2024油气田勘探与开发国际会议
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Unconventional Gas Reserves in Saudi Arabia

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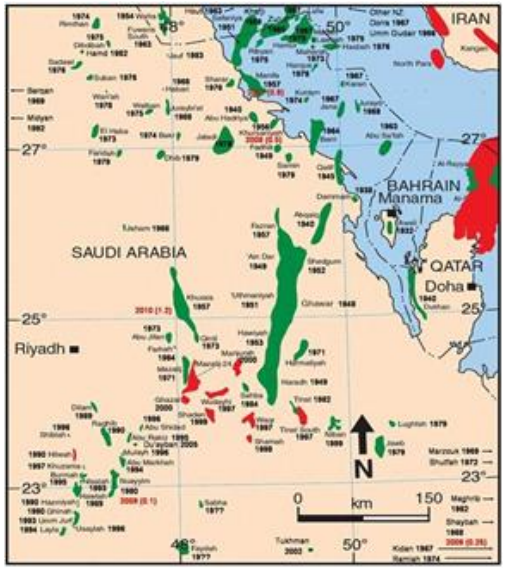
The objectives of this presentation are:

- ✓ Outline the global importance of conventional and unconventional oil and gas reserves in Saudi Arabia.
- ✓ Emphasis the development techniques required to exploit the unconventional oil and gas resources.
- ✓ Outline the key properties of the main unconventional natural gas resources in Saudi Arabia.

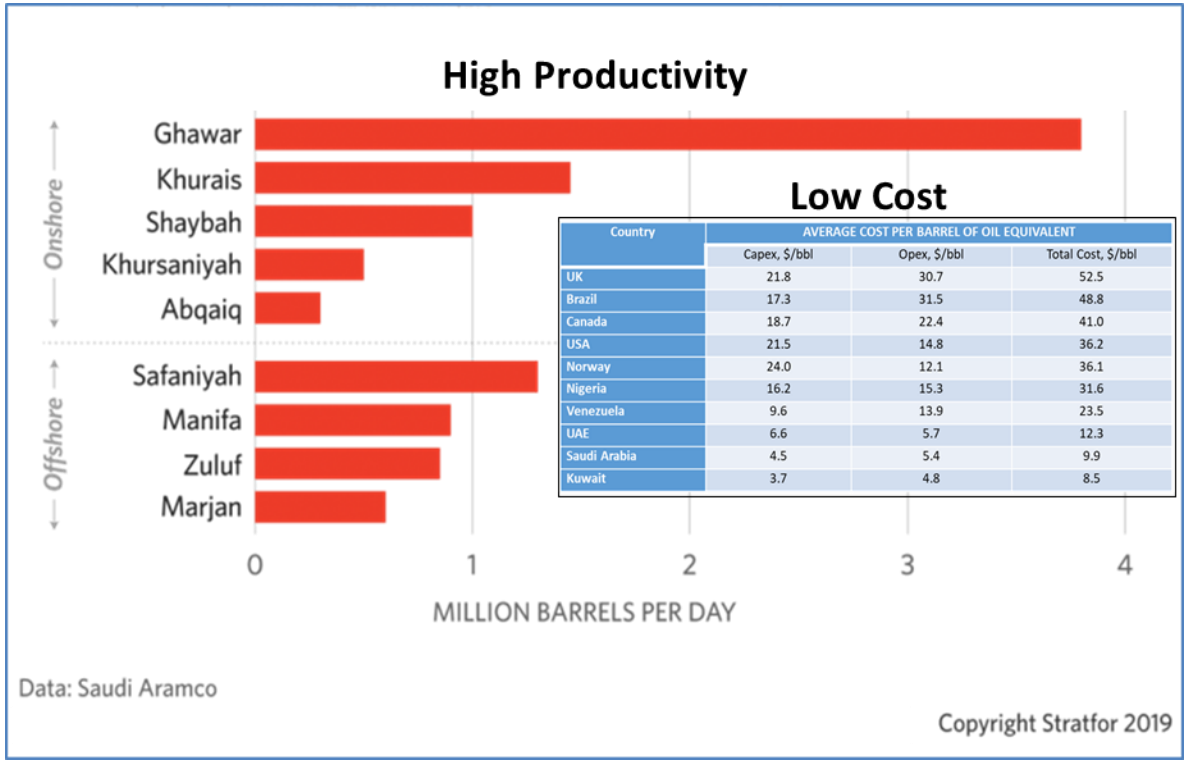
Conventional oil and gas resources in Saudi Arabia

- More than 125 oil and gas fields
- 1st Place in proved conv. oil reserves: 297.5 Bbbls
- 5th Place in proved conv. gas reserves: 294.3 Tcf
- Super pipelines, storage, and treatment facilities
- The World's super giant onshore oil filed (Ghawar)
- The World's super giant offshore oil filed (Safaniya)



Various Types of Saudi Arabian Oil

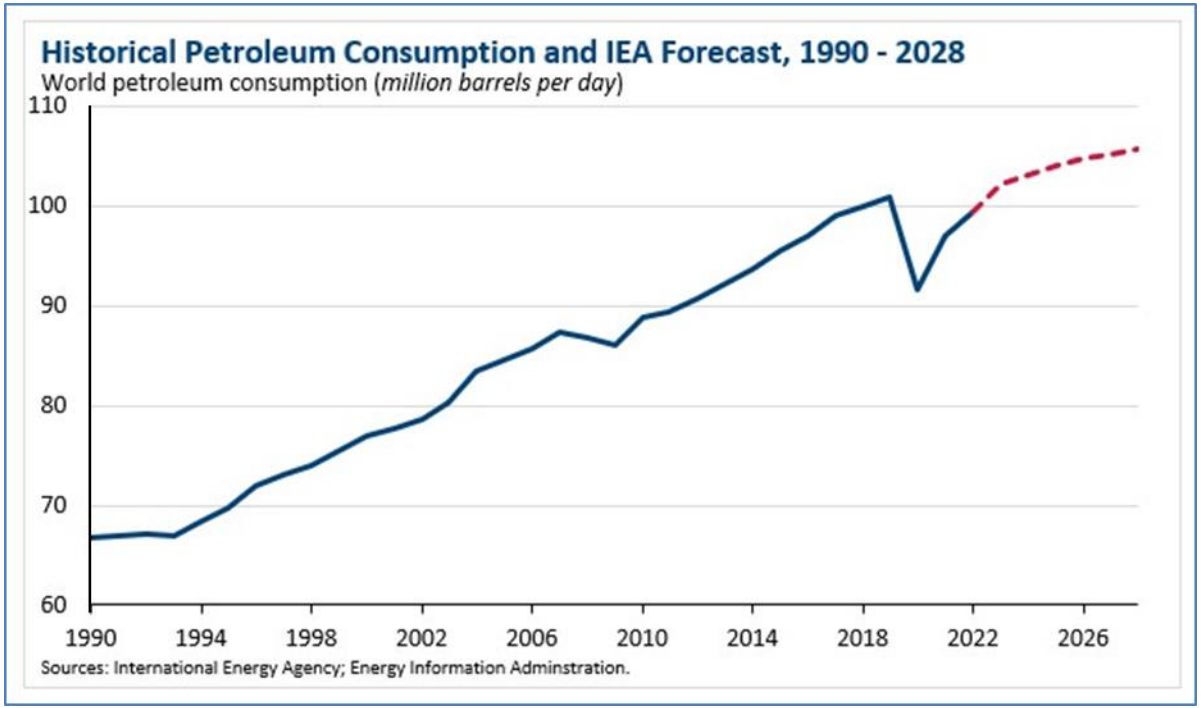
Crude oil type	API gravity index	Sulfur content	Percentage of crude oil reserves
Arabian Heavy	API < 29	more than 2.9%	35%
Arabian Medium	29 ≤ API < 33	2.2% to 2.9%	17%
Arabian Light	33 ≤ API < 37	1.3% to 2.2%	34%
Arabian Extra Light	37 ≤ API < 40	0.5% to 1.3%	13%
Arabian Super Light	API ≥ 40	less than 0.5%	1%



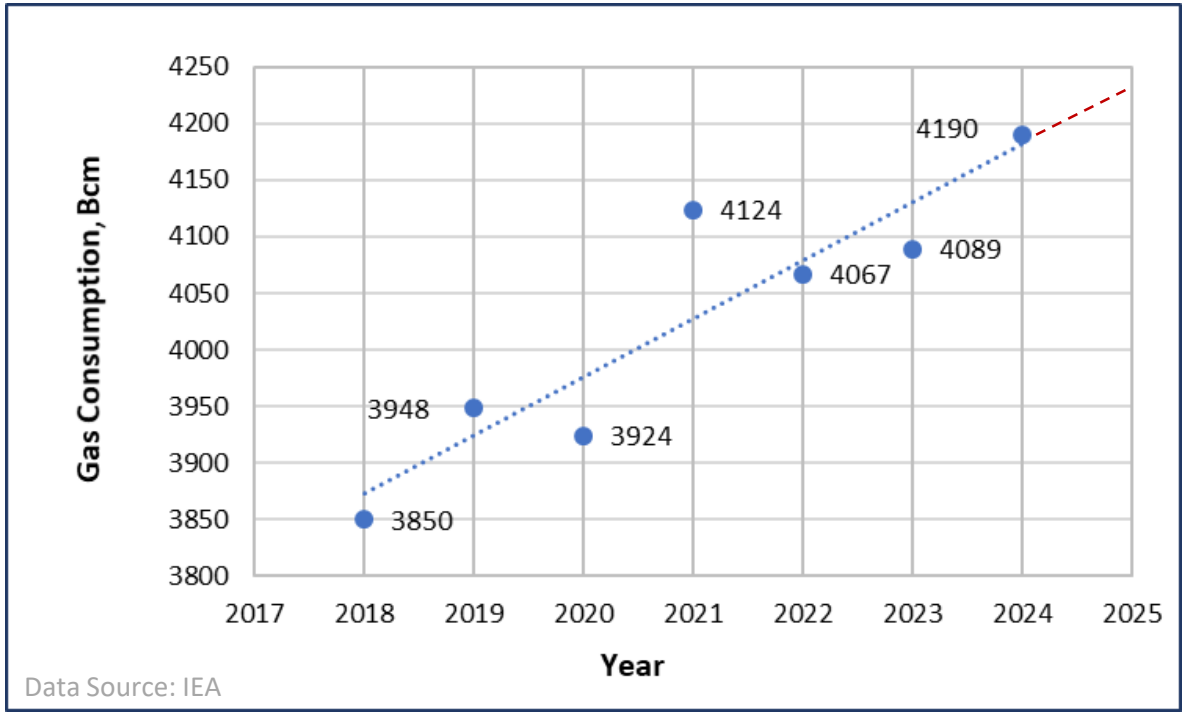
Low Cost

Country	AVERAGE COST PER BARREL OF OIL EQUIVALENT		
	Capex, $/bbl	Opex, $/bbl	Total Cost, $/bbl
UK	21.8	30.7	52.5
Brazil	17.3	31.5	48.8
Canada	18.7	22.4	41.0
USA	21.5	14.8	36.2
Norway	24.0	12.1	36.1
Nigeria	16.2	15.3	31.6
Venezuela	9.6	13.9	23.5
UAE	6.6	5.7	12.3
Saudi Arabia	4.5	5.4	9.9
Kuwait	3.7	4.8	8.5

Global Oil Demand

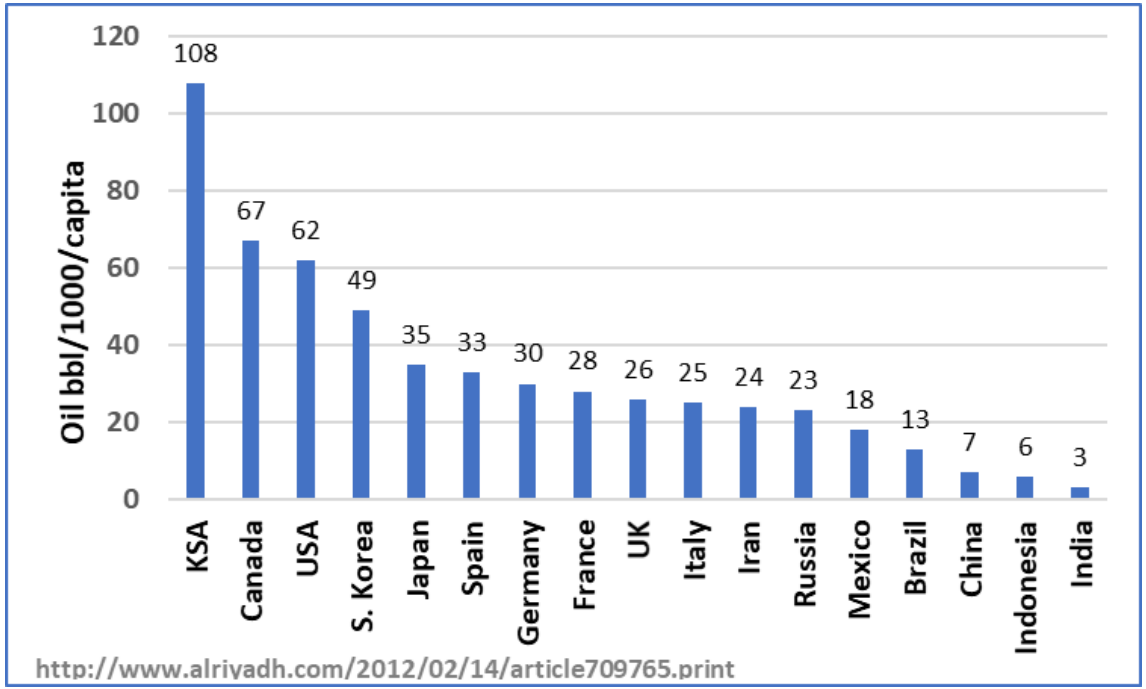


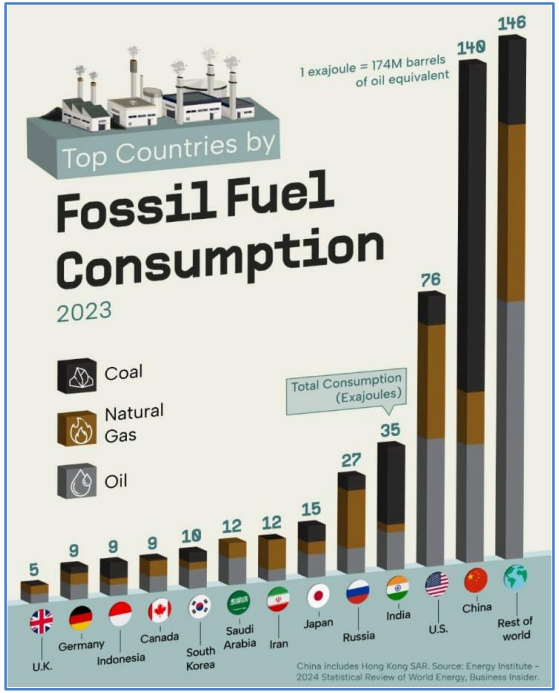
Global Natural Gas Demand



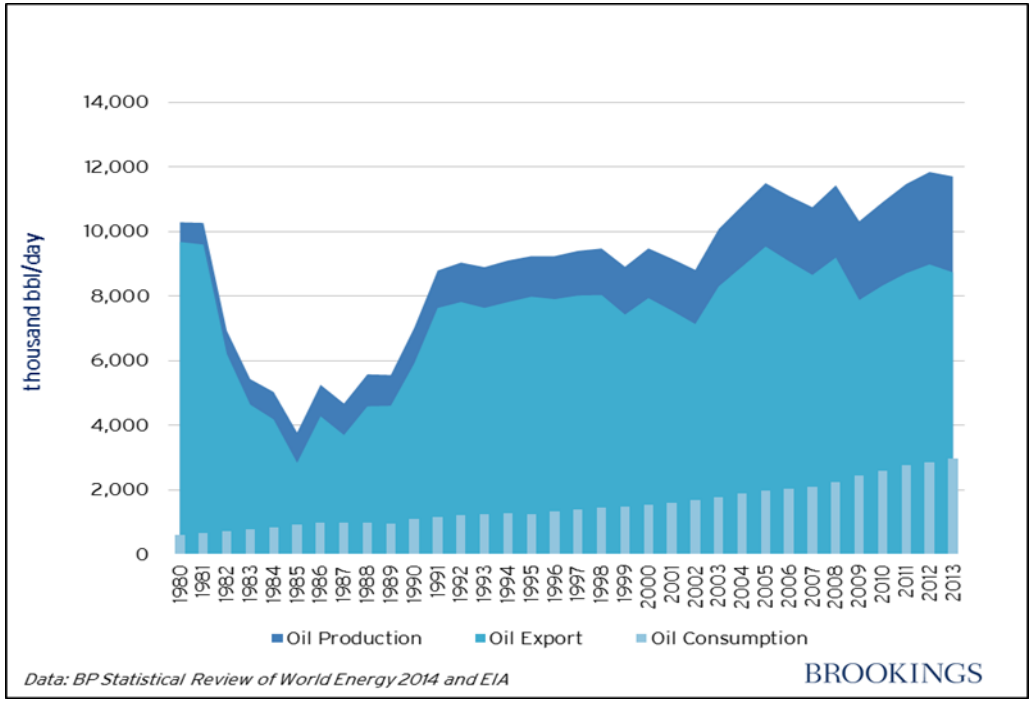
Data Source: IEA

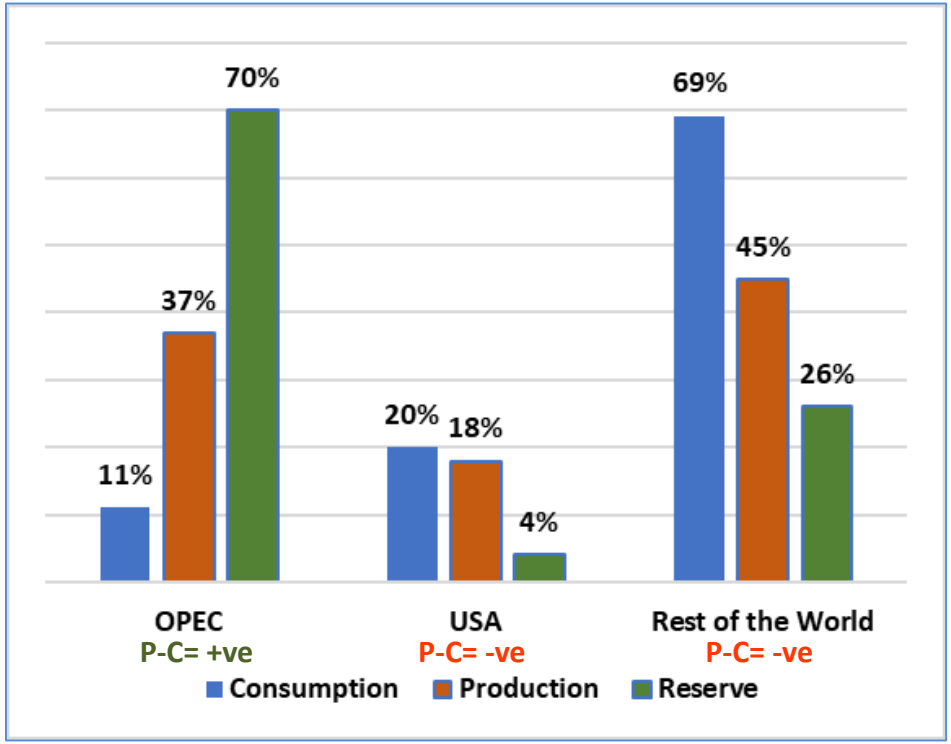
Global Oil Consumption per 1000 Capita

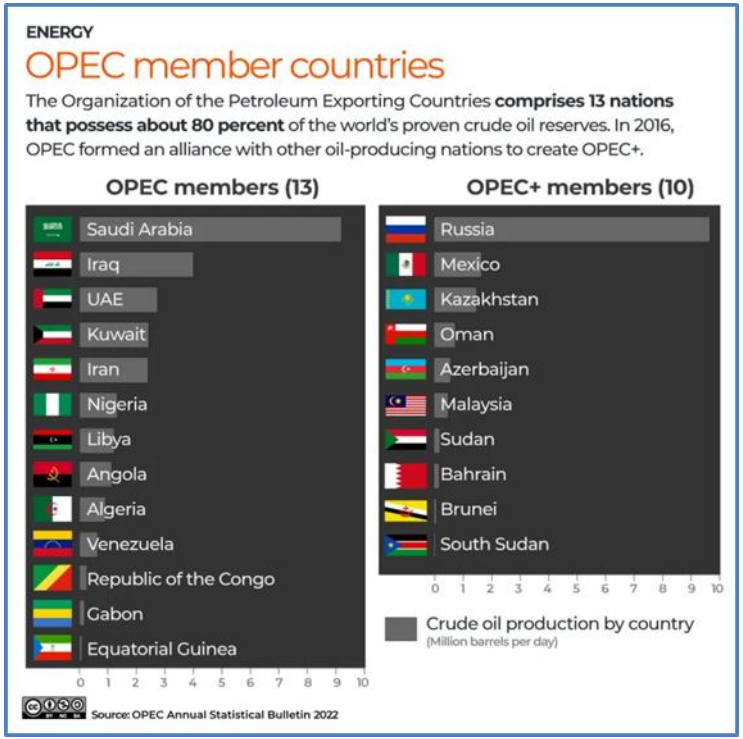




Saudi Arabia Oil Production, Export, and Consumption





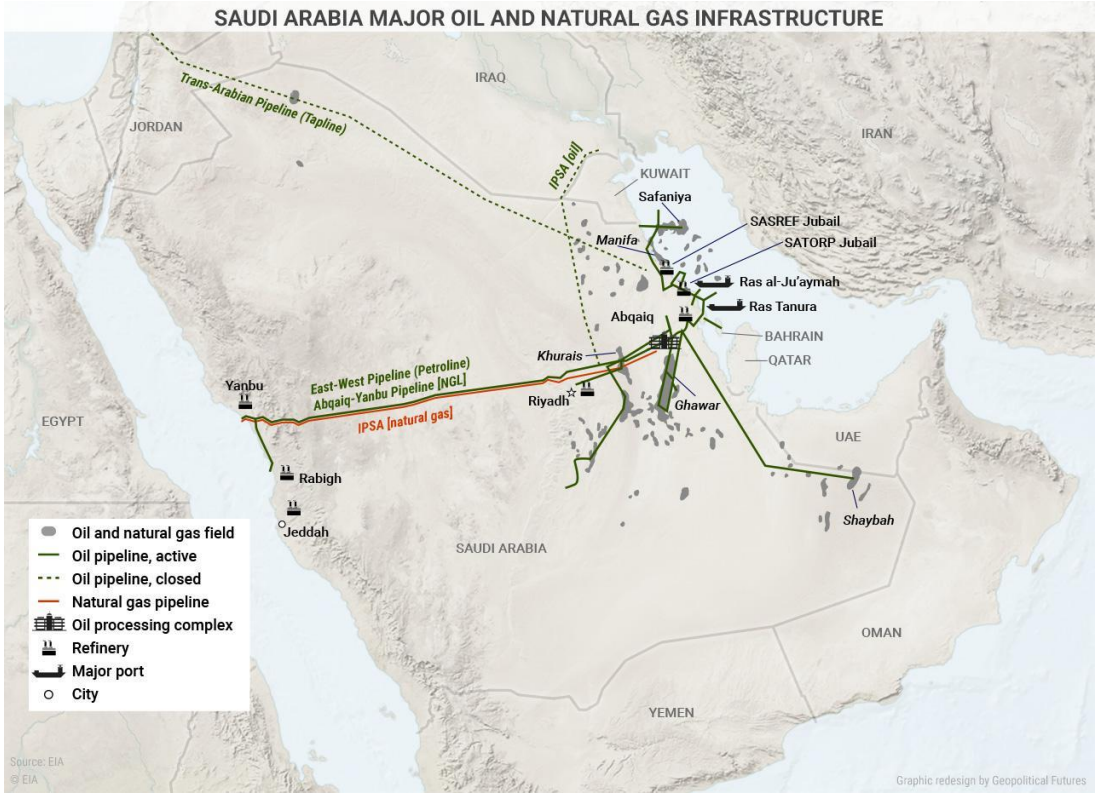


World's Current Oil Reserves, Production and Consumption

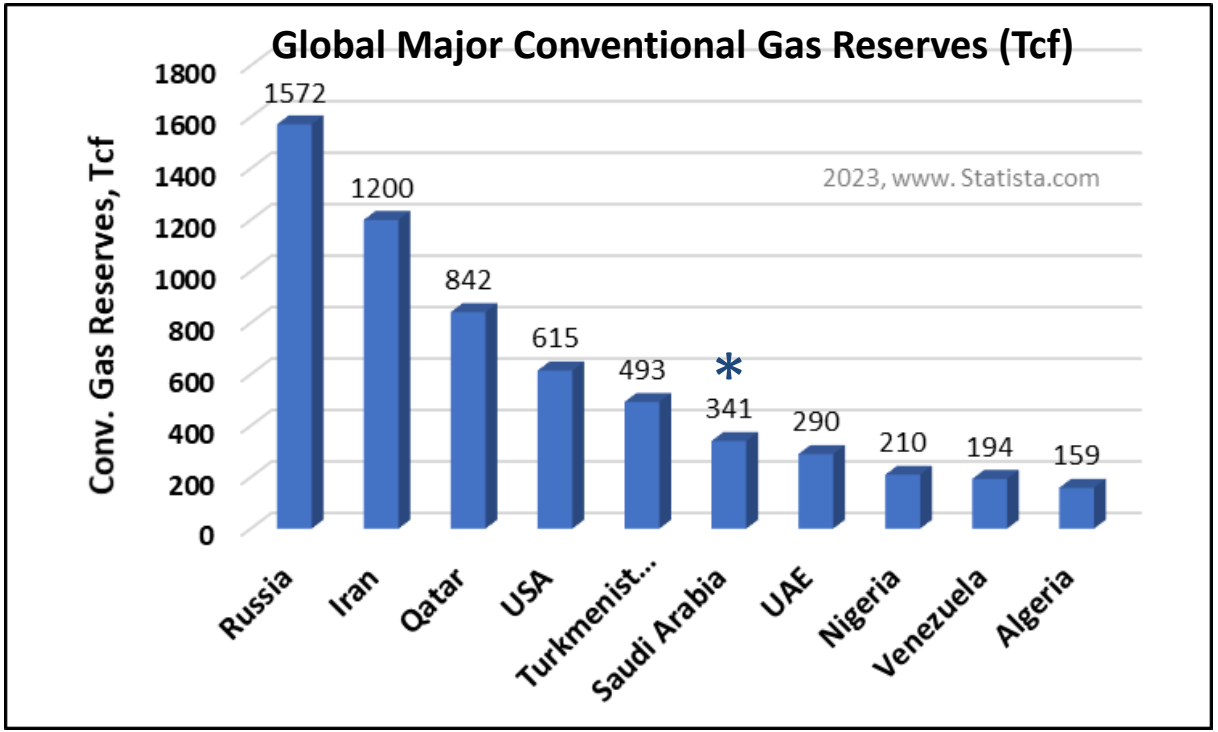
The role of Saudi Arabia to fulfil the surge in oil and gas demand:

- Reducing Saudi domestic oil consumption.
- Increasing Saudi domestic gas utilization.
- Increasing clean and renewable energy generation.
- Utilizing CO_2 capturing, storage and utilization.

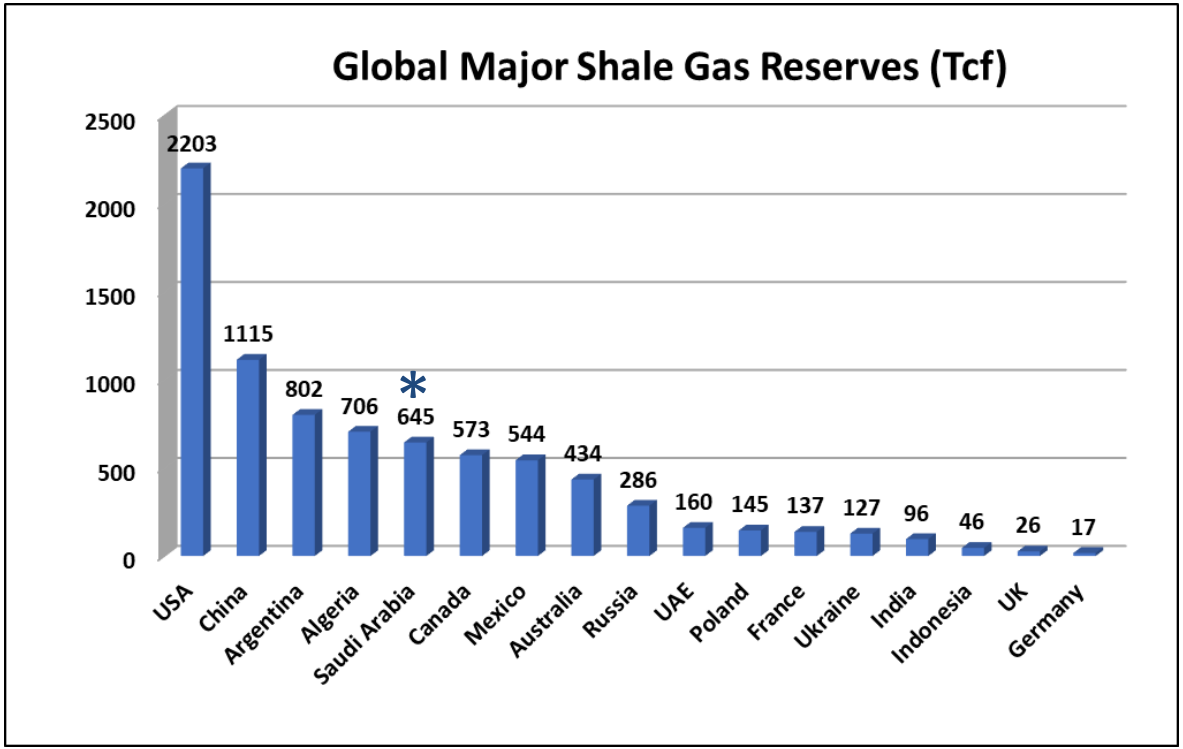
- Since the 1970s, Saudi Arabia has been capturing the natural gas that is released from its reservoirs as a byproduct of oil production.
- Besides that, Saudi Arabia is working in an extensive exploration and development program for Unconventional Gas Reserves.



- Oil Pipelines Network
- Gas Pipeline Network
- Zero Gas Flaring
- Environment Friendly Refineries
- Smart Well Completion
- Smart Field Monitoring
- Increase of N. G. Utilization
- Reduction of Crude Oil Burning
- Utilization of Renewable Energy
- CO2 Capturing, Storage and Utilization



Currently, Saudi Arabia meets its local natural gas consumption with domestic production and does not import or export natural gas.



Saudi Arabia shortly (2025) will be one of the main global natural gas producers using its unconventional shale gas resources.

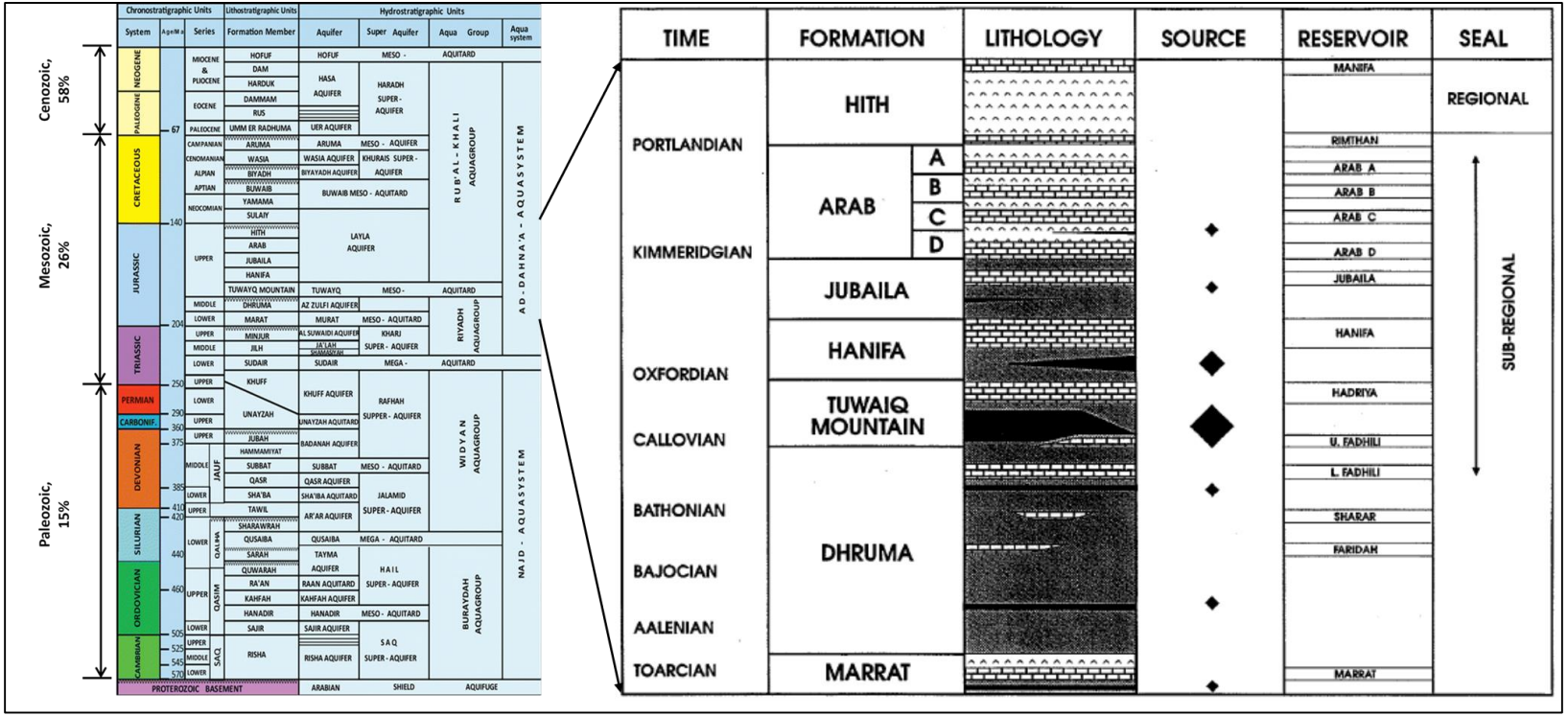
Gas fields found within shale rock formations are classified as unconventional. Extracting commercial quantities of natural gas from shale gas reservoirs requires:

- Advanced drilling techniques, such as horizontal and geosteering drilling,
- The use of massive hydraulic fracturing jobs using saline water.
- Smart completion and production strategies.
- Huge pipeline network, treatment and storage facilities.
- Available development budget.

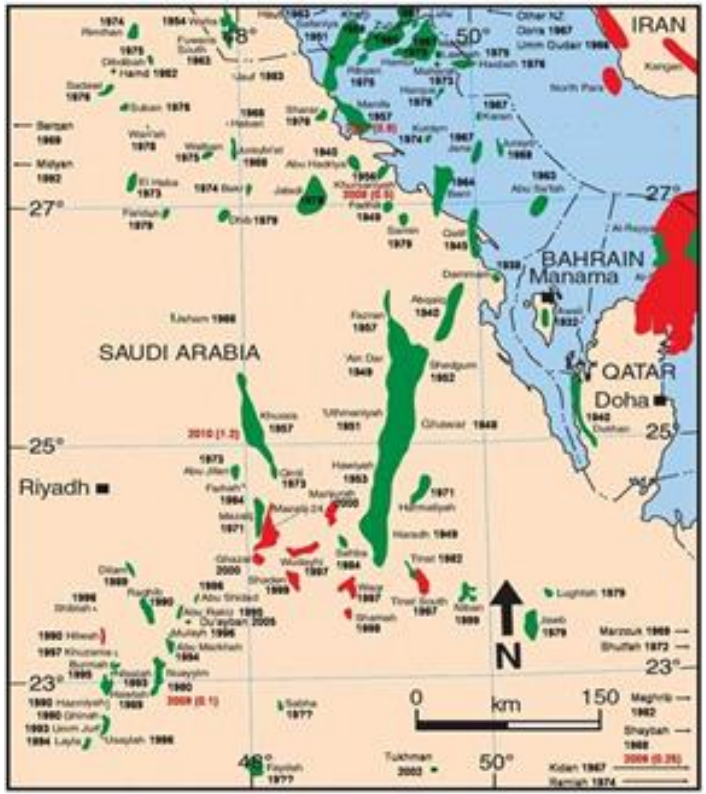
All the above technologies and capabilities are routinely used by Saudi Aramco in its previous oil and gas conventional projects.

All the previous technologies and capabilities are routinely used by Saudi Aramco in its oil and gas conventional projects. Additionally, Saudi Arabia is currently ranked within the major 20 economies worldwide.

Pioneer and Smart Oil and Gas Completion and Exploitation



Generalized and Jurassic Stratigraphic Column of Saudi Arabia



The mega giant Jafurah unconventional gas field (discovered in 2013) measures 170 km-long and 100 km-wide and is almost similar in size to Eagle Ford, the second-largest shale gas field in the US

Jafurah reserves reaching 229 trillion cubic feet of gas and 75 billion barrels of condensates.

$110bn overall investment in various Jafurah development stages.

Gas production at Jafurah is expected to begin in 2025.

Projected Jafurah production capacity is 3.1 billion standard cubic feet per day.

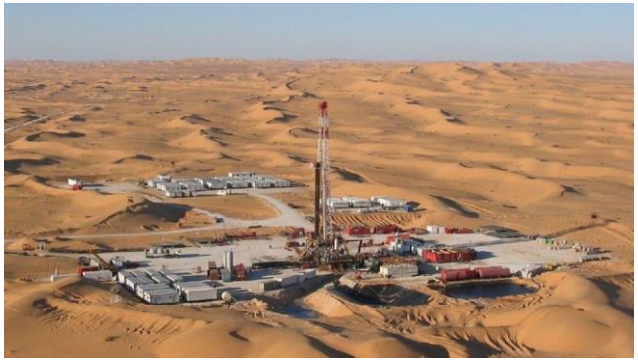
Jafurah could generate $9 billion a year in revenue.

Unconventional gas discoveries:

1. Awtad (أوتاد)unconventional gas field, 2022
2. Addahna (الدهناء) unconventional gas field, 2023
3. Smnah (سمنه) unconventional gas field, 2023
4. Alladam (اللدام) unconventional gas field, 2024
5. Alfrooq (الفروق) unconventional gas field, 2024

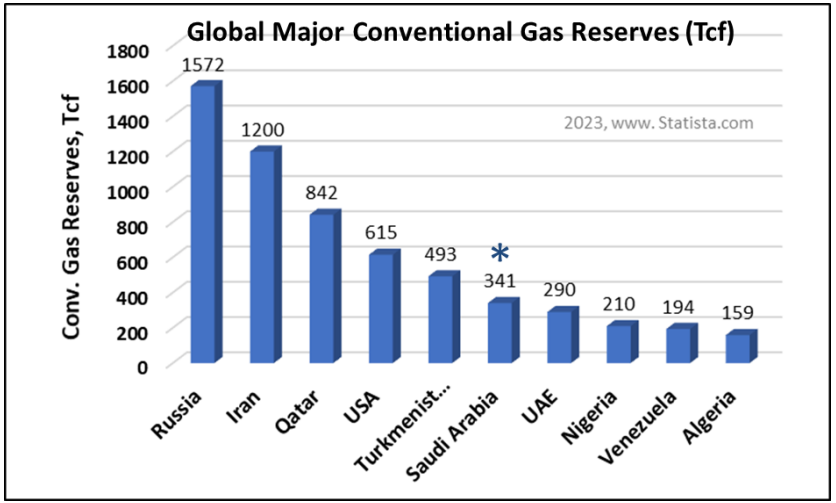
Conventional gas discoveries:

1. Umkhonser (أم خنصر) conventional gas field, 2022
2. Ashorfah (الشرفة) conventional gas field, 2022
3. Shehab (شهاب) conventional gas field, 2022
4. Shadon (شدون) conventional gas field, 2022
5. Aljahak (الجهق) conventional gas field, 2024
6. Alktoof (الكتوف) conventional gas field, 2024
7. Osakrah (عسيكرة) conventional gas field, 2024
8. Onyizah (عنيزة) conventional gas field, 2024



Saudi Arabia will utilize its natural gas in conjunction with renewable energy (50%:50%) to pursue its 2060 net-zero target

> 940 Tcf



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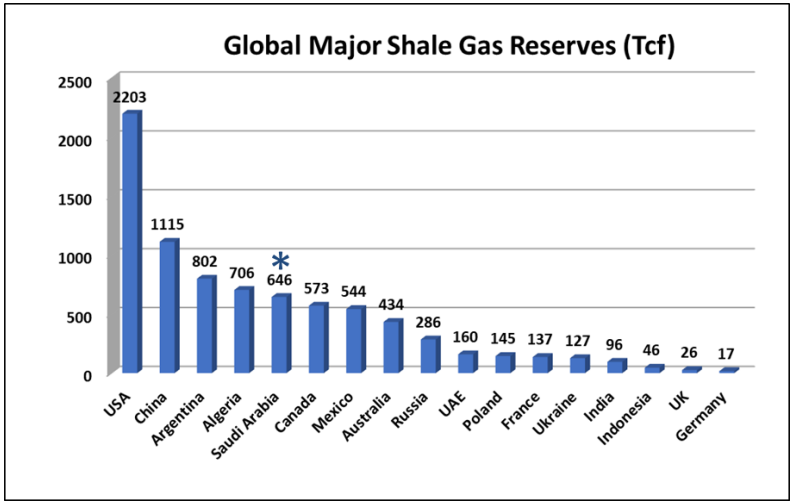

Conclusions

1. Saudi Arabia is the past, current and future safe and reliable source for energy supply.
2. Using its combined conventional and unconventional gas resources, Saudi Arabia will move forward in the global gas reserves ranking.
3. Saudi Arabia has the technological and financial means to accelerate exploration and development of its unconventional oil and gas resources.
4. The huge gas resources will help supply the world with more spare oil for a longer period of time.
5. Saudi Arabia will utilize its shale gas in conjunction with renewable energy (50%:50%) to pursue its 2060 net-zero target.

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谢谢大家 شكراً جزيلاً

Thank You

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