

Solutions & Services for a 100% Renewable world !

WHO WE ARE AND HOW WE ACT



Sun'R Group

French, independant, implied in the whole value chain



Developer & investor of PV assets

- ✓ Distributed storage units
- ✓ Rooftop & groundbased plants
- ✓ Dynamic agrivoltaic systems

PV plants operator

- ✓ Instrumentation, monitoring, control
- ✓ Operation & maintenance



Agrivoltaic plants pilot

- ✓ Service provider for every developer involved in / concerned by digital agriculture
- ✓ Complex algorithm based on crop growth model, meteo forecast and local / operational data
- ✓ Multi-criteria optimization : weather conditions, farming operations, ...



Complete aggregator

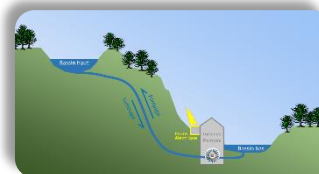
- ✓ Generation & storage units valorization
- ✓ Supplier of services to electric system

Technology developer

- ✓ Storage dedicated to RES integration
- ✓ Synergies agriculture and PV
- ✓ Piloting tools for energy infrastructure

Sun'R trajectory

Technology incubator to fully integrate Renewables



... to local valorization
and self-consumption

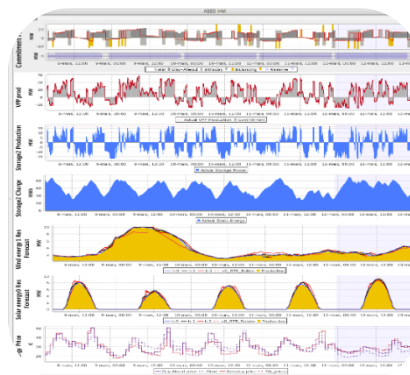
Direct sale from
2018

Renewables
aggregator
since 2017

Flexibility
systems (EMS)
since 2016

New
generation
technologies
since 2009
(dynamic
agrivoltaism)

Independent
producer (IPP)
since 2007
(rooftop,
ground-based)



From simple generation...

WHAT WE SAID 2 YEARS AGO IN BERLIN

Relevance of storage

Where should it be located ?

+ Strengths

– Weaknesses

Centralized storage

- ☺ Great capacity in a single unit

- ☹ Ignorance of local stakes
- ☹ Scarcity of suitable sites
- ☹ Requires grid development
- ☹ Public investment

« Territorial » storage

- ☺ Capacity mutualization
- ☺ Local issues management
- ☺ Investments optimization
- ☺ Repossession of the energy topic
- ☺ Joint investment

- ☹ Complexity of a new matter

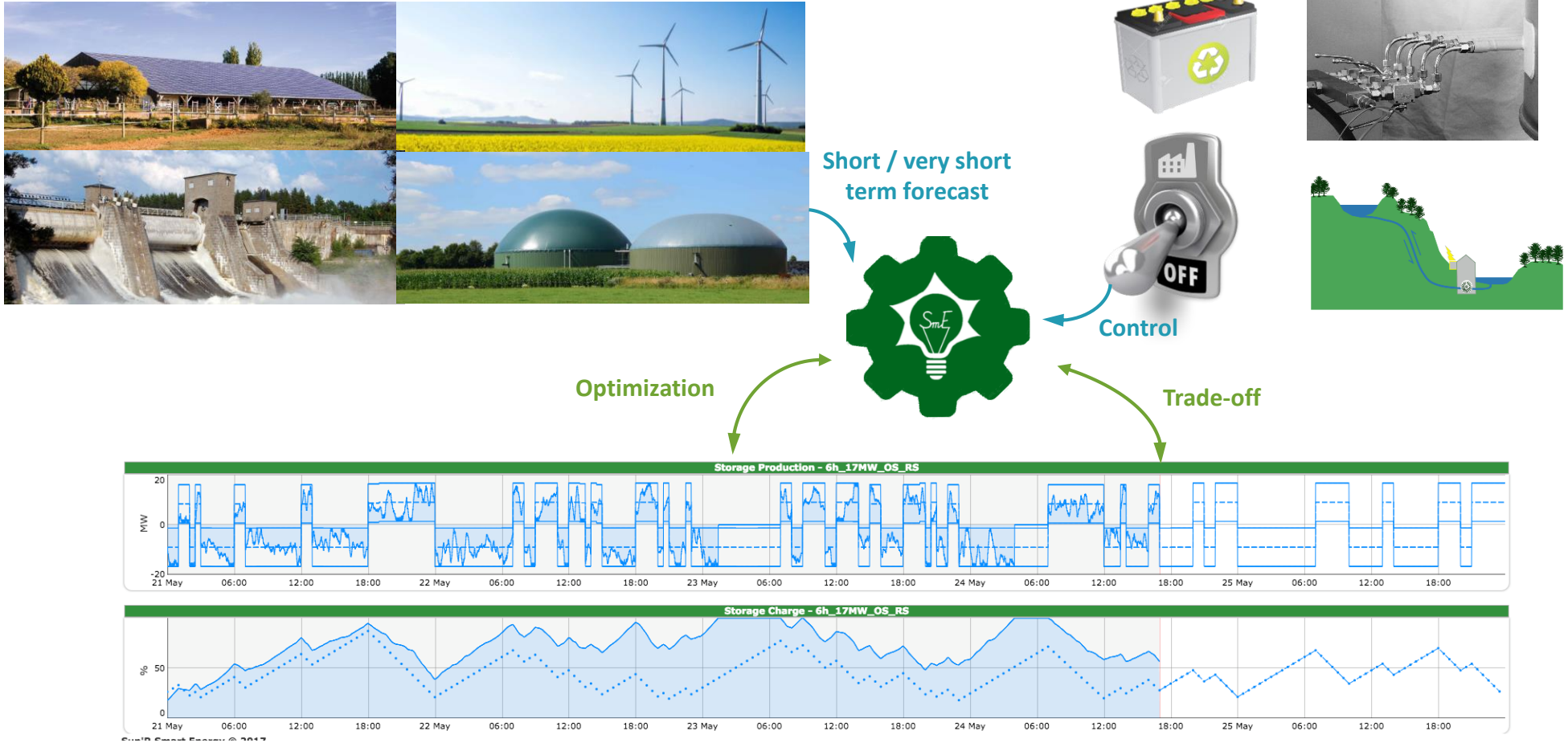
On site storage

- ☺ Individual investment
- ☺ (Self-consumption)

- ☹ Global overinvestment
- ☹ No mutualization
- ☹ If not a real islanding with permanent uncoupling, self consumption raises the question of grid financing

How to deal with storage ?

Couple with RES to supply energy & services to the system



Key takeaways 2016

- ✓ Together with European countries, France has to consider **decentralized and highly flexible storage units** deployment
- ✓ Small pumped hydro storage (PHS) provides a positive solution for **long lasting (> 40 years) needs**
 - ♦ Both for **technical needs** (supply & demand balance, frequency reserve, local network management, etc.)
 - ♦ And **economical challenges** (RES generation time-shifting to reach sales opportunities)
- ✓ It is a **reasonable risk** to invest in such storage units
- ✓ Yet, siting, dimensioning and operations management must be supported by **tailor-made modeling and decision making tools**



Ambitions

2017 : attempts to initiate a new storage program

Prove the value
of territorial
storage for the
distribution grid



- ▶ Analyse the constraints for the grid with advanced modelling tools
- ▶ Measure the benefits of distributed storage to relieve the grid and define the technical characteristics (location, size, capacity, power)
- ▶ Identify relevant sites to integrate storage and its type thanks to geographic information systems (GIS)

Create a win-win
business model
for both storage
and grid



- ▶ Evaluate the current and future techno-economic value of territorial storage
- ▶ Supply data and structure recommendations (Grid tariff, 5 & 6)
- ▶ Propose a complementary remuneration mechanism for storage

Develop 2 territorial
storage pilots with
different size and type



- ▶ **A lasting storage unit**, in a long-term vision, offering services to the distributed grid and allowing the future development of Renewables on that local grid (small PHS, local distribution company)
- ▶ **A temporary storage unit**, in a mid-term vision to help the local grid currently in trouble integrate in the next coming years new Renewables (battery of approx. 8MWh, Enedis)

Ambitions

2017 : small (aggregator) but beautiful !

- ✓ A very capable and pioneer actor
 - ◆ Open-air laboratory of 70 PV units
 - ◆ Near real time plants instrumentation
 - ◆ Proprietary EMS optimizing a virtual power plan (VPP) with storage
- ✓ But not enough big according to financiers
 - ◆ Require counterpark as solid as prior buyer = EDF
 - ◆ Not satisfied with a bank warranty covering the possible default period
- ✓ Unfortunately, a French market less open than in Germany



Does not trust in



Relies on



WHAT WE BELIEVE IN FOR THE FUTURE (MID OR LONG TERM ?)

Vision for the future

Helping territories re-appropriate energy

✓ From labeled “Territoires à Energie Positive” (get subsidies)

- ♦ Increase installed RES capacity
- ♦ Implement energy efficiency programs
- ♦ But : implication of grid operator ? Management of the new local system ?



✓ To really assumed **self-managed territories** (take ownership)

- ♦ Support the RES extension in relation to the territorial Climate & Energy Plan (PCAET), with more and more **flexible units** (e.g. agrivoltaic plants)
- ♦ Including the **consumption perspectives** (local community) and **network constraints** (grid operator)
- ♦ Resulting in **needs expression** for local flexibility assets
- ♦ Managing their **energy cover and import ratio**



Vision for the future

Helping territories re-appropriate energy

- ✓ First outlines of energy local re-appropriation
 - ♦ Without storage : in an artisanal zone of Bretagne (pilot project, 40 kWc)
 - ♦ With storage : grouping municipal buildings, shop and households (pilot project, 220 kWc and 120 kWh storage)

- ✓ But to become economically viable, still dependent on
 - ♦ Public decision makers : **stop undue fiscal and network tariff penalties**
 - ♦ Grid operators : **subcontract storage operation** to private specialized companies (e.g Sun'R Smart Energy), according to the European commission prescription



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