

Pan-European Gas Price Index

Basic Considerations

Dr. Albrecht Wagner

- **Currently, most gas price indices used in Europe are calculated on the basis of data from a single gas hub.**
- **Against this background, we were tasked with**
 - **constructing gas price indices for spot and front month on the basis of several European hubs and**
 - **calculating these indices on the basis of a 2013 data set for 8 European gas hubs* (brokered deals, major brokers) and**
 - **comparing the resulting prices and underlying volumes and deal counts to indices based on TTF and NBP alone and**
 - **providing practical notes on the use and final construction of such indices.**

* European gas hubs in the data set: AT-VTP, BE-ZEE, BE-ZTP, CZ-VTP, DE-GPL, DE-NCG, FR-PEG Nord, FR-PEG Sud, IT-PSV, NL-TTF, UK-NBP. Hubs with a volume share below 1% in the total were excluded from the indices; this affects BE-ZTP, CZ-VTP and FR-PEG Sud. So the total set of hubs considered in the indices is eight (8).

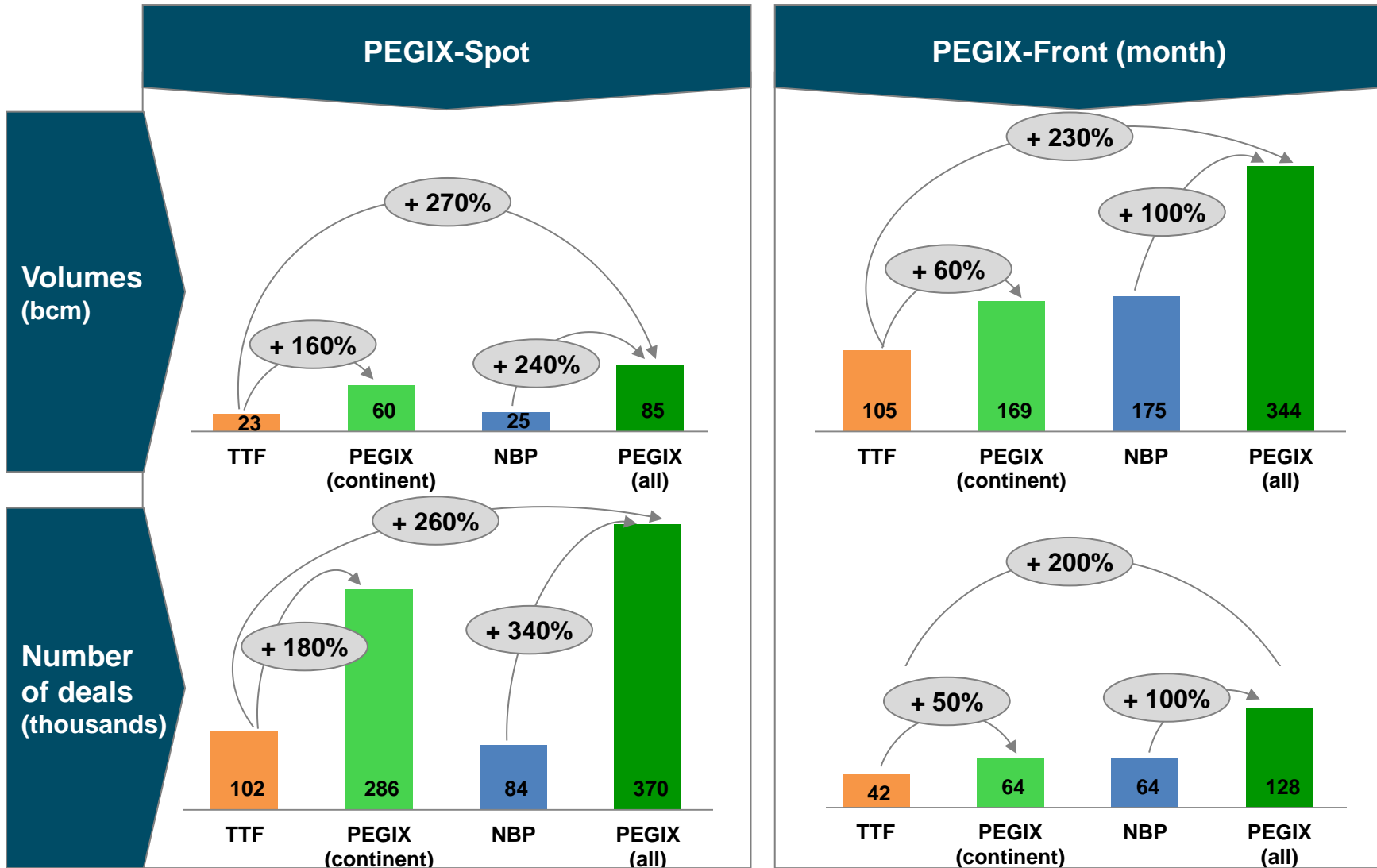
- Two ways of constructing a Pan-European Hub Gas Price Index (PEGIX) were analysed:
 - Spot based index: PEGIX-Spot
 - Front month based index: PEGIX-Front
- Both indices were constructed in two sub-variants:
 - Selected* continental hubs: PEGIX-Spot (continent), PEGIX-Front (continent) (AT-VTP, BE-ZEE, DE-GPL, DE-NCG, FR-PEG Nord, IT-PSV, NL-TTF)
 - Selected* continental hubs plus UK-NBP: PEGIX-Spot (all), PEGIX-Front (all)
- The PEGIX significantly increases the volume and deal base relative to single hub indices (see next slide).
- The PEGIX is hence a more robust representation of European gas prices than any single hub index.
- Summary of differences between the two PEGIX variants:
(the “winner” in each category is highlighted green)

Category	PEGIX-Spot	PEGIX-Front
Number of deals	<i>Higher</i>	<i>Lower</i>
Traded volume	<i>Lower</i>	<i>Higher</i>
Price volatility	<i>Higher</i>	<i>Lower</i>
Weight of two biggest hubs (TTF, NBP)	<i>Lower</i>	<i>Higher</i>

* Hubs with a volume share below 1% in the total were excluded from the indices; this affects BE-ZTP, CZ-VTP and FR-PEG Sud; the remaining “selected” continental hubs were AT-VTP, BE-ZEE, DE-GPL, DE-NCG, FR-PEG Nord, IT-PSV, NL-TTF.

PEGIX volumes and deals compared to TTF and NBP

2013*

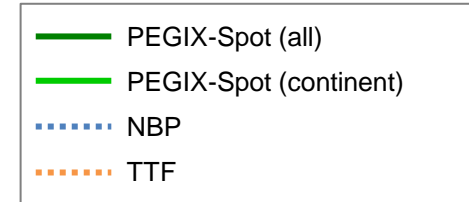
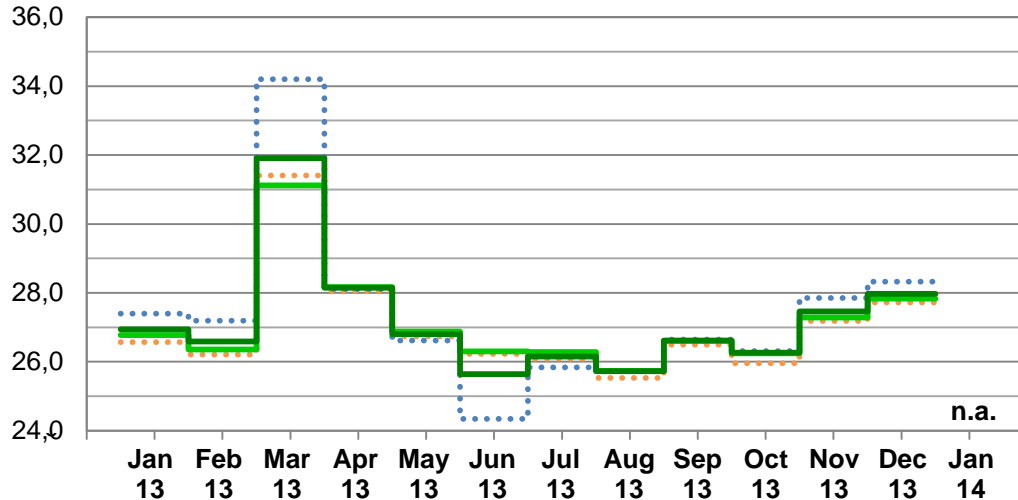


* Front month: Trading from 1st Jan 2013 to 31st Dec 2013, delivery from 1st Feb 2013 to 31st Jan 2014.

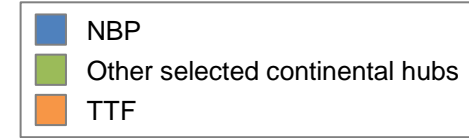
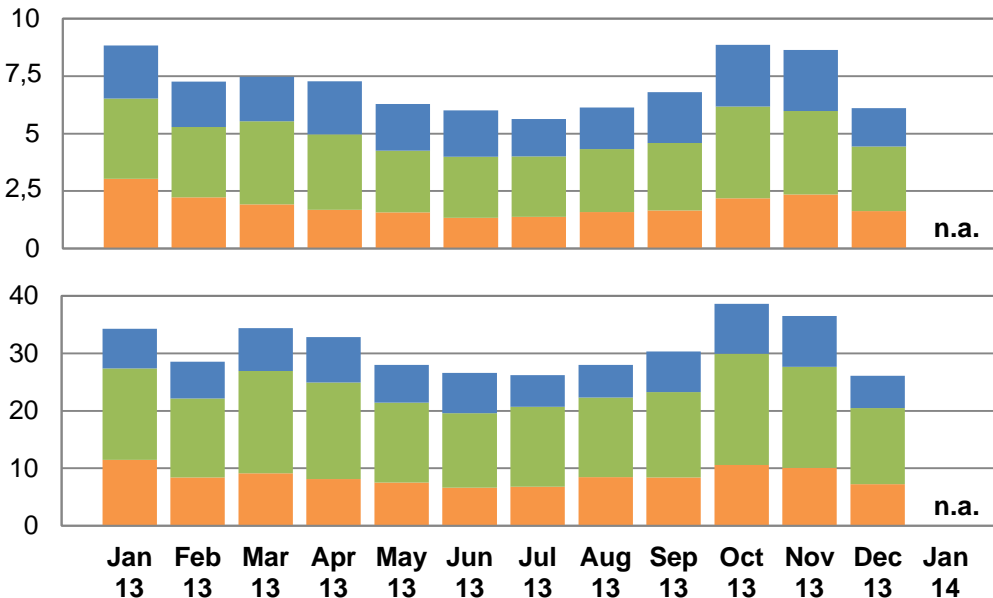
PEGIX-Spot: prices, volumes and deals

2013

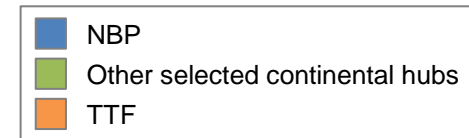
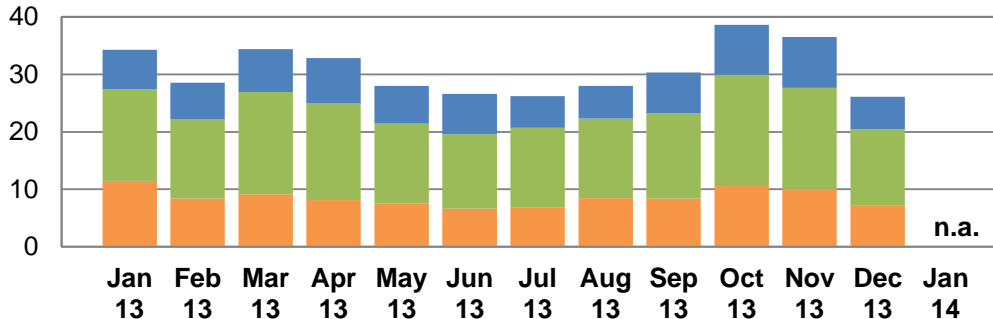
Spot based index
(Euro/MWh)



Spot volumes
(bcm)



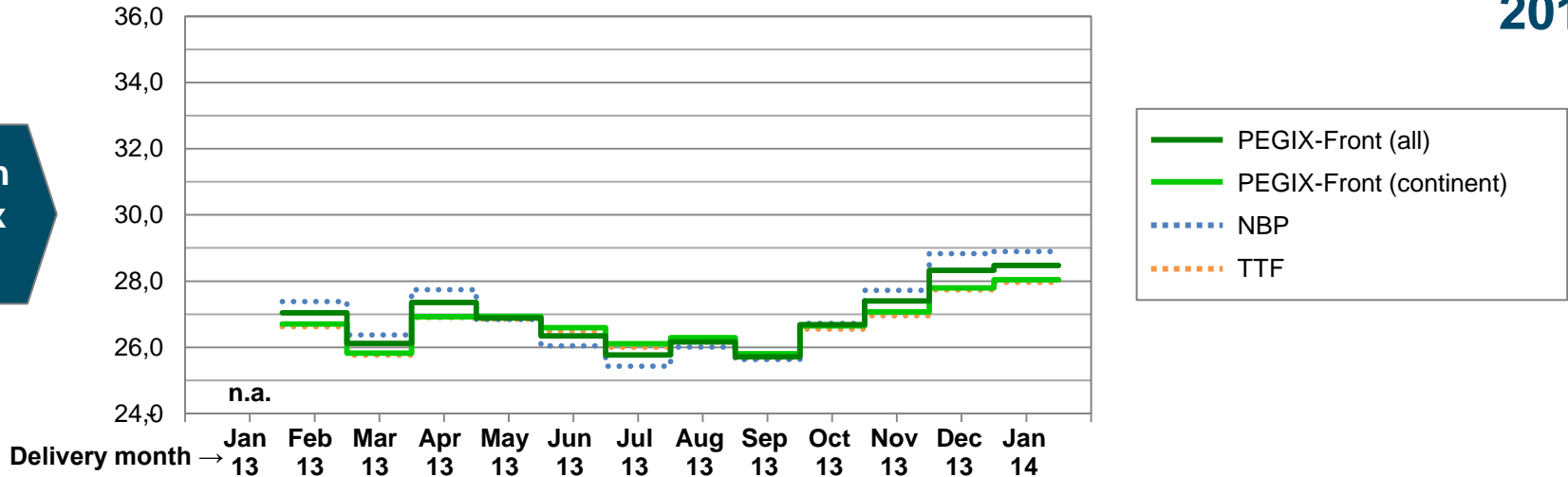
Number of spot deals*
(thousands)



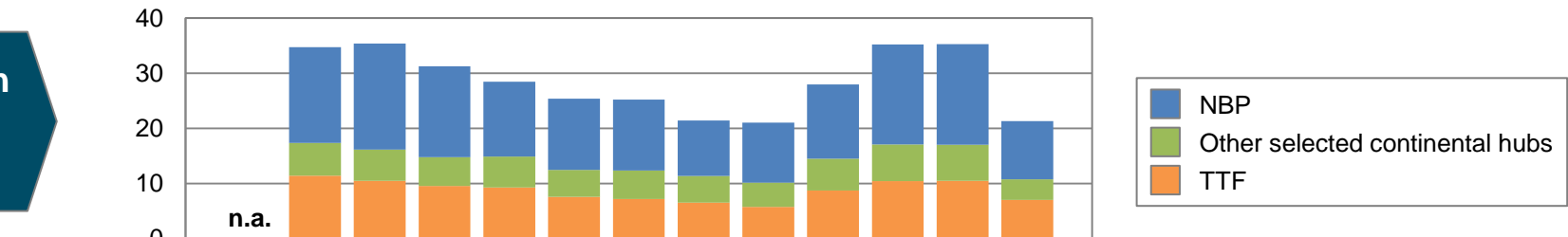
* 286 thousand deals on selected continental hubs in 2013 correspond to ~1,150 deals per trading day. Plus UK-NBP: 370 thousand deals in 2013 (~1,500 deals per trading day).

PEGIX-Front (month): prices, volumes and deals 2013*

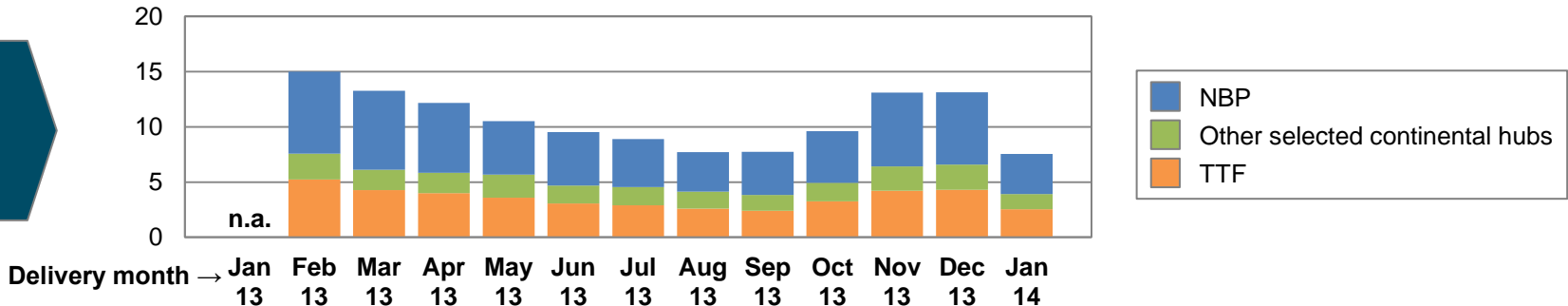
Front month based index (Euro/MWh)



Front month volumes (bcm)



Number of front month deals** (thousands)

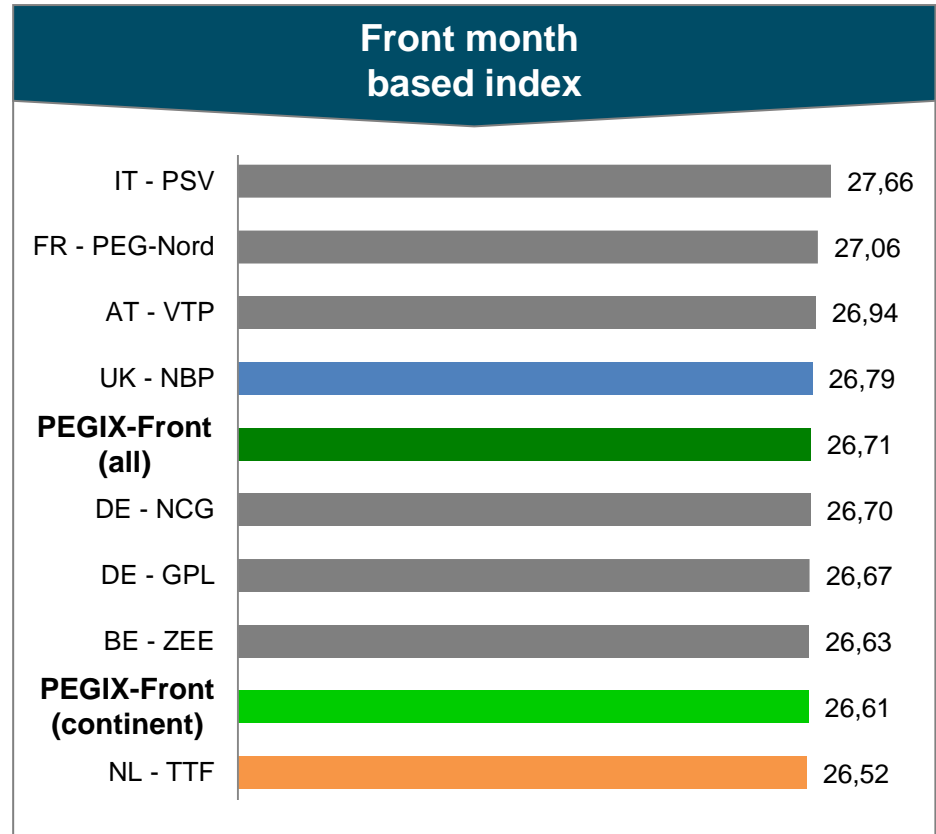
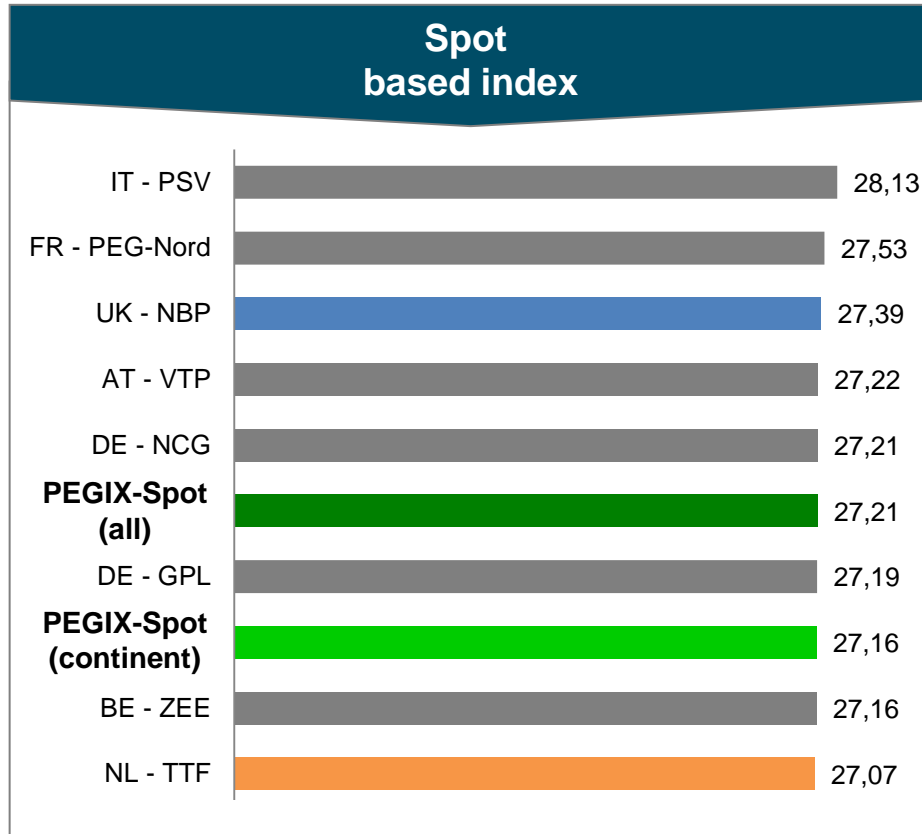


* Trading from 1st Jan 2013 to 31st Dec 2013, delivery from 1st Feb 2013 to 31st Jan 2014

** 64 thousand deals on selected continental hubs in 2013 correspond to ~260 deals per trading day. Plus UK-NBP: 128 thousand deals in 2013 (~ 520 deals per trading day).

Comparison of indices and markets

Averages Feb to Dec 2013*, Euro/MWh

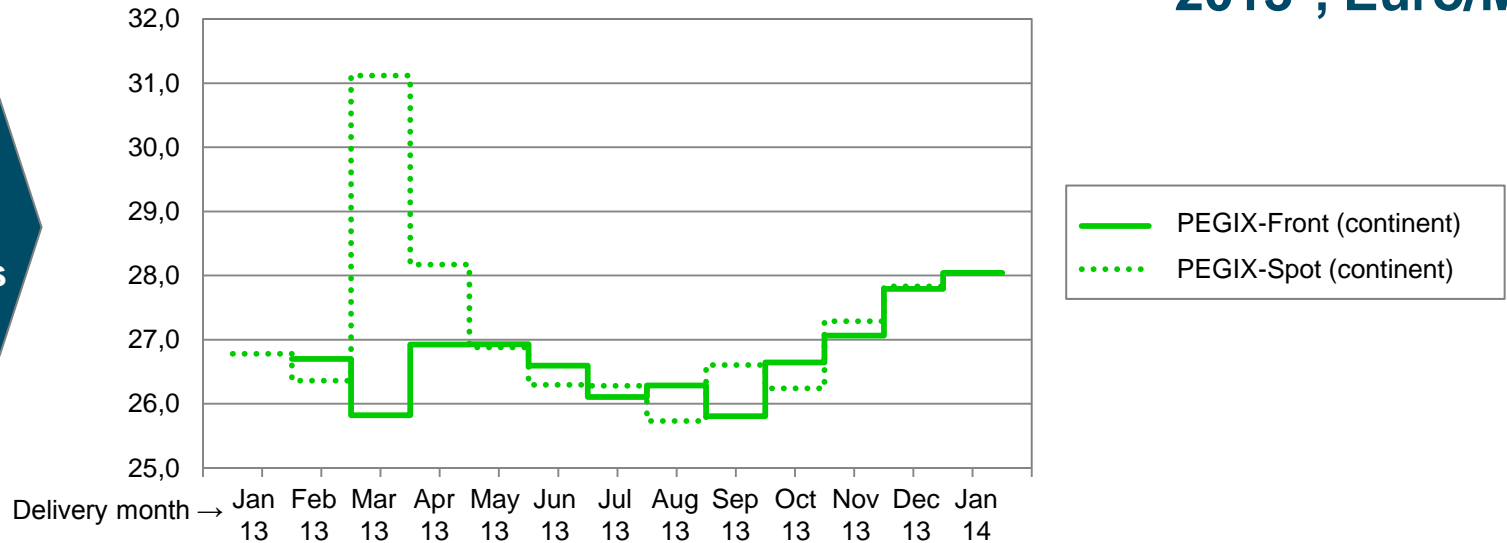


Order of markets according to spot based index (descending).

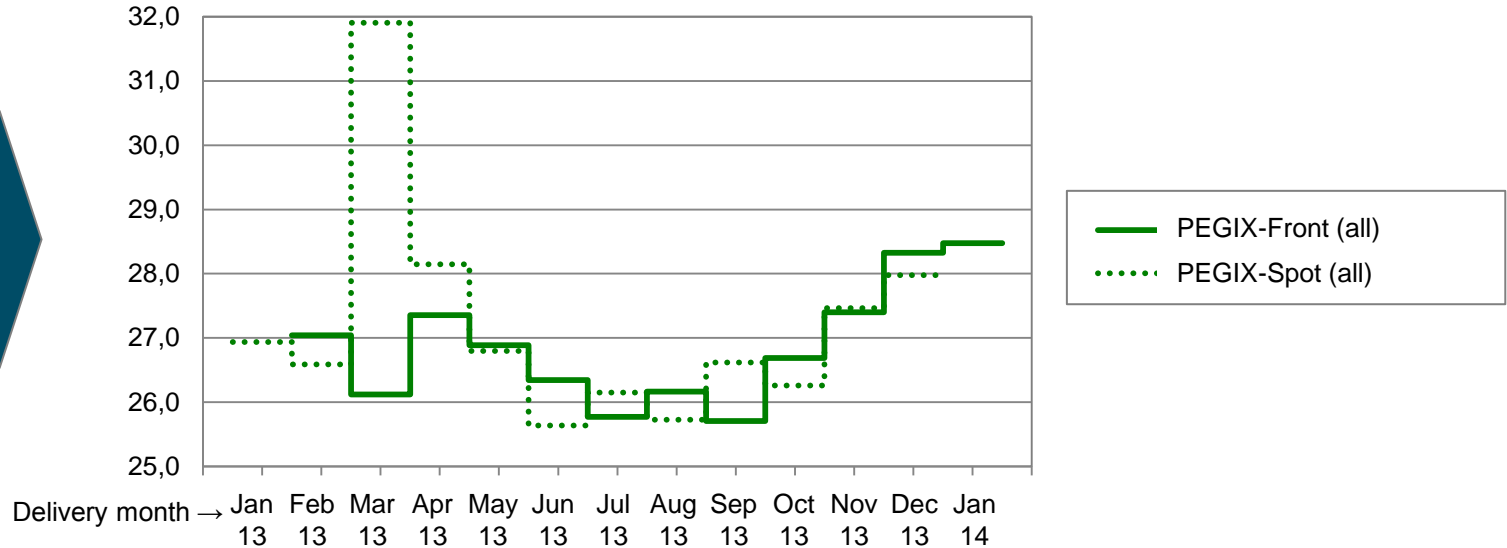
* Delivery from 1st Feb 2013 to 31st Dec 2013. Full delivery year 2013 not available due to some data lacking for front month products.

Comparison of PEGIX-Spot and PEGIX-Front 2013*, Euro/MWh

Indices for selected continental hubs



Indices for all selected European hubs (incl. NBP)



* Front month: Trading from 1st Jan 2013 to 31st Dec 2013, delivery from 1st Feb 2013 to 31st Jan 2014.

Practical notes on using PEGIX for indexing contracts for the sale and purchase of gas

- **PEGIX is harder to hedge than any single hub index because (clean) hedges would require using a set of forward products from all hubs included in the index, potentially on quite small volumes per hedge product (→ transaction cost, availability issues).**
 - **Potentially, a practical use of PEGIX would rather be as an upward (PEGIX + x) and downward (PEGIX – x) boundary on contract prices indexed to a single hub?
This would make sure that contract prices always stay more or less in line with the general development of European gas prices.**
- **In the current (first, simplified) version of PEGIX, the weightings of the individual hubs are based on the actual volume of the index product traded on each of these hubs.**
 - **Hence for determining the concrete hedge quantities, the contract parties would have to assume future shares of the individual hubs in the total volume of the index product over all hubs.**
 - **A simple solution for this complexity would be to fix the shares of each individual hub in the total index to a predetermined value (to be reviewed from time to time).**
- **In order to base PEGIX on a (more or less) complete set of transactions on European traded markets, data from a number of sources has to be collected (i.e. the major brokers and a few exchanges).**
 - **An alternative to all contract parties performing this onerous task, is commissioning an organisation trusted by all contract parties with calculating and distributing (publishing) the index.**

Practical notes on constructing PEGIX

For the practical application of PEGIX, design choices on the following issues have to be made:

- Underlying gas product (spot, front month)
- Hubs to be included
- Trading venues to be included (which brokers, which exchanges)
- Inclusion / exclusion criteria for individual transactions
(application of a trading (time) window, handling of sleeve deals ...)
- Detailed specification of the index methodology:
 - Weight of individual hubs in the index
 - Weight of individual deals (and potentially trading days) per hub
 - Unit and currency of index (incl. a methodology definition for required conversions)
 - Frequency of index calculation
 - Consideration of weekends and bank holidays (which differ across markets)
 - Consideration of (other) days without deals
 - ...