



Investment Opportunities in Upstream Petroleum Sector in Pakistan

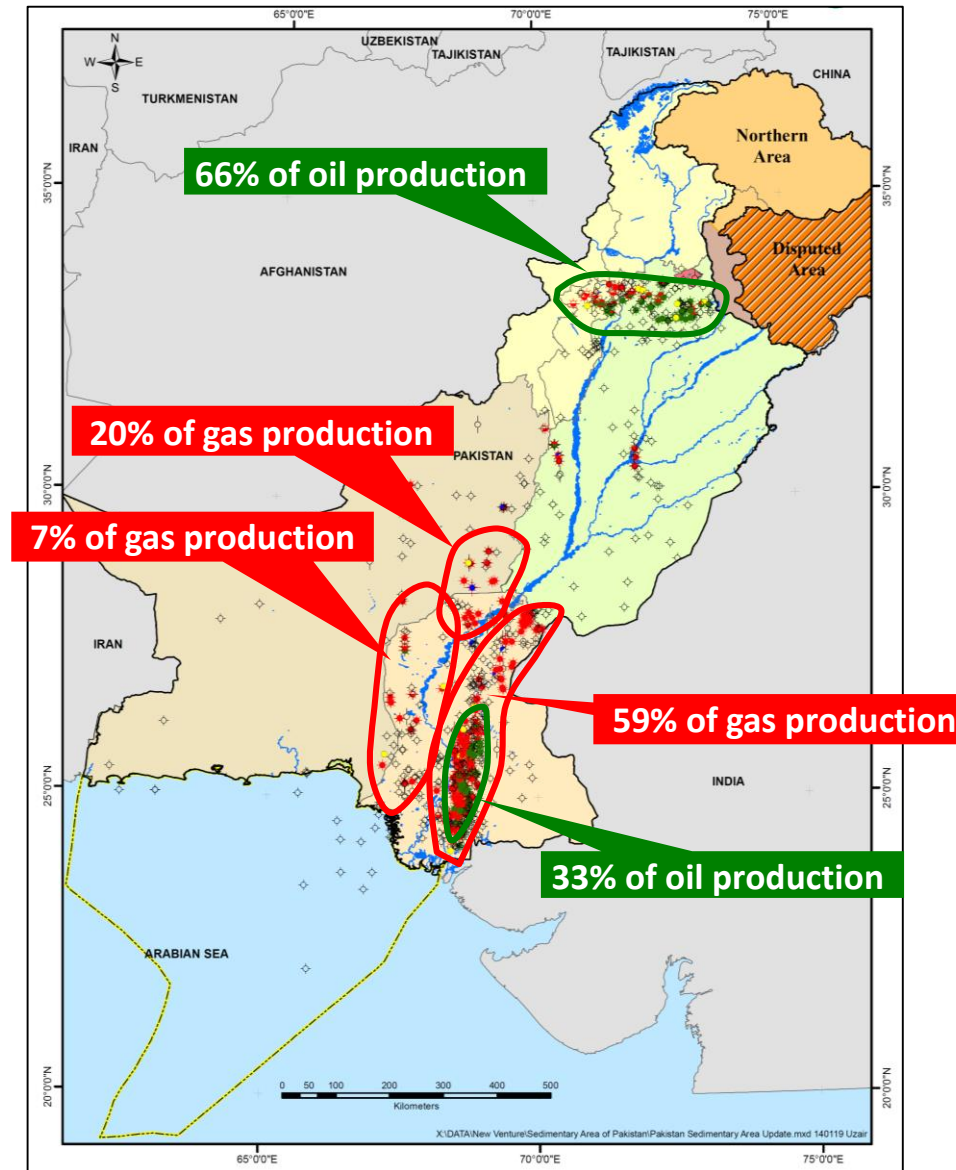
Pakistan's Upcoming Petroleum Exploration Bidding Rounds"

Moin Raza Khan
MD & CEO
Pakistan Petroleum Limited

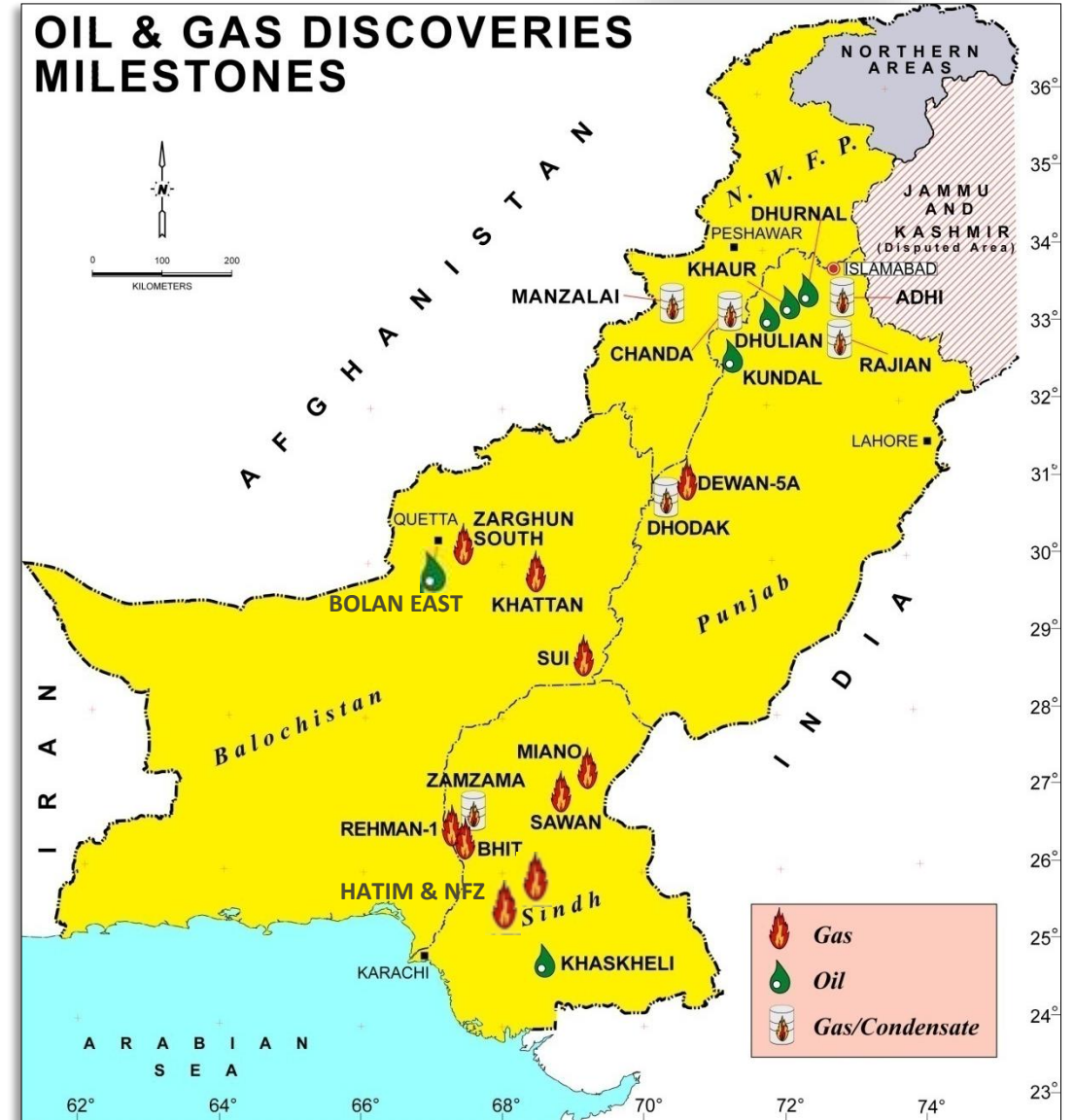
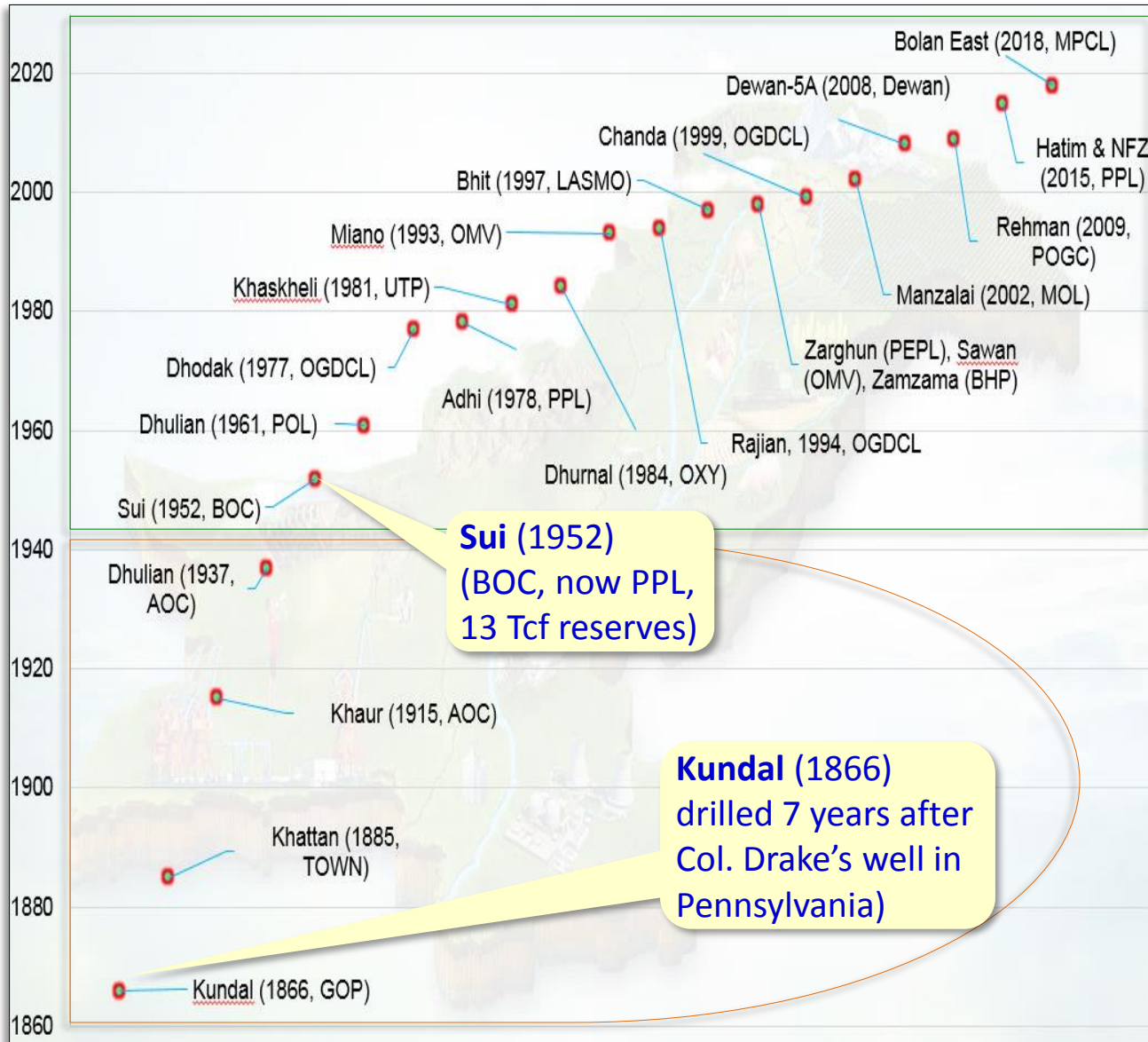
**Canadian Global Exploration Forum
(CGEF)**

Calgary, Canada
September 13, 2019

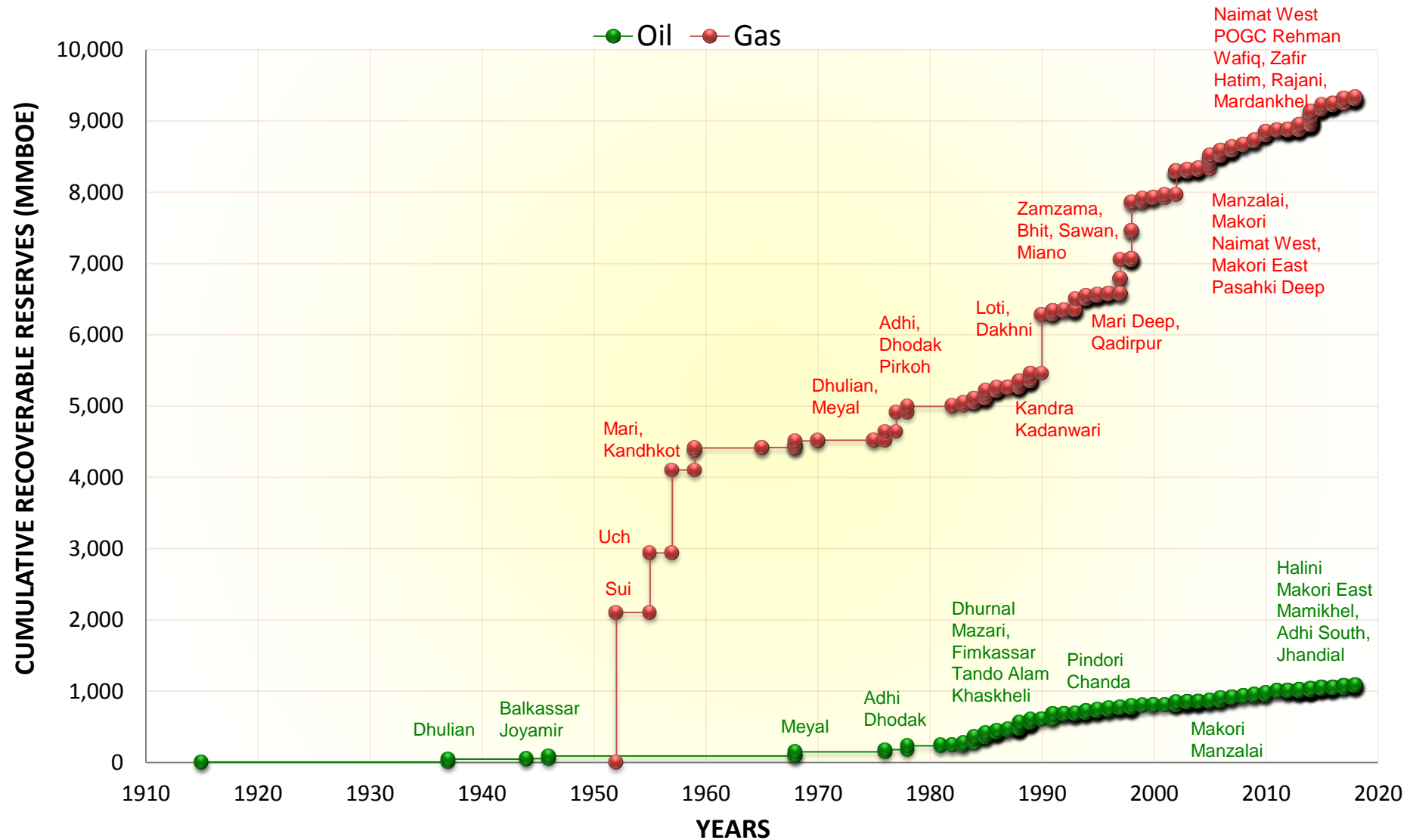
Pakistan's Oil & Gas Producing Areas



Exploration History - Milestones



Creaming Curve: Cumulative Hydrocarbon Reserves for <25% Onshore Land Area



• The above estimate is excluding Balochistan basin & offshore. Updates available as of 30 June 2018 for Wells & Reserves.

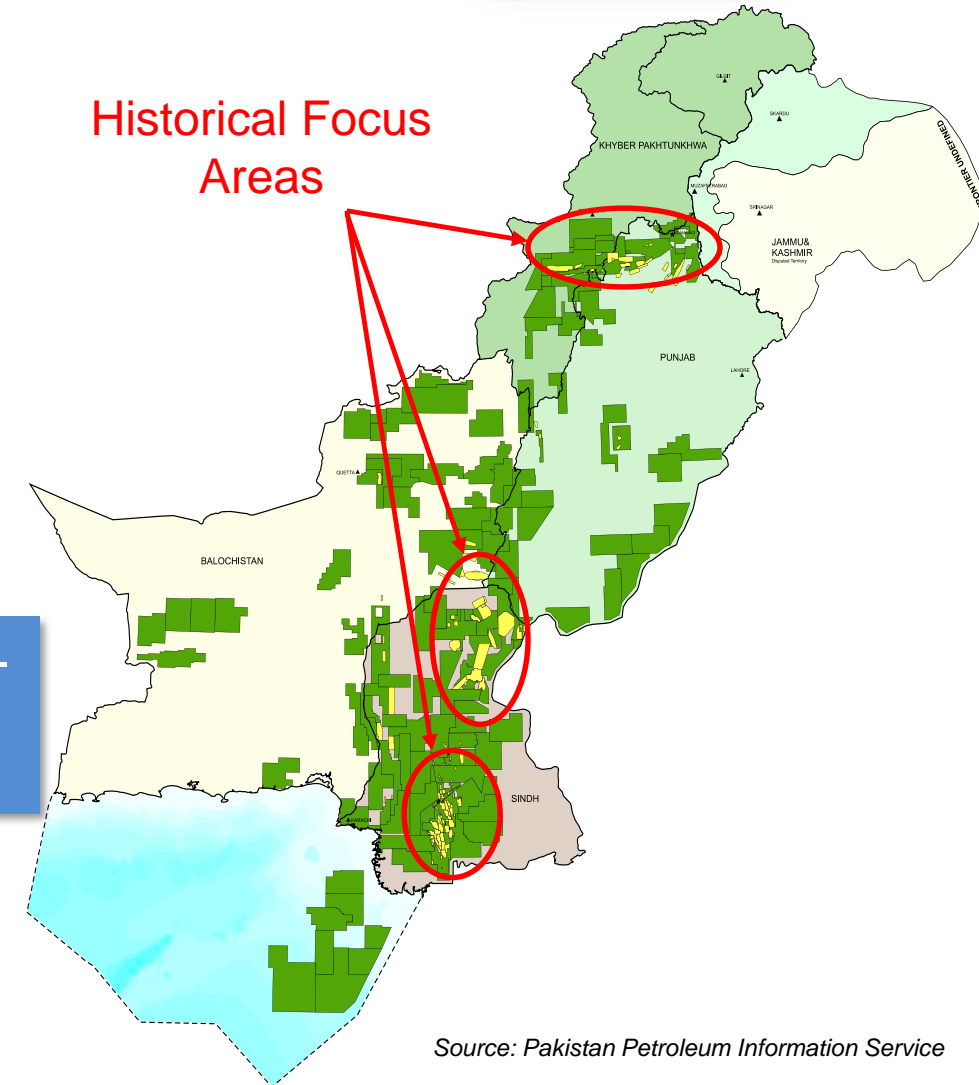
Pakistan E&P Industry



■ Exploration Potential in Pakistan:

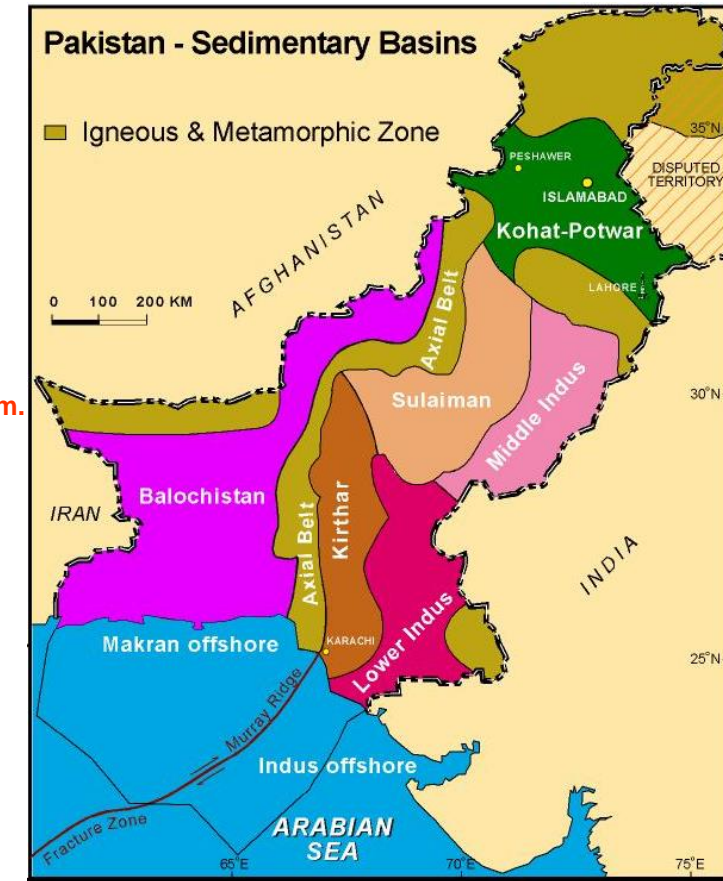
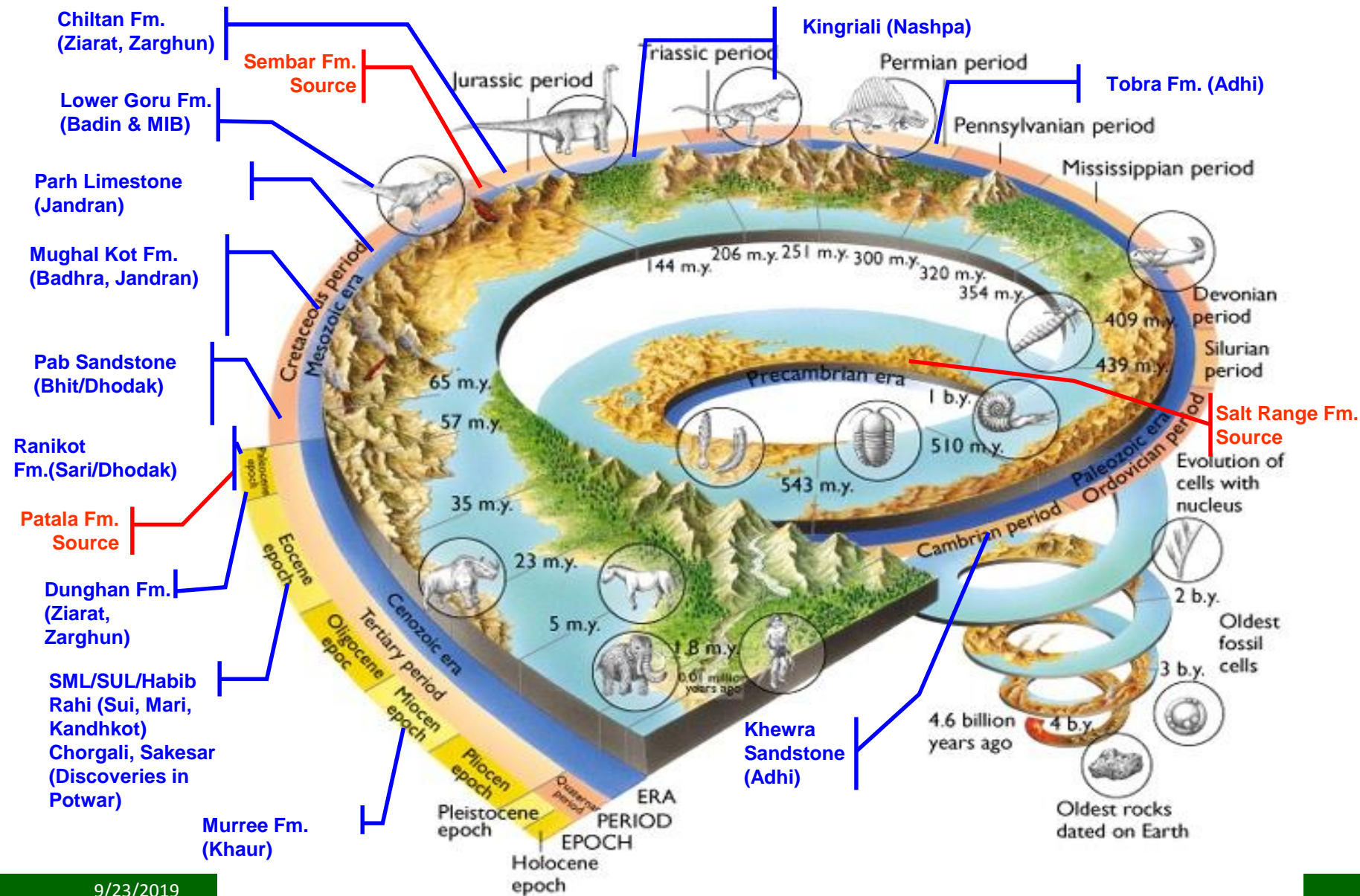
- Conventional
 - Deeper potential reservoirs
 - Offshore
 - Frontier region (Kirthar & Sulaiman Fold belt, Balochistan basin)
- Un-conventional
 - Tight Gas
 - Shale Gas

Less than 25% of Pakistan's land area has been explored –
Room for indigenous hydrocarbon reserves addition



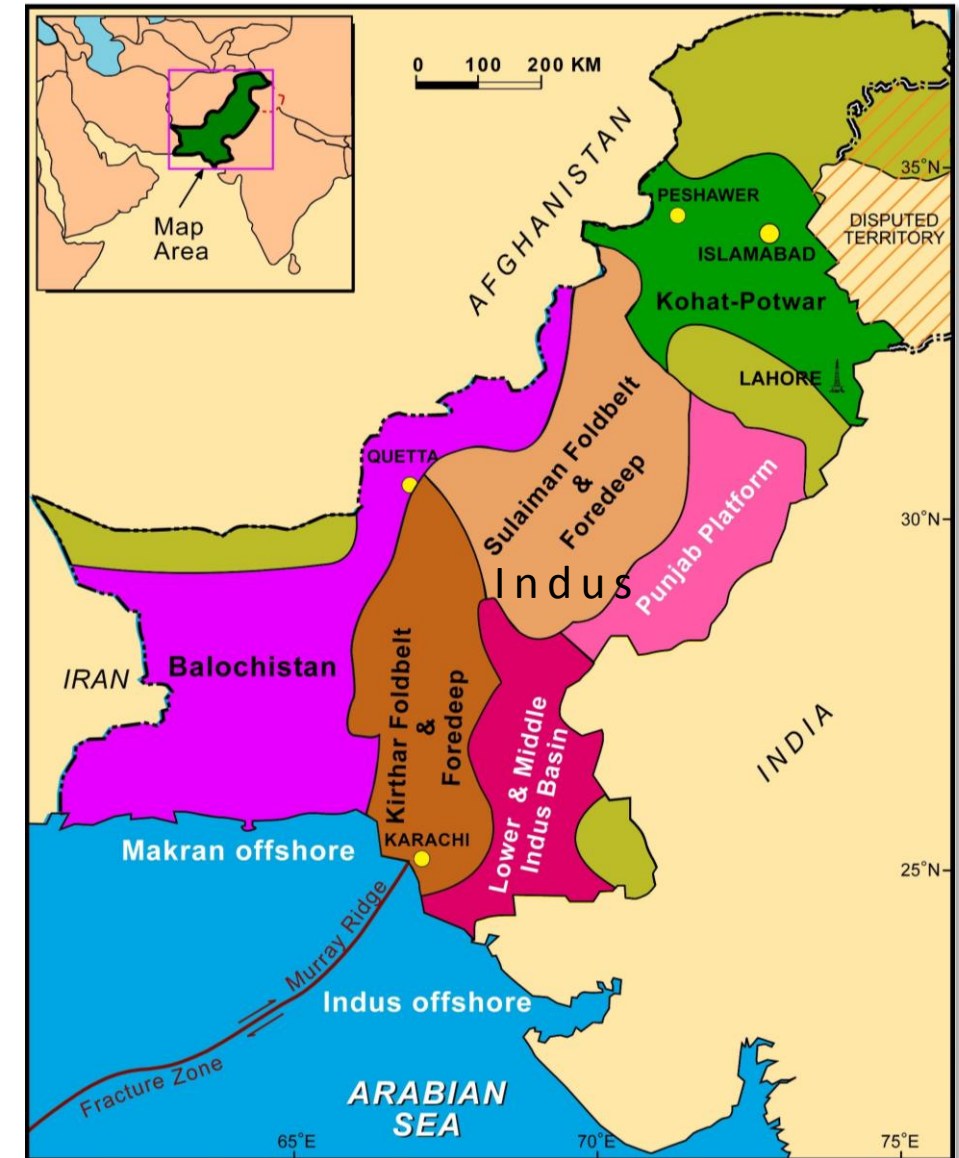
Source: Pakistan Petroleum Information Service

Petroleum System of Pakistan (Geological Time – One Billion Years ago to date)

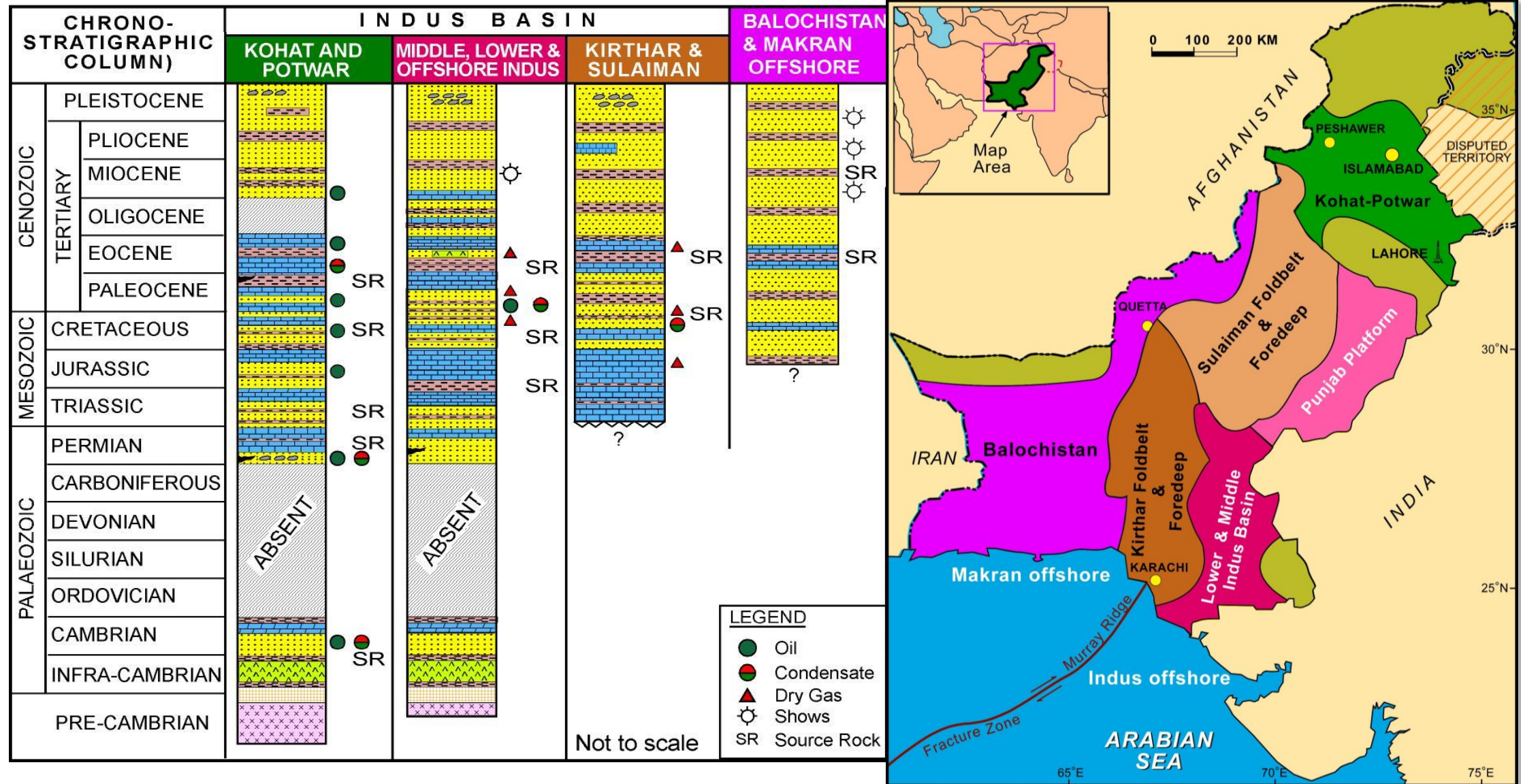


Petroleum System of Pakistan (Basins & Structural Provinces)

- Pakistan comprises of 4 Sedimentary Basins
 - 2 Onshore basins
 - Indus Basin
 - Kohat-Potwar
 - Punjab Platform
 - Middle & Lower Indus
 - Kirthar Foldbelt & Foredeep
 - Sulaiman Foldbelt & Foredeep
 - Balochistan Basin
 - 2 Offshore basins
 - Indus Offshore
 - Makran Offshore



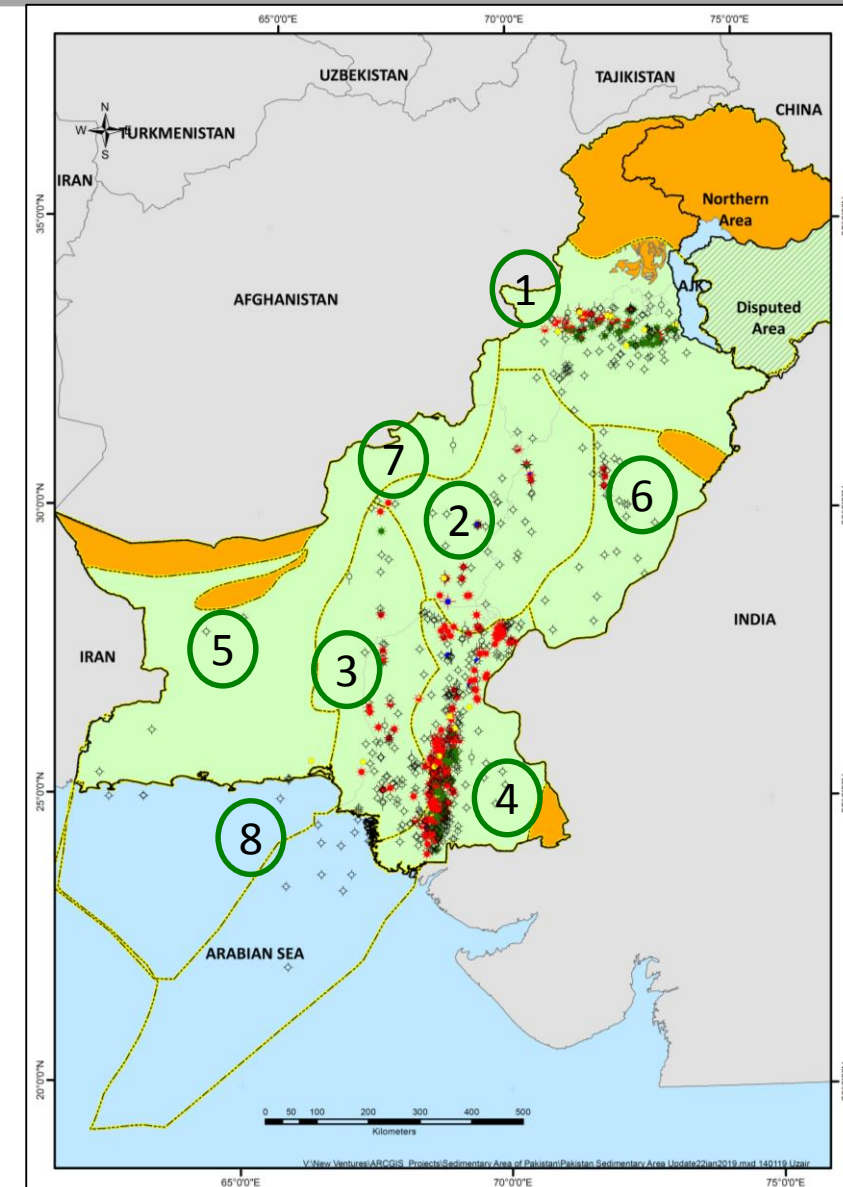
Basin-wise Hydrocarbon Occurrences (Stratigraphic Column)



Where is Room for Growth in Pakistan's Basins?

- Mature discovered areas with incremental discovery size
- Frontier areas – underexplored with high risk & high cost opportunities, and potentially medium to high reward

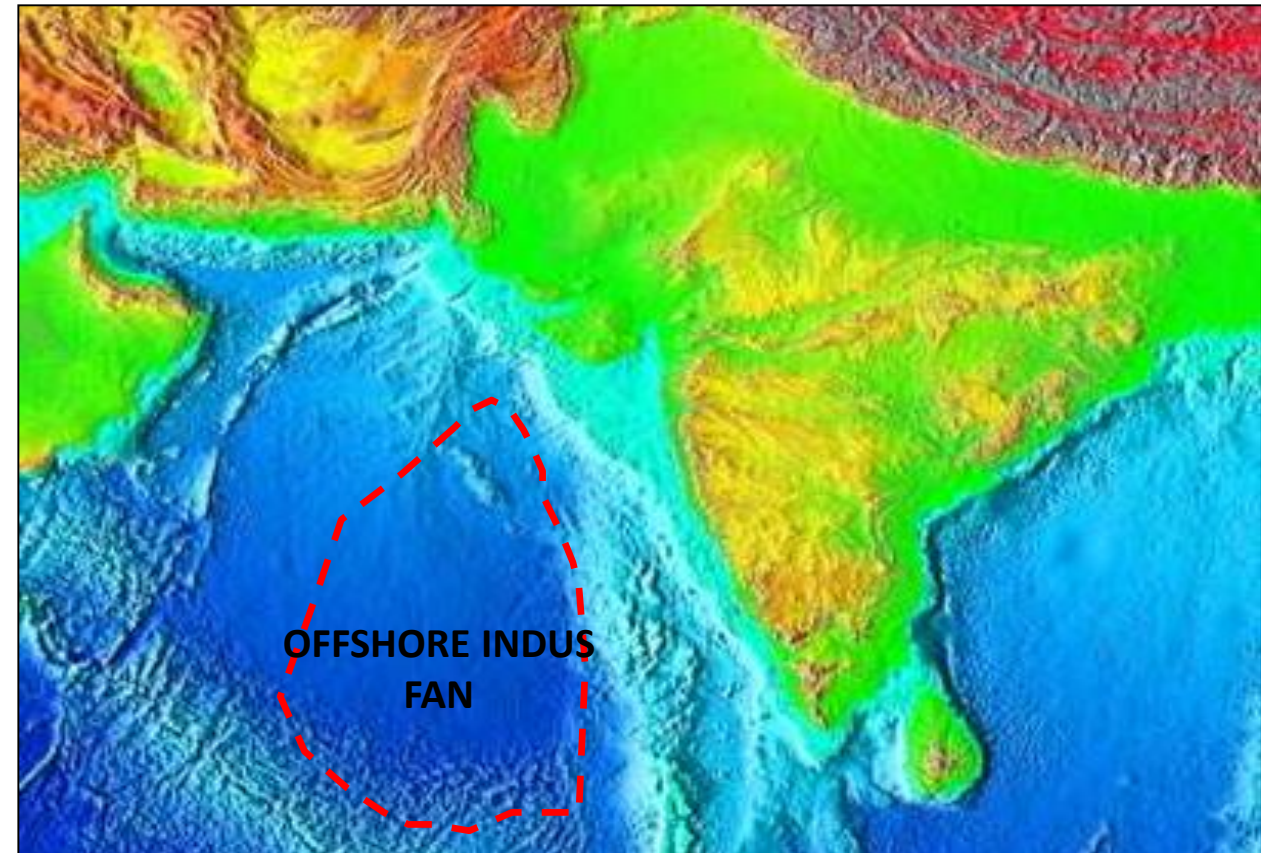
1. Western Kohat Foldbelt & Peshawar basin
2. Sulaiman Foldbelt Jurassic and Triassic plays
3. Kirthar Foldbelt – Jurassic / Triassic plays
4. Eastern Sindh Deeper plays – Infra Cambrian
5. Kharan fore deep basin
6. Punjab Platform
7. Pishin basin
8. Offshore Indus and Makran – shallow & deep



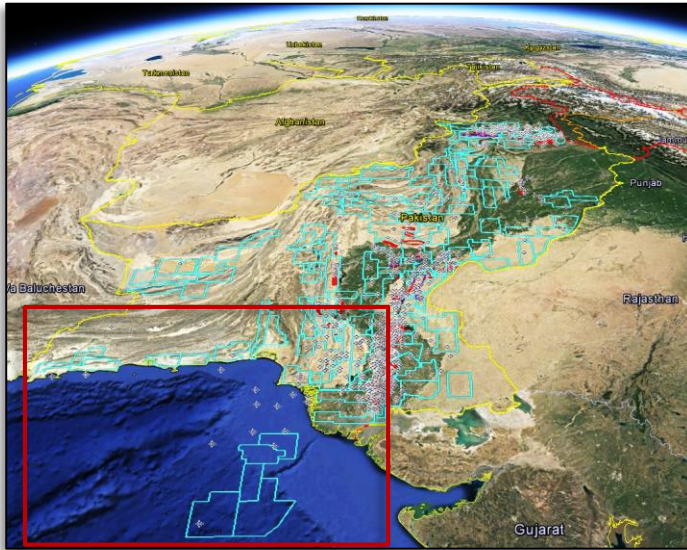
The Indus Offshore

- Area: **1,250,000 km²**
- World's 2nd largest delta fan, after the Ganges in Bengal.
- **Shallow water analogues of Indus Delta are producing worldwide – Niger, Mahakam, Mackenzie, Mississippi, Nile, Irrawady, Gipsland Basin etc**
- Water depth 0-4500 m
- Sediment thickness: up to 12 km
- One of the last/least unexplored prospective offshore basins in the world?

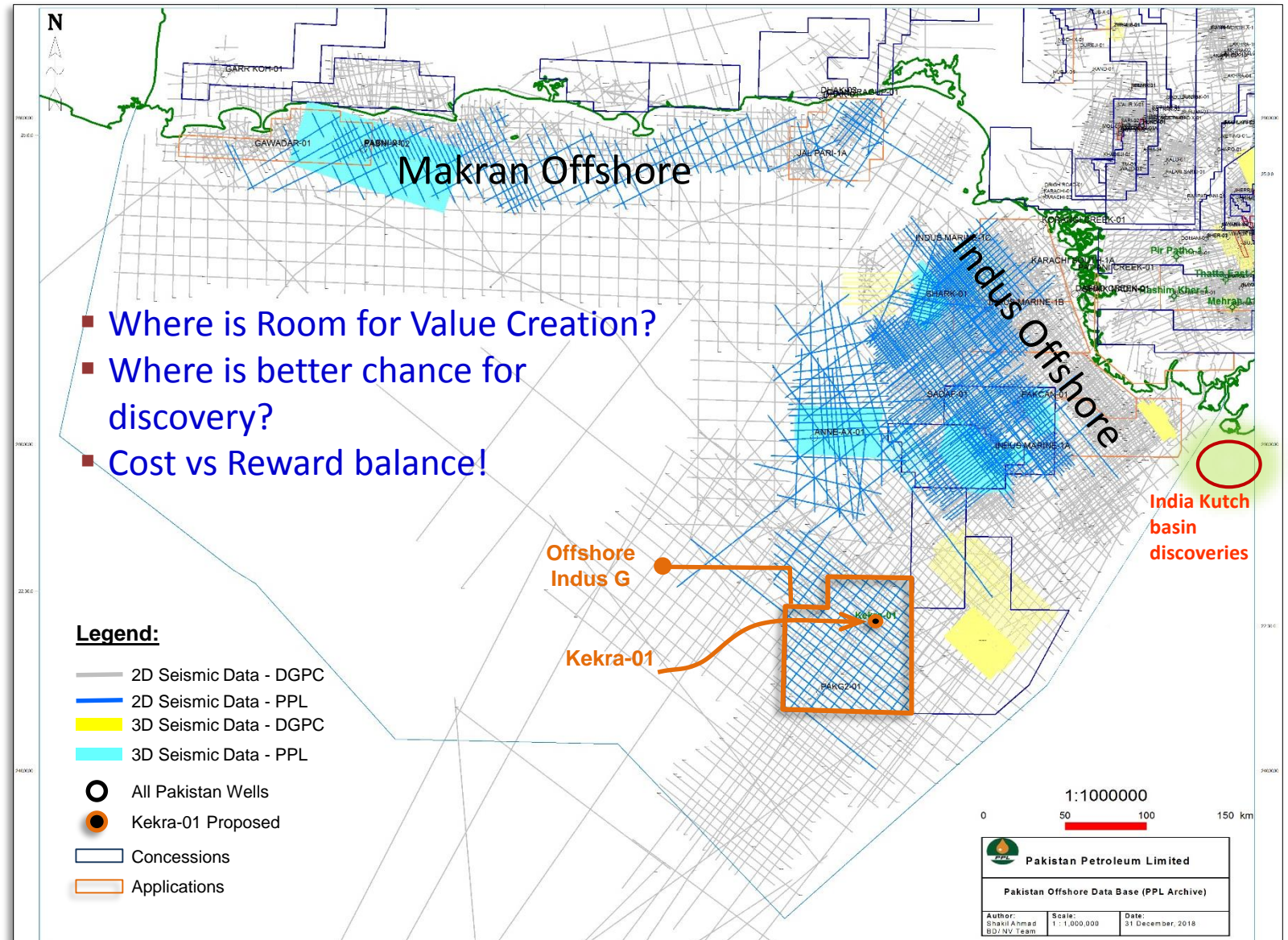
One of the last **unexplored, high prospectivity** basins in the world



Seismic Data in Offshore/ Coastal Areas

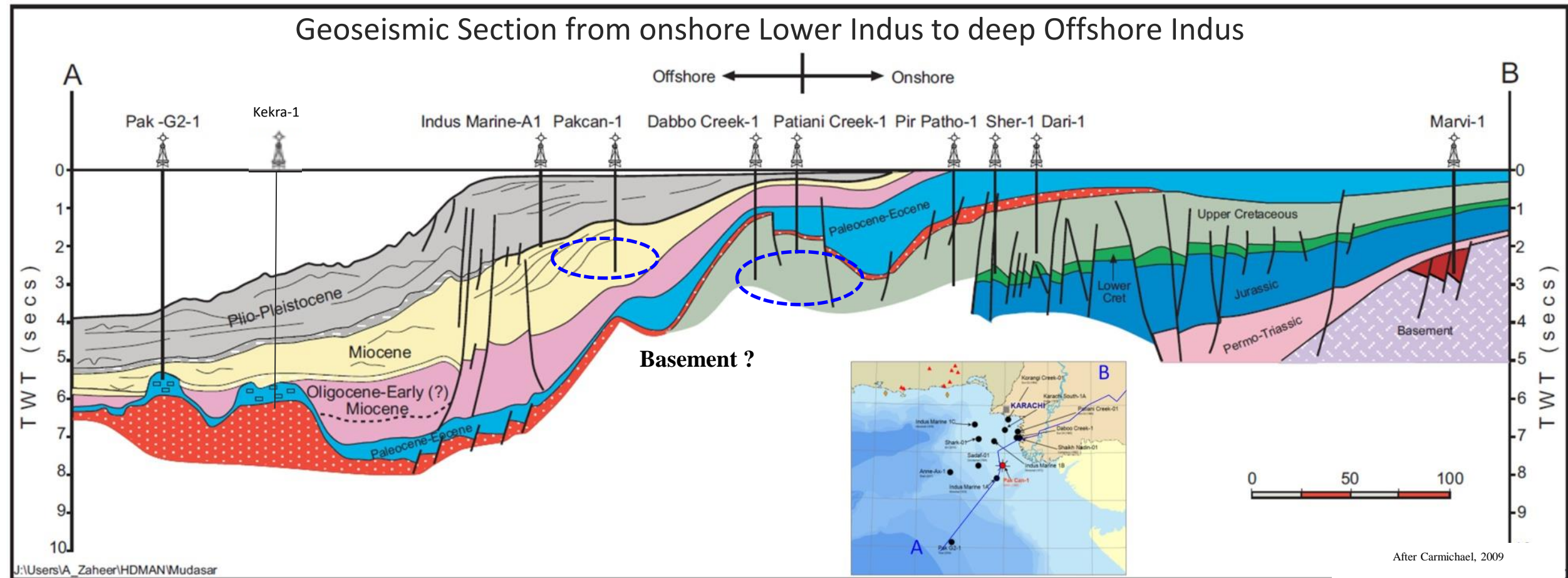


- Exploration focussed on deep water offshore acreages (large potential, risk & cost)
- PPL-OGDCL-Eni and ExxonMobil – joint consortium drilled offshore well Kekra-1



Offshore Indus – Geological Model

Geoseismic Section from onshore Lower Indus to deep Offshore Indus



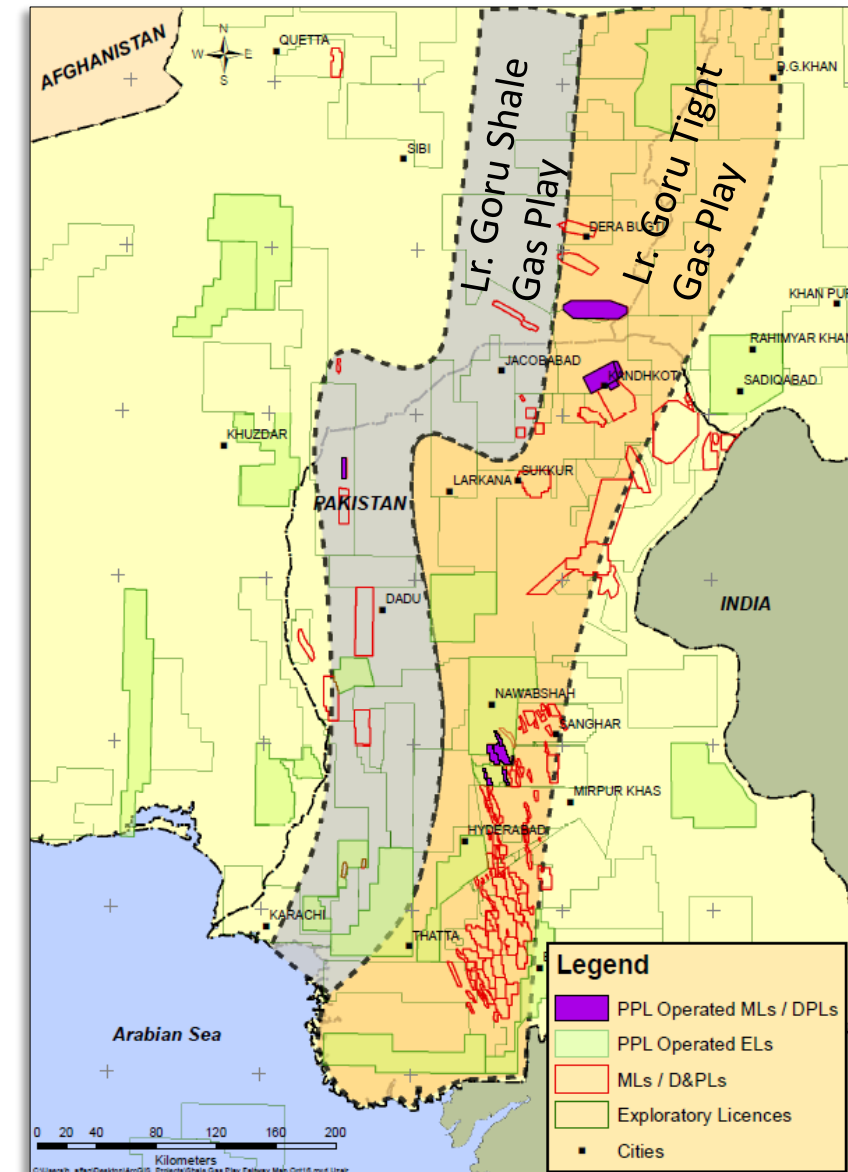
- Miocene sandstones are proven reservoir (PakCan-1)
- In deep offshore, reefal or shoal limestone of Eocene-Oligocene age with more than 20% porosity (Pak G-2-1)
- Upper Cretaceous and Paleocene plays may be targeted in near-shore areas

Potential Game Changer for E&P Sector in Pakistan

Unconventional Hydrocarbon Exploration/Exploitation

Tight Gas Reservoir (TGR) Potential

- Pakistan TGR Gas reserves estimated at ~100 TCF
- Several wells have encountered gas in tight reservoirs
- PPL successfully drilled the deepest & longest horizontal well; it flowed 13.5mmscfd (8 multistage hydraulic frac/acid stimulation)
- PPL is planning to drill TGR horizontal wells with:
 - latest drilling and production technology
 - multi frac and acid stimulation
 - service and equipment cost reduction through steep learning curve



Shale Gas potential in Pakistan

- Shale Gas potential (~ 100 Tcf gas & 10 - 14 Bbbls oil recoverable) – Pakistan among top 20 countries
 - The Shale Gas plays in Pakistan are unexplored
 - The identified Early Cretaceous shale plays are prospective.
 - Joint multidisciplinary team of PPL & OGDCL working on technical, commercial and legal aspects of a dedicated pilot project, and eventually embark upon it

Pakistan Petroleum Limited

E & P Investment Opportunities in Pakistan with PPL

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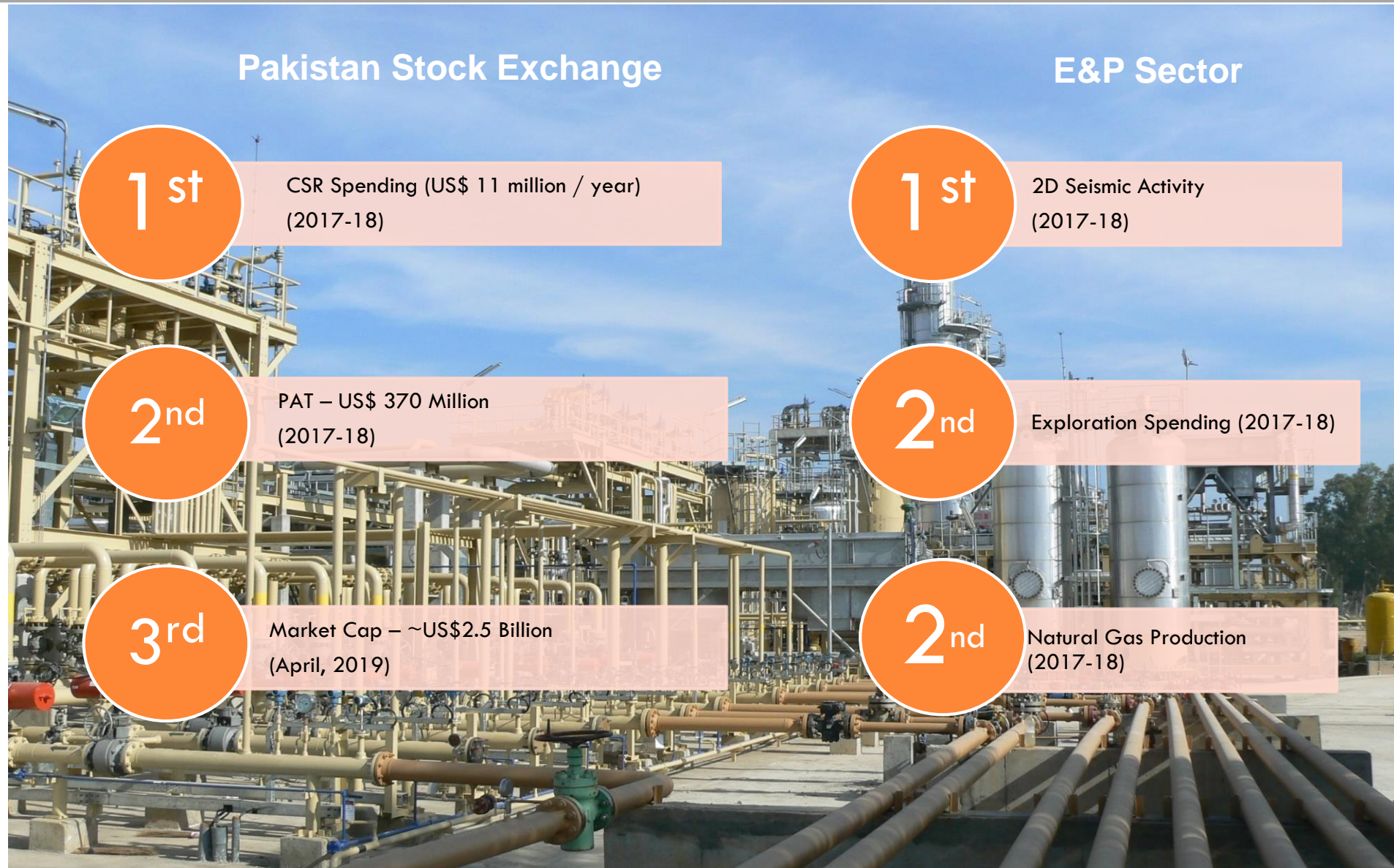
Email: a_mujahid@ppl.com.pk

PPL – Corporate History

- Century old legacy of Burmah Oil plc. UK
- 1950: Incorporated, with BOC as majority shareholder
- Major contributor of gas to Pakistan
 - 1952: Sui Discovery (>13 Tcf reserves)
 - 1959: Kandhkot Discovery
 - 1978: Adhi Discovery
 - 2013: Gambat South
- 1997: GoP purchased entire equity of BOC
- Around 68% of the Company's equity held by GoP, 25% by general public and investors through the stock exchange
- Contributes ~22% towards Pakistan's gas production
- Business operations across Pakistan and Abroad



PPL Market Standing



PPL's Strategy

- Promote exploration in Pakistan & diversify Company's portfolio
- Extensive exploration in frontier areas targeting new basins & plays (potential of bigger discoveries)
- Diversify portfolio risk through new acreage, farm-ins and farm-outs
- Optimization of production and recovery from current producing assets
- Technology innovations to produce Tight Gas at commercial rates
- Pursue Pakistan's offshore region
- Explore technologies with multinational JVs to develop shale gas

PPL Exploration & Production Portfolio

Exploratory Assets

PPL Operated	27
Partner Operated	19
Total Exploration Assets	46

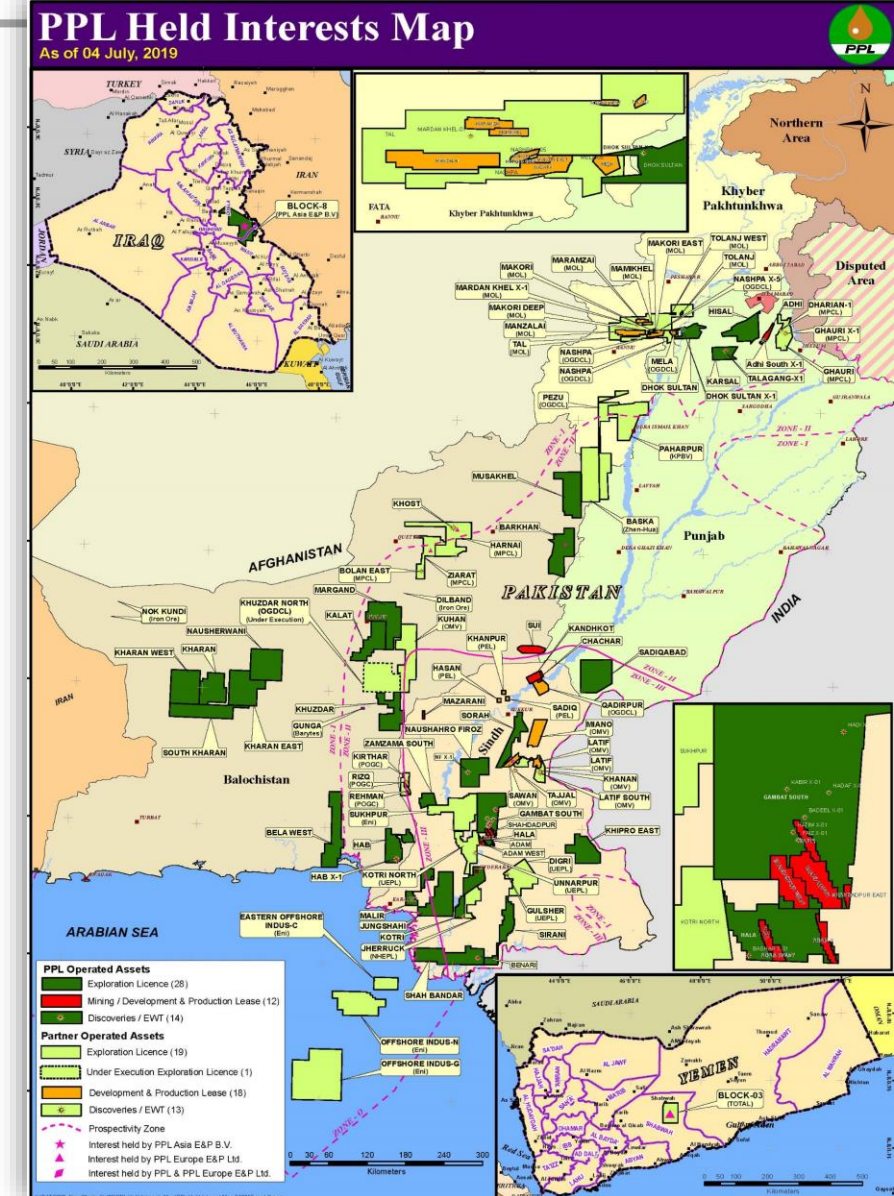
Producing Assets and Discoveries

PPL Operated	26
Partner Operated	31
Total Mining / D&PL Assets	57

Total Assets

Total PPL Operated Assets	53
Total Partner Operated Assets	50
Total Assets	103

* In addition, signing of Assignment Agreement for 30% WI in Pezu EL (OGDCL) under execution

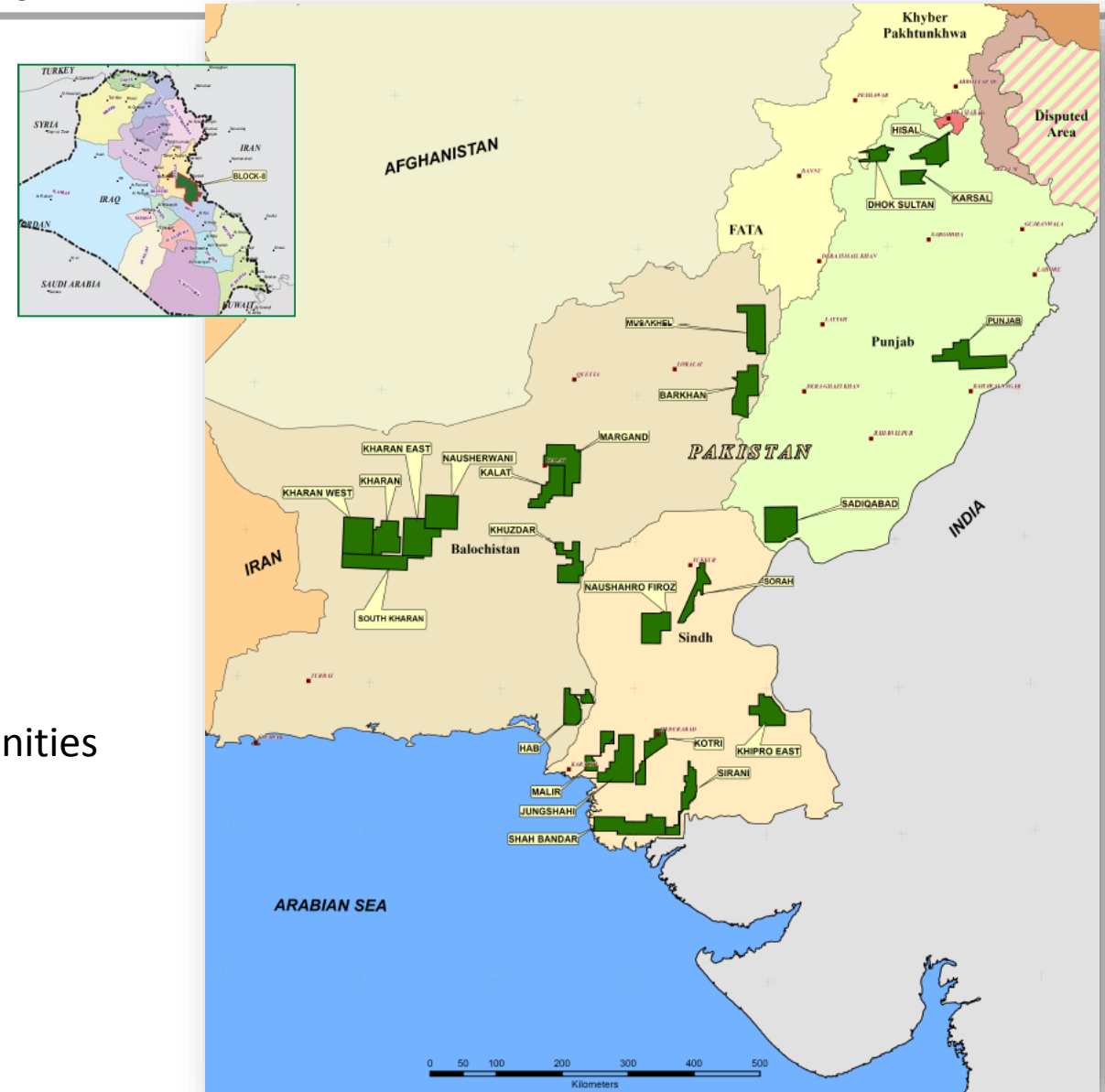


PPL Operated Exploration Blocks for Farm-in

S.N	Block	Province	PPL WI (%)	Area (s.kms)	Grant date	Work Completed			Planned Activity
						Wells	2D (L.kms)	3D (km2)	
Domestic Exploration Blocks									
1	Barkhan	Balochistan	35	2105.69	29-Dec-05	2	293	-	Seismic reprocessing
2	Dhok Sultan	KPK	75	703.23	16-Feb-10	2	420	525	Post well studies
3	Hisal	Punjab	62.5	1419	21-Feb-14	1	528	-	Post well studies
4	Hub	Balochistan	99.85	1448.9	21-Feb-14	3	475	-	Post well studies
5	Jungshahi	Sindh	100	2459.26	24-Dec-09	1	624	-	Seismic reprocessing
6	Kalat	Balochistan	100	1737.24	22-Mar-05	1	692	-	Planning to drill well
7	Karsal	Punjab	100	724.42	10-Feb-14	1	-	253	Post well studies
8	Kharan	Balochistan	100	1736	21-Jan-10	1	1053	-	Sesimic acquistion
9	Kharan East	Balochistan	100	2489.67	21-Jan-10	-	1118	-	Sesimic acquistion
10	Kharan West	Balochistan	100	2487.37	16-Feb-10	-	527	-	Seismic reprocessing
11	Khipro East	Sindh	97.5	2376.85	28-Feb-14	-	1208	-	Planning to drill well
12	Khuzdar	Balochistan	100	1750	09-Mar-05	1	167	-	Sesimic acquistion
13	Kotri	Sindh	100	1330.77	29-Apr-10	5	600	801	Post well studies
14	Malir	Sindh	95	764.01	21-Feb-14	1	482	-	Seismic reprocessing
15	Margand	Balochistan	100	2484	28-Feb-14	1	262	-	Post well studies
16	Musakhel	Balochistan	51	2176.15	20-Jun-19	-	-	-	None to date
17	Naushahro Firoz	Sindh	100	1746.82	04-Jun-10	3	841	855	Post well studies
18	Nausherwani	Balochistan	100	2470.83	10-Feb-14	1	644	-	Sesimic acquistion
19	Sadiqabad	Punjab	97.5	2430.85	21-Feb-14	2	-	490	Planning to drill well
20	Shah Bandar	Sindh	63.0	2470.52	21-Feb-14	1	330	372	Seismic inversion study
21	Sirani	Sindh	75	1378.71	29-Apr-10	2	878	1024	Planning to drill well
22	Sorah	Sindh	100	1152	20-Jun-19	-	-	-	Sesimic acquistion
23	South Kharan	Balochistan	51	2204	21-Mar-14	-	775	-	Geological studies
24	Punjab	Punjab	100	2411	provisionally granted	-	-	-	Geological studies
International Exploration Block									
25	Block-8 (Iraq)		100	6000	05-Dec-12	1		318	Post well studies

Opportunities of Partnership with PPL

- JV Partnership in Exploration Blocks
 - Twenty four (24) Exploration Licenses in Pakistan available for farm-in
- Production Opportunities
 - Tight gas discoveries
 - Shale Pilot
- International Joint Ventures
 - PPL's Block-8 in Iraq available for farm-in)
 - Acquired 318 km 3D seismic data in 2016
 - First exploratory well is underway
 - Interested in new international exploration opportunities



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Thanks