

Implementation of an Exploration Portfolio Management Platform

Yousef Al-Salali
Senior Petroleum Engineer - Exploration Group
Kuwait Oil Company (KOC)

Authors: Yousef Al-Salali and Talal Al-Adwani

Co Authors: Muhammad Al-Ajmi, Haifa Al-Bader, Abdulaziz Sajer, Sunil Singh, Waleed Morsy, Abdullah Al-Hamad, Hanan Al-Kandari and Mohammad Al-Bahar All from Kuwait Oil Company, Kuwait



What's Next?

SIS Global Forum 2017

September 13-15

Le Palais des Congrès de Paris

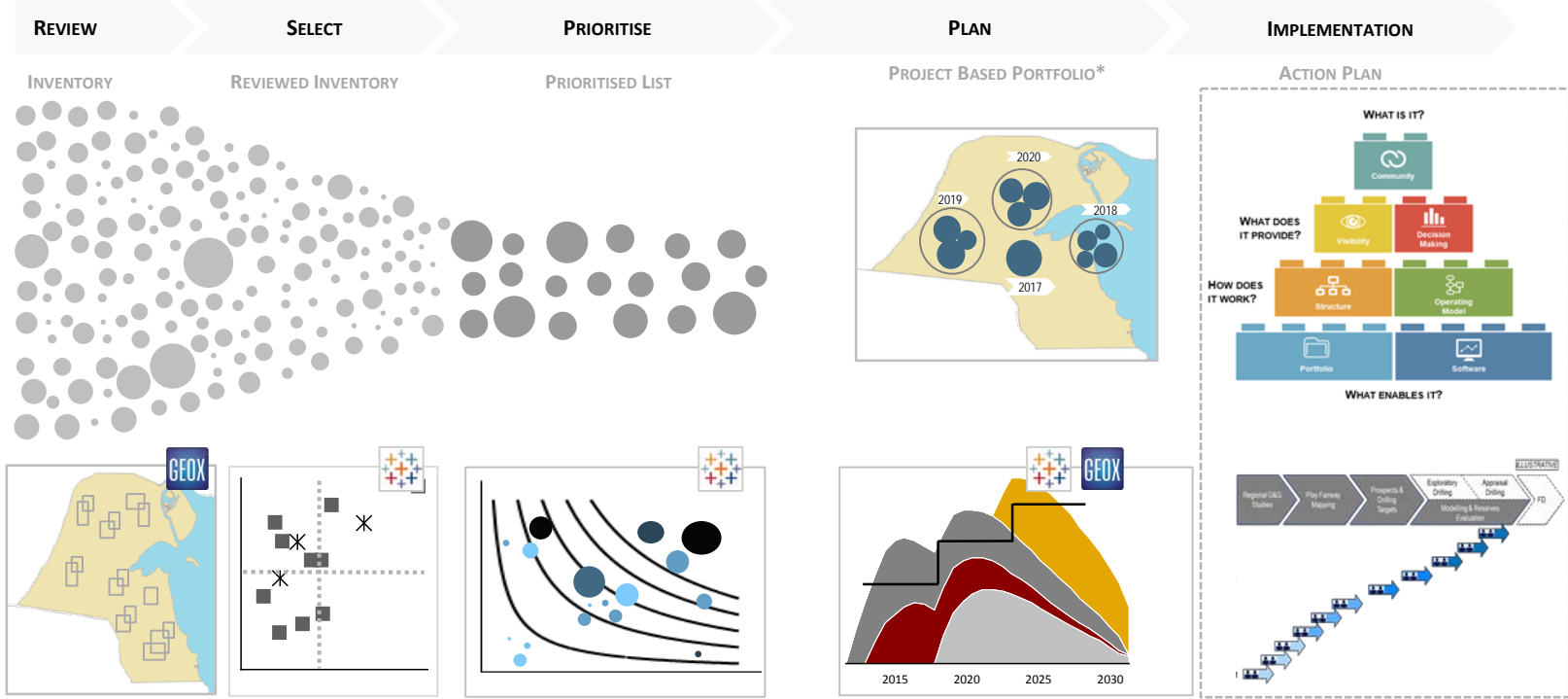
Schlumberger

EXPLORATION PORTFOLIO MANAGEMENT

- Currently, KOC have High Standards Exploration Portfolio Management Platform to Achieve Primary Strategic objectives of Production & Reserve Growth Targets.
 - Exploration developed an international system customized for Kuwait needs.
 - This System Optimize the way to Achieve Strategic Targets based on demand and needs.
 - Add full value of EG production potential to drive production growth for Kuwait.

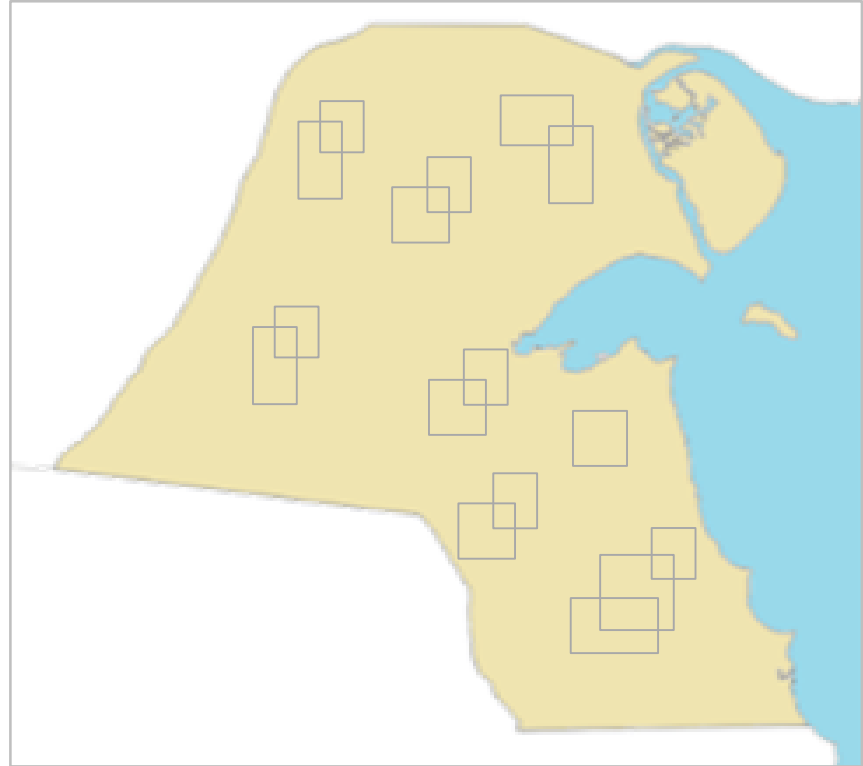
KOC has developed a strategic Portfolio Management approach laying the foundation for driving a step change in Kuwait's future oil & gas production

Leads & prospects
 Drillable prospects
 Sequenced drillable prospects
 Sequenced projects

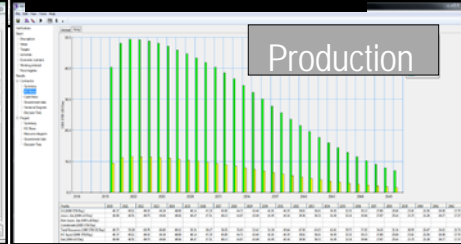
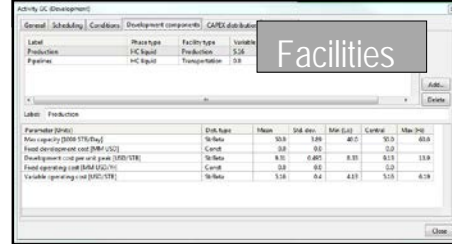
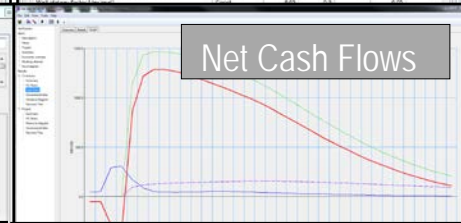
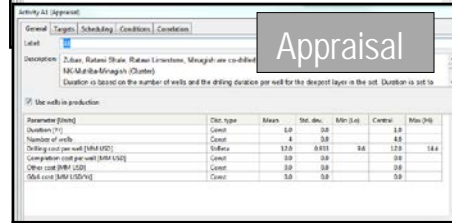
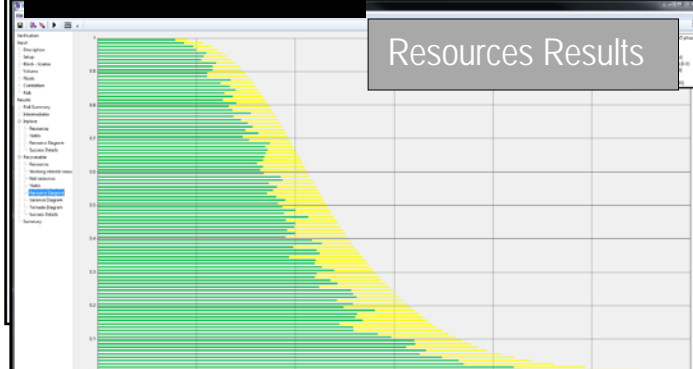
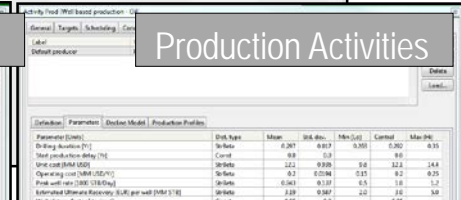
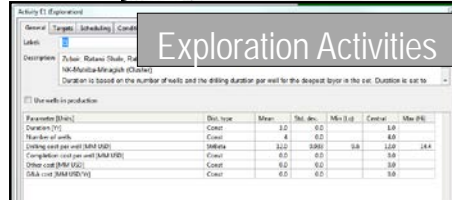
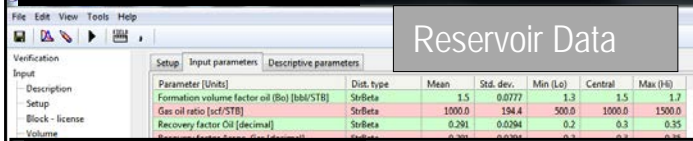
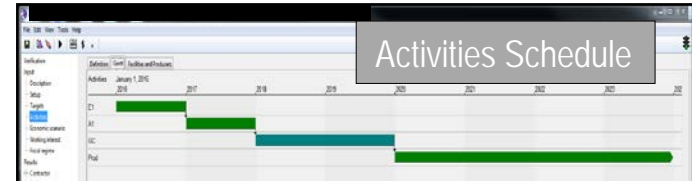
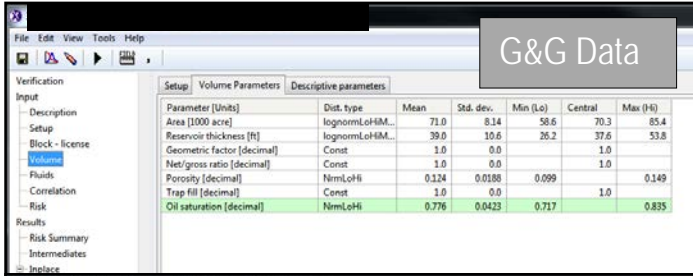


REVIEWED INVENTORY

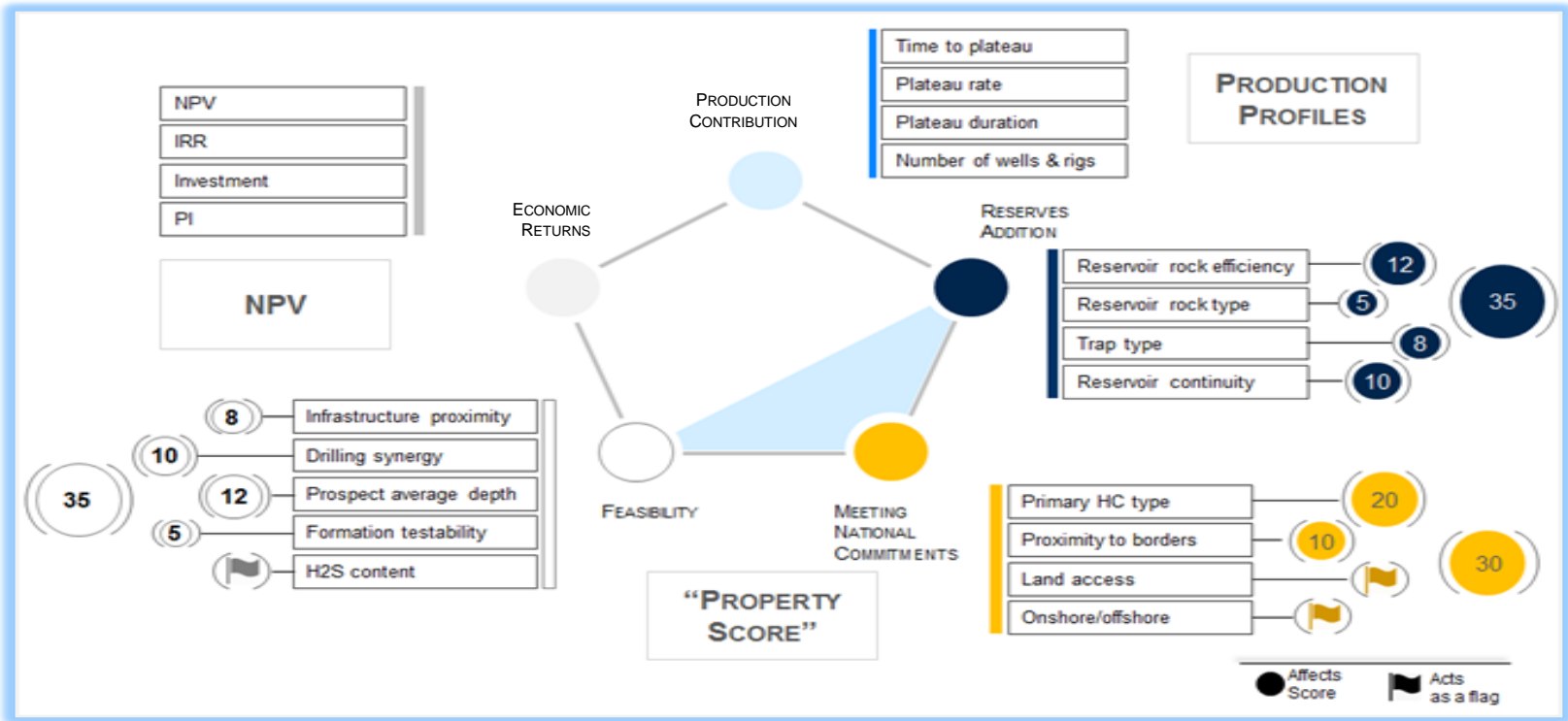
- Prospects Has been Reviewed and Reassessed based on International Standards
- Certified the Prospects Inventory by Reserve certifier.



Integrated Prospect Risk, Resource and Value Assessment Solution

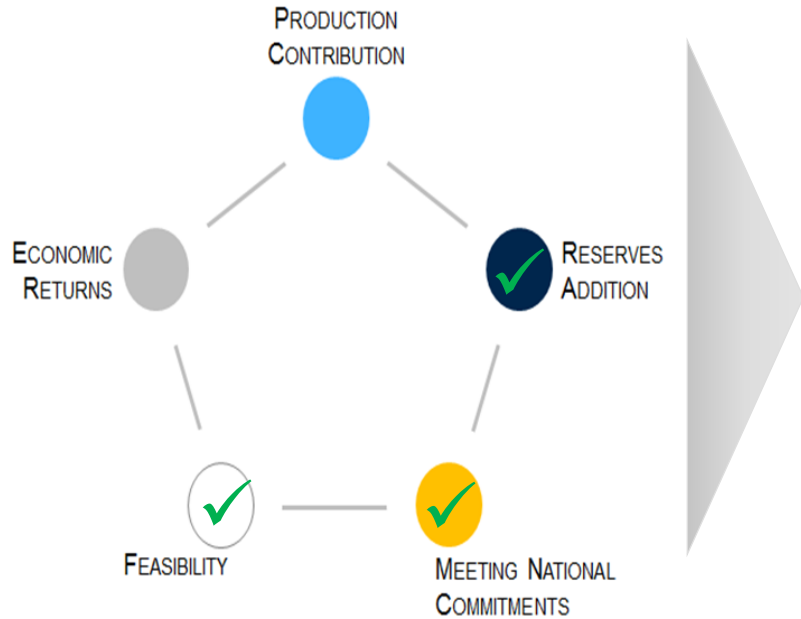


PRIORITIZATION



analytical prioritization framework that takes into consideration the strategic directions of the Exploration Group

Mapping strategic criteria to customized GeoX prospect properties



File Edit View Tools Help

Verification

Input

- Description
- Setup
- Definition
- Conformable Bed Groups
- Play Dependency
- Risk and Volume Dependence
- Leak Connections
- Correlation

Results

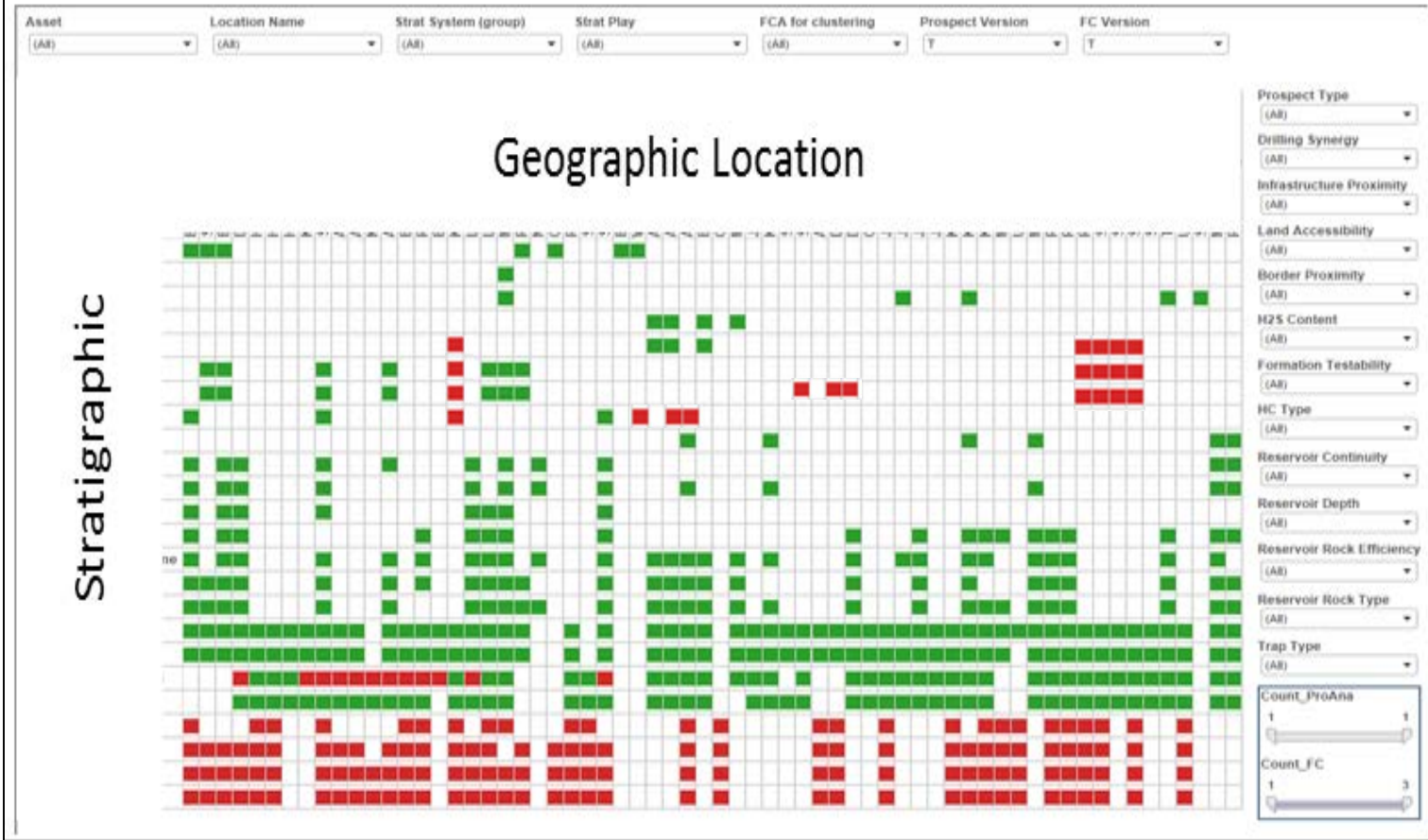
- Risk Summary
- Inplace
 - Resources
 - Resource Diagram
 - Success Details
- Recoverable
 - Resources
 - Working interest resources
 - Net resources
 - Resource Diagram
 - Success Details
 - Variance diagram
- Play-fractionals
- Joint Segment Probability
- Summary

Summary Properties Attachments Resource analog SEK-Burgan-Marrat

- Project
 - Type: DrillableProspect
 - Exploration Drilling Synergies: Codrilled with 2 or more targets/reservoirs
 - Codrilled with 2 or more: Undefined
 - H2S Content: Operationally acceptable
- Subsurface
 - Hydrocarbon Type: Volatile Oil
 - Reservoir Rock Efficiency: High Porosity - High Permeability
 - TrapType: Structural
 - Reservoir Continuity: Widely extended
 - Reservoir Depth: Deep
 - Formation Testability: Usual practice in KOC
 - Reservoir Rock Type: Carbonate
- Locational
 - Asset: SEK
 - Location Name: Burgan
 - Near or extends beyond borders: NO
 - Land accessibility: Easily accessible
 - Distance to infrastructure: Can use existing GC - near infrastructure
- Analysts
 - Geologist: Jurassic UnitPMU
 - Reservoir engineer: RMU - DP team

Edit

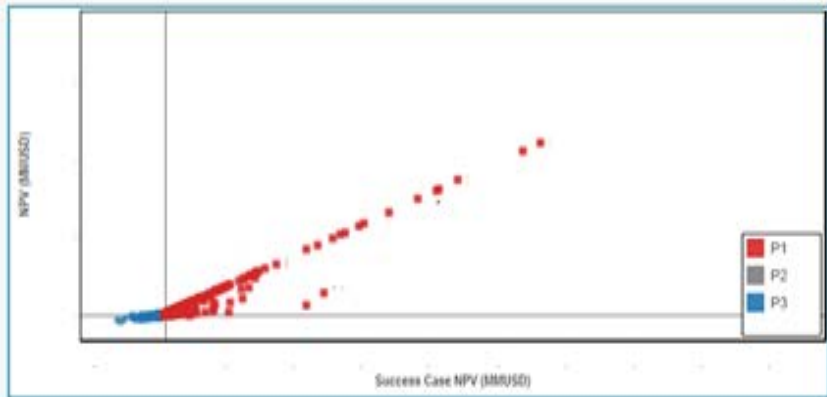
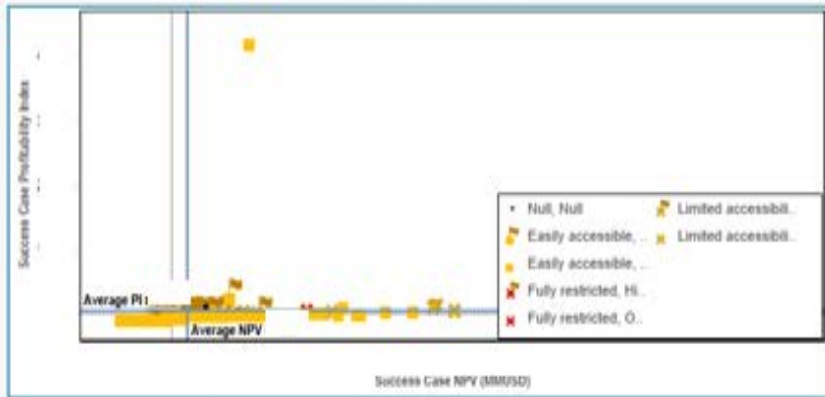
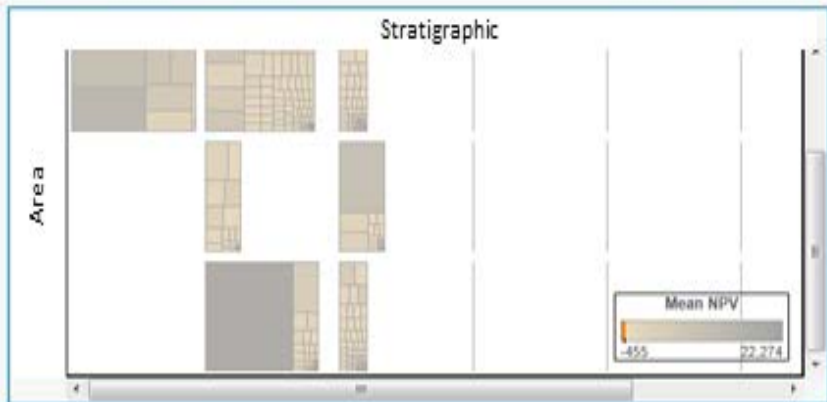
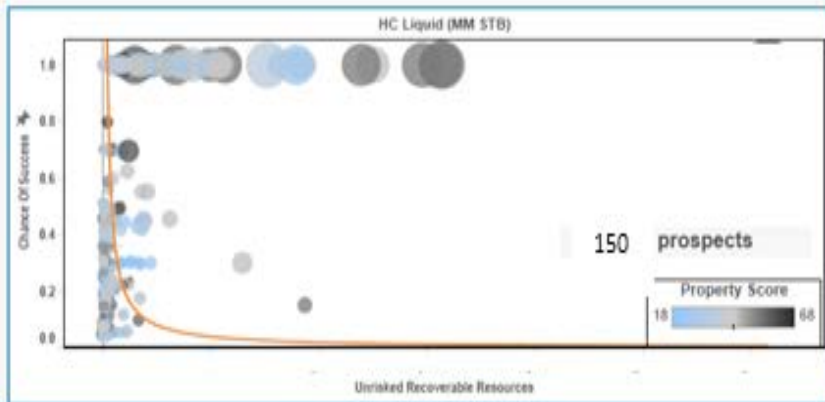
SELECTION CRITERIA



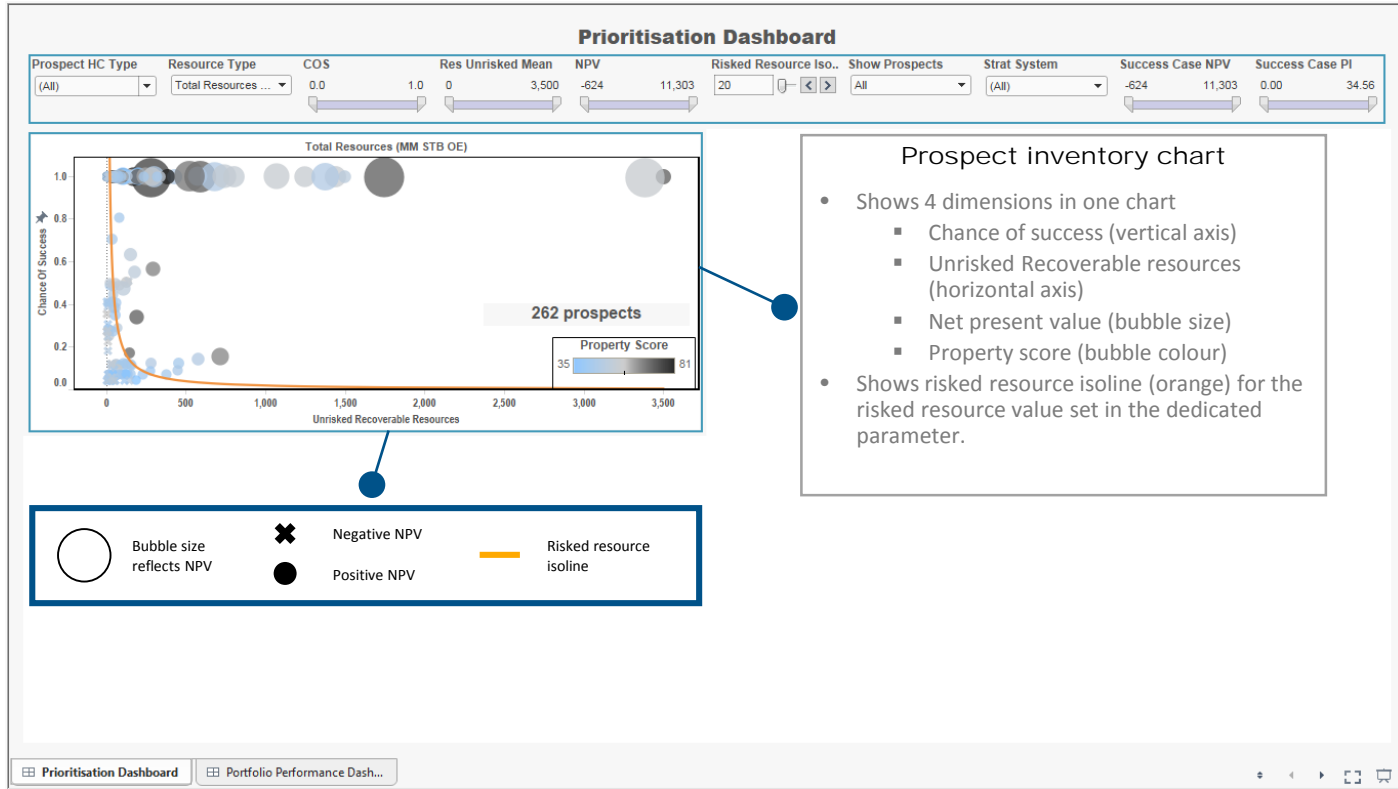
SELECTION CRITERIA

Prioritisation Dashboard

FCA for clustering	Prospect Ver...	FC Version	Prospect HC Type	Resource Type	Strat System	COS	Unrisked Rese...	NPV	Riskd Resour...	Show Prospects	NPV Success ...	PI Success Ca...
(All)	T	T	(All)	HC Liquid (MM ...	(All)	0.0	0 9,229	-464 18,478	20	All	-1,438 18,478	0.01 428.17



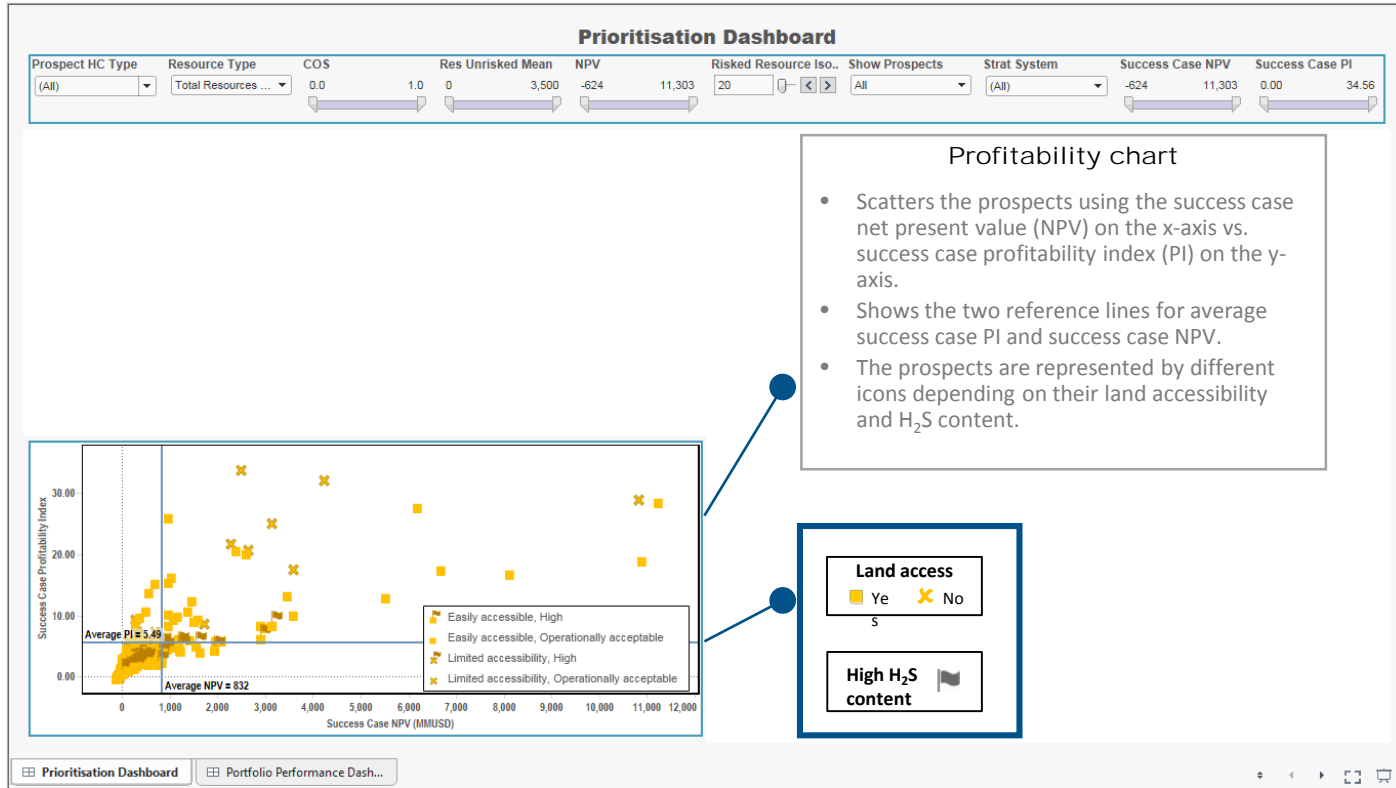
The prospect inventory chart displays the inventory through all strategic dimensions



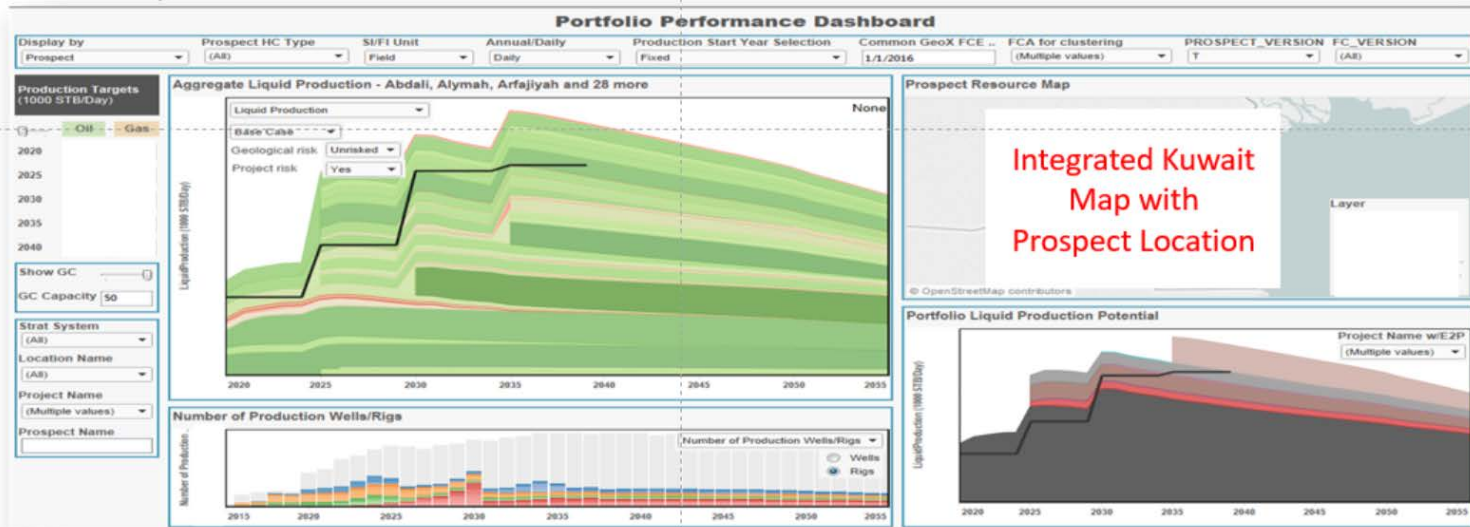
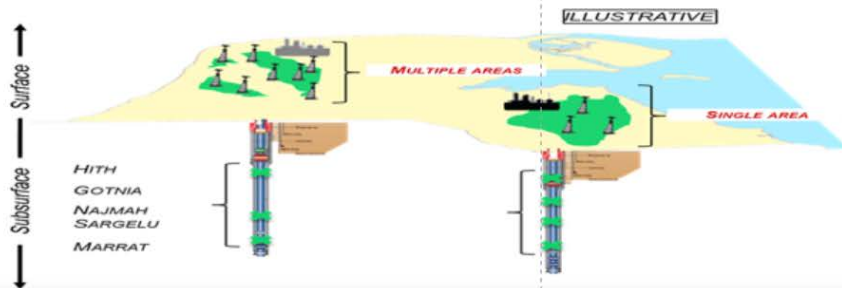
Prospect inventory chart

- Shows 4 dimensions in one chart
 - Chance of success (vertical axis)
 - Unrisked Recoverable resources (horizontal axis)
 - Net present value (bubble size)
 - Property score (bubble colour)
- Shows risked resource isoline (orange) for the risked resource value set in the dedicated parameter.

The profitability chart displays maximum capital requirement versus economic return



PROJECT BASED PORTFOLIO



Sequenced projects (One or more prospects) to achieve Strategic targets

PROJECT BASED PORTFOLIO

Portfolio Performance Dashboard

Display by: Prospect (All) Prospect HC Type: (All) S/F/I Unit: Field Annual/Daily: Daily Production Start Year Selection: Fixed Common GeoX FCE: 1/1/2016 FCA for clustering: (Multiple values) PROSPECT_VERSION: T FC_VERSION: (All)

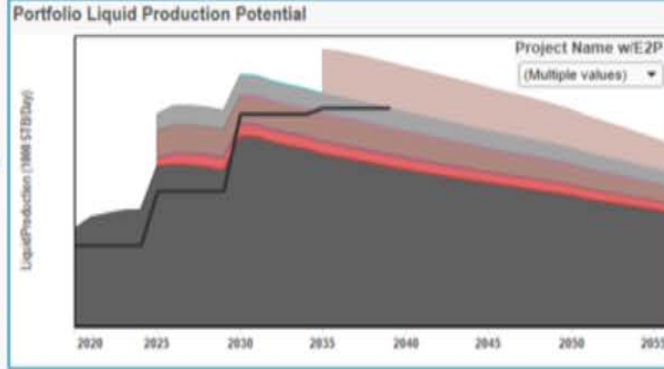
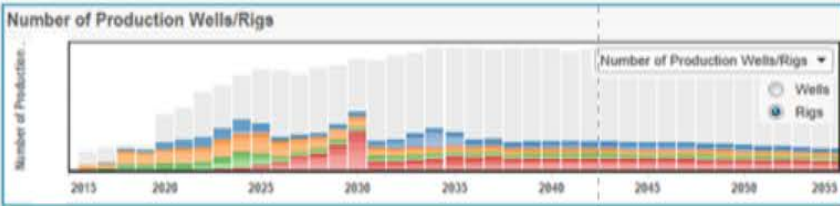
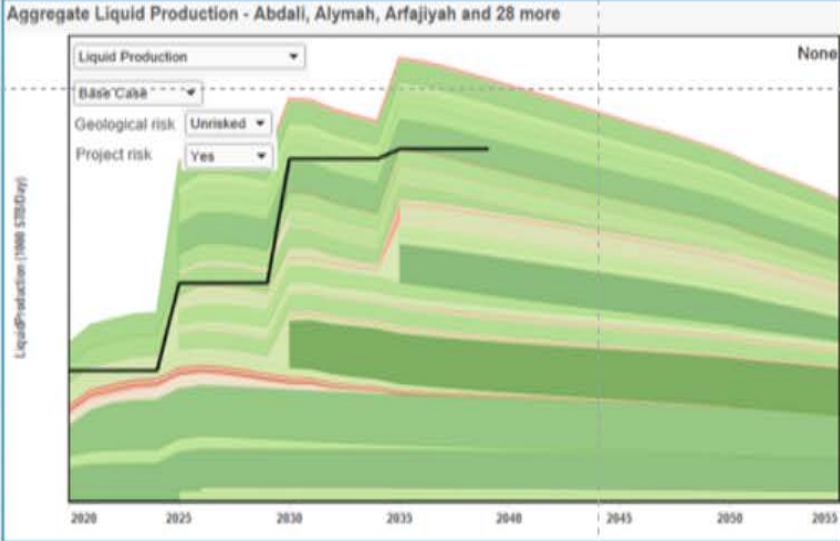
Production Targets (1000 STB/Day)

Oil Gas

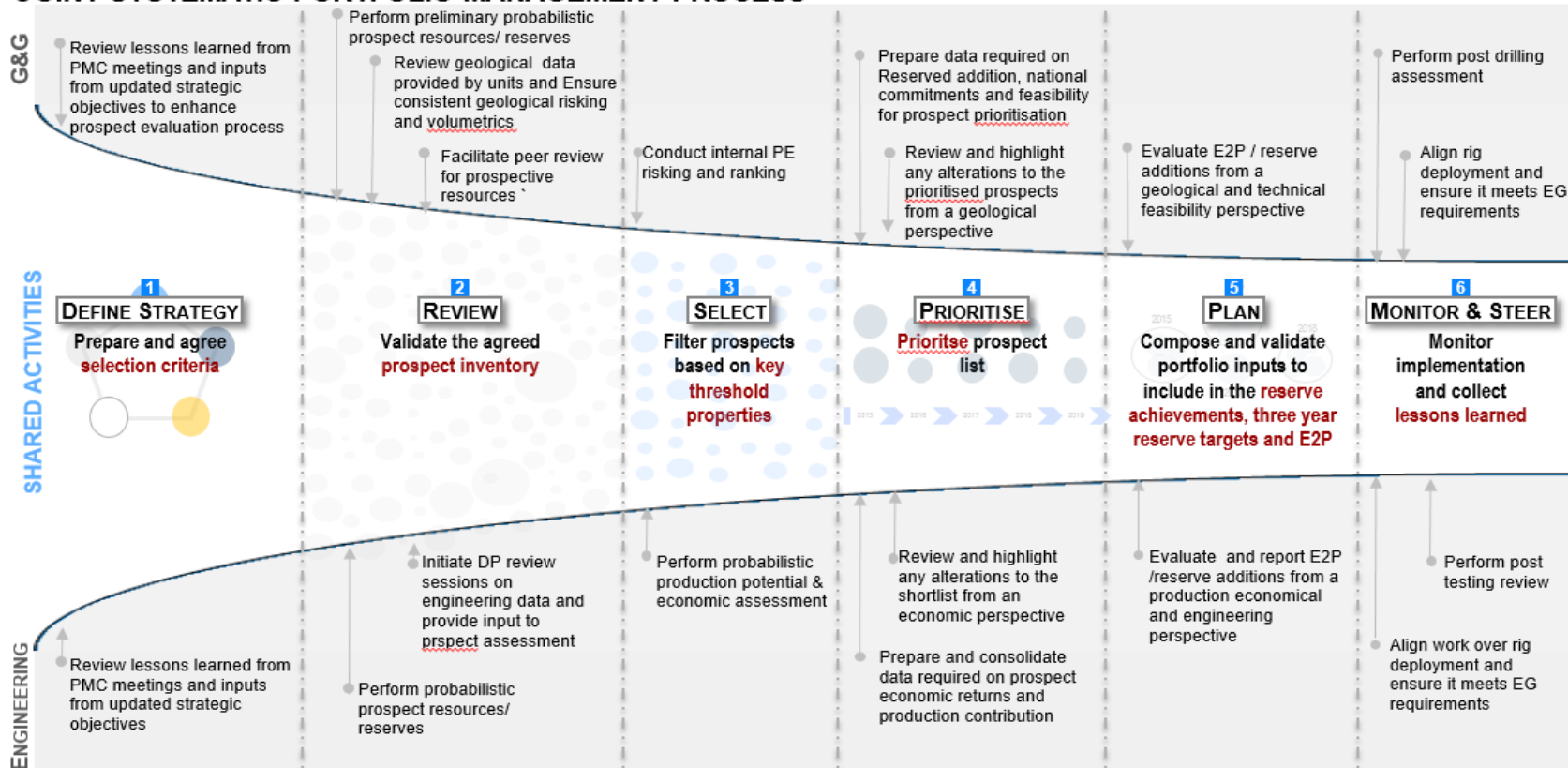
2020
2025
2030
2035
2040

Show GC
GC Capacity: 50

Strat System: (All)
Location Name: (All)
Project Name: (Multiple values)
Prospect Name:



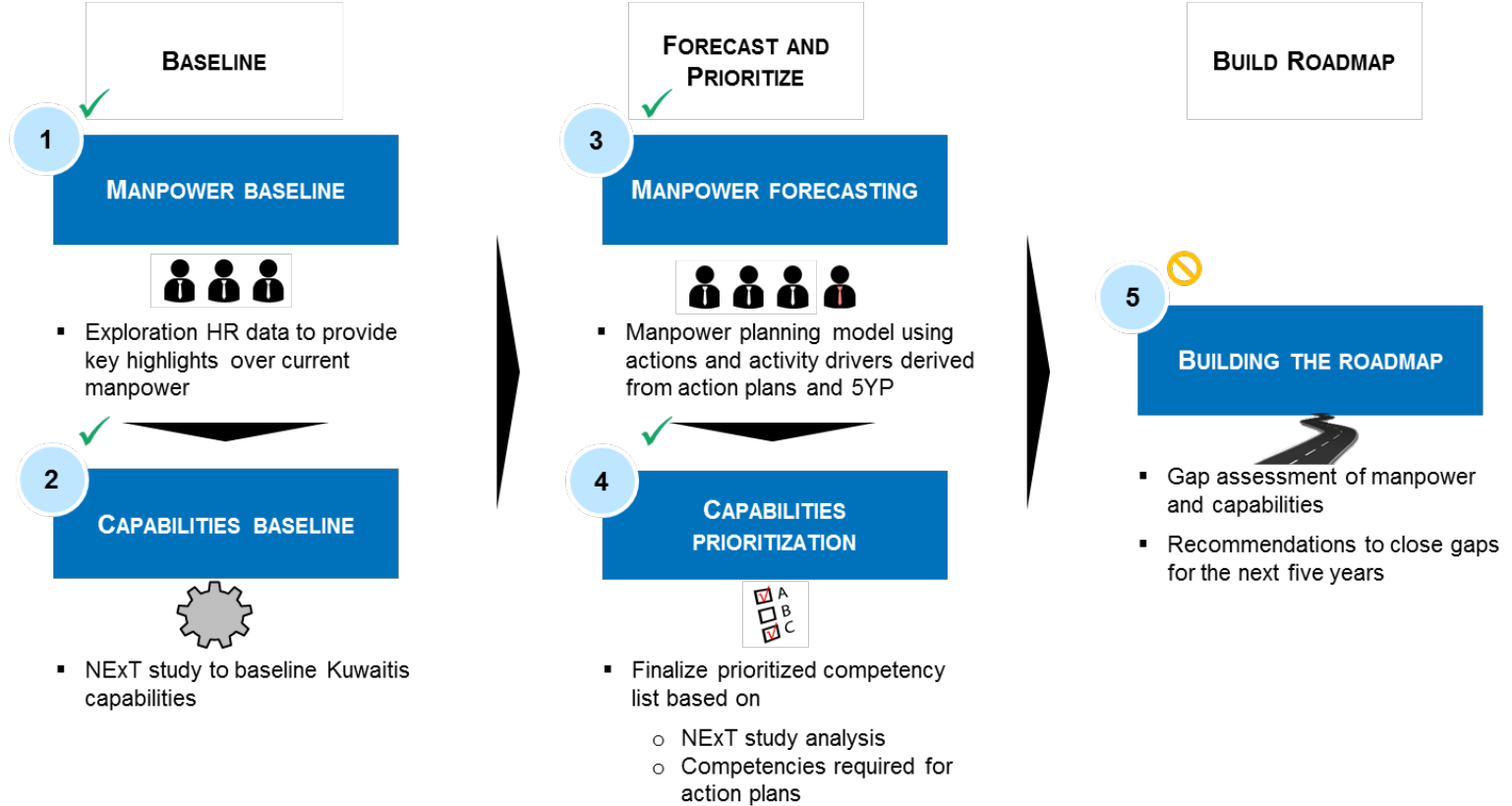
JOINT SYSTEMATIC PORTFOLIO MANAGEMENT PROCESS



MANPOWER PLANNING AND CAPABILITIES ASSESSMENT APPROACH

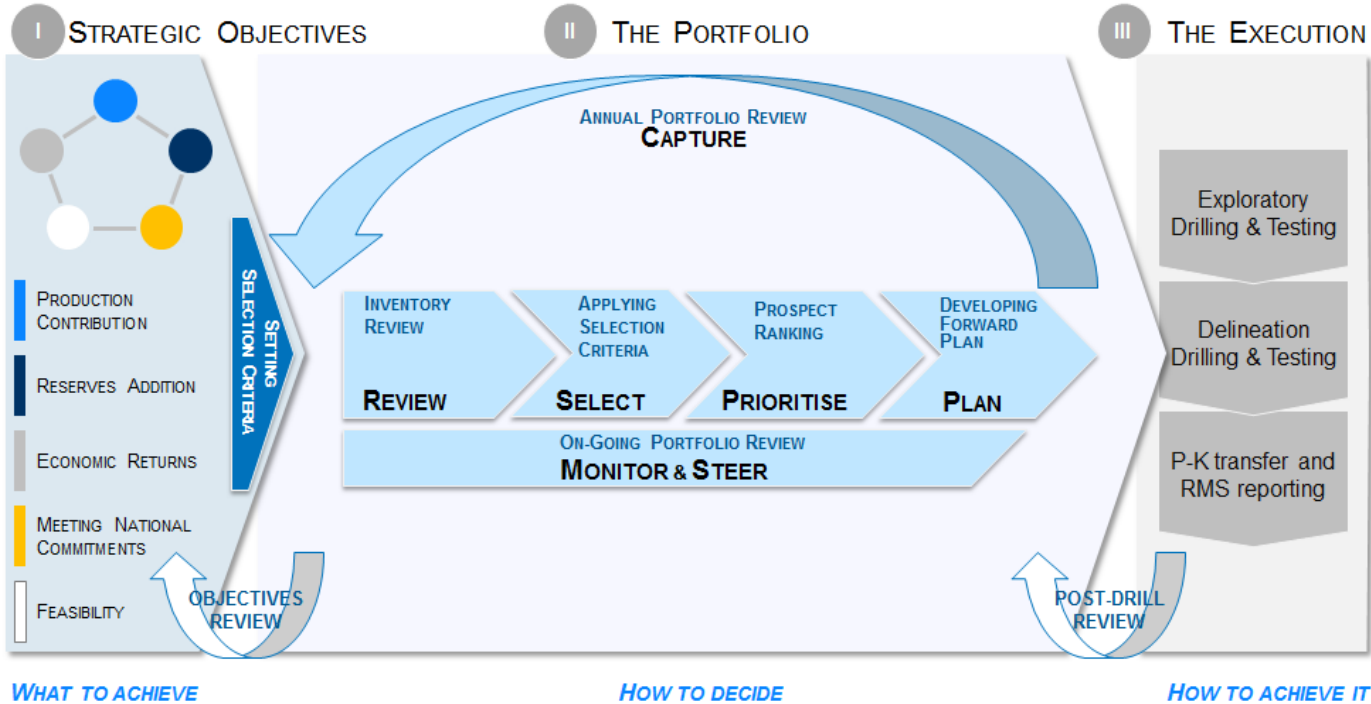
✓ Completed

⊘ In progress

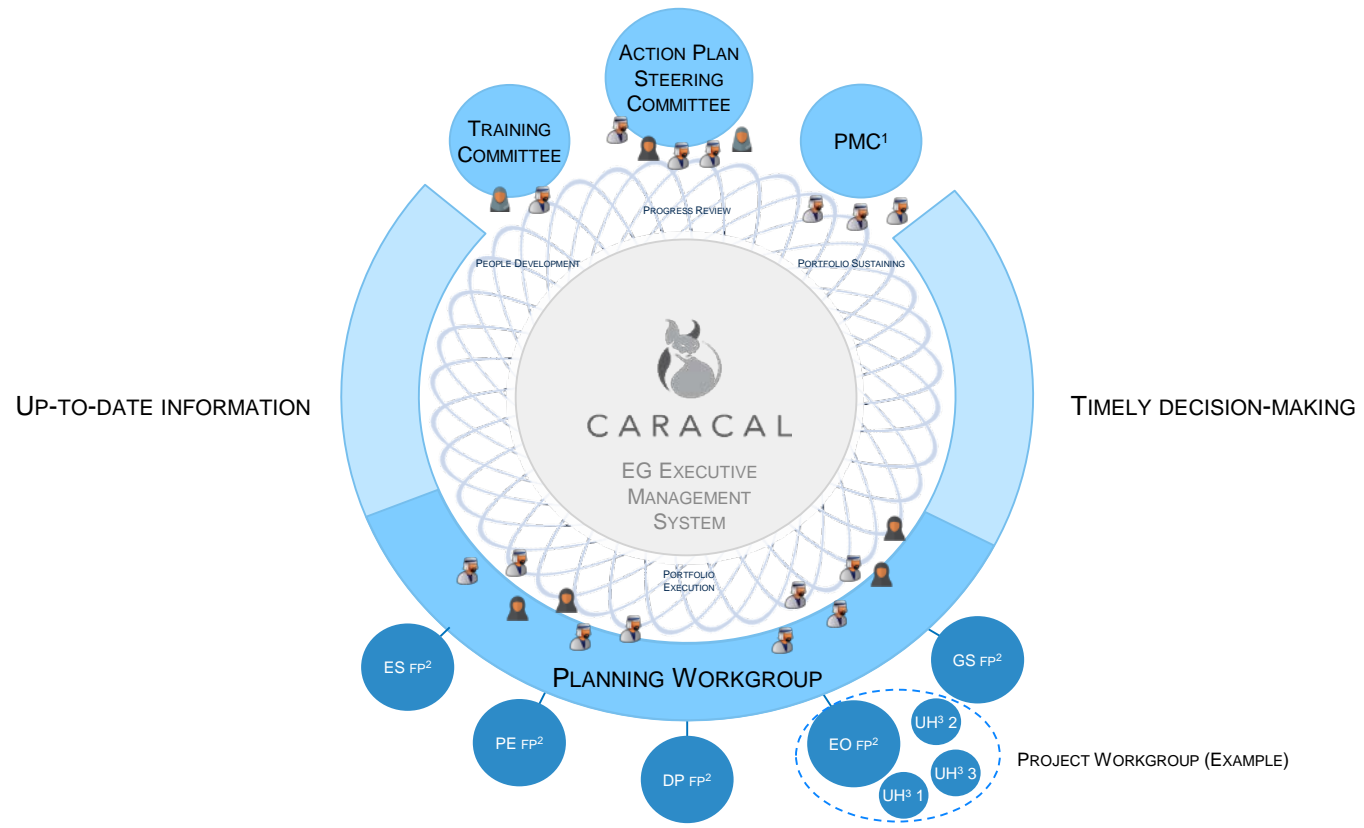


Source: ASE analysis

Link between Exploration Strategy, Portfolio Management and Technical Processes



Exploration Portfolio Management Structure



* CARACAL : KOC/Exploration Portfolio Management System

Consistency is the key in exploration portfolio management

01

“Exploration is best managed by managing the exploration portfolio”

G. McMaster (1997) quoted by A. Milkov (2015)

02

“For the portfolio management to succeed, each prospect must be assessed consistently”

P. Rose & G. Citron (2000)

03

“Sound portfolio management reflects the choices that are made after understanding project interactions relative to goals”

J. Howell & J. DuBois (2003)

Acknowledgment

The authors wish to acknowledge gratitude to Kuwait Oil Company (KOC) and Ministry of Oil for granting permission to publish a paper. The authors also like to extend appreciation to all associated teams.

Conclusions

Key achieved benefits

Consistency

1

Ensuring all prospects are assessed consistently before entering the prospect inventory

Strategic Fit

2

Ensuring prospects are ranked to reflect KOC strategic priorities and industry environment

Exploration Management

3

Giving the Exploration Management Team easy and flexible access to all the information they required to make the best decisions on where to allocate resources to across the exploration portfolio