Prosumption in France

Brussels, 29th of May 2018

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2. Market status

3. PV collective self-consumption presentation and remuneration scheme

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1. Individual/collective PV production/self-consumption

- Total selling of PV production
- Partial (collective) self-consumption
- Total (collective) self consumption

Since law n°2017-227 (24/02/17)
2. Market status

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).

Cumulated self-consumption installations connected to the grid per quarter

Source: Observatoire de l'énergie solaire photovoltaïque

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

Source: TECSOL
## Prosumption in France

### 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.

<table>
<thead>
<tr>
<th>P_{\text{inst}}</th>
<th>FIT (€/kWh)</th>
<th>Premium (€/Wp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 9 kW</td>
<td>0,1</td>
<td></td>
</tr>
<tr>
<td>9 kW &lt; P_{\text{inst}} &lt; 100 kW</td>
<td>0,06</td>
<td></td>
</tr>
</tbody>
</table>

- **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%.

<table>
<thead>
<tr>
<th>P_{\text{inst}}</th>
<th>FIT (€/kWh)</th>
<th>Premium (€/Wp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 3 kW</td>
<td>0,39</td>
<td></td>
</tr>
<tr>
<td>3 kW &lt; P_{\text{inst}} &lt; 9 kW</td>
<td>0,29</td>
<td></td>
</tr>
<tr>
<td>9 kW &lt; P_{\text{inst}} &lt; 36 kW</td>
<td>0,19</td>
<td></td>
</tr>
<tr>
<td>36 kW &lt; P_{\text{inst}} &lt; 100 kW</td>
<td>0,09</td>
<td></td>
</tr>
</tbody>
</table>

- **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.”

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.”


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

- **Primary sector**
  - Hospitals
  - Supermarkets

- **Secondary sector**
  - Offices
  - Schools

**Tertiary sector**

- Residential sector with an optimized electricity consumption profile

Schools are particularly relevant for collective self-consumption since they offer an interesting surface but are closed in the summer during high production periods and during week-ends.
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 **blockchain** developed in the framework of the DIGISOL project
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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...
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
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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
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**

- **92.7% Selfconsumption**
- **7.3% Excess**
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5. Tomorrow: use your energy wherever you are
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Thank you for your attention

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 764786

The DIGISOL project on collective self-consumption is cofinanced by PIA and operated by ADEME
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