

## A Study on Major Commercial Energy Consumption in India

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**Abstract:** Energy has been universally recognized as one of the most important input for economic growth and human development. Generally, it has defined as "Capacity to do work" thereby, for bring out desirable design on economic level there must be need of intensive of energy performance in various sectors of the country. Perceiving commercial energy at the one of economic viability consumption has equip the present status of economic level to be boost and reach global advance in due period with identification of which are highly consumes among public and the statistics of this has brought out in this study. Electricity, LPG, kerosene, coal and natural gas are the chosen commercial energy and data for the specified years have collected from central electricity authority CAE and Energy statistics 2015 for 2007 – 2014.

**Keywords:** Commercial, Natural gas, Transformation, Resources, Non-commercial.

### I. Introduction

Popularly, Energy meant that strengthen of physical for execute our daily attributes towards successful progress. But, in macro analytical programme considered the ENERGY is "Capacity to do work" this is a mean which applying in the Economic aspects. Because, energy is live blood of modern economics (Vidhya-2012). So, the Energy is how prominent to physical, same like significant for the economic development or any nation's maturity in the Economic views. Therefore, countries altogether persisting for attain maturity in all aspects with the execution of natural and artificial energies. Our country India has undertaking four kinds of sectors towards progressive trends with proposed targets through utilization of Energy efficiently. But, the consumption of Energy is inconsiderable one that availing still in nature with fluctuating ratio. Indeed, it also one of challenge to calculate the national outcomes among which are consuming kinds of Energies. Commonly, Energy has classified in to two types such as, renewable and non-renewable resources. Here, the energy meant as resources and classified as commercial and non-commercial type. This study described commercial type of energy and analyzed total consumption of India.

### Objectives

Here, the paper framed two objectives which describe the energy consumption among mentioned areas.

- ❖ To perceive the variations of commercial Energy consumption of India.
- ❖ To understand the commercial Energy that consuming highly in India.

### Purpose of the study

As we know, developing country like India has been promoting itself by enhancing various initiatives on all sectors and regions to achieve economic targets and for prepare to meet global competition for proclaim efficient nation. Accumulation of changes in energy consumption especially commercial energy pointed is indirectly spurs the problems on the consumption of non-commercial energy regularly consumes by rural people. Though, initiation of various commercial energy is always supports to economic growth and it never ever make worsen to that yet looking for another trend of consumption in non-commercial type and its reflects among the rural have to consider and necessary steps need to execute for the support of primary energy consumers and to boost economy level.

### Energy scenario in India

Our country India is also one of developing country in the world among others and here several kinds of sectors are performing well for nation's achievements. India's future depends on existing energy inclusion of wealth of human resources. At the same, amount of availing Energy and consumption over it, is a great challenge for Indian economy to do further economic activities. Non-renewable sources plays vital among rural India for various purpose including cooking due to various inconvenience situation of alternative energy. As commercial sources, Oil is major demandable energy for all sectors. But it was appeared as scarce during 1970s and it's price also mounted up in 1975 highly but not like 1973-74 due to the disputes of imposing duties on importing goods. Furthermore, Demand for Oil was transited to Electricity due to the expansion of industrialization. About 65% of electricity energy had been consumed by this sector (Debash Chakraborty-2007). Moreover, present consumption of energy is coming up for both commercial and non-commercial energies. The non-renewable energy sources reserved in India during 2011 was 295 billions and 757 millions and total potential of renewable power was 89.760MW in the same duration (Vidhya-2012). Indeed, country

India has possessing good and sufficient natural resources which possible to renewbut , if the consumption trends will run with the same ratio the non-renewable resources of oil for 30 years, natural gas 60 years and coal 200 years only can sustain because, by 2050 the global population possibility to attain 9 billion and use of total energy has increasing around 330 per cent on 1990-2020(Dheivanai-2014).

### **Commercial Energy**

Further classification of energy is taken as Commercial and Non-commercial energy. Here under the headline describing about commercial energy that meant “Energy which paying for our consumption or bringing to market for sold” such as coal, Electricity, lignite, petroleum, LPG etc. The commercial energy also a form of natural energy but, its demand and structural developments need to economic developmentby sector’s inducement on bringing up its value high through pricing and qualities. Due to over exploitation of this energy, availability and sustainability has affecting because, commercial energy not only energy use for existing various sectors but it is being used as essential energyfor households also. Therefore, demand for commercial energy is springing up in rural and urban Households for dynamic purpose therein contained.

### **Non-commercial Energy**

This energy is chasm needed for rural and urban Households for their cooking purposes and other. It mean “Energy which we need not to pay for our consumption or not bringing to market for sold” such as, dung cake, firewood, bio-mass and bio-gas, agricultural residual etc. This energy demand mainly existing among the rural people rather than the urban areas because of standard of living of the people have been progressive development and structural changes and ecosystem thereof. The major contribution of non-commercial energy is gets birth from nature only, it has distributing directly to the people’s hand by collecting own without any intermediators with free of cost. Therefore, Existing non-commercial energy is mainly utilizing by the rural people without limits it meant that consumes over than their requirements and it leads to scarce, demand and price of it also has been increase. Major cause for this is lack of awareness to protect natural resources for future purposes.

### **Energy Consumption**

Consumption process is an adequate performance of human beings for kinds of purpose that it depends upon several factors. Utilization of energy is based on existing requirements not based on efficient but the amount of it has been differs by sectors which have been progressing in India. Here, the study describing about commercial energy consumption trends in India. The energy consumption pattern has been unstable control and predict in developing country like India due to thrusting of targets towards growth.Major process of energy consumption is presented as commercial type in India. Because of people from here, for their entire needs of energy rely upon non-commercial type only due to easy to obtain, free of cost, available always, and sufficient existence etc. thereby people are consumes non-commercial energy over than their requirement and without no idea about future posterity and to keep energy sustain. Therefore, existence of non-commercial energy is go for nothing, scarce situation furtherand these will springingup among people. The major reason for the raising demand and limiting energy midst of people is over utilization and transiting this energy as commercial type. Therefore, even people from both rural and urban also ought to pay for natural or non-commercial energyt. On the other hand, demand is not only on non-commercial energy but it includes for commercial energy also due to developing process. Therefore demand for electricity is mounting up for household purpose in the rural area. So, the government generated plan for 100% village level electrification have to distribute pre-end of 2007(James Cust, Anoop Sing and KarstenNeuhoff -2007) it is so challengeable one even at current period also.

While compare the energy consumption with commercial and non-commercial energy, people are utilizing less of non-commercial and higher of commercial energy because of having sufficient income sources and ability for consume energy. For cooking and heating purposes people has been using commercial fuels only such as electricity, LPG, natural gas, coal etc. Therefore, demand for it, is always high and provision also less of its requires because of scarce of natural energy. Already natural or non-commercial energy is using by the people from rural not after considering energy for all including use as capital for production. Use of non-commercial energy is limit due to the structural and geographical view of land in the specified area that may not be fertile for the production or growing of non-commercial energy thereby people for their whole energy need’s purpose belonging to commercial energy and it’s demand still high because of highly consumption on it and technological progress which inspire them to consume more and more. So, the bate of energy is not only on non-commercial energy but it in the commercial energy also. Therefore, the trends of energy utilization among the people from household sector has going upward. In this present, except households other sectors of our country also expecting high provision of both energy to be supplied.

### **Variations**

In India, both rural and urban people still lacking for fulfill their energy requirements even for their everyday purpose. According to the International Energy Agency approximately 36 percent of India’s population over 400 million people facing lack of electricity energy (IEA-2009) and nearly 70 percent which

mean 725 million individuals still rely on biomass for their cooking purpose because it's utilization based on climate entirely and people from rural consuming 132kg fuel wood per month. Urban people also have consumes Kerosene along with LPG at the level of 9 liters per month. This was trends before 2010 but recent consumption pattern has been declining this present and increasing towards latest technological improvements. In the rural areas 91 percent of households consuming kerosene especially for lighting and cooking after electricity the measure of consumption kerosene was began to come down for lighting purpose only but the compares of rural and urban shows data at 94 percent in urban and rural 57 only. In rural electricity is not major use but it's use extends well beyond lighting in the urban (e.g., television sets, radios, irons and electric fans) (www.induanenergyportal.org) moreover, urban people looking forward for energy to consume as LPG, natural gas, electricity etc which are highly expensive to save their working time in the kitchen.

### Energy Demand

Demand is based on purchasing power and desire on the specified goods and service. same like, demand on consumption of energy also on the base of different structural conditions of people or consumers. Here, people from the country has consumes major commercial type of energy for fulfill their entire households cooking purposes. And expectations of people, that energy should be obtain with cheap and best ones especially, which is alternated recently and made as newly is most preferable one. Generally, commercial energy is major preference by both urban and rural people because of goods pertaining to electrical innovation and LPG for kinds of household work mainly lighting, cooking have stimulate them to utilize commercial type and inclusion of entertainment purpose also. Therefore, demand and consumption pattern therein is nearby 71 percent (www.indianenergyportal.org). But it possible to increase more than proposed amount due to novelty of technological progress towards electrical and other emphasis commodity which helps to promote the country's economy and other structural performance. But its consumption pattern zero chance to come down because of structural mounting even in individual life also. On the other hand, rural people also demanding more non-commercial energy because of existing their lifestyle and consumption pattern based on their economic efficient. Highly consumption of natural fuel woods is an everyday utilization of rural people around 132kg of fuel wood have been used and as commercial energy such as electricity and kerosene is begin to come up with the average of 57 percent while urban consumption at 94 percent. But current condition of non-commercial energy in rural declining with increasing ratio because of changes of lifestyle, increasing per capita income moreover affection of globalization and product's technical innovation and inventions forces them to transit towards commercial energy type.

**Table 1.1.** Commercial Energy Consumption

Major commercial Energy							
Energy Year	Electricity (kwh)	Kerosene (Million)	LPG (Million tons)	Coal (Million tons)	Natural Gas (Million Cubic meters)	Total consumption	Growth rate in (%)
1	2	3	4	5	6	7	8
2007-08	621.29	9.37	12.17	457.08	31.48	1131.39	-
2008-09	669.18	9.30	12.19	492.76	31.75	1215.18	7.40
2009-10	725.49	9.30	13.12	532.04	46.52	1326.47	9.15
2010-11	802.98	8.93	14.33	532.69	51.25	1410.18	6.31
2011-12	864.71	8.23	15.35	535.88	46.48	1470.65	4.28
2012-13	917.28	7.50	15.60	567.60	39.78	1547.76	5.24
2013-14	1010.00	7.17	17.13	571.89	34.64	1640.83	6.01
<b>C A G R 2007-08 to 2013-14 (%)</b>	<b>7.23</b>	<b>-3.68</b>	<b>5.07</b>	<b>3.30</b>	<b>2.98</b>	<b>5.48</b>	

Sources:

1. Central Electricity Authority
2. www.indexmundi.com
3. Energy Statistics 2015

## **II. Findings and Discussion**

Engraved statistical information shows that the trend of commercial energy consumption in India with data fluctuations that some of them at increase and decrease. Electricity is a major commercial energy that have been consuming in different sectors of India inclusion of residential thereby, its trend has increasing year by year that indicated above with high result in its consumption and in 2014 this was 1010kwh consumed this is high compare to former years from 2008. Consumption of kerosene in million tons have been declining from 2008 onwards due to accumulated changes in technical sectors on invention of virgin products which associated with alternative fuel type but, in 2014 it found 7.17 million tons have consumed in sectors of India.

LPG is an alternative cooking fuel from the consumption of kerosene and its trend has increasing in stable manner though 17.13 million tons found that consumed in 2014 it is high compare to former year. Coal energy consumption trend also like the consumption trends of LPG thereby, both energies on the sustainable increasing ratio until 2014 reported by Energy statistics 2015. Natural gas also kind of commercial type energy that consumes in industrial and residential sector mostly though its trends found in fluctuating ratio until 2011 there were increasing and 2012 onwards it began to decline found at 34.64 million cubic meters in 2014. Among the titled commercial energy in the table, based on compound annual growth rate, **Electricity** consumption determined as highly consumed energy and its needs also great for the nations contribution its CAGR was **7.23%** in 2014 this is great result among other commercial energies and **5.07%** of average growth rate found from **LPG** consumption in India the causes for the trends of both electricity and LPG energy is common due to economic development of nation.

## **III. Results**

Based on the engraved statistical inferences pertained to commercial energy consumption in India has been fluctuating that resulted from found growth rate therein but 2014<sup>th</sup> result shows that begin to get develop compare to 2013<sup>th</sup> growth rate. While consider the total consumption of commercial energy, that has been mounting up year by year and found at 5.48percentin compound annual growth rate result. Consumption trends of Natural gas shows from 2008 onwards fluctuating status but 2011<sup>th</sup> result brought high 51.25 consumption ratio the reason for this result is, price of natural gas is inversely related to petroleum and coal price. While these price increase demand for natural gas also will be increased because country India has lack of sources to produce for fulfill its domestic needs. For decline its consumption only because of necessities of alternative energy like coal, LPG and kerosene (www.eia.gov).

### **Causes for transformation of energy from non-commercial to commercial energy**

Most popular and recently made affection among the people is commercial energy and this considered that, "Have to pay for consume energy". Few years back during 2007, much of non-commercial energy used by groups of people but subsequently the demand for renewable energy start to diminish instead of that due to emerge of kinds of commercial energy among rural and urban areas. As the history base, some of disparities were exist among people as higher or lower in the community and breed, economically wise etc. furthermore, one of reason, that it was divided as area wise like rural and urban but people all were used uncategorized energy with less productive capacity. Therefore, over utilization caused for the classification of energy as commercial and non-commercial kinds. Subsequently, the people whoever able to use commercial and non-commercial energy on the base of their efficient, it begin to consume. After, through the development in industrials and business sectors, consumption products start to produce with the use of energy. So, the scarce of energy emerged among the people and it start to affect their lifestyle. Recent growth in technology also a tool for raising energy demand. People from urban have been consuming commercial energy always with less use of non-commercial energy. It will never affect the consumption of those people but by chance if there any scarce, that will affect but not by their economic components. Thus, the demand for commercial energy has began to sustain always among them. The energy consumption pattern of rural area is depending on efficiency of people and on possibility to collect and produce.

Though, some of non-commercial energy has been transforming into commercial energy because of scarce and over demand of non-commercial energy such as water, fuel wood and even oxygen etc. The major reason for this cause is structural changes and developments in rural areas with raising per capita income and need of energy during tribunal. Therefore, some of private and public industries come for complete the task for the better of public and with future ambitions of nation.

#### **IV. Data sources and Methodology**

This paper used secondary data for entire details pertaining to chosen title and mentioned statements engraved to this paper after the refers of several materials such as published papers through journals, submitted projects and thesis were so helpful for produce paper under mentioned topic. For enter the data [www.indianenergyportal.org](http://www.indianenergyportal.org), CEA, [www.indexmundi.com](http://www.indexmundi.com), Energy Statistics 2015 were too supportive towards complete this paper. Moreover, recent disputes related to consumption of both kinds energy were induced the presenter to produce paper under it effectively along with statistical inferences.

#### **V. Conclusion of the study**

The present study has described pertaining to energy consumption in the aspect of classified commercial type energy with the reference of India's different sectorial energy consumption. Energy conditions of the country with past data promoted us to analysis present and future requires of energy also used. Examines of commercial energies and it's affections among the people entitled here specifically and subsequently, consumption and demand pattern of energy with the causes of variations also included. Mainly, the causes for dynamic changes on energy consumption from non-commercial to commercial energy also engraved for the findings of present existing scarce in renewable sources for resolve it.

#### **Limitations**

This paper consist some of limitations have to solve in future. Here, less of commercial type energy used but doesn't choose luxury energy items with information of present amount of its consumption trend. The variations of energy consumption ought to indicate clearly and current condition must be pointed to analyses the energy consumption throughout country. The consumption pattern should be identify and the status of people at economically to be described for perceive the changes or improvements how emerged among them. Engraved reasons on increasing and transiting ratio of commercial energy demand, is required to explain with each of that changing process with moments.

#### **Scopes for further Research or suggestions**

Creative ideas towards the specified disputes are must not keep it prolong or manage instead giving appropriate solution for remedies. Therefore, this study also contributing some solutions for existing problem pertained to over commercial energy consumption in India.

1. Generation of awareness among public to consume commercial energy less to prevent utilization of primary energy as inputs.
2. Policy requires to ensure towards keep sustainable development on energy consumption.
3. Government should be regulate the production of commercial energy if it affect the economic growth.
4. Price and imports of commercial energy should be regulate.
5. Aware of efficient energy consumption have to proclaim.
6. Evaluate the problems of primary energy consumers due to spread of commercial energy.
7. Problems of over consumption of commercial energy leads worsen to nation that be proclaim.

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