CLIMATEUROPE FESTIVAL 2017
VALENCIA
METEOROLOGICAL FORECAST IN ENERGY PRODUCTION

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Iberdrola needs a production forecast to integrate energy in the market:

Main features:
- Every day at 12:00 market operator runs the cassation algorithm for D+1
- Purchases and sales in the markets are firm for each unit
- Differences between forecast and reality lead to lower revenues or even economic losses
Meteorology: Meaning of the forecasts

**Wind forecasts:**
- Increase in generation from wind
- Increase in energy demand (worse thermal sensation)
- Uncertainty about volume of production (risk associated to production level)

**High temperatures forecast**
- Higher demand during the day
- Delay in maximum generation capacity in thermal plants
- Lower flows in rivers

**Sea forecast**
- Increase in generation from wind
- Difficulties for maintenance services (access to facilities)

**Rainfall forecast**
- Increase in hydroelectric generation
- Constraints in hydroelectric production (flood management)
- Uncertainty about production volume

**Solar forecast**
- Increase in solar generation
- Increase in peak demand during the day in summer
- Increase of daytime generation (risk associated to production level)

**Snow forecast**
- Higher demand
- Melting management (delayed inflows to reservoirs)
- Difficulties in facilities maintenance (access)

**Sea forecast**
- Increase in generation from wind
- Difficulties for maintenance services (access to facilities)
Meteorology: Influence in hydroelectric management

**A good meteorological forecast is needed:** The difference between forecast and reality creates distortions in both water management and hydroelectric management.

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**Aspects to emphasize:** The meteorological forecasts are transformed into physical facts with different implications:

- **Rain / snow:** different speed of entry of water into the reservoir
- **High inflows:** need to control the maximum quota, risk of spills, laminar avenues ...
- **Low/null inflows:** Management of ecological, irrigation, human supply,
- **Electrical Commitments:** Feasibility of realizing the forecasts committed complying with the restrictions of the reservoirs
- **Plant maintenance:** It is necessary to adjust the dimensions so as to meet the limitations of the reservoir on days that the machine can not operate.
- **Economic Optimization:** It is necessary to optimize the production to try to produce the maximum amount possible in moments that the market compensates better.
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Meteorología: Influence in hydroelectric management

Es necesaria una buena predicción meteorológica: La diferencia entre la previsión y la realidad crea distorsiones tanto en la gestión hídrica como en la gestión hidroeléctrica.

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Meteorology: Influence in mid-term (seasonal) hydroelectric production

- In the execution of hydraulic exploitation plans in the medium term it is necessary to have forecasts of future inflows
- The forecast models used in Iberdrola in the medium term are based on time series

The forecast of a period depends on the possible transitions that may happen depending on previous periods of time

The probability of expected inflows is affected by short-term meteorological forecasts

Thus, the short-term meteorological forecasts influence all the transitions and therefore throughout the inflow forecast for the period under study

### Releases from Head Waters Reservoirs (hm³) and Annual Production in Generation in MED Area (GWh)

![Graph showing releases from head waters reservoirs and annual production in generation in MED area.](image-url)
THANK YOU
VERY MUCH

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