Grenoble's challenges regarding intelligent use and management of energy

Dr Xavier NORMAND
Project manager « Sustainable city »
City of Grenoble

GRENOBLE
FACTEUR 4

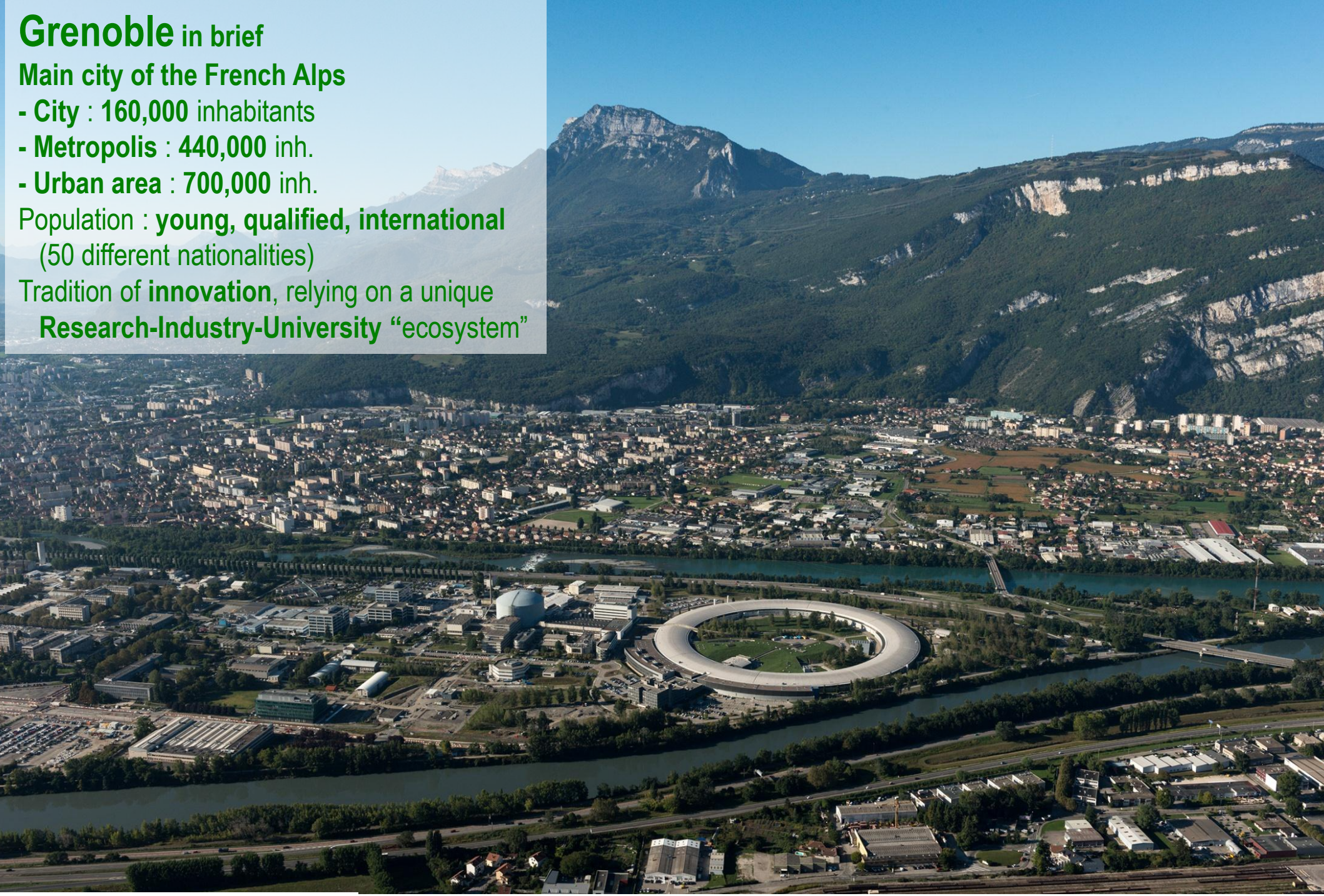
Grenoble in brief

Main city of the French Alps

- **City** : **160,000** inhabitants
- **Metropolis** : **440,000** inh.
- **Urban area** : **700,000** inh.

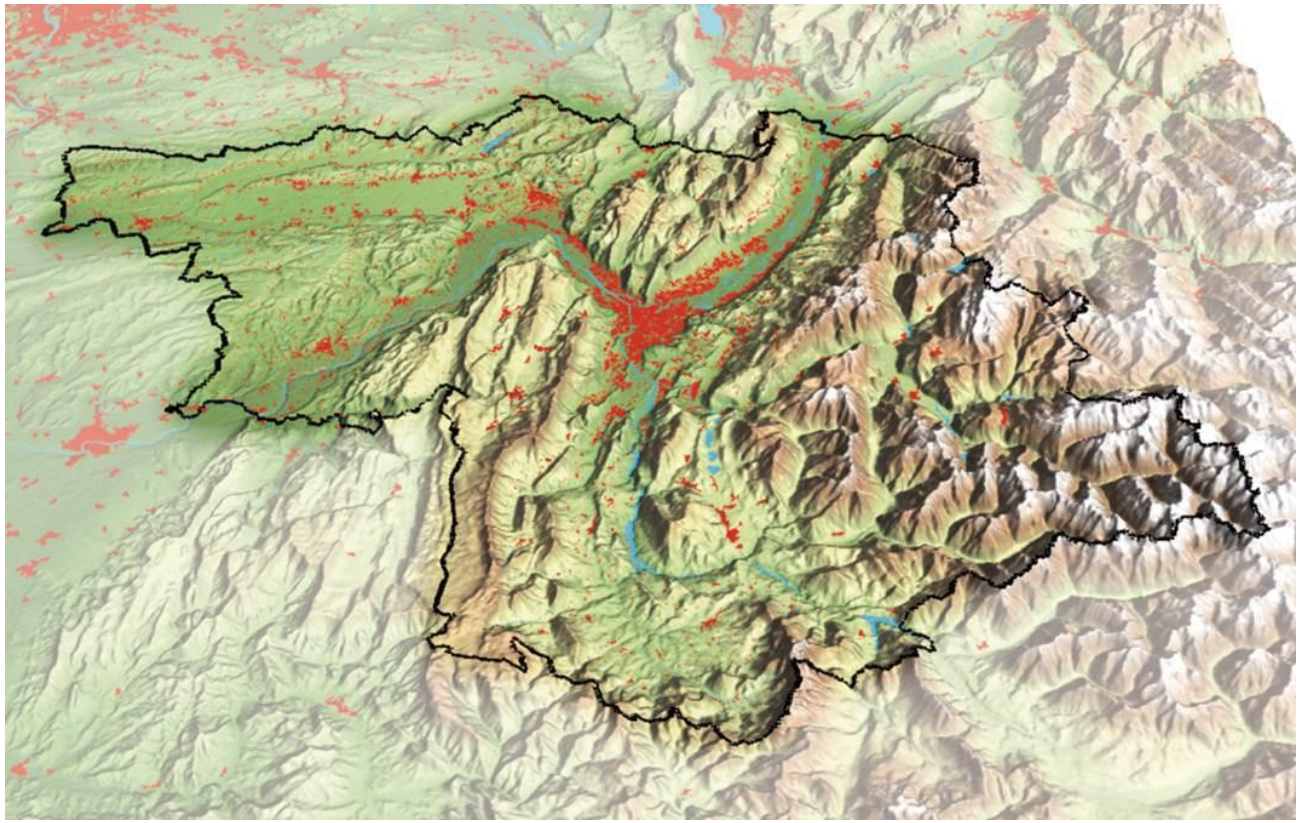
Population : **young, qualified, international**
(50 different nationalities)

Tradition of **innovation**, relying on a unique **Research-Industry-University** "ecosystem"



Grenoble.fr

Grenoble benefits from an exceptional **natural environment** (surrounded by mountains), also with severe **constraints due to its enclosed valley** (few building land, air pollution, frequent traffic congestion)



=> Policies towards **environmental protection** and **public transportation development** last for several decades

Sustainable city program: the « Grenoble Facteur 4 » action plan

GRENOBLE FACTEUR 4

+++ Grenoble
the positive energies

Covenant of Mayors
Committed to local sustainable energy

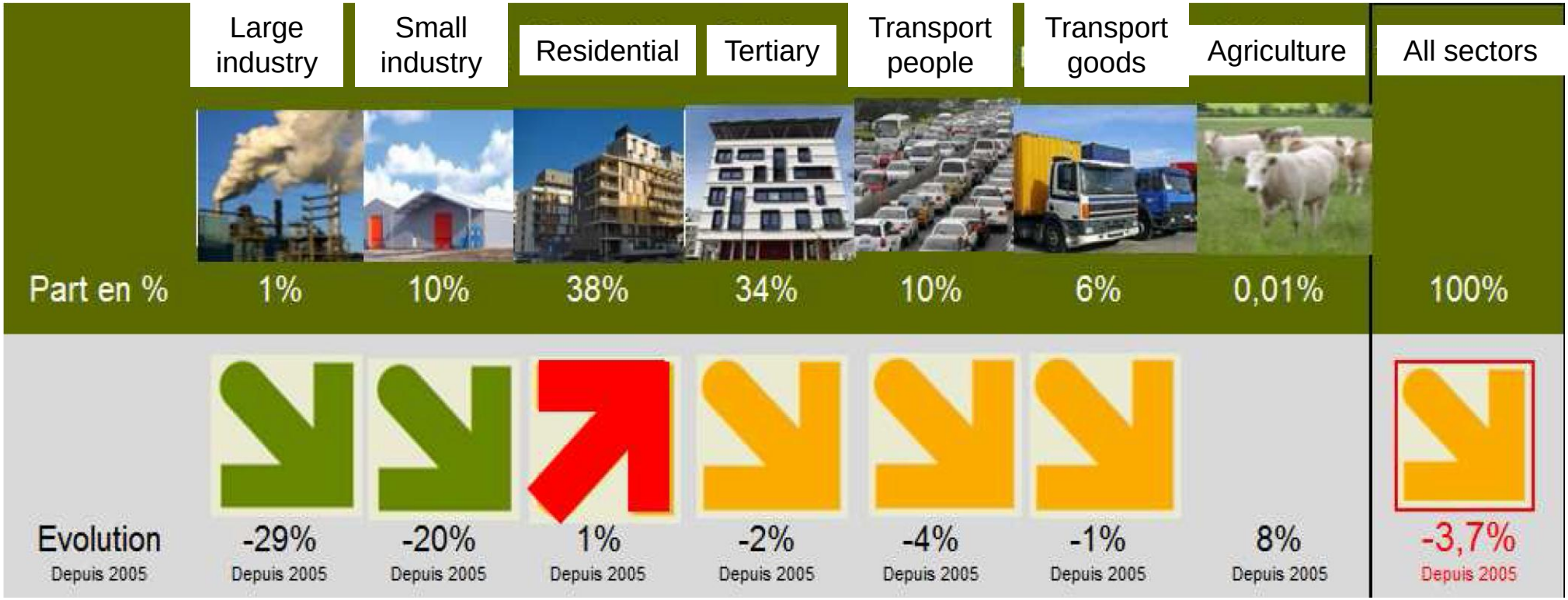
European Commission

- **2008**: adoption of the **EU Climate and Energy Package** (**3x20**), **Grenoble** is part of the first signatories of the **Covenant of Mayors**
- the **« Grenoble Facteur 4 »** 32-action plan was launched as the **framework** of an **integrated environmental policy** including the **objective** of **dividing GHG emissions** on the territory by **4** in **2050**:
  - The list of **actions**, with attached **targets**, was **fixed for the 6-year mandate**
  - An **observatory** for GHG emissions and energy consumption has been set up
  - It included an **« eco-citizen » participative program** focused on awareness-raising and best-pratice sharing

ACTIONS ÉCO-CITOYENNES GRENOBLE FACTEUR 4

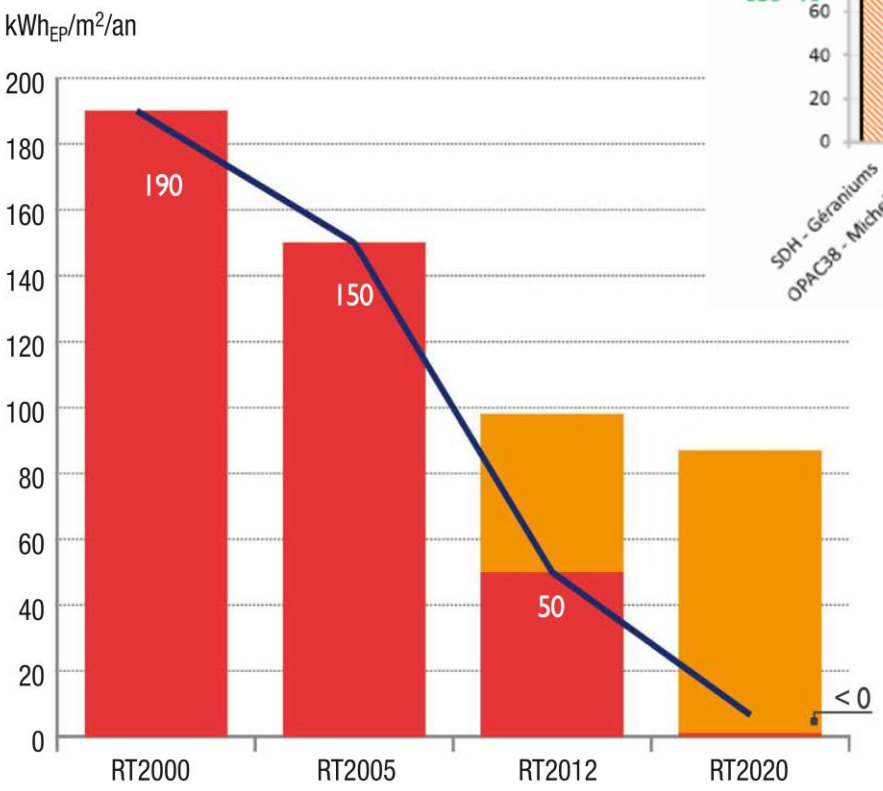
- **Energy** issues took a large part in the program:
  - **Thermal improvement** programs for **social housing** and **co-ownerships**
  - New buildings with **high energy performance** (ahead of regulation) and mastered cost
  - Development of **renewable energy sources**: PV, biogas, waste and biomass for the DHC network (more than 50%)
  - **Smart energy** research and innovation programs (GreenLys, power to gas, …)

Which are the new challenges about energy?

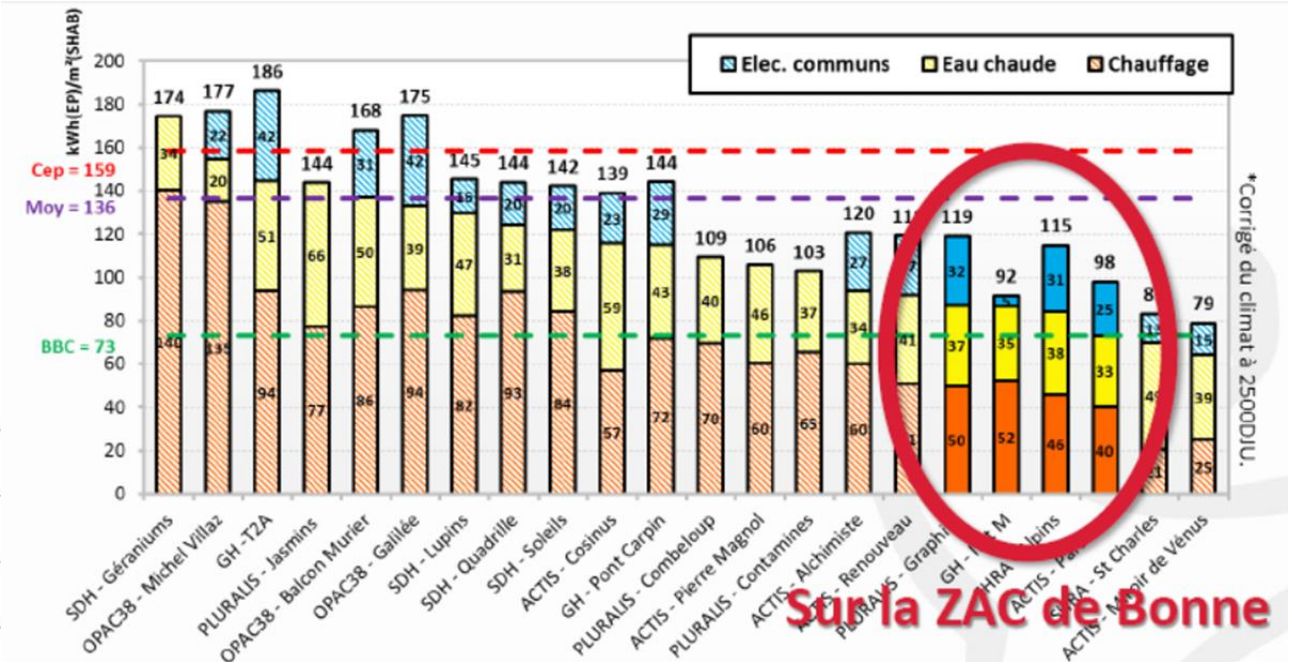


Energy consumption on Grenoble city territory, 2005-2012: the major challenge is on buildings

Energy performance of buildings is improving rapidly



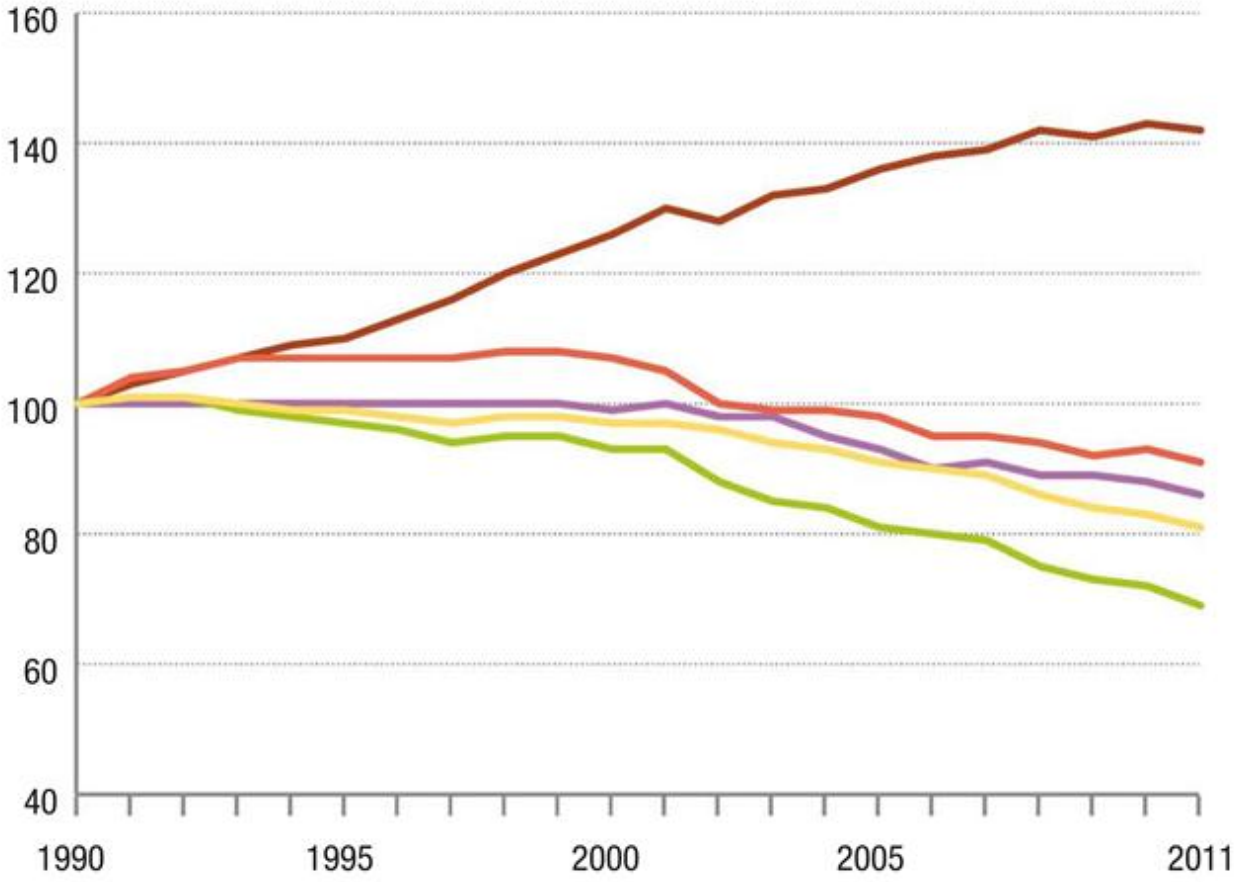
Thermal regulation in France



Monitoring on social housing in Grenoble

Sur la ZAC de Bonne

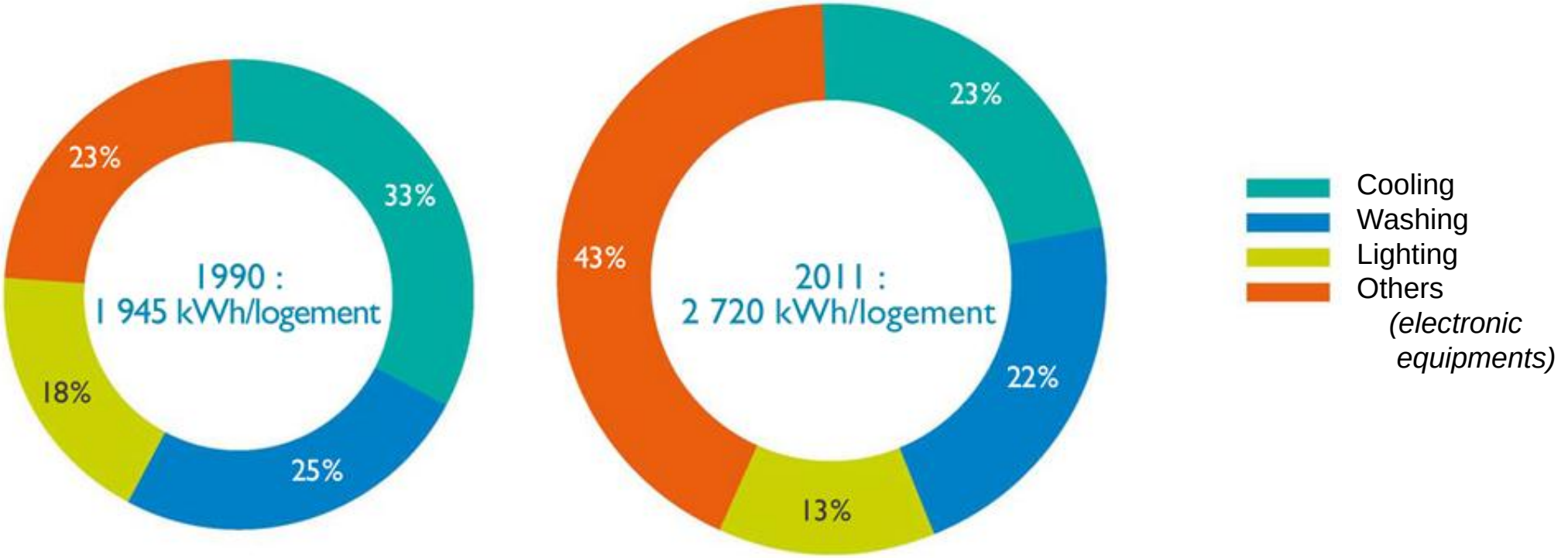
Energy expenses evoluate differently according to different uses…



Source ADEME – mean values for french families

All forms of energy are not equivalent (heat / power, high temp / low temp, …)

… and specific electricity becomes the main part in energy consumption



These are mean values for french families, the effect is **much stronger in high energy performance buildings**…

New challenges for the DHC

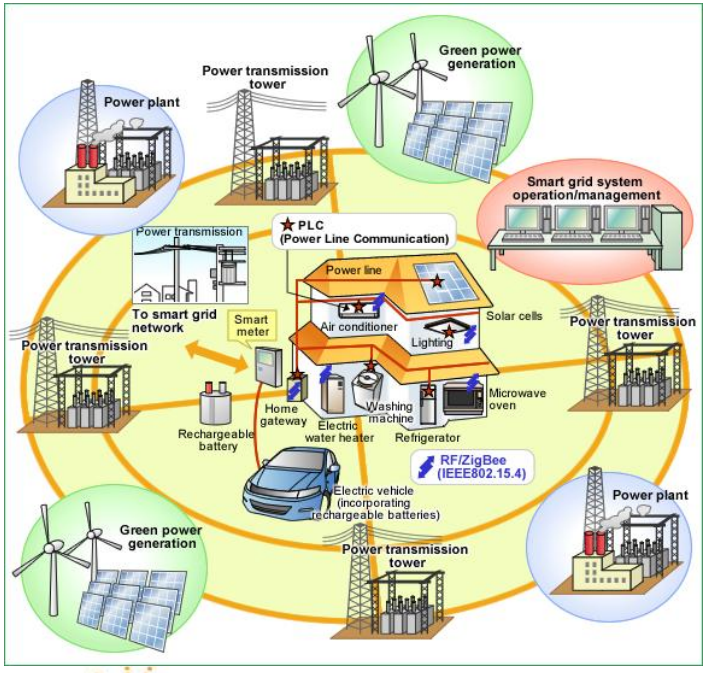
Compagnie de chauffage

- 213 employees
- Largest french DHC network after Paris, coverage rate approx. 50% in Grenoble city
- 6 thermal power plants
- 1 single meshed network, high temperature / high pressure
- 6 different fuels: household waste, wood, meat and bone powder, coal, oil, gas
- French « ECO-GRID » label: more than 50% of renewable and recovery energy

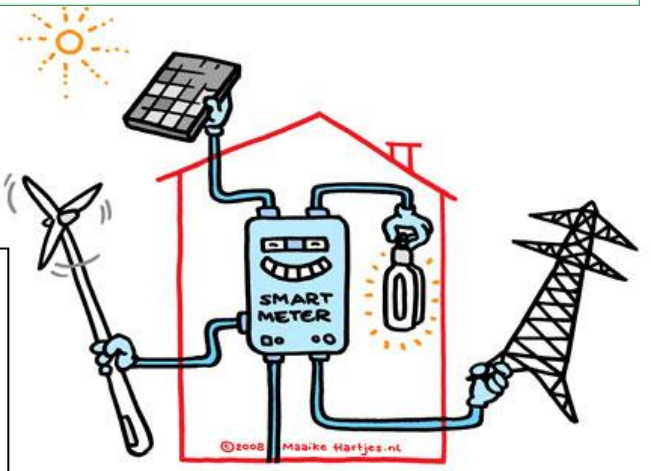
Challenges in new « Eco-Districts »:

- **Low temperature systems for heating**
- **Low cost solutions for « comfort cooling »**

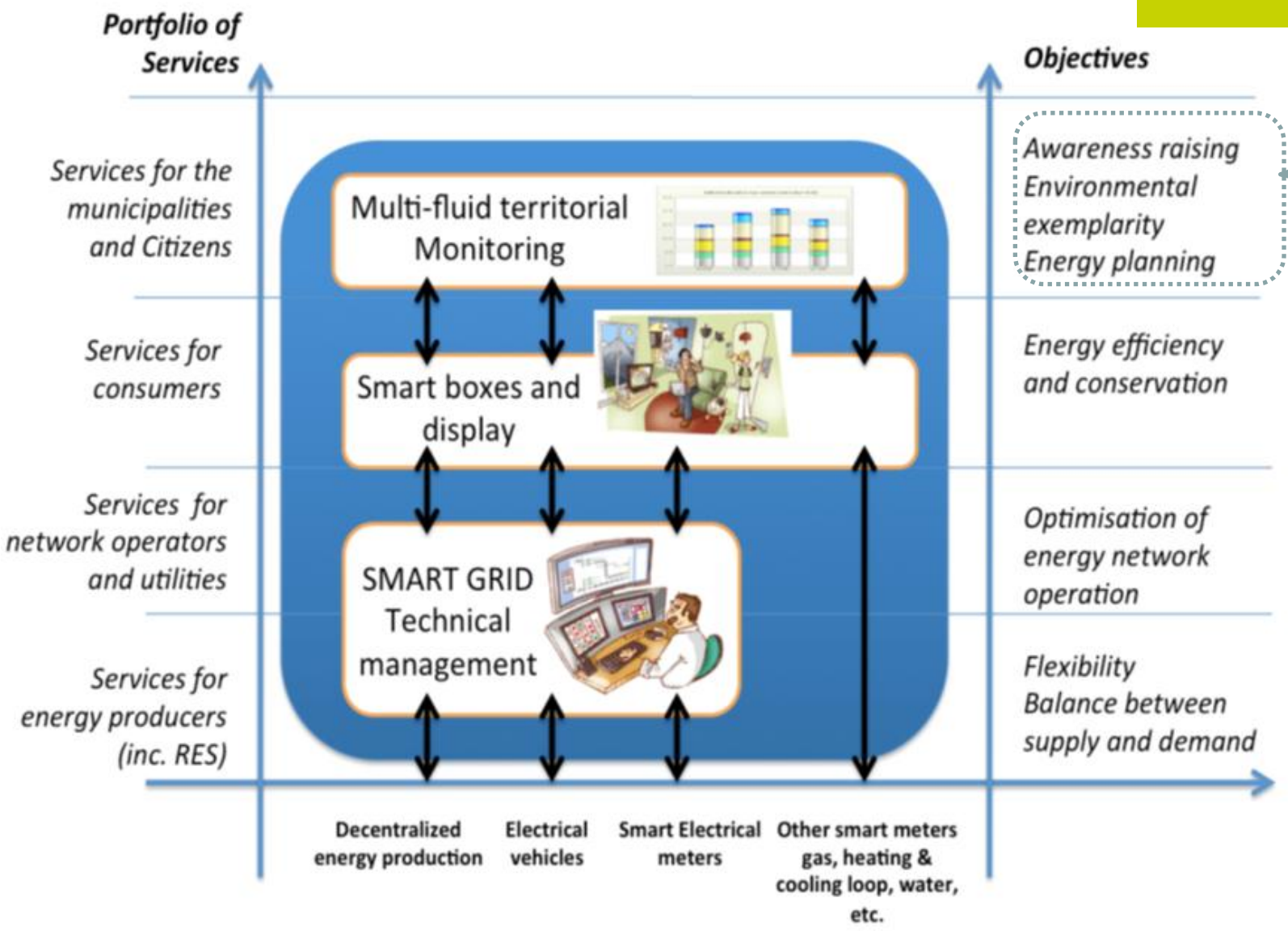
New challenges for smart energy management: involve the actors



Who needs to be smart?
Why? How?



Multi-level, multi-fluid monitoring system: the global concept



the « softest » part

Issues:

- hard/soft balance
- business models
- awareness-to-behaviour process