DF1 Project
14th March ‘07
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Agenda

• Welcome & Decarbonised Fuels 1 (DF1) Introduction

• General Miller overview & history

• DF1 strategy overview and design

• Hydrogen Power Generation details

• Offshore scope overview
Miller Platform Overview

- First post-Piper Alpha facility in UK – Commenced production 1992
- $1.3bn project…55,000Te structure
- Plateau production 200 mboed
- Recovered 345mmboe reserves (300mmboe sanctioned)
- Harsh scaling environment – 120 well squeezes p.a.
- Facilities design for sour service (Corrosion Resistant Alloys)
- High operating costs circa £50m p.a.
• Demonstrating the technology (proof of concept) will help the UK in trying to encourage other countries to play a more active part in tackling climate change.

• The hydrogen power project will deliver as much power as all the UK’s current wind farms.

• It is designed to generate 475MW of base-load, low carbon power.

• It will permanently store 1.8 million Te per annum of CO2 in the first UK re-use of an oil field for Carbon Capture & Storage (CCS).

• It will enable 50-60 million barrels of Enhanced Oil Recovery (EOR) from the Miller Field.
Flash movie…

• Press play…
DF1: Objectives

1. “Proof of concept” and demonstrate industrial scale CO2 system with green power generation.

2. Provide a highly reliable and assured system to store all of the CO2 produced by DF1 in Miller reservoir.

3. Utilise CO2 flood to maximise the economic recovery of further hydrocarbons from the Miller Field.

4. Contribute to organisational capability in upstream CO2 engineering and operations.
DF1 Onshore Development

• Connection into existing infrastructure at Peterhead and St. Fergus
• Greenfield site preparation at Peterhead
• Replacement of existing facilities at St. Fergus

• **Peterhead facilities include:**
  – Natural Gas Import
  – Desulphuriser
  – Syngas Unit
  – Gas Turbines
  – Heat Recovery Steam Generator
  – Amine CO2 Capture Unit
  – CO2 Dehydration and Low Pressure Compression

• **St. Fergus facilities include:**
  – Pipeline pigging facilities
  – High pressure compression
DF1 Offshore Development

- CO2 injection facilities and EOR mode of production till ~2030
- Long-term subsea storage of CO2
- Existing 30” pipeline import for dry CO2
- Oil export via Forties Pipeline System
- Produced gas re-injected
Produced Gas CO2 content

Carbon Dioxide Concentration in Produced Gas

- 35% - Miller gas no longer suitable for use as fuel gas
- 42% - Flared gas no longer guaranteed combustible
- ~75% - Gas no longer combustible
DF1 Offshore Scope overview

• Module (Greenfield)
  - 2,500Te Module on east face
  - CO2 injection pump facilities (ca 5,100 Te/day)
  - Fuel Gas membrane pkg & reject compression train (8MW)
  - Flare Gas Recovery pkg (0.5MW)
  - Co-Injection Coolers (31MW) & Local equipment room

• Brownfield
  - Structural strengthening for Module reception
  - Pipework interconnections to new Module
  - Gas compression system modifications
  - Replacement of Emergency Shutdown and Fire & Gas systems
DF1 timeline

**Concept selection:**
July 2005 – April 2006

**Front End Engineering Design:**
June 2006 – April 2007

**Detailed Engineering, Construction:**
July 2007+

**Target first gas:** 2011*

*Dependant on Government support required and timing of decision