



SEEPEX

a cornerstone for the Regional
Electricity Market



11th SE Europe Energy Dialogue, Thessaloniki, 26-27 June, 2018

Strategic partnership

- SEEPEX is the result of strategic partnership between EMS and EPEX SPOT



- SEEPEX is fully market driven (non-regulated business)
- SEEPEX is designed to be a customer-oriented company
- SEEPEX relies on EPEX market operation (ETS)
- Best practice in high transparency and surveillance standards
- Clearing services are provided by ECC according to standard model in place in other European countries

SEEPEX partners/shareholders: EMS (Serbian TSO)



- According to the new Energy Law (adopted in December 2014), JP EMS is entitled to establish the Serbian Market Operator (operator of the organized electricity market)

JP EMS core activities:

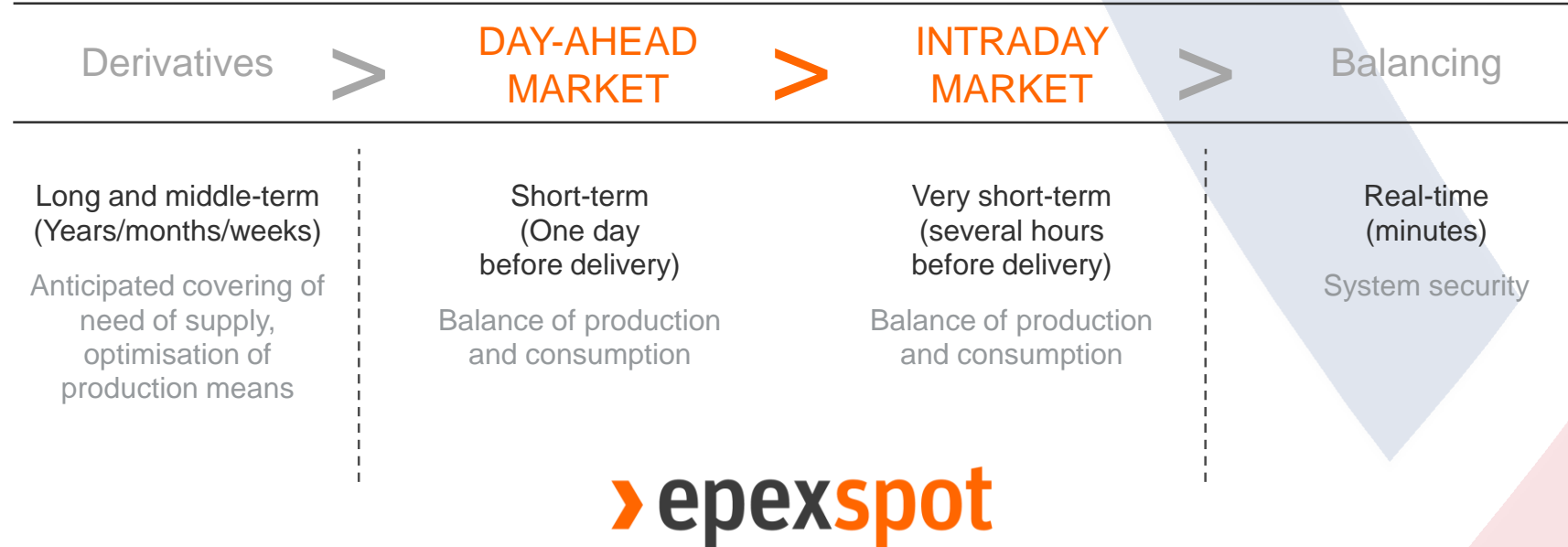
- Transmission
 - System Operation
 - Market Operation (TSO Market functions)
- Transmission – 400, 220 and part of 110kV network (installed power in EMS substations is about 15 400 MVA, HV Lines length 9.500km)
 - System Operation – two layers of grid control
 - National DC
 - Regional DC's
 - Market Operation – Development and administration of the Serbian Electricity Market



EPEX SPOT - European and an international success story

- EPEX SPOT created in 2008, roots going back to 2000
- Societas Europaea headquartered in Paris
- 535 TWh of traded volumes in 2017: 464 TWh on the Day-ahead market, 71 TWh on the Intraday market
- Over 285 Exchange Members
- Over 160 employees coming from 16 countries
- Offices in Amsterdam, Bern, Brussels, Leipzig, London and Vienna

The role of the Exchange in the market timeline



DAY-AHEAD AUCTION

- Optimisation of liquidity via an auction
- Market areas: Germany/Austria/Luxembourg, France, Great Britain, the Netherlands, Switzerland and Belgium

CONTINUOUS INTRADAY

- Flexibility through continuous trading
- Market areas: Germany/Luxembourg, France, Great Britain, the Netherlands, Switzerland, Belgium and Austria

The EPEX SPOT markets



Markets and services of the European Power Exchange EPEX SPOT

 Current EPEX markets

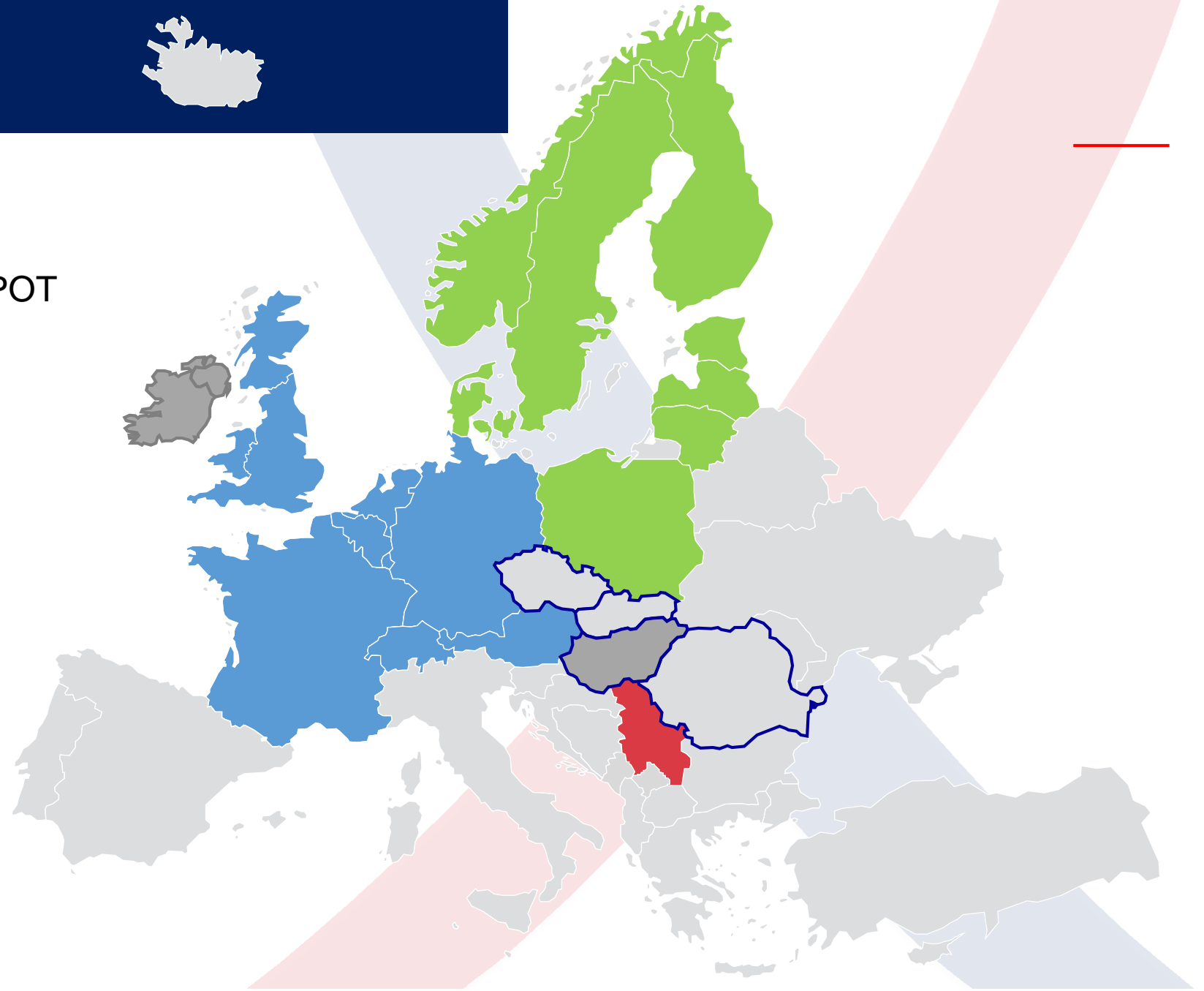
 Market Expansion

 Market operation services and 25% shares

 Market operation services

 Market coupling services

- 21 borders
- Area of 1600 TWh consumption
- Over 285 Exchange Members
- 535 TWh of traded volume in 2017



EPEX SPOT Market review 2017: Volumes and delivery zones

DE/AT/LU: 280 TWh

Thereof intraday: 47 TWh

Share in consumption: 50%

Delivery zones: 50Hertz, Amprion, APG, TenneT, TransnetBW

FR: 110 TWh

Thereof intraday: 4 TWh

Share in consumption: 23%

Delivery zone: RTE

NL: 35 TWh

Thereof intraday: 1.5 TWh

Share in consumption: 31%

Delivery zone: TenneT

UK: 66 TWh

Thereof intraday: 15 TWh

Share in consumption: 22%

Delivery zone: National Grid

BE: 19 TWh

Thereof intraday: 1 TWh

Share in consumption: 22%

Delivery zone: Elia

CH: 25 TWh

Thereof intraday: 2 TWh

Share in consumption: 43%

Delivery zone: Swissgrid

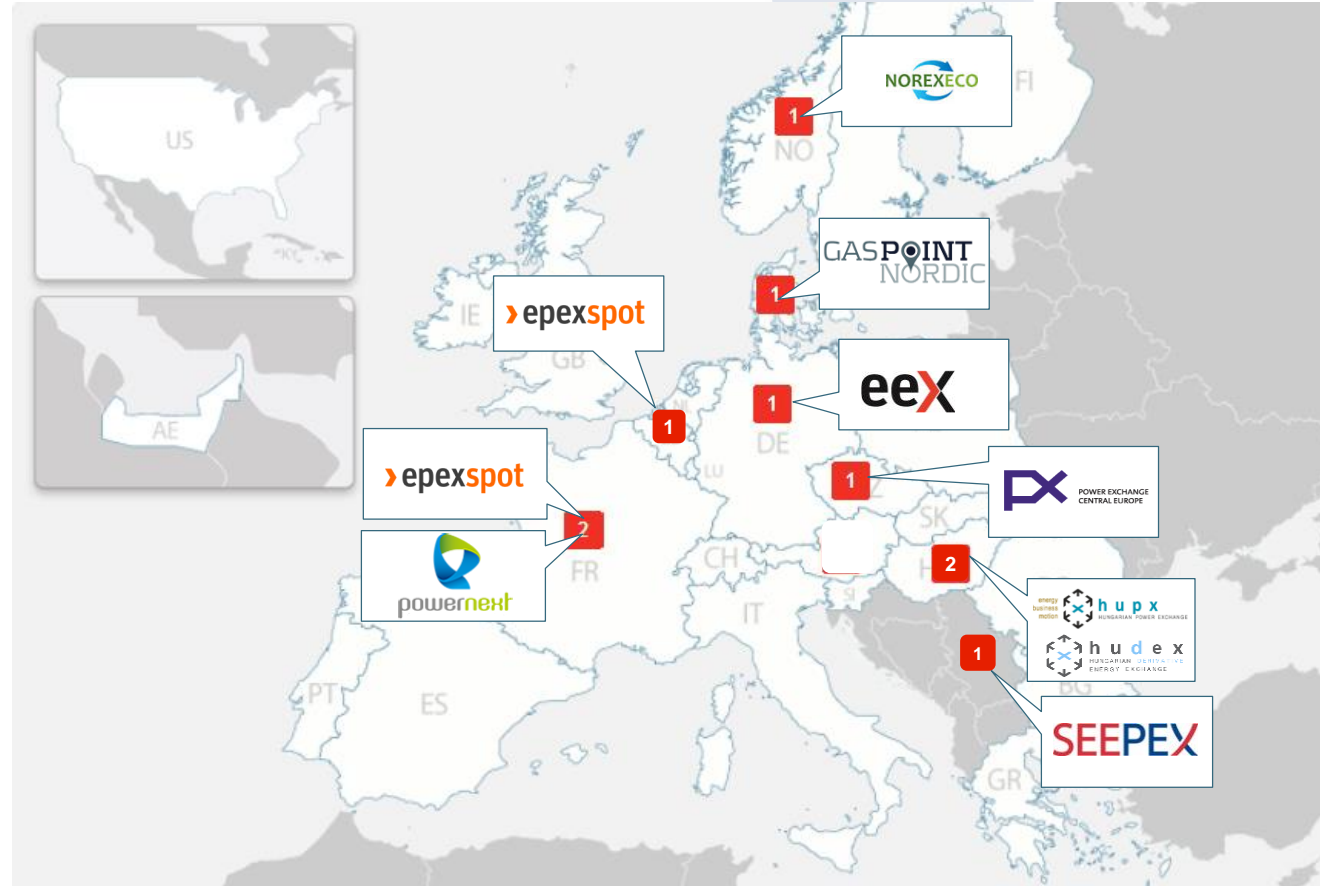
SEEPEX partners: ECC AG – Clearing house

10 Partner Exchanges

- EEX
- EPEX SPOT
- EPEX SPOT Belgium
- HUDEX
- HUPX
- Norexeco
- Powernext
- PXE
- SEEPEX
- CLTX (Singapore)

23 Clearing Members

454 Non-Clearing Members



▪ **European Commodity Clearing AG** performs the role of the **Central Counterparty** for SEEPEX

SEEPEx partners: ECC

Products cleared by ECC

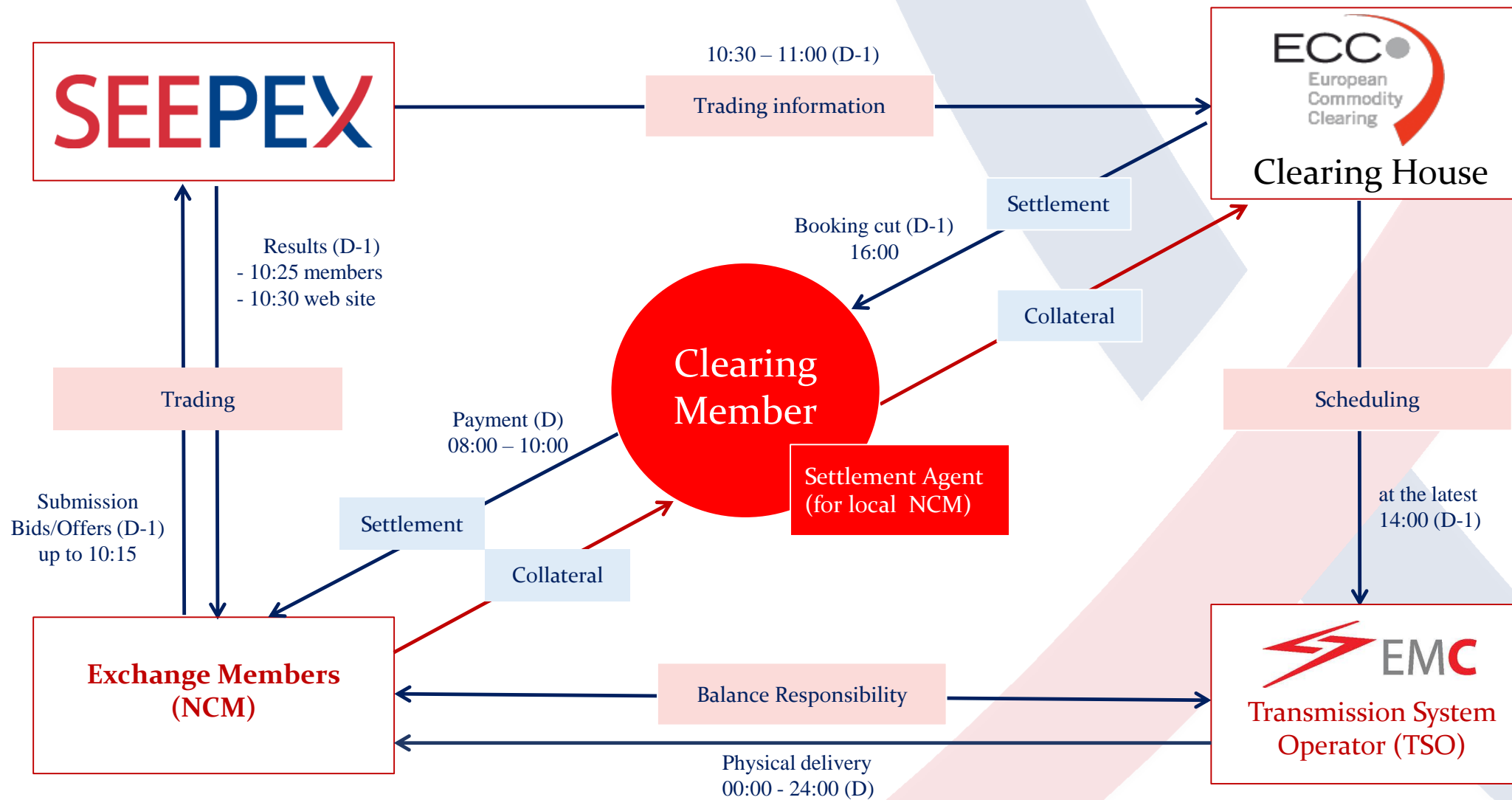
as of August 2016

| | | | |
|-----------------------|--|---|--|
| | <ul style="list-style-type: none"> Austrian Spot (IT ST) Belgian Spot (IT ST) & Futures (P/F) Czech Spot (ST) & Futures (F) Dutch Spot (IT ST) & Futures (P/F) French Spot (IT ST), Futures (P/F/non-MTF) & Options | <ul style="list-style-type: none"> German Spot (IT ST), Intraday Cap Futures & Futures (non-MTF) Greek Futures (F) Hungarian Spot (IT ST) & Futures (P/F) Italian Futures (F) & Options Nordic Futures (F) & Options Phelix Futures (F) & Options | <ul style="list-style-type: none"> Polish Futures (F) Romanian Futures (F) Serbian Spot (ST) Slovakian Futures (P/F) Spanish Futures (F) & Options Swiss Spot (IT ST) & Futures (F) UK Spot (IT ST) & Futures (F) |
| Natural Gas | <ul style="list-style-type: none"> Austrian Spot (IT ST) & Futures (P) CEGH Czech Spot (ST) & Futures (P) ETF Spot (IT ST) & Futures (P) GASPOOL German Spot (ST IT) & Futures (P/non-MTF) GRTGaz French Spot (IT ST) & Futures (P) | <ul style="list-style-type: none"> NBP UK Spot (IT ST) & Futures (P/non-MTF) NCG German Spot (IT ST) & Futures (P/non-MTF) PEG Nord French Spot (IT ST) & Futures (non-MTF) PSV Italian Futures (P/F/non-MTF) | <ul style="list-style-type: none"> TRS French Spot (IT ST) & Futures (P) TTF Dutch Spot (IT ST) & Futures (P/non-MTF) ZEE Belgian Spot (IT ST) & Futures (P/non-MTF) ZTP Belgian Spot (IT ST) & Futures (P/non-MTF) |
| Coal | <ul style="list-style-type: none"> API 4 FOB Richards Bay EURO/USD Futures (F)* | <ul style="list-style-type: none"> API 2 CIF ARA EURO/USD Futures (F)* API 5 FOB Newcastle Futures (F)* | <ul style="list-style-type: none"> API 8 CFR South China Futures (F)* Indonesian Sub-bituminous Futures (F)* |
| Oil | <ul style="list-style-type: none"> Brent 901 Formula Futures* | | |
| Environmentals | <ul style="list-style-type: none"> EU Aviation Allowances (EUAA) Spot (ST) & Futures (P) EU Emission Allowances (EUA) Spot (ST) & Futures (P) | <ul style="list-style-type: none"> GoO on Alpine Hydro Power (P) GoO on Nordic Hydro Power (P) GoO on Northern Continental Europe Wind Power (P) | <ul style="list-style-type: none"> Green Certified Emission Reductions (Green CER) Spot (ST) & Futures (P) |
| Freight | <ul style="list-style-type: none"> Dry Bulk Time Charter Futures (F) & Options | <ul style="list-style-type: none"> Dry Bulk Trip Time Charter Futures (F) | <ul style="list-style-type: none"> Dry Bulk Voyage Route Futures (F) |
| Power | <ul style="list-style-type: none"> DAP fob NOLA Futures (F)* DAP fob Tampa Futures (F)* | <ul style="list-style-type: none"> UAN fob NOLA Futures (F)* Urea (Granular) fob Egypt Futures (F)* | <ul style="list-style-type: none"> Urea (Granular) fob NOLA Futures (F)* Urea (Prilled) fob Yuzhnyy Futures (F)* |
| Dairy | <ul style="list-style-type: none"> Butter Futures (F) | <ul style="list-style-type: none"> European Whey Powder Futures (F) | <ul style="list-style-type: none"> Skimmed Milk Powder Futures (F) |
| Potatoes | <ul style="list-style-type: none"> European Processing Potatoe Futures (F) | | |
| Meat | <ul style="list-style-type: none"> Hog Futures (F) | <ul style="list-style-type: none"> Piglet Futures (F) | |
| Metals | <ul style="list-style-type: none"> Iron Ore 62% Fe CFR Tianjin (TSI) Futures (F)* | | |
| Fibre | <ul style="list-style-type: none"> Pulp Futures (F) | | |

* Indexes on ECC website

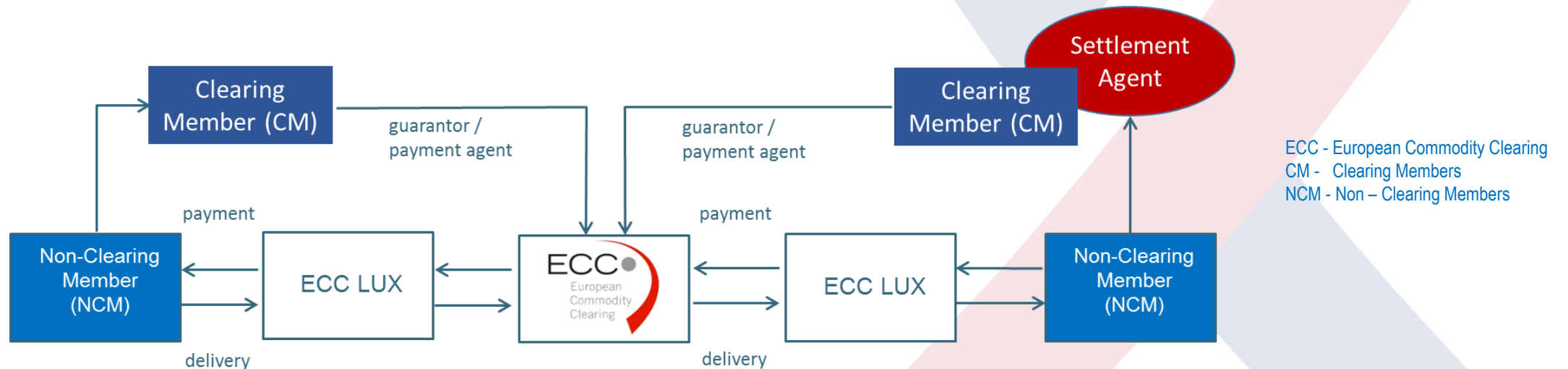
@SEEPEx: Please have a look at our website for an update:
<https://www.ecc.de/ecc-en/about-ecc/partners-products/products>

SEEPEX Business Model



SEEPEX Clearing Model

- Foreign SEEPEX Trading Participants - already existing NCMs at ECC
- Local SEEPEX Trading Participants - new NCMs at ECC
- All transactions are settled in Euro – standard financial settlement procedures applied
- Inclusion of ECC Lux in delivery chain
- ECC guarantees the fulfillment of the transactions in its role as CCP
- The Clearing Member is not part of the contractual chain, but is acting as guarantor for the transactions and provides cash settlement services




- All transactions are settled in Euro – standard financial settlement procedures is applied

ECC Clearing Process Financial Settlement

- All transactions concluded until 16:00:00 CET (booking cut) will be financially settled at the next day as follows:

| Trades concluded on | Thursday | Friday | Saturday | Sunday | Monday | Tuesday |
|---------------------|----------|--------|----------|--------|--------|---------|
| Thursday | T P BC | F | | | | |
| Friday | | T P BC | | | F | |
| Saturday | | | T | | P BC | F |
| Sunday | | | | T | P BC | F |
| Monday | | | | | T P BC | F |

 Spot Trade Report

 Payment Report

 Booking Cut

 Financial Settlement

SEEPEx products

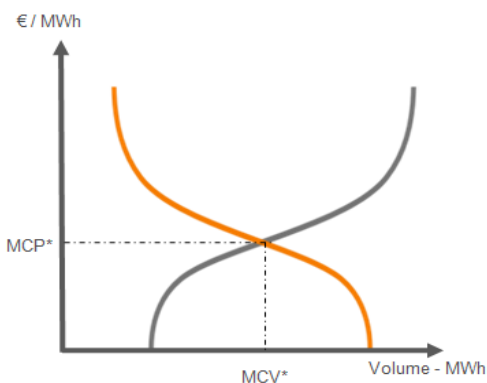
Day-ahead market as the first step

DAY-AHEAD AUCTION

- Auction, 7 days a week, year-round
- 24 hours of the following day are traded
- Hourly contracts available for trading
- Hourly and Block products are applied
- Reliable and robust trading platform through the EPEX Trading System (ETS)
- Compatible systems and processes with PCR / 4MMC
- Clearing: performed by ECC

MCP: Market Clearing Price

MCV: Market Clearing Volume



- Closing of order books (GCT) - 10:15 CET
- Publication time – 10:25 CET

- During the auction, all orders in the order book are matched to trades at a specific moment
- The buy entries are aggregated to form a demand curve, and the sell entries are aggregated to form an offer curve
- The Market Clearing Price (MCP) and the Market Clearing Volume (MCV) are the determined at the intersection point of this two curves

Possibility to submit order:

- Linear order
- Block order

Preconditions to trade on SEEPEX

Contractual relationships

Trading Agreement

- Between Exchange member and SEEPEX
- Relationship in terms of responsibility (trading, behavior on the market), requirements (technical, training of traders) and property (license to trade on SEEPEX)

Non-Clearing Agreement

- Between ECC, Clearing member and Exchange member

Balance Responsibility Agreement

- Between Exchange member and TSO
- Includes all contractual relationship between TSO and market participant regarding the imbalance settlement of corresponding balance group

Membership status



Expected new members

In the registration process

| | Company | REGION | Go-live readiness |
|----|-----------------------|---------------|-------------------|
| 17 | AB Energo | Local/Serbia | 2018 |
| 18 | Energia Gas and Power | Local/ Serbia | 2018 |

1. GEN-I
2. Energy Financing Team AG
3. Interenergo d.o.o.
4. JP Elektroprivreda Srbije Beograd
5. Alpiq Energy SE
6. HEP d.d.
7. MVM Partner Serbia d.o.o. Beograd
8. Statkraft Markets GmbH
9. EMS a.d., Beograd
10. Holding Slovenske Elektrarne d.o.o.
11. Elektroprivreda Republike Srpske – ERS
12. Petrol d.d Ljubljana
13. NEAS Energy A/S
14. Danske Commodities
15. Energy Supply
16. NIS a.d.

Targeted registration until Q4 2018

| | Company | REGION | Go-live readiness |
|----|----------------------------------|--------|-------------------|
| 19 | Freepoint Commodities Europe LLP | UK | 2018 |
| 20 | Edelweiss Energia | Italy | 2018 |
| 21 | CEZ | CZ/BG | 2018 |

SEEPEX main figures

SEEPEX Membership status

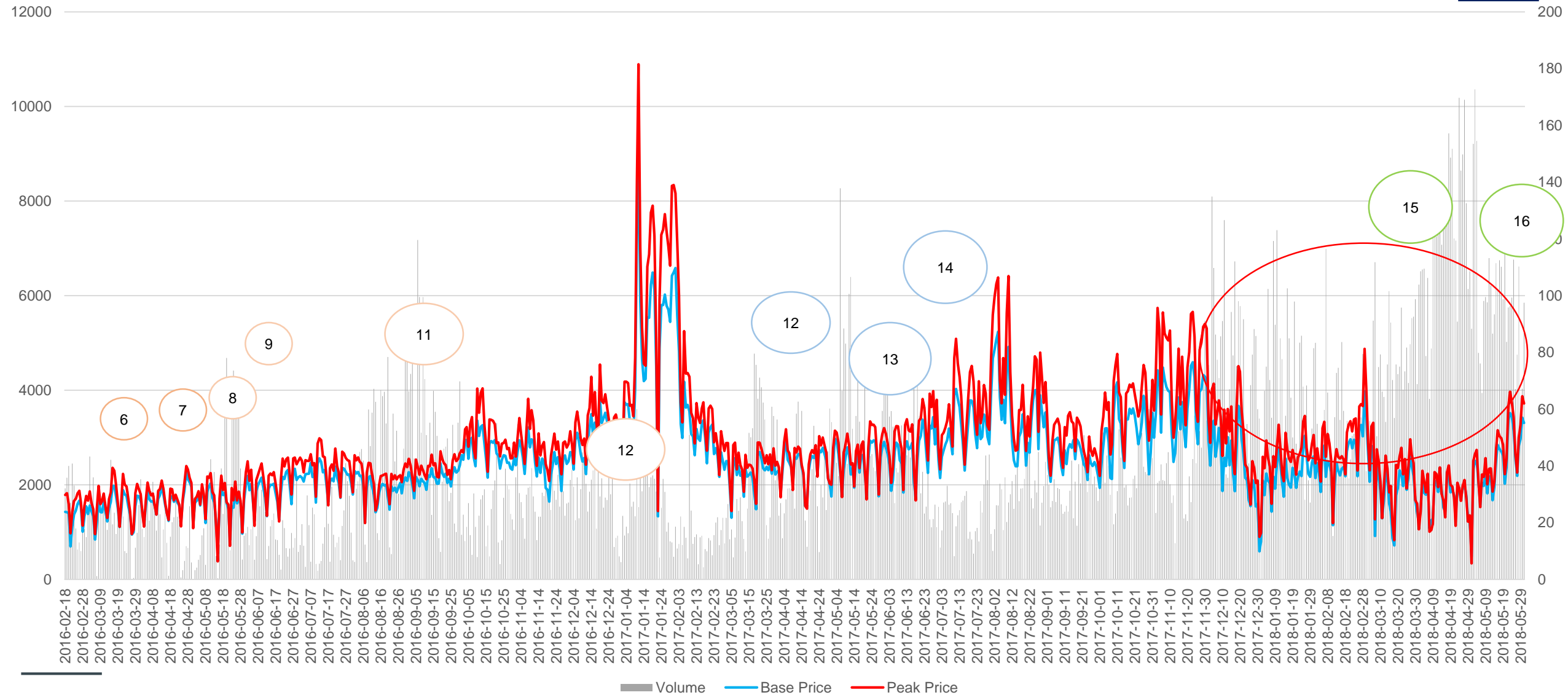
- Initial number of members: 6
- Current number of members: 16

SEEPEX Main figures

- Maximum monthly volume: 222 281,5 MWh in April 2018
- Maximum daily volume: 10 472,2 MWh on 20.06.2018.
- Maximum hourly volume: 846 MWh on 24.04.2018. (8th trading hour)

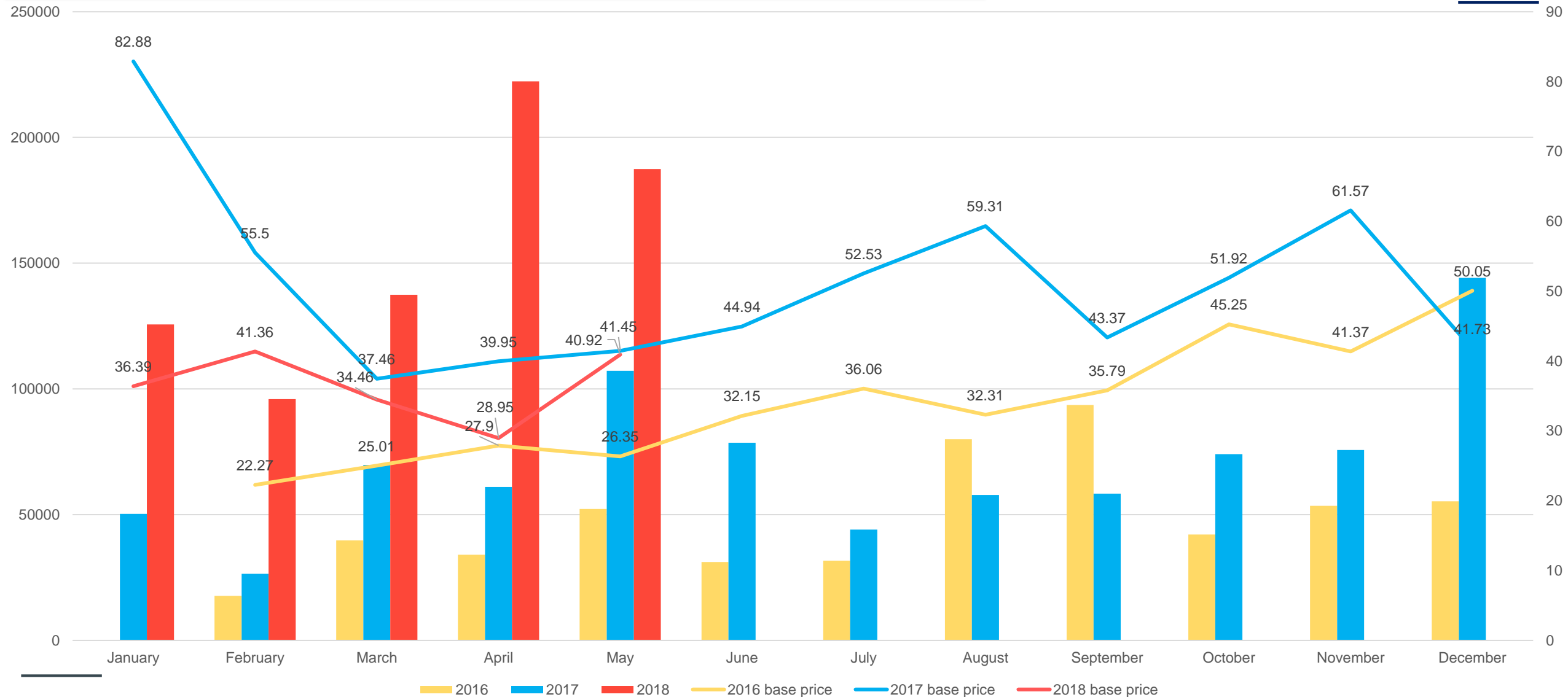
Price/Volume chart - daily

18.02.2018. – 31.05.2018.



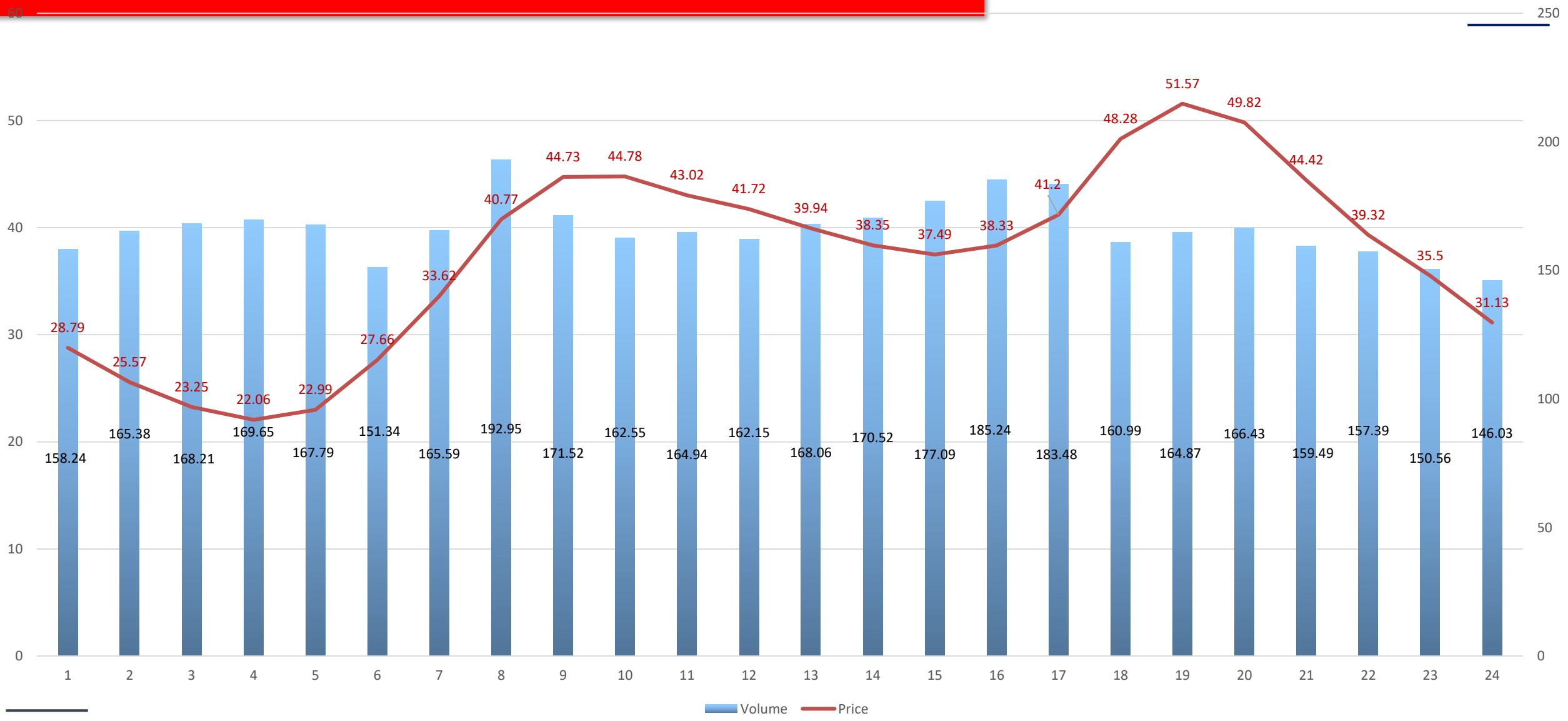
Price/Volume chart - monthly

February 2016 – May 2018



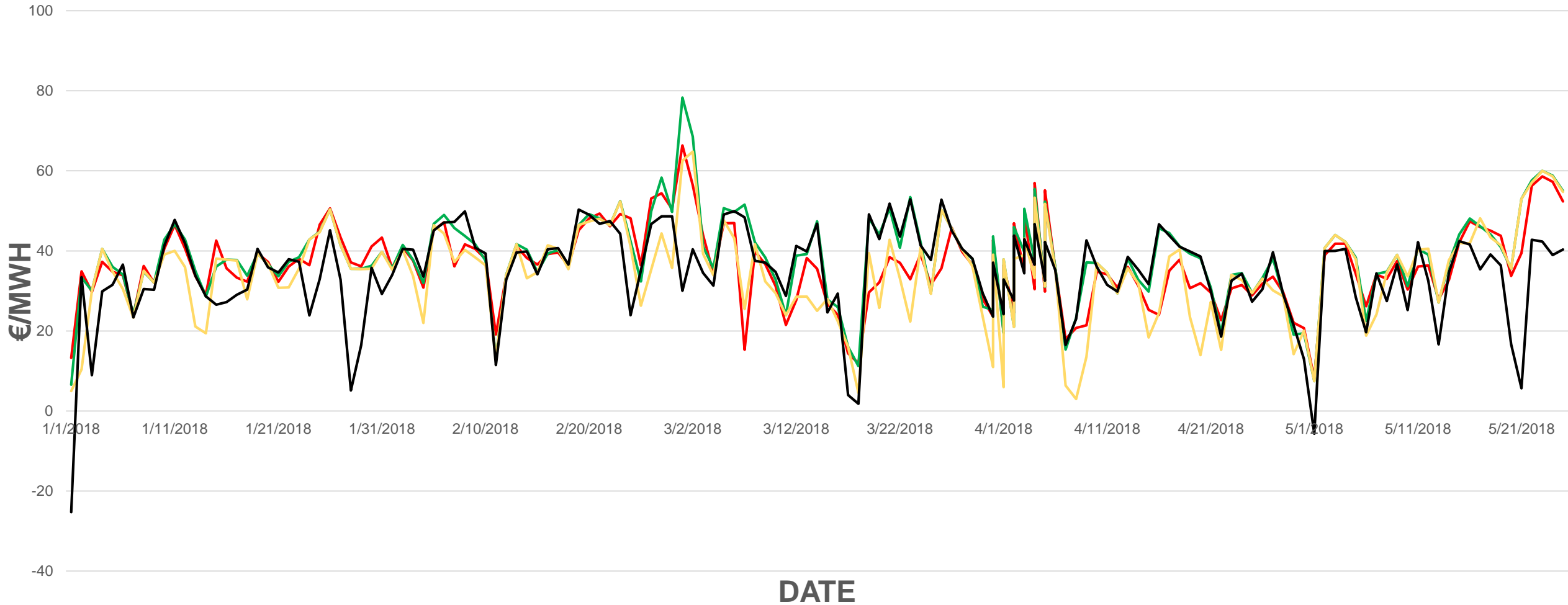
Average Volume and Prices - per hour

January 2018 – May 2018

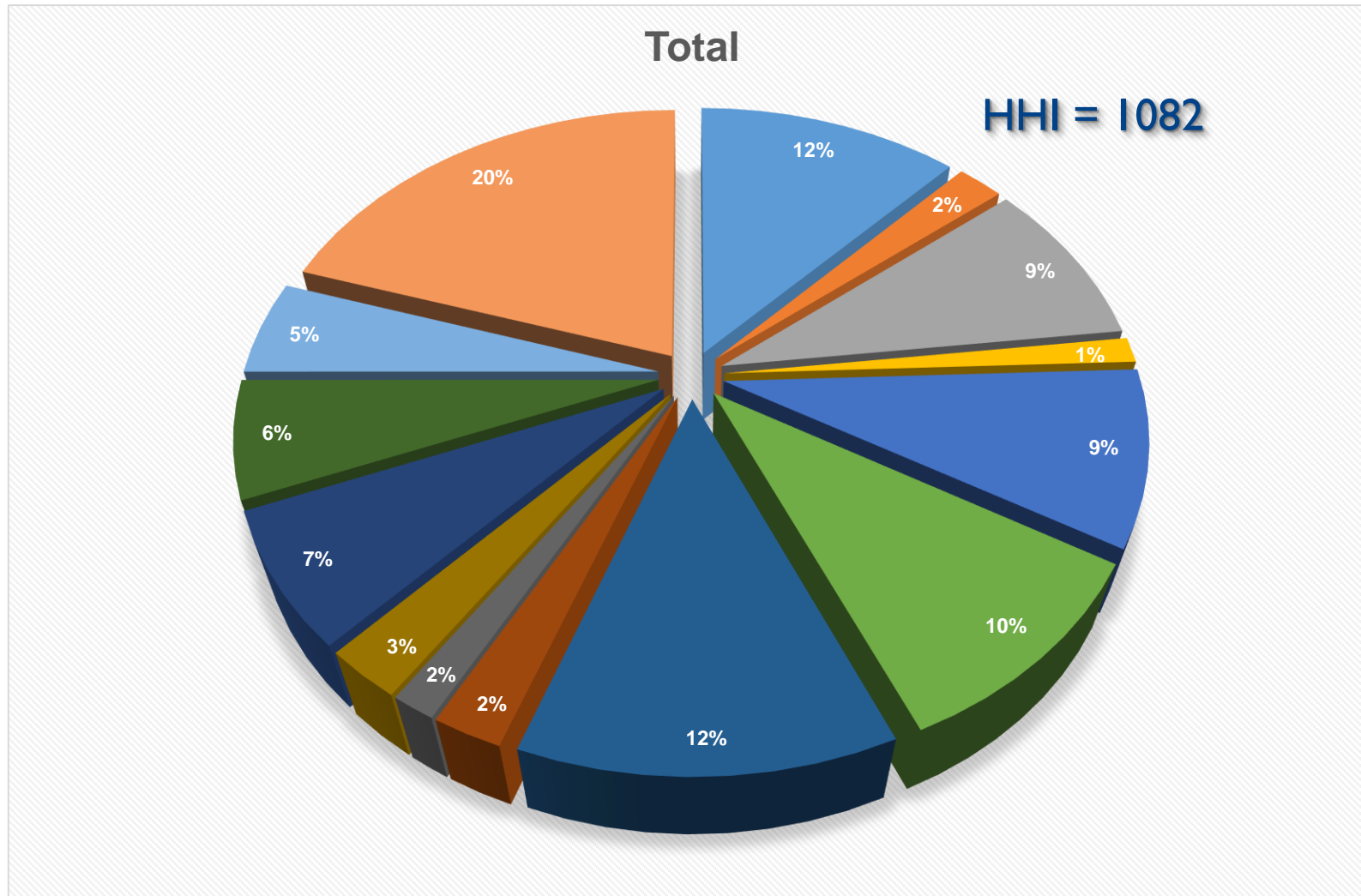


Price comparison SEEPEX-HUPX-OPCOM-GE/AT

01.01.2018. – 31.05.2018.



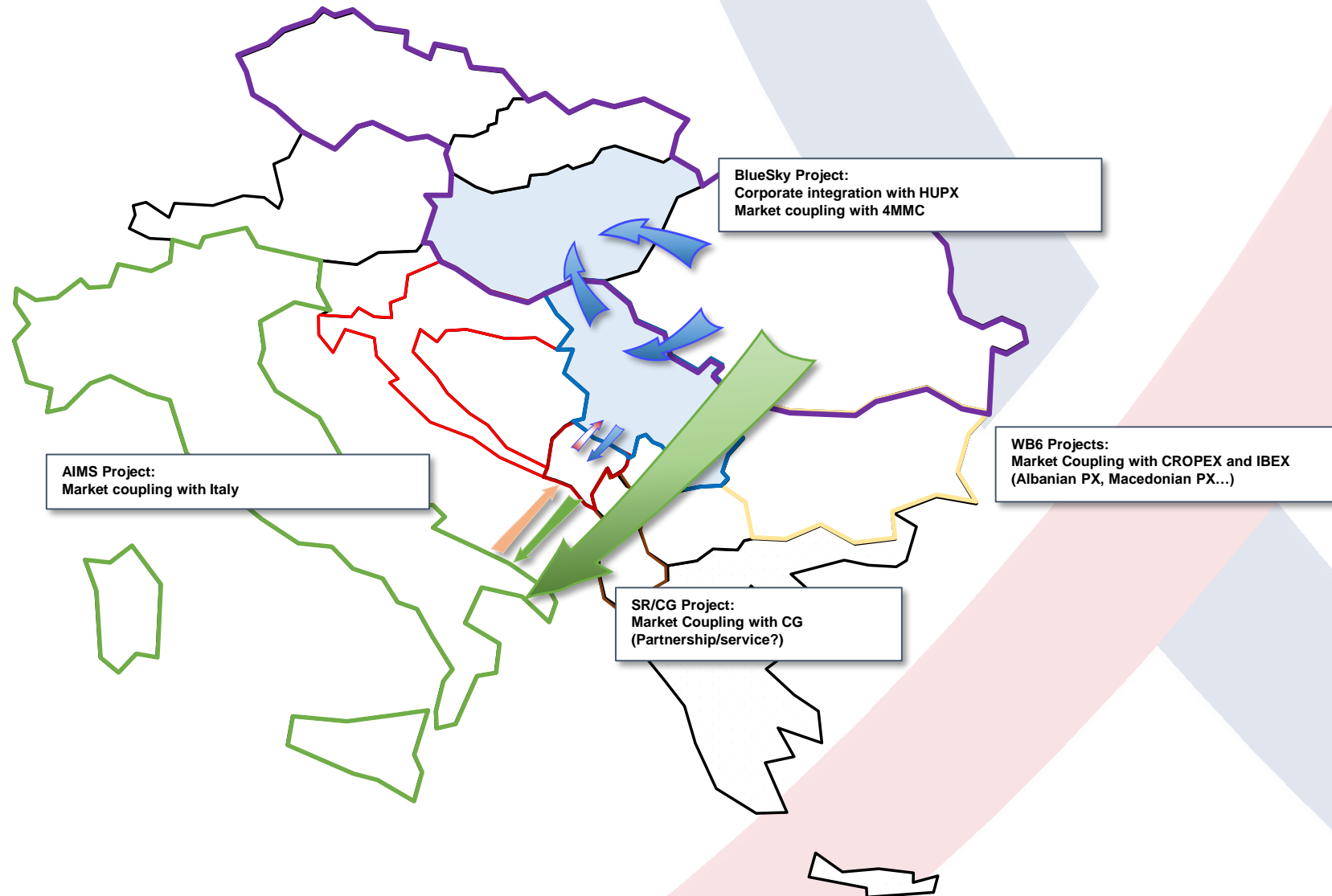
— SEEPEX — HUPX — OPCOM — GE/AT



HHI – Herfindahl-Hirschman Index

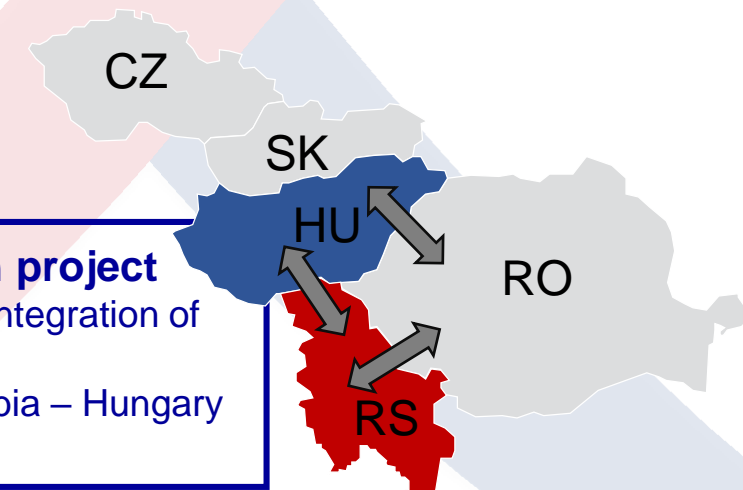
SEEPEX

Regional perspective



SEEPEx development 2018

- A new cross-regional Power Exchange for the CEE and SEE region to be established in 2019
- 5 February 2018 – Pentalateral MoU signed by EMS, MAVIR, EPEX SPOT, HUPX and SEEPEx
- **Main goals of the cooperation**
 - Merge HUPX and SEEPEx spot power businesses in order to create a **robust and strong spot Power Exchange in the CSEE region**, with DA and market coupling operations provided by EPEX
 - Enhance cooperation between TSOs and the NEMOs in the CWE/CEE common region and SEE region and contribute to the successful achievement of both political and economic common goals
 - Implement Market coupling (DA and ID) between Serbia and Hungary (and 4MMC)
- **Shareholders structure:** TSO cluster (EMS and MAVIR in initial stage) and EPEX SPOT
- Business and regulatory status to be:
 - Power spot focused
 - Customer driven
 - No monopoly status



Regional integration project

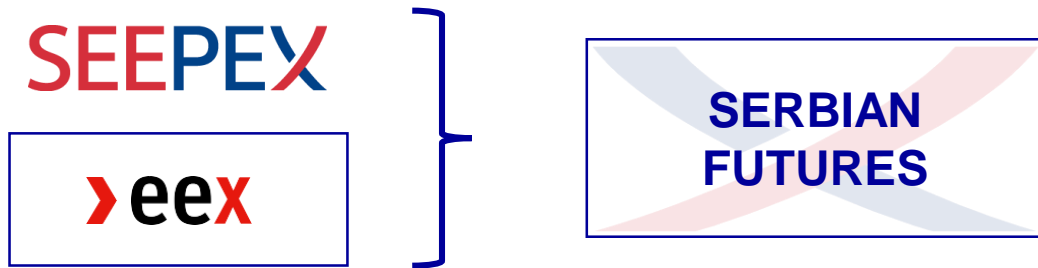
- Corporate/business integration of HUPX and SEEPEx
- Market Coupling Serbia – Hungary (and 4MMC)



SEEPEX development in 2018/2019

Serbian Financial derivatives (futures)

- Strategic partnership with the European Energy Exchange AG - strong and relevant EU partner (EU best practice and robustness/liquidity to be ensured)



- Reference price and physical delivery will be ensured via SEEPEX infrastructure (ETS platform and ECC clearing)
- Clearing services will be provided by ECC according to the standard model in place in other European countries
- Serbian Derivatives market setup will be fully compliant with European Financial Regulation
- Corresponding services for market participants as well as regulators will be provided according to REMIT, EMIR, MIFID II, MIFIR, MAR
- Best practice in high transparency and surveillance standards



Energy will belong to everyone...

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