Increasing the use of local resources while enhancing value and service

Real life cases, factors of success

Cedec, Bruxelles, October 18th 2016

Querfurt: local resource as a leverage to systemic change

- **Basic City case**

- Old, rather inefficient gas fuelled district heating system, high CO2 emissions
- Expensive energy supply due to disconnection of large customers and heavy fixed costs (~130 eurs/MWh)
- Social and economic problems linked to inefficient energy supply
- Huge wind power production surrounding the city, little relation to its intrinsic energy needs
- Concerns as regards an overall energy strategy that would fit the city development plans

Querfurt: local resource as a leverage to systemic change

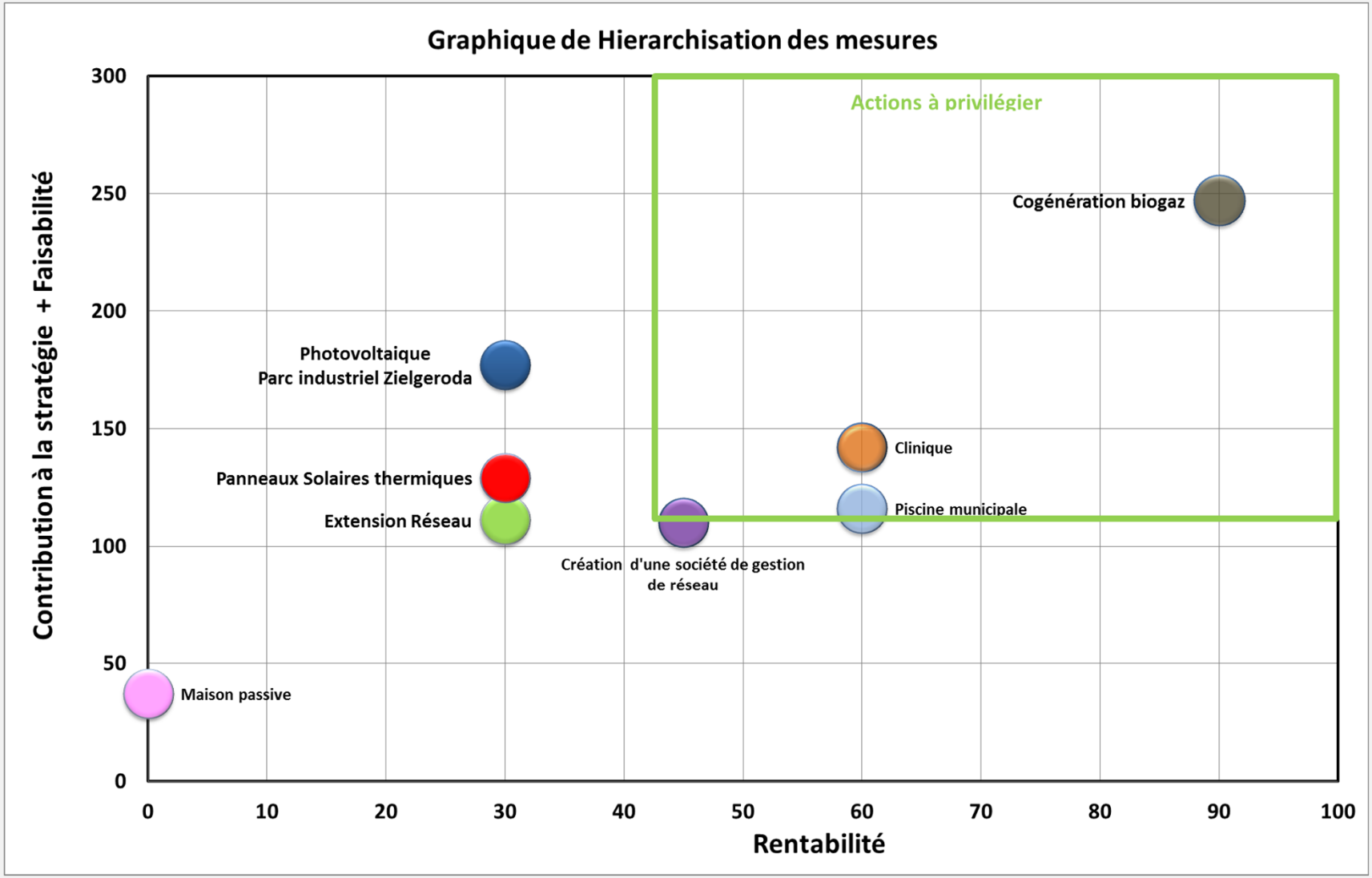
- Elaboration, benchmarking and prioritisation of a whole range of potential projects
- Design, development and financing of a new methanisation-cogeneration system and optimisation of the district heating network
- Identification of new heat offtake potential from large, unconnected potential customers; identification of new customers, support to the constitution of the agricultural JV (waste providers)
- Contract negotiation with waste providers and heat off-takers, procurement, construction and operation of the new methanisation and cogeneration plants

✓ **Return on equity for the investing municipal entity > 25%**

✓ **30% decrease of the district heating heat bills compared to basic plan**

✓ **40% decrease of CO_2 emissions form the district heating system**

Benchmarking each local resource project against alternatives, within a clear city/regional strategy

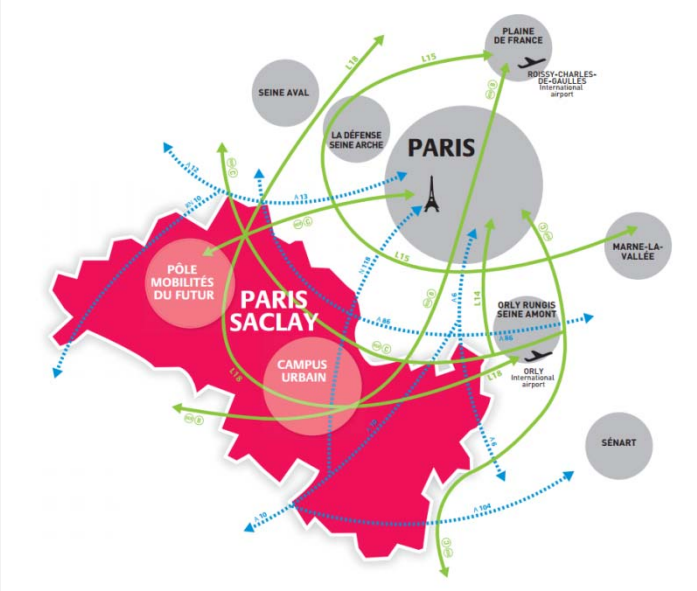


Key factors of success (1) : Querfurt

- Opening the scope : starting with in-depth needs forecast
- Thoroughly comparing options : avoid one sided enthusiasm
- Think systemic : link new devices to operational optimisation from the beginning
- Focus on implementation and capacity building in local companies and systems
- Think gradually: a project is a dynamic step in a long system history

Paris Saclay: local resource as a cornerstone to innovation and new smart DHC grids

- Paris Saclay, a project of cluster of excellence gathering :
  - The top French engineering and business schools
  - state-of-the-art research laboratories
  - and many private companies



60 000 ÉTUDIANTS
60,000 STUDENTS

- 25 000 au niveau Master
  25,000 Masters students
- 5 700 au niveau Doctorat
  5,700 Doctoral students

10 500 CHERCHEURS ET ENSEIGNANTS-CHERCHEURS
10,500 RESEARCHERS AND RESEARCH PROFESSORS

LES FONDATEURS DE L'UNIVERSITÉ PARIS-SACLAY
FOUNDING MEMBERS OF UNIVERSITÉ PARIS-SACLAY

- AgroParisTech
- CEA
- CNRS
- École Centrale Paris
- ENS Cachan
- École Polytechnique
- ENSAE ParisTech
- ENSTA ParisTech
- HEC Paris
- IHES
- INRA
- INRIA
- Institut Mines-Télécom (Télécom ParisTech, Télécom SudParis)
- IOGS
- ONERA
- Supélec
- Systematic
- Synchrotron Soleil
- Université Paris-Sud
- Université de Versailles-Saint-Quentin-en-Yvelines

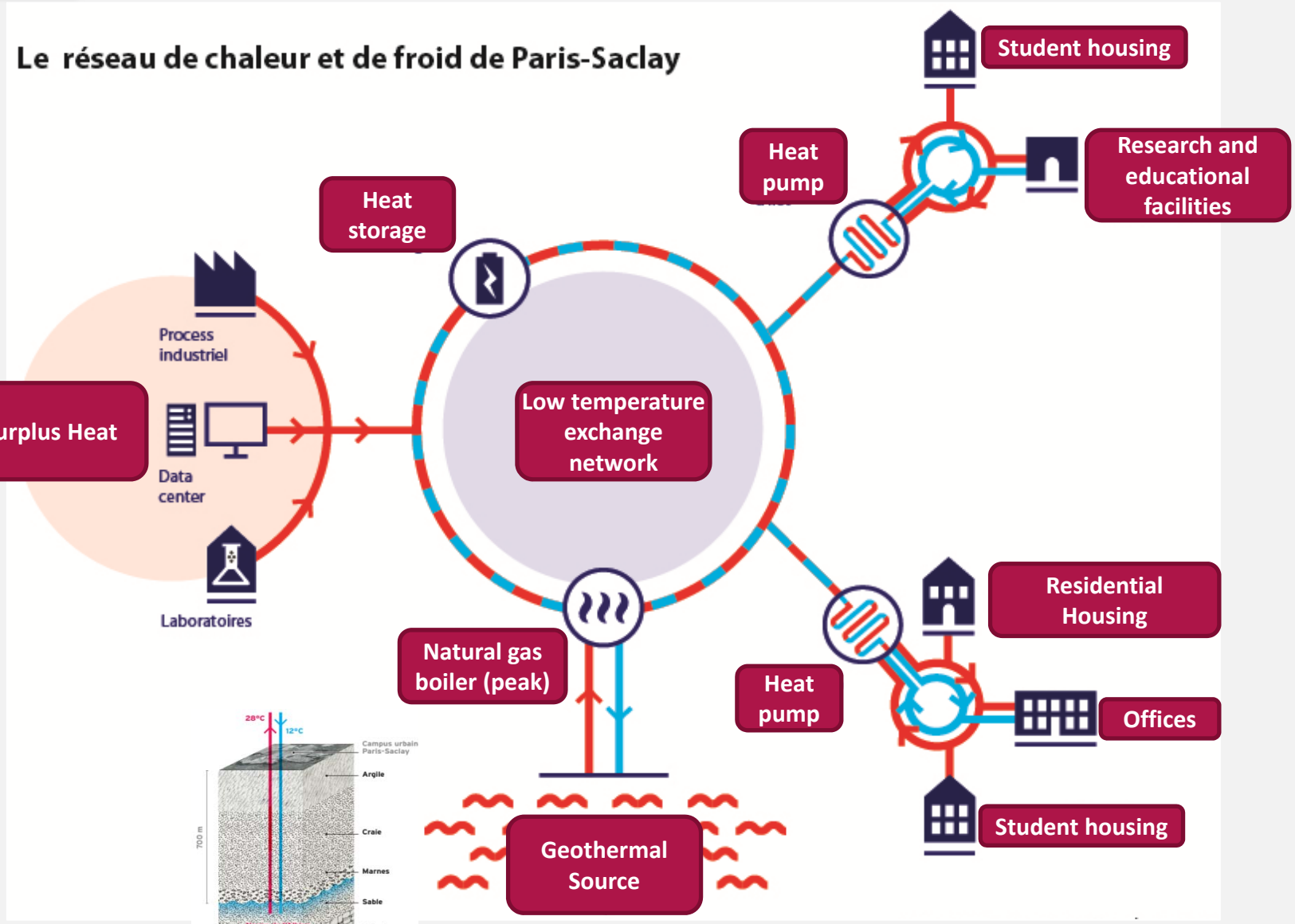
- Objective
  - to build a world renowned center of scientific research
  - A center of innovation and economic development
- PARIS-SACLAY constitutes a major scientific, economic and territorial development project

Paris Saclay : the urban development project

Key figures

- Paris Saclay : an urban development project
  - **1 740 000 m²** to be build between **2015 and 2028** with associated infrastructure
    - 550 000 m² education and research institutions
    - 560 000 m² of business
    - 380 000 m² family housings
    - 168 000 m² student housings
    - 86 000 m² of shopping facilities, public equipment etc..
  - Total invest
    - **1,5 billions €** for real estate projects
    - **1 billion €** devoted to laboratories, scientific facilities and collaborative institutes

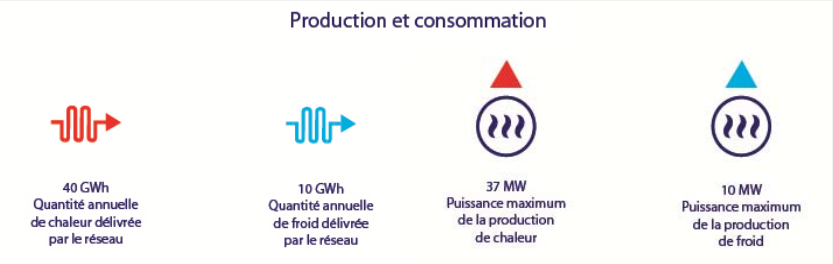
The Smart Heating and Cooling network of Paris Saclay



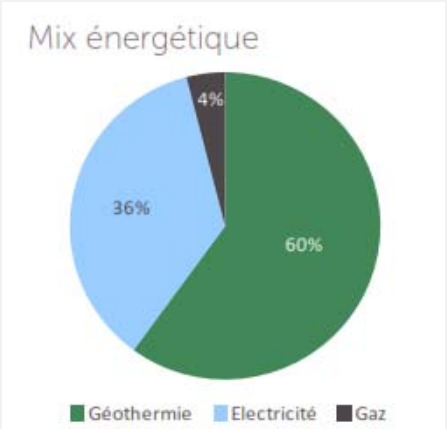
The Smart Heating and Cooling network project

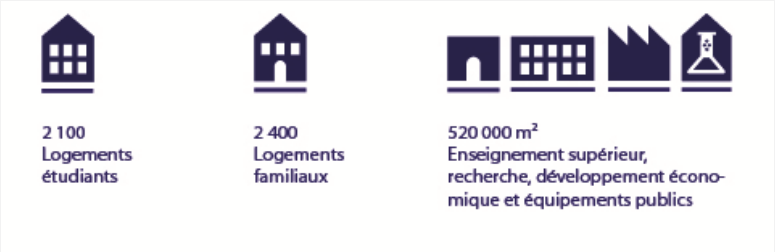
Key figures and advantages

- Network key figures :
  - Investment : 50 millions €uros
  - 10 km network
  - Two geothermal drills 700 m depth
  - 1 200 000 m² connected to the network within 2021



- Main advantages
  - **Low carbon** emission (< 100g CO2 / kWh) and **> 60% Renewable** energy based on **local resource** (geothermal)
  - Possible **energy exchange** at low temperature (30°C)
    - Industrial or research center processes (Synchrotron, CEA)
    - Data centers
  - Possible **balance** of heating needs and cooling needs between buildings (residential <-> offices <-> educational facilities)
  - **Competitive** price compare to natural gas price
  - Possible **electrical and heat demand response and real time optimization**





Lessons learnt and KFS (2/2): Saclay

- Measuring value full scope, long term
  - Pricing externalities
  - Comparing comparables (difficult with standalone solutions: performance gap; systemic hidden costs)
  - Pricing stability and instability
- Working harder on needs opens new optimisation fields
- Managing uncertainty over time matters in new projects : finding fair risk sharing agreements with cities and developers when the break-even point of a project depends on city development, and yet unclear building patterns
- Having the right tools to impose a solution, once it is thoroughly justified: long term, community value for money comes first
- Finding pragmatic, smart compromises and combinations between autonomous solutions and collective ones.