



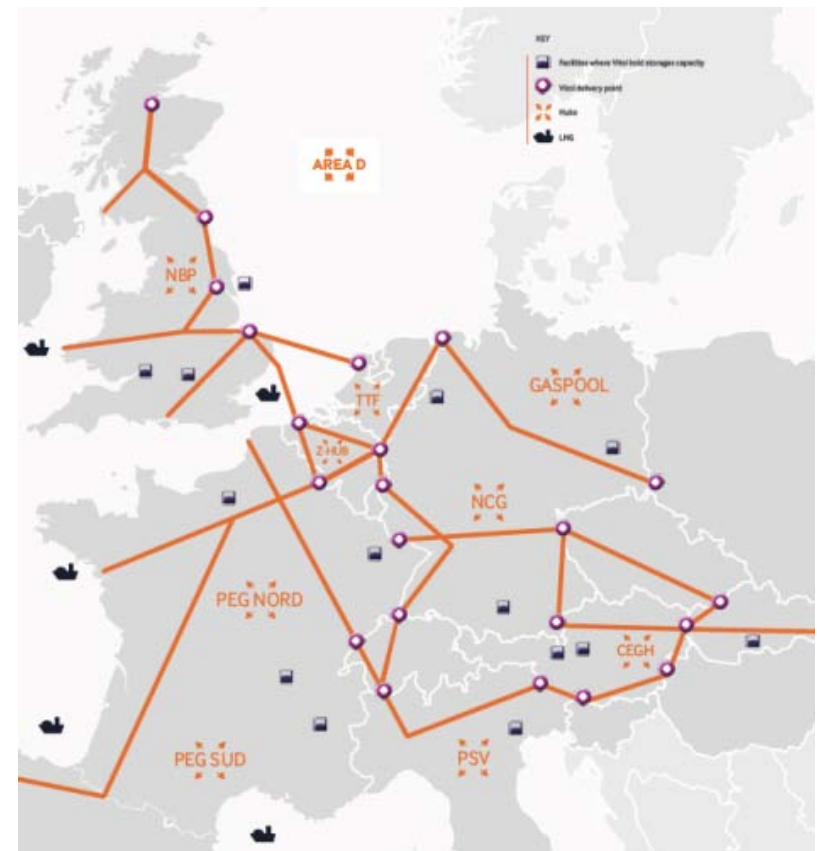
Optimization of Gas Storage

Olivia Barnes

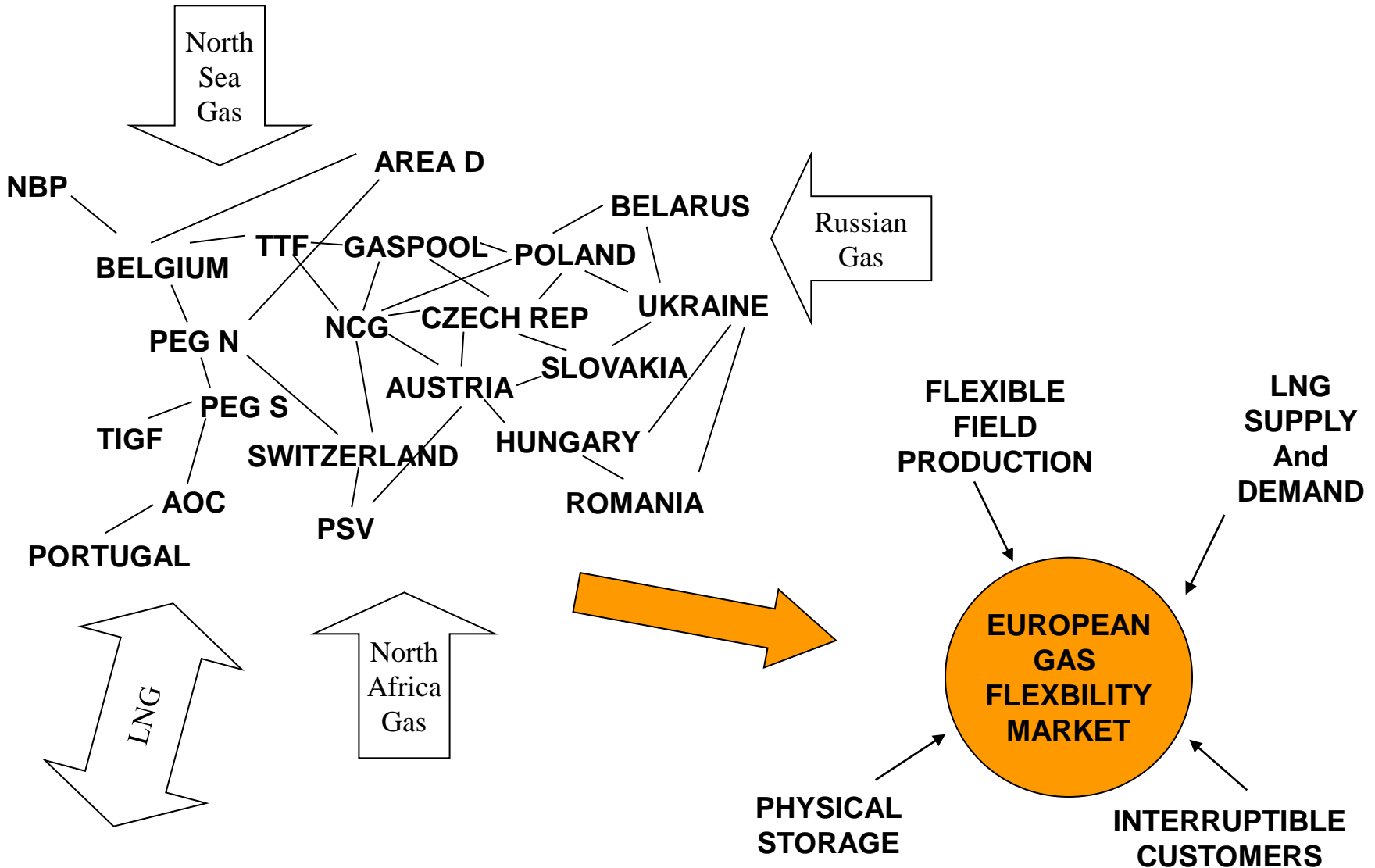


The Vitol Group exists to help meet the energy needs of a rapidly changing world. The world's largest independent energy trading company, we find, refine, trade, store and transport energy from where supply is abundant to where demand is great.

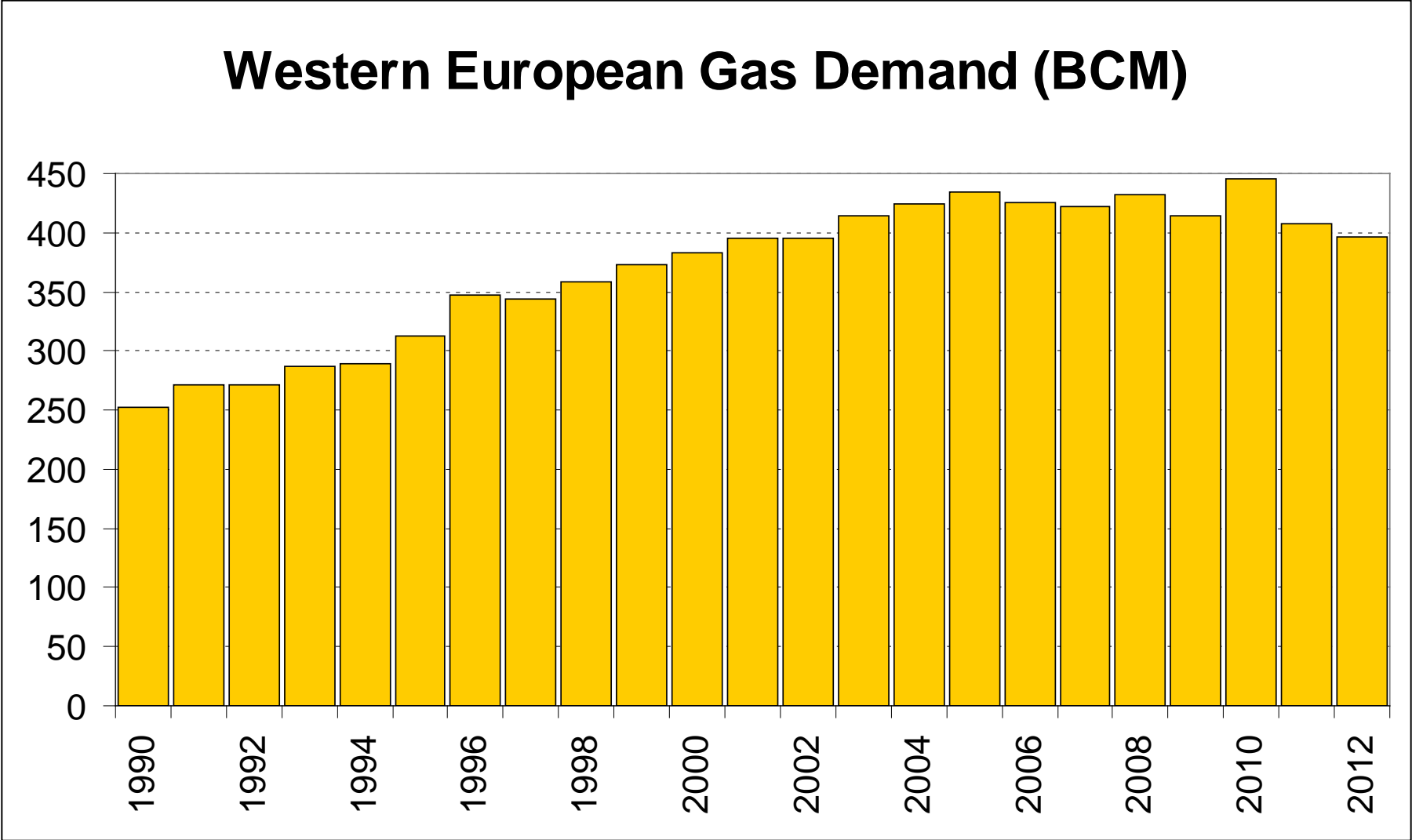
- Founded in 1966 in Rotterdam
- 46th consecutive year of profitable operations in 2011
- Revenues of \$297 billion in 2011
- 25 BCM of physical gas movements in Europe
- Physical gas Storage in 6 European countries with max withdrawal capacity of 35 MCM
- More than 2 million metric tonnes of LNG sales in 2011
- Over 6 million barrels of oil per day physically traded



The Pan-European Flexibility Market

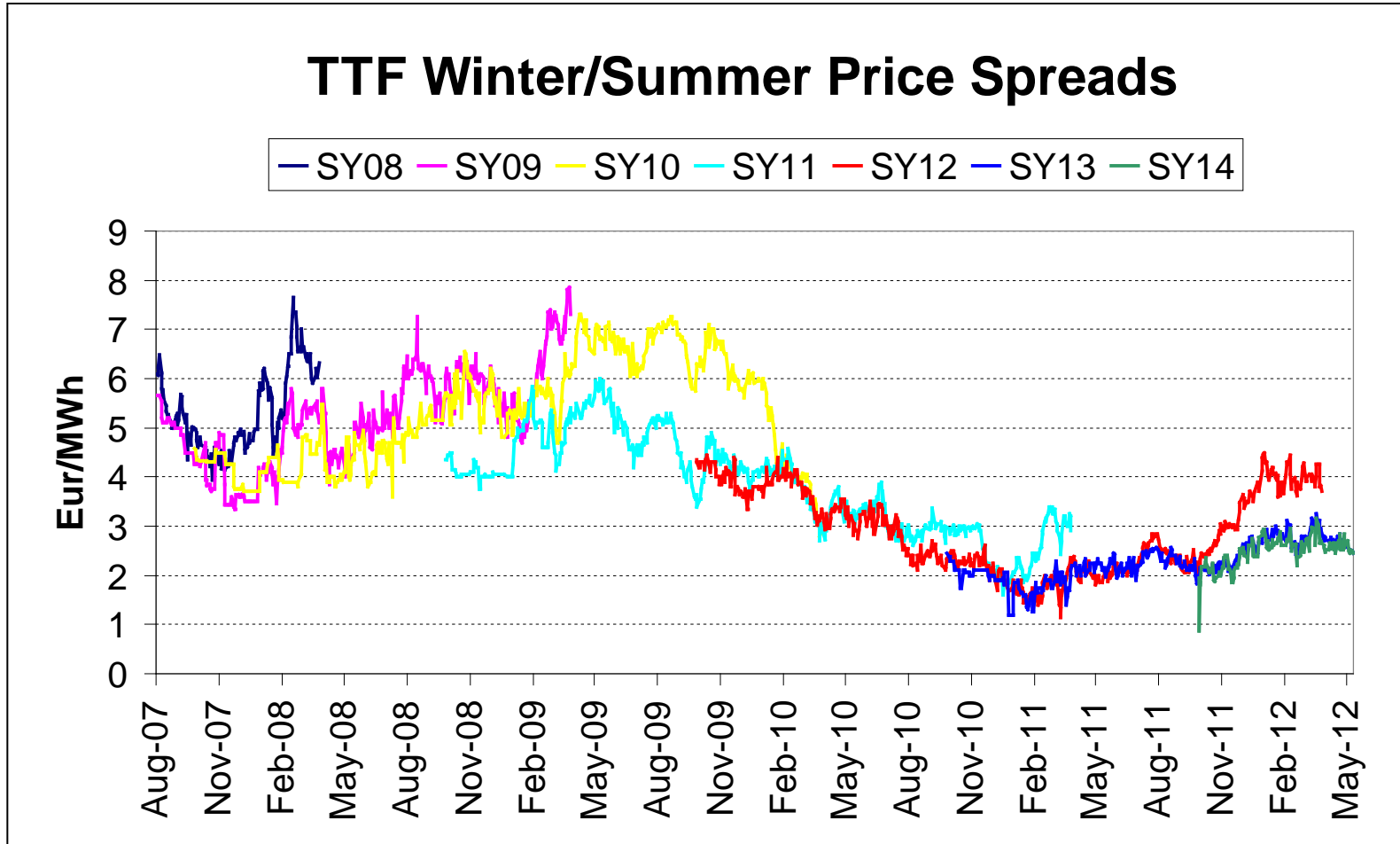


Western European Gas Demand (BCM)



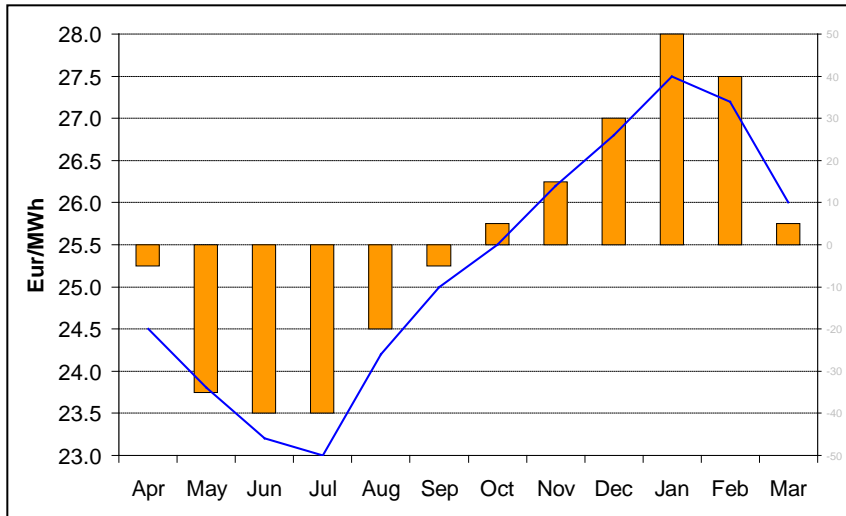
Why do Traders buy Storage?

- Traders react to price signals and arbitrage opportunities - real or anticipated

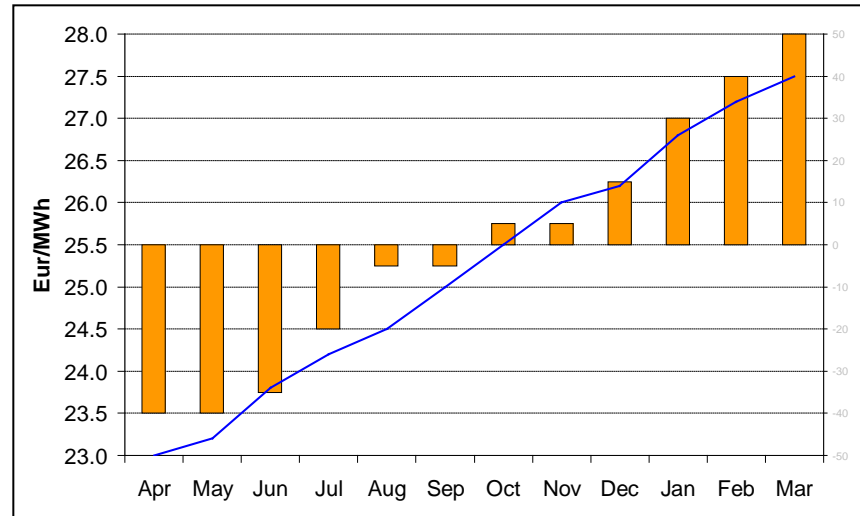


- INTRINSIC VALUE of STORAGE = Withdrawal price – Injection Price - Cost of Money

At the time of purchase



At a later date....



- By continuing to react to price signals → EXTRINSIC VALUE
- Re-planning and re-hedging
- Difficult to value due to unpredictability

- Security of physical supply to the portfolio
- Management of daily physical demand & supply variations
- Ability to buy and sell flexible products
- Evolution of products in tandem with the gas market
- Product Innovation & Customer service



**WHAT THE
CUSTOMER
WANTS**



**WHAT THE
ENGINEERS WANT
TO BUILD**



**WHAT THE
REGULATORS
CAN PERMIT**



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