



Capacity development and strengthening for energy policy formulation  
and implementation of sustainable energy projects in Indonesia

# **ENERGY PROFILE OF YOGYAKARTA PROVINCE 2006**

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**List of Abbreviation:**

DIY	: Daerah Istimewa Yogyakarta/Special Region of Yogyakarta
GRDP	: Gross Regional Domestic Product
BOE	: Barrel of Oil Equivalent
PLN	: National Electricity Company of Indonesia
JAMALI	: Electricity Interconnection System of Java-Madura-Bali
GWh	: Giga Watt Hour
ADO	: Automotive Diesel Oil
IDO	: Industrial Diesel Oil
FO	: Fuel Oil
PERTAMINA	: National Oil Company of Indonesia
SUSENAS	: Economic National Survey

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# Chapter I

## GENERAL INFORMATION OF YOGYAKARTA PROVINCE

### 1.1 Geographic and Political

#### 1.1.1 Geographic

Daerah Istimewa Yogyakarta (DIY) Province is one of the 33 provinces of Indonesia and lies in Middle Java. DIY Province is bordered by the Indonesian Ocean to the south, and is for the rest surrounded by Central Java Province, bordering:

- to the north east Klaten Regency
- to the south east Wonogiri Regency
- to the west Purworejo Regency
- to the north west Magelang Regency

Based on physiographical data, DIY Province consists of:

- Southern Mountains,
  - area : + 1,656.25 km<sup>2</sup>
  - height : 150 – 700 m
- Mount Merapi,
  - area : + 582.81 km<sup>2</sup>
  - height : 80 – 2,911 m.
- Mainland between Southern Mountains and Kulonprogo Mountains,
  - area : + 215.62 km<sup>2</sup>
  - height : 0 – 80 m
- Kulonprogo Mountains and South Mainland,
  - area : + 706.25 km<sup>2</sup>
  - height : 0 – 572 m

DIY Province lies between 7°.33' - 8°.12' South Latitude and 110°.00' - 10°.50' East Longitude of Greenwich, has an area of 3,185.80 km<sup>2</sup> or 0.17 percent of Indonesia area (1,890,754 km<sup>2</sup>). It is the smallest province after Daerah Khusus Ibukota (DKI) Jakarta Province, and consists of :

- Kulonprogo Regency, with area 586.27 km<sup>2</sup> (18.40 percent)
- Bantul Regency, with area 506.85 km<sup>2</sup> (15.91 percent)
- Gunungkidul Regency, with area 1,485.36 km<sup>2</sup> (46.63 percent)
- Sleman Regency, with area 574.82 km<sup>2</sup> (18.04 percent)
- Yogyakarta City, with area 32.50 km<sup>2</sup> (1.02 percent)

Based on National Land Bureau information, from the 3,185.80 km<sup>2</sup> area of DIY Province, 33.05 percent consists of Lithosol, 27.09 percent of Regosol, 12.38 percent of Lathosol, 10.97 percent of Grumusol, 10.84 percent of Mediteran, 3.19 percent Alluvial, and 2.47 percent Rensina.

The majority area of DIY Province lies at a height of 100m – 499m above sea level that is 65.65 percent, at height less than 100m around 28.84 percent, at height 500m – 999m around 5.04 percent and the areas that lies at heights above 1000m are around 0.47 percent.

DIY Province has tropical climate with average rainfalls is about 0.00mm – 390.60mm, influenced by dry season and rainy season. According to the Meteorology Station of Adisutjipto the average temperature in Yogyakarta during 2006 was recorded to be 26.5<sup>0</sup> C, It is lower than average temperature during 2005 which recorded 27.7<sup>0</sup> C, with the maximum

temperature is 34.7<sup>0</sup>C and the minimum temperature is 20.7<sup>0</sup>C. Humidity was recorded 37 – 97 percent, air pressure is 1,005.3mb – 1,017.2mb, with wind arrow is 180 degrees – 240 degrees and wind velocity is 0knot – 29knot.

### **1.1.2 Political**

The Regional Government consists of the Head of Region and Parliament. The Head of Region is responsible for executive matters and Parliament for legislative ones. The capital city of DIY Province is Yogyakarta City, the region is governed at the first level by the Governor.

To implement his duties, according to the coordinated plan and job program of regional development, and public services, there are organizations of Governor Staff. They are the Regional Secretariat and Regional Technical Institutions (Services, Boards, and Offices).

The Regional Secretariat has 3 assistants:

1. Government Assistant
2. Investment and Facilities Assistant
3. Empowerment Assistant

The Regional Secretariat Assistant consists of five bureaus:

1. Government Structure Bureau
2. Law Bureau
3. Cooperating Bureau
4. General Bureau
5. Organizational Bureau
6. Civil Service Bureau

The member of the provincial parliament (level I, DPRD I) are 89 persons, consisting of 26.97 percent of PDI-P, 20.22 percent of PAN, 15.73 percent of Golkar, 14.61 percent of Kebangkitan Bangsa, PKS and Demorkat each 11.24 percent.

Composition of the provincial parliament members by commission is of 24.62 percent Government commission, Economics/Finance commissions consist of 23.08 percent, Development commissions and Social Welfare commission each 26.15 percent ( not including Board of Directors 24 persons).

Number of parliament (level II, DPRD II) members in Kulonprogo Regency and Yogyakarta City each 35 person, Bantul Regency, Gunungkidul Regency and Sleman Regency each 45 persons. During 2006, there are 82 decisions made by Provincial parliament and 325 decisions made by Regency/City parliament.

## **1.2 Socio-economic**

### **1.2.1 Population**

Based on the result of National Survey in 2006, number of population in DIY Province was recorded 3,391,843 persons, consisting of 50.78 percent female and 49.22 percent male. Percentage of urban populations is 59.11 percent and rural population is 40.89 percent. Compared to 2005 population, the growth rate of population in DIY Province is 3.35 percent that is greater than the 1.88 percent population growth rate in 2005.

The growth rates of Yogyakarta City, Sleman Regency, and Bantul Regency are greater than province's growth, which are 5.16 percent, 5.56 percent, and 7.33 percent respectively. And the other two Regencies, Gunungkidul Regency and Kulonprogo Regency, have lower

growth rate compared to the provincial growth rate, which are -1.77 percent and -3.32 percent respectively.

With the total area of DIY Province is 3,185.80 km<sup>2</sup>, population density in 2006 is 1,065 persons per km<sup>2</sup>. The highest population density occurs in Yogyakarta City that is around 13,606 persons with an area of around 1 percent of total area of DIY Province. In contrary, the Gunungkidul Regency has the lowest population density of 460 persons per square kilometer with an area of 46.63 percent of the total area of DIY Province.

Based on National Socio-Economic Survey, the highest percentage of DIY Province population by age group are the productive and old people, there are 10.53 percent of the population in 20 – 24 years old and 13.65 percent in 60 years and over. The high proportion of old people population shows that population of DIY Province tends to have a high expectation of life.

### **1.2.2 Economy**

Base on Gross Regional Domestic Product (GRDP) at 2000 constant prices, economic growth of DIY Province in 2006 was recorded around 3.69 percent and it is lower than previous year that reached around 4.74 percent.

Some interesting illustration about the situation of DIY Province economics in 2006: there are positive growth rates in all sectors except for utility and financial services. Construction sector gets the highest growth of 13.28 percent. Transportation sector and services sector get positive growth around 5.28 percent and 3.87 percent. Meanwhile, in this year Agriculture sector get positive growth of around 3.80 percent.

Manufacturing sector growth rate is around 0.73 percent. Besides that, Manufacturing sector and Trade, Hotels, Restaurant sector that became accelerators of economic growth have a positive growth of 3.62 percent, a decrease from the previous year. While the contribution of manufacturing sector is lower than contributions of Agriculture sector and Services sector, manufacturing is a potential sector to encourage economic growth.

GRDP at constant price 2000 of DIY Province reached 17,538,187 million Rupiahs in 2006, GRDP per capita recorded 5.17 million rupiahs. Compared to 2005 GRDP per capita, 2006 GRDP per capita has increased around 0.37 percent.

Based on GRDP in constant price 2000, the contribution of Commercial Services sector and Agriculture sector has the two highest shares in economics of DIY Province. The highest share in economics of D.I. Yogyakarta is Services sector that reached around 23.19 percent in 2006. Agriculture sector and Manufacturing sector are around 18.86 percent and 14.15 percent respectively. Services sector has 14.08 percent contribution of GRDP. Transportation is sector 10.05 percent and financial service is around 9.08 percent. Meanwhile, Construction sector around 9.01 percent. Mining and Quarrying sector has the smallest share, only 0.72 percent from total GRDP at current price. Compared to 2005 share of GRDP, there were slight changes in all sector shares in 2006.

### **1.3 Energy Resources**

In order to conduct the economic activities in Yogyakarta province, primary energy is supplied from outside sources (Central Java province) particularly for fossil liquid fuel and electricity. Fossil liquid fuel is supplied to Yogyakarta from the PERTAMINA Refinery of Rewulu. This PERTAMINA Refinery does not only supply the fuel for Yogyakarta but also for regencies in Central Java which is located near Yogyakarta.

Electricity demand of Yogyakarta is supplied through interconnection with the transmission grid of Java-Madura-Bali (JAMALI). From the JAMALI transmission grid, electricity is connected to PLN customers through the distribution network of Yogyakarta province. The distribution network of Yogyakarta consists of eight electrical sub-stations with each station servicing certain areas in Yogyakarta.

For remote areas which are not accessed by PLN (off grid), the electricity demand is supplied by solar cell photovoltaic electricity generating systems (PLTS). Currently, a PLTS program has installed more than 175 units that are distributed in four regencies, i.e. kabupaten (regency): Sleman, Bantul, Gunungkidul and Kulonprogo. In Yogyakarta Province, solar cells are newly installed in 2008 and 2009 in Gunungkidul district. The installation of solar cell in Gunungkidul district consists of two types, which are communal system and SHS. The communal project consists of one frame mounted on the roof of a powerhouse. 4 rows of 9 panels, each 100 W<sub>peak</sub>, provide a total of 3.6 kW<sub>peak</sub>. Apart from this, in the other (more remote and scattered) 105 houses Solar Home Systems are installed. The solar panel provides 50W<sub>p</sub>. This is enough to run 3 lamps. The system has one battery to store energy. As a new installation, all of the solar cell in Gunungkidul district is still operating.

Yogyakarta has identified that it does not have any non-renewable energy sources such as liquid fossil fuels, coal and natural gas. Consequently, these energies must be supplied from other provinces in Indonesia. However, regional government, research institutions, universities and NGO have initiated to focus on the development and use of renewable energy sources such as solar, wind, ocean wave, hydro and biomass.

River/open channel flows is one of the energy sources that can be used to produce electricity with a generator driven by a turbine in the (micro-)hydropower plan system (PLTAS). Several data should be considered in order to evaluate the potential energy in such rivers/channels, i.e. debit (volume per time unit, Q), minimum daily flow, daily flow duration and topography area. Thus, the energy potential can be obtained from debit (Q) and water pressure (head, h). Currently, several potential locations have been already identified in Kulonprogo and Sleman regency. Total potential of microhydro in Yogyakarta Province is 1188.6 kW. The biggest microhydro potential is in an irrigation channel in Semawung and has a potential of 600 kW.

There are two installed micro hydro power plants in Yogya. The locations of the MHPP are in Turi and Minggir ( in Sleman regency). The first one was built in 2003 and planned to operate in 2005 with head of 10m and capacity of 4000 Watt. This plant was a demo project and serves for research propose for the Gadjah Mada University in Yogya. The second one was built also in 2003 but is still not operated.

Based on Meteorology and Geophysics Office of DIY Province, the potential of solar energy in DIY Province is estimated 4.8kWh/m<sup>2</sup>/day. Monthly average of solar radiation and clearness index in DIY Province are illustrated in figure 1.1. The clearness index is a measure of the clearness of the atmosphere. It is the fraction of the solar radiation that is transmitted through the atmosphere to strike the surface of the Earth. It is a dimensionless number between 0 and 1, defined as the surface radiation divided by the extraterrestrial radiation. The clearness index has a high value under clear, sunny conditions, and a low value under cloudy conditions.

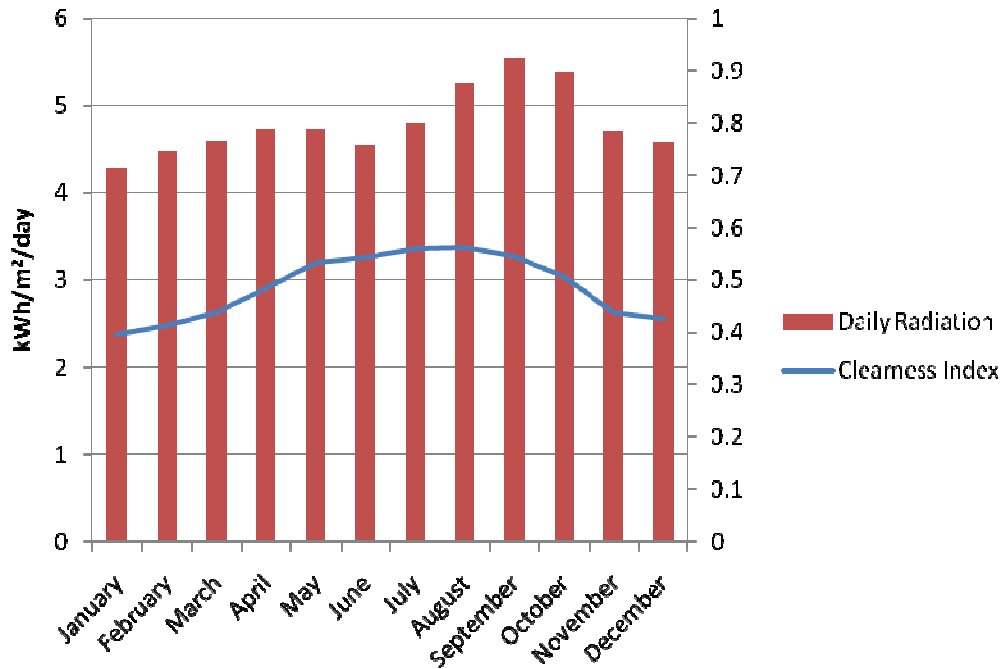


Figure 1.1. Monthly solar radiation and clearness index in DIY Province

The Province of Yogyakarta has wind energy potential from its geographic position which is located in the coastal area of southern Java. Average wind speed in Yogyakarta coastal area is 4.12 to 5.14 m/s, and this wind speed can be practically used to generate electricity by small to medium scale of wind energy power plant. Along DIY Province beach, the wind speed is 2.5 m/s to 4 m/s with a capacity potential of up to 10MW. In Sundak Beach, Srandakan Beach, Baron Beach, and Samas Beach, the wind speed is 4 m/s to 5 m/s with a potential capacity of 10 to 100MW.

Yogyakarta has also biomass potential from municipal waste. Based on data from the Yogyakarta waste management office, in 2002, there is about 5,703 m<sup>3</sup>/day of municipal waste production. Almost 35 % of the waste is transferred to the final waste disposal/landfill (TPA) in Yogyakarta. One of the largest TPA is Piyungan, located in Bantul. The area of the disposal location is about 12 hectares and can accommodate 2.7 million cubic meters of waste. Biomass potential also can also be generated from livestock. Animal waste from livestock such as cow, buffalo and goats contains high concentration of cellulose. In addition, cattle also produce liquid waste that can be used as a raw material for biogas. Protein, fat and carbohydrate content in the animal waste are one of the key factors in biogas production. Factors, such as temperature, anaerobe condition, acetone bacteria and methane bacteria; influence biogas production from animal wastes. These factors decompose organic materials into biogas. The bacteria will grow rapidly in the temperature of 36.7 to 54.4 °C. Methane bacteria will effectively work in the pH range of 6.8 to 8. Solid concentration in the water is around 310 % while reaction time of bacteria is about 10 to 30 days. Practically every cow can produce about 600 liters biogas per day with an energy content of approximately 22.5 MJ per liter of gas. Biomass potential can also be converted to biofuel from the Casava and Sugar Cane plant.



## Chapter II ENERGY BALANCE

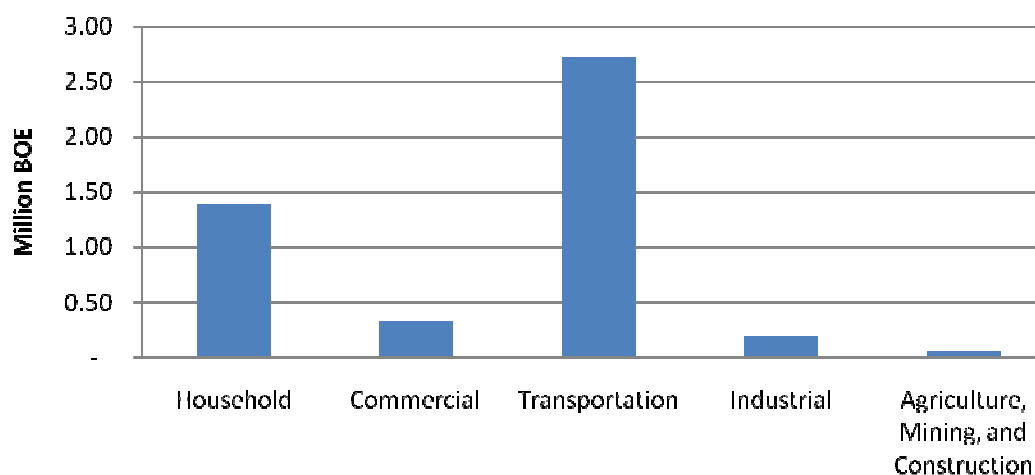
### 2.1 Final Energy Consumption

Total of final energy consumption of DIY Province in 2006 is 4.69 Million BOE. Compared to total of final energy consumption in 2005, energy consumption in 2006 is decreased by 4.6 percent from 4.91 Million BOE in 2005. The major contribution in the decrease of final energy consumption is from the industrial sector that shows a decrease in energy consumption of 36.1 percent compared with energy consumption of industrial sector in 2005.

Considering that industrial sector has experienced positive growth in 2006 as described in section 1.2.2, the decrease of energy consumption in industrial sector should be analyzed more comprehensively. Taking into account that the 2006 earthquake in DIY Province has not significantly affected industrial sector and the processes applied in industrial sector have not changed significantly, it means that the reliability of oil fuel data – the main fuel change in industry - from PERTAMINA is not so good. The observation of energy consumption, especially, in industrial sector can be done comprehensively by incorporating 2007 and 2008 energy profile of DIY Province.

#### 2.1.1 Final Energy Consumption by Sector

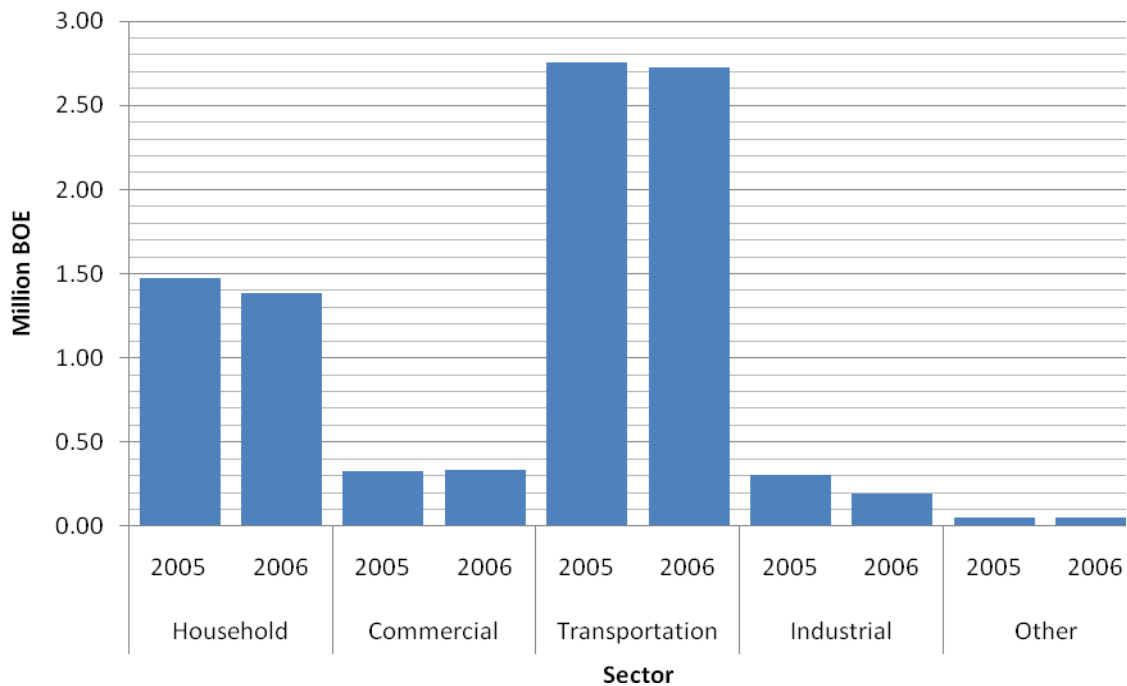
Energy consumption by sector in 2006 is dominated by transportation. Energy consumption in transportation sector in 2006 is reaching at the value of 2.73 Million BOE (58.1 percent). Household energy consumption is the second largest of 1.38 Million BOE (29.5 percent). Energy consumption of Commercial and Industrial Sector are 0.33 Million BOE (7.1 percent) and 0.19 Million BOE (4.1 percent) respectively. Other sector has the least energy consumption in 2006 of 0.05 Million BOE (1.1 percent). The final energy consumption in 2006 of DIY Province can be seen in Figure 2.1.



**Figure 2 .1. Final energy consumption by sector of DIY Province in 2006**

Figure 2.2 shows the comparison of final energy consumption by sector in 2005 and 2006. In the figure, it can be seen that decreasing in energy consumption is occurring in all sectors except commercial sector. In household sector, energy consumption has decreased by 7.2 percent from 1.63 Million BOE in 2005. Being the second largest sector, this decrease influences the most the total final energy decrease. The largest relative decrease of energy consumption occurred in industrial sector. The decrease of energy consumption in industrial sector is around 34.8 percent compared to energy consumption of industrial sector in 2005

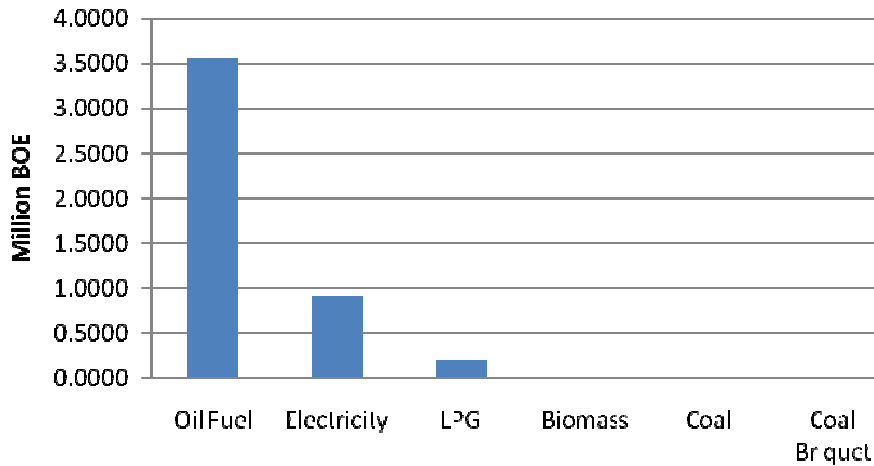
that reached 0.30 Million BOE, whereas energy consumption in other sector decreases 4.9 percent from 0.06 Million BOE in 2005. Energy consumption of commercial sector increased 1.9 percent compared to 2005 energy consumption of commercial sector in 2005 that only reached 0.33 Million BOE. Energy consumption of transportation sector in 2006 is also decreased by 1.1 percent from 2.73 Million BOE in 2005. Therefore, the total of final energy consumption in 2006 is decreased by 4.6 percent compared with total of final energy consumption in 2005.



**Figure 2. 2. Comparison of final energy consumption by sector in 2005 and 2006**

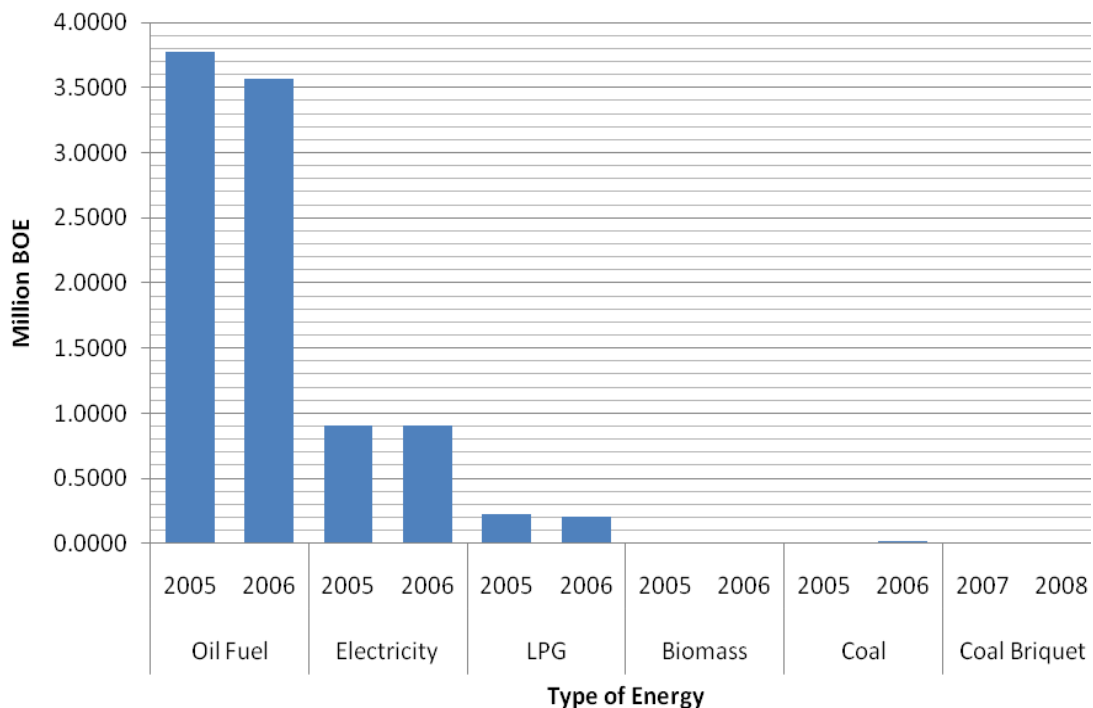
### **2.1.2 Final Energy Consumption per Energy**

Final energy consumption by type of energy is shown in figure 2.3. In the figure, it can be shown that oil fuel is still very dominant compared to other type of energy with the amount of energy of 3.56 Million BOE (76.0 percent). Energy type of electricity and LPG used in DIY Province in 2006 is 0.90 Million BOE (19.3 percent) and 0.20 Million BOE (4.3 percent) respectively. While the total of energy types of coal, biomass, and coal briquette is only around 0.4 percent compared to the total of final energy consumption in 2006. The amount of energy of coal, biomass, and coal briquette are 0.013 Million BOE (0.28 percent), 0.0033 Million BOE (0.07 percent), and 0.0027 Million BOE (0.06 percent) respectively.



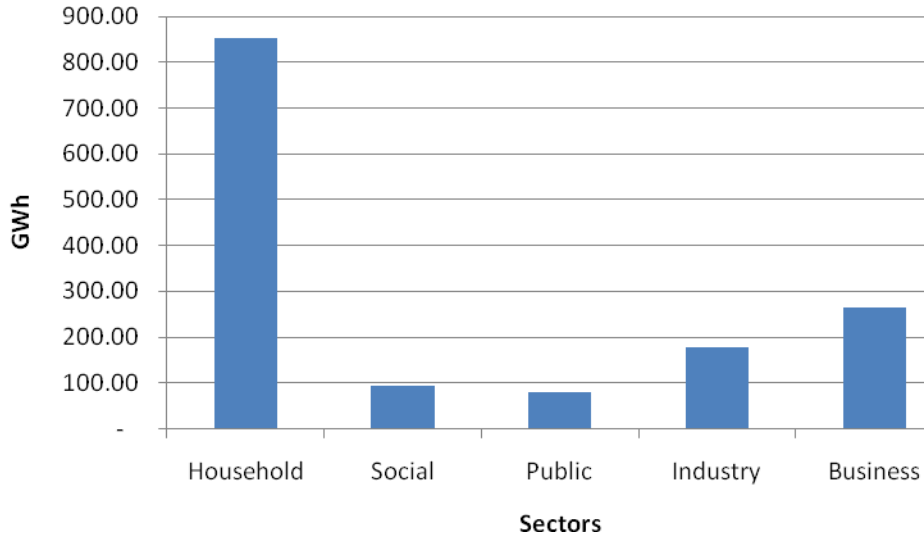
**Figure 2. 3. Final energy consumption by type of energy of DIY Province in 2006**

The comparison of final energy consumption by type of energy in 2005 and 2006 is shown in figure 2.4. Consumption of oil fuel and LPG is decreasing in 2006 compared to consumption of oil fuel and LPG in 2005. Consumption of oil fuel in 2006 decreased by 5.6 percent (3.78 Million BOE in 2005) and consumption of LPG in 2006 is also decreased by 11.6 percent (0.37 Million BOE in 2005). There is a small increase in consumption of electricity and biomass in 2006. In 2006, consumption of electricity is increased by 0.4 percent (0.90 Million BOE in 2005) and biomass increased by 0.7 percent (0.0028 Million BOE in 2005). Consumption of coal briquette is increased by 3.1 percent (0.0027 Million BOE in 2005). In the other hand, there is a very big increasing of coal consumption in 2006. Consumption of coal in 2006 is around eight times the coal consumption in 2005 (0.0015 Million BOE in 2005).



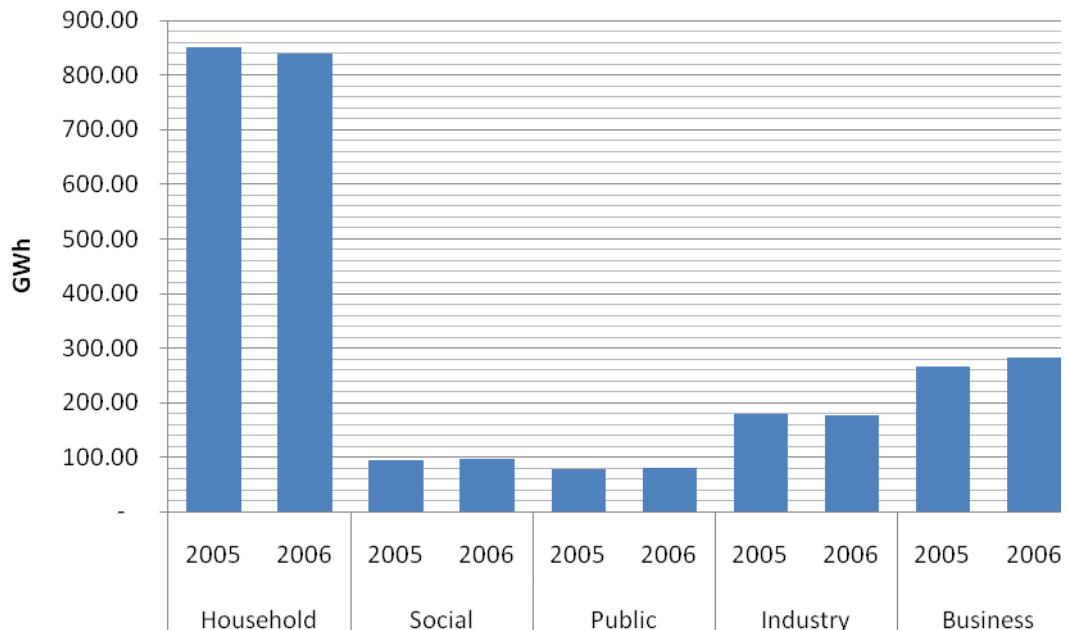
**Figure 2. 4. Comparison of final energy consumption by type in 2005 and 2006**





**Figure 2. 6. Electricity Consumption by sector of DIY Province in 2006**

In total, electricity consumption of DIY Province in 2006 increased by 0.42 percent compared to electricity consumption in 2005. The growth of electricity consumption in 2006 is very small compared to growth of electricity consumption in 2005 that reached 7.09 percent. The small growth of electricity consumption in 2006 is caused by the earthquake that occurred in 2006. Differences between 2005 and 2006 electricity consumption by sector is shown in figure 2.7. It can be seen in figure 2.7 that decreasing in electricity consumption has occurred in household and commercial sector by 1.32 percent and 1.10 percent respectively. In the other hand, electricity consumption in commercial, social, and public sector is increased by 6.14 percent, 1.75 percent and 1.75 percent respectively.



**Figure 2. 7. Comparison of 2005 and 2006 electricity consumption by sector in DIY Province**

## **2.3 Energy Supply**

### **2.3.1 Solid Fuel**

There are two kind of solid fuels that are used in DIY Province, which are coal and coal briquette. Coal and coal briquette are coal from Kalimantan that is supplied to DIY province through Central Java Province. The amount of consumed coal in 2006 is 3,031Ton a significant increase compared to consumed coal in 2005 by 8.4 times. Coal is only used in industry. Since there are no supply data of coal briquette, the increase of this type of energy is derived from the increase of activity level in household sector represented by growth of population in DIY Province. Consumption of coal briquette 2006 is 769 Ton

### **2.3.2 Liquid Fuel**

Oil fuel consists of gasoline, ADO, IDO, fuel oil, and kerosene and is supplied to DIY Province by PERTAMINA in Cilacap, Central Java Province through pipeline to refinery in Rewulu, Yogyakarta. The total of imported oil fuel that is consumed by DIY Province is 597,509 Kilo Liter that decreased by 5.6 percent compared to imported oil fuel in 2005 (631,663 Kilo Liter).

### **2.3.3 Gas**

LPG is the only gas fuel that is consumed by DIY Province. LPG distribution is delivered from PERTAMINA Cilacap to six LPG stations in Yogyakarta. From the stations, LPG is distributed to LPG agents in Yogyakarta Province and finally to LPG consumer. The total imported LPG that is consumed by DIY Province in 2006 is 23,671 Ton, a decrease by 11.59 percent compared to imported LPG in 2005 (26,775 Ton).

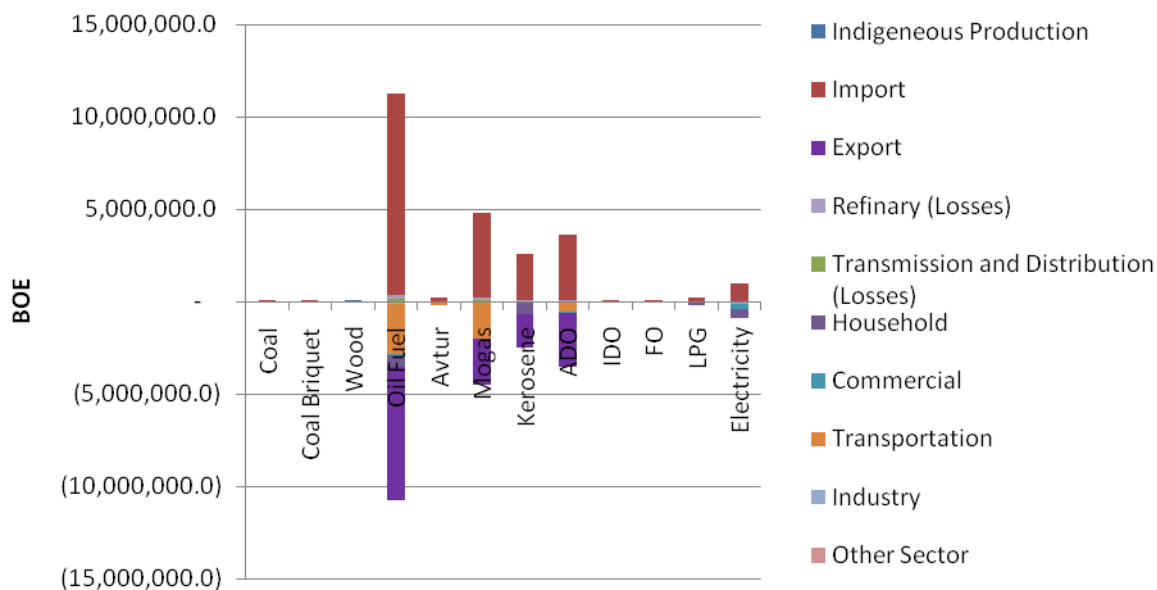
### **2.3.4 Biomass and Other Renewables**

Energy from biomass that is used in DIY Province is in the form of fire wood. Fire wood can be considered as a type of energy that currently can be produced by DIY Province. Fire wood is used in households only. Since there is no supply data of fire wood, the growth of consumed fire wood in DIY Province is derived by the growth activity level as represented by the growth of population. The amount of produced fire wood or consumed fire wood in 2006 is 1,433 Ton that is increased by 0.66 percent compared to produced fire wood in 2005 (1,424 Ton).

## **2.4 Energy and Commodity Balance**

### **2.4.1 Energy Balance**

Figure 2.8 shows energy balance of DIY Province in 2006. In the figure, it can be seen that all energy that is used in DIY Province is imported from outside DIY Province except fire wood. Oil fuel that consists of avtur, gasoline (mogas), kerosene, ADO, IDO, and fuel oil (FO), is very dominant compare to other type of energy. In 2006, total amount of oil fuel that is imported to DIY Province is 3,563,620 BOE. This amount of oil fuel is used by five sectors and dominated by transportation sector. Energy type of electricity in 2006 reaches the value of 904,454 BOE that is used by household, commercial, and industrial sector. Imported LPG in 2006 is 201,7868 BOE. All of imported LPG is used by household, commercial, and industrial sector. The amount of imported coal in 2006 is 12,962.6 BOE and used only by industrial sector. Coal briquette that is used by household sector reaches the value of 2,741 BOE in 2006. The only energy that is produced by DIY Province is fire wood. The amount of fire wood in 2006 is 3,294 BOE. Fire wood is used by household sector.

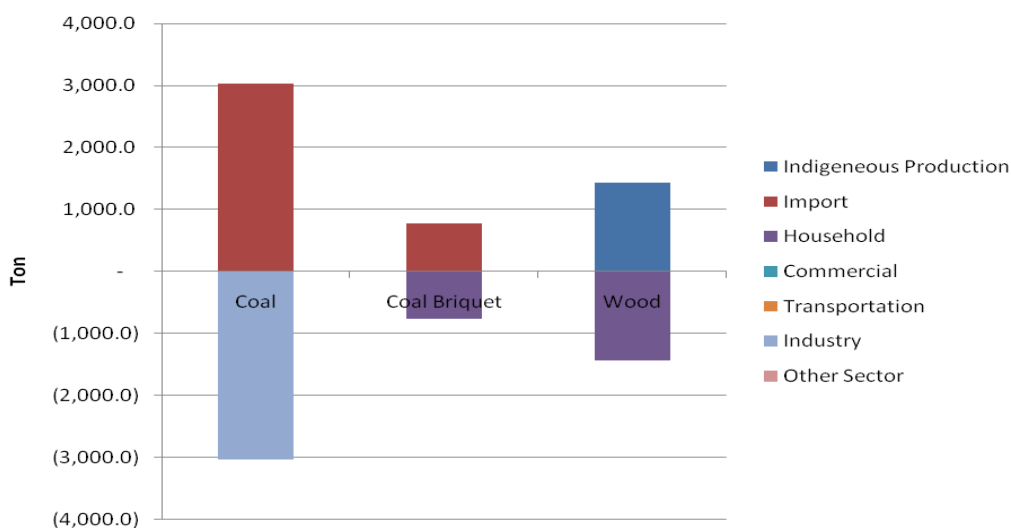


**Figure 2. 8. Energy balance of DIY Province in 2006**

It can be seen in figure 2.8, there is export of oil fuel of gasoline, kerosene, and ADO. This means that imported gasoline, kerosene, and ADO are not only used by DIY Province but also delivered to 11 cities in Central Java Province which are Magelang, Purworejo, Temanggung, Wonosobo, Klaten, Wonogiri, Boyolali, Surakarta, Karanganyar, Sukoharjo, and Sragen. The total of imported and exported Oil Fuel in 2006 is 10,934,957 BOE and 7,197,495.5 BOE respectively.

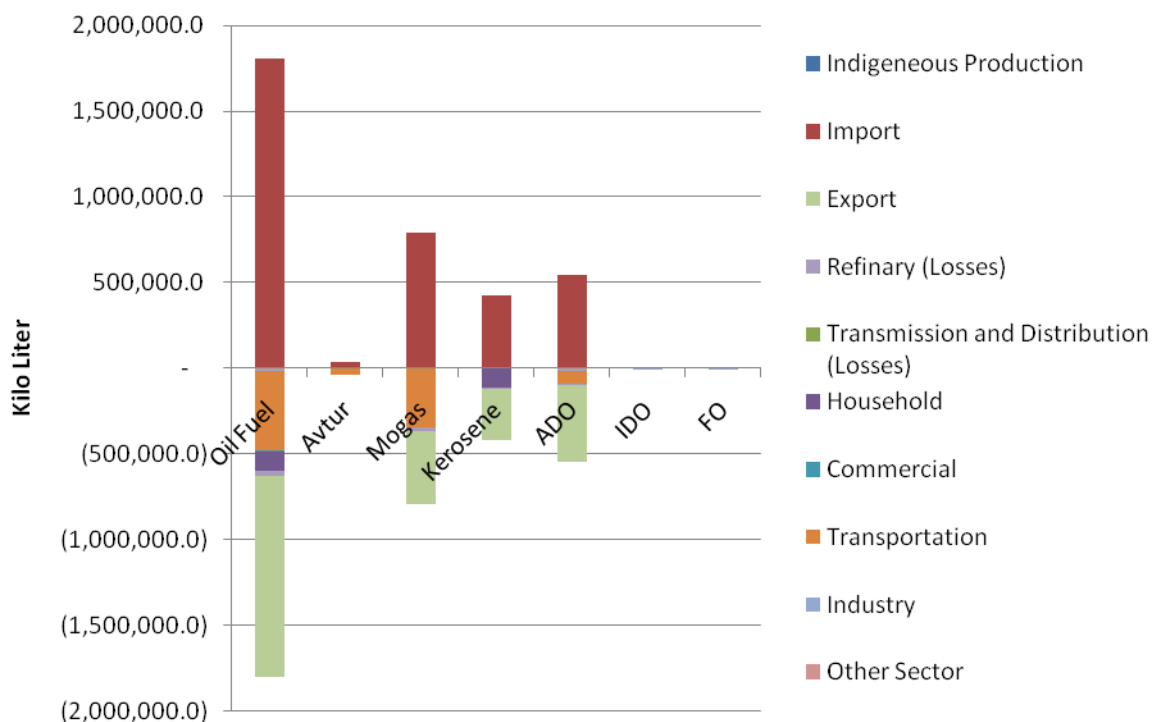
### 2.4.2 Commodity Balance

Commodity balance of solid fuel is illustrated in figure 2.9. Commodity of solid fuel consists of coal, coal briquette, and fire wood. Coal and coal briquette is imported from outside of DIY Province while fire wood is produce by DIY Province. In 2006, commodity of coal and coal briquette is 3,031 Ton and 769 Ton respectively. All commodity of coal is used by industrial sector and all commodity of coal briquette is used by household sector. Fire wood that is produced in 2006 is 1,433 Ton. All commodity of fire wood is used by household sector for cooking activity.



**Figure 2. 9. Commodity balance of solid fuel in 2006**

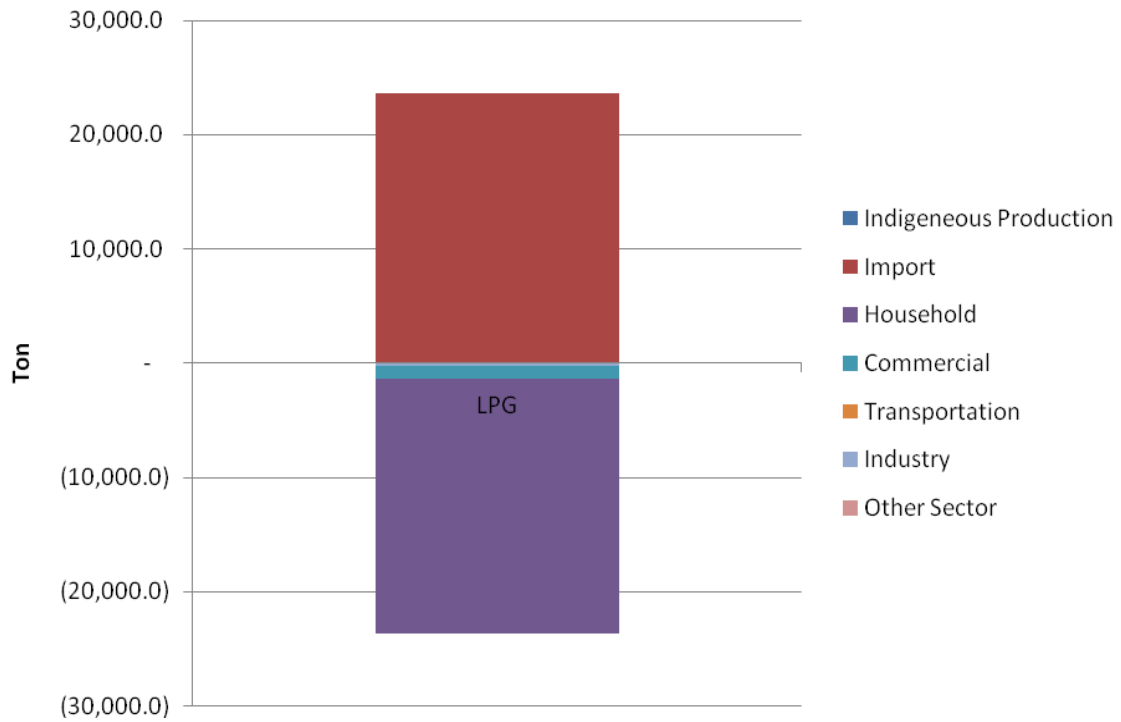
Figure 2.10 shows commodity balance of liquid fuel. All liquid fuel is imported from outside DIY Province with the total in 2006 is 1,805,837 Kilo liter. The total of commodity of oil fuel that is supplied to DIY Province in 2006 is 597,509 Kilo liter that is dominated by commodity of gasoline. The amount of gasoline commodity in 2006 is 346,274 Kilo liter and this entire commodity is used by transportation sector. Commodity of kerosene is 114,245 Kilo liter in 2006. Mostly, kerosene is used by household sector. Commodity of ADO is 93,707 Kilo liter and used by all sectors except household sector. Most of ADO is used by transportation sector. Commodity of IDO and FO in 2006 that is only used by industrial sector is 253 Kilo liter and 5,136 Kilo liter respectively. As described in section 2.4.1, oil fuels are also exported to 11 cities in Central Java Province. The total of exported commodity of oil fuel in 2006 is 1,179,158 Kilo liter.



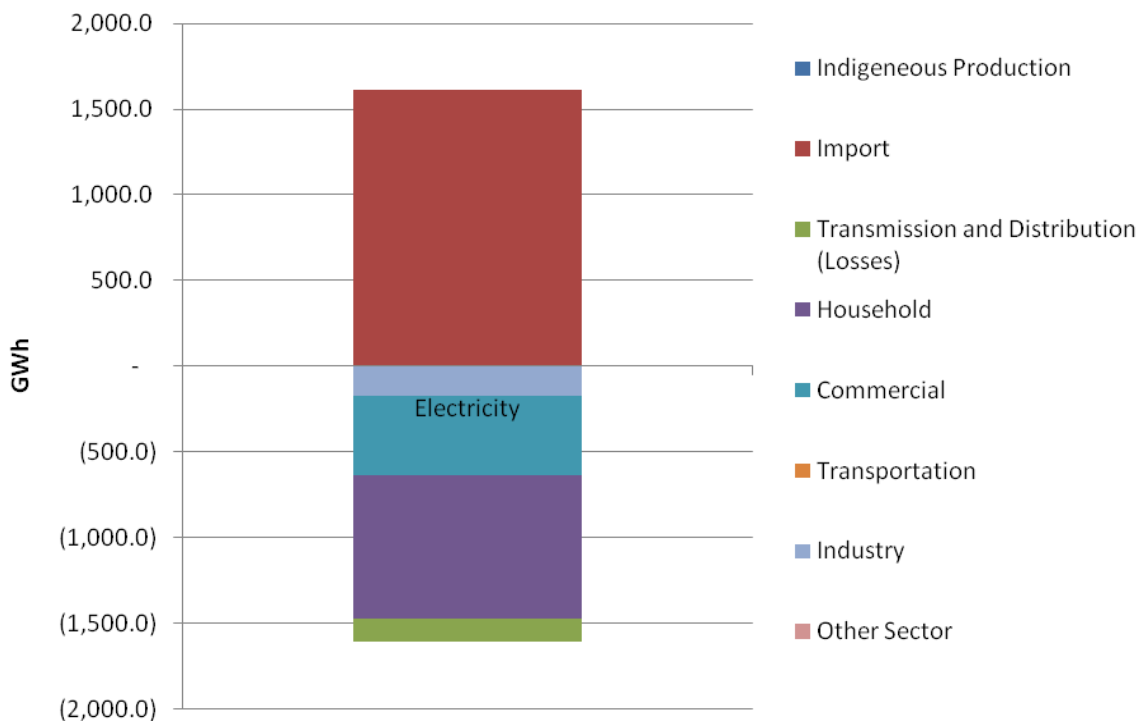
**Figure 2. 10. Commodity balance of liquid fuel in 2006**

Commodity of gas fuel is illustrated in figure 2.11. Commodity of gas fuel consist only LPG and is also imported from outside of DIY Province. In 2006, commodity of LPG is 23,671 Ton. As can be seen in figure 2.11, most of LPG is used by household sector, followed by commercial sector and industrial sector.





**Figure 2. 11. Commodity of gas fuel in 2006**



**Figure 2. 12. Commodity of electricity in 2006**

Figure 2.12 shows commodity of electricity in 2006. In figure 2.12, it can be seen that commodity of electricity is also imported from outside of DIY Province through interconnection system of JAMALI. The total of electricity commodity that is imported in 2006 is 1,609.7 GWh. A part of imported electricity is as losses in electrical distribution system in DIY Province. In 2006, losses in electrical distribution system are 8.34 percent. Therefore, the amount of commodity of electricity loss in distribution system is 134.3 GWh.

Commodity of electricity is used by household sector, commercial sector, and industrial sector. There is no available data on electricity production of off-grid systems in DIY. Currently, the electricity production of solar PV in DIY Province cannot be estimated due to lack of monitoring. The estimation of electricity production of solar PV could be done by creating synthetic hourly solar radiation data in a year from monthly solar radiation data and daily pattern of appliance that been supplied by solar PV. The daily pattern of appliance can be obtained by detailed survey in households that are connected to solar PV.

## **Chapter III**

### **DATA SOURCES AND ASSUMPTIONS**

#### **3.1 Data Sources**

Energy profile of DIY Province for 2006 consists of activity data and energy supply data. Activity data consists of demography, economic, and transportation activity data. While energy supply data consists of electricity, oil fuel, gas (LPG), and coal data.

Demography data that consists of area of DIY Province, provincial and regency population data, population density, number of household and household size, is collected from statistical office of DIY Province. Beside demography data, economic data is also collected from statistical office of DIY Province. The economic data consist of GDP data based on fixed price of 2000 that used to calculate economical growth of DIY Province. Population data is a representation of household activity level and GDP data is a representation of commercial, industrial, and other sector activity level.

Activity of transportation sector that consist of number of motorcycle, number of passenger car, number of truck, and number of buses, is collected from statistical office of DIY Province. The raw data of road transportation is collected by traffic services of regional police of DIY Province. Transportation data of train activity is collected from train company region VI of DIY Province. While transportation data of airplane is collected from Adisutjipto Airport Authority of Yogyakarta.

Electricity data that consists of electricity consumption, number of electricity costumer, and capacity of electrical distribution system, is collected from PLN office of DIY Province. Data of oil fuel, LPG, and coal is collected from PERTAMINA. Capacity of oil refinery in Rewulu, Yogyakarta is also collected from PERTAMINA.

Renewable energy potential of wind, solar, and hydro energy is collected from Energy and Mineral Resources Office of DIY Province, while data of biomass potential from agricultural residue and data of biofuel potential are collected from statistical office of DIY Province.

#### **3.2 Assumptions**

Since there is no supply data of fire wood and coal briquette, supply data of these two types of energy is derived by 2005 intensity level and corresponding activity level in 2006. Energy from fire wood and coal briquette in 2006 as a product of 2005 intensity and 2006 activity level is assumed as supply data of fire wood and coal briquette.

#### **3.3 Main Methodology Change with Energy Profile 2005**

Energy intensities in energy profile 2005 for household sector were calculated from SUSENAS data and were adjusted to meet supply level. In energy profile 2006, energy intensities for household sector are calculated based on energy intensities in 2005 and are adjusted to meet supply level.

Similar with household sector, energy intensities for industrial sector in energy profile 2005 were calculated based on industrial survey data. In energy profile 2006, energy intensities for industrial sector are calculated based on energy intensities in 2005 and are adjusted to meet supply level.

In energy profile 2005, energy intensities for commercial sector, other sector, and transportation sector were calculated based on national energy intensities and were adjusted to meet regional supply level, since there were no regional survey on commercial sector, other sector, and transportation sector. In energy profile 2006, energy intensities for these

three sectors is calculated based on 2005 energy intensities and is adjusted to meet supply level in 2006.

## Chapter IV

### Recalculation of 2005 Energy Profile Data

There are several recalculations applied to the 2005 energy profile data compared to the original versions established in the CAREPI project. Recalculation is done based on newly information about LPG consumption data, coal supply data, and consistency of share in electricity consumption between profile data of 2005 and 2006. This recalculation results in new energy intensity for LPG, coal, and electricity in the concerned sectors.

#### 4.1 LPG Consumption Data

The comparison of LPG consumption data between original version of 2005 energy profile data and revised version one is shown in table 4.1. It can be seen that LPG data consumption between the two versions is significantly different. Data of LPG consumption in the revised version is obtained after discussion with PERTAMINA and Energy and Mineral Resources Department of DIY Province. The discussion was held based on observed differences of data of LPG consumption between PERTAMINA of DIY Province office data (DICMER). In the discussion, PERTAMINA suggested that the original version of LPG consumption data was the amount of LPG that was delivered to DIY Province to six LPG resellers. The six LPG resellers then distributed the LPG not only to DIY Province but also to several cities in Central Java Province. The actual 2005 LPG consumption for DIY Province for the revised version in table 4.1 was proposed by PERTAMINA based on quota calculation of LPG for DIY Province.

**Table 4. 1. Comparison LPG consumption data between original version and revised version of 2005 energy profile data**

No.	Category	LPG Sold (Ton)					
		2003		2004		2005	
		original version	revised version	original version	revised version	original version	revised version
1	Household	41,068.7	21,914.9	32,434.9	24,884.3	40,359.7	24,884.3
2	Industry and Commercial	3,120.4	1,665.1	2,464.4	1,890.7	3,066.5	1,890.7
Total		44,189.0	23,580.0	34,899.3	26,775.0	43,426.2	26,775.0

New energy intensities for LPG were then recalculated to meet the new supply level in all related sectors, which are household, industrial, and commercial sector as indicated by the availability of the latest information about LPG consumption data. Recalculation of new energy intensities of LPG resulted in revised LPG consumptions for each sector. The comparison of original version and revised version of LPG consumption in related sectors is shown table 4.2.

**Table 4. 2. Comparison of LPG consumption of original version and revised version of 2005 energy profile data by sector**

No.	Sector	LPG Consumption in 2005 (BOE)	
		original version	revised version
1	Household	344,363.61	212,128.65
2	Industrial	3,751.66	2,341.22
3	Commercial	22,075.72	13,776.30
Total		370,190.99	228,246.17

## 4.2 Coal Data

In the latest discussion with PERTAMINA, PERTAMINA also informed about coal supply to DIY Province. In the original version of the 2005 energy profile data there was no supply data of coal for the industrial sector, therefore the consumption of coal in industrial sector was obtained from the product of coal use intensity and the activity level in industrial subsectors. In the revised version of 2005 energy profile data, coal supply was obtained by PERTAMINA amounting to 895.44 Ton. The implication of coal supply data availability resulted in coal intensity of industrial sector to be recalculated to meet this supply level. The comparison of original version and revised version of coal consumption in industrial sector is shown in table 4.3.

**Table 4. 3. The comparison of coal consumption in original version and revised version of 2005 energy profile data in industrial sector**

No.	Sector	Coal Consumption in 2005 (BOE)	
		original version	revised version
1	Industrial	1,532.54	3,829.43
Total		1,532.54	3,829.43

## 4.3 Electricity Data

The calculation of electricity of 2006 uses different shares compared to the 2005 calculation. In order to maintain the consistency of methodology in share calculation of electricity, the share of electricity in revised version of 2005 energy profile was recalculated using the same methodology that was used in 2006 energy profile data. The effect of this recalculation did not involve a different supply level of electricity in 2005, but it affected consumption share of electricity in related sectors. Recalculation of new share of electricity consumption in 2005 has affected electricity intensities across related sectors. Then, new electricity intensities resulted in new electricity consumption in all related sectors in 2005 energy profile data. The comparison of electricity consumption of original version and revised version of 2005 energy profile data is shown in table 4.4.

**Table 4. 4. The comparison of electricity consumption of original version and revised version of 2005 energy profile data**

No.	Sector	Electricity Consumption in 2005 (BOE)	
		original version	revised version
1	Household	546,925.63	521,930.32
2	Industrial	100,010.67	109,637.09
3	Commercial	253,767.81	269,136.70
Total		900,704.11	900,704.11

## 4.4 Final Energy Consumption

Final energy consumption of revised version of 2005 energy profile data developed based on recalculation that has been done for LPG, coal, and electricity. The total of final energy consumption in revised version is lower than in the original version as can be seen in table 4.5 and table 4.6.

**Table 4. 5. Comparison of final energy consumption of original version and revised version of 2005 energy profile data by type of energy**

No.	Type	Final Energy Consumptin in 2005 (Million BOE)	
		original version	revised version
1	Oil Fuel	3.7755	3.7755
2	Electricity	0.9007	0.9007
3	LPG	0.3702	0.2282
4	Biomass	0.0033	0.0033
5	Coal	0.0015	0.0038
6	Coal Briquet	0.0026	0.0026
Total		5.0538	4.9142

**Table 4. 6. Comparison of final energy consumption of original version and revised version of 2005 energy profile data by sector**

No.	Sector	Final Energy Consumptin in 2005 (Million BOE)	
		original version	revised version
1	Household	1.6292	1.4719
2	Commercial	0.3194	0.3265
3	Transportation	2.7567	2.7567
4	Industrial	0.2934	0.3039
5	Other	0.0552	0.0552
Total		5.0538	4.9142

## ANNEX I: Commodity Balance

	Unit	Coal	Coal Briquet	Wood	Oil Fuel	Avtur	Mogas
		Ton	Ton	Ton	Kilo Liter	Kilo Liter	Kilo Liter
<b>1</b>	<b>Primary Energy Supply</b>	<b>3,031.0</b>	<b>769.1</b>	<b>1,433.3</b>	<b>626,678.7</b>	<b>37,893.9</b>	<b>364,498.9</b>
	a. Indigeneous Production	-	-	1,433.3	-	-	-
	b. Import	3,031.0	769.1	-	1,805,836.6	37,893.9	792,252.6
	c. Export	-	-	-	(1,179,157.9)	-	(427,753.7)
<b>2</b>	<b>Energy Transformation</b>	-	-	-	-	-	-
<b>3</b>	<b>Own Use and Losses</b>	-	-	-	-	-	-
	a. Refinery	-	-	-	29,169.8	-	18,224.9
	b. Transmission and Distribution	-	-	-	-	-	-
<b>4</b>	<b>Final Energy Supply</b>	<b>3,031.0</b>	<b>769.1</b>	<b>1,433.3</b>	<b>597,508.9</b>	<b>37,893.9</b>	<b>346,274.0</b>
<b>5</b>	<b>Statistical Difference</b>	-	-	-	-	-	<b>0.0</b>
<b>6</b>	<b>Final Energy Consumption</b>	<b>3,031.0</b>	<b>769.1</b>	<b>1,433.3</b>	<b>597,508.9</b>	<b>37,893.9</b>	<b>346,274.0</b>
	a. Household	-	769.1	1,433.3	113,617.9	-	-
	b. Commercial	-	-	-	6,412.7	-	-
	c. Transportation	-	-	-	458,775.7	37,893.9	346,274.0
	d. Industry	3,031.0	-	-	10,611.0	-	-
	e. Other Sector	-	-	-	8,091.7	-	-



**Commodity Balance (Continued)**

	Unit	Kerosene	ADO	IDO	FO	LPG	Electricity
		Kilo Liter	Kilo Liter	Kilo Liter	Kilo Liter	Ton	GWh
<b>1</b>	<b>Primary Energy Supply</b>	<b>120,257.9</b>	<b>98,638.9</b>	<b>253.0</b>	<b>5,136.0</b>	<b>23,671.0</b>	<b>1,893.3</b>
	a. Indigeneous Production	-	-	-	-	-	-
	b. Import	423,408.4	546,892.6	253.0	5,136.0	23,671.0	1,893.3
	c. Export	(303,150.5)	(448,253.7)	-	-	-	-
<b>2</b>	<b>Energy Transformation</b>	-	-	-	-	-	-
<b>3</b>	<b>Own Use and Losses</b>	-	-	-	-	-	<b>417.8</b>
	a. Refinery	6,012.9	4,931.9	-	-	-	-
	b. Transmission and Distribution	-	-	-	-	-	417.8
<b>4</b>	<b>Final Energy Supply</b>	<b>114,245.0</b>	<b>93,707.0</b>	<b>253.0</b>	<b>5,136.0</b>	<b>23,671.0</b>	<b>1,475.5</b>
<b>5</b>	<b>Statistical Difference</b>	-	<b>(0.0)</b>	-	-	-	-
<b>6</b>	<b>Final Energy Consumption</b>	<b>114,245.0</b>	<b>93,707.0</b>	<b>253.0</b>	<b>5,136.0</b>	<b>23,671.0</b>	<b>1,475.5</b>
	a. Household	113,617.9	-	-	-	22,278.9	840.2
	b. Commercial	361.7	6,051.0	-	-	1,195.4	458.4
	c. Transportation	-	74,607.8	-	-	-	-
	d. Industry	249.0	4,973.0	253.0	5,136.0	196.7	176.9
	e. Other Sector	16.4	8,075.2	-	-	-	-

## ANNEX II: Energy Balance

	Unit	Coal	Coal Briquet	Wood	Oil Fuel	Avtur	Mogas	Kerosene
		BOE	BOE	BOE	BOE	BOE	BOE	BOE
<b>1</b>	<b>Primary Energy Supply</b>	<b>12,962.6</b>	<b>2,740.8</b>	<b>3,293.6</b>	<b>3,737,461.2</b>	<b>223,221.8</b>	<b>2,124,117.6</b>	<b>712,816.6</b>
	a. Indigeneous Production	-	-	3,293.6	-	-	-	-
	b. Import	12,962.6	2,740.8	-	10,934,956.7	223,221.8	4,616,852.2	2,509,711.1
	c. Export	-	-	-	(7,197,495.5)	-	(2,492,734.6)	(1,796,894.4)
<b>2</b>	<b>Energy Transformation</b>	-	-	-	-	-	-	-
<b>3</b>	<b>Own Use and Losses</b>	-	-	-	<b>173,840.7</b>	-	<b>106,205.9</b>	<b>35,640.8</b>
	a. Refinery	-	-	-	173,840.7	-	106,205.9	35,640.8
	b. Transmission and Distribution	-	-	-	-	-	-	-
<b>4</b>	<b>Final Energy Supply</b>	<b>12,962.6</b>	<b>2,740.8</b>	<b>3,293.6</b>	<b>3,563,620.5</b>	<b>223,221.8</b>	<b>2,017,911.7</b>	<b>677,175.8</b>
<b>5</b>	<b>Statistical Difference</b>	-	-	-	(0.0)	-	<b>0.0</b>	-
<b>6</b>	<b>Final Energy Consumption</b>	<b>12,962.6</b>	<b>2,740.8</b>	<b>3,293.6</b>	<b>3,563,620.5</b>	<b>223,221.8</b>	<b>2,017,911.7</b>	<b>677,175.8</b>
	a. Household	-	2,740.8	3,293.6	673,458.6	-	-	673,458.6
	b. Commercial	-	-	-	41,397.2	-	-	2,143.9
	c. Transportation	-	-	-	2,725,121.6	223,221.8	2,017,911.7	-
	d. Industry	12,962.6	-	-	71,160.8	-	-	1,475.9
	e. Other Sector	-	-	-	52,482.4	-	-	97.4

**Energy Balance (Continued)**

	Unit	ADO	IDO	FO	LPG	Electricity	Total
		BOE	BOE	BOE	BOE	BOE	BOE
<b>1</b>	<b>Primary Energy Supply</b>	<b>639,880.7</b>	<b>1,671.8</b>	<b>35,752.7</b>	<b>201,785.8</b>	<b>986,749.1</b>	<b>4,944,994.1</b>
	a. Indigeneous Production	-	-	-	-	-	3,293.6
	b. Import	3,547,747.2	1,671.8	35,752.7	201,785.8	986,749.1	12,139,195.0
	c. Export	(2,907,866.5)	-	-	-	-	-
<b>2</b>	<b>Energy Transformation</b>	-	-	-	-	-	-
<b>3</b>	<b>Own Use and Losses</b>	<b>31,994.0</b>	-	-	-	<b>82,294.9</b>	<b>256,138.6</b>
	a. Refinery	<b>31,994.0</b>	-	-	-	-	-
	b. Transmission and Distribution	-	-	-	-	82,294.9	256,138.6
<b>4</b>	<b>Final Energy Supply</b>	<b>607,886.7</b>	<b>1,671.8</b>	<b>35,752.7</b>	<b>201,785.8</b>	<b>904,454.2</b>	<b>4,688,855.5</b>
<b>5</b>	<b>Statistical Difference</b>	<b>(0.0)</b>	-	-	-	-	<b>(0.0)</b>
<b>6</b>	<b>Final Energy Consumption</b>	<b>607,886.7</b>	<b>1,671.8</b>	<b>35,752.7</b>	<b>201,785.8</b>	<b>904,454.2</b>	<b>4,688,857.5</b>
	a. Household	-	-	-	189,919.0	515,042.1	1,384,454.0
	b. Commercial	39,253.3	-	-	10,190.5	280,986.3	332,573.9
	c. Transportation	483,988.1	-	-	-	-	2,725,121.6
	d. Industry	32,260.3	1,671.8	35,752.7	1,676.4	108,425.8	194,225.6
	e. Other Sector	52,385.0	-	-	-	-	52,482.4

## ANNEX III: Detailed Energy Profile

### I. Energy Use Activity

#### 1. Demography

##### a. Population and Density in 2006

No.	Regency/City	Population (persons)	Number of Households	Area (km <sup>2</sup> )	Density (person/km <sup>2</sup> )
1	Kulonprogo	373,840	113,729	586.72	637.17
2	Bantul	884,086	212,434	506.85	1,744.28
3	Gunungkidul	683,444	193,344	1,485.36	460.12
4	Sleman	1,008,264	275,379	574.82	1,754.05
5	Yogyakarta	442,209	127,750	32.50	13,606.43
Total Province		3,391,843	922,636	3,186.25	1,064.53

Source: BPS

##### b. Population Growth

No.	Regency/City	Population Growth (%/year)		
		1990 - 1995	1995 - 2000	2000 - 2006
1	Kulonprogo	(0.04)	0.71	(0.43)
2	Bantul	1.19	0.91	2.88
3	Gunungkidul	0.31	0.43	(0.02)
4	Sleman	1.51	1.48	2.49
5	Yogyakarta	(0.38)	1.43	2.38
Total Province		0.72	1.00	1.70

Source: BPS

##### c. Household Size

No.	Regency/City	Number of Person in Household (Person/Household)			
		1995	2000	2005	2006
1	Kulonprogo	5.07	4.93	3.62	3.29
2	Bantul	4.68	4.16	3.42	4.16
3	Gunungkidul	5.10	4.90	3.46	3.53
4	Sleman	4.45	4.12	3.00	3.66
5	Yogyakarta	5.05	5.03	2.78	3.46
Total Province		4.81	4.51	3.22	3.68

Source: BPS

##### d. Population by Income Category

###### d. 1. Regency of Kulonprogo

###### Rural

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	67,070	73,157	30,328	47,050
2	Under 1.5X Poverty Line	131,868	99,068	92,980	83,242
3	Middle Income	91,322	121,712	129,693	110,687
4	20% Highest Income	72,755	76,206	64,249	60,622
Total		363,015	370,143	317,250	301,600

Source: Susenas

**Urban**

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	15,556	12,447	18,357	19,433
2	Under 1.5X Poverty Line	26,527	24,053	23,943	19,071
3	Middle Income	17,175	24,557	12,770	18,855
4	20% Highest Income	15,676	15,643	14,366	14,881
Total		74,934	76,700	69,436	72,240

Source: Susenas

**d. 2. Regency of Bantul****Rural**

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	10,800	21,843	12,461	25,995
2	Under 1.5X Poverty Line	73,103	53,344	54,572	49,889
3	Middle Income	98,301	110,888	130,199	134,175
4	20% Highest Income	45,135	47,043	49,415	52,515
Total		227,339	233,118	246,647	262,574

Source: Susenas

**Urban**

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	39,119	44,204	76,057	64,016
2	Under 1.5X Poverty Line	191,088	128,835	150,825	135,489
3	Middle Income	201,119	269,760	235,475	298,947
4	20% Highest Income	108,333	110,700	114,730	123,059
Total		539,659	553,499	577,087	621,511

Source: Susenas

**d. 3. Regency of Gunungkidul****Rural**

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	115,093	134,247	97,498	84,804
2	Under 1.5X Poverty Line	241,239	260,783	202,797	214,924
3	Middle Income	205,797	175,093	218,786	220,750
4	20% Highest Income	141,009	142,816	130,258	126,883
Total		703,138	712,939	649,339	647,360

Source: Susenas

**Urban**

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	1,176	7,508	7,800	7,361
2	Under 1.5X Poverty Line	3,527	10,510	8,190	6,892
3	Middle Income	24,395	12,312	20,669	14,361
4	20% Highest Income	7,054	6,606	9,750	7,469
Total		36,152	36,936	46,409	36,084

Source: Susenas

#### d. 4. Regency of Sleman

##### Rural

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	6,932	17,841	6,661	5,888
2	Under 1.5X Poverty Line	28,987	27,321	44,404	27,214
3	Middle Income	102,714	98,690	108,789	94,213
4	20% Highest Income	34,501	35,127	39,963	31,988
Total		173,134	178,979	199,817	159,303

Source: Susenas

##### Urban

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	37,110	45,394	51,952	76,421
2	Under 1.5X Poverty Line	139,510	110,539	81,703	105,291
3	Middle Income	353,930	397,107	470,679	497,584
4	20% Highest Income	129,889	137,567	150,973	169,824
Total		660,439	690,607	755,307	849,120

Source: Susenas

#### d. 5. City of Yogyakarta

##### Urban

No.	Income Category	1999	2002	2005	2006
1	Under Poverty Line	31,443	17,420	20,777	21,226
2	Under 1.5X Poverty Line	57,724	59,003	52,394	45,990
3	Middle Income	300,820	329,856	262,874	286,551
4	20% Highest Income	97,145	101,148	84,463	88,442
Total		487,132	507,427	420,508	442,209

Source: Susenas

## 2. Economy

### a. GRDP by Regency/City in 2006

No.	Regency/City	GRDP (Million Rp)	GRDP/Capita (mill Rp/cap/yr)
1	Kulonprogo	1,524,848	4.08
2	Bantul	3,299,646	3.73
3	Gunungkidul	2,830,583	4.14
4	Sleman	5,309,059	5.27
5	Yogyakarta	4,574,051	10.34
Total Province		17,538,187	5.17

Source: BPS

### b. GRDP by Sector

No.	Sector	GRDP (Constant Price of 2000) (million rupiah)					
		2001	2002	2003	2004	2005	2006
1	Agriculture	2,884,970	2,935,480	2,948,400	3,052,935	3,185,771	3,306,928
2	Mining	118,129	118,319	119,433	120,441	122,332	126,137
3	Manufacture Industry	2,199,898	2,261,886	2,325,236	2,400,776	2,463,230	2,481,167
4	Utility	110,705	128,931	135,379	144,845	153,115	152,467
5	Construction	972,157	1,053,019	1,178,024	1,284,471	1,395,079	1,580,312
6	Commercial Service	3,193,520	3,345,511	3,533,719	3,732,673	3,917,638	4,065,741
7	Transportation	1,241,096	1,328,681	1,437,072	1,582,194	1,673,352	1,761,672
8	Financial Service	1,227,184	1,314,860	1,408,894	1,500,542	1,623,210	1,591,885
9	Other Services	2,107,411	2,200,597	2,274,252	2,327,547	2,377,149	2,469,045
Total		14,055,071	14,687,284	15,360,409	16,146,424	16,910,877	17,535,354

Source: BPS

### c. GRDP Growth and Inflation

No.		2001	2002	2003	2004	2005	2006
1	GRDP Growth (%)	4.26	4.5	4.58	5.12	4.74	3.69
2	Inflation (%)	12.56	12.01	5.73	6.95	14.98	10.4

Source: BPS

### d. Value Added of Manufacture Industry Sector

No.	Subsector	Value added (Constant Price 2000) (million rupiah)					
		2001	2002	2003	2004	2005	2006
1	Food	696,555	695,205	742,507	800,848	845,594	860,186
2	Textile	465,973	489,219	502,380	508,391	510,219	511,559
3	Wood	311,451	316,500	316,920	323,944	323,919	336,147
4	Paper	115,899	112,777	122,742	124,966	129,735	129,201
5	Chemistry	103,019	109,942	110,043	112,353	114,892	117,393
6	Non Metal	117,875	139,423	121,658	126,292	129,566	126,765
7	Machinery	224,906	239,015	235,737	225,655	226,719	220,145
8	Others	164,222	159,805	173,250	178,328	182,586	179,771
Total		2,199,898	2,261,886	2,325,236	2,400,776	2,463,230	2,481,167

Source: BPS

### e. Value Added of Commercial Sector

No.	Subsector	Value added (Constant Price 2000) (million rupiah)					
		2001	2002	2003	2004	2005	2006
1	Hotel and Lodging	289,057	304,147	322,629	340,362	319,188	259,896
2	Wholesale and Retail	1,218,785	1,247,964	1,307,280	1,374,914	1,462,659	1,534,974
3	Restaurant	1,256,282	1,362,114	1,467,971	1,564,148	1,662,981	1,774,752
4	Financial Services	1,227,184	1,314,860	1,408,894	1,500,542	1,623,210	1,591,885
5	Amusement Services	55,106	56,772	57,919	65,442	67,681	70,717
6	Social Services	374,290	374,515	377,920	387,807	405,129	425,402
Total		4,420,704	4,660,371	4,942,613	5,233,216	5,540,848	5,657,626

Source: BPS

### f. Value Added of Other Sector

No.	Subsector	Value added (Constant Price 2000) (million rupiah)					
		2001	2002	2003	2004	2005	2006
1	Construction	972,157	1,053,019	1,178,024	1,284,471	1,395,079	1,580,312
2	Agriculture	2,884,970	2,935,480	2,948,400	3,052,935	3,185,771	3,306,928
3	Mining	118,129	118,319	119,433	120,441	122,332	126,137
Total		3,975,256	4,106,818	4,245,857	4,457,847	4,703,182	5,013,377

Source: BPS

## 3. Transportation

No.	Type of Mode	2001	2002	2003	2004	2005	2006
1	Passenger Car (unit)	67,309	70,203	74,728	78,817	82,705	84,786
2	Motorcycle (unit)	539,448	597,143	666,941	755,101	843,077	916,204
3	Bus (unit)	6,591	7,400	8,039	9,968	14,685	17,673
4	Truck (unit)	27,745	30,816	32,520	34,031	35,670	36,812
5	Train (1000 Km)	498	561	765	997	798	856
6	Aeroplane (1000 Km)	3,472	4,141	6,652	8,454	6,650	6,106

Source: BPS, Airport, and PT. KAI

## II. Energy Consumption

### 1. Energy Consumption from Supply Side

#### a. Oil Fuel Selling of Pertamina

No.	Type	Oil Fuel Sold (KL)					
		2001	2002	2003	2004	2005	2006
1	Avtur	16,800	20,037	31,431	52,468	41,270	37,894
2	Avgas	-	-	-	-	-	-
3	Premium	273,173	292,188	303,440	324,966	344,035	346,274
4	Kerosene	141,780	148,195	141,713	141,713	131,605	114,245
	a. Household	141,737	148,113	141,653	141,640	131,194	113,996
	b. Industry	43	82	60	73	411	249
5	Automotive Diesel Oil	152,046	144,309	125,739	103,473	108,081	93,707
	a. Transportation	124,958	116,023	99,101	79,835	88,850	88,734
	b. Industry	27,088	28,286	26,638	23,638	19,231	4,973
	c. Electricity	-	-	-	-	-	-
6	Industrial Diesel Oil	472	624	552	447	392	253
	a. Transportation	-	-	-	-	-	-
	b. Industry	472	624	552	447	392	253
	c. Electricity	-	-	-	-	-	-
7	Fuel Oil	4,160	8,420	5,446	7,536	6,280	5,136
	a. Transportation	288	-	-	-	-	-
	b. Industry	3,872	8,420	5,446	7,536	6,280	5,136
	c. Electricity	-	-	-	-	-	-
Total		886,889	915,321	881,771	883,772	878,021	810,850

Source: Pertamina 2006

#### b. Electricity Selling of PLN

No.	Category	Electricity Sold (GWh)					
		2001	2002	2003	2004	2005	2006
1	Household	631.44	731.52	760.23	789.48	851.44	840.20
2	Social	57.55	77.52	85.12	89.86	94.69	96.35
3	Public	43.03	49.98	54.19	76.95	78.59	79.96
4	Industry	158.82	182.18	183.99	181.63	178.85	176.88
5	Business	172.77	206.51	224.24	234.09	265.76	282.07
Total		1,063.62	1,247.71	1,307.77	1,372.01	1,469.34	1,475.46

Source: PLN 2006

#### c. Number of PLN electricity customer

No.	Category	Number of Customer					
		2001	2002	2003	2004	2005	2006
1	Household	556,683	574,546	594,655	623,957	644,167	669,802
2	Social	13,917	14,338	14,776	15,393	16,246	17,858
3	Public	2,223	2,441	2,753	3,186	4,098	4,505
4	Industry	455	450	454	451	448	452
5	Business	20,555	21,863	22,772	24,022	25,626	26,464
Total		593,833	613,638	635,410	667,009	690,585	719,081

Source: PLN 2006



**d.LPG Selling of Pertamina**

No.	Category	LPG Sold (Ton)			
		2003	2004	2005	2006
1	Household	21,914.9	24,884.3	24,884.3	22,278.9
2	Industry	1,665.1	1,890.7	1,890.7	1,392.1
Total		23,580.0	26,775.0	26,775.0	23,671.0

Source: Pertamina 2006

**f. Coal Selling**

No.	Kelompok Pelanggan	Penjualan Briket Batubara (Ton)			
		2003	2004	2005	2006
1	Industry	1,005.83	1,793.99	895.44	3,031.05
Total		1,005.83	1,793.99	895.44	3,031.05

Source: Pertamina 2008

**2. Intensity of Energy Use****a. Household Sector****a.1 Regency of Kulonprogo****Rural**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.0786	0.0520	-	0.0017	0.0014
2	Under 1.5X Poverty Line	0.1327	0.0782	-	0.0019	0.0015
3	Middle Income	0.1842	0.0941	0.01431	0.0002	0.0017
4	20% Highest Income	0.2905	0.1486	0.03936	-	0.0013

**Urban**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomassa
1	Under Poverty Line	0.0696	0.0861	0.00423	0.0008	0.0011
2	Under 1.5X Poverty Line	0.0913	0.0765	0.00554	0.0016	0.0014
3	Middle Income	0.3229	0.1219	0.07270	0.0002	0.0007
4	20% Highest Income	0.1177	0.1848	0.21623	-	0.0012

**a.2 Regency of Bantul****Rural**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.0932	0.0945	-	0.0031	0.0011
2	Under 1.5X Poverty Line	0.1377	0.1140	-	0.0014	0.0014
3	Middle Income	0.1360	0.1194	0.03781	0.0006	0.0014
4	20% Highest Income	0.2396	0.1451	0.09787	-	0.0009

**Urban**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.1328	0.0817	0.00806	0.0008	0.0012
2	Under 1.5X Poverty Line	0.2165	0.1166	0.01791	0.0024	0.0008
3	Middle Income	0.2715	0.1292	0.04189	0.0002	0.0008
4	20% Highest Income	0.2387	0.2525	0.13546	0.0003	0.0003

**a.3 Regency of Gunungkidul  
Rural**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.0583	0.1089	-	0.0007	0.0011
2	Under 1.5X Poverty Line	0.1036	0.0981	-	0.0017	0.0015
3	Middle Income	0.2006	0.1292	0.03069	0.0004	0.0022
4	20% Highest Income	0.1916	0.1675	0.07872	-	0.0025

**Urban**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomassa
1	Under Poverty Line	0.0687	0.0677	0.00417	0.0005	0.0011
2	Under 1.5X Poverty Line	0.1728	0.1087	0.01049	0.0025	0.0013
3	Middle Income	0.2494	0.1849	0.06145	0.0006	0.0009
4	20% Highest Income	0.2120	0.2212	0.15604	-	-

**a.4 Regency of Sleman  
Rural**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomassa
1	Under Poverty Line	0.0642	0.0554	-	0.0023	0.0011
2	Under 1.5X Poverty Line	0.1046	0.0827	-	0.0025	0.0013
3	Middle Income	0.1603	0.1501	0.02586	0.0003	0.0014
4	20% Highest Income	0.2300	0.1984	0.07218	-	0.0007

**Urban**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.1413	0.0480	0.00858	0.0011	0.0009
2	Under 1.5X Poverty Line	0.1848	0.0798	0.01122	0.0049	0.0011
3	Middle Income	0.2544	0.1681	0.07671	0.0003	0.0006
4	20% Highest Income	0.1527	0.3334	0.15509	-	0.0001

**a.5 City of Yogyakarta  
Urban**

No.	Income category	Energy Use Intensity in 2006 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.22845	0.13633	0.01387	0.00168	0.00017
2	Under 1.5X Poverty Line	0.30709	0.15465	0.02702	0.00379	0.00007
3	Middle Income	0.26652	0.18734	0.10023	0.00038	0.00003
4	20% Highest Income	0.16747	0.35360	0.20990	-	0.00001

### b. Commercial Sector

No.	Subsector	Energy Use Intensity in 2006 (BOE/million rupiah/year)			
		ADO	Kerosene	Electricity	LPG
1	Hotel and Lodging	0.12198	0.00021	0.15032	0.00514
2	Wholesale and Retail	-	-	0.03384	0.00077
3	Restaurant	-	0.00118	0.07739	0.00431
4	Financial Services	0.00280	-	0.00824	0.00000
5	Amusement Services	0.01714	-	0.37963	0.00023
6	Social Services	0.00442	-	0.02979	0.00002

### c. Industrial Sector

No.	Subsector	Energy Use Intensity in 2006 (BOE/million rupiah/year)						
		ADO	IDO	Kerosene	Fuel Oil	Electricity	LPG	Coal
1	Food	0.01293	0.00003	0.00059	0.02040	0.01610	0.00091	-
2	Textile	0.02123	0.00306	0.00097	0.02502	0.11994	0.00077	0.01911
3	Wood	0.00079	0.00000	0.00004	0.00148	0.01041	0.00020	-
4	Paper	0.00057	-	0.00003	0.00017	0.01272	0.00002	-
5	Chemical	0.02001	0.00013	0.00092	0.00368	0.04739	0.00006	-
6	Non Metal	0.04223	0.00006	0.00193	0.02965	0.04259	0.00297	0.00315
7	Machinery	0.00210	-	0.00010	0.00038	0.05820	0.00013	-
8	Other	0.00987	0.00033	0.00045	0.00340	0.02396	0.00012	0.01550

### d. Transportation Sector

No.	Subsector	Energy Use Intensity in 2006 (BOE/unit/year or BOE/1000 Km/year)		
		Premium	ADO	Avtur
1	Passenger Car (unit)	10.3093	0.5483	-
2	Motorcycle (unit)	0.9595	-	-
3	Bus (unit)	-	7.2008	-
4	Truck (unit)	7.1922	7.9946	-
5	Railway (1000 Km)	-	18.6288	-
6	Aeroplane (1000 Km)	-	-	36.5578

### e. Other Sector

No.	Subsector	Energy Use Intensity in 2006 (BOE/million rupiah/year)	
		Kerosene	ADO
1	Construction	-	0.019146
2	Agriculture	0.000029	0.006501
3	Mining	-	0.004989

### 3. Energy Consumption from Demand Side

#### a. Energy Consumption by Sector

No.	Type	Energy Consumption in 2006 (BOE)					
		Household	Commercial	Transportation	Industry	Other	Total
1	Avtur	-	-	223,221.76	-	-	223,221.76
2	Premium*	-	-	2,017,911.74	-	-	2,017,911.74
3	Kerosene	673,458.60	2,143.86	-	1,475.92	97.43	677,175.81
4	ADO	-	39,253.30	483,988.07	32,260.35	52,384.95	607,886.68
5	IDO	-	-	-	1,671.77	-	1,671.77
6	Fuel Oil	-	-	-	35,752.72	-	35,752.72
7	LPG	189,918.95	10,190.46	-	1,676.39	-	201,785.81
8	Coal	-	-	-	12,962.58	-	12,962.58
9	Coal Briquette	2,740.82	-	-	-	-	2,740.82
10	Electricity	515,042.06	280,986.31	-	108,425.83	-	904,454.19
11	Biomass**	3,293.58	-	-	-	-	3,293.58
Total		1,384,454.01	332,573.94	2,725,121.57	194,225.57	52,482.39	4,688,857.47

\* included Pertamina and Pertamina Plus

\*\*Firewood

#### b. Household Sector

##### b.1 Regency of Kulonprogo Rural

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	3,696.23	2,447.19	-	81.03	65.07
2	Under 1.5X Poverty Line	11,048.02	6,509.02	-	160.20	126.48
3	Middle Income	20,389.79	10,413.17	1,583.48	16.80	185.18
4	20% Highest Income	17,610.96	9,006.35	2,386.22	-	80.04
Total		52,745.01	28,375.73	3,969.70	258.04	456.78

##### Urban

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	1,353.30	1,674.00	82.16	15.14	21.46
2	Under 1.5X Poverty Line	1,740.94	1,458.92	105.69	29.70	26.92
3	Middle Income	6,087.96	2,298.91	1,370.65	4.46	13.95
4	20% Highest Income	1,751.45	2,750.55	3,217.85	-	18.00
Total		10,933.64	8,182.38	4,776.34	49.29	80.34

##### b.2 Regency of Bantul Rural

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	2,421.42	2,456.71	-	81.10	29.48
2	Under 1.5X Poverty Line	6,869.46	5,685.22	-	69.98	69.86
3	Middle Income	18,245.55	16,020.59	5,072.66	82.62	182.63
4	20% Highest Income	12,581.43	7,621.20	5,139.58	-	47.91
Total		40,117.86	31,783.73	10,212.24	233.69	329.88

**Urban**

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	8,503.88	5,232.55	516.26	49.56	78.93
2	Under 1.5X Poverty Line	29,340.08	15,797.90	2,426.08	321.49	109.62
3	Middle Income	81,149.33	38,616.54	12,521.40	53.01	224.85
4	20% Highest Income	29,370.36	31,067.58	16,669.83	40.92	39.13
Total		148,363.65	90,714.57	32,133.56	464.97	452.54

**b.3 Regency of Gunungkidul****Rural**

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	4,941.82	9,236.98	-	60.84	94.10
2	Under 1.5X Poverty Line	22,272.20	21,086.01	-	369.86	321.77
3	Middle Income	44,282.74	28,516.19	6,774.68	96.63	489.12
4	20% Highest Income	24,310.69	21,249.60	9,988.58	-	313.97
Total		95,807.46	80,088.78	16,763.26	527.32	1,218.96

**Urban**

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	505.94	498.55	30.71	3.75	8.25
2	Under 1.5X Poverty Line	1,191.19	749.17	72.32	17.16	9.27
3	Middle Income	3,581.73	2,655.88	882.52	8.33	12.57
4	20% Highest Income	1,583.55	1,651.96	1,165.52	-	-
Total		6,862.41	5,555.57	2,151.07	29.24	30.09

**b.4 Regency of Sleman****Rural**

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	378.04	326.04	-	13.52	6.43
2	Under 1.5X Poverty Line	2,845.51	2,249.48	-	67.10	35.40
3	Middle Income	15,101.80	14,142.05	2,436.66	29.21	134.76
4	20% Highest Income	7,357.89	6,347.98	2,308.81	-	21.57
Total		25,683.24	23,065.55	4,745.47	109.83	198.16

**Urban**

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	10,797.75	3,665.60	655.51	85.29	72.41
2	Under 1.5X Poverty Line	19,459.57	8,402.38	1,181.36	513.40	113.29
3	Middle Income	126,602.60	83,620.34	38,169.36	151.03	308.13
4	20% Highest Income	25,930.79	56,624.61	26,338.40	-	16.84
Total		182,790.71	152,312.94	66,344.63	749.72	510.68

**b.5 City of Yogyakarta  
Urban**

No.	Income category	Energy Consumption in 2006 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	4,848.99	2,893.79	294.37	35.74	3.65
2	Under 1.5X Poverty Line	14,123.16	7,112.44	1,242.48	174.13	3.24
3	Middle Income	76,371.32	53,683.61	28,721.55	108.83	8.03
4	20% Highest Income	14,811.17	31,272.98	18,564.28	-	1.23
Total		110,154.64	94,962.82	48,822.68	318.71	16.15

**c. Commercial Sector**

No.	Subsector	Energy Consumption in 2006 (BOE)				
		ADO	Kerosene	Electricity	LPG	Total
1	Hotel and Lodging	31,700.84	53.69	39,066.38	1,335.96	72,156.86
2	Wholesale and Retail	-	-	51,945.45	1,179.21	53,124.65
3	Restaurant	-	2,090.17	137,342.57	7,643.23	147,075.97
4	Financial Services	4,458.61	-	13,114.10	7.94	17,580.65
5	Amusement Services	1,212.32	-	26,846.62	16.07	28,075.01
6	Social Services	1,881.53	-	12,671.20	8.05	14,560.79
Total		39,253.30	2,143.86	280,986.31	10,190.46	332,573.94

**d. Industrial Sector**

No.	Subsector	Energy Consumption in 2006 (BOE)						
		ADO	IDO	Kerosene	Fuel Oil	Electricity	LPG	Coal
1	Food	11,120.84	24.84	508.78	17,550.53	13,846.75	779.14	-
2	Textile	10,860.97	1,564.61	496.89	12,798.85	61,354.86	392.26	9,776.67
3	Wood	265.56	1.39	12.15	496.65	3,498.42	67.08	-
4	Paper	73.56	-	3.37	22.08	1,643.21	2.23	-
5	Chemical	2,349.24	14.97	107.48	432.44	5,563.68	7.46	-
6	Non Metal	5,352.72	7.04	244.89	3,758.85	5,399.09	376.65	399.86
7	Machinery	462.29	-	21.15	82.57	12,812.46	29.66	-
8	Other	1,775.17	58.92	81.21	610.76	4,307.36	21.90	2,786.06
Total		32,260.35	1,671.77	1,475.92	35,752.72	108,425.83	1,676.39	12,962.58

**e. Transportation Sector**

No.	Subsector	Energy Consumption in 2006 (BOE)			
		Premium	ADO	Avtur	Total
1	Passenger Car (unit)	874,085.81	46,484.95	-	920,570.76
2	Motorcycle (unit)	879,065.47	-	-	879,065.47
3	Bus (unit)	-	127,260.44	-	127,260.44
4	Truck (unit)	264,760.45	294,296.43	-	559,056.89
5	Railway (1000 Km)	-	15,946.25	-	15,946.25
6	Aeroplane (1000 Km)	-	-	223,221.76	223,221.76
Total		2,017,911.74	483,988.07	223,221.76	2,725,121.57

**f. Other Sector**

No.	Subsector	Energy Consumption in 2006 (BOE)		
		Kerosene	ADO	Total
1	Construction	-	30,256.77	30,256.77
2	Agriculture	97.43	21,498.89	21,596.32
3	Mining	-	629.29	629.29
Total		97.43	52,384.95	52,482.39

### III. Energy Supply

#### 1. Crude Oil

##### a. Oil Fuel Storage

No.	Storage Name	Location	Capacity (KL)
1	Rewulu	Regency of Kulonprogo	55,500
Total			55,500

Source: Pertamina 2006

##### b Gas Pump

No.	No. SPBU	Address	Owner	Average Selling (KL/day)	
				Premium	ADO
1	SPBU 44 551 01	City of Yogyakarta	Ike Saraswati	17.81	2.84
2	SPBU 44 551 04	City of Yogyakarta	Aris Yudanto, SH	22.19	5.42
3	SPBU 44 551 05	City of Yogyakarta	Endro Haryanto, Drs	9.55	5.94
4	SPBU 44 551 08	City of Yogyakarta	Harkat Manunggal Jaya	24.52	8.26
5	SPBU 44 552 02	City of Yogyakarta	KPH Angling Kusumo	35.61	5.61
6	SPBU 44 552 03	City of Yogyakarta	Toni Mulyanto	6.19	3.35
7	SPBU 44 552 06	City of Yogyakarta	Benoe Harjo	11.10	3.87
8	SPBU 44 552 11	City of Yogyakarta	Sutiati Mursidi	13.16	1.03
9	SPBU 44 552 03	City of Yogyakarta	Betty Sri Mulyandari	22.19	6.14
10	SPBU 44 552 01	Regency of Sleman	Achmad Purnomo	23.48	2.84
11	SPBU 44 552 04	Regency of Sleman	Sindoetomo	29.42	6.45
12	SPBU 44 552 07	Regency of Sleman	Sutini Seger Sudrajat	27.35	22.19
13	SPBU 44 552 08	Regency of Sleman	Rejobumi Mitrasari	22.45	3.87
14	SPBU 44 552 09	Regency of Sleman	Diah Kusuma Handayani	20.90	1.81
15	SPBU 44 552 10	Regency of Sleman	Jati Nindiarto	24.77	2.32
16	SPBU 44 552 12	Regency of Sleman	Bray Sri Handayani, Dra	32.26	6.45
17	SPBU 44 555 01	Regency of Sleman	P. Koesnanto	18.06	13.68
18	SPBU 44 555 02	Regency of Sleman	R. Sri Bondan	9.03	1.03
19	SPBU 44 555 04	Regency of Sleman	Wien Gatot Sampurna	9.29	4.13
20	SPBU 44 555 05	Regency of Sleman	A. Zein Kadir	23.48	3.61
21	SPBU 44 555 06	Regency of Sleman	Siswanto, MM, Drs	16.00	4.39
22	SPBU 44 555 07	Regency of Sleman	Abdul Kadir, Drs	15.74	3.10
23	SPBU 44 555 08	Regency of Sleman	Diah Kusuma Handayani	14.19	2.58
24	SPBU 44 555 09	Regency of Sleman	Th. Soegiarti S	18.84	2.58
25	SPBU 44 555 10	Regency of Sleman	Suryo Prasetyo*, Drs	22.97	5.42
26	SPBU 44 555 11	Regency of Sleman	Dwi Tjahyono HS SH MM	20.90	5.94
27	SPBU 4x 555 01	Regency of Sleman	Yuni Atuti	5.16	5.32
28	SPBU 4x 555 02	Regency of Sleman	Tris Ari Sutiah	4.13	4.23
29	SPBU 44 555 12	Regency of Sleman	Retno Kartiko	3.87	1.03
30	SPBU 44 555 13	Regency of Sleman	Dwi Tjahyono Sutanto	18.58	6.71
31	SPBU 44 551 02	Regency of Bantul	Kopata	17.81	13.42
32	SPBU 44 551 03	Regency of Bantul	Anggreni	13.68	2.06
33	SPBU 44 551 06	Regency of Bantul	Asukadi Condro K	13.42	2.58
34	SPBU 44 551 10	Regency of Bantul	A. Zein Kadir	11.87	3.61
35	SPBU 44 557 01	Regency of Bantul	Bambang Muljoharjdo	3.10	1.29
36	SPBU 44 557 02	Regency of Bantul	Chuban Bustami, MM, Ir	11.10	3.87
37	SPBU 44 557 03	Regency of Bantul	Sudaryati	31.48	9.55
38	SPBU 44 557 04	Regency of Bantul	Imam Iskak	10.32	7.74
39	SPBU 44 557 05	Regency of Bantul	Hadi Siswo Harjono	19.35	8.26
40	SPBU 44 557 06	Regency of Bantul	Premisol Arimas	21.42	3.10
41	SPBU 44 557 07	Regency of Bantul	Akum Cahyono	11.35	2.58
42	SPBU 44 557 08	Regency of Bantul	Susilo Budi utami	7.74	4.65



**Gas Pump (Continued)**

No.	No. SPBU	Address	Owner	Average Selling (KL/day)	
				Premium	ADO
43	SPBU 44 558 03	Regency of Bantul	Arif Sampurno	19.61	5.94
44	SPBU 44 55 01	Regency of Kulonprogo	Pc. Her Benu Murwanto	14.71	9.81
45	SPBU 44 55 02	Regency of Kulonprogo	KPH Probo Kusumo	16.26	6.19
46	SPBU 44 55 03	Regency of Kulonprogo	Supriyana	13.42	9.29
47	SPBU 44 55 04	Regency of Kulonprogo	Kadari WK	14.97	14.45
48	SPBU 44 58 01	Regency of Gunungkidul	Sugiarto, SH	36.90	18.06
49	SPBU 44 58 02	Regency of Gunungkidul	Ujoko Suseno, S.U, Drs	7.74	4.13
50	SPBU 44 58 04	Regency of Gunungkidul	Bakti Pertiwi Mataram	11.10	5.16
51	SPBU 44 58 05	Regency of Gunungkidul	Sigit Anggoropriyo	7.23	3.87
52	SPBU 44 58 06	Regency of Gunungkidul	Suradi	9.29	5.16
Total				867.10	296.92

Source: Pertamina and Dinas Disperindagkop

**c. Kerosene Retailer**

No.	No. Pangkalan	Address	Owner	Average Selling (KL/day)
1	140301	City of Yogyakarta	Sukatirah	4.19
2	140244	City of Yogyakarta	Anton Handoko	16.77
3	140250	City of Yogyakarta	RM Russaban	12.58
4	140209	City of Yogyakarta	G. Supartini	12.58
5	140282	City of Yogyakarta	Saryono	6.13
6	140250	City of Yogyakarta	Veronika Ayuningtyas. SE	8.39
7	140245	City of Yogyakarta	Helwi Ristiani	4.19
8	140256	City of Yogyakarta	Soedibjo	4.19
9	140200	City of Yogyakarta	Firdaus Muhammad	4.35
10	140252	City of Yogyakarta	M. Andiyanto FM	4.19
11	140261	City of Yogyakarta	Harry Mulyandrio	6.13
12	140245	City of Yogyakarta	Budiharjo Sh	4.19
13	140297	Regency of Bantul	Sumantoro	12.58
14	140296	Regency of Bantul	Sakijo, S.A	12.58
15	150553	Regency of Bantul	Toni Mulyanto	20.97
16	140283	Regency of Bantul	Ida Siti S	16.77
17	140296	Regency of Bantul	V. Isti Tri. D	12.58
18	140249	Regency of Bantul	Sri Winarni	4.35
19	140291	Regency of Kulonprogo	Fauzan Noor	12.58
20	140290	Regency of Kulonprogo	A. Zein Kadir	12.58
21	140247	Regency of Kulonprogo	Setyawan	12.58
22	140286	Regency of Gunungkidul	Betty Sri. M	6.13
23	140294	Regency of Gunungkidul	Ign Sri, H., MM	14.52
24	140300	Regency of Gunungkidul	Widyarto, W. SH	12.58
25	140234	Regency of Gunungkidul	Emma Ratnaningtyas, SE	12.58
26	140248	Regency of Gunungkidul	Wahyu Wijanarko	4.19
27	140265	Regency of Sleman	A. Haryoto	13.55
28	140254	Regency of Sleman	Expra Baru	9.19
29	140288	Regency of Sleman	Suhadi Jaya Abadi	8.39
30	140303	Regency of Sleman	Sutiartiti M	17.58
31	140295	Regency of Sleman	Kopana	6.13
32	140258	Regency of Sleman	Ssi Rosalina	8.87
33	140253	Regency of Sleman	Muh. Rodhi Apriyanto	13.23
34	140299	Regency of Sleman	Wahyu Hardianto	16.77



**Kerosene Retailer (Continued)**

No.	No. Pangkalan	Address	Owner	Average Selling (KL/day)
35	140287	Regency of Sleman	Yos Widi H	17.90
36	140257	Regency of Sleman	Sri Wuryani Sh	5.32
37	140251	Regency of Sleman	"KSU-Lansia-	4.19
38	140255	Regency of Sleman	Shinta Rachmawati	5.00
Total				381.61

Source: Pertamina and Dinas Disperindagkop

**2. Hydro Power**

No.	Name	Location	Potential (kw)
1	Saluran Kalibawang	Kedungrong 1	90.0
2	Saluran Kalibawang	Kedungrong 2	100.0
3	Saluran Kalibawang	Semawung	200.0
4	Saluran Kalibawang	Tempel, Pendoworejo, Girimulyo	35.0
5	Saluran Kalibawang	Kemukus, Tanjungharjo, Nanggulan	5.3
6	Selokan Kamal	Kamal, Giripurwo, Girimulyo	34.0
7	Sel. Van Der Wicjk-3	Klagaran, Sedangrejo, Mingir	22.0
8	Sel. Van Der Wicjk-4	Kajoran, Banyuredjo, Sayegan,	25.0
9	Sel. Van Der Wicjk-5	Kedungprahu, Sendangrejo, Minggir	14.7
10	Sel. Mataram-1	Gasiran, Banyuredjo, Sayegan	9.5
11	Sel. Mataram-2	Bluran, Tirtonadi, Mlati	31.0
12	Sel. Mataram-3	Trini, Trihanggo, Gamping	23.0
13	Sel. Mataram 4	Gemawang	3.5
14	Sel. Mataram 8	Candisari, Kalasan	4.7
15	Kali Buntung	Kricak, Tegalrejo	12.4
16	Bendung Tegal	Tegal, Kebonagung, Imogiri	106.0
17	Sel. Van Der Wicjk-4	Desa Kajoran, Banyuredjo, Sayegan,	25.0
18	Sumber Cincin Guling 1	Gedad, Banyusoco, Playen	3.5
19	Sumber Cincin Guling 2	Gedad, Banyusoco, Playen	3.0
20	Sumber air tejun Slumpret	Mengguran, Bleberan, Playeng	41.0
Total			788.6

Source: Dinas Disperindagkop

**3. Electricity****a. Substation Transformer**

No.	Name	Location	Voltage (kV)	Capacity (MVA)
1	Kentungan	Regency of Sleman	150	120
2	Bantul	Regency of Bantul	150	120
3	Gejayan	City of Yogyakarta	150	120
4	Wirobrajan	City of Yogyakarta	150	60
5	Godean	Regency of Sleman	150	60
6	Medari	Regency of Sleman	150	30
7	Wates	Regency of Kulonprogo	150	46
8	Semanu	Regency of Gunungkidul	150	60

Source: PLN 2008

**b. Distribution Transformer**

No.	Regency/City	20 kV	
		Unit	MVA
1	Kalasan	800	32,239
2	Wates	1,320	45,667
3	Bantul	1,315	51,187
4	Sedayu	952	39,480
5	Wonosari	2,165	63,989
6	Sleman	1,101	61,417
7	Yogyakarta Utara	920	74,527
8	Yogyakarta Selatan	850	61,397
Total		9,423	429,903

Source: PLN 2008

**c. Transmission dan Distribution Line**

No.	Line Type	Length (kmc)
1	Intermediate voltage	20 kV 4,080.37
2	Low voltage	380/330 V 6,690.75

Source: PLN 2008

**d. Charged Capacity**

No.	Customer category	Electricity sold (MW)					
		2001	2002	2003	2004	2005	2006
1	Household	400.93	413.80	428.28	449.38	463.94	457.81
2	Social	28.31	29.17	30.06	31.31	33.05	33.62
3	Public	14.88	16.34	18.43	21.32	27.43	27.91
4	Industry	87.66	86.70	87.47	86.89	86.31	85.36
5	Business	107.40	114.24	118.99	125.52	133.90	142.11
Total		639.18	660.23	683.21	714.42	744.62	746.82

Source: PLN 2008

**e. Captive Power**

No.	Regency/City	Number of Captive Power (CP)	Installed Capacity (kVA)
1	UP Yogyakarta Utara	58	21,852
2	UPJ Kalasan	17	2,621
3	UPJ Sleman	27	12,872
4	UP Yogyakarta Selatan	34	13,915
5	UPJ Wonosari	23	6,067
6	UPJ Sedayu	18	7,838
7	UPJ Wates	6	1,814
8	UPJ Bantul	9	2,580
Total		192	69,559

Source: PLN 2008

**f. Electrification Ratio and Rural Electrification**

No.	Regency/City	Electrification Ratio	Rural Electrification
1	Kulonprogo	73.81%	100.00%
2	Bantul	71.83%	100.00%
3	Gunungkidul	64.00%	100.00%
4	Sleman	92.53%	100.00%
5	Yogyakarta	81.83%	100.00%
Propinsi		79.78%	100.00%

Source: PLN 2008

#### 4. Biomass

No.	Regency/City	Biomass Potential (ton)			
		Paddy	Maize	Coconut	Sugar Cane
1	Kulonprogo	95,962.35	11,959.98	24,155.00	23,467.06
2	Bantul	135,611.43	15,853.36	11,748.15	57,920.57
3	Gunungkidul	246,415.83	181,586.30	3,830.99	158.63
4	Sleman	229,286.65	14,158.85	8,476.68	4,569.22
5	Yogyakarta	886.74	61.51	2,197.00	-
Total		708,163.00	223,620.00	50,407.82	86,115.48

Source: BPS

#### 5. Bio-fuel

No.	Regency/City	Biofuel Potential (ton)	
		Cassava	Sugar Cane
1	Kulonprogo	52,709.74	23,467.06
2	Bantul	47,552.63	57,920.57
3	Gunungkidul	895,010.80	158.63
4	Sleman	20,963.34	4,569.22
5	Yogyakarta	33.49	-
Total		1,016,270.00	86,115.48

Source: BPS

#### 6. Bio-Gas

No.	Regency/City	Biogas Potential (animal)					
		Cow	Goat	Poultry	Pig	Buffalo	Sheep
1	Kulonprogo	45,318	74,612	2,279,635	772	408	23,698
2	Bantul	48,399	37,014	1,660,145	2,499	801	16,291
3	Gunungkidul	11,502	136,860	1,458,401	54	216	11,880
4	Sleman	45,983	31,412	5,619,901	4,494	3,545	55,607
5	Yogyakarta	133	284	70,747	42	20	416
Total		151,335	280,182	11,088,829	7,861	4,990	107,892

Source: BPS

#### 7. Wind Energy

No.	Location	Wind Speed (m/s)	Potential Capacity (MW)
1	Along Yogyakarta Beach	2,5 to 4	up to 10
2	Sundak, Srandakan, Baron, Samas Beach	4 to 5	10 to 100

Source: Dinas Disperindagkop

#### 8. Solar Energy

No.	Year	Location	Number of Unit
1	2003	Gunungkidul, Kulonprogo. Sleman	24
2	2004	Kulonprogo, Sleman	27
3	2005	Kulonprogo	24
4	2007	Sleman. Bantul	100
Total			175

Source: Dinas Disperindagkop

## IV. Energy Price

### a. Oil Fuel

No	Type	Oil Fuel Price (Rp/liter)					
		Jan 05	Oct 05	Jan 06	Jul 06	Jan 07	Jul 07
1	Avtur	3,608	6,776	5,390	6,083	-	-
2	Avgas	11,240	13,840	10,750	14,666	-	-
3	Premium						
	a. Transportation	1,810	4,500	4,500	4,500	4,500	4,500
	b. Industry	2,100	5,160	4,780	6,502	4,838	6,179
4	Pertamax	4,000	5,700	5,000	6,100	5,400	6,600
5	Pertamax Plus	4,200	5,900	5,200	6,300	5,550	6,700
6	Kerosene						
	a. Household	1,800	2,000	2,000	2,000	2,000	2,000
	b. Industry	2,200	6,400	5,320	6,372	5,541	5,926
7	Automotive Diesel Oil						
	a. Transportation	1,650	4,300	4,300	4,300	4,300	6,125
	b. Industry	2,100	5,350	4,950	6,321	4,983	5,859
8	Industrial Diesel Oil						
	a. Transportation	1,650	-	5,020	6,065	4,886	5,677
	b. Industry	2,050	5,130	4,810	6,065	4,886	5,677
9	Fuel Oil						
	a. Transportation	1,560	3,150	3,640	3,759,48	2,927	3,950
	b. Industry	1,600	3,150	3,480	3,759,49	2,927	3,950

Source: Pertamina

### b. LPG

No.	Customer Category	Unit	2007	2008	2009
			Price	Price	Price
1	Household	12 kg	63,000	69,000	70,200
2	Household	3 kg	-	-	12,000
3	Industrial	50 kg	343,900	362,750	367,750

Source: Pertamina

### c. PLN Electricity

No	Customer category	Tariff (Rp/kWh)			
		2003	2004	2005	2006
1	Household	493	528	530	539
2	Social	493	528	530	539
3	Public	613	622	634	641
4	Industry	565	601	600	617
5	Business	695	712	714	742

Source: PLN

## V. Other Information

### 1. List of Regional Regulation Related to Energy

No.	No. of Regulation	Content
1	No. 3 Tahun 2002	Development Program of Yogyakarta Province
2	No. 2 Tahun 2009	Long-term Development Program of Yogyakarta Province

## 2. List of Energy Stakeholder

### a. Government Offices

No.	Office Name	Address	Person In Charge	Telp. No.
1	Dinas Pekerjaan Umum	Jl. Bumi ijo, Yogyakarta	Edy Indrajaya	(0274) 581335
2	Dinas Perhubungan	Jl. Magelang no. 41 Yogyakarta	Mulyadi Hadikusumo	(0247) 561787
3	Dinas Pertanian	Jl. Gondosuli No. 6 yogyakarta 55165	Nanang Suwandi	(0274) 563937

### b. Company

No.	Company Name	Address	Person In Charge	Telp. No.
1	Pertamina DIY	Jl. Mangkubumi No.20 yogyakarta	Imam Hidayah Chalik	(0274) 565720
2	P.T. PLN APJ DIY	Jl. P. Mangkubumi No.16 Yogyakarta	Ari Agus Salim	(0274) 512401

### c. Non-Government Office

No.	Name	Address	Person In Charge	Telp. No.
1	Yayasan Dian Desa	Jl. kaliurang km 7 PO BOX 19 Yogyakarta	Anton Soejarwo	(0274) 885247
2	Lembaga Konsumen Yogyakarta	Jl. Sukonandi II nomor 4 A Yogyakarta 55162	Nanang Ismuhartoyo	(0274) 554457
3	Inspect Yogyakarta	Jl. Kenari 13 Sidoarum III Godean Yogyakarta	M. Fikron W. Arifudin	(0274) 798342