Paris Saclay, energy strategy and urban project

Paris Saclay
Development Authority

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Paris Saclay, an urban campus and Grand Paris hub
Moulon and Ecole polytechnique districts, a mix program development of 18,700,000 sq ft
Energy transition in the Paris Saclay urban project

Objectives

• Energy efficiency
• Minimize urban heat islands
• Supplying a competitive, low carbon, renewable energy to the buildings
• Fueling smart energy services and enabling innovation

Strategy

• Imposing energy efficiency standards
• Designing and developing a flexible collective energy infrastructure
• Imposing the connection to it to every new building
• Operating the system as a lower cost possible
• Animating an innovative ecosystem based on these infrastructures
• Long term development integrating densification and recycled energies
Paris Saclay DHC system: recycling, exchanging and distributing energy

Recycled energies from industrial and research facilities

Distribution and energy exchanges
Paris Saclay DHC system, a first step to multiple energies smart grid (thermal, electric, water, gas.)

7,200,000 sq ft connected to the system in 2022

District heating: 37 MW - 40 GWh/year  District cooling: 15 MW - 12 GWh/year
A complementary mix of energy consumers

- Building 18,000,000 sq ft - high energetic density due to research and industrial facilities

- A balanced mix of consumers, opening a broad scope for energy exchanges, based on a complementary mix of energy needs between offices, residential, education and research buildings
Sub-systems of the Paris Saclay DHC

- 2 geothermal drills (700 m depth – 200 m³ – 30°C)
- 2 centralized plants (natural gas boilers, TAR)
- 7 semi centralized heat pumps stations
- 6 km medium T°C network
- 15 km of water networks from heat pump stations (63°C/45°C & 6°C/12°C)
- More than 60 deliver stations
Paris Saclay, the thermal loop as a brick of a multi energies smart grid

PARIS-SACLAY MULTI ENERGIES SMART GRID

Electric Grids

PV Solar Systems
Developed, on roofs

Electric Mobility
Electrical vehicles integration

Smart Buildings
Connected to the community

DHC
Thermal loop supplied by geothermal energy

Demand/Respons systems

Flexibility
The steering of the thermal loop supporting the electric network flexibility

Optimization
Smart grid management

Physical energy infrastructures

HEAT
COOL
ELECTRICITY
Issues to optimize and key success factors

Political willingness, the unique public authority managing the overall development and operation are key success factors

Technical key factors
• Long term heat planning
• Management of temperature levels on the consumer side
• Maximize energy exchanges with and between consumers
• Interacting with the building management system (data)
• Modeling the network and looking for values

Economical key factors
• Contracting a base load capacity with some specific consumers
• Creating values with « prosumers » and incentives
• Dynamic heat pricing and cost driven operation
• Connecting heating and electricity market