Interreg 2 Seas Mers Zeeën

Triple-A

Awareness + Access = Adoption

European Regional Development Fund

Home Energy Monitoring Systems Implementation guide

Developed in the framework of the Interreg 2 Seas project Triple-A: Stimulating the Adoption of low-carbon technologies by homeowners through increased Awareness and easy Access

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1. Introduction

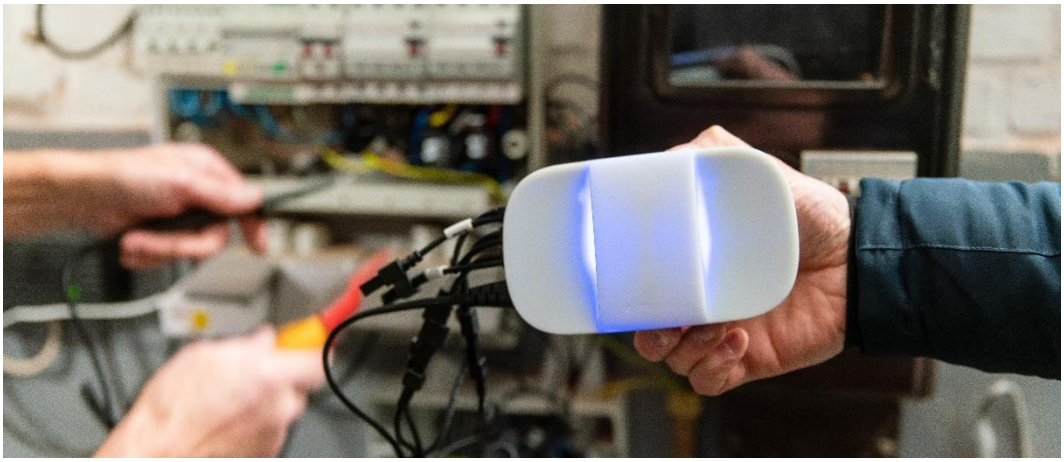
Context

The Interreg 2 Seas project "Triple-A" aims to increase Awareness, create easy Access to information and thus increase the Adoption of low-carbon technologies by homeowners of single-family houses. The approach is largely focused on local authorities supporting the customer journey and includes:

- providing information on websites (WP1).
- helping homeowners understand and monitor energy consumption by providing home energy monitoring/management systems (HEMS) (WP2).
- engaging residents through pop up consultancy (WP3).
- testing the installation of different technologies in demonstration exemplars (WP4).

Local authorities in the 2 Seas region face a common challenge to stimulate homeowners to adopt low-carbon technologies, which is crucial to achieving regional and EU targets for the reduction of CO_2 emissions. Nearly 50% of the final energy consumption in the European Union is used for heating and cooling, 80% of which is used in buildings. The member states of the European Union therefore strive to ensure that the building stock, which accounts for approx. 36% of total EU CO_2 emissions, is carbon-neutral by 2050. This is linked to the necessary efforts of local authorities to renovate their building stock with regard to energy efficiency and the use of renewable energy sources (See also the European Energy Performance of Buildings Directive, additions 2018).

About 50% of the project partner regions' dwellings consist of single-family (terraced and (semi) detached) housing in the owner-occupied sector. Thus, there is an enormous potential to reduce CO_2 emissions by stimulating homeowners to adopt low-carbon technologies. However, it can be very difficult to implement effective retrofit programmes and to engage homeowners to undertake these works. One approach to this is the use of demonstration homes.



Definition of HEMS

Home Energy Monitoring and/or Management Systems (HEMS) are tools that homeowners can use to **monitor and/or manage their domestic energy use**. If the system only provides insight into the energy consumption, it's called Home Energy Monitoring System. If the system also allows active control by the user, it is identified as a Home Energy Management System.

The use of Home Energy Monitoring Systems is not new and (often) related to the rollout of digital or smart meters in EU-countries. It is a precondition to give consumers feedback about their actual energy consumption and thus raise awareness. The presence of a digital/smart meter is not a necessity, though. The concept of a Home Energy Monitoring System covers both physical appliances and online monitoring tools, as well as a combination of both.

What is the purpose of this document?

During the Triple-A project, local authorities tested the implementation of Home Energy Monitoring and/or Management Systems (HEMS) in private homes, with the aim to evaluate the impact of those HEMS on the residents' energy use behaviour and their willingness to adopt low-carbon technologies, as well as to measure the effect of implemented low-carbon technologies in the homes.

The HEMS were promoted through local authorities' web portals and other online channels, in pop-up consultancy centers and during open home events. In many cases, local authorities provided the HEMS to homeowners as part of a data-sharing agreement, enabling the local authority to gain insight in the residents' energy consumption and provide personal advice to homeowners based on these insights.

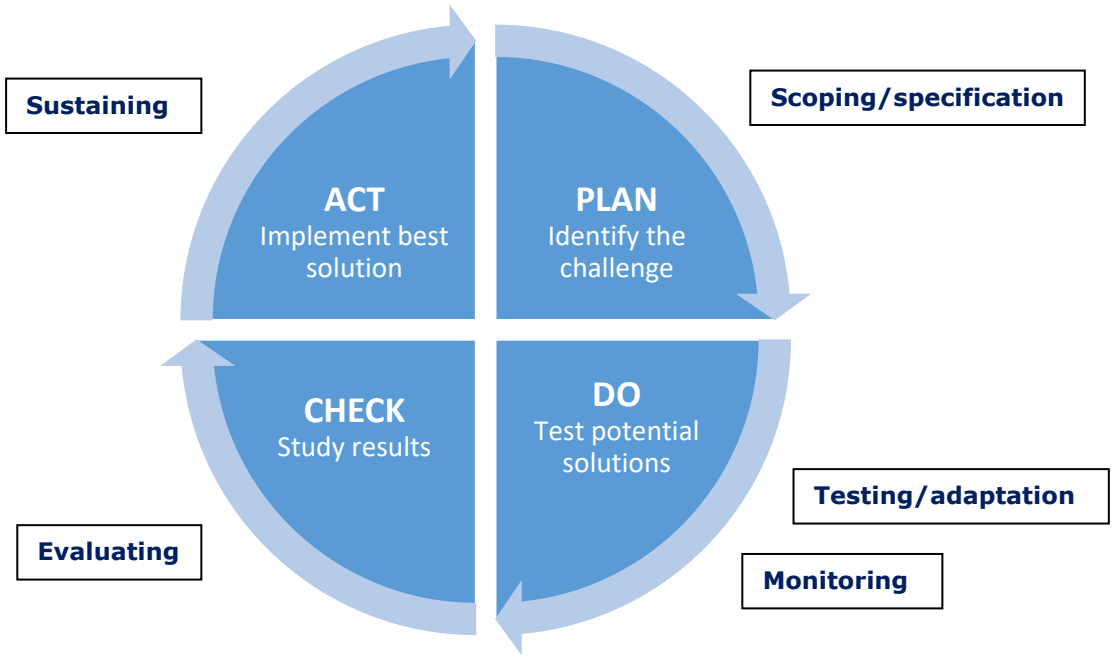
This document aims to outline the HEMS implementation process in private homes and provides examples and guidance from the experience of the project partners.

Who is this document for?

This document is aimed at local/regional authorities, businesses, consultants and other stakeholders who want to take part in the process of increasing the adoption of low-carbon technologies in private homes in their region. This also includes different stakeholders in the supply chain, such as manufacturers of physical HEMS or suppliers of energy monitoring platforms, HEMS installers or energy service providers.

2. Process

The HEMS implementation process applied in Triple-A was very similar to the principle of the Deming circle [1] (Plan, Do, Check, Act), and included following phases: Scoping/Specification, Testing/Adaptation, Monitoring, Evaluating and Sustaining.



2.1. Scoping/specification

The scoping phase included activities in determining the available HEMS in the market and detecting successful use cases of HEMS, including HEMS already used or developed by the project partners before the start of Triple-A.

During this scoping phase, specifications for the used monitoring systems were discussed and defined, as well as protocols for data transmission, sharing and security.

The listed specifications included the type of data to be collected by the HEMS, the way data is accessible, the type of feedback and interaction with the user as well as compatibility with monitoring platforms. The table in Annex 1 shows the different Home Energy Monitoring Systems and their characteristics, as selected by the Triple-A partners

Access to collected information/data
- Software (smartphone/tablet application, web portal)
- Hardware (directly through device)
- Real-time system

Feedback type
- Indirect (Historical feedback)
- Direct (Real-time feedback)

Meter readings
- Manual/analogue meter reading
- Automatic/digital meter reading
- Smart device

[1] *PDCA (Plan, Do, Check Act/Adjust), also called "Deming circle", is an iterative four-step management method used in business for the control and continuous improvement of processes and products.*

Type of information HEMS offers

- Energy consumption (electricity, gas, water…)
- Comfort
- Monitoring Indoor Air Quality (IAQ)

Compatibility with monitoring platforms

- EnergieID
- Brand specific platform created by the supplier
- Other platforms

2.2. Testing and adapting HEMS

After the initial selection of HEMS, several systems were tested to determine if adaptations/improvements were needed to comply with local authorities' expectations and defined specifications. This included not only adaptations to physical appliances, but also desired software upgrades to enhance functionalities of already installed systems.

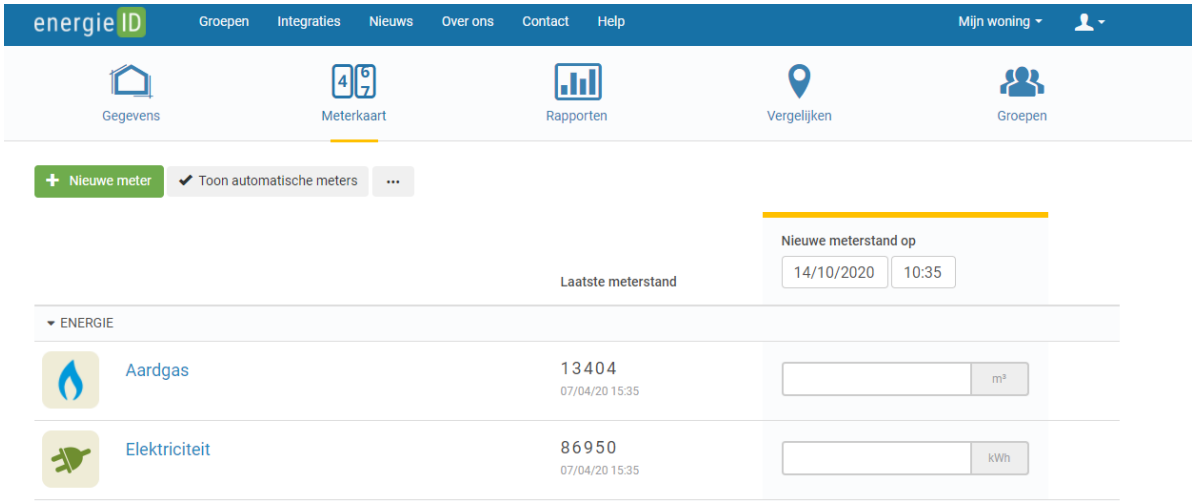
Hardware changes to the appliances appeared nearly impossible, as most devices are finished products marketed by the suppliers with very limited or no possibilities to adapt.

Software solutions, such as web platforms to facilitate monitoring of energy consumption, offer more flexibility for customization. Different platforms exist and were used during the Triple-A project. In cooperation with the platform suppliers, some project partners managed to adapt the available platforms to their specific needs.

Below are two examples of the platforms that were tested and adapted by partners, in close cooperation with the supplier.

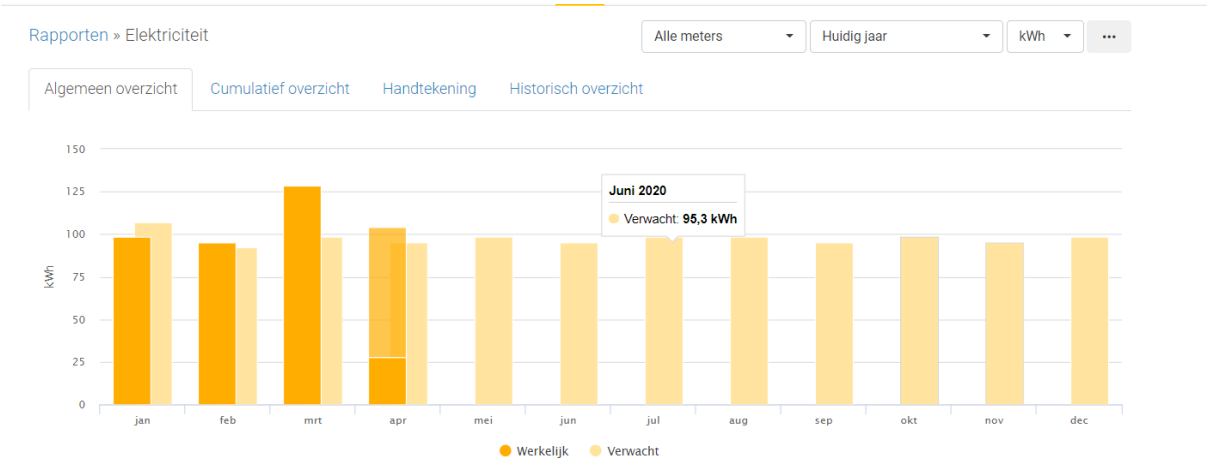
EnergieID

One of the platforms that was used by the Flemish partners to monitor homeowners' energy data was EnergieID (https://www.energieid.be/), a Belgian energy monitoring platform that allows manual input as well as automatic collection of energy consumption data (electricity, gas, water).



The platform can be used as a standalone solution but can be linked with different types of Energy Monitoring Systems and/or digital meters. The possibility to create user groups facilitates community building and benchmarking with similar profiles.

Collected data are processed in graphs and visual information, enabling the user to find out if real energy consumption is in line with expected results. EnergieID can be used on computer, tablet or smartphone.



Adaptations to the platform included suggestions from local authorities to make the platform more user-friendly and to simplify the graphs for easier understanding by the homeowners. In the framework of a coaching trajectory, the cities of Mechelen and Antwerp created specific groups of HEMS users to support community building and tailor-made advice.

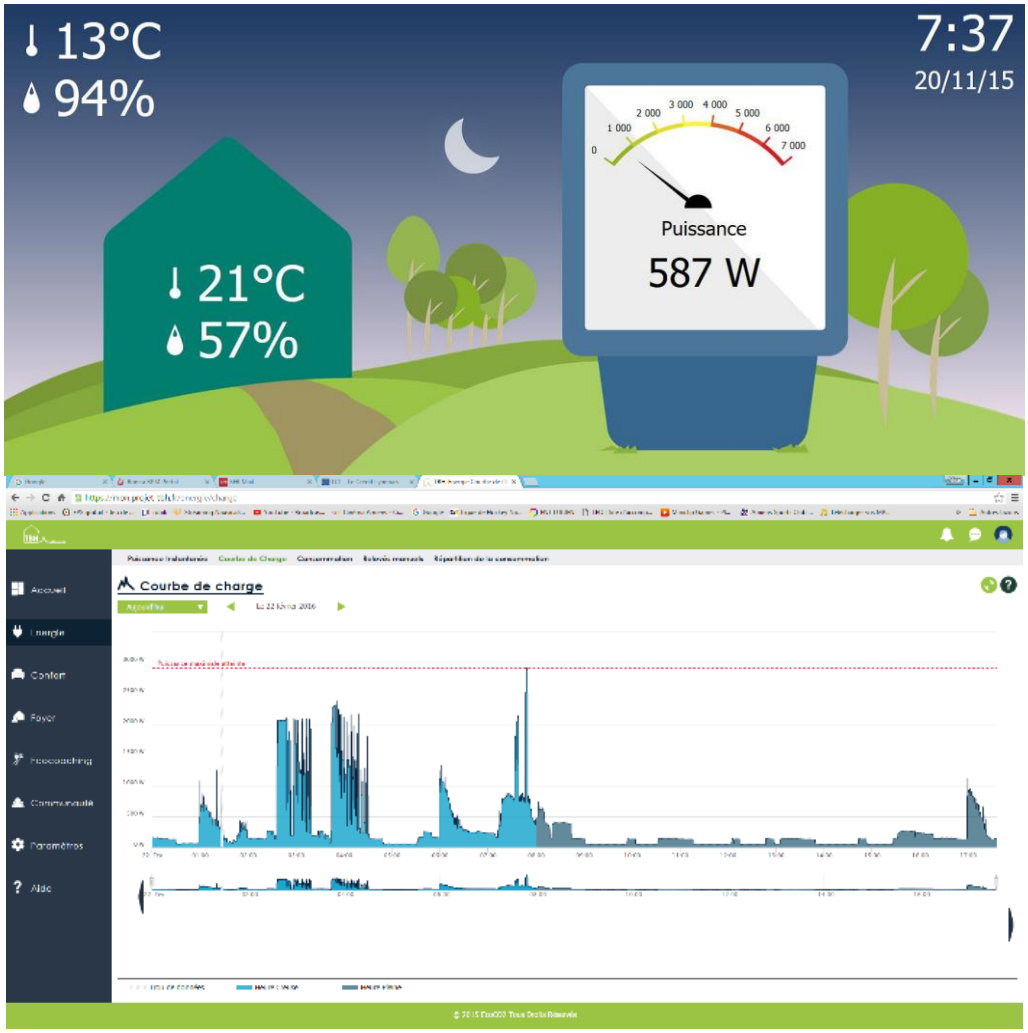
Eco CO_2 / Quart'home

For the implementation of HEMS, French partner PSEE Hauts de France cooperated with Eco CO_2, an innovative eco-business in the social and solidarity economy. Their mission is to educate citizens and organizations towards the sustainable reduction of their environmental impact. Eco CO_2 deploys support programs on energy savings and sustainable mobility, designs measurement tools and conducts behavioural studies.

In this context, Eco CO2 developed a platform – "mon.quarthome" – compatible with Quart'home (developed by Quartum), a HEMS device capable of monitoring energy consumption, temperature and humidity in the house.

The "mon.quarthome" platform is able to:

- permanently monitor the power demands of the housings
- continuously monitor the recorded data (electricity and gas consumption)
- provide information on the level of comfort in the house
- access to energy management applications, containing a "ECO'COACHING" part to sensitize subscribers to a reasoned or reduced use of energy and a report part allowing subscribers to make a monthly or annual review of their energy use in the house



The platform was adapted in order to facilitate analysis. Targeted or expected consumption cannot be compared directly with the energy consumption measured in situ without taking into account several factors, in particular the climatic conditions of the year followed and the conditions of use of the monitoring year. In order to increase the accuracy of the data collected, project partner SPEE Hauts-de-France cooperated with the installer of the HEMS to develop a survey for the residents as future HEMS users (see *"Annex 2. Technical survey"*). This survey collected relevant information about housing characteristics and demographics of the home owner, allowing better interpretation of the consumption monitoring data after installation of the HEMS.

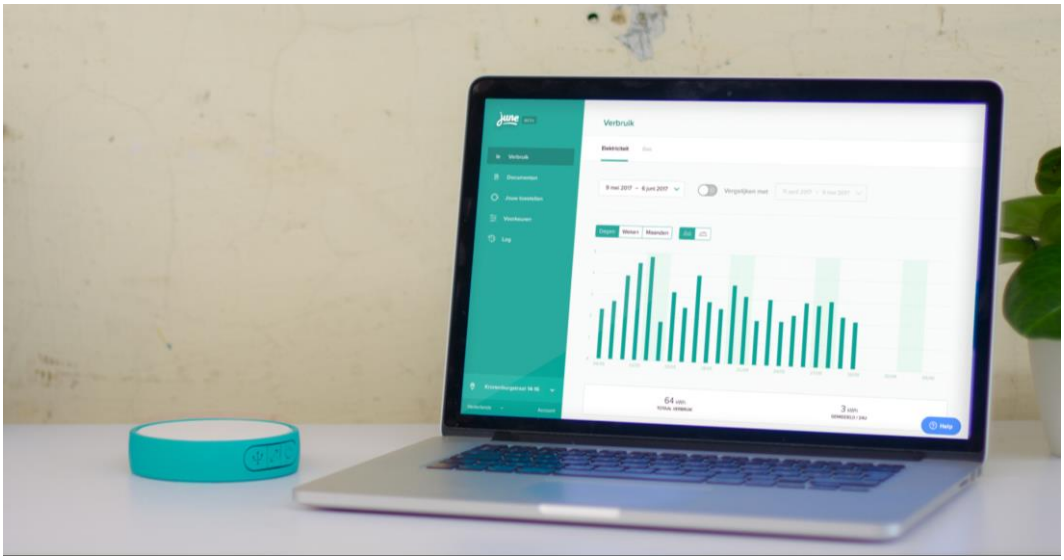
An example of the yearly consumption report produced by the "mon.quarthome" platform can be found in Annex 3.

2.3. Monitoring

The data and results gathered during the scoping and testing phase were evaluated in order to optimise the wider roll-out and installation of the HEMS in the target areas. Once the homeowners had their HEMS installed, the project partners monitored the use and impact of the HEMS following a common method.

Results were analysed and reported in an evaluation report (see: https://www.triple-a-interreg.eu/project-reports), indicating best practices in terms of energy use behaviour and the impact on willingness to adopt low-carbon technologies. The evaluation focused on:

- Resident satisfaction
- Impact of the installed HEMS on energy use
- Impact of the use of HEMS on willingness to adopt low-carbon technologies



In order to get insights in how satisfied people are with the HEMS before and after installation, the homeowners were asked to fill out two questionnaires. These questionnaires were designed to understand how the HEMS might affect people's behaviour regarding energy efficiency.

The first questionnaire (pre-installation) was sent to homeowners shortly after the installation of the HEMS. The aim was to measure how satisfied people were with the installation and whether they think the HEMS could help them to save energy. The questionnaire started with some demographic data, the type of HEMS that was installed, and the characteristics of their house.

In the post-installation questionnaire, that was sent 8 months later, we measured the overall satisfaction of residents with the installed HEMS and the changes in behaviour due to the installation of the HEMS.

More details about the questionnaires and the results of the survey can be found in the evaluation report on the Triple-A website (https://www.triple-a-interreg.eu/project-reports).

2.4. Evaluating and sustaining

In order to sustain the actions developed within Triple-A beyond the project, all local authority partners evaluated their approach for the implementation of Home Energy Monitoring Systems, through a survey covering four different aspects:

- Procurement of HEMS
- Promotion of HEMS
- Installation/implementation of HEMS
- Monitoring of homeowners' energy consumption data through HEMS

The results of this assessment (see *"Annex 4 – Evaluation survey HEMS implementation"*) led to valuable insights and suggestions for improvement. These were translated into hands-on recommendations for local authorities willing to adopt the HEMS implementation approach in their region. The recommendations can be found below.

3. Recommendations

3.1. Procurement of HEMS

Home Energy Monitoring/Management Systems are widely commercialised and therefore easily available through regular commercial actors. Most local authorities in the project obtained the HEMS through public procurement with financial support from the Triple-A project. One of the barriers hindering HEMS implementation was the initial cost, with a price ranging from 150 to 500 euro per unit.

In their search to increase cost-effectiveness, several partners tried to collaborate with the supply side. Unfortunately, this collaboration was not always successful, since suppliers were not willing to join the project, mainly due to the small quantities of HEMS being requested. Collective procurement organised at the regional level could speed up the process. Cooperation with experienced local suppliers/installers of HEMS positively impacted the procurement as well.

Recommendations

- Procurement in smaller quantities can be an issue, as many suppliers prefer to execute only bigger installations. If the installation is easy, it can be an option to purchase the HEMS you need and have them installed by your own services or by the homeowners themselves.
- If you are not comfortable with having people install the unit by themselves, try to procure them from local suppliers to deliver and install the units.
- Select a reliable contractor who has experience in installing HEMS and is convinced of the added value of the product.
- Try to involve a technical person in procurement as well, so that you can supply the technical data to the contractor and find the most suitable solution for the residents.

3.2. Promotion of HEMS

The local authorities used various methods and channels to promote the HEMS to homeowners. The HEMS were promoted both "virtually" and "physically", through local authorities websites, digital newsletters, social media, leaflets, as well as during open home events and in the pop-up consultancy centers. Project partners combined virtual and physical promotion to reach different target groups (different age range, size of family, etc.). When the promotion was done only virtually, it was not easy to explain how the HEMS function and how privacy is protected.

Moreover, it is difficult to reach homeowners who have limited digital skills or do not have easy access to online information. Breda, Hauts-de-France and Oostende promoted the HEMS in a pop-up consultancy center. This approach has the advantage of direct contact with the homeowners, but only reaches a limited number of people (the pop-up visitors). Kent County Council and Hauts-de-France applied the HEMS in demonstration homes, so that HEMS installation could be included in the home renovation process.

Recommendations

- Take into account the public perception of HEMS, you may need to ensure that residents understand the advantages and added value of HEMS a lot better in order to get uptake.
- Homeowners may be worried about their data and privacy issues. Make good agreements on terms and conditions (including GDPR) regarding the use of homeowners data.
- Direct contact with the residents allows you to explain the concept of HEMS and how you will protect the privacy of citizens, thus giving confidence. This direct contact is also a good opportunity to discuss other services you offer and to perform a remote energy scan where electricity, gas and water savings can be discussed.
- Direct contact is more difficult to organize and only reaches a smaller audience. These are usually not the people who live in energy poverty.
- Via your local authority's website, social media… you can reach a bigger audience and broader range of homeowners. However, it is not easy to explain how HEMS work and that privacy of citizens is protected if you only promote them in a digital way.
- Keep in mind what you want to reach by having the HEMS installed in citizens' homes. If your main goal is to get insight into their energy behaviour as a basis for personal energy saving advice, take that into account in your implementation strategy. If residents receive the HEMS for free, they might oppose less to its installation and at the same time be less critical of sharing their data.

3.3. Installation of HEMS

Thanks to the financial support from the Triple-A project, LAs could mostly put HEMS at the disposal of the homeowners for free. Some local authorities asked a deposit, whereby the HEMS remain the property of the local authority. In many cases, local authorities provided the HEMS to homeowners as part of a data-sharing agreement, enabling the local authority to gain insight in the residents' energy consumption and provide personal advice based on these insights. Homeowners signed an agreement with the local authority, clearly stipulating the terms and conditions for data-sharing and data protection of the homeowner. In exchange, local authorities provided the HEMS for free and could offer personal guidance and advice on energy consumption.

The HEMS were mostly installed by the supplier, to guarantee a correct installation. However, the local authorities had to rely on the supplier to make an appointment with homeowners for the installation. Some project partners teamed up with a local supplier, to give confidence to the homeowners and provide additional information on the use of HEMS at the time of installation. Homeowners in the city of Mechelen installed HEMS by themselves since the specific models were easy to use and install. This lowered the installation cost for the local authority. Instead of suppliers, local authority employees in Hauts-de-France positioned the HEMS at homes. This approach has the disadvantage that it requires dedicated staff and is thus very time and staff intensive.

Recommendations

- If the installation of the HEMS is easy, this could be done by the homeowners themselves, if necessary with guidance by technical staff from the local authority. If the installation is rather complex, we suggest cooperating with an experienced external partner for installation.
- Having the HEMS delivered and installed by an external supplier unburdens the homeowners (and the local authority) and has the advantage that everything can be installed in one go. Additionally, liability lies with the supplier if something goes wrong, not with the local authority or the homeowner.
- Keep in mind possible technical issues, such as the need for a power connection or the availability of WiFi to establish a connection between the HEMS and the monitoring application/web portal.
- As the local authority is usually seen as a reliable and neutral partner, try to team up with the supplier and have a member of your staff available at the time of installation. While the supplier takes care of technical installation, your employee could explain the appliance and how to use it, and make all necessary agreements for sharing their data.

3.4. Monitoring

Having access to the data collected by homeowners is crucial to monitor energy consumption. Data protection and privacy can be a significant concern for homeowners. Therefore, as mentioned before, local authorities tried to make the installation of the HEMS part of a data-sharing agreement and provided the device for free. Thanks to this approach, homeowners often were less likely to oppose its installation and at the same time be less critical of sharing their data.

Monitoring was sometimes hindered by technical issues as well, such as weak internet connection (necessary for transmission of the data to the online platform), requiring follow-up by a dedicated staff member. Another issue could be a lack of involvement of the homeowners in the monitoring process, due to various reasons. Making homeowners part of a community with the possibility to benchmark their energy consumption with other residents could increase their engagement and thus lead to more reliable data. Overall, the follow-up of data monitoring by the homeowners can be time consuming.

Recommendations

- Ensure you get an agreement with the homeowner about how their energy consumption data will be shared so that you can monitor data afterwards and use them to provide personal advice.
- Monitoring data from multiple residents requires time and dedicated staff. You could use a platform that allows for automatic energy data input from the HEMS, thus avoiding the need to manually input the data. Such platforms can also be used for "community building", allowing citizens to compare their energy usage with others.

4. Conclusion

Home Energy Monitoring/Management Systems (HEMS) are certainly good tools to monitor and/or manage homeowners' domestic energy use, as well as to measure the effect of implemented low-carbon technologies in their homes.

However, local authorities that want to use these systems as an instrument of local energy saving programs and community-based reinforcement strategies, have to take into account some elements.

Whereas to some extent most HEMS can contribute to the start of behaviour change, the impact on residents' willingness to implement new energy efficient investments is rather low. Therefore the HEMS don't seem a trigger to speed up energy efficient measures.

Data privacy issues can be a barrier to the implementation of home energy monitoring/management systems, that can possibly be overcome by a clear agreement between the local authority and the homeowner, stipulating the conditions for data sharing and the benefits for both parties.

Direct contact with homeowners, through personal advice, trialling in demo houses and demonstration in pop-up centres, can support the implementation of home energy monitoring/management systems, but requires dedicated staff and is more resource intensive than general communication such as through the local authority's website.

We hope this guide can help local authorities in their decision process on the implementation of HEMS as an instrument to support their carbon saving ambitions.

5. Annexes

Annex 1 – overview of selected HEMS and their characteristics

	Quart' home	EnergieID (platform)	2-Wire	CEMM	Iungo	June	Flukso	Fluvius digital meter	NEST	Netatmo Thermostat	Netatmo Healthy Home Coach	Plugwise	Smappee	Toon / Eneco	V-smart	Victron	Woonmeter
Access to collected data/information																	
Software (app, webpage login)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Hardware (through device)	x			x	x			x	x	x		x		x	x	x	x
Real-time system	x		x	x	x	x	x		x	x	x	x	x	x	x	x	x
Feedback type																	
Indirect		x						x									
Direct	x		x	x	x	x	x		x	x	x	x	x	x	x	x	x
Meter reading																	
Manual/analogue meter reading	x	x			x												
Automatic/digital meter reading	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Smart device										x							
Type of information HEMS offers																	
Energy consumption (heating, cooling, ventilation?)	x	x	x	x	x	x	x	x	x	x		x	x	x	x	x	
Comfort	x				x				x	x	x			x	x		x
Monitoring IAQ	x								x		x						x
Compatibility with monitoring platforms																	

Energie ID		x	x			x	x	x					x	x			
Platform created by the supplier	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	
Other platform									x								

Annex 2: Technical survey

In order to simplify analyses and comparisons, a technical questionnaire has been made to simplify analyses and comparisons for partners.

Indeed, energy consumption take into account environmental factors and usage factors; consumption monitored will so depends on each households. One will consider the following aspects :

- Actual occupancy : hourly occupancy rate, actual set temperature,
- Need for hot water : How do users occupy the house?
- What temperature do they heat the house to?
- Equipment operation

Below is a model of survey developed by PSEE with partners to start monitoring of consumption through HEMS. Some of the HEMS that partners selected have basic functionalities (only monitoring) and the first part of implementation. In that case, only the first part of the questionnaire is to be used.

I. TECHNICAL ELIGIBILITY

ELECTRIC METER

The electric meter is situated :

- Inside your dwelling
- Outside your dwelling

You electric meter is situated :

- In the open air
- In a wooden case
- In a metal case
- In a technical duct

Is your electric meter situated 20 meters away from the room where the tablet will be in, in your house ?

- Yes
- No

How many walls / floors / ceilings are there between the room where the tablet will be in and the point where you electric meter is ?

- None
- 1
- 2
- 3 or more

GAS METER

Have you got a gas meter ?

- Yes
- No

Is your gas meter a pulse transmitter ?

- Yes
- No

The gas meter is situated :

- Inside your dwelling
- Outside you dwelling

You gas meter is situated :

- In the open air
- In a wooden case
- In a metal case
- In a technical duct

Is your gas meter situated 20 meters away from the room where the tablet will be in, in your house ?

- Yes
- No

How many walls / floors / ceilings are there between the room where the tablet will be in and the point where you electric meter is ?

- None
- 1
- 2
- 3 or more

Add any comments about the first part "technical eligibility" (relevance of one question, adaptation of one question, bad turn of phrase, etc.)

Cliquez ici pour entrer du texte.

II. YOU AND YOUR HOME

Please fill in the blanks :

- First name:
- Surname:
- Address:
- Postal code:

- City:
- Email: address:
- Telephone number:

What type of family are you ?

- A single person
- A couple
- A couple with children
- A single parent with children

What is your profession ?

- Farmer, trader, craftsman, liberal profession, business owner
- Business or public service executive, professor (secondary / senior), scientific, intellectual or artistic profession
- Profession administrative or commercial intermediary company (in charge of banking customers, technician (s) commercial (e) ...) / Profession intermediate teaching (teacher of schools and college, trainer ...), health (nurse, assistant ...), public service (category B staff, non-commissioned officer)
- Technician, foreman, supervisor, team supervisor, site manager ...
- Public service employee (category C and D staff, nursing assistant, firefighter, gendarme ...) / Corporate administrative employee (secretary, switchboard operator, operator, sales assistant ...) / employee of the trade, hotel, catering, personal services, (salesperson, cashier, server, maternal assistant (the, hairdresser) ...)
- Worker in the industrial, agricultural, construction, transportation, energy, crafts, entertainment and leisure sectors (driver, deliveryman, mechanic, bricklayer, plumber, butcher, baker, apprentice, cleaning agent, gardener ...)
- Without a professional activity
- Retired

Indicate the composition of your home, including yourself:

- Number of adults over 65 :
- Number of adults between 18 and 64 :
- Number of children between 7 and 17 :
- Number of children under 7 :

How many of these people are present more than 3 nights a week (on average)?

- Number of people :

You live in a :

- A house
- A flat

Add any comments about the first part "you and your home" (relevance of one question, adaptation of one question, bad turn of phrase, etc.)

Cliquez ici pour entrer du texte.

III. YOUR HOUSING AND ITS EQUIPMENT

HEATING-VENTILATION

We will now focus on heating in your home.

What is the energy used for the main heating system of your home:

- Electric heaters
- Heat Pump
- Gas
- Fuel
- Wood
- Solar Heating
- Collective Heating

What is the approximate area heated by the main heater?

Surface :

Does your home have a controlled mechanical ventilation system? Controlled mechanical ventilation (abbreviated CMV) is a mechanical device designed to ensure the renewal of air inside rooms:

- Individual CMV
- Collective CMV
- None
- I don't know

DOMESTIC HOT WATER

We will now focus on the domestic hot water (DHW) of your home.

What is the energy used for the main production of domestic hot water of your home

- Electric water heater
- Electric water heater with heat pump
- Gas
- Fuel
- Wood
- Solar Heater
- Collective heater

List of equipment in your house :

Large appliances	Smaller appliances	Multimedia device
Fridge	Electric coffee maker	ADSL Box
Fridge freezer	Capsule coffee maker	Printer
Freezer	Electric kettle	Computer
Dishwasher	Toaster	Laptop
Washing machine	Kitchen robot	TV
Washer dryer	Vacuum	Home cinema
Dryer	Iron	HI-FI System

Electric hob		Alarm clock
Gas hob		DVD player
Ceramic hob		Tablet
Induction hob		
Electric oven		
Gas oven		
Micro-wave oven		
Extractor hood		
Wine cellar		
Electric heater		
Air conditioner		

Add any comments about the first part "your housing and its equipment" (relevance of one question, adaptation of one question, bad turn of phrase, etc.)

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IV. ELECTRICITY CONSUMPTION[2]

We will now take a look your electricity supply contract. To answer the questions in this section, it is necessary to bring your bills and go see your meter. Thank you for trying to answer the questions.

Your electric meter is a :

- Electromecanical-1-index meter
- Electromecanical-2-index meter
- Electronic
- Smart meter Linky

Please indicate the subscribed power of your subscription

- 3 kVA
- 6 kVA
- 9 kVA
- 12 kVA
- 15 kVA
- 18 kVA
- 24 kVA et +

Your electric subscription (specified on your invoice) is:

Please estimate your electricity consumption in kWh over 12 months

- consumption in kWh
- I cannot find nor estimate it

[2] For gas consumption, the questionnaire is the same except that there is nothing asked about subscription.

Please estimate your electricity consumption in € over 12 months

- consumption in €
- I cannot find nor estimate it

Add any comments about the first part "electricity consumption" (relevance of one question, adaptation of one question, bad turn of phrase, etc.)

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V. YOUR ELECTRICITY PRODUCTION

Do you produce your own electricity?

- Yes and I sell it to EDF (or other energy supplier)
- Yes and I use it for self-consumption
- No

Annex 3 – Yearly consumption report produced by the "mon.quarthome" platform

Mon rapport annuel
2019

Quart home

[A] MON FOYER

[1] Caractéristiques de mon logement et de mon foyer

Type de logement : Maison
Date de construction : Avant 1970
Nombre de pièces : 1 pièce
Surface chauffée : 85 m²
Type de chauffage : Gaz (chaudière individuelle)
Type d'eau chaude sanitaire : Gaz (chaudière individuelle, chauffe-eau)

Type de compteur : Électronique
Constante : 1,00
Type d'option : Base
Puissance souscrite : 6 kVA

Nombre de membres : 1
Nombre d'adultes : 1
Nombre d'enfants mineurs : 0

[B] MON INSTALLATION

Une bonne qualité de transmission des capteurs vers notre serveur est importante, puisqu'elle permet d'obtenir moins d'erreurs de calculs de consommation et/ou de températures et hygrométries, mais aussi d'afficher des courbes plus fines et plus proches de la réalité.

Entre, le 1 janvier 2019, et le 31 décembre 2019 inclus, le serveur Quarthome a reçu :

données électriques	données météo	données confort
97%	**97%**	**97%**
Transmission : **excellente**	Transmission : **excellente**	Transmission : **excellente**

[C] MA CONSOMMATION ÉLECTRIQUE

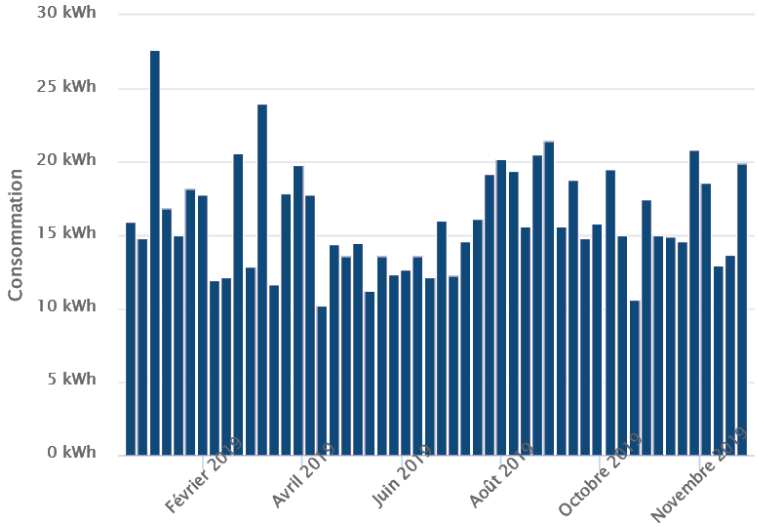
[1] Évolution de ma consommation

838 kWh

232 €*

* coût estimatif avec prise en compte de l'abonnement annuel et un tarif réglementé.

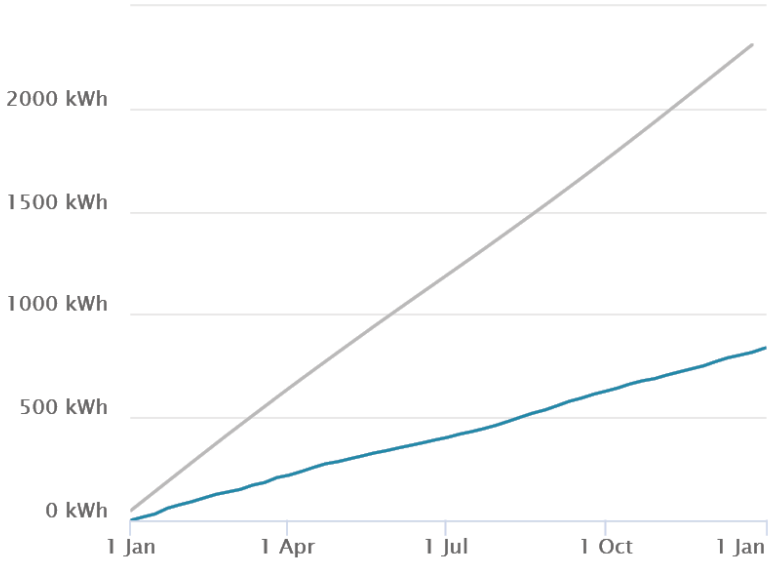
[2] Ma consommation hebdomadaire



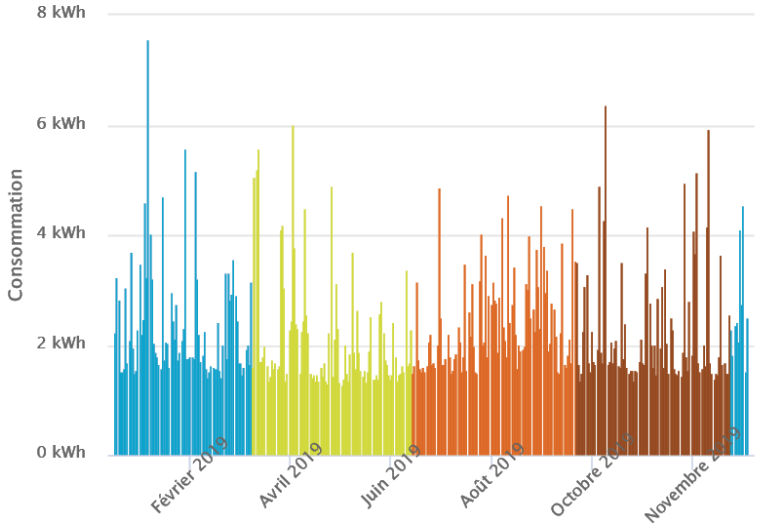
Ce graphique vous présente votre consommation d'électricité (en kilowattheure) du 1 janvier 2019 au 31 décembre 2019. Chaque bâton représente la consommation d'une des semaines composant la période.

En savoir plus

[3] Objectif de consommation



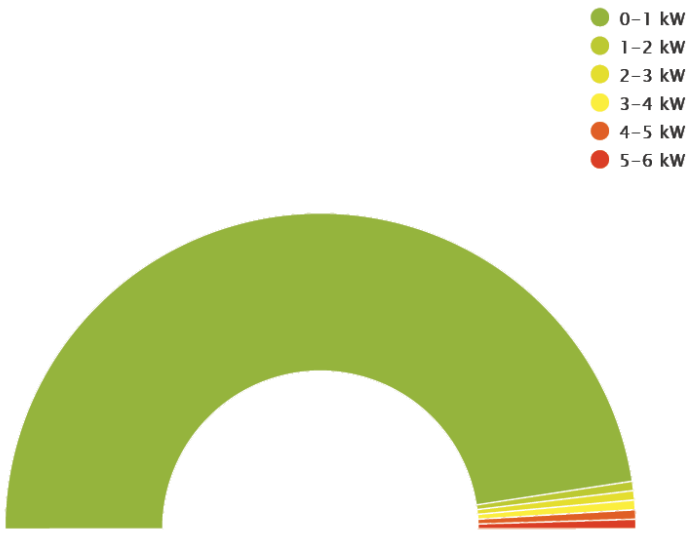
[4] Évolution de ma consommation électrique journalière depuis le début de 2019



Printemps **Été** **Automne** **Hiver**

Ce graphique vous permet d'observer les différents niveaux de consommation entre les saisons (Printemps (vert), Été (Jaune), Automne (Orange), Hiver (bleu)) ainsi que les grandes périodes d'absence ou de congés (succession de faibles consommations identifiables lorsque les bâton de couleur sont de faible dimension). Plus les bâtons sont hauts, plus vous avez consommé d'électricité sur cette période.

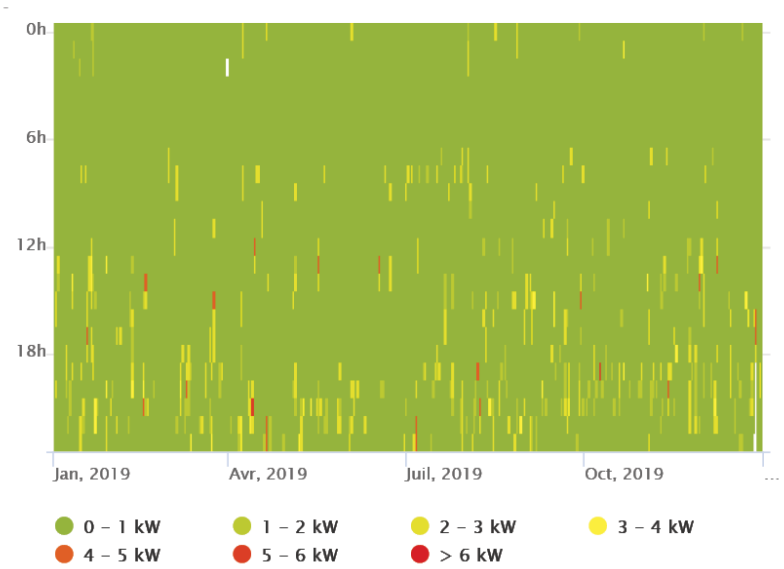
[5] Répartition des appels de puissance depuis le début de l'année 2019



Ce graphique vous permet de visualiser dans quelle plage de puissance se situent les appels de puissance de votre installation.

En savoir plus

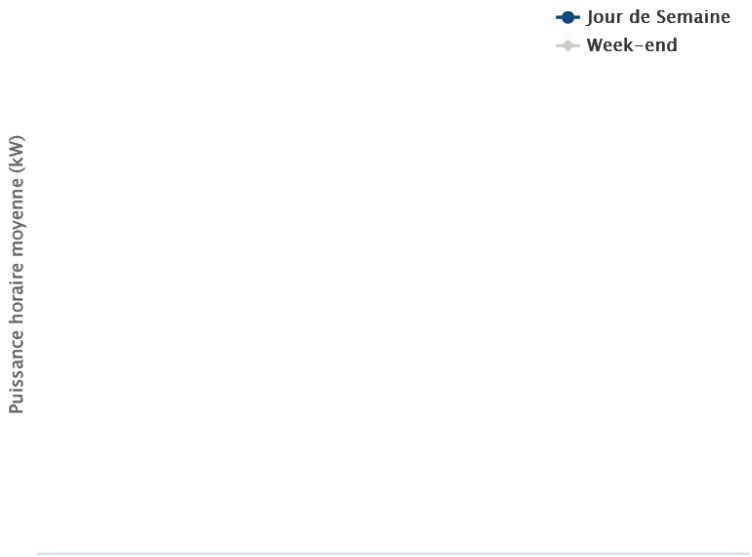
[6] Les appels de puissance maximum journaliers par tranche horaire depuis le début de l'année 2019



Ce graphique vous présente les appels de puissance maximum par tranche horaire enregistrés chaque jour. Il vous permet d'observer, par tranche horaire pour chaque jour, le niveau des appels de puissance de votre installation. Vous pouvez en déduire les périodes où votre installation a plus (orange, rouge) ou moins (vert, jaune) besoin d'électricité pour faire fonctionner vos appareils en fonctionnement ou en veille et, éventuellement, quand ces appels de puissance dépassent votre puissance souscrite (en rouge).

En savoir plus

[7] Profil horaire moyen des appels de puissance en semaine et le week-end

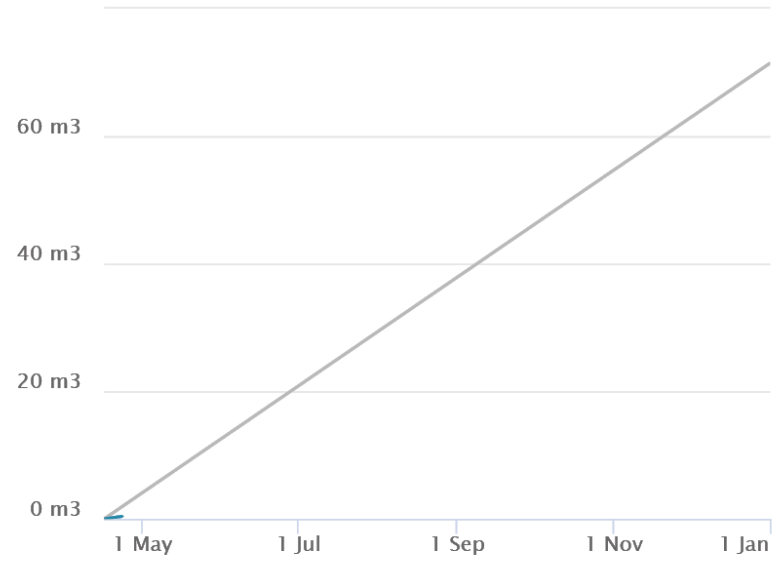


Ce graphique vous présente la moyenne des appels de puissance des jours de semaine et des jours de week-end. Cela vous permet de savoir quel est votre profil de consommation d'électricité en semaine et en week-end, c'est à dire les moments de la journée où votre installation a plus ou moins besoin de puissance électrique pour faire fonctionner vos appareils en fonctionnement ou en veille.

En savoir plus

[D] MA CONSOMMATION D'EAU

[1] Objectif de consommation



[E] MON CONFORT

[1] Depuis le début de l'année 2019

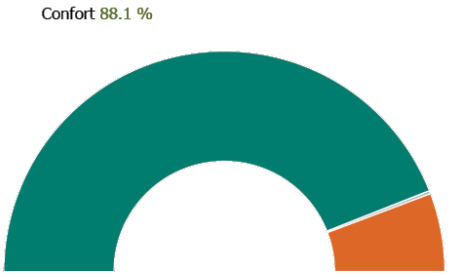
Ce graphique représente la répartition du temps passé dans chaque zone hygrothermique (confort, zones à risques) sur l'année écoulée.

La répartition du temps est indiquée en pourcentage (%).

La couleur change en fonction de la zone de confort dans laquelle se trouve le capteur intérieur.

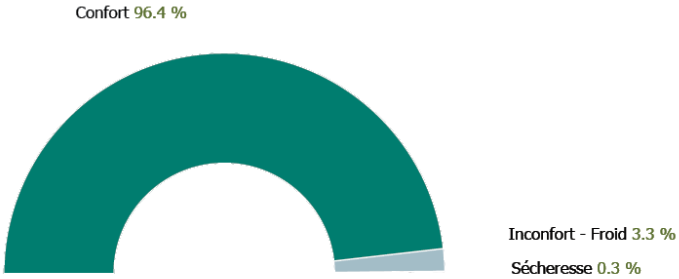
[2] Les températures moyennes et le confort saisonniers intérieur pour l'année 2019

Température moyenne d'été: 21.8°C



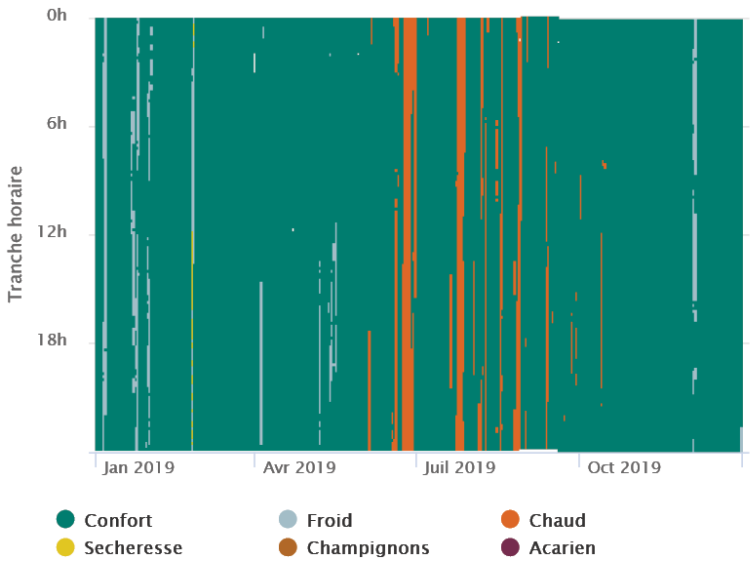
Répartition du confort intérieur d'été

Température moyenne d'hiver: 19.1°C



Répartition du confort intérieur d'hiver

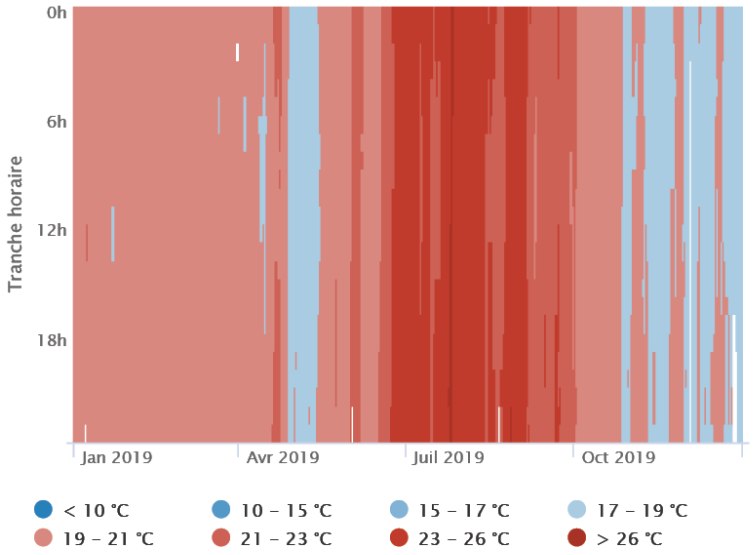
[3] Cartographie du confort de votre logement



Ce graphique vous présente le confort de votre logement par tranche horaire. Il vous permet d'observer, heure par heure, dans quelle zone de confort ou d'inconfort se situait votre logement. Les zones blanches représentent les absences de données.

En savoir plus

[4] Cartographie des températures intérieures



Ce graphique vous permet d'observer la température intérieure moyenne (par tranche de température) quotidienne de votre logement par tranche horaire.

Les couleurs du graphe vont du bleu foncé, pour les températures les plus basses, au rouge foncé pour les températures les plus élevées (+26°C)

En savoir plus

Annex 4 – Evaluation survey HEMS implementation

Procurement of the HEMS

What HEMS did you use?

What was the price of this HEMS (per unit, incl. installation)?

How easy was it to procure the HEMS from suppliers in your region?

☐ very easy ☐ easy ☐ neither easy nor difficult ☐ difficult ☐ very difficult

How did you obtain the HEMS?

☐ through public procurement, with financial support from Triple-A

☐ through public procurement, no external financial support

☐ offered by supplier (partnership, co-creation)

☐ other: ….

*Explain (eg. How did you cooperate?):

How was the HEMS put at disposal of the homeowners?*

☐ HEMS purchased by the homeowner (resident = owner of the HEMS)

☐ homeowner pays fee for use of the HEMS (LA/supplier = owner of the HEMS)

☐ HEMS was provided to homeowner free of charge, as part of (data sharing) agreement

☐ other: ….

*Explain:

Implementation of HEMS

How did you promote the HEMS?

☐ on website

☐ in pop-up consultancy center

☐ in existing demos

☐ by other means*

*Explain:

What were the perks & barriers of this/these promotion method(s)?

+	-

How did you select/convince homeowners to have the HEMS installed? (describe)

Who installed the HEMS in the homes?

☐ HEMS supplier

☐ external service

☐ local authority employee

☐ homeowners themselves

What were the perks & barriers of this/these installation method(s)?

+	-

How was the use of the HEMS and collection of data arranged with stakeholders (HEMS supplier, homeowners…)? (eg. terms of use, maintenance, ownership, collection of data, GDPR issues…)

Evaluation

How satisfied are you with the method to use HEMS for stimulating the adoption of low-carbon technologies, based on your project.

Satisfaction level of the method to use HEMS	*Unsatisfied*	*A little unsatisfied*	*Neither satisfied nor unsatisfied*	*Satisfied*	*Very Satisfied*
Procurement process					
Testing					
Implementation in houses					
Monitoring phase					

Overall, how satisfied are you with your method to use HEMS for the adoption of low-carbon technologies?

☐ unsatisfied

☐ a little unsatisfied

☐ neither satisfied nor unsatisfied

☐ satisfied

☐ very satisfied

Additional comments on the process of implementing the HEMS (eg. procurement/cooperation with suppliers, promotion of HEMS, selection of homeowners…)

What were the most important pros and cons of your method to use HEMS?

+	-

Please give three tips for future use of HEMS by LAs, based on your experiences.

1. …
2. …
3. …