State of the art of Seasonal and Subseasonal Wind and Wind Power Forecasting for the Iberian Peninsula and the Canary islands

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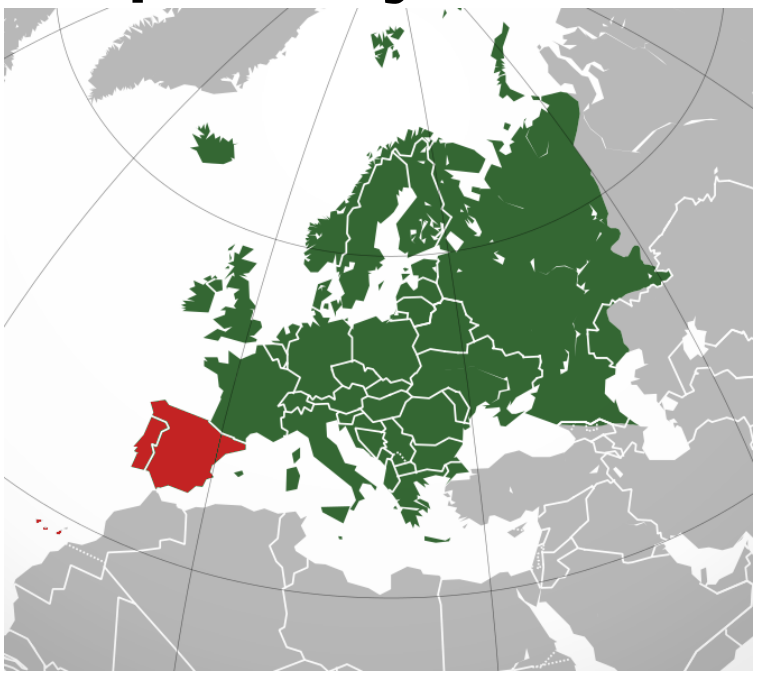
Introduction

- Iberian Peninsula wind power installed capacity:
  - Spain: 23.5 GW. The second EU country in installed capacity in wind power behind Germany
  - Portugal: 5.38 GW

Total capacity: 28.88 GW



Introduction

- The Naturgy Chair is interested in state of the art in seasonal wind forecast.
- Wind farms owned by Naturgy represent 5.32 % of the total wind power capacity installed in Spain.

Methodology

- Source of the scientific literature: Google Scholar
- Results for the period 2008-2018
- Four search strings

Search Strings
"wind power" + "seasonal" + "forecast" + "Iberian Peninsula" OR "Spain" OR "Portugal" - "neural networks" - "short term"
"wind power" + "seasonal" + "forecast" + "Canary Islands" - "neural networks" - "short term"
"wind" + "seasonal" + "forecast" + "Iberian Peninsula" OR "Spain" OR "Portugal" - "neural networks" - "short term "
"wind" + "seasonal" + "forecast" + "Canary Islands" - "neural networks" - "short term"

Methodology

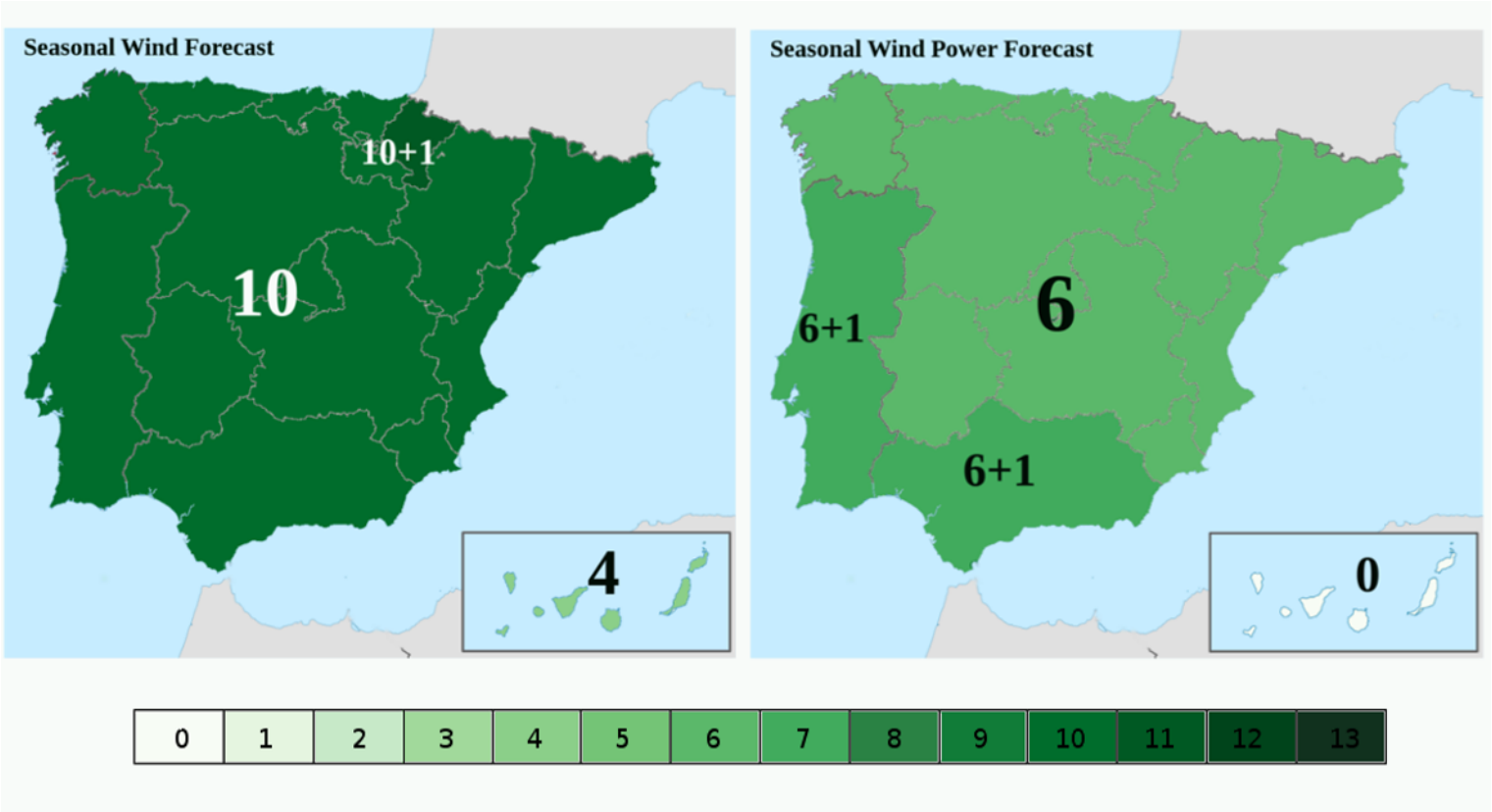
- An initial set of 8355 documents
- Each document was sieved by a software.
- Manual revision is done in order to obtain the final results of this systematic review.

Results I

Number of documents: 20

	Seasonal wind forecast	Seasonal wind power forecast	Total
Iberian Peninsula	11	8	19
Canary Islands	4	0	4

Results II


Seasonal Wind Forecast
10+1
10
4
Seasonal Wind Power Forecast
6+1
6
6+1
0
0
1
2
3
4
5
6
7
8
9
10
11
12
13

Results III

Methodologies	Number of papers
Climatic patterns	10
Seasonal forecast models	1
Regional models	7
Stratosphere	1

Results IV

- NAO, EA and SCAND are an important source of predictability for the IP.
- There is a strong relationship between the circulation of the lower stratosphere and the wind power generated a month ahead for Europe.
- We only found one paper dealing with seasonal forecast models, with GloSea5.
- The reanalysis are a good source of data for the research of wind seasonal forecast.

Conclusions I

- There is a lack of studies in the literature covering the Canary Islands as an isolated region.
  - 56 installed farms. 254 MW
- Given the shortage of studies about wind and wind power seasonal forecast and their relevance, it deserves much more research.
- Our results suggest that increasing efforts in this field could led to significant advances, that they are necessary and would be feasible.

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S. Bayo-Besteiro, M. García-Rodriguez, X. Labandeira, J.A. Añel, Seasonal and subseasonal wind and wind power forecasting for the Iberian Peninsula and the Canary Islands: A systematic review, International Journal of Climatology (Under review).

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