Is there a future for super mature fields? an example from the Netherlands.

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Production: 51,2 Mboe produced in 2010
74% gas, 26% oil

Reserves: 815 Mboe as of 12/31/10
76% gas, 24% oil

The Netherlands still contribute to a third of the production for years while reserves are slightly decreasing.
The Netherlands, a success story

- GDF SUEZ entered the Netherlands offshore in 2001 by acquisition (ex Placid, ex Oxy, ex Transcanada).
- By a combination of acquisition, development and exploration, we became in 2009 the first operator offshore in the Netherlands.
- How do we transform our position in such and mature area in a profitable venture?
The Netherlands, a success story

a) Commitment to Innovation for reduce cost

1- Recycling of satellites standard platforms

- The G14-A platform, which was placed in 2005, lies approximately 150 kilometers off the coast (from Den Helder) and has one production platform. This platform connects to the G17d-A platform by means of an underwater pipeline.

- The topside (the decks) of this satellite has been reused, having once served as the topside for the K11-B platform.
The Netherlands, a success story

a) Commitment to Innovation for reduce cost (continued)

1- Recycling of satellites standard platforms and sub sea template

- Surface installations on production fields that no longer produce, are abandoned: the topsides and the jackets are removed.
- The jackets are disposed of, but the topsides can be used at another location, as the case may be after a couple of adjustments.
- Four topsides have been thus removed, renovated, placed elsewhere and started a second life.
- Subsea manifold has been also reused
The Netherlands, a success story

a) Commitment to Innovation for reduce cost (continued)

2- Offshore Access System (OAS)

- The OAS is an extendable, motion compensating bridge that allows maintenance personnel to cross over safely from a moving ship to a fixed platform.

- The bridge can be extended to almost 20 meters and the system can be used in the case of waves of up to 2.5 meters in height.

- The OAS contributes to the safety of the maintenance personnel and yields considerable savings in helicopter hours.

GDF SUEZ E&P Nederland B.V. is a very competitive operator compared to its peers.
The Netherlands, a success story

b) Daring to explore: L5 Sierra

1- Location and ownership

- Southern North Sea; production licence
- GDF SUEZ E&P Netherland B.V. 60% operator
- EBN 40%

2- History

- L5 licence acquired from NAM in 2008
- Area identified as probably HP/HT, some leads identified, no well drilled to deep targets
- Immediately after acquisition, preparation of drilling proposal
- Drilling in summer 2010 encountered 1024 bar/185°C

3- Asset details

- 1.4 – 5.4 Bcm gas reserves (gross)
- HP/HT field discovered in 2010 with well L5-12 ST
b) Daring to explore: L5 Sierra (continued)

4- Base Case Development

- The L5 Sierra satellite platform will be a four legged six wells slot platform with free liquid separation
- Design is based on the affiliate typical satellite platform design
- The produced volumes will be evacuated to the L5-A platform. After that, the volumes will be evacuated to shore via the Nogat pipeline system
- IRR: above 40%

5- Schedule

- Planned first gas is in 2013: 2.5 years from discovery to start-up of production
- Expected end of life: 2021
The Netherlands, a success story

c) Extending to oil: Q13a Amstel

1- Location and ownership

- Southern North Sea; production license
- GDF SUEZ E&P Nederland B.V. 50% operator
- EBN 40%, TAQA Energy 10%

2- History

- Acquired from Delta Hydrocarbons 2010
- Discovered in 1962, appraised by 4 wells
- 5th appraisal well (Q13-12) scheduled for Q1 2011. Development decision has been taken based on Q13-12 appraisal results

3- Asset details

- 4.7 – 13.3 MMstb oil reserves (gross)
- The Q13-12 well proved the minimum economic field size
c) Extending to oil: Q13a Amstel (continued)

4- Base Case Development

- Targeting first oil 2013
- The oil and gas will be evacuated to the P15 treatment facilities for further treatment whereafter the volumes will be evacuated to shore, via an existing pipeline.

A potential candidate for CO2-EOR, thus providing synergies for the CCS project in Rotterdam
c) Extending to oil: Q13a Amstel (continued)

5- Unlocking exploration and development potential

As L5 Sierra, Amstel is allowing new developments in the same play.

- At least 2 discoveries:
  - Zaan
  - Wassenaar

- Several additional prospects:
  - Eem (9 km from Amstel)
  - Lek (4 km from Amstel)

- At the same time, old abandoned oil fields (Rijn/Schoonebeek) are redeveloped into production.
The Netherlands, a success story

d) Revisiting tight gas: L12/L15 Area

1- Location and ownership

- L12/L15 license located in Dutch sector of SNS. Distance of 5-10 km from coast of Wadden Islands
- GDF SUEZ E&P Nederland B.V. 30% operator
- EBN, Nuon, & Wintershall partners

2- History

- Acquired from NAM in 2008
- Cluster of (near)tight gas fields discovered by NAM in the 1970s
- L15-A and L12-C North developed in the ‘90s with 5 production wells from L15-FA platform

3- Asset details

- L15-A and L12-C North developed in the ‘90s with 5 production wells from L15-FA platform
- Producing fields are mature >80% of reserves (UR est. 7GNm3) produced
The Netherlands, a success story

d) Revisiting tight gas: L12/L15 Area (continued)

4- Main results

Discovery in 1976
- Permian Rotliegend
- Very poor reservoir properties
- Well test:
  - No initial flow
  - After acid job max flow ~ 300,000 Nm³/d at very high (~ 200 bar) drawdown

Appraisal well in 2011
- Very poor reservoir properties confirmed
- No initial flow on test
- After a Frac, maximum flow rate during clean-up 700000 Scm/day (40/64 choke) with 70 bar drawdown
- Flow limitation due to surface equipment

Very positive for further L12 development and exploration in this area considered previously as non commercial
Conclusion

What does it take to push back the frontiers of an old province?

- You do not need ground breaking technology, but be creative in applying existing ones in good conditions: that’s innovation
- Pay attention to existing infrastructures and their expected lifetime
- Be thorough, leave no stone unturned
- Take advantage of the most favourable E&P environment existing in Europe: small field policy, tax system, highly recognized technical authority.
- 34 Mboe reserves added with these three play revivals with a potential up 2 to 3 times the volume discovered.