Design of gas hubs & exchanges and evolution on the example of the Central European Gas Hub

Florian Alexander Güttl
MSc
Central European Gas Hub AG
Key Account PEGAS CEGH Gas Exchange

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Agenda

1. Introduction about HUBs & CEGH at a glance

2. Austrian Market Model

3. PEGAS CEGH GAS Markets
“Trading layer” (hub) versus “physical layer”
Development of Hubs – HUB Volumes

European Gas Hubs

CEGH  TTF  NBP  GRTgaz  PSV  huberator  GasPool  NCG
CEGH- Shareholder Structure

OMV Gas & Power GmbH

65%

Wiener Boerse AG

20%

Eustream a.s.

15%

Central European Gas Hub AG
CEGH – Historic Development

May
First Gas Release Program for EconGas

November
First time monthly net traded volume more than 1 bcm

December
Start of Gas Exchange Spot Market

2005
October
Start CEGH
Start OTC Market

2006

2008

2009

2010

2011

2012

2013

2014

January
Start of Within-Day Market
Operator of Virtual Trading Point for Austria

December
Start of CEGH Czech Gas Futures Market

January
Sum of net traded volume since 2005 in total 100 bcm

June
Vienna Stock Exchange acquires 20% share in CEGH

November
Start of Gas Exchange Futures Market

April
V4 bcm net traded volume per month

July
Start of Trayport ETS

September
Eustream joins CEGH with 15% share

October
Launch REMIT platform

February
Launch of Saturday and Sunday Contracts at CEGH Gas Exchange of Wiener Boerse

May
Launch of CEGH Czech Spot Market

January
Launch of CEGH VTP Confirmation Service

July
New CEGH Nomination Service

August
Launch of Quarter, Season and Year Products at the Gas Exchange Futures Market

September
Relaunch of CEGH CMT nomination platform

December
Czech Exchange products listed on PEGAS

2017

2016

2015

2014

2013

2012

2011

2010

2009

2008

2006

2005

Energy Community Secretariat
CEGH Volume Development 2017

**CEGH VTP:**
1 - 12 / 2017: 621.93 TWh
(y-t-y: +16.7%)

**PEGAS CEGH Gas Exchange:**
1 - 12 / 2017: 88.89 TWh
(y-t-y: +173.73%)
CEGH Volume Development 2018

CEGH VTP:
1 - 9 / 2018: 474.88 TWh
(y-t-y: +0.9%)

PEGAS CEGH Gas Exchange:
1 - 9 / 2018: 98.89 TWh
(y-t-y: +53.8%)
2 Pillars for CEGH's success

Central European Gas Hub

PEGAS CEGH Gas Markets

CEGH VTP

CZ VTP

Spot & Futures Market

- Standardized Products
- Clearing (no counterparty risk)
- Anonymous trading
- Transparent prices
- Liquidity providers
- Market Makers
- Min. 1MWh
- 3 hours lead time

CEGH

Virtual Trading Point

Nomination Platform

- Flexible volume (kWh)
- Bilateral contracts
- Renomination service,
- Edigas communication
- 1 hour lead time
CEGH Development of HUB Trading Nominated Volume

![Bar chart showing energy trading volumes from 2013.01 to 2018.09. The chart is color-coded and uses a linear scale on the y-axis ranging from 0 TWh to 100 TWh. The x-axis represents the months and years from 2013.01 to 2018.09.](image-url)
CEGH VTP: Daily Nominations since Jan 2013

All-time high: 01.03.2018
CEGH VTP: Daily Churn Rate since 01.2013
CEGH Development of HUB Trading
Continental European Gas Hubs - Churn Rate

Continental European Gas Hubs - Churn Rate

- CEGH
- PSV
- huberator
- NCG

Graph showing churn rate for Continental European Gas Hubs from 2013.01 to 2018.07.
CEGH VTP: Active Customers on daily basis since 2013
CEGH - Development of VTP Trading
Registered Members

Balance Group Resp. Parties 105
Virtual Traders 108
Registered Members 213
Member Structure CEGH VTP

- Austria: 17.8%
- Germany: 9.4%
- Switzerland: 12.2%
- Italy: 16.4%
- Hungary: 8.5%
- United Kingdom: 7.0%
- Slovakia: 5.6%
- Czech Republic: 4.7%
- Croatia: 2.8%
- France: 2.3%
- Denmark: 2.3%
- Slovenia: 8.5%
- Others: 8.5%

- Romania: 1.9%
- Bulgaria: 1.9%
- Belgium: 0.9%
- Spain: 0.5%
- Norway: 0.5%
- Russia: 0.5%
- Serbia: 0.5%
- Kasachstan: 0.5%
- Turkey: 0.5%
- Lithuania: 0.5%
- Cyprus: 0.5%
- Others: 8.5%
CEGH VTP Volume development and Austrian Gas Consumption (in TWh)

Volume Development at CEGH VTP

- Gas Consumption Austria
- Traded Volumes at CEGH VTP

Source: CEGH, E-control Austria
Graph: d-maps.com
EFET Hub Transparency Guidelines

**EFET Guide on the Features of a Successful Virtual Trading Point**

**Measures of Liquidity:**

- Number of registered participants
- Number of active participants (i.e. those who have conducted at least one trade in the last 12 months)
- Number of independent companies actively trading (i.e. stripping out multiple affiliates in same group)
- Numbers of trades
- Quantity traded (in absolute terms, relative to local demand and relative to Demand + transit flows)
- Concentration of trading (to understand whether a small number of traders are responsible for most trades or whether the market is highly diversified)
- Products actively traded: Within Day, Day Ahead, Balance of Month, Month ahead, Quarter ahead, Season +1, Season + 2, Year + 1, Year + 2, Year + 3
- Bid Ask spread for products traded
- Churn Rate
CEGH Market Statistics

CEGH publishes and regularly updates statistical values about the CEGH-VTP and CEGH Gas Exchange markets. The publication of market statistics follows the recommendation for measures of liquidity according to the “Guide on the Features of a Successful Virtual Trading Point” by the leading European Energy Trader organisation EFET (30th Oct 2013). The EFET Guide can be downloaded from the EFET website.

Key facts are shown in the table below. The data to its full extend is available for download.

Download as [pdf-file](#)  
Download as [csv-file](#)

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EFET Hub Annual scorecard 2017

Biggest risers: CZ and HU; next biggest VTP and PVB

2014 2015 2016 2017
Austrian Market Model
Baumgarten Station (*)

(*) ... owned and operated by Gas Connect Austria
CEGH-VTP will be developed to an even more liquid and attractive gas hub

- Baumgarten offers an excellent location for international gas trading
- State-of-the-art infrastructure, gas supply routes and modern gas trading platform of Central European Gas Hub (CEGH)
- Unique location between (more) liquid and (more) illiquid markets

**Gas hub Baumgarten**

Russian gas exports to Western Europe, in %

- Baumgarten: ~33%
- Others: ~67%

Largest station for natural gas in CE and first major gas hub for gas from East

Source of storage volumes: Gas Storage Europe

**Infrastructure and storage facilities**

20 storage facilities within 400 km

High storage capacity around Baumgarten assuring high flexibility and supply security
Introduction of the CEGH VTP and consequences for CEGH title transfer points

Previous CEGH locations

- Oberkappel (2 TT points)
- Ueberackern (2 TT points)
- Weitendorf (1 TT point)
- Mosonmagyaróvár (1 TT point)
- Murfeld (1 TT point)
- Baumgarten (13 TT points)

Current CEGH location

- CEGH VTP (1 title transfer point)
Operator of the VTP

§ 68 Austrian Gas Act (2011)

Main Tasks:

- Operating Virtual Trading Point (VTP)
- Providing commercial hub services
- Matching of trade nominations
- Cooperation with exchanges + clearinghouses
- …
(Last-resort) balancing by MAM

Energie-Control Austria Executive Board Ordinance on Provisions for the Gas Market Model ("Gas Market Model Ordinance 2012")

Section 26 (4) The market area manager shall net the volumes nominated for each balance group and inform the balance responsible parties of any imbalances over the day. Should the relevant balance responsible party fail to renominate and thereby eliminate any daily imbalances in the balance group within one hour, gas shall be purchased or sold at the virtual trading point to ensure that the group is in balance. Such exchange transactions at the virtual trading point shall be executed on behalf and for account of the balance responsible party, at the best available purchase/selling price at that time.
Interaction between operators

“Ex ante balancing” is done via OTC + exchange platforms

CEGH Exchange

Calculated netted position

CEGH VTP

Entry

Net positions and schedules are matched between operators

MAM

Exit

Schedules

DAM

“Ex post balancing” is done by BGC

Storage / Domestic Production

Consumption

VTP ...
MAM ...
DAM ...
BGC ...

Virtual Trading Point
Market Area Manager
Distribution Area Manager
Balance Group Coordinator
## Net position calculation per balance group

### BGR @ CEGH

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<td>Exchange</td>
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### + 300 Total

**net position to MAM**
Physical Settlement Process
**Possibilities of registration / network usage**

**Different roles of BGRPs and Virtual Traders**

BGRP – fully registered at all operators/entities depending on individual activities/portfolio

BGM – Not visible to the system operators except in case of exchange membership

VT – only registered at CEGH for pure trading on the OTC market
Balance Group Model according to § 26 Gas Market Ordinance

- A Balance Group is organized by a BGRP ↔ The BGRP is responsible for the Balance Group(s).
- Each network user has to be assigned to (at least) one Balance Group. (Not applicable for virtual gas traders)
  - One BGRP can have more than one balance group.
- MAM is doing balancing on behalf of and on the account of the BGRP
  - Each BGRP has to be an exchange member of the Within-Day Market!
- Balancing is done on Balance Group Level
The Impact of Balancing on BG Level

BGRP

MAM

Sells 50 for BGRP

BGRP

BG 1
→ BGM 1

- 50

BG n
→ BGM 2

... 

→ BGM n

+ 50

CEGH VTP

[Table with data]

Energy Community Secretariat
Price determination for within-day / balancing volumes

PEGAS CEGH Gas Exchange Within-Day Market = BALANCING PLATFORM

Auctions:
Prices are determined on principle of highest executable volumes

Limit = CEGHIX +/- 20%

One single market clearing price for each auction!
PEGAS CEGH GAS MARKETS
PEGAS: One Platform for one European Gas Market: Product offer

PEGAS is the central gas trading platform of EEX Group operated by Powernext, providing its members with access to all contracts in the Austrian, Belgian, Czech, Danish, Dutch, French, German, Italian and UK market areas.

PEGAS covers spot and derivatives contracts for the major European gas Hubs as well as trading in location spread products between these market areas.

This setup enables market harmonisation and forms the preferred pan European natural gas market.
PEGAS Markets and Market Shares

2017 Spot Market Shares

2017 Futures Market Shares
# PEGAS: Detailed Products and Services Offering

## Spot markets
- Hourly
- Within-Day
- Day-Ahead
- Weekend
- Saturday
- Sunday
- Individual Days

## Futures regulated & OTF markets
- Next 6 Months
- Next 6 Quarters
- Next 6 Seasons
- Next 6 Calendar years

## Other Services
- OTC Registration
- STP Service
- Gas Options

## Spread Products
- Time Spreads
- Locational Spreads
## View into PEGAS Spot Market

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**CEGH VTP**

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**GPL / TTF**

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**Bank Holiday display / Indb**

- **WD**: Wednesday
- **DA**: Day After
- **WE**: Weekend
- **Sat**: Saturday
- **Sun**: Sunday

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**CEGH**

**Regulatory School**

38
PEGAS and CEGH – Locational Spread products
PEGAS CEGH Austrian Gas Market *: Yearly Trading Volume since 2009

Futures Market
2009: 0
2010: 52.080
2011: 525.150
2012: 296.910
2013: 301.170
2014: 2.317.190
2015: 3.510.900
2016: 7.761.580
2017: 20.466.81
01.2018-09.2018: 39.894.57

Spot Market
2009: 8.640
2010: 1.061.160
2011: 2.016.290
2012: 2.761.020
2013: 12.917.73
2014: 18.944.25
2015: 22.964.49
2016: 24.715.42
2017: 68.432.92
01.2018-09.2018: 58.997.61

*up to Nov 2016: CEGH Gas Exchange of Wiener Boerse
PEGAS CEGH Austria:
Spot and Future Increase 1-9 2017 vs 2018

01-09.2017

01-09.2018

Futures + 166%

Spot +20%
Monthly Trading Volume since Dec 2009

- **Day ahead & Wkend**
- **Within day**
- **Futures Market**

All-time high

- Launch FM
- Implementation Trayport GV ETS
- New Austrian Balancing System
- Launch additional SM contracts
- Launch additional FM contracts
- Launch PEGAS CEGH Markets
Development of the Members since 2013
Registered Members PEGAS CEGH Gas Exchange

83 Active members

23 Solely passive members

13 Clearing Participants
THANK YOU VERY MUCH FOR YOUR ATTENTION

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