

# Subsea to Shore Gas Field Cost Reduction

Luc RIVIERE - TOTAL SA

Andrew MARPLE – TOTAL E&P UK

Dave MACKINNON – TOTAL E&P UK

Guillaume TOSI – TOTAL SA

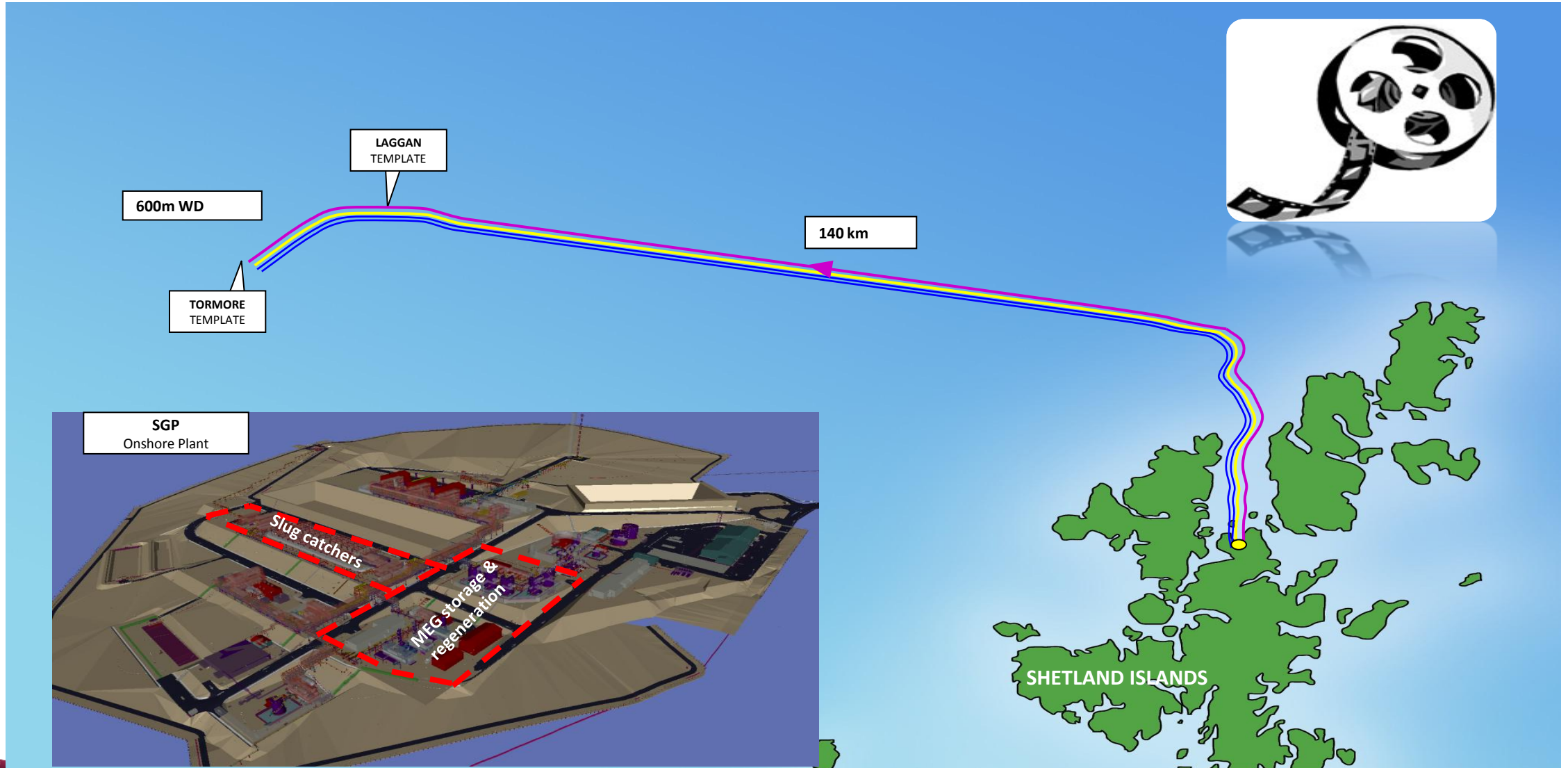


# Introduction

- Remote gas fields : subsea to shore is one of the best options
- But cost remains high
- Is it possible to reduce the development costs to make them profitable in a 50 \$/bbl environment ?
- Example of Laggan-Tormore – West of Shetlands – to Shetlands Gas Plant (SGP)



# Laggan-Tormore Development



# Onshore : MEG storage & regeneration





# Onshore : Slug Catchers



# Subsea

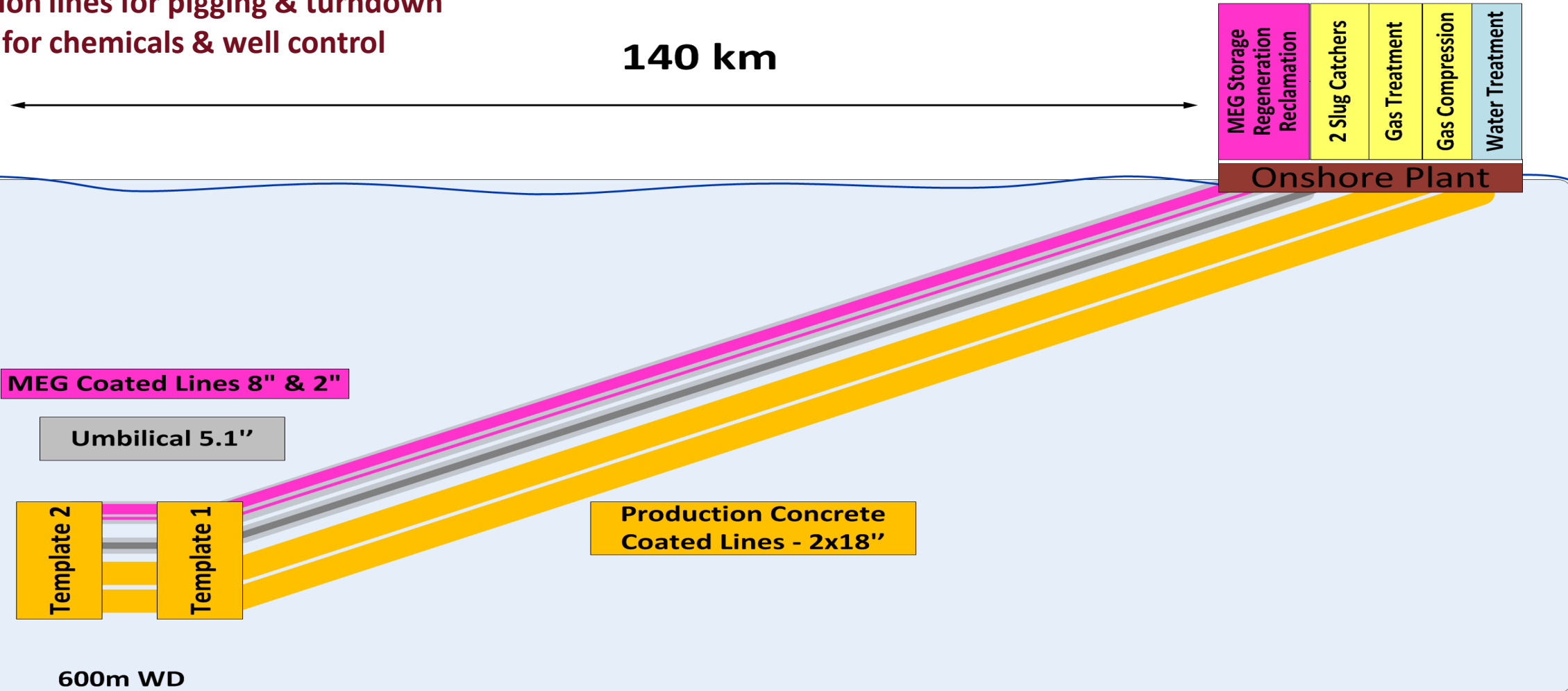


# Base Case : As Built

MEG continuous injection  
2 production lines for pigging & turndown  
Umbilical for chemicals & well control

Facilities CAPEX = 100%

140 km



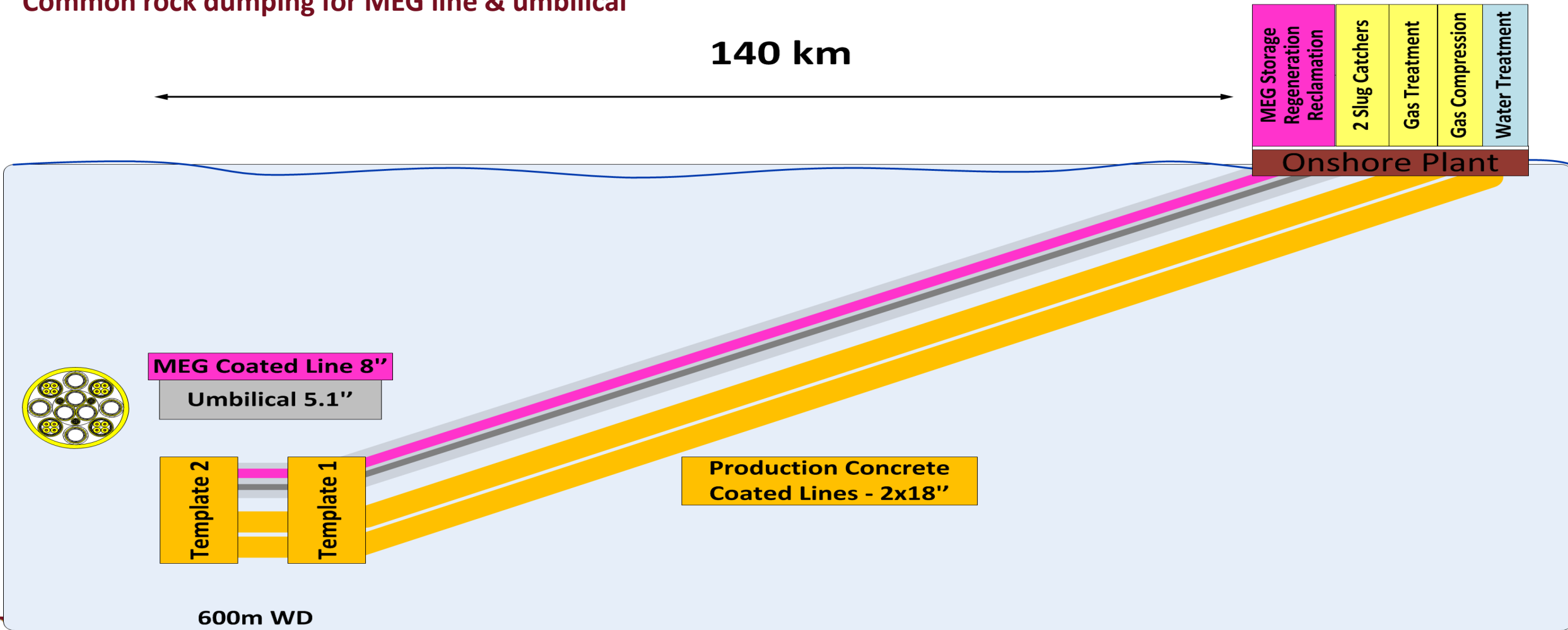


# Optimized Base Case

Suppression of 2" MEG line (use spare liner in umbilical)  
Common rock dumping for MEG line & umbilical

Facilities CAPEX = 96%

140 km



600m WD



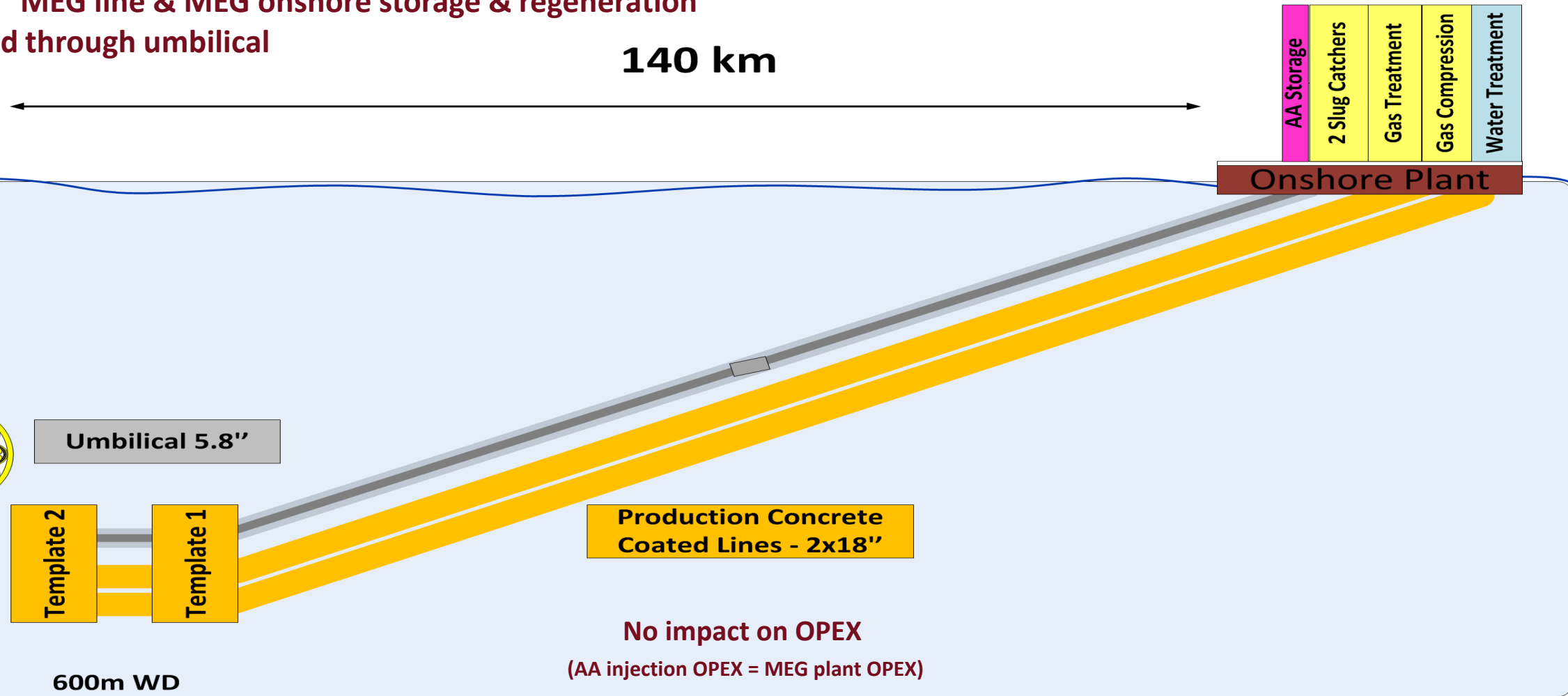


# Option 1 : Anti-Agglomerant Injection

Replace continuous MEG injection by continuous AA-LDHI injection  
Remove 8" MEG line & MEG onshore storage & regeneration  
AA injected through umbilical

Facilities CAPEX = 88%

140 km

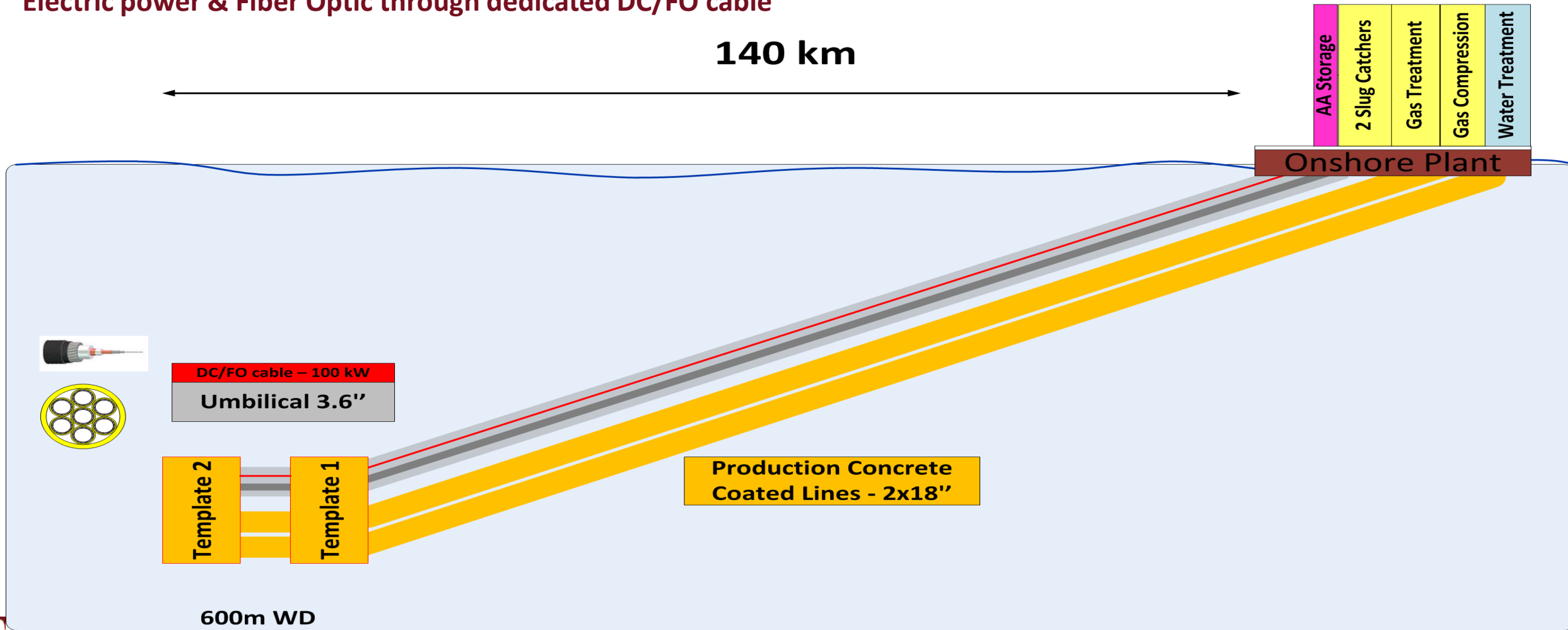


## Option 2 : All Electrical Subsea

Replace Electro-Hydraulic by All Electric

Electric power & Fiber Optic through dedicated DC/FO cable

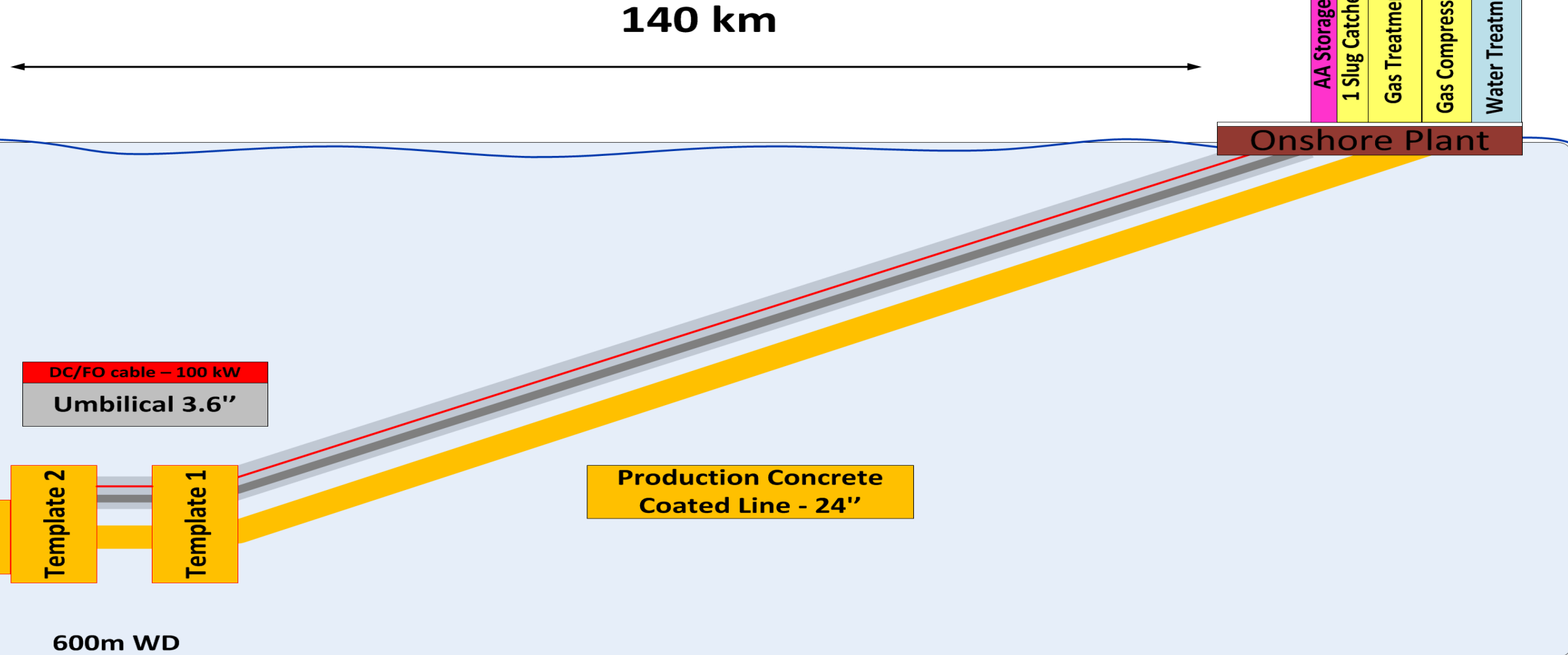
Facilities CAPEX = 84%



# Option 3 : One Single Production Line

Suppression of 1 production line & 1 slug catcher  
Add Subsea Pig Launcher

Facilities CAPEX = 77%



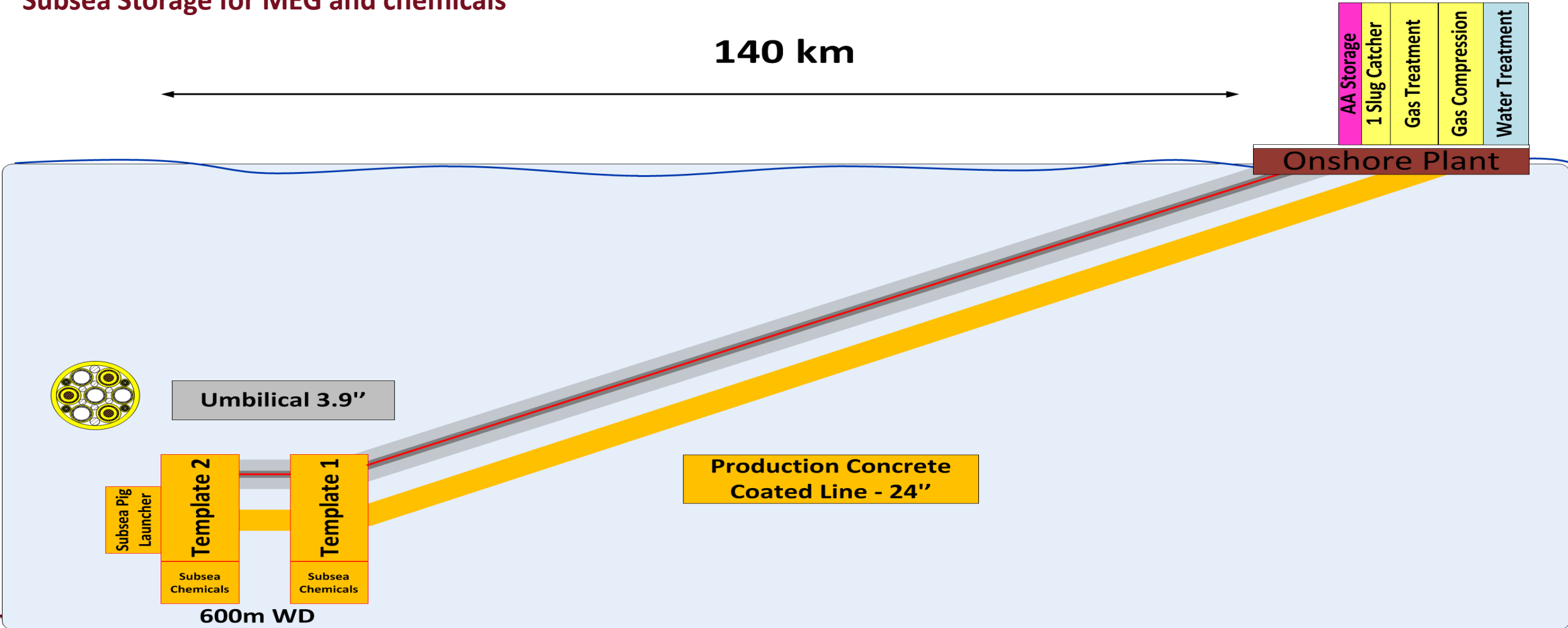


# Option 4 : Subsea Chemical Storage

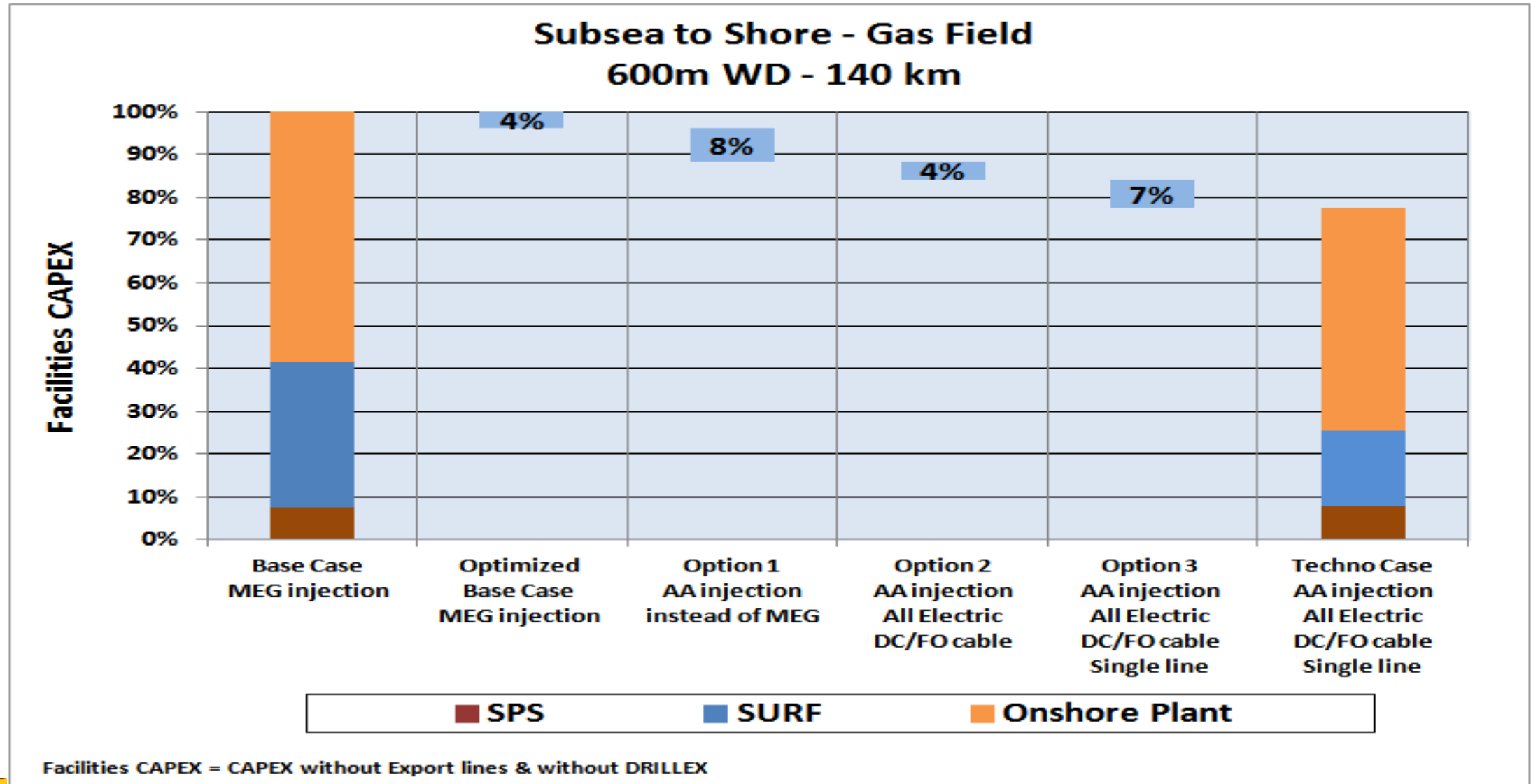
Umbilical for AA, Electric power and Fibre Optic  
Subsea Storage for MEG and chemicals

Facilities CAPEX = 79%

140 km



# Recap on Cost Reduction



# Conclusion

- Yes, we can reduce the cost of subsea to shore gas field development by about 20%
- But we need to :
  1. Change the hydrate management strategy
  2. Implement All Electrical Systems
  3. Improve fluids modeling to better assess single line constraints







# THANK YOU FOR LISTENING

Contact information  
Luc RIVIERE – TOTAL SA  
[luc.riviere@total.com](mailto:luc.riviere@total.com)

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