



DFBEW: Wind continued operation conference

Potential for continued operation and repowering in Germany and France

02.03.2021 | enervis energy advisors GmbH

1. volume for continued operation

2. revenue options for the continued operation of wind turbines

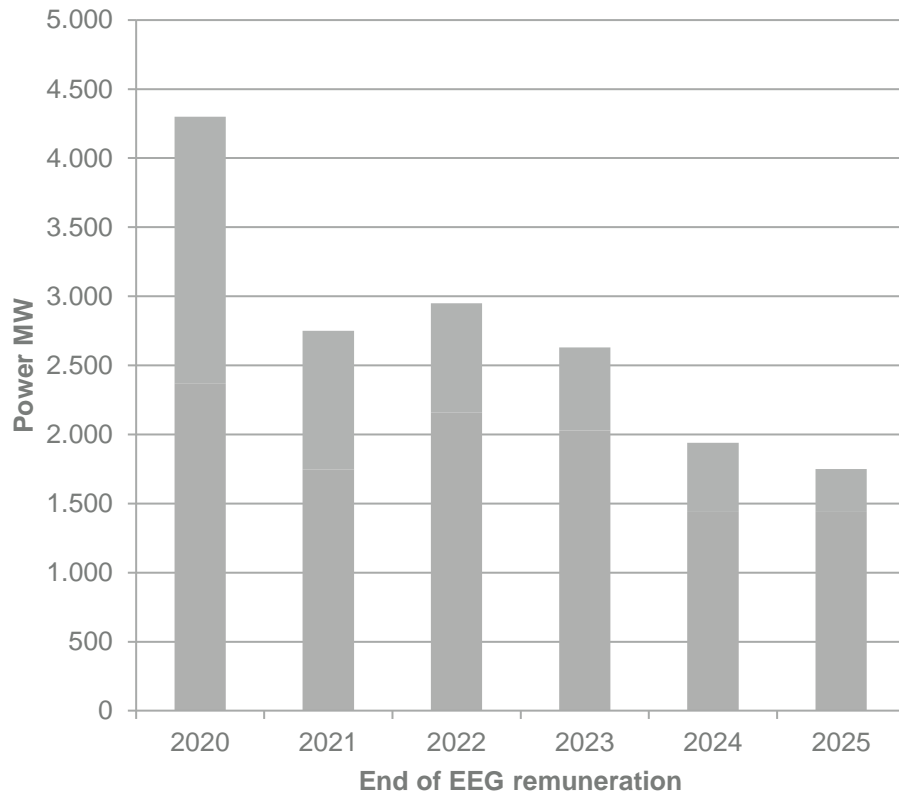
3. evaluation possibilities and analysis tools

4. conclusion

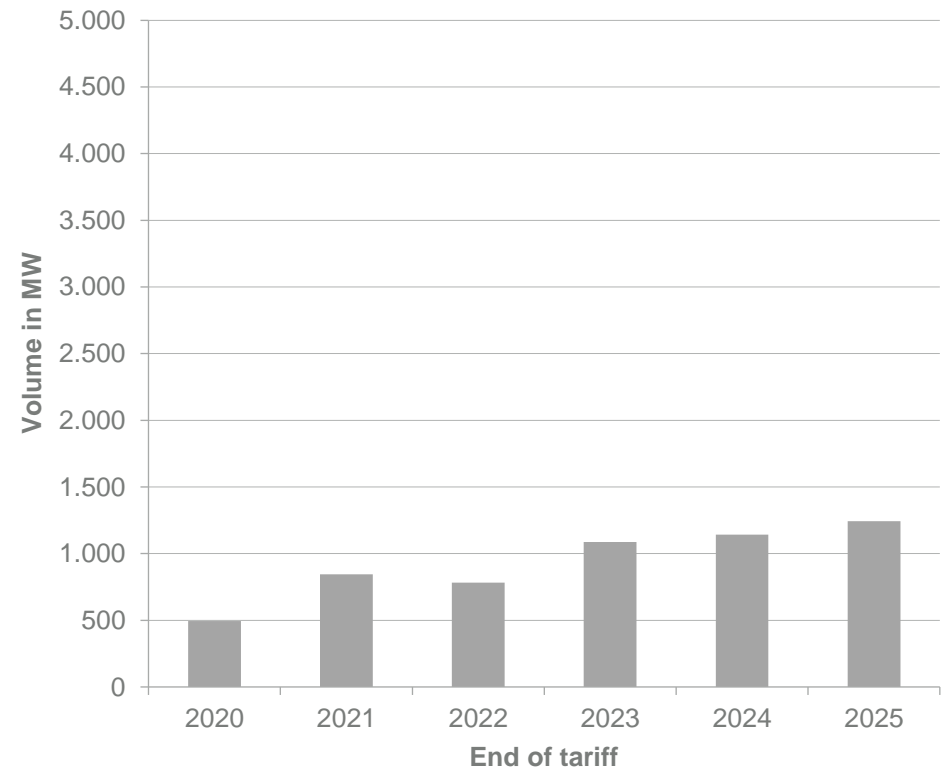
1. volume for the continued operation of wind turbines

Expiry of the remuneration

Germany

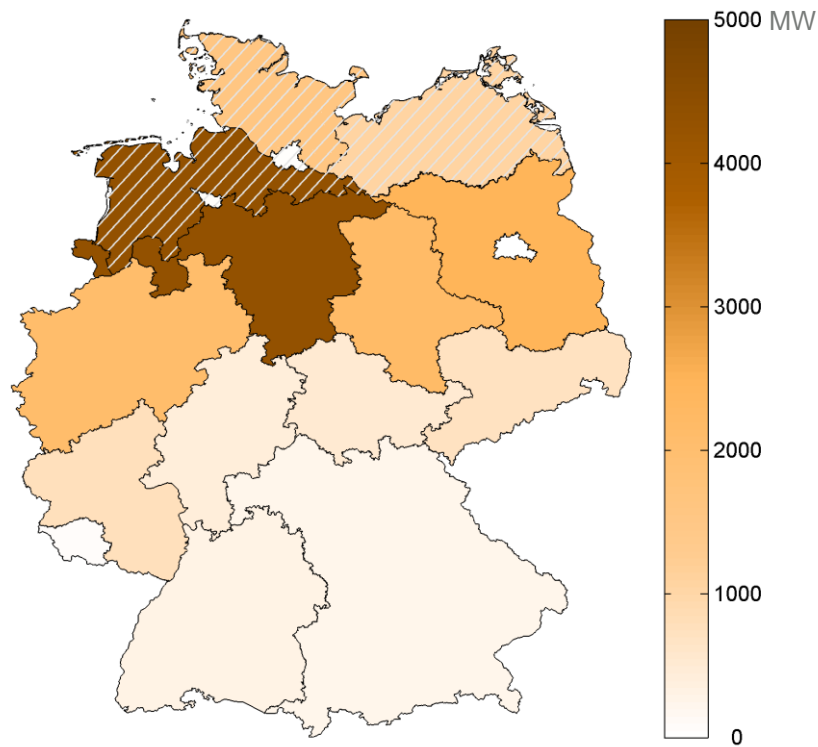


France

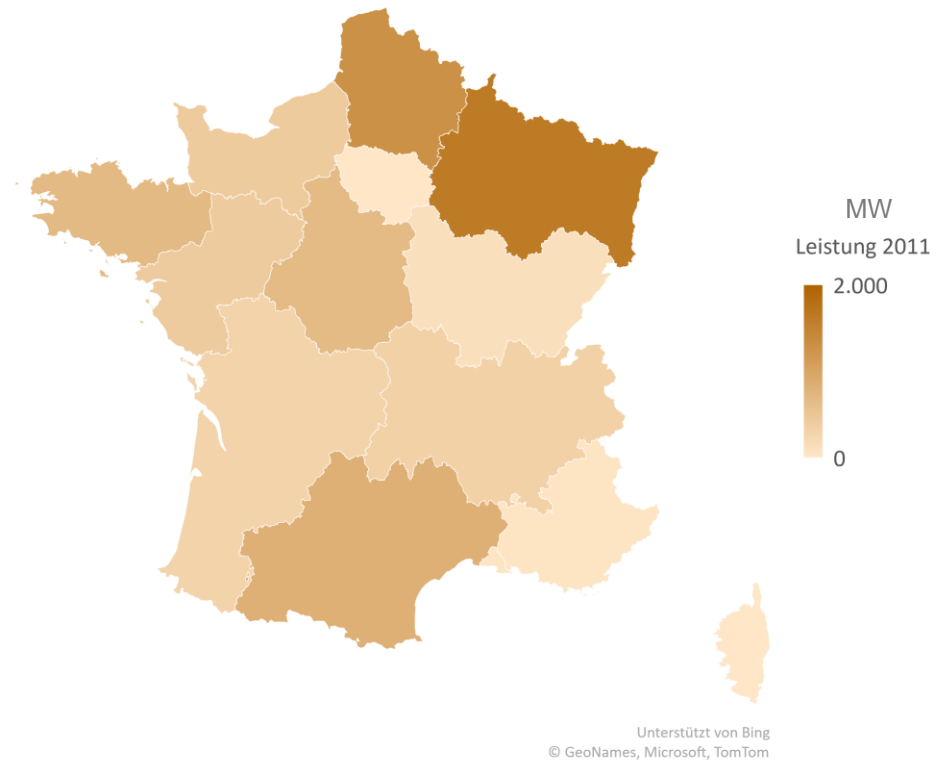


Regional distribution of old WTGs

Regional distribution Germany (<2006)



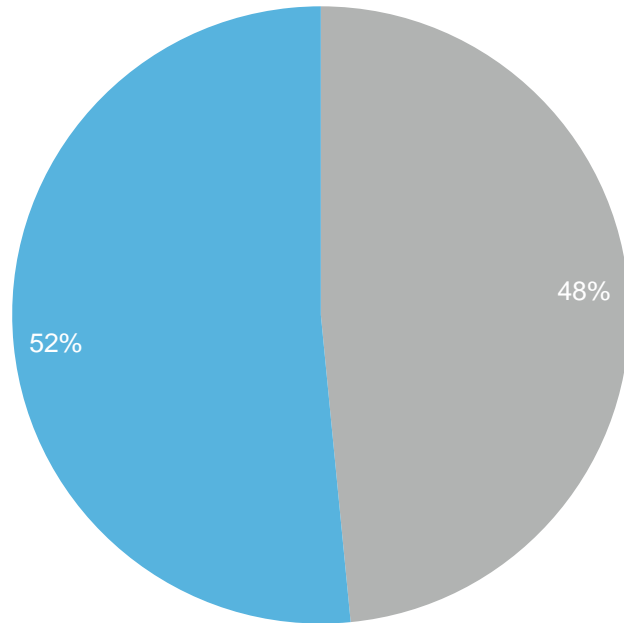
Regional distribution France (<2011)



Priority areas and repowering capability

In Germany, the existence of a legally binding priority area is relevant for repowering. In France, acceptance is particularly important.

Germany



■ Inside priority area ■ Outside priority area

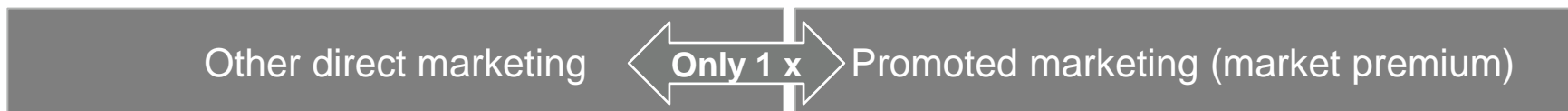
France

- **Wind turbines dismantling depends on operators' choice at the end of the tariff validity period (15 years until 2016, 20 years from 2017) between:**
 - Continue operation
 - Dismantle the installation
 - Install more efficient wind turbines (repowering)
 - Dismantling rate:
 - Year 15: 30%
 - Year 20: 80%
 - Year 25: 100%
- **For Repowering a new permit is needed, this is as extensive as for a greenfield project**

2. revenue options in continued operation

Germany: Variants for marketing in continued operation

	1	2	3	4
Compensation mechanism	PPA for continued operation	Spot marketing	Follow-up remuneration of monthly reference market value + fixed monthly market premium	Follow-up remuneration by feed-in tariff via tender
Applicability for old turbines (over 20y)	all	all	Over 20y: only in 2021	<ul style="list-style-type: none"> Over 20y: 2021 and 2022 only and not repowerable
Remuneration period	unlimited	unlimited	For 2021 only	per tender the FiT is valid until 31.12.2022 each
Revenue security?	Yes	No	No, but supplemented by partial security through premium	Yes
GoO?	Yes	Yes	No	No
marketing costs	(among others DM costs, ...)	DM costs	• 4 €/MWh	• 4 €/MWh
Action?	active	active	automatic	wait and see



France: Variants for marketing in continued operation

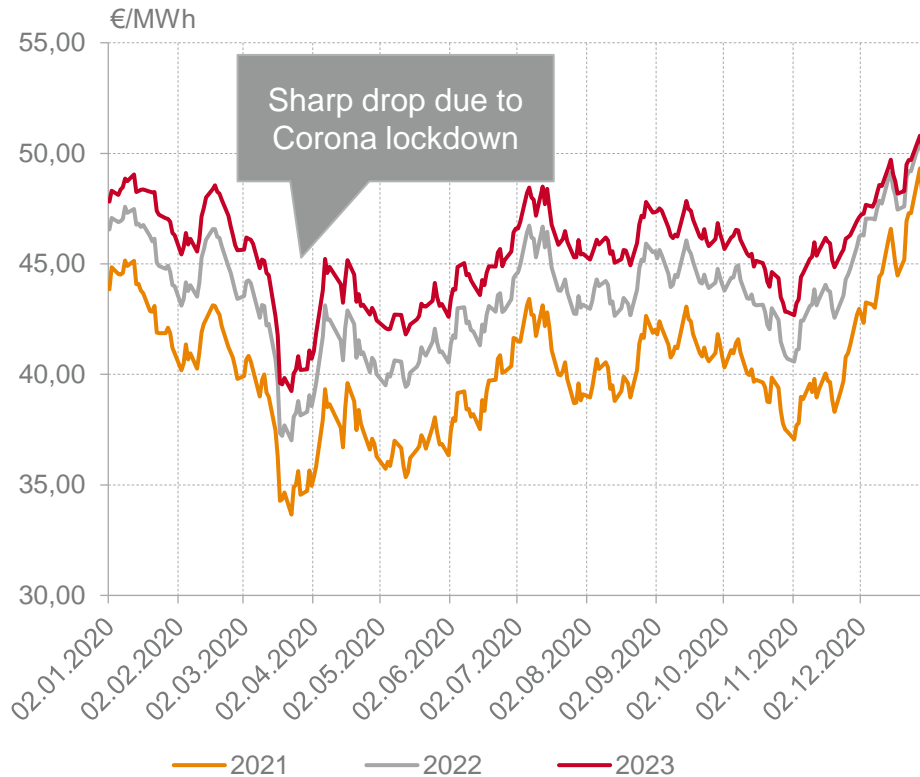
	1	2	3	4
Compensation mechanism	PPA for continued operation	Spot marketing	Follow-up payment by means of monthly reference market value + fixed monthly market premium	Follow-up remuneration by means of AW via tender
Applicability for what turbines	all	all	Ü-20: only in 2021	• Ü20: 2021 and 2022 only • and not repowerable
Remuneration period	unlimited	unlimited	For 2021 only	per tender the AW is valid until 31.12.2022 each
Revenue security?	Yes	No	No, but supplemented by partial security through premium	Yes
GoO?	Yes	Yes	No	No
Marketing costs	(among others DM costs, ...)	DM costs	• 4 €/MWh	• 4 €/MWh
Action?	active	active	automatic	wait and see
	Other direct marketing		Promoted marketing	

Not available

Fluctuations in future market prices on the EEX

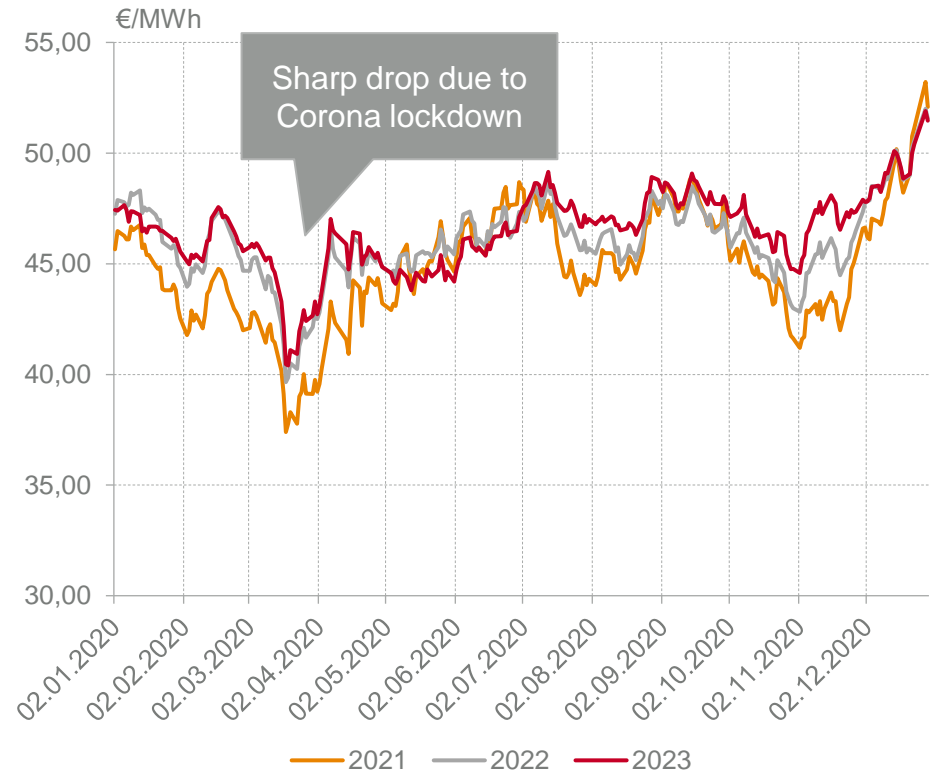
Forward market prices form the basis for PPA pricing, they fluctuate on a daily basis, sometimes significantly, this has a direct impact on PPA valuations

Germany



EEX futures market price data

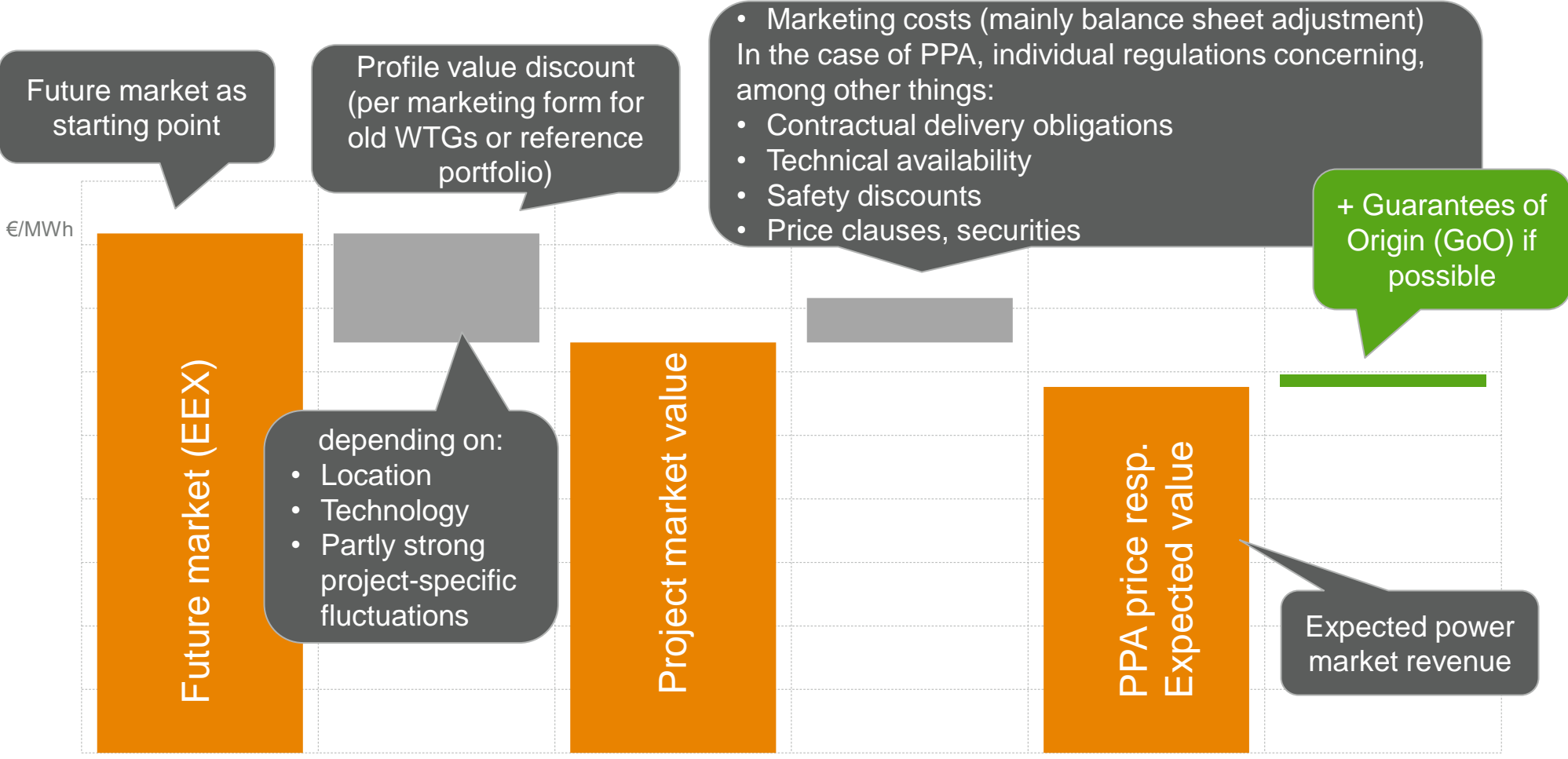
France



EEX futures market price data

3. evaluation possibilities and analysis tools

Evaluation and pricing of various revenue options for continued operation.

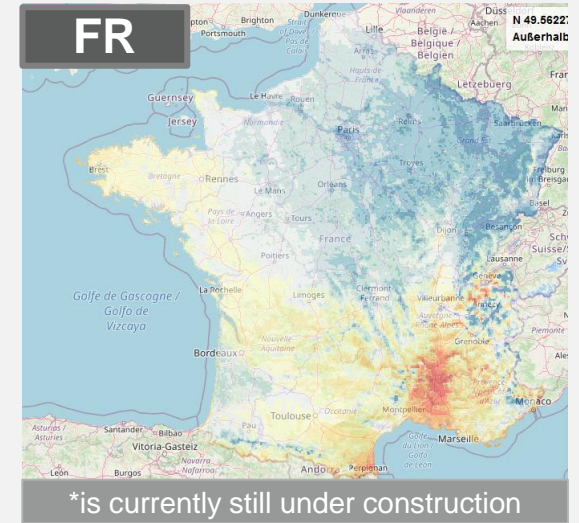


4. conclusion

Conclusion - PPAs for continued operation must be evaluated



PPA - Atlases (online) from enervis



What PPA price can I expect?

Contractual arrangement?

Long-term revenues? Transaction value?



- PPA Tools
- Consulting
- Revenue report (project-specific)

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