

## Effects of moving the timing of day-ahead markets towards real time

Post 2020 evolution of the Target Model: Quantitative assessments

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# Overview

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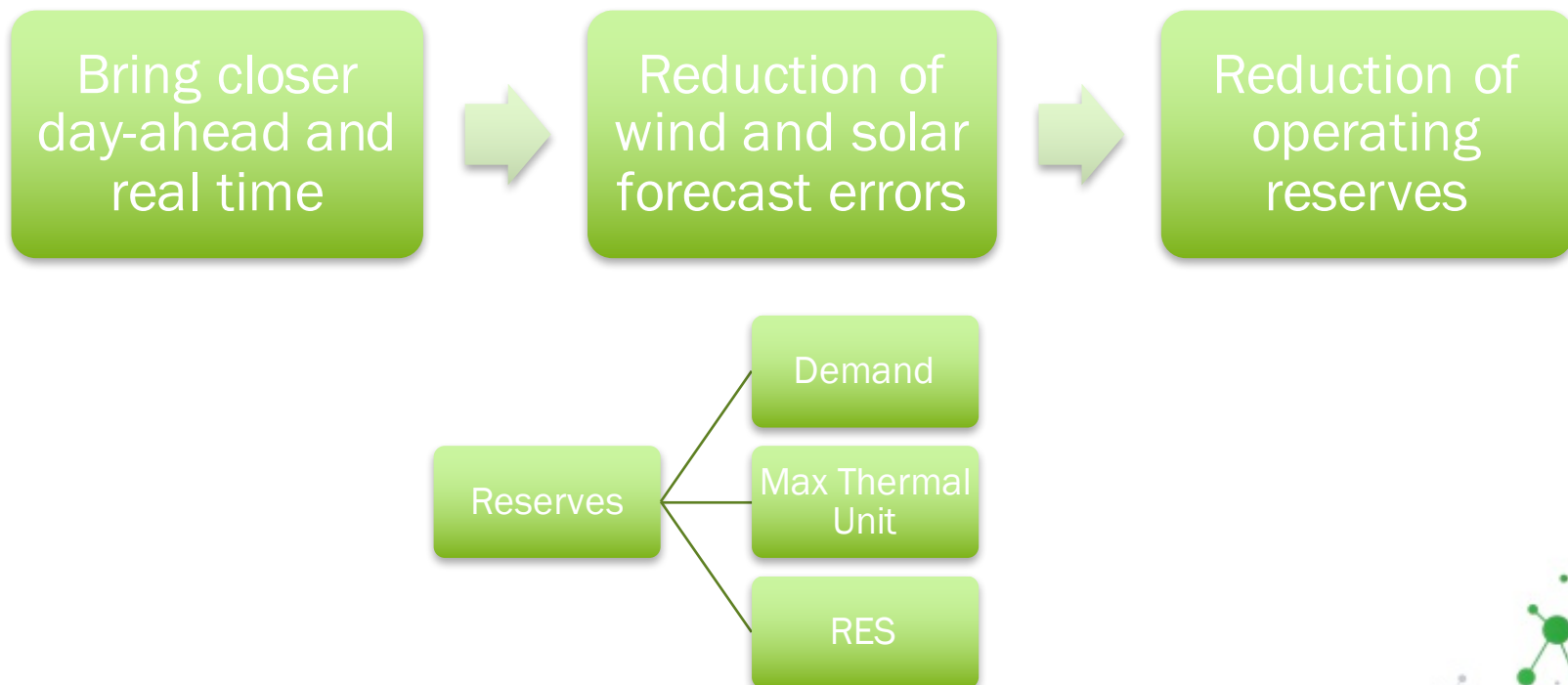
- Objective
- Methodology
  - ROM model
  - Scope
- Results
- Conclusions



## Objective and methodology

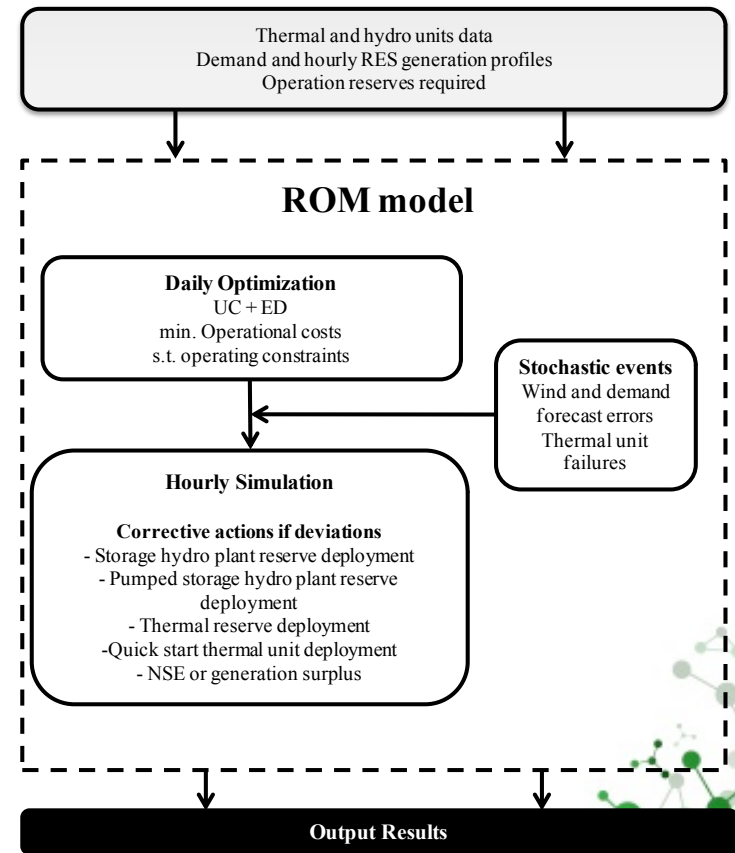
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- Impact of bringing the day-ahead market closer to real-time operation



# Methodology: ROM model

- Operation model developed in IIT-Comillas
- Used in other EU projects
  - MERGE, SUSPLAN, TWENTIES...
- Unit commitment: represent day-ahead market
  - Technical constraints generation units: thermal and hydro
  - Operating reserves
  - Network
- Real-time





## Methodology: scope

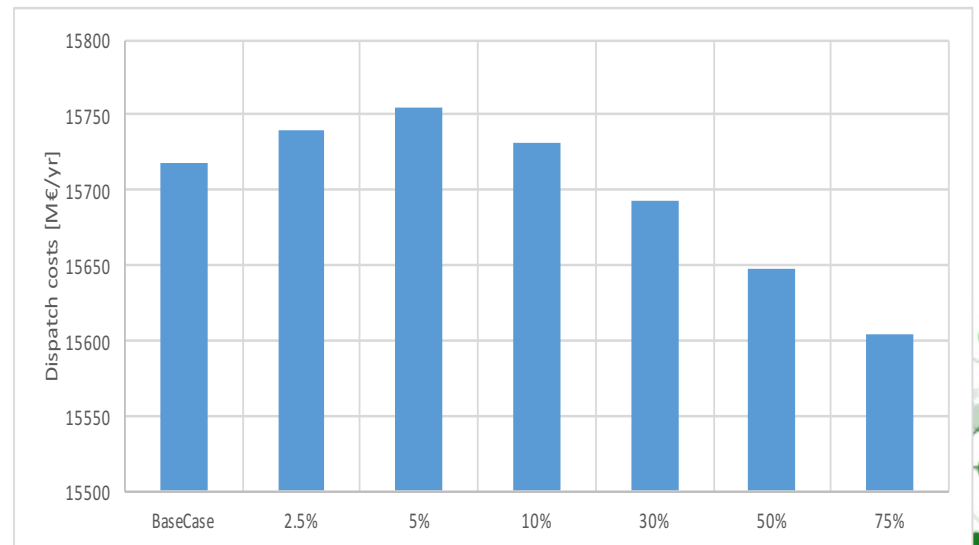
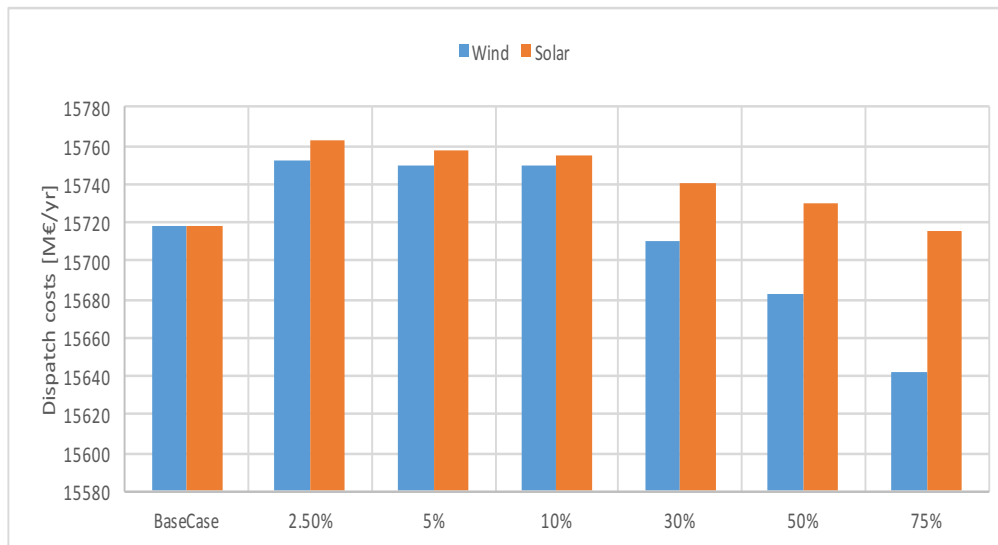
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- Spain in 2030
  - 1 year – 8,760 hours
  - Vision 3 TYNDP 2014
- Generation
  - Detailed generation units in Spain
- Real-time is considered
- Network
  - No internal network
  - Interconnections between countries



## Results: reduction in forecast errors

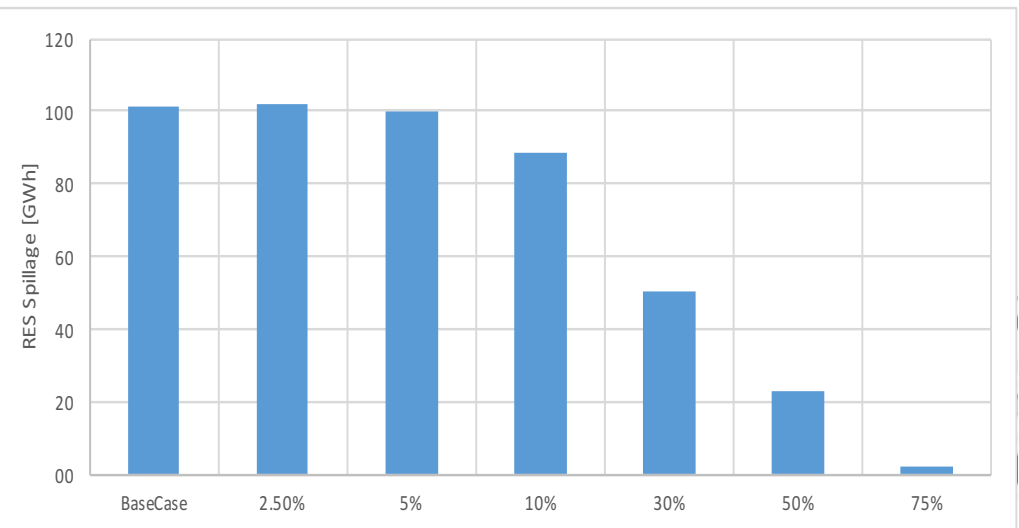
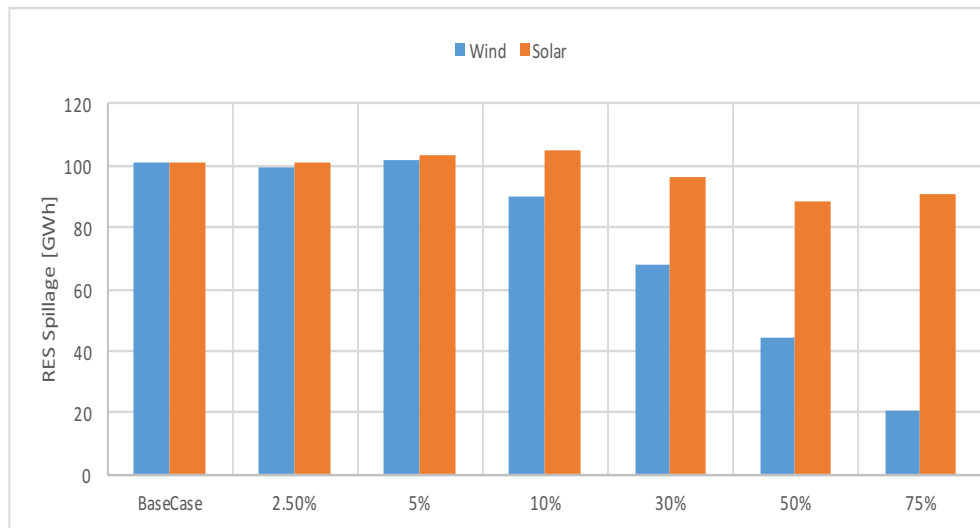
- Does not imply reduction in dispatch costs
  - When reduction is small for wind (need 30%)
  - Until reduction is big for solar (75%)
  - When reduction is small for both (need 30%)





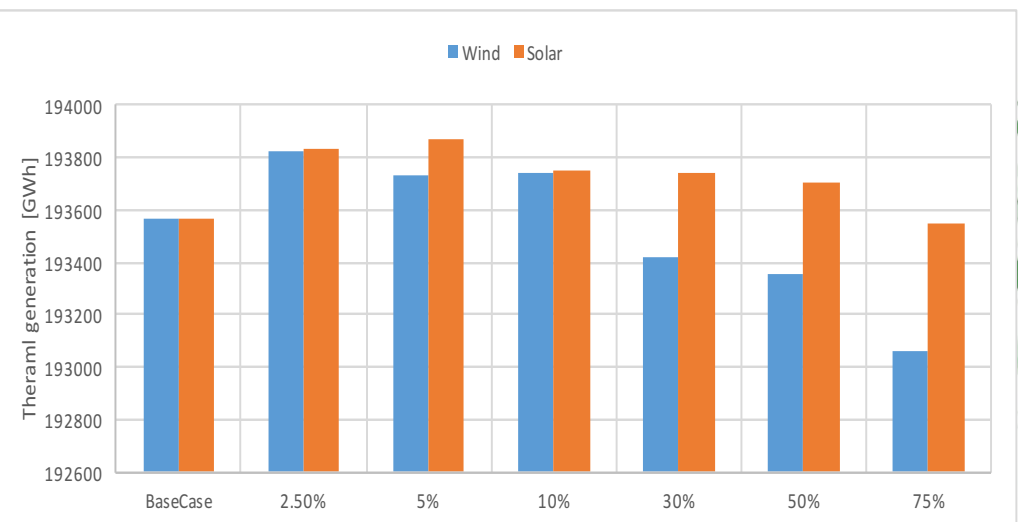
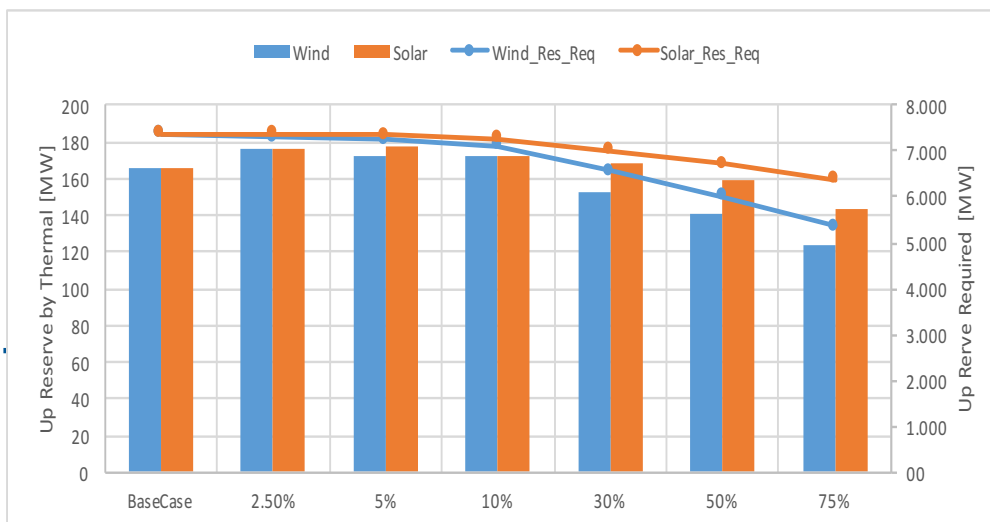
## Results: reduction in forecast errors

- Help integrates RES
  - For wind almost at the beginning
  - Only when solar error is reduced 30% or more



## Results: reduction in forecast errors

- Why dispatch costs are not reduced?
  - Reduction in reserves only significant for high reduction in forecast errors
    - 30% wind and 75% solar
  - Low reduction of reserves
    - Provided by thermal units do not decrease
    - Thermal generation increases







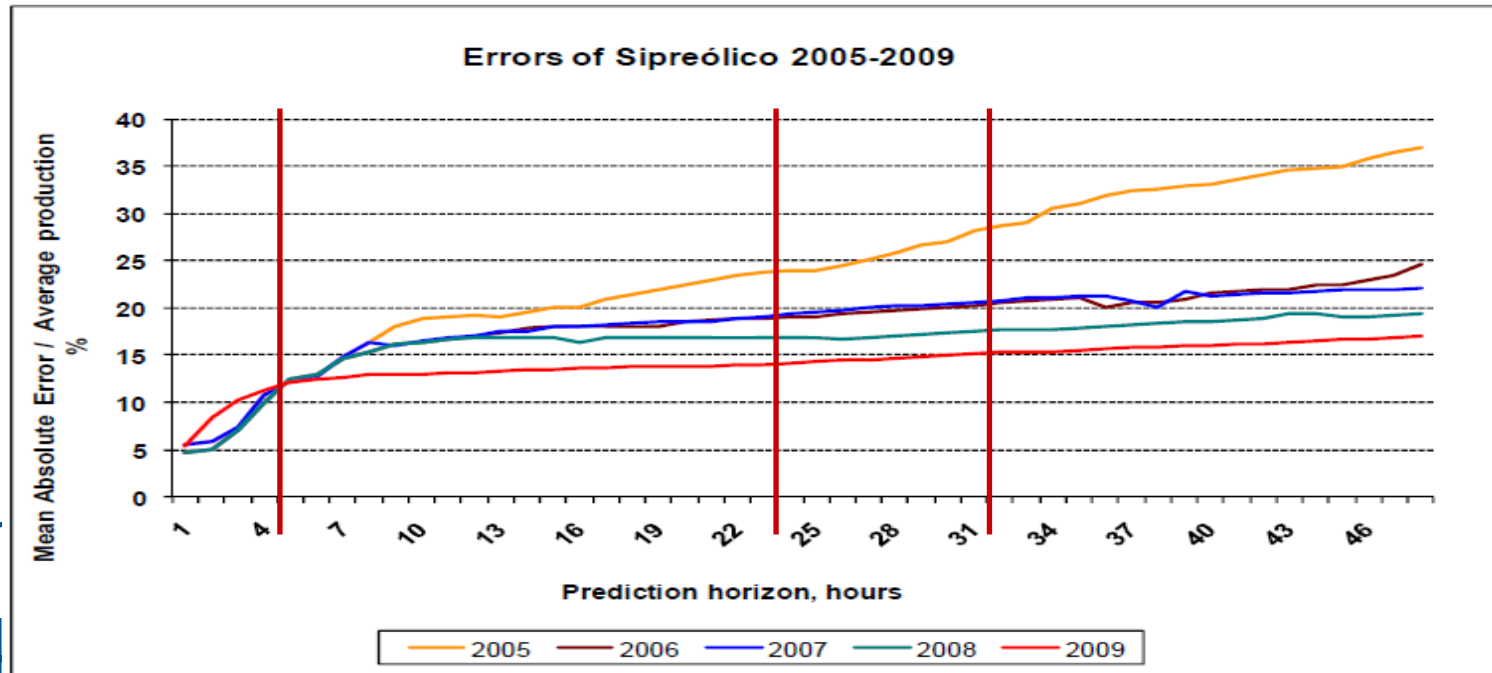
## Results: reduction in forecast errors

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- Thermal generation increases for low levels of reduction in forecast error
  - Integration of RES provokes the disconnection of flexible generation (hydro)
- Part of generation and reserves provided by hydro are replaced by thermal
  - More units committed to be able to provide reserves (not at maximum production)

# Conclusions

- Small reduction of wind and solar forecast error
  - Increase of generation dispatch costs
- Reductions in wind forecast error have more influence
  - Wind is more important in the system than solar





## Conclusions

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- Bringing closer day-ahead market to real time only a few hours is **not worthy**
  - Reduction of forecast error is small
  - Do not produce benefits
- Day-ahead market has to be very close to real time to reduce enough forecast errors
  - About 20 hours!
  - But this is not feasible in power systems like Spain: some units will be automatically out of the system
  - Other power systems with more flexibility has this possibility
- **Alternative: a market scheme like in Spain**
  - Day-ahead market followed by intraday markets to re-schedule the dispatch based on updated forecasts



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Thank you very much  
for your attention