# Rescheduling of generation plant maintenance

User Group System Operations

Elia

Bruxelles, Emperor

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# INTRODUCTION - CONTEXT

# Context of the project

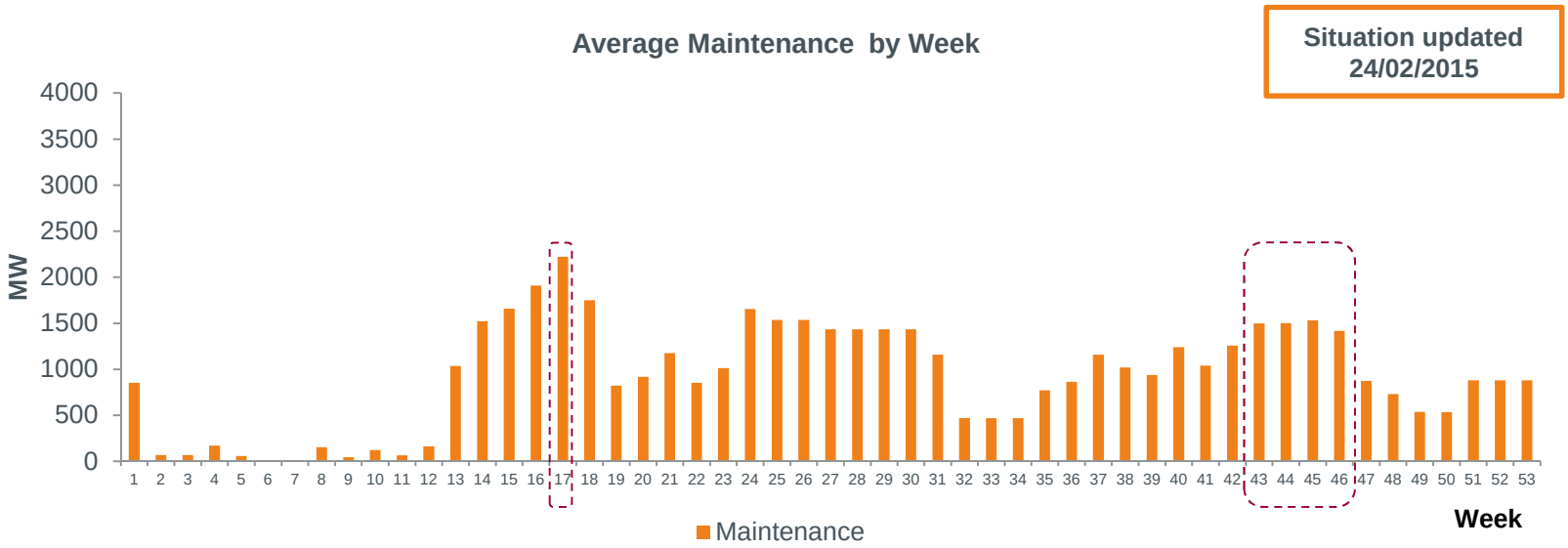
The Belgian system is facing a situation where the installed generation capacity is structurally insufficient to cover the demand all year round :

1. Scarcity risk context
2. Installed conventional generation capacity is still decreasing

# Context of the project

The Belgian system is facing a situation where the installed generation capacity is structurally insufficient to cover the demand all year round :

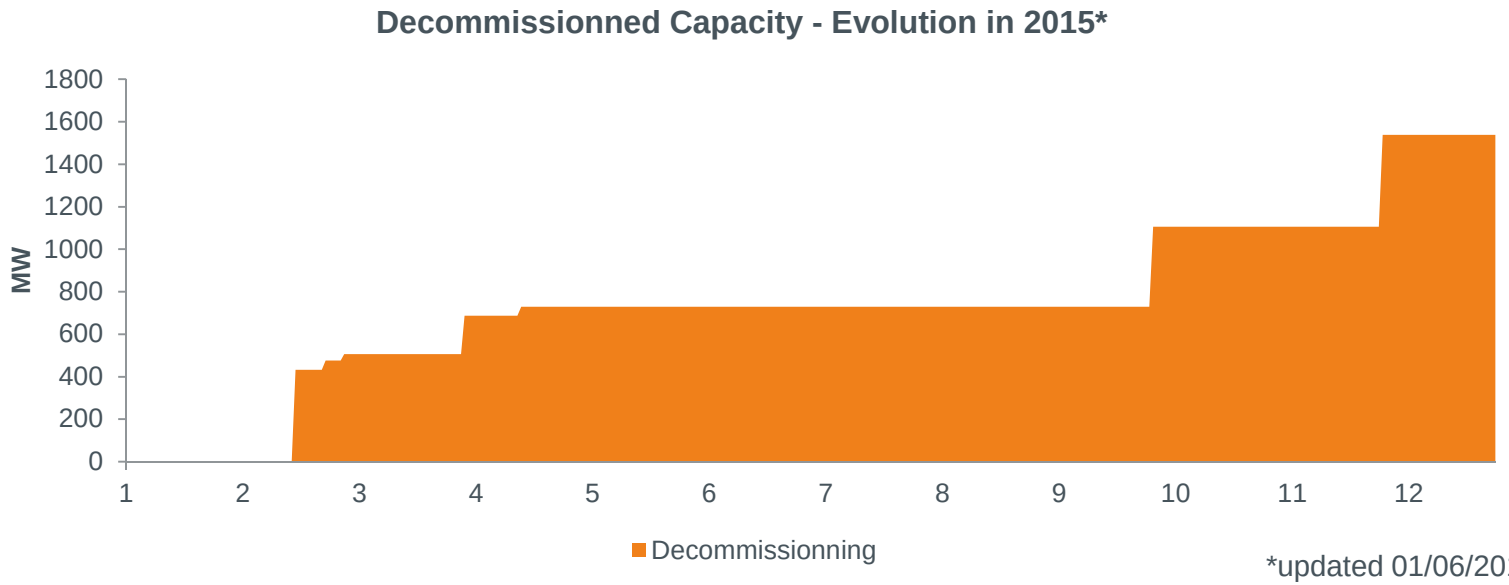
1. Scarcity risk context
   - ❑ *In 2015, in a scarcity risk context, almost all plant maintenances have been moved out of winter 2014-2015, leading to high maintenance levels in April 2015, as well as in Autumn 2015*



# Context of the project

The Belgian system is facing a situation where the installed generation capacity is structurally insufficient to cover the demand all year round :

2. Installed conventional generation capacity is still decreasing
   - ❑ *As production capacities decrease in Belgium, adequacy management (maintenance planning,…) will be more and more important in the coming months/years*.




*updated 01/06/2015

# PROJECT - PRESENTATION

# Project : Generation plant maintenance

The main goals are

1. *Distribute the risk  of structural shortage* with an equal weight along the year
2. *Give more information* to the ARPs in terms of mid term adequacy
3. *Receive more information* about the planned outage requests

* Adequacy can be defined as a system's capacity to satisfy total demand at all times. It differs from security, which is a system's capacity to cope with sudden disruptions (balancing and stability of the grid), to enable it to operate in real time."
CREG, 2012, http://www.creg.info/pdf/Etudes/F1182EN.pdf

# Project : Generation plant maintenance

The main goals are

1. *Distribute the risk  of structural shortage* with an equal weight along the year

   → *Taken into account several scenarios of*
   - ❑ *Load evolution (based on historical data, seasons, bank holidays, economical growth, …)*
   - ❑ *Solar production (based on historical data, seasons, …)*
   - ❑ *Wind production (based on historical data, seasons, …)*
   - ❑ *Decomissioning (based on information from ARPs)*
   - ❑ *Forced outages simulations (based on statistical data)*

2. *Give more information* to the ARPs in terms of mid term adequacy

3. *Receive more information* about the planned outage requests

# Project : Generation plant maintenance

The main goals are

1. *Distribute the risk  of structural shortage* with an equal weight along the year

2. *Give more information* to the ARPs in terms of mid term adequacy

   - ❑ *Increase transparency about mid term adequacy following the EntsoE guidelines*
   - ❑ *Give more information about the available periods for maintenance before receiving the ARPs planned outage request*
   - ❑ *Discuss with a technical support*

3. *Receive more information* about the planned outage requests

# Project : Generation plant maintenance

The main goals are

1. *Distribute the risk  of structural shortage* with an equal weight along the year
2. *Give more information* to the ARPs in terms of mid term adequacy
3. *Receive more information* about the planned outage requests
    - ❑ *In terms of flexibility for the ARPs themselves*
    - ❑ *In order to make the bilateral discussion and coordination easier*

# Project : Generation plant maintenance

In order to *avoid*

1. *Ponctual risk of structural shortage* on specific weeks along the year

2. *Additional workload* for ARPs and Elia during the year

# Project : Generation plant maintenance

In order to *avoid*

1. *Ponctual risk of structural shortage* on specific weeks along the year

   - ❑ Due to very high maintenance levels in certain weeks*
   - ❑ SoS risk not perfectly distributed*

   ** Experience feedback 2013/2014/2015*

2. *Additional workload* for ARPs and Elia during the year

   - ❑ Due to suboptimal communication about maintenance planning
   - ❑ Due to late publication of structural shortage risk
   - ❑ Due to late request of changes

Note : this information could also be used during the year for change request from Elia or ARPs

# TECHNICAL INFORMATION

# Technical Approach – Probabilistic approach

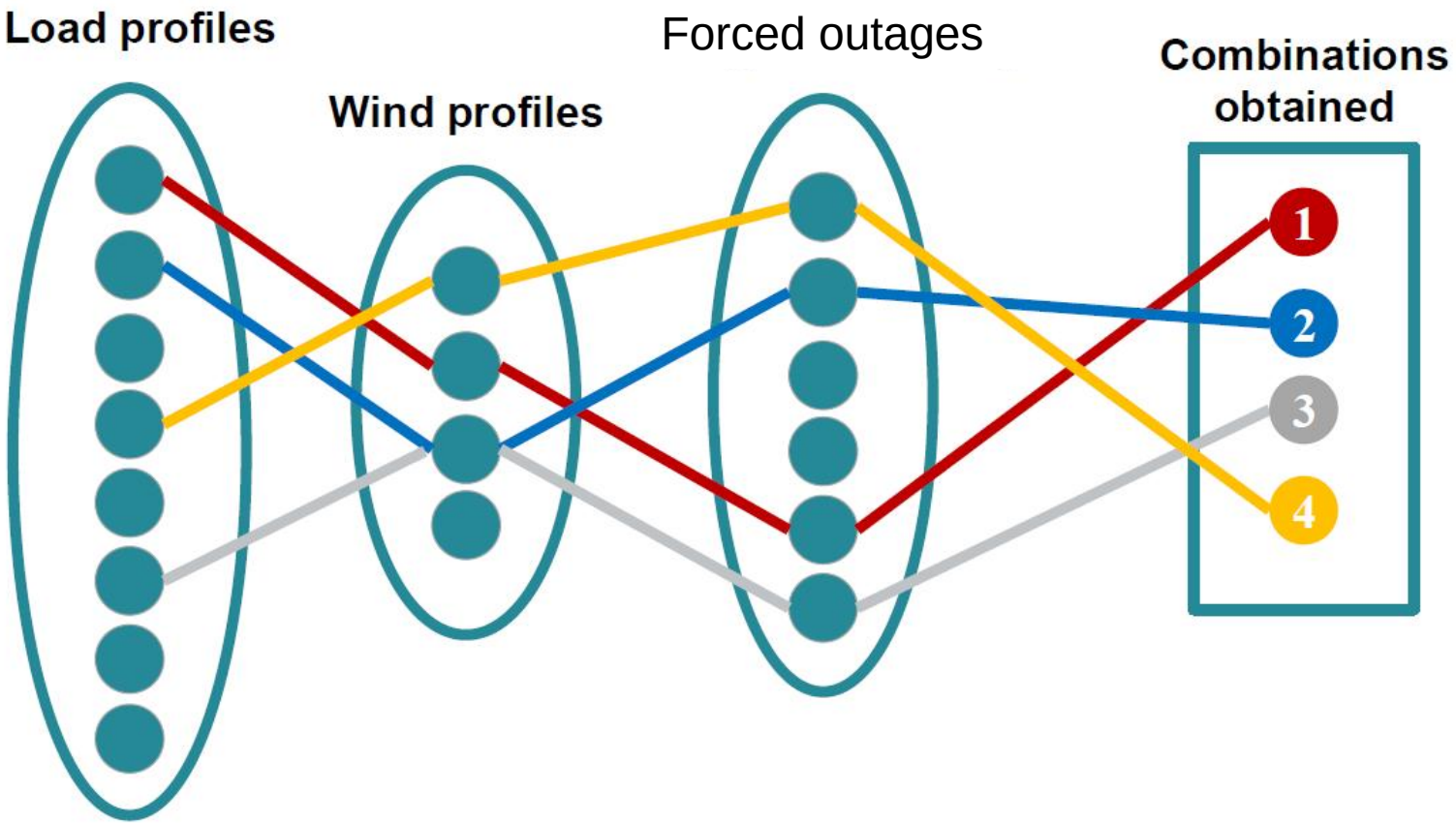
We use a tool in order to implement a *probabilistic approach*. This tool is able to *generate a given amount of profiles* for a given input.

The given inputs are :

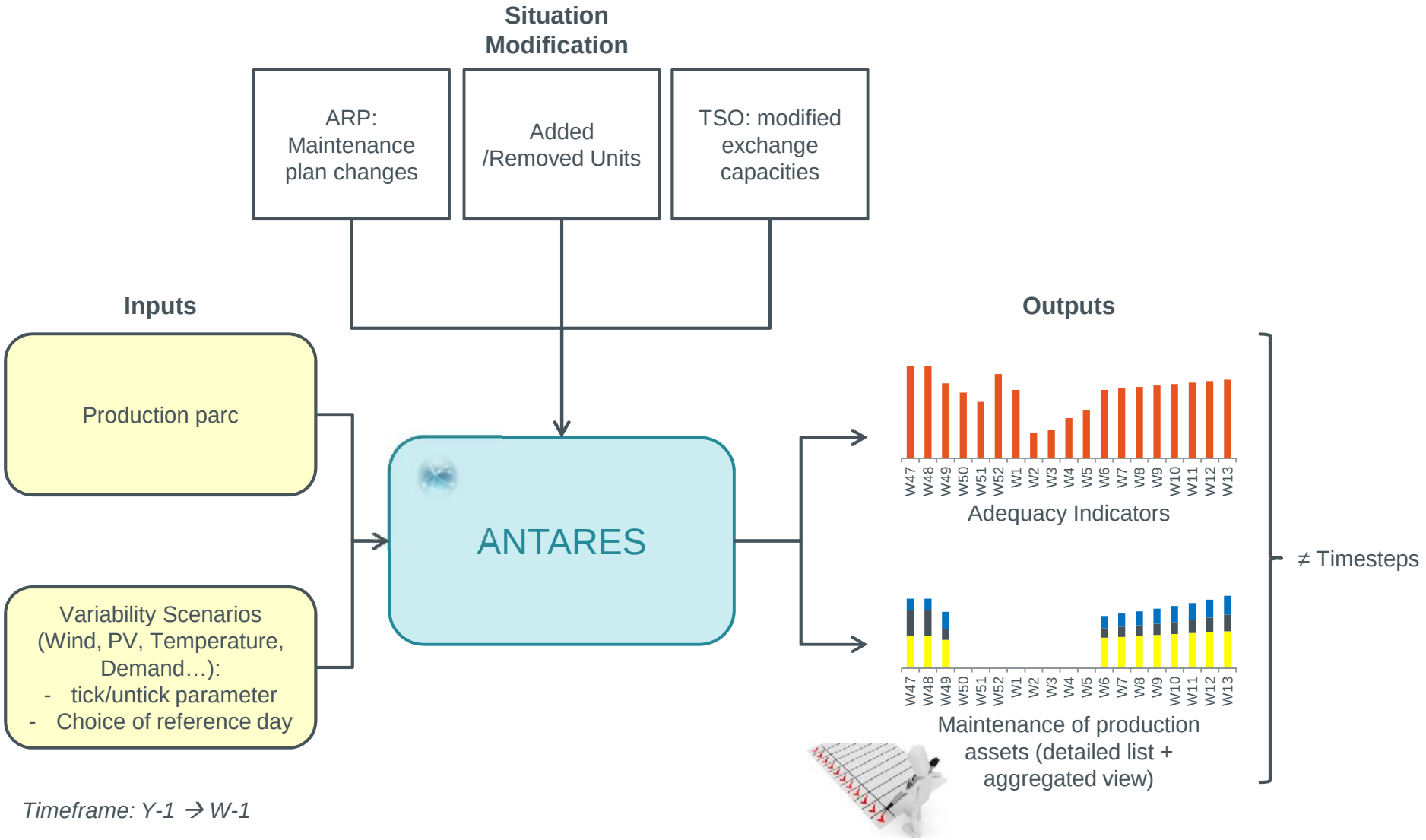
- Wind/solar generation
- Load
- Outage scheduling (forced outage)
- Hydro monthly productions

The tool gives profiled outputs of *risk of structural shortage* (unsupplied energy) and *capacity available for maintenance*.

The Monte Carlo scenarios can be chosen at random (with draws correlation), or defined by the user.

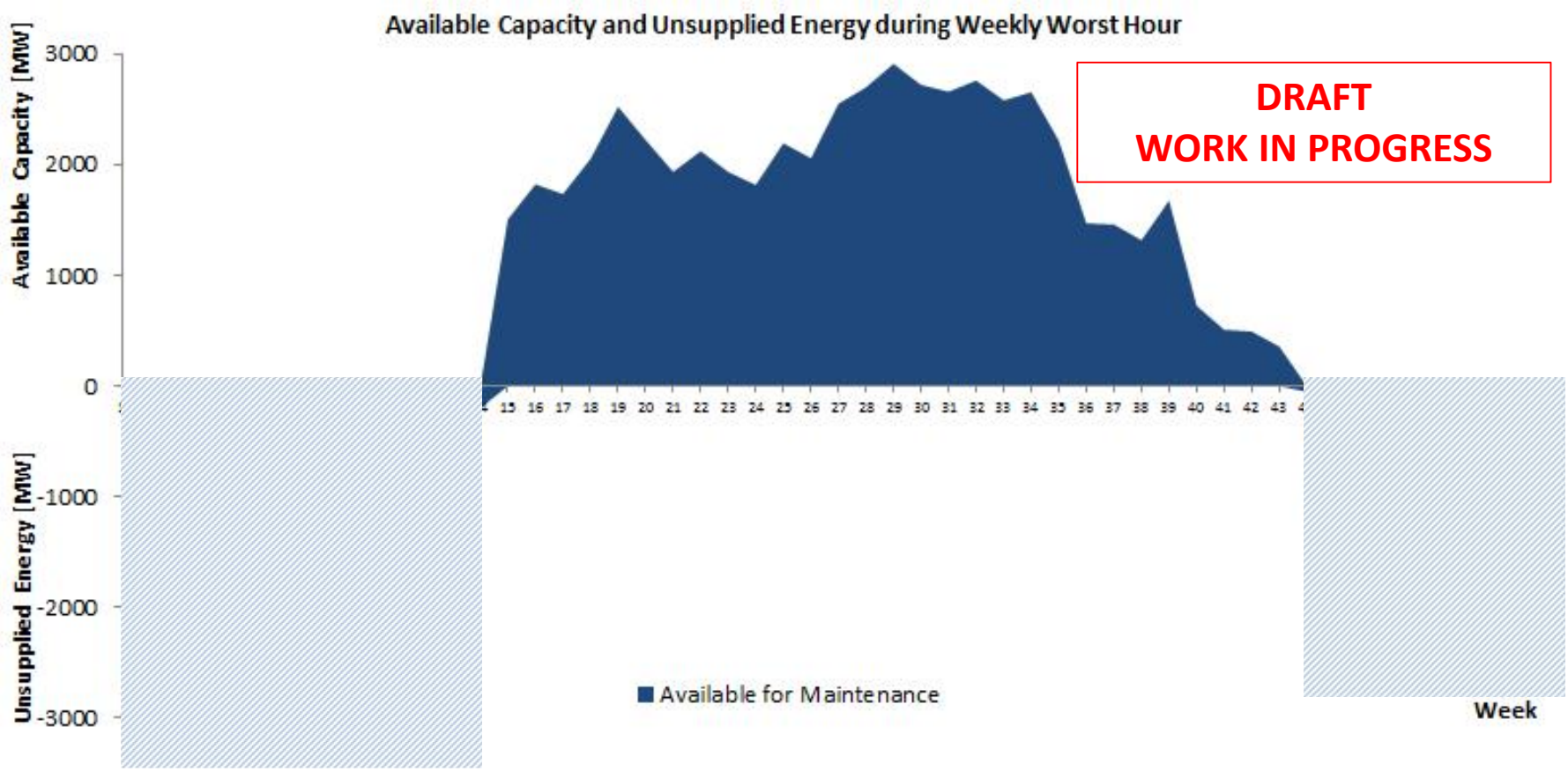


# The tool helps to highlight risky time points, based on probabilistic analysis.



# RESULTS – DRAFT

# Results – Ideal Global Maintenance Planning




*Maintenance plannings need to follow the shape of the curve in order to distribute the risk of structural shortage identically all over the year*

# ADDITIONAL INFORMATION

# Additional information requested for the process 2015

*End of July :*

Elia will send the updated Ideal Global Maintenance planning with all information to understand and read the curve correctly

*Mid of August :*

Deadline for ARPs to communicate maintenance planning for each plan (yearly process) :

- Information to be sent :
  - Request of ideal maintenance planning and *potential variants*
  - *Acceptance windows* round those proposals (including conditions/remarks, if needed)