



COLLECTIVE SELF-CONSUMPTION AND
NEW POSSIBILITIES OFFERED BY ENERGY
COMMUNITIES IN FRANCE

EXECUTIVE SUMMARY

This white paper primarily aims to enlighten stakeholders interested in developing a collective self-consumption project (CSC) in France by providing a brief overview and formulating a set of recommendations to address various barriers and facilitate project development.

It also provides information on ongoing regulatory developments regarding the transposition of European directives related to citizen and renewable energy communities, in an attempt to discern their potential contributions to the development of local renewable energy sharing projects.

This report does not address the impact of CSC and energy communities on the overall electrical system. The current operation shifts the costs (balance responsibility, variability management, information system) to other stakeholders (suppliers, network managers, etc.) that are different from the self consumers themselves. A large-scale development implies costs that will necessarily be passed on to some or all consumers, if the effects on the overall electric system are not properly assessed.

Fifteen interviews were conducted with various stakeholders (energy suppliers, network managers, businesses and advisors, software developers, researchers, and academics). The interviews were complemented by a literature review on the subject.

There is a growing interest in collective self-consumption from stakeholders with a very diverse background. This translates into a **massive spate of projects over the past 3 years**, and the momentum seems to be continuing in 2023.

Reasons for this include:

- **Better economic prospects,**
- Regulatory developments and **new support mechanisms** that have allowed more projects to emerge (opening of CSP to medium voltage, eligibility, subject to power and conditions, to the obligation to purchase, investment premiums, or additional remuneration...),
- **New regulatory requirements** encouraging the development of renewable energies on roofs and parking lots,
- **Smart-meter rollout,**
- A better understanding of the system and stakeholders' **professionalization** (energy unions, associations, or new specialized companies).

The recent energy crisis has also sparked interest from French regions and departments, as those are starving to improve their energy independence and guarantee long-term energy price stability to public infrastructures and citizens.

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Regarding **available technologies**, the feedback from already established projects has shown that **in the vast majority of cases, an advanced smart meter such as Linky ticks almost all the boxes required**.

Indeed, most operations are small-scale and only cover a small portion of participants' consumption. Furthermore, a more or less noticeable evolution in consumption behaviors is generally observed, allowing for very satisfactory self-consumption rates. However, significant variations are noted among projects (sizing, participant typology). As the EV fleet is expected to increase in size, demonstrators have started to experiment a car-sharing service combined with a bidirectional charging station to optimize self-consumption rates, thus providing a dual usage of the vehicle's battery, with potential environmental and economic benefits waiting to be confirmed.

Since **profitability largely depends on optimizing the overall self-consumption rate of an operation**, the battery or EMS' relevance must be studied case by case, but most interviewed stakeholders recommend adding consumers to the operation.

Regarding the **challenges encountered** by project leaders, besides the complexity of the legal and **administrative structuring** of the operation and contracting with the network manager, the long-term operation animation time is often underestimated and can involve significant costs.

Patrimonial Collective Self-Consumption (CSC), which allows a single entity to share energy among the various consumption sites it owns (the Region for example), presents few additional complexities compared to individual self-consumption and can be considered in a number of cases, avoiding substantial time dedicated to training and animating a collective.

However, it may be interesting to involve individuals in an operation to reduce surplus production, and **CSC also addresses multiple issues** explaining why most operations include individuals: tackling energy poverty (this aspect must be buttressed by a cost-benefit analysis), raising awareness of energy transition and energy consumption management, acceptability of renewable energies, democratization of energy production, etc.

More broadly, CSC helps **increase demand flexibility** by encouraging participants to adjust their behaviors to consume more synchronously with local renewable production, but this requires significant awareness efforts and animation time.

The white paper thus provides a set of recommendations, firstly on **training and supporting actors**, and secondly on **innovations**.

It should be noted that the vast majority of project leaders need support from third parties (consultancy firms, energy unions, associations...).

Furthermore, **the involvement of local authorities** is often a key: they strengthen the confidence of participants and institutional partners, secure projects, facilitate their financing, and can provide available land.

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Finally, TSG's recommendations to promote the development of CSC put a premium on **regulatory innovations**:

- **Clarifying the use of specific TURPE** (French Transmission Use of System and Public Distribution Tariff), which provides additional incentives to maximize self-consumption rates,
- **Remunerating flexibility** as a service provided by energy communities, on par with other consumers, especially for significant installed capacities,
- **Expanding the scope of operations while preserving the local dimension of projects**,
- Dedicated project companies (SPVs) specifically set up for a given CSC operation and composed of the participants in that operation should be able to count CSC as their main commercial activity,
- **Maintaining public support mechanisms** to provide guarantees to investors,
- **Clarifying the status of self-consumers** under existing law to encourage them to play a more active role and to ensure they have the same rights and guarantees as traditional consumers, especially regarding billing and access to information,
- **The possibility of experimenting with beneficial uses for the grid via CSC, for example, vehicle-to-building. Self-consumption for charging in the afternoon and reinjection from 6 PM to 8 PM helps limit the increase in demand at sunset while allowing, if necessary, reinjection from the vehicle.**

The white paper was prepared by a dedicated working group of the Think Smartgrids association, involving around thirty members, in collaboration with the National Federation of Concessionary and Regulated Local Authorities (FNCCR), a partner of the association.

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AN IMPORTANT GROWTH POTENTIAL FOR COLLECTIVE SELF-CONSUMPTION (CSC)

Five years ago, collective self-consumption still appeared as a confidential topic championed by only a few committed communities, hindered by its complexity and highly uncertain profitability prospects. The possibility of launching an operation connecting one or more producers to one or more consumers to share locally produced electricity was established following the 2015 Energy Transition Law for Green Growth. By the second quarter of 2019, there were still only 16 operations in France.

Since then, a combination of several factors has significantly changed the landscape, including French and European determination to greatly accelerate the development of renewable energies, regulatory developments favorable to CSC, the decrease in the cost of photovoltaic production systems, rising energy prices, and the growing interest of communities in projects that allow them to secure a stable, long-term energy supply while consuming green, local electricity.

As of early December 2023, the number of operations in France stood at **259, with over 600 projects underway**. Beyond municipalities and social housing providers, an increasing number of industrialists, SMEs, real estate developers, and associations are initiating projects.

The number of projects is expected to grow even further: the European Commission is convinced that CSC, especially when driven by «energy communities,» will be a powerful driver to **the deployment of renewable energies, promote energy efficiency, and more broadly, raise citizens' awareness of various energy consumption-related issues**. Pilot projects such as the five demonstrators of the European IElectric project have already shed light on how these energy communities can increase **social acceptance of RES. It can also spark interest among consumers for flexibility solutions and energy consumption management**. To date, «citizen energy communities» introduced by European law in France are subject to the same regime as collective self-consumption for energy sharing, but several provisions are still being transposed, and the potential contributions to the development of energy communities in France will be discussed in this white paper.

Based on a **collective approach, collective self-consumption is likely to accelerate the development of renewable energies while encouraging participants to collectively consider energy production and consumption** from the get-go.

Finally, CSC helps address the urgent challenge of developing demand flexibilities in France. Currently, the available volume of flexibility is insufficient to ensure supply-demand balance by 2030. **Through its participatory aspect, CSC raises awareness regarding consumption patterns and modulation in compliances** :with the French Energy-Climate Strategy. **This should attract the full attention of policymakers to reap its long-term benefits. Integration into the overall electrical system must not be overlooked.**

With the proliferation of projects, **new actors and services are also emerging** to support project managers. Given that training and support the main identified factors to accelerate CSC deployment, this should keep the momentum going.

After providing an overview of CSC in France, the white paper will focus on new stakeholders and available offerings, as well as key technologies and strategies to promote project development. The potential contributions of European directives introducing energy communities will be discussed.

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ABOUT THINK SMARTGRIDS

Think Smartgrids is a professional association created in 2015, chaired by its president Xavier Piechaczyk, aiming at developing the smart grids sector in France and developing international collaborations. It brings together more than a hundred members from across the smart grids value chain: large groups, intermediate sized companies, SMEs and start-ups, and competitiveness clusters.

Public actors, network operators, industrialists, consultants and actors from the academic world are all represented within the association, reflecting the diversity of the French smart grid ecosystem. Think Smartgrids ensures the development of the French Sector in a global market estimated to be worth €75 billion. Through its actions and the expertise it provides, the association hopes to be an incubator for new collaborations between its members, as well as between its members and international stakeholders.

To develop the French smart grids sector and respond to its needs, Think Smartgrids relies on a Scientific Council, three Commissions -Commission training, Commission Territories and Innovation, and International Commission- and several working groups (institutional relations, digitalization and visibility).

THE THINK SMARTGRIDS ASSOCIATION

The Think Smartgrids association federates an ecosystem of French stakeholders contributing to the decarbonization and efficiency of power systems: grid operators RTE and Enedis, the main French manufacturers and equipment suppliers in the energy sector, major digital services companies, numerous SMEs and French startups at the cutting edge of energy and digital technologies, as well as the academic and research ecosystem.

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