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***“The Creation of a Traded Gas Hub
in SE Europe”***

An unattainable dream or a realistic strategic objective?

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The European gas sector is facing a strong wave of change along with a number of realities and challenges

- ✓ Rising imports dependency mainly due to decreasing indigenous gas production
- ✓ Increasing competition from other regions to secure future gas quantities (i.e. China and India)
- ✓ Persisting instability in neighboring gas producing and transiting countries
- ✓ Declining gas demand due to pure economic growth, changes in the energy & environment protection policies, energy efficiency measures and RES support
- ✓ Changing roles and risks of key market players due to the ongoing market liberalization process
- ✓ Emerging gas hub pricing mechanisms
- ✓ Evolving climate change and sustainability policies

SE Europe experiences additional and more complicated realities and challenges

- ✓ Indigenous gas production in the region is set to decline further and thus will continue to be unable to meet the forecasted demand in the years to come
- ✓ Nearly all countries in the region have high import dependency on a single gas supplier (100% in many cases)
- ✓ Gas markets in most countries in the region remain still national with limited integration and lack of cross borders trade and bi-directional gas flows
- ✓ Moreover, low level of interconnectivity, insufficient LNG and UGS capacity and ineffective/divergent regulatory regimes create numerous obstacles for the development of gas-to-gas competition

The creation of competitive and secure wholesale regional gas markets as well as of traded gas hubs is a vital part of the EU's energy policy

- **Gas Target Model (GTM) provides a long term perspective in line with the Third Energy Package**
- **GTM aims to contribute to secure and competitive European gas market – development of gas hubs is a key goal**

GTM's four objectives are:

- Enhance security of supply through market-based measures
- **Facilitate wholesale market functioning which includes a liquid spot market and forward/futures markets**
- Ensure regulatory and market arrangements for efficient use of gas fired power plants
- Facilitate new uses of gas through appropriate and limited regulatory interventions

Why gas hubs/exchanges are important

- ❑ Market liberalization, unbundling, TPA, changing consumer's needs and their continuous efforts to reduce energy costs, along with transition of oil-indexed LTCs create scope for trade
- ❑ If a gas hub/exchange is correctly set up, properly managed and operated in accordance with best European practices, will secure abundant natural gas and transparent market mechanisms which in turn will lead to the creation of a competitive wholesale gas market
- ❑ Last but not least, revenues and job creation generated by the gas hub development and operation cannot be ignored

Why gas hubs/exchanges are important (cont.)

Gas hubs/exchanges can create favorable conditions for the development of a marketplace for attractive spot, forward and future market transactions and thus are able to:

- ✓ Provide accurate, neutral, transparent and efficient price signals and guarantee safe gas transactions to all market participants
- ✓ Enhance development of gas-to-gas competition for the benefit of the consumers and regional economies
- ✓ Facilitate trading of standardized gas products/contracts
- ✓ Provide the necessary market information

However, the development stage of the various regional gas hubs differ substantially

Advanced hubs: NBP and TTF

Broad liquidity

Sizeable forward markets which contribute to supply hedging

Larger presence of financial players

Price reference for other EU hubs and for long-term contracts indexation



Advancing hubs: NWE region

Ongoing increasing liquidity

More reliant on spot products and balancing operations

Progress on supply hedging role but **relatively lower longer-term products liquidity levels** results in weaker price risk management role



Developing hubs: Poland and Czech R.

Improving liquidity from a lower base taking advantage of enhanced interconnectivity

Liquidity partially driven by market obligations imposed on incumbents

Still significant reliance on long-term contracts



Illiquid hubs: SEE, Iberia, Baltic

Reliance chiefly on long-term contracts

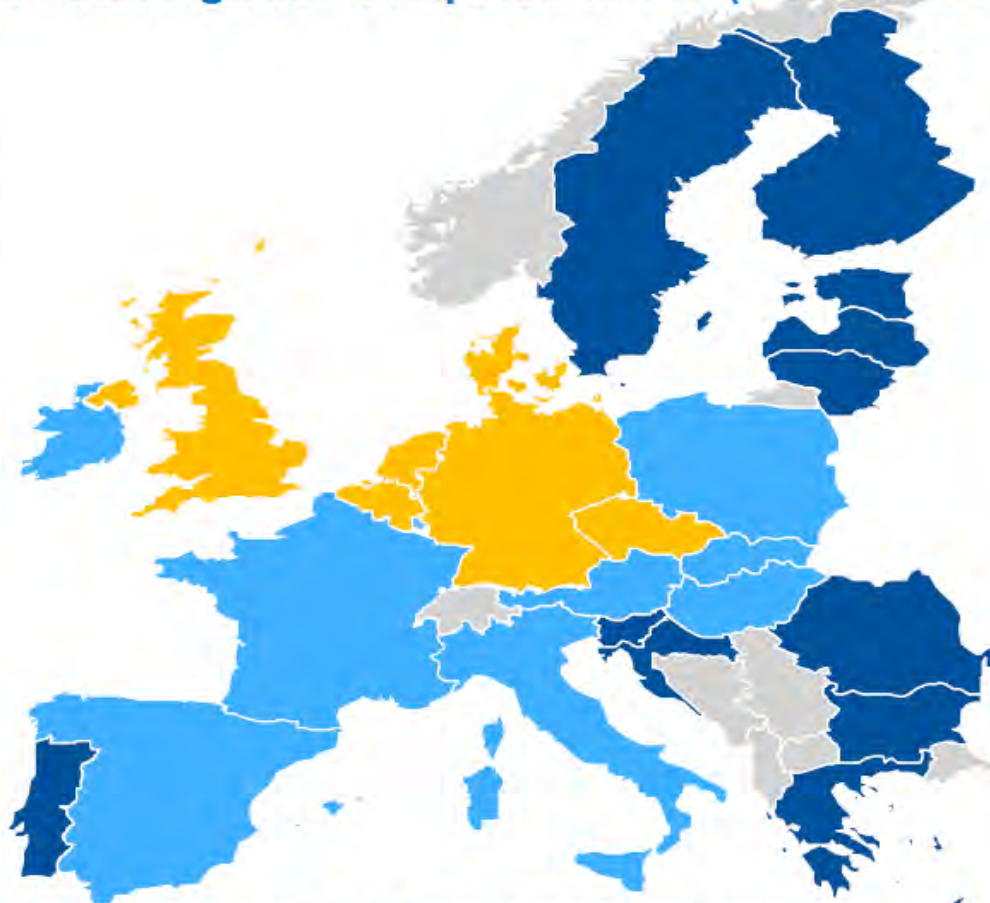
Embryonic organised market places



ACER had estimated the gas sourcing cost in various European regions in 2014

2014 Calculated gas sourcing cost* compared to TTF (= 23.7 € /MWh)

- <1 euro/MWh
- 1-3 euro/MWh
- >3 euro/MWh



Price levels are higher in those regions with

- less competitive market frames
- Less developed hubs
- weaker inter-connection

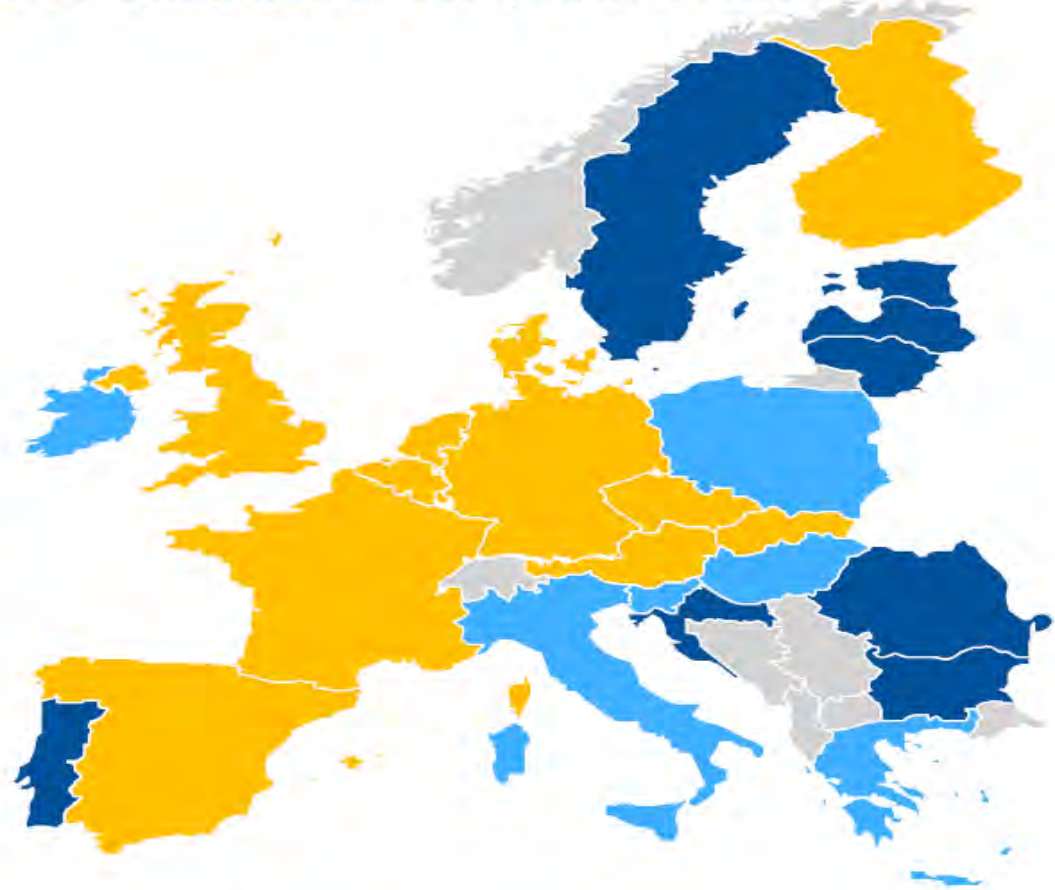
* Suppliers' sourcing costs take into account both border import and diverse hub product prices. A weighted average of monthly sourcing costs and demand is performed to obtain the yearly figure.

.... and measured the impact of the increasing gas-to-gas competition one year after

2015 Calculated gas sourcing cost* compared to TTF (= 21.0 € /MWh)

- <1 euro/MWh
- 1-3 euro/MWh
- >3 euro/MWh

1. Influence of lower oil price
2. Impact of reverse-flows
3. Improved LNG competitiveness

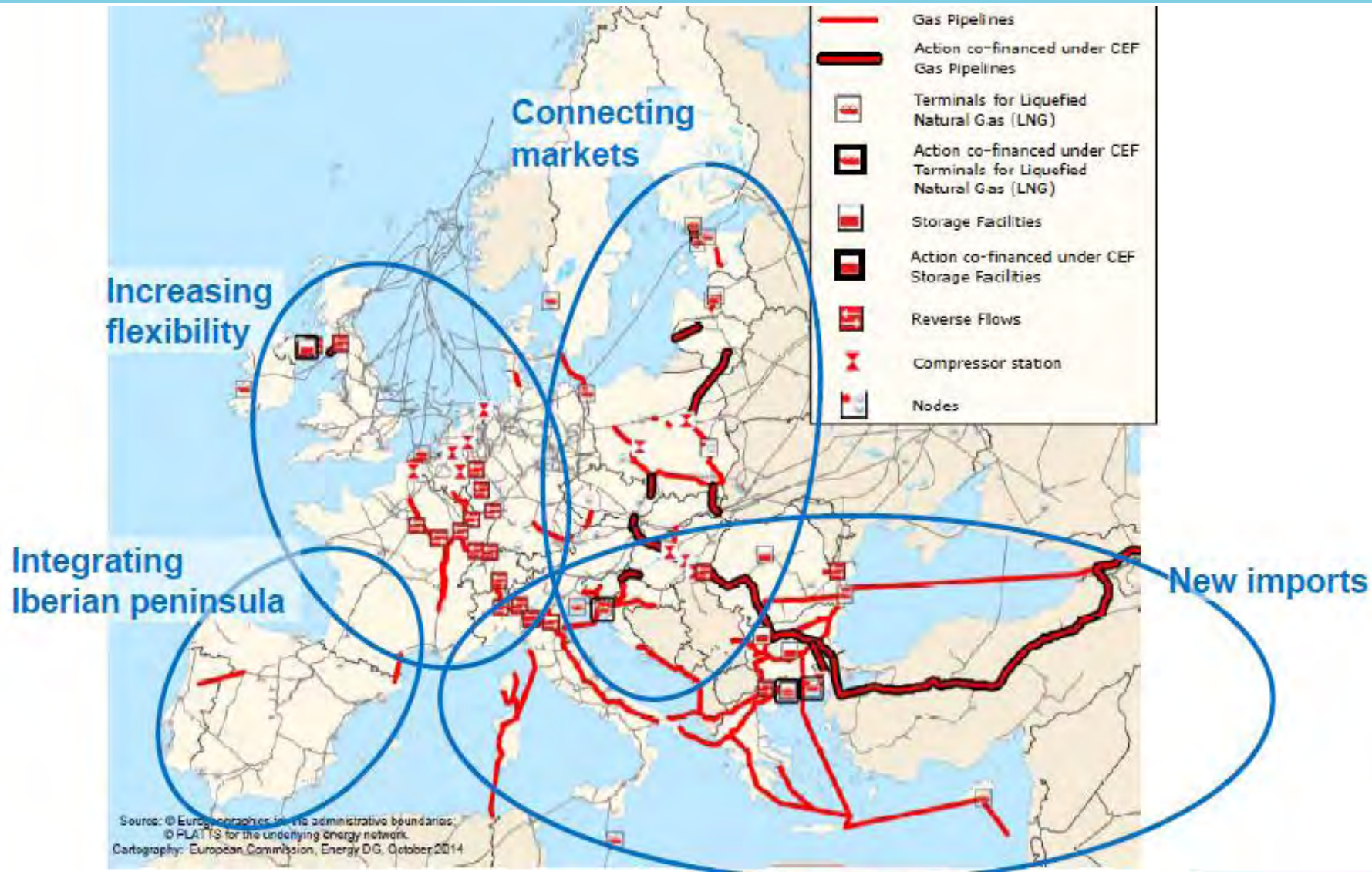


* Preliminary results

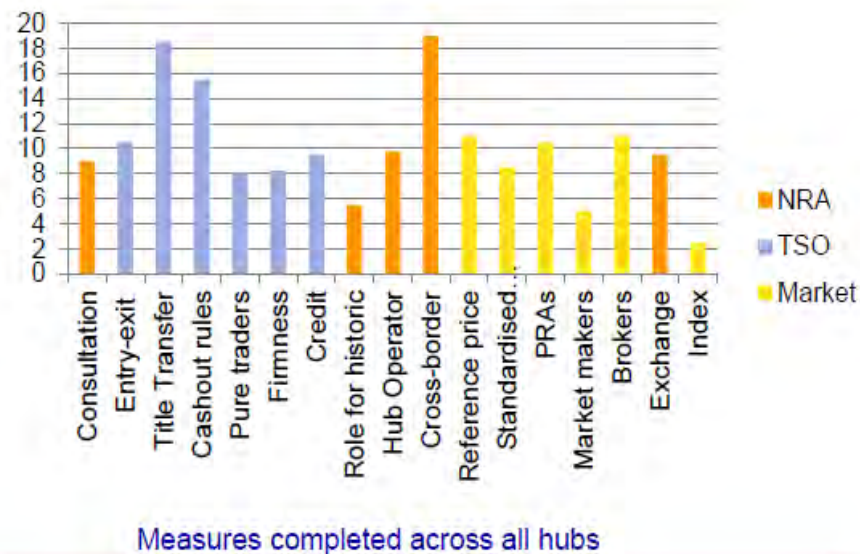
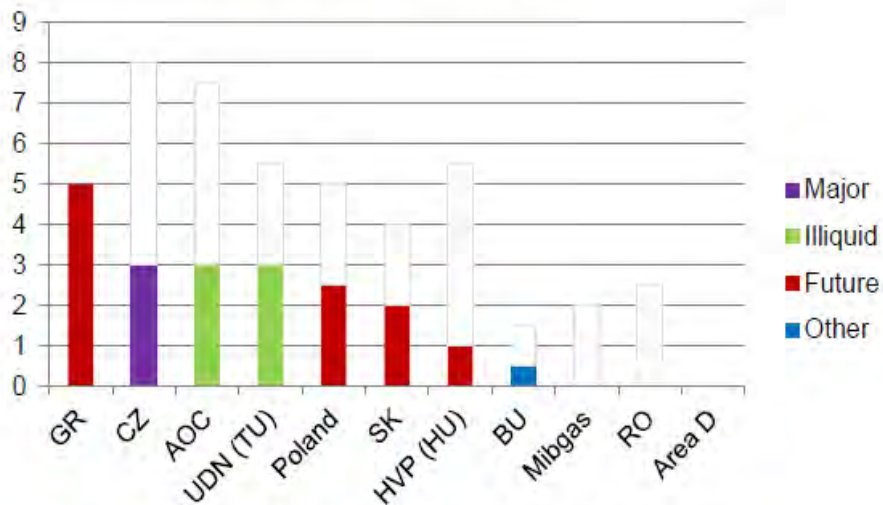
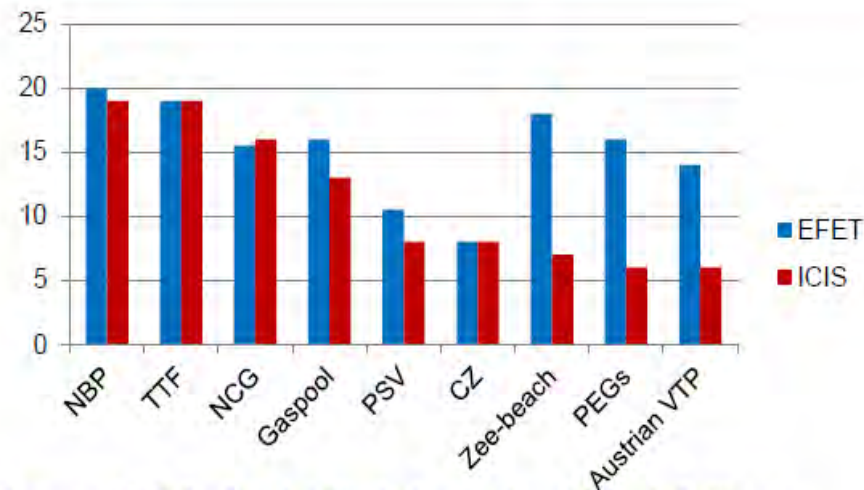
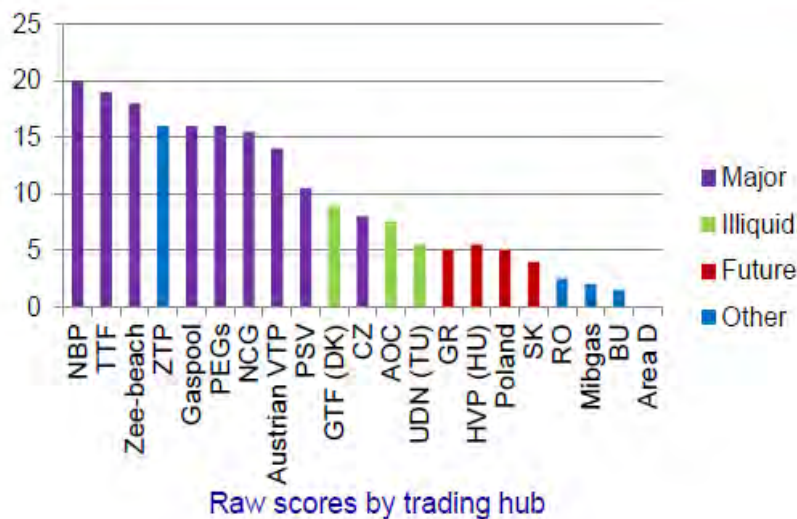
The quest for a traded gas hub in SE Europe

- ❑ Last years' developments towards the implementation of key infrastructure project have ignited the debate for the creation of physical and/or virtual gas hubs in the region
- ❑ Such projects include TANAP & TAP, IGB, IBR, Alexandroupolis FSRU, Kavala UGS, South Stream or Turkish Stream, East Med Pipeline etc.
- ❑ Piped gas and/or LNG from various sources (e.g. Russia, Caspian Sea, Middle Est, N. Africa, East Med, the Gulf and beyond including US LNG) would compete in order to reach SEE and CEE markets.
- ❑ Furthermore, interconnection and reverse-flow capabilities along with backhaul services already offered or about to be offered soon will facilitate market integration and competition in the region

SE Europe is set to become a new gas entrance to Europe and under certain conditions a traded gas hub



EFET Study for Gas Hub Development Scores (2014)



Factors and conditions needed for the creation of a successful liquid gas hub in SE Europe

Despite their nature (physical or a virtual ones), gas hubs can only be emerged in regions where and when:

- There are sufficient gas interconnections and storage facilities while gas supplies are coming from more than one source
- There is a culture of regional energy cooperation among countries and regulators on a regional not national issue
- Markets are really integrated and open to competition while prices are driven only by gas supply and demand
- Local governments and regulators have already adopted the necessary legislations and regulations in accordance with Third Energy Package and ACER guidelines (including in particular provisions for TSOs independence, attractive cross-border Interconnection Agreements, effective gas balancing rules, cost reflected entry/exit tariffs etc. etc.)
- An effective and functional gas trading electronic platform has already been in place

Greece in particular has certain geographic and not only advantages to host such a traded gas hub in the region



Conclusions

- ❑ **The creation of competitive/secured wholesale gas markets and traded gas hubs is a vital part of the EU energy policy**
- ❑ **Gas hubs/exchanges are important because they can create favorable conditions for the development of a marketplace for spot, forward and future market transactions**
- ❑ **SE Europe is set to become a new gas entrance to Europe and under certain conditions a traded gas hub within the next few years**
- ❑ **Greece (and Turkey) have certain advantages to become gas hubs, but regional cooperation and further systematic efforts are needed to create all the necessary conditions precedent**
- ❑ **Otherwise hub nationalism may delay or even prevent the creation of a traded gas hub in the region, which will be a negative sum for all countries and consumers involved**

Thank you for your attention

Questions?

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