



Solar energy and electric mobility: which synergies for energy transition?

Feedback from pioneers



Study Context



Observations :

- Development of electric mobility
- A growing solar panel stock
- Energy transition pressing needs
- Emergence of new model, including coupling devices

→ **The opportunity to study complementarity between solar panel and electric charging station**

Study scope



Industrial and service sector, equipped with solar panel and / or electric charging station

The study is based on experts feedback coming from the following area :

Firm with charging station or solar panel project.



Solution suppliers



Facilitators



Main issues

→ *What are the main questions that mark out a PV / EM coupling project?*

Motivations?



Improve/Up one's CSR assessment

Convey a positive image to stakeholders and strengthen the sense of belonging of employees



Be law-compliant

Anticipate the compulsory installation of charging stations provided for by the LOM



Optimise costs

Financing the switch to electric mobility and pooling expenses

Challenges?



Comply by administrative obligations

Anticipate administrative constraints related to works, integrate connection rules



Stay at isocosts

Develop an economic model to achieve profitability within a reasonable timeframe



Remove organizational obstacles

Engage project stakeholders and establish appropriate governance

Main steps: most people interviewed felt lost in the operational implementation

	SIZING		CONTRACTOR
	ADMINISTRATIVE PROCEDURES		CONNECTION TO THE GRID
	MAINTENANCE		INTERNALIZED OR OUTSOURCED MAINTENANCE

The economic interests of photovoltaic and electric mobility coupling

01

Pooling costs

The different facilities generate costs that can be pooled (such as connection work, installation work, maintenance of the installations).

02

Saving energy and power

The PV production allows to supply the EVCI while limiting the purchase from energy suppliers. Self-consumption can limit the need for power that is subscribed to the DNO. This sometimes avoids exceeding a threshold that would require heavy and costly connection work at the customer's expenses.

This use case requires synchronizing consumption and PV production.



What about storage and batteries ?

Storage – for example by batteries - deserves to be studied in order to expand the use of PV as a direct power source for EVCI. It is the subject of demonstrators. Storage is necessary to reduce maximum power consumption from the grid therefore DSO investments.

Various and customized economic models

FINANCING MODELE

CAPEX

- ✓ Better acceptability from the board
- ✓ Simplifying administrative procedures



OPEX

- ✓ Profitability quickly achieved (the first year)
- ✓ Cash conservation



TIERS INVESTISSEMENT

- ✓ Acquisition de l'installation sans avance de trésorerie



CONTRACTUAL MODEL PV

TOTAL SALE

- ✓ **Modèle aujourd'hui le plus rentable**

SELF-CONSUMPTION

- ✓ **Energy savings**
- ✓ **Avoidance of threshold effects**



The business model is improved by all existing subsidies. However, they seem poorly known and require support.

Other types of experiments have already been launched in France on extended perimeters

Island environment

- **FlexMob-île, Belle île:** A fleet of Zoé and Kangoo ZE will be supplied by a network of charging stations. The carsharing service will benefit from the surplus energy produced by solar panels installed on the roofs of main public buildings. Charging of electric cars is triggered when the building produces more energy than it consumes.
- **VIAsole en Corse:** development of software tools to synchronize EV charging according to renewable energy production and the constraints of the electricity network
- **Appel à projet de l'ADEME (2019):** 13 projects selected out of 36 candidates for an investment of € 3.3 million

Urban

- **Ombriwatt, Harnes:** installation of shelters equipped with solar panels that will supply charging stations for electric vehicles. Energy for municipal buildings and electric vehicles
- **aVEnir, PACA et Auvergne-Rhône-Alpes :** ensure the integration of electric mobility at a lower cost on the network. Includes a use case of synchronization between recharging and PV production.

Many experiments remain on the perimeter of the same site. Demonstrators exploring synergies between players over a wider geographical area will help maximize the societal impact.

The convictions that emerge from this WG



The first motivation lever for photovoltaic / electric mobility coupling is now CSR



The implementation of this type of coupling is not industrialized: there is a specific solution for each need. Communicated feedback is still scarce.



The promoters of this type of project need help to link processes (and actors) mobility and renewable energy production which evolve in parallel.



Future studies deserve to integrate the synergies that these actors could have among themselves to optimize the sizing of infrastructures. In particular to take into account network impacts.



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