Power Construction Corporation of China (POWERCHINA)

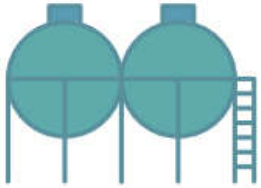
is an integrated construction group that provides investment and financing, planning design, engineering construction, equipment manufacturing, and operation management for clean and low-carbon energy, water resources, environmental construction and infrastructure.

In 2022 POWERCHINA ranks				
	100th	30th	1st	5th
	among Fortune Global 500 companies	among Top 500 Enterprises of China	among the Top 150 Global Design Firms by ENR	among the world's 250 largest global contractors according to ENR

Introduction to Structure

Fuel Supplier

To be determined



Fuel Supplier

Ammonia & HFO

Fuel Offtaker

BPDB

Electricity

Payment

Power Plant Investor

Beringia Energy Global

Power Plant EPC

Power Engine Supplier

中国电建
POWERCHINA

1200MW DF Engine Power Plant Project

Executed by stages

April，2024

Content

1 Bangladesh Power Situation

2 How to Bring RNE to Bangladesh

3 DF Power Plant Project Envision

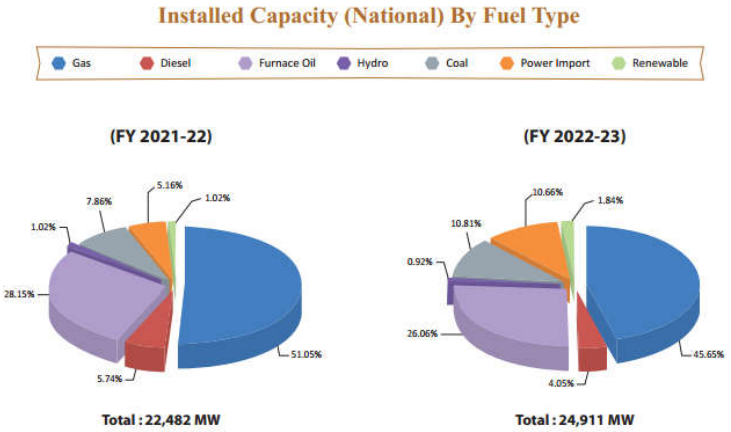
4 Next Step

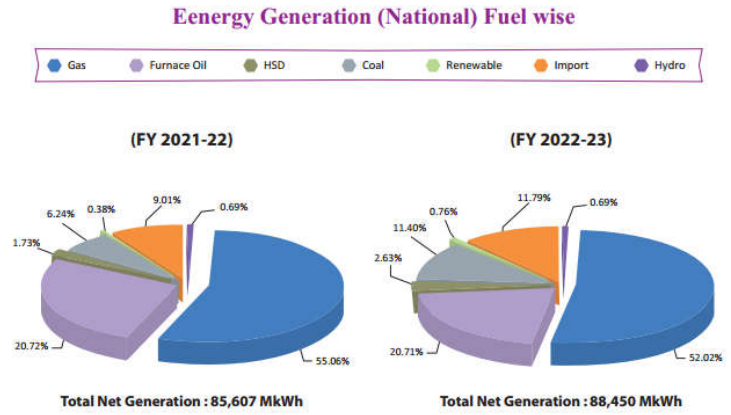
PART 1

Bangladesh Power Situation

Part1 Bangladesh Power Situation

Bangladesh Power Capacity is 25951MW at Present. Currently Power system relies heavily on Natural gas , Oil and Coal. In future More power will be from Gas/RNE/Imported. Furnace Oil/HSD still run in near future





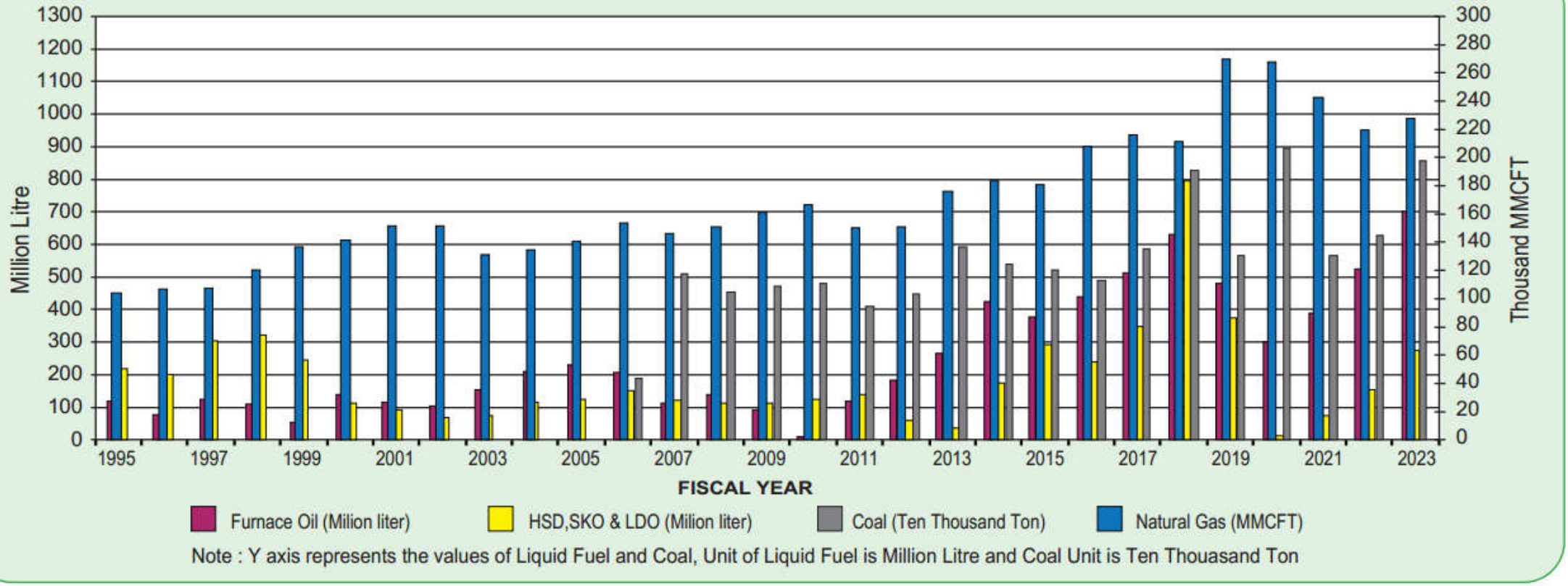
As per PSMP-2016,JICA，The Power Generation Capacity development Plan from 2025 to 2041 as follows:

	2025	2030	2035	2040	2041
Coal Power ↑↑↑	6977	9377	11777	18195	20195
Gas Power ↑↑↑	8516	9432	15447	20328	20177
HSD ↓	1520	1520	1373	220	0
Furnace Oil ↓↓	2485	2030	300	0	0
Import ↑↑	2500	5000	7000	9000	9000
Nuclear ↑↑	2232	3432	4632	5832	7032
Hydro	230	330	330	330	330
RNE ↑	2718	3458	3864	3864	3864
Total	27178	34579	44723	57769	60598

Part1 Bangladesh Power Situation

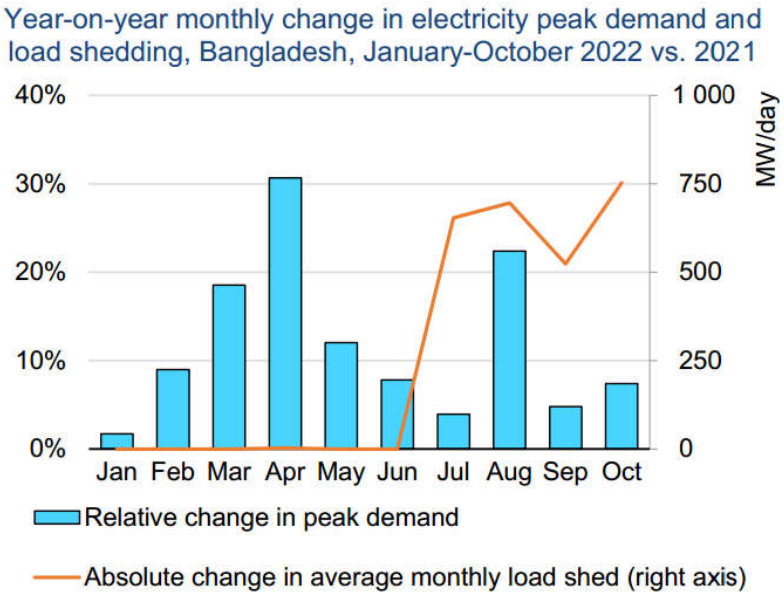
Looking back, we can find the furnace oil consumption didn't diminish due to shortage of natural gas, further more HSD was largely used due to peaking load.

In future, Furnace oil will be used until 2035 to undertake large portion of load. HSD still need to provide peaking service



In Bangladesh, natural gas plays a prominent role in electricity supply, making up about 80% (2018-2022 average) of the generation mix. At the same time, Bangladesh relies on LNG imports to meet fuel demand for power generation and was therefore hit hard by high LNG prices in 2022. LNG accounts for approximately 20% of the total natural gas consumption of Bangladesh. Because of a notable decrease in its foreign exchange reserves, the government stopped buying LNG from the spot market during the period of July-November 2022, which resulted in fuel shortages for the power sector

Following the LNG shortage, Bangladesh faced harsh power disruptions due to load shedding



Electricity Market Report 2023, IEA

At the current consumption pace without discovery and development of new domestic gas reserves, the country will become solely dependent on LNG imports post 2030.

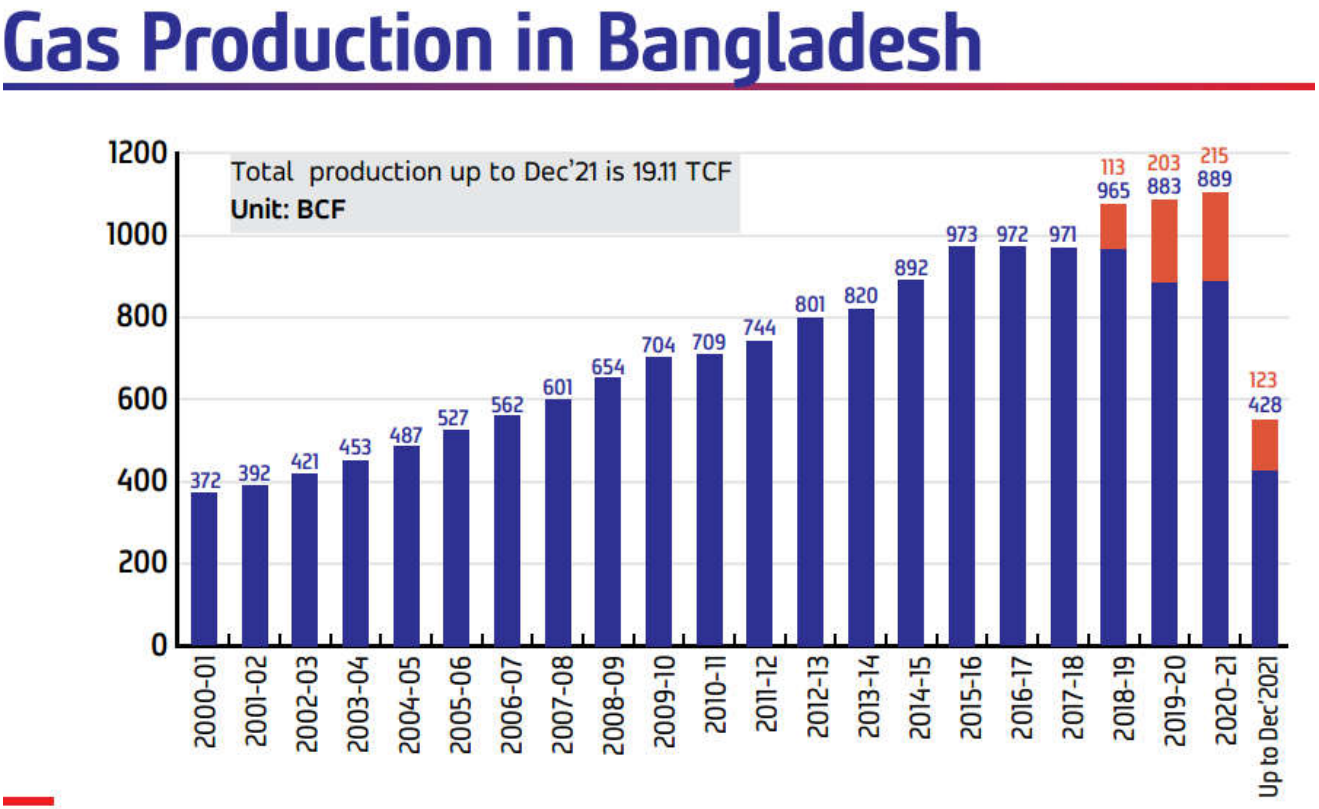
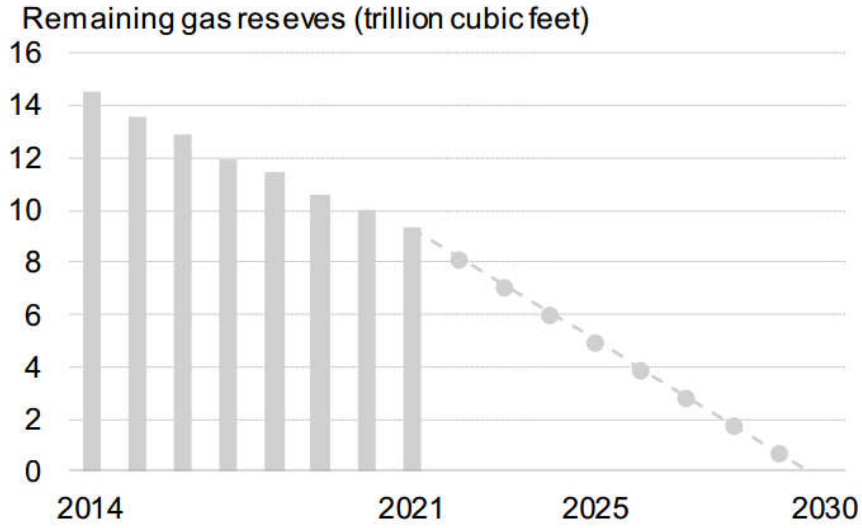


Figure 36: Bangladesh gas reserves, historical trends and projection

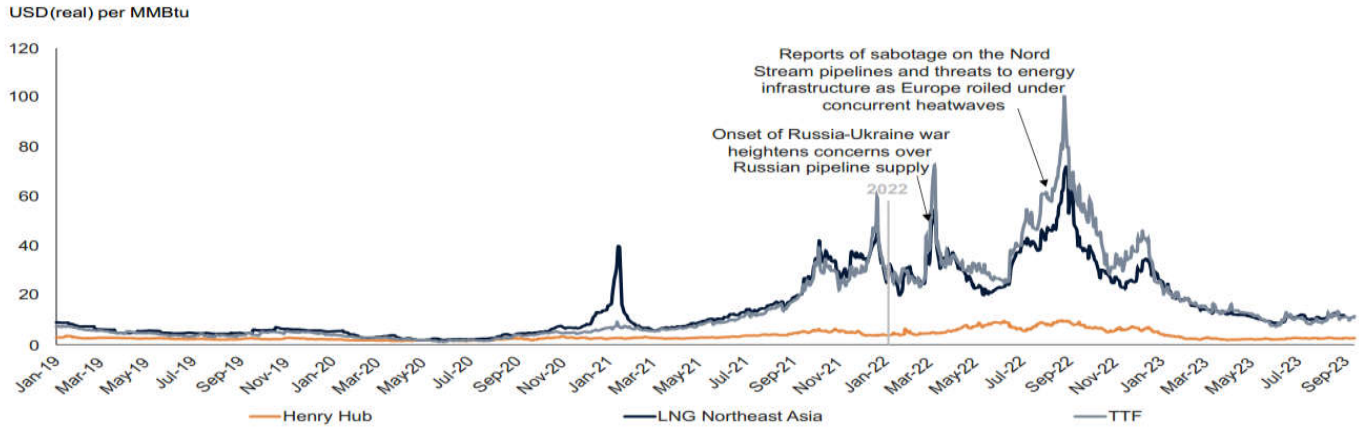


Source: BloombergNEF, Petrobangla. Note: An average of annual gas production from 2017 to 2021 is used to estimate when local gas reserves may run out.

Fuel Price

SL. No.	Fuel Type	01.07.2019	04.07.2021	08.10.2021	05.11.2021	05.11.2021	16.12.2021	01.01.2022	14.02.2022	10.03.2022	25.03.2022	01.06.2022	06.08.2022	15.08.2022	30.08.2022	01.02.2023	03.04.2023
1.	High speed Diesel oil (TK./ Lit)	59.74	65.00	65.00	65.00	80.00	80.00	80.00	80.00	80.00	80.00	80.00	110.30	110.30	105.43	105.43	105.43
2.	Furnace oil (TK./ Lit)	34.46	53.00	59.00	62.00	62.00	60.00	60.00	63.00	67.00	74.00	74.00	74.00	85.00	85.00	85.00	80.00
3.	Natarul Gas (TK./ 1000 Cft)	126	126	126	126	126	126	126	126	126	126	142.14	142.14	142.14	142.14	396.43	396.43
4.	Coal (US $./ M Ton) (Inc. VAT)	136.00	136.00	136.00	136.00	136.00	136.00	184.80	184.80	184.80	184.80	184.80	184.80	184.80	184.80	184.80	184.80

Figure 3: International gas prices



Price of Furnace Oil: 18USD/MMBtu

Price of LNG price : ~13USD/MMBtu

Recently Bangladesh has signed LNG supply contract for next 15 years. imported LNG is mainly from Qatar ,Oman and Spot market.

Price of LNG price formular from Oman: 11.90%*Brent price +0.4USD/mmBtu

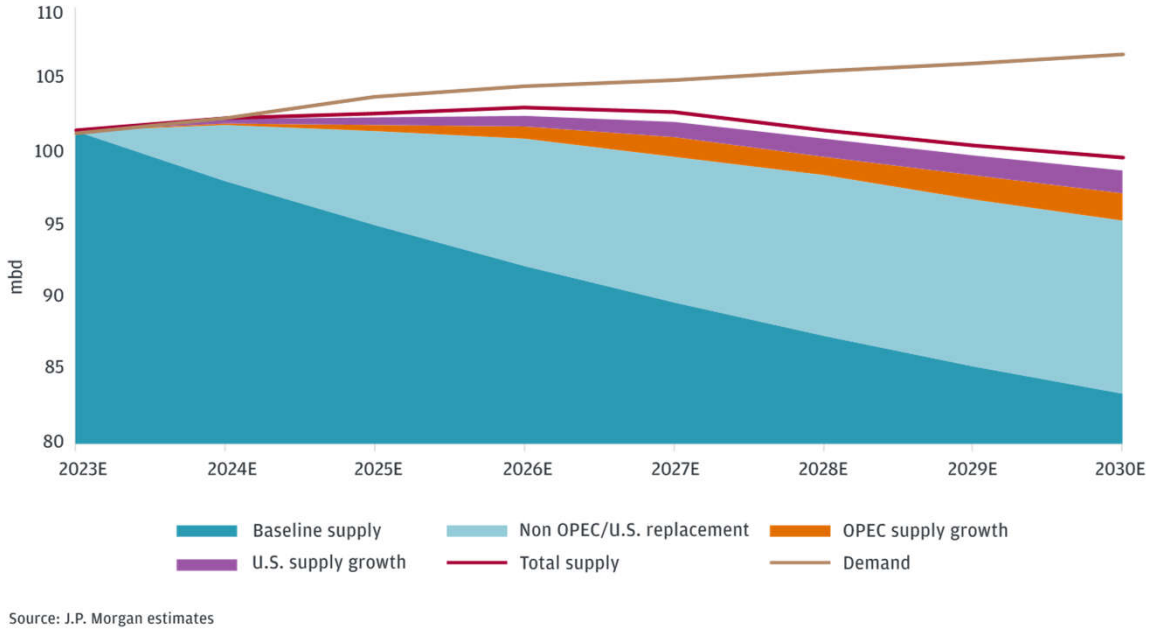
Price of LNG price formular from Qatar: 12.65%*Brent price +0.5USD/mmBtu

Assuming,

Transportation cost is 2USD/mmBtu;
Regasification cost is 1USD/mmBTU;
Today, Brent Price is 87USD/barrel;

In future, the Imported Regasifed LNG is 13-15USD/mmBtu

Overall, J.P. Morgan Research estimates that global oil markets could face a 1.1 mbd deficit in 2025, widening to 7.1 mbd in 2030. Consequently, oil prices could spike to $150/bbl over the near to medium term and $100/bbl over the long term — above J.P. Morgan Research's $80/bbl long-term forecast. "We believe the global economy is able to withstand triple-digit nominal oil prices, as in real terms such prices remain below the peak levels seen in 2008 and 2011 and are also below the demand destruction zone," Malek said.



Source: J.P. Morgan estimates

If Brent price will rise to 100 USD/barrel in 2030. the regasified LNG price will be 15-16USD/MMBtu

If Brent Price reach 150 USD/Barrel, The Regasified LNG price will be close to 20USD/mmBtu

COP28 Decision:

*COP28 closed today with an agreement that signals the **"beginning of the end" of the fossil fuel** era by laying the ground for a swift, just and equitable transition, underpinned by deep emissions cuts and scaled-up finance.*

*COP28 call on governments to speed up the **transition away from fossil fuels** to renewables such as wind and solar power in their next round of climate commitments*

Bangladesh is facing several climate-related challenges, including dry seasons, cyclones, floods, severe weather, and rising sea levels. The climate change is threat to Bangladesh.

Today's Power Mix of Bangladesh Largely relies on Natural gas power, Coal power and HFO/Diesel power, the Carbon emission is heavy. The finical burden is much hard to cope with when international events occur, like Russia-Ukraine War, Covid-19, etc..

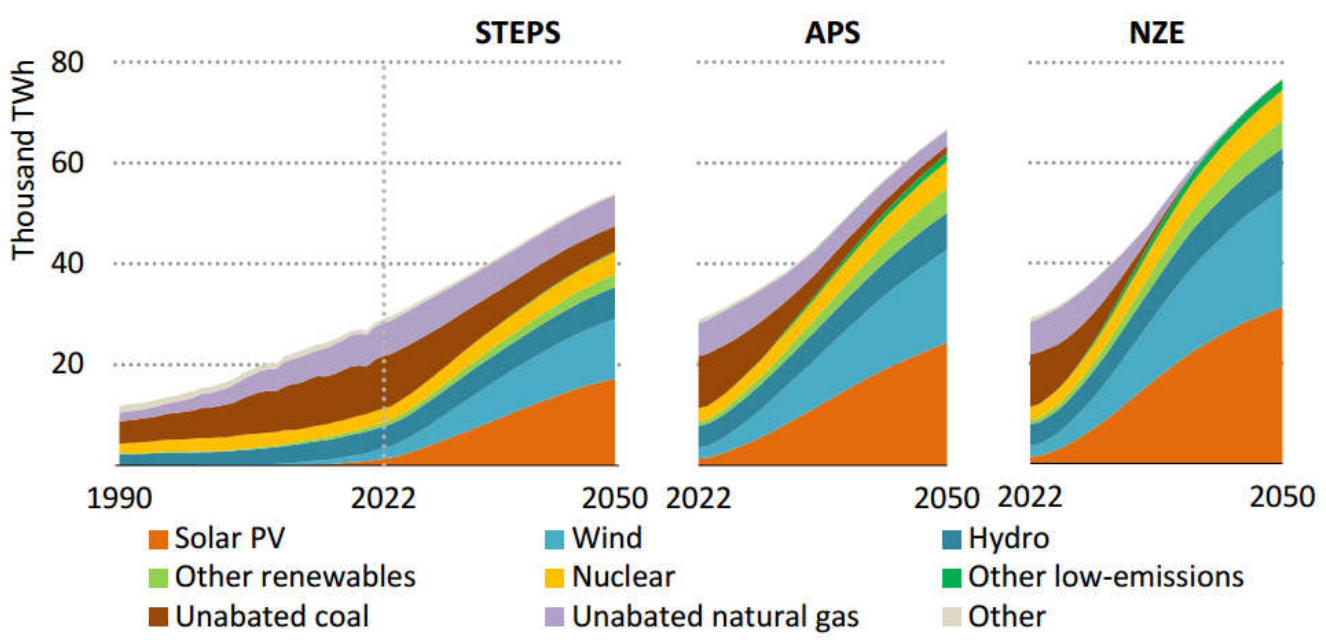
To Summarize the current situation of BD's Power:

1) Bangladesh Need more power generation for future
2) The Imported Re-gas LNG will be expensive and Unstable
3) Furnace oil is also very expensive fuel and Unstable, tariff is ~20Uscent/kWh now
4) To realize COP28 commitment, reduce fossil fuel consumption and more indigenous/imported RNE should be considered.
5) In future High indigenous RNE penetration will lead to unstable power grid. New power plant will run as power grid regulating station.
6) Stable/dependable Capacity, High efficiency and rapid response capability of power plant is very important

PART 2

How to Bring RNE to Bangladesh

Figure 3.15 ▷ Global electricity generation by source and scenario, 1990-2050



IEA. CC BY 4.0.

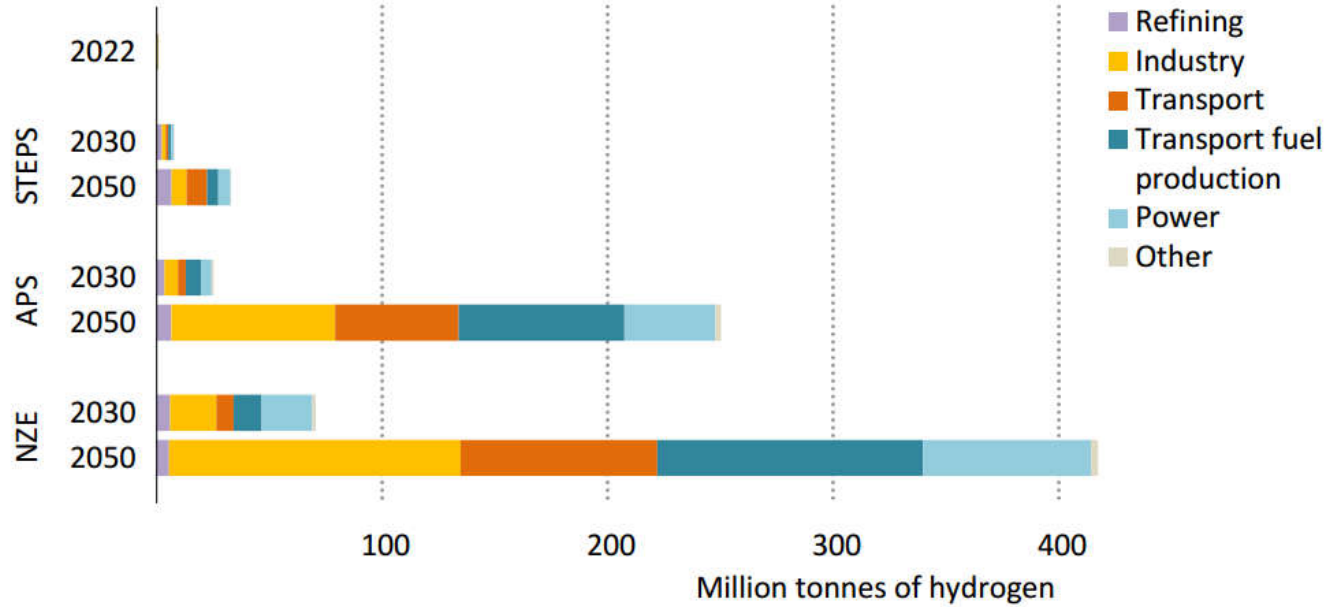
Renewables outpace electricity demand growth to 2030 in the STEPS, leading to a peak in coal-fired power in the near term though announced pledges call for faster declines

The **Stated Policies Scenario (STEPS)** provides an outlook based on the latest policy settings, including energy, climate and related industrial policies.

The **Announced Pledges Scenario (APS)** assumes all national energy and climate targets made by governments are met in full and on time.

the **Net Zero Emissions by 2050 (NZE)** Scenario which limits global warming to 1.5 ° C.

Figure 3.36 ▷ Global hydrogen demand by sector and scenario, 2022-2050



IEA. CC BY 4.0.

Demand for low-emissions hydrogen increases 60% per year to 2030 in the APS, but despite continued strong growth, by 2050 it is at only 60% of the level required in the NZE Scenario

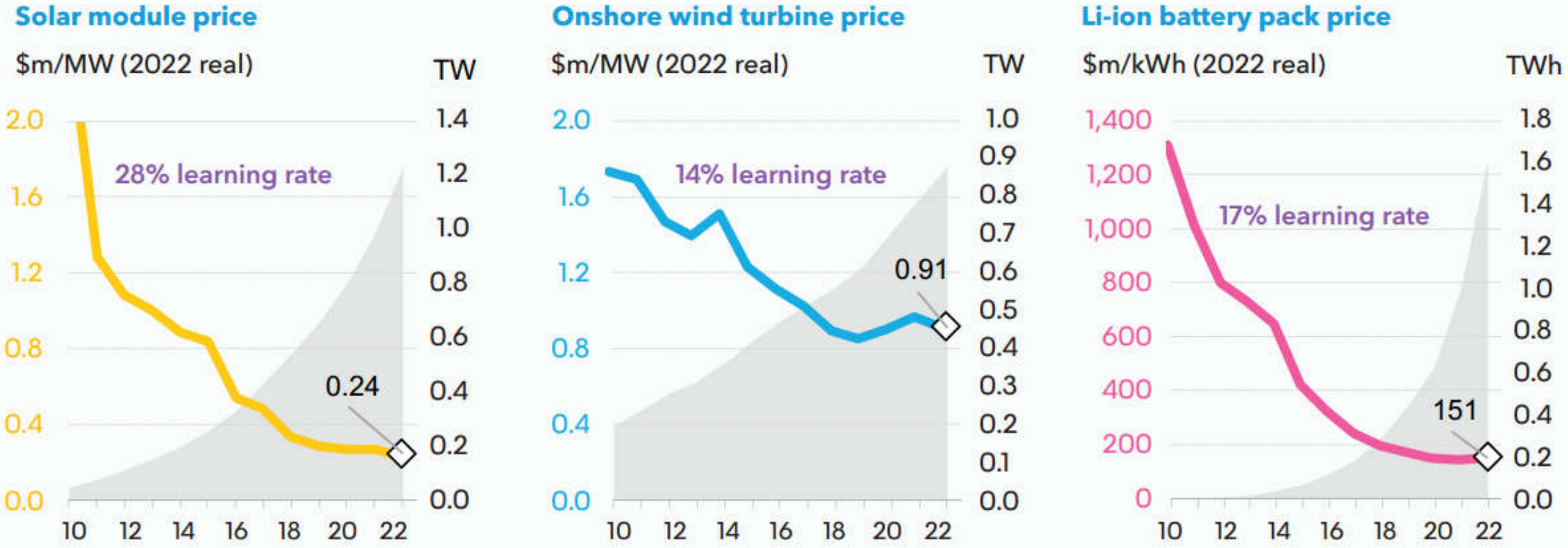
The **Stated Policies Scenario (STEPS)** provides an outlook based on the latest policy settings, including energy, climate and related industrial policies.

The **Announced Pledges Scenario (APS)** assumes all national energy and climate targets made by governments are met in full and on time.

the **Net Zero Emissions by 2050 (NZE)** Scenario which limits global warming to 1.5 ° C.

Part2 How to bring RNE to Bangladesh

The Renewable Energy Power Project cost is experiencing Rapid Falling. The Solar panel and Wind Turbine/Tower Price today in China is close to the price forecast of 2030



Source: BloombergNEF.

Note: Gray area shows the cumulative global installed capacity of each technology.

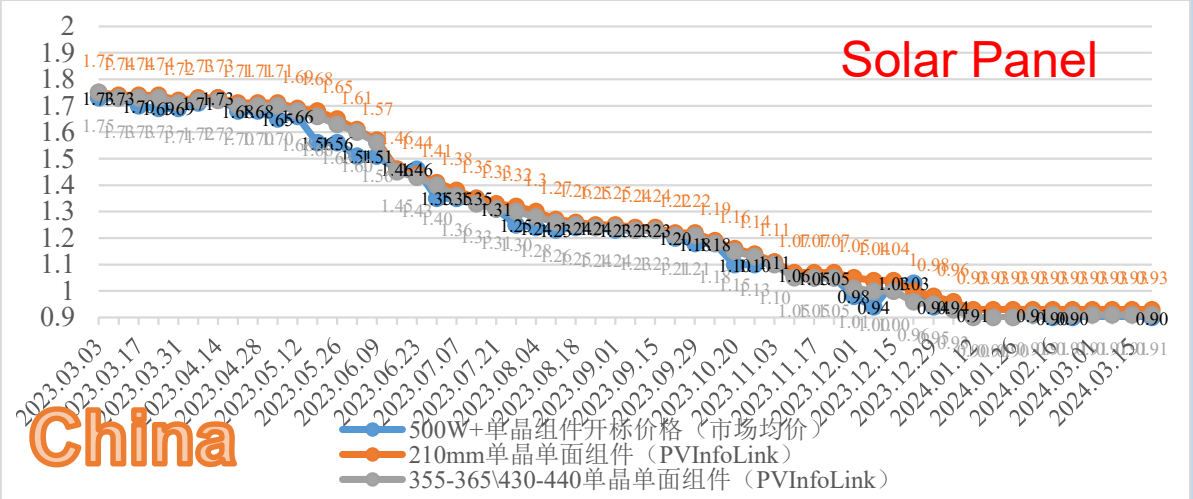
Part2 How to bring RNE to Bangladesh

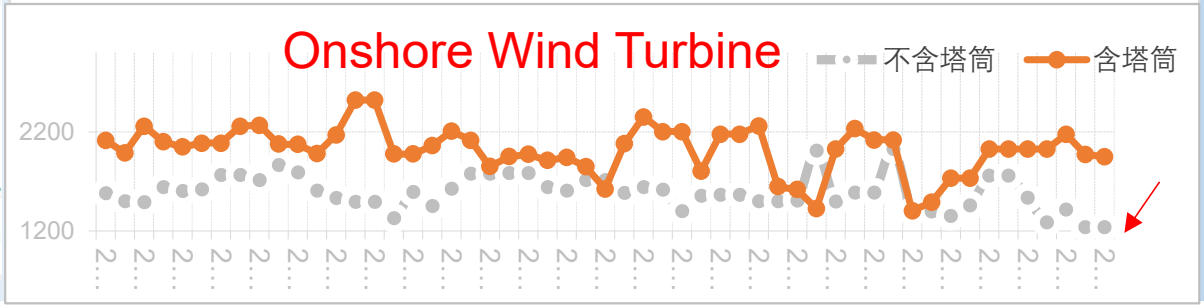
	Capital costs (USD/kW)			Capacity factor (%)			Fuel, CO_2, O&M (USD/MWh)			LCOE (USD/MWh)			VALCOE (USD/MWh)		
	2022	2030	2050	2022	2030	2050	2022	2030	2050	2022	2030	2050	2022	2030	2050
United States															
Nuclear	5 000	4 800	4 500	90	90	90	30	30	30	105	105	100	105	105	100
Coal	2 100	2 100	2 100	35	15	n.a.	30	25	25	100	210	n.a.	100	205	n.a.
Gas CCGT	1 000	1 000	1 000	55	40	15	45	40	40	65	70	120	65	65	75
Solar PV	1 120	690	480	21	22	23	10	10	10	50	30	25	55	55	60
Wind onshore	1 220	1 160	1 110	42	43	44	10	10	10	30	30	30	35	40	40
Wind offshore	4 060	2 520	1 900	42	46	49	35	20	15	120	70	50	125	80	60
European Union															
Nuclear	6 600	5 100	4 500	70	75	80	35	35	35	160	130	110	160	130	110
Coal	2 000	2 000	2 000	30	n.a.	n.a.	125	150	160	205	n.a.	n.a.	190	n.a.	n.a.
Gas CCGT	1 000	1 000	1 000	20	10	n.a.	170	125	130	230	270	n.a.	205	190	n.a.
Solar PV	990	620	450	14	14	14	10	10	10	65	40	35	80	85	90
Wind onshore	1 750	1 670	1 610	29	30	30	20	15	15	60	55	55	65	65	60
Wind offshore	3 420	2 280	1 740	50	56	59	15	10	10	75	45	35	75	55	40
China															
Nuclear	2 800	2 800	2 500	80	75	70	25	25	25	70	70	65	70	70	65
Coal	800	800	800	50	30	20	50	60	70	65	90	115	65	70	65
Gas CCGT	560	560	560	30	20	15	95	95	100	120	130	140	105	100	90
Solar PV	720	430	300	13	13	14	10	10	10	50	30	25	65	60	70
Wind onshore	1 100	1 040	1 000	26	27	28	10	10	10	45	40	35	50	50	50
Wind offshore	2 820	1 880	1 420	32	39	43	25	15	10	100	60	40	105	65	40
India															
Nuclear	2 800	2 800	2 800	80	85	90	30	30	30	70	70	65	70	70	65
Coal	1 200	1 200	1 200	65	70	70	40	35	30	60	55	50	60	50	40
Gas CCGT	700	700	700	25	40	45	95	70	60	125	90	80	120	70	50
Solar PV	640	390	270	20	21	22	5	5	5	40	25	15	45	40	55
Wind onshore	1 120	1 060	1 010	26	28	30	15	10	10	55	45	40	60	50	55
Wind offshore	3 060	2 060	1 500	33	37	39	25	20	15	135	85	60	135	90	65

Notes: O&M = operation and maintenance; LCOE = levelised cost of electricity; VALCOE = value-adjusted LCOE; kW = kilowatt; MWh = megawatt-hour; CCGT = combined-cycle gas turbine; n.a. = not applicable. Cost components, LCOE and VALCOE figures are rounded. Lower values for VALCOE indicate improved

IEA: World Energy Outlook 2023

The Rapid Renewable Energy Power Project Cost shrinking will lead to Green Energy trade.
The Green Energy is represented by energy trade instead of Location-bounded Resource.





Part2 How to bring RNE to Bangladesh

Solar

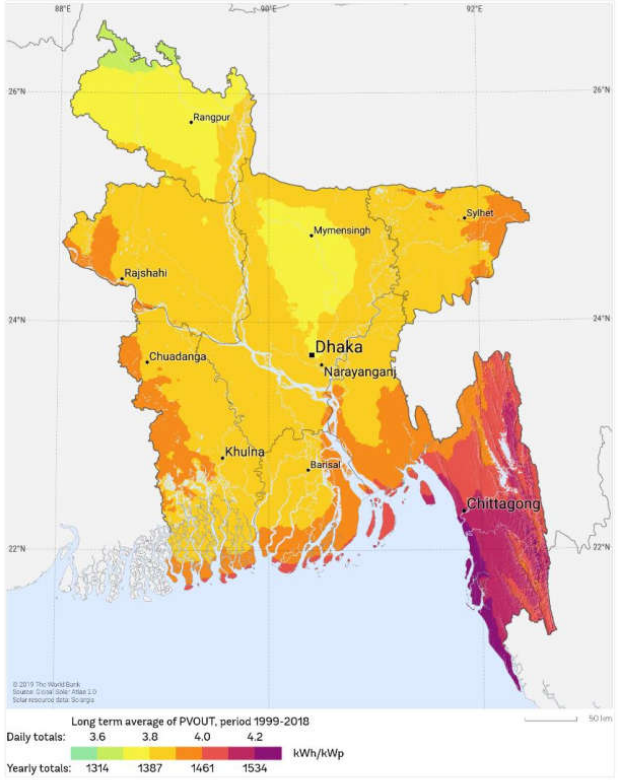
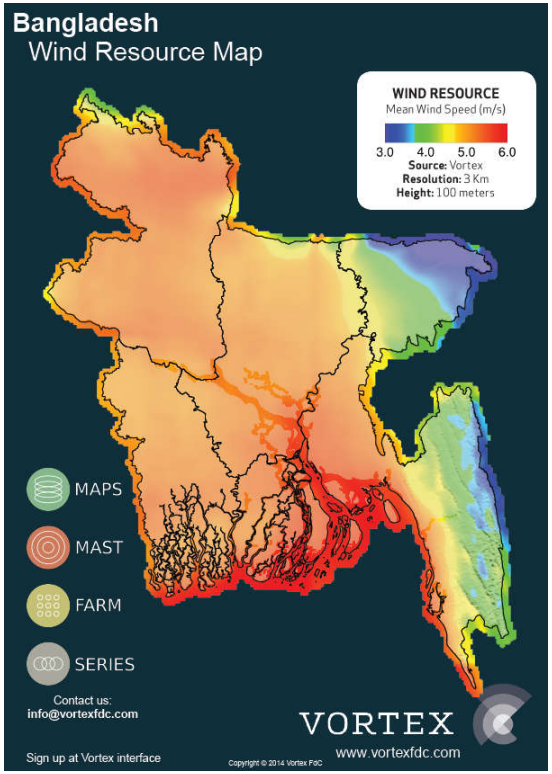


Figure 1.5: Photovoltaic Power Potential in Bangladesh (Source: ESMAP).

Wind



possible to develop Green Energy in Bangladesh?

Currently, the tariff of

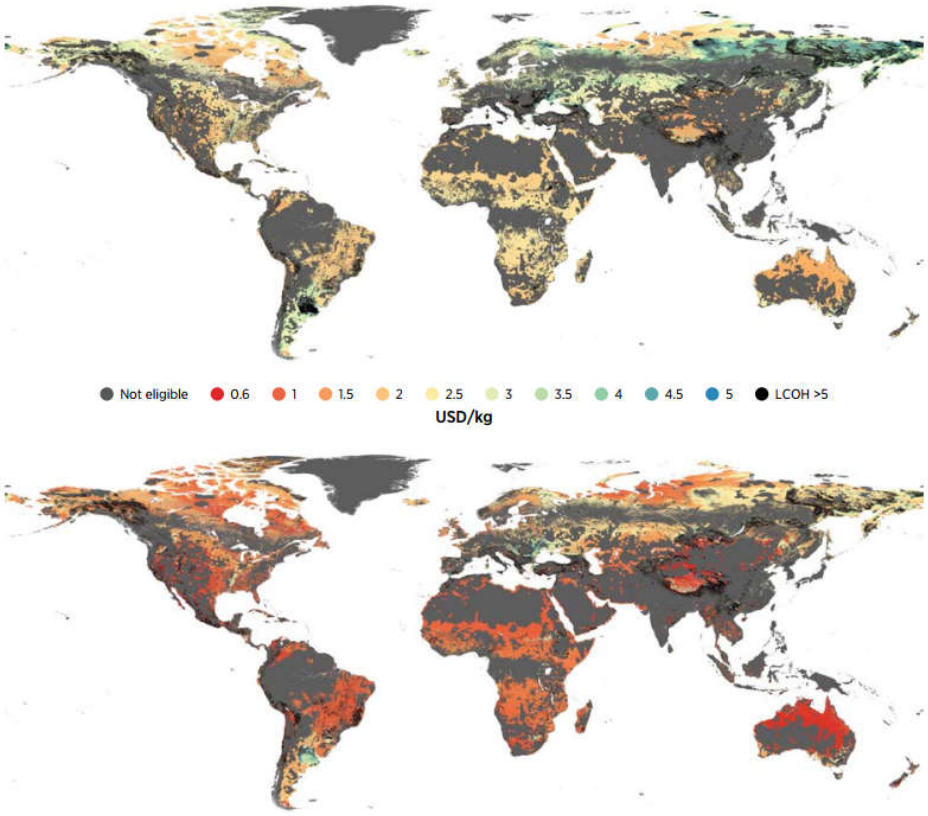
Solar:	*10USC/kW.H；*
Onshore Wind:	*13USC/kW.h;*
Offshore wind:	*13-15USC/kW.h;*

Bangladesh is rich in Solar resource. Wind resource is mediocre with strong seasonal feature.

Generally, the Solar and Wind resource is better in South part of Nation. Large –Scale Solar and Wind farm will be installed in this region, which will bring high power grid unstable in future.

Part2 How to bring RNE to Bangladesh

FIGURE 1.3. Global levelised cost of hydrogen (LCOH) in 2030 (top) and 2050 (bottom)

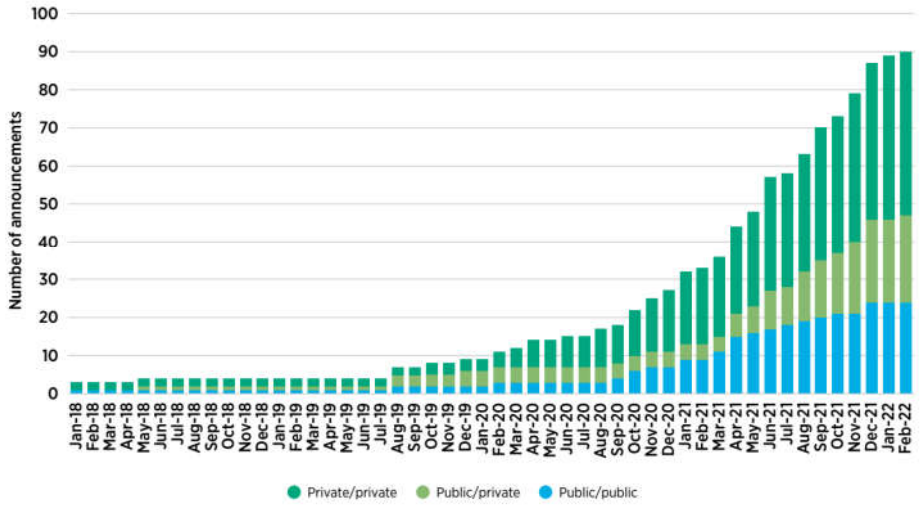


IRNEA: The global energy demand today is 80% supplied by fossil fuels. Fossil fuel reserves are highly concentrated in a few countries, with the top five countries5 holding 62% and 64% of the global oil and gas reserves, respectively (BP, 2021). This leads to a market dominated by a few countries, which has historically led to price spikes in cases of supply disruptions. Instead, in a decarbonised energy system largely supplied by renewables, there is a limited concentration of energy supply since every country has the potential to generate renewable energy to various degrees and of various types. There is a change from energy stocks (i.e. fossil fuels reserves) to energy flows, from continuous expenditure for importing fuels to capital expenditure (CAPEX) on assets with low marginal production cost, and from large centralized facilities to plants that can be deployed at virtually any scale (e.g. solar PV) (IRENA, 2019).

IRNEA: Overall GLOBAL HYDROGEN TRADE TO MEET THE 1.5 ° C

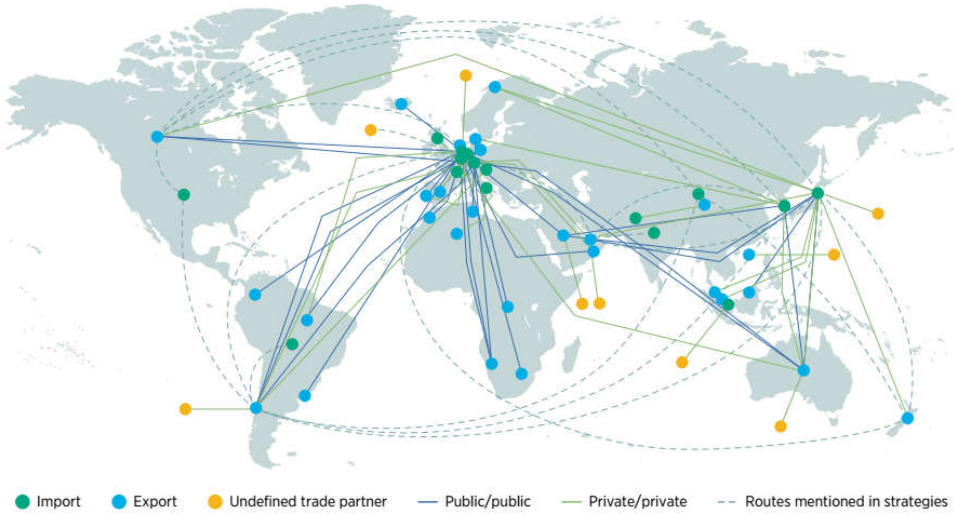
Part2 How to bring RNE to Bangladesh

FIGURE 1.5. Cumulative number of announcements of agreements for hydrogen trade since the beginning of 2018



Note: This count excludes agreements that were for hydrogen technologies in general and did not mention trade explicitly.

FIGURE 1.6. Bilateral trade announcements for global hydrogen trade until March 2022

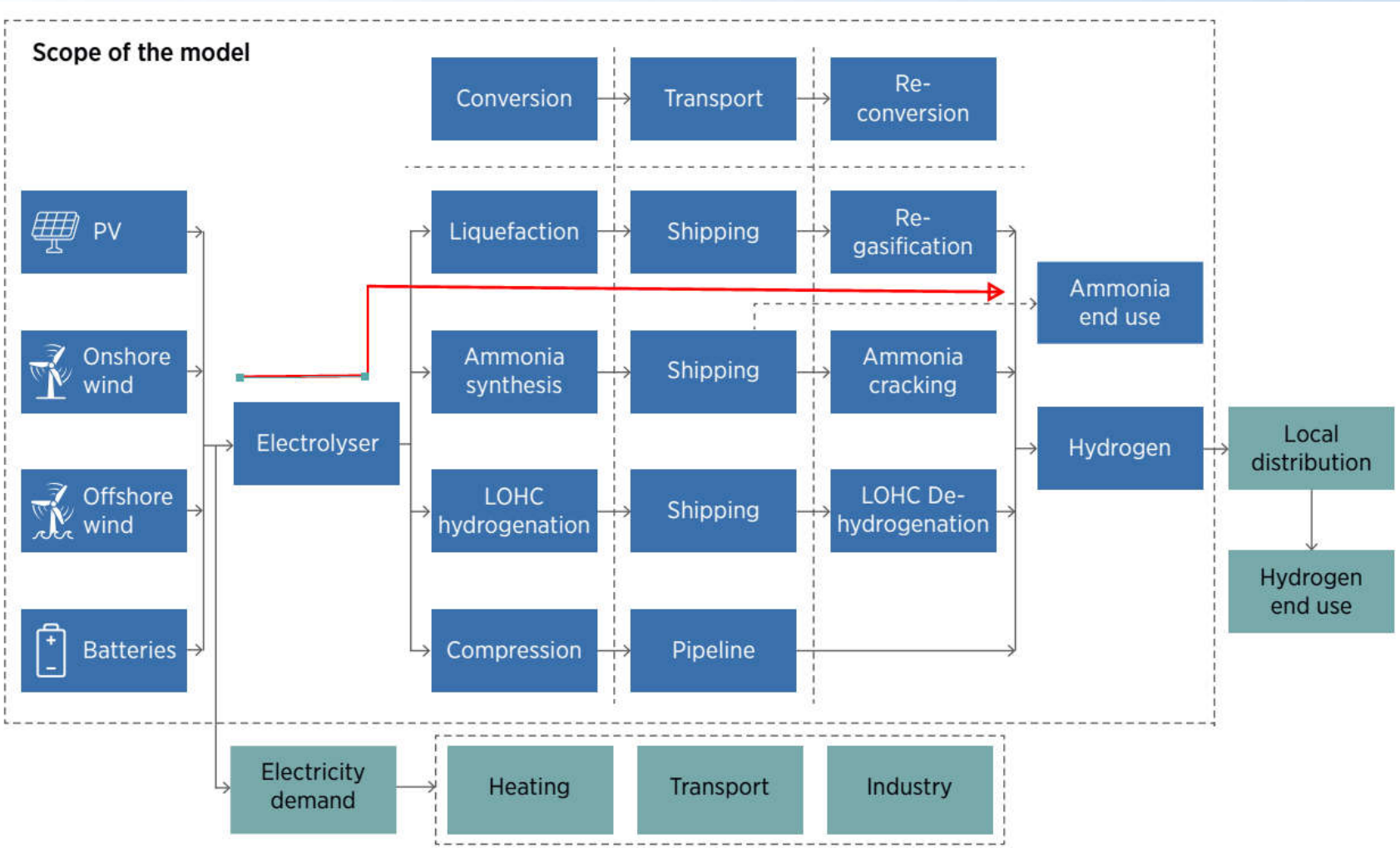


Map source: Natural Earth, 2021.
Note: Information on this figure is based on that contained in government documents at the time of writing.

Reasons for Hydrogen trade:

- *limited domestic potential, restrictions on technology choices (e.g. nuclear, CCS)*
- *relatively poor renewable resources leads to a promising outlook for importing renewable energy despite the additional transport cost.*
- *energy security*

Part2 How to bring RNE to Bangladesh



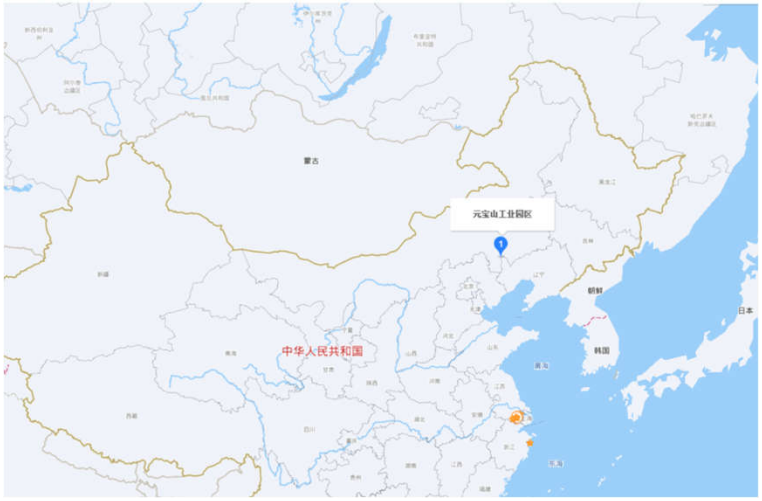
Today the best acknowledged way to Convert H_2 to Ammonia for ease transportation;

The Directly use hydrogen is still no mature

Part2 How to bring RNE to Bangladesh

The Green Ammonia process system is very hard to design and built, which is isolated from Power Grid. China now is building lots of Large-scale Green Hydrogen, Ammonia, Methanol factory. the experience will be used for green Ammonia production in any location of world.

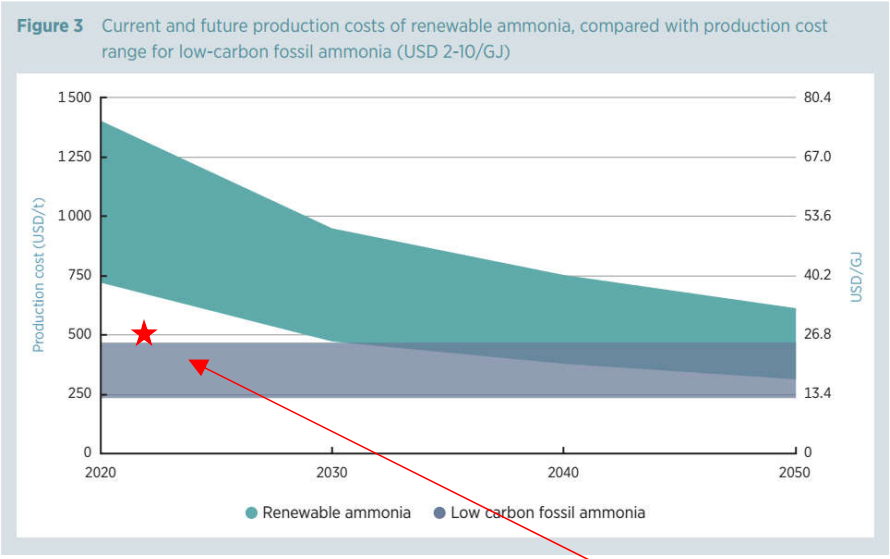
Most Projects are located in North Part of China for abundant Solar/wind resource, and large number of Hydrogen, Ammonia final Users.

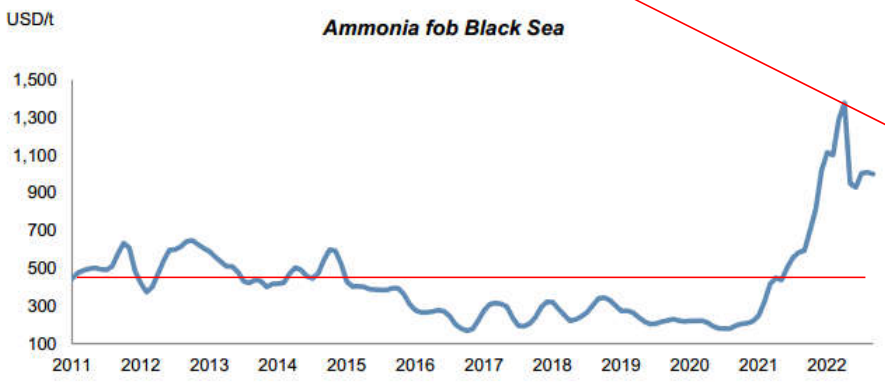


Typical Similar Project:
Solar Farm : 50MW
Wind Farm: 210MW
Energy storage :39MW/1h;
Yearly hydrogen production: 10,000t
Yearly Ammonia Production: 57,000t
Total Investment: 0.35 billion USD

Part2 How to bring RNE to Bangladesh

IRNEA: INNOVATION OUTLOOK RENEWABLE AMMONIA

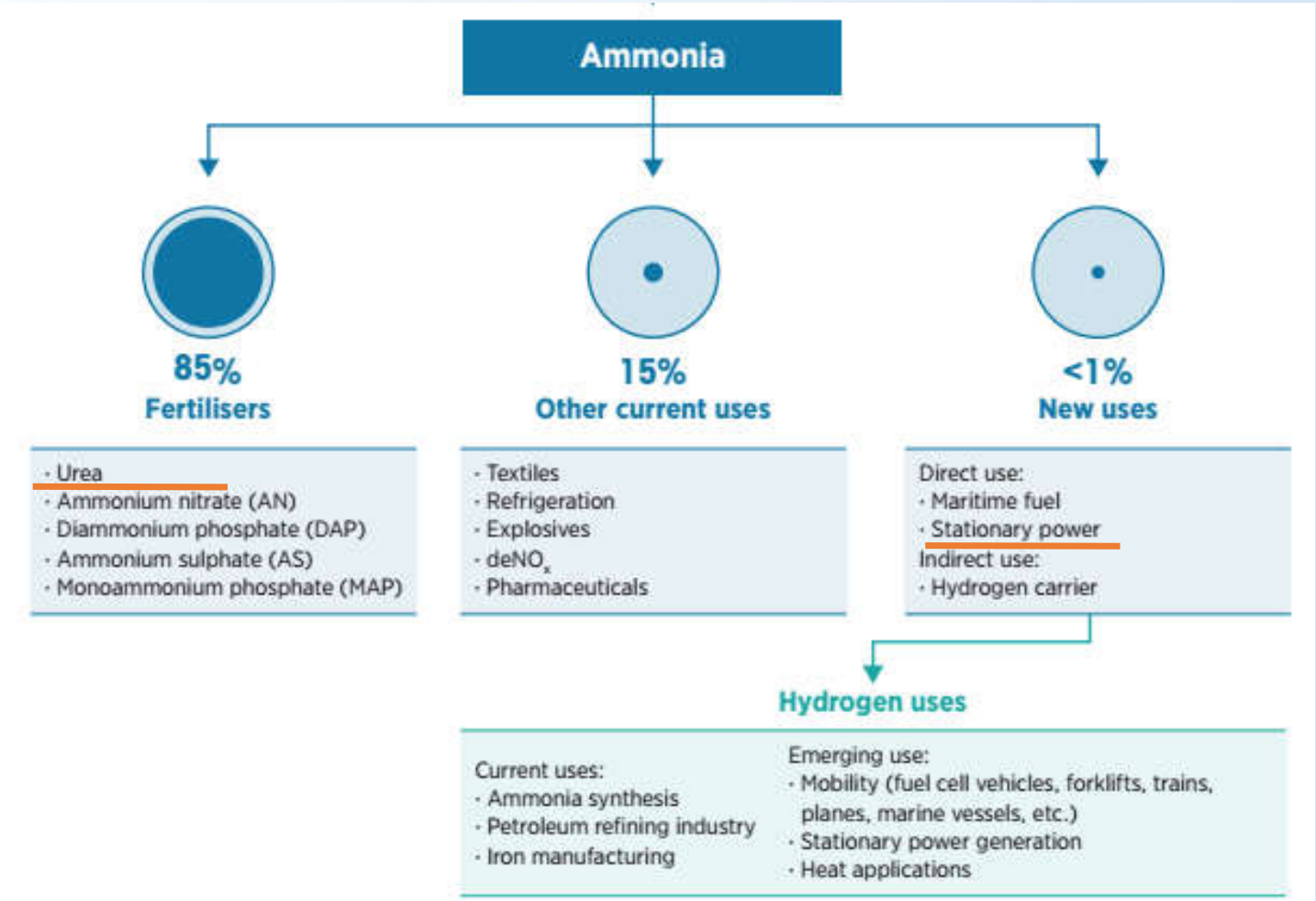




The cost of Green ammonia depends mainly on

- cost of renewable power, optimal mix of solar/wind/battery
- cost of electrolyzation
- efficiency of ammonia synthesis loop
- Better control of process
- number of operational hours per year (capacity factor)

We assume to build this ammonia factory in Oman, We estimate the landing price of Ammonia in Bangladesh can be 500USD/T, which is very competitive



What Ammonia can be used in Bangladesh?

Ammonia is commonly used for Fertilizer Industry.

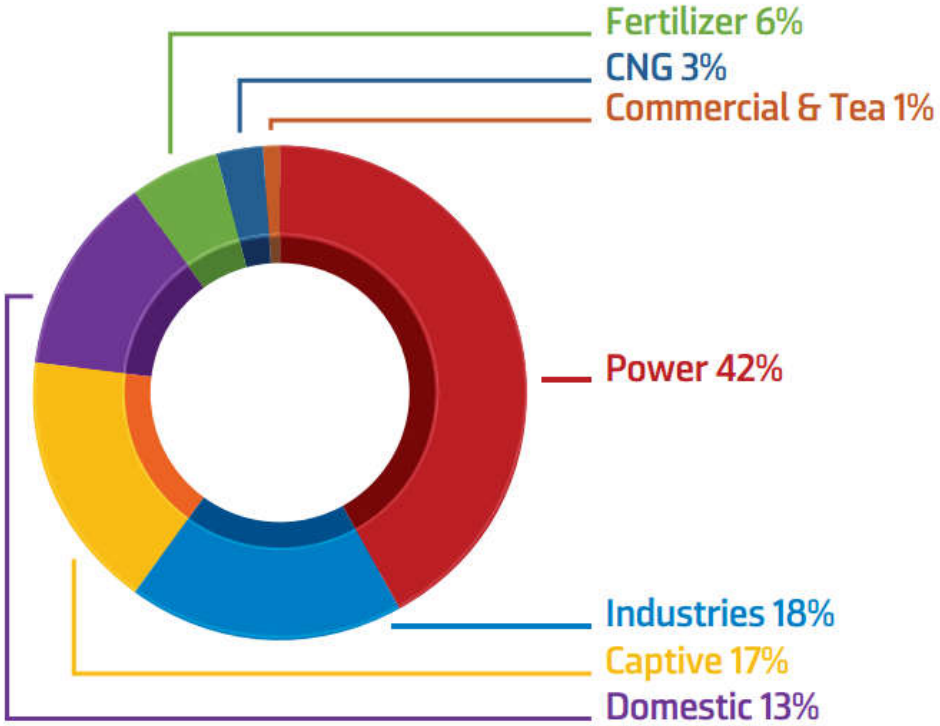
Also Power Plant use ammonia as fuel feedstock long time ago, today green Ammonia power plant will be built to meet Decarbonization.

To use Green Ammonia in Fertilizer industry

Part2 How to bring RNE to Bangladesh

By the end of 2020-21 financial year, total sales was 1,017.5 BCF, of which power sector (Grid + Non-Grid) consumed the largest part amounting to 425.8 BCF followed by fertilizer sector 64.7 BCF, captive power 169.1 BCF, industry 181.7 BCF, domestic sector 134.2 BCF, and other non-bulk sectors 42 BCF. As of December, 2021 the gas sector catered to about 4.319433 million customers of various categories. Most of these customers fall under the domestic category; however, the power sector remained the largest customer.

Natural gas consumption In Bangladesh

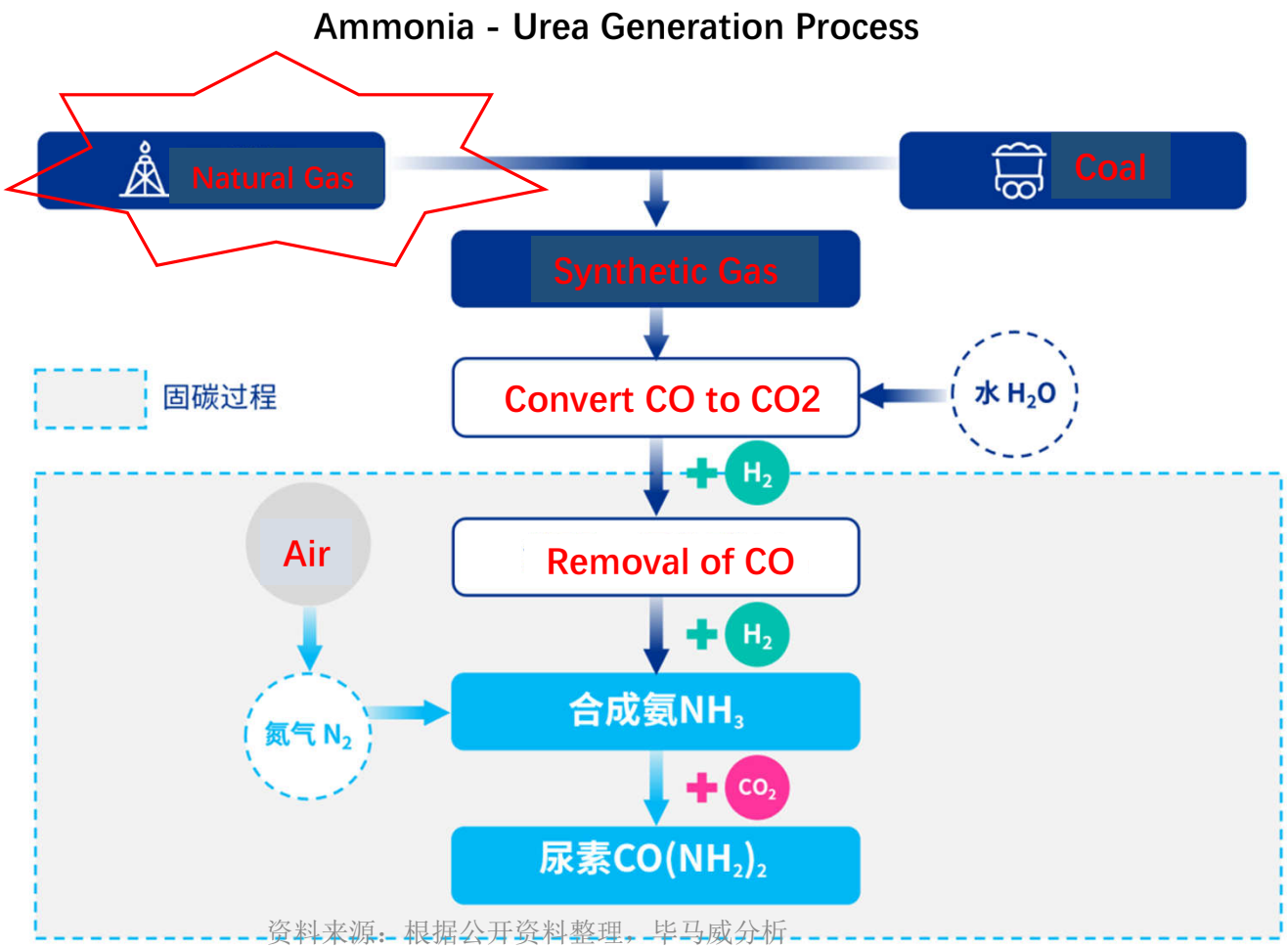


Total Sales: 1017.5 BCF

In Bangladesh, the Total fertilizer factory full capacity is 8million ton/y, the ammonia consumption is about 4.6 million ton/y, or natural gas consumption is 5.6bcm.

Now fertilizer plant operate at 30% load factor, the consumption gas is 64.7bcf=1.8BCM;

If can save some of these natural gas Which is enough for 1200MW gas power plant operate at full load



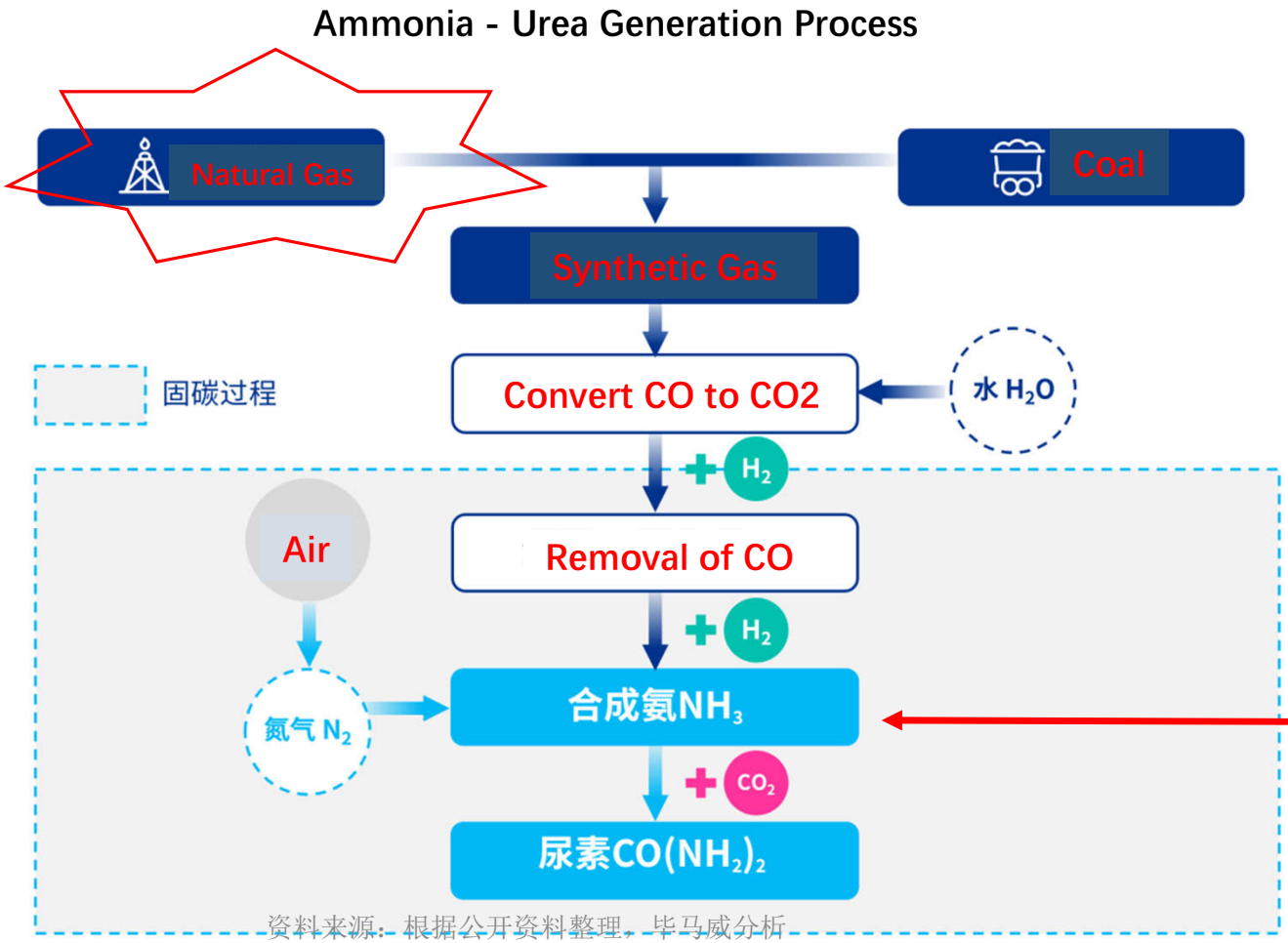
资料来源：根据公开资料整理，毕马威分析

Today's production of nitrogen fertilizers is energy intensive. In Bangladesh, ammonia production is mainly based on natural gas as a raw material and steam methane reforming (SMR) as the main technology.

The first step involves splitting the natural gas molecules with the help of steam and high temperatures, to obtain hydrogen and CO2.

In a second step, this hydrogen is then combined with nitrogen from air to produce ammonia.

Finally, the Ammonia combined with Co2 to produce Urea.



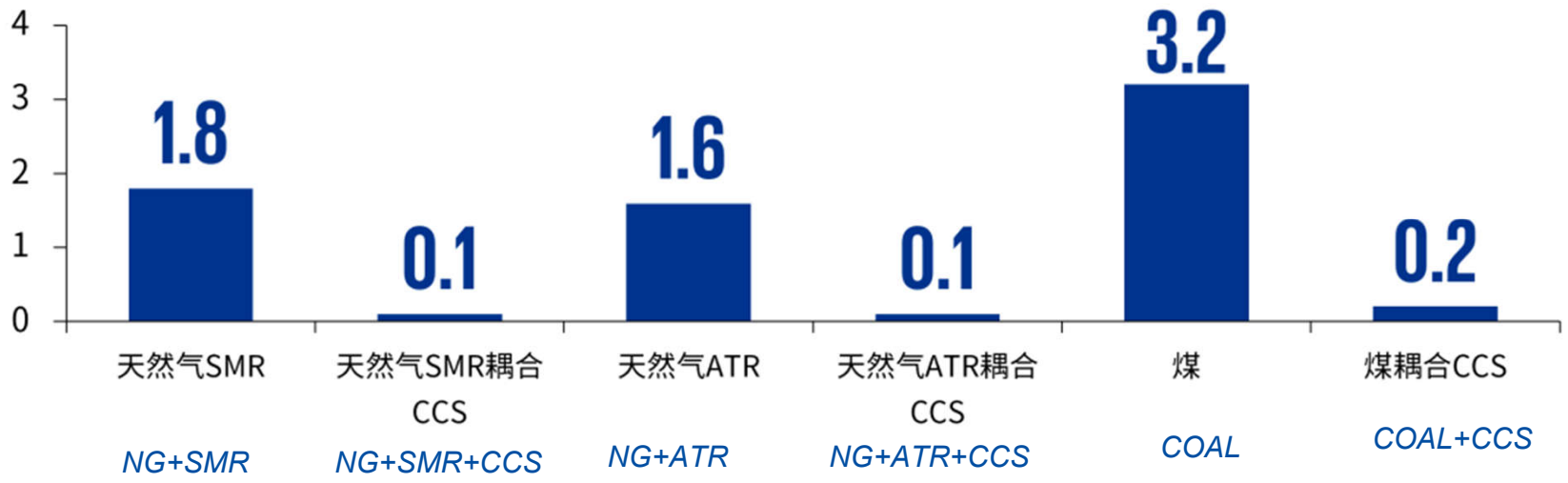
资料来源：根据公开资料整理，毕马威分析

By using imported Ammonia to reduce Ammonia generation in the Urea process, which will reduce the natural gas Consumption.

Replaced by Imported Ammonia

Without CCS (Carbon Capture Storage), the process of Ammonia making will emit larger quantity of CO2. The Substitution of Natural gas with Ammonia, will reduce the CO2 emission

CO2 emission for each ton ammonia producing



资料来源：IEA，毕马威分析
注：SMR是蒸汽甲烷重整，ATR是自热重整，CCS 是碳捕捉和存储。

Part2 How to bring RNE to Bangladesh

The Substitution of Natural gas with Ammonia in Urea production, will reduce the CO2 emission and

To produce 1t Urea , it will consume 600-800m3 natural gas【in Bangladesh, more than 1000m3】; or consume 0.58t ammonia;

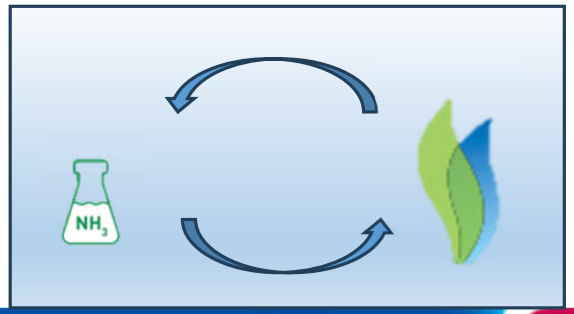
If we use ammonia to substitute the natural gas , assuming:

- By bringing in 1t ammonia, 1600m3 natural gas can be saved.
- If Ammonia is 500USD/t, natural gas is saved, the saved natural gas price is equivalent to 10USD/mmBtu, which is acceptable;
- If the price is 400USD/t, the natural gas price is equivalent to 8USD/mmBtu.

Which is Cheaper than Imported LNG price;

Imported Ammonia

500USD/t



Saved Natural gas

10USD/mmBtu

To use Green Ammonia in Power Generation

Role of Green Ammonia Power Plant

1: Balancing of Green Ammonia oversea supply and Domestic Consumption for fertilizer.

If imported ammonia as feedstock for Urea production, the seasonal Unbalance of import and consumption can be used as fuel for power plant.

2: Provide 100% Green Energy for pillar industry future

*The major export industry of Bangladesh is textile, All famous brand signed **Fashion Pact in 2022**, which promise 100% renewable energy be used in 2030. currently all textile manufactures are doing endeavor to install rooftop PV system to enlarge the green energy proportion.*

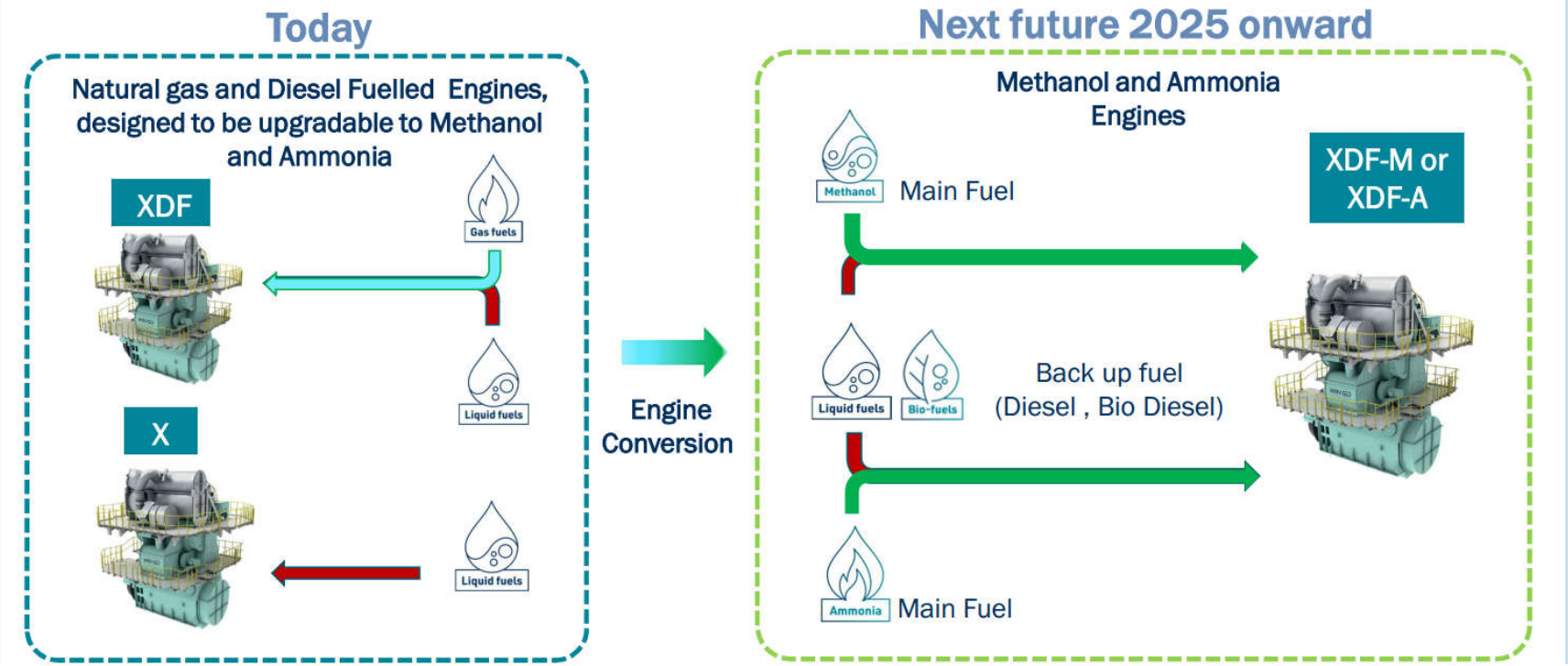
But the Solar system only work effectively from 10am to 3pm at relatively high power factor. The textile working hours are longer than this. Battery Energy Storage may be used for this application to keep stable green energy supply daily only with short duration of less than 4 hours.

Even with large scale solar power and offshore wind power, 100% Green energy can only be guaranteed by Ammonia power plant;【Fluctuations and climate changes】

3: reduce CO2 emission by replace Oil power plant partially

WinGD is pioneer of Dual fuel engine(Green Ammonia & HVO/MGO/HFO),

Power Generation Machine shall be efficient, rapid response, suitable to high ambient temperature, and fuel flexibility



Part2 How to bring RNE to Bangladesh

If

Green Ammonia is imported at price: ~500USD/T

Total investment :

Power Plant:	*~1100USD/KW*
Ammonia Receiving terminal:	*~320USD/KW*
Yearly power factor:	*~30%*

The Electricity tariff will be : ~25Ucent/kWh(Not include Ammonia Receiving Terminal)

*To Compare **Green Energy** with **Fossil Energy**, Carbon emission credit has to be considered. The Europe's enforcement on the CMB in 2026 presents the Carbon emission will be the cost.*

Currently,

HFO power plant, Tariff is 20uscent/kWh, CO2 Emission is 0.8Kg/kWh(=8uscent/kWh)

Diesel Power plant , Tariff is 26uscent/kWh, CO2 Emission is 0.8Kg/kWh(=8uscent/kWh)

If consider Carbon credit is 100usd/t in Europe, the Tariff of Ammonia power plant is lowest

Part2 How to bring RNE to Bangladesh

The Import of Green Ammonia to Fertilizer industry and Power plant can bring the following Benefit to Bangladesh Gov:

1. Save natural gas from Urea process with ammonia replacement
2. Decrease the Imported Urea
3. Invest in Primary energy production, Ammonia, to stable energy price
4. Decrease the CO2 emission of fertilizer industry and power industry
5. Save more natural gas for industrial use
6. Produce more Urea for sustainable Agriculture development
7. Gain Green energy to support textile industry cope with future Carbon Tax
8. Obtain Green Ammonia as Fuel Experience for future indigenous Green Energy
9. To regulate the power generation while large scale-RNE in Region
10. Meet the COP28 result, easy to obtain Bank support

PART 3

DF Power Plant Project Envision

The Whole Projects Includes :

Sub-project 1: Ammonia Sourcing
(Build Green Ammonia Plant or Buy Ammonia from Global Market)

Sub-project 2: Transportation planning

Sub-Project 3: Fertilizer industry Imported Ammonia Consumption estimation
(Retrofit the existing Fertilizer Factory or Build new one)

Sub-project 4: Build Dual fuel Power Plant

Sub-project 1:

Build Green Ammonia Plant

or

Buy Ammonia from Global Market

Build Green Ammonia Plant	Buy Ammonia from Global Market
Have priority on Ammonia supply	Establish purchase strategy for stable supply
Ammonia Price is stable	Price will be affected by seasonal market
Location is best for transportation	The transportation cost is uncontrollable

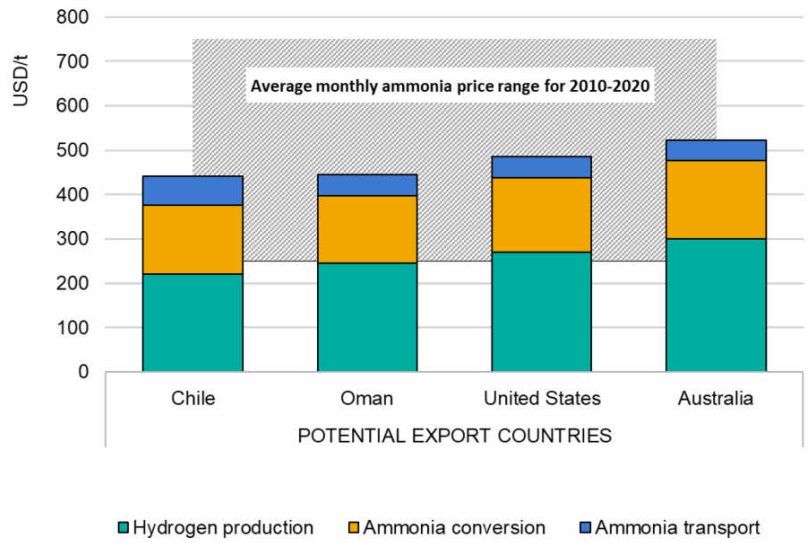
The Green Ammonia:

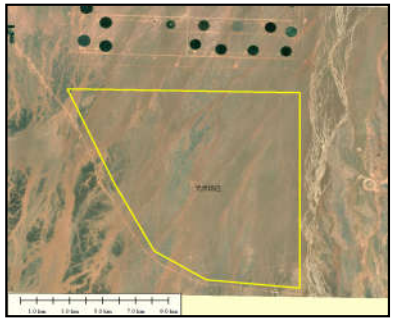
1. Select the Best site(RNE resource, transportation, and national policy)
2. Select the Best process design for Cheapest Ammonia

1. Current Progress
   A. The Green Ammonia site is suggested at the OMAN for the following reasons:
   - ✓ Good RNE resource(Rank 6th Biggest Hydrogen Producer by 2030)
   - ✓ Good Gov. Willingness (the Hydrogen Oman (HYDROM) to lead)
   - ✓ Good Infrastructure for Ammonia Export (Port, Experience)
   - ✓ Good Distance

Part3 DF Power Plant Project Envision

Figure 2.7 Renewable ammonia supply costs in potential export countries in 2030





According to our preliminary calculation , the landing price of Green Ammonia is 500~550USD/t;

The whole system will be optimized at next stage.

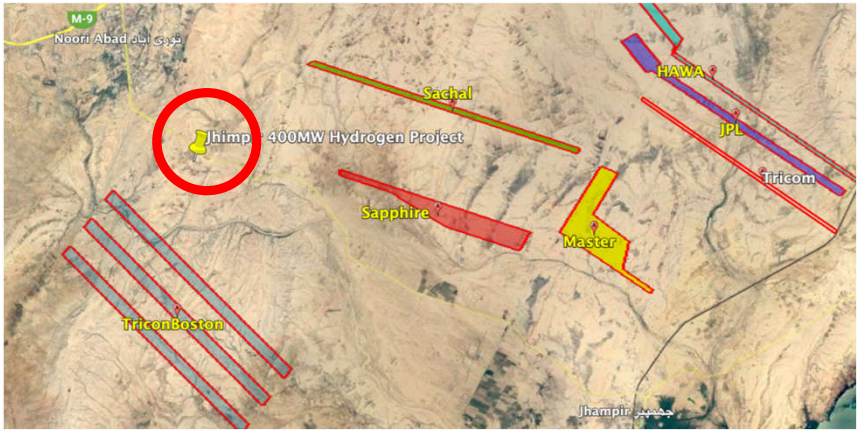
PowerChina already finished projects In Oman
3 Gas Power Plant
2 Gas Power Plant + Seawater Desalination
2 Solar Power Project

Good cooperation with all Green Ammonia Product Chain Partner:

Part3 DF Power Plant Project Envision

In Pakistan, Vitenam, Dubai, and The Mauritanian ,PowerChina has already started the Green Hydrogen Project

Last year PowerChina signed one Green Ammonia Replace Natural gas in Fertilizer Factory Project in Uzberkstan



Sub-project2:
Transportation:
1: Select best suitable transport vessel
2: Negotiate on the long-term Service

Sub-project3:
Existing Fertilizer factory In Bangladesh:

1. Make research on the existing Fertilizer factory and define the Green Ammonia replacement quantity
2. Retrofit the Fertilizer Factory
3. Build the Green Ammonia receiving and distribution net
4. Or , Build new Fertilizer factory with Green Ammonia

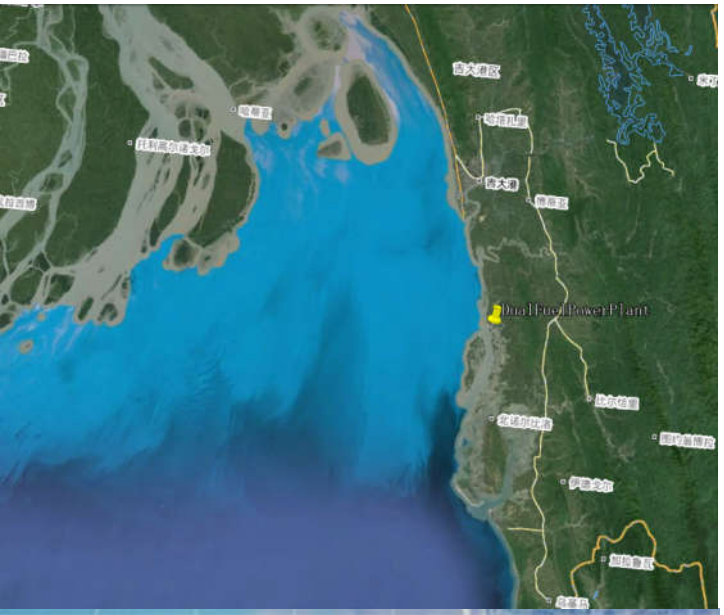
Sub-project4:

Power plant:

1. Location of PP
2. Ammonia Receiving Terminal
3. Best Machine for Ammonia and HFO
4. To Build Power plant with top level technology Engine

1. Current Progress
   A. The Power Plant location is decided for the following considerations;
   - ✓ Close to Ammonia Receiving terminal
   - ✓ Close the PowerGrid with high RNE penetration
   - ✓ Land is available for develop and Marine transport is ready

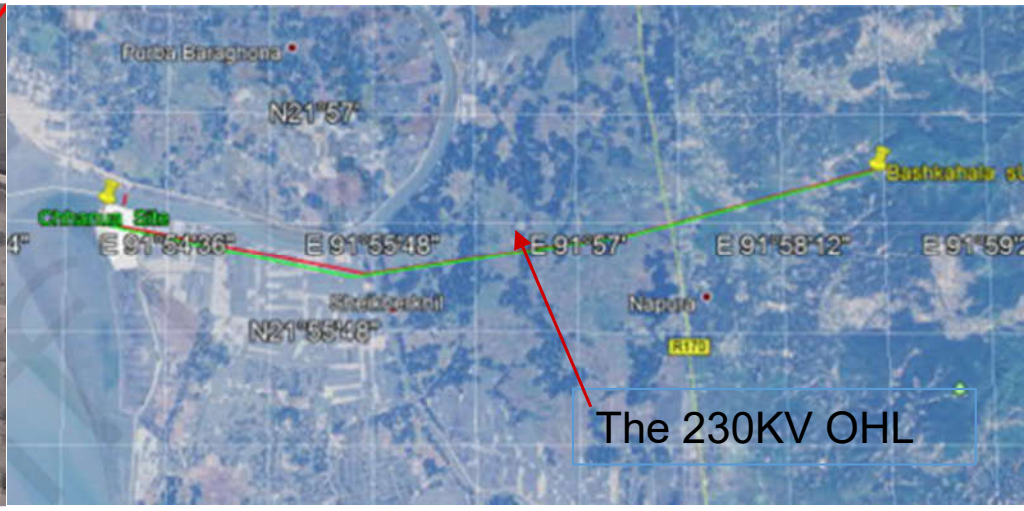
Part3 DF Power Plant Project Envision



Located in Cox Bazar, 1200MW Dual-fuel (Ammonia & HFO) will be executed by stages.

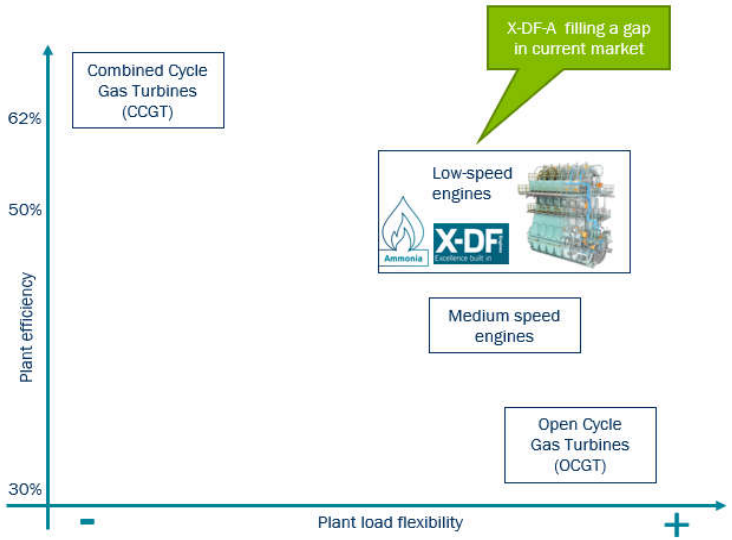
HFO storage facilities will be constructed.

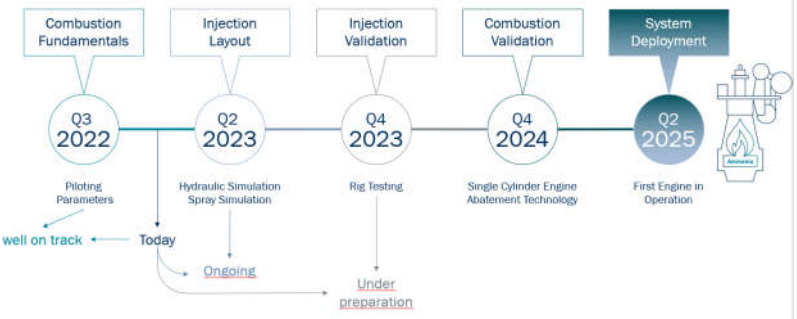
Medium-size Ammonia tank system will be built for seasonal storage



WinGD X-DF-A: Zero-carbon Powerplant Solution

- Winning the energy decarbonisation challenge





The WinGD XDF-A AMMONIA genset represents the best solution to achieve the lowest cost of electricity and zero CO2 emissions:

- High efficiency across all loads
- High electric inertia (approx. 3 times better than GT or 4 stroke) , providing optimal support to stabilize renewable grid systems
- No power derating due to ambient condition at Site
- No performance degradation over time
- **Lower OPEX & maintenance costs**
- **100% reduction in CO2 emissions with green ammonia combustion**
- Possibility to burn biodiesel fuel as back up fuel

- **The WinGD XDF-A ammonia engine is on a development track that will lead to the first commercial operation (marine) in Q2/2025.**
- **Starting from the basis of the 6X52DF-A, a 9MWe Genset concept is currently being developed**
- **Variant up to 25 MWe are in the study phase (larger bore)**

The Feature of this Power Plant:

1. Dual-fuel Engine(Ammonia or HFO)
2. 220KV outgoing line connect with Power Grid
4. Function of this Power Plant:

- *Generate electricity to power grid with Ammonia or HFO as fuel*
- *Using Surplus Imported Green Ammonia to generate 100% green power and balance Ammonia supply-demand*
- *Regulate Power grid frequency when more RNE connect with PowerGrid*

1. Project Develop Strategy

   A. The Project is executed by phases, for obtaining more experience and take advantage of the lower price of future Green Ammonia. Initial Capacity of Phase 1: 60MW
   B. Investigate the imported ammonia substitute the natural gas in Fertilizer company, the possibility and quantity.
   C. Invest the Green Ammonia industry to get the Green/Blue/Gray Ammonia at best price; Green Ammonia is anchor, to obtain the Blue/Gray Ammonia at best season;
   D. Decide on Ammonia Souring and strategy
   E. Planning for Ammonia Transportation

PART 4

Next Step

Next step:

1：Sign the MOU between Government and Developer to make further study on the Landing price of Green Ammonia

—by BD Gov and PowerChina/Investor

2：Ammonia plant site, and Green Ammonia Producing Plant FS

---By PowerChina

3：To Investigate the existing fertilize factory

---By Gov of BD

4：Power Plant Project FS

—By Consortium

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POWERCHINA

Thank You!

POWERCHINA-FEDI

April，2024