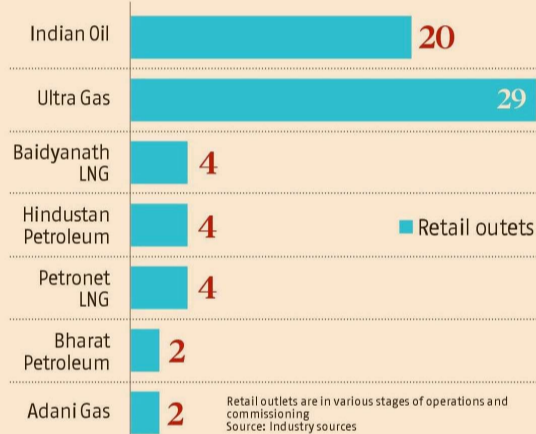


# BITTER CHILL PILL

LNG, or chilled natural gas, is a \$29 billion opportunity. So, what is keeping the sales low?



## LEADING LNG RETAIL OUTLET PLAYERS



**S DINAKAR**  
Mumbai/Chennai, 17 December

An attendant at Indian Oil's fuel retail outlet on the outskirts of Chennai slips on a pair of cryogenic gloves and an apron as a 55-tonne Volvo-made LNG-fired truck carrying a black Delhivery container snakes its way into one of the country's first LNG dispensing stations for a refill — the insulated gloves protect the attendant from cold burns, while discharging chilled, liquefied natural gas into a cryogenic tank fitted onto the side of a ₹1.2 crore truck, a pump official explains.

The station has a single dispensing unit connected by insulated pipes to a 56-kilolitre cylindrical, cryogenic LNG storage tank standing on its head. The entire process takes 20 minutes, more than what it would take to refuel a diesel vehicle. One of the dispensing pipes is used to reduce pressure in the truck's tank and the other releases the liquefied fuel.

Vehicles in India will now roll on four kinds of fuels — petrol/diesel, pressured natural gas or CNG, bio-fuels like ethanol derived from grains or waste, and the latest where natural gas is chilled to a liquid at -161 degree centigrade. LNG in transport is a \$29 billion market opportunity if it completely displaces diesel, industry officials say.

It has been 17 months since Indian Oil's Sriperumbudur outlet began operations but it receives no more than 20 trucks a day, for sales of around 80 tonnes of LNG a month, an industry official says. That is insufficient to cover the expenses for a station that takes several months to build and costs ₹5-₹8.5 crore, excluding land — several-fold pricier than a typical petrol pump.

Indian Oil saw worse when the outlet started in mid-2023. There were no customers for weeks before two or three retrofits came calling. The action began in December, after Blue Energy Motors, an Essar affiliate, sold 40 trucks to state-run container company Concor, which then awarded a bid to Indian Oil for refueling.

### Fuel economics

The economics of the fuel are alluring. At current levels, LNG, at ₹78.84 a Kg, costs less than half of diesel. "If per kg of LNG is at ₹84 and it gives 3.2 km per kg, the running cost is ₹26.25 per km. For diesel, at ₹92 per kg, the operating expense is ₹35.38 per km," said Maqsood Shaikh, CEO of Ultra Gas & Energy, an Essar company.

Of course, that is assuming you run the trucks for more than 20 hours a day to contain boiloffs — a technical limitation of the fuel where gas gradually escapes from LNG

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For long-distance trucking, LNG is cheaper, the mileage is higher, emissions are 30 per cent lower, and it improves energy security through lower oil imports. "The future of LNG is retail LNG," said Yiyong He, founder at LNG Easy, in a LinkedIn post. "Go to China to see LNG regas and refueling stations." The current liquid-to-gas model is something that Europe and Japan did in the past.

But LNG fuel sales are negligible in India because of the scarcity of trucks running on this fuel. There are only 24 pumps today across the country (compared to 93,115 petrol and diesel pumps and 6,373 CNG outlets) catering to around 650 trucks, concentrated on certain routes. Both state and private players, including Ultra Gas, Indian Oil, Petronet LNG, Hindustan Petroleum, Bharat Petroleum, and Baidyanath LNG plan to add 73 outlets in the next few years, according to an industry document. At least 17 are ready to start

once the authorities give the green signal. Indian Oil has seven stations operational across the country, with another 13 likely to start in 2025 once the vehicle fleet improves. In addition, it is developing 50 stations in the golden quadrilateral and north-south highways — one every 300 km, a company official says. Supplies to these retail outlets, in case of Chennai, come from Indian Oil's Ennore LNG import terminal from, where they are dispatched in 14-17.5-tonne cryogenic containers loaded on trucks.

India imports nearly half of its gas needs in the form of LNG. "The government can support LNG trucking by increasing the number of LNG

refuelling stations, providing subsidies and tax breaks," said Darshan Ghodawat, CEO, AVA Global Logistics. "Speedy clearances will encourage use of LNG in heavy vehicles industry."

Private players complain of 40 levels of approvals in districts, with most states oblivious to Petroleum & Explosives Safety Organisation's (PESO) regulations governing LNG in transport. The trucks are expensive because they require specialised tanks and technology, which could be a turn-off for fleet operators and refuelling stations are too few to be practical, Ghodawat said.

### LNG ecosystem

The scarcity of fuel stations is reflected in New Delhi-based think tank Teri's prognosis that LNG use in transportation in India is a slow burn. Volumes are projected at just 0.4 million tonnes by 2030-31, from virtually nil now, but could rise to 74 million tonnes within two decades, around a quarter of today's total LNG imports. Combining CNG and LNG, India will need around 10 million tonnes of LNG alone for use in transportation in a decade, and more than 50 million tonnes by

2050. India's overall LNG imports in the current fiscal year, ending March 2025, may be around 27 million tonnes, industry officials say.

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Ultra currently operates two outlets but "we are almost ready with around six stations, aiming to close the fiscal with 10, and scale it up to 100 by December 2027," said Shaikh, who was earlier with Gujarat Gas. An Ultra outlet in Chennai, located near Indian Oil's outlet, serves 180-200 trucks a month. The fuel costs ₹84 a kg, higher than ₹78 a kg that Indian Oil charges at its outlet. Also, private sector outlets cost more than ₹8 crore to build, much more than what an Indian Oil spends.

Besides high capital costs, boiloff is one of the key reasons why an LNG retail outlet or a truck must be utilised to the maximum. Unlike other liquid fuels, LNG stored in a tank will escape in gaseous form at 1-3 per cent a day. Fewer the trucks visiting the outlet, the more Indian Oil or Ultra loses in boiloff. If an LNG-fired truck is left standing for lack of business, boiloff will empty the entire tank in a few weeks.

The refiner uses some of the boiloff to operate a gas-fired generator at its pump, but the cost of this power is more than that of utility-supplied electricity. To minimise losses, outlets must sell at least 7 to 8 tonnes of LNG a day, enabling a refill of their storage every three days.

"Between seven and 30 days, there is an exponential rise," Shaikh said. "If the boiloff problem is not solved through a regulatory mechanism, it will be very difficult for stations to come up."

The simple method is to compress the boiloff (methane gas) and sell it as CNG, eliminating the damage to the environment from methane emissions. But regulation bars selling of the CNG to a third party. PNGRB gave a mandate of licensing through selling of natural gas through pipeline, but people have expanded that to the level that even without a pipeline, nobody can sell gas in their area, an industry source says.

Big logistics players such as Amazon, Delhivery, and Flipkart must adopt LNG-fired trucks for the sector to grow, says Raunak Modi, ratings agency CareEdge's logistics analyst.

A pickup may be possible after big logistics and e-commerce players started embracing the fuel. Delhivery has deployed Volvo trucks, which cost twice as much as Indian-made ones and run on both diesel and LNG. Blue Energy, the biggest supplier of LNG trucks with more than 500 units, supplied Concor. Greenline Logistics signed up Flipkart and Tata Motors and has released around 100 trucks in the market, industry officials say. Ashok Leyland is another potential manufacturer. But a key obstacle looms in the lack of cryogenic fuel tanks, largely supplied by INOX India, and a few by Cryogas India.

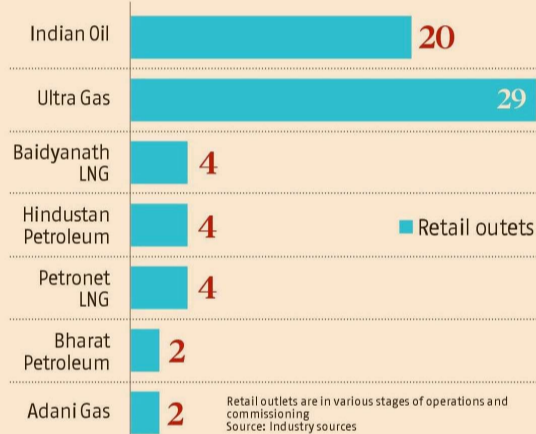
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## Green hydrogen, wind projects need govt push for 2030 targets: Report

**NITIN KUMAR**

New Delhi, 17 December

India is on track to meet its 2030 clean energy goals for solar power and battery energy storage systems (BESS), but immediate government support is needed to accelerate the deployment of offshore wind and green hydrogen (GH2), according to a report.

The report, 'Budgeting for Net Zero: Government Support Needed to Meet India's 2030 Clean Energy Goals', is jointly produced by the Center for Study of Science, Technology and Policy and the International Institute for Sustainable Development. It highlights that while solar PV and BESS are progressing well with the current levels of subsidies and policy initiatives, other emerging clean technologies require urgent intervention to bridge cost gaps and achieve competitiveness.

The report estimates that offshore wind faces the largest cost gap, with existing government support falling short of what is needed. To leverage India's 71 Gw offshore wind potential, additional support of about ₹9,000 crore per Gw (\$1.08 billion per Gw) would be required.

# HPCL's Barmer refinery to begin processing in Jan

With 9 mt crude oil refining capacity, facility to produce 2.4 mt petrochemicals

**SUBHAYAN CHAKRABORTY**  
New Delhi, 17 December

With pre-commissioning of multiple units already being done, Hindustan Petroleum Corporation Ltd (HPCL)'s upcoming 9 million metric tonnes per annum (mtpa) capacity refinery in Rajasthan's Barmer may begin processing crude oil in the first month of 2025, official sources said. However, while mechanical completion of the entire petrochemical complex stands at 82 per cent, the plan to double capacity within the first 12 months is on schedule, they added.

"Work on the refining units have been completed. Production testing will begin in January. Commissioning activities will take place from March onwards," a highly placed source said. The refinery will have a total of 29 process units, including a 4.8 mtpa vacuum distillation unit, and 1.8 mtpa naphtha hydrotreater unit, and these units are at different stages of completion.

Announced in 2013, India's largest greenfield, integrated refinery and petrochemical complex, the Rajasthan Refinery Project (RRP), has seen the deadline being extended multiple times. The Paradip Refinery, operated by



REPRESENTATIVE IMAGE

## BUILDING BLOCKS

<b>₹5,150 cr:</b> Expected contribution to public exchequer	<b>₹12,250 cr:</b> Estimated product exports	<b>35,000:</b> Workers directly engaged; up to 1 lakh indirect jobs	<b>₹43,129 cr:</b> Initial cost <b>₹72,000 cr:</b> Final cost
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Source: Centre

state-run Indian Oil Corporation (IOC), was the last standalone refinery commissioned in India in 2016 with an installed annual capacity of 15 million tonnes (mt). Since then, many refiners have pursued expansion projects, but HPCL Rajasthan Refinery Limited (HRRL) will be the first standalone refinery to be developed. It will produce more than 2.4 mt of petrochemicals. It is also set to house the world's largest unit for polypropylene, a common thermoplastic, and swing unit for polyethylene, to make more than 30 different polymer grades, and produce BS-VI grade petrol and diesel.

The complex will operate at 75 per cent-80 per cent of capacity in the first year as various units get commissioned, officials said. It is designed to run with over 83 per cent of imported medium-grade crude and the remaining being domestic crude, with Russian Urals grade crude being a favourite choice, S&P Global Commodity Insights believes.

"The refinery will try to diversify its crude basket for better security as future tightening of Russian barrels cannot be ruled out. The Arabian and Basrah grades are next in the top three crude types that the refinery will use," Abhishek Ranjan, South Asia oil research

lead at S&P Global Commodity Insights, said. HPCL also wants to cater to oil produced at the nearby Mangala oilfield operated by Cairn in the district, given that it has a dedicated pipeline to the same.

### Ups and downs

Construction of RRP is being overseen by HRRL, a joint venture between HPCL and the Rajasthan government, incorporated in 2013. While HPCL owns 74 per cent of the equity in HRRL, the state government, which owns the rest 26 per cent stake, has repeatedly pointed out spiralling cost overruns and delays with the project.

### MEGA PLAN

- ▶ **Sep, 2013:** The then UPA Chairperson Sonia Gandhi lays foundation stone
- ▶ **Jan, 2018:** PM Narendra Modi announces the commencement of work
- ▶ **Dec, 2022:** Initial deadline
- ▶ **Dec, 2024:** Deadline for commissioning earlier announced by HPCL

# India's oil imports rebound in Nov with refineries back in full swing

**SUKALP SHARMA**

NEW DELHI, DECEMBER 17

AFTER HITTING a 12-month low in October, India's crude oil imports in November recovered as most of the country's refineries were back operating at optimum capacity following the maintenance shutdown season, and demand for fuels and other petroleum products also picked up.

Consequently, import volumes from the top five source markets—Russia, Iraq, Saudi Arabia, the United Arab Emirates (UAE), and the United States (US)—grew sequentially, per ship tracking data. Within this group, the UAE and the US registered the highest growth in percentage terms.

India's oil imports had declined to a yearly low in October amid maintenance-related shutdowns at some refineries and the geopolitical crisis in West Asia, which had fanned fires of volatility in international oil prices. The oil prices have trended lower since and are relatively stable as well, which evidently contributed to higher imports.

In November, Indian refiners cumulatively imported 4.69 million barrels per day (bpd) of crude, up 6.6 per cent month-on-month, according to provisional vessel tracking data from international

## INDIA'S TOP SOURCE MARKETS FOR CRUDE IN NOV

Supplier	Volume (mn bpd)	Market Share
Russia	1.79	38.1%
Iraq	0.88	18.7%
Saudi Arabia	0.62	13.2%
UAE	0.43	9.2%
US	0.22	4.7%

Source: Kpler

commodity market analytics firm Kpler.

Supplies from Russia—India's largest source market for crude—rose nearly 2 per cent sequentially to 1.79 million bpd, accounting for over 38 per cent of India's total oil imports in November. Oil import volumes from Iraq were sequentially higher by 1.2 per cent at 0.88 bpd. The growth was the lowest—0.4 per cent—for Saudi Arabia. India's oil imports from Saudi Arabia stood at 0.62 million bpd in November. Iraq and Saudi Arabia accounted for 18.7 per cent and 13.2 per cent of India's crude oil imports in November.

Oil imports from the UAE in November rose 15.1 per cent sequentially to 0.43 million bpd, while those from the US were higher by almost 31 per cent at 0.22 million bpd.

"Indian imports have rebounded after the annual lows

seen in October. Russia remained the largest supplier overall, with volumes to India being quite range-bound lately. India's buying of Iraqi barrels has been just as stable, too, with India nominating a fix 860,000-870,000 bpd for the past three months. Saudi Arabia, on the other hand, continues to struggle with another month where it lagged Russia and Iraq by a wide margin," said Viktor Katona, head of crude analysis at Kpler. Among the top suppliers, Saudi Arabia has been hurt the most in terms of market share erosion due to Russia's rise as India's mainstay for crude, as Riyadh's crude has generally been priced at a significant premium to oil from Russia and even Iraq.

Prior to the war in Ukraine, Iraq and Saudi Arabia were the top two suppliers of crude oil to India.

**FULL REPORT ON**

[www.indianexpress.com](http://www.indianexpress.com)



## Trailukya Borgohain Appointed as Director (Ops) of Oil India Limited

**NEW DELHI:** Trailukya Borgohain has been appointed as Director (Operations) of Oil India Ltd (OIL) on Tuesday. Borgohain is a seasoned oil & gas professional with over 30 years of experience spanning the entire spectrum of E&P operations. He holds an MSc in Applied Geology from IIT Roorkee and an MBA in Energy Leadership from Texas A&M University, Texarkana, USA. He joined OIL as an Executive Trainee in the year 1995 in the Geological Department at Field Headquarters, Duliajan. Borgohain has been instrumental in several key discoveries across Assam, Rajasthan, and Gabon. His leadership was pivotal during his tenure as General Manager and Head of OIL's Gabon Exploration Project from 2017 to 2021.



MPOST

# अगले माह से बाड़मेर में रिफाइनिंग

महत्वाकांक्षी परियोजना बाड़मेर रिफाइनरी और पेट्रोकेमिकल हब का मकैनिकल काम 82 प्रतिशत पूरा

शुभायन चक्रवर्ती  
नई दिल्ली, 17 दिसंबर

राजस्थान के बाड़मेर में कच्चे तेल के शोधन का कार्य 2025 के पहले महीने से शुरू हो सकता है। आधिकारिक सूत्रों ने कहा कि हिंदुस्तान पेट्रोकेमिकल्स कॉर्पोरेशन लिमिटेड (एचपीसीएल) की आगामी 90 लाख टन सालाना (एमएमटीपीए) क्षमता की रिफाइनरी की कई यूनिट की प्री-कमिशनिंग का काम पूरा किया जा चुका है। उन्होंने कहा कि पूरे पेट्रोकेमिकल कॉम्प्लेक्स का मकैनिकल निर्माण कार्य 82 प्रतिशत पूरा हो चुका है और निर्धारित समय से 12 महीनों के भीतर क्षमता को दोगुना करने की योजना है।

उच्च पदस्थ सूत्र ने कहा, 'रिफाइनिंग यूनिट का काम पूरा किया जा चुका है। प्रोडक्शन को लेकर परीक्षण जनवरी में शुरू होगा। मार्च और उसके बाद से कमिशनिंग गतिविधियां शुरू हो जाएंगी।' इस रिफाइनरी में 29 प्रॉसेस यूनिट होंगी, जिनमें 4.4 एमएमटीपीए की वैक्यूम डिस्टिलेशन यूनिट और 1.8 एमएमटीपीए क्षमता की नैफ्था हाइड्रोड्रीटर यूनिट शामिल हैं। इन्हें पूरा किए जाने का काम विभिन्न चरणों में है।

देश की सबसे बड़ी एकीकृत नई



रिफाइनरी और पेट्रोकेमिकल कॉम्प्लेक्स, राजस्थान रिफाइनरी प्रोजेक्ट (आरआरपी) की घोषणा 2013 में की गई थी।

इसका काम पूरा करने की तिथि कई बार बढ़ाई गई। सरकार द्वारा संचालित इंडियन ऑयल कॉर्पोरेशन (आईओसी) की पारादीप रिफाइनरी भारत की अंतिम एकल रिफाइनरी है, जहां 2016 में उत्पादन शुरू हुआ था। इसकी सालाना क्षमता 150 लाख टन है। इसके बाद से कई रिफाइनरी ने विस्तार परियोजनाओं पर काम किया, लेकिन एचपीसीएल राजस्थान रिफाइनरी लिमिटेड (एचआरआरएल) पहली एकल रिफाइनरी होगी, जो विकसित की जा रही है। यह रिफाइनरी 24 लाख

टन से ज्यादा पेट्रोकेमिकल्स का उत्पादन करेगी। यह विश्व की सबसे बड़ी पॉली प्रोपलीन की इकाई होगी, जहां 30 से ज्यादा अलग अलग पॉलिमर ग्रेड का निर्माण और बीएस-6 ग्रेड के पेट्रोल व डीजल का उत्पादन होगा। अधिकारियों ने बताया कि विभिन्न इकाइयों के चालू होने के बाद यह परिसर पहले वर्ष में 75 से 80 प्रतिशत क्षमता पर काम करेगा। एसएंडपी ग्लोबल कमोडिटी इनसाइट्स का मानना है कि रिफाइनरी को 83 प्रतिशत से अधिक आयातित मध्यम श्रेणी के कच्चे तेल और शेष घरेलू कच्चे तेल के साथ चलाने के लिए डिजाइन किया गया है, जिसमें रूसी यूराल ग्रेड का कच्चा तेल पसंदीदा विकल्प होगा।

यू रही निर्माण की चाल

■ सितंबर 2013: तत्कालीन संयुक्त

प्रगतिशील गठबंधन की चेयरपर्सन

सोनिया गांधी ने आधारशिला रखी

■ जनवरी, 2018: नरेंद्र मोदी द्वारा फिर से उद्घाटन करने पर काम शुरू हुआ

■ दिसंबर, 2022: रिफाइनरी का काम पूरा करने की प्रारंभिक समय सीमा तय की गई

■ दिसंबर, 2024: एचपीसीएल द्वारा पहले कमिशनिंग की समय सीमा घोषित

आए कई उतार चढ़ाव

आरआरपी का निर्माण एचपीसीएल राजस्थान रिफाइनरी लिमिटेड (एचआरआरएल) द्वारा किया जा रहा है, जो एचपीसीएल और राजस्थान सरकार के बीच 2013 में स्थापित एक संयुक्त उद्यम है। एचआरआरएल में एचपीसीएल की हिस्सेदारी 74 प्रतिशत है, वहीं शेष 26 प्रतिशत हिस्सेदारी राजस्थान सरकार की है। परियोजना में देरी के कारण इसकी लागत में बढ़ोतरी हुई है।

अब तक देश में एक स्थान पर सबसे ज्यादा निवेश से स्थापित रिफाइनरी को तैयार करने की नई अंतिम तिथि 2022 तय की गई थी। एचआरआरएल ने तब यह भी कहा था कि सभी वैधानिक अनुमतियां मिलने की अंतिम तिथि से 4 वर्षों के भीतर परियोजना पूरी कर ली जाएगी।

एक अधिकारी ने कहा, 'महामारी के कारण परियोजना के मुख्य कंपोनेंट में से एक, 9 मुख्य रिफाइनरी इकाइयों और चार मुख्य पेट्रोकेमिकल इकाइयों के निर्माण में पहले के अनुमान से अधिक समय लगा है।'

भारत में तेल की बढ़ती मांग को देखते हुए केंद्र सरकार कच्चे तेल के शोधन की क्षमता बढ़ाकर 450 एमएमटीपीए करने पर काम कर रही है, जो अभी 250 एमएमटीपीए है।

एसएंडपी ग्लोबल कमोडिटी इनसाइट्स में साउथएशिया ऑयल रिसर्च के प्रमुख अभिषेक रंजन ने कहा, 'रिफाइनरी अपने क्लूड बॉस्केट के विविधीकरण का प्रयास करेगी, जिससे बेहतर सुरक्षा सुनिश्चित हो सके क्योंकि भविष्य में रूसी तेल की कमी की संभावना से इनकार नहीं किया जा सकता है। अरबियन और बसरा ग्रेड अगली शीर्ष तीन कच्चे तेल की श्रेणी है, जिसका इस्तेमाल होगा।'

एचपीसीएल, बाड़मेर में केयर्न द्वारा संचालित निकटवर्ती मंगला तेल क्षेत्र से उत्पादित तेल की आपूर्ति भी चाहती है, क्योंकि इसके लिए उसके पास एक समर्पित पाइपलाइन है।



## अप्रैल-नवंबर में पेट्रोलियम उत्पादों का निर्यात 3% बढ़ा

नई दिल्ली, (पंजाब केसरी): पेट्रोलियम नियोजन एवं विश्लेषण प्रकोष्ठ के आंकड़ों के अनुसार, अप्रैल से नवंबर के दौरान भारत का पेट्रोलियम उत्पादों का निर्यात लगभग 3% बढ़कर 42 मिलियन टन हो गया, जबकि पिछले वित्त वर्ष की इसी अवधि में यह 40.9 मिलियन टन था। हालांकि, नवंबर में शिफमेंट पिछले साल की तुलना में 7% घटकर 5.3 मिलियन टन रह गया, जो यूरोप को आपूर्ति में उल्लेखनीय गिरावट के कारण हुआ। मूल्य के संदर्भ में, देश ने इस वित्त वर्ष में अप्रैल-नवंबर में 31.2 बिलियन डॉलर के पेट्रोलियम उत्पादों का निर्यात किया, जो पिछले वर्ष की समान अवधि के 31.6 बिलियन डॉलर से 1.3% कम है। पेट्रोलियम नियोजन एवं विश्लेषण प्रकोष्ठ के आंकड़ों के अनुसार, अप्रैल से नवंबर के दौरान भारत का पेट्रोलियम उत्पादों का निर्यात लगभग 3% बढ़कर 42 मिलियन टन हो गया, जबकि पिछले वित्त वर्ष की इसी अवधि में यह 40.9 मिलियन टन था। हालांकि, नवंबर में शिफमेंट पिछले साल की तुलना में 7% घटकर 5.3 मिलियन टन रह गया।