PIONEER, Delhi, 11.12.2023
Page No. 10, Size:(25.72)cms X (8.43)cms.

At COP28, sticking points remain on fossil fuels, adapting to climate

PTI ■ DUBAI

Negotiators have been urged to narrow down their options so they can agree on how to save Earth from disastrous levels of warming and help vulnerable societies adapt to weather extremes as the clock runs down on United Nations climate talks.

COP28 President Sultan al-Jaber told journalists Sunday afternoon that negotiators were "making good progress", just not fast enough.

"Am I satisfied with the speed and the pace?" al-Jaber said, as protesters could be heard nearby calling for the end of fossil fuels. "The answer is no. ... Time has come for us to shift gears. Time has come for us to deliver."

There some were signs negotiators were moving forward on Sunday: A new draft agreement on global adaptation goals - which will determine how poor countries will brace themselves for climate change-fuelled weather extremes like drought, heat and storms - was released. The draft text expresses concern over the gap between the money needed for adaptation and how much countries are getting, but it doesn't say exactly how much cash countries need to adapt to climate change.

One option in the draft proposes an assessment of each country's vulnerability to climate change by 2025 and to establish early warning systems for extreme weather events by 2027. Another option is for countries to come up with national adaptation plans and implement them by 2030.

The new draft "presents the skeleton of what could be a reasonable framework" on how to adapt to climate change, said Ana Mulio Alvarez of climate think tank E3G, but to be effective, adapting to climate change "requires developed countries to provide support to developing countries" to actually enact plans.

Mohamed Adow of climate think tank Power Shift Africa said that the draft "sets clear targets, but overall the text is weak" as it doesn't adequately address how to finance adaptation.

Thibyan Ibrahim from the Small Islands Developing States negotiating bloc called the progress on adaptation "a bit disappointing".

A draft text on the Global Stocktake - the part of the negotiations that assesses where the world is at with curbing warming and how countries can stick to climate goals - were still stuffed with several options over how to phase-out planet-warming fossil fuels.

"Now is the time to shift gears and get to consensus," COP28 President Sultan al-Jaber said in a plenary session late Saturday.

Shantal Munro-Knight, a climate negotiator for Barbados, said motivation to get a strong deal among countries was high.

"I don't think anyone wants to go away from the COP without a really ambitious program, and that's where I think everybody is. You didn't hear negative pushback too much because we are all in that moment," Munro-Knight said.

But Marshall Islands Climate Envoy Tina Stege acknowledged "there is a lot more work that needs to be done.

BUSINESS LINE, Delhi, 11.12.2023
Page No. 7, Size:(15.97)cms X (10.37)cms.

FIRE-PROOFING

ATOM's alloy solution to prevent fuel explosions

How a start-up is making fuel storage safer with its explosion-resistant technology

Nabodita Ganguly

Between 2016 and 2020, fire-related accidents killed 35 people every day in India, according to the data from National Crime Records Bureau (NCRB). Increasing consumption of flammable fuels have also added to the risk of fuel-caused explosions.

This is where ATOM, a company that "provides tested and easy integration fuel storage solutions" to prevent fuel explosions comes in.

Establishing in 2011, with the aim of finding a solution for safely transporting oil and gas, the company gained initial momentum when the Special Protection Group (SPG) was looking for explosion-resistant fuel tanks for their VIP bulletproof vehicles. This marked the starting point of ATOM's journey in providing bulletproof and explosion-resistant solutions for vehicles, says Vinod Menon, CTO of the company.

Since then, they have successfully developed various products for the safe storage and transportation of hydrocarbon fuels. They have also expanded its expertise to include pressurised vessels for LPG and propane.

THE SCIENCE BEHIND IT

Ninety per cent of global accidents result from human error, with major explosions often originating from small, mobile fuel storage tanks, says Ajit Tharoor, CEO, ATOM.

Their technology involves the addition of a proprietary alloy inside fuel storage tanks. This alloy takes care of the explosive vapour inside the tanks by employing flame quenching techniques.

Without the addition of any mechanical, chemical or electrical triggers, this simple physical solution breaks the vapour down into smaller units, allowing for confined burning through the process of 'controlled deflagration'.

In addition, the alloy's high heat conductivity reduces hot points and structured packing optimises tank volume without compromising on the fuel's capacity. These principles collectively make the technology effective in preventing explosions inside fuel tanks.

THE FUTURE IS HERE. Tanker explosions may soon become a thing of the past MANOB CHOWDHURY

The company said that it has also entered into a research and development agreement with the Foundation for Science Innovation and Development, Indian Institute of Science, Bangalore.

"This is part of ATOM's road map towards research on multiple fronts to actively innovate and develop explosion-resistant fuel tanks and storages tailored for future fuels, including hydrogen," says a release from the company.

Beyond this, the technology also addresses carbon footprint concerns, says Tharoor. As the tech utilises an alloy with high conductivity to address evaporation loss during fuel transportation, there is potential to reduce the carbon footprint of transportation by up to 60 per cent, says Tharoor.

While many countries have given ATOM the go-ahead to enter their markets, the Indian Petroleum and Explosives Safety Organisation (PESO) has yet to approve the technology. Since "it's a completely new set of technology, they have no idea how to certify it," says Anil Nair, Chairman of ATOM. The start-up applied for approval two years ago.

As they wait for approval, they continue conducting trials with the Indian Army to store fuel at high altitudes and deserts.

"We must react to which market comes to us faster, but for us, the prime market is India, and we hope India will soon turn around for us," hopes Nair.

BUSINESS LINE, Delhi, 11.12.2023
Page No. 4, Size:(17.32)cms X (19.39)cms.

Biogas can fuel a green economy

CHALLENGES. It is being promoted for blending with CNG and PNG. However, infrastructure issues need to be sorted out

CAPITAL IDEAS.

RICHA MISHRA

Amul will soon set a template for a circular economy.

After tasting success with its BioCNG pilot project in Banas Dairy, Gujarat, Amul is now looking at four more such new plants in Banaskantha with an investment of ₹230 crore, Jayen Mehta, Managing Director of Gujarat Cooperative Milk Marketing Federation (GCMMF), had shared recently.

BioCNG is an advanced version of biogas produced from organic sources such as animal manure (farm yard manure) and food waste. Biogas has been traditionally used in India's rural landscape.

Amul's move is also in sync with the Centre's initiative to promote cleaner fuel as well as bring down the country's dependence on imported and expensive fossil fuel. In fact, on November 25, the Centre announced mandatory blending of CBG (Compressed Bio-Gas) in CNG (Transportation fuel) and PNG (Domestic cooking fuel) segments of City Gas Distribution (CGD) Sector.

CBG Blending Obligation (CBO) will promote production and consumption of Compressed Bio-Gas in the country, Hardeep Singh Puri, Minister of Petroleum & Natural Gas and Housing & Urban Affairs, had said. A decision to introduce phase-wise mandatory blending of CBG in CNG (Transport) and PNG (Domestic) was taken by the National Biofuels Coordination Committee (NBCC), chaired by Puri.

The key objectives of the CBO are to stimulate demand for CBG in CGD sector, reducing Liquefied Natural Gas (LNG) imports, saving in forex, promoting circular economy and to assist in achieving the target of net zero emission among others.

The CBO will be voluntary till FY25 and mandatory blending obligation would start from FY26. CBO shall be kept as 1 per cent, 3 per cent and 4 per cent of total CNG/PNG consumption for FY26, 2026- 27 and 2027-28 respectively, the official statement had said.

From 2028-29 onwards CBO will be 5 per cent. A Central Repository Body shall monitor and implement the blending mandate based on the operational guidelines approved by the Minister for Petroleum & Natural Gas.

This is definitely a step in the right direction, albeit a bit late. Besides, for smooth operations and implementation of the projects certain hurdles need to be cleared.

According to industry players, there is no organised system of collecting waste and disposing it. There is an urgent need to create a proper collection system.

CBG Blending Obligation scheme is to boost demand for compressed bio-gas in City Gas Distribution sector, reduce LNG imports and save on forex

BLENDING CHALLENGES

Currently, there are few such project developers and availability of technology is also a challenge. For the project to succeed there has to be long-term assurance of feedstock, said an industry player, adding a lot will also depend on the kind of biomass that can be procured.

According to Gaurav Kedia, Chairman, Indian Biogas Association, "As such blending is possible and it is also being done. But, you need to upgrade the biogas and take out the undesirable components like C02, hydrogen Sulphide and Ammonia etc. There are standards prescribed by BIS. Yes, blending will create a fuel which is also a lot cleaner than typical CNG and PNG. It can reduce greenhouse emission by at least 30 per cent or so and it will also help reduce the air pollution if we look at it on a life analysis basis."

Kedia agrees that among the existing challenges there is a need to improve infrastructure. While there is no worry on the demand side, there could be issues on the supply side given the current capacity is less than one per cent.

According to him, there could be some technical challenge from the promoter as well as seller side, but it will not create a major hurdle. But this policy will be a boost to the sector and will attract investors. In fact, 5 per cent blending of biogas with natural gas will reduce LNG import $1.17 billion.

Infrastructure, clearly is the key aspect, as not all plants will be located near the CNG network and pipelines will be required. Besides, infrastructure, funding of such projects will also need a boost with larger awareness campaigns to sensitise bankers and other institutions.

On December 4, Rameswar Teli, Minister of State in the Ministry of Petroleum & Natural Gas, in a written reply in Rajya Sabha, informed about the government steps including incentivisation and supporting research and development, promoting production CBG from various feedstock, including agricultural and municipal waste, and its use in transportation sector.

These measures include: Central financial assistance for setting up of plants for generation of Biogas/Bio-CNG from urban, industrial and agricultural waste; Concession on custom duty for import of machinery and components required for initial setting up of projects for generation of Power and Bio-CNG; Additional Central Assistance for Municipal Solid Wastes (MSW) based CBG plants under Swachh Bharat Mission Urban 2.0; Remunerative CBG procurement price and indexing the same with CBG Retail Selling Price; Policy guidelines for co-mingling of CBG with Natural Gas in CGD network for improving offtake; among others.

As in the case of electricity, here too financial issues between the Centre and States can crop up. Promoters may have to deal with States directly for payments.

Then there is also issue of pricing that will need to be reworked after blending – CNG price and CBG price.

Therefore, an entire eco-system needs to be developed to make it a success.

BUSINESS LINE, Delhi, 11.12.2023
Page No. 10, Size:(15.95)cms X (10.11)cms.

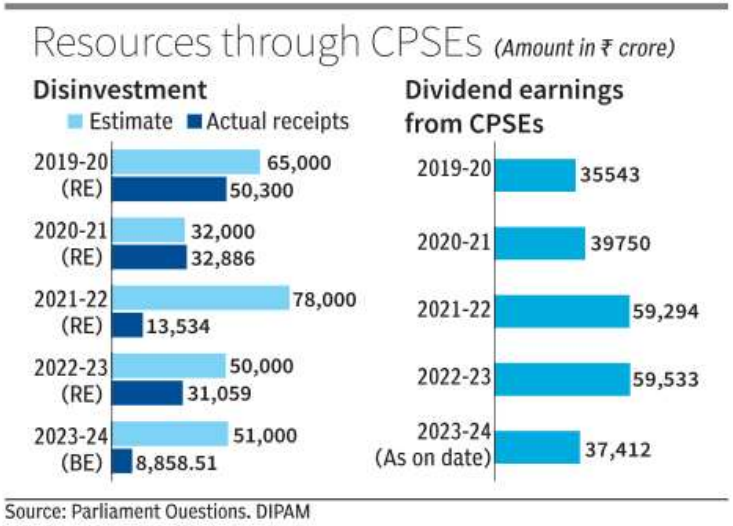
CPSE divestment: DIPAM invites bids to empanel merchant bankers, law firms

STAKE SALE PUSH. Sale of shares will be carried out via offer for sale, dribbling

Shishir Sinha
New Delhi

Even as disinvestment proceeds for the current fiscal are unlikely to reach the Budget Estimate, the Finance Ministry has initiated a fresh effort to push minority stake sales in Central Public Sector Enterprises (CPSEs). It has invited bids to empanel merchant bankers-cum-selling brokers (MBSB) and legal advisors for stake sales.

"The GoI intends to empanel MBSBs for two years (further extendable by one year) to disinvest its shareholding through the offer for sale through stock exchange mechanism/sale of shares in the stock market (dribbling) as per SEBI/Stock Exchanges Rules and Regulations," a proposal floated by the Department of Investment and Public Asset Management (DIPAM) said. A similar statement has been used for the empanellment of legal advisors.



Source: Parliament Questions. DIPAM

According to the Department of Public Enterprises (DPE), there are 389 CPSEs in India (as on March 31, 2022), out of which 248 are operational.

Minority stake sales in various PSEs are carried out based on investor interest and market conditions, as per SEBI-approved methods and norms. According to DIPAM, empanelled MBSBs will be required to advise on the timing and modalities of the OFS. They will advise on regulatory norms and assist in securing approval and exemptions.

BEST RETURNS

They are expected to ensure the best returns to the government and will conduct market surveys, and domestic and international roadshows to generate interest amongst prospective investors.

Empanelled MBSBs are also required to arrange physical and/or online meetings with the top management of key domestic and international investors, including institutional and HNIs, for filling all buckets of various investor categories, including retail, facilitate communication about the growth potential of the company and articulate the key marketing themes and positioning of the company.

SCOPE OF WORK

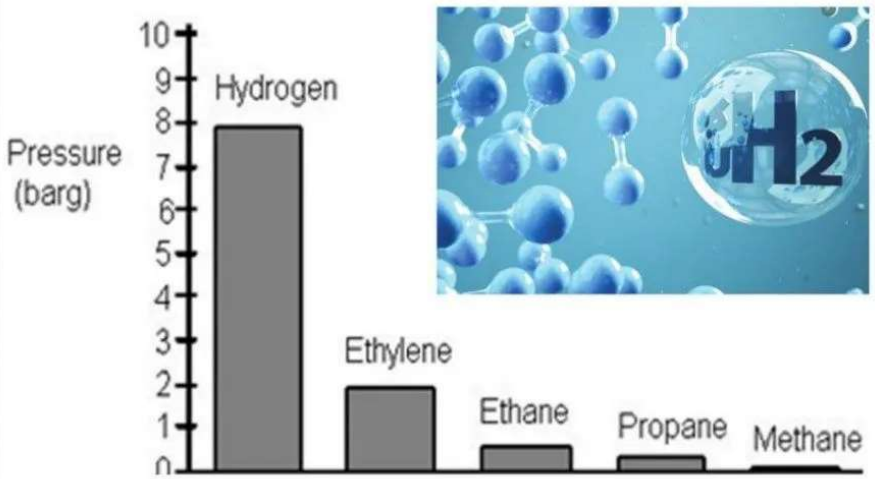
Similarly, the scope of work for legal advisors includes drafting, reviewing and finalising the notice for filing with stock exchanges and public notice.

They will be involved in drafting responses to queries received from SEBI, stock exchanges, depositories, etc., until the completion of all activities relating to OFS; draft consent letters for intermediaries to be submitted to DIPAM; provide advice, consulting, and hold discussions with officials of the company during OFS; provide other legal advice on research publication and dissemination, statutory and corporate advertisement in connection with the OFS as may be required.

STATESMAN, Delhi, 11.12.2023
Page No. 6, Size:(11.64)cms X (24.98)cms.

Hydrogen Safety

To ensure safe handling, stakeholders must pursue and promote safety improvements beyond standards and regulations. They are perhaps not there yet. They must also promote cross-industry learning, and ensure that all are aligned to the safety objectives. And finally, accidents will happen; stakeholders must ensure they learn from them



In the realm of safety, regulatory, and policy considerations, fostering a hydrogen economy is imperative as safety serves as the linchpin for its promotion.

The repercussions of neglecting safety are multifaceted, influencing not only GDP but also posing threats to human life, triggering adverse environmental impacts, jeopardizing business reputation and success, and even tarnishing a country's image, thereby hindering investment prospects.

Additionally, it can instil fear in communities, rendering society less tolerant to avoidable accidents.Safety is a critical consideration in the new energy (Green Hydrogen)sector to achieve decarbonization.

The green hydrogen economy involves the production, storage, transportation, and utilization of hydrogen, and each of these steps poses potential safety challenges.

Here are several reasons highlighting the importance of safety in the green hydrogen economy:

Delving into basic facts, recent data on fire incidents in India, revealing 1.6 million fires and 27,027 deaths, raises concerns. When compared with international cases, India's death toll is 2.5 times higher than China's. The inadequate corporate governance in process safety exacerbates these risks. To address this, there is a pressing need toimplementmodern tools in quantitative risk analysis and risk management, encompassing training, capacity building, and innovation. Use of Virtual Reality (VR) basedtrainingmodules is essential for effective safety training.

How dangerous is Hydrogen? Hydrogen differs from substances like hydrocarbons, and needs to be handled differently;

* It is extremely buoyant, 14 times lighter than air, and rises six times faster than natural gas;
* Odourless and non-toxic;
* Gas at ambient conditions, cryogenic liquid;
* Wide flammability range: 4-75% (methane 5-15%);
* Very small molecules - leaks easily;
* Laminar burning velocity about 3 m/s, which is six times faster than hydrocarbon gases;
* Low ignition energy: 0.02 mJ, which is about 10 per cent of the ignition energy for hydrocarbon gases;
* Negative Joule-Thompson effect and possibility for auto-ignition of leakages from high pressure.

We need to gain knowledge, develop designs and operating procedures, so that hydrogen can be implemented as an energy carrier without unacceptable societal risk

How does hydrogen compare to other gases? The chart publishes alongside makes this clear.

However, while acknowledging that there are knowledge gaps in hydrogen safety, ongoing research aims to fill these voids, covering aspects such as hydrogen jet fires, liquid hydrogen pool formation, rapid phase transitions, BLEVEs, evaporation and fires from liquid hydrogen pool, transition from deflagration to detonation, establishing correlation between reservoir pressure, aperture geometry, leakage rate, probability for spontaneous ignition, and more.Experimental work and model development is required.

Currently, FLACS is the only CFD-based safety analysis software validated for hydrogen. New experimentsneed to be conducted to make FLACS cover gaps.

Hydrogenis a not-so-new energy carrier. Some facts are noteworthy.

* H2 has been produced and used for a hundred years - what is new?
* It was used in controlled industrial environments with strict safety regulations;
* In the future, transport and other "domestic" uses would put hydrogen much closer to the public.

DR. J P GUPTA

The writer is Chair, Environment & Green Hydrogen Committee, PHDCCI, and Managing Director, Greenstat Hydrogen India Pvt. Ltd. He can be reached at jpglobalconsultinggroup@gmail.com

To ensure safe handling, stakeholders must pursue and promote safety improvements beyond standards and regulations. They are perhaps not there yet.

They must also promote cross-industry learning, and ensure that all are aligned to the safety objectives. And finally, accidents will happen; stakeholders must ensure they learn from them.

A global approach calls for the following:

Continuous-research for safe design, including

* Industry, government and universities/institute collaborations;
* Development of 'Centers of Excellence' (examples of USA, UK, Germany, China and Norway etc.)
* Emphasis from the boardroom to the front line
* Make safety second nature
* Ongoing research to ensure inherent safe and reliable designs
* Prevention of accidents

Effective Accident Response

* Minimize damage through VR training for fire-fighters, employees and disaster management teams

Global Use of 3D Models and VR

* Advanced use of 3D models globally for risk assessment
* VR employed to create realistic training scenarios

Topmost Priority to Process Safety

* Process safety given the highest priority in all activities
* Aims to establish a strong ecosystem for sustainable safety

Coming now to regulatory and policy issues, there should be one safety directorate for effective co-ordination rather than shared responsibilities with several ministries as follows;

I. The Ministry of Consumer Affairs, Food and Public Distribution:Bureau of Indian Standards (BIS) is involved in developing standards and specifications for hydrogen production, storage, and transportation;

II. The Department for Promotion of Industry and Internal Trade (DPIIT): Petroleum and Explosives Safety Organization (PESO) under DPIIT is the nodal agency for regulating safety of hazardous substances such as explosives, compressed gas and petroleum;

III. Ministry of Road Transport & Highways (MoRTH): This is the nodal ministry for regulation of the automotive sector in India;

IV. Oil Industry Safety Directorate (OISD):This is a technical directorate under the Ministry of Petroleum and Natural Gas (MoPNG);

V. The Petroleum and Natural Gas Regulatory Board (PNGRB):PNGRB's role would be crucial for regulating hydrogen blending in natural gas pipelines;

VI. Statewise Directorates of Industrial Safety & Health.

In conclusion, it may be said that the imperatives are

* Developing skilled persons through VR;
* Database for all accidents;
* Audit for higher learning after each accident;
* Follow International Standards, till the Indian Standards are formulated;
* Corporate Governance in safety from Board Room to Front Line;
* Setting up of Centres of Excellences in each state in India for Training, Capacity Building and Innovation.
* Given the global nature of the hydrogen economy, international cooperation on safety standards and best practices is essential. Collaborative efforts can help establish a consistent and robust framework for ensuring safety across borders.
* Ongoing research and development in hydrogen technologies should prioritize safety innovations. This includes advancements in materials, storage systems, and production methods that enhance safety while maintaining efficiency and cost-effectiveness.

BUSINESS STANDARD, Delhi, 11.12.2023
Page No. 4, Size:(26.02)cms X (34.01)cms.

India may buy more oil from UAE after COP talks

Discussions were on the sidelines; India re-establishing traditional supplies

SUBHAYAN CHAKRABORTY
New Delhi, 10 December

India is expected to ramp up its purchase of crude oil from the United Arab Emirates (UAE) in the coming months following discussions between the two countries on the sidelines of the ongoing COP28 summit in Dubai, multiple sources in the know said. The UAE has historically been India's third-largest source of crude.

It has suffered the largest drop in shipments since Indian refiners began to binge on Russian crude in 2022.

In the first six months of the current financial year (FY24), India has imported $3.2 billion worth of crude from the UAE, down from $9.35 billion in the same period of the preceding year, Commerce Department data showed.

The resultant 65 per cent fall is the highest for India's top 10 sources of crude oil. Both countries have signed a free trade agreement, which went into effect in May 2022 and aims to raise non-oil trade to $100 billion by 2030.

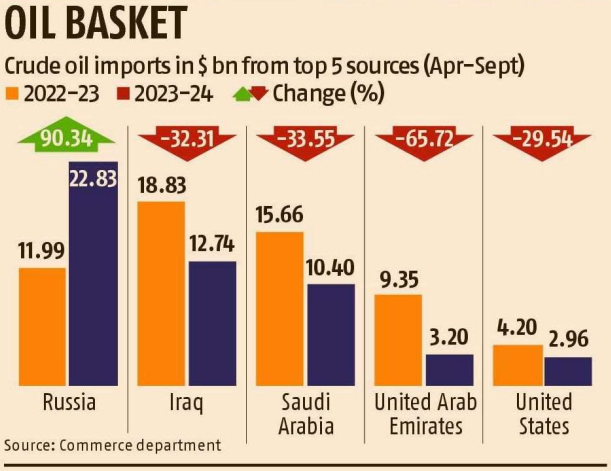
Trade in hydrocarbons, however, will remain a major component given it makes up nearly 50 per cent of bilateral shipments, officials said.

"We expect more crude from UAE to arrive in the next few months. Discussions are currently underway at Dubai," an official at a major refinery said.

He pointed out that the UAE is also set to ramp up exports of its flagship Murban grade of crude from as early as January 2024.

In August this year, the Abu Dhabi National Oil Company (ADNOC) and the Indian Oil Corporation Limited (IOCL) executed their first crude oil transaction using the Local Currency Settlement (LCS) mechanism.

This is expected to reduce transaction costs, cut down delays in settlements, and improve predictability in trade, officials said.



Discussions in Dubai

The annual meeting of the United Nations Conference of the Parties of the United Nations Framework Convention on Climate Change, more commonly referred to as COP, is set to end on October 12.

The meeting is taking place at a time when nations are increasingly divided over how to achieve a substantial decline in global demand for oil and gas to limit global warming to 1.5 degrees Celsius by 2050.

After more than a year of securing major shipments of Russian crude, India is increasingly looking to re-establish supplies from its traditional partners in West Asia.

Top officials from state-owned oil marketing companies have travelled to the summit and meetings have taken place with other major global oil companies, multiple people in the know have confirmed. In October, the share of Russian crude in India's imports slipped to 33 per cent, down from September's 35 per cent, and much lower than its historic high of 42 per cent, *Reuters* reported. This has happened even as the share of Saudi Arabia and Iraq has crept up in recent months.

Estimates made by London-based commodity data analytics provider Vortexa, which tracks ship movements to estimate imports, showed imports from Saudi Arabia rose to 924,000 barrels per day (bpd) in October, up from 523,000 bpd the previous month. Meanwhile, Russian shipments to India slipped 8 per cent to 1.55 million barrels per day (bpd) in October, down from 1.62 million bpd in September.

Since April, the majority of Russian oil sold to India has been on the Dubai benchmark, with an average discount level of $8-10 per barrel.

BUSINESS LINE, Delhi, 11.12.2023
Page No. 8, Size:(7.10)cms X (18.07)cms.

PORT OF CALL.

Mangaluru's ₹8,347-crore maritime boost

BUSINESS MAGNET. New Mangalore Port HS MANJUNATH

AJ Vinayak

The recently concluded Global Maritime India Summit (GMIS) is expected to bring in investments worth around ₹8,347 crore to the Mangaluru region. The New Mangalore Port Authority (NMPA), the only major port in Karnataka, exchanged seven memorandums of understanding with various stakeholders.

A majority of the investment proposals are focused on port-led industrialisation, with Mangalore Refinery and Petrochemicals Ltd (MRPL) at the top of the heap.

MRPL has proposed ₹5,000 crore investment in port infrastructure for business development and ₹1,500 crore in its own desalination plant (augmentation of capacity).

NMPA also exchanged MoUs with Hindustan Petroleum Corporation Ltd (₹800 crore) and Indian Oil Corporation Ltd (₹500 crore) towards port-led industrialisation.

Sealord Containers Ltd's MoU focuses on setting up an integrated LPG and bulk liquid POL (petroleum, oil and lubricants) storage facility in Mangaluru. This is expected to attract investments worth ₹500 crore.

NMPA's MoU with PHPC Associates for installation of tank farms and/or storage infrastructure at New Mangalore Port is expected to attract around ₹47 crore investment.

Ananthesh V Prabhu, President of Kanara Chamber of Commerce and Industry, told *businessline* that the investments will enhance the region's trade and commerce. Welcoming MRPL's proposal to augment capacity at the desalination plant, he said the chamber had earlier taken up the matter with the authorities concerned.

He stressed the need to make available industrial land in the vicinity of the port to support the industrial activities generated by the investments.

Calling for improved connectivity between the port and the hinterland, he said a significant chunk of cargo business was lost to other ports due to poor connectivity between Mangaluru and Bengaluru. This needs to be addressed to effectively reap the benefits of the investment, he said.

Stating that NMPA is committed to extending its contribution to the maritime sector, AV Ramana, Chairman of the port authority, said the MoUs were a step in the right direction.

BUSINESS STANDARD, Delhi, 11.12.2023
Page No. 8, Size:(52.49)cms X (6.80)cms.

Work faster, be flexible: 11th-hr push for fossil fuel deal

Draft paper lists adaptation targets for 2030 but disagreement lingers

PRESS TRUST OF INDIA
Dubai, 10 December

Just two days before the UN climate talks here are scheduled to end, negotiators on Sunday released a draft document to guide countries' efforts to adapt to climate change and monitor collective progress. However, it falls short of expectations.

The Paris Agreement in 2015 introduced the concept of a Global Goal on Adaptation (GGA), a parallel to the global mitigation goal aimed at limiting global temperature rise to 1.5 degrees Celsius as compared to pre-industrial (1850-1900) levels.

Unlike mitigation, where progress can be tracked using a single metric, adaptation requires a more complex approach.

The Glasgow-Sharm El-Sheikh Work Programme on the Global Goal on Adaptation, initiated at COP26 in Egypt, started a series of workshops and negotiations to establish an operational framework for the GGA at COP28.

Though the document acknowledged that the finance required for adaptation "remains insufficient" and the gap between the funds available and the actual financial support needed is "widening", it doesn't quantify anything.

COP28 President Sultan al-Jaber called on countries on Sunday to work harder, be flexible and accept compromise to reach a deal on tackling climate change, including wording for the first time on the future of fossil fuels. In remarks made to journalists as negotiators started to tackle some of the more contentious issues in the deal, such as the future for fossil fuels, al-Jaber told nations that watering down the ambition of the deal and failure were not options.

According to a UN report released last month, developing countries require $215-387 billion annually for climate adaptation, but they are only receiving about $21 billion.

This financial shortfall has led to frustration among poorer and developing nations most affected by climate change.

Zambia's Environment Minister Collins Nvozu, speaking on behalf of the African group, on Saturday said adaptation is a matter of survival for Africa and an agreement on a global goal of adaptation would be the most important outcome for Africa from COP28.

Mohamed Adow, the founder and director of Power Shift Africa, an independent think tank based in Kenya, said, "There is no mention of adaptation finance, and this is a challenge. If we don't close the adaptation finance gap now, there will be no way to do this ever." The document includes references to "equity and Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC)" in the final text, something developing countries are fighting hard for during the negotiations.

These principles recognise that countries' efforts to combat climate change should be viewed in light of their contributions to total emissions and that richer nations should shoulder primary responsibilities, given their significant historical emissions.

While the draft reiterates that developed countries should at least double adaptation support to developing nations by 2025 compared to 2019 levels, it lacks reference to any baseline.

There is a reference to "sustainable agriculture" in the text, as a solution for mitigation and resilience. It also includes goals without specific targets related to water, food, health, and agriculture.

Harjeet Singh, head of global political strategy at Climate Action Network International, stressed the need to increase support for developing countries to meet specific adaptation targets currently under discussion. "This action aims to protect communities from worsening climate impacts. Without immediate measures, we risk exposing people to increasingly severe consequences such as rising seas, intensified floods, and recurring droughts," he said.

KEY ADAPTATION TARGETS

- Attaining climate-resilient food, agricultural production and supply
- Strengthening resilience against climate-related health impacts
- Promoting climate-resilient health services and reducing climate-related morbidity
- Increasing resilience of infrastructure and human settlements to climate change impacts