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Energy Performance Monitoring

- *Lyon confluence* -

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Hespul

- ✚ **Lyon Confluence is one of the first very energy efficient district built in France**
 - It is a kind of “prototype”
 - Ambitious energy performances are targeted (<50 kWh/m²/year; 80% REN for heating)
 - New systems and techniques has been used
 - lot of money and time have been spent in this project
- ✚ **Thus, monitoring is necessary as to:**
 - **Assess actual energy performances of the buildings**
 - **Better understand what work and what do not work**
 - Global ratios are not sufficient to achieve this goal
 - We need explanatory variables (data at a 10 minutes time step)

-  **Qualify the outdoor conditions**
(T°C, humidity, solar radiation, wind)
-  **Actual operating conditions of buildings:**
comfort (T°C & humidity) and air flow (quality of the envelope airtightness)
-  **Heating consumption** (both at dwelling level and at substations/stations level)
-  **Hot water consumption**
-  **Ventilation electricity consumption**
-  **Electrical consumption** (dwellings and common areas)
-  **Indoor air pollution** (CO₂ and VOCs : Volatile Organic Compounds)

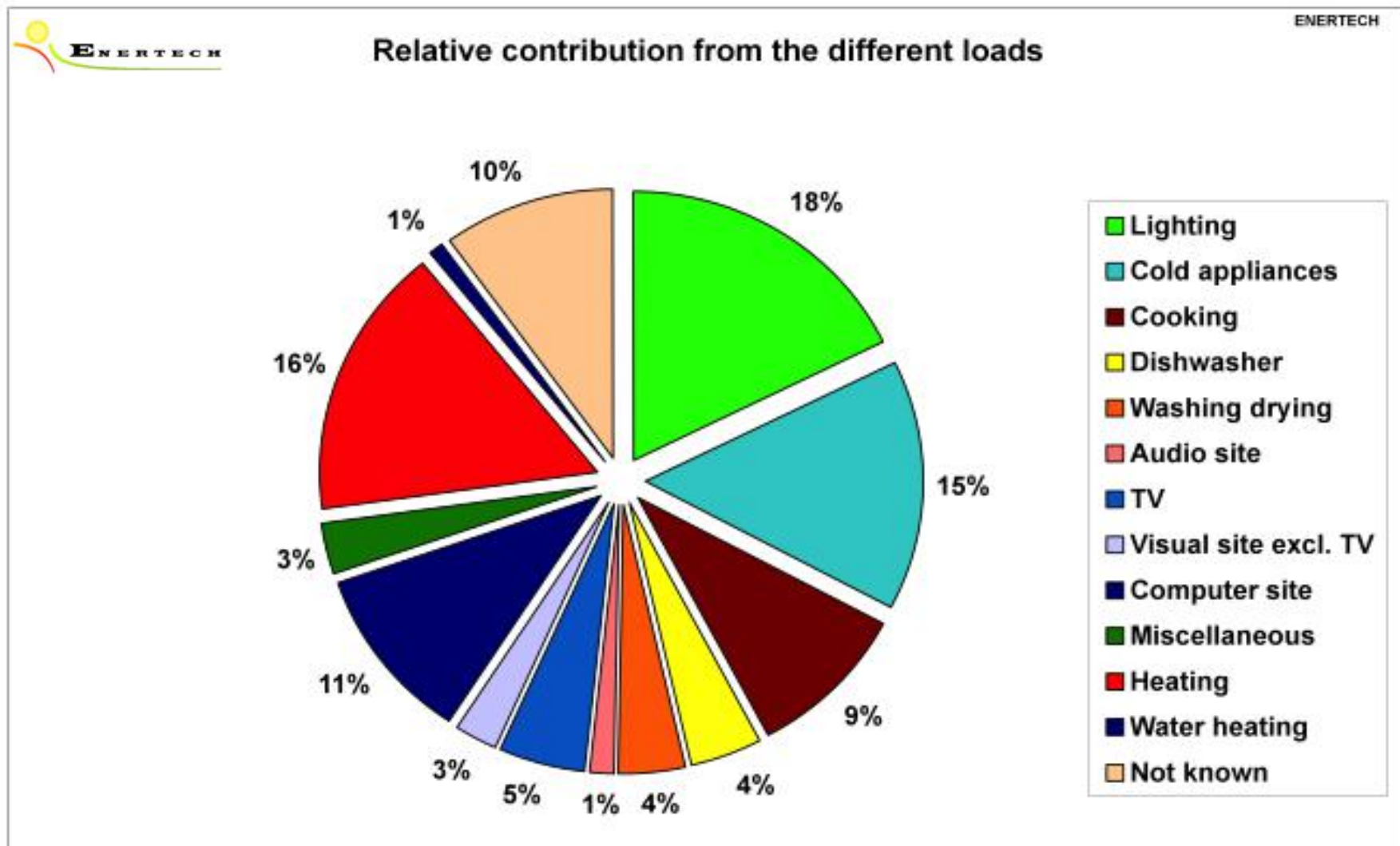
- **All common areas and systems**
- **About 10% of the dwellings**

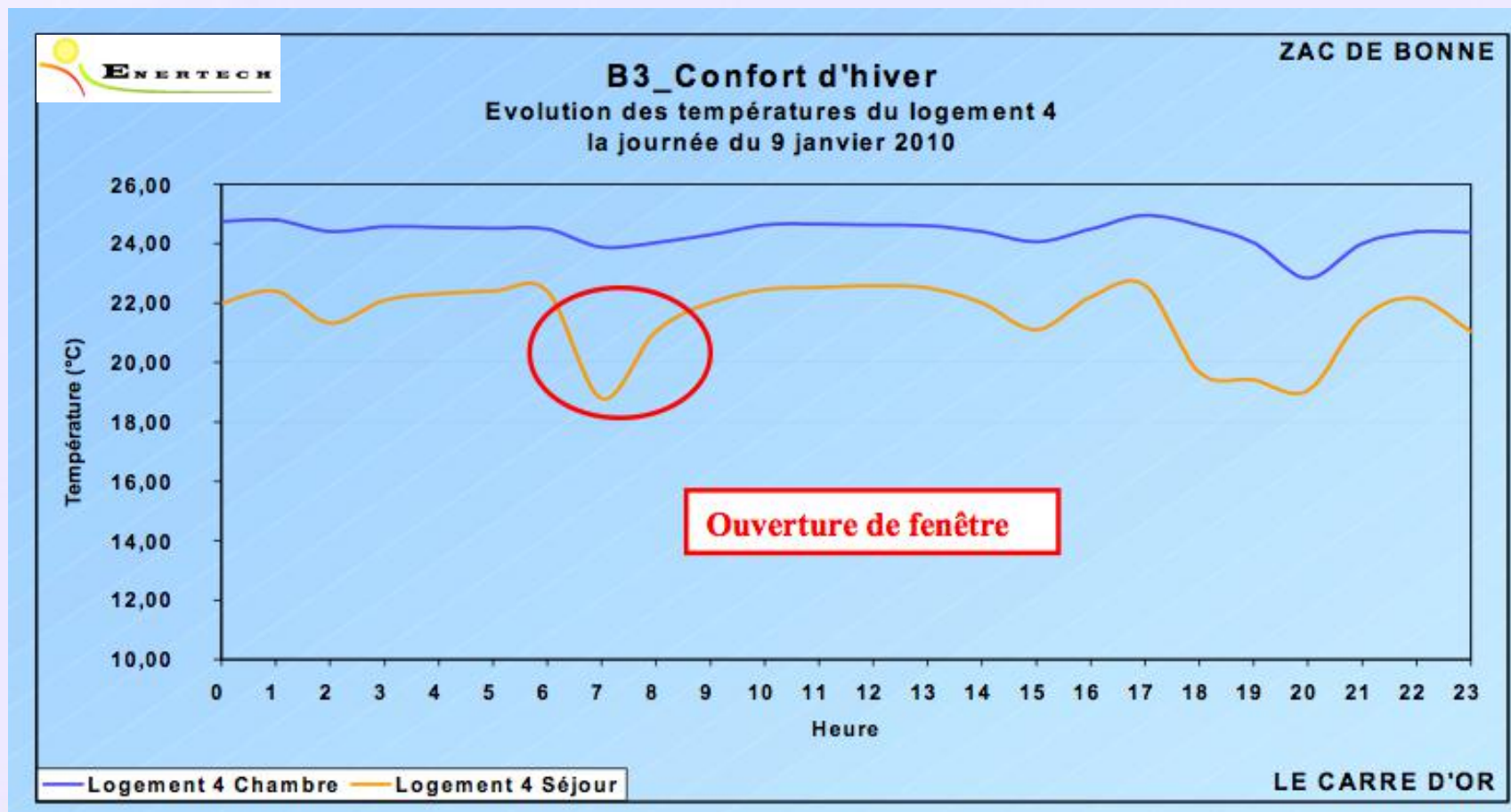


- + kWh/m² heated area by uses
- + Green house effect gases balance
- + Reconstitution of the thermal and energy balance by uses
- + Evaluation of the maintained comfort (winter/summer)
- + Analysis of the occupancy modes and of the behaviour of the inhabitants

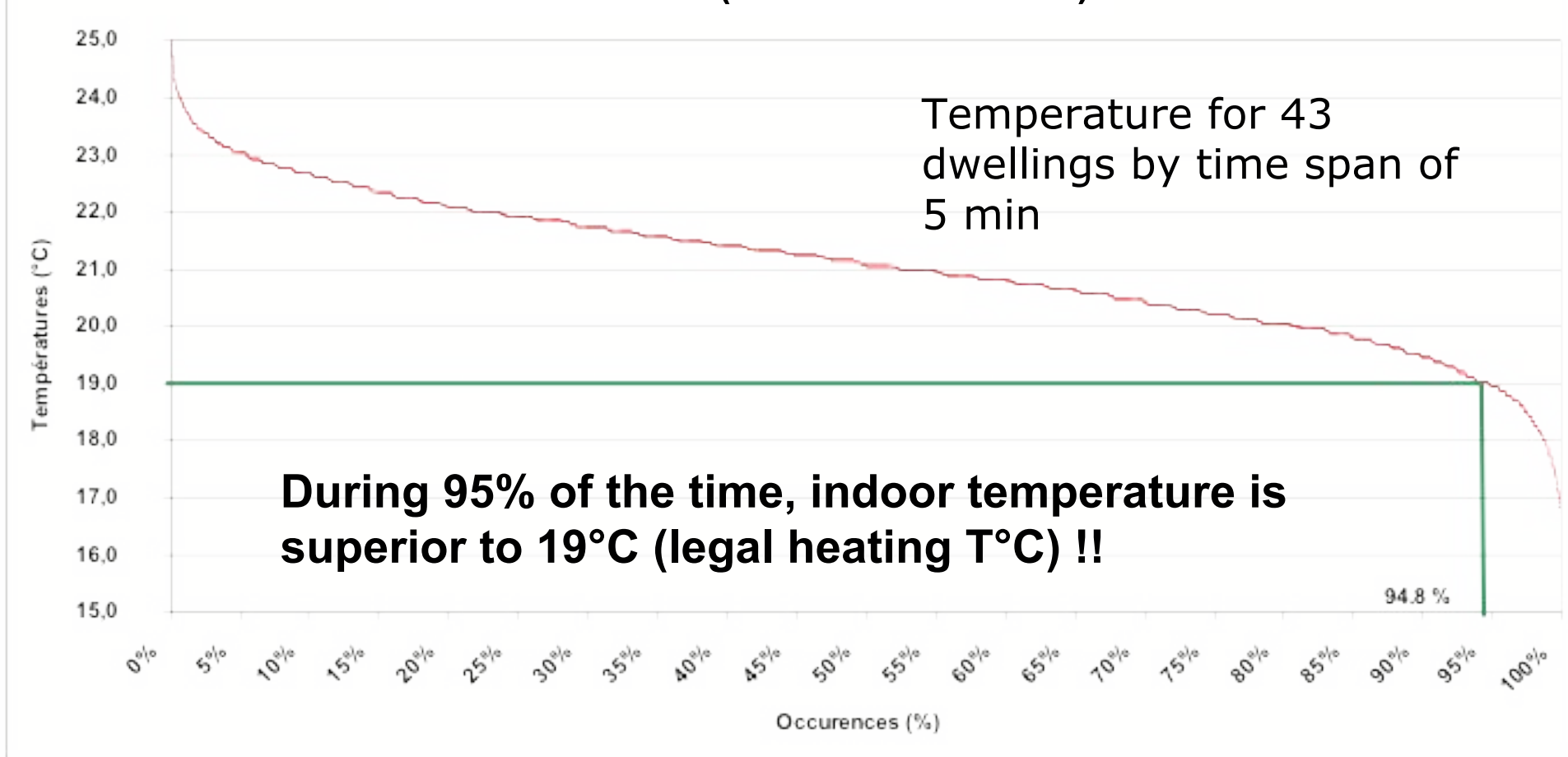


Examples of results (2)

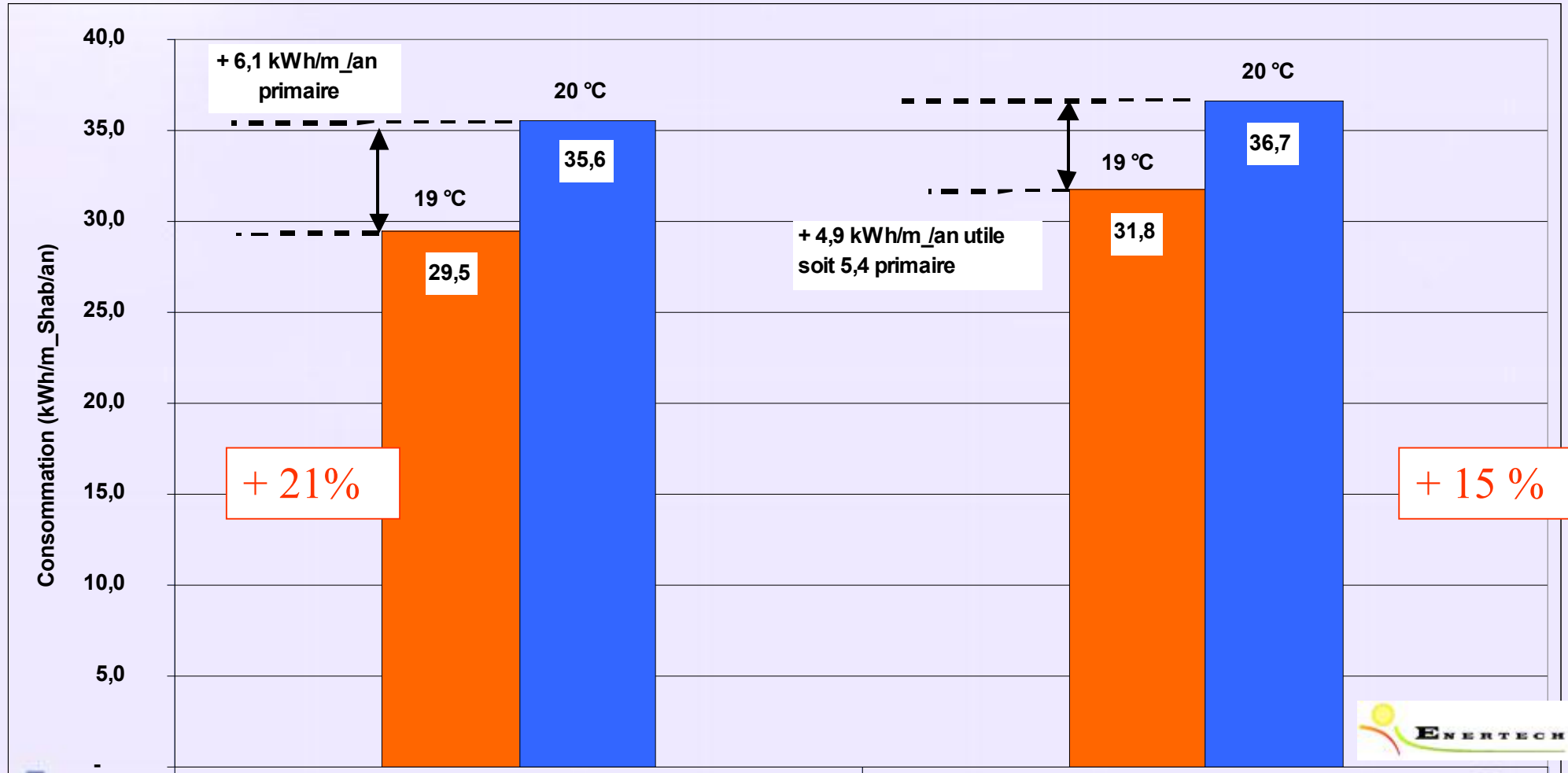




Temperature - cumuled frequency - Zac de Bonne (Grenoble -France)



Examples of impact of the indoor temperature



1°C above 19°C imply on over consumption of 15 à 20% for energy efficient buildings

Planning of the monitoring campaign

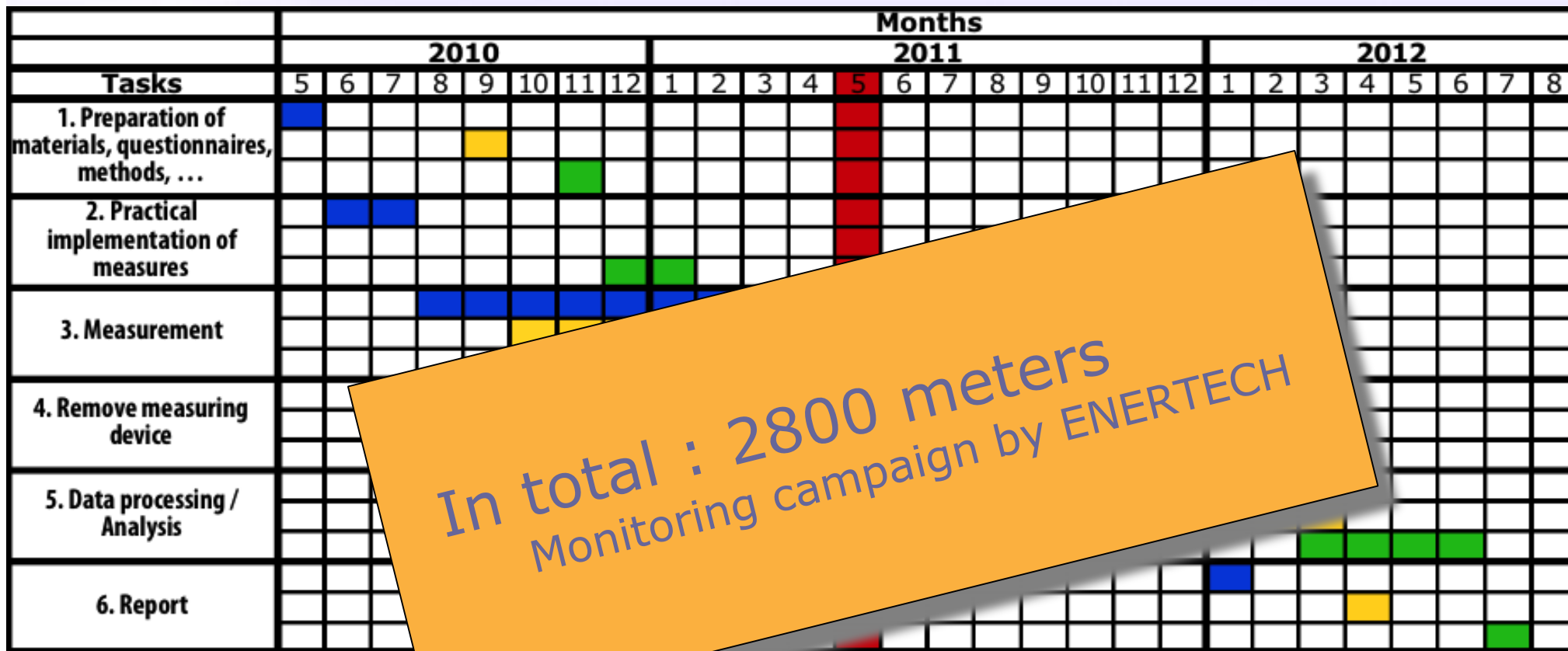
Tasks	Months																										
	2010						2011												2012								
	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7
1. Preparation of materials, questionnaires, methods, ...	Blue				Yellow		Green							Red													
2. Practical implementation of measures		Blue	Blue					Green	Green					Red													
3. Measurement				Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Red	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
4. Remove measuring device														Red		Blue			Yellow								
5. Data processing / Analysis														Red			Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue	Blue
6. Report														Red							Blue				Yellow		Green

Ilot	Total Number of housings	Housing Number to equip
A	280	21
B	298	35
C	157	19

Blue	Lot A
Yellow	Lot B
Green	Lot C



Planning of the monitoring campaign



In total : 2800 meters
Monitoring campaign by ENERTECH

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A	280	21
B	298	35
C	157	19



Strengths

- ➡ explanatory variables (data at a 10 minutes time step)
- ➡ Accurate results and in depth analysis
- ➡ Possibility to identify the impacts of outdoor environment and/or inhabitants behaviors

Weaknesses

- ➡ No intermediary (or live) results
- ➡ Need to wait 1 year of measures + 6 months of analysis
- ➡ No interaction possible with inhabitants or M&O companies

- Operation & Maintenance tool
- Alarm for default of production
- Centralization & archiving of production data for several PV system on a single platform
- A analysis at the system level
- Automatic publication of production data

Carte
Exploitation
Rapport
Configuration

Période de travail

Jour: [dropdown]

2 [dropdown] 6 [dropdown] 201 [dropdown]

Mes systèmes

Parc SÉRGIES [dropdown]

	Statut
Siège SOREGIÈS	●
CHARROUX	●
VARENNES	●
COLOMBIERS	●
CENON SUR VIENNE	●
CHAPELLE BATON	●
SAINTE-SAVIOL	●
VENDOURS	●
VOULEME	●
DOUSSEY	●
JOUHET	●
FROUX	●
CHATELLERAULT	●
GENOUILLE - DUBOUX	●
LA TOUCHE DES PINS	●
PRESSAC-VALLEE	●

Synthèse de la sélection

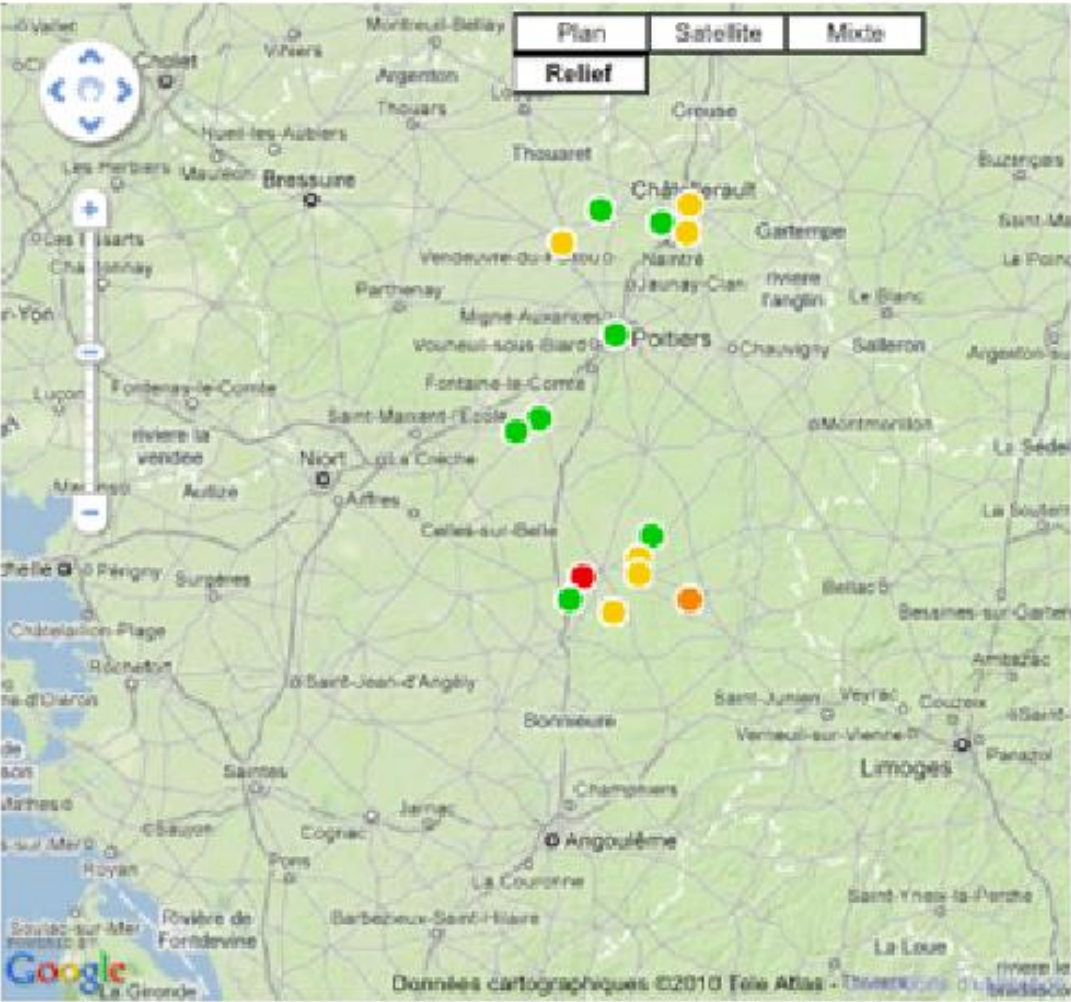
Puissance suivie: 2611 kWc

Nombre de systèmes: 15/16

Le 25 juin

Plan
Satellite
Mixte


Relief



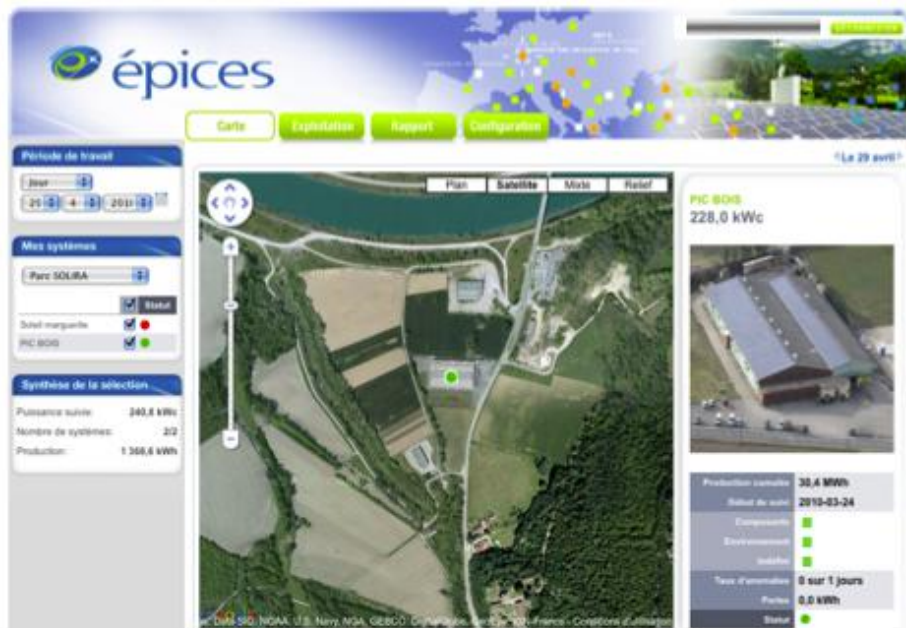
Données cartographiques ©2010 Tele Atlas

VOULEME

142 kWc



Production cumulée	82 MWh
Début de suivi	2009-11-10
Composants	●
Environnement	●
Indéfini	●
Taux d'anomalies	0 sur 1 jours
Pertes	0 kWh
Statut	●



Aperçu géographique des systèmes



Détail du fonctionnement de chaque onduleur

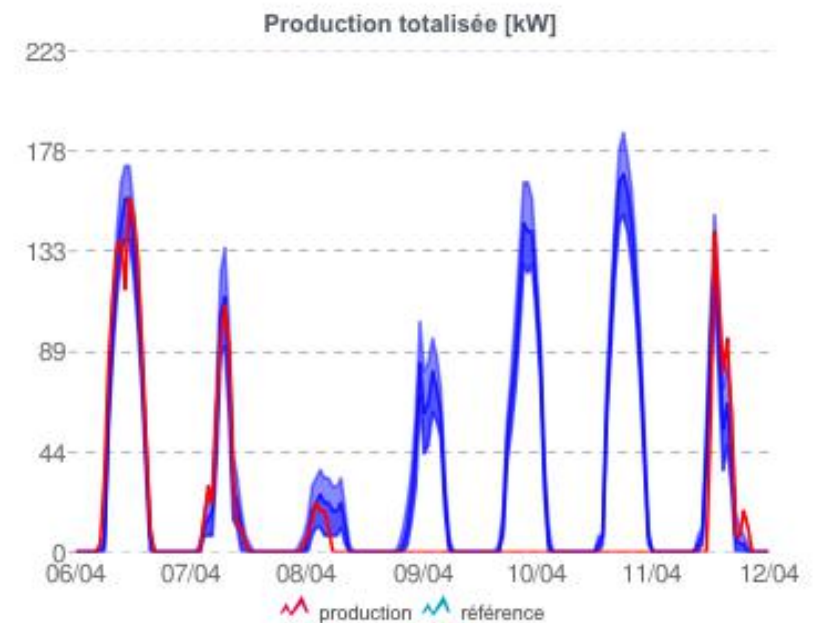
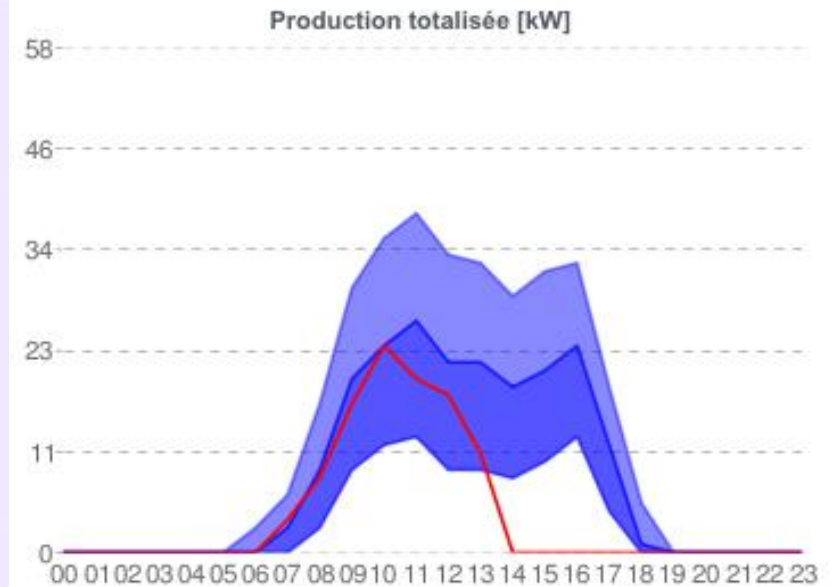


Vue directe du fonctionnement des systèmes et analyse des défauts



Example of a default identification for PV systems

PV system: 228 kWc
Default: system disjunction
Duration: 90h
Looses: 2 912 kWh
Price: 1 690€



- ✚ **Detailed monitoring is essential to:**
 - evaluated actual energy performance of the building
 - To precisely identify the main consumption item and work on them for next buildings (learning by doing process)
- ✚ **PV monitoring & follow up** enables to identify defaults/failures and avoid loose of production



Thank you for your attention !



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        	      	 <p>Regione Lombardia</p> 

Contact

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