TRANSNET BW

Enerday 2016 „Energy Efficiency and Demand Response“

DEMAND RESPONSE AN OPTION FOR RESERVE POWER / REDISPATCH?

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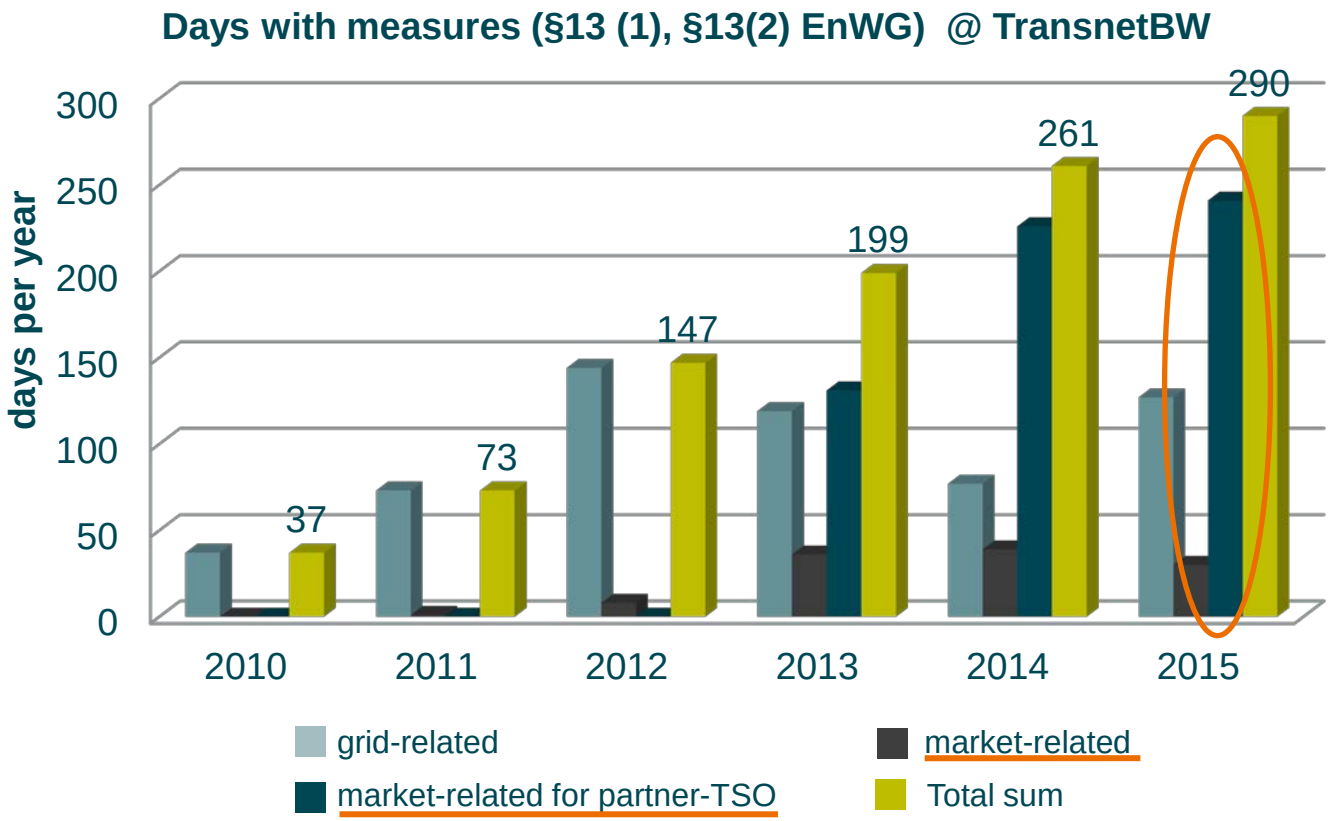
Thesis

DEMAND RESPONSE IS AN OPTION …

Thesis 1	… for short and small redispatch calls!
Thesis 2	… for just-in-time redispatch calls!
Thesis 3	… to reduce power reserve calls!
Thesis 4	… to re-organise the calling order according to EnWG!

Current consequences at TransnetBW of the German Energiewende

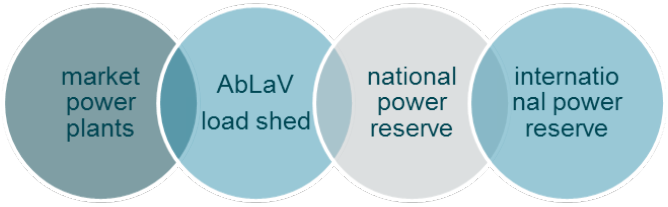
INCREASING CHALLENGE

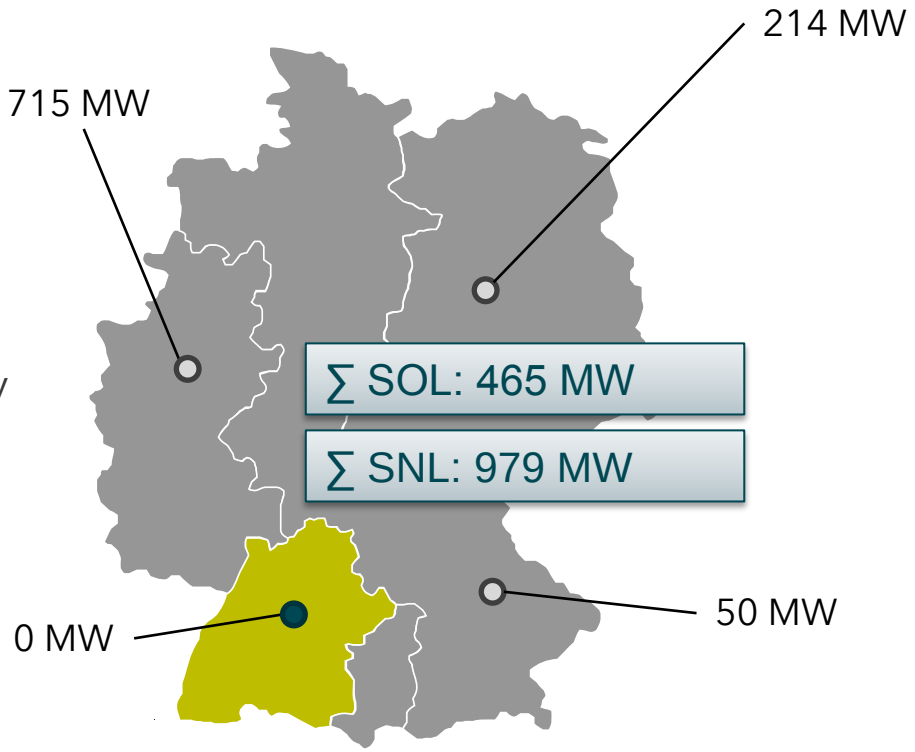


Products and Tools for Redisptach

LOAD SHEDDING UNITS WITHIN ABLAV

- 50 MW minimum load
- >= 110 kV connection point
- product: SOL (seconds) / SNL (minutes)
- 3 call duration options (A, B, C)
- 4 partners (6 contracts)
- Business branch: aluminium & chemistry





Source: intern

Products and Tools for Redisptach

NATIONAL RESERVE POWER IN THE SOUTH

Combined heat and power Heilbronn (EnBW)
250 MW

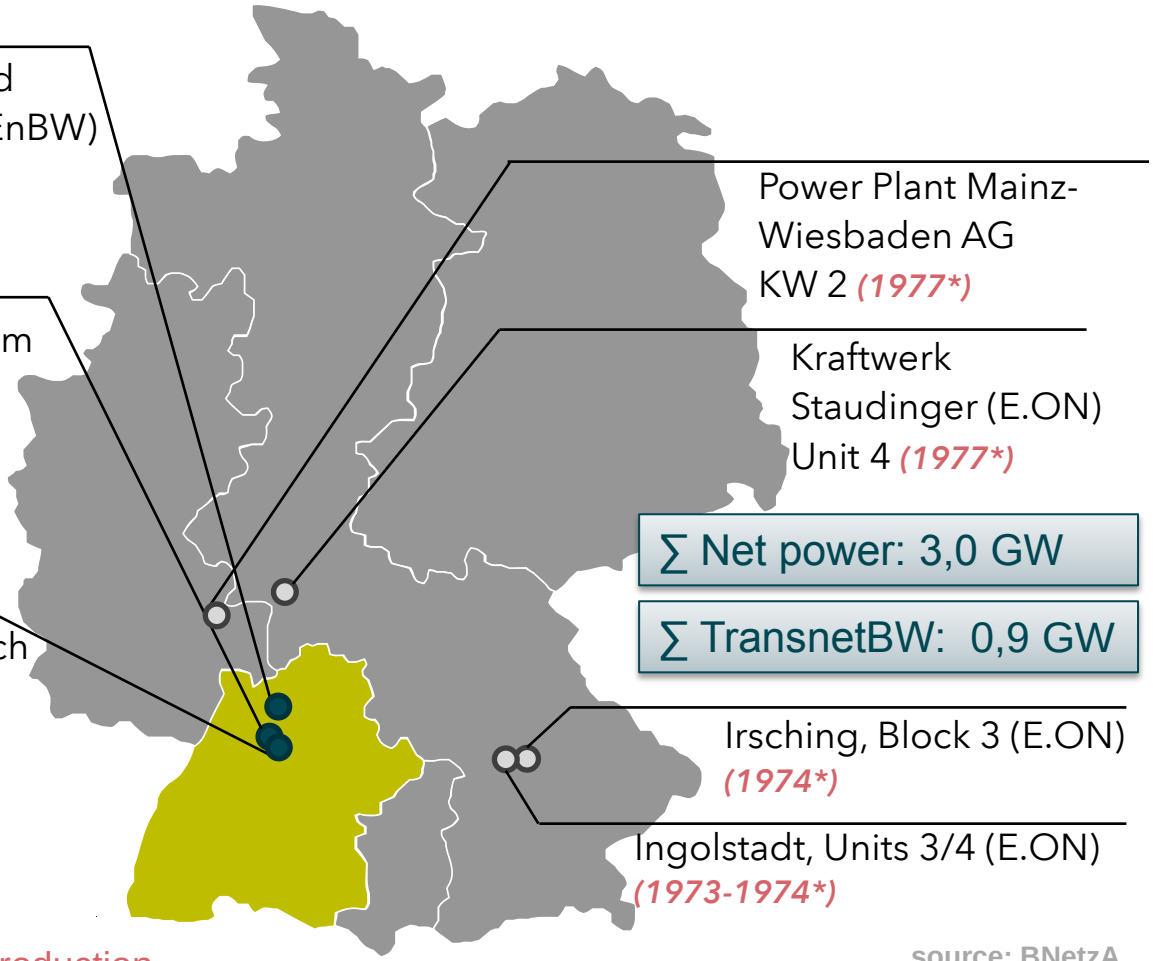
Units 5/6 since 04/2015 *(1965-1966*)*

Power plant Walheim (EnBW)
244 MW

Units WAL1, WAL2 since 07/2014
(1964-1967)*

Power plant Marbach (EnBW)
424 MW

Units GT II/GT III/DT III *(1971-1975*)*



Power Plant Mainz-Wiesbaden AG
KW 2 *(1977*)*

Kraftwerk Staudinger (E.ON)
Unit 4 *(1977*)*

∑ Net power: 3,0 GW

∑ TransnetBW: 0,9 GW

Irsching, Block 3 (E.ON)
(1974)*

Ingolstadt, Units 3/4 (E.ON)
(1973-1974)*

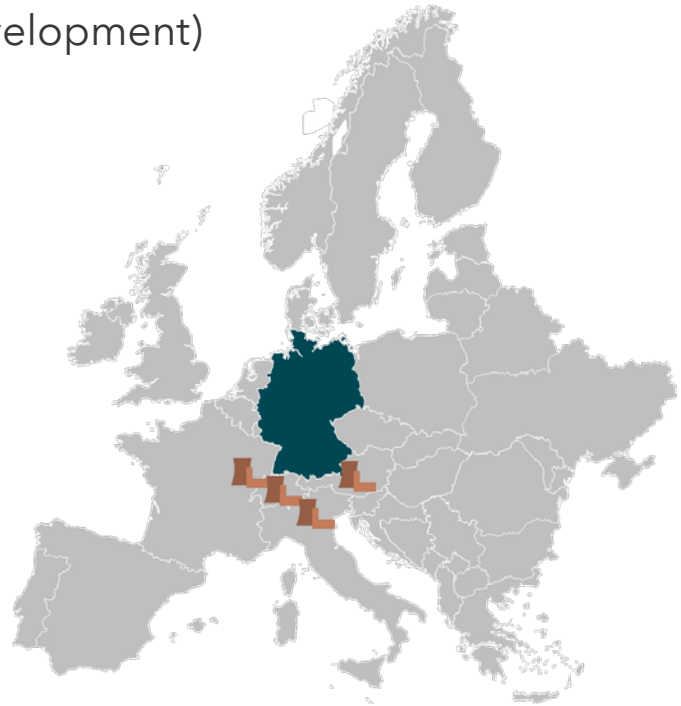
*start of commercial power production

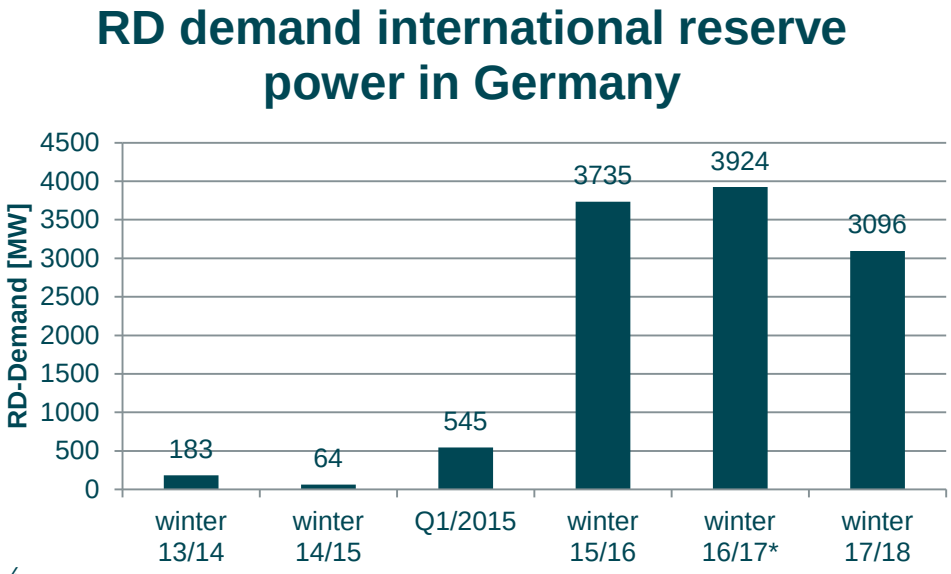
source: BNetzA

Products and Tools for Redisptach

INTERNATIONAL POWER RESERVE

- ca. 4 GW for Winter 2016/17 (*under contractual development)
  - Italy
  - Austria
  - Switzerland
  - France



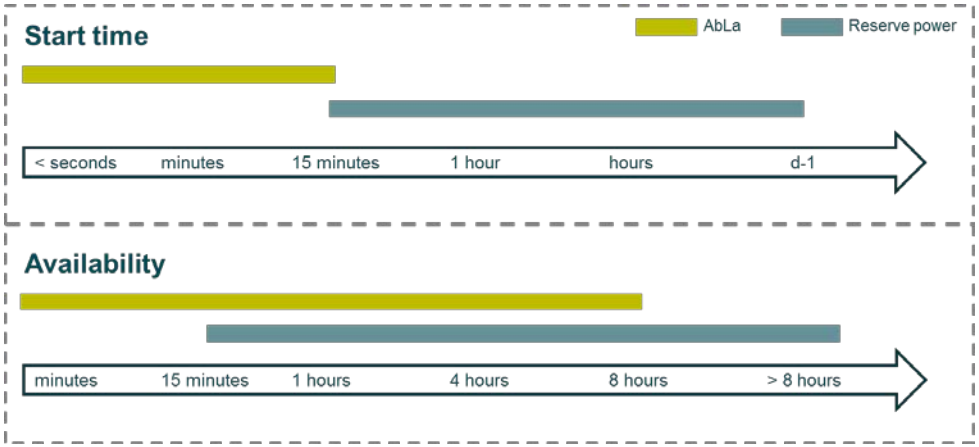


source: intern

Products and Tools for Redispatch

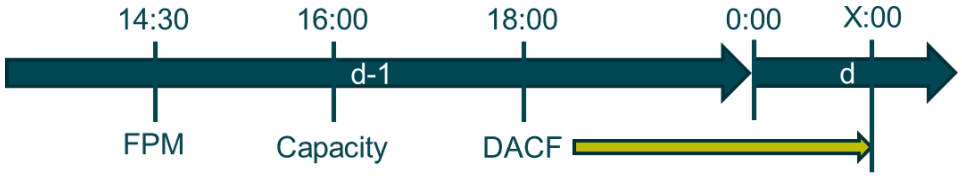
CHALLENGES BY TOOLS/PRODUCTS

- Loads
  - smaller in size (MW)
  - lower availability (hours/day)



- Reserve power plants
  - slow in starting
  - long-term order (capacities)

- Market power plants
  - delayed reaction to DACF
  - quality of schedule information



Thesis

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Thesis 1: Demand response is an option for short and small redispatch calls!

IS ABLA SUITABLE FOR SHORT AND SMALL?

Type A (1h), B (4h) and C (8h)

SNL	PQ	Work
Type A	858 MW	858 MWh
Type B	117 MW	468 MWh
Type C	50 MW	400 MWh

Statsitic from 01.02.2014 to15.09.2015

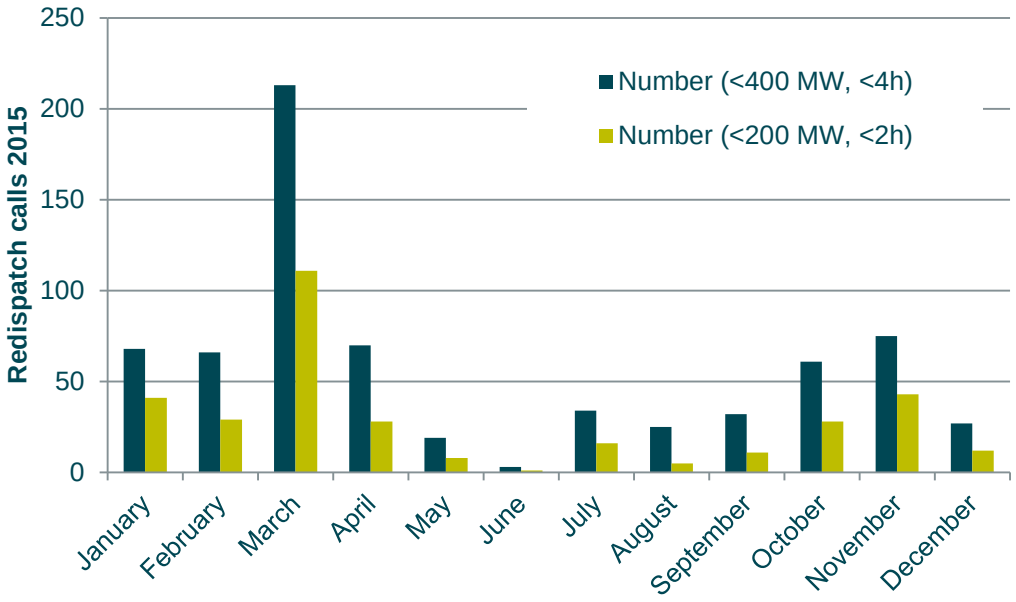
congestion management	balancing purposes
/ total number: 24 calls / total time: ~ 37 h / mean call duration: ~ 1h	/ total number: 66 calls / total time: ~ 40 h / call duration: 7 min. to 1h

Thesis 1: Demand response is an option for short and small redispatch calls!

IS THERE SMALL AND SHORT REDISPATCH?

/ Mean work: 108 MWh for „< 200 MW Calls“ with std. dev. 61MWh

/ Mean work: 289 MWh for „< 400 MW Calls“with std. dev. 244 MWh



∑ 400MW: 693 x (2015)

∑ 200MW: 333 x (2015)

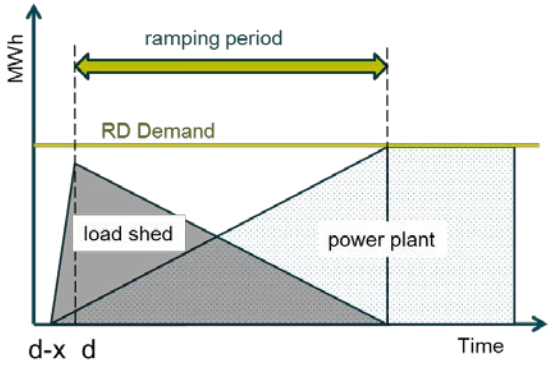
14-fold resp. 29-fold chance to increase redispatch use

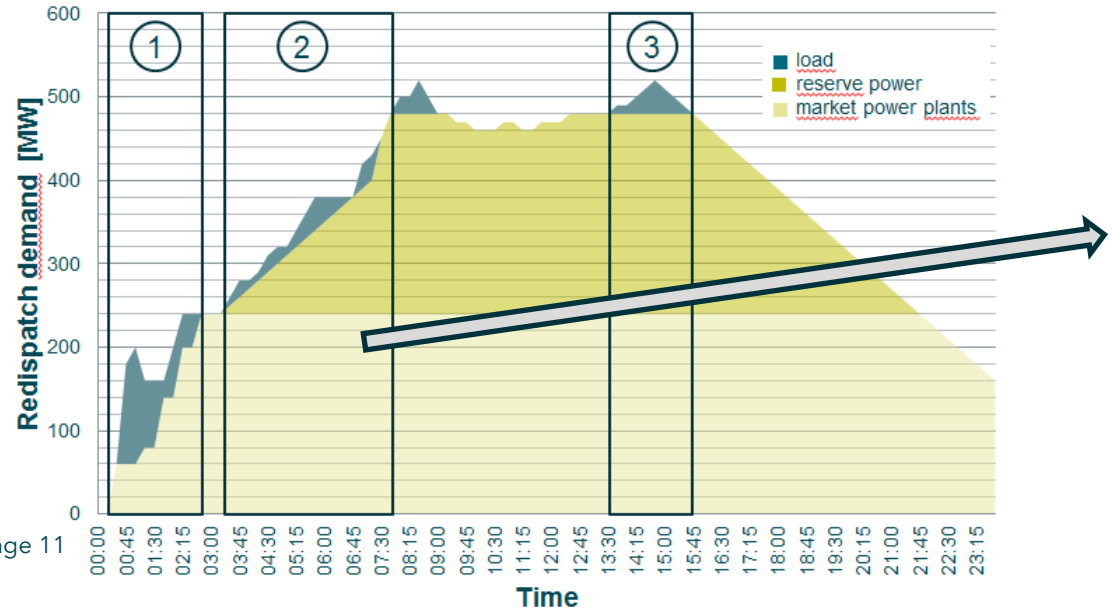
Thesis 1 ✓

Thesis 2: Demand response is an option for just-in-time redispatch calls!

DSR A „BRIDGING“ TOOL

- quick starting product in DACF process
- unforseen power plants unavailability
- ramping period for slow starting plants
- peak demand due to weather changes
- +/- 3h reserve power hold due to weather changes



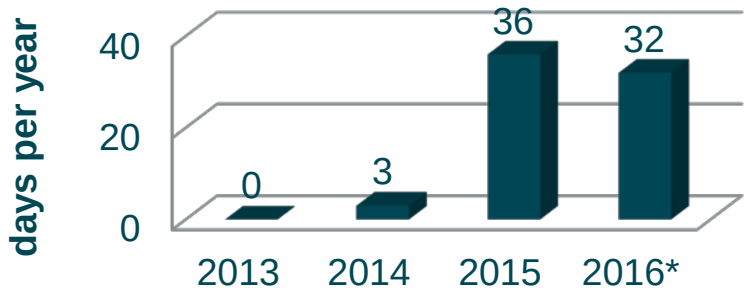


Thesis 2 ✓

Thesis 3: Demand response is an option to reduce power reserve calls!

FULL AND PARTIAL SUBSTITUTION

Reserve power use in Germany



* national reserves ø131 MW units
international reserves 2 of 4 <= 100MW portfolio

Reserve power < 2000MWh winter 15/16

Date	MWh
09.11.2015	1000
15.11.2015	1950
19.01.2016	495
06.02.2016	1050
11.02.2016	1108
19.02.2016	50
25.02.2016	908
26.02.2016	1005
29.02.2016	50
01.03.2016	380

SNL	PQ	Work
Type A	858 MW	858 MWh
Type B	117 MW	468 MWh
Type C	50 MW	400 MWh

*independent of geographical location

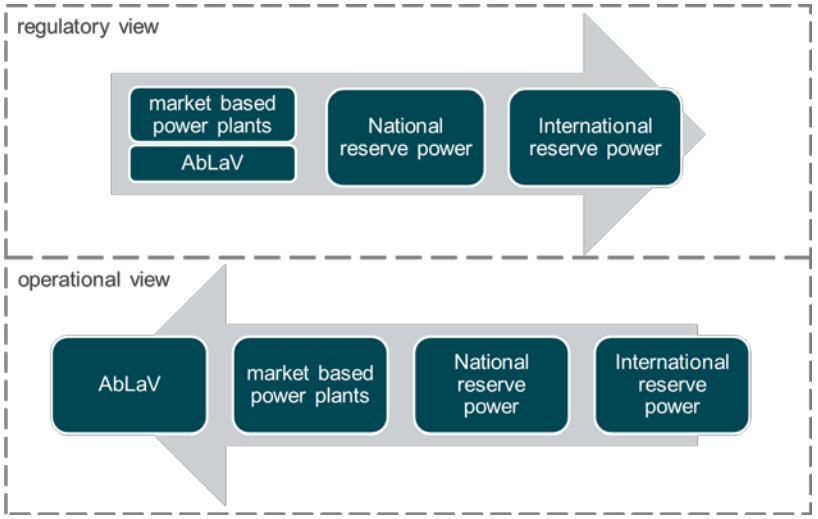
13% (6%) chance of reserve power use reduction in 2016*!

Thesis 3 ✓

Thesis 4: Demand response is an option to re-organise the calling order according to EnWG!

MERIT-ORDER AND TIMELY CALLS

- XBID-1 intraday auction IT-CH reduced ATC
  - 45% time: capacity < portfolio (Nov. 15)
  - Afternoon mostly: < 1GW resp. 0MW
- Examples:
  - 13.11.2015: 17MW missing in 1h of 7h
  - 24.11.2015: 523MW missing in 2h of 8h
- d-2 international power reserve order to guarantee capacity



DSR as a bridging tool to re-organise the merit-order

Thesis 4

Conclusion

DEMAND RESPONSE IS AN OPTION …

Thesis 1 … for short and small redispatch calls!  ✓

/ 14-times / 29-times redispatch use potential

Thesis 2 … for just-in-time redispatch calls!  ✓

/ DSR is a bridging tool (unforseen events, weather changes)

Thesis 3 … to reduce power reserve calls!  ✓

/ 13% (6%) full substitution chance in 2016

Thesis 4 … to re-organise the calling order according to EnWG!  ✓

What is needed besides the HVDC powerline projects?

OUTLOOK TO STRENGTHEN DSR AS ONE FLEXIBILITY OPTION

- Concept for system operation
  - combined merit-order of all redispatch products with geographical info
  - objective-decision making tool considering unavailabilities of loads
  - Case scenarios (e.g. CACM and loads as a „bridging“ product)

- Larger load portfolio
  - more frequent, longer and larger calls
  - smooth ramping as load is a block product
  - load shedding units in southern Germany
  - additional load units in northern Germany

>> New load sheding guideline (AbLaV) might address some aspects!

TRANSNET BW

Enerday 2016

THANK YOU !

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