USE OF SEASONAL FORECASTS AT HEP-TRGOVINA D.O.O.

HEP Trgovina d.o.o.

SEECOF/MEDCOF/PRESANORD Climate Outlook Forum

Joint session with end-users and stakeholders

November 23, 2017

Zagreb, Croatia

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OVERVIEW

- Info about HEP-Trgovina d.o.o. (HEP Trade Ltd.)
- Why do we need seasonal forecasts?
- Types of available seasonal forecasts we use
- The ways we use seasonal forecasts
- Conclusion

INFO ABOUT

- HEP-Trgovina d.o.o. (HEP Trade Ltd.) is a part of HEP group, Croatian national energy company which deals with generation, distribution and supply of electricity, heat energy and natural gas to customers
- it carries out the following activities on behalf and for the account of HEP:
 - > purchase and sale of electricity, lease of cross-border transmission capacities
 - > purchase and sale of gas, lease of transportation system capacities
 - ➤ emission trading
 - green certificate trading
 - power purchase agreements with producers other than HEP Group
 - > optimization of HEP's power plant operations to ensure the required electricity volume for HEP's customers under most favourable terms



WHY DO WE NEED SEASONAL FORECASTS?

• we need weather forecasts in general, from shortrange to long-range forecasts, when:

> optimizing and scheduling electricity and gas supply and generation in regard to demand



trading electricity and gas

deciding on the hydroelectric
t operations and on the capacity and timing of renewables

Suppl

Managing climate variability consequences

- sub-seasonal and seasonal forecasts are used for mid-term and long-term portfolio management, planning and trading up to one year ahead
- regarding seasonal time scale, the questions we are trying to answer are:

| | portfolio and reservoir management | | generation planning | | price forecasting and trading |
|---------------------|---|--|---|--|--|
| W ar el er | hen should we organize nual overhaul, maintenance d reparation of the specific ements in the electro- ergetic system (EES)? | | How will we optimally meet the expected energy demands in the next season? Will there be an optimal amount of power and energy for supply HEP's customers and for providing auxiliary services in EES? | | When is the optimal moment for buying or selling electricity at the market? |
| | | | | | |

Will we have to use additional, more expensive generation sources? What might be the best strategy for fuel (gas, coal) procurement?

- there are a few main **meteorological** questions, predominantly regarding temperature and precipitation:
- Will the next season be hotter or cooler/drier or wetter than normal?
- Will the next season be hotter or cooler/drier or wetter when compared to the same season in the previous few years?
- Should we expect high impact events (draught or flood, heat wave or cold wave, storms, strong winds) during the season?



CLIM4ENERGY – A service providing climate change indicators tailored for the energy sector

TYPES OF AVAILABLE SEASONAL FORECASTS WE USE

• monthly forecasts up to 6 months ahead:



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• monthly forecasts up to one year ahead:



• 3 months aggregated forecasts:





December 2017 - Febraury 2018 Surface Temperature Anomaly Forecast



IRI Multi–Model Probability Forecast for Temperature for December–January–February 2018, Issued November 2017



C3S multi-system seasonal forecast Mean 2m temperature anomaly Nominal forecast start 01/11/17 Variance-standardized mean









model consensus for the upcoming winter

THE WAYS WE USE SEASONAL FORECASTS

- knowing that uncertainty is inherent characteristic of seasonal forecasts and that model accuracy depends on the meteorological variable in question, the geographic region and the time of the year, we try to rely on seasonal forecasts in different ways:
 - by comparing different models' outputs
 - by comparing current seasonal forecasts to previous forecasts for the same season





IRI Multi–Model Probability Forecast for Temperature for December–January–February 2018, Issued September 2017



IRI Multi–Model Probability Forecast for Temperature for December–January–February 2018, Issued August 2017



> by using additional information attached or associated to seasonal forecasts, such as:



model skill

than 0.3 are shaded in grey.

probability for lower/upper third of the distribution



probability for temp./precip. anomalies to be above/below normal

NMME prob fcst TMP2m IC=201711 for lead 1 2017 DJF



probability for lowest/highest 20% of climatology



© NOAA / NMME / C3S

by comparing seasonal forecasts for particular season with observed anomaly for that season



IRI Multi-Model Probability Forecast for Temperature for December-January-February 2017, Issued October 2016





Temperature Anomaly Winter 2016/17 (reference period 1961–1990)









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CONCLUSION

 despite abundance of seasonal forecasts and skill measures, it is still hard to make long-term decisions based exclusively on them, because of their, relatively speaking:

> low usability

(when no privileged scenario has been given or when forecast has been updated too late)

- Iow reliability (past incorrect forecasts)
- ➤ model weaknesses

(no information on episodes of severe weather)



- however, during the decision-making process, we take every new seasonal forecast into consideration, in order to improve the efficiency of our operations
- seasonal forecasting is a complex and challenging area and we, as end-users, are aware that there is still a lot to learn when it comes to interpreting seasonal forecasts, in order to get the most of them

Thank you for your attention!

Predicting renewable ressources

BODO LINE

Hydropawar