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REPORT ON MEASURES AND PROPOSALS FOR MICROGRIDS AND ENERGY COMMUNITIES

PP1 – AURA-EE

ALPGRIDS Policy Document

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Short Description
<p>The document summarizes the specific measures proposed by AURA-EE to public authorities in charge of energy plans, both at local and regional level.</p> <p>The energy plans were previously selected and analysed by the partner.</p> <p>The measures reported can be already integrated in the energy plan or just proposed to the public decision maker in view of next coming plan updates.</p> <p>Measures are supported by a preliminary qualitative and quantitative analysis estimating their potential impacts, associated costs and recommendations for the implementation.</p>

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Introduction

This deliverable focuses on the measures to propose for the development of microgrids and energy communities in Auvergne-Rhône-Alpes, through the modification of local or regional energy plans.

AURA-EE has chosen to focus on the issue of collective self-consumption (CSC), which is a new legal framework enabling every electricity consumer to purchase electricity directly from a local RES producer, provided some conditions are respected. Collective self-consumption has been introduced in the French law in 2017 ([law 2017-227](https://www.legifrance.gouv.fr/loda/id/JORFTEXT000034080223/2017-03-30/))¹, and was subsequently complemented by several decrees. This law has been converted into the Energy Code (article L315-2) and then completed by another law (2019-1147) which enlarges a bit the definition. Further to this new legal framework, the concept of energy communities appeared and first definitions were also introduced in the French law.

The measures which are presented in this report come from

- The outputs of the 6 pilot sites analyzed in WPT1: with the support of the local DSO SDED, a call for interest was launched towards all the municipalities of the Drôme department in 2020 and led to the selection of 6 pilot sites. On these pilot sites, technical, economical and legal studies were implemented to better identify the hurdles and needs on collective self-consumption projects involving energy communities and / or public authorities.
- The discussion that AURA-EE could have with regional stakeholders within the regional sounding boards which took place in 2021 and enabled to cross various point of view on the issue

¹ <https://www.legifrance.gouv.fr/loda/id/JORFTEXT000034080223/2017-03-30/>

1 CONTEXT ANALYSIS: LOCAL, REGIONAL AND NATIONAL LEVEL

At national level, energy policies and objectives mainly derive from the national programming of energy (called PPE). Then, the recent evolutions of the legal framework have entitled Regions to have more power in terms of energy planning. For that reason, each Region has to complete a “SRADDET” scheme, that is to say a global regional plan for land planning, climate and energy. In Auvergne-Rhône-Alpes this plan was approved in December 2019.

Another regional plan, called S3RENR, is meant to plan the integration of renewable energies in the grid network. This scheme is compulsory for each region. It is managed by the national TSO and aims at planning the works to realize on the transport grid infrastructures so as to integrate the necessary RES productions in the long term.

At a local level, the “PCAET” are local climate and energy plans which are compulsory for any municipality over 20 000 inhab (but smaller territories can also launch a voluntary PCAET). They contain a diagnosis of the resources and potentialities and propose an action plan. There are 101 PCAET in AURA (already achieved or under process).

Some territories can also set up “CTE” which are local voluntary commitment on ecology transition.

2 ENERGY PLAN(S) SELECTION AND ANALYSIS

AURA-EE chose to analyze the PCAET of one of the 6 pilot sites, the plan of “Communauté de communes du Val de Drôme”.

CC Val de Drôme en Biovallée	
Name of the plan	PCAET of Val de Drôme
Date of release / last update	January 2020
Authority responsible for the plan	Grouping of municipalities “Val de Drôme en Biovallée »
Strategic vision	<p>The strategic vision covers many different fields: agriculture, industry, transports, energy, etc. The main objectives are :</p> <ul style="list-style-type: none"> - To decrease energy consumptions by 32% between 2015 and 2030 - To multiply RES production by 3.7/ More particularly the objective is to produce 353 GWh by 2030 which means 261 additional GWh compared to the present situation. - To decrease by 24% the GHG emissions between 2016 and 2030 - To decrease atmosphere pollution

Policy	<p>The plan contains 35 actions, out of which</p> <ul style="list-style-type: none"> - 5 concern the production of renewable energies - 5 other actions concern the mobilisation of local stakeholders among which citizens - Other measures deal with transport, agriculture, adaptation to climate change, training and sensitization, mitigation of GHG emissions
Number of short term actions	<p>All the actions of the plan start in 2020 and most of them last between 2020 and 2024, a few of them are planned until 2030.</p>
Number of long term actions	<p>At short term (by 2022) there are 2 main actions on RES:</p> <ul style="list-style-type: none"> - build a Master planning scheme on RES (“SDE”) - foster the development of RES in the agriculture sector <p>The plan also contains an action (n°21) to foster the local development of RES; self-consumption solutions are mentioned.</p> <p>At a longer term, the plan aims at following and assessing the implementation of the “SDE” (planned until 2030) and ensures, through the organization of workshops, that the PCAET measures are progressively transposed in the planning documents.</p>
Incentives and funds for microgrids/REC	<p>No action is specially dedicated to microgrids but the plan mentions that the municipality will support the actions which contribute to the objectives of the plan and help find some funding if necessary.</p>
Participatory approach based actions	<p>The plan contains the following measures :</p> <ol style="list-style-type: none"> 1) Launch call for tenders to support citizen based approaches for energy transition 2) Organize a citizen club for the follow-up of the PCAET action plan
Environmental impacts	<p>The plan contains a detailed environmental assessment of the territory: weaknesses are observed as regards water, natural risks, biodiversity and human activities. These aspects are crossed with the action plan of the PCAET : all the 35 actions have positive actions on the environment and only 8 of the can also have variable or negative impacts. It mainly concerns landscape and biodiversity in relation with the development of RES for instance.</p>
Economic impacts	Not assessed
Social impacts	Not assessed
Other features	[short description]

2.1 Barriers for microgrids and energy communities

AURA-EE identified several hurdles for the collective self-consumption projects. Some of them concern technical aspects, whereas other are more on the legal or economic side.

- Complexity of procedures and contracting solutions for collective self-consumption

This is the very first obstacle which is underlined by all the stakeholders and which is the main reason why there are still so few projects at the national level (more or less 60 in December 2021). It covers several different procedures which are required within CSC projects :

- The obligation to create a moral body between producers and consumers: this obligation means that a company or an association (chosen in most cases) has to be created between all the members of the CSC project. Statutes have to be written and each year, a general assembly has to be hold, which also means that an activity report has to be written and responsible managers must be designed for the governance of this moral body. Aim of this structure is to be the main contact point for the DSO. In practice it creates complexity and makes the project more difficult to operate.
- The collection of taxes is still not clear, especially when the project only concerns one municipality which produces on one building and consumes with the other buildings. There is no idea about the way local and national taxes can be collected on the self-consumed electricity.
- The legal contracts to set up when the projects are financed by a third party like an energy community are quite complex, especially if there are public buildings concerned. Public procurement has to be adapted to this specific case and there is few chance that small municipalities can accept to settle such complex contracts. Besides, because of the existing framework, there is no possibility for a third-party investor to be the producer in a CSC operation where the PV plant also feeds the corresponding building through an individual self-consumption scheme (before sharing the excess with other consumers).

- Difficulty for municipalities to obtain the load curves of their buildings

The design of collective self-consumption mainly relies on the good matching between production periods and consumption periods. To assess whether this connection is relevant or not on a given site, studies must be done on the basis of

- Production simulation curves, depending on local irradiance and equipment characteristics (orientation, slope, shading, PV technology, etc.)
- Consumption load curves, registered by smart-meters at a 30 or 60min time step.

What we discovered through the work led on the pilot sites of ALPGRIDS, is that municipalities have had many difficulties to activate the load curves of their buildings and access the data. Whereas the procedure of activation seems quite easy to do on the website of the DSO, many errors occurred and delays of several months were sometimes observed.

- Difficulty to reach an economical balance, without subsidies

Several situations exist according to the size of the project, the contractual scheme adopted, the type of building, etc. Nevertheless, it is often quite difficult to reach a payback time under 20 years, when considering a CSC project, if no subsidies are considered. If the PV project exceeds 100 kWp, the business model is a bit better since the feed-in tariff of the excess energy is quite high, but not all the projects can start with such a big PV project, especially in small rural areas.

The economic balance depends a lot on the hypothesis which is made on the evolution of the retail electricity price, so more or less it depends on the way the project owner predicts this evolution.

2.2 Local/regional potentials for microgrids and energy communities

Despite of the obstacles, there are several opportunities to develop the model of collective self-consumption and the potential is quite important at a regional scale:

- In AURA region, numerous citizen-owned energy cooperatives exist and already operate PV projects (full injection on the grid). They represent a type of energy community which is quite sensitive to the elaboration of local energy loops, where production is made close to consumption points. Hence, many of these cooperatives are eager to develop collective self-consumption projects or other energy services. They are just asking for clear legal contracts since they would operate as third-party investors.
- The regional council has voted a solar regional plan in 2020 and ambitious objectives have been set up as regards the development of PV. The aim is to reach 6,5 GWp of installed capacity in 2030, instead of 1,3 GWp in December 2021. It means that the deployment of PV plants must be strongly accelerated and supported. All the regional stakeholders are urged to cooperate and develop more PV, among which CSC solutions.
- The region benefits from a good irradiance, solar potential is quite high and it makes business models easier to balance than in the north of France.
- Energy communities play an important role towards the local acceptance of RES projects. The more renewable energies take off, the harder it will be to keep a good social acceptance. Through energy communities, many stakeholders and especially citizens become key players in energy transition, and take part into governance and funding.

At a local scale, the grouping of municipalities of Val de Drôme is strongly committed in the development of PV plants and clearly plans to develop new plants through the collective self-consumption scheme. They also have several activity areas on their territory, with numerous companies, which are very interesting use cases for CSC.

3 LOCAL/REGIONAL AUTHORITIES IN CHARGE OF THE PLAN

3.1 Strategic vision

The grouping of municipalities “Val de Drôme” is composed of 22 municipalities. There are presently close to 690 PV plants in operation in these municipalities, representing more than 18 MWp installed. 10 MWp are provided by PV plants which are connected to the low voltage grid (> 250 kVA). PV generation is consequently already quite developed but is expected to develop even more.

Actually it has been stated in the strategic energy policy of the territory that solar photovoltaics represents the highest RES production potential on this territory. The objective is to reach 100 GWh/yr by 2030, that's to say more or less 5 times the present production. The potential mainly relies on the roofs of the buildings.

Regarding wind production, there are actually 2 wind plants on the territory, and the objective by 2030 is to multiply the production by 7 through the set-up of 11 wind plants of 3 MW each.

Other very ambitious objectives are displayed on biomass and energy efficiency.

Geothermal energy, solar thermal and biogas represent small opportunities on this territory and do not play an important role in the energy strategy.

3.2 Contacts and meetings

AURA-EE met the grouping of municipality on January 5th 2022 to present the results of the pilot study and discuss the measures to implement so as to develop more CSC projects on the territory.

4 DEFINITION OF THE MEASURES/Strategies SUPPORTING MICROGRIDS AND ENERGY COMMUNITIES

- **Measure 1 Launch a first collective self-consumption project**

Reason of the measure: there are very few CSC projects in France and AURA whereas it appears to be an interesting scheme for the local consumers. The pilot study of Alpgriids showed that there was a possibility to build such a project on the activity area of Eurre.

Description: the grouping of municipalities “CC of Val de Drôme” will rely on the Alpgriids feasibility study to develop a first project. They will contact the DSO to sign an agreement on CSC. The objective is to put the project in operation during year 2022.

Impact quantification: This project will decrease the electricity bill which suffered from an important increase in January 2022. It will also enable the production of renewable electricity at a local scale. Various scenarios are still considered, but the first CSC project could start with a 70 kWp PV plant, generating 90 MWh/yr. 25 MWh could directly serve for the local consumptions of the public buildings.

Economical benefits: the feasibility study stated that this CSC project could generate 5000€/yr of economy on the electricity bill of the municipality, but this assessment was made in 2021, before the huge increase of the electricity price in 2022. So the economical benefits would be even higher.

Environmental benefits: it has been assessed that a 70 kWp PV plant could save 175 t CO₂ during the whole lifetime of the project

- **Measure 2 : Procedures with DSO’s IT tool to be simplified and secured**

Reason of the measure: as explained above, load curves are easily available on the DSO platform and it can take a long time to access the data which are necessary to design the best technical solution of the CSC project. The CC of Val de Drôme suffered a lot from this issue and needs to find a solution with the DSO.

Description: the municipality will define a clear procedure with the DSO so that it can have a reliable access to the consumption data. We also suggest that a training should be proposed for municipalities to explain them how to use this tool and obtain the data necessary to the sizing of their projects.

Impact quantification: the impact mainly consists in the reduction of time delays to develop new projects.

- **Measure 3 : support the emergence of energy communities**

Reason of the measure: energy communities play an important role in social acceptance, development of local RES projects, sensitization on energy transition, etc. Nevertheless, the emergence of energy communities is not easy and need to be accompanied by public policies.

Description : public authorities should help energy communities to emerge on their territory by organizing public meetings, proposing public buildings for PV plants, taking part as shareholder in the emerging communities, etc. An effort should also be made to include various types of stakeholders in the emerging communities such as local companies, NGOs, citizens, farmers, industries, etc.

Depending on the needs, the municipalities could also propose subsidies, logistic support, or communication support to the communities to ensure that they will develop successfully.

Impact quantification : this measure would clearly simplify the deployment of new project and improve the economic balance. Other CSC projects will be developed, not only with the municipality, but with many other stakeholders. This will lead to further increase of RES production and decrease of GHG emissions.

Social benefits: energy communities bring social link and cooperation at a local scale, enable more acceptance of RES project and also generate economic benefits that can be invested in other projects with a social purpose

5 INTRODUCTION OF MICROGRID MEASURES IN ENERGY LOCAL PLANS

5.1 Recommendations for the measure implementation

Measure 1 : To optimize the chance that a first CSC project gets into operation quickly, the municipality should change the size of the PV plant which was initially planned, so as to improve the business model. Instead of developing 4 small PV plants it is recommended that they try to find only one site for a bigger PV plant, which will represent less costs.

Measure 3 : to make some energy communities emerge, the municipality should rely on the tools and networks that already exist. In AURA region, there is a regional network for energy projects involving citizens where a lot of experience is shared, trainings are proposed and so on. This regional network can help the municipality in terms of methodology, organization, best practices, etc.

5.2 Monitoring indicators and measure update

Measure 1

The following indicators will serve to assess the advancement of Measure 1:

- Power of PV plant connected to the grid
- Collective self-consumption rate
- Number of public buildings and other users which will self-consume the PV production through a CSC scheme

Measure 2

The main indicator is

- Number of load curves registered on the DSO's platform

Measure 3

The following indicators will serve to assess the advancement of Measure 3:

- Creation of an energy community
- Number of members involved in the community by typology (citizens, municipalities, SMEs, etc.)