

Investor Day Cairn Oil & Gas

August, 2019



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Agenda

Vision

Technology & Innovation

Producing Blocks: Onshore & Offshore

Exploration Blocks: OALP & PSC

Organization Design & People

Sustainability



Safety accountability:

Building confidence amongst workforce to “Stop Unsafe work” and “Refuse to work, if unsafe”, strengthened with consequence management policy.



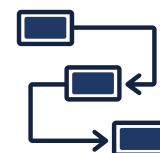
HSEQ assurance:

Increased Visible Felt Leadership at Site



Strengthening Safety culture:

Infield awareness & Training sessions to improve HSEQ Performance, lateral learning of safety alerts recommendations.



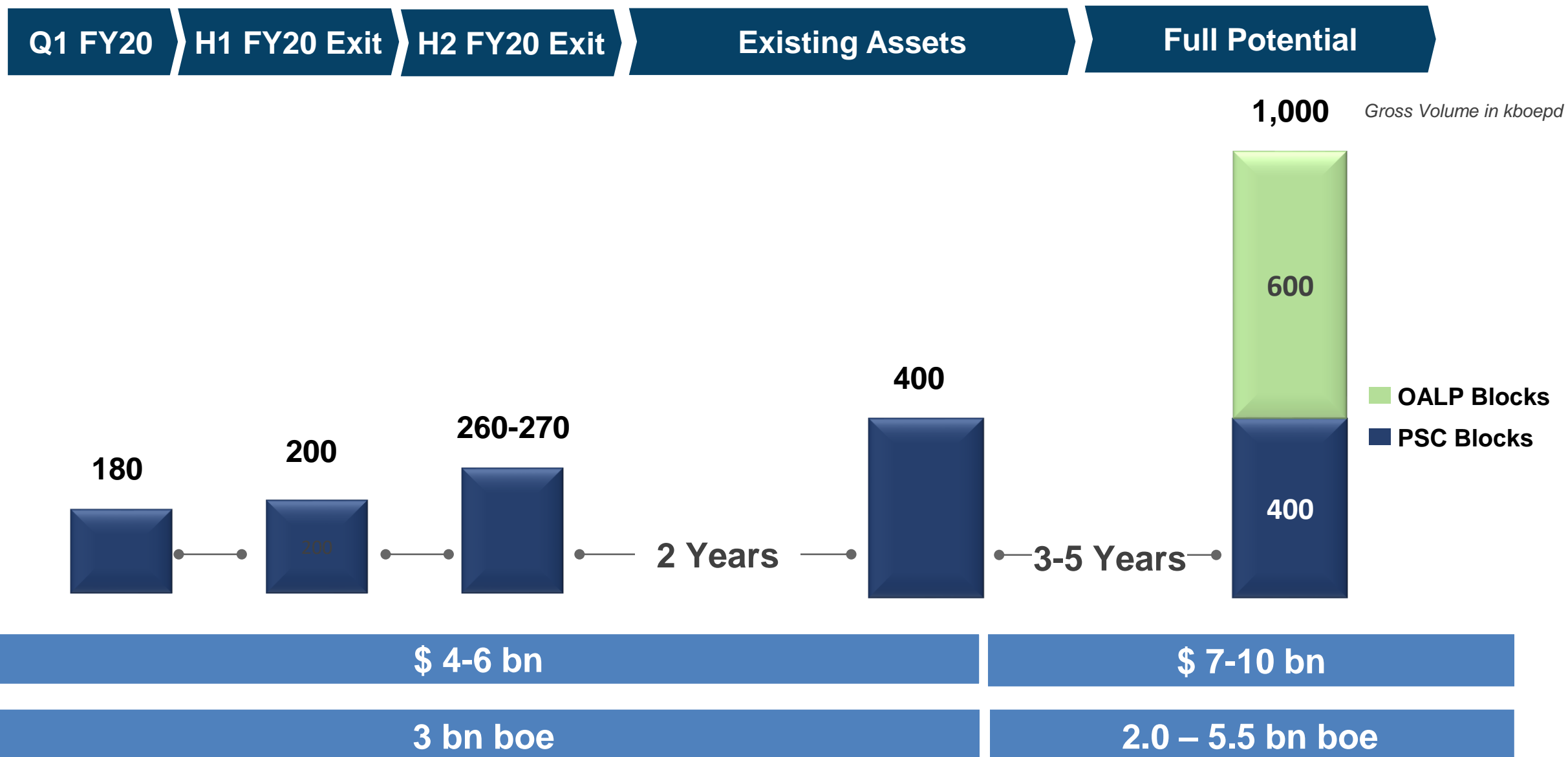
HSEQ Risk Management Process: Focus on safety Critical task and safety critical Risks



Sustainability:

Waste to Fuel - Establish real-time disposal of Oil based drill cutting waste to cement industry.

99 % of produce water treat & recycle back into system for injection

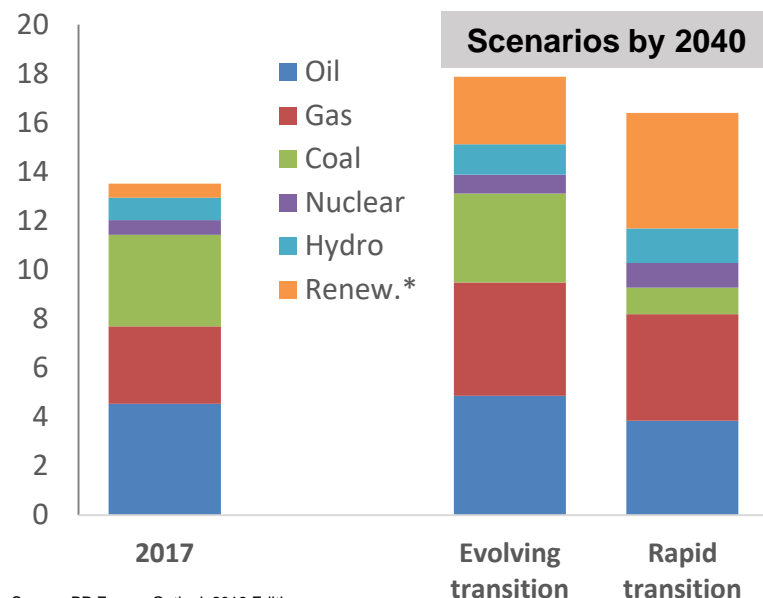


Contribute over 50% of India's Oil Production

- Vision** → Produce 50% of India's domestic crude oil
- Portfolio** → Blocks in proven petroleum basins across India (Onshore & Offshore) to accelerate Reserve & Resource accretion:
 - PSC Blocks : Increase from 1.2 bn boe to 3.0 bn boe through EOR and Exploration
 - OALP: Discover 2.0 - 5.5 bn boe from 51 OALP blocks
- Volume** → Exit at 260-270 kboepd by March 2020 and ramp-up beyond 400 kboepd in ~ 2 years
- Capex** → Investment of \$ 3.2 bn already committed with IRR >20% at \$ 40/bbl
- Cost** → Operating cost at ~ \$ 7.5 boe; top quartile globally
- People** → Highly experienced & diversified global talent pool; integrated project management
- Technology** → Cutting edge technology & Digitalization to foster incremental value accretion
- Sustainability** → Zero Harm, Zero Waste & Zero Discharge; Inclusive development of communities

Oil to remain key energy fuel

Primary energy consumption by fuel (Billion Toe)

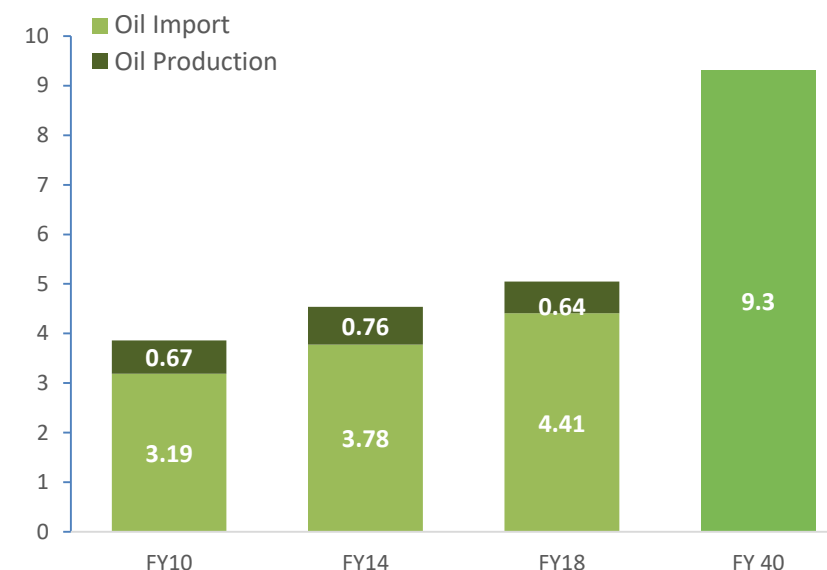


Source: BP Energy Outlook 2019 Edition

- All scenarios suggest Oil to be a significant energy source
- Demand b/w 80-130 mn bbl/d
- Significant investments are required to meet demand

India to lead Global consumption growth

Import and domestic oil production in India (mbpd)



Source: Ministry of Petroleum and Natural Gas, BP Statistical Review 2018, Aranca Research

- India's crude oil demand is expected to double by 2040
- Rapidly growing consumption and high import dependence necessitates need capex investment in O&G

Indian Hydrocarbon Potential

India has vast untapped potential of hydrocarbon resources

Prognosticated resources of 307 bn bbl, of which ~71% is yet to be discovered

Of the 26 sedimentary Basins only 7 produce hydrocarbons at present

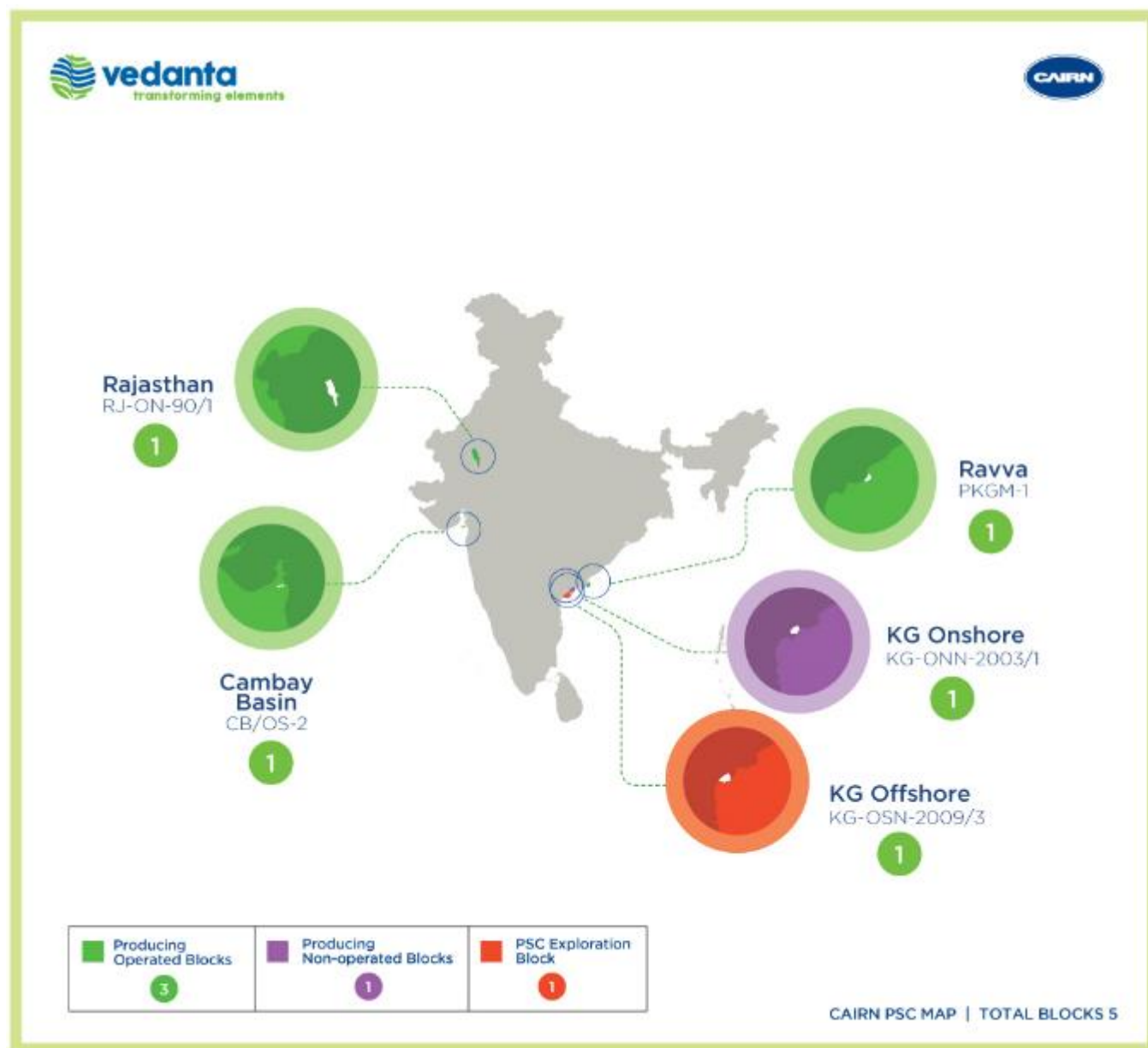
Favorable Government Policies

Open Acreage Licensing Policy (OALP)

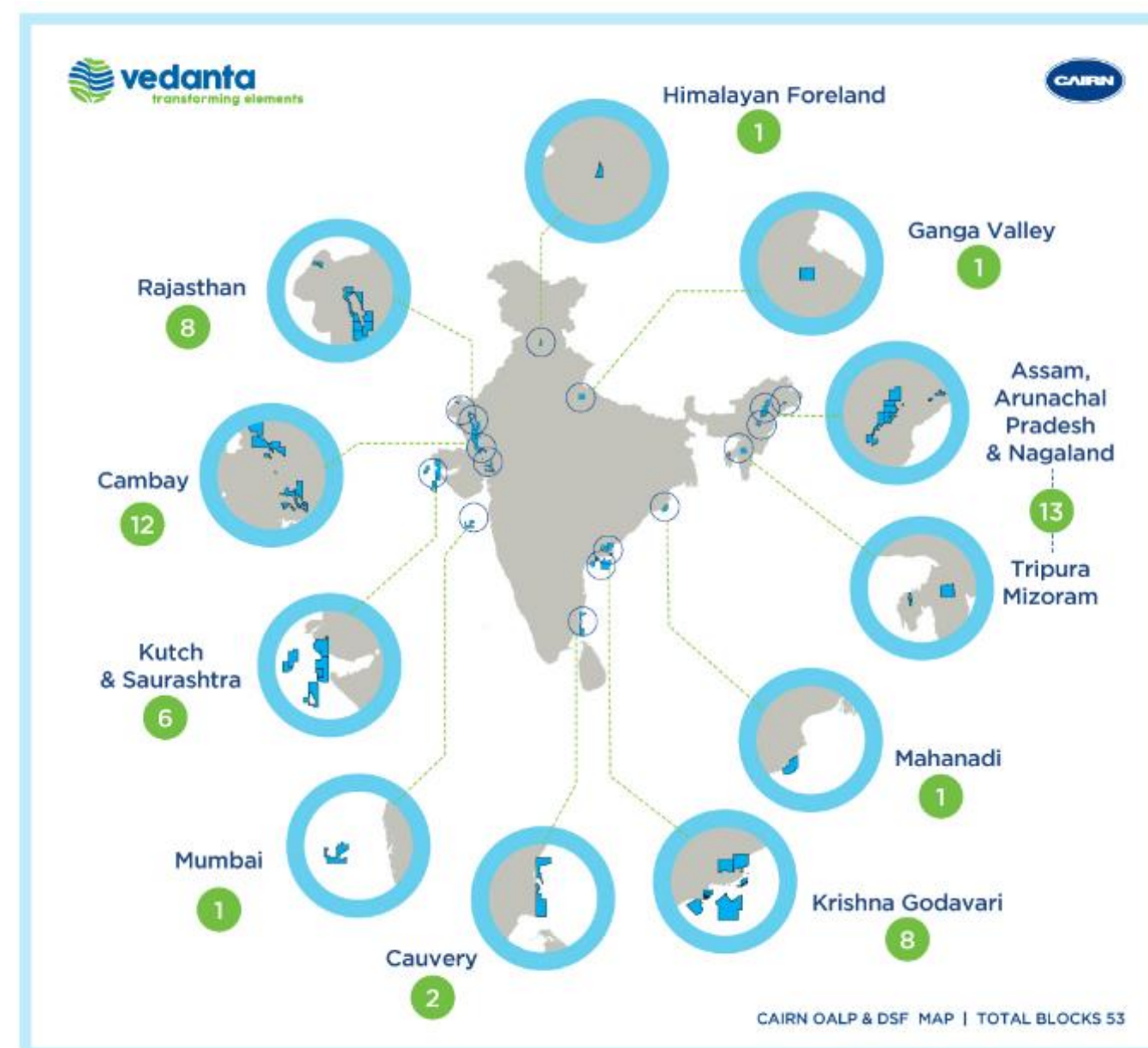
Incentive for Enhanced Recovery methods

Discovered Small Fields (DSF) policy

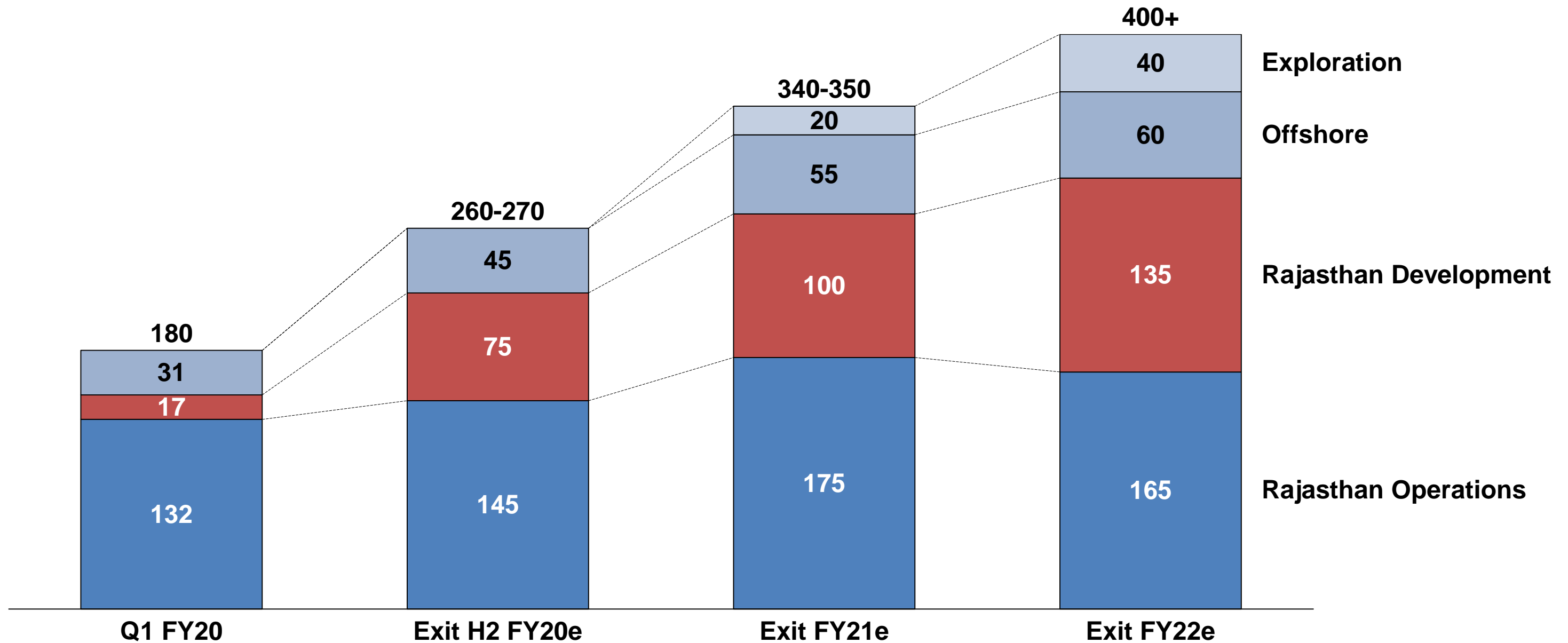
PSC Blocks



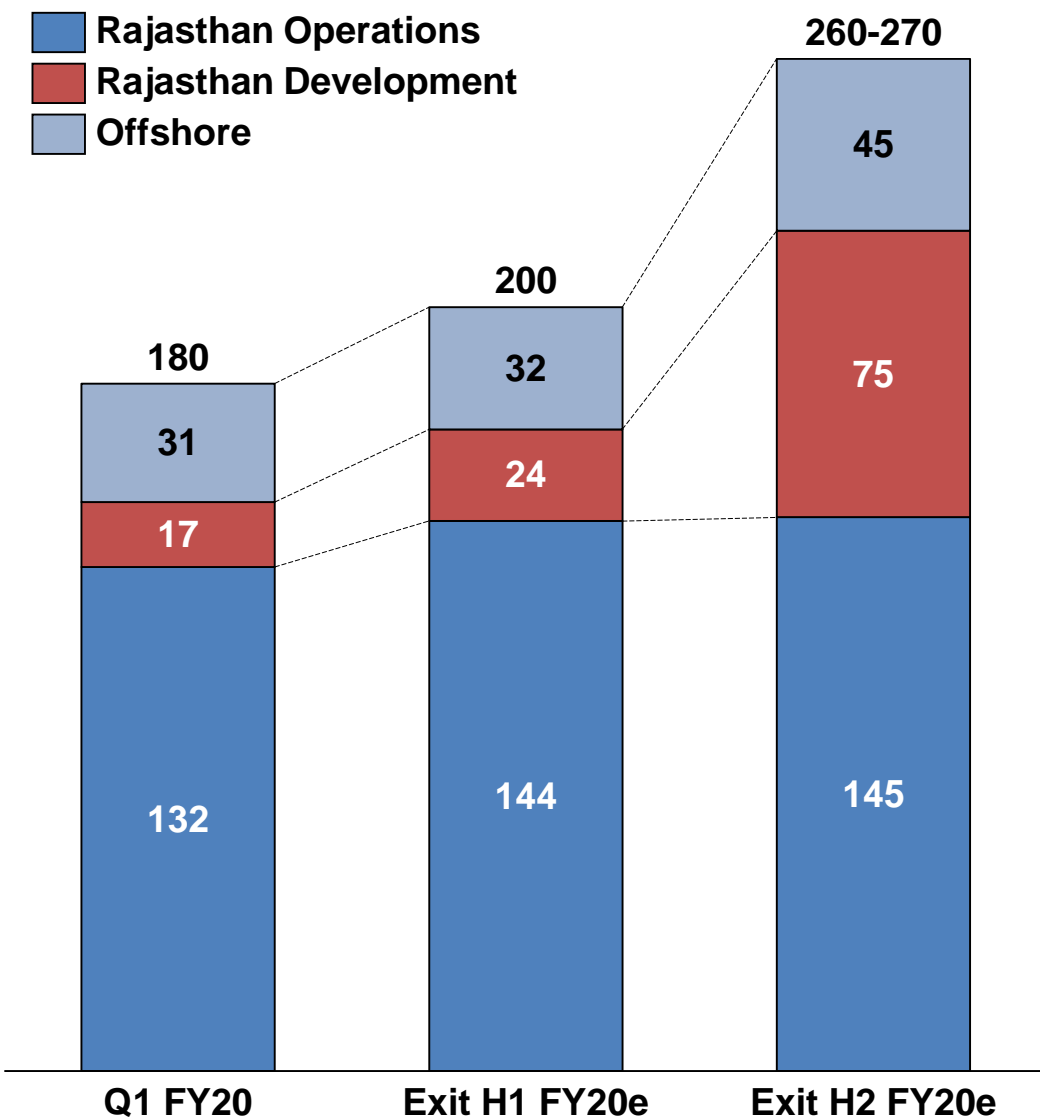
OALP & DSF Blocks



13x Acreage increase from 5,000 sq. km. to 65,000 sq. km. spread across basins in India



Significant increase in production from the Current Producing Blocks



	<u>Impact</u>	<u>Initiatives</u>
Offshore	14 k	<ul style="list-style-type: none"> ○ Ravva Infill Drilling ○ Well intervention to sustain base production
Rajasthan Development	30 k 15 k 13 k	<ul style="list-style-type: none"> ○ MBA Polymer, Infill wells & ASP ○ Aishwariya Barmer Hill ○ RDG terminal & pipeline infrastructure
Rajasthan Operations	7 k 6 k	<ul style="list-style-type: none"> ○ RDG Early production facility up-gradation ○ Mangala Liquid Handling Up-gradation & Asset Integrity Management partly offset by natural field decline

Change H2 vs Q1

Wells Drilled
139 to 250

Wells Hooked Up
46 to 185

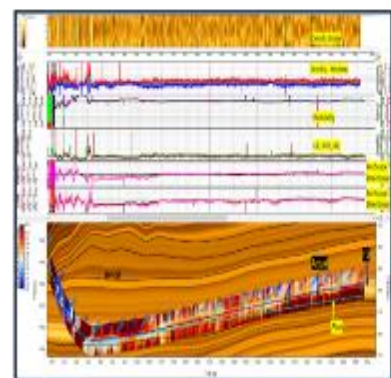
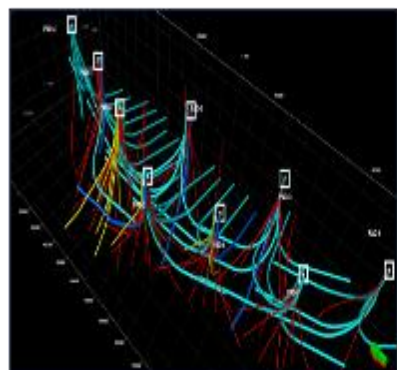
Liquid Handling Capacity
1.1 to > 1.3 mmbld

Gas Processing Capacity
84 to 240 mmscfd

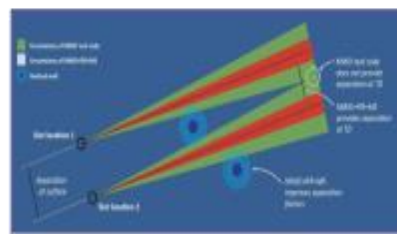
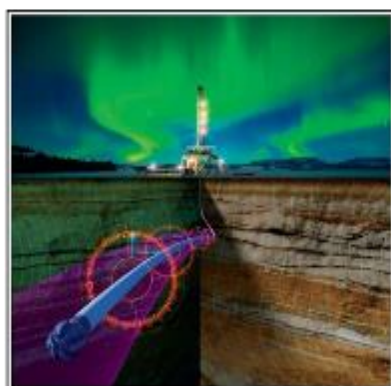




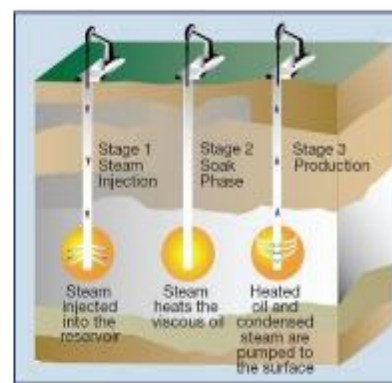
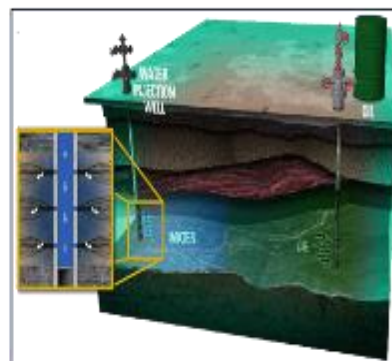
Well Placement in Low Permeability Reservoir



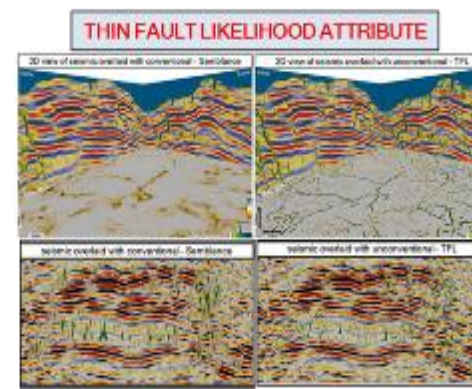
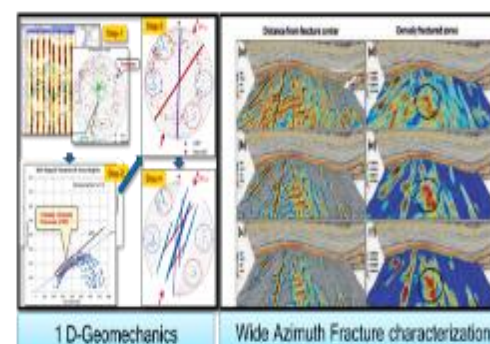
In Field Magnetic Reference



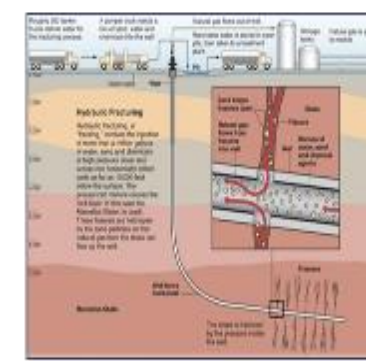
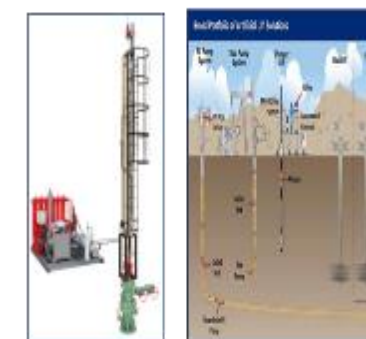
Secondary & Tertiary Recovery Techniques



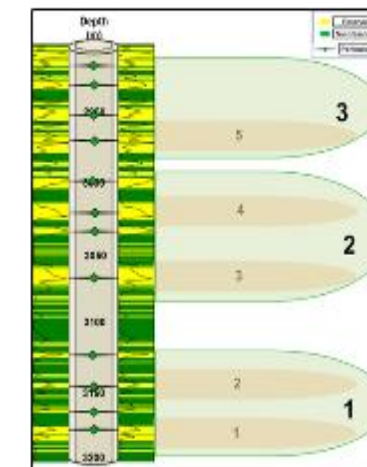
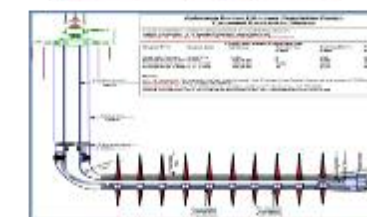
Advance Reservoir Characterization



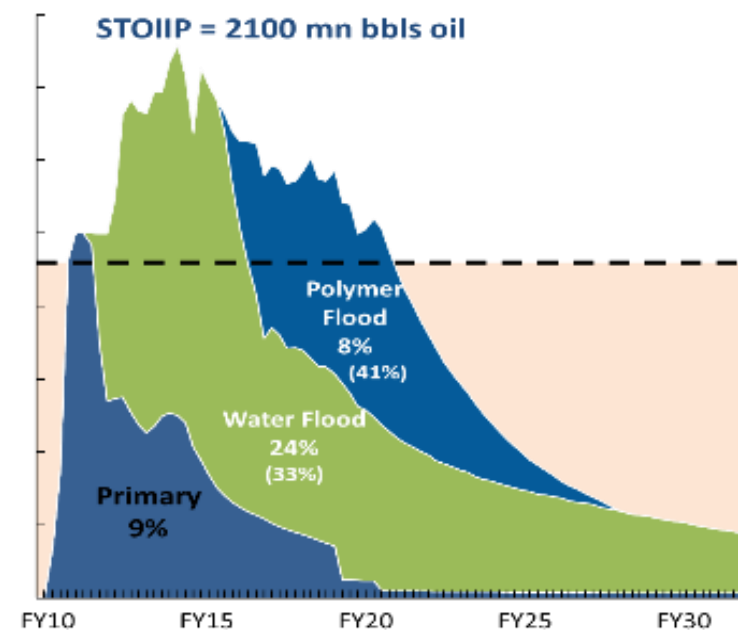
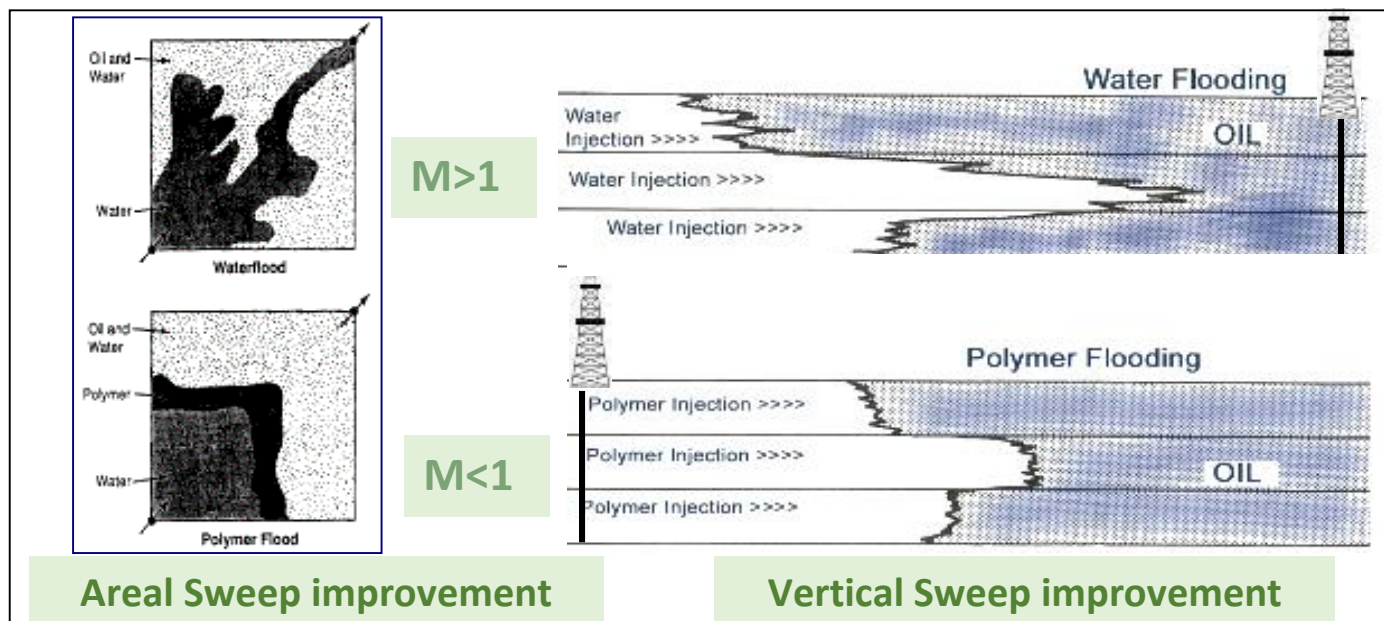
Artificial Lift Systems



Limited Entry Frac Technique & Broadband precision

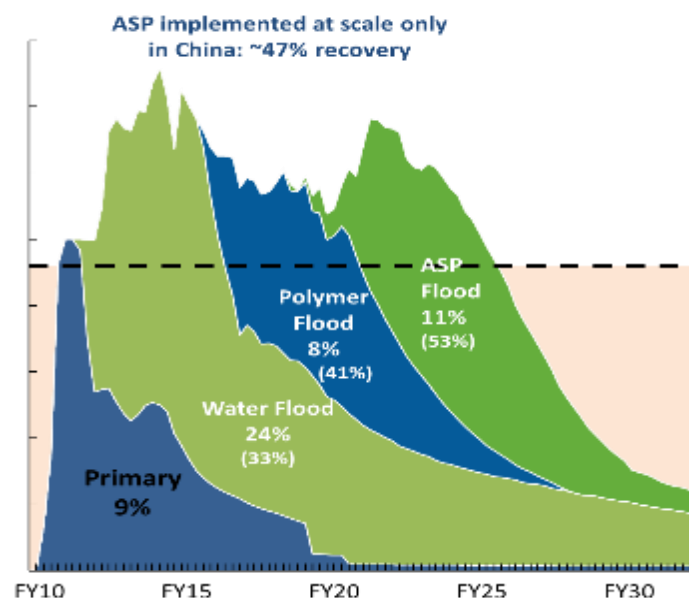
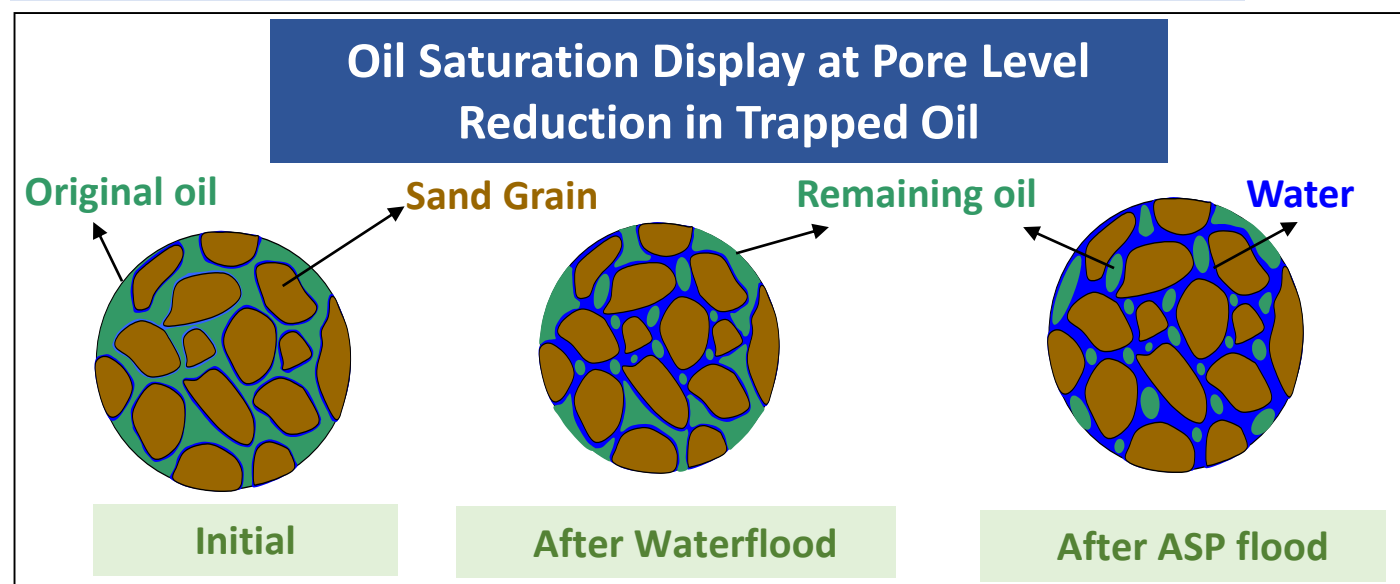


EOR Polymer: Improved sweep efficiency



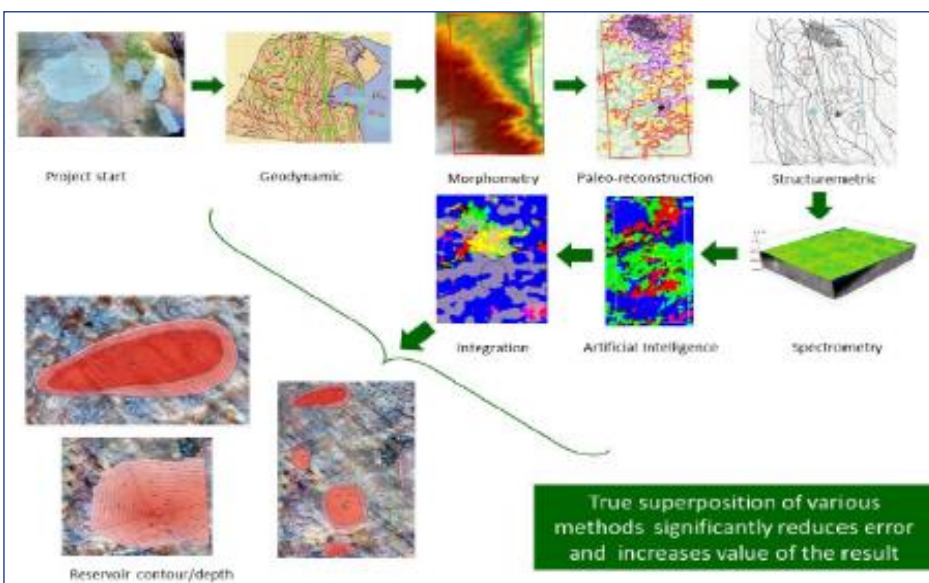
- EOR Polymer Successfully Implemented in Mangala
- Replicating the success in Bhagyam & Aishwariya Fields
- World's largest Centralised Polymer Mixing Facility with a capacity of 1,00,000 blpd mother solution

EOR ASP: Improved displacement efficiency



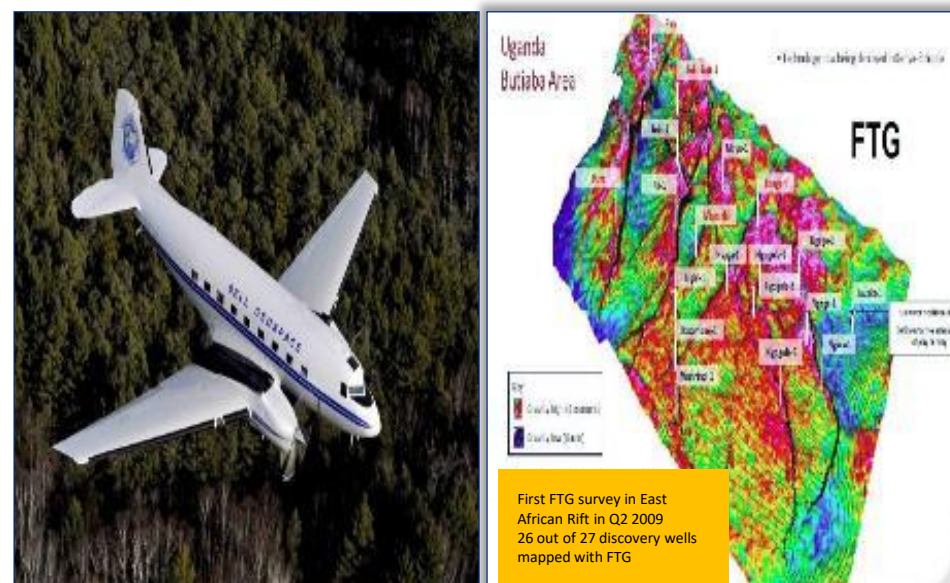
- World's largest ASP Project being implemented in MBA Fields
- EOR Policy provides 50% reduction in Cess

Satellite Based EM Technology



- Allows **early detection** & areas of prioritization of other surveys
- **Independent of the terrain** access, weather windows
- **Reduces project time**

Airborne FTG Survey

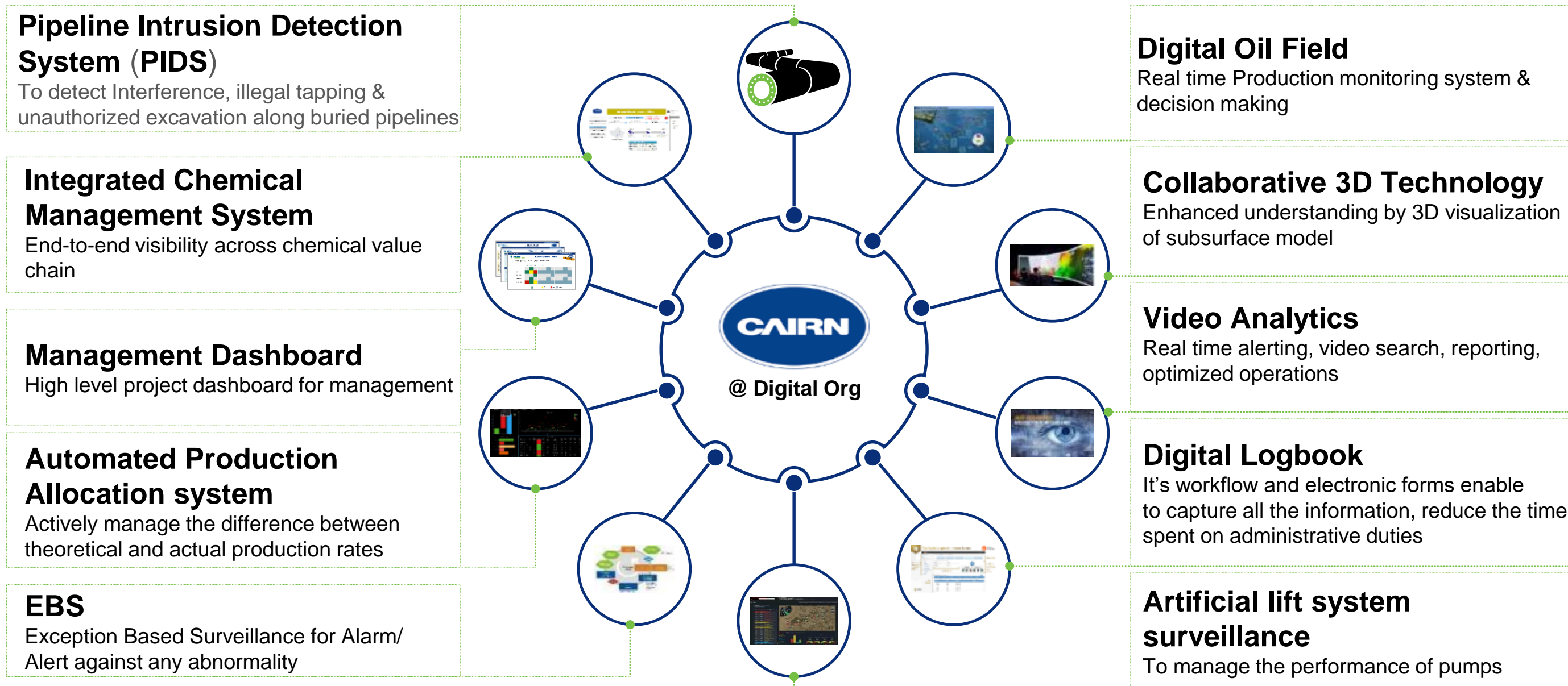


- **Provides early sub-surface** data in 3-4 weeks time
- **Reduction of data acquisition time**
- **Covers inaccessible & difficult terrain**

Cable less Seismic Survey



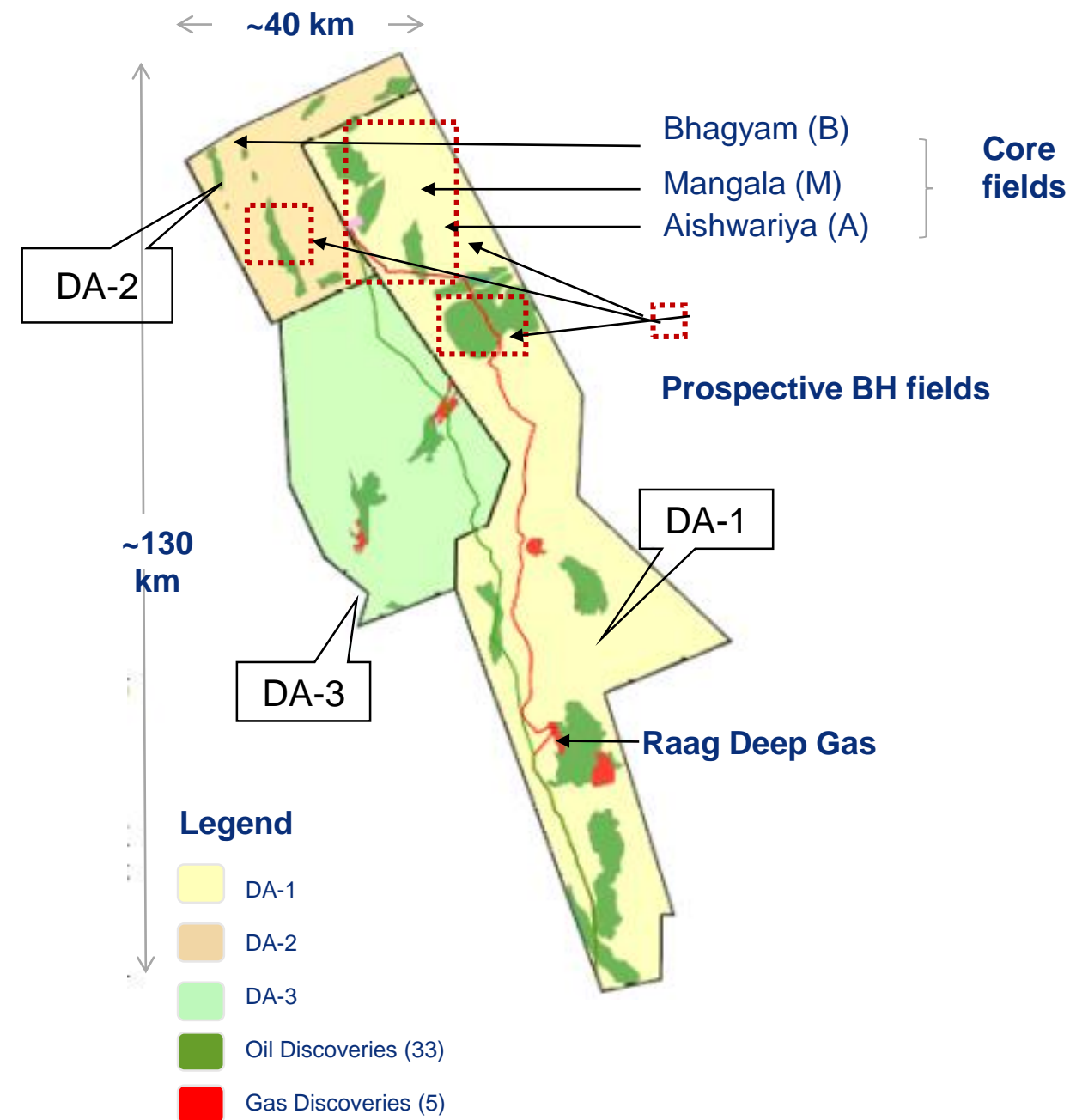
- **Flexibility to deploy** across roads, rivers & environmentally sensitive areas
- **Higher productivity** with no downtime for cable repairs
- **Reduced crew & transportation cost**

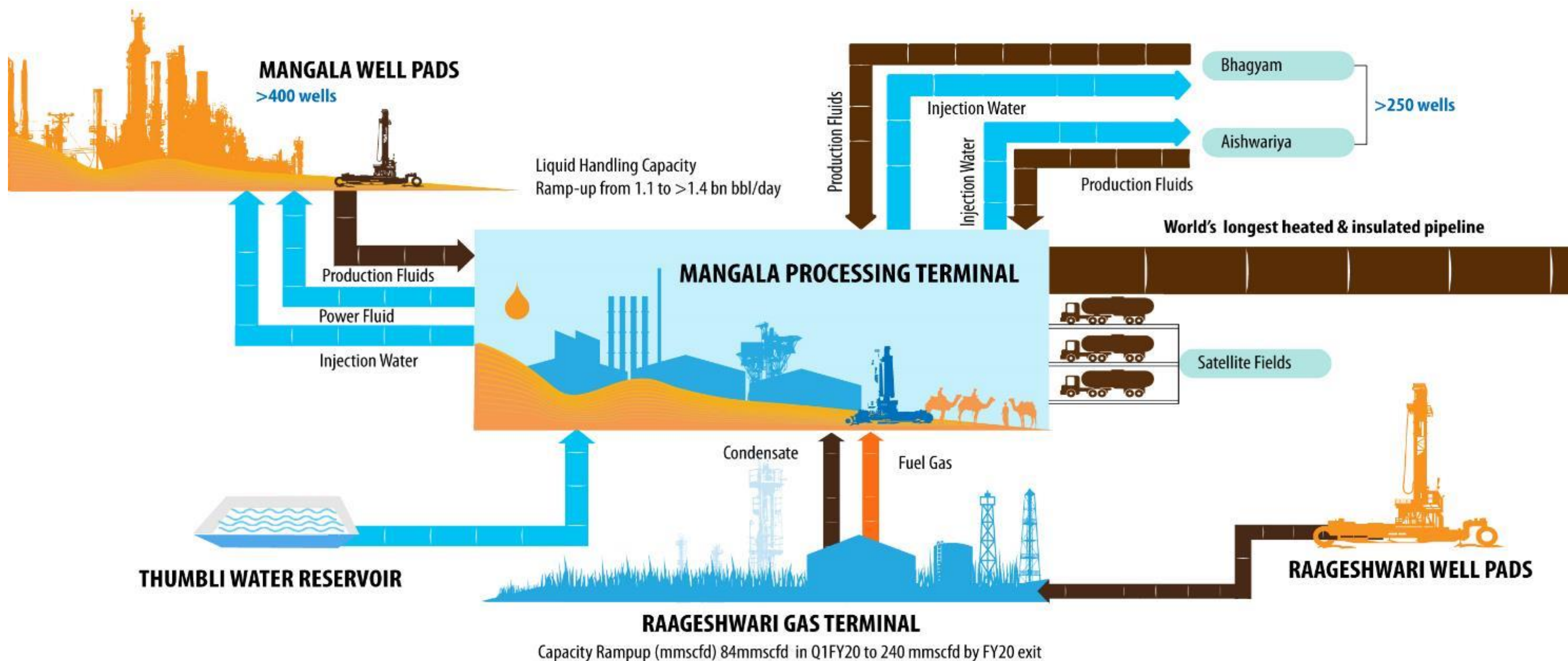


Producing Blocks: Onshore (Rajasthan)



- Spread over 3,111 square km in Barmer, Rajasthan
- 7 Hydrocarbon bearing Reservoir Systems
- 38 discoveries till date across Reservoir Systems
- Liquid Handling capacity of >1.1bn barrels
- > 500 producer and injector wells
- > 500 million barrels produced till date
- > 1bn boe of reserves & resources (2P + 2C)
- Top quartile operating cost globally at ~7.5 \$/bbl
- Technology:
 - World's longest heated & insulated pipeline (~700 kms)
 - World's largest polymer flood project





Leveraging the world class processing facilities for growth projects

Area: 1.6 sq. Kms (400 acres)

Crude Oil Sales to: IOCL, BPCL, MRPL, RIL, Nayara

Three processing trains: >1 MMbbls liquid per day

Oil Storage Capacity: 488,000 bbls

- 4 Export Tanks, capacity 122,000 bbls/tank

Water injection Capacity: 826,000 bwpd

- 8 injection pumps each of capacity 118,000 BWPD
- 5 Power Fluid pumps each of capacity 81,000 BWPD

Secure Landfill: Hazardous & Non-Hazardous

Steam Boilers: 805 TPH

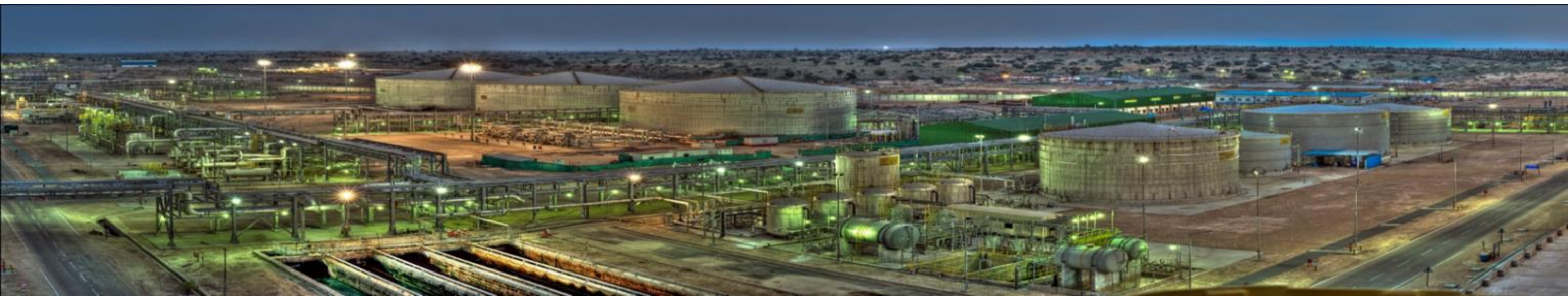
- 7 boilers each of capacity 115 TPH
- HP steam for power generation
- MP steam for process heat
- LP steam for other utilities

Captive power STG: 60 MW

- 5 STG each of capacity 12 MW

Grid Power: 100 MW Infrastructure

- Current sanctioned demand – 52 MVA



Adds incremental production of over 125 kbopd at peak

Mangala, Bhagyam & Aishwariya (MBA) fields:
- India's largest onshore discoveries

HIIP

2,156 mmbbls

Produced Till Date

496 mmbbls*

Reserves + Resources (2P+2C)

641 mmbbls

23%

+

30%

Total HIIP in MBA – 2.2 Billion boe



Project Snapshot

MBA Infill & Polymer

Partner	Activity	Gross Capex (\$ Million)	EUR (mmbbls)	Peak Production (kboepd)
Halliburton	87 Wells & Facilities	240	58	30
		Till FY19	FY20	FY21 & Beyond
	Wells			
	Drilling	66	21	-
	Hook Up	32	55	-

MBA ASP

Partner	Activity	Gross Capex (\$ Million)	EUR (mmbbls)	Peak Production (kboepd)
BH-GE	Wells (143-286)	1,200	200	95
Under Award	Facilities			
		Till FY19	FY20	FY21 & Beyond
	Drilling	7	56	80-223
	Hook Up	1	21	121-264

* Till March 2019

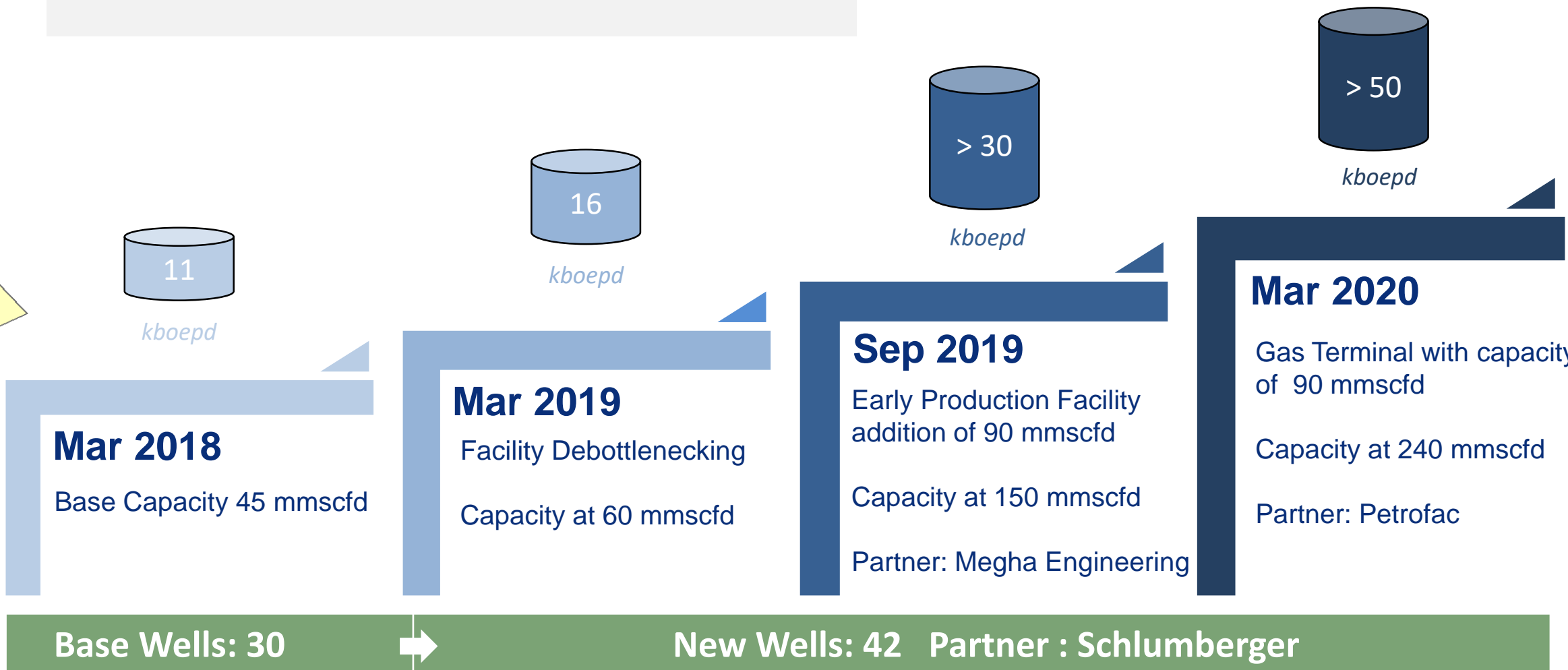
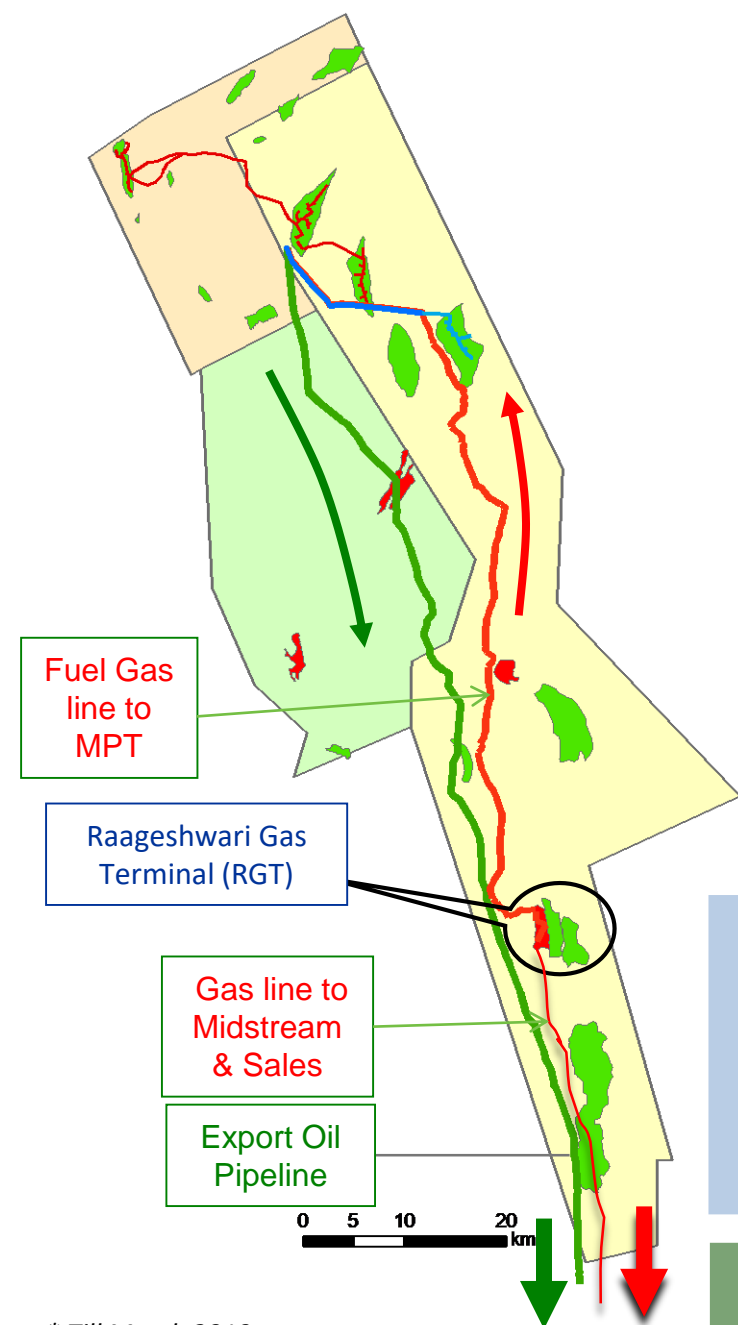
EOR Polymer & ASP Projects to increase recovery factor from MBA Fields to >50%

Tight Gas: Raageshwari Deep Gas (RDG)

Multi fold increase in Gas production, to contribute over 50 kboepd at peak

Total HIIP : 309 mmboe
 Produced Till Date : 11 mmboe*
 Reserves + Resources (2P+2C) : 85 mmboe

Capex Investment of \$ 630 million towards:
 - Early production facilities (90 mmscfd)
 - New Gas Terminal (90 mmscfd)
 - Wells



* Till March 2019

Gas business set to become sizeable in Cairn Portfolio

Completion by Q4 FY20



Sub-station building



Control Room Building



Gas Terminal



Feed booster compressor



Condensate storage tank



Cable Laying- Compressors

Tight Oil: Aishwariya Barmer Hill (ABH)

First step in unlocking the full potential of the Barmer Hill in the Rajasthan block

Project Snapshot



Partner	Activity	Gross Capex (\$ Million)	EUR (mboe)	Peak Production (kboepd)
Schlumberger	39 Wells & Facilities	170	32	20

	Till FY19	FY20	FY21 & Beyond
Drilling	20	19	-
Hook Up	-	38	1

India's Largest Fracking Program – Technical Excellence

India's largest lateral fracking

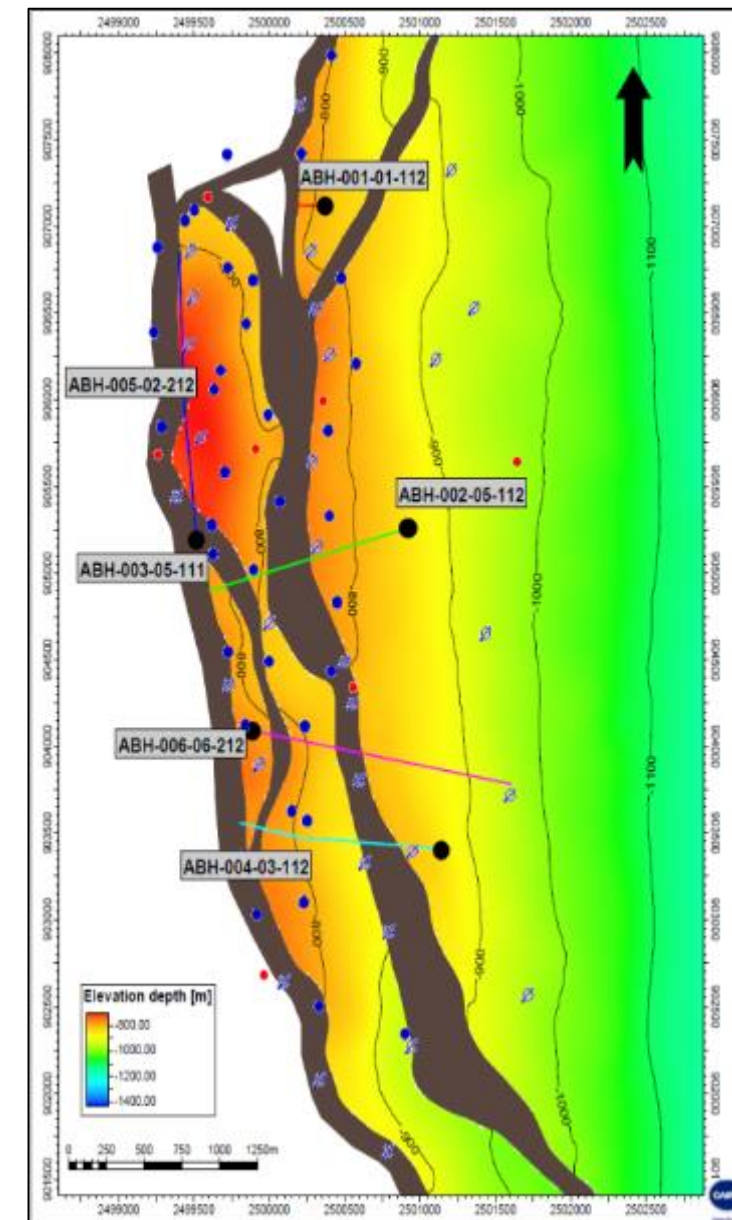
1,380m Lateral

4 stages fracked within 24 hour

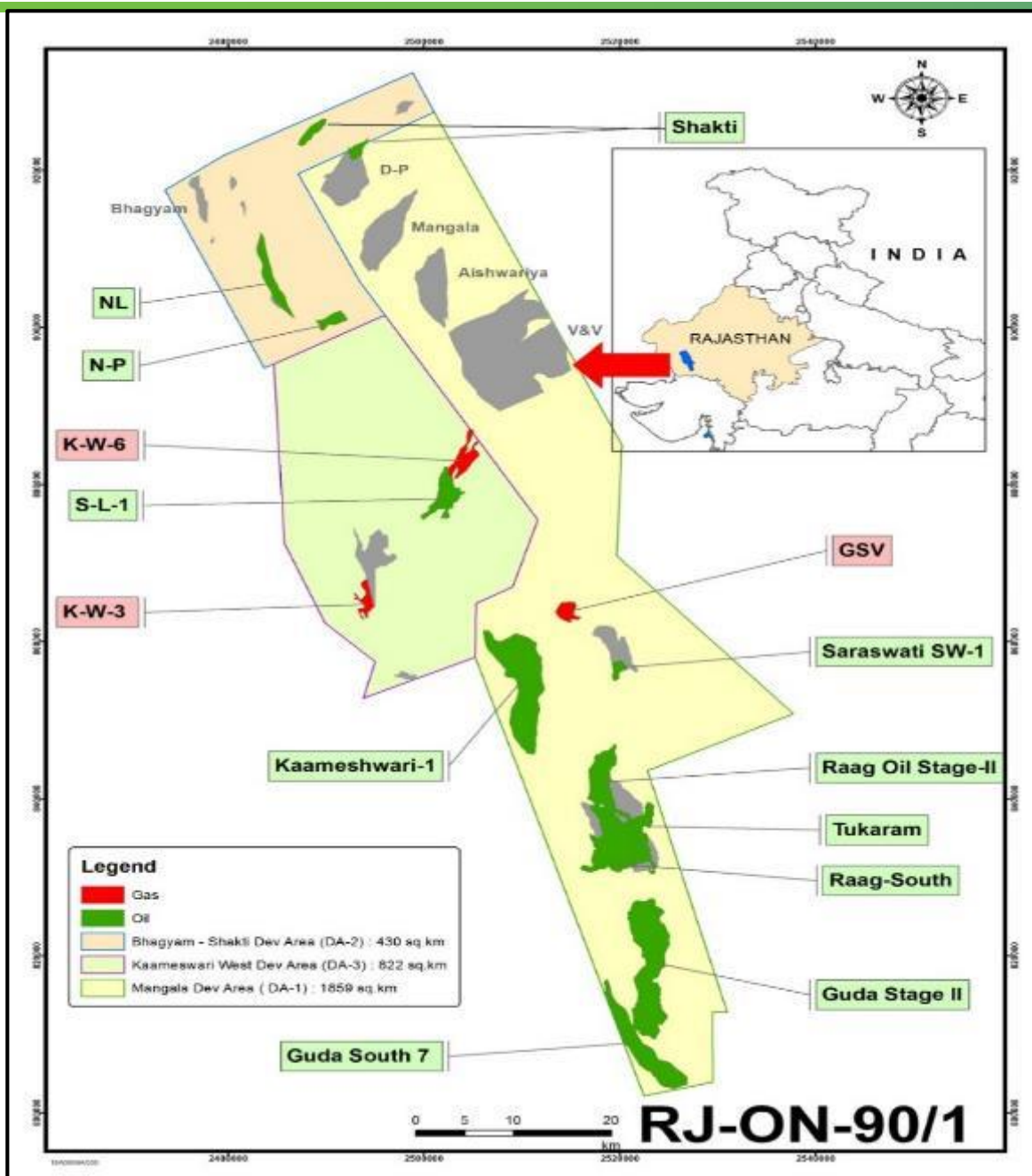
4 stage/day

Multiple frac stages across 14 wells

180 frac stages



Redefining operation excellence and fracking technology in India



Project Snapshot

Partner	Activity	Gross Capex (\$ Million)	EUR (mmboe)	Peak Production (kboepd)
Halliburton	Integrated Development of 10 Satellite fields	164	18	10



Project Scope:

Sub Surface:

Drilling of 35 new wells
Re-entry of 20 existing wells
Frac in 25 wells;

Surface Facilities:

Construction of 2 CPFs and 13 QPFs
33 km of intra-field pipelines



Project Duration:

18 months



Partner:

Halliburton

Producing Blocks: Offshore (Ravva & Cambay)



HIIP

978 mmboe

Production Till date

430 mmboe

2P + 2C

Reserves & Resources

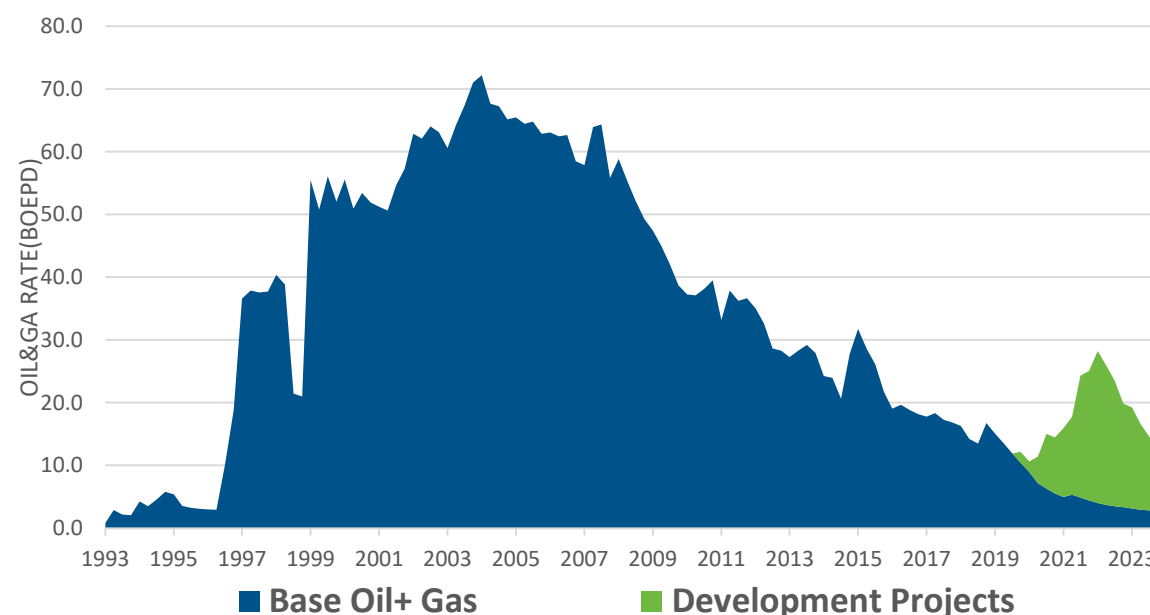
72 mmbboe

Exploration Potential

> 200 mmboe

Production Journey: Ravva

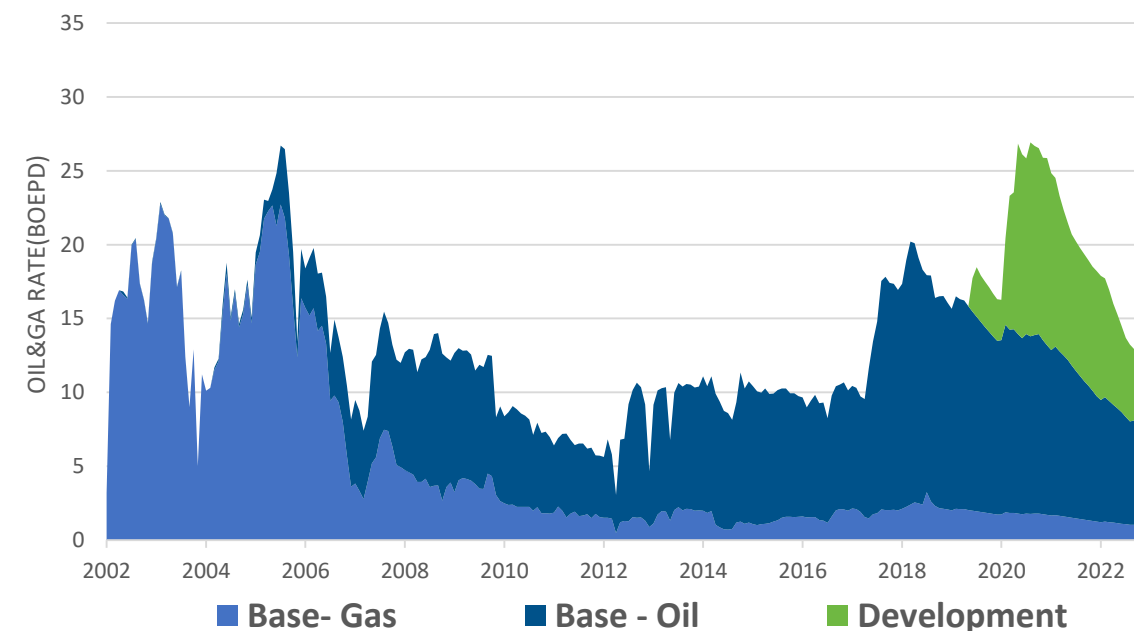
(Kboepd)



- Commencing Drilling Campaign in Q3 FY20
- 9-16 wells exploration and development wells
- Reserves add 17 mmboe, Resource 50-60 mmboe
- Capex investment of \$ 185 million
- Partner: Halliburton

Production Journey: Cambay

(Kboepd)



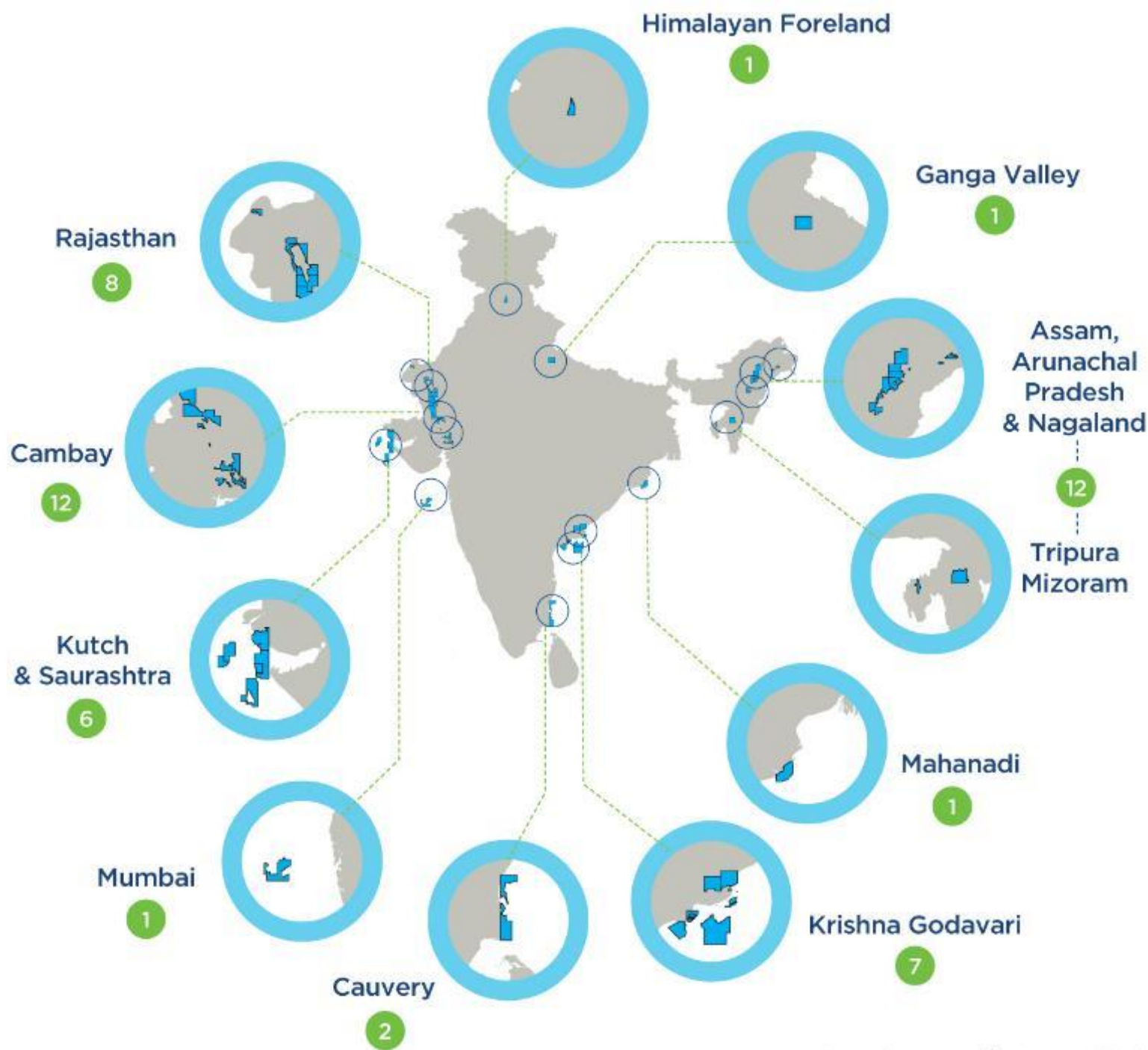
- Completed Successful 4 wells infill program in FY19
- Planning for an additional infill drilling campaign towards end of FY20

Ravva - Multifold increase in production; Cambay - Gas field converted into Oil Field

Exploration: OALP & PSC Blocks



OALP: Resource opportunity of 5.5 bnboe



51
Well Diversified
40 Onshore
11 Offshore

5.5
Resources (bnboe)
Upside Scenario

500
Peak Production (kboepd)
Upside Scenario

- ~60,000 sq.km. acreage; mostly proven oil and gas basins, both conventional & unconventional play
- ~\$ 800 M Capex for exploration; Additional capex for development / production
- Lloyd's Register awarded Integrated Project Management contract
- Integrated end-to-end contract award by mid August

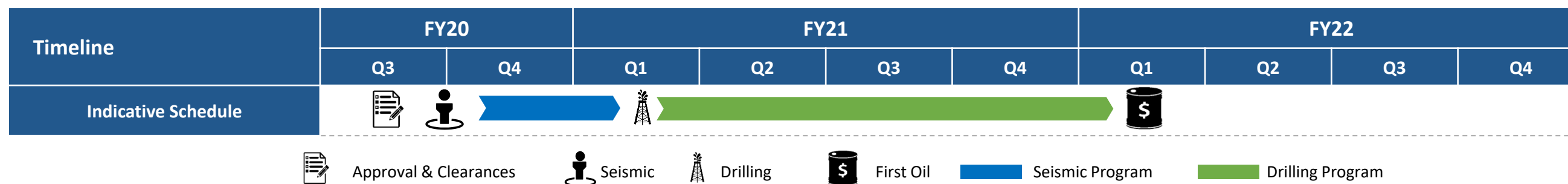
Features of OALP

- ❑ Biddable Revenue Sharing Model
- ❑ Single, uniform license for all types of hydrocarbon resources including conventional & unconventional resources
- ❑ Freedom in pricing and marketing of Oil & Gas
- ❑ Exploration allowed during the entire contract period
- ❑ Contract duration for development and production is maximum of 20 years
- ❑ No cess applicable on crude oil production





Levers for Early Monetization

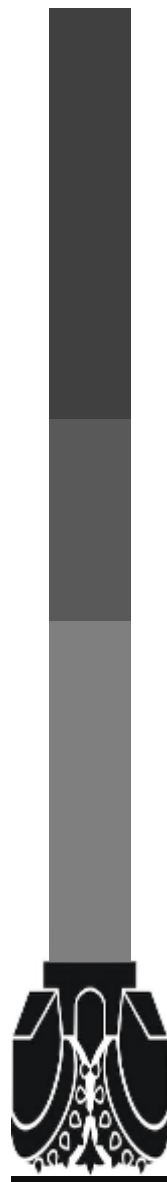
- ❑ Block Prioritisation:
 - Near Field Exploration
 - Low Cost Frontiers
- ❑ Leverage Existing Infrastructure:
 - Share facilities
 - Utilize existing rigs in the region
- ❑ Quick Production Facilities (QPF)
- ❑ Technology Drivers:
 - Satellite Based EM Technology
 - Airbone FTG Survey
- ❑ Digitalization Adoption

Embracing a disruptive approach to unlock the vast potential of OALP blocks



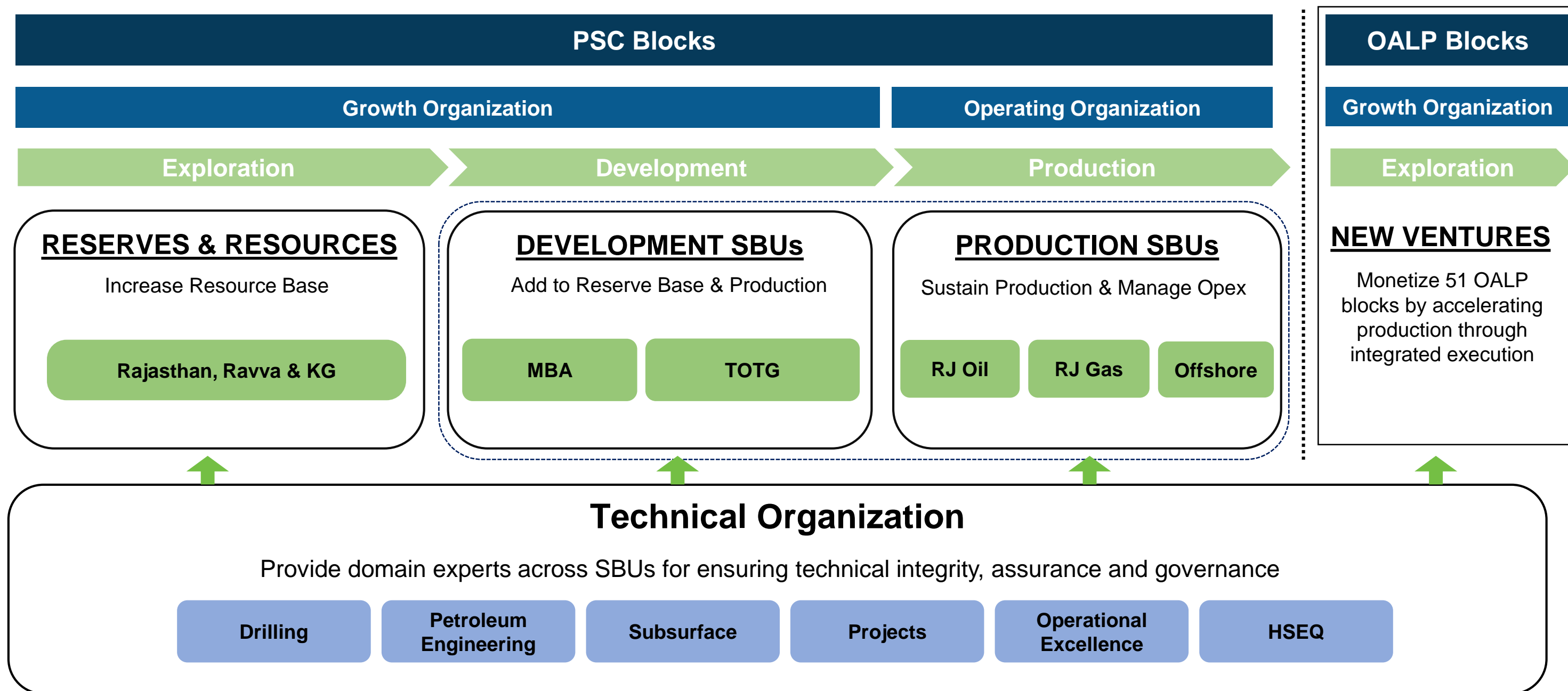
Partnering with Global Oil Field Service Companies for End to End Integrated Execution

	Investment (\$ Million)	Resources (mmboe)	Work Program (Wells)	Partner	Status
 Rajasthan Exploration	60	300-600	7-18	Schlumberger	Drilling from Q2 FY20
 Rajasthan Tight oil Appraisal	75	200	14	Schlumberger / Halliburton	Drilling from Q2 FY20
 KG-Offshore	60	300	2	Schlumberger	2 Discoveries – Evaluation Ongoing
 Ravva	85	50	4-9	Halliburton	Drilling from Q3 FY20



Strong exploration fundamentals supports reserves & resources growth







Ajay Dixit
Chief Executive Officer
(Acting)

39 years,
Siemens
Electrical Engineer, Delhi College
of Engineering



Vivek Rathi
Chief Financial Officer
(Acting)

24 years
Thermo Fischer Scientific, HUL, Amex,
GE Capital, Johnson & Johnson
CA, CS & CWA



Oscar Quintero
Chief Operation Officer

20 years
Chevron, Shell, Hess Corp.,
Occidental, Permian Resources
MBA, University of Houston



Arthur de Fautereau
Chief Technical
Officer

25 years
CS resources, Total, Perenco
MSc. Petroleum, IFP School, France



Sai Subramaniam
Director,
RJ Operations

26 years
British Gas B. Tech, Chemical,
BITS Pilani



Sanjay Kumar
President,
Development

17 years
Petroleum Engineer, ISM IIT
Dhanbad, MS, Heriot Watt
University, UK



Shobhit Tiwari
Head HSSEQ

30 years
Reliance, ONGC, Cairn
B. Tech, Mechanical Engineering,
GB Pant University



Prachur Sah
Director, New Ventures
& Reserves

20 years
Schlumberger
M.Sc., Heriot Watt University, UK
B. Tech, IIT Mumbai



Rana Kar
Chief Marketing Officer

24 years
Shell, British Gas
B. Tech, NIT, PGDM Finance &
Marketing, IIM Calcutta



Muthir Kharusi
President, RJ Oil
Production

24 years
Shell, Petroleum Devt. Oman
B. Tech, Glamorgan University



Rohit Tandon
President, Tight Oil Tight Gas
Devt. & Facilities

19 years, Cairn
Exec Mgmt., Cornell. MS Heriot Watt.
Petroleum Eng, ISM, IIT Dhanbad



Pankaj Jain
President, Offshore &
KG Development

24 years
GSPL
MBA (Finance), ICFAI Business
School



Madhavi Jha
Head Corporate
Communication

16 years
Honeywell
BA English Literature, Delhi
University, PG Diploma, IIPM



Rajesh Mohata
Head Procurement &
Supply Chain Management

26 years
Adani, HZL
B. Tech, Jodhpur University, PG Diploma,
Business Management, Pune University



Avantika Oli
Acting Chief Human
Resources Officer

13 years
E&Y
B. Tech, Computer Eng., NSIT
PMIR, XLRI Jamshedpur



Pooja Yadava
Head Legal &
Compliance

13 years
Vedanta Group
BSL & LLB, ILS Law College



Rakesh Agiwal
Head, Joint Venture
Management

20 years
Coca-Cola
CA, CS & CWA



Biswanath Ghosh
Head Exploration,
Offshore

18 years
MSc. Applied Geophysics,
ISM IIT Dhanbad



Fiona Macaulay
Member – Exploration
Advisory Board

Coro Energy, Echo Energy,
Rockhopper Exploration PLC, Mill
House Enterprises, Swiftdale Ltd,
Quad Operations Ltd



John Dolson
Sr. Advisor – Geology

DSP Geosciences & Associates,
LLC, Delonex Energy



John Hughes
Sr. Advisor -
Geophysics

SLR, ConocoPhillips, ADNOC,



Chandler T Wilhelm
Member – Exploration
Advisory Board

Wilhelm Geoscience Services
LLC, Shell Houston



Shonn Patrick Arndt
Technical Specialist -
EOR

Royal Dutch Shell, TransCanada,
Canadian Natural Resources Ltd,
Cenovus / EnCanna



Andrew Cartwright
CHSO-MBA
Development

BP, Shell, Kvaerner Process
Limited, PTT, Veolia Water
Outsourcing Ltd



Dennis Beliveau
Technical Specialist
Reservoir Engineering

Shell, Banbury House



Thomas Alan Arthur,
Technical Specialist
Reservoir Engineering

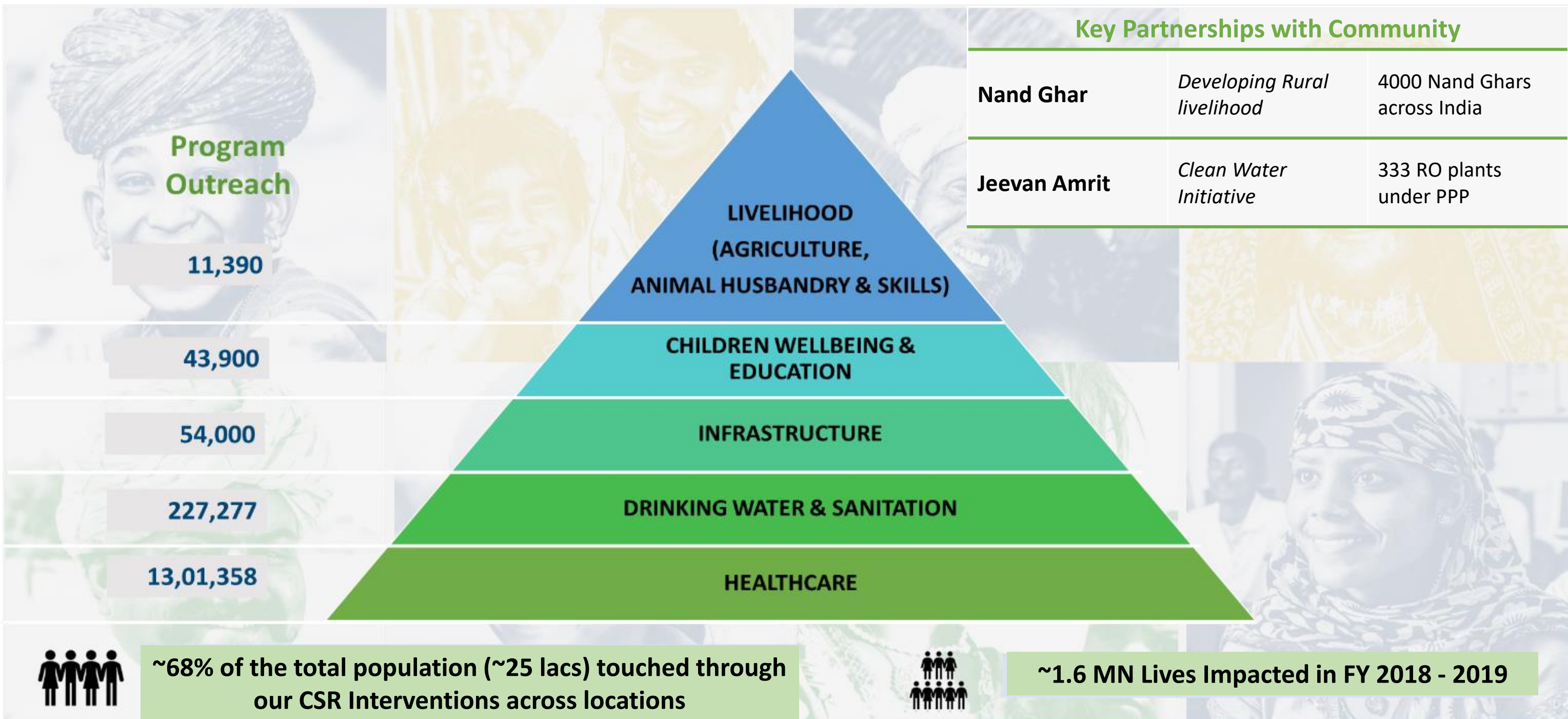
BHP, Chevron, Marathon



Thomas Elliott
Drilling Fluids
Specialist

Halliburton, Scomi Oiltools,
Tullow Oil





THE SOCIO-ECONOMIC IMPACT

Local Employment & Business Opportunities

2014-2018: 8,600+ locals employed
2017-18: 47% of 7,400 workers are locals



Land Compensation

110 crores paid for permanent land (1,200 Ha)
6 crores paid annually for temp land (400 Ha)

2 Hotels in 1998;
now it has 22 hotels

A **fourfold** rise has been witnessed in vehicle sales since 2006

Rs. 3,000
average monthly house rent
in 1998 has now gone up to
Rs. 50,000

Rs. 250 crore
worth of fixed deposits are held by the
townsfolk now; in 1998, it was negligible

1,200 crores worth of contract to local vendors

01

ROYALTY

\$ 6 Billion

02

CESS & NCCD

\$ 6 Billion

03

PROFIT PETROLEUM

\$ 14 Billion

04

SALES TAX & VAT

\$ 2 Billion

05

CORPORATE TAX & DDT

\$ 1 Billion

Total Contribution

\$ 29 Billion

Delivering long-term value to Government, Local Communities and all Stakeholders



Cairn named among "Dream Companies to Work For" by ET Now. (February 2019)



"Community Project of the Year" at Asia CSR Best Practices Award in 2017



Ravva offshore and onshore facility secured "first" place in Manufacturing – Process category and a 5-star rating award for Excellence in EHS practices in CH-SR-EHS Excellence Award 2017



Barmer Unnati, a Cairn CSR initiative was awarded the 'SKOCH Bronze Award' and 'SKOCH Order of Merit' by CCI in 2018



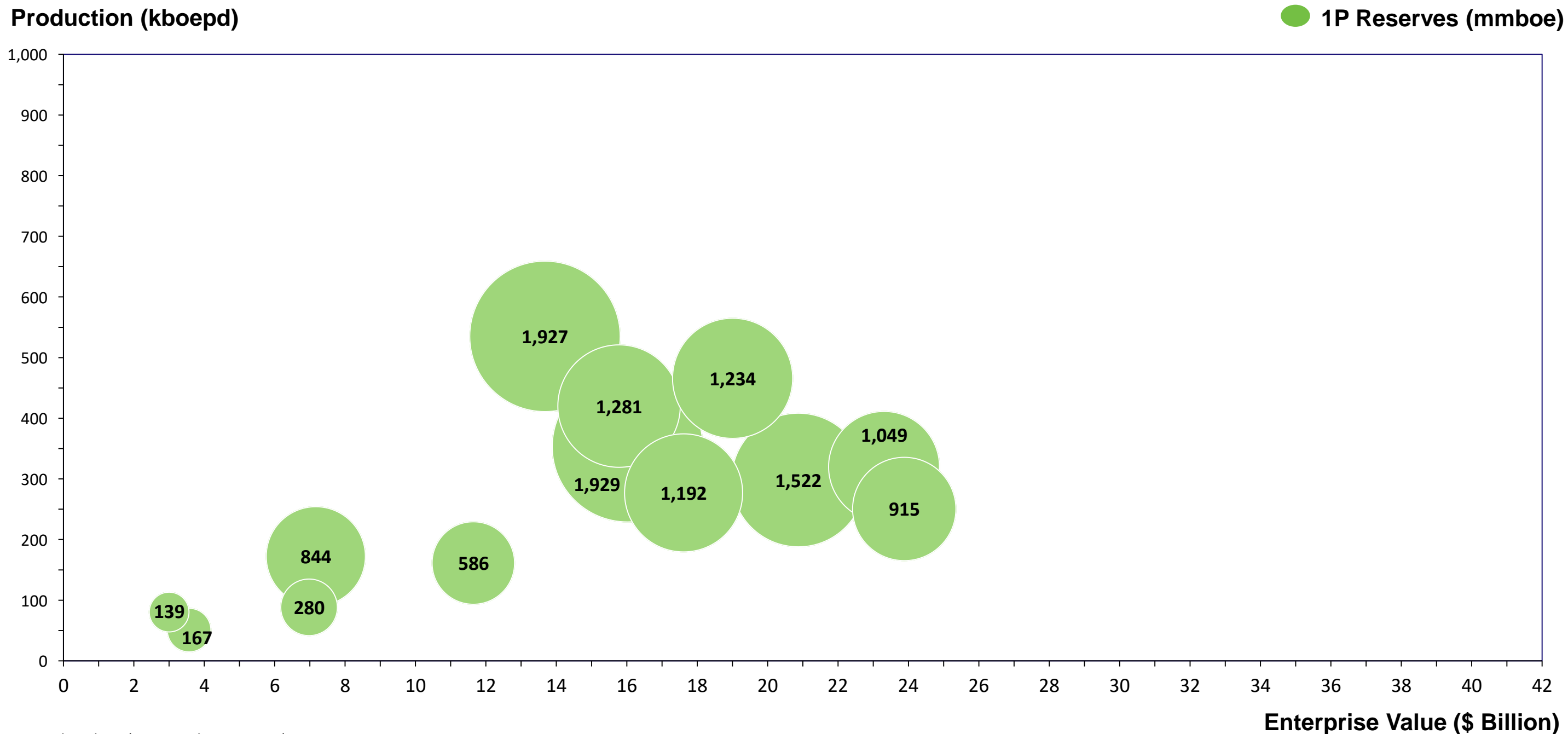
Raageshwari Gas Terminal (RGT) has won "Sword of Honour" from British Safety Council for excellence in HSE Management

Rajasthan CSR Award 2018 for Jeevan Amrit Project



Cairn's Ravva offshore Asset won "Golden Peacock Occupational Health and Safety Award" for the year 2017





Source: Bloomberg (Data For the year 2018)

Above list includes companies such as Apache, Continental, Devon, Hess, Noble Energy, Marathon, Pioneer, Tullow Oil, Santos, Murphy Oil, Kosmos Energy, Woodside, Premier Oil, etc,

Thank You