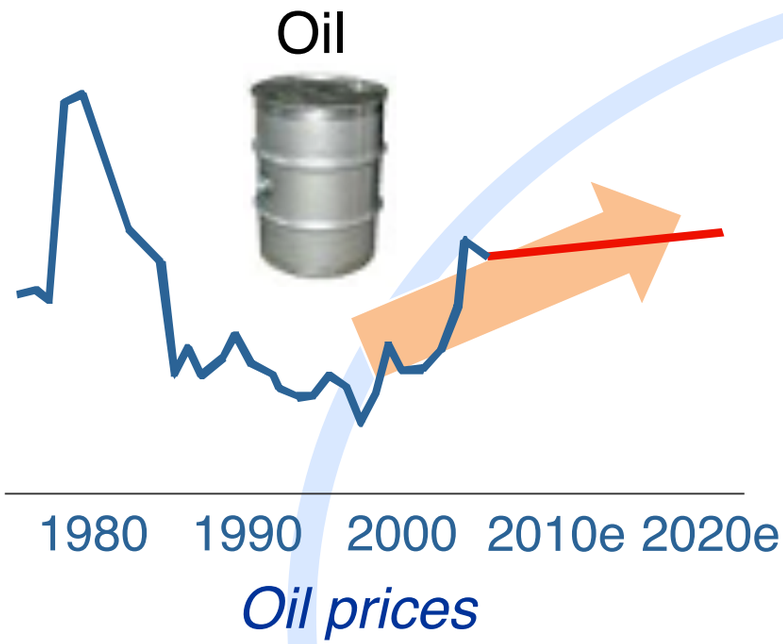
Enterprise-wide approaches to power sector energy efficiency improvements

7 Décembre 2011

Claude K Nahon
Senior Vice President
Sustainable Development

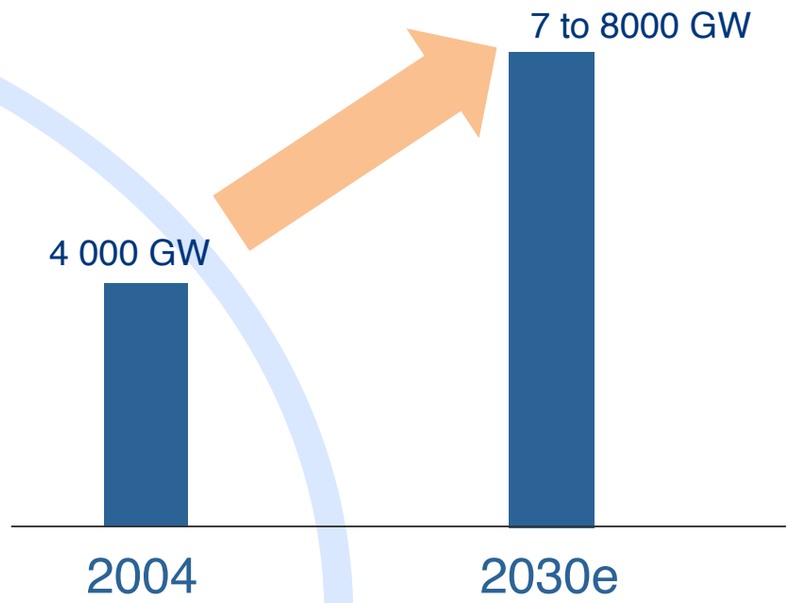
The Big Bang...

Continuing expensive fossil fuels



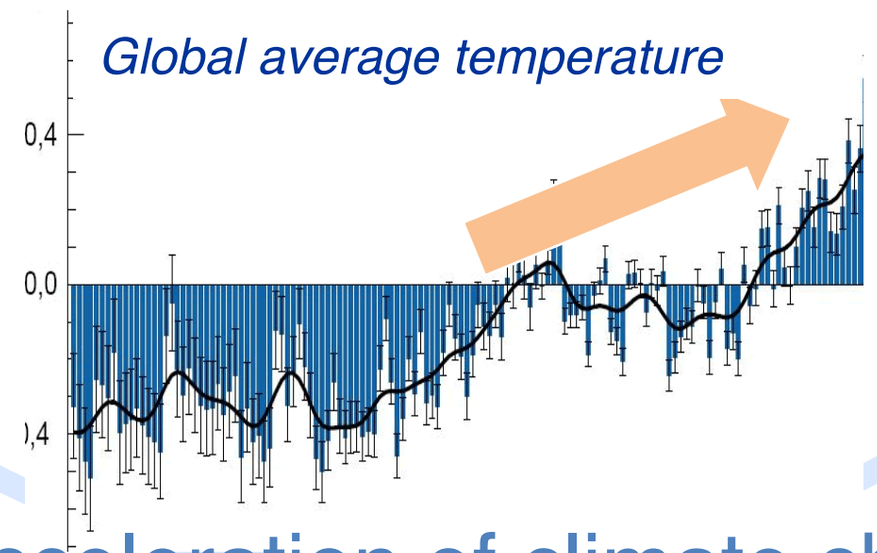
Oil prices

Energy needs in strong growth



Electricity generation capacity installed in the world

Three challenges beyond the crisis



Acceleration of climate change

Sources : EDF, AIE, GIECC

The double Big Bang...

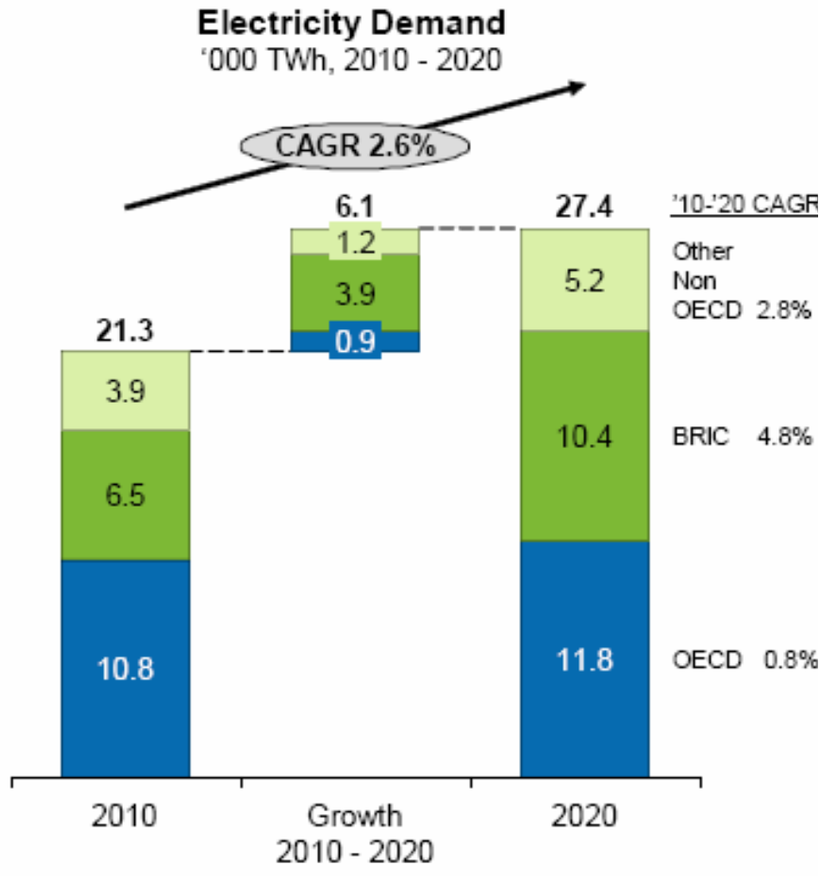
Four key developments are changing the world·

An increase in the urban population: 50% of pe living in cities, 70% by 2050

Resource scarcity

A plural and multi-polar world (new emerging powers: China, Brazil, India, etc.)

An ever-more sprawling, decentralised world (urban systems, local energies, smart grids and meters, etc.)



Source : IEA World Energy Outlook 2010

1/3

of global energy **needs** met by **electricity**

2 Billions

people who don't have **access to energy**,

40 %

of global **GHG** emissions from **energy sector,**

Source: IEA

There is no “silver bullet technology”

Electricity accounts for 40% of the energy sector GHG emissions. Holding global warming under +2°C requires us to divide the carbon content of electricity by a factor 10 (from 500 to 50g CO2/kWh) by 2050

This means a complete reversal of the global electricity mix:

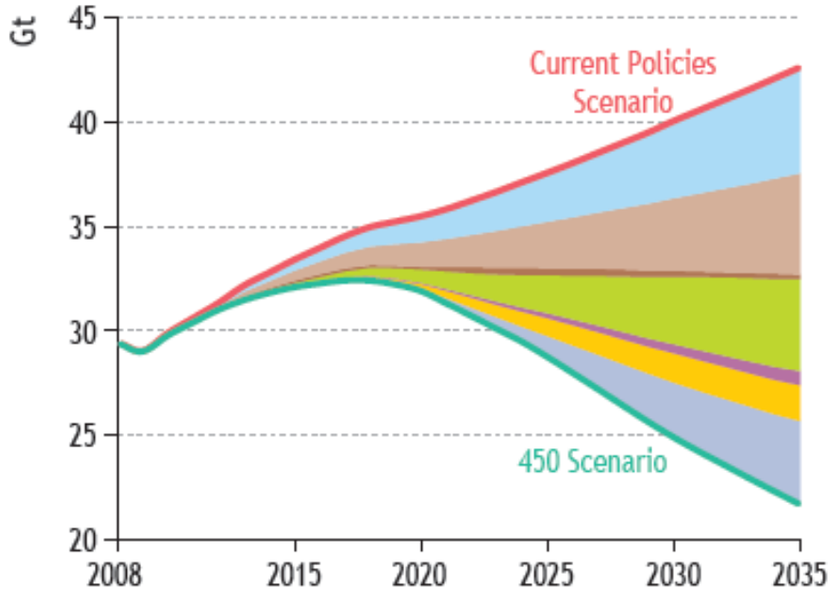
- From 1/3 carbon-free and 2/3 fossil today
- To 1/3 fossil with CCS and 2/3 carbon-free.

To achieve this, we need to have development on the supply side of ambitious energy efficiency programs.

Energy efficiency is a key answer

- 50% of potential reductions of CO2 emissions
- Technologies to curb demand and promote energy efficiency

World energy-related CO_2 emission savings by policy measure in the 450 Scenario



	Abatement		
	2020	2030	2035
Efficiency	71%	49%	48%
End-use (direct)	*34%*	*24%*	*24%*
End-use (indirect)	*33%*	*23%*	*23%*
Power plants	*3%*	*2%*	*1%*
Renewables	18%	21%	21%
Biofuels	1%	3%	3%
Nuclear	7%	9%	8%
CCS	2%	17%	19%
Total (Gt CO_2)	3.5	15.1	20.9

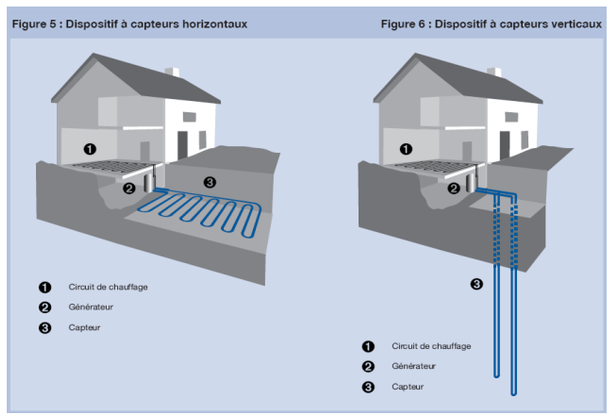
Source : AIE 2010

Induction

Industrial Heat Pump

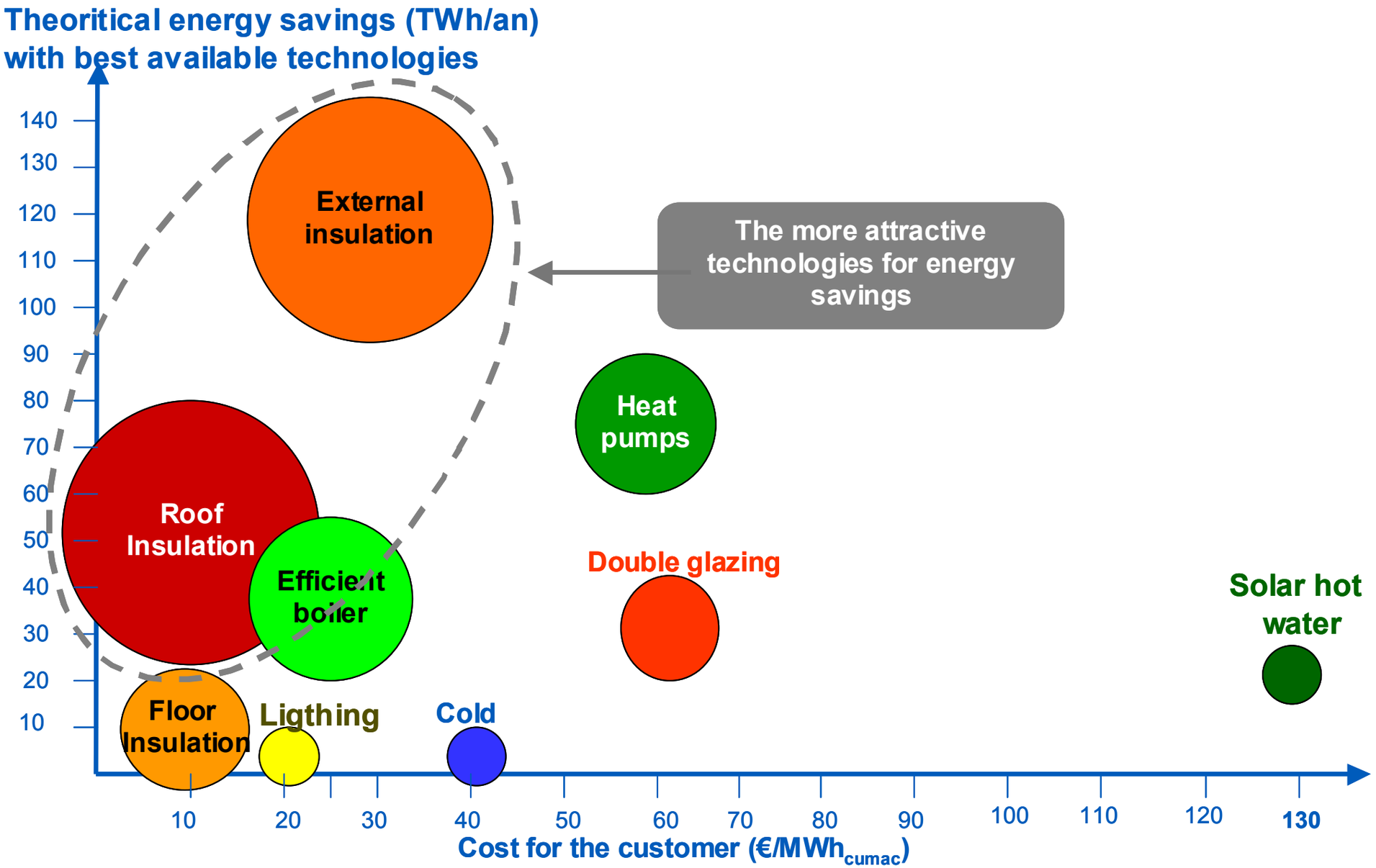
Housing insulation

Residential Heat Pump



High potential of energy efficiency improvements but its content varies among regions

- Insulation is the most effective action
- The refurbishment market is large, provided that it is made more affordable to customers
- A reduction of the needs for heating by 30 to 50% is achievable in **Northern Europe**
- Stakes and objectives are different in **Southern Europe**



Energy efficiency increases at moderate pace because of barriers

Investment costs (up-front payments)

- **High preference for present consumption** (low value to uncertain long - term savings)
- Financial constraints (income insufficient to invest)
- Reluctance of the customer to invest in energy efficiency rather than in its own core business

“Split incentives”

- Actors making investment are not necessarily those that will reap the benefits

Transaction costs

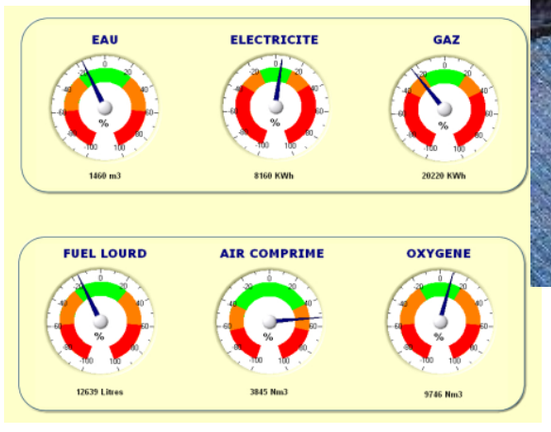
- Large number of players on both sides of markets (customers – installers)
- **Lack of professional skills (importance of capacity building)**

For the potential of energy efficiency improvement to be tapped, we need public policies combining high performance standards and electricity prices reasonably reflecting costs

Three directions to realize the energy efficiency improvement potential

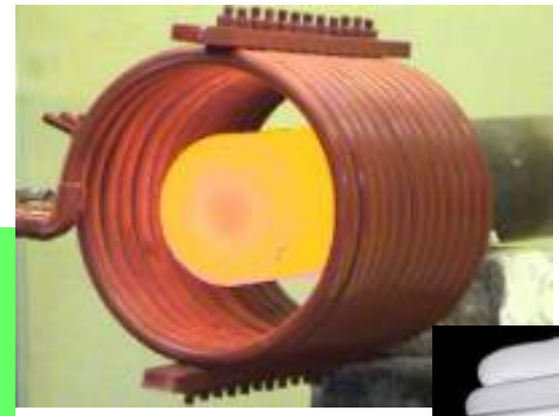
Increasing investment

1 – Reduce energy requirements



2 – Use local renewable energies and recover heat losses

3 – Use high efficiency systems



Energy efficiency require

1. A favorable national framework with no overlapping regulations

2. Local industrial partnerships

3. Financial relevance, clear investment policies and smart investments : PPP – Create clear and stable incentives,

4. Corporate Social Responsibility

Energy efficiency improvements

Any development program should :

- Include Demand Side Management

- Ensure balance between commercially proven technologies, incentivised technologies and R&D development

- Need ownership from all the stakeholders

Thank you

Energy Efficiency: EDF policy in France

Increasing customer consciousness and inciting him to be “virtuous”

- Information on energy savings
- Advertising campaigns, …

Realising diagnoses to identify sources of energy savings

Accompanying the customer (incl. financially) to help him make the good choice and implement it properly

(Directly or indirectly through partners)

Prefiguration of solutions

Engineering and installation of solutions

Operation & maintenance of solutions

Some examples of EDF actions :
services to enterprises & local authorities

EDF LEADING THE ENERGY CHANGE

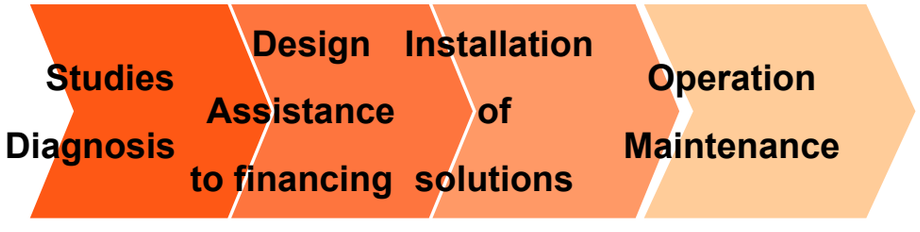
Optimal Solutions GROUPE EDF

Our objectives : help entreprises & local authorities reduce energy consumption & CO_2 emissions

To fulfill client's energy-related needs:

- Heating
- Cooling
- HVAC
- Lighting
- Building efficiency

Intervention over the whole value chain with qualified partners



Intervention on the occasion of key events

- Equipment replacement
- Extension of site
- Building or retrofit of a building

4 directions of action :

- reduce energy needs
- use local & renewable energy sources
- use high efficiency equipments
- secure energy supply

More than 2000 industrial customers/local authorities as clients

EDF

Some example of EDF actions in France capacity building

An innovating and voluntary training device for **building companies and craftsmen dedicated to energy saving**

Four sessions :

- Identification of the key elements of a global energy saving offer
- Controlling of the software to implement this offer
- Knowledge, control and implementation of the energy improvements technol
  lighting and other electrical equipment, etc.) : one for residential and anothe

Formation aux Économies d'Énergie des entreprises et artisans du Bâtiment — FEE Bat

In practise

- **100 centres in France**
- Since the beginning of 2008, nearly 20 000 professionals trained.
- A new objective in negotiation : **120.000 trained at the end of 2012.**
- A reflection in progress for modules on the new Positive Energie buildings

Training sessions in public lighting optimisation for **Local authorities' technical departments**

Examples of EDF actions in France
services to residential customers

Consumption follow-up ("Suivi conso")

- A follow-up of the annual consumption in kWh and €, starting from a on line questionnaire , with monthly analyses if required
- Practical advices to reduce consumption/bill.
- Annual assessment of consumption

Customisable home

- *For the customer to see and simulate his energy costs*

Energy labelling application (Iphone)

- *T o support the customer's choice of appliances*

Work estimates ("Estimation Travaux")

- A detailed and personalised estimation by phone of potential energy savings in case of renovation

Work objectives & achievement ("Objectif Travaux")

- A thermal audit of the house, with a report including recommendations
- Professionals partners Bleu Ciel d'EDF (with a quality reference frame) carrying out the job

Loan for housing refurbishment

- *Lowered interest rate*