Improving North Sea Recovery
- Creativity and Innovation in Field Exploitation

Dave Lynch – VP Resource
BP North Sea
Global energy demand and the supply trajectory

Worldwide oil & gas demand is projected to continue to grow

…… and we are moving further into environmental, technical and political frontiers to meet this demand
Substantial remaining potential in the UKCS

- 40 bnboe produced to end 2010
- Potential for a further 14-26 bnboe
  - Increased recovery from existing fields
  - Developing new discoveries yet to be appraised
  - Exploring for new possibilities
- But …..
  - Pace of progression a concern
  - Risk of “resource evaporation”
- Positive industry / Govt response
1. Deliver the base through safe reliable operations; excellent reservoir management
2. Efficient execution of 6 major projects
3. Deliver planned option set – infill, wellwork, debottlenecking
4. Deploy solutions to identify and progress ‘barred’ volumes and target Recovery >50%
Recovery Factor = Pore scale displacement × Sweep × Drainage × Time

- Ability of recovery process to displace oil or gas
- Movement of mobile oil & gas to wells
- Connection of wells to oil and gas
- Physical & commercial constraints affecting end of field life

Focus of EOR → Focus of IOR
Improving displacement and sweep: BP EOR Projects

- **Clair**: LoSal™ waterflood – start up 2016
- **Schiehallion & Loyal**: Polymer waterflood - start up 2017
- **Foinaven**: Potential for water EOR
- **Magnus**: WAG since 2001
- **ETAP**: Potential for water EOR
- **Ula**: WAG since 1999
- **Valhall**: Sulphate injection research

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Improving drainage and sweep: New wave of seismic technology

BP operated North Sea Seismic surveys

LoFS
OBC
Towed Streamer (4D)
Towed Streamer (3D)

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Imaging and drilling: Static image for well placement

1992 - 1994

2009

Advances In Seismic

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Improving asset life: a focus on renewal

- Significant challenge with ageing infrastructure
- Key to be able to describe the potential benefit
- Will drive the right level of investment
Conclusions

- Clear potential exists in North Sea resource base
- Not easy but there are proof points that solutions exist
- Must intervene to focus efforts on improving recovery
- Benefit from a more collaborative approach across operators, the supply chain and government
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Imaging and drilling: 4D for sweep optimisation

Baseline 3D

1996 T31 Upper Sand

2004 4D Difference

Waterflood

Barrier

Poorly Supported Area

4D Monitor Surveys – all consistently processed with baseline

1996 Baseline 3D

2004 4D Difference

First Oil

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