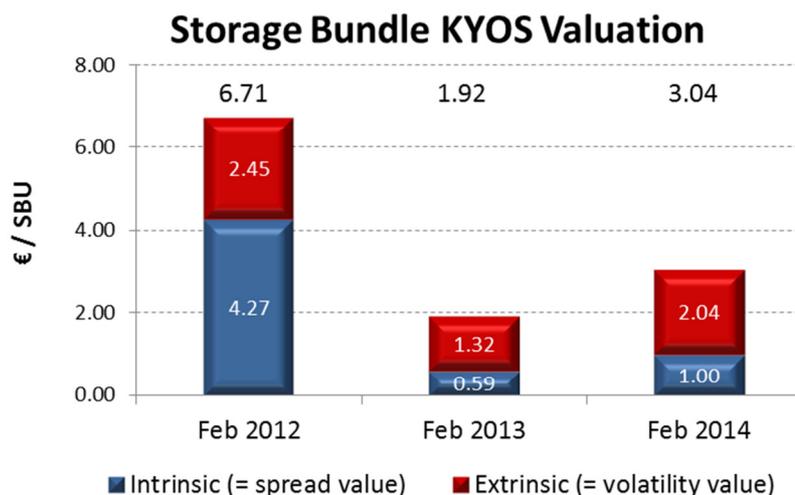


## KYOS independent analysis – February 2014

### GasTerra gas storage value bundle valued at 3.04 €/SBU

GasTerra offers virtual gas storage capacities on the TTF. The Feb'14 storage bundle (SBU) has recently been valued with the KyStore software. The estimated value is 3.04 € per SBU. This is about half a Euro more than the auction price, and a Euro more than the estimated price of last year. The specification of the Feb'14 SBU is presented below.



Contract Period: 1 Apr '14– 1 Apr '15  
 Delivery Point: TTF  
 Valuation date: 12 February '14

Available storage space: 1,440 kWh  
 Begin and end volume: 0 kWh  
 Injection capacity: 0.3333 kWh/h  
 Withdrawal capacity: 0.6-1.0 kWh/h  
 Injection cost: € 0.40 per MWh  
 Withdrawal cost: € 0.03 per MWh

[www.apxendex.com/services/storage/gas-storage-service](http://www.apxendex.com/services/storage/gas-storage-service)

Last year, KYOS estimated the value of the Feb'13 SBU at 1.92 €/SBU. The increase of 1.12 €/MWh is about equally caused by a higher winter-summer spread and higher market volatility. The spread between Q1-15 and Q3-14 equals 2.23 €/MWh (ICE-Endex closing of 12 February 2014), compared to 1.80 a year earlier. The spot volatility estimate of the previous year went up from 31% to 36%; although this is a small increase, in combination with the other inputs it leads to a 1/3 higher extrinsic value.

The yearly storage bundle for the period 2014/15 is the third in a series by GasTerra. KYOS has followed the price development, both the prices that were realized in the auctions (see table) and the value assessed by KYOS. Two years ago, the storage bundle price was much higher, both the price which participants paid, and the value assessed by KYOS. Last year, due to a significant decline in winter-summer spread and in spot volatility, the value fell sharply. The offered price in the auction was even below the minimum required by GasTerra and the auction failed. Now, the value increased, but is still low. In general, the KYOS assessment has been slightly higher than what the market is willing to pay. An explanation might be that market players factor in market uncertainty and a profit margin, which may justify a higher discount rate. The current valuations assume a 5% discount rate (earlier we used 0%). With a discount rate of about 7% the KYOS value would match the auction outcome.

Auction Date	Feb 2012	Feb 2013	Feb 2014
Storage product	Apr 12 - Apr 13	Apr 13 - Apr 14	Apr 14 - Apr 15
Weighted Auction Price	6.28	Failed	2.58

The calculations use 3 front months and 4 quarters to lock in the intrinsic value on the TTF market. A bid-ask spread of 0.20 €/MWh is assumed for all products, including spot. Forward prices are from ICE-Endex. The calculated full option value is based on a spot trading strategy including forward hedges, making it possible to secure most of the full storage value. The underlying methodology is Least-Squares Monte Carlo. See <http://www.kyos.com/software/analytical-energy-software/kystore-gas-storage-optimization>.

For more details or a trial account to make your own KyStore calculations, contact us at [info@kyos.com](mailto:info@kyos.com).