



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

# **ENERGY PROFILE OF YOGYAKARTA PROVINCE 2008**

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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 in July and August up to 346.2mm maximum in February, influenced by dry season and rainy season. According to the Meteorology Station of Adisucipto Airport, the average temperature in Yogyakarta during 2008 was recorded 26.11<sup>0</sup>C it's lower than average temperature during

2007 which recorded 27.35<sup>0</sup>C, with the minimum temperature is 16.6<sup>0</sup>C and the maximum temperature is 34.8<sup>0</sup>C. Precipitation was recorded 0.0 mm – 346.2 mm and rain days per month 0.0 times – 25.0 times. Humidity was recorded 28 percent – 97 percent, air pressure is 1,005.3 mbar – 1,014.2 mbar, with wind arrow is 60 degrees - 240 degrees and wind velocity is 0.0 knot – 5.4 knot.

### **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 2008, there are 784 decisions made by Provincial parliament and 360 decisions made by Regency/City parliament.

## **1.2 Socio-economic**

### **1.2.1 Population**

Based on the result of Population Projection of The 2005 Intercensal Population Survey, in 2008 number of population in DIY Province was recorded 3,468,502 persons, consisting of 50.19 percent female and 49.81 percent male. Percentage of urban populations is 64.30 percent and rural population is 35.70 percent.

The growth rate of provincial population is 0.99 percent, that is lower comparing with the previous years. The growth rate of Bantul Regency, Sleman Regency and Yogyakarta

City are greater than province's growths, which are 1.43 percent, 1.31 percent, and 1.29 percent.

With the total area of DIY Province is 3,185.80 km<sup>2</sup>, population density in 2008 is 1,089 persons per km<sup>2</sup>. The highest population density occurs in Yogyakarta City that is around 14,059 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 462 persons per square kilometer with an area of 46.63 percent of the total area of DIY Province.

The highest percentage of DIY population by age group is productive and old people, there are 10.75 percent population in 25-29 years old. Population in 0-24 years old is 35.51 percent, population 25-59 years old is 51.75 percent and 12.74 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 2008 was recorded around 5.02 percent and it is higher than previous year that reached around 4.31 percent.

Some interesting illustration around situation of D.I. Yogyakarta economic in 2008, there are positive growth on all sectors. Transport/communication sector get high growth, that are 6.61 percent. While construction sector, trade/hotels/restaurant sector, financial sector, agriculture sector and electricity/gas/water supply sector growth around 6.09 percent, 5.73 percent, 5.63 percent, 5.59 percent and 5.53 percent. Meanwhile, services sector and manufacturing sector get little growth around 4.46 percent and 1.52 percent. While the contribution of manufacturing sector is lower than contributions of trade/hotels/restaurant sector, agriculture sector and services sector, manufacturing as a potential sector to encourage economic growth.

GRDP at constant price 2000 of DIY Province reached 19,208,936 million Rupiahs in 2008, GRDP per capita recorded 5.5 million rupiahs per person. Compared to 2007 GRDP per capita, 2008 GRDP per capita has increased around 3.90 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 Commercial Services sector that reached around 23.36 percent in 2008. Agriculture sector and Manufacturing sector are around 18.32 percent and 13.36 percent respectively. Services sector has 13.99 percent contribution of GRDP. Transportation is sector 10.41 percent and financial service is around 9.32 percent. Meanwhile, Construction sector around 9.57 percent. Mining and Quarrying sector has the smallest share, only 0.75 percent from total GRDP at current price. Compared to 2007 share of GRDP, there were slight changes in all sector shares in 2008.

### **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.

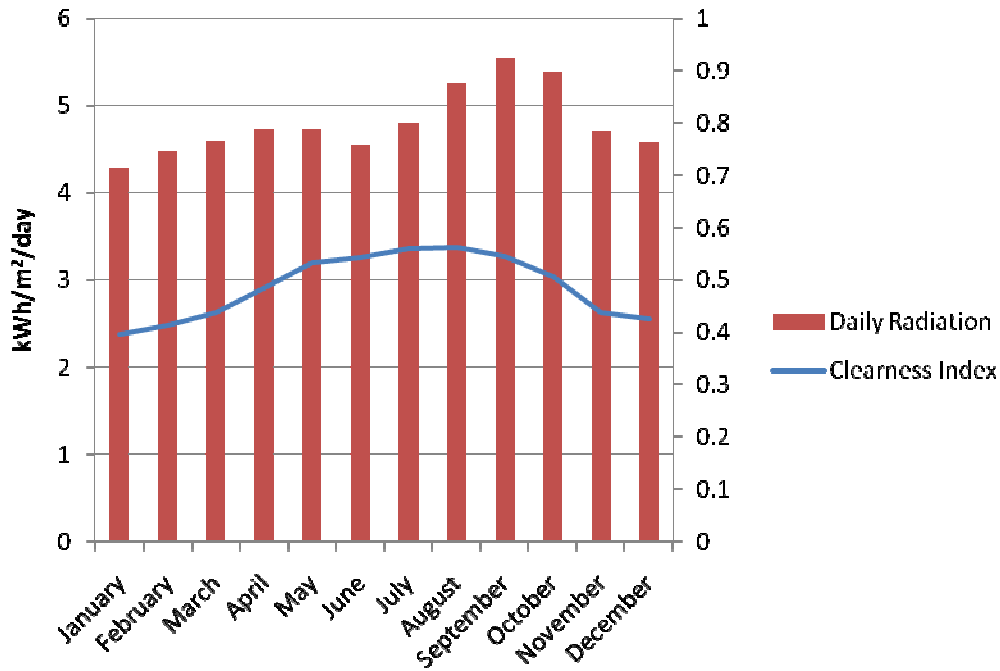
For remote areas which are not accessed by PLN (off grid), the electricity demand is supplied by solar cell photovoltaic electricity generating systems (PLTS). Currently, a PLTS program has installed more than 175 units that are distributed in four regencies, i.e. kabupaten (regency): Sleman, Bantul, 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 50Wp. 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. In 2010, there was a new installation of solar cell utilization in a communal cattle in Moyudan, Sleman regency. The capacity of this installation is 6 x 50Wp that use to illuminate during night activity.

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.



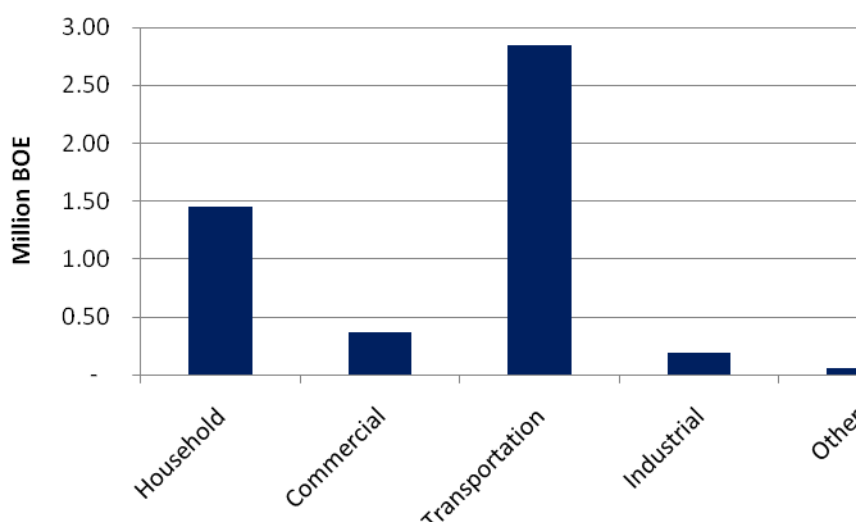
## Chapter II ENERGY BALANCE

### 2.1 Final Energy Consumption

Total of final energy consumption of DIY Province in 2008 is 4.91 Million BOE. Compared to total of final energy consumption in 2007, energy consumption in 2008 has increased by 3.9 percent from 4.73 Million BOE in 2007. In 2008, all fuel type increased except biomass that decreased 0.6 percent compare to biomass in 2007.

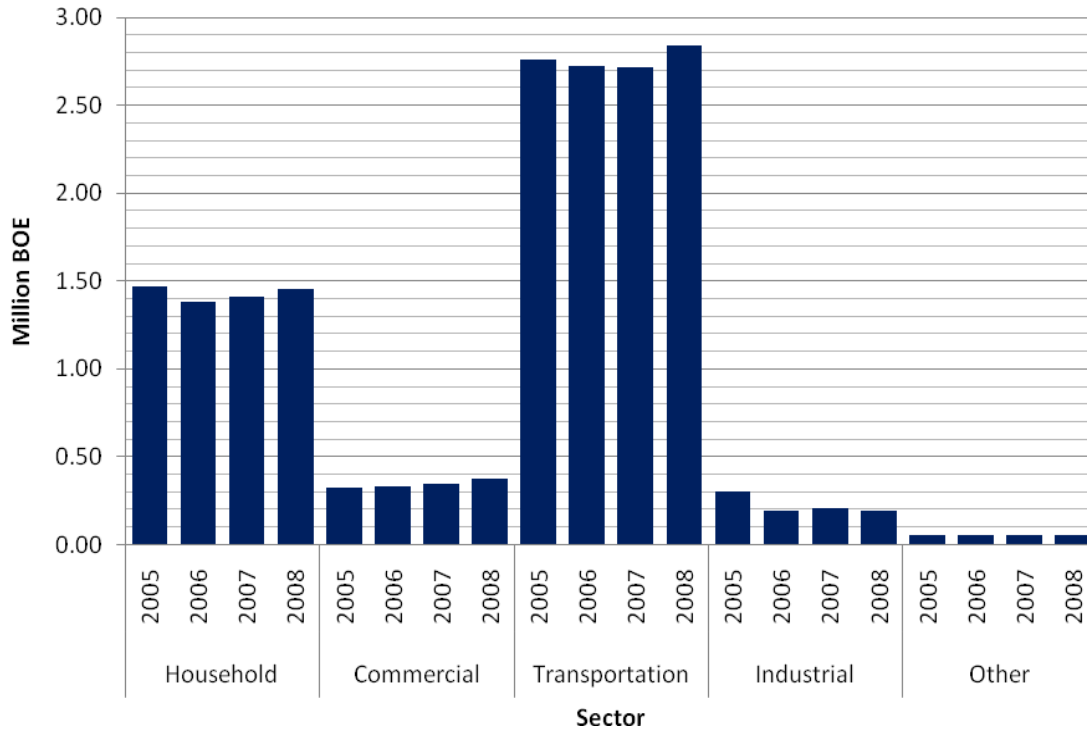
#### 2.1.1 Final Energy Consumption by Sector

Energy consumption by sector in 2008 is dominated by transportation. Energy consumption in transportation sector in 2008 is reaching the value of 2.84 Million BOE (57.85 percent). Household energy consumption is the second largest with 1.46 Million BOE (29.63 percent). Energy consumption of Commercial and Industrial Sector are 0.37 Million BOE (7.56 percent) and 0.19 Million BOE (3.89 percent) respectively. Other sector has the least energy consumption in 2008 of 0.05 Million BOE (1.07 percent). The final energy consumption in 2008 by sector of DIY Province can be seen in Figure 2.1.



**Figure 2 .1. Final energy consumption by sector of DIY Province in 2008**

Figure 2.2 shows the comparison of final energy consumption by sector from 2005 to 2008. In 2006, it can be seen from the figure that a decrease 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.

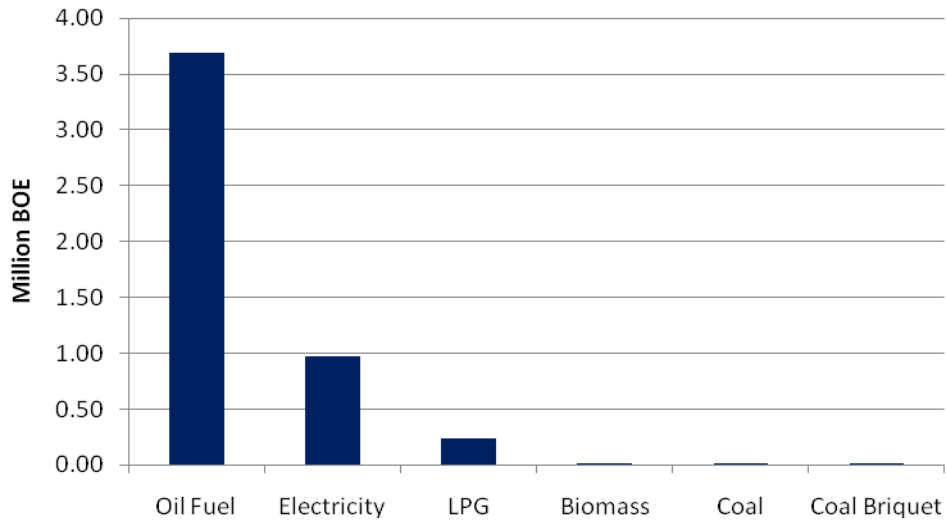


**Figure 2. 2. Comparison of final energy consumption by sector in 2005 - 2008**

The energy consumption of household sector starts to increase in 2007 by 1.94 percent and continues to increase in 2008 by 3.13 percent. In commercial sector, energy consumption has increased between 2005 and 2008. In 2007, energy consumption of commercial sector increased by 3.44 percent and 7.93 percent in 2008. The energy consumption of transportation sector still decreased in 2007 by 0.33 percent but in 2008, the energy consumption increased by 4.64 percent. In industrial sector, the energy consumption in 2007 has increased by 5.82 percent but in 2008 the energy consumption decreased by 7.03 percent. In other sector, the energy consumption in 2007 decreased by 3.57 percent and in 2008 increased by 3.96 percent.

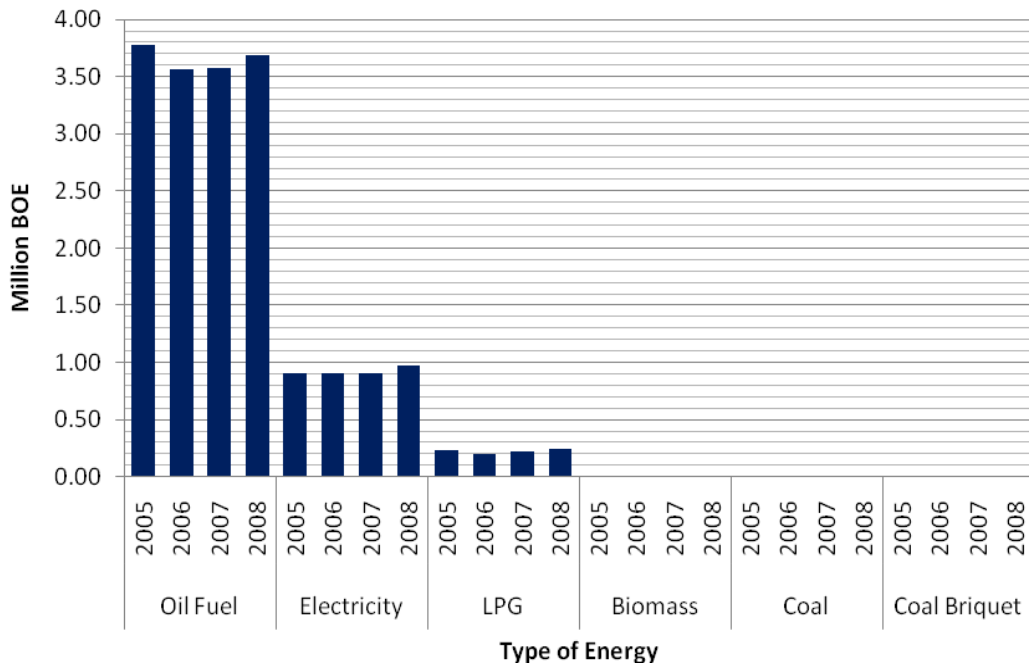
### **2.1.2 Final Energy Consumption per Energy**

Final energy consumption by type of energy is shown in figure 2.3. The figure shows that oil fuel is still very dominant compared to other type of energy with an amount of 3.68 Million BOE (75.01 percent). Energy type of electricity and LPG used in DIY Province in 2008 is 0.97 Million BOE (19.7 percent) and 0.24 Million BOE (4.9 percent) respectively. While the total of energy types of coal, biomass, and coal briquette are only around 0.40 percent compared to the total of final energy consumption in 2008. The amount of energy of coal, biomass, and coal briquette are 0.013 Million BOE (0.26 percent), 0.0033 Million BOE (0.07 percent), and 0.0028 Million BOE (0.06 percent) respectively.



**Figure 2. 3. Final energy consumption by type of energy of DIY Province in 2008**

The comparison of final energy consumption by type of energy from 2005 to 2008 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 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 has 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 increased by 3.1 percent (0.0027 Million BOE in 2005). On the other hand, there is a very big relative increase 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 – 2008**

Oil fuel consumption in 2006 to 2008 is increasing. The consumption of oil fuel increased by 0.45 percent and 2.94 percent in 2007 and 2008 respectively. There is a small increased consumption of electricity in 2007 of about 0.41 percent. While in 2008, the consumption of electricity significantly increased by 6.54 percent. In 2007 and 2008, there is a considerably constantly increase in LPG consumption. The LPG consumption has increased by 9.27 percent and 9.18 percent in 2007 and 2008 respectively. Meanwhile, the biomass consumption decreased by 0.69 percent and 0.59 percent in 2007 and 2008 respectively. Coal consumption increased in 2007 by 2.49 percent and decreased in 2008 by 2.34 percent. Coal briquette consumption has also increased in 2007 by 1.02 percent and in 2008 by 1.24 percent.

## 2.2 Energy Transformation

### 2.2.1 Electricity Production and consumption

The electricity system in Yogyakarta province is part of the electrical power interconnection system of Java-Madura-Bali (JAMALI), which covers seven provinces in Java and Bali. This system is an interconnection system at extra high voltage of 500 kV which is extending along the Java-Madura-Bali Island. This system is the biggest electricity system in Indonesia, which consumes almost 80 percent of electricity production. JAMALI interconnection system in Province of Central Java and Yogyakarta is illustrated in Figure 2.5. Yogyakarta province does not have any production unit within its territory.

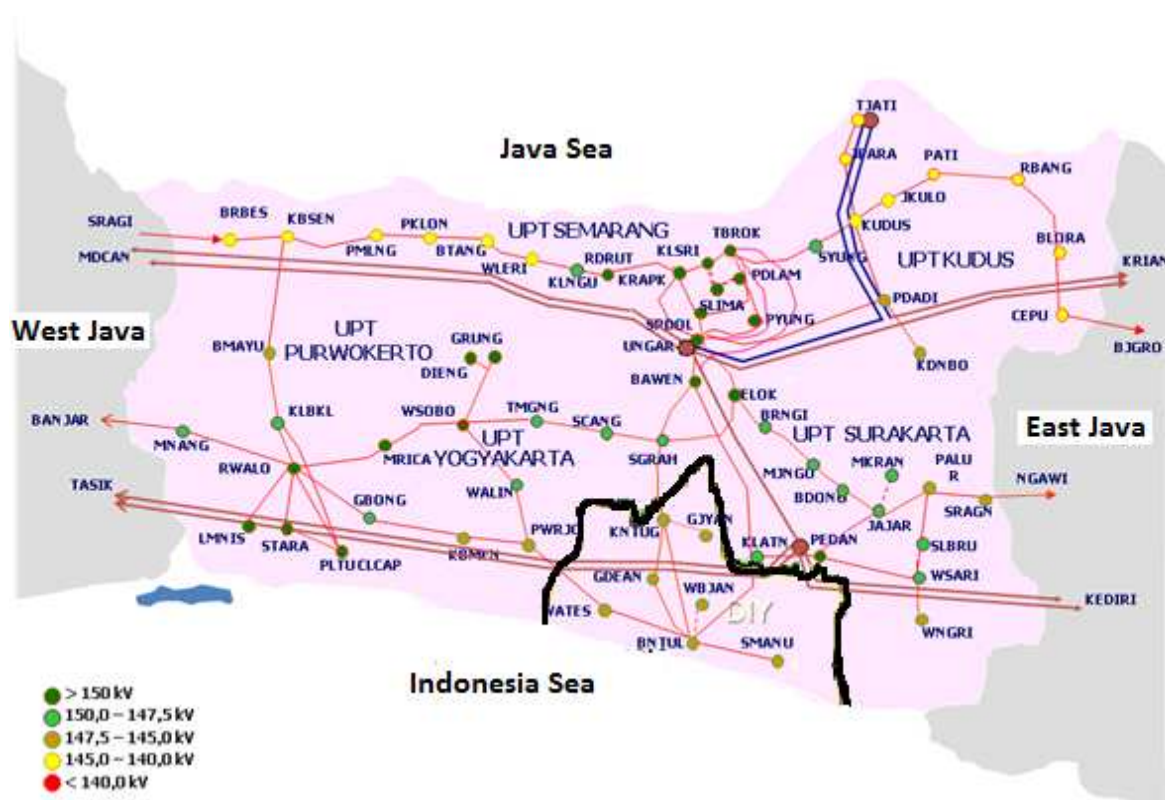
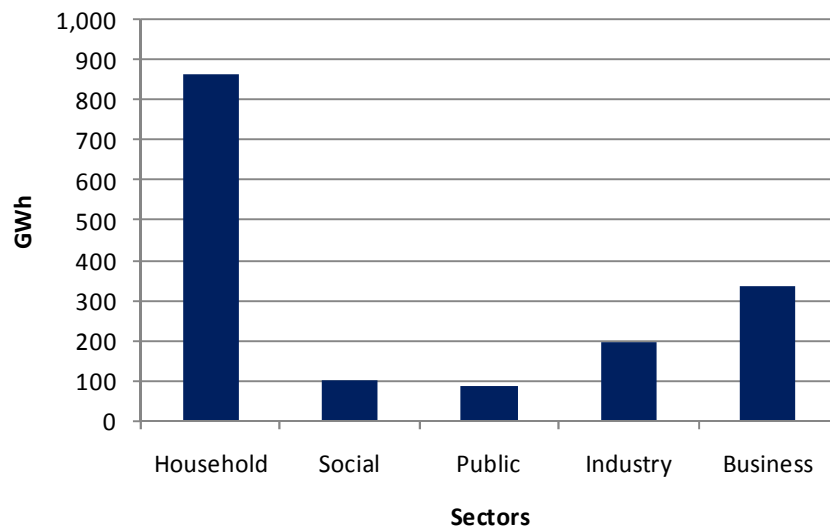


Figure 2. 5. JAMALI Interconnection system in Central Java

PLN, as Electricity Company, through Yogyakarta Office has a duty to serve the electricity needs of the community in Yogyakarta. Total consumption of electricity in the Yogyakarta province in 2008 is about 1,578GWh which is supplied by eight electrical substations with a total capacity of 616MW. Electricity consumption by sector is shown in figure

2.6. It can be seen in figure 2.6 that household sector has the largest electricity consumption of 867Gwh. Commercial (Business) and industrial sector has electricity consumption of 334GWh and 193GWh respectively. Social and public sector has electricity consumption of 101GWh and 84GWh respectively.



**Figure 2. 6. Electricity Consumption by sector of DIY Province in 2008**

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. In 2007, there is still small growth of electricity consumption which increased by 0.41 percent. Meanwhile, there is significant growth of electricity consumption in 2008 that is increased by 6.54 percent. Differences between 2005 and 2008 electricity consumption by sector are shown in figure 2.7.

In 2006, it can be seen from figure 2.7 that a decrease in electricity consumption has occurred in household and industry sector by 1.32 percent and 1.10 percent respectively. On the other hand, electricity consumption in commercial, social, and public sector has increased by 6.14 percent, 1.75 percent and 1.75 percent respectively. In 2007, a decrease in electricity consumption in household and industrial sector still occurred. Household and industrial electricity consumption decreased by 1.34 percent and 1.12 percent respectively. Meanwhile, electricity consumption in commercial, social, and public sector has increased by 5.78 percent, 1.72 percent, and 1.72 percent respectively. In 2008, there is a significant increase of electricity consumption in household sector, industrial, and commercial sector by 4.61 percent, 10.47 percent, and 11.85 percent respectively. While, electricity consumption in social and public sector have the same increase, that is 2.80 percent.

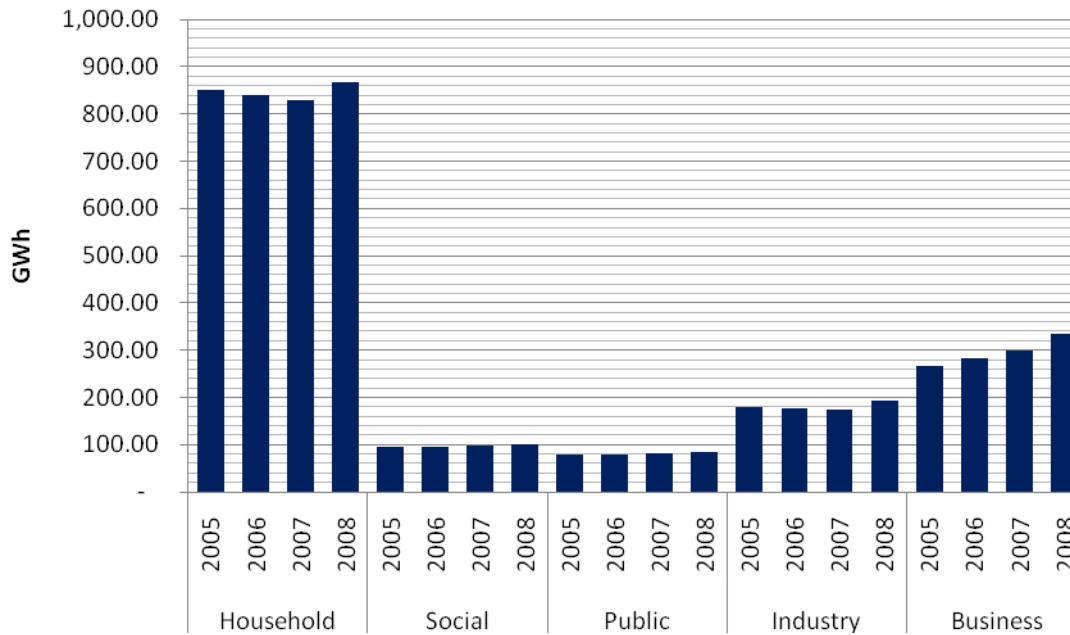


Figure 2. 7. Comparison of 2005 and 2006 electricity consumption by sector in DIY Province

## 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 2008 is 3,149.98Ton which increased by 1.4 percent compare to coal supply in 2007. 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 2008 is 786.56Ton

### 2.3.2 Liquid Fuel

Oil fuel consists of gasoline, ADO, IDO, fuel oil, avtur, and kerosene and is supplied to DIY Province by PERTAMINA in Cilacap, Central Java Province through pipeline to the refinery in Rewulu, Yogyakarta. The total of imported oil fuel that is consumed by DIY Province is 618,584.26Kilo Liter that increased by 3.05 percent compared to imported oil fuel in 2007 (600,262.79Kilo 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 28,240Ton, an increase by 9.18 percent compared to imported LPG in 2007 (25,866Ton).

### 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

2008 is 1,415Ton that is a decrease by 0.59 percent compared to produced fire wood in 2007 (1,423Ton).

## 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, consisting of avtur, gasoline (mogas), kerosene, ADO, IDO, and fuel oil (FO), is very dominant compare to other type of energy. In 2008, total amount of oil fuel that is imported to DIY Province is 3,684,796 BOE. This amount of oil fuel is used by five sectors and dominated by transportation sector. Energy type of electricity in 2008 reaches the value of 1,049,887 BOE and is used by household, commercial, , industrial sector, and including grid losses. Imported LPG in 2008 is 240,735 BOE. All of imported LPG is used by household, commercial, and industrial sector. The amount of imported coal in 2008 is 12,974 BOE and used only by industrial sector. Coal briquette that is used by household sector reaches the value of 2,803 BOE in 2008. The only energy that is produced by DIY Province is fire wood. The amount of fire wood in 2008 is 3,251 BOE. Fire wood is used by household sector.

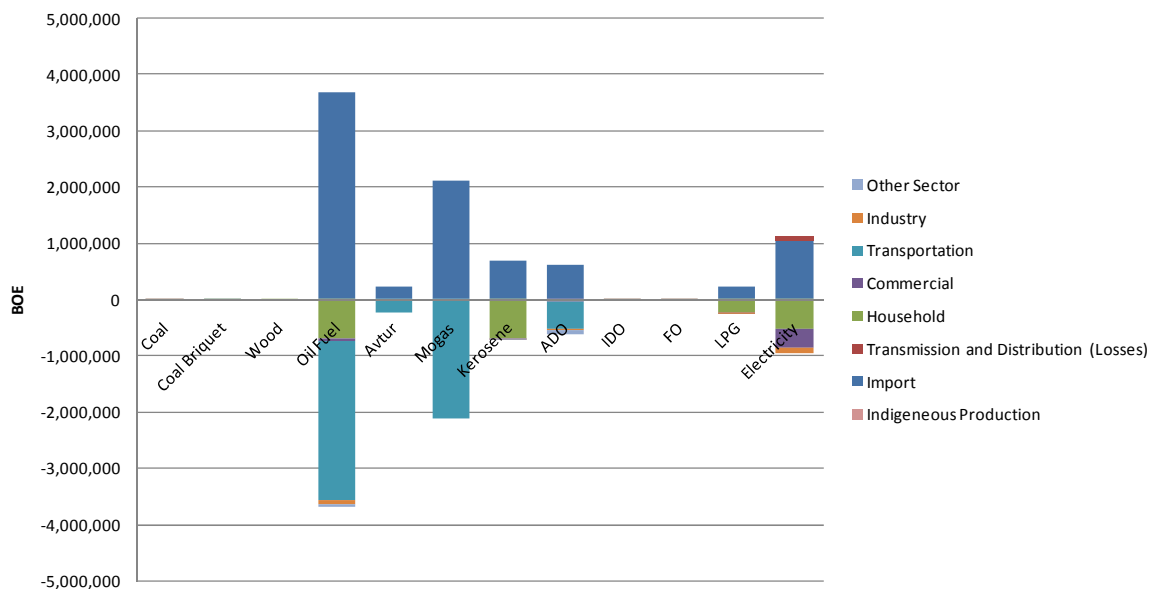
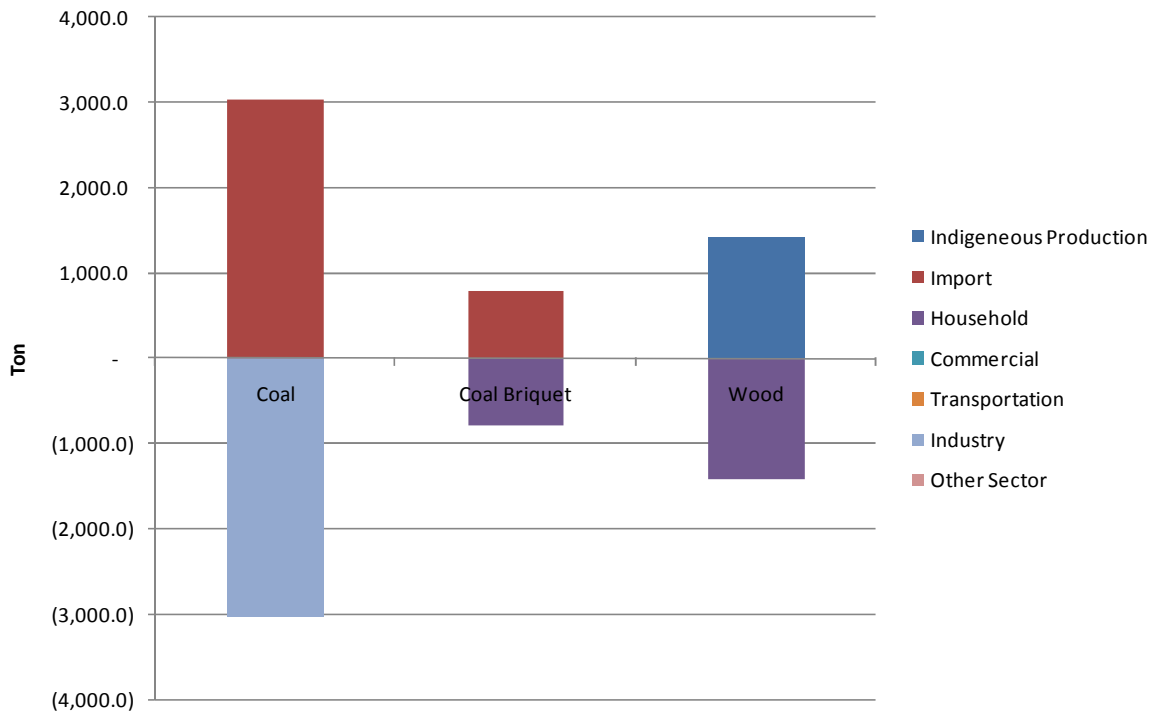


Figure 2. 8. Energy balance of DIY Province in 2008

### 2.4.2 Commodity Balance

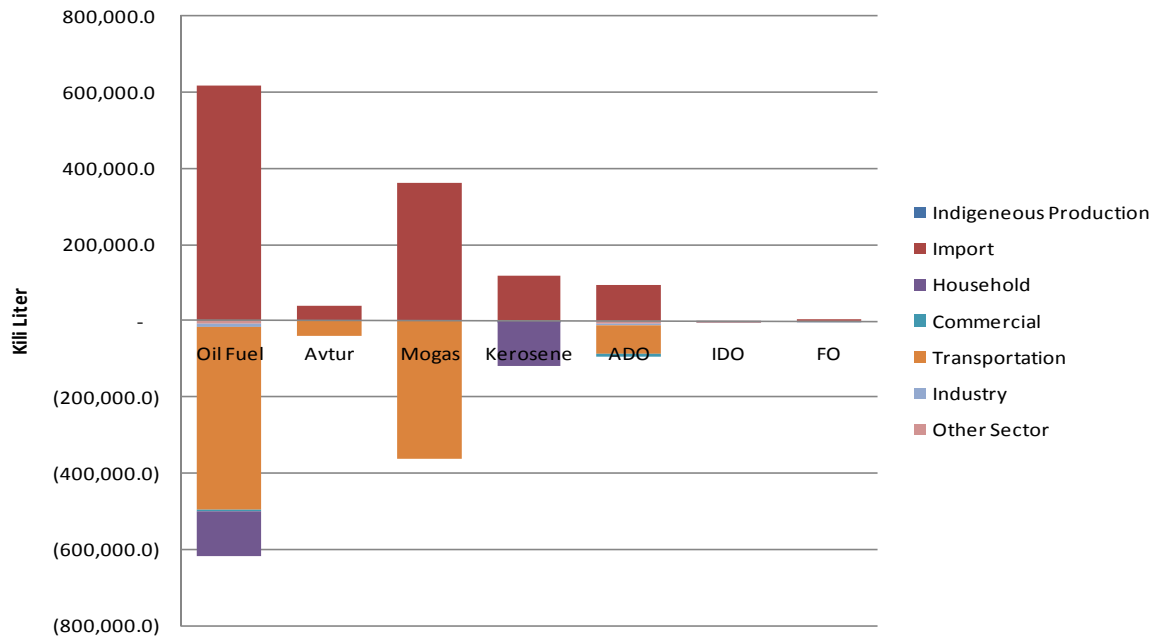
Commodity balance of solid fuel is illustrated in figure 2.9. Commodity of solid fuel consists of coal, coal briquette, and fire wood. Coal and coal briquette is imported from outside of DIY Province while fire wood is produce by DIY Province. In 2008, commodity of coal and coal briquette is 3,033 Ton and 787 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 2008 is 1,415 Ton. All commodity of fire wood is used by household sector for cooking activity.



**Figure 2. 9. Commodity balance of solid fuel in 2008**

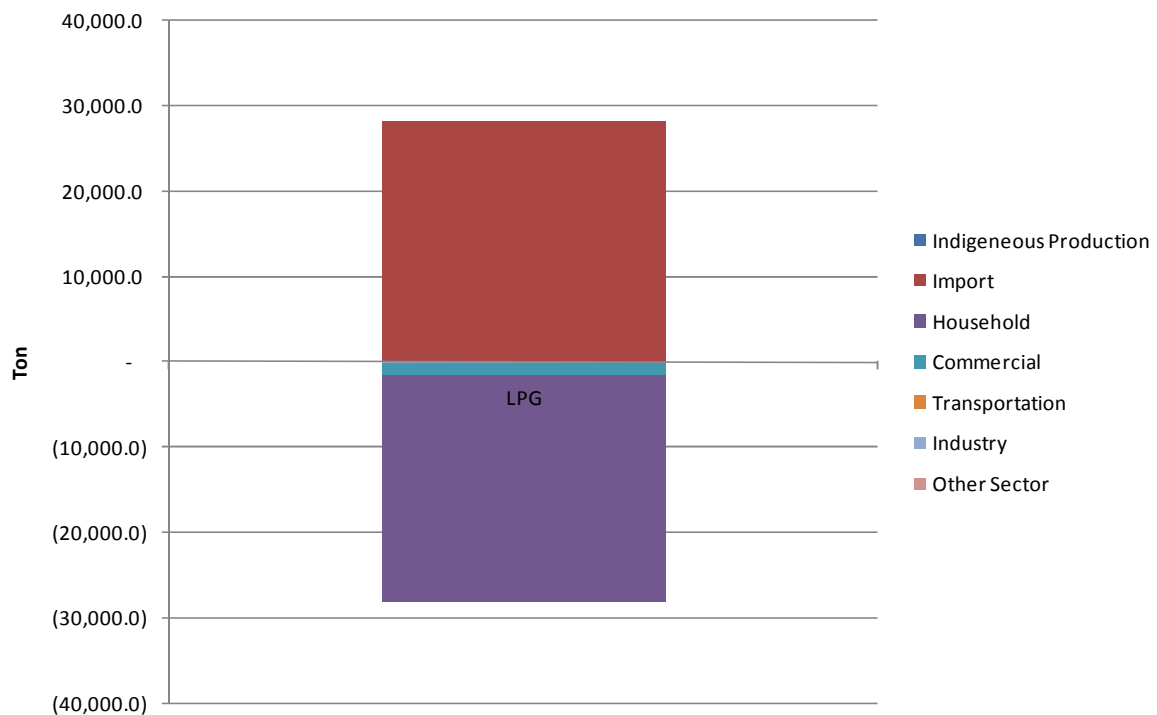
Figure 2.10 shows commodity balance of liquid fuel. All liquid fuel is imported from outside DIY Province. The total of commodity of oil fuel that is supplied to DIY Province in 2008 is 618,584 kiloliter and is dominated by commodity of gasoline. Motorcycles and passenger cars consume 45.44 percent and 42.46 percent of gasoline respectively, while 12.09 percent of gasoline is consumed by gasoline-powered load-vehicles. The amount of gasoline commodity in 2008 is 364,344 kiloliter and this entire commodity is used by transportation sector. Commodity of kerosene is 117,255 kiloliter in 2008. Kerosene is mainly used by household sector. Commodity of ADO 93,920 kiloliter and used by all sectors except household sector. Most of ADO is used by transportation sector. Trucks and buses consume 57.14 percent and 28.71 percent of ADO in transportation sector respectively. Commodity of IDO and FO in 2008 that is only used by industrial sector is 32 kiloliter and 3,352 kiloliter respectively.



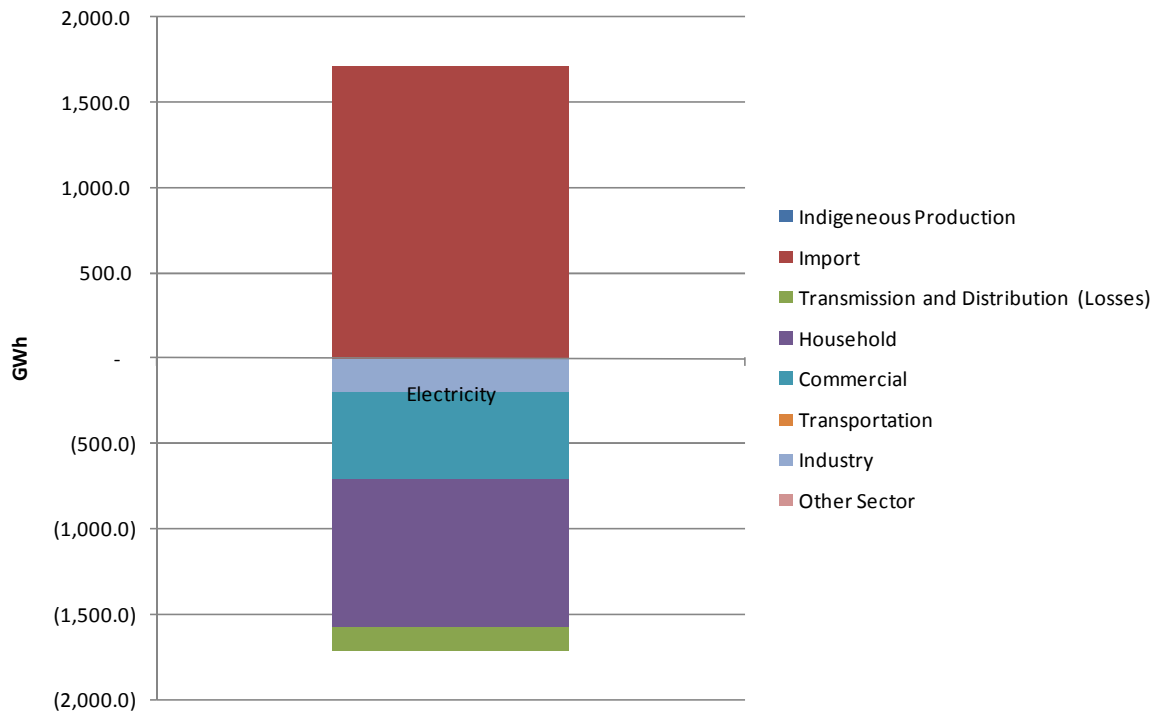


**Figure 2. 10. Commodity balance of liquid fuel in 2008**

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 2008, commodity of LPG is 28,240 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 2008**



**Figure 2. 12. Commodity of electricity in 2008**

Figure 2.12 shows commodity of electricity in 2008. 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 2008 is 1,713GWh. A part of imported electricity are losses in the electrical distribution system in DIY Province. In 2006, losses in electrical distribution system are 7.84 percent. Therefore, the amount of commodity of electricity loss in distribution system is 134.3GWh. 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 2008 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 consisting 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. The population data by income classes is derived from 2005 and 2008 SUSENAS data and that for 2006 and 2007 is calculated by interpolation between 2005 and 2008. The population data by income classes can be seen in Table 3.1. 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.

**Table 3. 1. Population by Income**

<b>Rural</b>					
No.	Income Category	2005	2006	2007	2008
1	Under Poverty Line	146,948	163,737	173,859	183,776
2	Under 1.5X Poverty Line	394,753	375,268	353,424	341,064
3	Middle Income	587,467	559,826	514,638	471,061
4	20% Highest Income	283,885	272,007	257,176	242,991
Total Province		1,413,053	1,370,837	1,299,097	1,238,893
<b>Urban</b>					
No.	Income Category	2005	2006	2007	2008
1	Under Poverty Line	174,943	188,456	201,214	211,204
2	Under 1.5X Poverty Line	317,055	312,733	301,676	283,954
3	Middle Income	1,002,467	1,116,299	1,206,975	1,290,877
4	20% Highest Income	374,282	403,676	425,572	443,575
Total Province		1,868,747	2,021,164	2,135,437	2,229,609

*Source: Susenas*

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 consisting 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, 2006, and 2007 intensity level and corresponding activity level in 2008. Energy from fire wood and coal briquette in 2008 is a product of 2007 intensity and 2008 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 2008, energy intensities for household sector are calculated based on energy intensities in 2007 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 2008, energy intensities for industrial sector are calculated based on energy intensities in 2007 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 2008, energy intensities for these three sectors is calculated based on 2007 energy intensities and is adjusted to meet supply level in 2008.

## ANNEX I: Summary of Energy Profile in 2008

### A. Socio - Economic

Land Area	3,186	km2
Population	3,468,502	Persons
Number of Households	1,015,452	Households

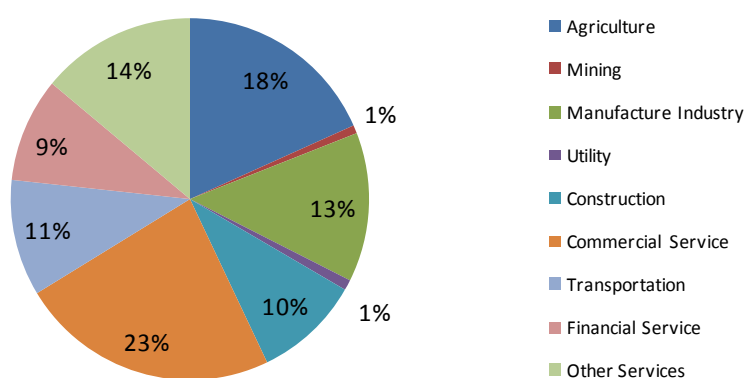
### Gross Regional Domestic Product (GRDP)

Value	19,210	Billion Rupiah
Per Capita	5.5	Million Rupiah

### GRDP by Sector (% of total GRDP)

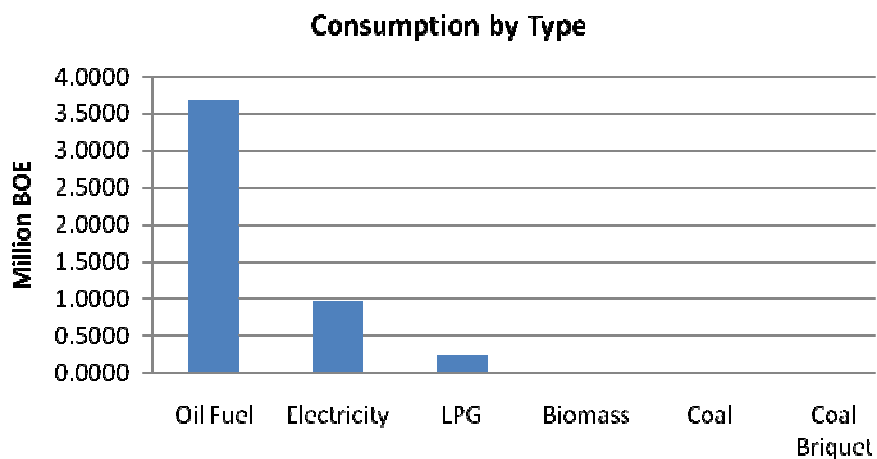
Agriculture	18.32%
Mining	0.75%
Manufacture Industry	13.36%
Utility	0.91%
Construction	9.57%
Commercial Service	23.36%
Transportation	10.41%
Financial Service	9.32%
Other Services	13.99%
	100.00%

**GDP By Sector**



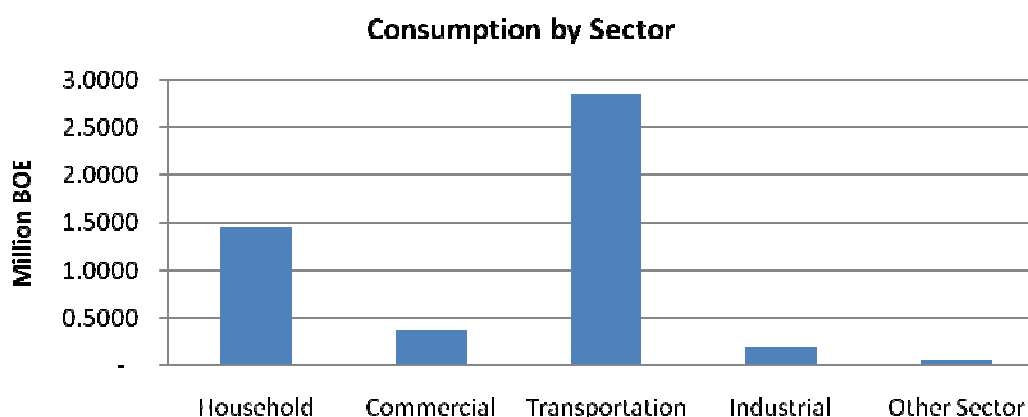
### B. Final Energy Consumption

Consumption by Type		
Oil Fuel	3.6848	Million BOE
Electricity	0.9676	Million BOE
LPG	0.2407	Million BOE
Biomass	0.0033	Million BOE
Coal	0.0130	Million BOE
Coal Briquet	0.0028	Million BOE
<b>Total</b>	<b>4.9122</b>	<b>Million BOE</b>



#### Consumption by Sector

Household	1.4555	Million BOE
Commercial	0.3713	Million BOE
Transportation	2.8421	Million BOE
Industrial	0.1906	Million BOE
Agriculture, Mining, and Construction	0.0526	Million BOE
<b>Total</b>	<b>4.9122</b>	<b>Million BOE</b>



#### C. Energy Economy Indicator

Elasticity of Final Energy Use	0.79	
Intensity of Final Energy Use	0.26	BOE/Million Rupiah
Final Energy Consumption per Capita	1.42	BOE/Capita/Year
Electricity Use per Capita	455.08	kWh/Capita/Year
Electrified Village Ratio	100.00	%
Electrification Ratio	84.48	%

**ANNEX II: 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>3,033.9</b>	<b>786.6</b>	<b>1,415.0</b>	<b>618,584.3</b>	<b>39,681.3</b>	<b>364,344.0</b>
	a. Indigeneous Production	-	-	1,415.0	-	-	-
	b. Import	3,033.9	786.6	-	618,584.3	39,681.3	364,344.0
<b>2</b>	<b>Energy Transformation</b>	-	-	-	-	-	-
<b>3</b>	<b>Own Use and Losses</b>	-	-	-	-	-	-
	a. Transmission and Distribution	-	-	-	-	-	-
<b>4</b>	<b>Final Energy Supply</b>	<b>3,033.9</b>	<b>786.6</b>	<b>1,415.0</b>	<b>618,584.3</b>	<b>39,681.3</b>	<b>364,344.0</b>
<b>5</b>	<b>Statistical Difference</b>	-	-	-	-	-	-
<b>6</b>	<b>Final Energy Consumption</b>	<b>3,033.9</b>	<b>786.6</b>	<b>1,415.0</b>	<b>618,584.3</b>	<b>39,681.3</b>	<b>364,344.0</b>
	a. Household	-	786.6	1,415.0	116,631.8	-	-
	b. Commercial	-	-	-	6,437.1	-	-
	c. Transportation	-	-	-	478,816.3	39,681.3	364,344.0
	d. Industry	3,033.9	-	-	8,587.0	-	-
	e. Other Sector	-	-	-	8,112.0	-	-

**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>117,255.0</b>	<b>93,920.0</b>	<b>32.0</b>	<b>3,352.0</b>	<b>28,240.0</b>	<b>1,712.7</b>
	a. Indigeneous Production	-	-	-	-	-	-
	b. Import	117,255.0	93,920.0	32.0	3,352.0	28,240.0	1,712.7
<b>2</b>	<b>Energy Transformation</b>	-	-	-	-	-	-
<b>3</b>	<b>Own Use and Losses</b>	-	-	-	-	-	<b>134.3</b>
	a. Transmission and Distribution	-	-	-	-	-	134.3
<b>4</b>	<b>Final Energy Supply</b>	<b>117,255.0</b>	<b>93,920.0</b>	<b>32.0</b>	<b>3,352.0</b>	<b>28,240.0</b>	<b>1,578.5</b>
<b>5</b>	<b>Statistical Difference</b>	-	-	-	-	-	-
<b>6</b>	<b>Final Energy Consumption</b>	<b>117,255.0</b>	<b>93,920.0</b>	<b>32.0</b>	<b>3,352.0</b>	<b>28,240.0</b>	<b>1,578.5</b>
	a. Household	116,631.8	-	-	-	26,579.2	867.1
	b. Commercial	371.3	6,065.8	-	-	1,426.2	518.1
	c. Transportation	-	74,791.1	-	-	-	-
	d. Industry	235.0	4,968.0	32.0	3,352.0	234.6	193.2
	e. Other Sector	16.9	8,095.1	-	-	-	-



### ANNEX III: 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>12,974.9</b>	<b>2,803.2</b>	<b>3,251.6</b>	<b>3,684,796.2</b>	<b>233,750.4</b>	<b>2,123,214.7</b>	<b>695,017.3</b>
	a. Indigeneous Production	-	-	3,251.6	-	-	-	-
	b. Import	12,974.9	2,803.2	-	3,684,796.2	233,750.4	2,123,214.7	695,017.3
<b>2</b>	<b>Energy Transformation</b>	-	-	-	-	-	-	-
<b>3</b>	<b>Own Use and Losses</b>	-	-	-	-	-	-	-
	a. Transmission and Distribution	-	-	-	-	-	-	-
<b>4</b>	<b>Final Energy Supply</b>	<b>12,974.9</b>	<b>2,803.2</b>	<b>3,251.6</b>	<b>3,684,796.2</b>	<b>233,750.4</b>	<b>2,123,214.7</b>	<b>695,017.3</b>
<b>5</b>	<b>Statistical Difference</b>	-	-	-	-	-	-	-
<b>6</b>	<b>Final Energy Consumption</b>	<b>12,974.9</b>	<b>2,803.2</b>	<b>3,251.6</b>	<b>3,684,796.2</b>	<b>233,750.4</b>	<b>2,123,214.7</b>	<b>695,017.3</b>
	a. Household	-	2,803.2	3,251.6	691,323.6	-	-	691,323.6
	b. Commercial	-	-	-	41,550.5	-	-	2,200.7
	c. Transportation	-	-	-	2,842,142.2	233,750.4	2,123,214.7	-
	d. Industry	12,974.9	-	-	57,166.2	-	-	1,392.9
	e. Other Sector	-	-	-	52,613.7	-	-	100.0

**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>609,268.4</b>	<b>211.4</b>	<b>23,333.9</b>	<b>240,734.7</b>	<b>1,049,886.6</b>	<b>4,994,448.1</b>
	a. Indigeneous Production	-	-	-	-	-	3,251.6
	b. Import	609,268.4	211.4	23,333.9	240,734.7	1,049,886.6	4,991,195.5
<b>2</b>	<b>Energy Transformation</b>	-	-	-	-	-	-
<b>3</b>	<b>Own Use and Losses</b>	-	-	-	-	<b>82,294.9</b>	<b>82,297.9</b>
	a. Transmission and Distribution	-	-	-	-	82,294.9	82,297.9
<b>4</b>	<b>Final Energy Supply</b>	<b>609,268.4</b>	<b>211.4</b>	<b>23,333.9</b>	<b>240,734.7</b>	<b>967,591.7</b>	<b>4,912,150.2</b>
<b>5</b>	<b>Statistical Difference</b>	-	-	-	-	-	-
<b>6</b>	<b>Final Energy Consumption</b>	<b>609,268.4</b>	<b>211.4</b>	<b>23,333.9</b>	<b>240,734.7</b>	<b>967,591.7</b>	<b>4,912,152.2</b>
	a. Household	-	-	-	226,577.3	531,560.3	1,455,515.9
	b. Commercial	39,349.7	-	-	12,157.4	317,594.7	371,302.6
	c. Transportation	485,177.1	-	-	-	-	2,842,142.2
	d. Industry	32,227.9	211.4	23,333.9	2,000.0	118,436.8	190,577.9
	e. Other Sector	52,513.7	-	-	-	-	52,613.7

## ANNEX IV: Energy Use Activity

### 1. Demography

#### a. Population and Density in 2008

No.	Regency/City	Population (persons)	Number of Households	Area (km <sup>2</sup> )	Density (person/km <sup>2</sup> )
1	Kulonprogo	374,783	103,279	586.72	638.78
2	Bantul	909,812	223,141	506.85	1,795.03
3	Gunungkidul	686,772	194,345	1,485.36	462.36
4	Sleman	1,040,220	335,935	574.82	1,809.64
5	Yogyakarta	456,915	158,752	32.50	14,058.92
Total Province		3,468,502	1,015,452	3,186.25	1,088.58

Source: BPS

#### b. Population Growth

No.	Regency/City	Population Growth (%/year)			
		1990 - 1995	1995 - 2000	2000 - 2005	2005 - 2008
1	Kulonprogo	(0.04)	0.71	0.15	0.09
2	Bantul	1.19	0.91	1.99	1.46
3	Gunungkidul	0.31	0.43	0.33	0.25
4	Sleman	1.51	1.48	1.87	1.34
5	Yogyakarta	(0.38)	1.43	1.82	1.31
Total Province		0.72	1.00	1.37	1.01

Source: BPS

#### c. Household Size

No.	Regency/City	Number of Person in Household (Person/Household)					
		1995	2000	2005	2006	2007	2008
1	Kulonprogo	5.07	4.93	3.62	3.29	3.63	3.62
2	Bantul	4.68	4.16	3.42	4.16	4.08	4.08
3	Gunungkidul	5.10	4.90	3.46	3.53	3.53	3.53
4	Sleman	4.45	4.12	3.00	3.66	3.11	3.10
5	Yogyakarta	5.05	5.03	2.78	3.46	2.09	2.88
Total Province		4.81	4.51	3.22	3.68	3.43	3.42

Source: BPS

#### d. Population by Income Category

##### d.1 Regency of Kulonprogo

##### Rural

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	67,070	73,157	30,328	47,050	64,516	81,090
2	Under 1.5X Poverty Line	131,868	99,068	92,980	83,242	76,705	70,551
3	Middle Income	91,322	121,712	129,693	110,687	96,625	82,846
4	20% Highest Income	72,755	76,206	64,249	60,622	59,463	58,256
Total		363,015	370,143	317,250	301,600	297,309	292,743

Source: Susenas

##### Urban

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	15,556	12,447	18,357	19,433	21,058	22,807
2	Under 1.5X Poverty Line	26,527	24,053	23,943	19,071	14,193	8,532
3	Middle Income	17,175	24,557	12,770	18,855	26,072	34,047
4	20% Highest Income	15,676	15,643	14,366	14,881	15,813	16,654
Total		74,934	76,700	69,436	72,240	77,136	82,040

Source: Susenas

**d.2 Regency of Bantul  
Rural**

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	10,800	21,843	12,461	25,995	32,525	38,965
2	Under 1.5X Poverty Line	73,103	53,344	54,572	49,889	34,723	25,120
3	Middle Income	98,301	110,888	130,199	134,175	108,783	94,347
4	20% Highest Income	45,135	47,043	49,415	52,515	43,733	39,361
Total		227,339	233,118	246,647	262,574	219,764	197,793

Source: Susenas

**Urban**

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	39,119	44,204	76,057	64,016	50,115	32,041
2	Under 1.5X Poverty Line	191,088	128,835	150,825	135,489	117,838	92,562
3	Middle Income	201,119	269,760	235,475	298,947	375,863	447,148
4	20% Highest Income	108,333	110,700	114,730	123,059	133,414	140,268
Total		539,659	553,499	577,087	621,511	677,230	712,019

Source: Susenas

**d.3 Regency of Gunungkidul  
Rural**

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	115,093	134,247	97,498	84,804	71,191	59,221
2	Under 1.5X Poverty Line	241,239	260,783	202,797	214,924	225,116	238,173
3	Middle Income	205,797	175,093	218,786	220,750	219,344	222,080
4	20% Highest Income	141,009	142,816	130,258	126,883	125,706	124,236
Total		703,138	712,939	649,339	647,360	641,357	643,711

Source: Susenas

**Urban**

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	1,176	7,508	7,800	7,361	10,481	11,842
2	Under 1.5X Poverty Line	3,527	10,510	8,190	6,892	9,034	9,516
3	Middle Income	24,395	12,312	20,669	14,361	15,436	13,091
4	20% Highest Income	7,054	6,606	9,750	7,469	8,902	8,612
Total		36,152	36,936	46,409	36,084	43,853	43,061

Source: Susenas

**d.4 Regency of Sleman  
Rural**

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	6,932	17,841	6,661	5,888	5,627	4,500
2	Under 1.5X Poverty Line	28,987	27,321	44,404	27,214	16,880	7,221
3	Middle Income	102,714	98,690	108,789	94,213	89,886	71,787
4	20% Highest Income	34,501	35,127	39,963	31,988	28,274	21,138
Total		173,134	178,979	199,817	159,303	140,667	104,646

Source: Susenas

**Urban**

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	37,110	45,394	51,952	76,421	98,357	123,496
2	Under 1.5X Poverty Line	139,510	110,539	81,703	105,291	123,168	145,014
3	Middle Income	353,930	397,107	470,679	497,584	487,355	479,949
4	20% Highest Income	129,889	137,567	150,973	169,824	177,220	187,115
Total		660,439	690,607	755,307	849,120	886,100	935,574

Source: Susenas

**d.5 City of Yogyakarta  
Urban**

No.	Income Category	1999	2002	2005	2006	2007	2008
1	Under Poverty Line	31,443	17,420	20,777	21,226	21,203	21,018
2	Under 1.5X Poverty Line	57,724	59,003	52,394	45,990	37,443	28,329
3	Middle Income	300,820	329,856	262,874	286,551	302,249	316,642
4	20% Highest Income	97,145	101,148	84,463	88,442	90,223	90,926
Total		487,132	507,427	420,508	442,209	451,118	456,915

Source: Susenas

**2. Economy**

**a. GRDP by Regency/City in 2008**

No.	Regency/City	GRDP (Million Rp)	GRDP/Capita (mill Rp/cap/yr)
1	Kulonprogo	1,662,370	4.44
2	Bantul	3,618,060	3.98
3	Gunungkidul	3,070,298	4.47
4	Sleman	5,838,246	5.61
5	Yogyakarta	5,021,149	10.99
Total Province		19,210,123	5.54

Source: BPS

**b. GRDP by Sector**

No.	Sector	GRDP (Constant Price of 2000) (million rupiah)					
		2003	2004	2005	2006	2007	2008
1	Agriculture	2,948,400	3,052,935	3,185,771	3,306,928	3,333,382	3,519,768
2	Mining	119,433	120,441	122,332	126,137	138,358	144,772
3	Manufacture Industry	2,325,236	2,400,776	2,463,230	2,481,167	2,528,020	2,566,422
4	Utility	135,379	144,845	153,115	152,467	165,772	174,933
5	Construction	1,178,024	1,284,471	1,395,079	1,580,312	1,732,945	1,838,429
6	Commercial Service	3,533,719	3,732,673	3,917,638	4,065,741	4,257,088	4,488,089
7	Transportation	1,437,072	1,582,194	1,673,352	1,761,672	1,875,307	1,999,332
8	Financial Service	1,408,894	1,500,542	1,623,210	1,591,885	1,695,164	1,790,556
9	Other Services	2,274,252	2,327,547	2,377,149	2,469,045	2,565,477	2,686,635
Total		15,360,409	16,146,424	16,910,877	17,535,354	18,291,513	19,208,936

Source: BPS

**c. GRDP Growth dan Inflation**

No.		2001	2002	2003	2004	2005	2006	2007	2008
1	GRDP Growth (%)	4.26	4.5	4.58	5.12	4.74	3.69	4.31	5.02
2	Inflation (%)	12.56	12.01	5.73	6.95	14.98	10.4	7.99	9.88

Source: BPS

**d. Value Added of Manufacture Industry Sector**

No.	Subsector	Value added (Constant Price 2000) (million rupiah)							
		2001	2002	2003	2004	2005	2006	2007	2008
1	Food	696,555	695,205	742,507	800,848	845,594	860,186	907,914	946,419
2	Textile	465,973	489,219	502,380	508,391	510,219	511,559	508,540	506,725
3	Wood	311,451	316,500	316,920	323,944	323,919	336,147	327,564	331,821
4	Paper	115,899	112,777	122,742	124,966	129,735	129,201	133,385	135,900
5	Chemistry	103,019	109,942	110,043	112,353	114,892	117,393	113,887	116,098

No.	Subsector	Value added (Constant Price 2000) (million rupiah)							
		2001	2002	2003	2004	2005	2006	2007	2008
6	Non Metal	117,875	139,423	121,658	126,292	129,566	126,765	119,285	116,582
7	Machinery	224,906	239,015	235,737	225,655	226,719	220,145	227,699	224,278
8	Others	164,222	159,805	173,250	178,328	182,586	179,771	189,745	188,599
Total		2,199,898	2,261,886	2,325,236	2,400,776	2,463,230	2,481,167	2,528,020	2,566,422

Source: BPS

#### e. Value Added of Commercial Sector

No.	Subsector	Value added (Constant Price 2000) (million rupiah)							
		2001	2002	2003	2004	2005	2006	2007	2008
1	Hotel and Lodging	289,057	304,147	322,629	340,362	319,188	259,896	287,901	342,329
2	Wholesale and Retail	1,218,785	1,247,964	1,307,280	1,374,914	1,462,659	1,534,974	1,613,884	1,693,640
3	Restaurant	1,256,282	1,362,114	1,467,971	1,564,148	1,662,981	1,774,752	1,848,580	1,929,414
4	Financial Services	1,227,184	1,314,860	1,408,894	1,500,542	1,623,210	1,591,885	1,695,164	1,790,556
5	Amusement Services	55,106	56,772	57,919	65,442	67,681	70,717	76,936	79,678
6	Social Services	374,290	374,515	377,920	387,807	405,129	425,402	429,787	443,028
Total		4,420,704	4,660,371	4,942,613	5,233,216	5,540,848	5,657,626	5,952,252	6,278,645

Source: BPS

#### f. Value Added of Other Sector

No.	Subsector	Value added (Constant Price 2000) (million rupiah)							
		2001	2002	2003	2004	2005	2006	2007	2008
1	Construction	972,157	1,053,019	1,178,024	1,284,471	1,395,079	1,580,312	1,732,945	1,838,429
2	Agriculture	2,884,970	2,935,480	2,948,400	3,052,935	3,185,771	3,306,928	3,333,382	3,519,768
3	Mining	118,129	118,319	119,433	120,441	122,332	126,137	138,358	144,772
Total		3,975,256	4,106,818	4,245,857	4,457,847	4,703,182	5,013,377	5,204,685	5,502,969

Source: BPS

### 3. Transportation

No.	Type of Mode	2001	2002	2003	2004	2005	2006	2007	2008
1	Passenger Car (unit)	67,309	70,203	74,728	78,817	82,705	84,786	89,598	97,142
2	Motorcycle (unit)	539,448	597,143	666,941	755,101	843,077	916,204	1,012,319	1,116,944
3	Bus (unit)	6,591	7,400	8,039	9,968	14,685	17,673	21,232	22,120
4	Truck (unit)	27,745	30,816	32,520	34,031	35,670	36,812	38,537	39,654
5	Train (1000 Km)	498	561	765	997	798	856	1,357	1,357
6	Aeroplane (1000 Km)	3,472	4,141	6,652	8,454	6,650	6,106	5,975	6,394

Source: BPS, Airport, and PT. KAI

### 5. Intensity of Energy Use

#### a. Household Sector

##### a.1 Regency of Kulonprogo Rural

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.0774	0.0525	-	0.0017	0.0014
2	Under 1.5X Poverty Line	0.1308	0.0789	-	0.0019	0.0015
3	Middle Income	0.1816	0.0949	0.01625	0.0002	0.0017
4	20% Highest Income	0.2864	0.1499	0.04472	-	0.0013

**Urban**

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomassa
1	Under Poverty Line	0.0687	0.0869	0.00480	0.0008	0.0011
2	Under 1.5X Poverty Line	0.0900	0.0772	0.00630	0.0016	0.0014
3	Middle Income	0.3183	0.1231	0.08259	0.0002	0.0007
4	20% Highest Income	0.1160	0.1865	0.24565	-	0.0012

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

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.0918	0.0954	-	0.0031	0.0011
2	Under 1.5X Poverty Line	0.1357	0.1150	-	0.0014	0.0014
3	Middle Income	0.1341	0.1205	0.04295	0.0006	0.0014
4	20% Highest Income	0.2362	0.1465	0.11119	-	0.0009

**Urban**

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.1310	0.0825	0.00916	0.0008	0.0012
2	Under 1.5X Poverty Line	0.2135	0.1177	0.02034	0.0024	0.0008
3	Middle Income	0.2676	0.1304	0.04758	0.0002	0.0008
4	20% Highest Income	0.2353	0.2548	0.15389	0.0003	0.0003

**a.3 Regency of Gunungkidul****Rural**

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.0574	0.1099	-	0.0007	0.0011
2	Under 1.5X Poverty Line	0.1022	0.0990	-	0.0017	0.0015
3	Middle Income	0.1978	0.1304	0.03486	0.0004	0.0022
4	20% Highest Income	0.1889	0.1690	0.08943	-	0.0025

**Urban**

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomassa
1	Under Poverty Line	0.0678	0.0684	0.00474	0.0005	0.0011
2	Under 1.5X Poverty Line	0.1704	0.1097	0.01192	0.0025	0.0013
3	Middle Income	0.2459	0.1866	0.06981	0.0006	0.0009
4	20% Highest Income	0.2090	0.2232	0.17727	-	-

**a.4 Regency of Sleman****Rural**

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomassa
1	Under Poverty Line	0.0633	0.0559	-	0.0023	0.0011
2	Under 1.5X Poverty Line	0.1031	0.0834	-	0.0025	0.0013

3	Middle Income	0.1580	0.1515	0.02938	0.0003	0.0014
4	20% Highest Income	0.2268	0.2003	0.08200	-	0.0007

#### Urban

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.1393	0.0484	0.00974	0.0011	0.0009
2	Under 1.5X Poverty Line	0.1822	0.0805	0.01275	0.0049	0.0011
3	Middle Income	0.2508	0.1696	0.08715	0.0003	0.0006
4	20% Highest Income	0.1505	0.3365	0.17619	-	0.0001

#### a.5 City of Yogyakarta

##### Urban

No.	Income category	Energy Use Intensity in 2008 (BOE/capita/year)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	0.22521	0.13759	0.01576	0.00168	0.00017
2	Under 1.5X Poverty Line	0.30275	0.15608	0.03069	0.00379	0.00007
3	Middle Income	0.26275	0.18908	0.11387	0.00038	0.00003
4	20% Highest Income	0.16510	0.35687	0.23846	-	0.00001

#### b. Commercial sector

No.	Subsector	Energy Use Intensity in 2008 (BOE/million rupiah/year)			
		ADO	Kerosene	Electricity	LPG
1	Hotel and Lodging	0.09581	0.00019	0.15094	0.00548
2	Wholesale and Retail	-	-	0.03398	0.00082
3	Restaurant	-	0.00111	0.07771	0.00459
4	Financial Services	0.00220	-	0.00827	0.00001
5	Amusement Services	0.01347	-	0.38121	0.00024
6	Social Services	0.00347	-	0.02991	0.00002

#### c. Industrial sector

No.	Subsector	Energy Use Intensity in 2008 (BOE/million rupiah/year)						
		ADO	IDO	Kerosene	Fuel Oil	Electricity	LPG	Coal
1	Food	0.01266	0.00000	0.00055	0.01283	0.01745	0.00105	-
2	Textile	0.02079	0.00039	0.00090	0.01573	0.13004	0.00089	0.01911
3	Wood	0.00077	0.00000	0.00003	0.00093	0.01128	0.00023	-
4	Paper	0.00056	-	0.00002	0.00011	0.01379	0.00002	-
5	Chemical	0.01960	0.00002	0.00085	0.00232	0.05139	0.00007	-
6	Non Metal	0.04135	0.00001	0.00179	0.01864	0.04618	0.00345	0.00315
7	Machinery	0.00206	-	0.00009	0.00024	0.06310	0.00016	-
8	Other	0.00967	0.00004	0.00042	0.00214	0.02598	0.00014	0.01550

#### d. Transportation sector

No.	Subsector	Energy Use Intensity in 2008 (BOE/unit/year or BOE/1000 Km/year)		
		Premium	ADO	Avtur
1	Passenger Car (unit)	9.2815	0.4794	-
2	Motorcycle (unit)	0.8638	-	-
3	Bus (unit)	-	6.2967	-
4	Truck (unit)	6.4752	6.9907	-
5	Railway (1000 Km)	-	16.2896	-



6	Aeroplane (1000 Km)	-	-	36.5578
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#### e. Other sector

No.	Subsector	Energy Use Intensity in 2008 (BOE/million rupiah/year)	
		Kerosene	ADO
1	Construction	-	0.017098
2	Agriculture	0.000028	0.005806
3	Mining	-	0.004455

### 6. Energy Consumption

#### a. Energy Consumption by Sector

No.	Type	Energy Consumption in 2008 (BOE)					
		Household	Commercial	Transportation	Industry	Other	Total
1	Avtur	-	-	233,750.40	-	-	233,750.40
2	Premium*	-	-	2,123,214.66	-	-	2,123,214.66
3	Kerosene	691,323.60	2,200.73	-	1,392.94	100.02	695,017.29
4	Automotive Diesel Oil	-	39,349.74	485,177.13	32,227.91	52,513.65	609,268.43
5	Industrial Diesel Oil	-	-	-	211.45	-	211.45
6	Fuel Oil	-	-	-	23,333.94	-	23,333.94
7	LPG	226,577.30	12,157.44	-	1,999.97	-	240,734.70
8	Coal	-	-	-	12,974.90	-	12,974.90
9	Coal Briquet	2,803.16	-	-	-	-	2,803.16
10	Electricity	531,560.26	317,594.67	-	118,436.77	-	967,591.70
11	Biomass**	3,251.57	-	-	-	-	3,251.57
Total		1,455,515.89	371,302.58	2,842,142.19	190,577.88	52,613.67	4,912,152.20

\* included Pertamina and Pertamina Plus

\*\*Firewood

#### b. Household Sector

##### b.1 Regency of Kulonprogo

##### Rural

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	6,280.27	4,256.72	-	139.66	112.14
2	Under 1.5X Poverty Line	9,231.17	5,567.72	-	135.78	107.20
3	Middle Income	15,045.19	7,866.06	1,346.44	12.58	138.61
4	20% Highest Income	16,684.16	8,734.93	2,605.09	-	76.92
Total		47,240.79	26,425.43	3,951.53	288.01	434.87

##### Urban

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	1,565.83	1,982.88	109.54	17.77	25.19
2	Under 1.5X Poverty Line	767.84	658.73	53.72	13.29	12.05
3	Middle Income	10,837.68	4,189.63	2,811.79	8.05	25.19
4	20% Highest Income	1,932.34	3,106.67	4,091.12	-	20.15
Total		15,103.68	9,937.90	7,066.17	39.10	82.57

**b.2 Regency of Bantul  
Rural**

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	3,578.24	3,716.58	-	121.57	44.19
2	Under 1.5X Poverty Line	3,409.90	2,889.05	-	35.23	35.18
3	Middle Income	12,648.03	11,369.30	4,052.21	58.09	128.42
4	20% Highest Income	9,296.54	5,765.06	4,376.33	-	35.91
Total		28,932.71	23,739.99	8,428.55	214.89	243.69

**Urban**

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	4,196.09	2,643.20	293.55	24.80	39.51
2	Under 1.5X Poverty Line	19,760.60	10,892.50	1,882.94	219.63	74.89
3	Middle Income	119,660.67	58,294.70	21,277.00	79.29	336.31
4	20% Highest Income	33,003.67	35,739.59	21,586.15	46.64	44.61
Total		176,621.02	107,569.99	45,039.64	370.37	495.32

**b.3 Regency of Gunungkidul  
Rural**

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	3,402.18	6,510.14	-	42.49	65.71
2	Under 1.5X Poverty Line	24,332.18	23,583.13	-	409.87	356.58
3	Middle Income	43,919.10	28,953.41	7,742.81	97.21	492.07
4	20% Highest Income	23,466.74	20,998.85	11,110.94	-	307.42
Total		95,120.21	80,045.53	18,853.75	549.56	1,221.78

**Urban**

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	802.38	809.43	56.13	6.03	13.27
2	Under 1.5X Poverty Line	1,621.51	1,044.01	113.44	23.70	12.80
3	Middle Income	3,218.56	2,443.25	913.87	7.59	11.46
4	20% Highest Income	1,799.99	1,922.33	1,526.68	-	-
Total		7,442.44	6,219.02	2,610.13	37.32	37.53

**b.4 Regency of Sleman  
Rural**

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	284.80	251.46	-	10.33	4.91
2	Under 1.5X Poverty Line	744.31	602.37	-	17.80	9.39
3	Middle Income	11,344.17	10,875.41	2,109.26	22.25	102.68
4	20% Highest Income	4,793.47	4,233.71	1,733.31	-	14.25
Total		17,166.75	15,962.95	3,842.57	50.39	131.24

### Urban

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	17,202.17	5,978.39	1,203.43	137.83	117.02
2	Under 1.5X Poverty Line	26,421.74	11,679.39	1,848.42	707.10	156.03
3	Middle Income	120,387.28	81,402.77	41,825.78	145.68	297.21
4	20% Highest Income	28,166.57	62,966.95	32,968.47	-	18.56
Total		192,177.76	162,027.50	77,846.10	990.60	588.82

### b.5 City of Yogyakarta

#### Urban

No.	Income category	Energy Consumption in 2008 (BOE)				
		Kerosene	Electricity	LPG	Coal Briquet	Biomass
1	Under Poverty Line	4,733.52	2,891.95	331.15	35.39	3.61
2	Under 1.5X Poverty Line	8,576.44	4,421.64	869.47	107.26	1.99
3	Middle Income	83,196.59	59,869.58	36,055.73	120.26	8.87
4	20% Highest Income	15,011.68	32,448.79	21,682.50	-	1.27
Total		111,518.24	99,631.95	58,938.85	262.92	15.74

### c. Commercial Sector

No.	Subsector	Energy Consumption in 2008 (BOE)				
		ADO	Kerosene	Electricity	LPG	Total
1	Hotel and Lodging	32,798.41	66.42	51,671.36	1,875.70	86,411.90
2	Wholesale and Retail	-	-	57,553.30	1,386.87	58,940.18
3	Restaurant	-	2,134.30	149,932.44	8,857.10	160,923.84
4	Financial Services	3,939.25	-	14,812.12	9.52	18,760.90
5	Amusement Services	1,072.92	-	30,374.34	19.30	31,466.57
6	Social Services	1,539.15	-	13,251.10	8.94	14,799.20
Total		39,349.74	2,200.73	317,594.67	12,157.44	371,302.58

### d. Industrial Sector

No.	Subsector	Energy Consumption in 2008 (BOE)						
		ADO	IDO	Kerosene	Fuel Oil	Electricity	LPG	Coal
1	Food	11,981.03	3.48	517.84	12,141.41	16,518.78	996.01	-
2	Textile	10,534.43	197.22	455.31	7,971.42	65,896.89	451.45	9,684.29
3	Wood	256.69	0.18	11.09	308.26	3,744.42	76.94	-
4	Paper	75.77	-	3.27	14.60	1,874.06	2.73	-
5	Chemical	2,274.97	1.88	98.33	268.90	5,966.01	8.57	-
6	Non Metal	4,820.28	0.82	208.34	2,173.58	5,383.83	402.46	367.74
7	Machinery	461.17	-	19.93	52.89	14,153.06	35.11	-
8	Other	1,823.58	7.87	78.82	402.88	4,899.70	26.70	2,922.87
Total		32,227.91	211.45	1,392.94	23,333.94	118,436.77	1,999.97	12,974.90

**e. Transportation Sector**

No.	Subsector	Energy Consumption in 2008 (BOE)			
		Premium	ADO	Avtur	Total
1	Passenger Car (unit)	901,623.06	46,571.71	-	948,194.77
2	Motorcycle (unit)	964,824.86	-	-	964,824.86
3	Bus (unit)	-	139,282.08	-	139,282.08
4	Truck (unit)	256,766.73	277,210.41	-	533,977.15
5	Railway (1000 Km)	-	22,112.92	-	22,112.92
6	Aeroplane (1000 Km)	-	-	233,750.40	233,750.40
Total		2,123,214.66	485,177.13	233,750.40	2,842,142.19

**f. Other Sector**

No.	Subsector	Energy Consumption in 2008 (BOE)		
		Kerosene	ADO	Total
1	Construction	-	31,433.68	31,433.68
2	Agriculture	100.02	20,434.97	20,534.98
3	Mining	-	645.00	645.00
Total		100.02	52,513.65	52,613.67

## ANNEX V: Energy Supply

### 7. Crude Oil

#### a. Oil Fuel Storage

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

Source: Pertamina

#### 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
43	SPBU 44 558 03	Regency of Bantul	Arif Sampurno	19.61	5.94

No	No. SPBU	Address	Owner	Average Selling (KL/day)	
				Premium	ADO
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 Ayuningtiyas. 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
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

No.	No. Pangkalan	Address	Owner	Average Selling (KL/day)
38	140255	Regency of Sleman	Shinta Rachmawati	5.00
Total				381.61

Source: Pertamina and Dinas Disperindagkop

## 8. Hydropower

No.	Name	Location	Potential (kw)
1	Saluran Kalibawang	Kedungrong 1	90.0
2	Saluran Kalibawang	Kedungrong 2	100.0
3	Saluran Kalibawang	Semawung	600.0
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			1,188.6

Source: Dinas Disperindagkop

## 9. 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	804	34.44
2	Wates	1,327	48.78
3	Bantul	1,322	54.67
4	Sedayu	957	42.17
5	Wonosari	2,177	68.35

No.	Regency/City	20 kV	
		Unit	MVA
6	Sleman	1,108	65.60
7	Yogyakarta Utara	925	79.60
8	Yogyakarta Selatan	855	65.58
Total		9,475	459.19

Source: PLN 2008

### c. Transmission dan Distribution Line

No.	Line Type	Length (kmc)
1	Intermediate voltage	20 kV 4,716.48
2	Low voltage	380/330 V 7,656.56

Source: PLN 2008

### d. Charged Capacity

No.	Customer category	Electricity sold (MVA)							
		2001	2002	2003	2004	2005	2006	2007	2008
1	Household	400.93	413.80	428.28	449.38	463.94	457.81	516.35	541.10
2	Social	28.31	29.17	30.06	31.31	33.05	33.62	41.33	50.80
3	Public	14.88	16.34	18.43	21.32	27.43	27.91	34.30	38.01
4	Industry	87.66	86.70	87.47	86.89	86.31	85.36	86.21	85.00
5	Business	107.40	114.24	118.99	125.52	133.90	142.11	159.24	167.57
Total		639.18	660.23	683.21	714.42	744.62	746.82	837.43	882.48

Source: PLN 2008

### 10. Biomass

No.	Regency/City	Biomass Potential (ton)			
		Paddy	Maize	Coconut	Sugar Cane
1	Kulonprogo	116,948.58	20,238.47	26,924.40	3,511.92
2	Bantul	156,755.38	23,013.39	10,201.11	6,941.15
3	Gunungkidul	252,024.40	221,941.47	7,282.91	411.90
4	Sleman	271,493.09	20,166.29	8,369.41	4,920.34
5	Yogyakarta	1,026.80	8.02	14.71	-
Total		798,248.24	285,367.64	52,792.54	15,785.31

Source: BPS

### 11. Biofuel

No.	Regency/City	Biofuel Potential (ton)	
		Cassava	Sugar Cane
1	Kulonprogo	42,131.43	3,511.92
2	Bantul	36,492.01	6,941.15
3	Gunungkidul	797,513.22	411.90
4	Sleman	16,789.75	4,920.34
5	Yogyakarta	-	-
Total		892,926.41	15,785.31

Source: BPS



## 12. Biogas

No.	Regency/City	Biogas Potential (animal)					
		Cow	Goat	Poultry	Pig	Buffalo	Sheep
1	Kulonprogo	51,404	75,276	2,429,656	744	332	23,687
2	Bantul	51,452	46,746	1,905,674	3,317	734	24,999
3	Gunungkidul	115,421	147,340	1,547,684	67	136	12,581
4	Sleman	51,504	35,075	6,480,705	4,519	3,387	68,955
5	Yogyakarta	146	343	67,146	119	18	553
Total		269,927	304,780	12,430,865	8,766	4,607	130,775

Source: BPS

## 13. 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

## 14. 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

## ANNEX VI. Energy Price and State Revenue from Energy Sector

### a. Oil Fuel

No	Type	Oil Fuel Price (Rp/liter)					
		Jan 06	Jul 06	Jan 07	Jul 07	Jan 08	Jul 08
1	Avtur	5,390	6,083	-	-	-	-
2	Avgas	10,750	14,666	-	-	-	-
3	Premium						
	a. Transportation	4,500	4,500	4,500	4,500	4,500	6,000
	b. Industry	4,780	6,502	4,838	6,179	7,341	9,126
4	Pertamax	5,000	6,100	5,400	6,600	8,900	8,900
5	Pertamax Plus	5,200	6,300	5,550	6,700	9,000	9,000
6	Kerosene						
	a. Household	2,000	2,000	2,000	2,000	2,000	2,500
	b. Industry	5,320	6,372	5,541	5,926	8,091	11,229
7	Automotive Diesel Oil						
	a. Transportation	4,300	4,300	4,300	6,125	4,300	5,500
	b. Industry	4,950	6,321	4,983	5,859	7,944	11,277
8	Industrial Diesel Oil						
	a. Transportation	5,020	6,065	4,886	5,677	7,747	10,761
	b. Industry	4,810	6,065	4,886	5,677	7,747	10,761
9	Fuel Oil						
	a. Transportation	3,640	3,759,48	2,927	3,950	5,496	6,783
	b. Industry	3,480	3,759,49	2,927	3,950	5,496	6,783

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

**ANNEX VII. Other Information****16. List of Regional Regulation Related to Energy**

No.	No. of Regulation	Content
1	No. 3 Tahun 2002	Development Program of Yogyakarta Province

**17. List of Energy Stakeholders****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