



Regulatory Mechanisms for the Deployment of RES Morocco case study

Joint ECRB-MEDREG WORKSHOP:

Support mechanisms for RES integration & flexibility mechanisms and innovation technologies

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Agenda



The three main pillars for the deployment of RES in Morocco



The Moroccan energy strategy



A new legal and institutional framework for the deployment of RES



Flexibility mechanisms and innovation technologies

1

The three main pillars for the deployment of RES in Morocco





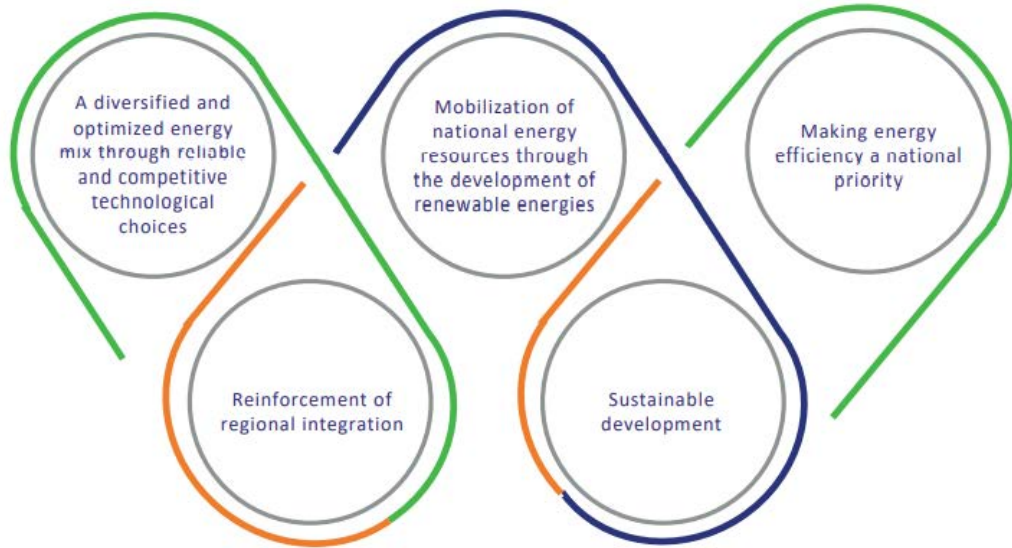
The Moroccan energy strategy

Clear strategic guidelines and objectives with a ambitious goal for the deployment of RES

2

A national energy strategy with clear strategic guidelines and objectives

5 Strategic Guidelines

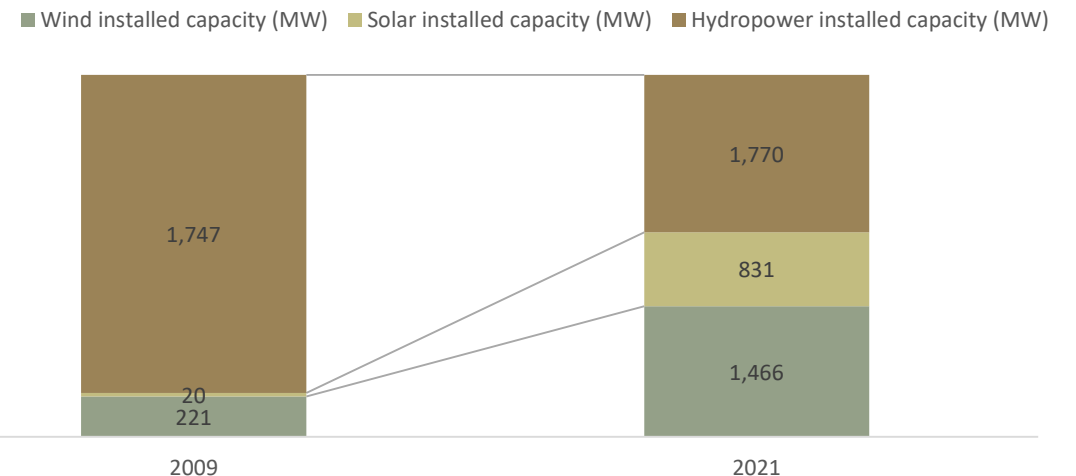
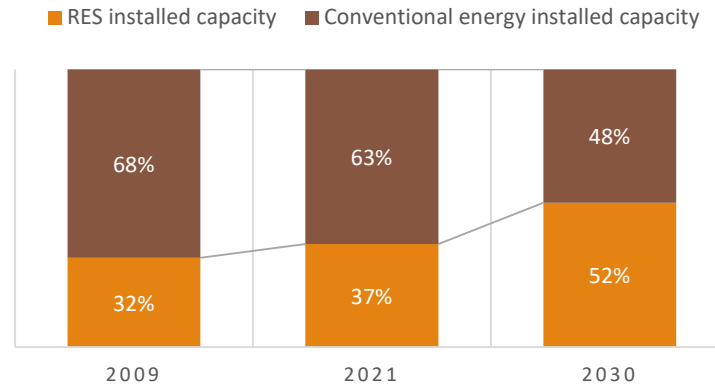


4 Fundamental Objectives



The goal is to achieve more than 52% RES in total installed capacity by 2030

- **2009:** a **42%** RES installed capacity goal by 2020 (12% solar, 12% wind, 12% Hydro)
- **2015:** Further planned increase in the renewables capacity to reach **52%** of the total installed capacity by 2030 (20% solar, 20% wind, 12% hydro).



An addition of

10 GW

RES capacity
between 2015-2030



4200 MW



4560 MW



1330 MW

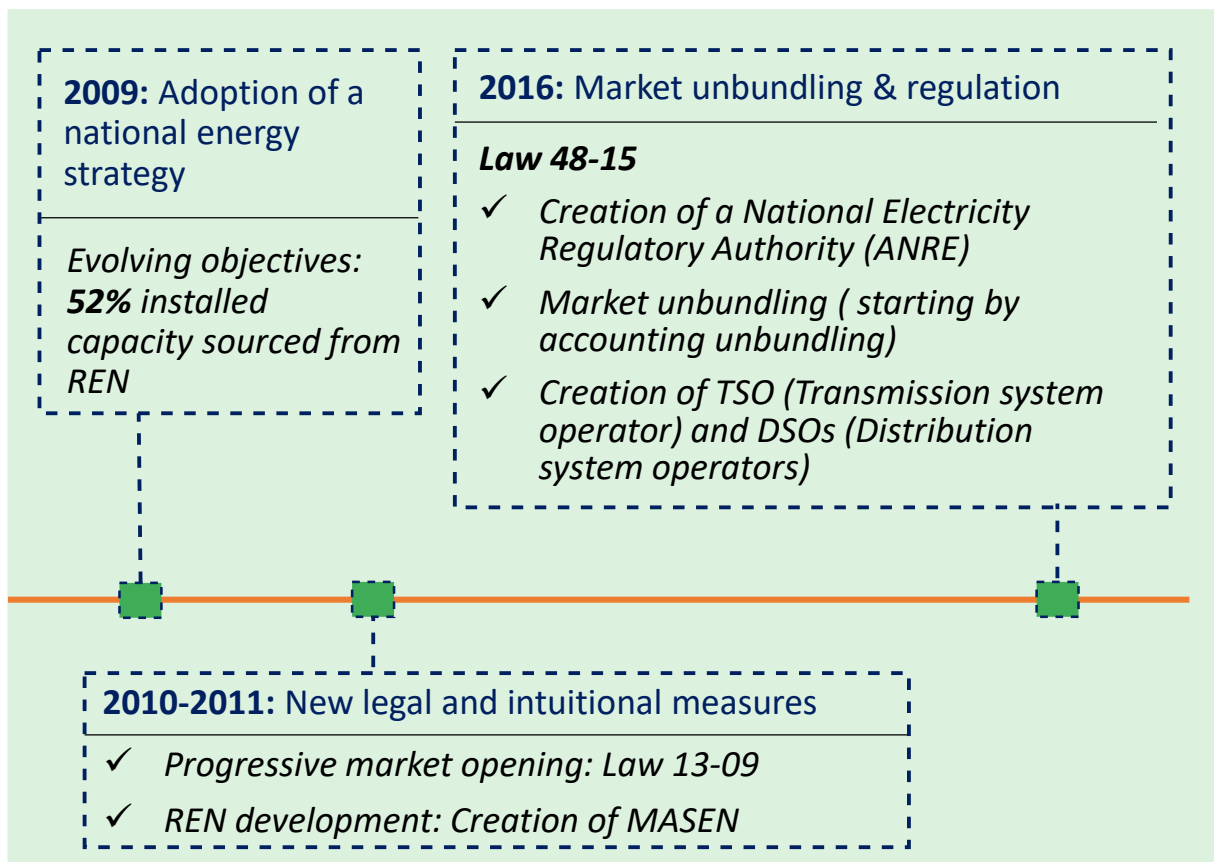


anre

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NATIONAL ELECTRICITY REGULATORY AUTHORITY

A new legal and institutional framework for the
deployment of RES

Evolving legal framework for an appropriate investment environment



Law 13.09 as amended in 2015 (law 58-15): grants the right to private investors to develop REN projects for commercial purposes and use the national transmission, MV and LV distribution grid to transmit electricity to the final consumer.

Lessons learned
Stakeholders' feedback & experiences

Bill n° 40-19: Draft Amendment to law 13-09 building on the 10 years' experience post law 13.09 enactment

Auto-generation bill n° 82.21 (2021): a legislative and regulatory framework for auto-generation is under development and should be finalized shortly.

A revamped institutional framework to support the deployment of RES



Law
n° 48-15

- Restructuring of the electricity sector and creation of ANRE by virtue of the law n° 48-15. ANRE is responsible for regulating the electricity sector by assuring equal and fair access of all users to the national transmission and distribution grids.



Law
n° 37-16

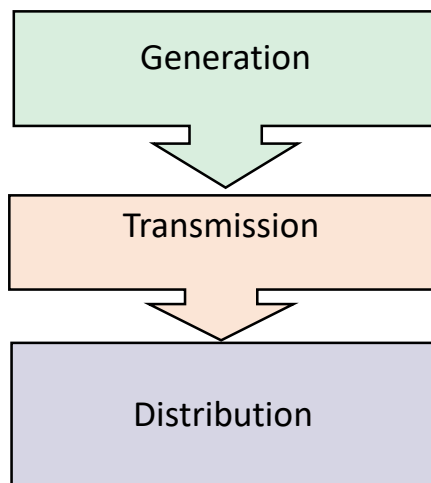
- Creation of the Moroccan agency for sustainable energy (MASEN) by virtue of the law n° 37-16. Masen is in charge of developing big scale REN projects in Morocco to satisfy the national increasing demand of electricity.



- Creation of other organization to promote the development of RES and EE, such as IRESEN, SIE and AMEE.

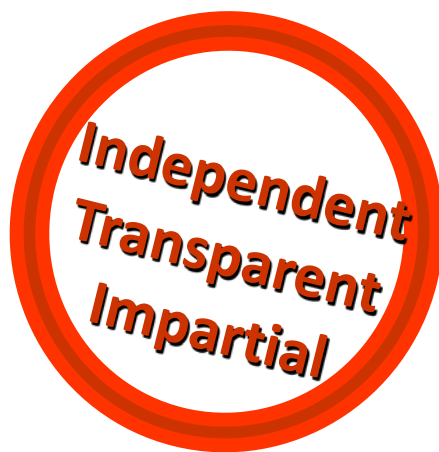
ANRE: The Moroccan electricity regulatory authority

Vertically-integrated market



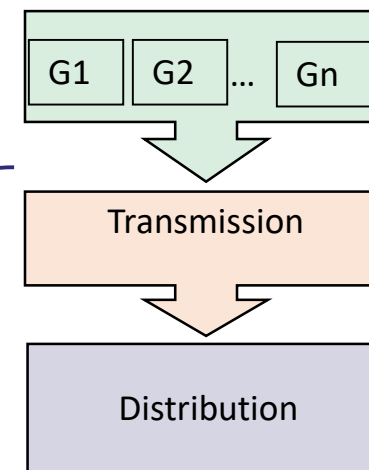
Law 48-15 comes into force in April 2021

ANRE becomes fully operational !



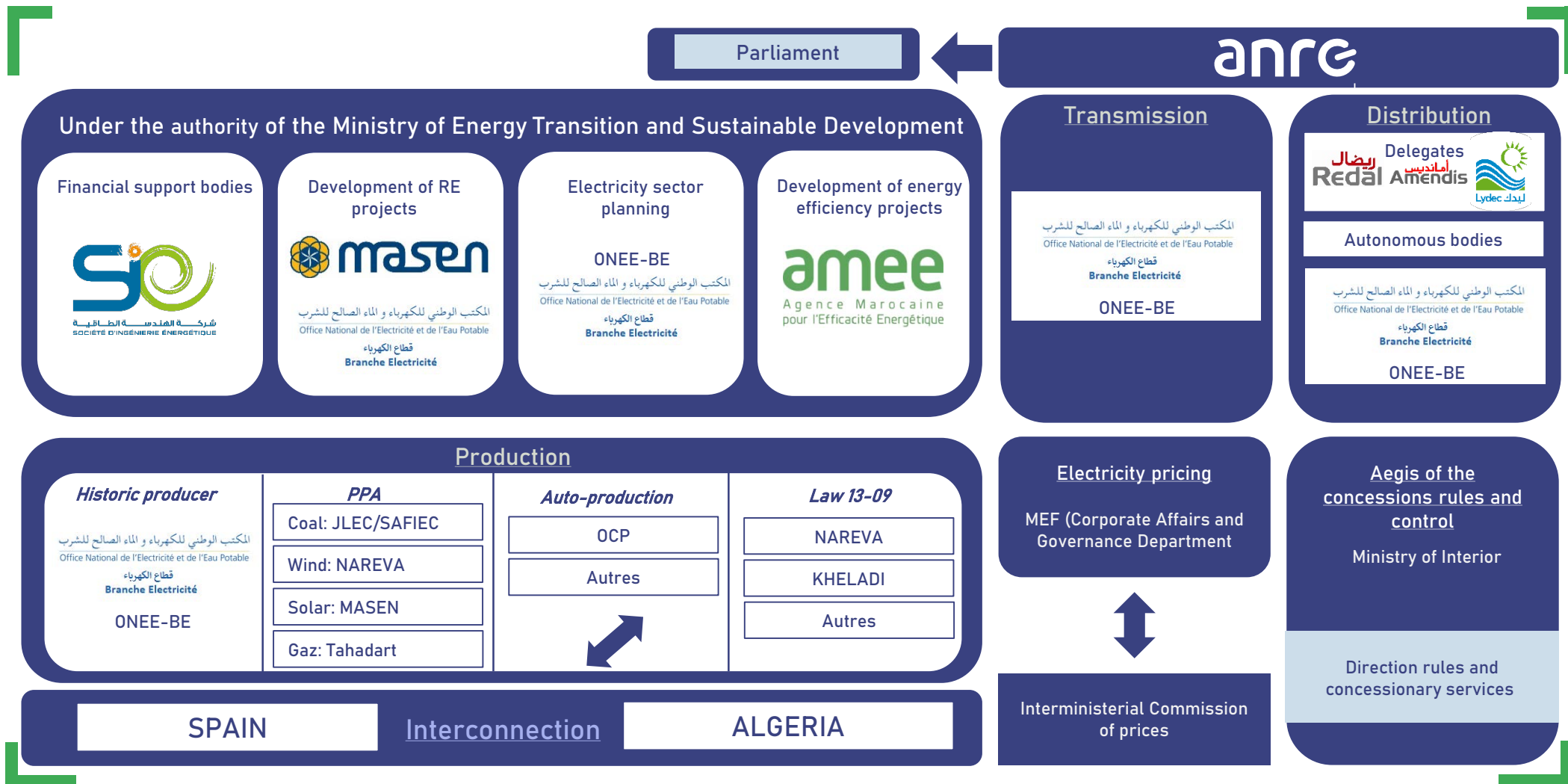
Unbundled electricity market

ANRE ensures the **proper functioning of the electricity market** and **regulates the access** of producers to the national electricity transmission and distribution networks



- Ensuring equal access to the national electricity transmission grid and to the national electricity distribution grid.
- Settings tariffs for the use of the national electricity transmission grid and of the national electricity distribution grid.
- Approving the rules and tariff for access to electricity interconnections.
- Arbitrating disputes between transmission and/or distribution grid operators and users of the grid in relation to grid connection, access and use
- Sanctioning In case of a proved infringement
- Accompanying the implementation of the national energy transition.

The current Institutional Landscape of the Moroccan Electricity Sector





Flexibility mechanisms and innovation technologies

Extension and development of the national electricity transmission network for RES power evacuation



28 352 km

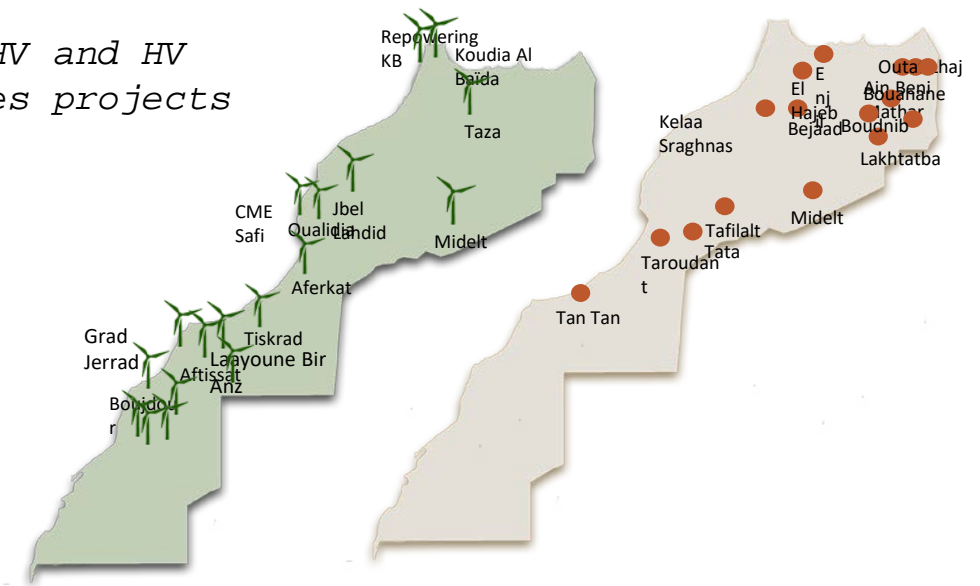
543 transformers
with 27 377 MVA
total capacity

*Massive integration of Wind in
the South of Morocco*



*Investing in VHV and HV
transmission lines projects*

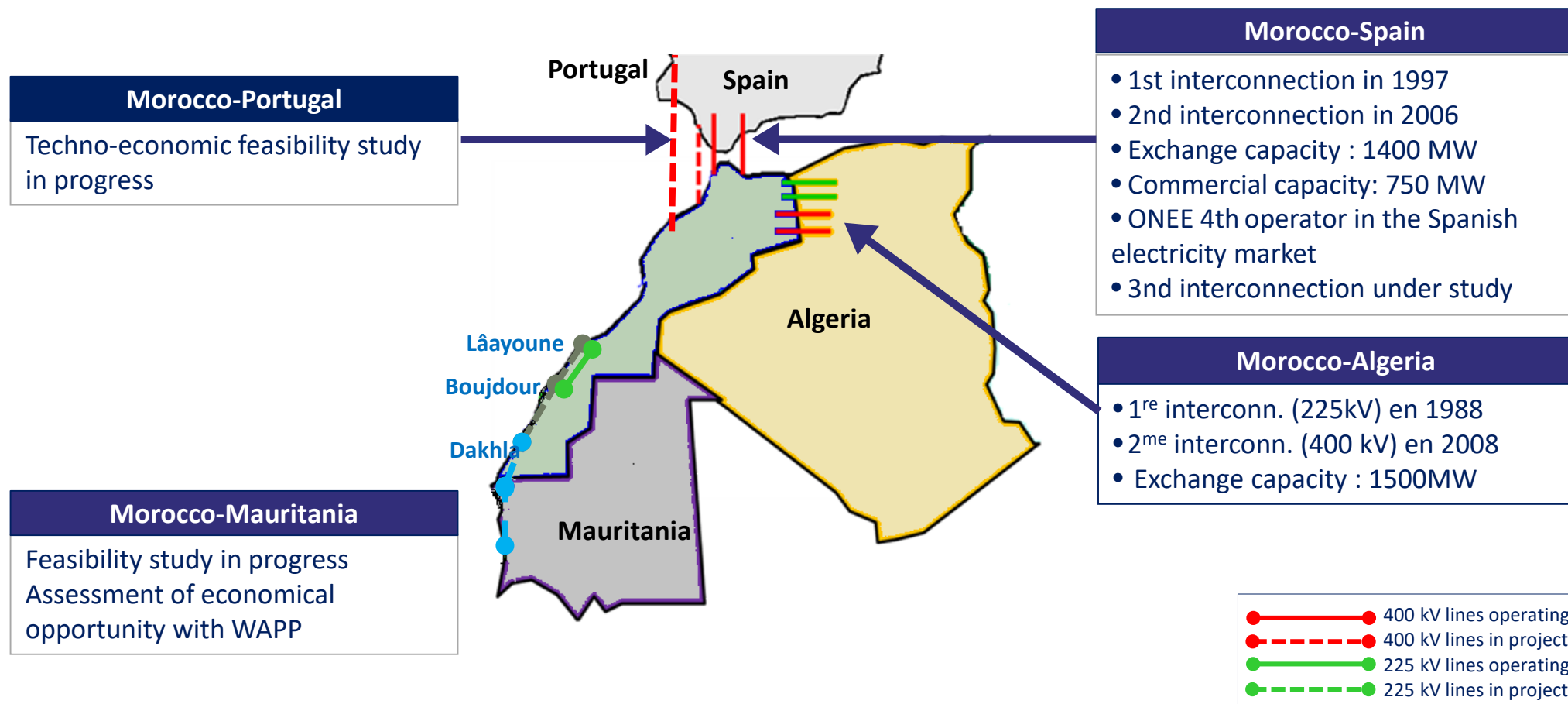
**Under-development and planned
wind and solar energy projects in
Morocco by 2030**



ANRE's major role

- Approve an Investment program that allows the TSO to develop a **reliable, secure and efficient transmission network** capable of accommodating the foreseen high share of intermittent RES.
- Set a **equitable transmission network use tariff** to i) enable the TSO to accompany the national energy strategy and ii) attract investors.

Interconnexions: Quintessential for RES integration and security of supply



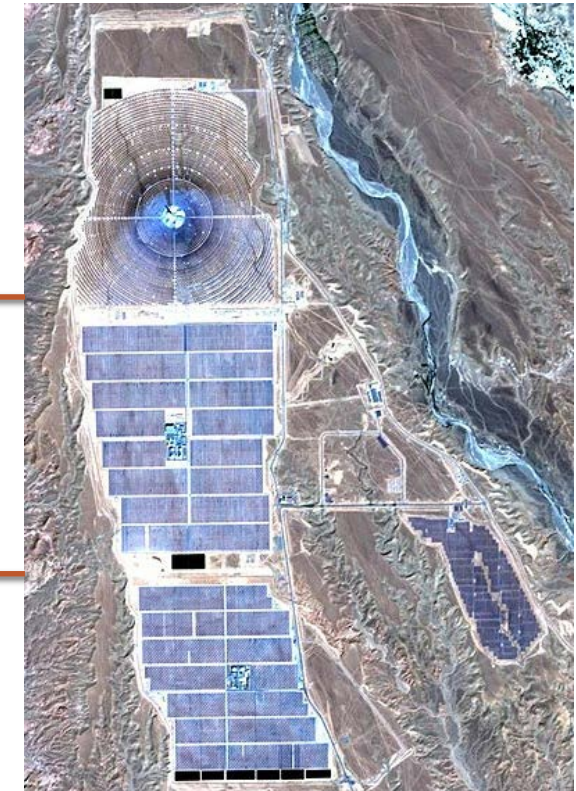
Development of Solar energy projects with storage system

- **MASEN requires storage capacity in its calls for tender for the development of solar thermal energy projects.**
- **All Concentrated solar projects developed so far by Masen have a Molten salt energy storage system.**

NOOR III -150 MW
CSP solar tower
7 hours storage

NOOR II -200 MW
CSP parabolic trough
7 hours storage

NOOR I - 160 MW
CSP parabolic trough
3 hours storage



**NOOR Ouarzazate solar complex
582 MW total installed capacity**

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Developpement of Pumped Storage Hydropower (PSH)

Pumped storage hydropower in Morocco:

- 460 operational since 2005 (PSH Afourer)
- 350 MW under construction in its final phase (PSH Abdelmoumen)
- 600 MW foreseen through 2 PSH (PSH EL Menzeh & Ifahsa)

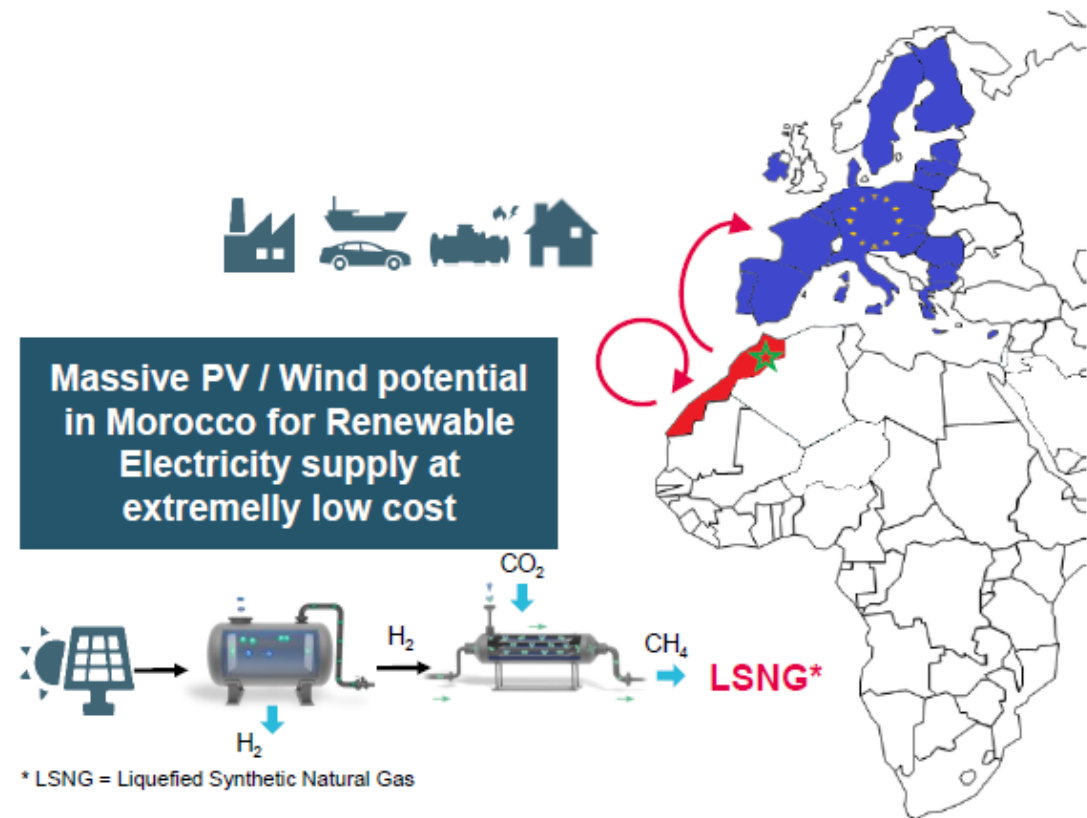


PSH by 2030: 1410 MW



Green hydrogen potential in Morocco

- 4 to 8% of global green hydrogen production
- GreenH2 Cluster: Cluster dedicated to hydrogen research, innovation and industry.
- Interest expressed by large companies.
- Very competitive cost: 2 to 3 times cheaper than Europe.



Thank you

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