

CERN campus: mapping of the building versus energy consumption and an example of design and construction of a green building.

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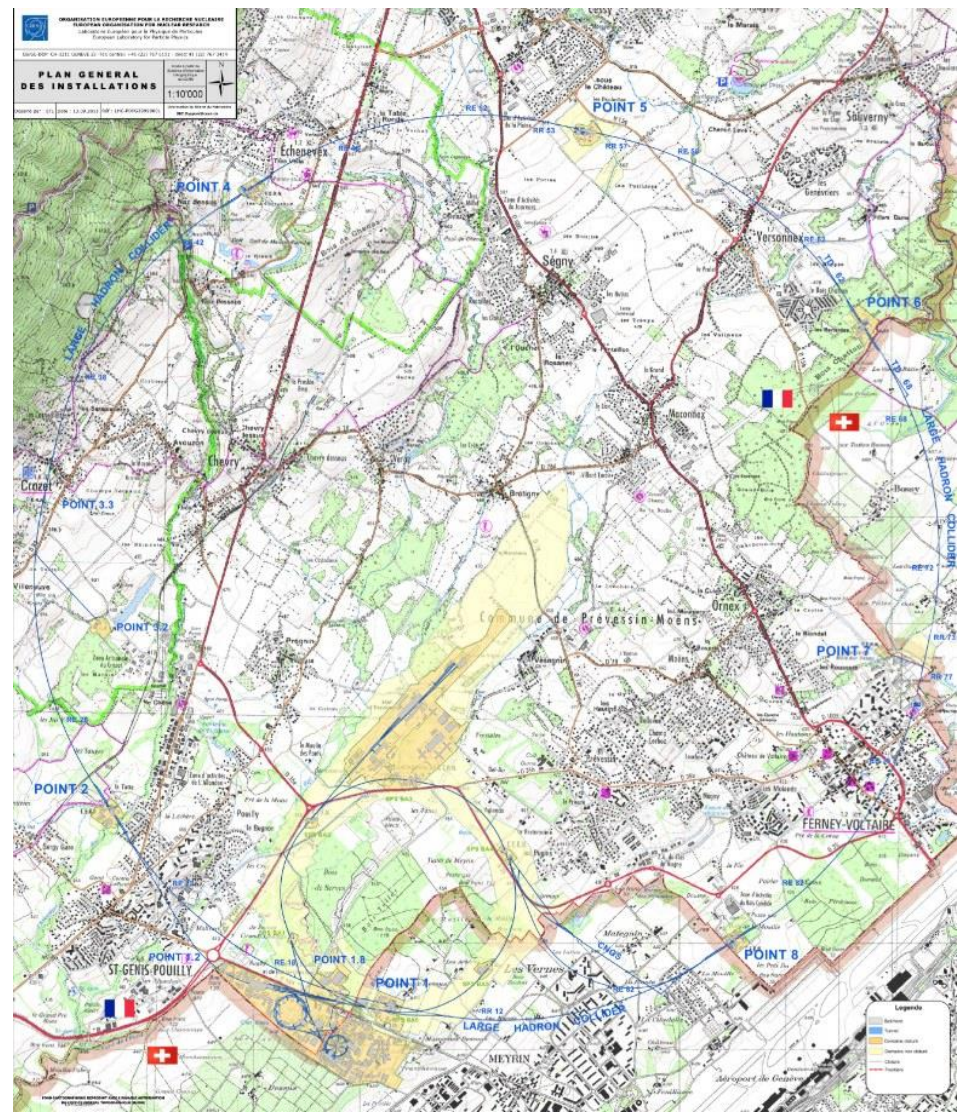
Head of the Site Engineering Group

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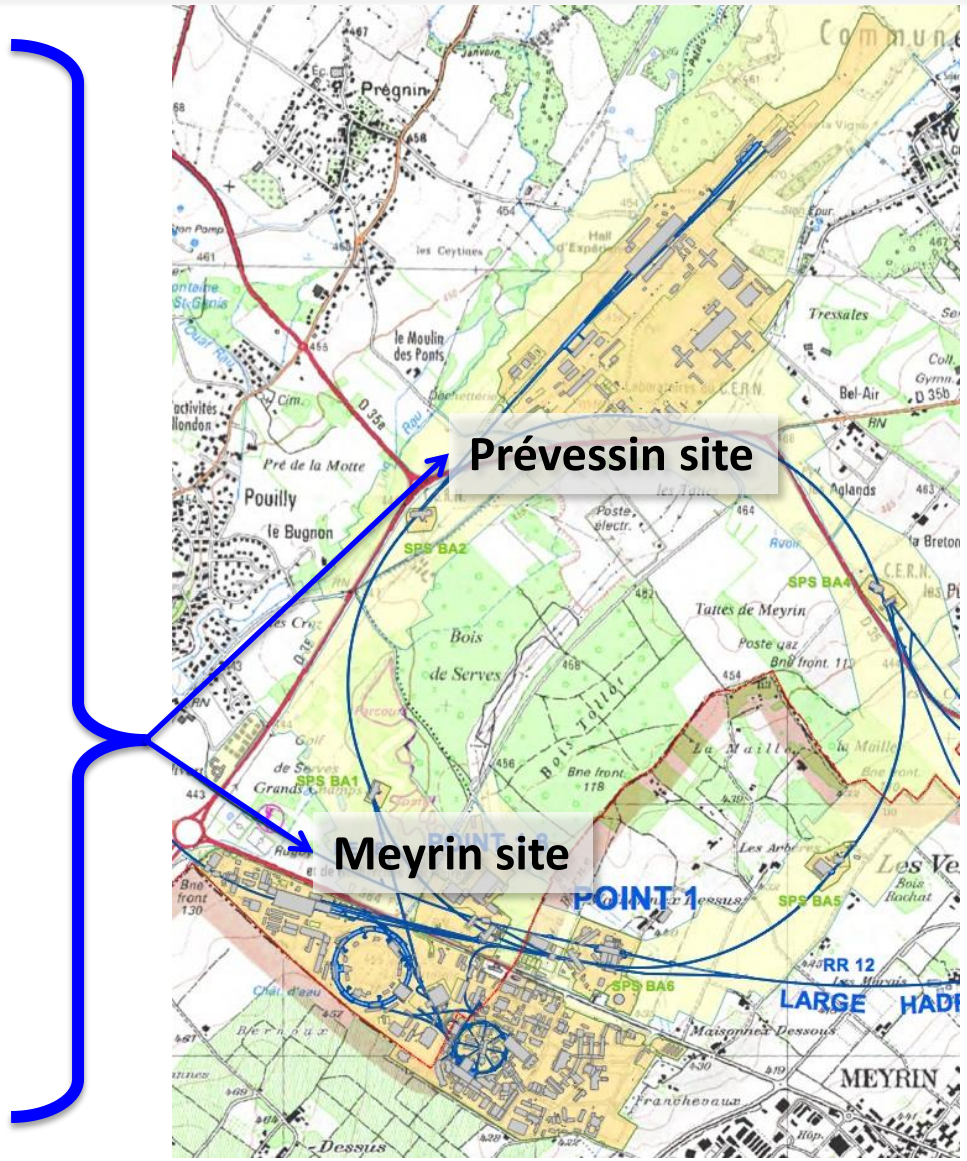


- The CERN campus: situation and outlook
- Mapping heating space energy consumption
- Models, simulations and estimates
- Example of application of energy concepts

- 590 hectares of available land
- 2 main sites
 - Meyrin (CH)
 - Prévessin (FR)
- 15 satellite sites
- 650 buildings - 10m² up to 20.000m²
- 60% of the buildings are 30+ years old
- 2 Heating plants (3 x 15 MW + 3 x 5 MW)
- 22km + 7km of district heating network
- 80 km of tunnels
- 250 km of roads
- 10.000 professionals on site daily
- 100.000 tourist visitors annually

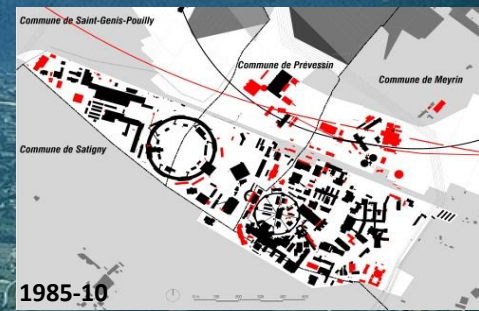
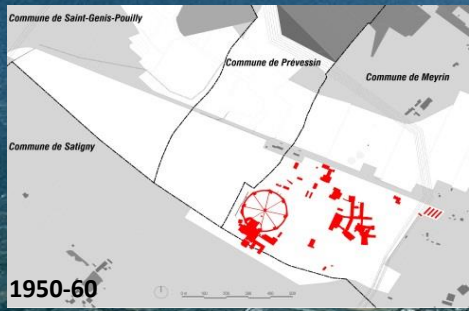


- **Work facilities**
 - (offices, labs, workshops, etc.)
- **Social facilities**
 - (restaurants, hostels, banking services, post office, clubs and a kinder garden)
- **Visitor facilities**

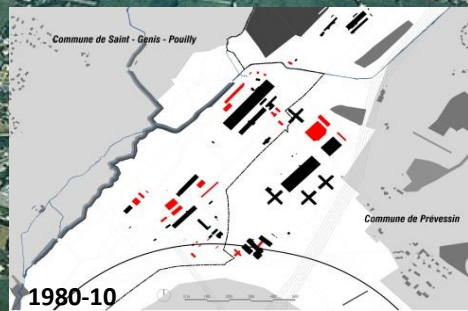
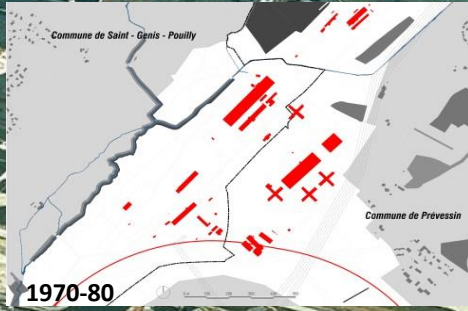


Two sites with a history

MEYRIN



PRÉVESSIN



Two sites with a future



MEYRIN

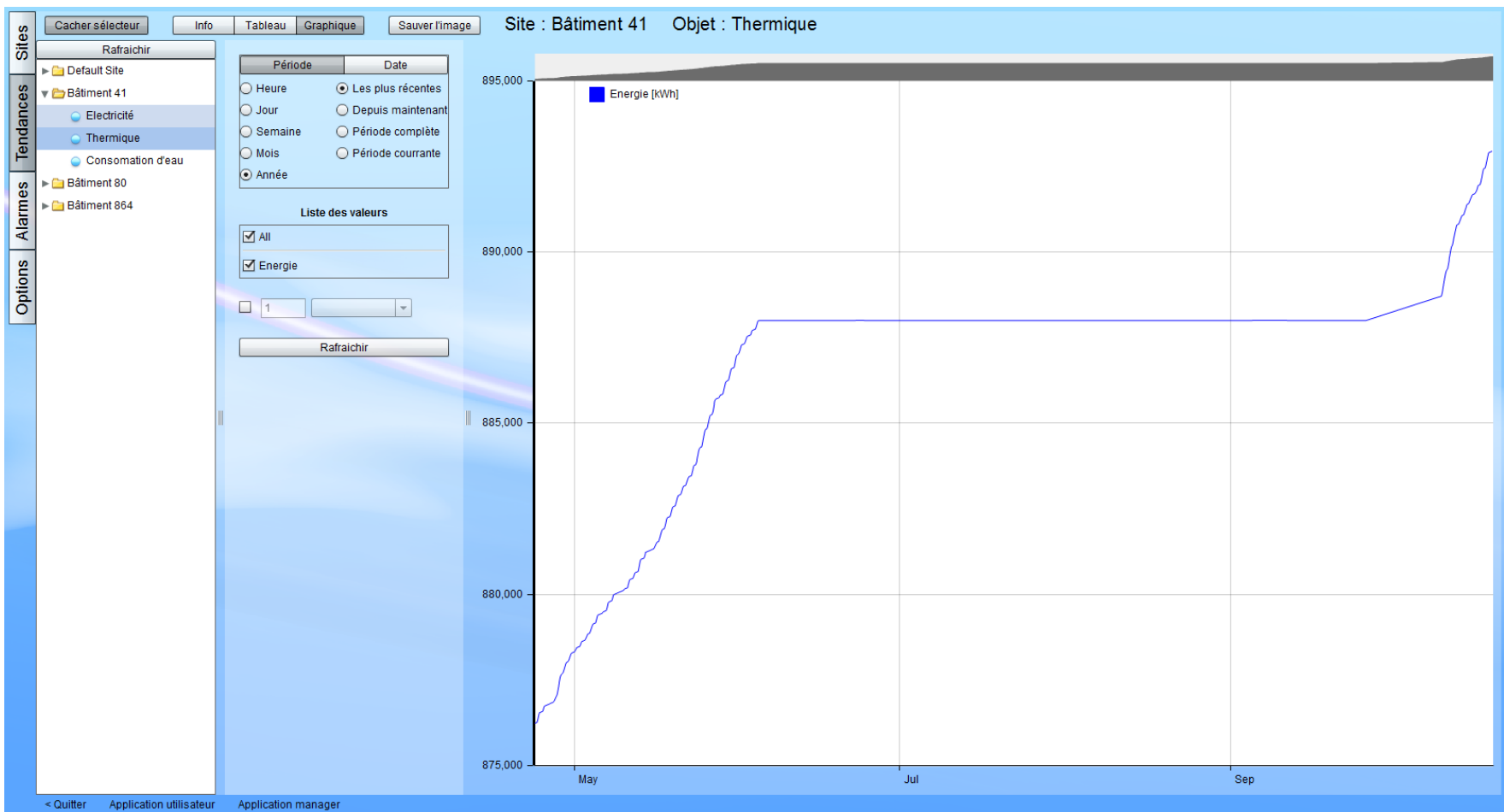


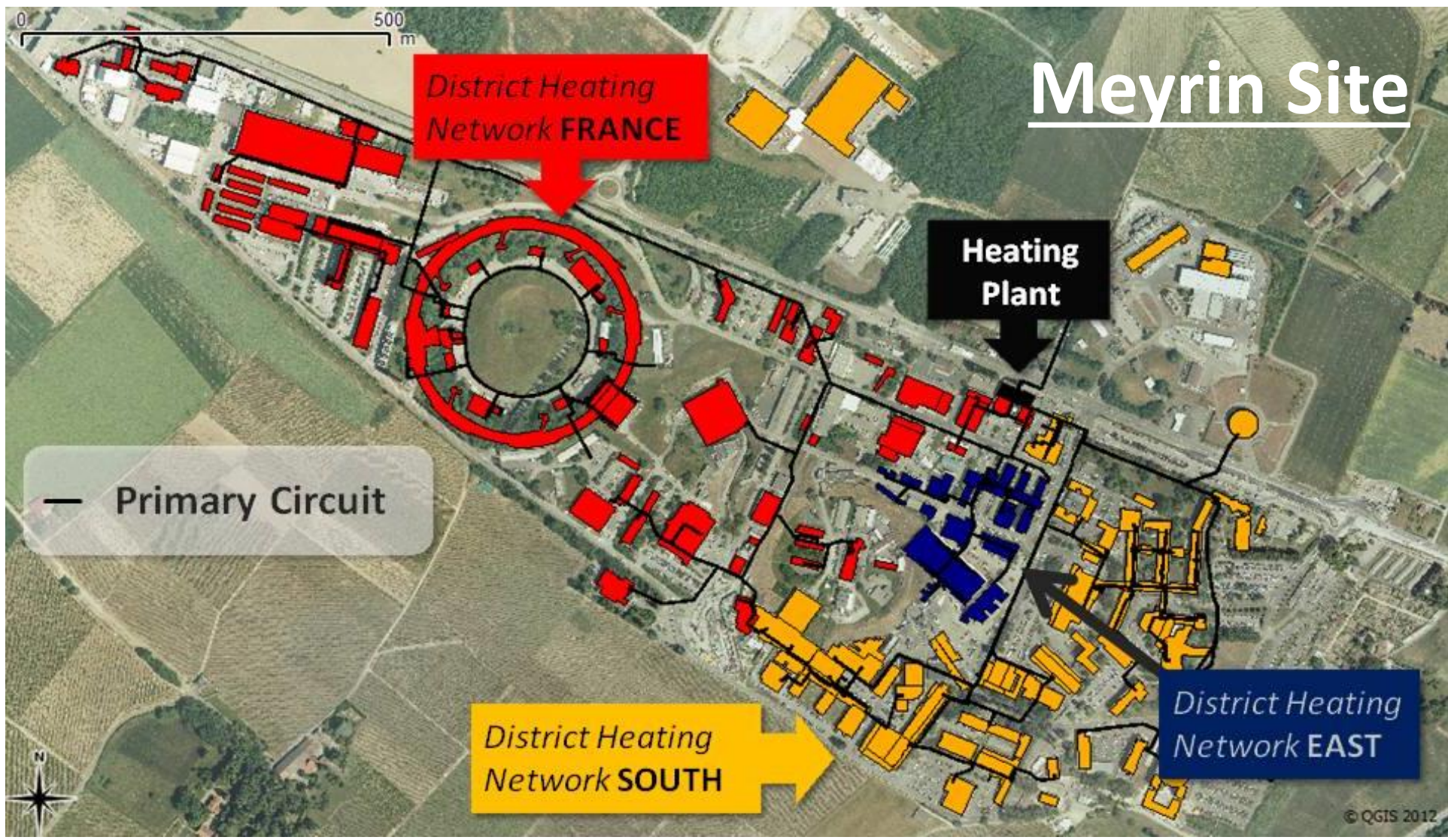
PREVÉSSIN



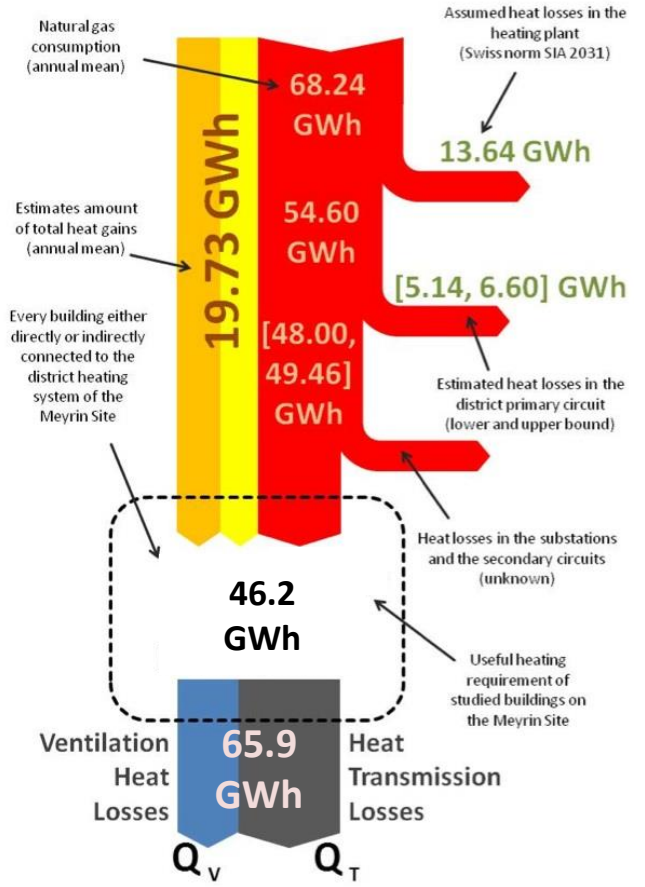
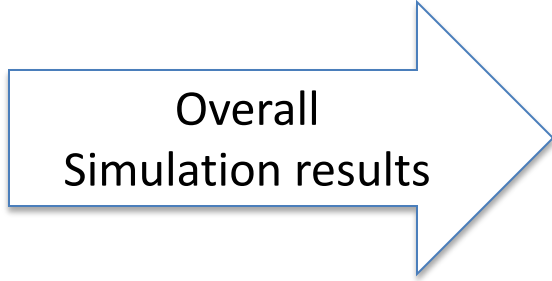
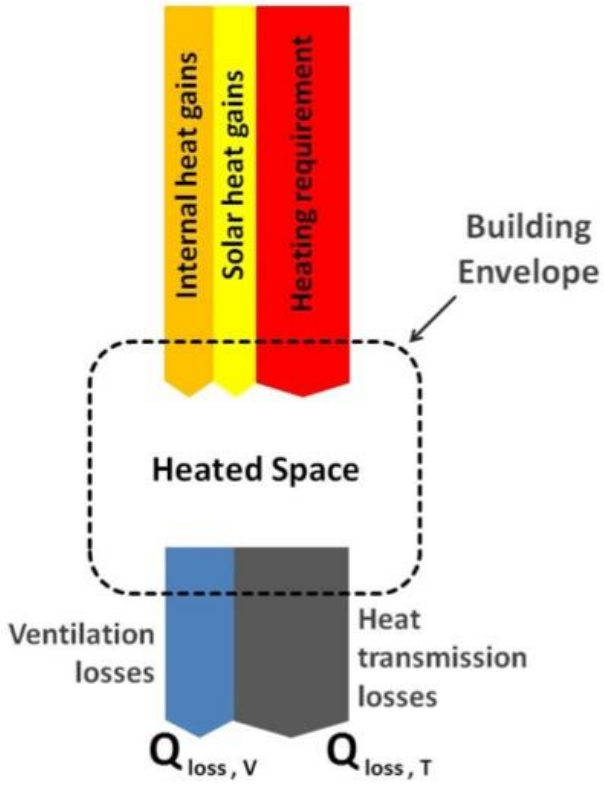
- Buildings:
 - Renovation of building envelop, lighting systems, HVAC systems (safety and energy efficiency).
 - New buildings energy concept (RT2012, SIA380).
- Energy efficiency:
 - Renovation of the heating process regulation at all levels (district heating plants and local control, -gas -NOx).
 - Implementation of local energy measurements (today only available at high aggregation level).

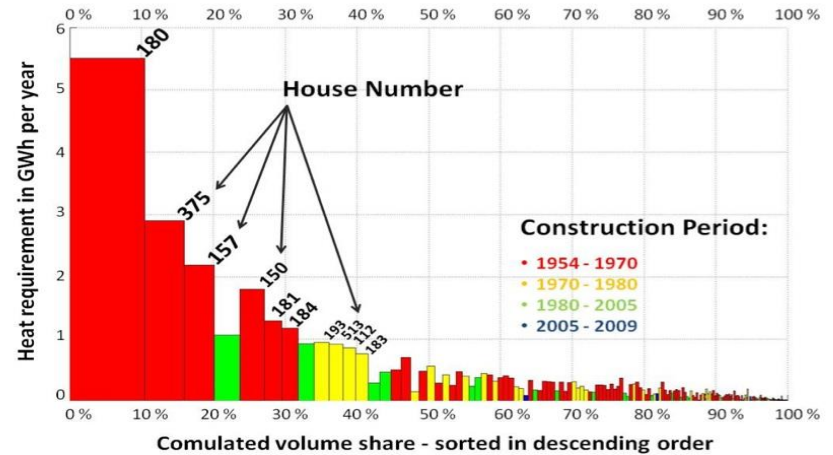
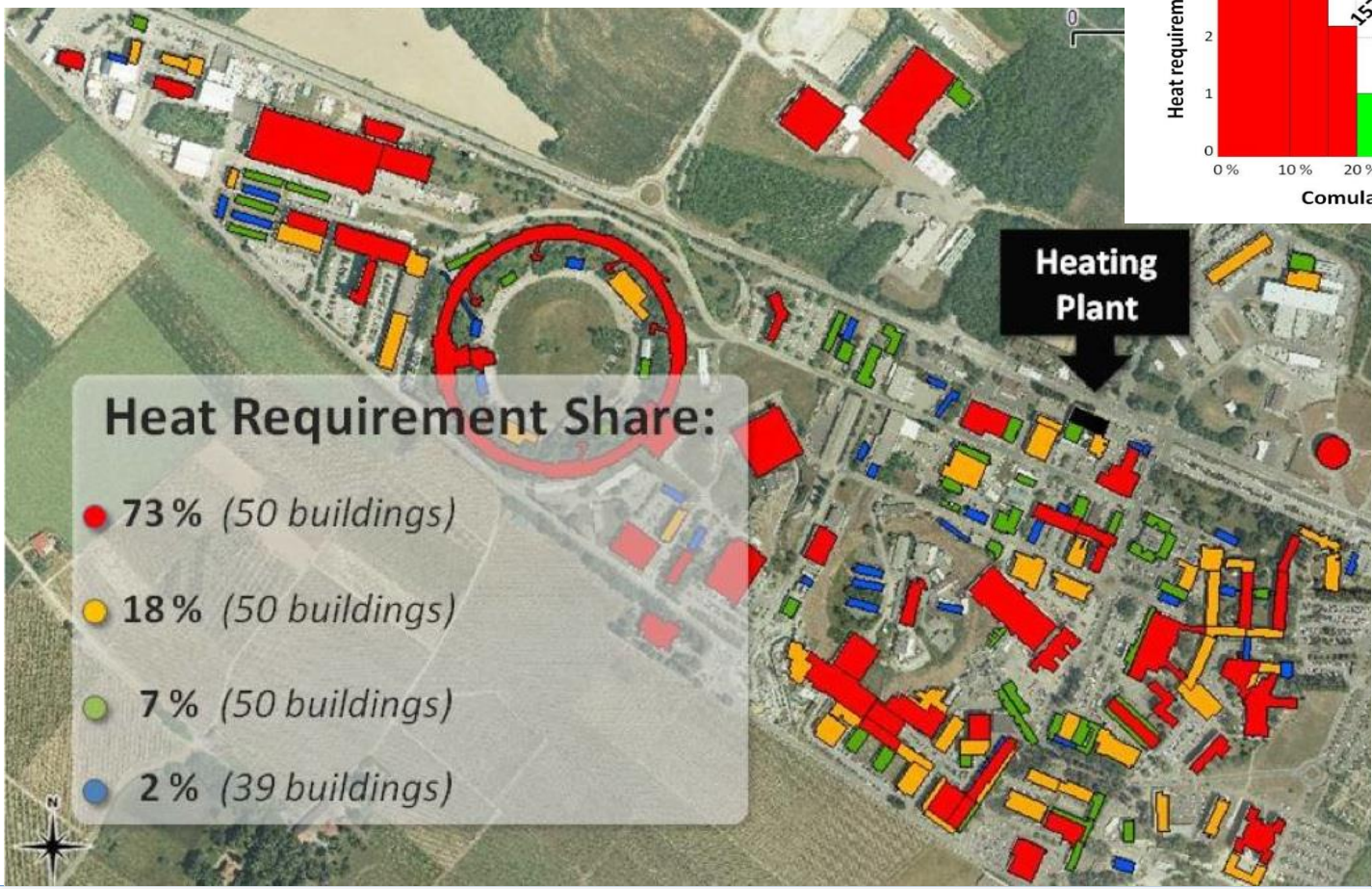
- Example: local energy measurement.





- Model where heat energy is used (requirements)
- Model where/how energy is dissipated

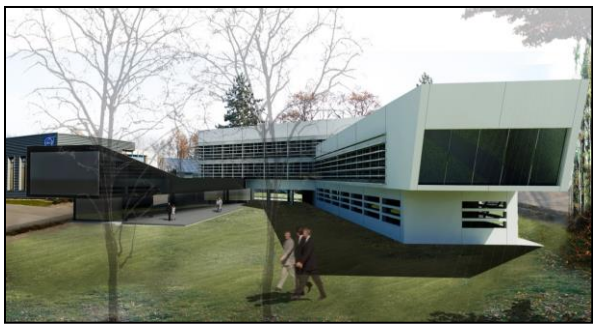




- Consolidation benefits
- Planning tool
- Identify synergies for waste heat recovery



- **Building 774**
- **RT2012 standard**
- **Renewable energy and energy recovery**
- **Designed to interact with other sources**



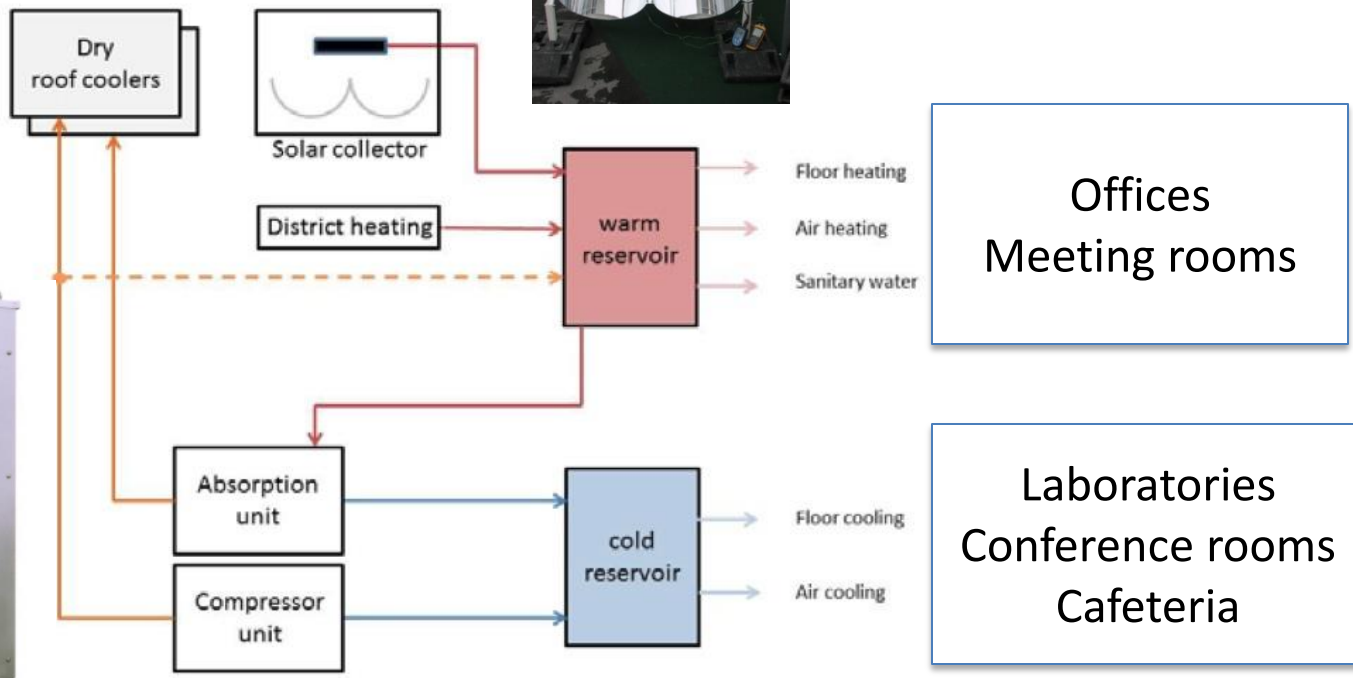
Excellent insulation
Triple-glazed windows
Fixed shading structure

← Building design
Systems design →



SRB panels

Absorption unit



- Energy is a key aspect in the renovation of old infrastructures and in new building designs.
- The model of the heat consumption/usage of the sites provides us an invaluable tool to target interventions and plan for future developments and synergies (energy recuperation).
- New infrastructures are designed with built-in capability to have synergies with eventual energy recuperation.

Thank you for your attention

QUESTIONS?

For additional material and contacts:

- <http://gs-dep.web.cern.ch/en/content/gs-se>