

# 17<sup>th</sup> INTERNATIONAL CONFERENCE & EXHIBITION ON LIQUEFIED NATURAL GAS (LNG 17)



## Introduction of South Hook Combined Heat & Power (CHP) Opportunity

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April 2013

International Organizers



Host Association



# Presentation Outline

- What is CHP?
- South Hook History
- South Hook CHP Concept
- Conclusions

# CHP = Combined Heat & Power

- Same as “cogeneration”
- Uses energy that would otherwise be wasted from thermal power production
- CHP contributes 11% of electric power in Europe, 8% in the United States



ExxonMobil LaBarge CHP  
Wyoming, USA (100 MW)

# CHP Offers Many Advantages



**ExxonMobil Beaumont CHP  
Texas, USA (~500 MW)**

- Energy efficiency
- Emissions reduction
- Operating cost savings
- Reliability improvement

# .....CHP also has challenges



**ExxonMobil Antwerp CHP  
Belgium (125 MW)**

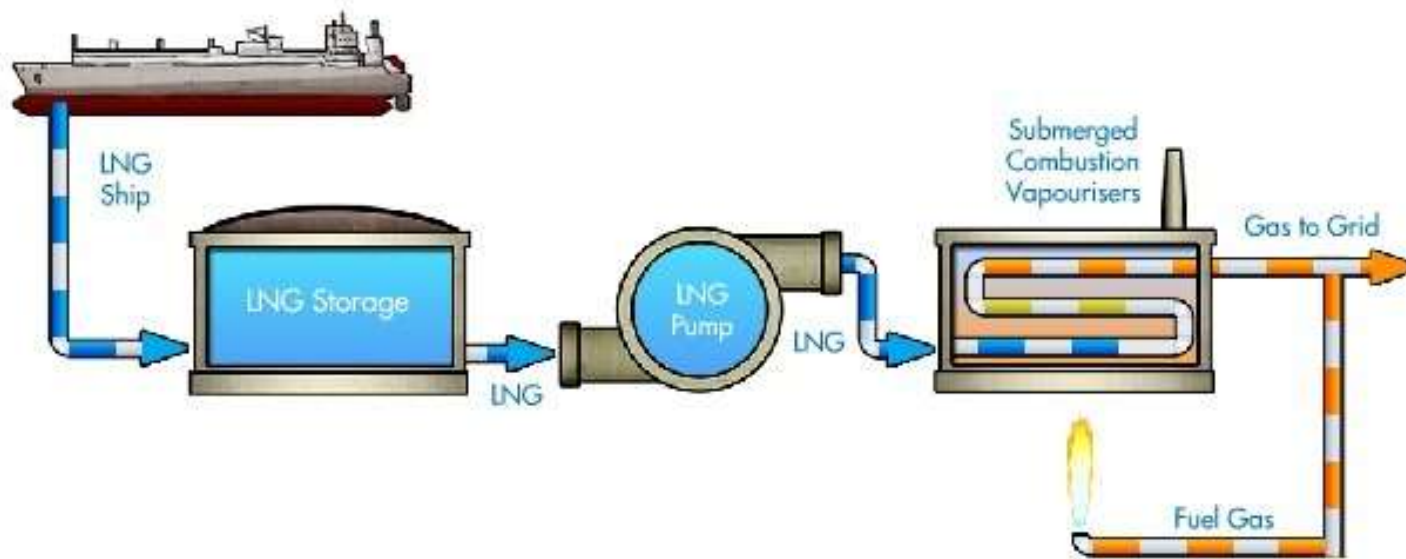
- Brownfield construction
- Location dependent on site heat demand
- High capex vs stand-alone gas power plant
- Requires stable regulatory framework

# South Hook LNG Terminal History

- Located on Milford Haven in Wales
- South Hook Terminal fully commissioned in 2010
- Joint venture with Qatar Petroleum International, ExxonMobil, Total



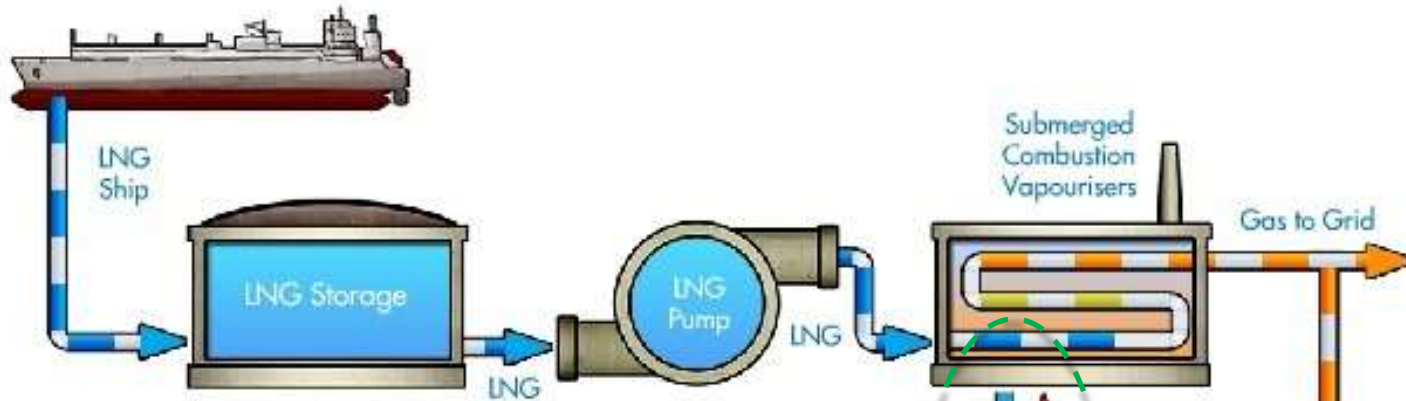
# Current Terminal Operation



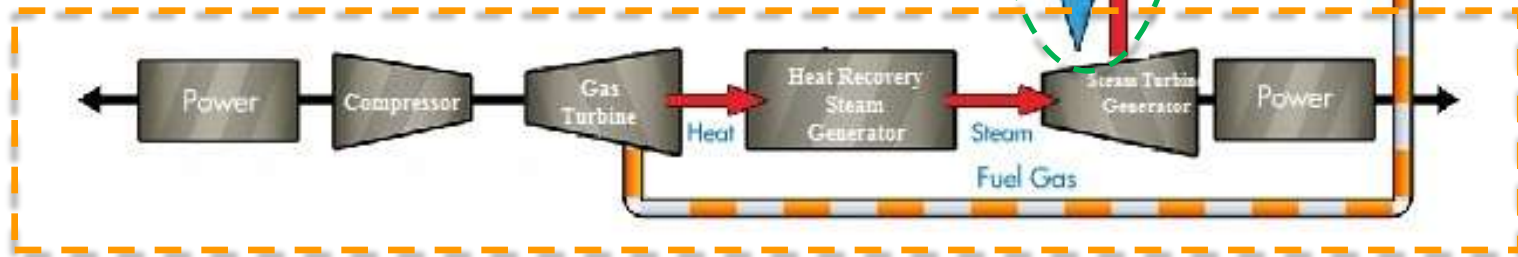
- South Hook is a conventional LNG receiving and regassification terminal
- Warm water, heated by fuel gas, is the medium for heat transfer in the vaporisers



# South Hook CHP Concept



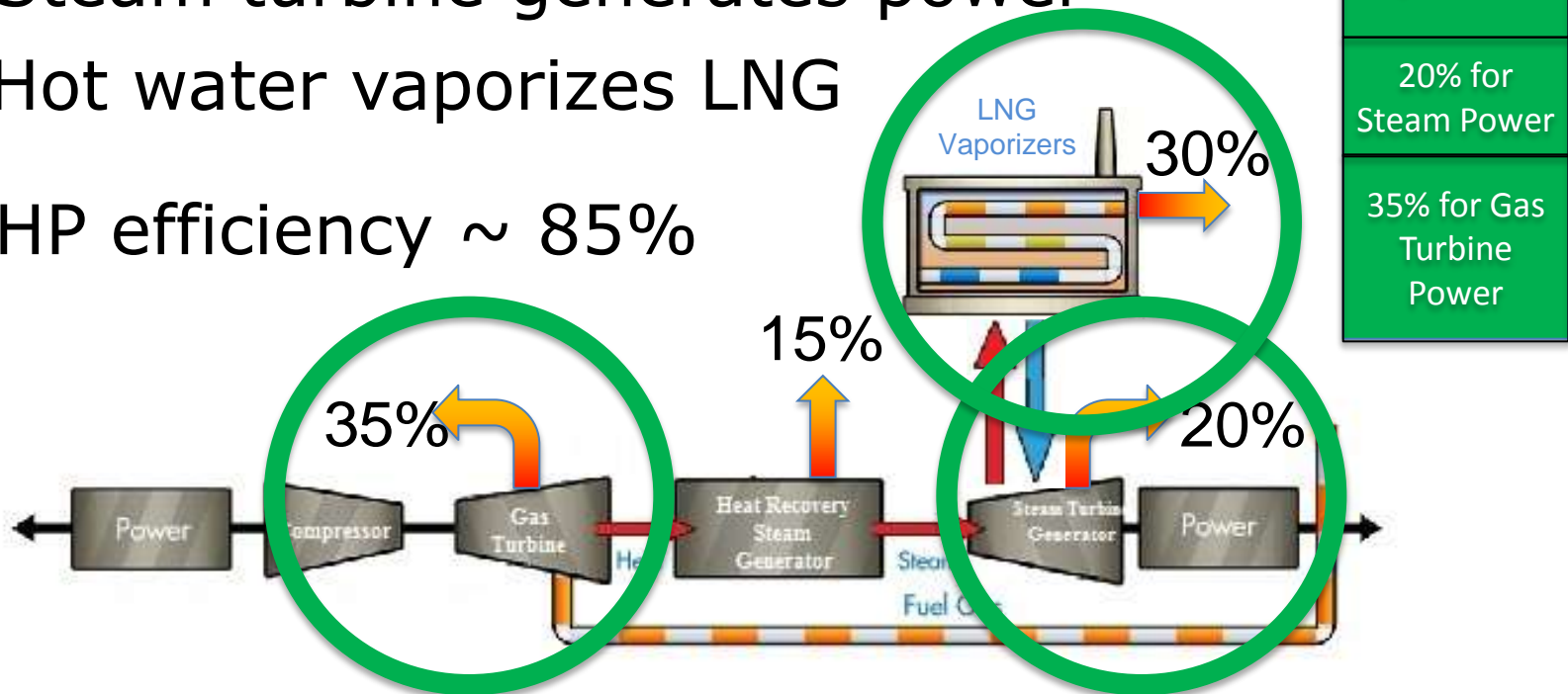
- Residual heat from a gas-fired combined cycle plant could be used for LNG vaporisation





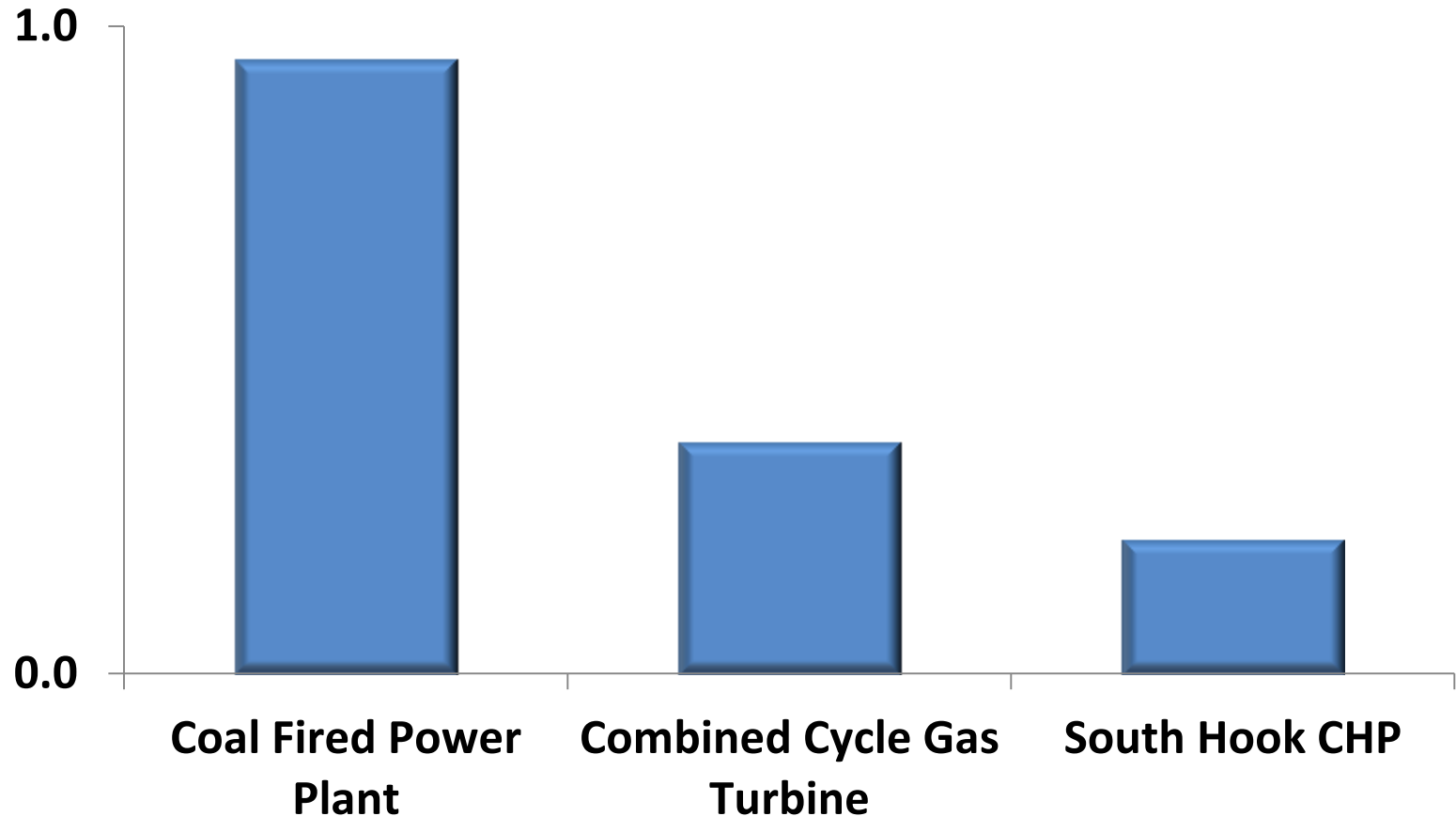
# SHCHP - High Efficiency

- Heat from combustion used 3 times
  - Gas turbine generates power
  - Steam turbine generates power
  - Hot water vaporizes LNG
- CHP efficiency  $\sim 85\%$



# SHCHP – Low Emissions

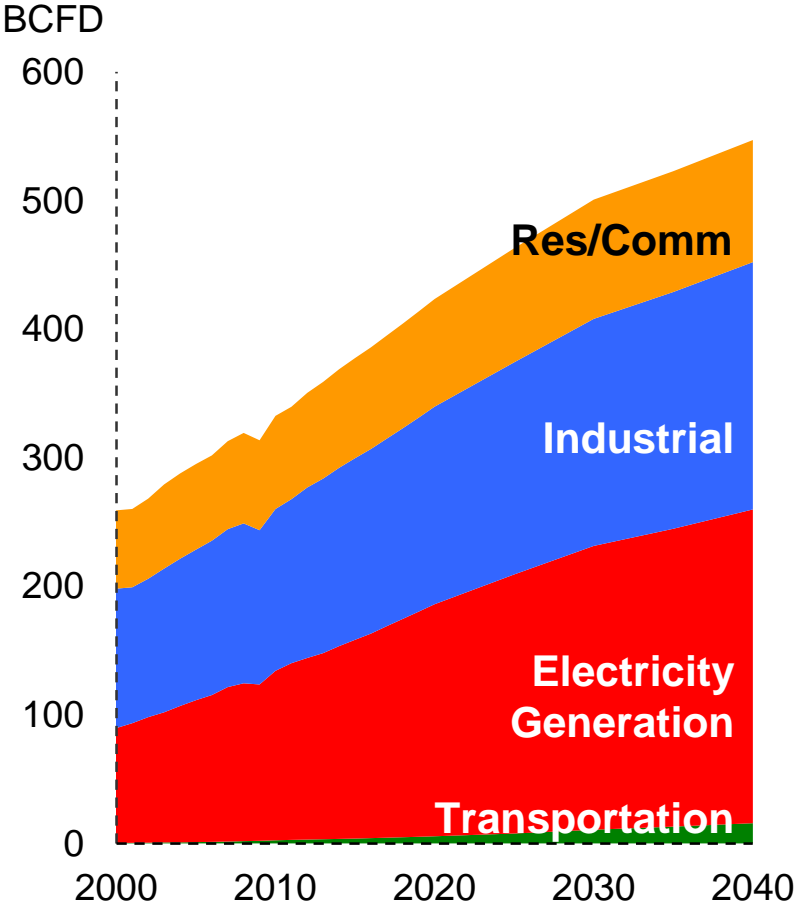
Tonnes CO<sub>2</sub> per Megawatt-Hour



Source: ExxonMobil Analysis

# Gas for Power Growing Rapidly

Gas Demand By Sector



Source: ExxonMobil 2013 Outlook for Energy

# Conclusions

- Gas plays a critical role in power generation
- CHP can further extend the environmental benefits of gas-fired power generation
- Strong partnerships are key to identifying innovative opportunities like South Hook CHP

**Thank  
You**

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