LNG AS FUEL BENEFITS

Air pollution – the invisible killer
(42,000 untimely deaths in France/year !)

→ No fine particles emissions

→ World Health Organization has just classified diesel exhausts as carcinogen substances

→ Practically NO Nitrogen Oxide (NOx) emissions and NO Sulfur Oxide (SOx) emissions

Decrease engine **Noise** and reduce **Vibrations** at all operating speeds
LNG AS FUEL MARKET POTENTIAL

- **Maritime LNG demand in Northern Europe:**
  “It is estimated that by 2020, the maritime LNG demand will be 2-4 million tonnes per year in SECA.”
  - DMA study, October 2011

- **Maritime LNG global demand:**
  - Significant growth starting in 2020
  - Need for infrastructure to support shipowners’ decision to build LNG fuelled vessels

Source: Lloyds register « LNG fuelled deepsea shipping – August 2012 »
IMPORT FACILITIES SHOULD NOT BE A BOTTLENECK

- 4 Mtpa in 2020 represents only 5% of the ECA LNG reception capacity

- Infrastructure issue is a « Small Scale Infrastructure » issue.
THE MAIN CHALLENGES

- Make LNG available in smaller parcels:
  - trucks: 40 m³
  - bunkering barge: ~1,000 m³
  - Bunkering vessel: up to 10,000 m³

- From very large scale facilities: Missing links
  - bunker vessels,
  - refuelling facilities for maritime and for land transport

- With the same safety standard

1 cargo of 160 000 m³
= 4000 trucks
LONG TERM POTENTIAL

- Various estimates of market potential with a consensus on 2020 as the beginning of a significant growth period
- More than 80% of the market potential materializes after 2020
- How to justify investing today?

Source: IHS CERA.
Development of a new service: Reloading

- 3.9 bcm reloaded in 2012
- i.e. three times more than in 2011
- or about 7% of the unloaded quantities
- equivalent to 70% of the capacity of Snoevith liquefaction plant in Norway!

- Elengy and Fosmax:
  - start up of the service in 2011
  - about 10 operations already

sources: Poten &Partners, GIIGNL,Elengy
LNG ships, an efficient alternative to pipeline... ... between European countries

- In addition to directly diverted LNG quantities
- 1/3 of the reloaded quantities in 2012 stayed in Europe;

Main flows:
- from Belgium to Spain and Portugal
- from Spain to Italy and Greece

- This confirms the LNG advantage of being able to be delivered closest to where it is the most needed
LNG as a genuine alternative to pipeline

- Confirmation that LNG shipping reloading & diverting
  - is not only a simple tool for importing LNG, but is also a genuine alternative to pipeline transportation
    ⇒ Virtual offshore pipeline
  - contributes to reduce investment risks, by avoiding expensive pipeline that may rarely or even never be used!
The role of the economic situation
The role of the economic situation

Don’t forget: The evolutionary Principles of Darwin apply to all of us – including the Gas market – only the fittest survive, and fit means fit for the environment in which we live (operate)
CHICKEN AND EGG PROBLEM?

- Just before WWI, Churchill decided to convert the Navy fleet from coal to oil

- Several hurdles had to be tackled:
  - New technology uncertainty
  - High retrofit cost
  - Dependance on foreign resources
  - Very unpopular decision

- … but was the decision process simpler?
Thank you for your attention
IT STARTED WITH SMALL SCALE

- **1965**:
  - First LNG from Algeria to France
    - LNG terminal in Le Havre
    - Jules Vernes Tanker
    - Camel plant in Arzew (0.9 Mtpa)

- **1969**:
  - Alaska-Japan
    - Kenai LNG: 1.5 Mtpa