Prosumption in France

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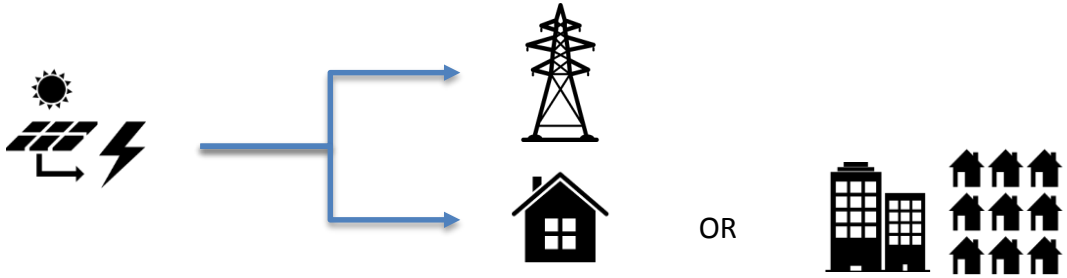
Prosumption in France

1. Individual/collective PV production/self-consumption

Total selling of PV production

Partial (collective) self-consumption



Since law n°2017-227 (24/02/17)

Total (collective) self consumption

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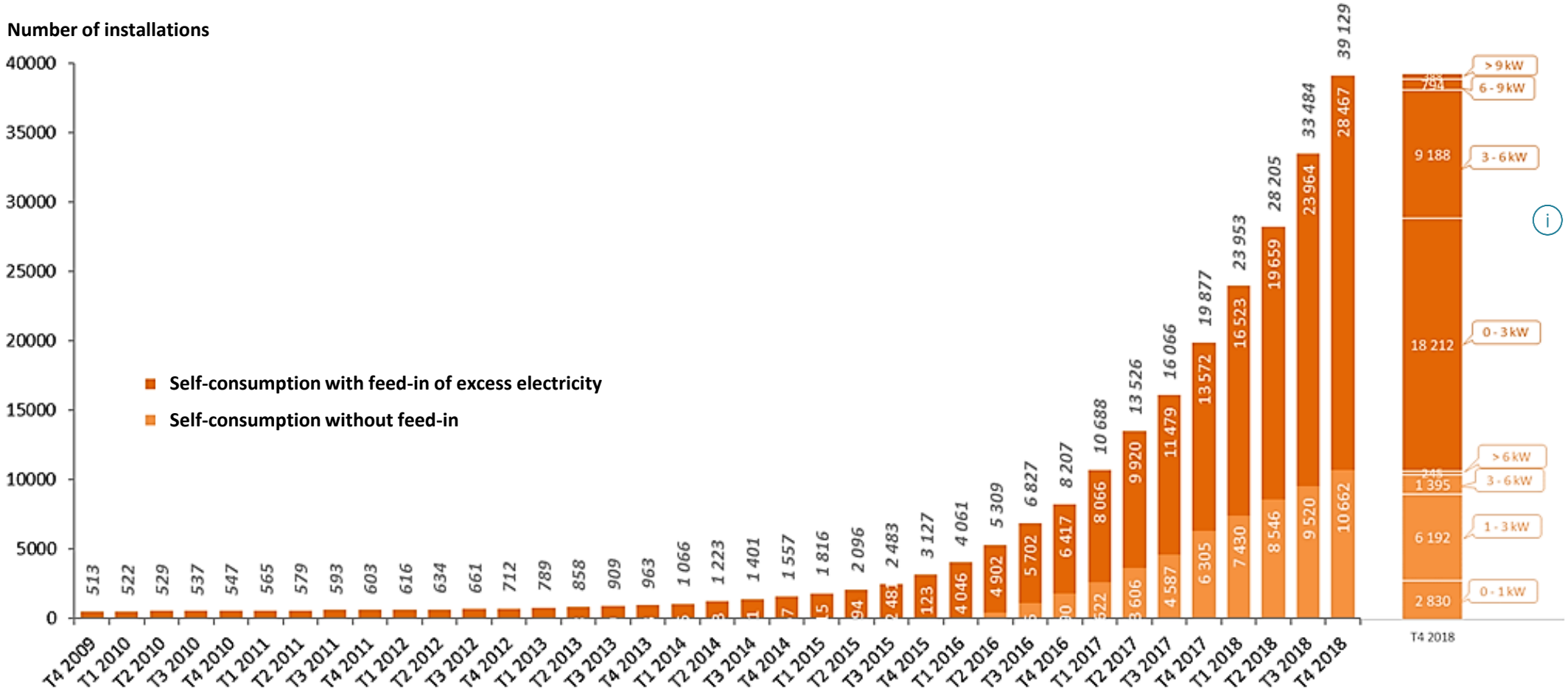
2. Market status

Cumulated self-consumption installations connected to the grid per quarter

ⓘ 20 000 households self-consumed in France in 2017 (500 000 in Germany). According to RTE estimations, their number could double each year and amount to 4 millions by 2035 representing 9 to 20 TWh (maximum 4% of the total French electricity consumption)



ⓘ Installations between 0 and 3 kW represent 85% of the self-consumption with feed-in of excess electricity installations

Source: Observatoire de l'énergie solaire photovoltaïque

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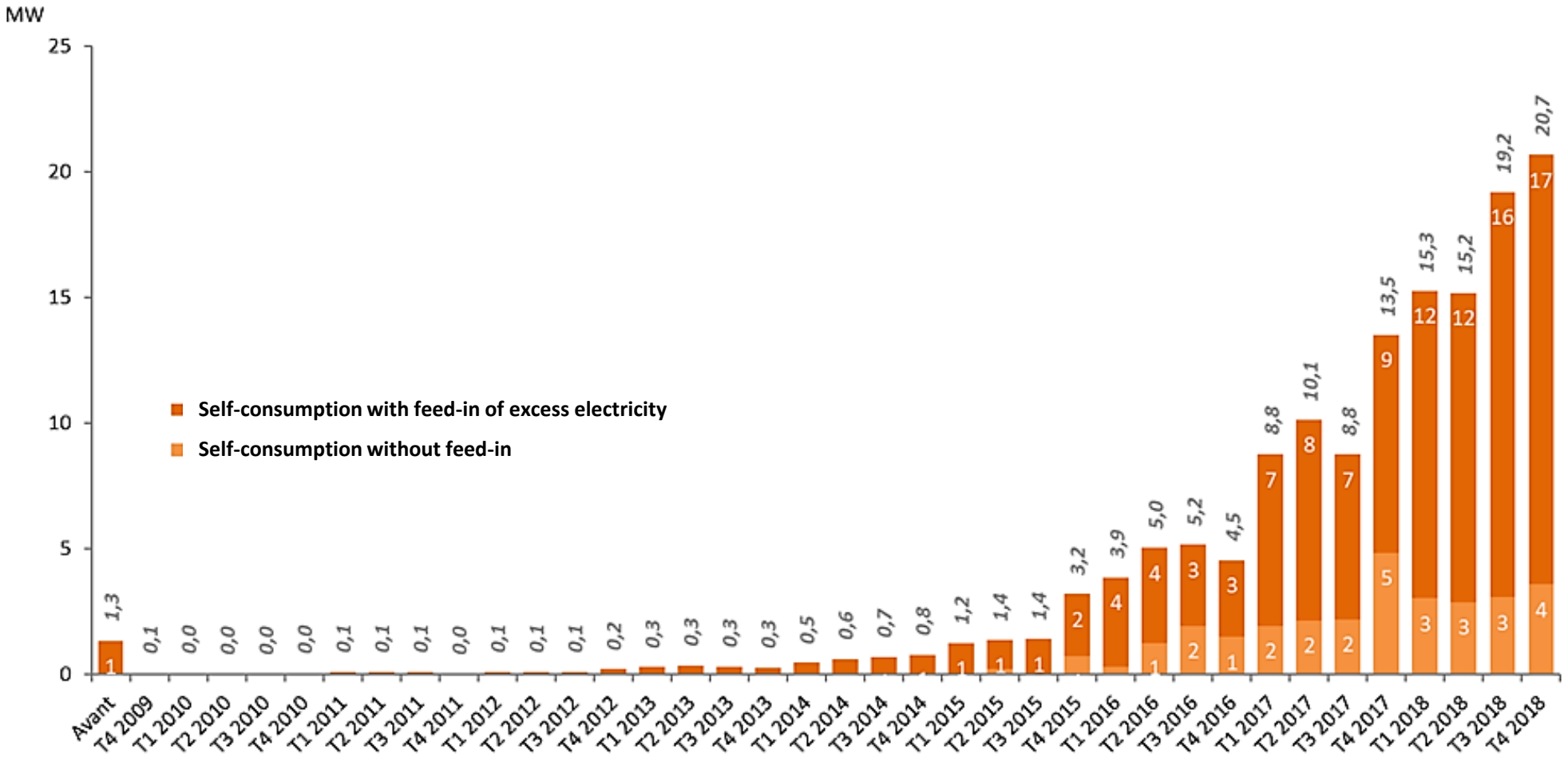
2. Market status

Evolution of connected installations in MW per quarter



Source: Observatoire de l'énergie solaire photovoltaïque

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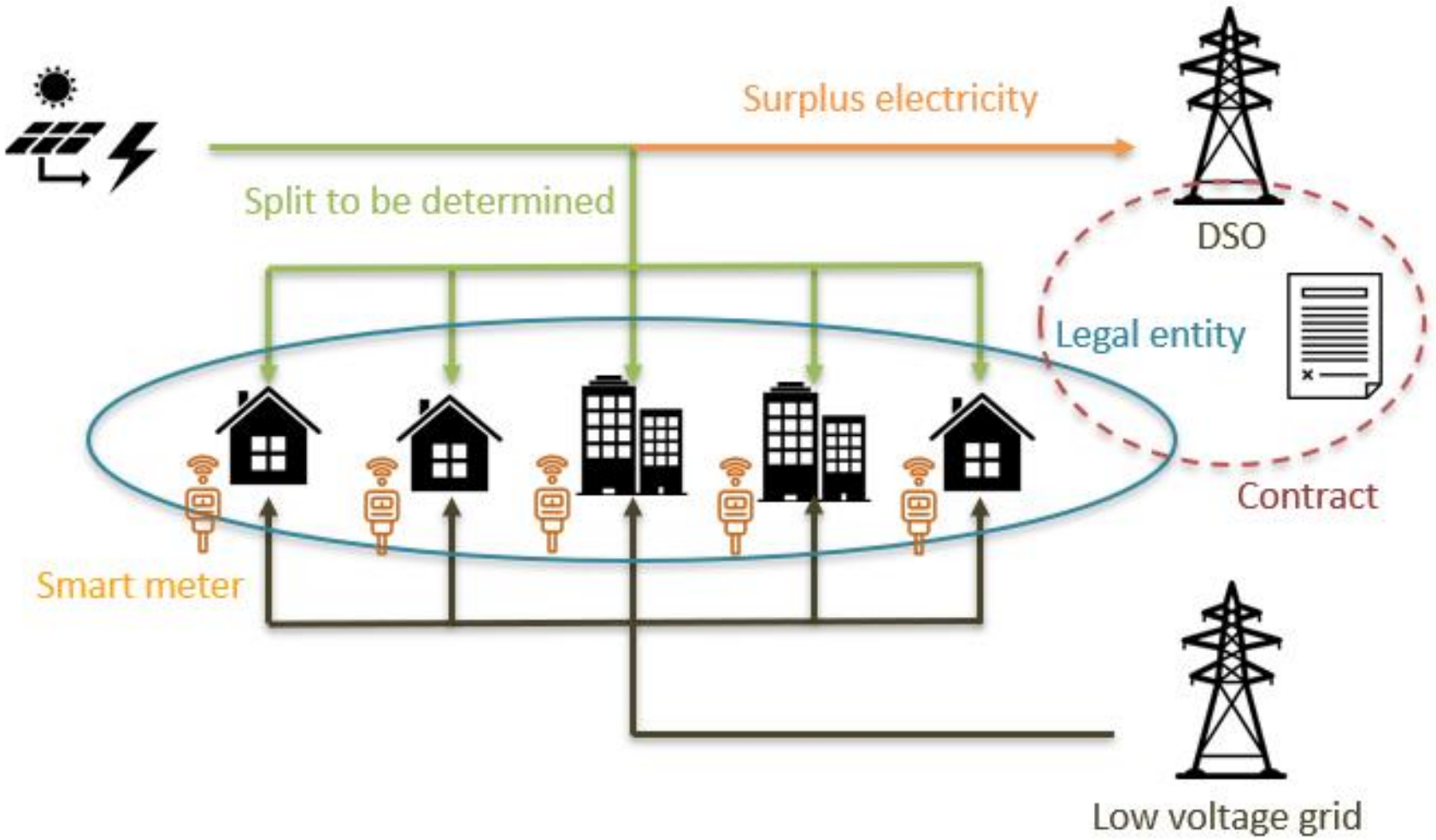
3. PV collective self-consumption presentation and remuneration scheme



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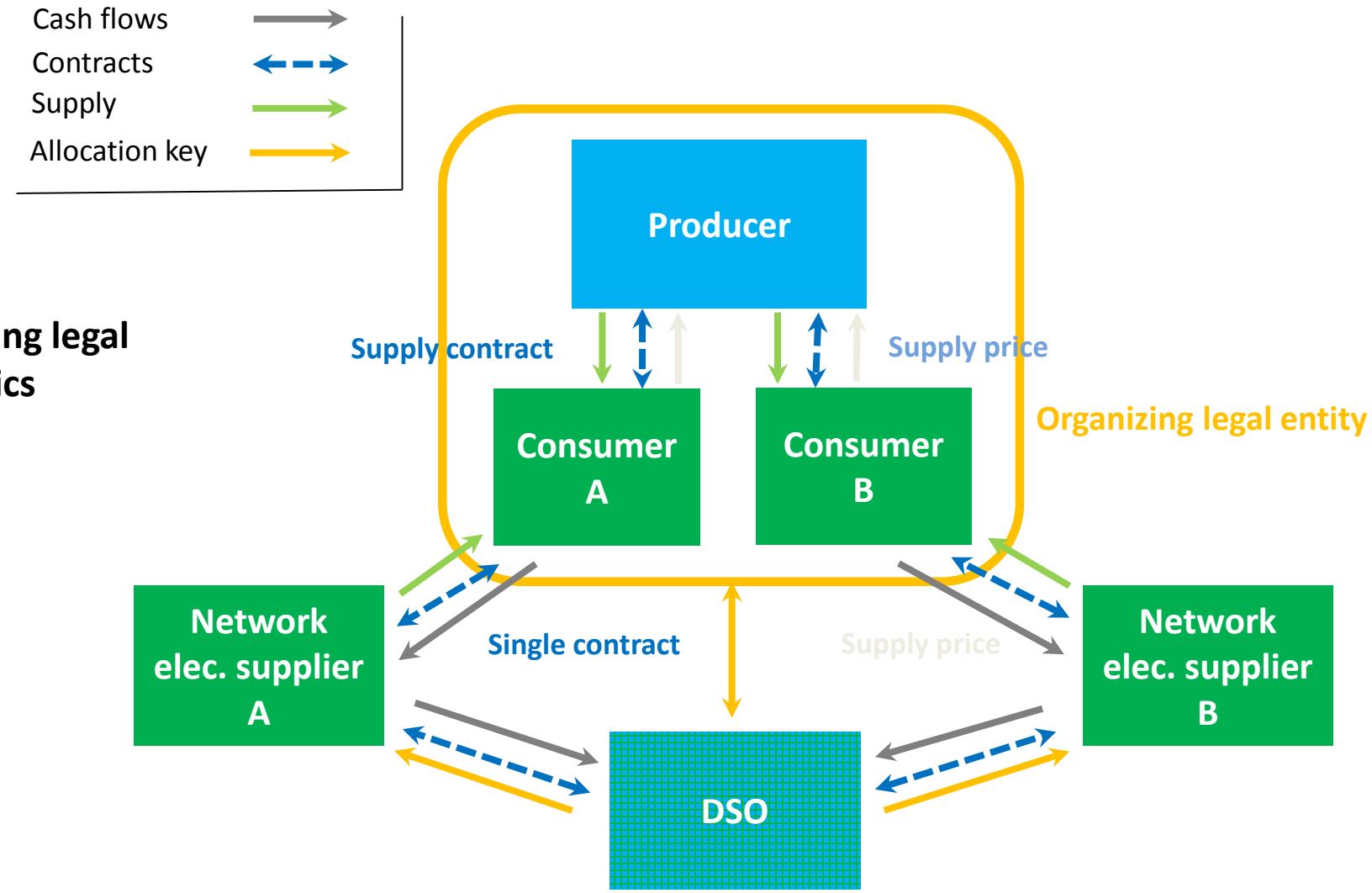
3. PV collective self-consumption presentation and contractual model

Contractual models : organizing legal entity and other characteristics



Source : TECSOL

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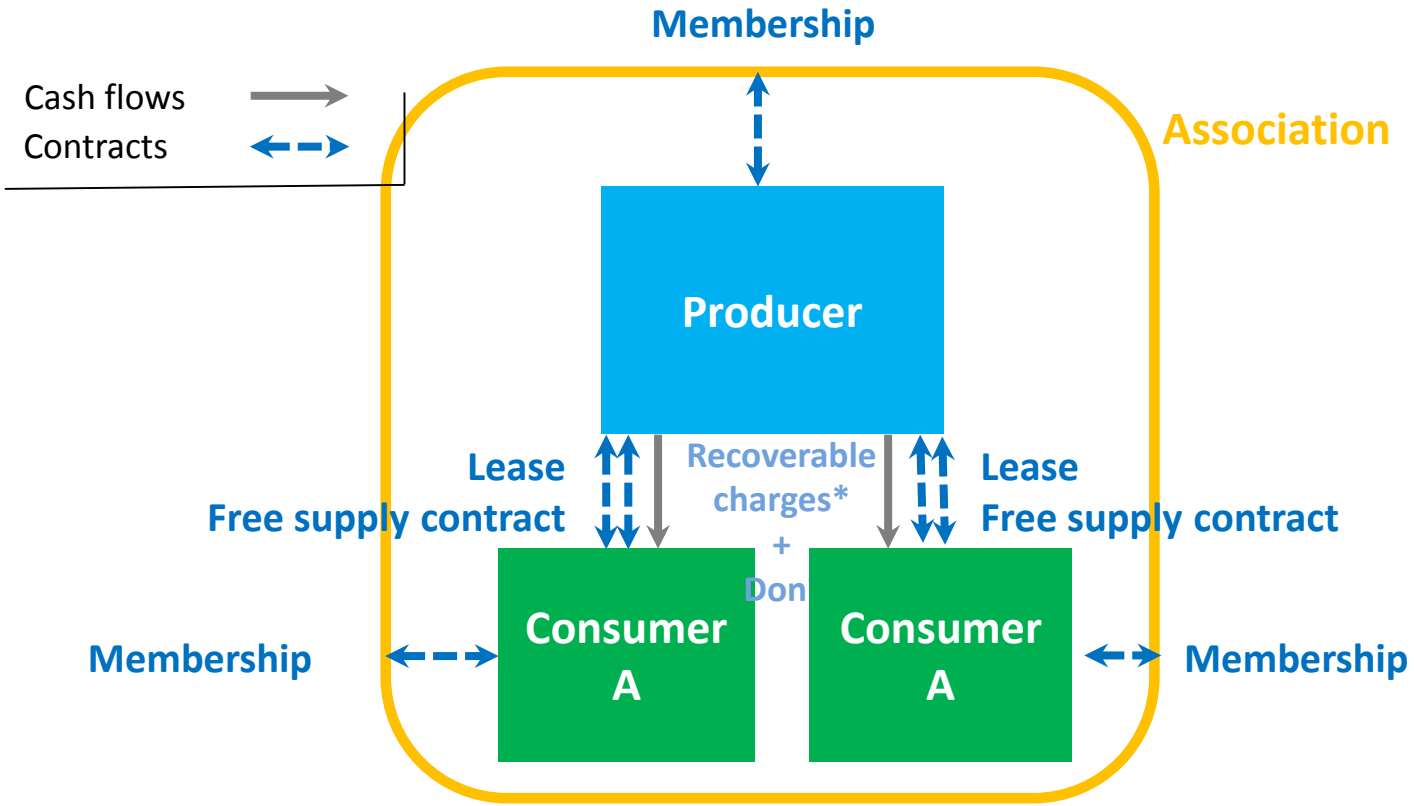
3. PV collective self-consumption presentation and contractual model



Use case : social housing

*to cover OPEX

Source : TECSOL

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3. PV collective self-consumption presentation and remuneration scheme

- **P < 100 kW:** Feed-in-Tariff (FIT)

FIT (€/kWh) for the surplus fed into the grid during 20 years and capacity premium (€/Wp) during 5 years.

FIT	P_{inst}< 9 kW	0,1 €/kWh
	9 kW < P_{inst} < 100 kW	0,06 €/kWh
Premium	P_{inst} < 3 kW	0,39 €/Wp
	3 kW < P_{inst} < 9 kW	0,29 €/Wp
	9 kW < P_{inst} < 36 kW	0,19 €/Wp
	36 kW < P_{inst} < 100 kW	0,09 €/Wp

- **100 kW < P < 500 kW:** Self-consumption tenders

Fixed premium during 10 years (€/kWh) applicable to electricity both self-consumed and fed into the grid and an additional bonus of 5€/MWh on the self-consumed electricity that is lowered when the self-consumption ratio is lower than 50%.

Only individual self-consumption benefits from an exemption from electricity taxes for self-consumed electricity

Only individual self-consumption benefits from the surplus feed-in-tariff

Collective self-consumption does not benefit from the surplus feed-in-tariff

Collective self-consumption needs to pay a specific grid access fee which is presently most of the time not favorable

But time is changing !

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4. Regulatory framework for (collective) self-consumption

22/05/2019 : **“PACTE” law: changes were made to some articles of the Code de l’Energie for an experimental period of 5 years**

“The self-consumption is collective when the electricity supply is made between one or more producers and one or more end-consumers linked to each other within a legal entity and whose draw-off and injection points are located ~~in downstream from the same public medium to low voltage substation~~ on the low-voltage grid and respect the criteria, particularly those of geographical proximity, set by order of the Minister of Energy after consulting the Energy Regulatory Commission.”

Code de l‘Energie, Chap. V, Art. L315-2

ⓘ The geographical limit will most certainly be 2km (1km max from a central point)

“The Energy Regulatory Commission establishes tariffs for the use of **specific public electricity distribution networks** for consumers participating in self-consumption operations ~~when the installed capacity of the generating facility supplying them is less than 100 kilowatts.~~”

Code de l‘Energie, Chap. V, Art. L315-3

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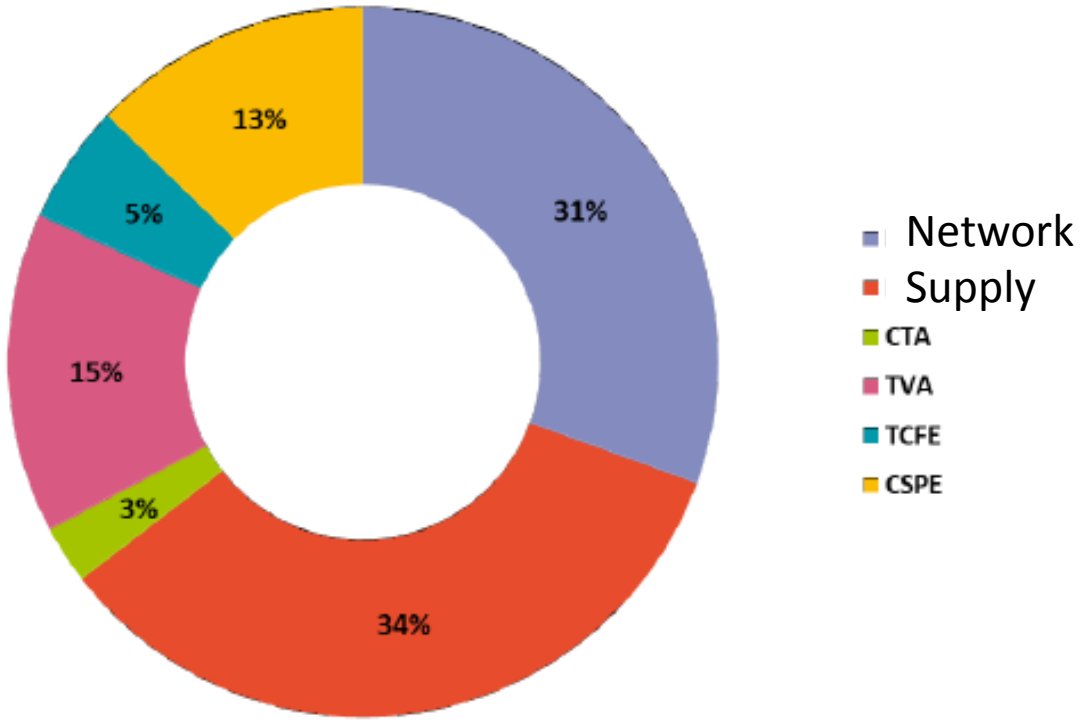
5. Advantages and attractiveness of (collective) self-consumption



Decomposition of a electricity bill for a residential client (31/12/18)
Source : Analyse CRE

Build-in of the economical balance of a French Collective Selfconsumption project

A consumer in a collective self-consumption operation will essentially erase from his bill the supply part, in greater or lesser proportion depending on the producer's strategy

The higher the self-production rate, the more interesting the operation will be.

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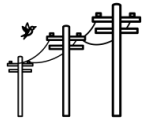
5. Advantages and attractiveness of (collective) self-consumption

Become master of one’s electricity origin,

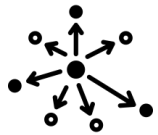
Savings on the electricity bill and protection against electricity prices increase

Development of the PV market



Reduce the need for line reinforcement and investment in new electricity transmission infrastructure

Sensitize the prosumers to the management of their electricity consumption (to increase self-consumption ratio)



Contribute to the decentralization of the electricity production

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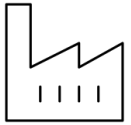
5. Advantages and attractiveness of (collective) self-consumption

Typical profiles for (collective) self-consumption: consumption profiles that are the closest to the production profile of a PV plant:

Primary sector

Secondary sector



Tertiary sector

Hospitals

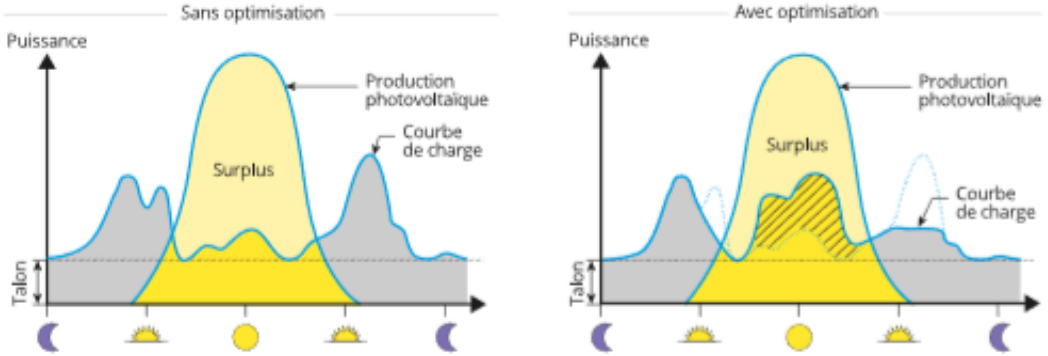
Supermarkets

Offices

Schools

ⓘ Schools are particularly relevant for collective self-consumption since they offer a interesting surface but are closed in the summer during high production periods and during week-ends.

Residential sector with an optimized electricity consumption profile



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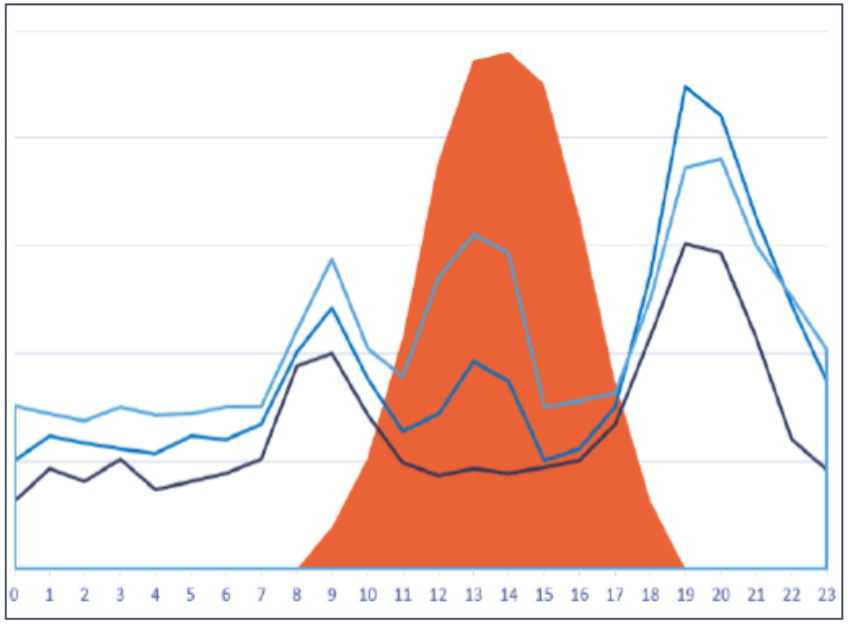
5. Advantages and attractiveness of (collective) self-consumption

Interest in a dynamic repartition



Les faits :

C1 a consommé l'équivalent de 50% de la prod

C2 en a consommé 30%

C3 en a consommé 20%

Si on avait fixé la règle statique

33% pour C1 -> distribution de 33% de la prod

33% pour C2 -> distribution de 30%

33% pour C3 -> distribution de 20%

-> 17% non valorisé

Source : Sunchain

Repartition with <u>blockchain</u> developed in the framewok of the DIGISOL project

INVESTIR L'AVENIR

ADEME

Agence de l'Environnement et de la Maîtrise de l'Energie

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Example: Bordeaux, France (10/17)

Inauguration of the first collective self-consumption project in France

In the first year the produced electricity was only used for the common areas. The idea for 2019 and 2020 is to extend the consumption to the households and to the supermarket at the ground floor.

260 m²; 36 kWc

37000 kWh have been produced in the 10 first months among which 40% have been self-consumed.

Difficulties to extend so far…

Prosumption in France
Example: Cher, France (11/17)

Inauguration of a self-consumption project in France including PV panels, storage units and smart consumption piloting

9 public buildings (city hall, school, nursery, …) , 61 dwellings, 78 public lighting points and a electrical vehicle charging point.

800 PV modules

Objective: - meet 70% of electricity consumption needs
- produce 226500 kW per year
- save 100€/year/household

SMARTMAGNE

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Example: Pénestin, France (03/18)

Inauguration of a self-consumption project in France including

12 companies, 50 households in a 500m radius

234 m²; 140 PV modules (Hanwha Q Cells); 40,6 kWc

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Example: Alès, France (05/19)

Inauguration of the biggest collective self-consumption project in France

100 social dwellings

600 m²; 300 PV panels; 100 kWc

20% of electricity consumption needs

Should save 100€/year/household

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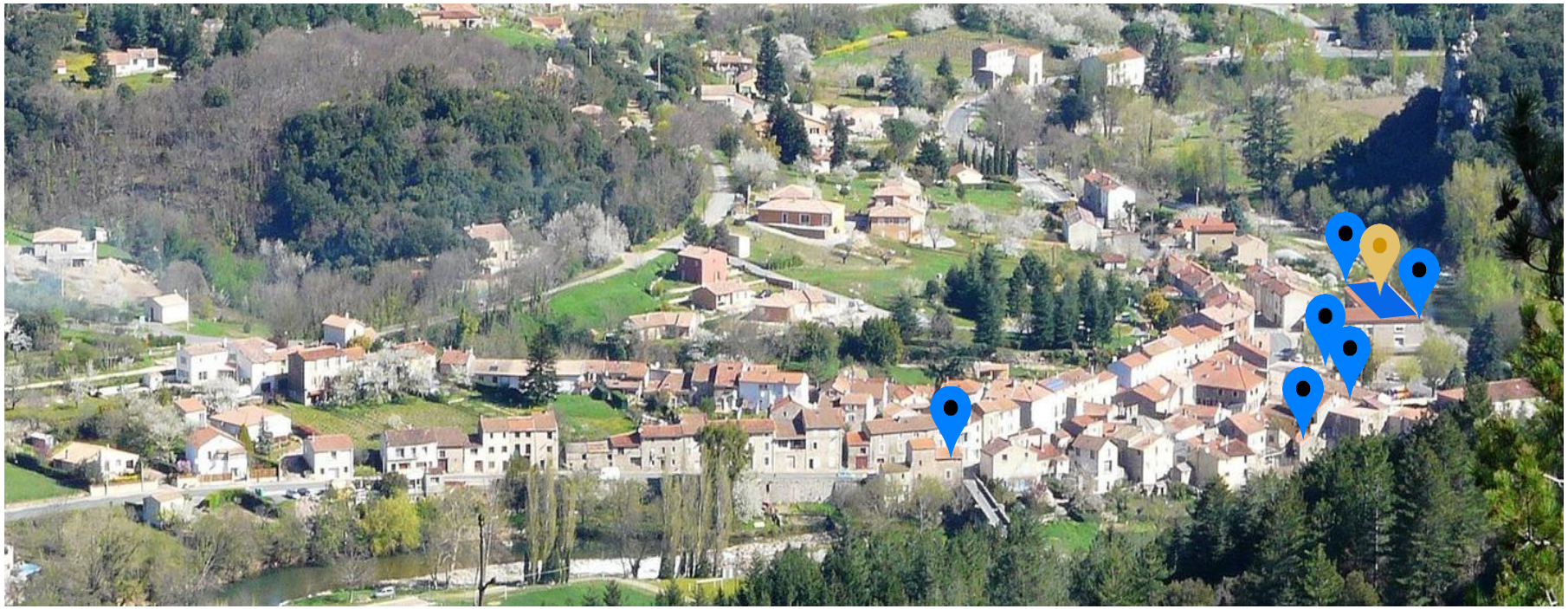
Example: Prémian, France (07/18)



First collective self-consumption project in France **using Blockchain**

Building owner & producter : **Commune de Prémian**
« Personne Moral Organisatrice » : **Prémian Energie Positive**
Engineering company : **TECSOL**

Prosumption in France
Example: Prémian, France (07/18)

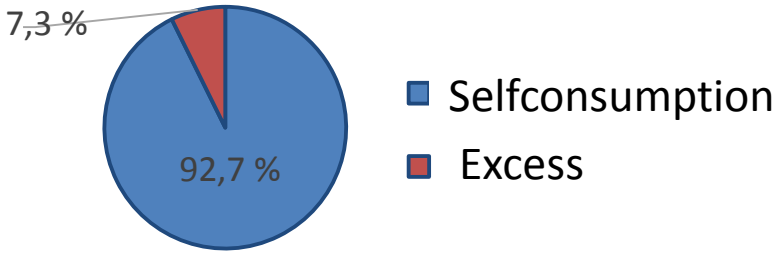
First collective self-consumption project in France **using Blockchain**

28 kWp
1 producer, **7** consumers
52000 € investment
1158 € annual electricity savings
19,5 % solar fraction

Installation connected

Dynamic repartition Sunchain with Blockchain technology

SUNCHAIN



Prosumption in France

5. Tomorrow : use your energy wherever you are

PVP 4Grid

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Thank you for your attention

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References

ADEME, “Les avis de l’Ademe: L’autoconsommation d’électricité d’origine photovoltaïque”, (02/18)
https://www.ademe.fr/sites/default/files/assets/documents/avis-de-lademe_autoconsommation_pv_fevrier2018.pdf

PV Magazine, “EDF commissions “France’s largest collective self-consumption PV project”, C. Rollet, (05/19)
https://www.pv-magazine.com/2019/05/08/edf-commissions-frances-largest-collective-self-consumption-pv-project/

ADEME Occitanie, “Autoconsommation photovoltaïque: Comment produire de l’électricité et la consommer chez soi?”, M. Bzdokalec, (02/19)
https://www.ademe.fr/sites/default/files/assets/documents/photovoltaique-autoconsommation-010839.pdf

PV Europe, “Exemplary collective self-consumption project in northern France”, (02/18)
https://www.pveurope.eu/News/Solar-Generator/Exemplary-collective-self-consumption-project-in-northern-France

DGEC, “Self-consumption framework in France“, L. Oriole, (05/18)

La Tribune, ‘Environ 20000 foyers Français pratiquent l’autoconsommation“, Article partenaire Enedis, (12/17)
https://www.latribune.fr/entreprises-finance/la-tribune-de-l-energie-avec-enedis/environ-20-000-foyers-francais-pratiquent-l-autoconsommation-760556.html

https://www.observatoire-energie-photovoltaique.com/index.php?option=com_content&view=article&id=207&Itemid=617

La Tribune, “Autoconsommation collective : expérimentation concluante pour Gironde Habitat et Enedis“, P. Cheminade, (11/18)
https://objectifaquitaine.latribune.fr/innovation/2018-11-29/autoconsommation-collective-experimentation-concluante-pour-gironde-habitat-et-enedis-799296.html

https://thenounproject.com