



Wholesale electricity price analysis in South-East Europe (SEE): CASE STUDY → 400 KV TIRANA 2 – PRISTINA

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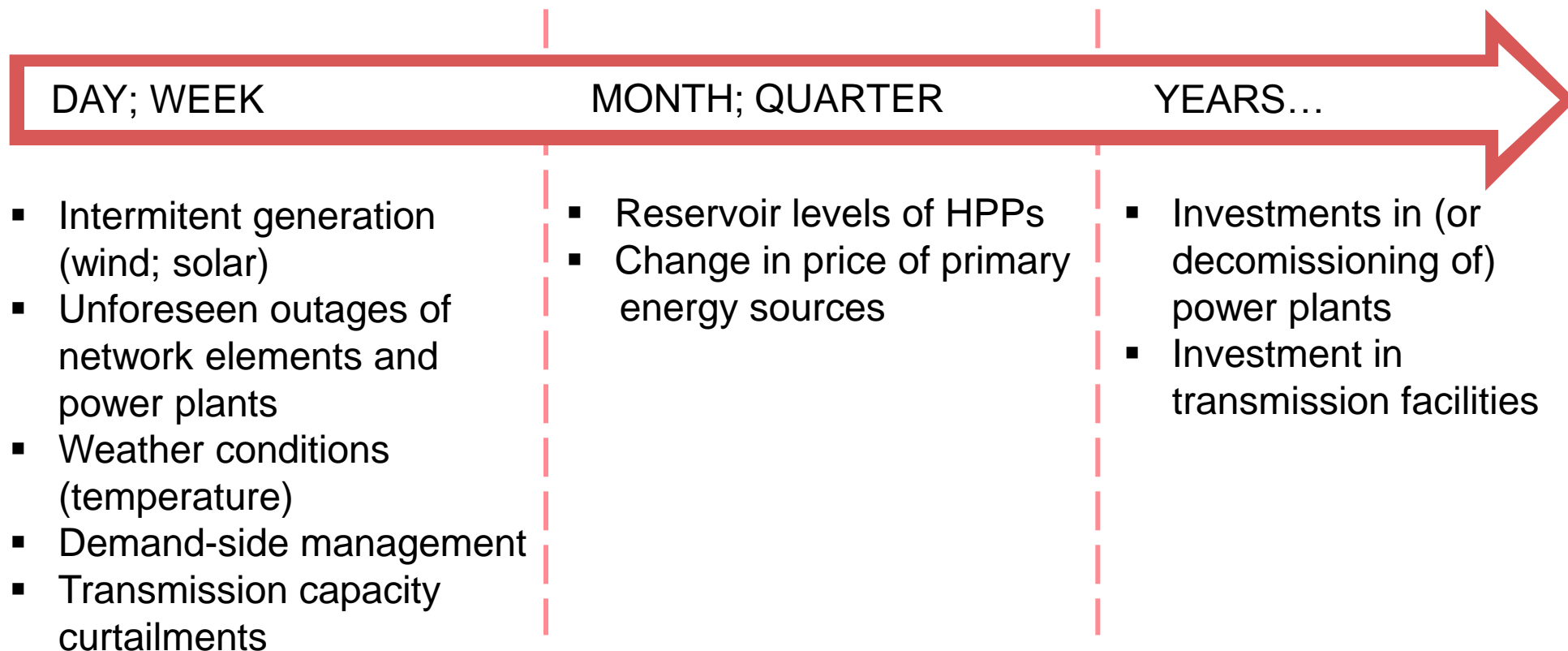
Operations / Team: Network Security Standards

Co-Convener ENTSO-E SEE Regional SG CMMI

En.Trading 015

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Electricity price forecasting: Price Volatility

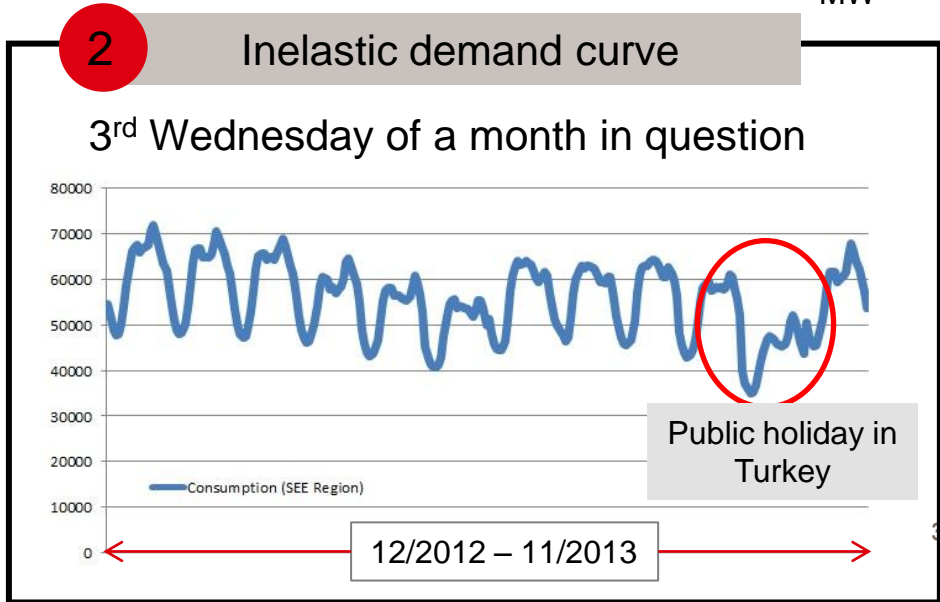
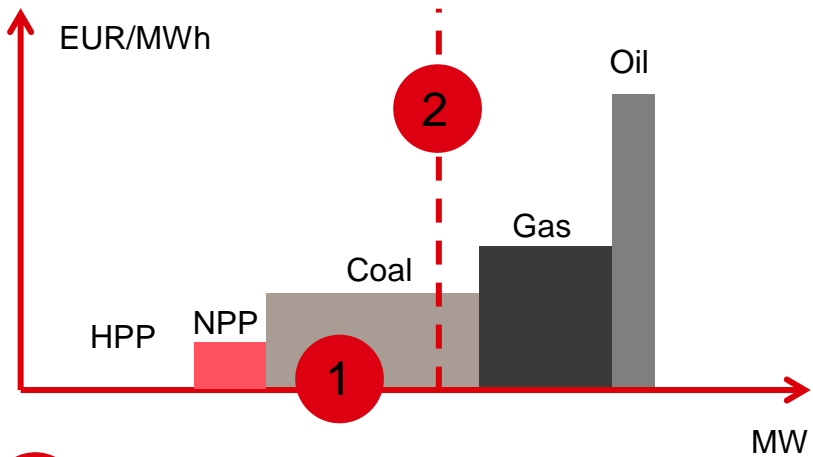


Market Modelling: Merit-Order-List (MOL)

1 Stepwise upward sloping supply curve

- Variable costs of generation based on the different technology (see table) which mainly depend on:
 - primary fuel prices,
 - efficiency rate of turbine and
 - O&M costs.

Technology	Fuel
Gas Turbine	Gas
Coal – stone/brown	Coal
Nuclear	Nuclear
Hydro	Water
Combined-Heat Power	Biomass
Renewables	Solar, Wind



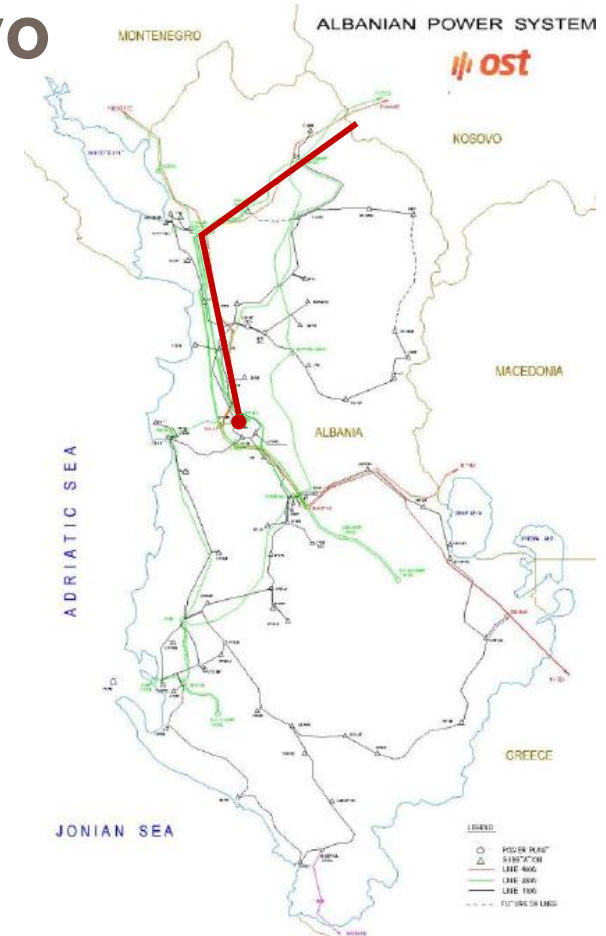


Dry-Run test scenarios:
Wholesale energy price forecasting on a day-ahead level

Testing of the MC Simulation: Case Study – OHL: Albania-Kosovo

- Commissioning of the new 400 kV tie-line Tirana 2 (AL) – Pristina (KS):
 - Total length: 240 km (90 km in Kosovo, 150 km in Albania)
 - Total costs: 75.5 million Euros
 - Project funded with the loan from the German development bank KfW

Total NTC without investment (Base Case)	Total NTC with investment (Case 01)
AL>KS: 210 MW	AL>KS: 500 MW*
KS>AL: 210 MW	KS>AL: 500 MW*



Testing of the MC Simulation: Case Study – OHL: Albania-Kosovo

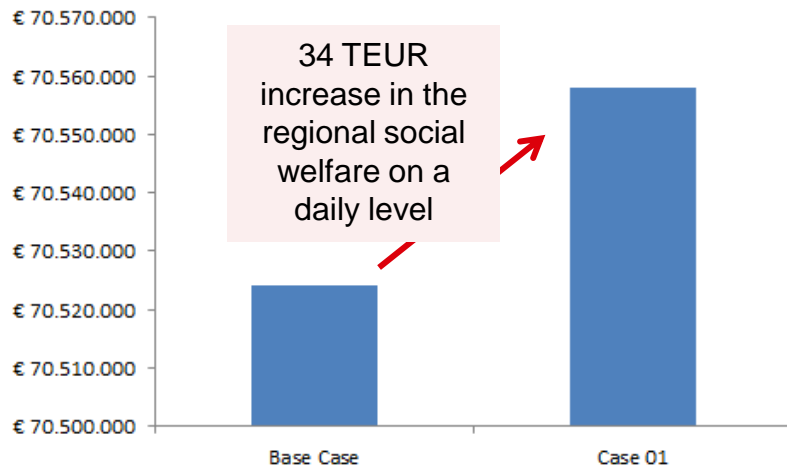
Sell orders	Buy orders
<ul style="list-style-type: none"> the best estimate of marginal costs → different unit technology (hydro; thermal; renewables...) and efficiencies 	<ul style="list-style-type: none"> hourly consumption profiles for winter (respectively summer) with the „capped“ costs (willingness to pay) of 100 EUR/MWh (considered as „price-taking“ order)
<ul style="list-style-type: none"> Total number of bids: ca. 2500 buy/sell orders for 24h period (ca. 100 per hour) Available cross-border capacities: <ul style="list-style-type: none"> → Real total NTCs used for the optimisation (financial usage of LT transmission rights considered) 	

Analysis of Results:

Test Case – NTC increase AL-KS (social welfare & accepted bids)

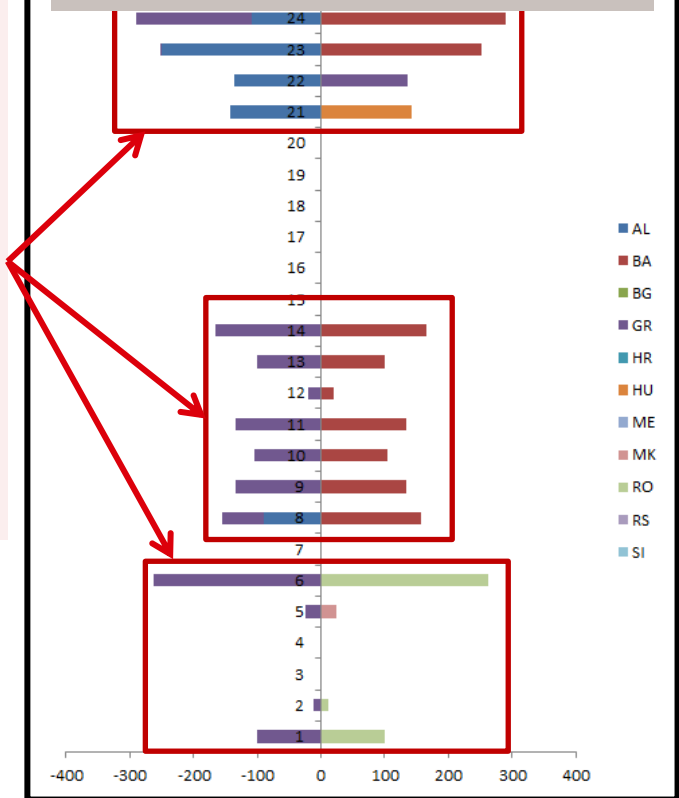
Total social welfare = producer surplus + consumers surplus + congestion income

Social welfare: Base Case vs. Case 01



- Capacity increase allows for more trade not only for AL but also for the entire region → more expensive bids in GR and AL replaced with the cheaper „sell“ bids mainly from BA and RO

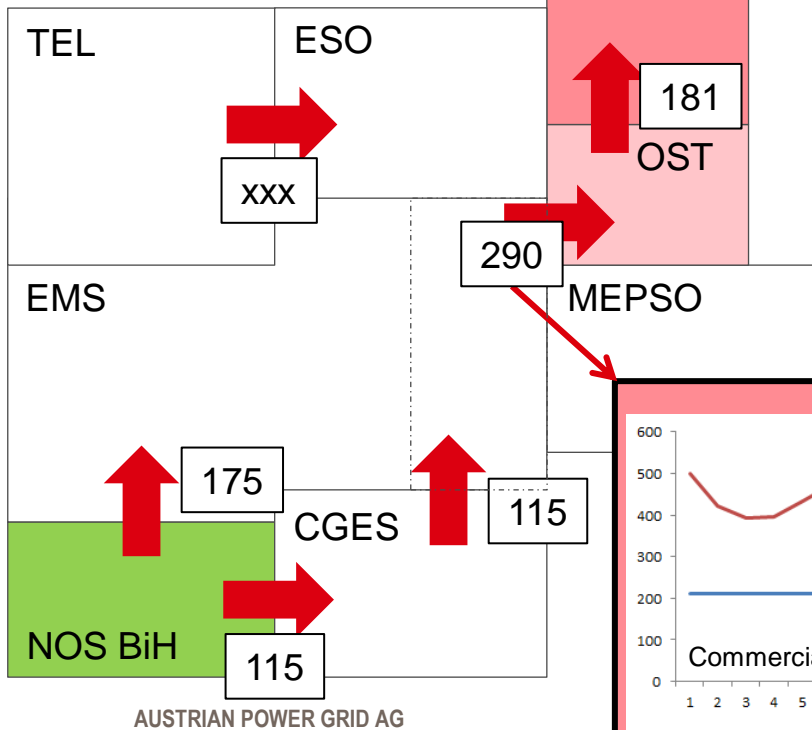
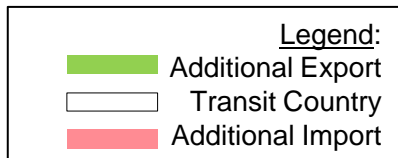
Accepted bids: Base Case vs. Case 01



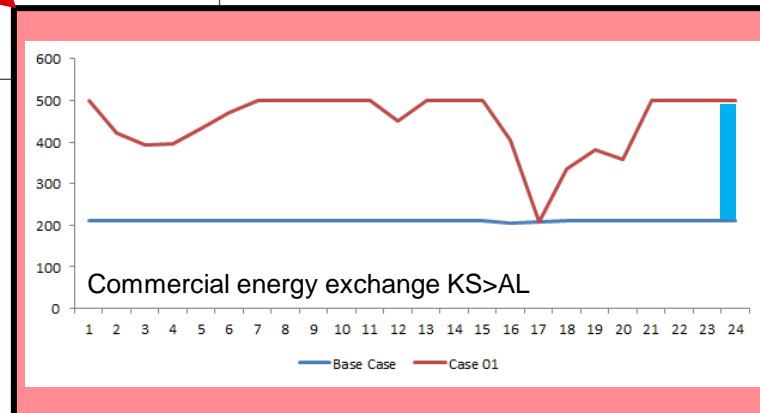
→ commercial exchange

Analysis of Results:

Test Case – NTC increase AL-KS (detailed analysis for hour 24)



- Entire ATC used for KS>AL in >50% of hours during a day



Country	Hour	Delta Net Position
BA	24	+290
GR	24	-181
AL	24	-109

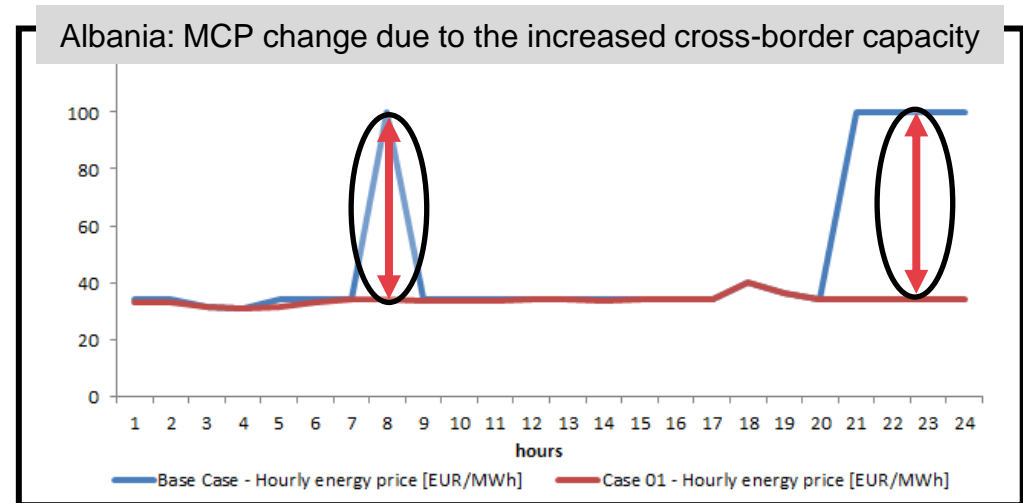
- In BA, energy producers surplus increase for 9800 EUR in h:24 (marginal bid of 33.8 EUR/MWh); in AL, most expensive generation bid completely rejected, as consumption is covered from BA

→ energy price and volume

Analysis of Results:

Test Case – NTC increase AL-KS (detailed analysis for hour 24)

- app. -14 EUR/MWh price change on a daily level (price in the other countries slightly increased - hourly: app. +0.2 EUR/MWh)



Bid No	Buy/Sell	Area	Order Type	Hour	Offered Price [MWh]	Offered Volume [MWh]	Accepted Volume [MWh]		MCP [EUR/MWh]	
							Base Case	Case 01	Base Case	Case 01
Bid 1 AL	BUY	AL	HOURLY	24	100	931	910	100	931	34
Bid 2 AL	SELL	AL	HOURLY	24	6	257	257	100	257	34
Bid 3 AL	SELL	AL	HOURLY	24	66,1	88	88	100	0	34

Net position change:
-109 MW
Price change:
-66 EUR/MWh

Thank you for your attention!!!

Questions?

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