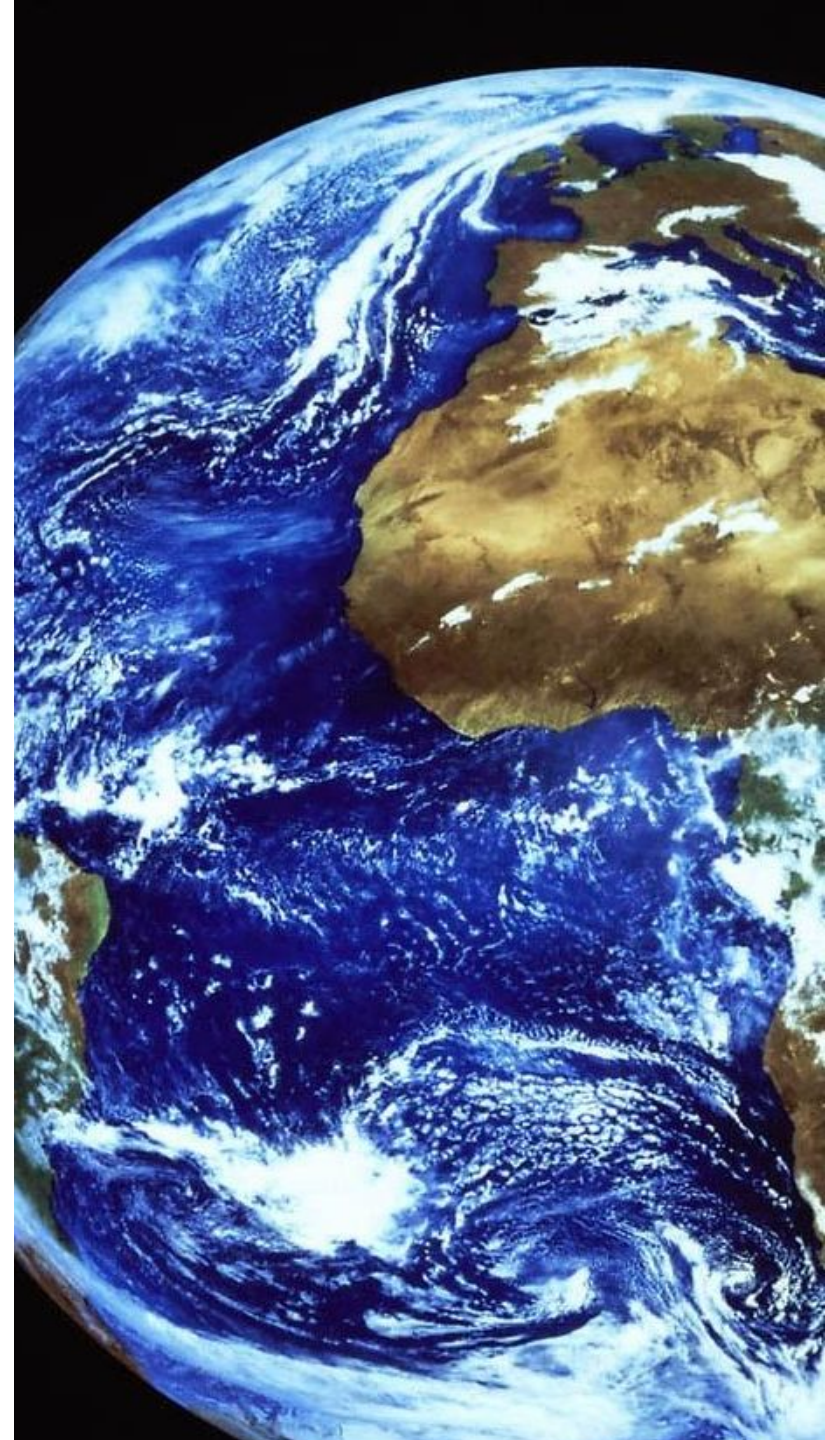


# ELECTRICITY AND WEATHER AND CLIMATE FORECASTS

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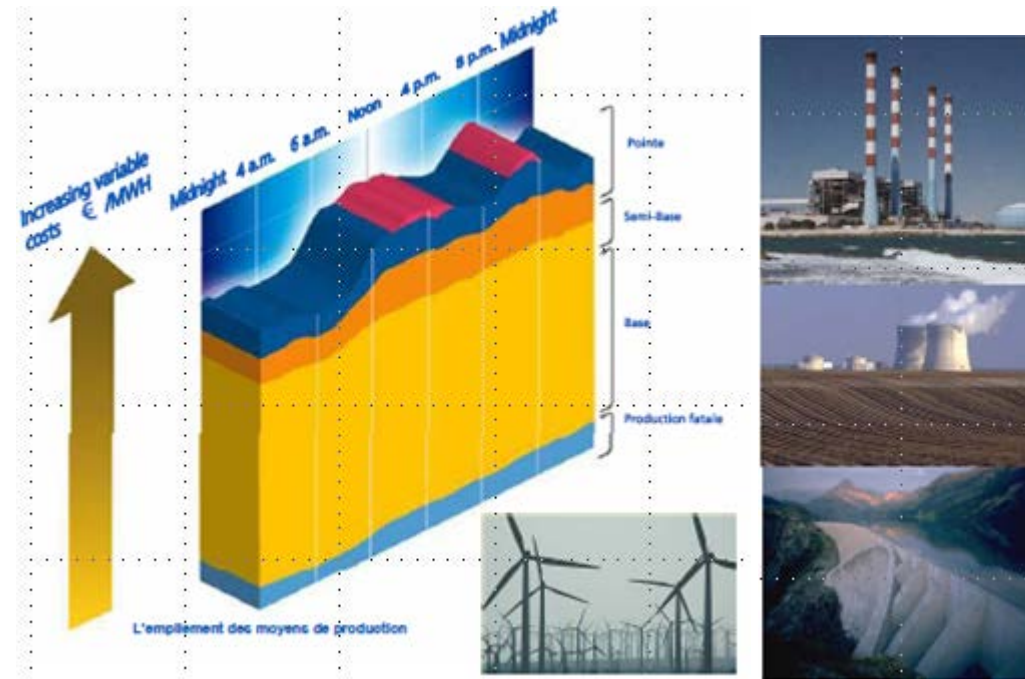
# Electricity, weather and climate

From technical requirements to financial requirements

- Our CEO mentioned weather and climate at analysts meetings
  - It has an impact on our results at short and middle term
  - Carbon management
- Weather and climate have large impacts on power sector
  - At all time scales from real time to decades
  - At all scales from local to global

# Power Offer/Demand balance: a complex problem

- Production units' program:
  - 58 nuclear reactors
  - 435 hydro power units
  - ~50 thermal (coal, gas, fuel)
  - ~900 Wind farms
  - ~250,000 solar (including households)
- Problems:
  - Production=Demand at each time step
  - Many constraints
  - Financial optimization of production costs



- Huge optimization problem: 1 000 000 variables & 10 000 000 constraints for day+2 30 minutes forecasts
- Highly non convex and non linear, discrete and continuous variables
- Highly demanding on optimality (1% difference → several millions euros/year) and feasibility (all technical constraints must be satisfied)

# Three « highlights »

## Adaptation

- Climate extreme events and resilience of communities
- Existing facilities
- New infrastructures

## Renewables

- New datas requirements
- Predictability
- intermittency

## Water

- Water scarcity
- Previsibility of shape (snow, rain, flow, quality,....)
- ICEM 2015