

# Hybrid Projects at BayWa r.e.

Wind/PV-Hybrids in Germany and France





# BayWa r.e. Facts and Figures

Founded

**2009**

Turnover 2023

**5.8bn €**



EBIT 2023

**192.3M €**

Employees

**> 5,400**



Globally active

**34**

countries

BayWa r.e. is a leading global renewable energy developer, service provider, distributor, and energy solutions provider.







## Our portfolio covers a broad range of renewable energies



### Projects

**6 GW** installed capacity in wind and solar globally

**32 GW** global project pipeline solar, onshore and offshore wind, storage and hybrid (thereof **8 GW** worldwide)



### Asset Operations

**10.5 GW** under operational management; digital asset operations expertise and technical management for solar, wind farms and biogas plants; services in energy trading

**6.8 GW** direct marketing portfolio and broad energy trading services incl. PPA

New **IPP portfolio**; plans to ramp up to 2.5 GW in the medium term



### Solutions

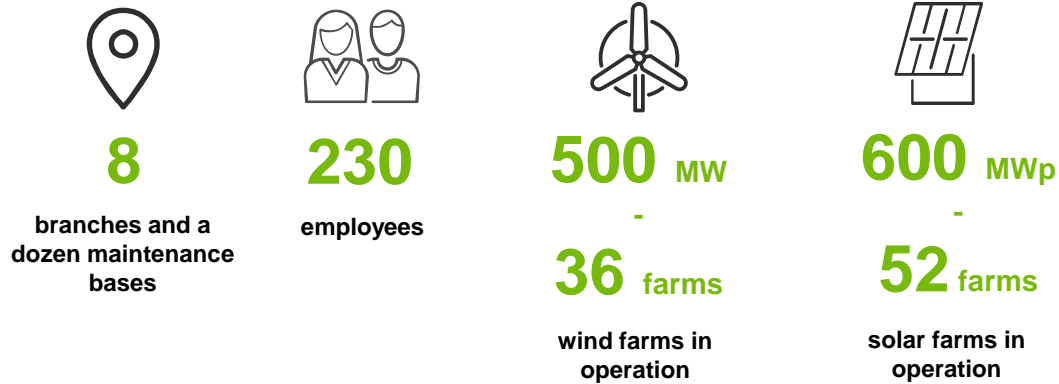
**30 years** of solar distribution experience, a wide range of quality products and services for about **17,000** installation and sales partners globally

Tailor-made **Energy Solutions** for commercial and industrial clients from self-consumption to green energy supply



# BayWa r.e. France gives priority to proximity

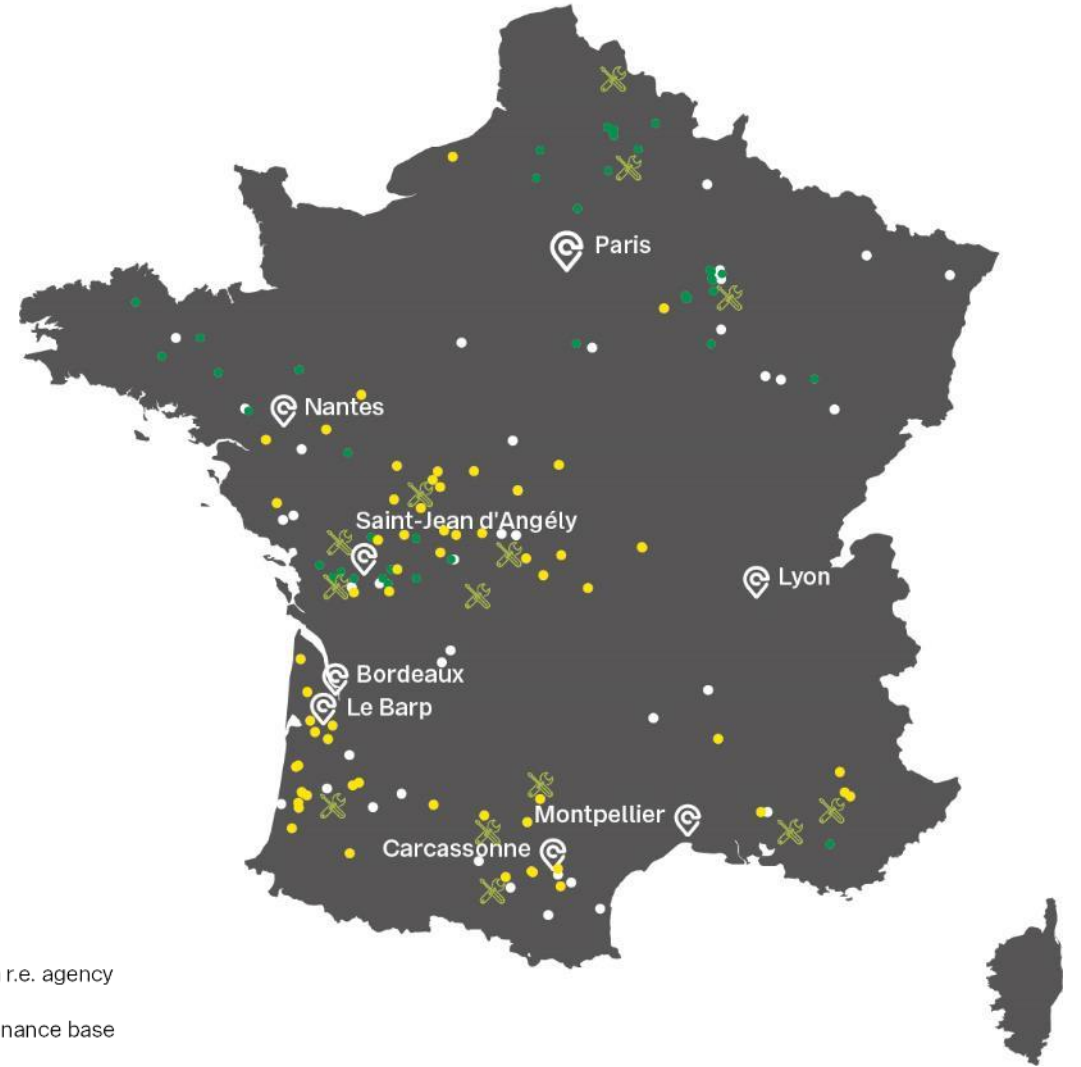
## Key figures BayWa r.e. France








## r.e.think energy with the territories

At BayWa r.e., we are convinced that the energy transition will not happen without the support of our fellow citizens and their representatives.

That's why we believe that local communities must be at the heart of the development of renewable energy projects.



-  BayWa r.e. agency
-  Maintenance base
-  Solar farms built and in operation
-  Wind farms built and in operation
-  Wind and solar projects submitted or authorized





## **Wind/PV-Hybrids**

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1. What are the benefits?
2. The grid connection of Hybrids
3. The Permitting of Hybrids



## Why do we need hybrids?

### We need hybrids among others to...

- mitigate risks of increasing grid capacity scarcity & falling capture prices
- benefit from synergies (i.e. infrastructure savings, extended revenue opportunities) and regulatory incentives
- optimize the land use and save costs.  
Land is more efficiently used since installed capacity and energy output per square meter of used land increases
- integrate even more RE-sources and contribute to a more sustainable and flexible energy system
- provide a buffer for future growth and expansion of the grid (defer investments in grid infrastructure)
- flatten generation profiles from volatile renewable energy sources





# “Overbuilding” the grid connection capacity can be key

## Facts

- Grid connection points are increasingly becoming an asset itself in many regions
- Standalone RE power plants do not fully utilize the **point of connection (PoC\*)** for a large part of the time
- The utilisation of a limited grid connection capacity can be optimised by connecting more than one RE-generator and/or storage assets

Capacity of the contracted PoC  
< SUM of the installed generation & storage capacity



Savings from using shared infrastructure  
> costs of potential curtailments

## Benefits

The overall objective is to maximise benefits on different levels:



Project development



Performance / Operators



Economics / National economy



Power System

Overbuilding the point of connection (PoC\*)  
can be beneficial on different levels.







# Permitting of Wind/PV-Hybrids in Germany and France

## General Facts

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- Hybrids are not treated as such for permitting:
  - The wind project and the PV project run through different independent permitting procedures with different durations and challenges
- Wind projects are authorised according to the BImSchG / ICPE rules.
- PV-projects (ground mounted) are authorised according to urbanism and need to receive building permit.

## Germany specifics

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- Instruction duration process limited to 18 month

*NOTA - further details to be completed soon -*

## France specifics

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Lots of similarities between both PV and Wind permitting processes : initial & impact assessment, audition at landscape or land consumption Commission, Public enquiry but Wind permit is much complex and landscape oriented.

Administration's collaborative culture is stronger than wind permitting complexity





## Case study

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# Berg-Espich – Completion of innovative solar-wind hybrid project

**Project success** The solar park, built in several construction phases, uses the infrastructure and the grid connection point of the existing wind park, which went into operation in 2013.

**Location** Bayreuth, Germany

**Capacity** 46 MW (wind + solar) installed  
32 MW max. injected

**Completion** July 2023

## Further information

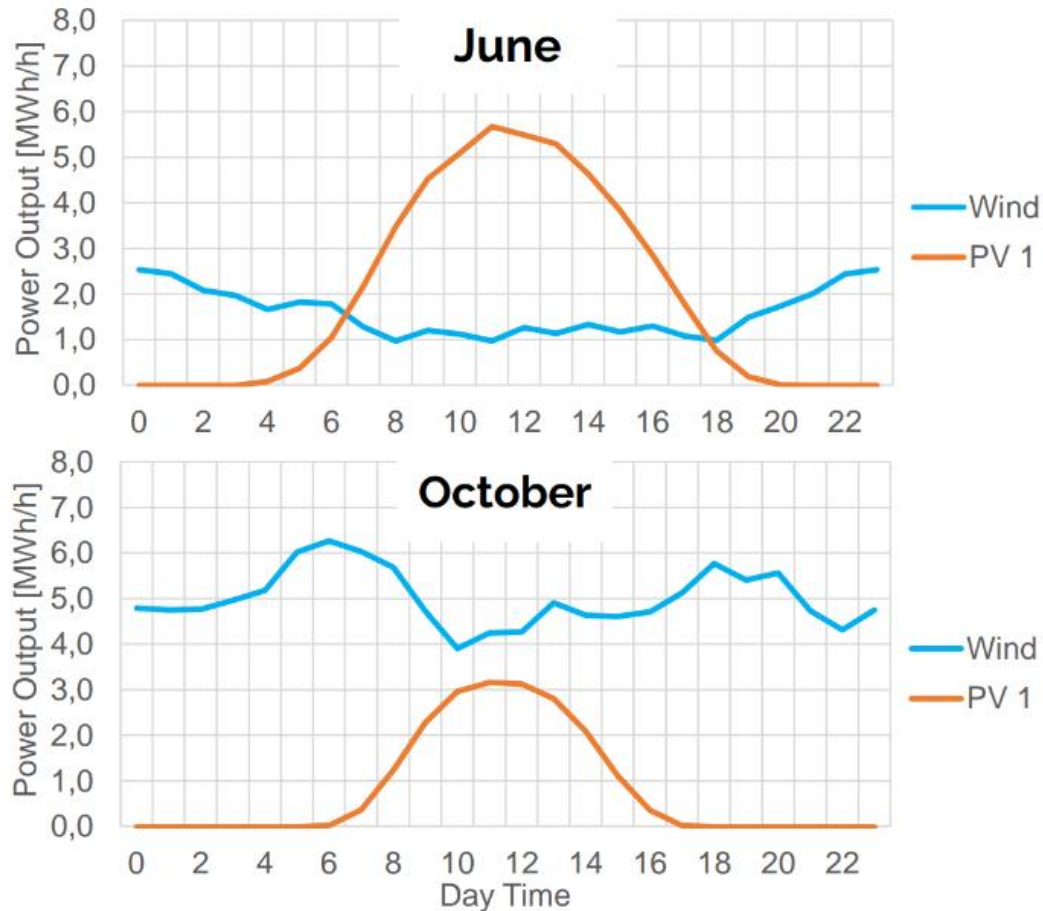
- The solar park is connected to the grid of a wind farm constructed in 2013.
- The main challenge for this innovative project was to adapt the existing components and use the existing infrastructure to ensure maximum and stable production while simultaneously generating electricity from wind and solar energy.
- In addition to being cost effective, hybrid systems will also become more popular due to the positive impacts on the electricity grid.





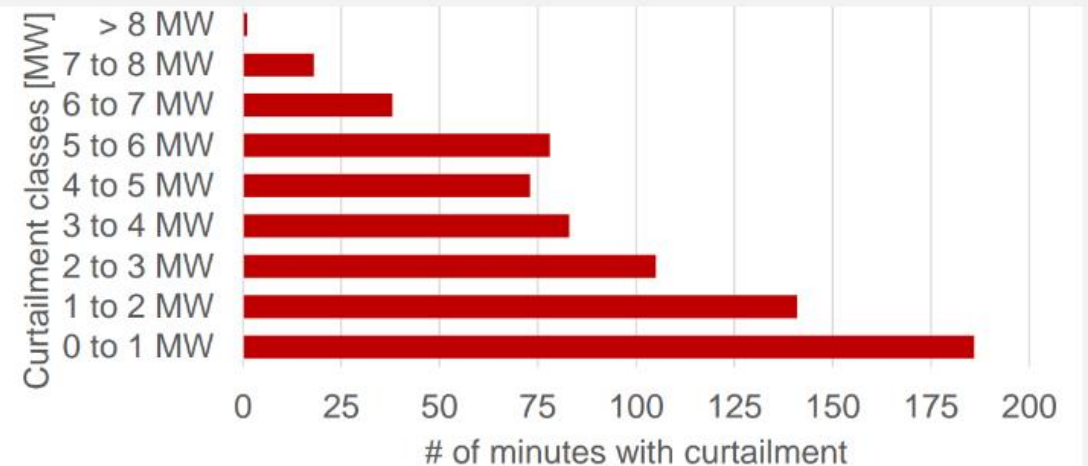
# Complementarity of generation profiles confirmed

## Average daily profiles in 2021:



## Theoretical case - 2<sup>nd</sup> PV section installed in 2021:

- 40 MW generation capacity vs 32 MW grid capacity
- Grid connection point overbuilt by 8 MW
- Curtailment calculated on a per minute basis:
  - Curtailment occurs in 700 min of the year 2021



- Total curtailment would have been 33 MWh/a
- 0.2% of the total PV generation





## Haute-Voie – Imagined hybrid but not treated as such

**Project success** The project is planned as a greenfield colocation wind and solar project on a non-attributed commercial area.

**Location** Loisy s/ Marne, Maisons-en-Champagne, France

**Capacity** 63 MW (wind + solar)

**Completion** Expected between **2028** and **2032**

### Further information

- Both permit applications have been filed at the same time in 2020.
- The solar park is approved since July 2022, Authorization for Wind plant is still awaiting. Instruction process extended 4-times already
- Awarded in case study of CRE 'Bac à sable', testing an over-17-MW grid capacity connection if injection doesn't exceed it.
- cPPA is planned with a large cement plant located nearby





**Can Nalbantoglu**

Président



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