

LES ORRES 9 JANUARY 2023

Smart  
Mountain  
for  
tomorrow

19<sup>th</sup> OCOVA FORUM

# ASSISTANCE IN THE ENERGY MANAGEMENT OF PUBLIC FACILITIES



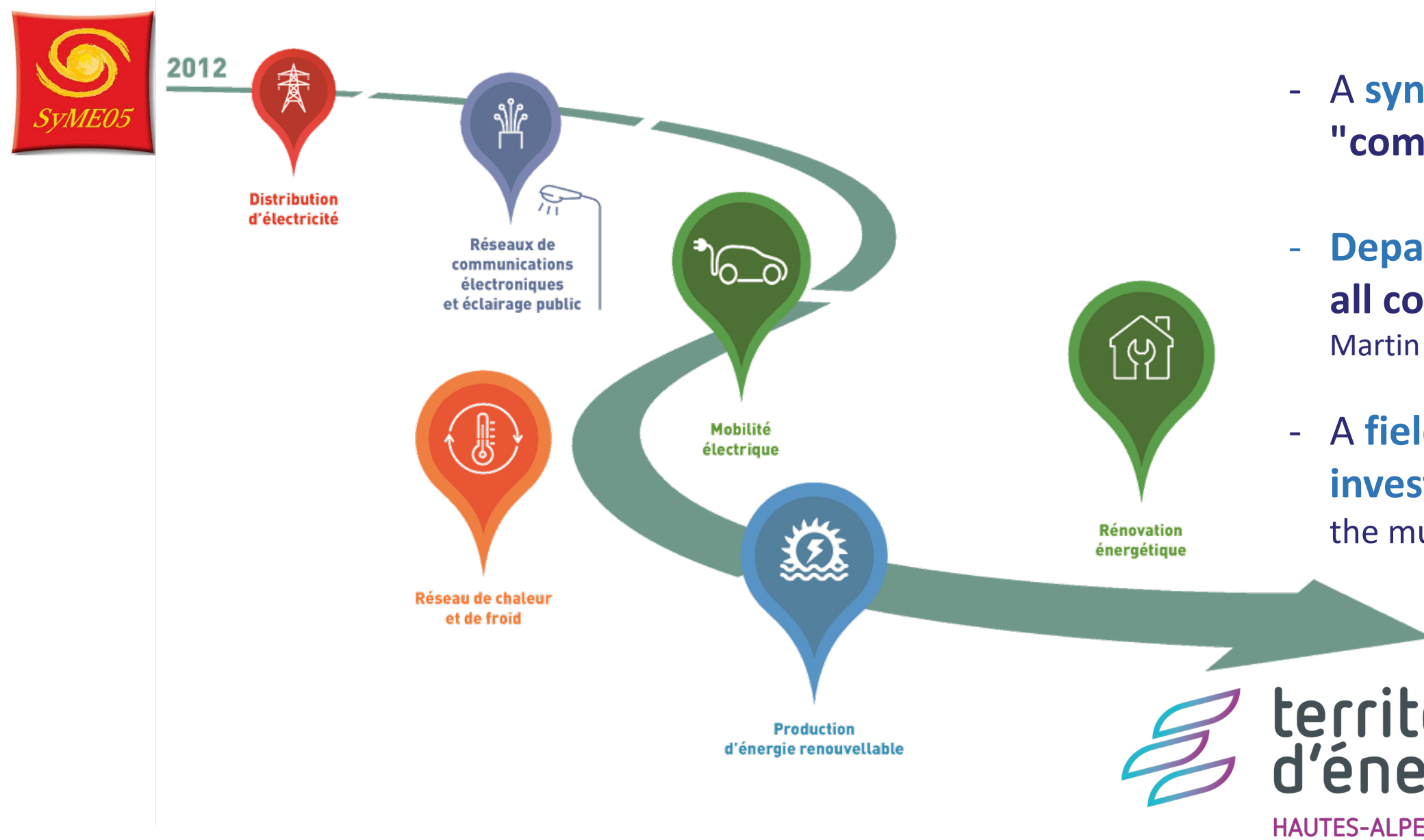
## 1. Presentation of Territoire d'énergie Hautes-Alpes SyME05

## 2. Our approach to digital systems management

- Construction of the knowledge chain and testing
- Operation and management phase
- Operational review and continuous improvement

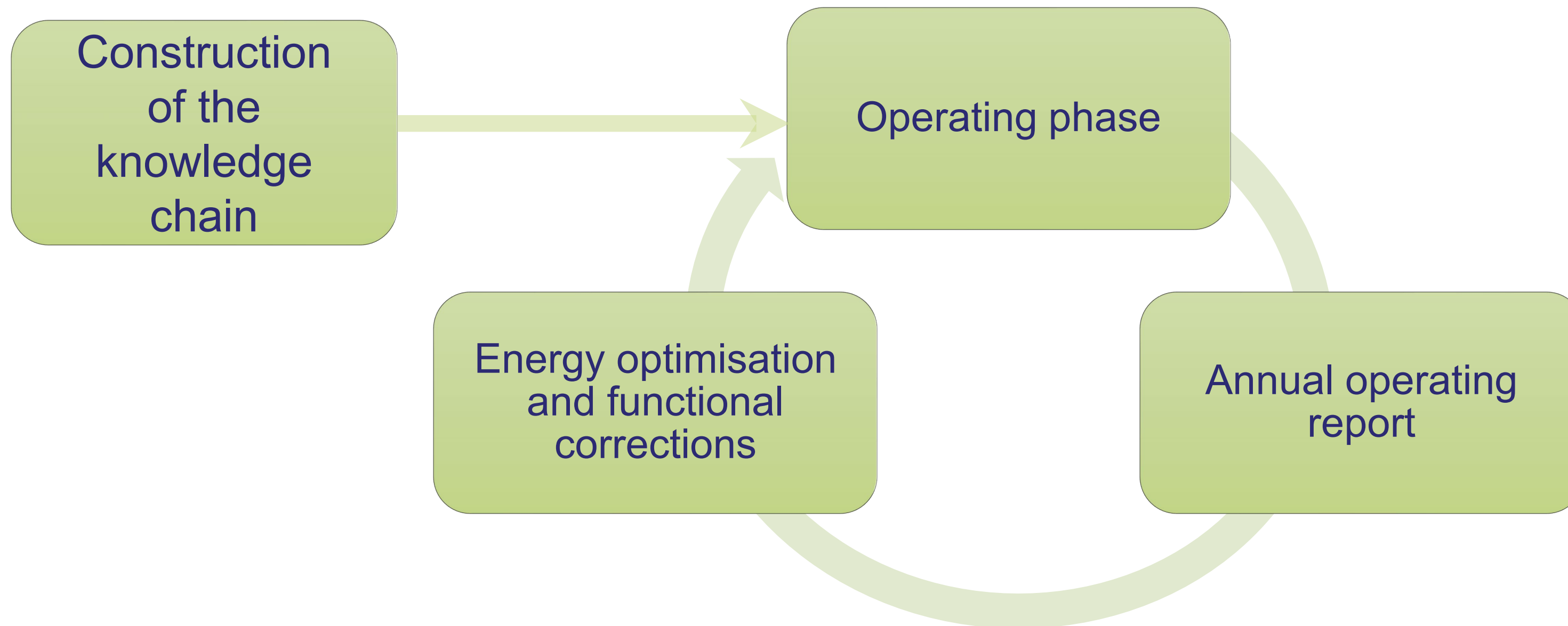
## 3. Use case DURANCIA balneo-spa in MONTGENEVRE

## 1. Presentation of TE05



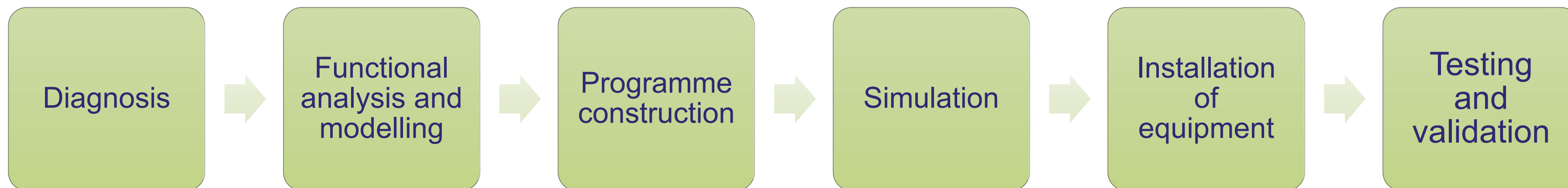
- A **syndicate of municipalities**: a **public actor** that is part of the "communal" block
- **Departmental level**:  
**all communes (159) in the department** except Gap, Briançon and St Martin de Queyrieres.
- A **field player with 28 agents carrying out €6M of investments**: knowledge of the territories, action as close as possible to the municipalities, several tools and skills...
- A **key player in the field of energy**: expertise, mastery of energy constraints, potentials, methods of action, etc.

# 1. Our approach to digital systems management



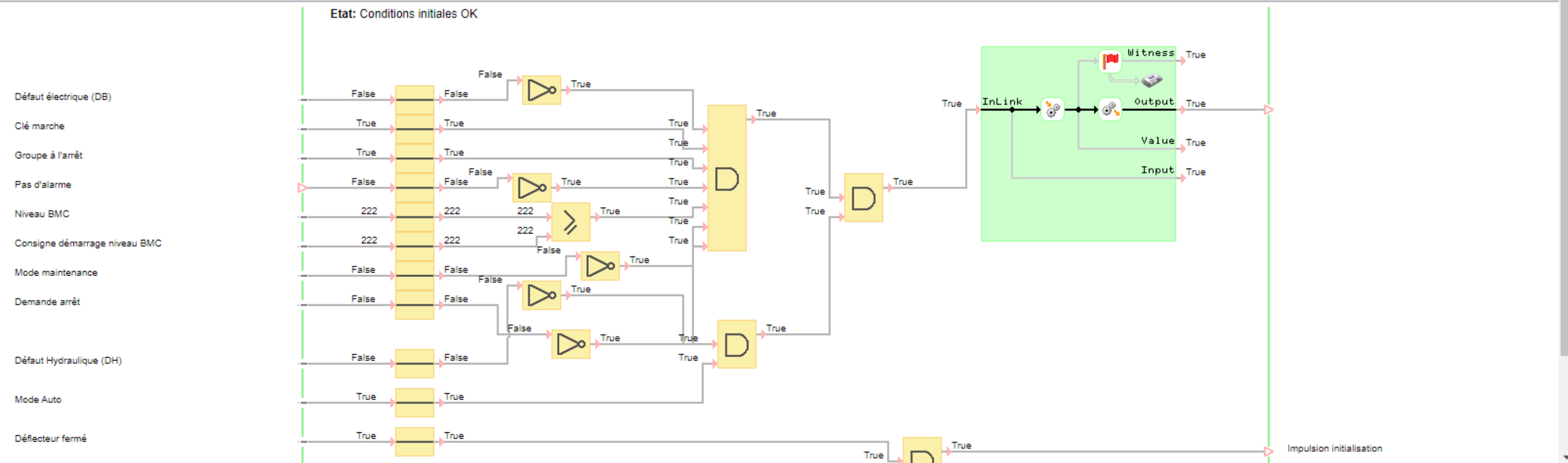
# 1. Our approach to digital systems management

- Construction of the knowledge chain and testing





## Variable Logique "Conditions initiales"



### Paramètres de la ressource

[Identité](#)
[Groupe](#)
[Informations](#)
[Sprite](#)
[Témoin](#)
[Journal](#)
[Enfants \(0\)](#)
[Schéma](#)
[Traitement d'entrée](#)
[Traitement de sortie](#)
[Etat](#)

Valide ☒

Libellé

Attributs

Equipements



Classes



Zone

Reflét

Type de reflét

Serveur BACnet

Valide ☐

Admin

Ajouter une ressource

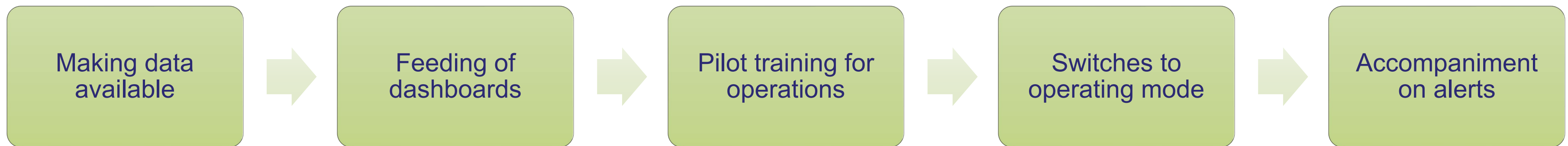
Liste des ressources

Ressources (311)

- eShare
- Device BACnet
- PLUG Embase UC
- Data-Center
- ExtenBUS
- USBDevice
- Flux
- Système
- Compteurs
- 1- Séquence démarrage
  - Conditions initiales
  - Conditions démarrage en cours
  - 1- Ouverture Vanne de pied
  - 2- Ouverture déflecteur
  - 3- Ouverture injecteur
  - 4- Couplage au réseau
- 2- Montée en puissance
  - Conditions permanentes
  - 5- Ouverture injecteur 1 à 10%
  - Ouverture injecteur 1
  - Fermeture injecteur 1
  - Ouverture/fermeture injecteur 2
  - Passage sur 2 injecteurs
  - Passage sur 1 injecteur
- 3- Séquence d'arrêt
- 4- Ressource de omd
- 5- Etat DI spécifique
- 6- Consignes
- 7- Alarmes
- 8- Défauts
- 9- Comptage / bilan
- 10- Mode maintenance
- 11- Mode Manuel
- 12- Pour Synoptique
- 13 - Acquiescement de défaut
- 14 - Débit torrent

# 1. Our approach to digital systems management

- Operation and management phase

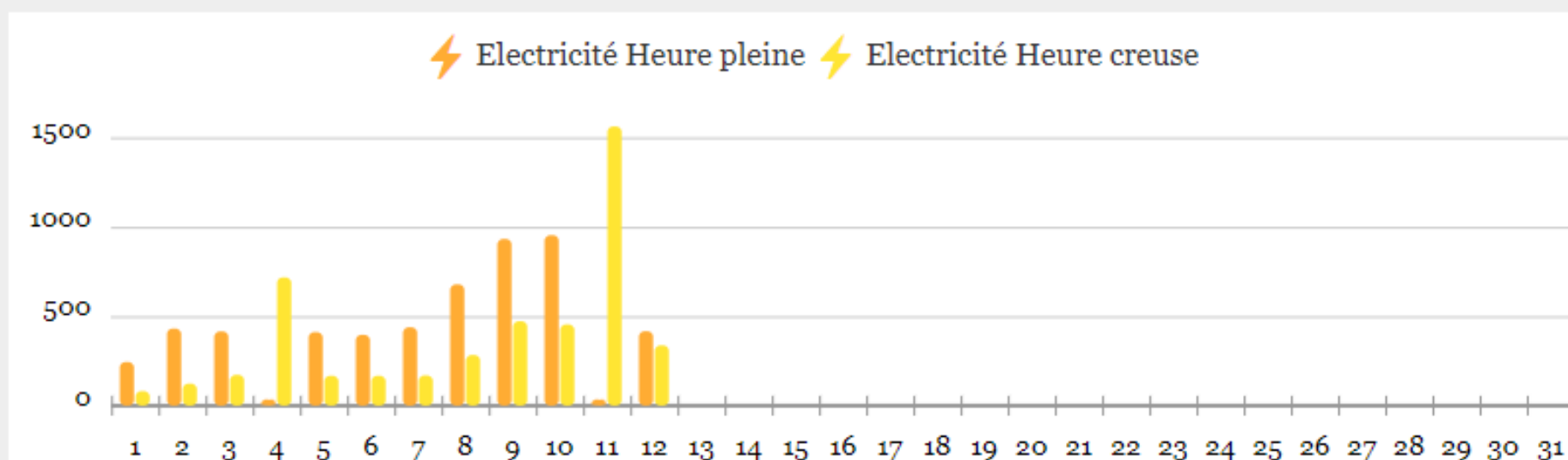
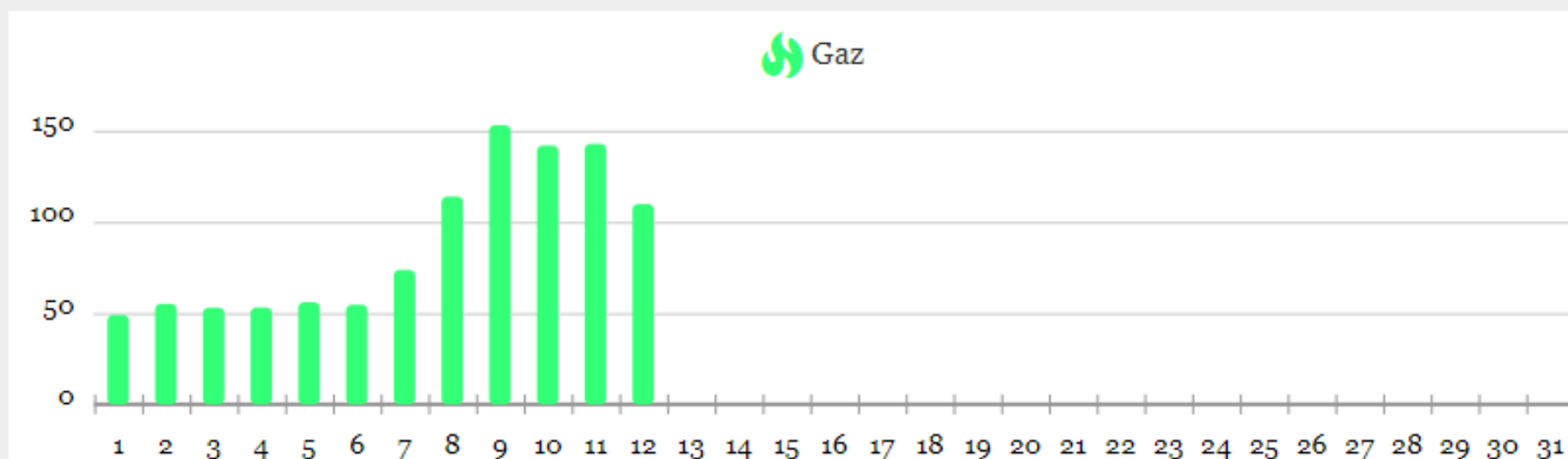
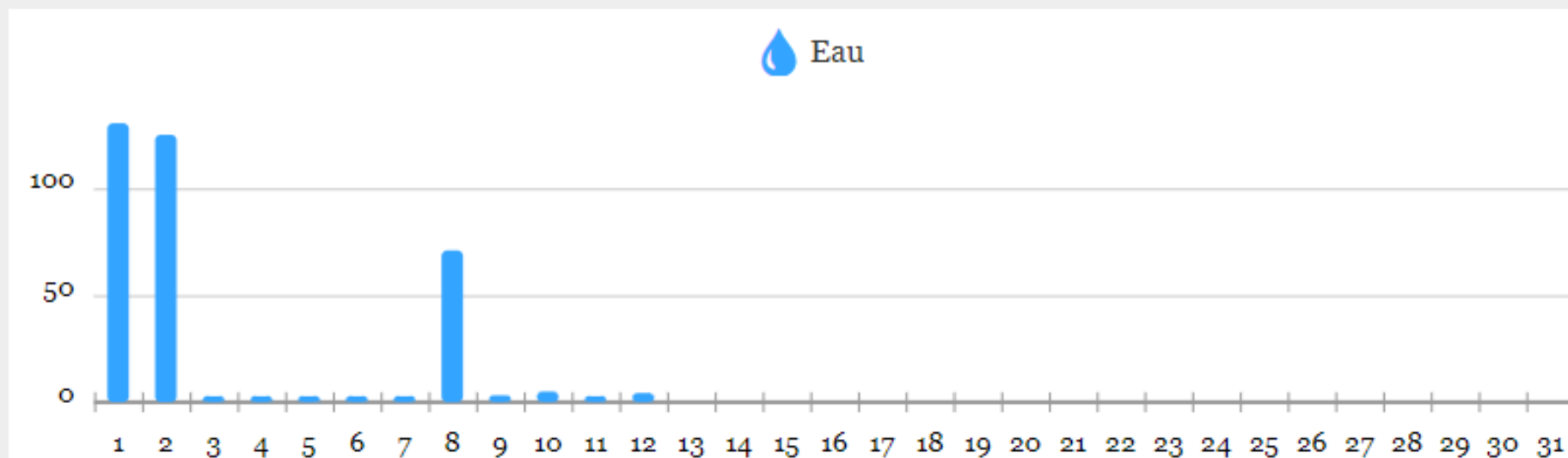




- Multi-énergies
- Répartition EF
- Compteurs électriques

Mensuel par jour ▾

## Consommation Décembre 2022







## Détail 12 Déc.

 4,3<sup>m³</sup>

 109,8<sup>m³</sup>

 416<sup>kWh</sup>

 337<sup>kWh</sup>

	Minimum	Moyenne	Maximum
 Eau	0 m³ ⓘ	0,31 m³	2 m³ ⓘ
 Gaz	4,8 m³ ⓘ	7,84 m³	11,7 m³ ⓘ
 Electricité ...	0 kWh ⓘ	29,71 kWh	83 kWh ⓘ
 Electricité ...	0 kWh ⓘ	24,07 kWh	57 kWh ⓘ



# MONTMAUR Graph CO2 école

CO2 (ppm)

- Primaire RDC

☆

👁
- Maternelle

☆

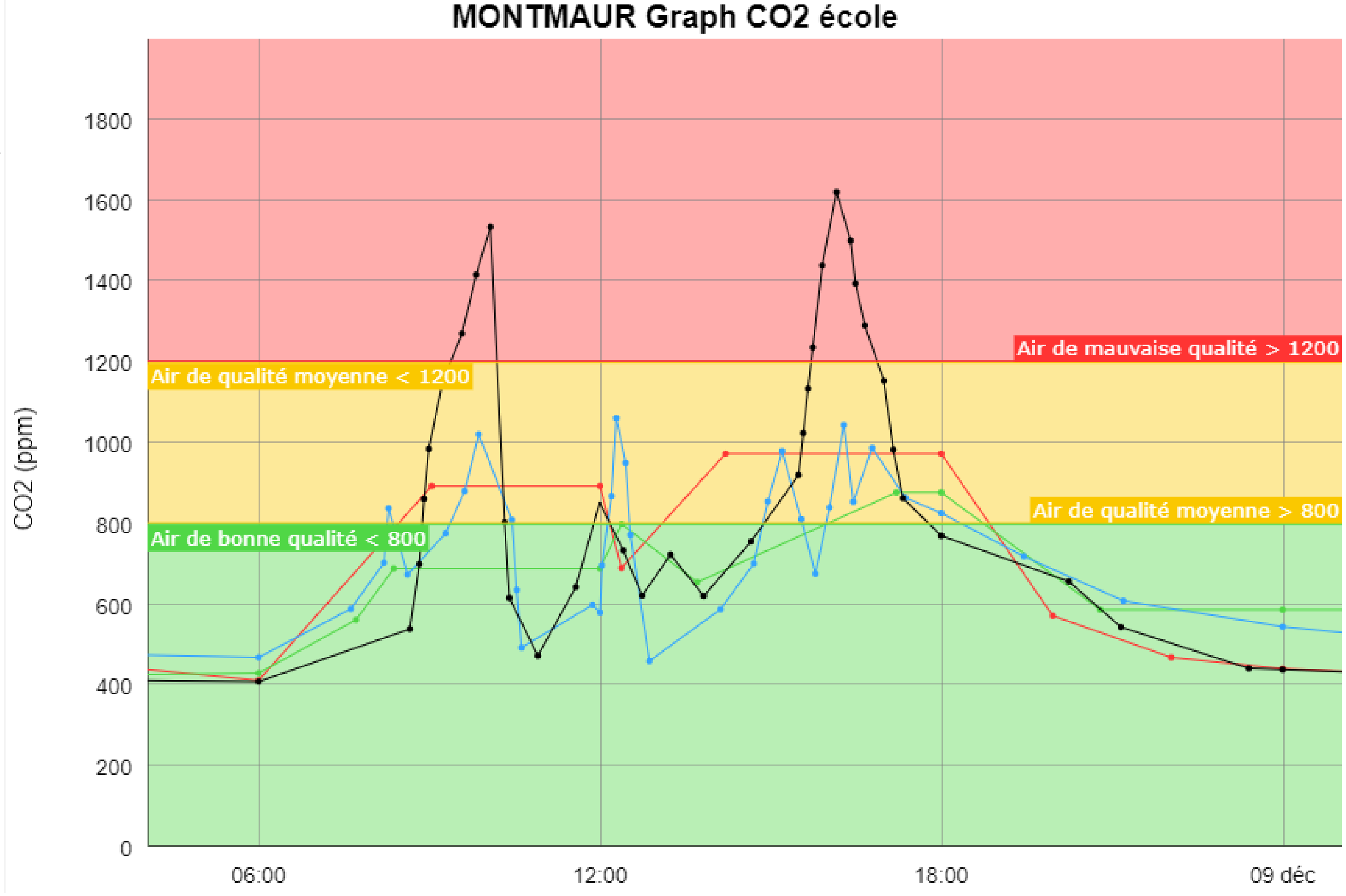
👁
- Cantine

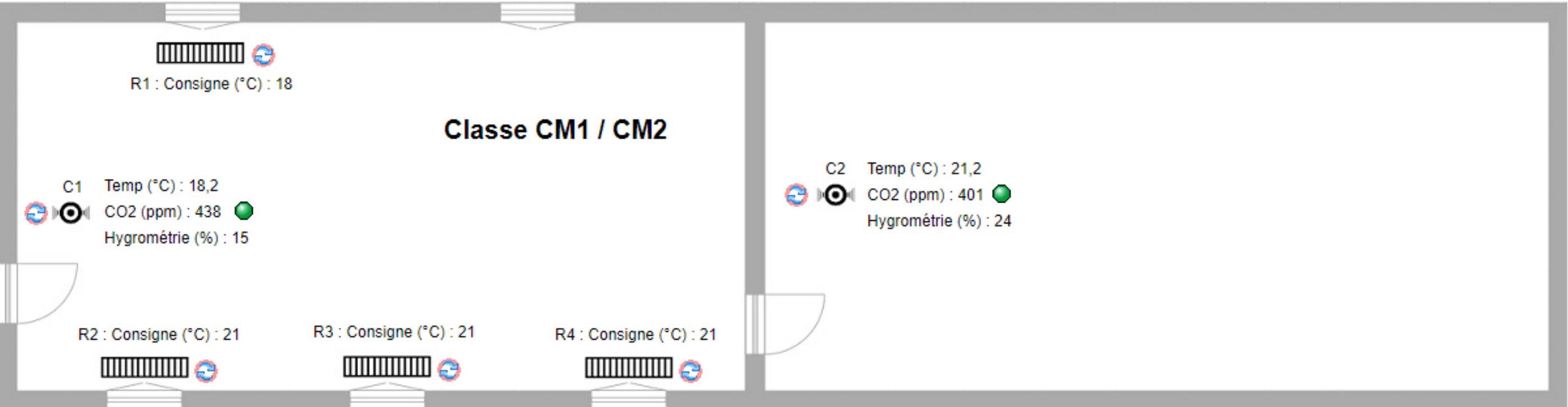
☆

👁
- Primaire étage

☆

👁





Aujourd'hui  
**-9°/-1°**  
Neige

Mardi 13  
**-4°/2°**  
Faible chute de neige

Mercredi 14  
**-4°/2°**  
Neige

MÃ©tÃ©o Les Orres Ã©M6mÃ©tÃ©o

[Retour menu](#)

[Graphique T°](#)

[Graphique CO2](#)



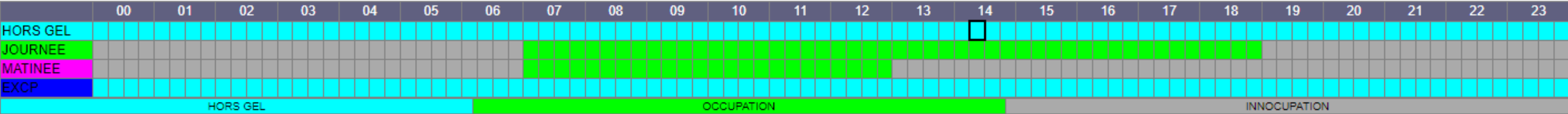
Voir les Samedis

Voir les Dimanches

PÃ©riode actuelle Automatique

Retour en automatique Ã  la prochaine pÃ©riode

Valider



PÃ©riode actuelle Automatique

Retour en automatique Ã  la prochaine pÃ©riode

Valider

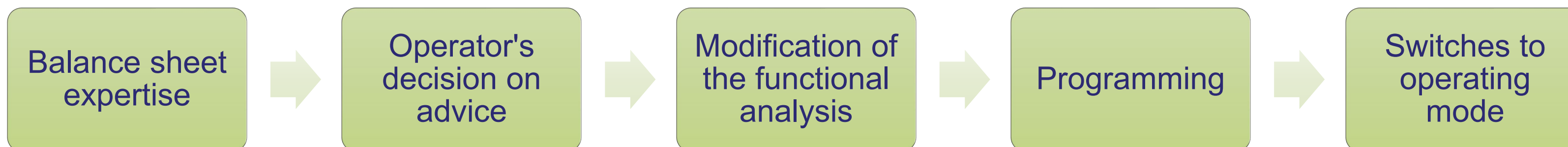
Consigne Hors Gel (°C) : 15

Consigne Occupation (°C) : 21

Consigne Innocupation (°C) : 18

## 2. our approach to digital systems management

- Operational review and continuous improvement



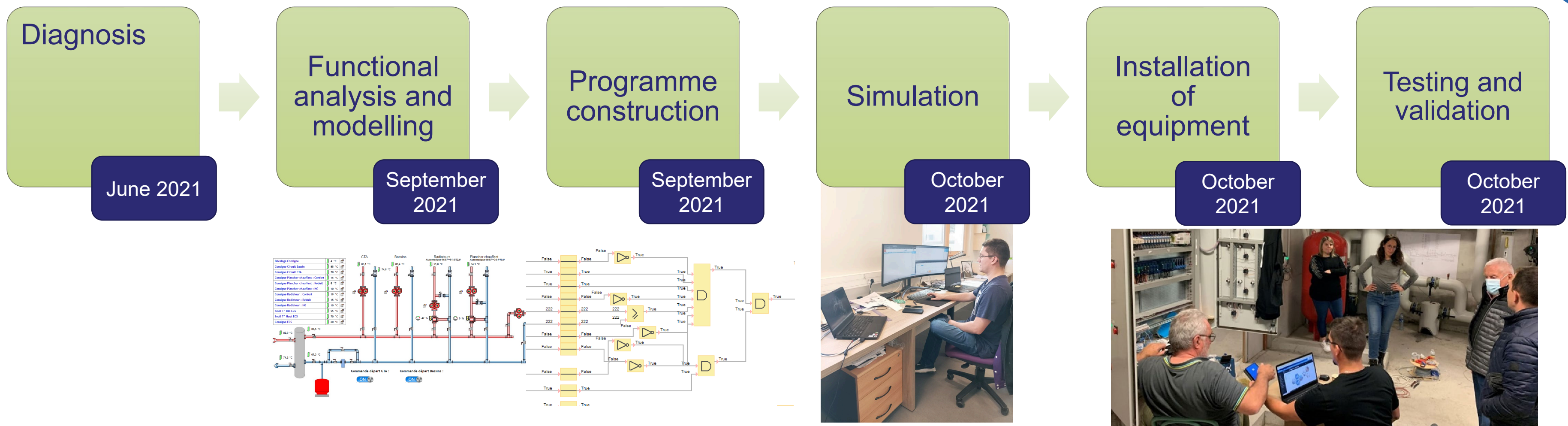


### 3. Use case DURANCIA balneo-spa in MONTGENEVRE





### 3. Use case DURANCIA balneo-spa in MONTGENEVRE



- Replacement of the PLCs for monitoring and controlling the production of heating and hot water.
- Installation of a boiler cascade, burner control and improved hydraulic operation
- Creation of a supervisor accessible remotely for visualising operation, monitoring consumption and sending alarms.
- Collection and monitoring of metering data; volumetric meter for propane gas in the primary sector, ICT electricity meter for SMEs
- The installation of IoT sensors for temperature/humidity/CO2/luminosity.
- Recovery of data from the CAREL air handling units and basins to feed them into the supervision system

### 3. Use case DURANCIA balneo-spa in MONTGENEVRE

*A programme co-financed by*



L'EUROPE INVESTIT DANS LES ZONES RURALES



Winter season 2021/2022: - **26.3%** gas consumption

Summer season 2022 balance: - **39%** gas consumption

Financial balance sheet: -11.4% on gas bills \*

Operating phase

Energy optimisation  
and functional  
corrections

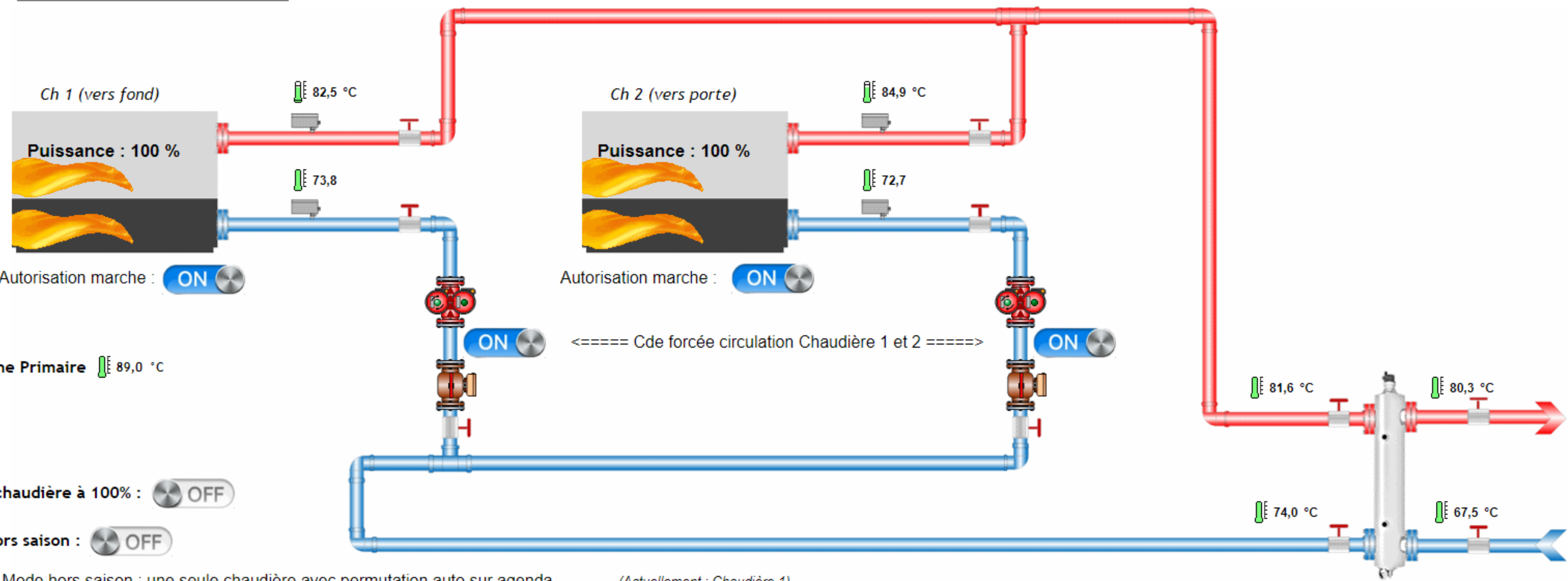
Annual operating  
report

\* A gain reduced by the increase in the price of gas



























Chaudière

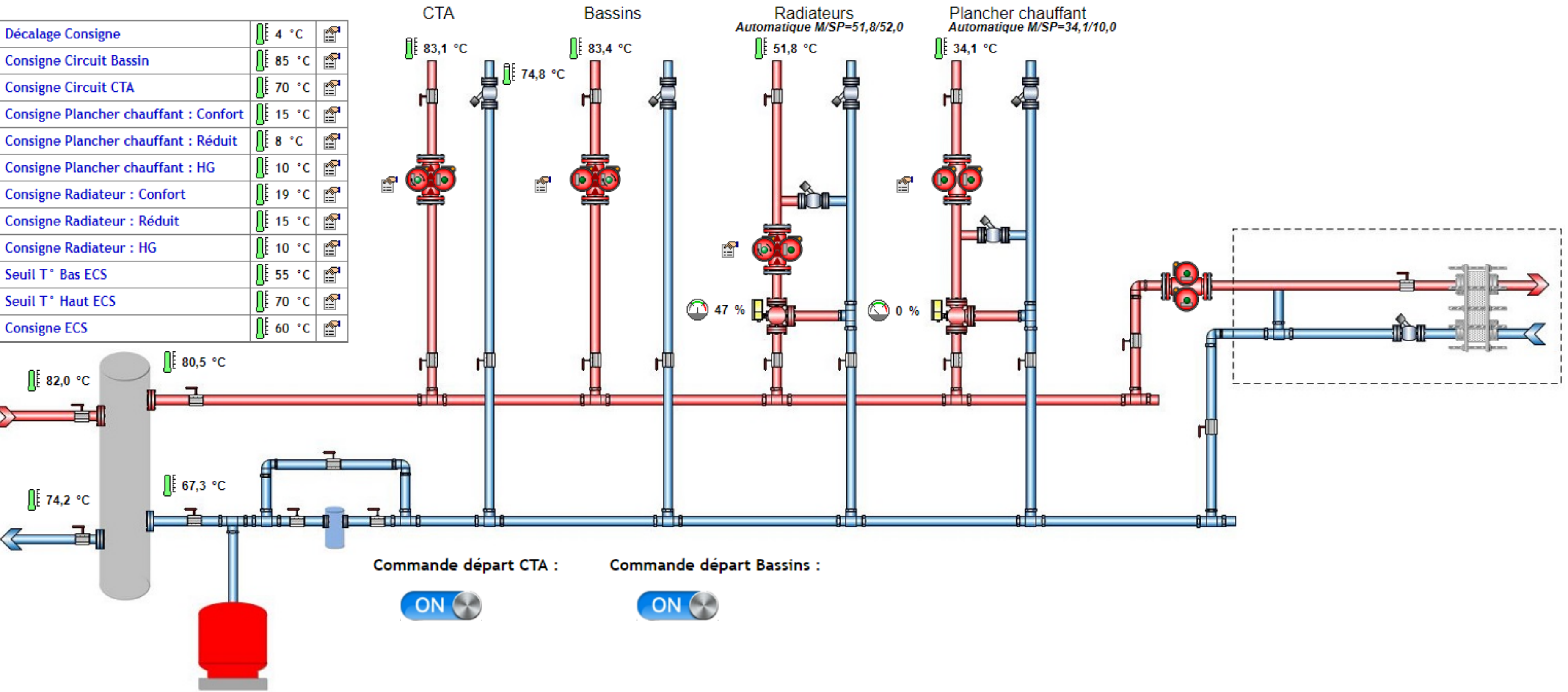
Décalage Consigne	4 °C	
T° Max arrêt cascade	95 °C	
Hystérésis étage brûleur	1,5 °C	



(On) Mode hors saison : une seule chaudière avec permutation auto sur agenda  
(Off) Mode saison: Les 2 chaudières s'allument en même temps

(Actuellement : Chaudière 1)

Décalage Consigne	 4 °C	
Consigne Circuit Bassin	 85 °C	
Consigne Circuit CTA	 70 °C	
Consigne Plancher chauffant : Confort	 15 °C	
Consigne Plancher chauffant : Réduit	 8 °C	
Consigne Plancher chauffant : HG	 10 °C	
Consigne Radiateur : Confort	 19 °C	
Consigne Radiateur : Réduit	 15 °C	
Consigne Radiateur : HG	 10 °C	
Seuil T° Bas ECS	 55 °C	
Seuil T° Haut ECS	 70 °C	
Consigne ECS	 60 °C	

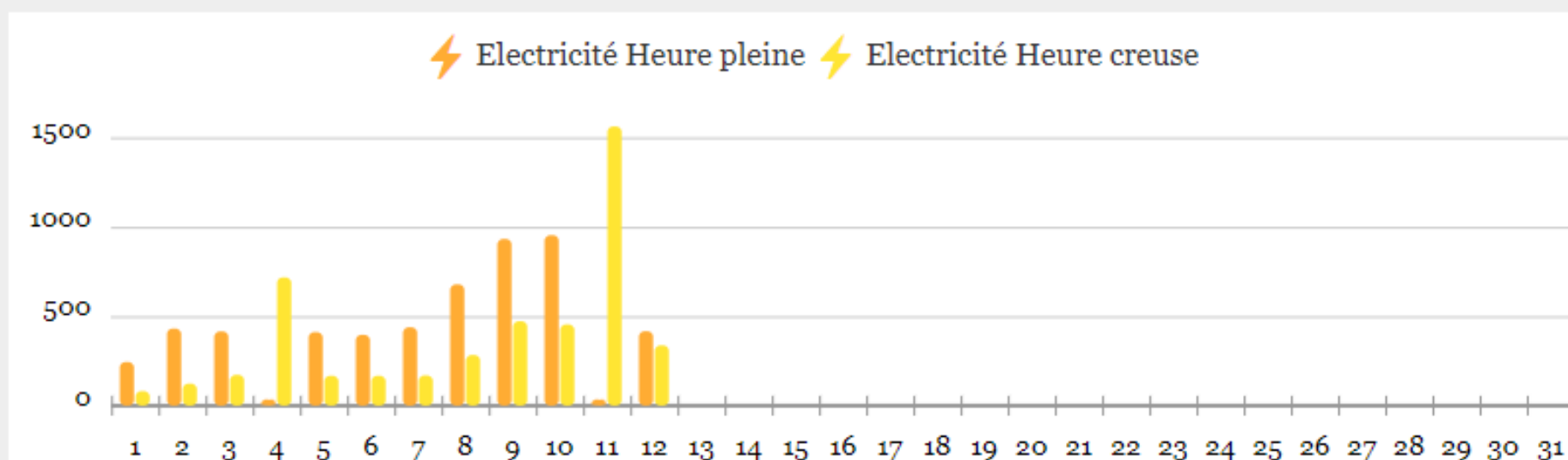
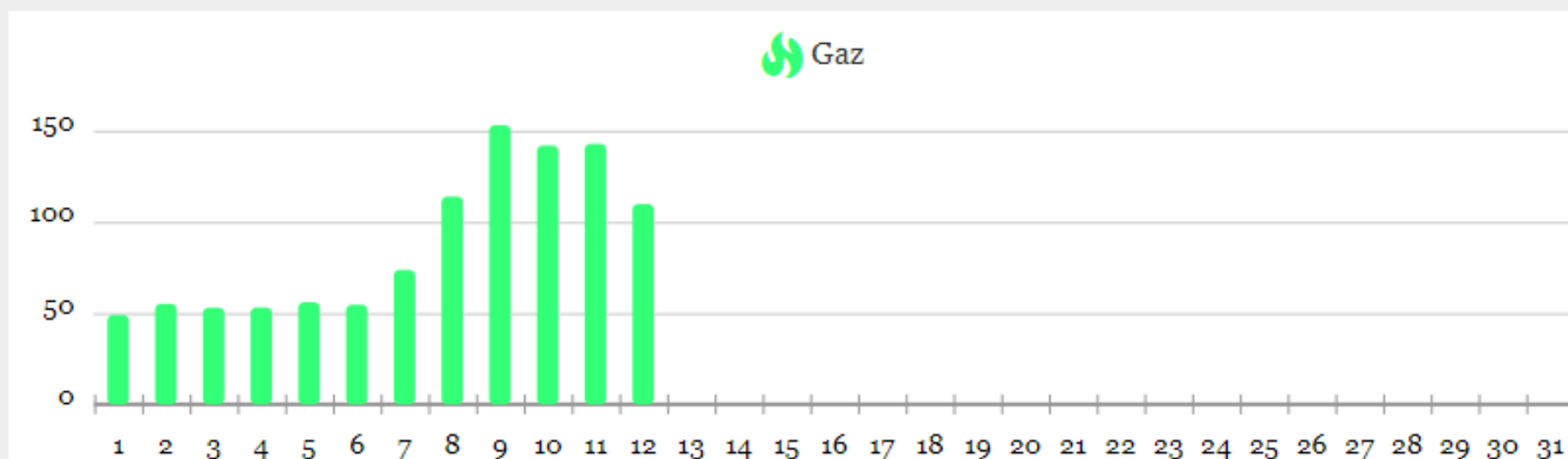
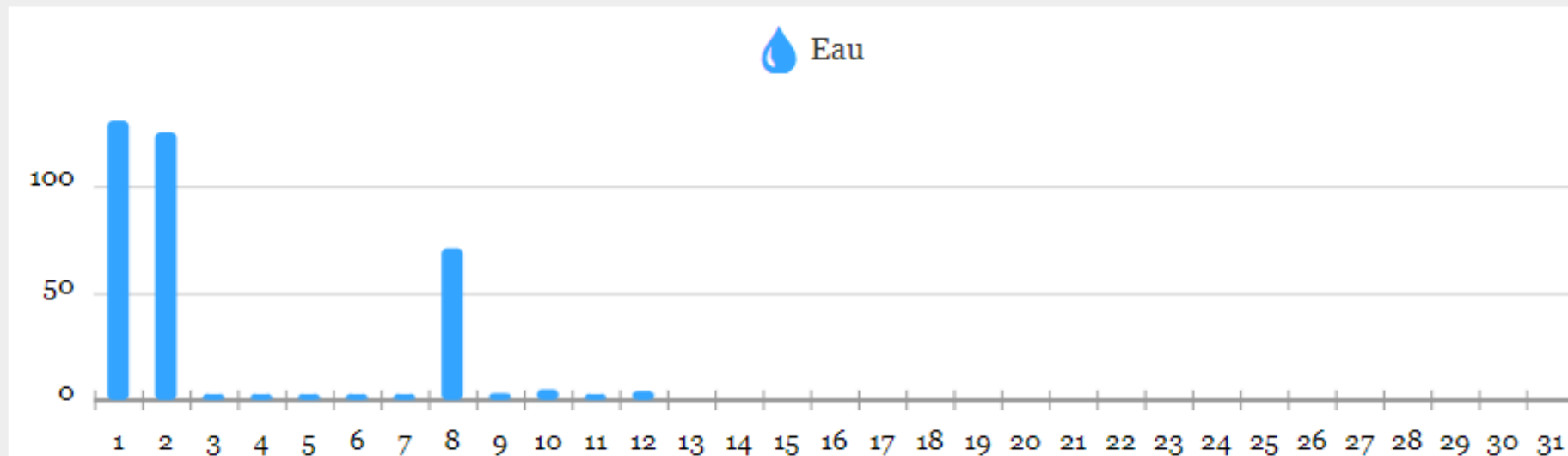




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Types of data currently managed by TE05:

## 240 Sensors on 6 sites

- Hydraulic fluids: pressures, temperatures, flows, levels
- Gaseous fluid: Pressures, volumes,
- Atmospheric data: CO2, temperature, humidity, light.
- Spatial data: motion detector,
- Electrical quantities: power, voltage, current, cosPhi

## 79 Actuators on 5 disparate systems

- Hydraulic proportional valves and actuators,
- Control of motorised thermostatic valves,
- Proportional control of hydraulic cylinders
- Pump/fan/blower control
- Control of street lighting/heating/ECS contactors

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