

# Regulatory framework and support schemes for wind energy in France

**Renewable Energy Office  
French General Directorate for Energy and  
Climate Change**

**French Ministry for the Ecological and  
Inclusive Transition**

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Ministère de la transition écologique et solidaire

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# Recent developments and prospects for wind energy in France



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# Ambitious renewable energy targets

	2020	2030
European Union	20% renewables in energy consumption	27% renewables
France	23 % renewables in energy consumption (27 % electric renewables)	32 % renewables (40% electric renewables)

- **France started setting up support mechanisms for renewables in the early 2000s with feed-in tariffs**
  - Skyrocketing development of renewables:

**60 MW in 2000** to approximately 18 GW at the end of 2015  
(without hydroelectricity)

# History of wind energy targets in France

Publication of the objective	Objective	Source
February 1996	250 to 500MW at the end of 2005	« Eole 2005 » program
March 2003	2 to 6GW on 01/01/2007 (with 0,5 to 1,5 offshore)	PPI de 2003
July 2006	13,5GW at the end of 2010 (1GW offshore) 17GW at the end of 2015 (4GW offshore)	PPI de 2006
December 2009	11,5GW at the end of 2012 (1GW offshore) 25GW at the end of 2020 (6GW offshore)	PPI 2009
April 2016	15,5GW at the end of 2018 (0,5GW offshore) 24,8 to 29 GW at the end of 2023 (3GW offshore)	PPE 2016



# Current situation

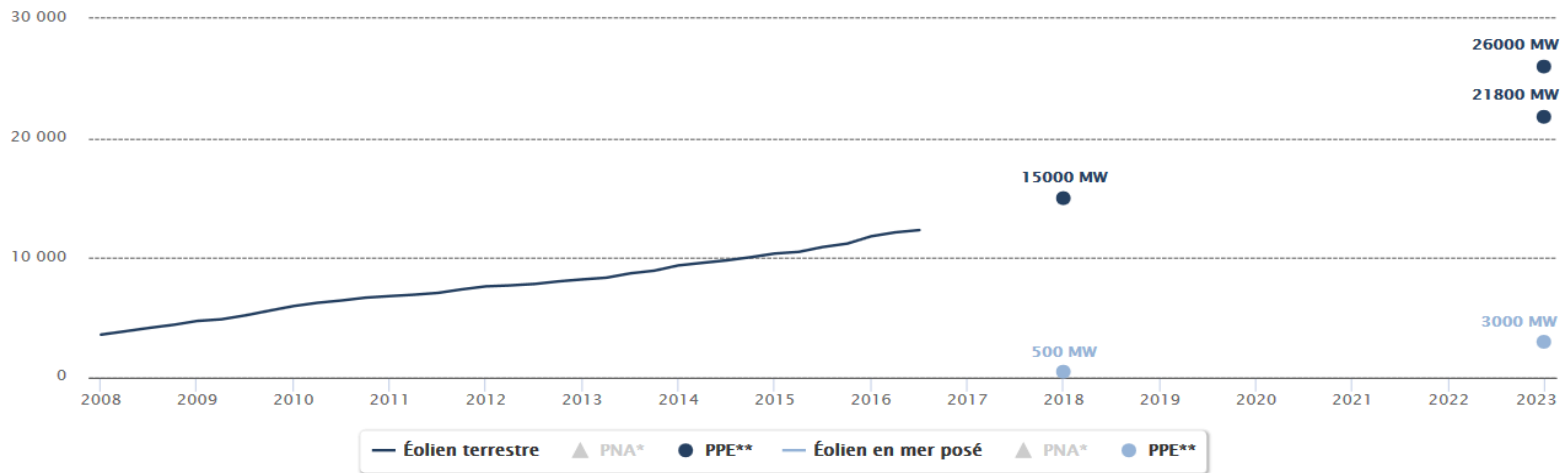
	30/06/17	2018 objective	2023 objective (low)	2023 objective (high)
Wind energy (GW)	12,33	15	21,6	26

- The French **energy multi-year program** is currently under revision and a **new version** should be published in **2018**
- After few years of slowdown, **2016 has been the best year in France's wind energy history**



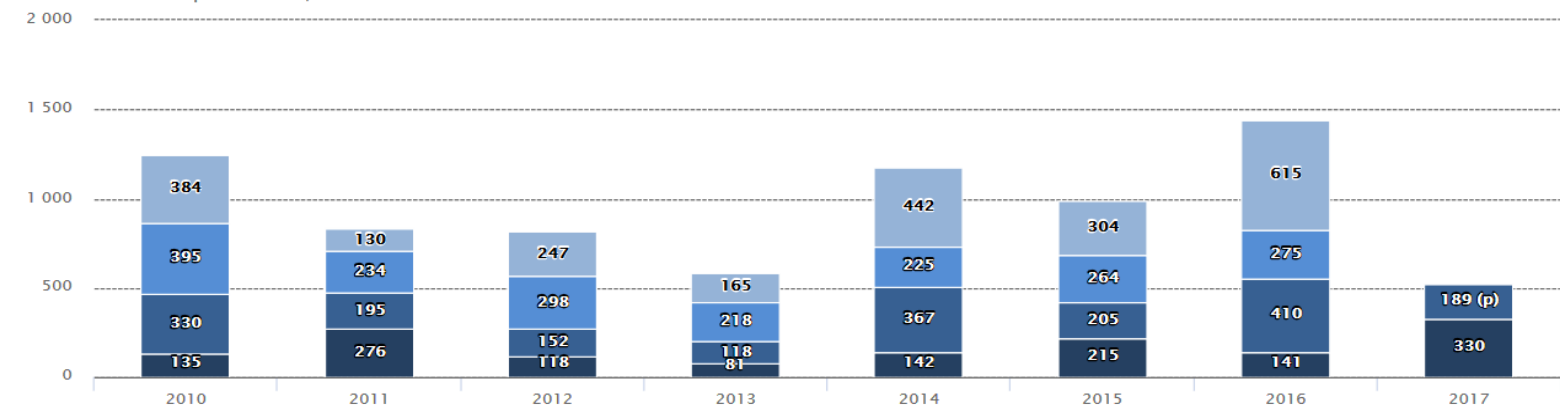
## Évolution du parc éolien

Puissance en MW



## Éolien : nouveaux raccords

Puissance raccordée par trimestre, en MW



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# Latest evolutions of the french regulatory framework



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# From feed-in tariffs to feed-in premium

- France has been using **feed-in tariffs** for wind energy since 2001
- **In 2016** France moves **towards feed-in premiums** for wind energy to comply with European guidelines
- 2016 is considered as a « **transition year** » for wind energy. This transition is managed by a specific regulatory text published at the end of the year 2016\*
- In **may 2017** a brand new **two-part framework** is published.

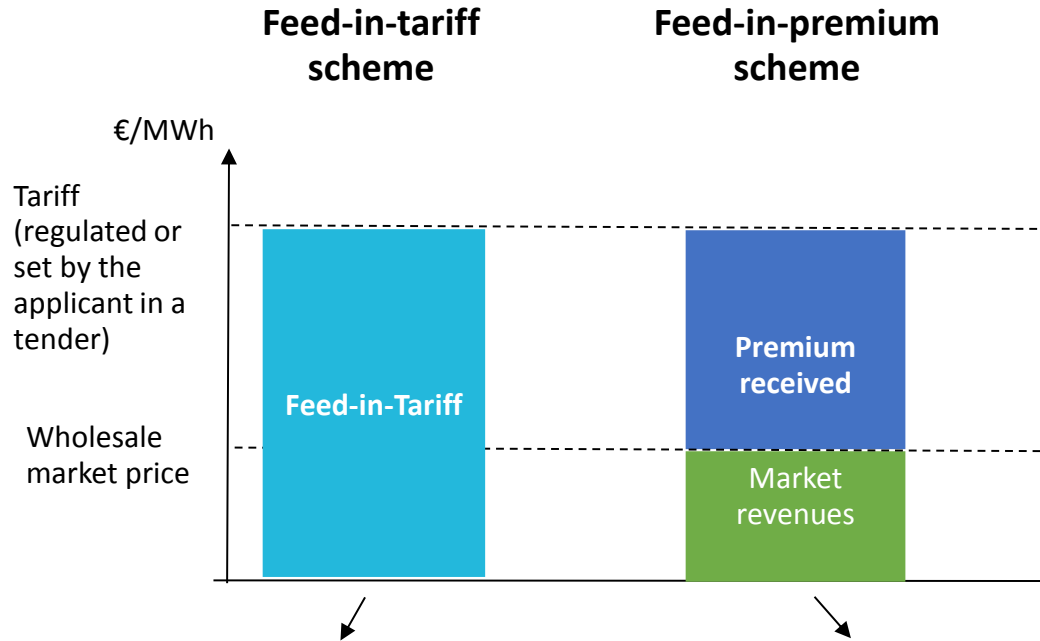
\*Arrêté du 13 décembre 2016 fixant les conditions du complément de rémunération de l'électricité produite  
les installations de production d'électricité utilisant l'énergie mécanique du vent

par





# Two types of support schemes

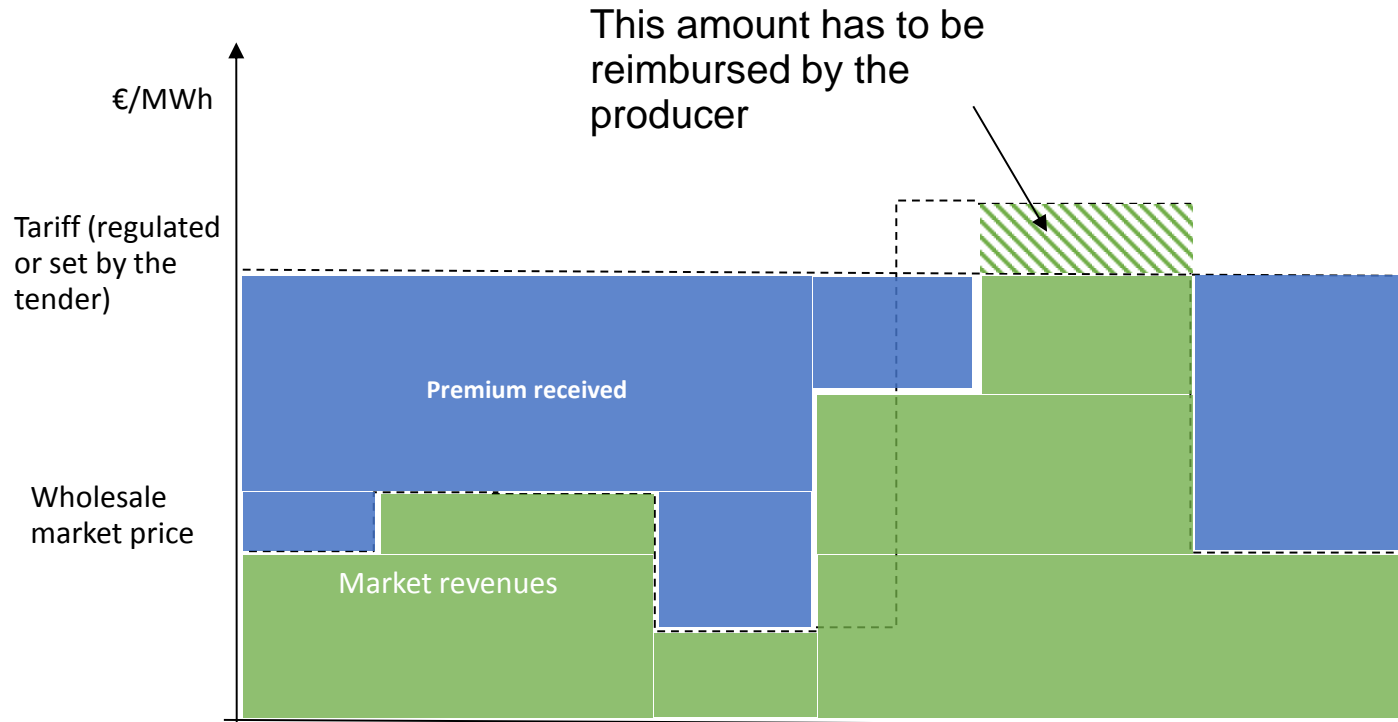


*The producer sells the electricity produced to a compelled buyer at a fixed price, independently of supply and demand in the market and independently of the market price*

*The producer is responsible for selling its electricity in the market and receives a premium in addition to its market revenues*

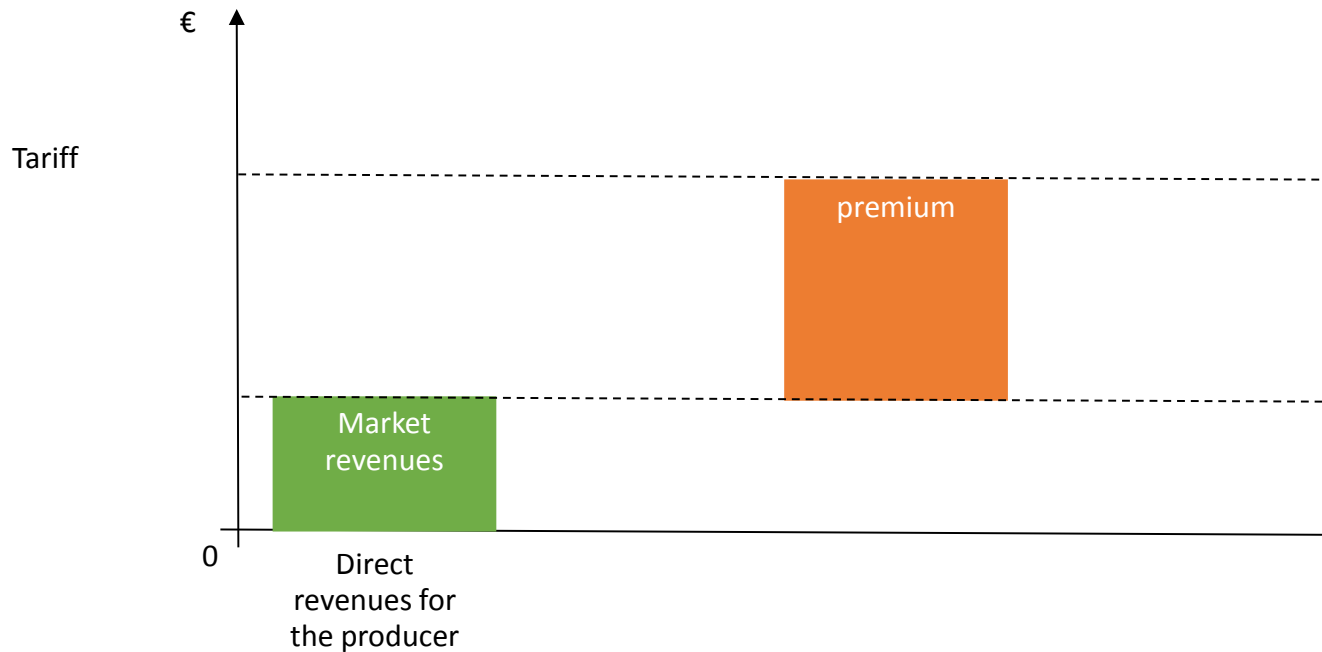
# Feed-in premiums

## Feed-in-premium scheme (or contract-for-difference)



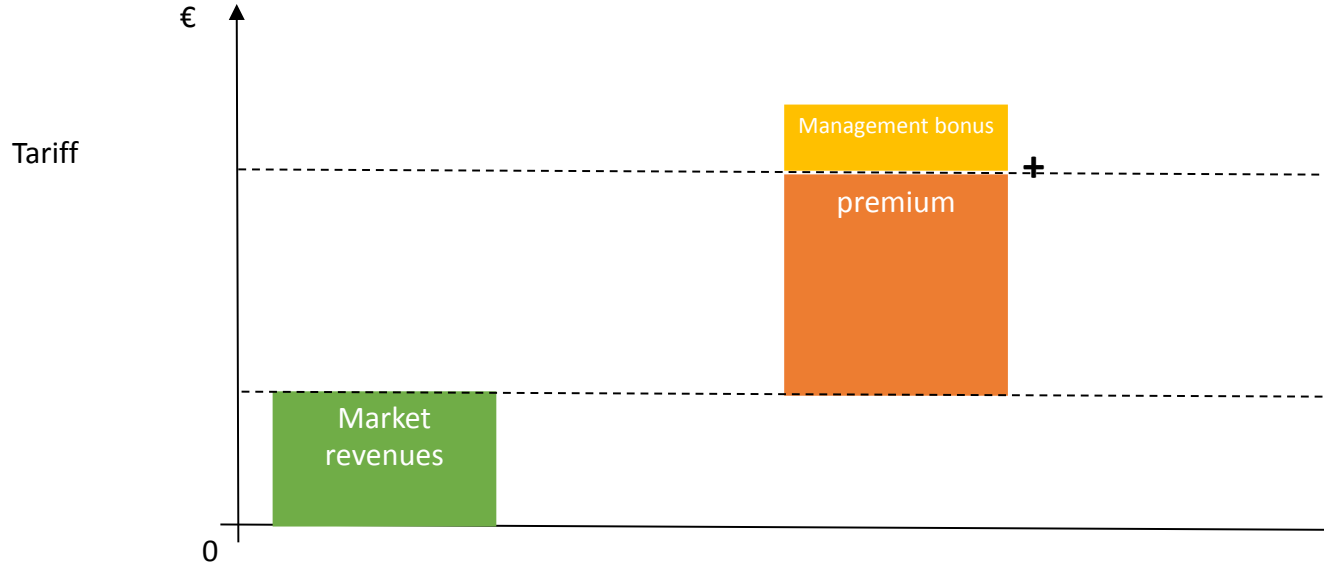
# Complément de rémunération

- Composed of a **premium** defined in €/MWh



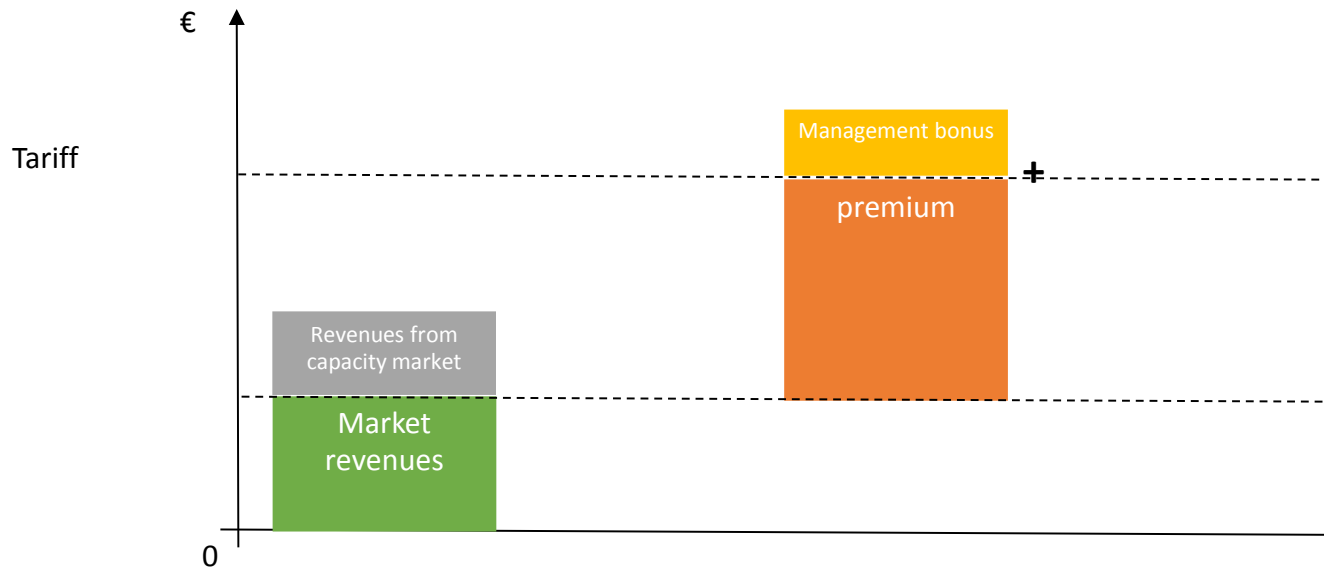
# Complément de rémunération

- Composed of a **premium** defined in €/MWh + « **management bonus** »
- « **Management bonus** » included as a part of the tariff in the tendering process bids



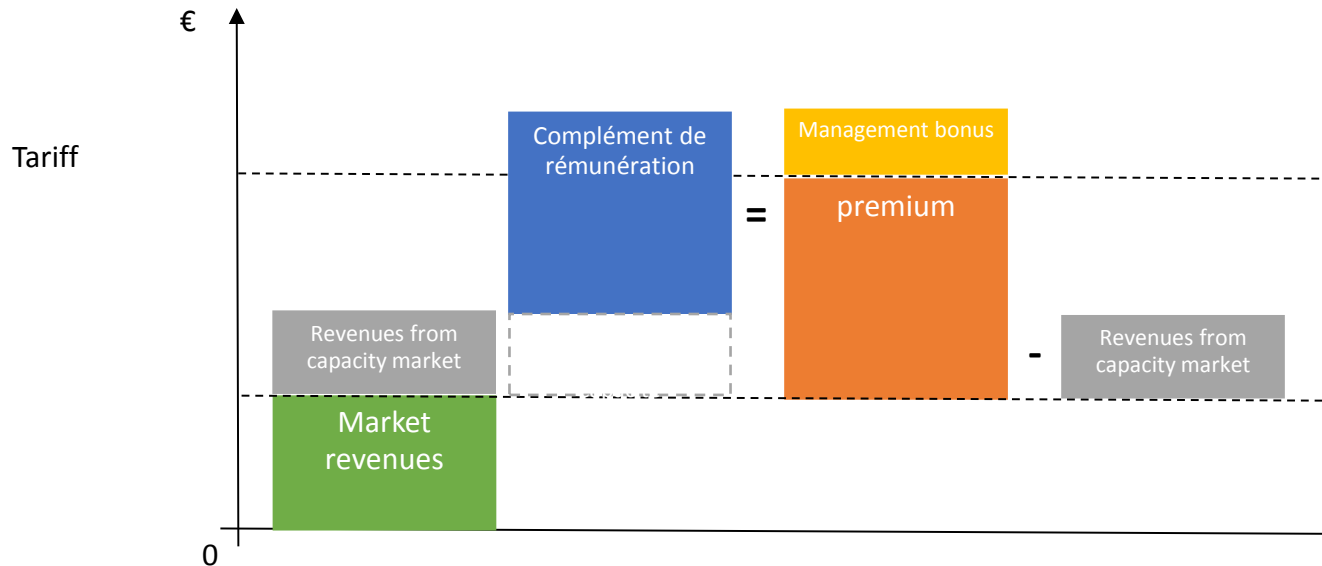
# Complément de rémunération

- Composed of a **premium** defined in €/MWh plus a « **management bonus** »



# Complément de rémunération

- Composed of a **premium** defined in €/MWh plus a « **management bonus** » and minus **revenues from the capacity market**.



# A two-part framework for windpower

Direct contracting (cumulative conditions)	Tendering process (projects that can't meet the direct contracting conditions)
Max, 6 wind turbines	7 wind turbines and more
Pturbine < 3MW	Any windfarm with a Pturbine >3MW
A distance rule between farms must be respected	Any windfarm that doesn't meet the distance rule
Environmental permit required	Environmental permit required



# Direct contracting in windpower





# Direct contracting : structure

- Contracts include an **annual cap system** which **aims to limit producers revenue**
  - The **cap (in MWh)** is designed for each wind farm and **depends on rotor size**
  - **MWh price also depends on the rotor size**
- ➔ This structure is designed to avoid some farms with good wind conditions being « over supported ». It promotes use of large rotors but allows at the same time use of smaller ones that might be needed in France for many particular reasons



# Direct contracting : structure

- Cap calculation :

with: -n number of turbines  
 -Di rotor diameter of the i turbine

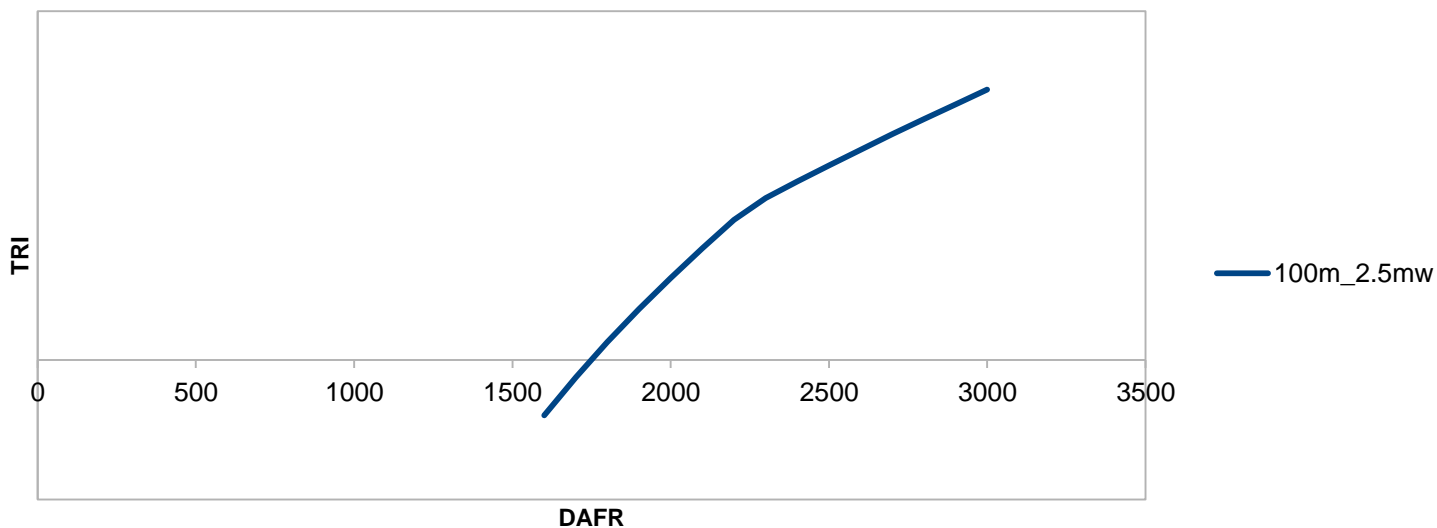
$$P = \frac{1}{20} \sum_i^n K_i * \Pi \left( \frac{D_i}{2} \right)^2$$

- Tariff :  $K_i = \frac{13}{D_i / 110}$

Largest rotor diameter	Tariff value for the first P MWh each year (€/MWh)	Tariff value for any other MWh produced each year (€/MWh)
<80m	74	40
80m<x<100 m	linear	40
> 100 m	72	40

# Direct contracting : Example

- Wind turbine of 100m rotor diameter and 2,5MW
  - 5,62 GWh/year at « high tariff »
  - Capping starts being effective at 2248h/year



# Tendering process

- The **single criterion** for selection is MWh **price**
- Winners of the tender get **feed-in premium contracts**, tariff for each winner is **fixed by his individual tender offer**.
- Winners should build the project within **3 years**, otherwise the duration of the contract is reduced
- **Environmental permit**
  - An environmental permit is **required** to participate in the tender.
  - An **exception** is made **for the first period** where it is possible to submit projects that are still under public inquiry (advanced phase of the environmental procedure)



# Tender process : crowdfunding

- **Energy transition for green growth Act** (art 11) introduced in 2015 the possibility for producers to **use crowdfunding**
- Candidates meeting certain financing requirement shall be awarded a **bonus of 2 - 3€/MWh**.

## Requirements :

- The candidate is a **local authority** or a **group of local authorities**;
- The candidate is a **joint stock company** with at least **20 % of its capital** held by **20 people\*** or by **one or several local authorities**;
- **At least 20 % of the whole financing** is held by **20 people\*** or by **one or several local authorities**;

\* To participate people have to live in the project's department or in a neighbouring department

# Tendering process : bank guarantee

- Once announced, tender winners must **deposit a bank guarantee** to the French government **within 2 months**;
- Financial guarantee amount is fixed by law : **30 000€/MW**;
- Guarantee is **given back after completion of the wind farm**, provided the project not subject to delays;
- If **project encounters a delay of more than a year**, the entire **guarantee shall retained** by the French government.

# Repowering ?



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# Repowering in the new framework

- In both **tendering process and direct contracting**, repowering is possible **in the form of a total repowering**
- To be eligible to a feed-in premium contract, wind farms have to be considered as « new »
- To be considered as a « new » project, the main equipment of the wind farm must not have been used in any previous commercial contract.
- Must of the equipment is composed of turbines, towers, connections between the turbines and « electric systems » components





# Other recent evolutions

- 2013 - *Loi Brottes*: Removal of several regulatory pressure (maximum of 5 turbines, 12MW limit, specific areas for wind energy development)
- 2015 : time limits for electrical connection
- 2016 : Removal of a procedure needed to benefit of a support (CODOA)
- **2017 : Unique environmental permit** : grouping of multiple permits in a single one, procedure time reduced, time for administrative litigation reduced
- **2017 : Tendering process over 3 years, ensuring better visibility**

