** the trade standards in force today and **propose new recommendations**, especially for insulation work. The **French federation of insurance companies (FFSA)** has agreed on **taking into account the recommendations of the trade**, considering that the objectives of the programme are to ensure the **safety of construction activities**.
- ✓ **To revise the standards for initial and continuing training** in the sector to ensure proper implementation of technologies that are key for buildings' energy efficiency.

- ✓ **To disseminate information** through a special web site for the programme (<http://www.reglesdelart-grenelle-environnement-2012.fr>). An initial publication, “BBC feedback and risks” [French], analyses feedback on low-energy buildings over a year and the risks of poor quality.

Labelling and support systems:

- A number of **labels** aim to identify and certify the quality of the building with respect to the environment, in particular the energy performance, e.g. “BBC”, “Effinergie”, “Effinergie +”, “HPE”, “THPE”, “HQE”, and “Promotelec performance”. Others, such as “Qualisol”, “Qualibois” and “Qualipac”, are symbols of quality for business and demonstrate their skills in various areas of work. Still others, such as “Eco artisan” or “les Pros de la performance énergétique”, are quality emblems issued to construction companies.
- The “Reconnu Grenelle Environnement” label was established in November 2011 in a Charter signed by the State, ADEME, the trade federations and the quality organisations. This label, which concerns certain indications of a company’s quality, aims to enhance the relevance of these symbols in terms of energy performance. Under the Charter, the State is committed in particular to implementing the principle of “**eco**” **cross-compliance**: to receive assistance for energy performance work, the work must have been performed by a company or craftsman who holds a quality label and meets the requirements of the “Reconnu Grenelle Environnement” label. Qualibat, Qualifélec, Qualit’EnR, the CAPEB’s “Eco Artisan”, the FFB’s “Pros de la performance énergétique” are recognised as symbols of the company’s quality.
- To assist the industry with change, to take part in these changes and **to develop local economic potential**, a network of **10 building energy platforms** was established in April 2012, with four missions:
 - ✓ To transfer R&D.
 - ✓ To demonstrate best practices.
 - ✓ To create and share knowledge and skills.
 - ✓ To ensure initial and continuing training at every level.
- At the territorial level, **platforms that bring together all the stakeholders**, including building professionals and the banks who are project partners, help carry out the work through various measures (control of specifications, assistance with funding applications, even checks on the works, etc.).
- ADEME’s **Espaces Info Energie** network (advice to individuals about energy efficiency and renewable energy) is present throughout the country.

- The "BATI ENVIRONNEMENT ESPACE PRO" (BEEP) network, consisting of regional bodies and a national network, brings together the **resource centres**, which have a dual purpose:
 - ✓ To coordinate the trade on the topics of energy and environmental performance (to stimulate demand and a high-quality supply),
 - ✓ To consolidate and make available the experience and know-how by setting up a regional observatory on activity in this field, including through the identification of activities and skills.

EXPECTED CONTRIBUTION OF THE BUILDING SECTOR TO THE 2020 GOALS

These measures should help to achieve the **2020** targets set for building energy performance and renewable energy:

For new construction

Starting from **2020**, to build "**positive energy**" buildings (BEPOS): every house and building will produce more energy than it consumes. The generalisation of BEPOS will take place through new thermal regulations.

In 2012, one task of the Grenelle building plan, and of the "2020 Responsible Building Regulations" working group in particular, is to monitor the implementation of the 2012 thermal regulations (RT 2012) and **consider an initial approach** for the 2020 regulations (**RBR 2020**). A study day held on 9 July 2012 produced a progress report.

► For renovation work

To renovate the 800,000 most energy-consuming social housing units by 2020. To undertake work on energy efficiency in public and private tertiary sector buildings between 2012 and 2020.

In the field of vocational training, including continuing vocational training

POLICIES AND STRATEGIES RELATING TO GREEN SKILLS AND JOBS

- ▶ **A National mobilisation plan for green economy jobs and occupations** (PNMEME - originally called the National mobilisation plan for sectors and territories) has been implemented since September 2009 by the Ministry of Sustainable Development. This plan covers both jobs concerned with the environment as well as jobs that are being affected by developments in the green economy. It determines the priorities to be implemented. It focuses on 11 sectors, but needs to be expanded to every sector. Jobs in construction and renewable energy are two of the 11 priority sectors. The themes that define the actions to be taken include the following:
 - Identification and anticipation of the changes that greening will bring about in skills (qualitative) and jobs (quantitative) at a global and territorial level, and in different sectors.
 - Determination of the recruitment requirements in terms of quantity and quality.
 - Informing people about occupations on the rise and promoting them.
 - Incorporation of the changes implied by the green economy into all training programmes.
 - Adaptation of training courses, mechanisms and tools; organisation of teacher and trainer training.
 - Making the green economy a lever for access to employment for social groups in difficulty.
 - Support for businesses undergoing change.

The plan concerns:

1. **Knowledge of and provision of resources** through the creation of an Observatory on jobs and careers in the green economy, by the creation of 11 sector committees, by further studies, and by providing online information about the plan on the website of the Ministry of Sustainable Development.
2. **Revision of initial and continuing vocational training and the corresponding diplomas or degrees** via ministerial advisory committees that review the diplomas, a cross-sector mission monitoring the certifications entrusted to the National commission on professional certifications, the revision and creation of training in school vocational training and in higher education, regional level contracts for the development of vocational training, the revision of all training courses by the Association for adult vocational training (AFPA).
3. **The professionalisation of all those involved in vocational and job counselling**, in particular by means of a mission confided in the inter-ministerial delegation on guidance in order to better inform guidance structures for young people on opportunities in jobs related to sustainable development, the development of numerous job sheets by the Pôle Emploi agency, the revision of official job standards, etc.

4. Spreading the principle of the greening of employment in other job prospecting agencies through conferences, job and qualifications forecasts, participation in work in European or international bodies on the green economy, etc.

- ▶ As a product of the work of the mobilisation plan, the **National observatory on jobs and careers in the green economy** was created in **2010** to meet the need to better understand employment in this "new" economy. It coordinates with the regional and sector observatories.

The work it is conducting concerns the **identification of the scope** of green growth and the **statistical monitoring of jobs, an assessment of the sectoral and macro-economic impact** of green growth on **jobs, how jobs are changing**, recruitment and the **adaptation of training**.

Four working groups have been set up, including a group led by Pôle emploi that intends to analyse how jobs are changing, the different categories of potential employees, pressures on the labour market and the adaptation of training. This last point has not yet been developed.

▶ Other initiatives

- Training in energy savings in buildings: **FEE Bat**. To deal with the issues involved in energy efficiency, this training scheme has been put in place to support and train building professionals in developing their skills. It focuses mainly on mastering a global approach to the issues involved in energy renovation.
- In addition, and to work more closely with regard to professional skills, in 2008 ADEME launched the **PRAXIBAT®** programme, with the establishment of technical and educational platforms. The mobilisation of everyone involved in training and the pooling of the technical and financial resources of the partners should help to cover the entire country with this training tool in vocational skills.
- **The CAPEB's "Eco artisans" label** and the **FFB's "Pros de la performance énergétique" label**, which propose a quality approach with an overall vision of the building in question.
- The Qualit'EnR approach of professionals engaged in the promotion of renewable energies. The interventions are analysed from the perspective of the overall energy efficiency of the building to ensure optimum long-term performance.
- The Format'eree (renewable energy training) charter created at the initiative of the CLER (Liaison committee for renewable energy) in 2009 to improve the overall quality of all training in renewable energy and energy management, by bringing them closer to the world of the tradesmen and by ensuring that trained personnel are monitored to ensure that they are properly prepared for the workplace.
- The BZEE network, which originated in Germany, is developing training programmes related to renewable energy that are practically oriented to meet the industry's qualifications requirements. To meet the needs of qualified technicians outside Germany, there was cooperation with Canada and France (3 high schools and a Greta unit) to develop the training required. BZEE certificates enjoy wide recognition in the field of wind energy.

NATIONAL AND REGIONAL IMPLEMENTATION OF THE EUROPEAN FRAMEWORK ON QUALIFICATIONS AND OTHER EU STUDIES AND TRAINING POLICY IN THE BUILDING SECTOR

Proposals of the Grenelle building plan

In 2009, in the report of the Comité de filière “Métiers du bâtiment”,⁶ a study on training needs showed that **out of 150,000 people** entering the building labour force, **only 48,000** had received training specific to the building trade. This figure illustrates the **difficulty of finding qualified labour**, which is especially serious given that professionals need to perform to an extremely high level. This finding led the authors of the report to formulate a two-point proposal as part of their recommendations:

- **To scale the tool and the training facilities to the needs**, estimated at 70,000 young people in initial training per year.
- To **support** this mobilisation with an **information campaign** among young people on the building trades and on the opportunity created by the implementation of the Grenelle de l’environnement (environmental forum) commitments.

The report also proposes to give "20,000 more young people initial training" and to provide teachers with training related to the needs of the Grenelle de l’environnement (environmental forum).

The European Certifications Framework defined by the European Commission

“The European Qualifications Framework (EQF) acts as a translation device to make national qualifications more readable across Europe, promoting workers' and learners' mobility between countries and facilitating their lifelong learning.”

The goal is that all training set up starting in 2012 will refer to the appropriate level of the EQF. The member states are also asked to establish correspondences between their own qualification frameworks and the EQF.

⁶ Grenelle building plan. Report of the Comité de filière “Métiers du bâtiment”. 2009

The EQF has 8 different levels to assess all the instruction and training provided.

This framework applies to all types of training, including vocational training.

Level 1	⇒	Basic general knowledge
Level 2	⇒	Basic factual knowledge of a field of work or study
Level 3	⇒	Knowledge of facts, principles, processes and general concepts, in a field of work or study
Level 4	⇒	Factual and theoretical knowledge in broad contexts within a field of work or study
Level 5	⇒	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge
Level 6	⇒	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles
Level 7	⇒	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research - Critical awareness of knowledge issues in a field and at the interface between different fields
Level 8	⇒	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields

A report by the CNCP (National commission on professional certification)⁷ established a translation table that defines the correspondence between the French categories and those of the EQF. This transposition indicates that level V training in our categorisation corresponds with level 3 in the EQF.

⁷ CNCP. Référencement du cadre national de certification français vers le cadre européen de certification pour la formation tout au long de la vie. 2010

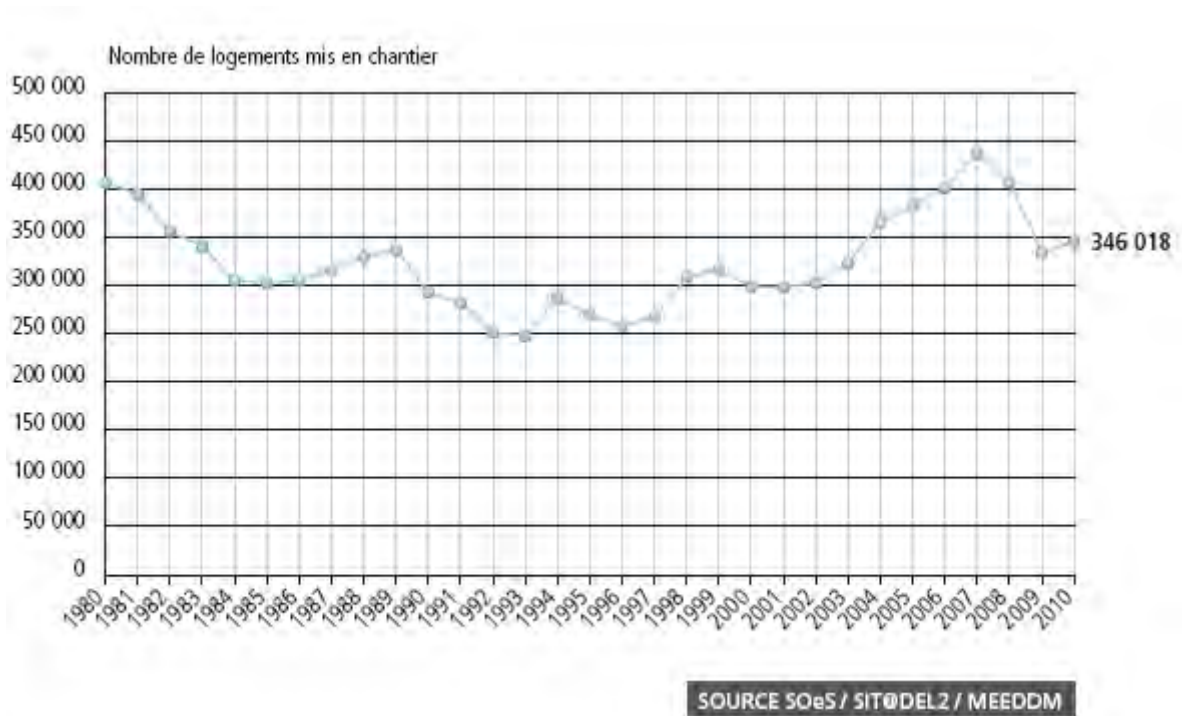
STATISTICS ON THE CONSTRUCTION AND ENERGY SECTOR

STATISTICS ON THE BUILDING SECTOR

The current situation

► Changes in **residential housing**⁸

The number of housing starts in 2010 rose by 3.5%, to a level of 346,018 units. Housing demand rose by 15.1%, to 453,542 units.



⁸ French Ministry of Education, CG Conseil. Sustainable development, energy management. Changes and impact on training programmes. 2010



Changes in tertiary buildings⁹

Total housing starts of non-residential premises stood on 31 May 2012, for 12 months in total, at 25.6 million square metres, up 5.6%. Hotel accommodation and crafts experienced the largest increases, with a growth rate of over 8%. Only agricultural and forestry construction was down, by 16%.

	Declared starts	May 2012	Change*
Housing (number of dwellings)	Ordinary housing	369,095	2.5%
	Individual single-family	133,252	-6.4%
	Grouped individual	51,494	-8.5%
	Apartments	184,349	14.1%
	Service housing (dorms, etc.)	23,194	-1.4%
	Total	392,289	2.2%
Non-residential (1,000s of m ²)	Hotel accommodation	733.6	8.9%
	Offices	3,802.7	16%
	Shops	4,189.1	5.3%
	Crafts	1,156.5	8.7%
	Industry	3,438.6	5.6%
	Agricultural or forestry operations	1,430.6	-16%
	Warehouses	3,651.8	3.4%
	Public service or public interest	7,006.2	6.4%
Total	25,409.1	5.6%	

Source: CGDD, SOeS
*June 11 to May 12/June 10 to May 11

FFB 2013 Outlook: The FFB is predicting a decrease in activity of 1.2% in 2012 and 3.5% in 2013, largely due to the sharp decline in new construction (- 8.9% for residential and - 4,4% for non-residential).

(Source: *Batiactu* of 12/12/2012)

⁹ CAPEB. Chiffres clés 2011. Updated January 2013

Low-energy (BBC) and positive-energy buildings

► BBC

Evaluation of BBC-Effinergie certification in new and renovation¹⁰

New construction

- Projects labelled between 2007 and 30 June 2012:
 - ✓ 39,363 apartments
 - ✓ 19,877 single-family homes:
 - 14,760 individual houses in dispersed sector
 - 5,117 single-family homes in housing developments
 - ✓ 82 tertiary constructions, i.e. 444,573 m² in area

Geographical distribution of labelled projects



2. Applications for labels

Applications for labels have increased constantly since 2007. Between 2009 and 2012, the monthly number of applications for labels for single-family homes increased by a factor of 10. This was also the trend for apartments.

Nombre mensuel de demandes de labellisation (nombre de logement)	Logement Individuel	Logement Collectif	Opération Tertiaire
Année 2009	240	1090	2
Année 2010	1055	5174	11
Année 2011	2714	15063	33
Année 2012 (1 ^{er} trimestre)	3014	19820	10

¹⁰ Observatoire BBC. Summary of labelling as of 30/06/2012

Renovation

1. Projects granted a **BBC-Effinergie Renovation** label from 2009 to 31 March 2012
 - ✓ 7,029 apartments
 - ✓ 120 single-family homes
 - ✓ 10 tertiary constructions, i.e. 34,993 m² in area

2. **Applications for a BBC-Effinergie Renovation label** have risen in a straight line since 2009 and as of 30 June 2012 represented:
 - ✓ 46,680 apartments
 - ✓ 1,250 single-family homes
 - ✓ 121 tertiary operations, i.e. more than 1 million m²

Positive energy buildings - **BEPOS**

The ADEME Bepos database lists **180 positive-energy buildings in France**. There have been 20 to 30 new operations completed every year since 2009.

A **positive-energy building label** associated with RT2012 is in the **process of being developed**. It will define the BEPOS technical requirements.

STATISTICS ON THE CURRENT WORKFORCE IN THE SECTOR

Workforce characteristics

The number of salaried and non-salaried employees in the building sector in 2010 totaled 1.5 million, with 635,000 of them salaried.

The decline in construction activity in connection with the economic and financial crisis had a negative impact on the workforce, which shrank 2.9% in 2009 and 1.1% in 2010.

Age pyramid

- The **average age of salaried building employees**¹¹ in 2010 was 37.5, with those under 30 representing 30.1% of the total (down from 2009) and those over 50 representing 19.5% (up from 2009). This phenomenon could reflect companies' desire to keep older employees on their books.
- **Average age of construction workers in 2010 by profession**

¹¹

FFB. Les indicateurs sociaux du Bâtiment. 2012

Répartition par métier et par tranche d'âge des salariés recensés le 15/03/10

METIER	Age non déterminé	Moins de 18 ans	18 ans et 19 ans	20 ans à 24 ans	25 ans à 29 ans	30 ans à 34 ans	35 ans à 39 ans	40 ans à 44 ans	45 ans à 49 ans	50 ans à 54 ans	55 ans à 59 ans	60 ans à 64 ans	65 ans et plus	Nombre de salariés d'âge connu	Age moyen
Carreleur		639	964	2 746	2 709	2 071	2 032	1 936	1 755	1 333	930	160	31	17 306	34
Charpentier		929	1 406	4 466	4 069	2 700	2 427	2 228	2 177	1 772	973	127	20	23 294	33
Monteur en climatisation		18	56	318	316	177	158	133	78	54	29	6		1 343	31
Couvreur,couvreur zingue		1 208	1 819	5 918	5 992	3 831	3 799	3 723	3 763	2 879	1 381	178	23	34 514	34
Electricien	2	2 324	3 788	12 825	13 173	10 054	9 693	10 294	9 347	8 213	5 254	743	79	85 787	35
Étanchéiste		44	181	1 348	1 803	1 762	1 899	1 749	1 383	908	574	199	21	11 971	37
Installateur thermique		1 018	1 522	4 532	3 979	2 772	2 480	2 221	2 116	1 826	1 380	198	36	24 060	33
Monteur en isolation		40	89	522	741	541	642	779	714	500	288	56	7	4 919	38
Monteur levageur		2	12	177	260	201	213	294	257	194	127	14	2	1 753	38
Maçon	1	4 396	6 174	21 022	23 541	20 161	22 189	22 511	22 338	18 036	13 259	3 520	462	177 589	37
Menuisier		2 239	3 155	10 640	11 151	7 869	8 459	8 761	8 259	6 555	4 168	487	78	71 821	35
Métallier		534	854	3 087	3 659	3 022	3 385	4 079	4 079	3 154	2 149	296	52	28 350	38
Miroitier		26	62	370	430	340	333	428	348	279	159	24	1	2 799	37
Peintre	1	2 058	2 963	8 761	8 904	7 405	9 281	9 930	9 810	8 200	5 607	976	139	74 034	37
Plâtrier,plaquiste		714	1 031	3 649	4 416	3 461	3 553	3 436	3 116	2 377	1 567	219	36	27 575	36
Plombier		1 963	2 462	8 699	5 888	4 033	3 785	3 290	3 259	3 045	2 443	397	61	37 315	34
Solier moquetiste		35	94	441	496	433	496	496	444	350	276	51	9	3 621	37
Staffeur		18	30	136	155	141	179	156	144	104	87	30	1	1 181	37
Tailleur de pierre		79	156	399	384	328	260	261	209	163	112	9	5	2 365	33
Monteur d'échafaudages		3	18	255	442	414	409	413	368	220	109	19	2	2 672	37
TOTAL	4	18 286	26 826	88 311	92 608	71 716	75 632	77 118	73 964	60 162	40 872	7 709	1 014	634 269	36

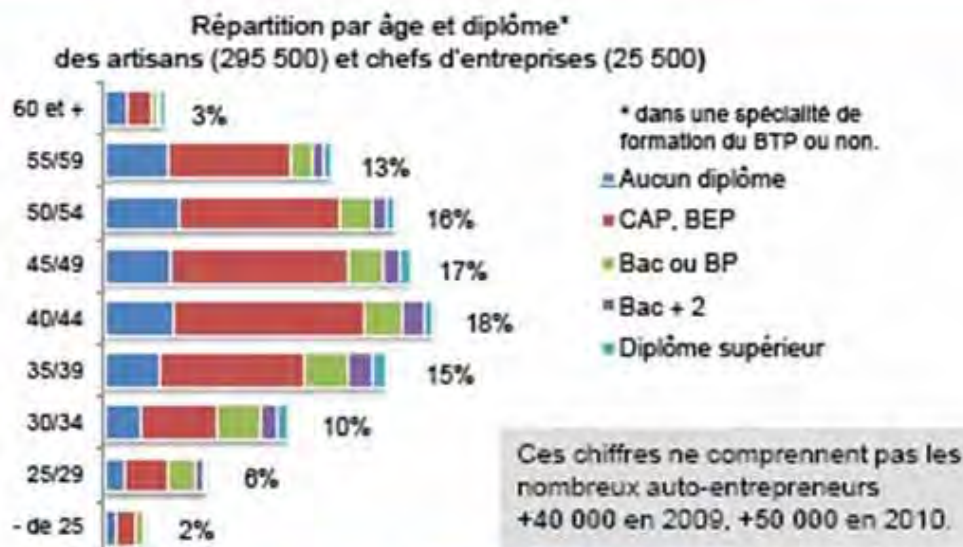
Extraction tableau UCF

■ Average age of craftsmen and company heads

The average age of craftsmen and company heads in the construction sector was **43.9**, most of whom had a diploma level of about level **V**.

321 000 en 2009
34,5 % de l'ensemble des secteurs d'activité

Nombre d'artisans et de chefs d'entreprises
dans le secteur du bâtiment et des travaux publics
France métropolitaine
Source : INSEE – Recensement au 1^{er} janvier 2007*



* Les résultats du recensement de la population sont obtenus à partir du cumul des informations collectées lors des cinq dernières enquêtes de recensement. Ainsi l'année de référence 2007 correspond à la période 2005-2009.

Âge des artisans et chefs d'entreprises	Âge moyen	55 ans et +
Maçonnerie	43,8	16%
Menuiserie	44,3	16%
Charpente bois	42,6	12%
Couverture	43,3	13%
Plomberie	44,4	18%
Chauffage	44,3	18%
Peinture	44,3	17%
Plâtrerie	42,3	13%
Carrelage	43,2	14%
Métallerie	43,8	14%
Électricité	45,0	18%
Réseaux électriques	46,7	21%
Canalisations	46,3	22%
Génie civil	44,1	17%
Routes	45,9	25%
Terrassement	43,6	14%
Total	43,9	16,0%

Tableau de bord de l'emploi et de la formation - CCCA-BTP - juin 2011

Breakdown of workforce

- Breakdown of employees by seniority¹²

After having almost doubled in 30 years from 1970 to 2000 (from 3.8 to 7.9 years), the seniority of employees in construction has been falling constantly since 2008 in line with growth and economic activity.

The 2009 economic crisis and its aftermath have led to less inter-company mobility and to more seniority in 2010, which rose to 7.2 years.

By comparison, taking all economic sectors together, 43% of salaried employees have been with their company more than 10 years on average.

Par ancienneté dans l'entreprise

Source : FFB (données au 15 mars de chaque année)
* Insee enquête emploi

TRANCHE D'ANCIENNETÉ	Variation des effectifs en % 2010/1970	BTP						Ensemble des secteurs économiques*
		Répartition en %						Répartition en %
		1970	1980	1990	2000	2009	2010	2010
Inconnue ou < 5 ans	- 35,3	72,5	58,7	53,8	49,5	56,7	54,4	40,0
De 5 à 9 ans	+ 15,7	14,5	20,3	15,3	18,3	18,7	19,6	17,0
De 10 à 14 ans	+ 27,4	6,1	9,8	12,6	12,6	7,9	9,0	43,0
De 15 à 19 ans	+ 56,2	3,3	5,5	9,0	6,4	6,3	6,0	
De 20 à 24 ans	+ 96,2	2,1	2,8	4,8	6,0	4,2	4,8	
De 25 à 29 ans	+ 237,2	0,6	1,6	2,7	4,3	2,8	2,5	
30 ans et plus	+ 259,0	0,9	1,3	1,8	2,9	3,4	3,7	
Ensemble des salariés du BTP	- 14,0	100	100	100	100	100	100	100

ANCIENNETÉ MOYENNE	Variation de l'ancienneté 2010/1970	1970	1980	1984	1990	2000	2009	2010
	+ 3,4	3,8 ans	5,6 ans	7,0 ans	7,1 ans	7,9 ans	6,9 ans	7,2 ans

¹² FFB. Les indicateurs sociaux du Bâtiment. 2012

- Breakdown of employees by trade¹³

Changes in the workforce by trade between 1970 and 2010 reveals a phenomenon of inversion between structural works and finishing works which, with 61.8% of the workforce, became the largest sector. Nevertheless, there were contrasting changes in the workforce, with the fittings sector showing an increase of 96% since 1970, while the painting sector fell overall by 14.3%.

Source : FFB (données au 15 mars de chaque année)

CORPS D'ÉTAT	Bâtiment					
	Variation des effectifs en % 2010/1970	Répartition en %				
		1970	1980	1990	2000	2010
● Gros œuvre	- 43,2	54,6	49,2	42,9	39,5	38,2
● Second œuvre	+ 10,5	45,4	50,8	57,1	60,5	61,8
dont :						
<i>Métal</i>	+ 11,3	4,5	5,1	6,7	6,4	6,2
<i>Couverture plomberie</i>	+ 8,5	10,6	11,3	12,5	14,3	14,1
<i>Installation thermique et isolation</i>	+ 24,5	3,2	4,1	4,4	4,2	5,0
<i>Électricité</i>	+ 50,8	5,4	8,1	9,0	10,0	10,1
<i>Bois</i>	+ 15,1	7,9	10,1	10,4	10,8	11,3
<i>Peinture</i>	- 14,3	9,1	9,8	10,8	10,6	9,6
<i>Aménagement</i>	+ 96,2	1,2	1,5	2,3	2,7	2,8
<i>Autres</i>	- 35,6	3,5	0,8	1,0	1,5	2,7
Ensemble des salariés du bâtiment	- 18,8 ¹	100	100	100	100	100

1. Pourcentage calculé à partir des données arrêtées au 15 mars de chaque année.

¹³

FFB. Les indicateurs sociaux du Bâtiment. 2012

- Breakdown of employees by trade in 2010¹⁴

METIER	TOTAL
Carreleur	17 306
Charpentier	23 294
Monteur en climatisation	1 343
Couvreur,couvreur zingueur	34 514
Electricien	85 789
Étanchéiste	11 971
Installateur thermique	24 060
Monteur en isolation	4 919
Monteur levageur	1 753
Maçon	177 590
Menuisier	71 821
Métallier	28 350
Miroitier	2 799
Peintre	74 035
Plâtrier,plaquiste	27 575
Plombier	37 315
Solier moquettiste	3 621
Staffeur	1 181
Tailleur de pierre	2 365
Monteur d'échafaudages	2 672
TOTAL GENERAL	634 273

¹⁴ UCF. Tableaux statistiques des salariés du BTP as of 15 March 2010

■ Breakdown of employees by job category¹⁵

The trend has been steady since 1980: the relative share of manual workers fell from 83.3% in 1980 to 74% in 2010, whereas the share of Etam (foremen) rose (from 11% to about 19%) while managers stayed at about 7%.

Among the manual workers, about 60% are skilled or highly-skilled.

Par catégorie professionnelle

Source : FFB (données au 15 mars de chaque année)
* Insee enquête emploi

CATÉGORIE PROFESSIONNELLE	Variation des effectifs en % 2010/1980	Bâtiment					Ensemble des secteurs économiques*
		Répartition en %					Répartition en %
		1980	1990	2000	2009	2010	2010
Ouvriers	- 16,9	83,3	79,2	75,9	74,9	74,0	24,1
dont							
- BAT A				42,0	42,1		
- BAT B				34,3	34,0		
- BAT C				23,4	23,6		
- non déterminés				0,3	0,3		
Etam	+ 54,6	11,3	13,6	15,3	18,0	18,6	58,9
Cadres	+ 26,8	5,4	7,1	6,8	7,1	7,4	17,0
Ensemble des salariés du bâtiment	- 6,5	100	100	100	100	100	100

1. Pourcentage calculé à partir des données arrêtées au 15 mars de chaque année.

- BAT A : ouvriers d'exécution positions 1 et 2 (coefficients hiérarchiques 150 et 170) ;
- BAT B : ouvriers professionnels, compagnons professionnels position 1 (coefficients hiérarchiques 185 et 210) ;
- BAT C : compagnons professionnels position 2, maîtres ouvriers ou chefs d'équipe positions 1 et 2 (coefficients hiérarchiques 230, 250 et 270).

¹⁵ FFB. Les indicateurs sociaux du Bâtiment. 2012

- Breakdown by size of company¹⁶
The number of salaried construction employees came to 1,175,508.
60% of the workforce are concentrated in the crafts and SME sector.

Salaried employees

Workforce segment	Salaried employees	Breakdown
Companies with 1 to 9 employees	479,727	41%
With 10 to 19 employees	222,269	19%
Companies with fewer than 20 employees	701,996	60%
Companies with 20 employees or more	473,512	40%
Total Construction	1,175,508	(100%)

Source: UNEDIC as of 31/12/2010

Reading: construction companies with fewer than 20 employees employ 701,996 employees, i.e. 60% of all construction employees

Non-salaried workforce

	Non-salaried workforce	Breakdown
Non-salaried	414,718	
of which self-employed*	99,729	24%

Source: RSI as of 31/12/2011

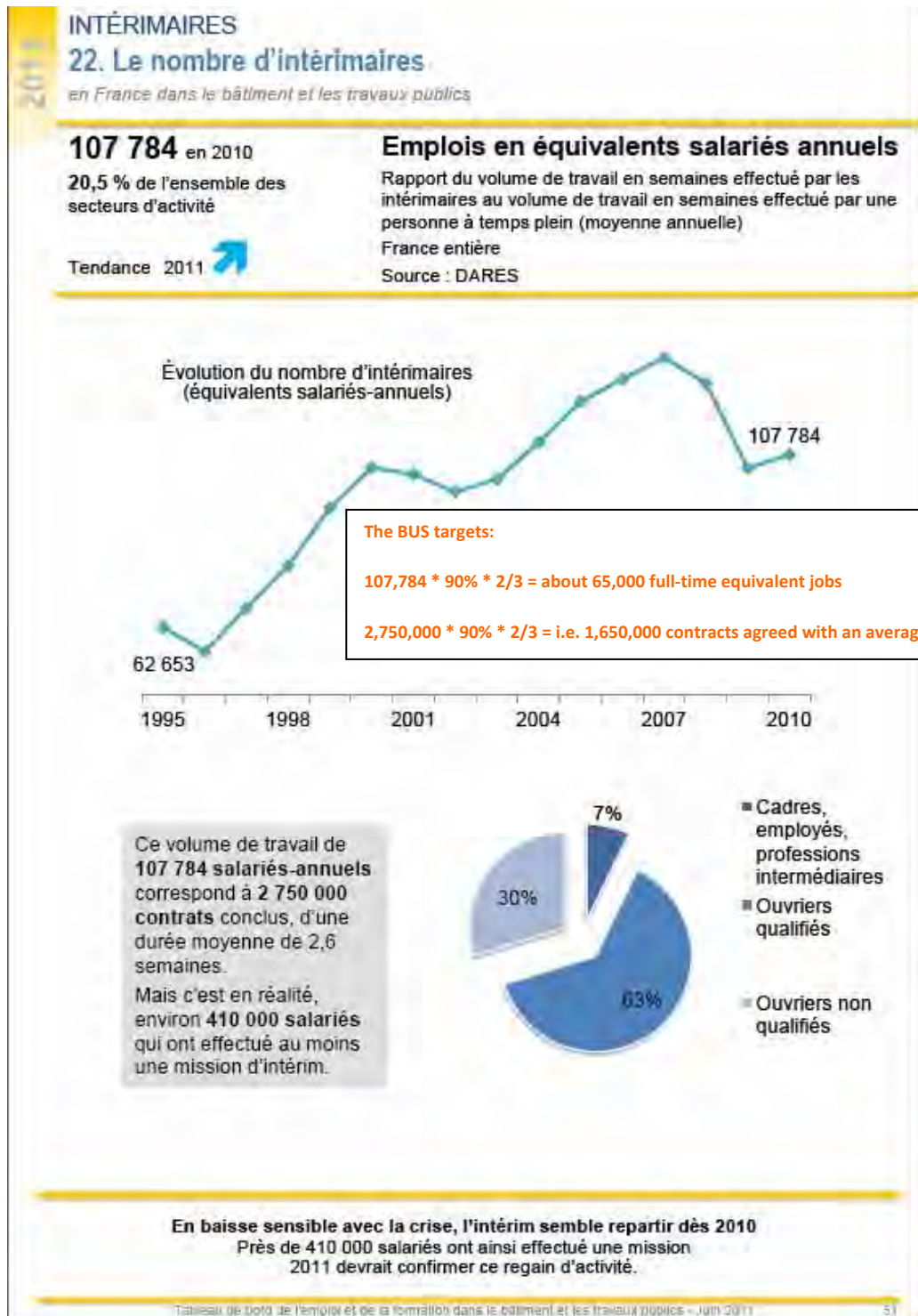
¹⁶ CAPEB. Chiffres clés 2011.

Temporary work

In 2010, the construction industry had 107,784 full-time annual equivalent jobs, or about 410,000 employees on contracts with an average duration of 2.6 weeks.

Out of the 90% of temporary jobs involving blue-collar workers, about two-thirds are employed in the building sector.

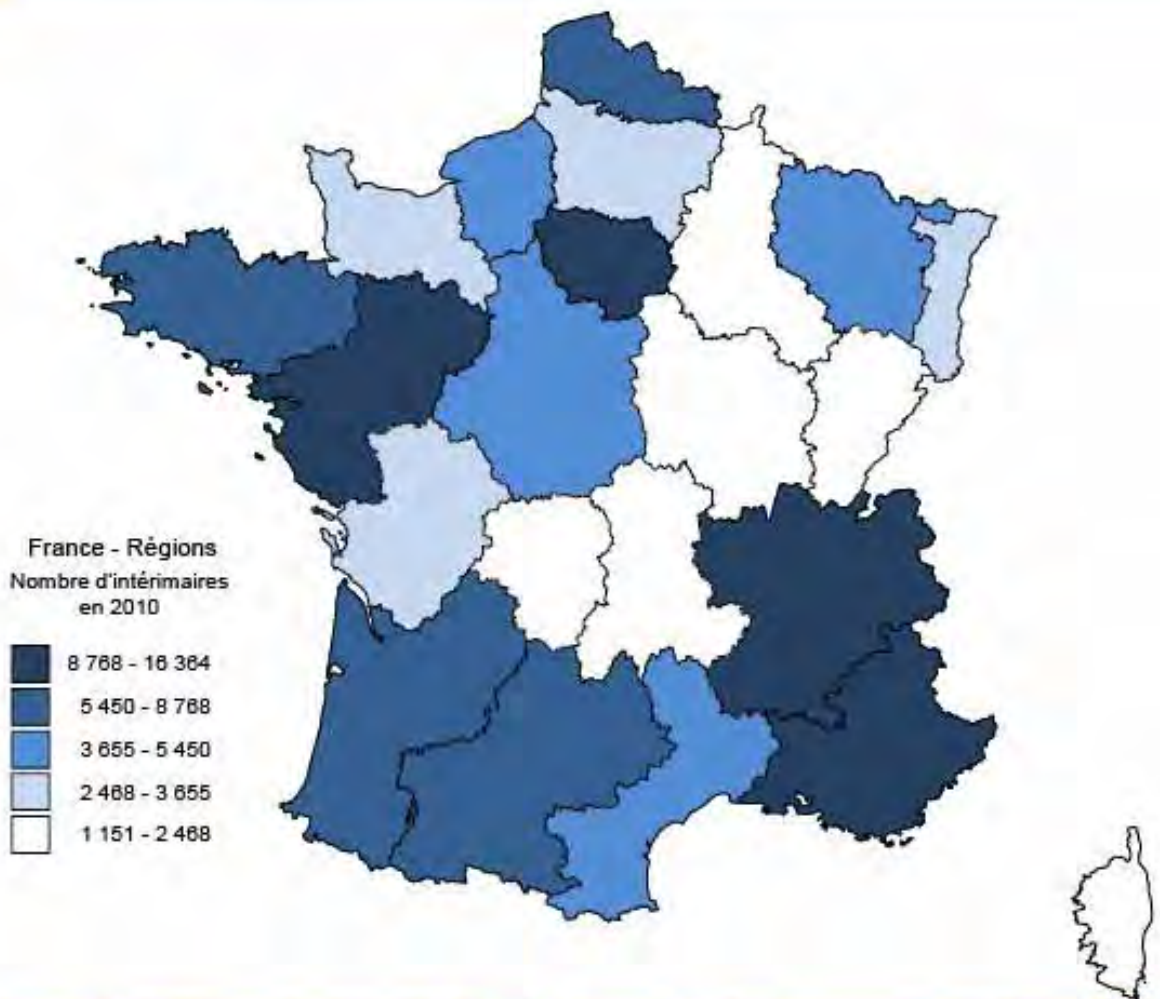
Temporary jobs, which declined significantly with the crisis, seemed to be recovering in 2010 and tend to be rising in 2011.



2011

22. Le nombre d'intérimaires

par région dans le bâtiment et les travaux publics



France - Régions
Nombre d'intérimaires
en 2010



Régions	nombre	%	Régions	nombre	%
Alsace	2 788	2,6	Limousin	1 151	1,1
Aquitaine	7 283	6,8	Lorraine	3 655	3,4
Auvergne	1 664	1,5	Midi-Pyrénées	5 952	5,5
Basse-Normandie	2 561	2,4	Nord - Pas-de-Calais	6 727	6,2
Bourgogne	2 378	2,2	Pays de la Loire	8 768	8,1
Bretagne	5 450	5,1	Picardie	2 468	2,3
Centre	3 897	3,6	Poitou-Charentes	2 855	2,6
Champagne-Ardenne	1 816	1,7	Provence-Alpes-Côte d'Azur	8 904	8,3
Corse	nd		Rhône-Alpes	11 246	10,4
Franche-Comté	1 352	1,3	Guadeloupe	405	0,4
Haute-Normandie	3 994	3,7	Guyane	310	0,3
Île-de-France	16 364	15,2	Martinique	nd	
Languedoc-Roussillon	5 092	4,7	Réunion	400	0,4
			France métro + DOM	107 784	100

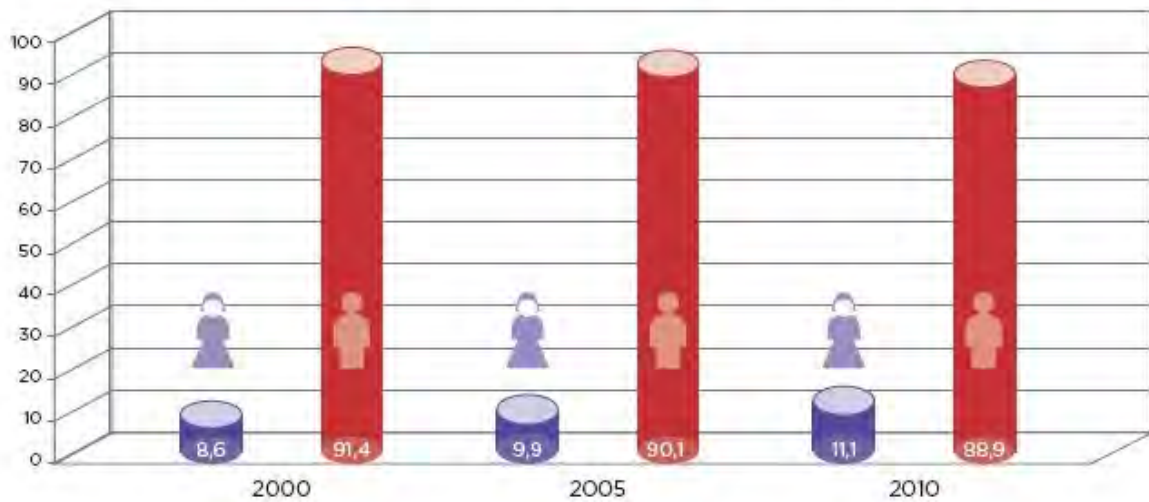
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Tableau de bord de l'emploi et de la formation dans le bâtiment et les travaux publics - Juin 2011

- Women in construction¹⁷

The share of women in construction is rising steadily. They represented an 11% share in 2010. Nevertheless, out of 100 women employees in the sector, only 11 of them were employed as a manual worker. By job category, the proportion of manual workers who are women came to 1.6%.

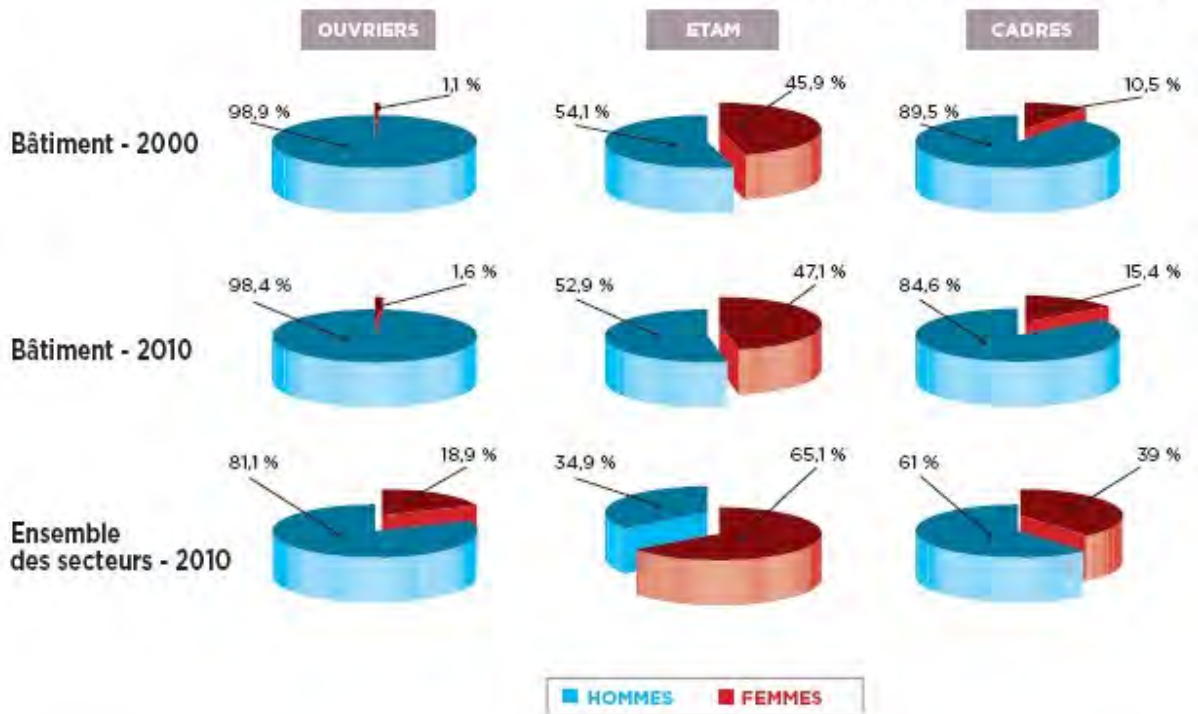
Part des femmes dans les effectifs salariés du bâtiment (en %)



¹⁷ FFB. Les indicateurs sociaux du Bâtiment. 2012

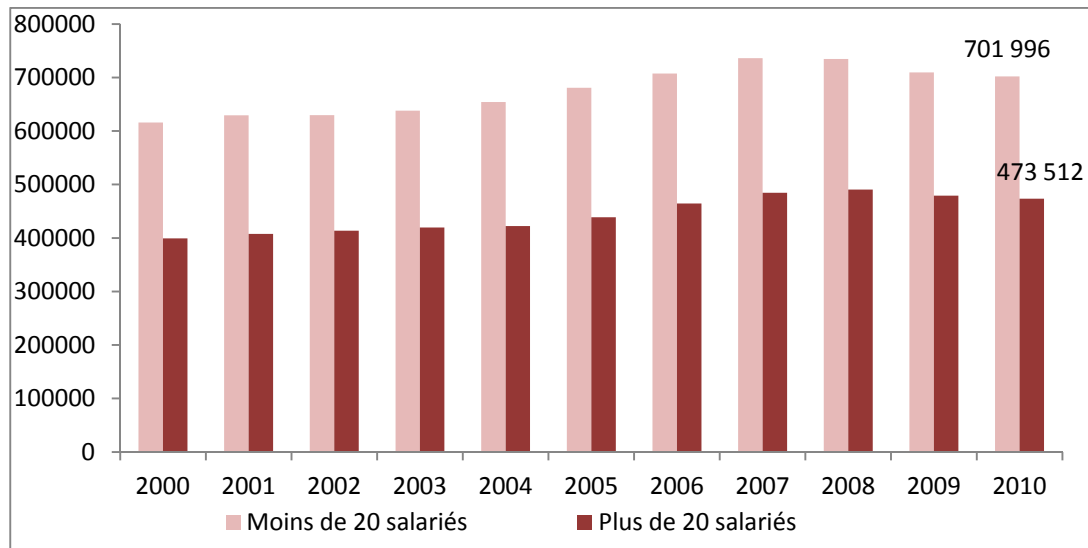
Proportion de femmes dans chaque catégorie professionnelle (sur 100 salariés)

Source : FFB (données au 15 mars de chaque année)



Labour market

Between 2000 and 2010, construction companies with fewer than 20 employees created more than 80,000 jobs.



Source: UNEDIC on 31/12 of each year

According to the CAPEB,¹⁸ 7% of construction crafts firms did not manage to meet their recruitment needs. **The number of unfilled job positions can be estimated at about 15,000.**



In the crafts sector alone, **the CAPEB estimates** that 180,000 employees will need to be replaced within the coming 10 years.

¹⁸ CAPEB. Chiffres clés 2011



Statistics on the supply and demand for jobs (Source: *Pôle emploi* - 2011)

ROME codes	Supply	Demand
F1501 Installation of wood frames and structures	3,247	4,953
F1502 Installation of metal structures	5,378	6,623
F1601 Application and decoration with plaster, stucco and staff	703	1,910
F1602 Building electricity	22,142	61,824
F1603 Installation of sanitary and thermal equipment	19,489	52,273
F1604 Mounting fixtures	13,676	30,311
F1606 Painting buildings	19,518	85,189
F1607 Installation of joinery closures	17,025	22,320
F1608 Installation of rigid pavements	6,063	15,444
F1609 Installation of flexible pavements	2,227	2,603
F1610 Installation and restoration of roofing	11,521	15,172
F1611 Installation and restoration of facades	3,920	7,938
F1612 Cutting and decorating in stone	797	2,501
F1613 Sealing and insulation work	3,856	5,385
F1703 Masonry	29,821	85,013

In 2011, the sharp deterioration in the labour market that began in 2009 continued, with a very high number of job seekers compared to the job offers for each specialty. This is in contradiction with the hiring difficulties raised by the CAPEB. There might well be a mismatch between the profiles sought by businesses and the skills of the job seekers.

CHANGES IN GLOBAL ENERGY CONSUMPTION

The **energy consumption** of the construction sector¹⁹, and more specifically of the **residential-tertiary** field, is a major issue for sustainable development.

Even though the goals for new building are increasingly tough, **reducing the sector's overall energy bill** will mainly involve the **renovation of existing buildings** that were built before the standards promoting energy efficiency. 1% of the existing stock is renovated every year; at this pace, only one-third of residential housing will be renovated within 30 years. The goal is to reduce the consumption of the existing stock by 38% by 2020. The priority is therefore the **16.1 million dwellings constructed before 1975** which have an average consumption of 328 kWh/m²/year and the 800,000 social housing units (among the 4.2 million to renovate) with a consumption of more than 230kWh/m²/year, in order to bring these down to 90 to 150 kWh/m²/year.

(By way of comparison, the average consumption of new housing is currently between 80 and 100 kWh/m²/yr.)

Répartition des types de logements en France

En millions de logements construits

	Parc ancien (avant 1975)	Parc récent de 1975 à 1981	Parc récent de 1982 à 1989	Parc récent après 1990	Total
Maisons individuelles	8,5	1,8	1,7	2,4	14,4
Immeubles collectifs	7,6	1,3	0,8	1,6	11,3
Total	16,1	3,1	2,5	4	25,7

Source : Ceren, 2007. SOeS (www.ifen.fr) - Données essentielles de l'environnement

In 2007, residential and tertiary sector buildings consumed 44% of final energy consumption in France, with two-thirds of that by residential and one-third by tertiary. This consumption is up 42% since 1970.

Electricity and gas account for 35% and 34%, respectively, of energy consumption in the residential-tertiary sector. Their use has increased by a factor of 7 over the last three decades, mainly to replace oil and coal.

Consommation énergétique finale du secteur résidentiel – tertiaire, par type d'énergie utilisée

En Mtep

	1970	1980	1990	2000	2007
CMS *	7,95	3,25	1,81	0,69	0,38
Pétrole	25,11	25,46	17,99	15,55	12,69
Gaz	3,48	9,65	13,82	20,10	22,71
Électricité	3,48	9,06	14,87	19,94	23,97
EnRt **	7,48	6,56	9,20	8,10	7,87

Notes : consommation corrigée des effets du climat ; hors utilisation de ressources à des fins non énergétiques ; * CMS : combustibles minéraux solides (charbon + coke de houille) ; ** EnRt : énergies renouvelables autres que hydraulique, éolien et photovoltaïque.

Source : SOeS, 2008. SOeS (www.ifen.fr) - Données essentielles de l'environnement

¹⁹ **Ministère du Développement Durable** – La consommation énergétique des bâtiments et de la construction [Energy consumption of buildings and construction].



The average unit consumption of residences fell by 41% between 1973 and 2005. This decrease was primarily the result of progress in the field of energy savings and because of thermal regulations set for new housing. But this trend was offset by the increase in the housing stock, improved comfort and the appearance of new high-consumption needs (household appliances, air conditioning, etc.). This explains the increase in total energy consumption.

In 2010, the consumption of the residential-tertiary sector was down 1.2%, thus returning to its 2003 level. This figure seems to indicate a change in behaviour driven firstly by rising energy prices and secondly by measures to promote energy savings. The renewable energies are continuing to grow (4.8%). This growth is due mainly to the success of heat pumps and to progress in new methods of heating with wood, both in individual and collective housing.

The share of renewables in primary energy consumption in 2010 was 8.4%.

Thermal energy for the production of heat and cold has already met the targets of the 2012 PNA (National action plan for renewable energy).

Energy consumption in the residential sector

In 2010, the residential sector consisted of 33 million units, 27.7 million of which were principal residences. The energies used most commonly were:

- For **heating: natural gas** (44%), **electricity** (33%), and **fuel oil** (14.4%).
- For **domestic hot water: electricity** (45.5%), **natural gas** (39%) and **fuel oil** (9.5%).

There has been growth in the installation of systems to produce central heating and hot water. The consumption associated with these two items accounts for 75% of the residential energy total.²⁰

Energy consumption in the tertiary sector

In 2009, final consumption in the tertiary sector grew significantly less than the total stock heated. The area heated in the tertiary sector came to 912,354,000 m².

In 2010, gas was the energy most commonly used for heating (45.8% of the area heated); electricity (25% of the area) rose by 3.4%, and fuel oil (19.3% of the area) continued to decline (-3.2%).

New tertiary space is characterised by the increased use of heat pumps (+22%).

Approximately 4 million square metres are heated by renewable energy: solar panels, found on more than 70% of these surfaces, come first.²¹

²⁰ ADEME. Chiffres clés 2011 du Bâtiment [Key construction data 2011]

²¹ ADEME. Chiffres clés 2011 du Bâtiment [Key construction data 2011]