JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

A STUDY ON THE ISSUES AND CHALLENGES OF NORTH EASTERN REFINERIES IN INDIA WITH SPECIAL REFERENCE TO NUMALIGARH REFINERY LIMITED, NUMALIGARH, ASSAM

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Abstract: The development of India's Petroleum industry can be traced in the North Eastern part of India. North East region of India is the eastern gateway of India's 'Act East' policy. Developing this region is the top priority of the government for overall economic development of the country. North East refineries have been playing a vital role in economic development of this region. But, these refineries unlike other refineries of the country have been facing many problems. The present study focuses on the issues and challenges faced by the refineries in North East region of the country with special reference to Numaligarh Refinery Limited (NRL), Numaligarh, Assam. Addressing these problems both by Central and State government in co-operation with these refineries will make them capable to work successfully which would attract the interest of the investors towards these refineries.

Key words: **Hydrocarbon Potential**, **North-East, Issues & Challenges, Economic Development**

I. INTRODUCTION

The development of India's Petroleum industry can be traced in the North Eastern part of India. North East region of India includes eight states namely, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. India's first oil well was drilled in Assam near Digboi Town. Currently North East region has four refineries at Digboi, Guwahati, Bongaigaon and Numaligarh with total 7 Million Metric tonne Per Annum (MMTPA) capacity. Today, Assam is one of the leading producers of onshore crude oil and contributes over 24% of the total onshore crude production which is about 12.18% of the total crude production in India. In North East, there are more than 100 oil fields viz. Digboi, Naharkatia, Moran, Rudrasagar, Sonari, Amguri, Geleki, Dikom, Kathaloni, Baghjan, Laplingaon, Panidihing, Hugrijan, Tengakhat, Borhola etc. North East refineries have been playing a vital role in economic development of the country. Unlike other parts of the country, running a refinery in North East is a matter of challenge as refineries operating in this region has been facing many problems. Government of India has been providing 50 percent excise duty benefit to these refineries as financial incentive. The present study focuses on the issues and challenges faced by the refineries in North East region of the country with special reference to Numaligarh Refinery Limited (NRL), Numaligarh, Assam.

II. REVIEW OF LITERATURE

Many research works have been done on Petroleum industry of the country. However, only few studies have been carried out on the refineries operating in India. The summary of the extensive literature reviewed for carrying out this study have been given below-

Mueller (2007) in his study on shifting global specs push more refinery investment found that all the refineries in the world were increasing their investment to cope u with the changing specifications for gasoline and diesel fuel. The demand for petroleum products were increasing with the changes in the specifications for transport fuels.

Bhatt (2012) in his study found that the profitability of Oil and Natural Gas Company (ONGC) is highest among the other petroleum companies in India followed by Reliance Industries Limited. Its profitability is almost equal to Bharat Petroleum Corporation Limited and Hindustan Petroleum Corporation Limited.

Krichene (2002) examined the relationship between demand and supply of crude oil and natural gas for the period 1918-1999. By applying the demand and supply model for world crude oil and natural gas, he made an estimation by a two-stage least squares method and re-estimated an error correlation model (ECM). He found that the long run price elasticity is significantly low.

Sharma (2012), in her paper on 'Financial Analysis of Oil and Petroleum Industry' concluded that petroleum industry has both potential domestic and international market. The main constrained of this industry in India is related to infrastructural developments. The other reasons include lack of proper storage facility, fluctuation in import prices and limited refining capacity etc.

Olowonirejuaro (2013) concluded in her paper on 'What are the challenges and future prospects of India's Petroleum Products refineries?' that pricing mechanism of petroleum products is not only the problem faced by petroleum refiners but it needs to be addressed as it is the most weighty challenge with diverse effects. The petroleum pricing in India affects the investment returns and profitability of the national oil companies which stand as an obstacle in optimizing refining capacity. This leads to supply-demand imbalances in the country.

III. NEED/IMPORTANCE OF THE STUDY

The refineries located in North Eastern part of the country play an important role in economic and industrial development of this region of the country. Therefore, it is important to understand the challenges faced by these refineries to make them viable to face the unforeseen situation in future by bringing some reforms in both upstream and downstream sector of petroleum industry.

IV. OBJECTIVE OF THE STUDY

To highlight the factors affecting North East refineries in India.

V. RESEARCH METHODOLOGY

Analytical Research Method has been applied in this study where the researcher has used the data collected from different sources and analyzed the same through simple statistical tool to make a critical evaluation of the material. To analyze the issues and challenges of northeastern refineries, one refinery among four refineries of the region i.e. Numaligarh Refinery Limited (NRL), Numaligarh, Assam has been selected. Here, the researcher analyzed the problems faced by NRL to generalize the same for other refineries located in the region.

Considering the nature of the objective, data for the study have been collected from both primary and secondary sources. Primary data were collected from the Annual Report of the Numaligarh Refinery Ltd, Numaligarh and the secondary data were collected from various reports of Expert Group formed by Government of India to advise on Pricing Methodology of petroleum products, published report of Government, Research Paper, articles, Journals, newspapers and mainly from Petroleum Planning and Analysis Cell (PPAC) which is attached to the Ministry of Petroleum and Natural Gas, Government of India through its website. All the sources are documented and referred in this work.

VI. RESEARCH QUESTIONS

To achieve the objective of the study following research questions have been framed-

1. Unlike other refineries in India, why North East refineries have been availing 50% excise duty benefit from Central Government?
2. Is there any petroleum pricing issue with North East refineries?

VII. ANALYSIS AND DISCUSSIONS

Numaligarh Refinery is the commitment made by Government of India in the historic "Assam Accord" signed on 15th August, 1985 which was perceived as a tool for economic development of the region. It is the largest refinery among all the refineries located in the region in terms of refining capacity which is of 3 Million Metric Tonne Per Annum. This "Mini Ratna PSU" awarded refinery has a good record of regularly upgrading its technology and undertaking expansion programme as per the need of the industry. Still, this refinery has been facing many problems like other refineries in the region. The factors affecting North Eastern refineries with reference to Numaligarh Refinery Limited (NRL), Numaligarh, Assam are discussed below with facts and figures-

a. Pricing

Although, NRL has been operating as a petroleum refining company since its inception, it entered lately in the retail distribution sector in the year 2004-05 with the permission from the government to set up 510 retail outlets. It had set up 75 retail outlets in various parts of the country out of which, 67 were within North East. NRL expanded its retail network outside the North East with the help of BPCL as strategically the company continued its retail marketing activities within the Freight Economic Zone of Numaligarh Refinery. But as per government regulation, only public sector oil marketing companies are entitled to get under recovery compensation like Indian Oil Corporation Limited (IOCL), Bharat Petroleum Corporation Limited (BPCL) and Hindustan Petroleum Corporation Limited (HPCL). Numaligrah Refinery Limited is the subsidiary of BPCL with 61.65% share holding by BPCL. Therefore, unlike other PSU Oil Marketing Companies, NRL was not covered under government's compensation scheme and was not enjoying any financial support from the government for the losses it incurred from its retail business for which it had to absorb the entire burden of retail under recoveries for a period of nine years from 2004-05 to 2012-13. It can be understood from the profitability of NRL which acts as an index of performance of a company. The most common profitability ratio is Return on Investment (RoI). Accordingly, performance of NRL can be judged through return on investment ratio of the company. The RoI of NRL is given below:

Table 7.1 Return on Investment (RoI) of Numaligarh Refinery Limited (NRL)

Year	Net Profit	Net worth	RoI	Percentage (%)
2006-07	5688.03	20449.68	27.81476	27.81%
2007-08	3728.11	22440.97	16.61296	16.61%
2008-09	235.64	2350.65	10.02446	10.02%
2009-10	232.08	2450.04	9.472498	9.47%
2010-11	279.26	2601.06	10.73639	10.74%
2011-12	183.7	2699.26	6.805569	6.81%
2012-13	144.26	2757.45	5.231645	5.23%
2013-14	371.09	2990.83	12.40759	12.41%
2014-15	718.31	3354.98	21.41026	21.41%
2015-16	1209.82	4279.19	28.27217	28.27%
2016-17	2100.57	5180.64	40.54653	40.55%
2017-18	2044.65	5044.35	40.53347	40.53%

Source: Annual Report of NRL

From the above table it can be observed that during implementation of trade parity pricing i.e. between 2005-2014 all the oil marketing companies were making losses as they had to sale their products at a price below their desired price which led to incurrence of high amount of under recovery. In the same way, as NRL was not covered under the Government's compensation scheme, its losses from the retail part were mounting gradually and affected company's return on investment which had been decreasing from 27% in the year 2006-07 to 5% in the year 2012-13. After that a rationalized decision was taken by NRL to hand over its entire retail network to its parent company Bharat Petroleum Corporation Ltd (BPCL) in the year 2012-13 and apparently, NRL started to grow and RoI of the company gathered momentum from 21% in the year 2014-15 to 40% in the year 2017-18. Except NRL, no other refinery in the region was involved in retailing segment and currently, all the four refineries are standalone refineries engaged only in refining activities.

b. Lower capacity utilisation-

The capacity of Numaligarh refinery is 3 MMTPA. This refinery has been processing domestic crude oil from the oil fields of North East, the price of which is linked to the international market. But due to inadequate availability of indigenous crude oil, NRL has been operating below its installed capacity as shown in the following table:

Table 7.2 Installed capacity and crude oil processing of NRL

Year	Installed Capacity		Capacity utilization or crude oil processing	
	In MMTPA	In percentage	In MMTPA	In percentage
2005-06	3.00	100%	2.13	71%
2006-07	3.00	100%	2.50	83%
2007-08	3.00	100%	2.56	86%
2008-09	3.00	100%	2.25	75%
2009-10	3.00	100%	2.61	87%
2010-11	3.00	100%	2.25	75%
2011-12	3.00	100%	2.82	94%
2012-13	3.00	100%	2.47	83%
2013-14	3.00	100%	2.61	87%
2014-15	3.00	100%	2.77	93%
2015-16	3.00	100%	2.52	84%
2016-17	3.00	100%	2.68	89%
2017-18	3.00	100%	2.80	93%

Source: Annual Report of NRL

From the above table it is clear that even at this sub optimal size, NRL could not utilise its capacity to the fullest which is an important factor as it has been affecting the financial growth of the company. To utilise its full capacity, NRL cannot import limited quantity of crude as it would be cost prohibitive and uneconomical.

c. Limited supply/availability of indigenous crude oil

The another important factor affecting North East refineries is limited availability of crude oil in north east region as the refineries in this region has been processing indigenous crude oil or domestic crude oil. The historical record of crude oil production in North East region of India is given in the following table:

Table: 7.3 Historical record of Crude oil production in NER

Year	Crude Oil production (MMTPA)
2010-11	4.84
2011-12	5.14
2012-13	4.98
2013-14	4.82
2014-15	4.54

Source: Hydrocarbon Vision 2030 for North East India- Final Report

From the historical record of crude oil production in north east region as shown in the above table it can be observed that the total production is almost 5.00 MMT per year by ONGC, Oil and other private players from this region where the total refining capacity of all the four refineries in the region viz. Digboi Refinery, NRL, Bongaigaon Refinery and Guwahati Refinery, process domestic crude oil is 7.00 MMT per year. This situation compels these refineries to operate below their capacity. It is applicable in case of NRL also which has been working on an average at 85% capacity. To match up the demand of the refinery, if it imports small quantity of crude then, with the transportation cost, this activity would be uneconomical for the refinery. However, the NRL is now planning to expand its capacity with expanded pipeline connectivity to 8 MMTPA with imported crude oil which would be economical and cost effective.

d. High transportation cost

A refinery should be located at a place which is near their raw materials or near their markets. It should be located at some intermediate point from where communication links to anywhere within the globe can be easily established. Therefore most of the major refineries are situated on the coast or near the coastal areas where either they produce or consume from other country. If we examine the location factor of the North East refinery then one can understand that these refineries are not located in advantageous position for which their transportation cost is much higher than the refineries situated at coastal area. This region of the country is connected to rest of India through Siliguri corridor which is also called as 'Chicken's Neck'.
This corridor is extremely important because North East can connect other parts of the country through this corridor by rail or road which is a narrow stretch of land of about 22 Kilometres located in the Indian states of West Bengal as shown in the following map-

Numaligarh Refinery is also facing the same problem as it has been using three transpiration mode viz. pipeline, truck and rail to bring its products from the refinery to various destinations in the local market as well as to export the products through the Siliguri corridor. Currently, this refinery is using a product pipeline owned by Oil India Limited the length of which is 654 Kilometres with 1.7 MMTPA capacity through which NRL transfers 60%-65% of their output and carry the remaining part through rail or road. It increases the transportation cost which can be understood by making a comparison with a refinery located at coastal area. For this purpose, Chennai Petroleum Corporation Limited (CPCL), subsidiary of IOCL the largest refinery in South India has been chosen which is strategically located at eastern coast with 2 refineries with total capacity of 11.5 MMTPA at Tamil Nadu and at Cauvery Basin near Nagapattinam. The transportation cost of these two refineries i.e. NRL and CPCL can be compared to understand the importance of the location of a refinery which affects the cost of production as well as its profitability. The transportation cost of CPCL is the combination of both refineries under this as taken out from their annual report.

Table: 7.4 Transportation cost NRL and CPCL

Year	NRL(Capacity- 3 MMTPA/MMT)		CPCL(Capacity-11.5 MMTPA/MMT)	
	Rs. (In Crore)	Capacity Utilization or Crude processing(MMT)	Rs. (In Crore)	Capacity Utilization or Crude processing(MMT)
2009-10	144.03	87%	27.45	87%
2010-11	95.97	75%	83.94	93%
2011-12	164.83	94%	58.95	92%
2012-13	112.78	83%	57.85	84%
2013-14	194.29	87%	30.81	92%
2014-15	214.49	93%	36.47	94%
2015-16	172.14	84%	107.55	83%
2016-17	178.03	89%	64.01	90%
2017-18	209.41	94%	72.87	94%

Source: Annual Report of CPCL, Annual Report of NRL, Ready Reckoner published by PPAC

From the above table it is clear that the extent of transportation expenses depends on where the refinery is located which facilitates easy access to any of the destination of the globe. It can be observed from the above table that the capacity of NRL is 3 MMTPA with average 87% capacity utilization whereas the total capacity of two refineries under CPCL is 11.5 MMTPA which is three times more than NRL's capacity with average 90% capacity utilisation. But the transportation cost of NRL is more than double than coastal refineries under CPCL as location of these refineries helps in reducing logistics costs. With its sub-optimal capacity, NRL is spending a huge amount as carrying charge to bring the crude oil and to transfer the refined product from the refinery to local market as well as export the same to various countries as only 61%-65% of the products can be moved through pipeline from NRL to Siliguri corridor which forced the refinery to use alternate mode of transportation such as road and rail networks which are costlier than pipeline transportation. Prior to this NRL-Siliguri pipeline project, 80% of NRL's product goes through railways. This high cost due to longer lead distance travel. Empty racks also added to energy cost. Moreover, the profitability of the refineries situated in this region has been adversely affected by high transportation cost and logistical bottleneck.

e. Disadvantage due to duty restructuring

There are many taxes levied in the process of procuring crude oil such as national calamity and contingent duty (NCCD), import duty, excise duty, VAT and state entry tax. These are absorbed by the refiners. National calamity and contingent duty was imposed in the year 2003-04 on both imported and domestic crude oil which is an additional burden for the refineries. It was imposed to provide support to the areas affected by natural calamities which is Rs. 50 per tonne for both the sources. Those refineries processing domestic crude oil suppose to pay VAT and state entry tax. On the other hand, imported crude oil processing refineries do not require to pay any other taxes except custom duty or import duty which has been nil since a decade. In short, refineries processing imported crude oil are in an advantageous position than refineries processing indigenous or domestic crude oil. Accordingly, NRL has been paying VAT and entry tax at the time of procuring crude oil from the domestic players. Time to time both central and state government has been changing these tariff rates for which refineries bear the adverse impact of this on their earnings. For this periodical changes in duty rates, NRL along with all the north eastern refineries has been paying more because of processing indigenous crude oil to the government on account of high tax as compared to other refineries processing imported crude oil. This can be understood from the following table:

Table: 7.5 Comparison of tax levied on imported and Indigenous crude oil

Year	Tax levied on ***imported*** crude oil	Tax levied on ***Indigenous*** crude oil	
	Custom duty (rate in percentage)	VAT (rate in percentage)	Entry tax (rate in percentage)
2007-08	5%	4%	2%
2008-09	Nil	4%	2%
2009-10	Nil	4%	2%
2010-11	Nil	4%	2%
2011-12	Nil	5%	2%
2012-13	Nil	5%	2%
2013-14	Nil	5%	2%
2014-15	Nil	5%	2%
2015-16	Nil	5%	2%
2016-17	Nil	5%	2%
2017-18	Nil	5%	2%

Source: PPAC website

From the above table it can be understood that the duty restructuring led to reduction in custom duty from 5% to nil which did not bring any benefit to north east refineries as these refineries are processing indigenous crude oil. In fact this change in duty rates affected the financial health of these refineries in the region as they are required to pay VAT 5% and entry tax 2% for movement of the crude oil from one state to another. These taxes are irrecoverable as these cannot be recovered from the

product prices which reduce the gross margin of the refiners. Because, charging these taxes from consumers will lead to double taxation which is not permitted. On the other hand, imported crude oil processing refineries did not require to pay anything, as custom duty on imported crude oil had been abolished in the year 2008-09. However, recently in June, 2019 government of India announced to charge both custom duty and excise duty Rs.1 per tonne each on crude oil which was earlier nil. But these newly increased duties are nominal in nature which will hardly affect the refineries processing imported crude oil.

f. Limited demand

The market in the North East region is limited as a result demand for the petroleum products in this region is very limited as compared to other parts of the country. The consumption of Petroleum, Oil, Lubricant (POL) products in this region out of the total consumption in the country can be seen and understood from the following table:

Table 7.6 Consumption of petroleum products in NE region

Consumption of POL products (MMTPA)	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
In India	120.7	128.9	133.6	137.8	141.0	148.1	157.1	158.4	165.0
In North East region (NER)	2.1	2.3	2.5	2.7	2.8	3.0	3.0	3.2	3.2
% of NER in all India consumption	1.8%	1.8%	1.8%	2.0%	2.0%	2.0%	1.9%	2.0%	1.9%

Source: Hydrocarbon Vision 2030 for North East India report

As it can be seen that the consumption of petroleum products in NE region constitutes hardly 2% of the total consumption of the country which is one of the issues of the region to be dealt with. In case of NRL also, a little portion of their total production is absorbed within the region and rest of the output goes outside the region. The following table will make the picture more clear:

Table: 7.7 Sale of Petroleum products in NE region by NRL

Year	Total sales (TMT)	Sales in North East	
		TMT	In percentage
2010-11	2140	725	28%
2011-12	2730	620	23%
2012-13	2410	612	24%
2013-14	2550	530	22%
2014-15	2695	518	19%
2015-16	2138	278	13%

Source: Report of Annual General Meeting of NRL (from NRL's website)

From the above table it can be seen that out of the total supply of the products by NRL, only 20% (on an average) is consumed within the region. Rest of the products goes out of the North East region which increases the fright cost for transporting the goods from the region to other parts of the country. Apart from the transportation cost, there are many disadvantages of exporting the products than selling it in the local market like longer pay back period, administrative cost associated to market the product etc. The reason for limited demand for petroleum products in the north east may be due to lack of economic developments and low industrial base except tea and wood based industries as compared to other parts of the country. Lack of industrial growth due to poor infrastructure is the main reason for limited demand for POL products in the region. Therefore, increased industrialization with improved business climate, favourable policies and connectivity infrastructure development will attract consumption of petroleum products in the region. The rising income level and growing population can also increase the demand for petroleum products in the region. Overall, limited demand of petroleum products in north east region acts as a hindrance not only to growth of NRL but also to the growth of all the refineries in the region both financially and physically.

Thus, from the above discussion it can be said that Numaligarh Refinery along with other refineries located in North East India have been facing many difficulties as compared to other refineries in other region in terms of transportation cost, limited supply of domestic crude from the region, capacity utilisation etc. The primary challenge these refinery is facing due to geographical isolation and poor infrastructure which leads to logistical bottleneck. Because of these problems faced by all the four refineries in the region, Government of India has extended 50% excise duty relief to these refineries. It means, the four refineries located in the region viz. Digboi Refinery, Guwahati Refinery, Bongaigaon Refinery and Numaligarh Refinery get 50% exemption on excise duty paid to Central government. They can retain 50% of the excise duty realised from the sale of the products which increases their gross refinery margin. Therefore, these refineries are sensitive to change in the excise duty on petroleum products which directly affects the profit of the refineries in the region. For example, in the year 2011-12, government of India reduced excise duty on High Speed Diesel (HSD) from Rs. 4.60 per litre to Rs. 2 per litre. This duty restructuring affected these refineries as their total collection from excise duty on HSD had been declined which automatically reduced the region excise duty benefit. However, the oil companies have been requesting the finance ministry to enhance North East excise duty concession from 50 to 100 percent. Well, currently it is a matter of question whether government will be convinced or not on their request.

VIII. FINDINGS

The findings of this research work are the answers of the research questions as given below-

1. Findings addressing the Research Question No.1

From the analysis and discussions, it was found that running a refinery in north east region is very difficult as these refineries have been facing many challenges on diverse fronts as given below-

(a) The refineries in the North East region have been processing indigenous crude oil. But due to inadequate availability of indigenous crude oil in the region, these refineries have been operating below its installed capacity.
(b) To utilise the full capacity of the refineries, it cannot import limited quantity of crude oil as it would be cost prohibitive and uneconomical.
(c) As these refineries are operating below their installed capacity, they cannot produce the required amount of output to reap required profit which affects their financial growth.
(d) Due to limited pipeline connectivity in this region, only 61% of the output of the refineries can be transported through pipeline. For rest of the products these refineries have to use alternate transportation mode which are less cost effective.
(e) Unlike other refineries located in coastal area, the North East refineries have been facing problem from their location. This region of the country is connected to rest of India through Siliguri corridor, the distance of which is 501 Km from north-east India. These refineries unnecessarily need to spend on this additional cost of transportation.
(f) The market in the North East region is limited as a result, demand for the petroleum products in this region is very limited. This resulted into transportation of major portion of output out of north east region which again increases freight cost of these refineries.
(g) Last but not the least, as these refineries have been enjoying the benefit of retaining 50 percent of their excise duty collection, any change in the tax rates or duty restructuring affect their financial health adversely.

The above discussed problems did not allow the north east refineries to generate sufficient amount of margin. Due to these, Government of India has been providing the benefit of 50 percent exemption in excise duty to these refineries as financial incentive.

2. Findings addressing the Research Question No.2

Presently, there are no pricing issues with north east refineries in India. There is only one refinery in this region which was engaged in retail marketing i.e. Numaligarh Refinery Limited, Numaligarh. This integrated refinery is a subsidiary of Bharat Petroleum Corporation Limited which had retail marketing channels. But, during implementation of trade parity pricing mechanism, this refinery was unable to run due to heavy incurrence of under recovery. Hence, it stopped operating retail channels and continued with refining business. Other than this, no refinery in this region faced problem due to pricing system of petroleum products.

IX. SUGGESTIONS

(a) Providing 50 percent excise duty benefit to these north east refineries would not make them stronger to face the problems. Therefore, government either should extend the excise duty concession percentage or it should provide some additional incentive along with this to the refineries located in north east region of the country for their survival.
(b) Due to locational disadvantage, freight subsidy should be given to these refineries to lessen the burden of transportation cost.
(c) All the refineries in the region should increase their crude processing capacity so that they can use imported crude oil to fully utilise its capacity.
(d) Government should speed up the process of achieving the target of Hydrocarbon Vision 2030 for North East India under which many projects have taken to make the petroleum industry of the region stronger.

X. CONCLUSION

North East region of India is considered as the eastern gateway of India's 'Act East' policy. Therefore, developing this region is the responsibility of the government for overall economic development of the country. This research work has highlighted the challenges the oil refineries located in this region have been facing. Addressing these problems both by Central and State government in co-operation with these refineries will make them capable to work successfully which would attract the interest of the investors towards these refineries. Government already has taken steps to leverage region's hydrocarbon potential under North East Hydrocarbon Vision 2030, but the actual result could be seen by the end of 2030.

XI. LIMITATION

Since it is difficult to study each of the four refineries located in North East region individually, a case study of Numaligarh Refinery Limited, Numaligarh has been chosen for the study.

XII. SCOPE FOR FURTHER RESEARCH

This study has been carried out by taking out only one refinery of North East region i.e. Numaligarh Refinery Limited as a case which creates an ample scope for further study as studying all the refineries in this region individually will throw light to many other problems which have not been highlighted here.

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