Demand Side Response
How to value flexibility

Febeliec infosession : 10th June 2013

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About INEOS

- Global, vertically-integrated chemical company
- Founded in ‘98 - rapid growth by acquisitions
- 40 b$ sales
- 15 000 employees
- 51 manufacturing locations in 11 countries
- Privately owned

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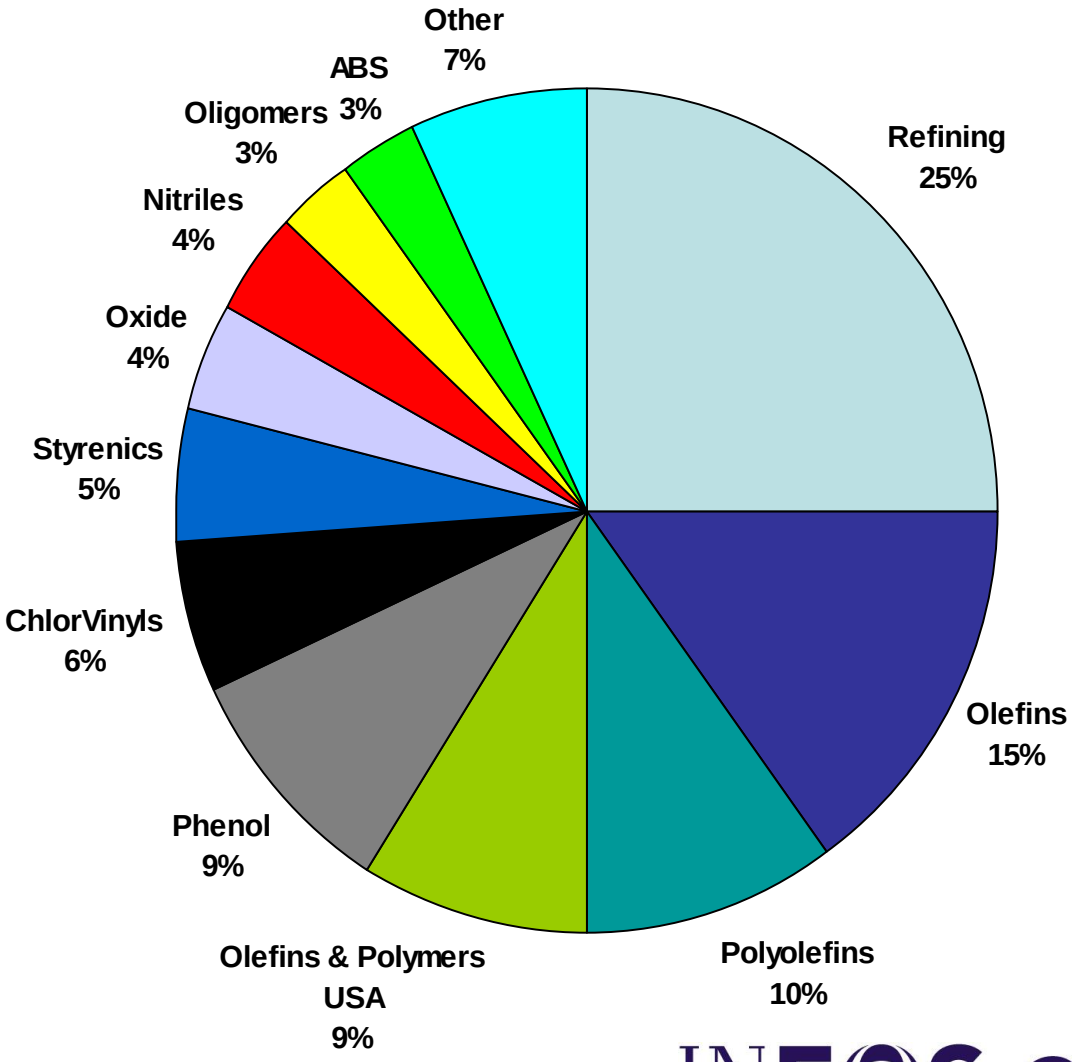
INEOS sales by business



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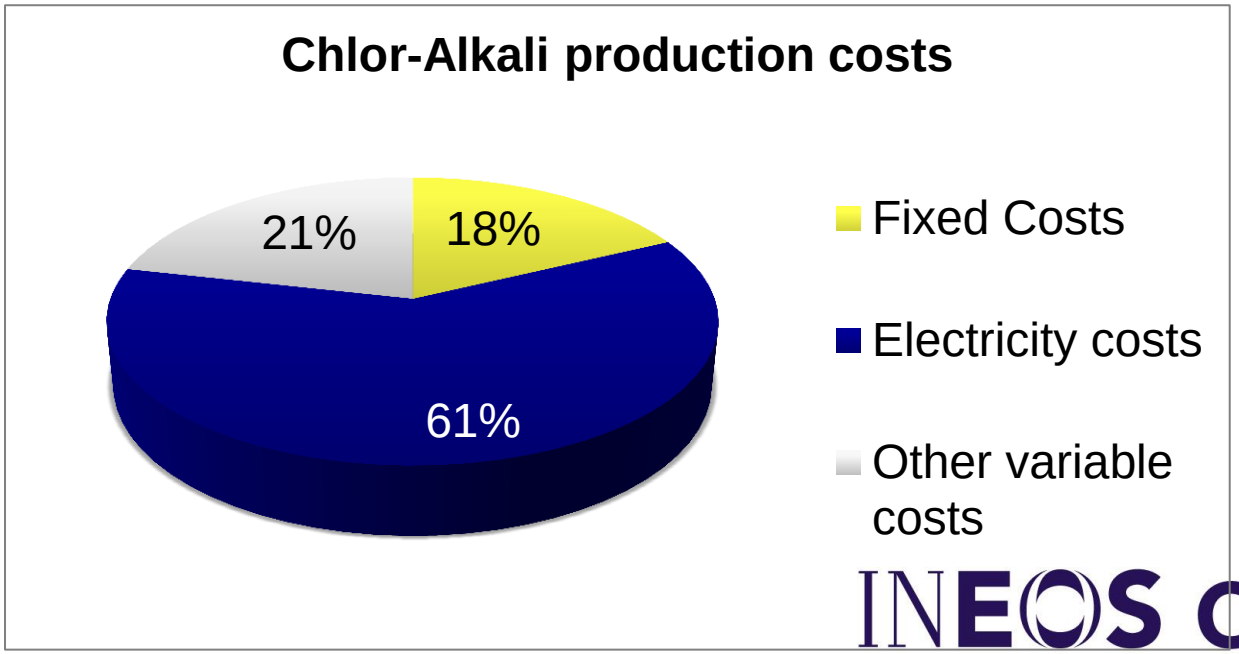
Electricity is a major cost for INEOS operations

- Total INEOS electricity consumption of about 12 TWh
- Electricity is main cost driver for Chlor-Alkali business
  - Electricity is a raw material
  - Electricity costs are more important than labour costs
  - Electricity costs determine where to produce and where to invest



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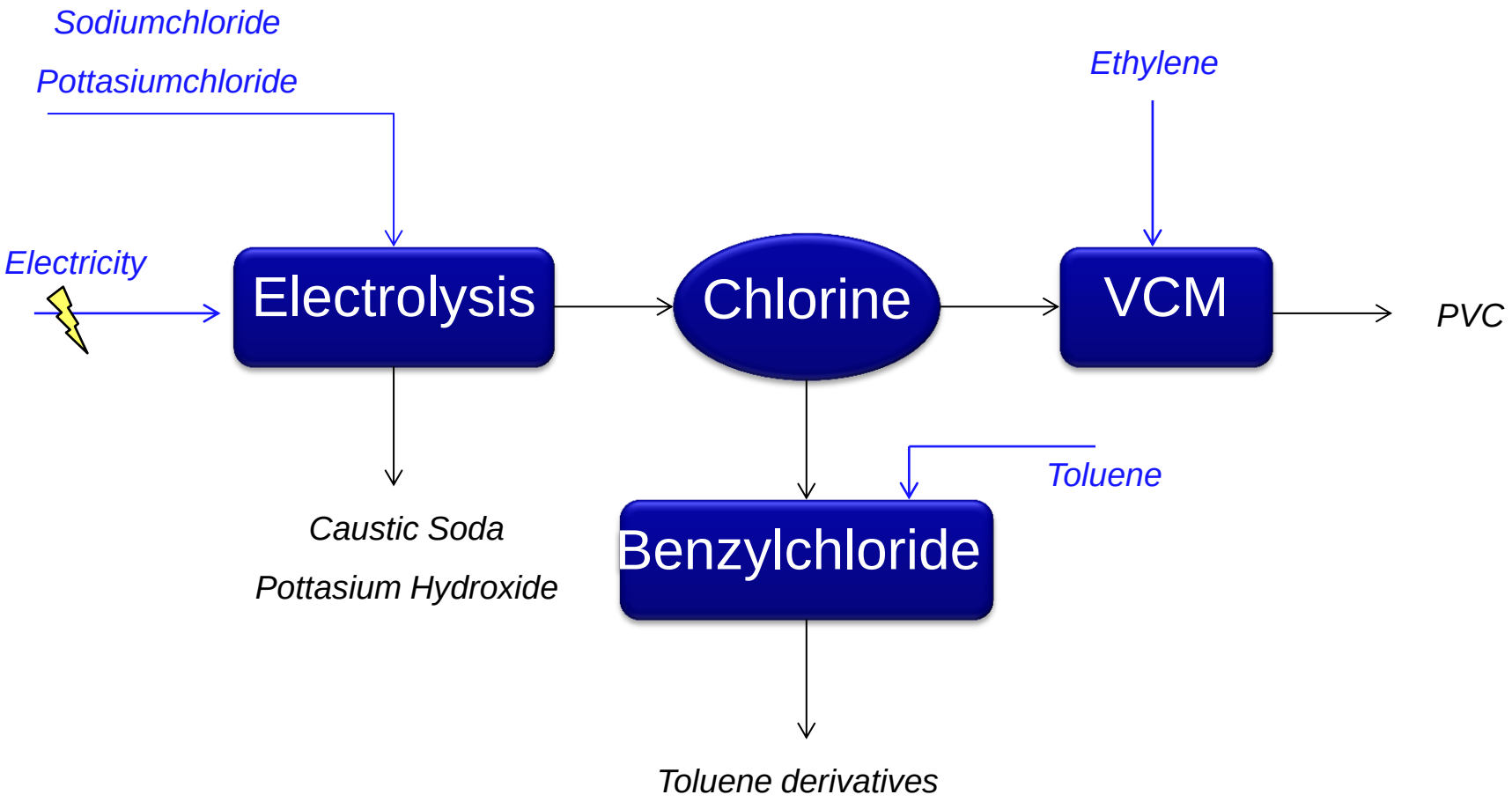
Overview of the VCM production process



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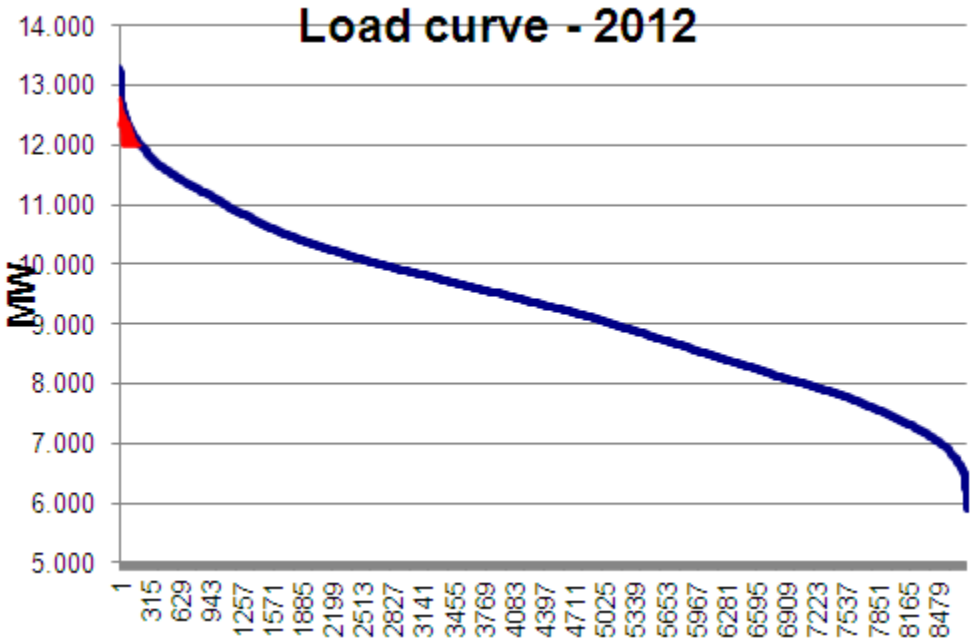
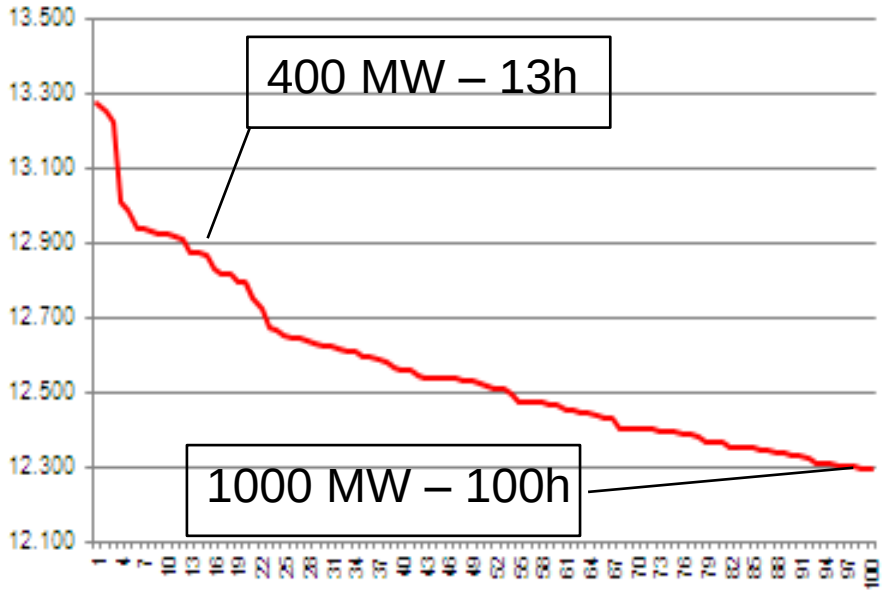
Value of Demand Side Response ?

De Standaard

Goverment wants to subsidse new power plants

Het ontwerp van koninklijk besluit dat nu op de tafel ligt, bepaalt dat die nog op te richten centrales tien jaar lang een jaarlijks steunbedrag van **87.682,1 euro** per geïnstalleerde megawatt kunnen ontvangen.





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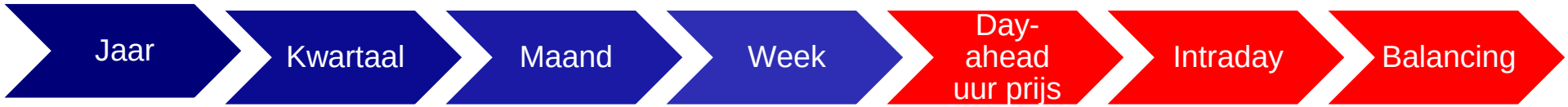
Most important precondition for Demand Side Response : the correct price of electricity

- “I have a yearly fixed priced contract so I am protected against price spikes”
- “for 60 €/MWh I will not even think about stopping a production process”
- Budget / Contract price => have no relevance
- All purchased electricity is to be valued at Belpex prices
  - Increased with the variable transport costs + taxes



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Most important condition for Demand Side Response: Correct value of electricity

ICE Endex Power BE

CONTRACT	BASE		
Jun-13	45.20 €/MWh *	-0.03 €/MWh	-0.1%
Jul-13	37.54 €/MWh *	-0.04 €/MWh	-0.1%
Aug-13	37.32 €/MWh *	-0.29 €/MWh	-0.8%
Q3-13	38.69 €/MWh *	-0.01 €/MWh	0%
Q4-13	50.40 €/MWh	+0.47 €/MWh	+0.9%
Q1-14	50.72 €/MWh *	+0.24 €/MWh	+0.5%
Q2-14	39.14 €/MWh *	-0.11 €/MWh	-0.3%
Cal-14	43.95 €/MWh	+0.35 €/MWh	+0.8
Cal-15	43.15 €/MWh	+0.47 €/MWh	
Cal-16	43.15 €/MWh *	+0.16 €/MWh	+0.4%

Applying date : 3 May 2013

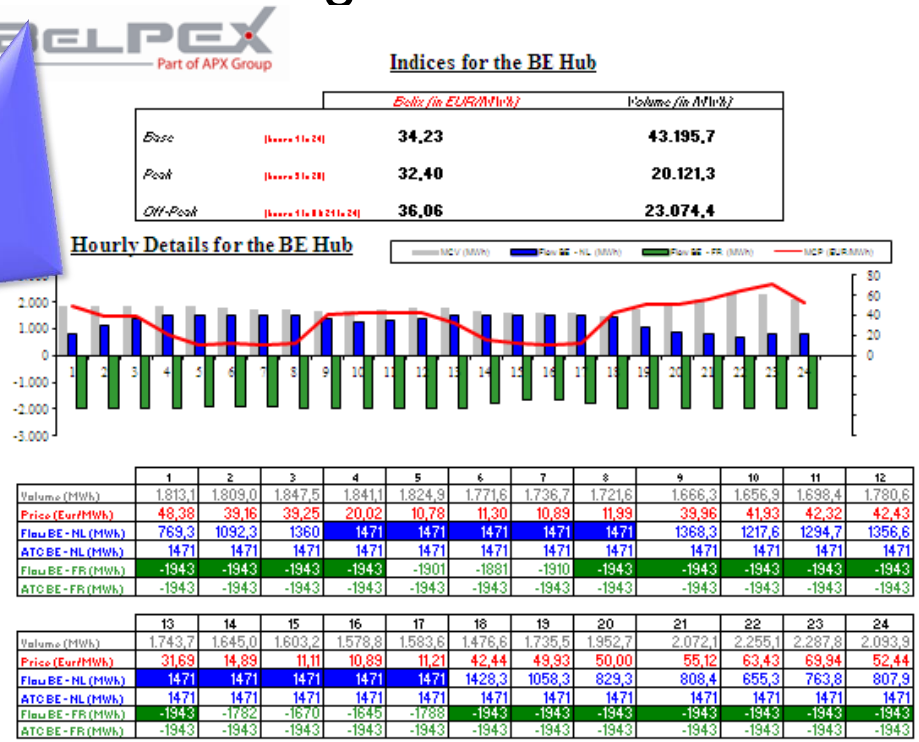
js en ben beschermd tegen prijspieken”

een proces stil”

=> niet van belang

– Verhoogd met de variabi

Jaar → Kwartaal → Maand → We

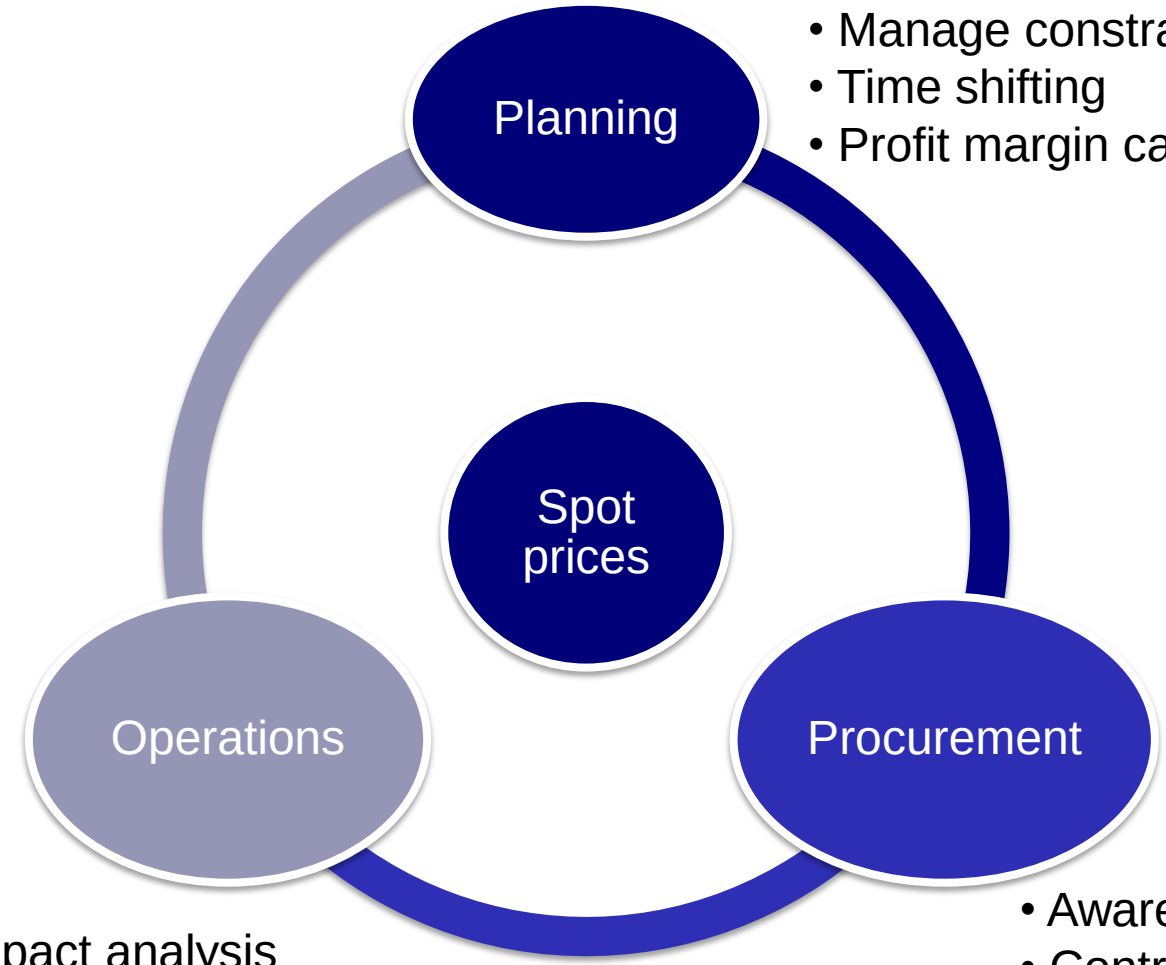


	1	2	3	4	5	6	7	8	9	10	11	12
Volume (MWh)	1.813,1	1.809,0	1.847,5	1.841,1	1.824,9	1.771,6	1.736,7	1.721,6	1.666,3	1.656,9	1.698,4	1.780,6
Price (Eur/MWh)	48,38	39,16	39,25	20,02	10,78	11,30	10,89	11,99	39,96	41,93	42,32	42,43
Flow BE - NL (MW)	769,3	1092,3	1360	1471	1471	1471	1471	1471	1368,3	1217,6	1294,7	1356,6
ATC BE - NL (MW)	1471	1471	1471	1471	1471	1471	1471	1471	1471	1471	1471	1471
Flow BE - FR (MW)	-1943	-1943	-1943	-1943	-1901	-1881	-1910	-1943	-1943	-1943	-1943	-1943
ATC BE - FR (MW)	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943

	13	14	15	16	17	18	19	20	21	22	23	24
Volume (MWh)	1.743,7	1.645,0	1.603,2	1.578,8	1.583,6	1.476,6	1.735,5	1.952,7	2.072,1	2.255,1	2.287,8	2.093,9
Price (Eur/MWh)	31,69	14,89	11,11	10,89	11,21	42,44	49,93	50,00	55,12	63,43	69,94	52,44
Flow BE - NL (MW)	1471	1471	1471	1471	1471	1428,3	1058,3	829,3	808,4	655,3	763,8	807,9
ATC BE - NL (MW)	1471	1471	1471	1471	1471	1471	1471	1471	1471	1471	1471	1471
Flow BE - FR (MW)	-1943	-1782	-1670	-1645	-1788	-1943	-1943	-1943	-1943	-1943	-1943	-1943
ATC BE - FR (MW)	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943	-1943

Cooperation between departments is crucial

- Use contractual framework
- Manage constraints
- Time shifting
- Profit margin calculations



- Execution
- Process impact analysis
- Search for flexibility
- Awareness at operators

- Awareness at mgt.
- Contractual framework
- Tendering products

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Different products to capture the DSR value

Capacity product

- Fixed yearly remuneration
- Engagement: Y-1
- Reaction time: x h/m/s

- Elia Interuptibility
- Aggregators
- Suppliers
- Elia R1 Load

Energy product

- Value of the energy at a given moment
- Engagement: D-1 or later
- Reaction time: D-1 or later

- Belpex bieding
- Intraday/Balancing
- Elia : free bids (under construction)

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Main contractual conditions of the Elia interuptibility product

- Products

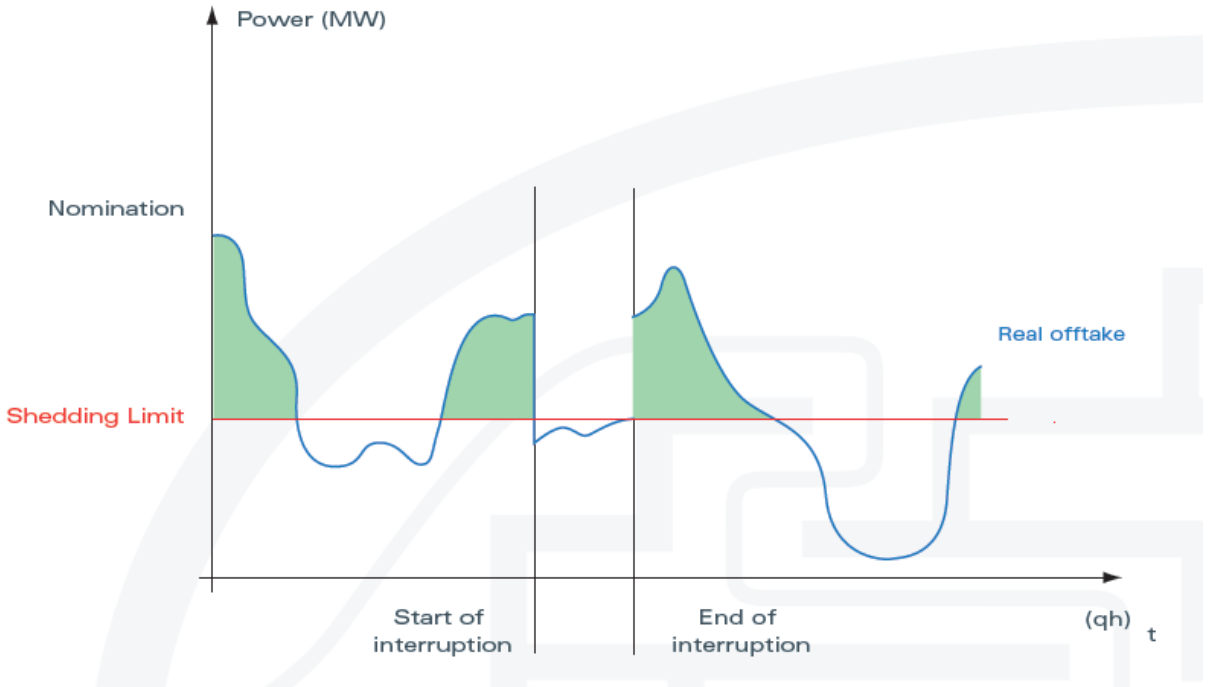
	SLA 2	SLA 4	SLA 8
Max nr. activations	12	4	4
Max duration/activation	2	4	8
Max duration/year	24	16	24
Response time (min)	3	3	3

- Capacity fee (€/MW)
- Activation fee
  - Max (75 €/MWh ; 108% Belpex)
- Reference Reserve Power : min. 5 MW
  - Average load (MW) per period
  - Compared ex-post with the actual ref. power

	Peak	Off-peak	Weekend
Shedding Limit SL	25	20	20
Reference Power PRef	35	30	30
Reference Reserve Power Rref	10	10	10

Elia interuptibility : operational requirements

- Elia provides a signal
- Shedding Limit must be reached within 3 min.
- 87 h unavailability allowed



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How to react to the spot prices

- Include spot prices in the contract
  - Fixing can happen via a CfD
  - Sell-back options
  - Transparency on profile & unbalance costs/benefit
- Aggregators
  - Recent evolution
  - More flexible criteria due to pooling

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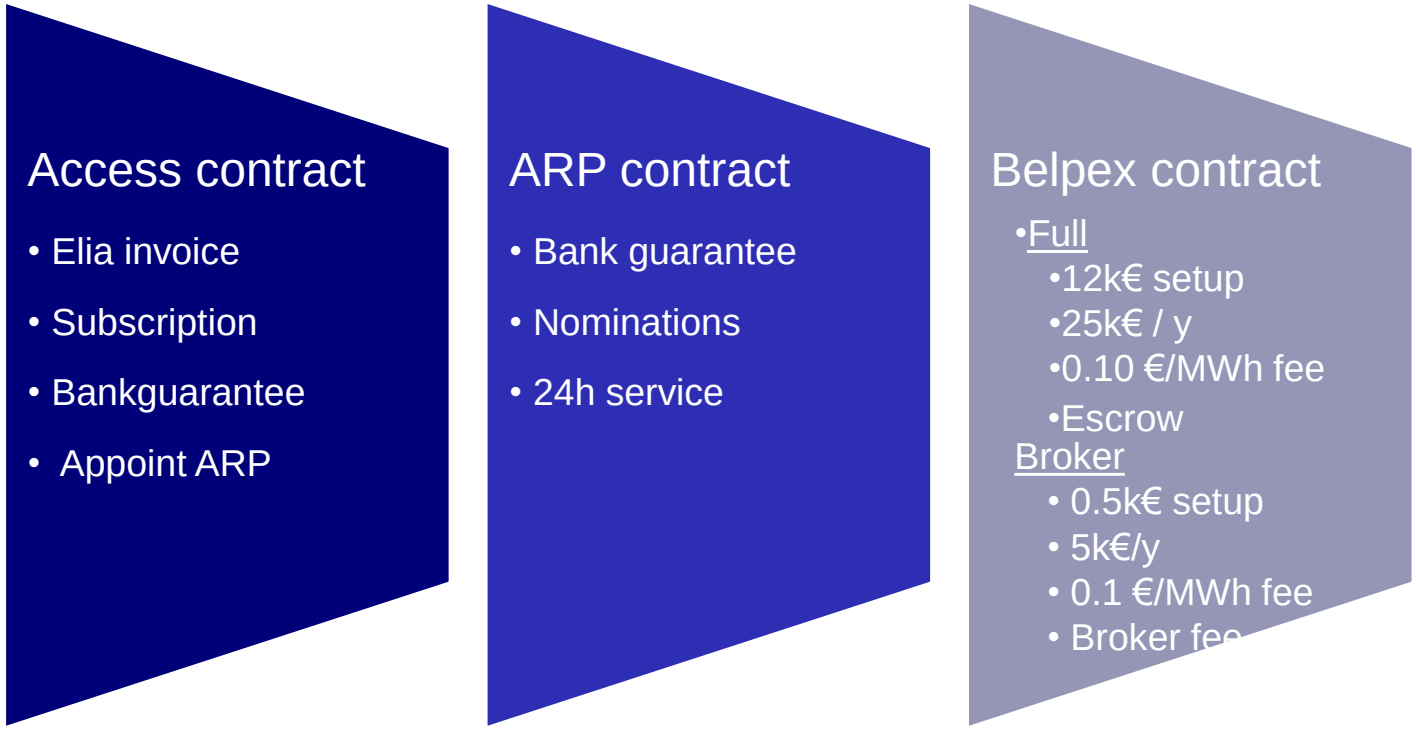
DIY: Contractual framework in order to react on the spot prices via Belpex membership



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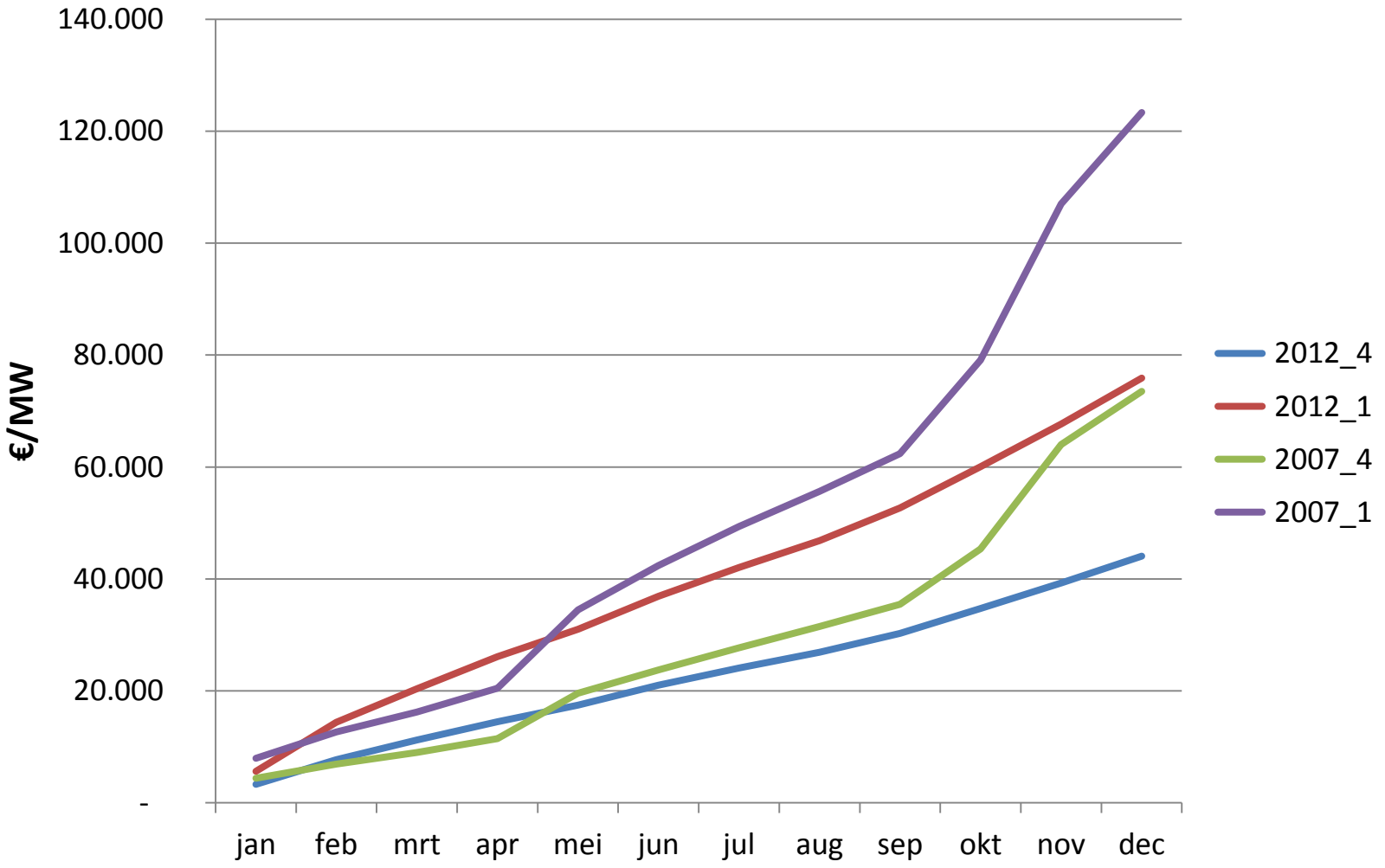
Value that can be captured by reacting on belpex prices



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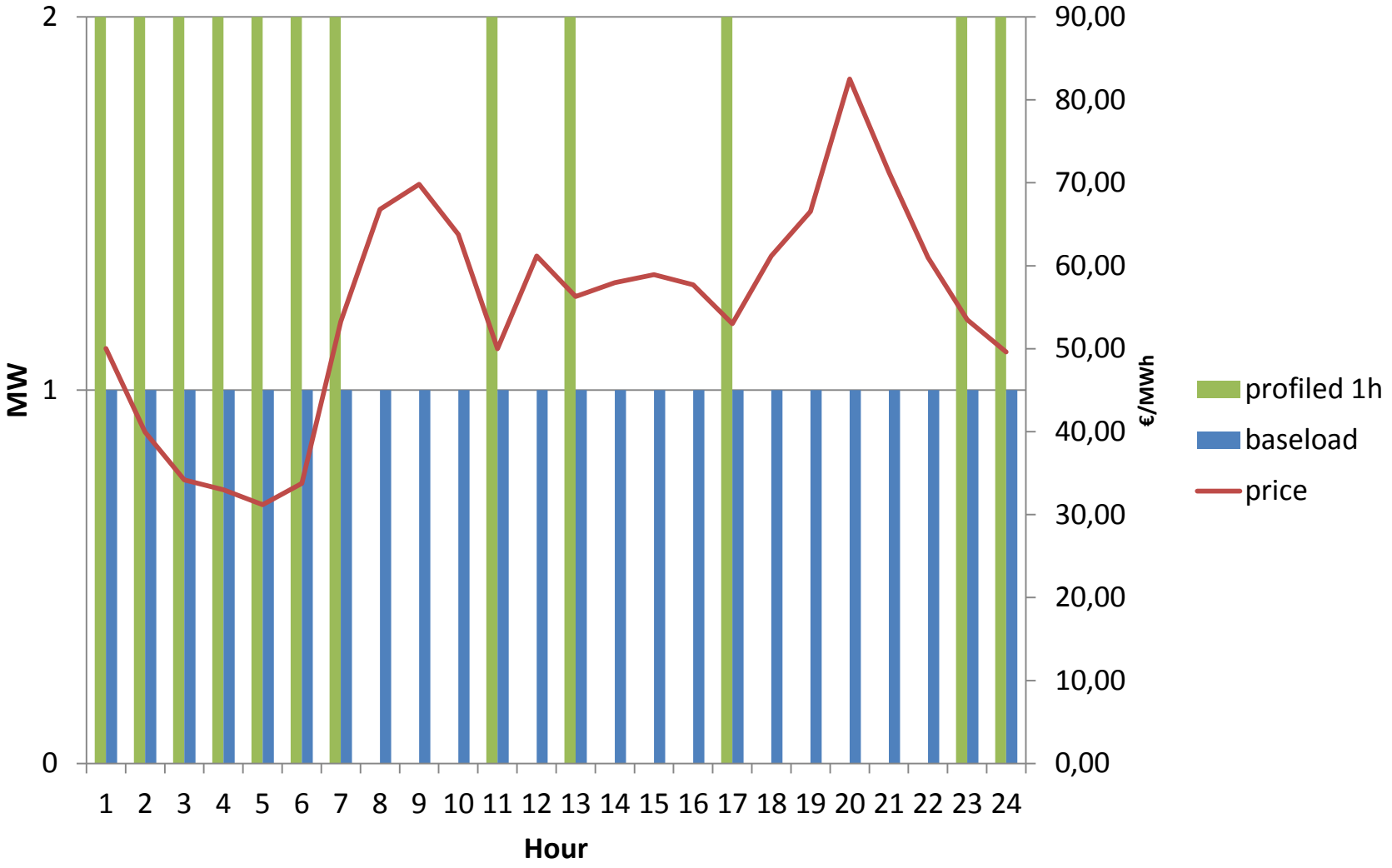
Value that can be captured by reacting on belpex prices: scenario A very flexible



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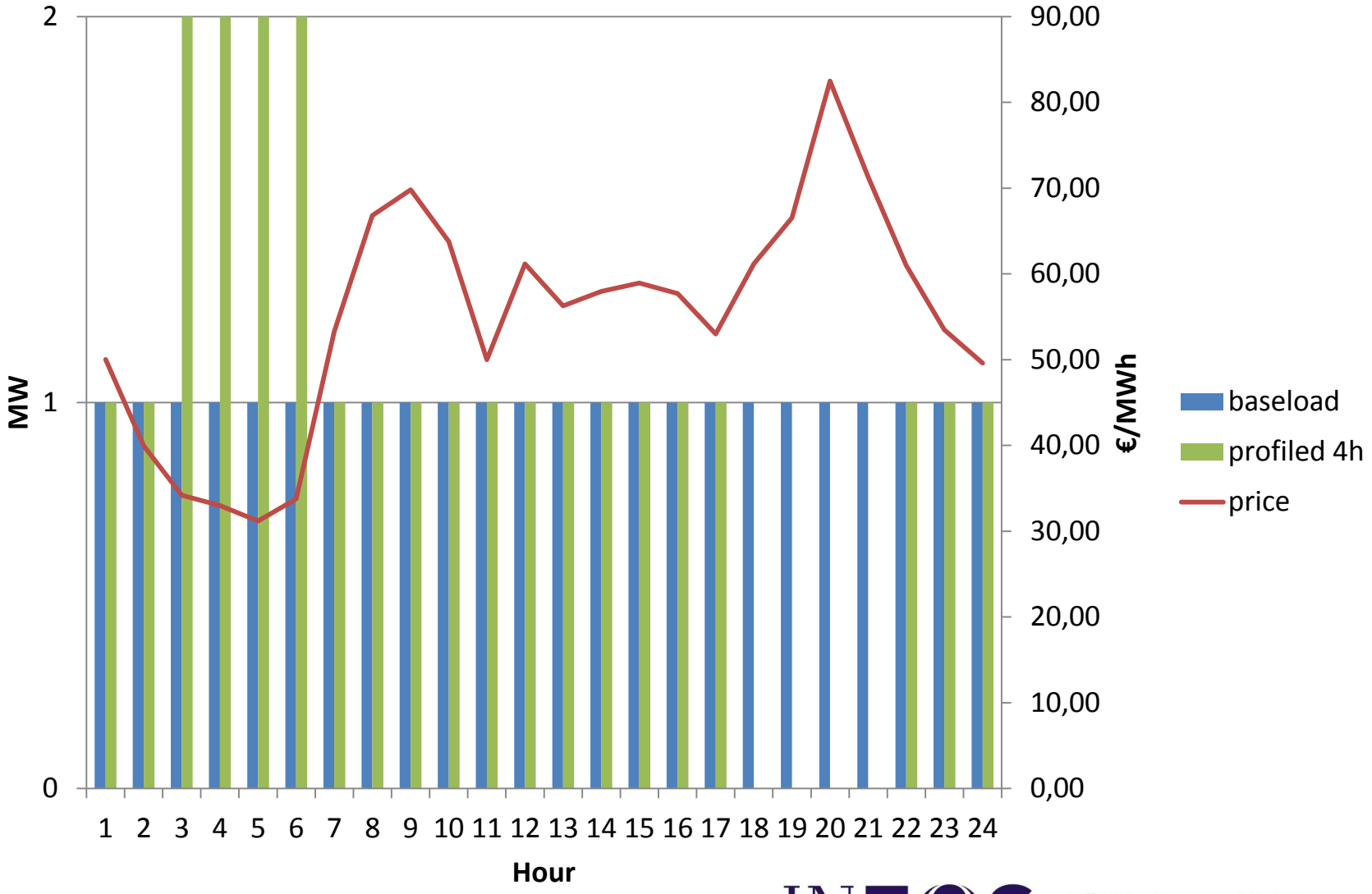
Value that can be captured by reacting on belpex prices: scenario B semi flexible



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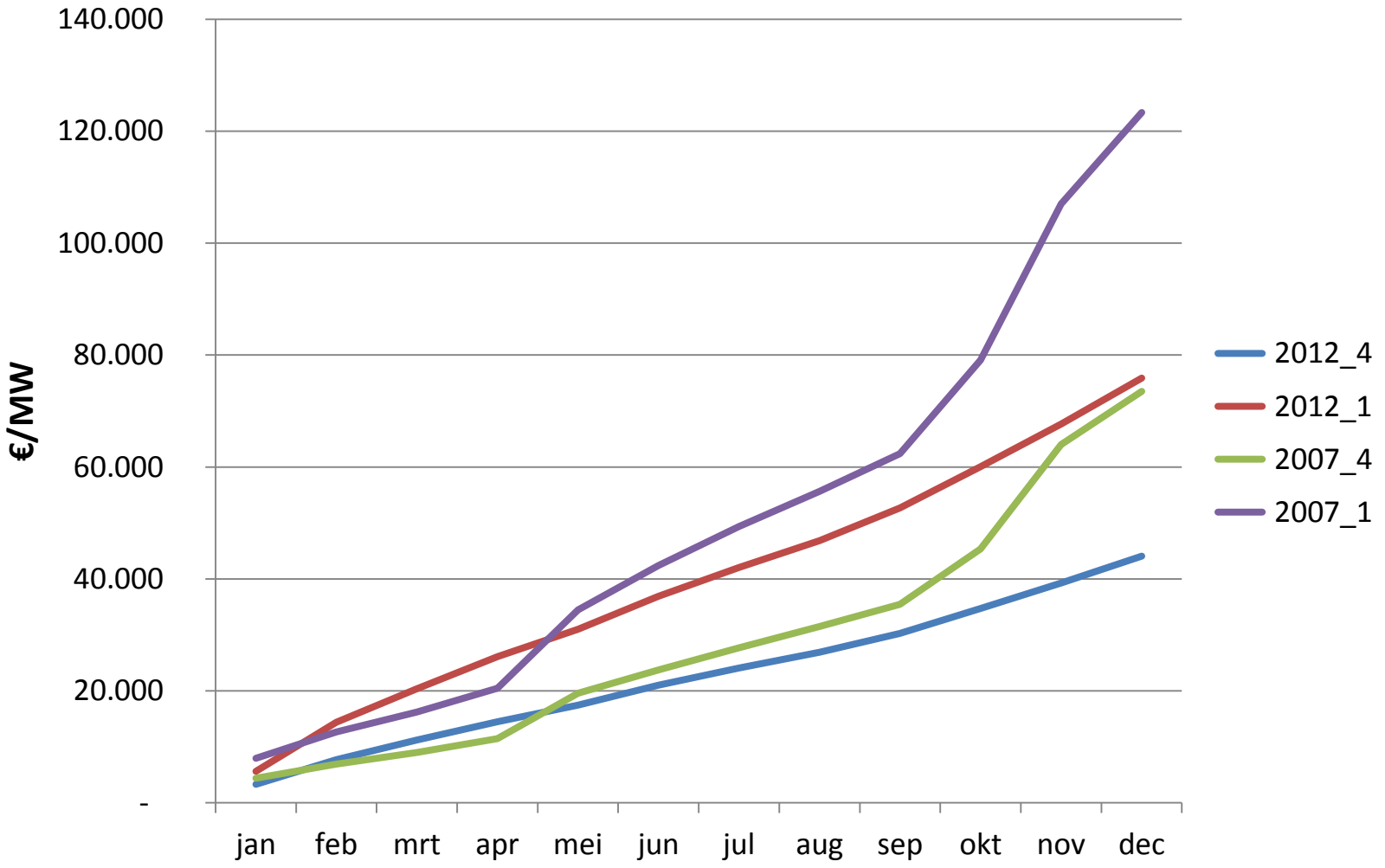
Value that can be captured by reacting on belpex prices



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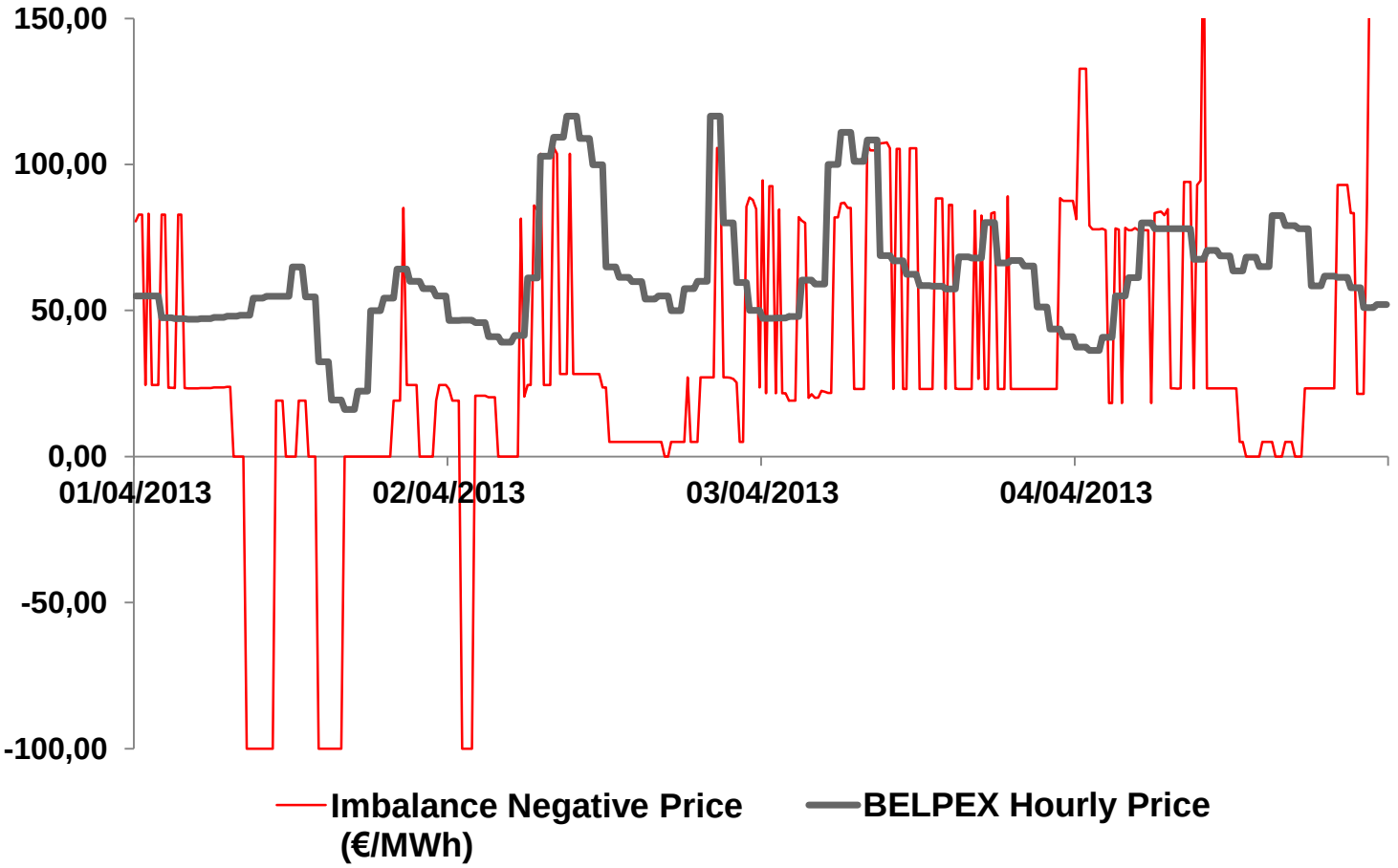
Also the balancing market offers opportunities



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More information

Autumn School : 08 – 09 October 2013

Basic balancing training

Commercial actors: aggregators/suppliers

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Questions

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