

2nd Public Stakeholder Consultation Workshop on Adequacy Methodology Proposal

ENTSO-E premises, 17 June 2014



Reliable Sustainable Connected

Today's Agenda:

No	Subject	Time
1	Welcome	10:00 10 min.
2	Introduction: <ul style="list-style-type: none">• Consultation process• Organization for the day	10:10 10 min.
3	Outcomes of the 1 st workshop and web survey	10:20 15 min
4	Target methodology: <ul style="list-style-type: none">- Presentation- Q&A	10:35 45 min.
5	First steps of implementation in next reports: <ul style="list-style-type: none">- Outlook- SO&AF	11:20 60 min.
6	Lunch	12:20 60 min
7	Introduction to the roadmaps for the years ahead: <ul style="list-style-type: none">- Outlook and SO&AF reports' improvements	13:20 20 min.
8	Interactive group sessions on the roadmaps: <ul style="list-style-type: none">- SO&AF roadmap- Outlook roadmap	13:40 60 min.
9	Summary of group sessions	14:40 30 min.
10	Conclusion: <ul style="list-style-type: none">- Short summary of the day- Consultation next steps- Timeline for next reports	15:10 20 min.
	End of meeting	15:30

Consultation Process :



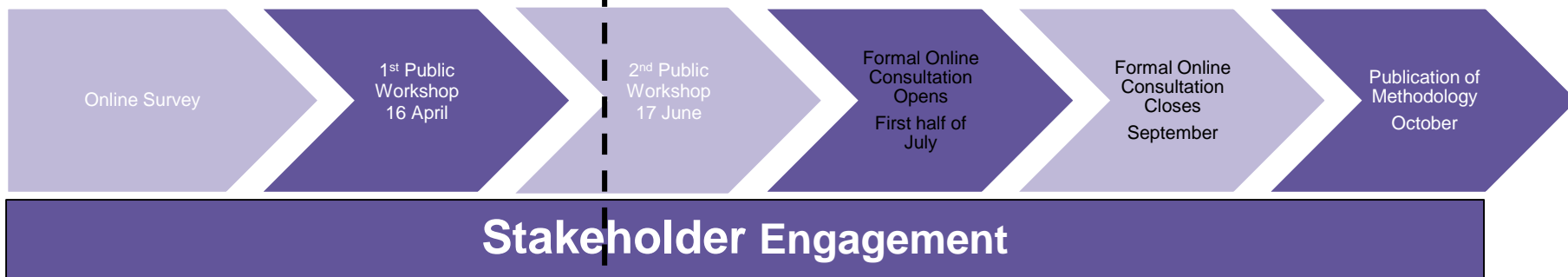
2014

April

June

September

October





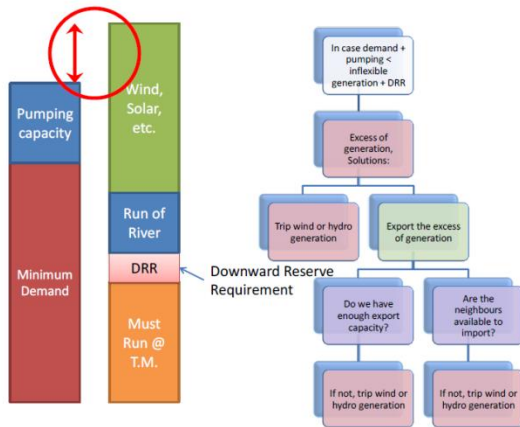
OUTCOME OF 1ST WORKSHOP

Risks missing in the existing methodology

ADDRESSED RISKS

SO&AF

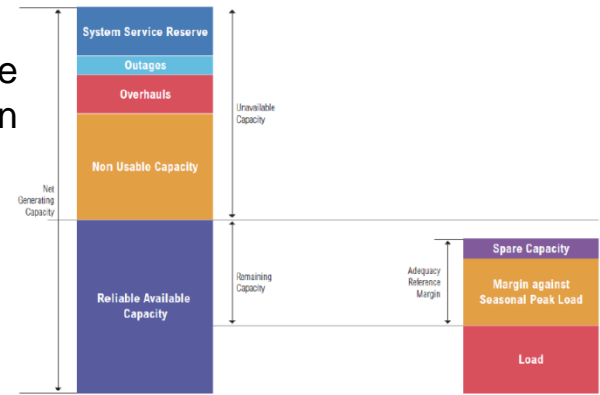
Assesses the ability of the generation to match the consumption in some predefined snapshots (upward margin at peak load).



Seasonal Outlooks

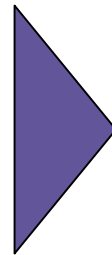
Assess the upward adequacy and the downward adequacy of the power system during the successive season using a sequence of snapshots which represent:

- Weekly peak load (upward)
- Weekly minimal demand conditions daily and nightly (downward)



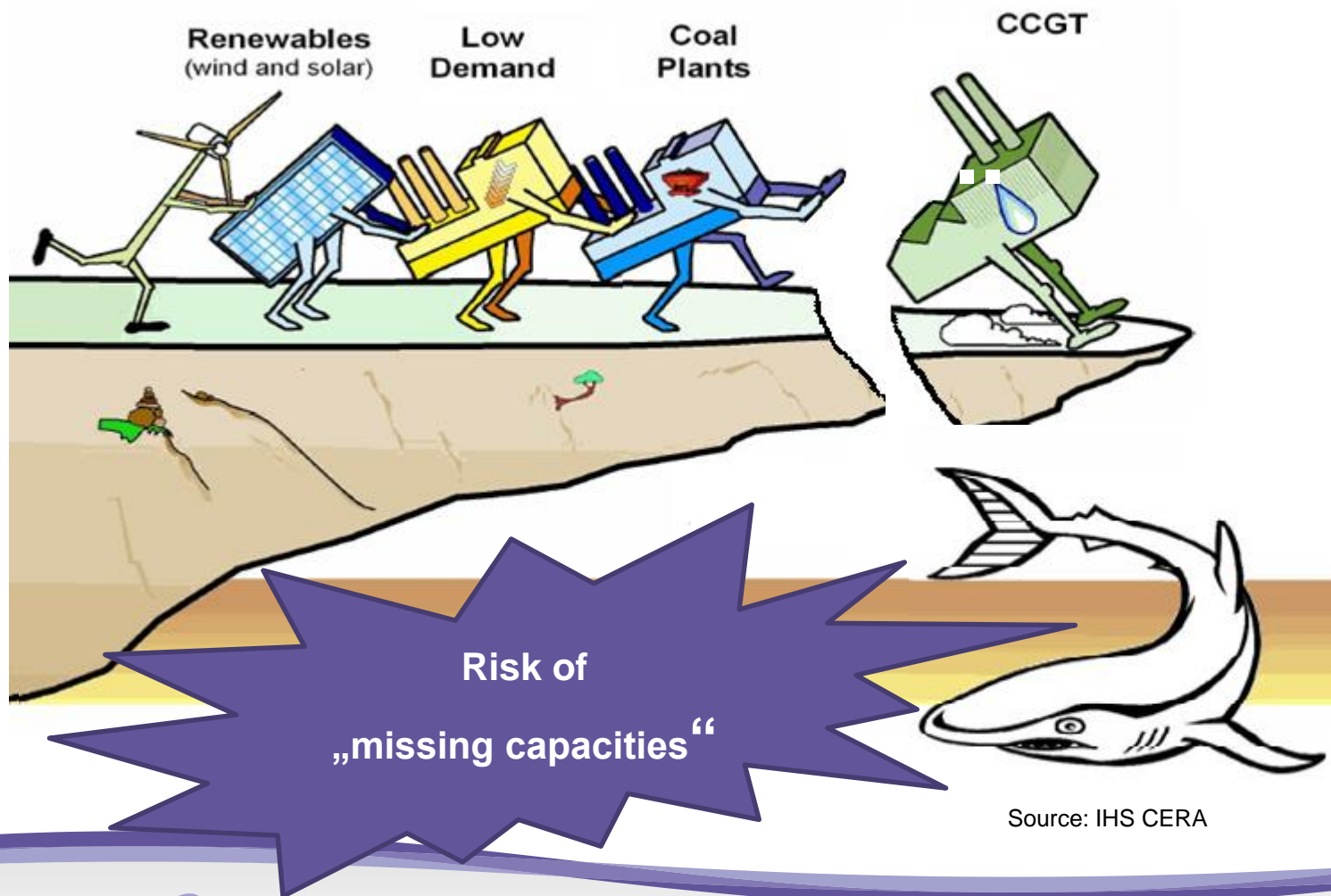
Changes in:

- Energy mix (eg. RES integration)
- Market structure (eg. IEM)
- Consumption behaviour (eg. DSM)



**For the future,
which additional risks will
need to be addressed?**

Risks missing in the existing methodology



Different uses of adequacy reports

Different kind of risk exposure:

Short term :

- sensitivity on climate fluctuations
- production changes (generation, grid ...)
- energy commodities prices
- seasonality

Long term :

- sensitivity on macro economical indicators
- investment risk, political decision (EU goals ..)
- global factors, fundamentals

Different attitude to the risk of the stakeholders:

- investors, generation providers
- TSO, market operators, regulators
- politicians, state institutors, EC
- developers, energy substituents

Different scale of impact:

- local, regional vs. pan-European
- economical sustainability
- environmental



Different uses may focus on specific benchmarks, granularity and structure of the assessment

Adequacy on different time horizons



Short term



Long term

6 months

1 year

5 years

10 years

**Operational
decisions**

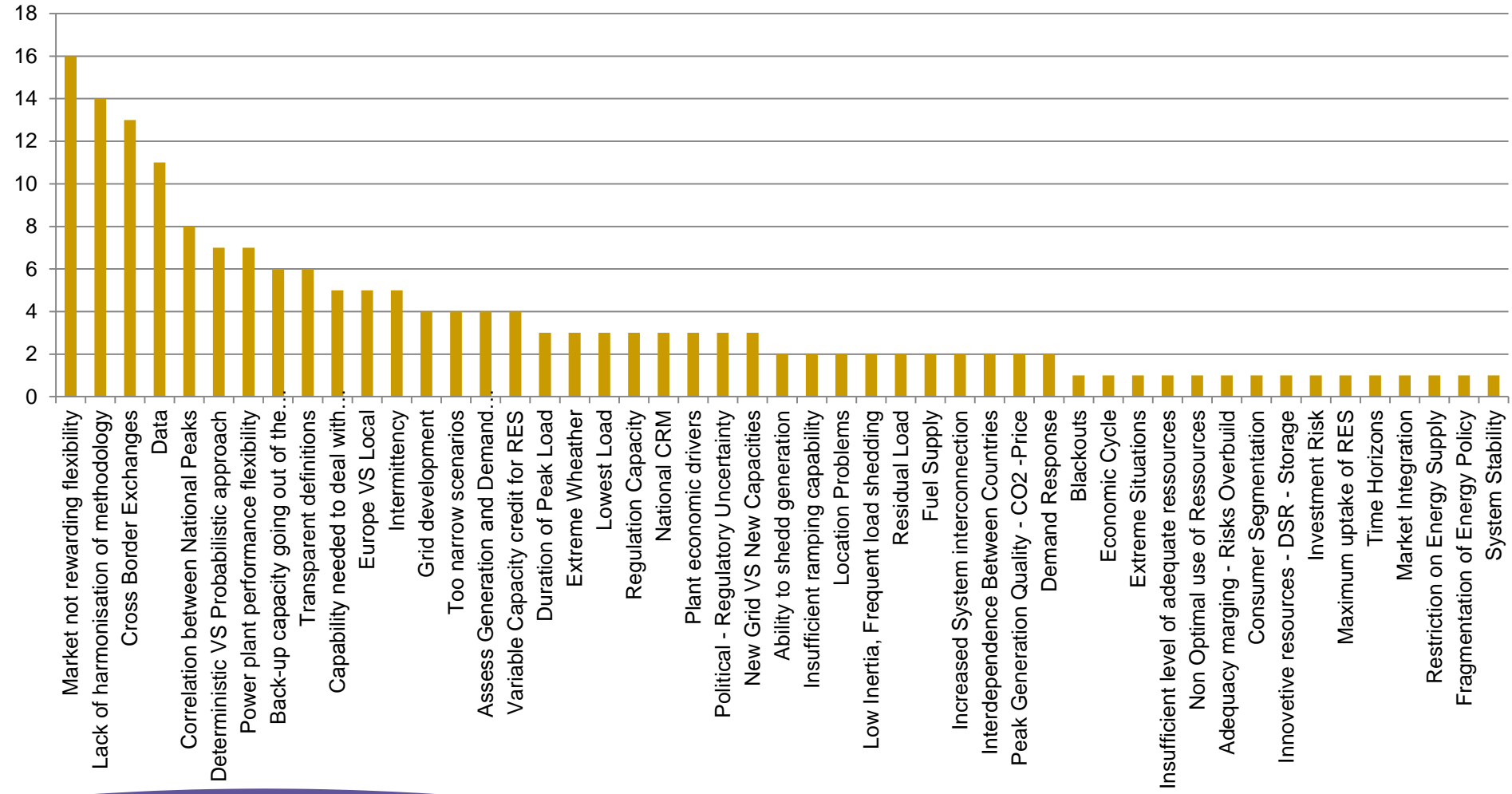
**Investment
decisions**

**Policy/political
decisions**

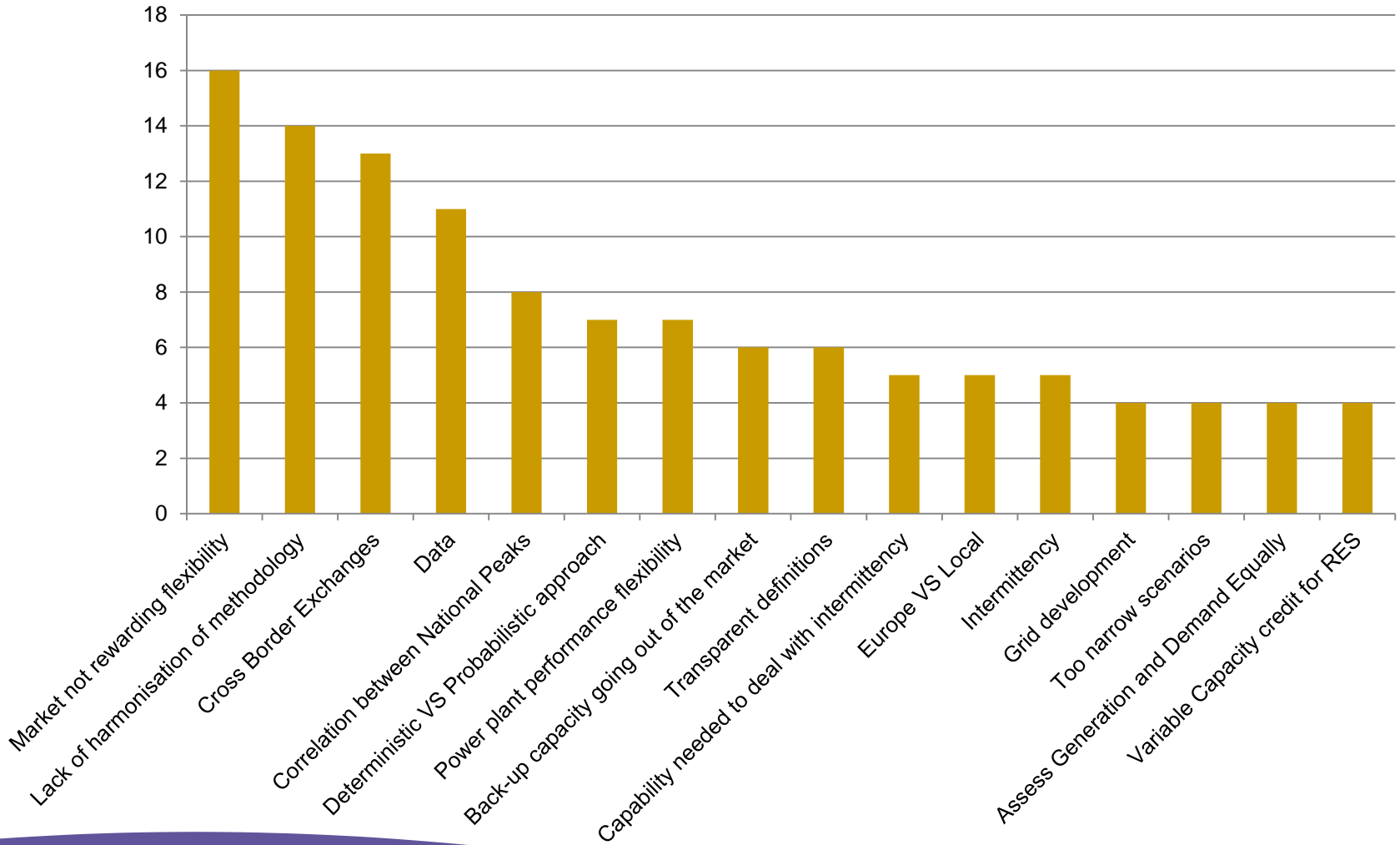


Which risks do you consider should be addressed in the different time horizons?

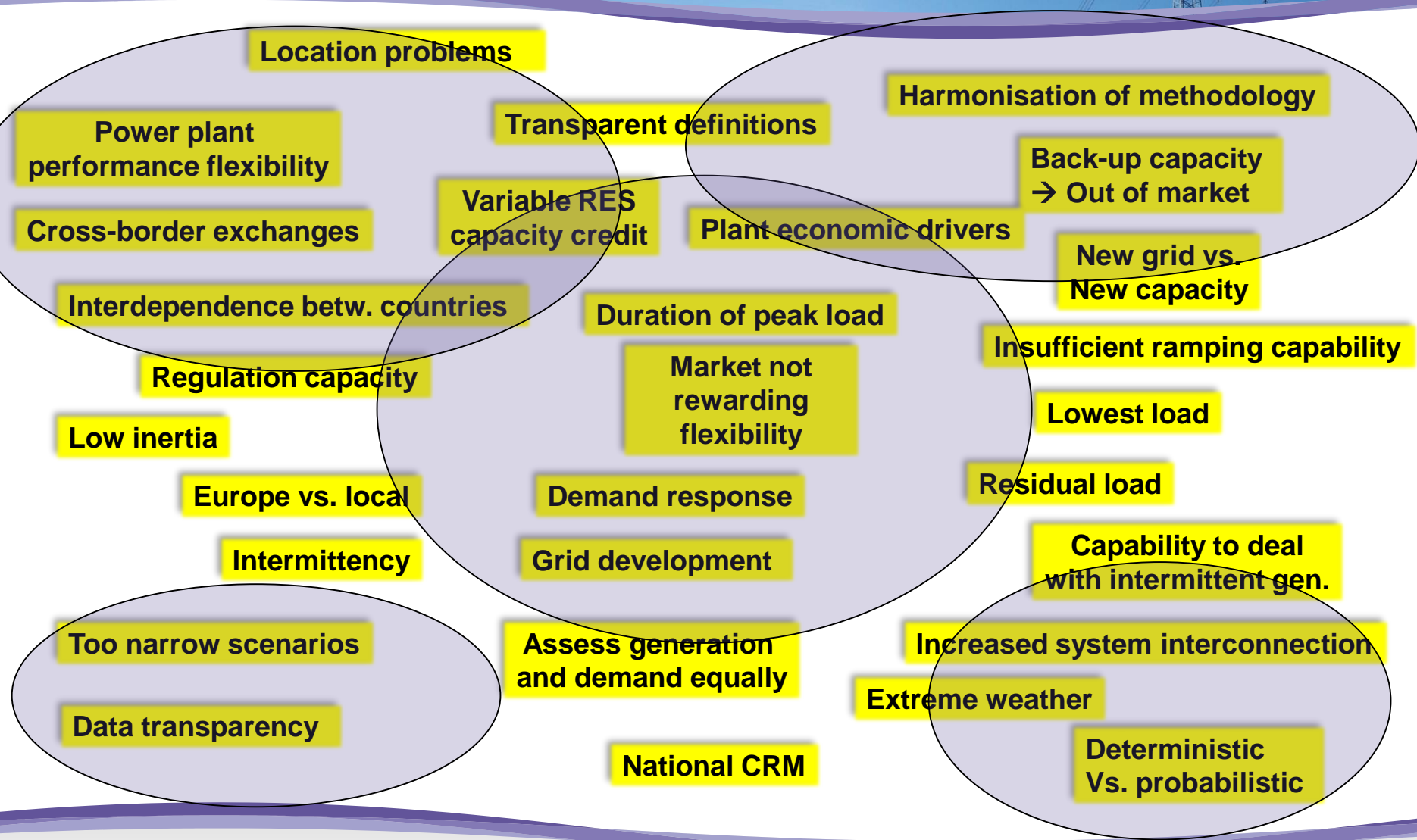
Input results from the workshop



Prioritisation



Outcomes of the 1st Workshop and Web Survey:





TARGET METHODOLOGY

Stakeholder Requirements

Market not rewarding flexibility:

- ENTSO-E will report on expected needs for flexibility as part of its adequacy forecast.
- The adequacy analysis can be performed with an hourly resolution.
- Pan European Climate Database (PECD) can be used to model the volatility of load, wind and solar generation.

Harmonization of methodology:

- The core methodology will be the basis for short and long-term reports.
- The methodology will include a common set of indicators, same categories and definitions.
- The datasets provided will have common underlying assumptions.

Data transparency

- ENTSO-E will improve harmonisation through detailed transparency on input data and methodology.
- The input data will be published provided there are no confidentiality or confidence issues.

Stakeholder Requirements



Cross border exchanges:

- The ENTSO-E adequacy methodology will take into account the contribution of the cross border exchanges.
- A market model will be used in the future ENTSO-E methodology for adequacy assessment in order to evaluate the expected role of interconnectors.
- The Available Transfer Capacity (ATC) approach will first be used to model the cross-border exchanges in the future ENTSO-E methodology for adequacy assessment.

Deterministic VS Probabilistic:

- The ENTSO-E target modeling for adequacy assessment will be probabilistic.
- The transition of the methodology will be a gradual step by step approach, to be further specified for each report.



Methodology improvements

- Methodology target document
- Roadmap
- Detailed methodology document for next reports



MORNING SESSION



MORNING SESSION OUTLOOK REPORT

Outlook Reports Improvements



Scope of proposed improvements for next Winter Outlook 2014/15⁽¹⁾:

- **achievable improvements** reflecting the key requirements for target methodology
- **demonstrate the ability** to respond to main stakeholder expectations.

Market doesn't reward flexibility

- Starting some data collections in order to make a first step toward flexibility assessments

Harmonization of methodology

- Harmonization of different underlying assumptions and input data on the whole geographical scope in order to define realistic Pan-EU scenarios

Data transparency

- Enhance transparency on methodologies and input data

Cross border exchanges

- Cross-border exchanges are already taken into account in the current methodology, anyhow more detailed data on XB capacities will be introduced

Probabilistic approach

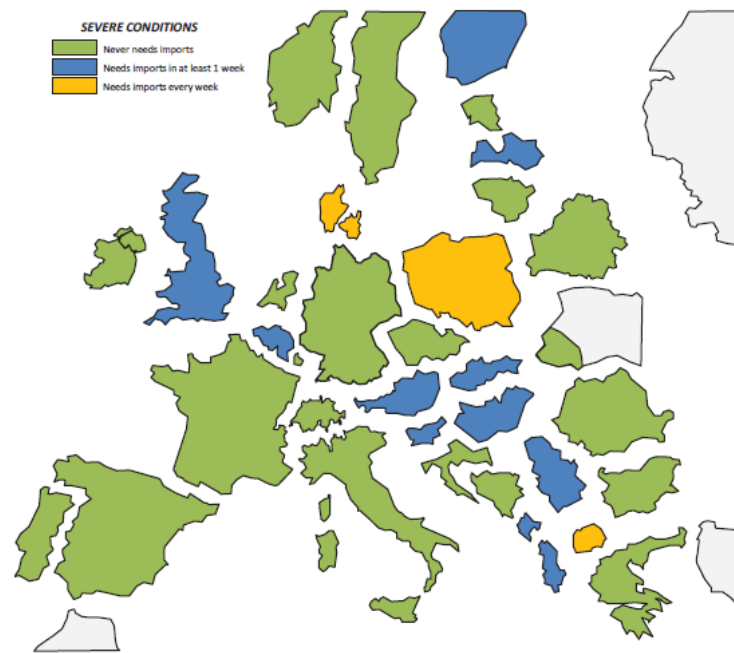
- The current deterministic approach will be complemented with some probabilistic evaluations on critical periods

Current methodology

- Cross-border exchanges modelled according to the NTC approach
- A calculation is performed in order to determine whether – considering the given NTC's and the remaining margin for every country – it is possible to route the energy needed from countries having a surplus to countries having a deficit

Main point of improvements

- For each week of the assessment period, only one NTC value is collected (peak value)
- The performed simulation is not market-based



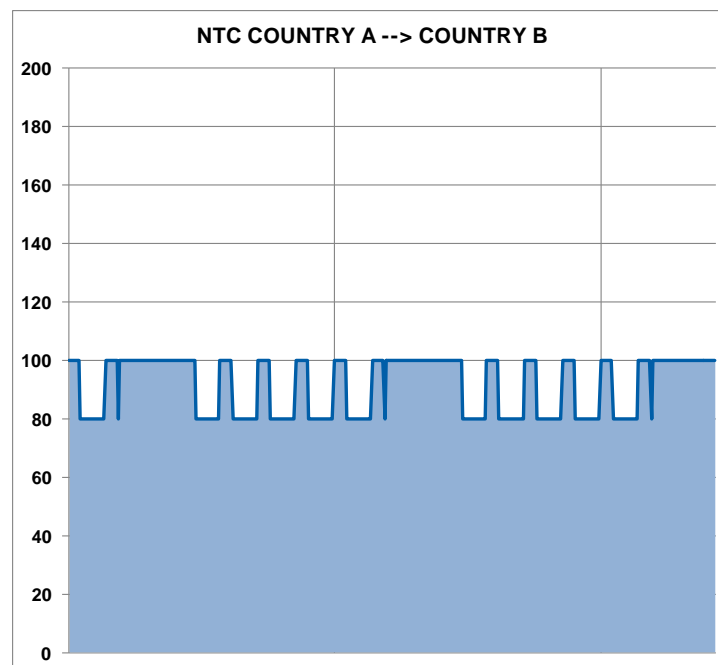
Cross-border exchanges – First step (WO 2014/15)

Additional input data:

- **NTC** values collected for both **peak and off-peak** hours of each week

Additional value

- The role of interconnectors as a contribution to the ability of each area to balance its load and generation will be more properly modelled



Cross-border exchanges – Second step (SO15)

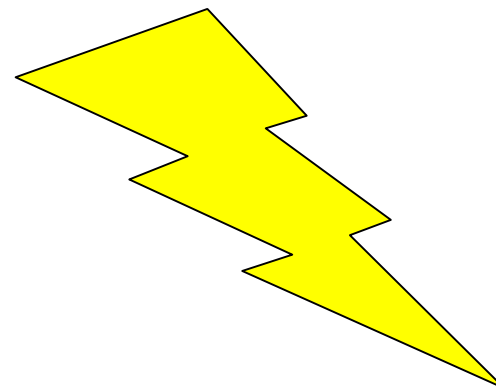


Additional input data:

- Forced Outage Rate of interconnectors and the related impact on the NTC

Additional value

- Identification of possible SoS issues related to unplanned events at the interconnection



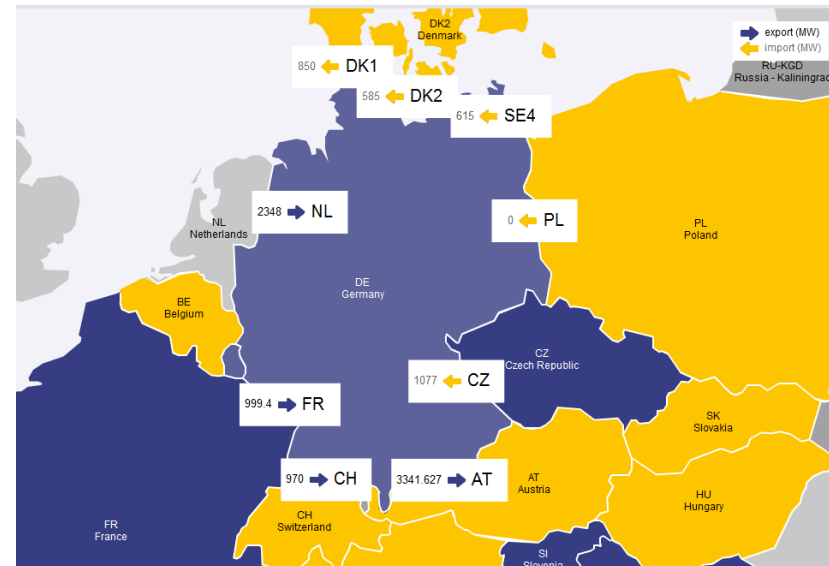
Cross-border exchanges – Third step (SO16)

New approach:

- Although a model which simply simulates the exchange of capacity margins might be enough for an adequacy assessment, the future ENTSO-E adequacy studies will be integrated with appropriate market simulations

Additional value

- These simulations will provide an estimation of the expected cross-border flows and, in addition, such modelling will allow ENTSO-E to produce an extensive range of indicators (e.g. estimated marginal technology, CO2 emissions, RES curtailments...) which have been listed by the Stakeholders as the most interesting ones



Assessing the impact of potential gas shortages

Additional input data:

- Gas availability scenarios
- Sensitivity of load and available generation capacity to gas availability

Results of the assessment:

- Identification of possible SoS issues related to lack of gas availability
- Identification of possible countermeasures
- For Winter Outlook 2014/15 and further as necessary



Outlook Roadmap

WO14/15

- **First flexibility data collection**
- **Harmonization enhancement in scenario and input data definition**
- **Transparency enhancement through consultation process and data publication**
- **Cross-border exchanges model's details improvements**
- **First simplified probabilistic assessment complementary to the usual deterministic approach**

SO15

- **Improvement of cross-border exchanges and probabilistic model through forced outage simulation**
- **First flexibility assessment**

SO16

- **Market-based approach**
- **Modelling of energy constraints for pumping units and ramping constraints for thermal units**



MORNING SESSION SO&AF REPORT



Scope of proposed improvements for next SO&AF Report :

- **achievable improvements** reflecting the key requirements for target methodology
- **demonstrate the ability** to response on main stakeholder expectations.

Market doesn't reward flexibility

- complete analysis of the system margins to meet the new flexibility requirements

Harmonization of methodology

- harmonize scenarios to fully benefit from the assessment, ensure consistency of correlated values

Data transparency

- enhance transparency on the availability of variable generation and non-used capacities.

Cross border exchanges

- enable further enhanced assessment and modelling of cross-border exchanges to adequacy

Probabilistic approach

- extension of the SO&AF reports with a probabilistic assessment of RES and temperatures.

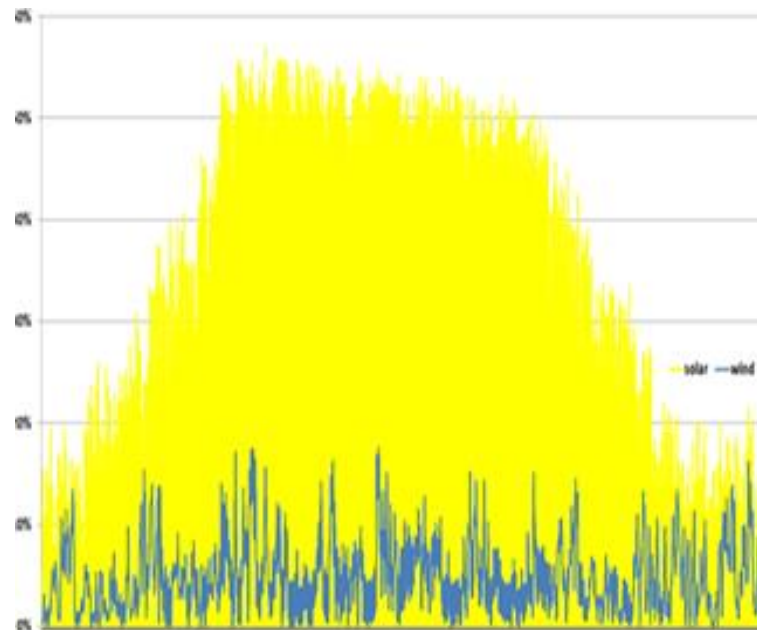


Current methodology

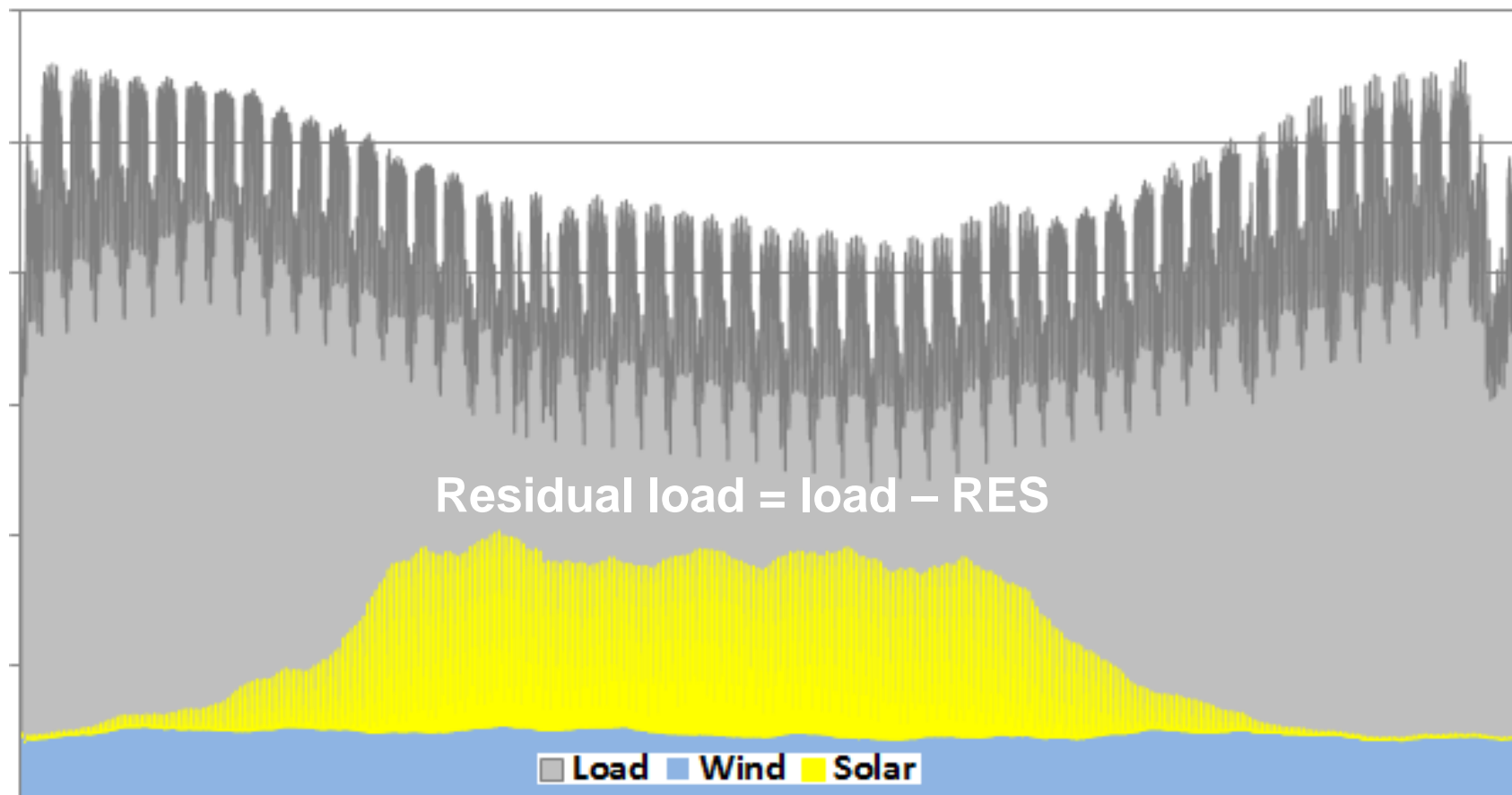
- Assessing of remaining capacity in reference times
- Not all critical situations can be captured
- Information on correlation of simultaneous events is necessary.

Assessment of the residual load:

- efficient way to combine the effect of different weathering impacts
- correlated time series of load, wind and solar production
- load curve needs to be standardized on 'temperature normal'.
- for wind and solar we can use PECD data.



Mathematical presentation of the residual load



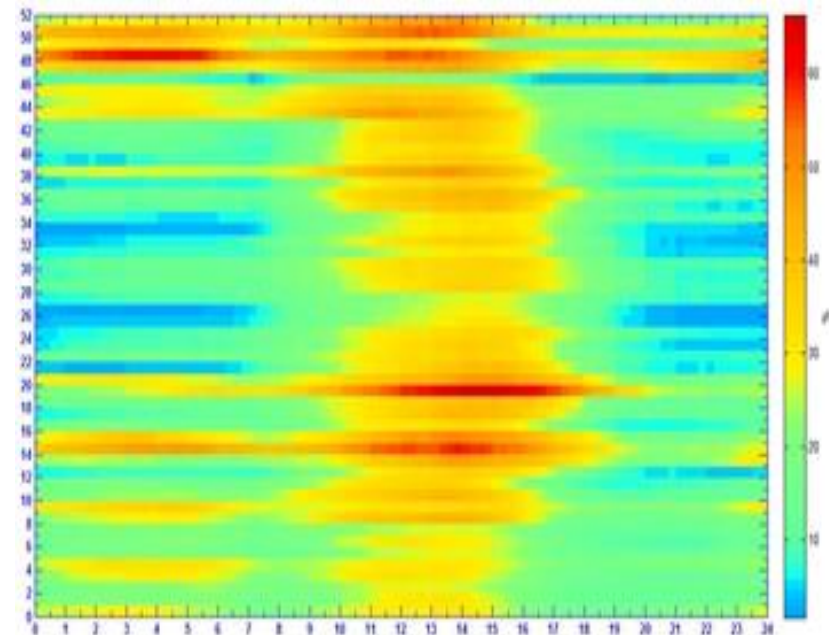


Additional input data:

- **RES generation** will be modelled using the country capacities multiplied by the hourly load factors from the **PECD Database**
- **Common procedure** can be applied for time series generation for any time interval

Results of residual load assessment:

- statistical distribution during the year,
- chromatic representation of maximum and minimum appearance,
- spreads between minimum and maximum to be regulated by the system,
- short term residual load volatility based on statistical analysis of the ramps,
- hourly fluctuations based on the simulations of climate factors



SO&AF Roadmap - step 1:



Step 1

- **Harmonize categories and the scenario definitions**
- Harmonization of key assumptions and data collected
- Introduce several climatic scenarios
- **Hourly residual load assessment**

SO&AF 2015

- **Simplified probabilistic assessment** of RES ramping and temperature sensitivity of load
- Enhance the interconnected margin exchanges calculation taking into account bilateral interchange capacities
- Publish all acceptable data

Step 2

- **Evolve towards a target methodology for SO&AF 2016-2017**
- Properly taking into account all the identified improvements, best available mathematical techniques and modeling

SO&AF Roadmap - step 2:



SO&AF
2016

- **Improvement of cross-border exchanges** and probabilistic model through forced outage simulation
- First flexibility assessment

SO&AF
2016 or
2017

- **Market-based approach**
- Modelling of energy constraints for pumping units and ramping constraints for thermal units

SO&AF
2017 or
2018

- **Further towards probabilistic assessment and simulations**
- Flexibility assessment
- Harmonized categories with the Outlook report
- Transparency and publishing all acceptable data



AFTERNOON SESSION

Interactive Group Session

- Four interactive groups, each focusing on either:
 - SO&AF Roadmap
 - Outlook Roadmap



SO&AF Roadmap



SO&AF
2015

- **Assessment of flexibly needs based on evaluation of hourly residual load**
- **Harmonize categories with the Outlook report and the scenario definitions**
- **Transparency on key assumptions and publishing all acceptable data**
- **Enhance the interconnected margin exchanges calculation considering bilateral NTCs**
(instead total import/export national capacity)

SO&AF
2016

- **Probabilistic zonal modelling**
- **Assessment of flexible capacities availability**

SO&AF
2017

- **Introduction of market-based approach system simulations**
- **Modelling of energy constraints for pumping units and ramping constraints for thermal units**

SO&AF
2018

- **Examine possibility of fully market based probabilistic assessment**

Outlook Roadmap



**WO
14/15**

- **First flexibility data collection**
- **Harmonization enhancement in scenario and input data definition**
- **Transparency enhancement through consultation process and data publication**
- **Cross-border exchanges model's details improvements**
- **Simplified probabilistic assessment complementary to the usual deterministic approach**

SO15

- **Improvement of cross-border exchanges and probabilistic model through forced outage simulation**
- **First flexibility assessment**

**WO
15/16**

- **Modelling of energy constraints for pumping units and ramping constraints for thermal units**

**SO16
or later**

- **Market-based approach**

Summary of Group Sessions

Most discussed issues

SO&AF:

- Is residual load the best approach to assess flexibility? If so, at which geographic scale?
- Transparency and harmonisation of assumptions behind current Scenarios A & B
- Clear definitions of flexibility indicators are expected
- Articulate ENTSO-E approximated studies with detailed local ones
- The ambition is quite high and dependent to the availability of data
- Monitoring and consultation of methodology improvements is required

Outlook:

- Internal constraints within market zone should be taken into account
- Conclusions in ENTSO-E reports should be easy to understand to non experts and includes recommendations

Next steps - Consultation Process :



2014

April

June

September

October



Stakeholder Engagement

Next steps – Next reports publication

Winter Outlook 2014/15
and
Summer Review 2014

- end
November
2014

Scenario Outlook and
Adequacy Forecast
2015-2030

- Q2/2015

THANK YOU



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Reliable Sustainable Connected