

# Accelerated Green Asset Evaluation with DELFI

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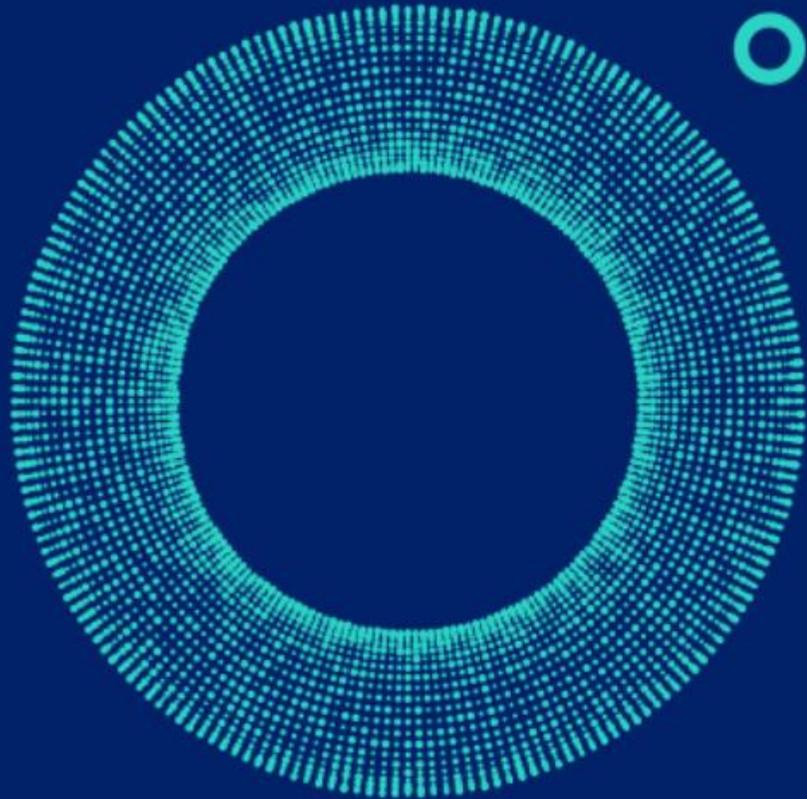
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## Accelerated Green Asset Evaluation with DELFI

### Background

- ❖ JERA, the world's biggest LNG buyer
- ❖ JERA Assets

### CaseStudy

- ❖ Project "Kraken"
- ❖ DELFI Accelerated Asset Evaluation

### Way Forward

- ❖ Current Deployment
- ❖ More Accelerated Evaluation

### Conclusion & Acknowledgement

# Background, JERA the world's biggest LNG buyer

## JERA = Japan's Energy for a new eRA

Before	MOU between TEPCO* <sup>1</sup> and Chubu Electric Power* <sup>2</sup> Alliance for entire value chain, upstream investment - power generation
Apr, 2015	JERA Established
After	Succeeding parent company's... <ul style="list-style-type: none"><li>- Upstream Assets</li><li>- Sales &amp; Procurement Agreements</li><li>- Fuel Transport &amp; Trading</li><li>- Fuel Receiving, Storage &amp; Gas export</li><li>- Thermal Power Generation</li><li>- New Venture Business</li></ul>

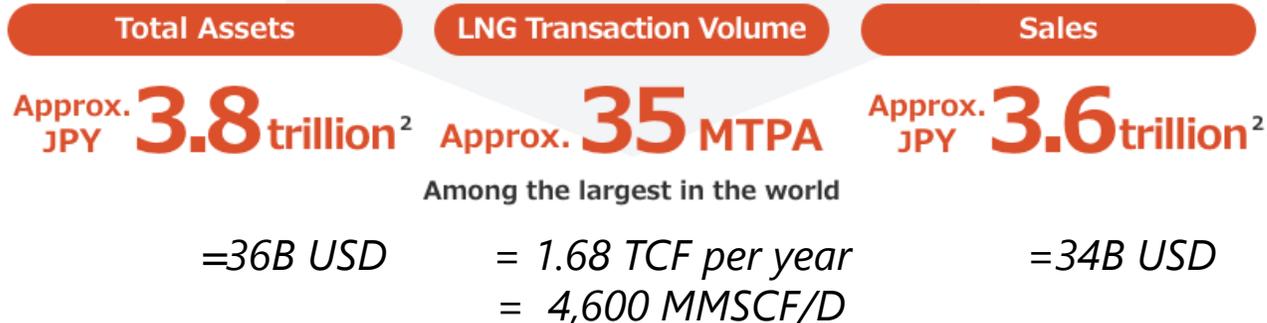


\*1 TEPCO; Japan, 1<sup>st</sup> Electric Power Company,  
Revenue= 57B USD

\*2 Chubu; Japan, 3<sup>rd</sup> Electric Power Company,  
Revenue= 27B USD

# Background, JERA the world's biggest LNG buyer

## JERA Value Chain



As of April 2019

<sup>1</sup>...Fiscal year ended March 2018   <sup>2</sup>... Estimate value for FY2019   <sup>3</sup>...Includes jointly operated terminals  
<sup>4</sup>...Includes capacity under construction   <sup>5</sup>...As of December 2018

### Fuel Trading



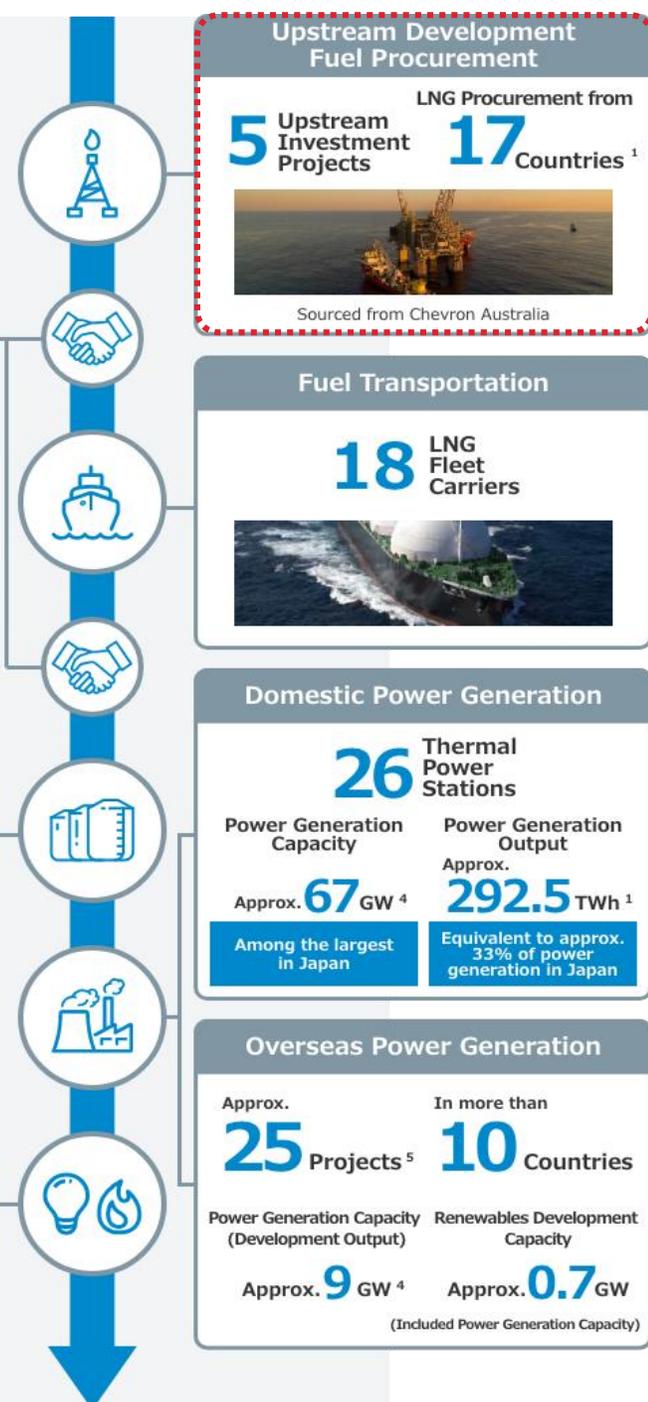
### LNG Receiving and Storage Terminals

LNG Tank Capacity in Japan  
**7.74** Million kL<sup>3</sup>  
Equivalent to approx. 40% of LNG tank capacity in Japan

**8** LNG Receiving Terminals in Japan<sup>3</sup>



### Electricity and Gas Sales

# Background, JERA the world's biggest LNG buyer



Ichthys LNG Project  
Australia



Wheatstone LNG Project  
Australia



Gorgon LNG Project  
Australia



Darwin LNG Project  
Australia & East Timor



What's Next?

## JERA Investment Assets (from Austrasia area only)

- ✓ *Looking for new Green Field Assets...*
- ✓ *Need accelerated evaluation scheme...*

# CaseStudy

# CaseStudy; Project Kraken

Age (Ma)	Period	Epoch	Stage	North Carnarvon Basin phases	Exmouth Plateau
190	Jurassic	Early	Pliensbachian	Pre-rift active margin	Murat Siltstone
			Sinemurian		
200			Hettangian		
	Triassic	Late	Rhaetian		Brigadier Formation
210			Norian		Mungaroo Formation
220			Carian		
230			Ladinian		
240			Anisian		
	Middle	Early	Olenekian		
			Induan		
250			Changhsingian		

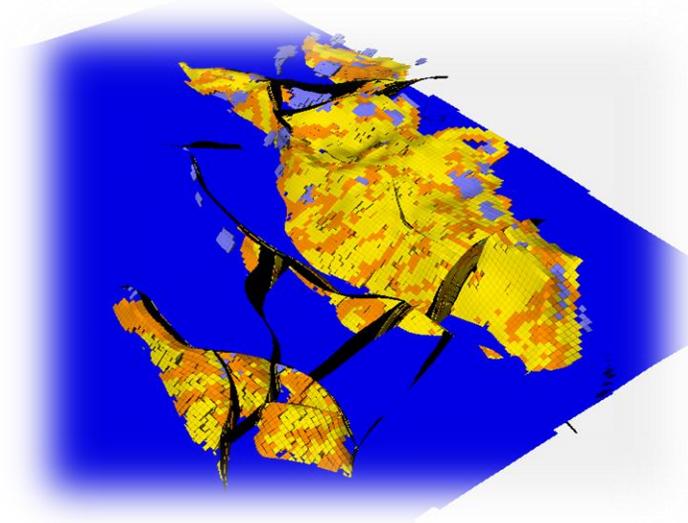
## Kraken Field General Information

Late Triassic Fluvial Gas Sand Reservoir

Main&West Block, Fault segmented, Fractured, Water Drive

- ✓ Full 3D Seismic Coverage
- ✓ 7 Appraisal wells
- ✓ Core from 4wells
- ✓ DST for 3wells
- ✓ Porosity; Approx. 10%
- ✓ Permeability; 1mD – D
- ✓ CO2: 10%, Low CGR

GIIP; 7.0 TCF  
EUR; 4.6 TCF

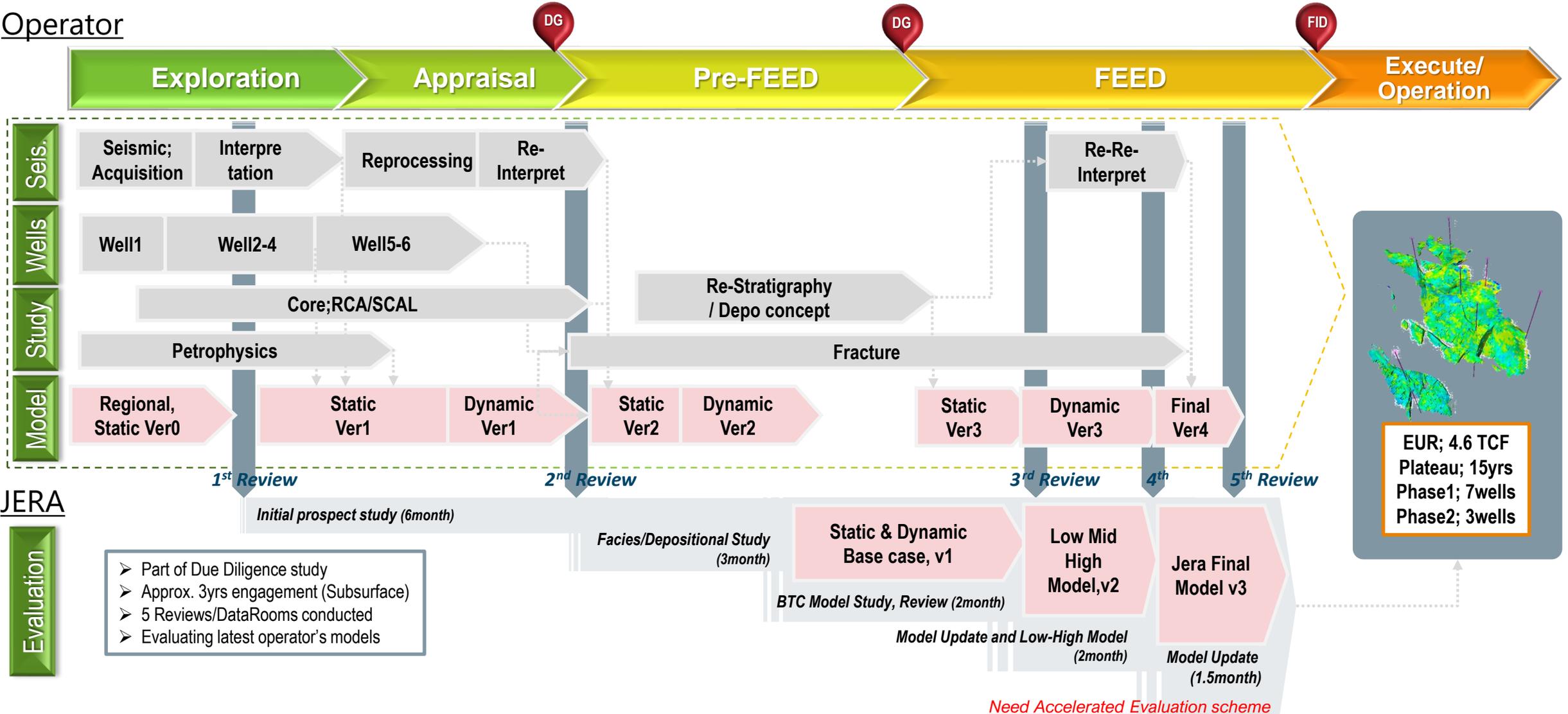


\*Remark, "Kraken" is hypothetical field.

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# Project Kraken, Asset Evaluation Timeline

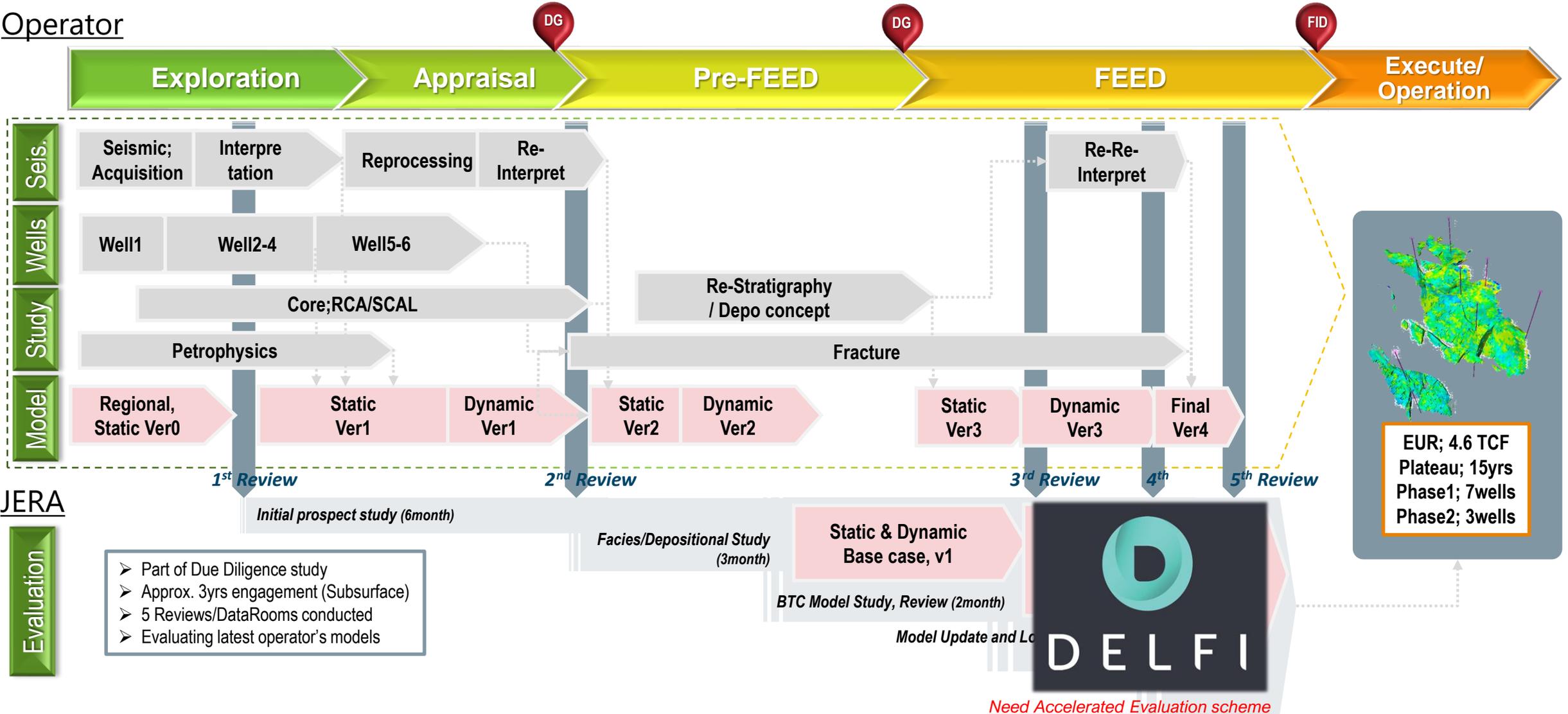
Operator



- Part of Due Diligence study
- Approx. 3yrs engagement (Subsurface)
- 5 Reviews/DataRooms conducted
- Evaluating latest operator's models

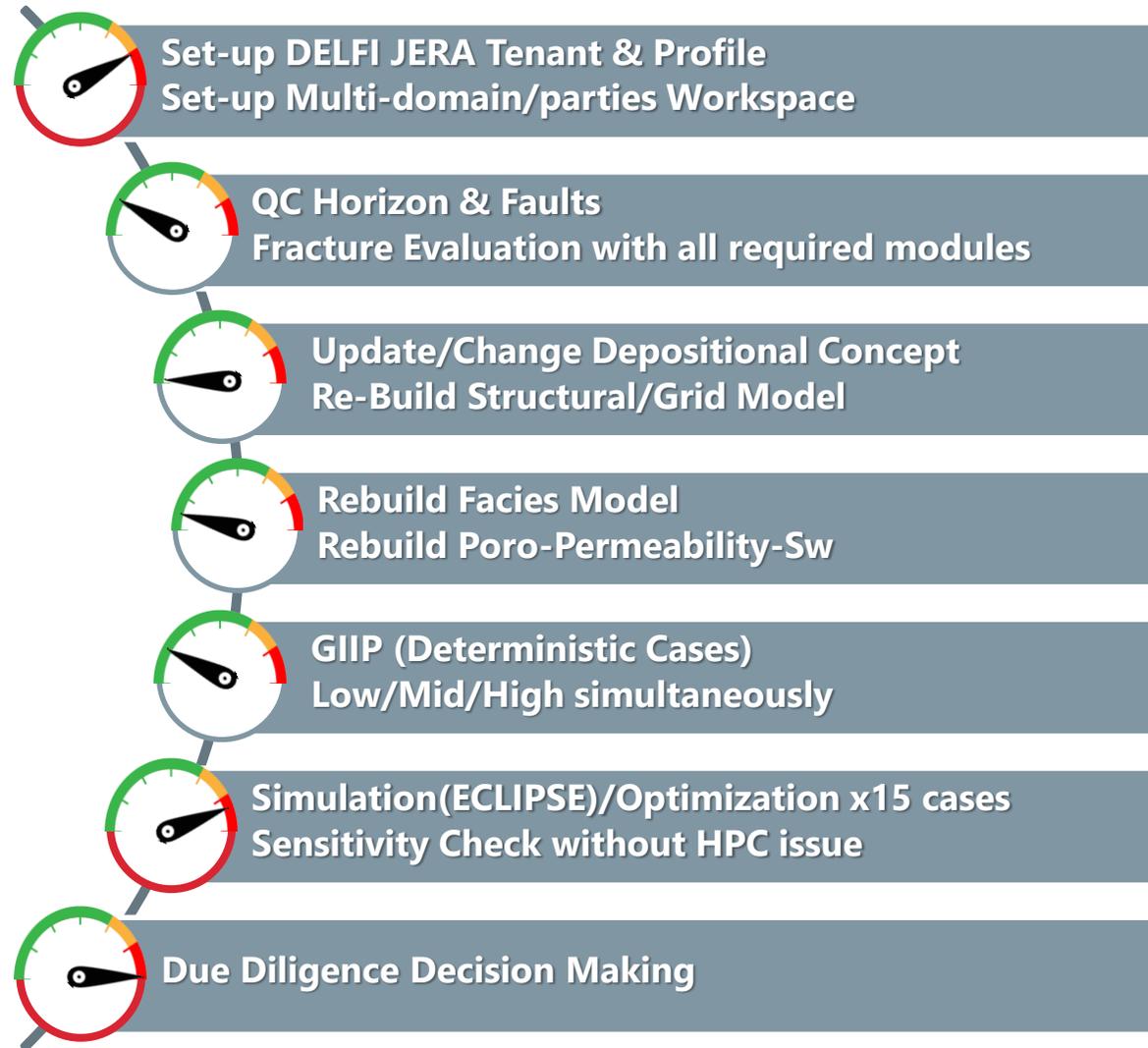
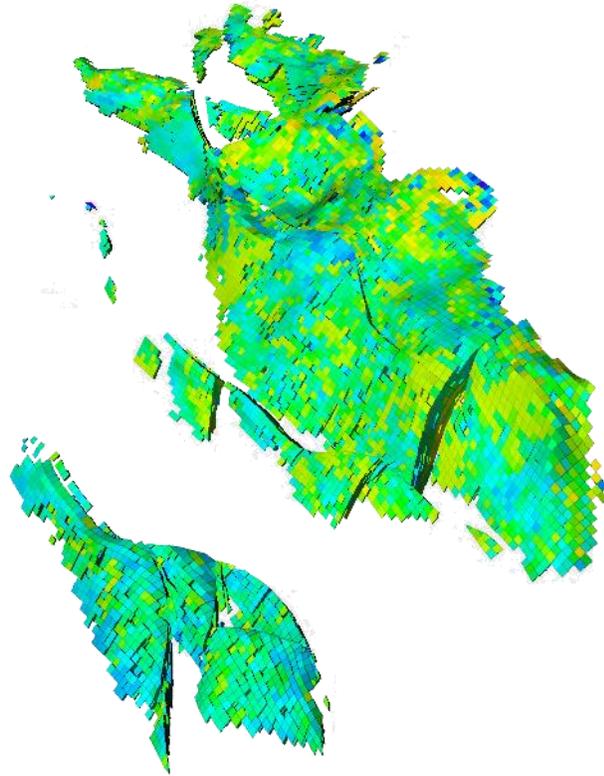
# Project Kraken, Asset Evaluation Timeline with

Operator

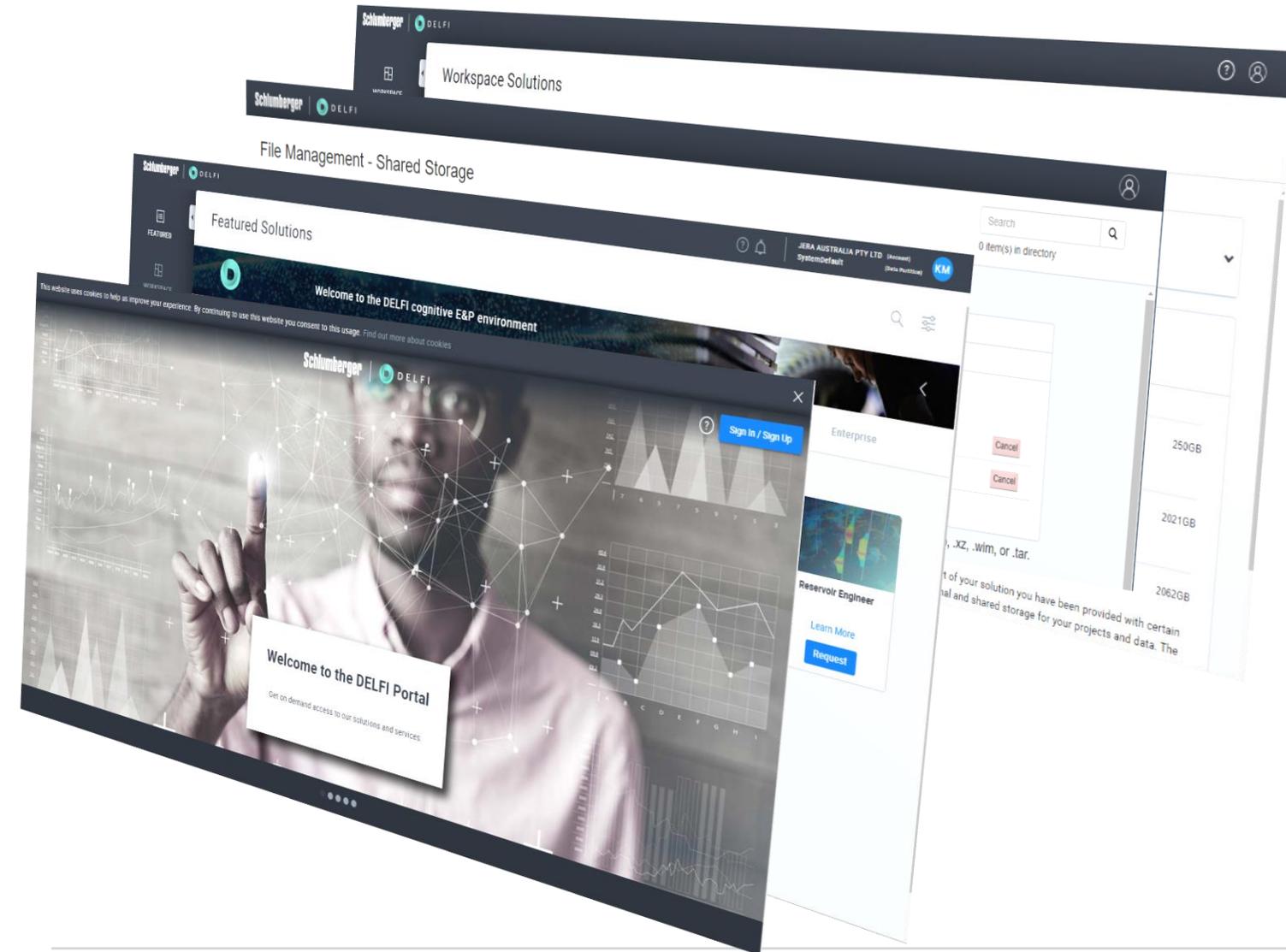




## Accelerated Evaluation Workflow with DELFI



# Project Kraken, Accelerated Evaluation with



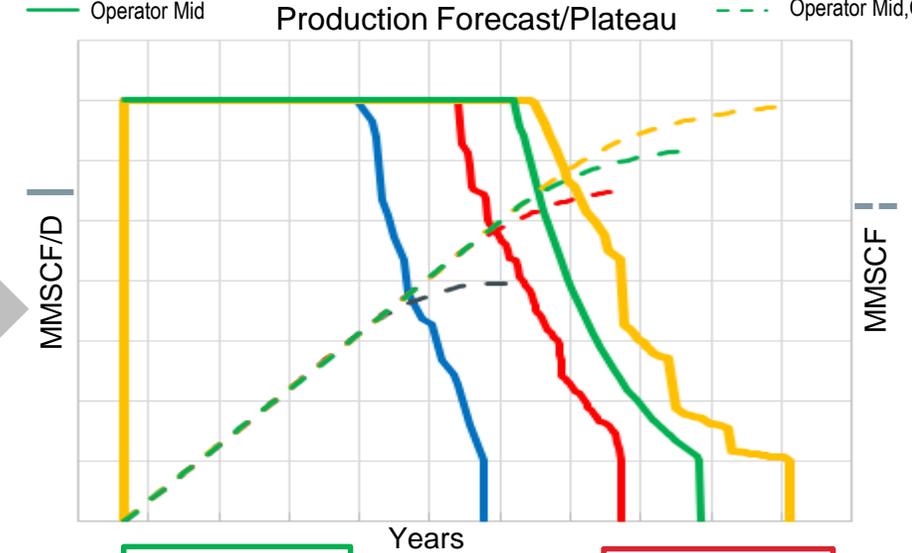
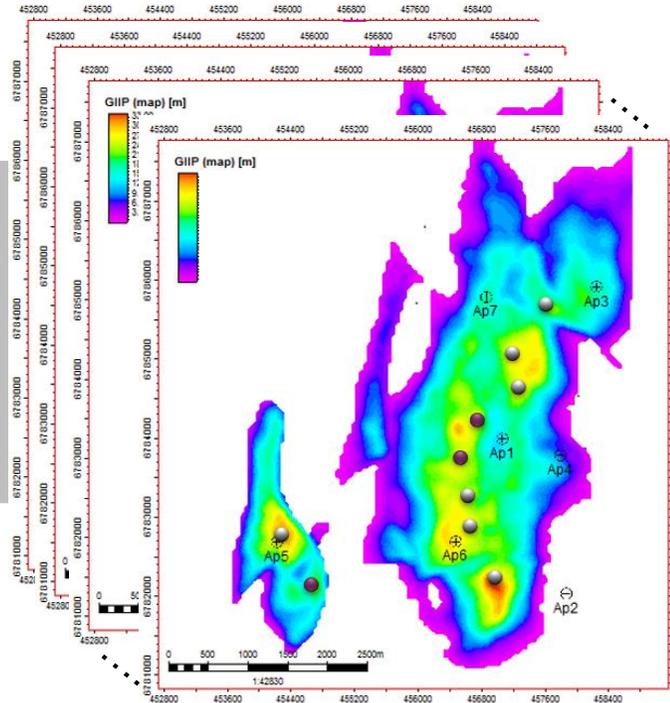
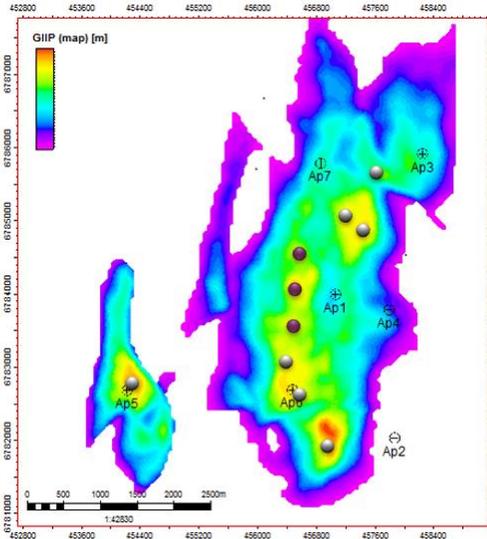
## Accelerated Asset Evaluation Start-Up with DELFI

- ❖ Proof-Of-Concept Agreement
  - 1<sup>st</sup> commercial use of DELFI in Australia
- ❖ JERA Tenant/Workspace Set-Up
  - JERA Users & SLB Experts Accounts
- ❖ Data Uploading to DELFI Storage
  - Project Files(Petrel, ECLIPSE)
  - Data & Report (Incl. PDF, PPT, Excels...)

*Accelerated Accessibility & Collaboration*



## Accelerated Evaluation with DELFI Optimization



**EUR; 4.6 TCF  
Plateau; 15yrs  
Phase1; 7wells  
Phase2; 3wells**

**JERA; 4.1 TCF  
Plateau; 13yrs  
Phase1; 7wells  
Phase2; 3wells**

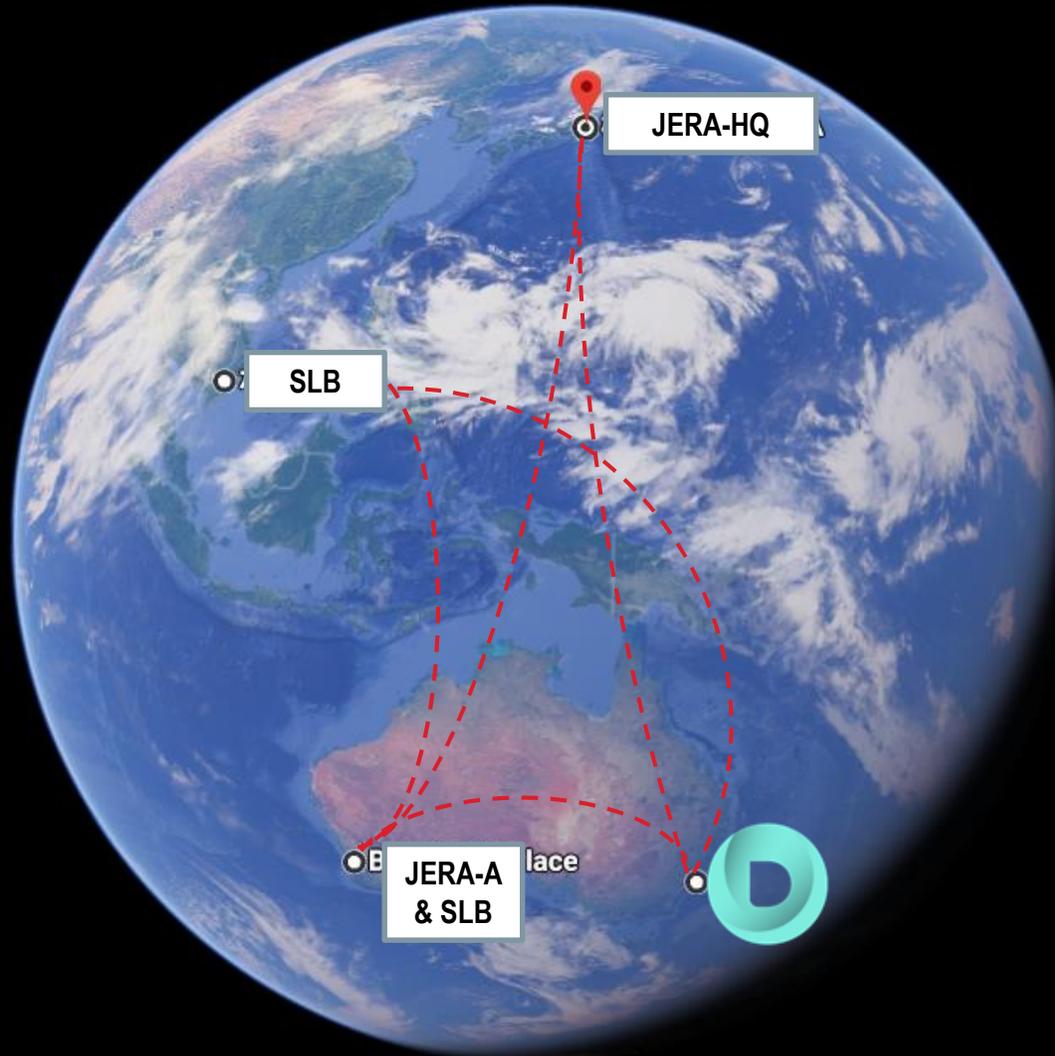
### ❖ 15 ECLIPSE Runs

- Sensitivity Check, Multiples runs w Low/Mid/High Scenario
- Well Location Optimization Algorithm Applied for EUR/Plateau/EOFL\*

*Accelerated Scalability, Productivity*

\*More technical/workflow detail will be explained in EAGE Workshop on Faster Subsurface Characterisation 2019, Nov, Perth, Australia

# Project Kraken, Accelerated Evaluation with



## Accelerated Decision Making in DELFI Cloud

### JERA HQ(Tokyo) – Decision Making Hub

- ❖ Due Diligence main decision making hub
- ❖ Supervising subsurface study
- ❖ Monitor the progress in Perth & DELFI-Sydney

### JERA-A & SLB Perth – Subsurface Evaluation Hub

- ❖ Physical subsurface review(DataRoom, discussions...)
- ❖ Sent the DELFI job, Report to HQ

### SLB@Vietnam - Subsurface Working Hub

- ❖ Sent the DELFI job, Report to Perth Hub



# The Way Forward



# The Way Forward, Current Deployment

## Workspace Solutions

### Projects



Ichthys LNG Project  
Australia



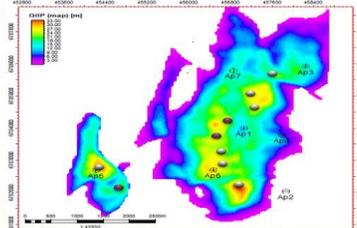
Wheatstone LNG Project  
Australia



Gorgon LNG Project  
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Darwin LNG Project  
Australia & East Timor



Project Kraken



Another Green Field

### On Going Deployment(Outside of DELFI)



Production Reports

Production Data Management System

# The Way Forward



ExplorePlan



FDPlan



CorporatePlan

Existing JERA DELFI Environment

Sullys LNG Project Australia

Wabulstone LNG Project Australia

Gorgon LNG Project Australia

Darwin LNG Project Australia & East Timor

Project Kraken

Another Green Field

Power BI

Avocet

Production Reports

Production Data Management System

## Virtual Data Room

Global access

Trusted software—quick and easy set up and management

Security and confidentiality

*More Accelerated Environment,  
Multidiscipline Collaboration & Decision Making*

# Conclusion

## Accelerated Green Asset Evaluation with DELFI

### Background

- ❖ JERA, the world's biggest LNG buyer
  - > Upstream Investment - Power Generation Value Chain
- ❖ JERA Assets
  - > Look for new Green Assets & Need Accelerated Evaluation scheme

### CaseStudy

- ❖ Project “Kraken”
  - > PoC DELFI, 1<sup>st</sup> Commercial Use of DELFI in Australia
- ❖ DELFI Accelerated Asset Evaluation
  - > Accessibility, Collaboration, Scalability, Productivity & Decision Support

### Way Forward

- ❖ Current Deployment
  - > DELFI + Avocet/PowerBI
- ❖ More Accelerated Evaluation
  - > Accelerated Multidiscipline Collaboration & Decision Making

# Acknowledgments

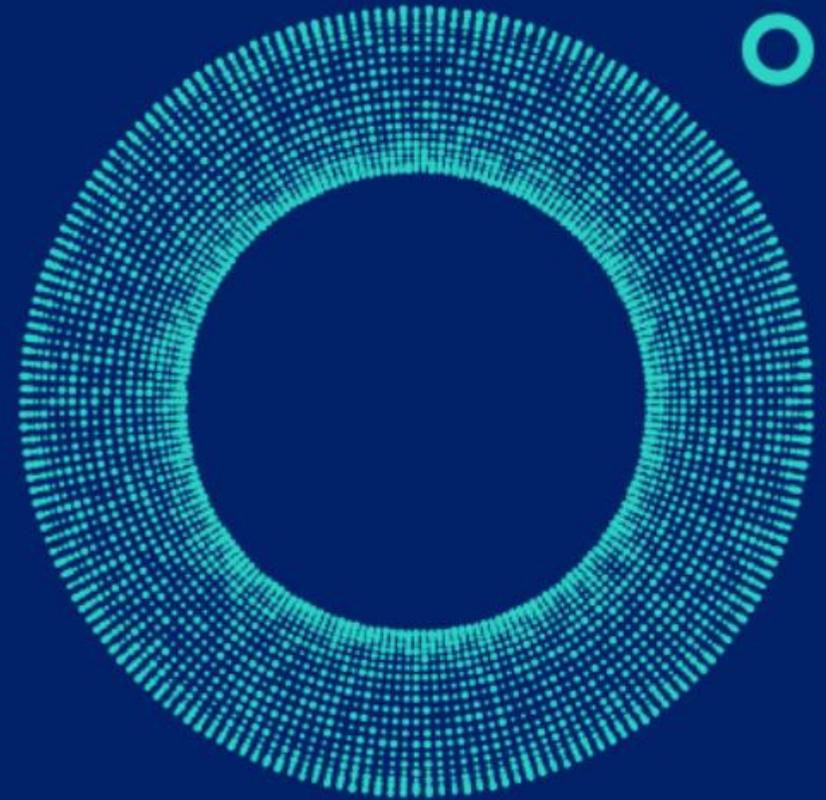
## “Accelerated Green Asset Evaluation with DELFI”

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