EQUITEE: an innovative software tool to test and monitor strategies for energy transition

Objectives

PCET, SRCAE
Précarité
PLH
SCOT
PLU
OPAH
PDU

- **Energy transition**
  - What is the evolution of GHG emissions related to the development of the territory?
  - How decline energy and climate objectives in the territory?
- **Fuel poverty**
  - Where and how to focus efforts against fuel poverty?
  - What are the dynamics of residential mobility in the territory?
- **Housing policy**
  - What housing supply propose to accommodate new residents in the territory?
  - How to account the different population profiles in land use scenarios?
- **Urban development**
  - How to integrate attractiveness of the areas in scenarios?
  - How to anticipate sprawl of the territory?
  - How to fight against suburbanization of the poorest in the territory?
- **Sectorial actions plan**
  - Which actions plan to engage to renovate building stock?
  - What objectives of modal transfers aim to integrate energy issues-GHG?

Functionalities

DIAGNOSES

The software **automatically** provides authorities with local diagnoses.

SCENARIO & FORECAST ANALYSES

The software allows **interactive forecasting**. During meetings, land use scenarios are developed and tested; the software **ensures the consistency of assumptions** across sectors and scales of work.…

URBAN PLANNING & ACTION PLAN

EQUITEE permits local authorities to **monitor chosen indicators** throughout the lifetime of the action plan.

Specificities

Create your own scenarios

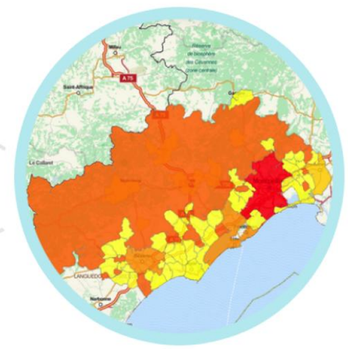
To test and monitor strategies for energy transition and climate action plans.

Used by actors involved in territorial planning: communities, urban planning agencies, developers, government departments, research departments.…

Statistical treatment of personal data

Individual and household data : population, type of habitat, fiscal and social income, household budget survey, economic activity profile, natural urban development, energy databases…

To adapt local strategies to budget capacities of local actors



From regional to neighborhood scales

Automatic diagnoses at each scale

Consistancy of actions plan at each scale

One software for all services and agencies

All sectors : housing, mobility, services, industry, agriculture, climatic impacts…

Assumptions and results are centralized in one software

For all urban planning documents : SCOT, SRCAE, PCET, PLU, PLH…

Methodology

Bottom-up and sectorial approach
National and public data => Open data

Clear definition of the housing stock by segments (year of construction, type): flow analysis (vacancy, reoccupation, new construction) and definition of the technical characteristics (area, number of buildings renovated by thermal insulation: types of actions and average energy savings)

↓

Analysis of the necessary requirements (This is the energy required to fulfil a requirement, excluding the performance of production equipment. In the case of heating, for example, these requirements characterise the performance of the insulation): for heating, hot water for domestic use, air conditioning, ventilation, lighting, cooking, and specific electrical purposes.

↓

Establishing the pattern of changes in performance in the different building sectors: performances of new dwellings, frequency of renovation by sector, distribution of the different batches of works, and associated gains

↓

Market share of the different equipment to fulfil the necessary requirements (including flow analysis of technological changes of highly commercial usage: heating and DHW). Rate analysis of electrical appliances

↓

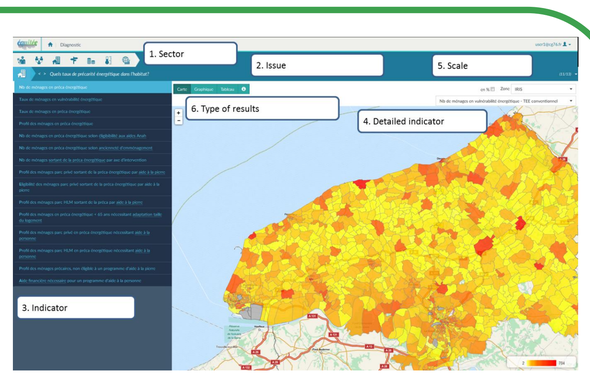
Performance analysis of different equipment (and technological developments over time)

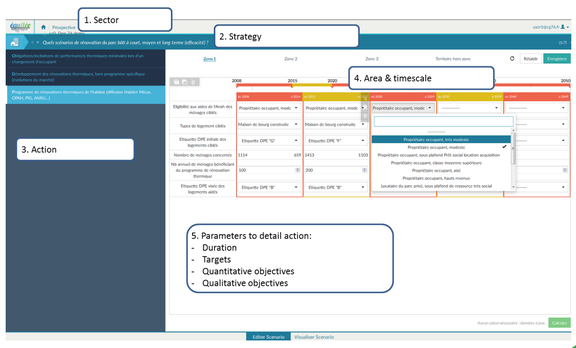
↓

Calculation of final energy consumption by usage (and associated key ratios)

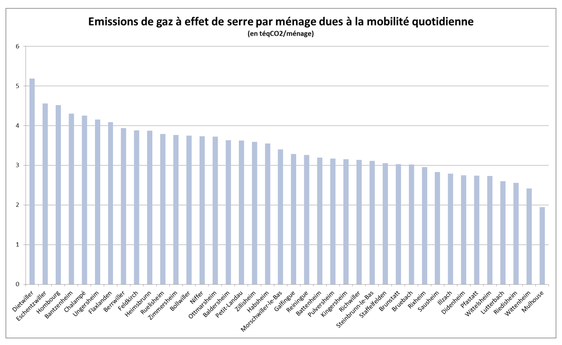
↓

Calculation of direct and indirect greenhouse gases emissions by segment

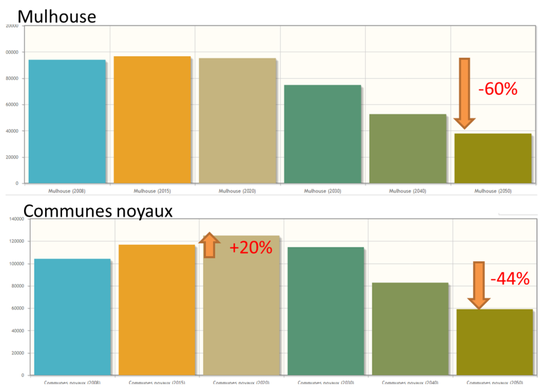




Forecasting approach and strategy



Mobility GHG emissions according to location in Mulhouse Agglomeration



GHG emissions from 2008 to 2050 in Mulhouse Alsace Agglomeration

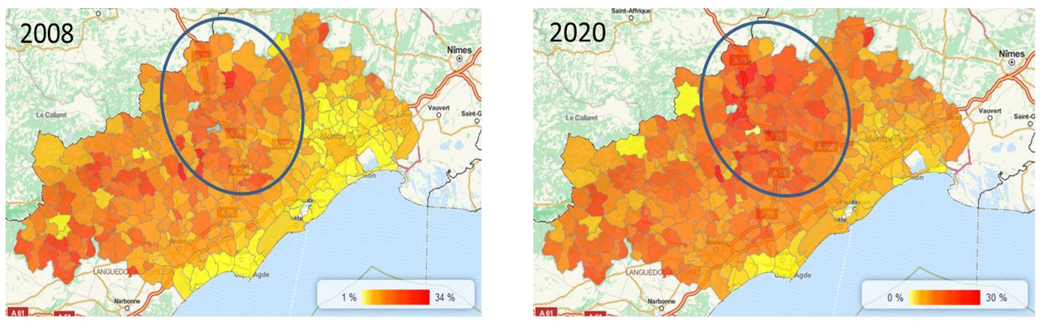
The prospective analysis consisted in extending construction patterns of new buildings observed during the past decade as well as patterns of residential migration according to population profiles. The analysis also incorporates trends for renovations according to household profiles, substitutions of equipment and energy prices.

The results show divergent trends with regard to resilience and sustainability:

- Greenhouse gas emissions fall substantially in the Lodévois (-20%, mainly due to substitutions of obsolete heating systems), while the decrease is significantly lower (-4%) in the Vallée de l'Hérault that faces a major population growth through migration.
- Fuel poverty in habitat increases in Lodévois (+ 2% or in numbers + 400 households), which is welcoming poor new inhabitants; while it drops (-1%) in the Vallée de l'Hérault where richer new inhabitants are welcomed.

These diagnoses and forecasting simulations question (i) the strategy for territory planning, and (ii) the scope of existing programs against fuel poverty. They emphasize, with a systemic view, the impact of residential mobility and migration on the development of the vulnerability of territories:

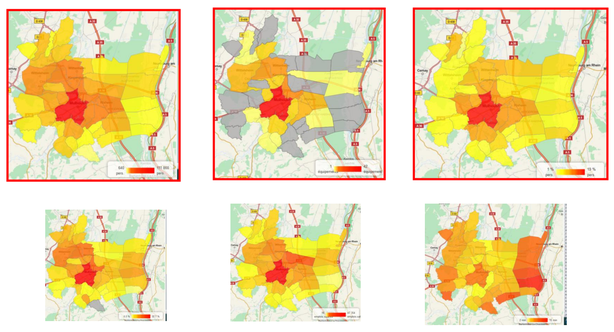
- Consequences of welcoming populations in vulnerable territories facing dilapidated housing and low accessibility;
- Associated action plans to fight against fuel poverty in housing and mobility.



Trends for fuel poverty rates in housing, 2008 and 2020 in Coeur d'Hérault

Diagnoses

"Coeur d'Hérault" is a territory of about 70 000 inhabitants faces a rapid growth in population, and strong urban sprawl. Real estate needs compete with those of the preservation of agricultural and natural soils. The challenge for "Coeur d'Hérault" is to articulate – in theory and practice – energy transition and achievement of Factor 4, while reducing inequalities and fuel poverty, through land planning, and policies dedicated to habitat, mobility, social and environmental issues.
Urban community of Mulhouse Alsace Agglomeration is facing rapid development of fuel poverty ; local actors cope with this phenomenon with dedicated action plan and planning strategy.

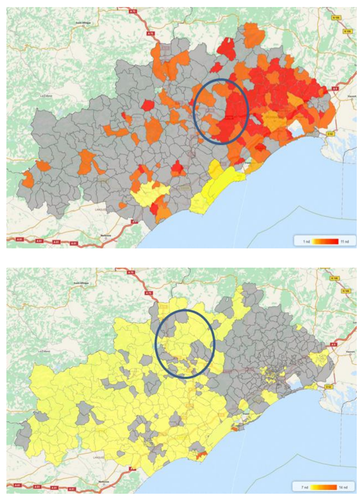


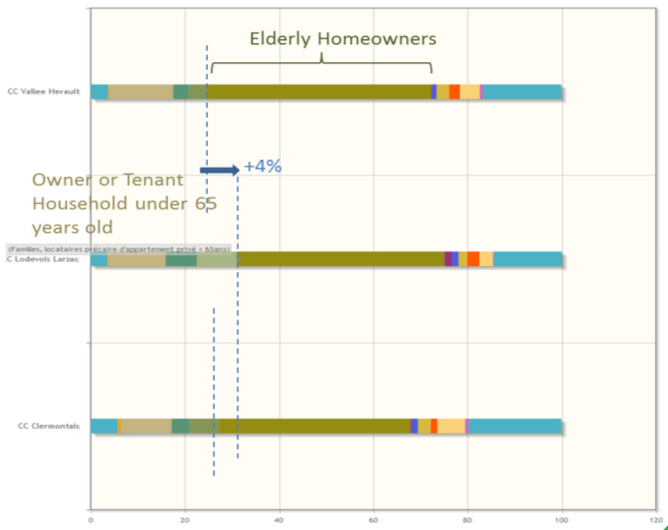
Population, accessibility, autonomy, mobility… : many criteria to define coherent analysis area

Residential migration:

households with high financial resources live in the Westand

households low financial resources live in the East





Profile of Households in fuel poverty in Coeur d'Hérault

Urban planning project for the territory

Example of Cœur d'Hérault territory :

- **To promote social diversity in the East:**
  - To increase densification in a post-1970 neighbourhood
  - To increase low-cost housing programs in this sector
  - To develop land acquisition and public program operations in this sector
- **To ameliorate living conditions for low-income households, especially in the West of the territory:**
  - To focus public refurbishment programs in the West (refurbishment is supported by housing market in the East)
  - To condition public refurbishment programs to very high energy gains in the East
- **To forecast demographic growth according to resilient strategy in a low-income area:**
  - To reinforce commercial development perspectives in the West

Technical details

- Licence : mode SAAS
- Technical system : AIGLE
- Data bases : INSEE (RGP, ERFS, BPE, STES,CLAP), SITADEL, CORINE LAND COVER, AGRESTE, EACEI, ENTD, EIDER, GASPAR, FRANCE03, GEOIDD, ONRN, OBSRL, OBSRVL, OBSRVT, ONML
- Possibility to import specific local data
- OpenData
- Exports : .CSV, .SHP

Contact : s.poutrel@burgeap.fr, 04 66 26 94 30 website : www.equitee.fr

• BURGEAP SA and IGIP GmbH have created together a European engineering company: (BIHSE).
BURGEAP provides public and private clients with a complete range of services in environmental engineering and development aid : cities and territorial planning / energy and climate / environmental industry / urban infrastructures and greenbuilding / nuclear industry and decommissioning.
www.burgeap.fr - burgeap@burgeap.fr +33 (0)1 46 10 25 70 19, rue Villette, 69425 Lyon Cedex 03, France

• BUSINESS GEOGRAFIC (CIRIL) : Business Geografic is a Web GIS and Geo-Business Intelligence specialist. Business Geografic provides all kinds of web and mobile mapping applications to public administrations and private companies, for professional purposes as well as for the general public.
www.business-geografic.com - contact@business-geografic.com +33 (0)4 72 69 16 80