EMPOWER
Interreg Europe

LORIENT AN ORIANT

SEN
Sensibilisation à l'énergie par le numérique

CONSOMETERS

ALOEN

BREIZH ALEC
RÉSEAU BRETON DES AGENCES LOCALES ÉNERGIE CLIMAT

Région BRETAGNE

Energy monitoring with Consometers collective and Free Software: together we go further!

11 may 2022

Background to the project

EMPOWER
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- Objectives

EMPOWER
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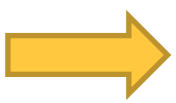
SEN
Sensibilisation à l'énergie
par le numérique

Develop and document



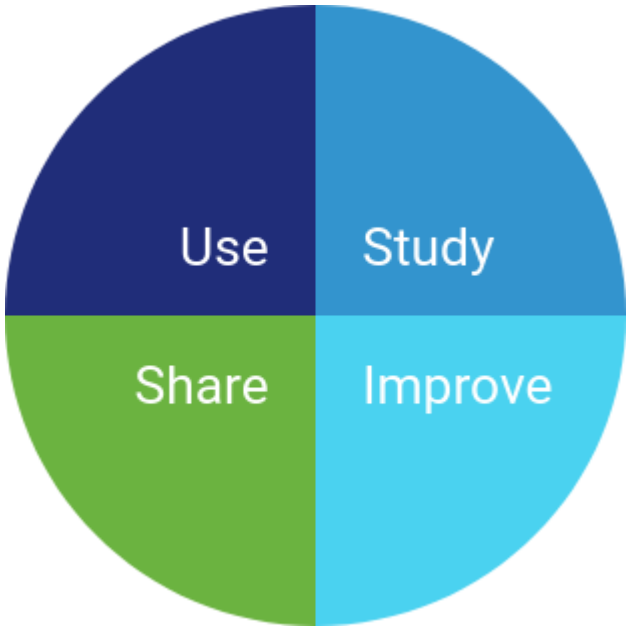
A range of tools for visualising energy and ecological transition data

Methods facilitating their appropriation by the actors of the territory (citizens, communities, economic actors)

With Free and Open-source Software !

Free and Open-Source Software

- Remember, back in 2018, with
- The four freedoms:



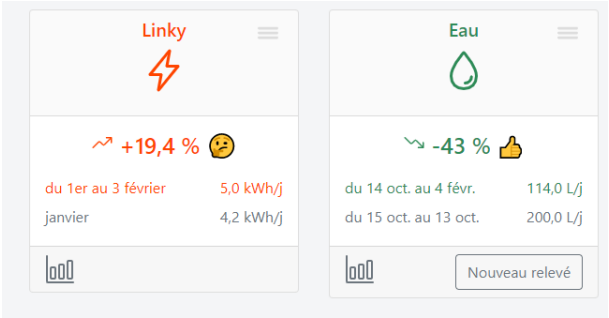
i.e « Cooperation > Competition »

Free and Open-Source Software

- What now ?

SEN used F.S. to create tools
=> Other local stakeholders are now using SEN's work, as Free Software

Grand défi software



ConsoHerozh software

Free and Open-Source Software

- What now ?

SEN's code is open for review !
Issues and remarks are made on the
public « forge » :
https://github.com/consometers

```
class DetailedMeasurements:

    # TODO(cyril) ensure Python >= 3.7 to preserve dict order

    MEASUREMENTS = {
        # ------------------------
        # Courbes au pas enregistré
        #
        # 7 jours consécutifs maximum dans les 24 derniers mois par rapport
        # à la date du jour, limités à la dernière mise en service.
        #
        # Courbe de puissance active consommée brute
        "consumption/active_power/raw": {
            "params": {
                "initiateurLogin": None,
                "pointId": None,
                "mesuresTypeCode": "COURBE",
                "grandeurPhysique": "PA",
                "soutirage": "true",
                "injection": "false",
                "dateDebut": None,
                "dateFin": None,
                "mesuresCorrigees": "false",
                "accordClient": "true",
            },
            "availability": ["C1", "C2", "C3", "C4", "C5"],
            "metadata": {
                "measurement": {
                    "name": "active-power",
                    "direction": "consumption",
                    "quantity": "power",
                    "type": "electrical",
                    "unit": "W",
                    "aggregation": "mean",
```

?

Free and Open-Source Software

- What now ?

Community contributed back !
2 organisations proposed corrections and
improvements to our software,
representing many days of labour.

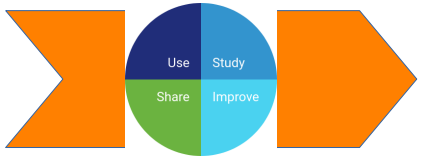
Improve

- Working together to access smartmeter data!

SEN
Sensibilisation à l'énergie par le numérique

Hard to use at 100 % :

- ✓ Data 1
- ✗ Data 2
- ✗ Data 3



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Better data coverage :

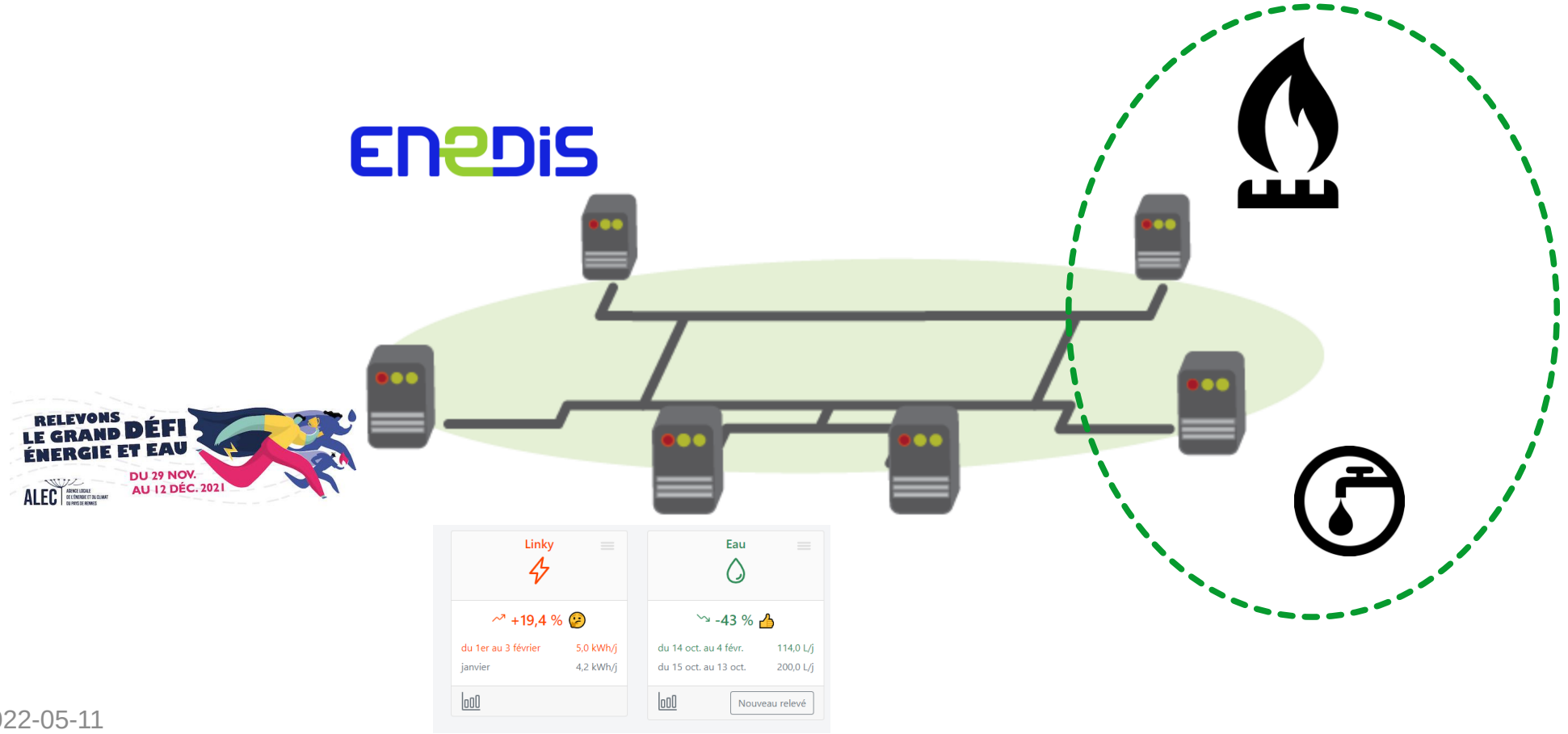
- ✓ Data 1
- ✓ Data 2
- ✓ Data 3

Ability to share a single access contract, between partners

Federation = other data providers will be easier to implement

Improve

- Federation = easier access to new data providers, easier entry for new services, robustness to changes in provider



Free and Open-Source Software

- What now ?

SEN’s tools are used in other products
Those products are also released
as Free Software !

Share – VisoConso software

In 2021, procurement procedure by **Local Energy Agency of Rennes**:

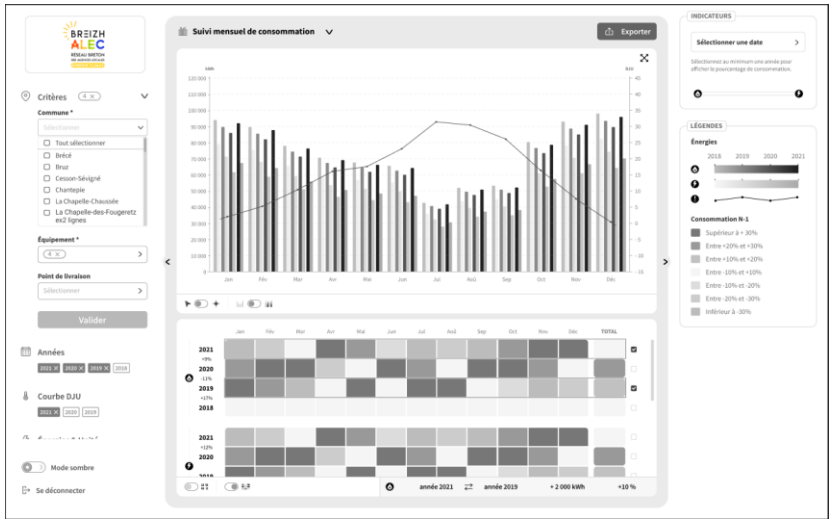
- Request for free and open-source licensing of the product
- Work from scratch with an IT company to develop the software
- **SEN** is involved as *Assitant to Contracting Authority,* and also provides data access

The needs to be addressed are:

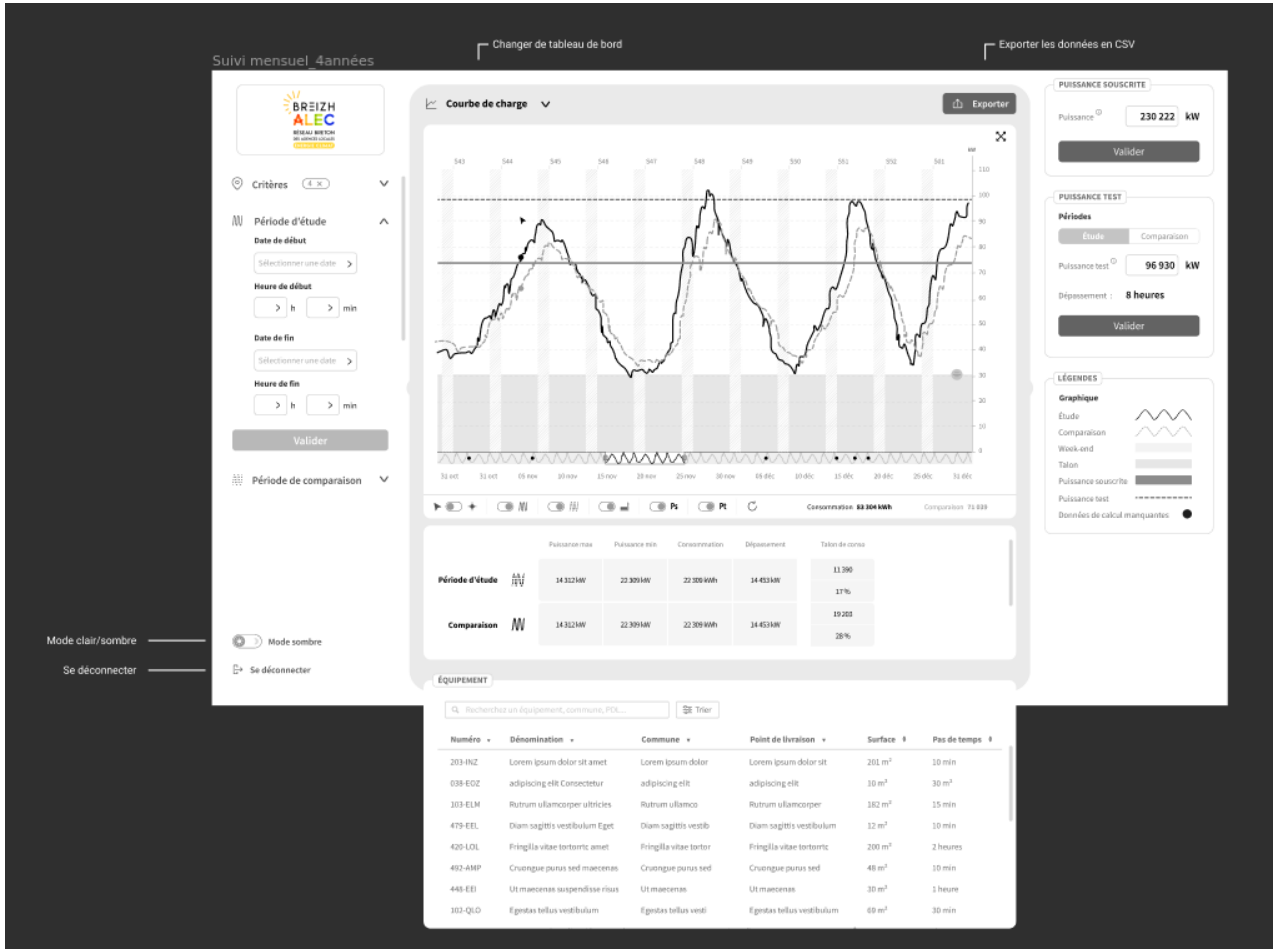
- Access to energy data for municipalities, linked to weather data
- Long-term energy monitoring of their estate
- Third-party access to provide counsel and guidance
- Local and Regional aggregation of data, for coordination with regional actions

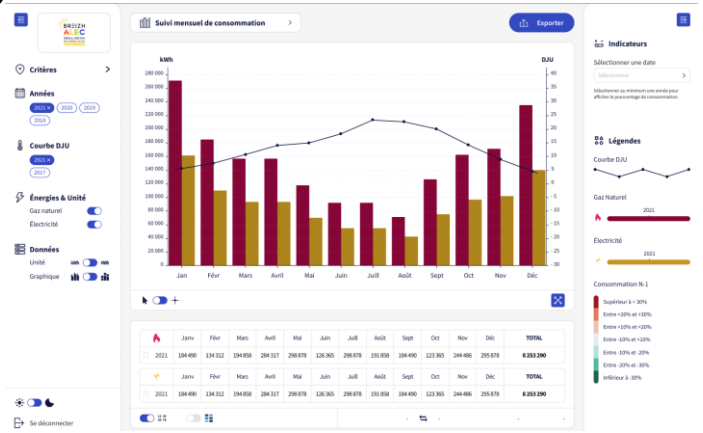
VISOCONSO will be completed **this spring** and will be duplicable in any place thanks to its **free software licence** !

Share – VisoConso software



Heatmaps, yearly to hourly consumption data,
Peak power analysis...





Share – VisoConso software

Why Free Software ?

- **Freedom** of use, now and in the future
- No vendor lock-in, ability to retrieve data and to change provider as needed
- Ability to **pool resources** with other actors and lower the overall cost of providing the service
- **Evolutions** to the software will be made in a transparent way

Public Money

Public Code

the little teddy bear project energy consu

2020 : The project was conceived during a DataMix hackathon

A REMIX ?

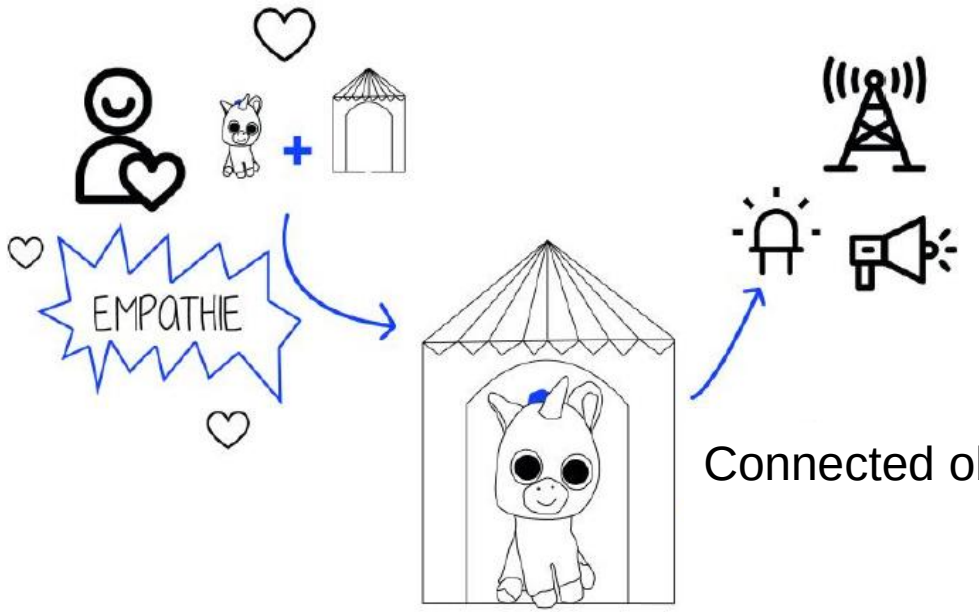
- *A 3 days **event***
- *participants with really **different** skills working together on the same issue.*
- ***concretes** and tangibles prototypes are created at the end of the 3 days,*
- *thanks to the use of machines such as **3D printers or laser cutters.***

An example here : https://www.flickr.com/photos/association-bug/sets/72177720297594589/

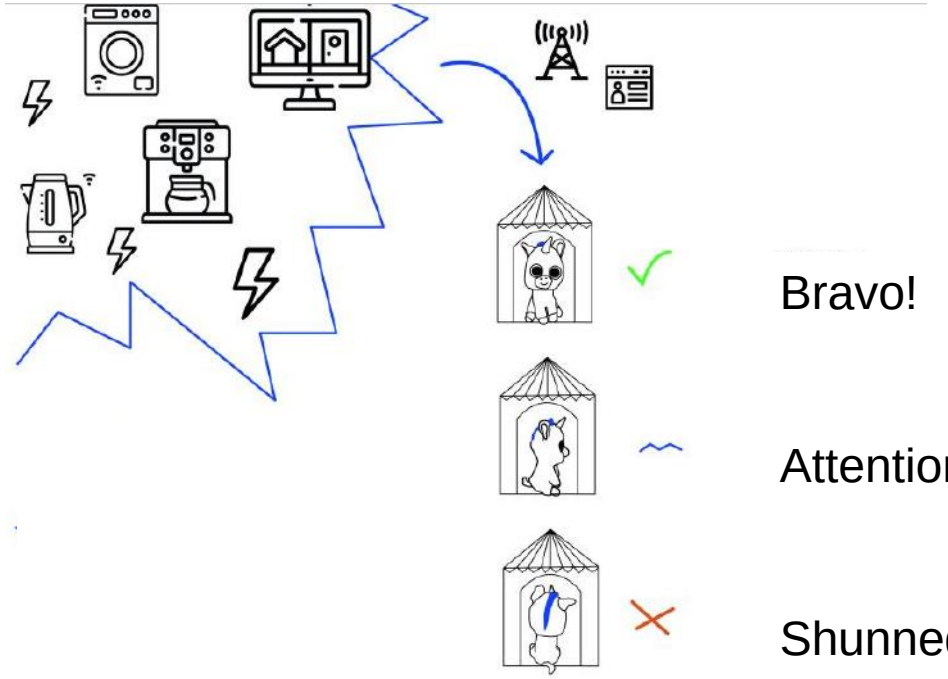
Our question : "kWh" do not “speak” to the public → how to show them their consumption in a different way

the Prototype aims to measure and make tangible, the electrical consumption of a family, through a connected object with EMOTION, FUN and SENSITIVITY

→ Creating affect and empathy



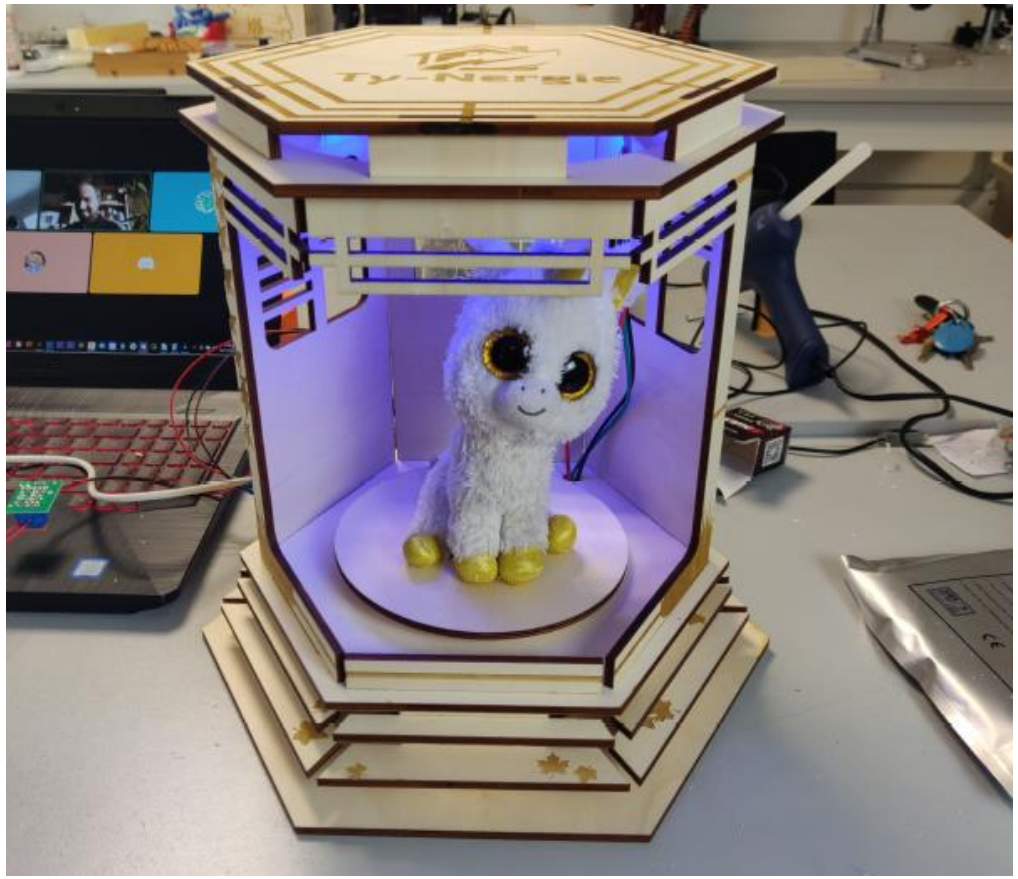
Connected object



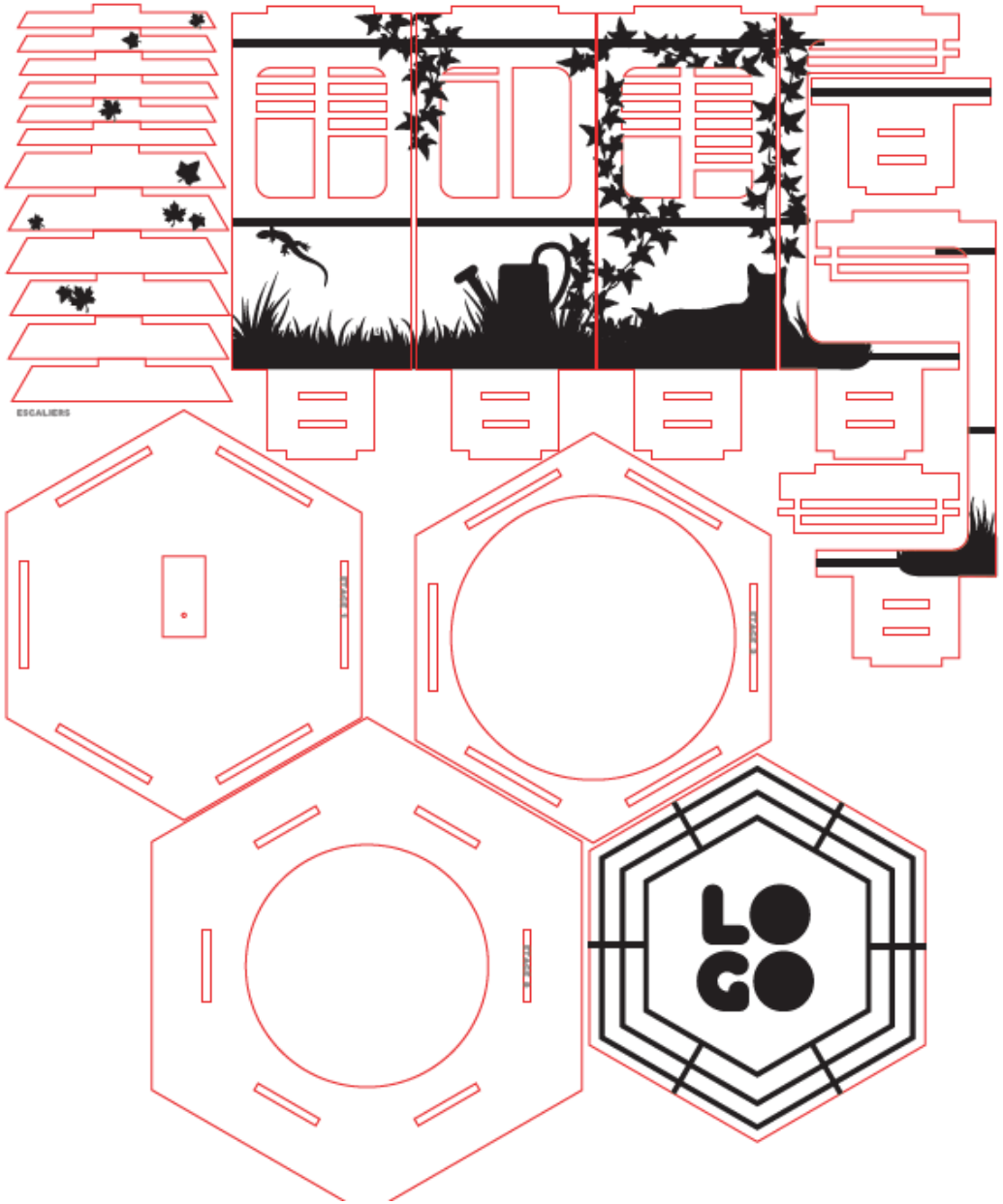
Bravo!

Attention

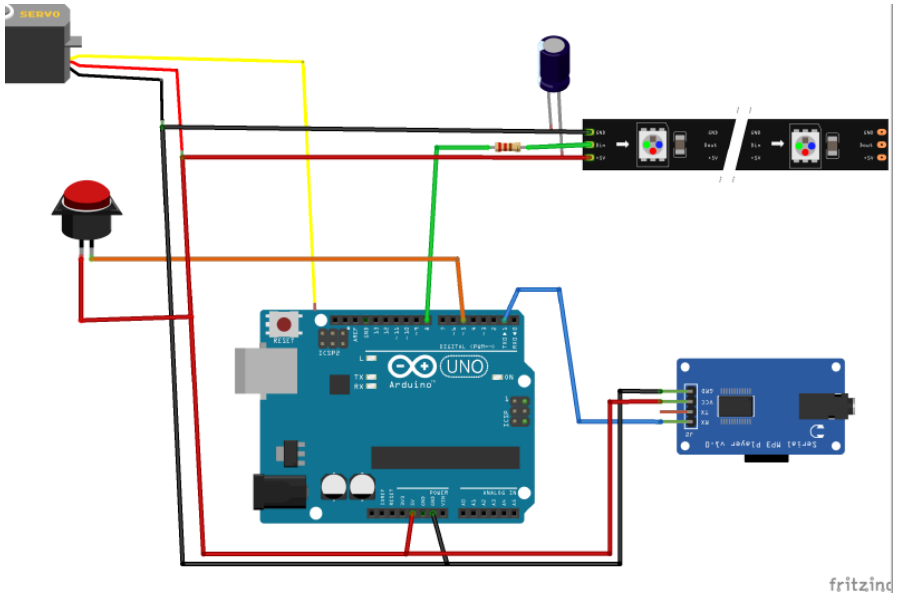
Shunned



the doudou house recovers data from the linky meter thanks to a local radio transmitter.
If your consumption is correct, the doudou faces you with a green light and a nice music,
if not, it turns its back to you with a red light and a disgruntled sound



house plans file for the laser cutter



the electrical network plan

use of 3D software to imagine the house

the little teddy bear project energy consu

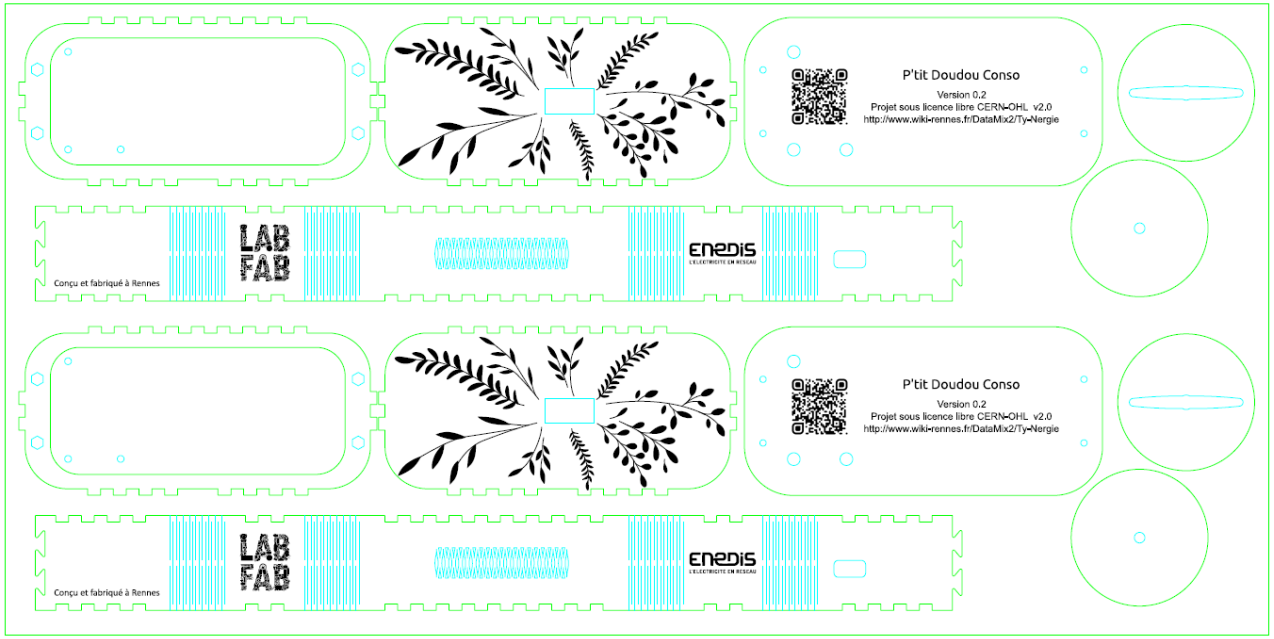
2021 : The project continue with some people and partners

A new simpler and more sober version (with less wood) is created and tested with 5 families participating in the great energy challenge

Families assemble their own object during **very popular workshops**

Requirements :
the teddy bear Consumption requires a **WiFi** network and a **Linky meter.**
Electricity consumption data are collected via the Linky and an ERL module (**Local Radio Emitter**).
These data are sent to a **platform**, before being used by the internet connection of the teddy bear Consumption card, in the form of **API** (data interpretable by an object).
The configuration of the installation is done very simply through a smartphone (iOS or Android).

Equipment:
An **ERL module,** in order to capture the data in the current form of the Ptit Doudou Conso ; →
For the Petit Doudou Conso:
ESP8266 - NodeMCU;
The laser cut box →
Prototyping cable (Dupont) Male - Female ;
3 NeoPixel LEDs (from an ADA1376 ribbon) ;
ServoMotor (Emax);
Micro-USB cable (with or without On / Off switch) ;
Set of M3 Nylon screws with hexagonal head.
Some tools will be needed to assemble the Ptit Doudou Conso:
Wood glue ;
Soldering iron and tin ;
Hot glue ;
Screwdrivers (small) ;
Cutting pliers ;
Velcro (to attach the comforter to the articulated object).



the little teddy bear project energy consu

2022 : The project continues with more and more partners and experimenters. And students from a computer science school

1/ april : partners meeting :
Epitech school, Enedis,
Rennes and Lorient cities.

2/ may : 1 day of “ideation work” with students and creation of a 3rd prototype improved following feedback from families

3/ autumn : use of the prototype with families working in Lorient city administration as part of an ISO 50001 approach :

For organizations committed to reducing their climate impact, conserving resources and improving their bottom line through effective energy management

Improvements for the P'tit doudou :

- It changed state too often (color and position)

- Difficulties to correlate the teddy's movements with the consumption of the household

- If the wifi connection have gaps in the transmission of information its reaction was not adapted.

- The rotation is limited to only 90 ° against the 180 ° provided

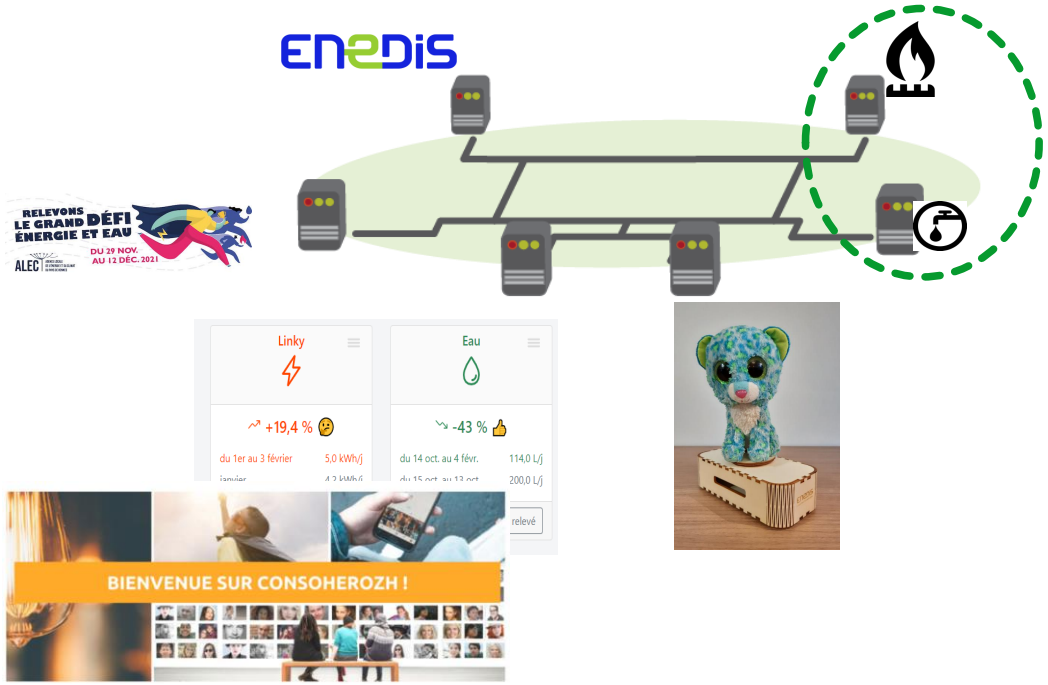
- Implementation of an average value and a step of 10 min for the monitoring of consos

-The noise of the servo motor can be surprising when it starts to turn the teddy.

- A major constraint of the proximity of the ICT with the Wifi which conditions the good functioning of the system.

- Provide a device for holding the teddy box to avoid tinkering afterwards.

- **Proposal from ALEC : to go further by developing a platform that would allow to follow one's data, to modify one's objectives, to see how many times one has been in the red.**



→ Maybe with the federation's plateforms and frees softwares

Free and Open-Source Software

- What now? → All of this!

Free and Open-Source Software

- What now ?

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=> Other local stakeholders are now using SEN's work, as F.S.

SEN's code is open for review !
Issues and remarks are made on the public « forge » :
https://github.com/consometers

SEN's tools are used in other products
Those products are also released as Free Software !

Community contributed back !
2 organisations proposed corrections and improvements to our software, representing many days of labour.

https://www.consometers.org

https://github.com/consometers

https://www.consoherozh.fr

Thank you!

Ilustrations by Undraw.co - Katerina Limpitsouni