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## Hydro in the European Gas Market

**Capital Markets Day**

December 12, 2003

# Presentation Outline

- Gas market overview
  - Supply and demand
  - Regulatory issues
  - Price formation
- Hydro's gas portfolio
  - Major achievements in 2003
  - Market positions and strategies
- Summary

# Presentation Outline

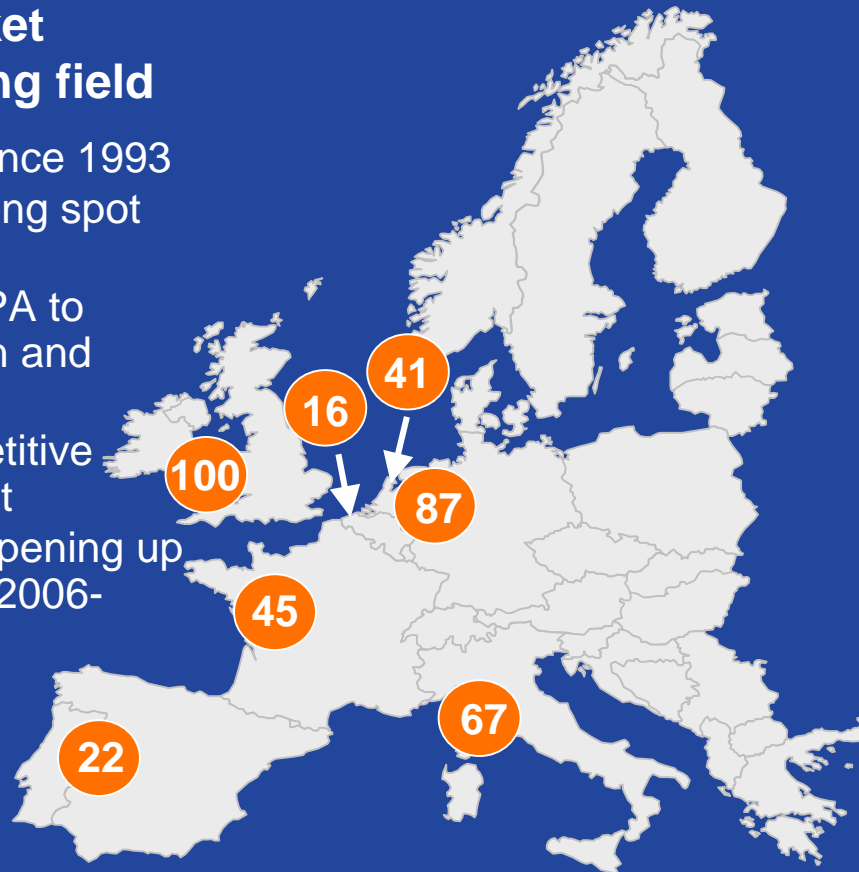
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# European Gas Market Characteristics

## UK gas market

### - Level playing field

- Liberalized since 1993
- Well functioning spot market
- Regulated TPA to transportation and storage
- Highly competitive supply market
- Supply gap opening up in the period 2006-2010



● Gas demand  
2002 (bcm)

## Continental gas market

### - Moving towards UK model

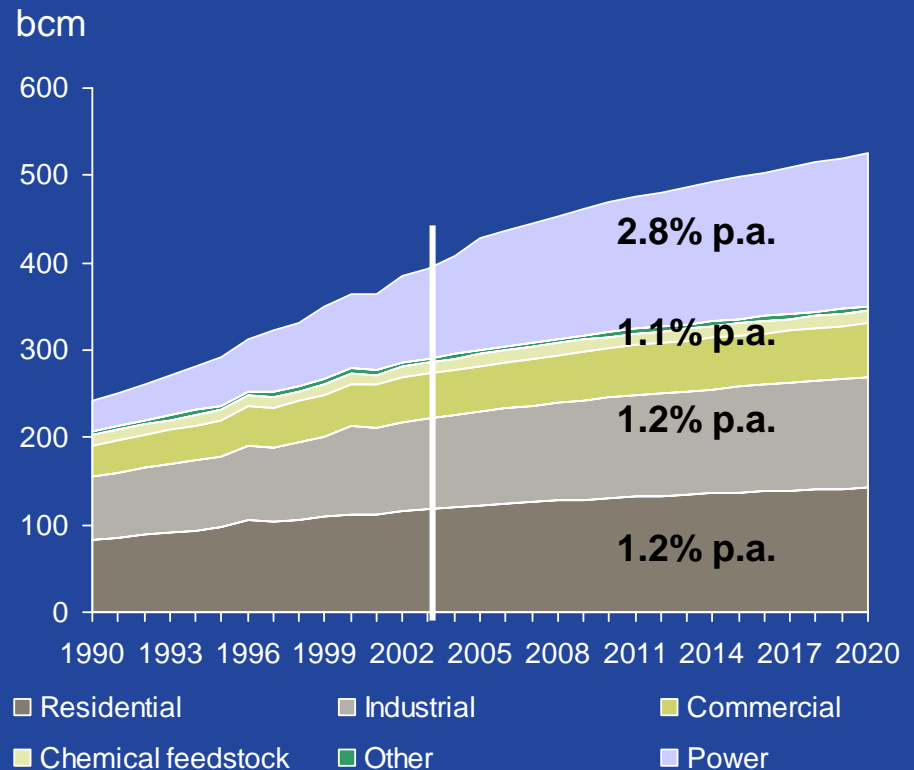
- Varying degree of liberalization
- Limited transportation TPA
- Zeebrugge and TTF liquid gas hubs, and Bunde/Emden emerging
- Dominated by incumbents
- Limited supply competition
- Oversupply

Source: BP Statistical Review of World Energy (July 2003)

Note: A conversion factor of 1.17 bcm per mtoe has been used

# EU "Big 7" Gas Demand Forecast

- Expected gas demand growth 1.8% annually 2002-2020
- Growth mainly driven by demand in gas for power
- Key uncertainties
  - Nuclear power
  - Kyoto protocol implementation and renewables
  - Price level relative to other energy sources (oil, coal, electricity, solar, fuel cells etc.)



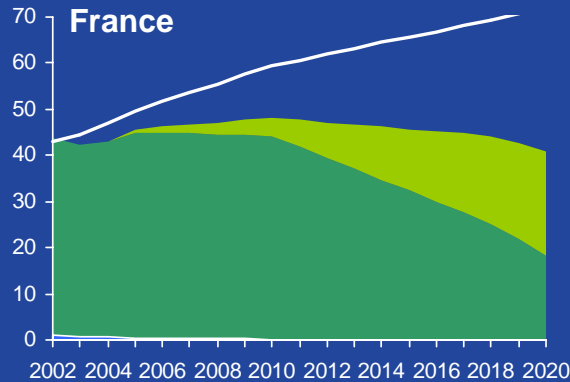
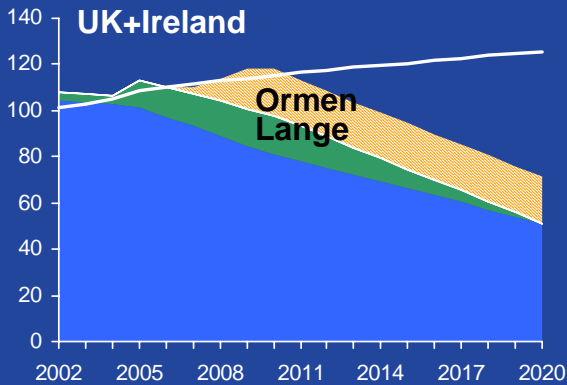
Source: *Global Insight Supply and Demand Report July 2003; Norsk Hydro*

Note: "Big 7" consists of the UK, Germany, the Netherlands, Belgium, France, Italy and Spain  
A conversion factor of 1.17 bcm per mtoe has been used

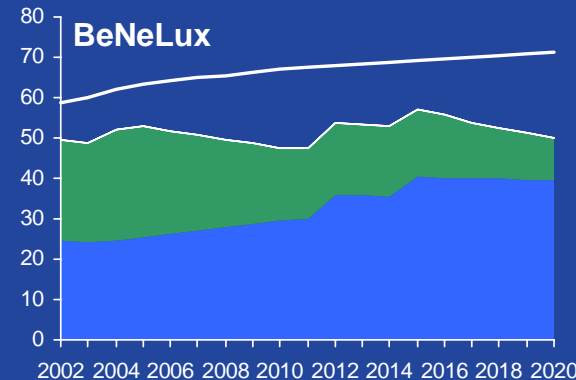
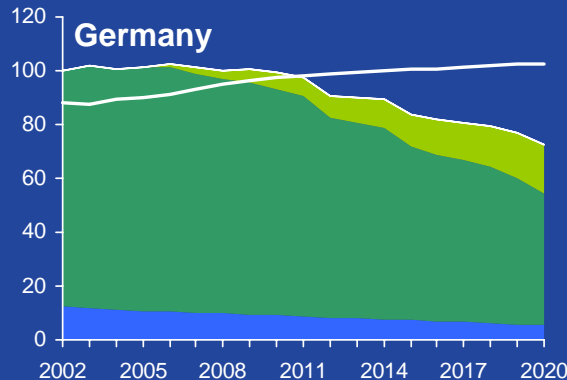
# Supply and Demand by Country

## Contracted Imports and Exports

bcm (100% ACQ)



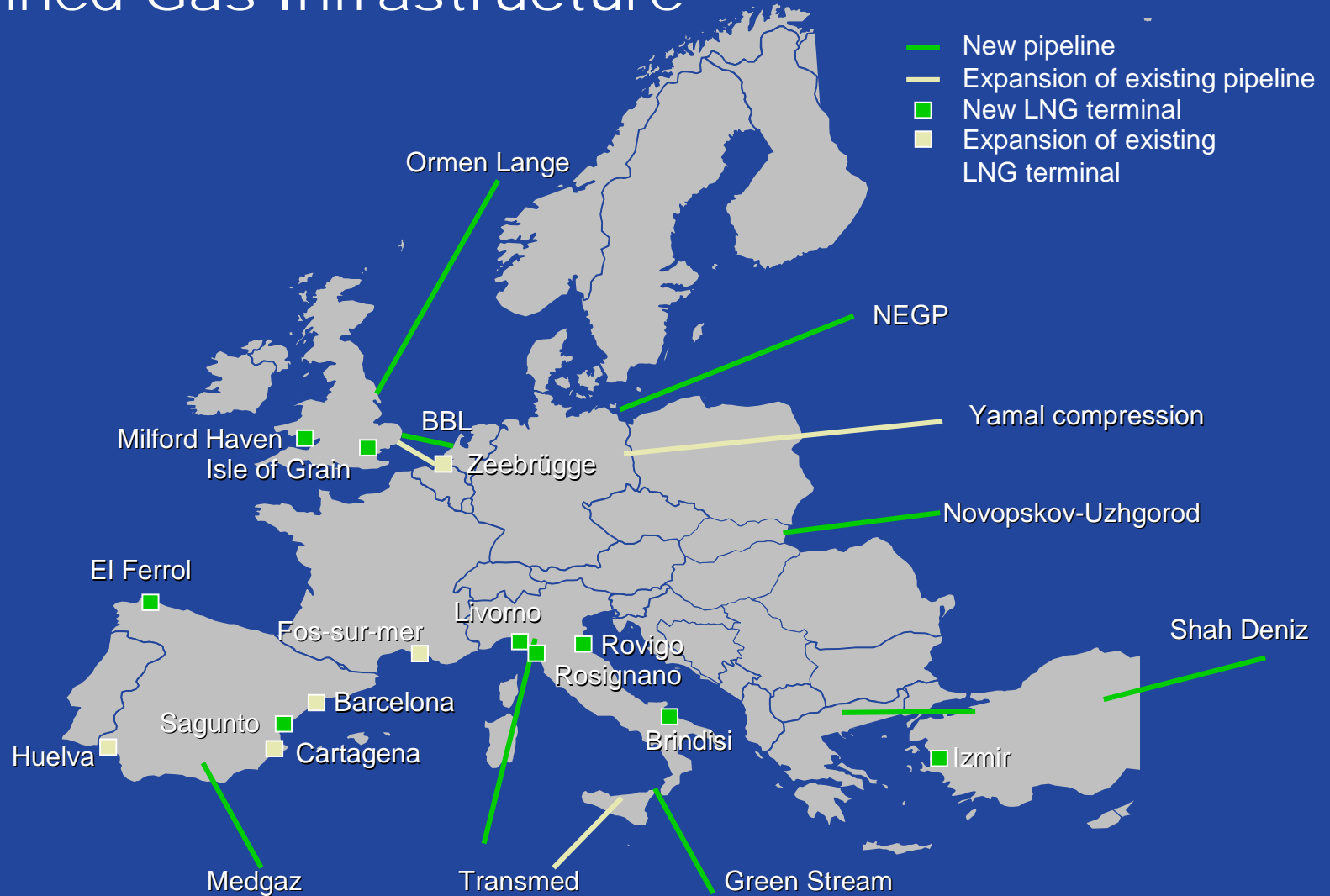
- Production
- Contracted imports
- Assumed prolongations



Source: Global Insight Supply and Demand Report July 2003

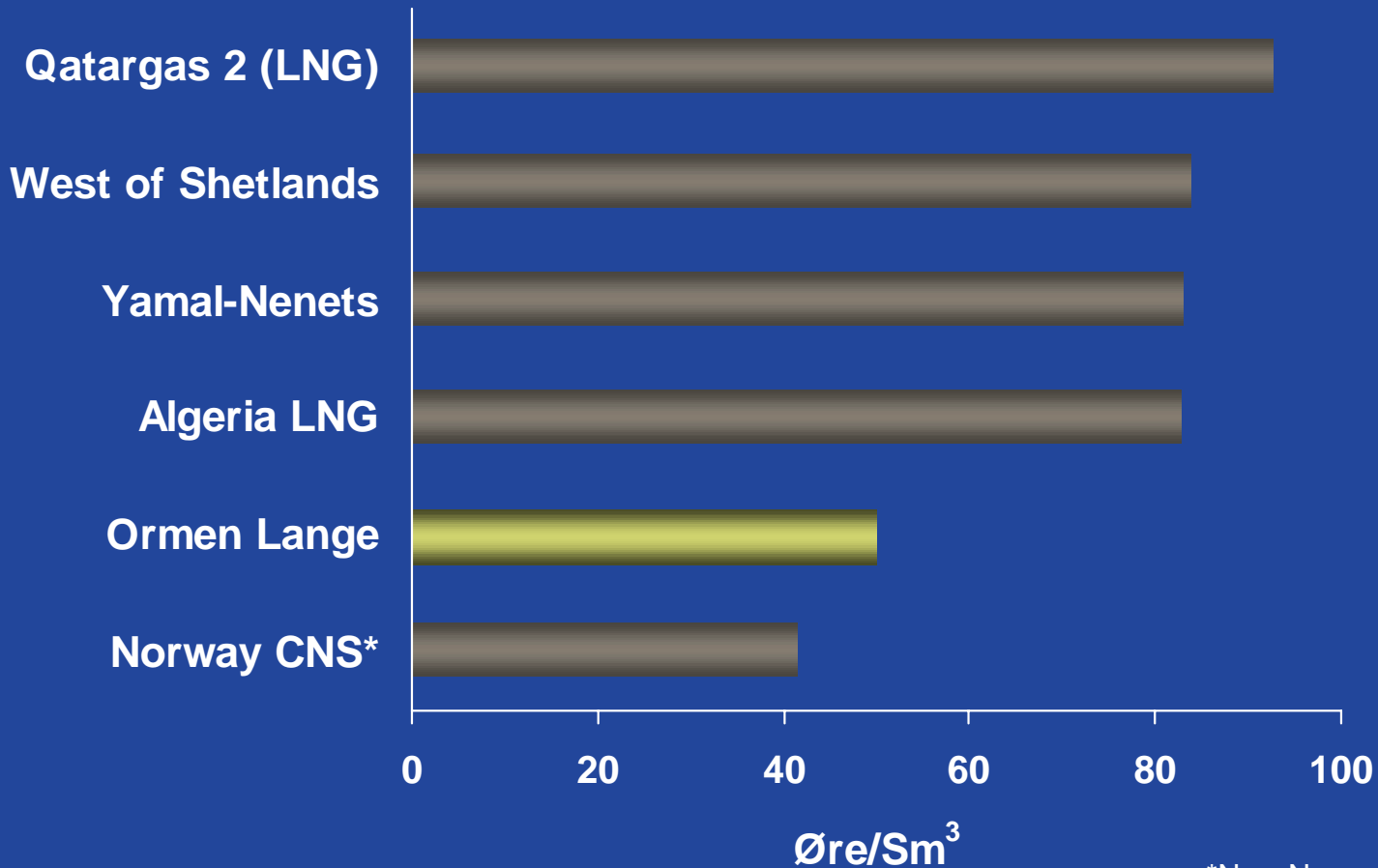
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# Planned Gas Infrastructure



# Norwegian Supplies to the UK are Competitive

Gas delivered to the UK National Balancing Point (NBP)



Source: Wood Mackenzie (November 2002) ; Hydro

\*New Norway Central North Sea

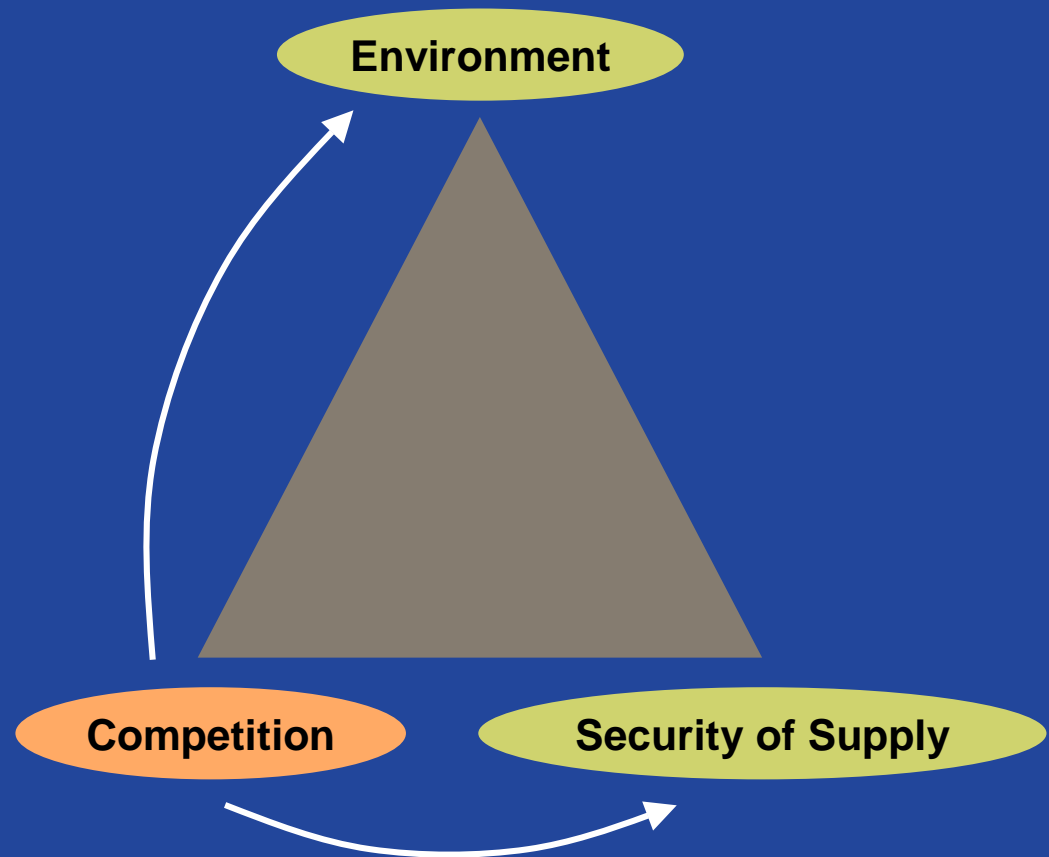
# Gas Market Liberalization Continues – Creates New Business Opportunities

- A revised Gas Directive was adopted on 26, June 2003
  - Market opening for business customers by July 2004, and full market opening by July 2007
  - Legal separation of transmission/distribution and marketing by July 2004 and January 2007 respectively
  - Regulated TPA and independent regulator
- The member countries have one year to implement the new directive into their own legislation

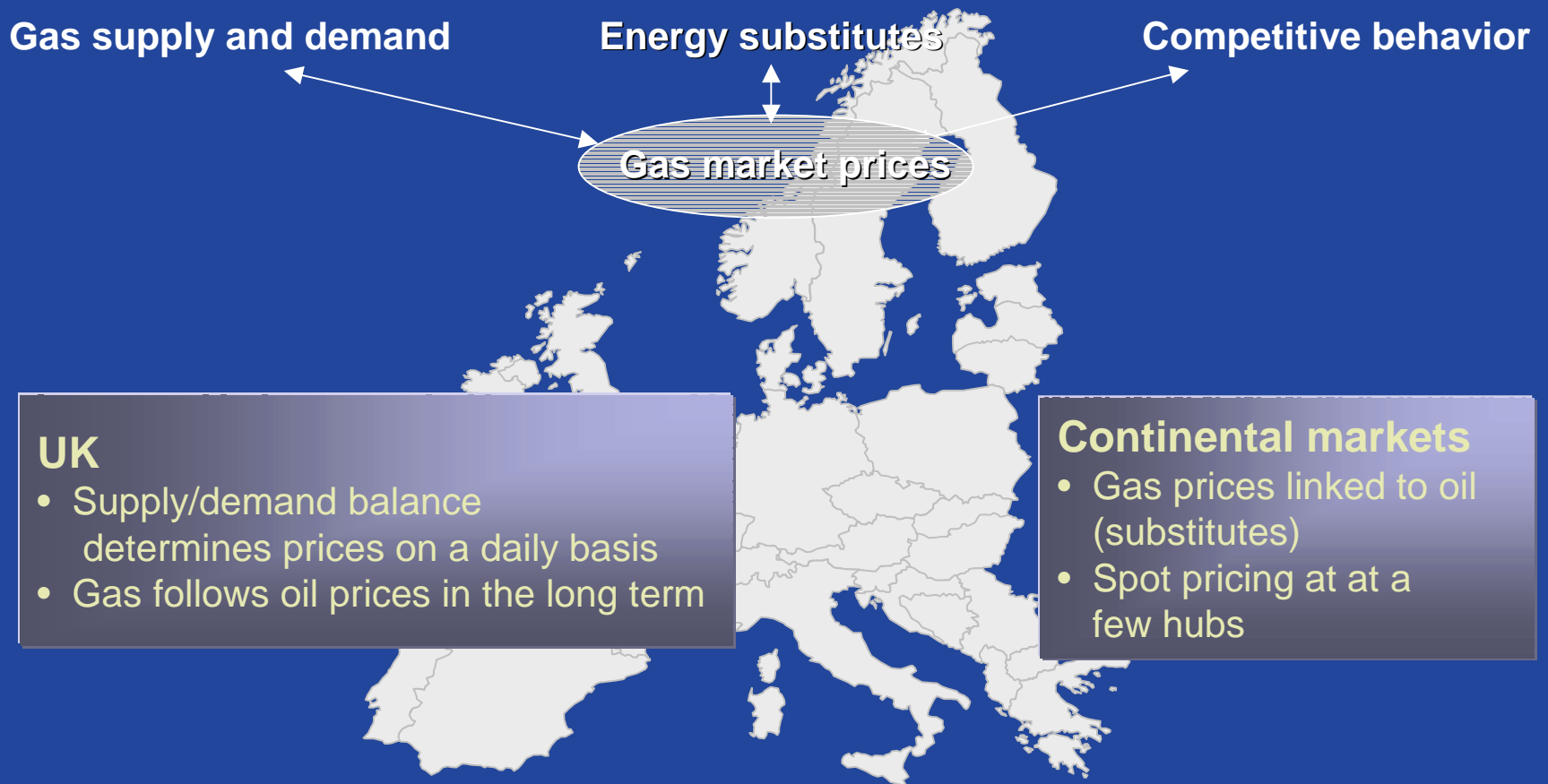
# European Authorities Concerned – Security of Supply Matters

## Need for new capacity:

- Increasing gas demand
- Decreasing supply from “near” gas sources
- Gap to be closed mainly by one source (Russia)
- Gas supplies to fulfill environmental concerns

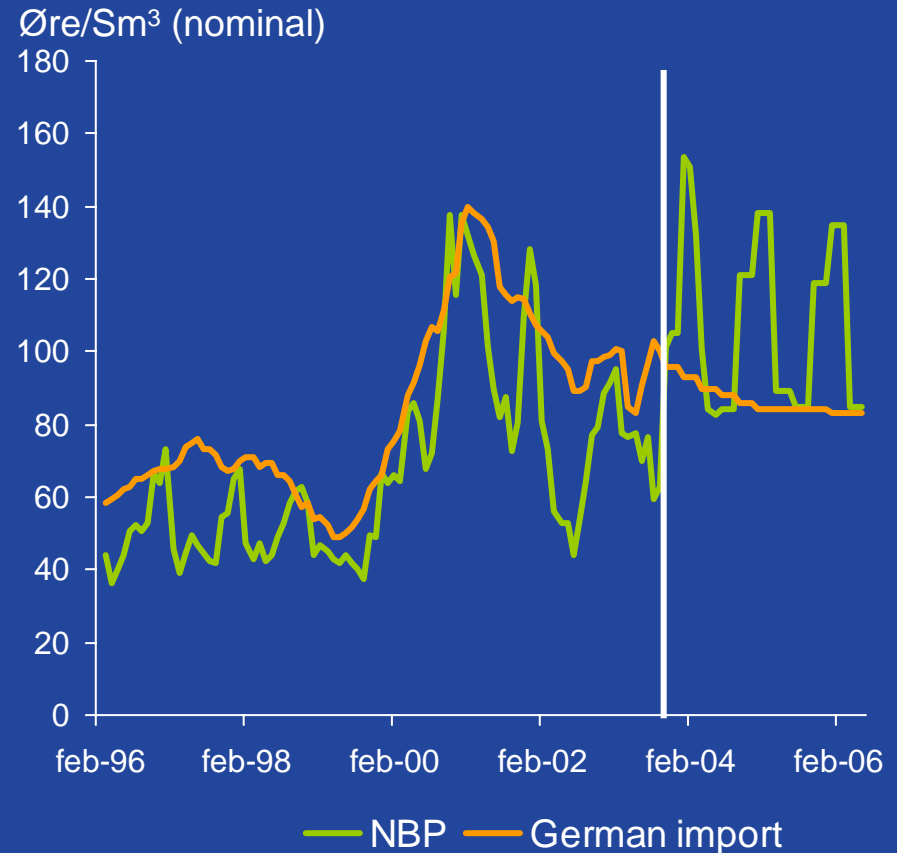


# Price Formation in the European Gas Market



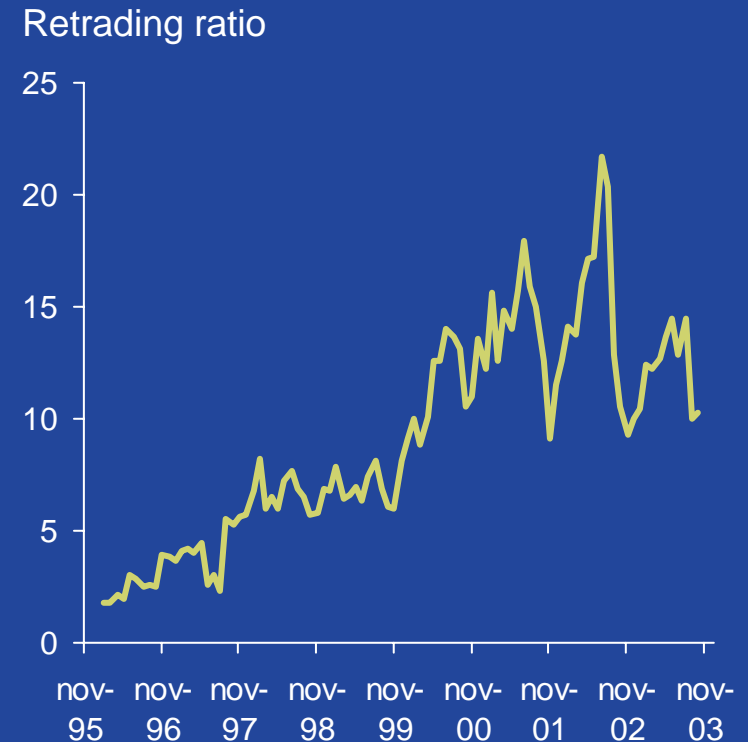
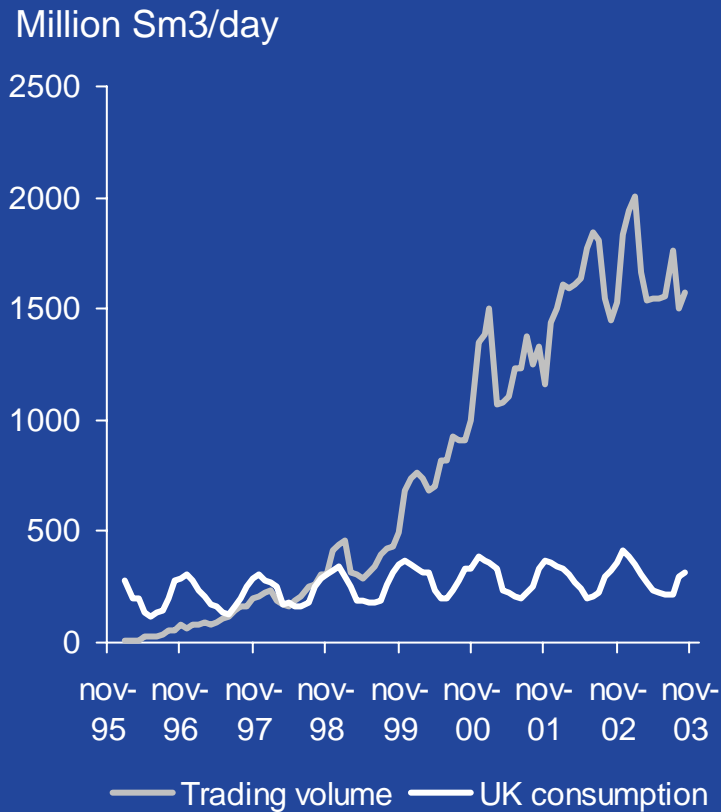
# Two Distinct Markets – but One Price...

- The liquid NBP spot price has become the benchmark value of gas in the UK
- NBP spot price influenced by Continental oil indexed prices
- High volatility of spot prices



Note: The National Balancing Point (NBP) is the spot price reference in the UK

# Development of NBP Liquidity

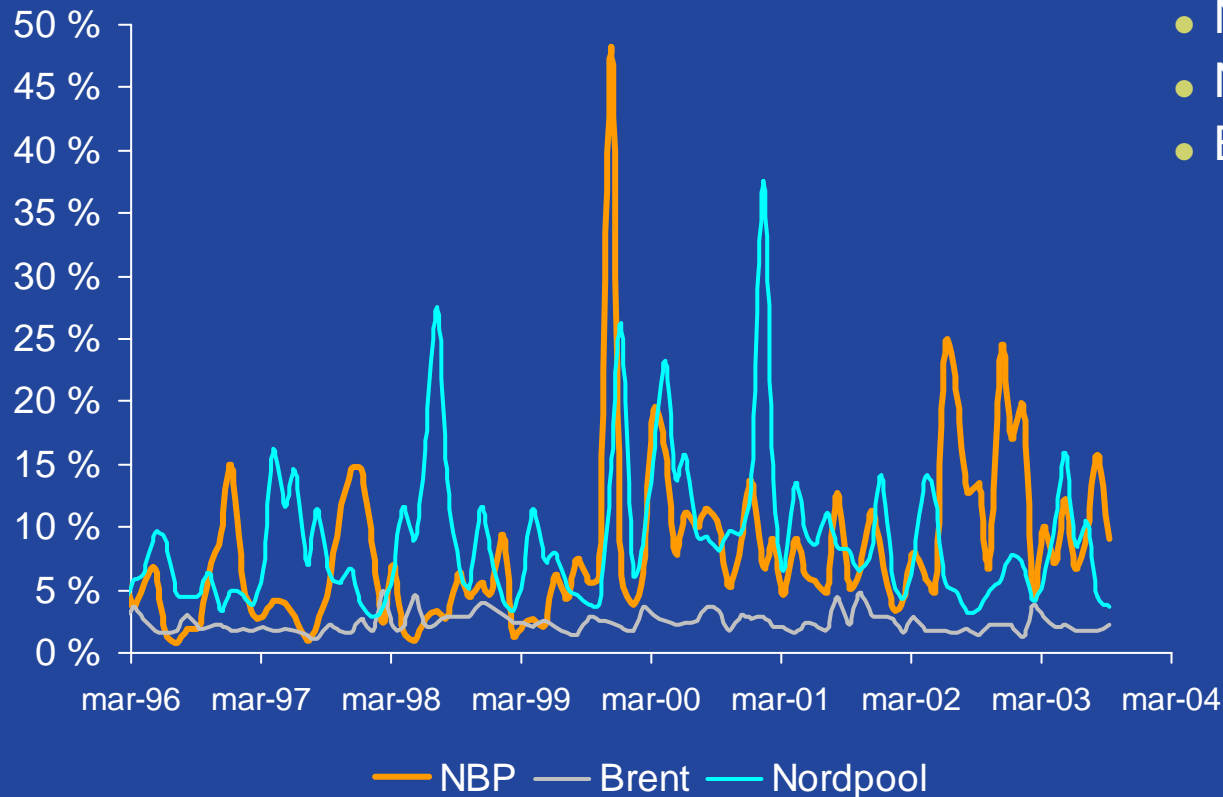


Note: Accumulated volumes traded for each month (as opposed to *during* each month) ; retrading is equal to the number of times the gas has been traded before physical delivery

Source: Heren European Spot Gas Markets (ESGM)

# Hydro has Long Experience in Volatile Markets

Monthly average of daily volatility



Average daily volatility

● Nordpool:	10.4%
● NBP:	10.3%
● Brent:	2.7%

Note: Volatility calculated as the standard deviation of  $\ln(p_n/p_{n-1})$  for each month

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# Major Achievements in 2003

- Expanded customer portfolio
- Increased value under existing long-term contracts
- Value creation through swap deals
- Gas purchases on the NCS
- Long-term purchase of gas from Maersk
- UK trading and marketing JV with Wingas
- Duke acquisition

# HydroWingas – New UK Marketing Joint Venture

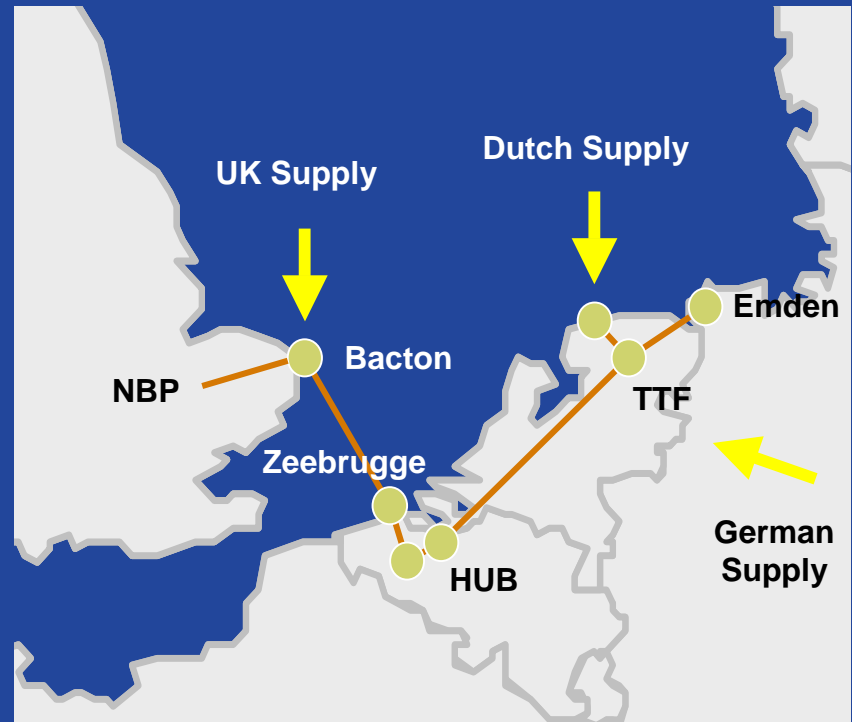
- Jointly owned company to market and sell gas in the UK
  - Primarily to wholesalers, large end-users and power plants
- Combines Wingas' and Hydro's gas and marketing skills
- Builds market presence and expands arbitrage possibilities
- Scale and diversity of sourcing improves competitive strength



# Purchase of Duke's European Gas Activities

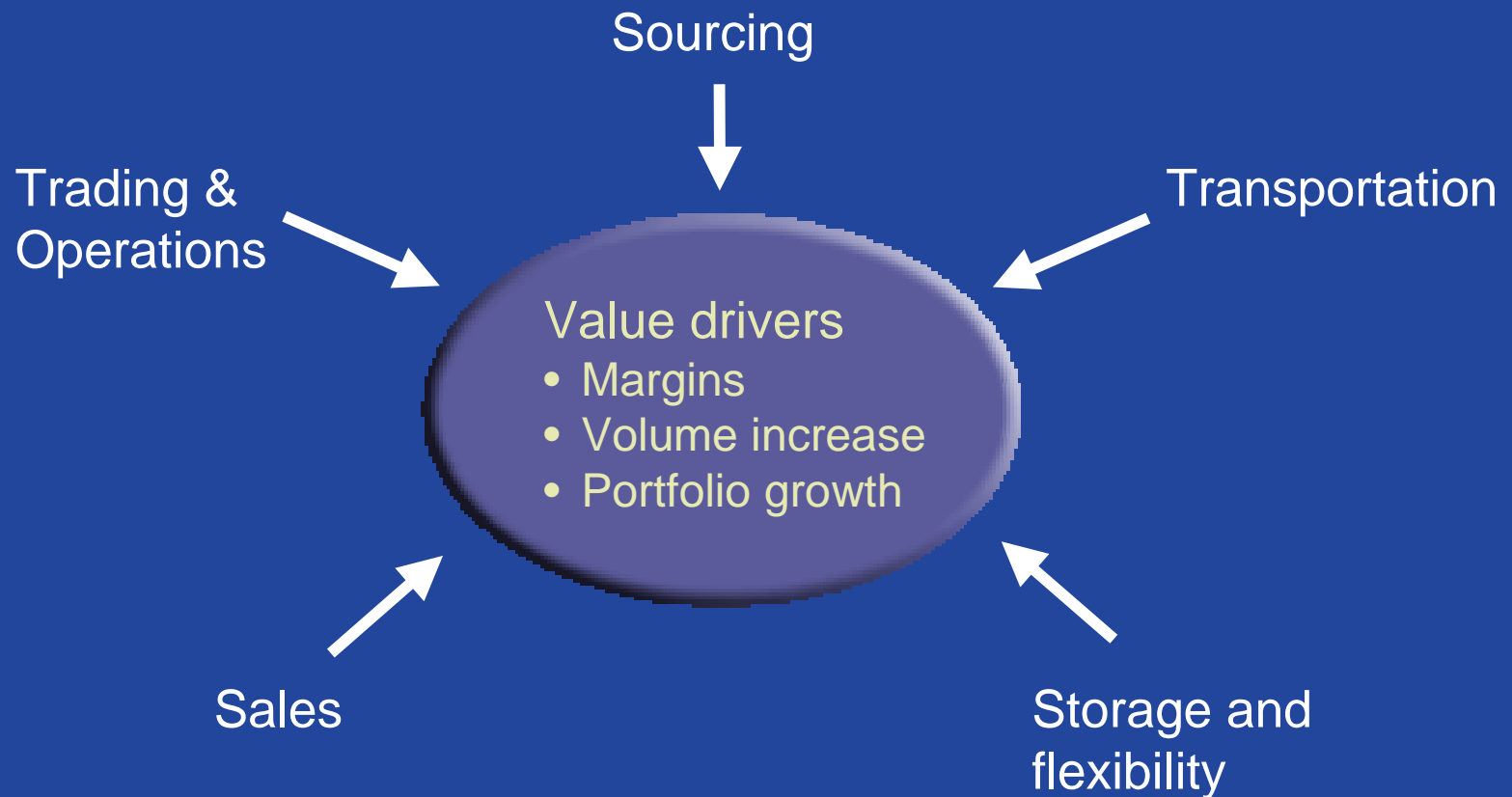
## Key assets:

- Supply contracts
- Transportation capacities
- Swap and storage contracts
- End-user contract portfolio

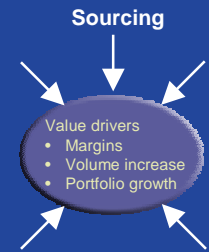


Note: Hub, TTF and the NBP are the marketplaces at Zeebrugge, in the Netherlands and in the UK, respectively

# Value Creation Through Active Portfolio Management



# Strong and Flexible Gas Position in Northwest Europe

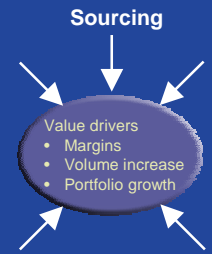


## 2004 (E)

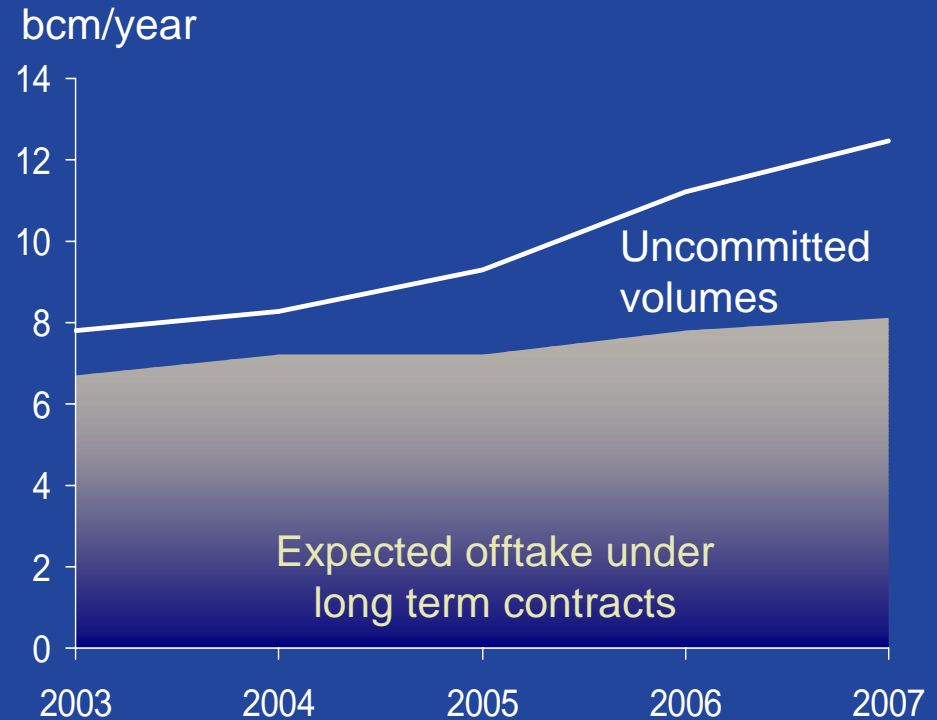
- Equity production: 8 bcm
- Third party purchases: 4-5 bcm



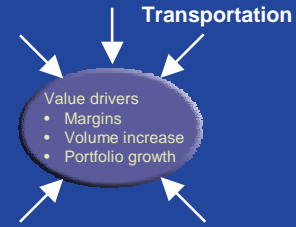
# Gas Production Increasing Steeply



- From 7.5 bcm in 2003(E) to 11-12 bcm in 2007(E)
- Continue to develop a strong and mixed customer portfolio
  - Long-term contracts
  - End-user sales
  - Short-term sales



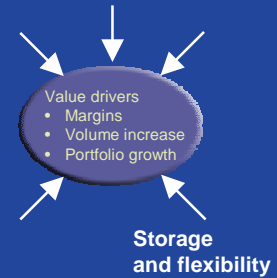
# Strong and Flexible Transportation Portfolio in Northwest Europe



- Access to a flexible upstream transportation system
- Interconnector capacity
- Transportation agreements tailored to sales portfolio
- Entry capacities into the Dutch and UK markets



# Adding Value Through Storage and Flexibility



- Production flexibility
- Swing in gas sourcing contracts
- Storage and balancing contracts
- Trading
- Hydro pursues storage projects to support growing business and market opportunities



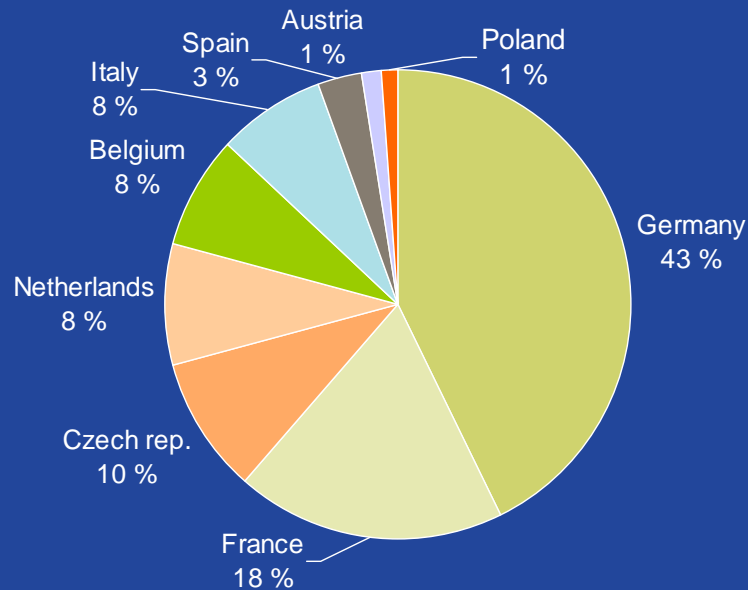
\* Subject to approval by EU competition authorities



# Hydro's Customer Portfolio 2004

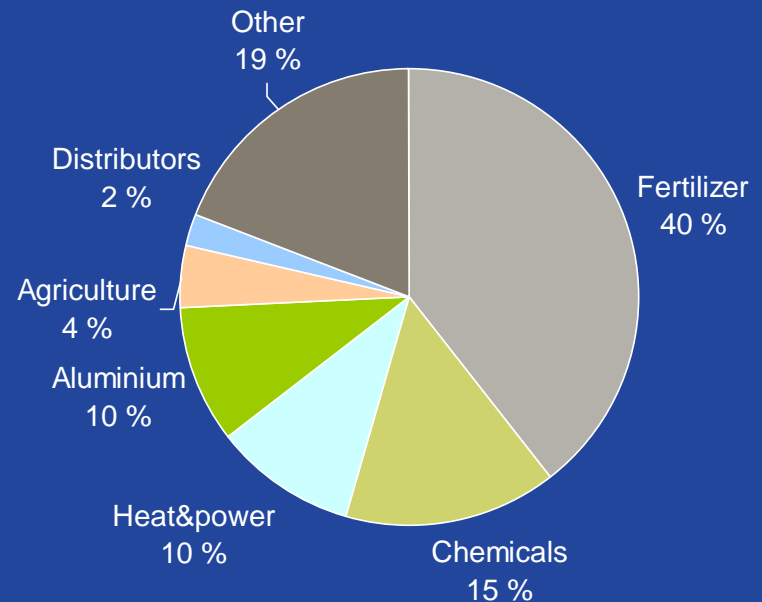


## Long-term sales



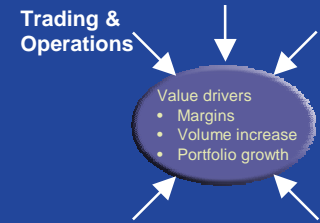
Expected sales in 2004: app. 7 bcm  
16 customers in 9 countries

## Short-term sales



Expected sales in 2004: 5-6 bcm

# Well Developed Trading and Operations Capabilities



- State-of-the-art trading infrastructure including systems
- Ability to successfully balance supply and demand requirements
- Risk governance system



# Summary

- Hydro is well positioned and expands its activities in the European gas market
  - Strong physical and contractual positions
  - Extending market presence
    - UK marketing
    - Duke acquisition
    - Growing customer portfolio
  - Building on existing customer relations
  - Expanding trading presence

# Forward-Looking Statements/ Use of Non-GAAP Financial Measures

In order to utilize the "safe harbour" provisions of the United States Private Securities Litigation Reform Act of 1995, Hydro is providing the following cautionary statement: This presentation contains certain forward-looking statements with respect to the financial condition, results of operations and business of the Company and certain of the plans and objectives of the Company with respect to these items. By their nature, forward-looking statements involve risk and uncertainty because they relate to events and depend on circumstances that will occur in the future. The actual results and developments may differ materially from those expressed or implied in the forward-looking statements due to any number of different factors. These factors include, but are not limited to, changes in costs and prices, changes in economic conditions, and changes in demand for the Company's products. Additional information, including information on factors which may affect Hydro's business, is contained in the Company's 2002 Annual Report on Form 20-F filed with the U.S. Securities and Exchange Commission.

With respect to each non-GAAP financial measure Hydro uses in connection with its financial reporting and other public communications, Hydro provides a presentation of what Hydro believes to be the most directly comparable GAAP financial measure and a reconciliation between the non-GAAP and GAAP measures. This information can be found in Hydro's earnings press releases, quarterly reports and other written communications, all of which have been posted to Hydro's website ([www.hydro.com](http://www.hydro.com)).