Annex 1 – Action plan – PP5 - City of Lorient

Part I – General information

Project: EMPOWER

Partner organisation: PP5 LORIENT

Other partner organisations involved (if relevant):
ALOEN & Breizhalec (Local Energy Agencies),
Brittany Region
Local Public Company “Wood Renewable Energy”

Country:_FRANCE
NUTS2 region: Brittany

Contact person: PIERRE CREPEAUX

email address: pcrepeaux@mairie-lorient.fr
phone number: +33 2 97 35 32 72

Part II – Policy context

The Action Plan aims to impact:	X	Investment for Growth and Jobs programme
	□	European Territorial Cooperation programme
	□	Other regional development policy instrument

1. Policy instrument addressed:

ERDF OP of Brittany 20142020.TO 4: Supporting the transition to a low carbon economy in all sectors.

Further details on the policy context and the way the action plan should contribute to improve the policy instruments:

The policy instrument is focused on the Priority Axis N 3 – Sustain Energy and ecological transition in Brittany, Specific objective 3.2 – Reduce the carbon footprint of the buildings in Brittany and it targets :

• The refurbishment of social housing within regional climate and energy policies, prioritising dwellings with electric heating and a consumption greater than 330 kWh/m2/year. Works shall include thermal insulation and the expected consumption reduction has to exceed 40%.

• Innovative projects in terms of intelligent buildings and districts integrating renewable energies

• Planned use of financial instruments

In addition, and given the local characteristics of human settlements in Brittany strongly based on private ownership targeted actions will more specifically address the private residential housing.

Actions addressing shared ownership through financial engineering shall be privileged. Lorient already experiences crowdfunding in RES and looks actively into implementing the various possible financial instruments (e.g. French State Investments for the Future, EcoZero Interest Loans, "pay as you save" PPP based mechanisms, etc.

During the first 3 years of the Empower project, the city of Lorient established relations, via the local energy agency ALOEN, coordinator of the stakeholder group, with the managing authority (Brittany Region) in order to determine the specific needs for improvement of this policy instrument. It appears from these exchanges that the Brittany Region wishes to develop a digital ecosystem capable of producing and managing the data of intelligent networks. A macro project, "SMILE", has been initiated with the main institutional and economic partners of the Brittany territory, and the contributions of the EMPOWER project are part of this global strategy. A joint venture between EMPOWER and SMILE has been set up as part of the "SEN1" project, which specifically focuses on monitoring and visualising energy consumption data.

2. A common framework between Managing Authority and Lorient

On 25th September 2019, during the 2nd Import Workshop organized on the Empower Project, which had a broad scope (digital and energy transition) Lorient, Brittany Region and Lorient Agglomération published a common press release

(https://www.lorient-agglo.bzh/fileadmin/user_upload/Actualites/Communiques-de-presse/2019/Communique_strategie_bretonne_energetique_et_numeriquement_responsable.pdf)

This press release established a framework in which this action plan will be integrated.

The framework in details:

Since the beginning of 2018, the city of Lorient, Lorient Agglomération and the Brittany Region have been cooperating on projects development of digital applications and platforms, on energy data governance and the identification of synergies with European regions.

They thus identify 4 structuring axes of a future common roadmap:

1. Governance of the digital transition of energy

    a- Define governance: contribute to public service and data valorisation energetic

    b- Define field animation and service or infrastructure operators

2. 100% of the territories covered by a base of digital tools for monitoring their energy consumption from 2023 onwards

    a- A federation of software applications, operational at the end of 2020

    b- Between 2020-2022, a base of basic applications, as well as developments complementary by the territories as needed (Needs Laboratory, digital service incubator, etc.)

    c- Animation of users and users (ALEC/ADEME/Makers/Clusters digital) and sharing open source experiences through a register of regional good practices

    d- Continuation of action research on the sociology and psychology of users around monitoring and the valuation of their data.

    e- "teach" citizens (Energy Info Spaces/Makers/companies/associations)

3. Have the lowest possible data carbon footprint

    a- Diagnose and anticipate the inflation of emissions related to the use of digital tools

    b- Set emission reduction targets and principles for efficient architectures

    c- Reach the reduction target through actions on infrastructure and good practices / digital practices

4. Reconciling energy transition and business models

    a- Develop new "self-supporting" business models

    b- Define public support for the initiation and public service of data valorisation energy (referents public actors, one-stop shop for verified/qualified data)

This Regional Action Plan is taking action for the following parts of the framework:

Action 1 → Framework #1.b

Action 2 → Framework #1.a

Action 3 → Framework #4.a

Part III – Details of the actions envisaged

IMPORTANT DISCLAIMER - General presentation of the Regional Action Plan

The city of Lorient has been working for several years on the monitoring of energy consumption, in particular by being associated with the SOLENN project, led by the local energy agency ALOEN (the results - in French - of this programme are available here: https://www.aloen.fr/nos-actions/solenn). The SOLENN project lasted from 2014 to 2018, i.e. it preceded the EMPOWER project by 3 years, and allowed the city of Lorient to have a big lead in understanding the stakes of monitoring energy consumption in buildings.

This project has contributed a lot to the EMPOWER project. In this respect, it is particularly important to note the numerous requests from project partners to have access to the knowledge elements of the SOLENN project, both during the ALMADA technical workshop in October 2018 and during import workshops, particularly in Ireland and Germany.

For its part, Lorient had started its own reflection on consumption monitoring systems prior to its participation in the EMPOWER project. Indeed, since 2014, Lorient was looking to develop a monitoring system to track the energy consumption of its own buildings, in the context of the installation of photovoltaic solar panels for self-consumption. When the lead partner asked to join the EMPOWER project, Lorient had specifically indicated in the application form that it wished to continue along the path already mapped out, i.e. to develop a monitoring software system based on free and open architectures.

Thus, right from the start of the EMPOWER project, Lorient was ahead of the game, benefiting from the feedback from the SOLENN project and its own experience of thinking about free architectures in the service of energy monitoring.

It is important to note that this state of affairs (3 years of prior reflection on the monitoring of energy consumption, before starting EMPOWER), had three important consequences in the positioning of Lorient during the EMPOWER project:

1- Lorient was able to offer cutting edge feedback to all of the EMPOWER project partners. These technical inputs were greatly appreciated and greatly benefited the EMPOWER project.

2- Lorient had previously started to benchmark monitoring techniques. As a result, Lorient had learning needs in terms of monitoring systems far beyond what the EMPOWER project partners could present during study visits. Lorient therefore applied himself to using the opportunity of organizing his own study visit to find very innovative technologies and implementations, and took more intense advantage of the technical workshops of ALMADA and MAGDEBURG to advance his own knowledge. The dual architecture of EMPOWER, allowing study visits and technical workshops, has enabled Lorient, despite its advance on the subjects, to benefit from the exchange of experience.

3- Because of its previous reflections, and especially thanks to the experience and the address book acquired by ALOEN in the management of the SOLENN project, Lorient was directly able to create a group of stakeholders "project oriented", aggregating regional stakeholders from local authorities, owners of buildings to be monitored, the Managing Authority, stakeholders in the energy transition (local energy agencies) and above all free software stakeholders who were able to imagine solutions on measure for the monitoring issues revealed by EMPOWER. The project was an opportunity to create an innovative and efficient laboratory of ideas, recognized as such on numerous occasions by the Managing Authority and the national energy agency (ADEME).

During the project, Lorient has therefore focused on :

- sharing its knowledge, with a very significant participation during the technical workshops (3 presentations at ALMADA, totalling more than 1h30 of exchanges, 1 presentation at MAGDEBRURG) and during the Import Workshops (participation of stakeholders from Lorient in 3 import workshops).

- to look for best practices that go beyond the simple knowledge of monitoring systems, and above all allow the development of a new open, free, scalable and powerful monitoring system.

- develop a truly ambitious and innovative regional action plan in direct link with the managing authority.

For this reason, and this point is particularly important, the Lorient regional action plan is not simply a desire to import good practices from other countries. It is a will shared with the managing authority to go beyond what has been done up to now in France, in Europe, and perhaps even in the world.

Indeed, action n°2 in particular is inspired not by the assets identified in the good practices presented during the various technical and import workshops, but by their limits.

The aim of this Regional Action Plan is to go beyond these limits, not to imitate them.

This way of thinking might perhaps seem surprising in the process of running Interreg Europe projects. It is, however, strictly in line with the objective of the programme:

*" To support exchange of experience and sharing of practices among actors of regional relevance with the aim of integrating and deploying **the lessons learnt by cooperation** within mainstream regional policies instruments, in particular through their programmes for Investment for Growth and Jobs and, where relevant, European Territorial Cooperation." (Programme Manual – page 11)*

Indeed, the 3 actions presented below integrate the lessons learned by Lorient from the cooperation.

For the city of Lorient, what are these lessons?

There are three of them:

A- There are many energy monitoring systems, all of which have more or less the same functionalities, with slight variations on the visual aspects. The ALMADA technical workshop demonstrated this perfectly, with 2 days of presentations of a very wide range of energy monitoring systems. Integrating a standard monitoring system is not a technical issue but a good management of the public procurement process.

However, each of these energy monitoring systems is designed to be closed and self-sufficient, especially in order to be able to sell the monitoring service in the long term, which makes the users captive.

This state of affairs is a major problem, as it poses (at least) two main problems:

- It sterilises innovation, because monitoring companies aim at making their users captive (possibly through an aggressive commercial strategy in the early years). As the transition to another solution is difficult, users of monitoring systems continue to use technologies that may eventually become obsolete simply because of high transaction costs.

- This hinders the potential for reducing greenhouse gas emissions, as the use of ageing technologies impacts the proper understanding of energy consumption by their users.

Thus, by construction, the systems currently available on the market minimise their potential for reducing energy consumption.

This learning from Lorient during the EMPOWER project is fundamental. It enables the actions of the managing authority to be effectively oriented for the period to come. The objective of the City of Lorient is to enable all the participants in the EMPOWER project, and more generally all the European territories, to benefit

from scalable monitoring solutions by design that allow the management of the full potential of each person's energy data.

B- The "user-based" approach of the SOLENN project is particularly innovative, as demonstrated by the very keen interest in sharing this feedback with the partners. This strong interest shown by the partners of the EMPOWER project is a very important source of learning for the city of Lorient. Indeed, Lorient and ALOEN, the initiator of the SOLENN project, were able to conduct a large number of technical discussions with the partners of the EMPOWER project on the psychological and social issues of consumption monitoring. These discussions, during the LORIENT study visit, the ALMADA technical workshop and the import workshops in MAGDEBURG and SOUTH IRELAND, enabled Lorient to refine its understanding of the results of the SOLENN project thanks to the primacy of questions asked by actors working in various cultural contexts. This is a very strong added value for Lorient which would not have been possible without the EMPOWER project.

C- The technical monitoring tools, while sharing the same general architecture, must be adapted to the context of each country, due to the strong disparities in the deployment of smart meters in particular. This element of knowledge was particularly brought to Lorient during the ALMADA technical workshop, which enabled a wide range of technical solutions to be visualised. It was also brought by study visits by Lorient stakeholders to Maribor (Slovenia), Kalmar (Sweden) and Almada (Portugal). This knowledge was also provided by the preparation and implementation of the study visit to Lorient. Indeed, Lorient took advantage of the opportunity of the EMPOWER project to discover good practices in Rennes, which until then had not been thoroughly investigated. Thanks to the study day, Lorient was able to discover a concrete application of monitoring implementation for communal buildings (Saint Sulpice La Forêt) and discuss with a young pioneering company on the deployment of sensor systems.

In the action plan proposed below, actions n°1 and n°2 respond to lesson A learned by Lorient during the EMPOWER project. The aim is to develop an original monitoring system based on a free and open architecture (action n°1) and to enable all architectures that are currently closed to exchange data between them (action n°2).

Action n°3 seeks to respond to lessons B and C by devising an economic model based on low-cost technical monitoring systems (based on the systems and architectures developed in Actions 1 and 2) to raise awareness and reduce consumption among various groups: inhabitants and small and medium-sized enterprises.

ACTION 1 Designing and implementing a free and open Energy monitoring system

1. **The background** (

During the EMPOWER project and in particular during the technical workshop in October 2018 in ALMADA, the city of Lorient was able to observe that there is a very wide variety of closed systems (i. e. proprietary) concerning monitoring.

The city of Lorient has learned a lot during the different exchange times of the EMPOWER project. **The October 2018 technical workshop in Almada provided a comprehensive overview of the monitoring solutions available in Europe.**

Lorient especially observed with the deepest interest the projects shown by:

- MAE (PP7) / Sepin: monitoring system
- Santander City Council (PP9): presentation of different monitoring systems already on the market
- https://www.energieid.be : Citizen's role on the future development of the energy sector by Jan Pecinovsky

These three presentations showed successful monitoring systems, which seemed technically effective. We consider that these three presentations showed us the best that is currently being done at the European level.

In particular, the monitoring system proposed by energieid.be could integrate participatory monitoring. This is a possibility given to several systems (micro inverters, sensors, humans directly) to communicate data to the participatory collection site and to benefit from visuals for monitoring consumption or production. This system is particularly interesting in its collective approach but the logic remains that of a centralized system.

We therefore consider that thanks to EMPOWER, and in particular to the creation of the register of good practices and the organisation of the Almada technical workshop, the city of Lorient has a precise and nuanced view of the current state of consumption monitoring technologies.

As a result, it is stated by the City of Lorient that the state of the technologies currently available in Europe does not meet the need specifically expressed by Lorient at the initiative of the project, namely the availability of an open, free and scalable system allowing the monitoring of consumption for any type of actor with a real estate portfolio.

The city of Lorient wishes to be inspired in particular by the technical efficiency of the project presented by SEPIN and the participatory aspect proposed by energieid.be. However, important technical elements are not guaranteed by these two projects: openness, scalability, scalability.

This statement is to the credit of the EMPOWER project. Determining that something does not exist is always more difficult than showing that it exists.

It is therefore proposed by the City of Lorient in its Regional Action Plan to develop this type of system, first on the city's municipal buildings and then to make it available, via the managing authority, to all stakeholders wishing to benefit from it.

The political instrument will therefore be improved in its component "- Innovative projects in terms of intelligent buildings and districts integrating renewable energies" by providing the managing authority with an evolving and scalable technical architecture enabling it to develop and propose a technical architecture for all actors in the energy transition.

Since the beginning of the EMPOWER project, Lorient has been working on a new innovative monitoring system based on free software bricks. The very first developments were presented to the partners during the study visit organised in Lorient in November 2017 and the general architecture was the subject of several presentations in Almada in October 2018.

The work undertaken within the framework of EMPOWER has therefore been able to reinforce the city of Lorient on the need to set up free and open monitoring solutions. Thus, after a test phase relating to the electrical consumption of a building (Kermelo school) and the photovoltaic production of several sites in the city (results visible on http://zabbix.empower-lorient.fr - connect as a guest) it was decided to extend the open monitoring system developed on this occasion to a larger number of buildings in the city of Lorient.

2. **Action** (please list and describe the actions to be implemented)

The action will consist:

1. in extending the open monitoring system to several buildings (objective: between 10 and 20 main consumer buildings in the city of Lorient), and increasing the quantity of parameters monitored.
2. in transmitting the open monitoring system to the managing authority in order to help it to better implement its policy instrument.

More specifically:

1. A public procurement procedure will be launched to select companies capable of working in the prototype open monitoring system drafted by the City of Lorient as part of the EMPOWER projectThis public procurement procedure should make it possible to select companies that can contribute their expertise in 4 areas:

- technical support

- acquisition of data aggregators

- sensor acquisition

- programming and coding

The development programme for the open monitoring system will be carried out on 20 main consumer buildings in the city of Lorient and will include

- initially on the monitoring of electricity consumption and photovoltaic production in real time

- then, with the deployment of smart gas meters planned from 2020, on building heating consumption

- additional developments will be tested: monitoring of water consumption, monitoring of solar thermal production

2. Several transmission sessions will be organised with the managing authority in order to present the possibilities of the tool, to take stock of the needs for further development and to list the modalities allowing the Brittany region to disseminate this technology to the stakeholders in its territory.

How will this action will enhance the policy instrument?

This action will allow the in situ demonstration of a low marginal cost, scalable and open monitoring system.

This is very strongly linked to the policy instrument. Indeed, the development of energy efficiency in social housing and private buildings requires very economically optimized solutions for the actors of these two worlds to seize it. The development of an open, robust and inexpensive solution, accompanied by the managing authority, will enable the energy monitoring culture to be carried effectively to actors who are now far from it.

What specific measures or procedures deriving from interregional learning element will be taken into consideration and how they will be implemented in the RAP?

- IOT as seen during the study visit in Lorient in novembre 2017: coding procedures and hardware tools will be integrated in the design of the action. The city of saint sulpice la forêt is the owner of this GP. As indicated previously, the good practice related to this action was analysed thanks to the EMPOWER project during the study visit that took place in Lorient. Indeed, the city of Lorient had not had the opportunity to take the time to draw up an inventory of the innovative actors and to contact the owners of this particularly promising experiment. The study visit took place in November 2017, with partners from MAGDEBURG, KALMAR, SOUTH IRELAND and FIRENZE.

3. **Players involved** (please indicate the organisations in the region who are involved in the development and implementation of the action and explain their role)

- City of Lorient: will develop and implement the open monitoring system

- Local stakeholder group "Consometers" for the validation of the open character of solutions

- Energy distributors: implementation of smart meters (national policy)

- Local energy agency for the follow-up of results and work on the modalities of dissemination to private actors in the territory (SMEs).

- Lorient Agglomération for portability to the municipalities of the agglomeration

- Brittany Region for portability to Breton municipalities.

4. **Timeframe**
   Implementation and development of the Proof Of Concept: 2017-2019 during the development of the EMPOWER project
   Wider deployment (city of Lorient): 2019-2020
   Wider deployment (agglomeration - region): 2020-2021

5. **Costs** (if relevant)

60 000€ for City of Lorient

Portability to Brittany region: estimated 50 000€ (to be confirmed during the deployment process)

6. **Funding sources** (if relevant):

Lorient's own budget
Brittany Region's budget.

ACTION 2 Open monitoring federation

1. **The background**

During the EMPOWER project, the city of Lorient was able to see that there is a very wide variety of monitoring systems (Technical Workshop in Almada, October 2018).

The presentation made by P6 Energy Agency for Southeast Sweden by Stefan Olsson: *Energy monitoring and Internet of Things – the role of energy monitoring in "digitalized" cities, smart cities view* helped Lorient to design the following action.

Indeed, this presentation and the discussions that followed allowed the stakeholders from Lorient (Ville de Lorient, ALOEN, Librasys - IT SME) to reinforce their analysis on the development of the smart city in Europe. The needs for interconnection between data platforms are real, but private companies are reluctant to make available all the data they have collected, which is understandable from a commercial point of view. Thus, two solutions seem to emerge: the creation of public actors to guarantee the supply of data or the creation of communication protocols between the data of private actors to benefit from increased competitiveness. It is towards this second solution that the city of Lorient has committed itself in the framework of this action n°2. It should be noted that the principle and the first results of this action have been validated and co-financed by the Managing Authority, the city of Lorient having for its part financed the establishment of the technical specifications of the federation project within the framework of EMPOWER.

Within the framework of the ALMADA technical workshop and study visits, as well as through work carried out locally, the city of Lorient and its stakeholder's group have identified globally 3 ways to produce a monitoring system:

1/buy an existing, proprietary solution ("ready to wear")

2/developp locally - in conjunction with companies - a proprietary solution more specifically adapted to the needs of the community ("haute couture")

and

3/develop open, scalable solutions that can be adapted to any type of user. ("Do It Yourself")

This is the third solution that has been adopted in Lorient. However, in order to create a truly open environment. It is the core of action #1

However, the managing authority considers that, as part of its policy instrument, it must be able to propose an ecosystem of solutions for monitoring and developing intelligent networks. Indeed, the policy instrument must be able to adapt to all categories of actors in the territory, from individuals to large companies, associations and public actors in particular. However, a single platform cannot provide services dedicated to all the types of actors identified. Unfortunately, it is not possible for an actor like the Brittany Region to finance the development of an entire ecosystem of solutions: it must therefore stimulate the conditions for the emergence of ecosystems of solutions that will allow the monitoring of the energy consumption of a vast panel of different actors, and will also be able to allow the development of intelligent networks, through the exchange of consumption data in particular.

Thus,the principle of this action is not only to develop a monitoring solution (action 1), **but to propose ways of discussing monitoring solutions with each other**.

The local stakeholders group of Lorient (called "the consometers") made a video to explain the context of the project: https://youtu.be/o8me7RqZsss

2. **Action**

The aim is to create the principles of a **federation** allowing the sharing of data from various monitoring systems. An integration of the national electricity consumption data collected by ENEDIS is also intended, even if the integration of these data is not one of the criteria for the

success of the project.

How will this action will enhance the policy instrument?

This will allow the emergence of intelligent networks that are currently constrained by non-interoperable proprietary protocols.

More specifically, the sub-actions to be implemented under this action are as follows:

1/ “Proof of Concept” work

* Define the methodology to be adopted in order to start the construction of this federated system for monitoring the energy consumption of buildings

* Choose a technical federation protocol and data formalism in an objective way and methodological, with written justification for the final choice.

* Apply the GDPR to the project data itself (prefiguring version).

* Carry out specific software developments in order to exchange data via a protocol and according to a predefined formalism between two pre-existing tools (logNact and BMHS).

* Implement a case of cross-data use between two open monitoring system that are currently in development in Lorient / Bretagne “BMHS” and “LogNact” (transmission of data and display).

* Deposit of all sources and documentation made on an access software forge public (ex: github, gitlab) and under free license.

* Drafting of a document to conclude the work (feedback, advice).

This action is being undertaken jointly by the City of Lorient and the Brittany Region, as part of the "SEN1" project, which consists in developing a system to monitor building consumption on a regional scale.

2/ Further developments are envisaged in order to implement graphical representations or via other means that allow a diversity of users to have access to the understanding of the data produced by the monitoring systems. Calls for projects will be implemented with different types of users, in particular in the form of hackathons, in order to define the best ways of representing data, in line with the results obtained in the SOLENN project (presented at the technical workshop in Almada in October 2018).

What specific measures or procedures deriving from interregional learning element will be taken into consideration and how they will be implemented in the RAP?

In the present case, all the monitoring systems Lorient saw during the EMPOWER project had a similar pattern of proprietary and non interconnectable softwares. Thanks to the EMPOWER project, Lorient and its local group of stakeholders were able to discover this pattern, analyze it and imagine an innovation to bring out a new monitoring solution. The process of experience exchange really INSPIRED Lorient for this action n°2.

Although the IT federation is a brand new concept that has not been seen in international learning, with the exception of the presentations made by Lorient stakeholders at the technical workshop in Almada in October 2018, **this action is therefore directly linked to the learning process.**

Indeed, one of Lorient's main lessons learned during Phase 1 of the Empower project was that consumption monitoring softwares, by construction, does not discuss with each other. All the presentations made during the study visits and technical workshops showed that the projects were individually effective but not interconnected, as they were not interconnectable.

As a result, it was the international learning process that allowed Lorient to define a "hole in the racket" and pushed the local stakeholder group to think outside the box.

.

3. **Players involved** (please indicate the organisations in the region who are involved in the development and implementation of the action and explain their role)

* ALOEN and BreizhALEC, as coordinators of the SEN1 project.,

* the Brittany region, as pilot of the smile project, of which SEN1 is one of the sub-projects

* City of Lorient, which develops one brick of the SEn1 project on its own buildings

* Each service provider involved in the work to be done

4. **Timeframe**
   POC (Proof Of Concept): end of 1st semester 2019
Continuation of the federation's deployment: 2020-2021

5. **Costs** (if relevant)
   POC specifications: 4000€
   POC: 50 000€

   Subsequent deployment: to be defined after POC results

6. **Funding sources** (if relevant):
   Specifications of the POC: City of Lorient
   POC: Brittany Region (Managing Authority)

   Subsequent deployment: to be defined as part of the project

ACTION 3 Financing of monitoring system by a renting scheme

1- **The background**

Consumption tracking systems, while saving money, are relatively expensive. It is indeed necessary to pay for the equipment as well as licenses to use the equipment.

With the need to develop these monitoring tools, the question of their financing becomes important. Indeed, a system that is too expensive will not be implemented. Similarly, if the balance between costs (installation and monitoring) and benefits (energy savings) is uncertain, many potential users will not install a consumption monitoring system.

As part of the implementation of the EMPOWER project, the city of Lorient and the managing authority (Brittany Region) are working on open source systems that can generate savings in licensing costs and use robust and inexpensive equipment (notably Raspeberry Pi, action 1).

The city of Lorient has also implemented a solar panel rental system in a different context, allowing it to use the electricity production of these panels without acquiring them through a simple annual rental contract. This action was presented at the Magdeburg technical workshop in December 2018. During this technical workshop, further discussions where done with project partners, revelling the potential of this economic model in the field of energy monitoring.

During this technical workshop in Magdeburg, a presentation was also made by the Santander City Council partner PP9 on the different types of financial arrangements that can be implemented to finance projects. This presentation truly impressed Lorient's stakeholders and a work began on how to address the challenge of creating "pay as you save" monitoring systems within the legal tools defined by Francisco Puente.

Finally, work on psychological and social representations related to the monitoring of energy consumption was carried out under the coordination of ALOEN during the SOLENN project, which predates EMPOWER. The results of these studies were presented at the Almada technical workshop in October 2018. One of the elements that emerges from this work is that users of monitoring systems are more active and vigilant soon after installation and that the effects seem to erode over time. Thus, the "lifetime" possession of monitoring systems does not seem relevant in view of the decrease in the results over time. On the other hand, multiplying the number of users who donate within defined monitoring periods makes it possible to reuse measuring equipment and thus optimize its financial cost and environmental impact.

2- Action

It appears from these three presentations that it must be interesting to couple:

- consumption monitoring via open systems

- an economic model based on the time-limited rental of measuring devices

- the possession of these devices by a private operator serving the communities of a territory

The action will consist in developing a model for financing by leasing energy meter systems. It will be divided into several stages:

1/ implementation of actions 1 and 2 of the Regional Action Plan in order to finalize the consumption monitoring system and the first building blocks of the IT federation

2/ analysis of the costs of acquiring equipment and installing sensors and data aggregators

3/ development of a support solution, in conjunction with ALOEN, to support the analysis of data measured by open systems

4/ proposal made by the City of Lorient to the "Bois Energie Renouvelable" Local Public Company (ESCO which is 50% owned by the City of Lorient) to provide its shareholders (18 local authorities) with consumption monitoring systems on their most energy-intensive buildings, in exchange for a rental contract. **This idea is directly issued from the presentation of Santander City Council during technical workshop in Magdeburg.**

5/ implementation of consumption monitoring systems for interested shareholders

6/ analysis of the savings made with regard to the sums committed for the implementation of the system

How will this action will enhance the policy instrument?

This action will directly address the “planned use of financial instruments” challenge of the policy instrument. Indeed, the Brittany Region, in its policy instrument, wishes to develop the energy transition on its territory not only through technical measures but also through actions on financial instruments to create leverage effects accelerating the energy transition on its territory.

Indeed, the cost of acquiring monitoring solutions is often too high to allow their deployment, which limits building consumption analyses.

The aim of this action is to propose to the managing authority a new method of financing monitoring systems **that can be integrated as a complementary financial instrument in the operational programme**.

What specific measures or procedures deriving from interregional learning element will be taken into consideration and how they will be implemented in the RAP?

- The climate action fund, as seen in the study visit in almada in april 2018, will be very useful for deploying the action #3. The design of the financial tool will be examined and transferred to the renting scheme envisaged in Lorient.
- Santander’s city council presentation in technical workshop in Magdeburg (December 2018), summarizing all the financial models used to finance new infrastructure and emphasizing on the role a local ESCO could play in the deployment of cost effective and welle financed solutions.

3- Players involved

City of Lorient: implementation of the monitoring system (action 1 of the RAP)

Brittany region: implementation of the federation (action 2 of the RAP)

ALOEN: proposal of the methodology for assistance in monitoring consumption

Local Public Company "Renewable Energy Wood" (ESCO): economic dimensioning of the

project and implementing of the renting scheme

4- Timeframe

- deployment of actions 1 and 2 of the RAP: 2020 (deployment of actions #1 and #2 of the RAP are needed to implement the action #3 since it will be built on the technical framework of those 2 actions.)

- technical and economic design and proposal to the Local Public Company of an economic model: 1st quarter 2021

- experimentation in buildings of other local authorities: 2nd semester 2021

7. **Costs** (if relevant)
   purchase of monitoring systems and data storage space: 20 000€
   definition in connection with ALOEN of a monitoring methodology: 20 000€

8. **Funding sources** (if relevant):

   Brittany Region

   Local Public Company “Bois Energie Renouvelable”

   Users (renting)

Date:_____

Signature: _____

Stamp of the organisation (if available): _____