

The electricity sector in germany engineering essay

[Engineering](#)



2. 1 INTRODUCTION OF THE ELECTRICITY SECTOR IN GERMANY

In the year 2009 the electricity sector produced 61 % fossil fuel power, produced 23 % nuclear power and 18 % renewable energy whereas we can see that wind, solar, hydro, geothermal power is totally negligible in Germany. Germany has mainly planned a policy of phasing out nuclear power by 2022. As comparing 2009 to 2004 nuclear power production has decreased by 19 %. From total power production their share has been declined from 27 % to 23 % with a rise in renewable electricity which includes wind power, biomass, solar power and also increase in coal and natural gas consumption. Due to nuclear power there is an increase in coal share of power production to 50 %. EU15 average (EU15: 7409 kwh/person) an 77 % of the OECD average (8, 991 kwh/person) is equal in the year 2008 which is been produced by Germany by considering per person consumption. Germany is one of the largest exporters of electricity with 10 % of the overall exports. During the year 2010 Germany reinforced its position as a net exporter by 20 %. There are four largest electricity companies (RWE, E. ON, Vattenfall and EnBW) which are dominating to German electricity industry. These four largest companies together control 90 % of the country's electricity generating capacity. This structure grouping with the jamming prevailing at all German borders with the exception of Austria is thought to stop effective competition from developing. As the new supplier entered in to the market after the liberalization the graph has fallen sharply in recent years and due to this effect there are many supplier who exit from the German market. In 1998 there was full competition between electricity and

gas market in Germany but there are frequent players in both markets. Electricity and gas sector is not competitive because they are characterized by high degree of horizontal and vertical integration as they are dominated by a few of the largest company. Most of the large electricity and gas network operators are already removed and the deadline for removing is 1st July 2007. In gas sector retail prices are free for all customers where as in case of electricity sector charges for households will continue to be regulated until 1st July 2007. In all European countries the German customer pays the highest prices for the electricity. Since 1995 prices for households have remained same which is less than 6 % increase in spot price. After Italy and Luxembourg the household are the third highest among all member states. In 2006 the EU average of the household price is 27 %. From 1995 to 2001 there is a decline trend in electricity prices for industrial users. Since they have been constantly rising every year and currently increasing 16 % above the EU 15 and EU25 average.

Electricity per person and by power source Electricity per person in Germany

Energy in Germany
 Capita Prim. energy Production Import Electricity Co2-
 emission Million TWh TWh TWh TWh Mt
 2004 82.54 04815822509580849200782.
 3385315942344591798200882. 1389915602453587804200981.
 9370514782360555750201081. 8380715282362590762
 Change 2004-2010-
 0.9 %-6.9 %-4.4 %-6.9 %2.7 %11.3 %Mt= 12.63 TWh, prim. energy
 includes energy loss that are 2/3 for nuclear power

2. 2 ROLE IN THE ECONOMY OF ELECTRICITY SECTOR IN GERMANY

The electricity sector plays an important role in an economy. Though the substantial development made in the power sector in the country, most of the regions in the country are suffering from shortage of electricity.

Sufficient capacity addition and its utilization in the most optimal manner results the most important aspect of the power development. Adequate capacity addition, an extensive network of transmission and distribution has been developed over the years for evacuating power produced and utilizing the same by the ultimate consumers. The new capacity additions call for further development of the transmission system. The addition programmed is being constantly monitored by the Power System Project Monitoring division in the Central Electricity Authority.

2. 2. 1 ROLE OF CENTRAL ELECTRICITY AUTHORITY

The Central Electricity Authority is a key foundation in promoting and assisting the timely completion of the scheme for improving and increasing the electricity system. The Power System Project Monitoring Division which working as a facilitator in faster construction of the transmission schemes and renders valuable help to the utilities in solving their problems like technical, financial and arranging various clearances like forest clearance from MOE and F etc.. To achieve the target of the electricity sector the officers of the Power System Project Monitoring Division conduct the " REVIEW MEETINGS" in the of Central Electricity Authority which provide an excellent ground for interaction and to ensure the completion of schemes.

2.3 STRUCTURE OF ELECTRICITY SECTOR IN GERMANY

Germany's electricity industry is a traditionally developed system with federal structure existing alongside public and private utilities. It has progressed in to a three tier electricity supply system consisting of supra regional associations, regional utilities and municipal power suppliers. The electric utilities concluded differentiation agreements among each other, which defined their respective supply areas within these they signed concession contract with the municipalities, the marvelous power of these regional monopolies also affected the prize of electricity and gas. The strongly centralized structure of energy supply was claimed to be essential for protection, efficiency and supply reliability, in the context of nuclear power it was argued that reactor safety could only be assured for centralized, large power stations with regard to coal-fired power plants. It was seen that modern, economical pollution control was only potential with large scale power stations. Before the EU committee launched in the 1980s, the structure had proved to be inflexible to the area that the German energy market remained almost entirely protected from the competition in the market. German politics unbreakable the rigidity of those structures and so did the fact that all the parties had silently accepted the reasons for monopolization. Liberalization of the energy market effected the revision of the German energy industry act in 1998 due to the demanded by the EU. The major purpose of these revisions was to stand in the competition in the electricity market to meet the objective by using lower electricity and gas prices that were affected by the inflation. The energy industry had become costly and useless as a result of its protection. Large IPPsTwo semi-public

<https://assignbuster.com/the-electricity-sector-in-germany-engineering-essay/>

power companies Six semi-public power companies (ELSAM) Large
 IPPs ELKRAFT power pool ELKRAFT system (grid operator) Extra (grid operator)
 Germany

Germany

Small IPPs Small IPPs 24 distribution companies 78 distribution companies

CHART 1: Structure Of Electricity Sector In Germany

2. 4 FUNCTION AND BUSINESS ACTIVITIES OF ELECTRICITY SECTOR IN GERMANY

There are many activities which are been produced by the Germany are as follows:

NUCLEAR POWER

In March 2011, nuclear power in Germany accounted for 24% of nationwide electricity consumption before the eight plants had shut down permanently. In the 1950s and 1960s German nuclear power initiated with research reactors, and coming online in 1969 with the first commercial plant. In recent 10 years it has been high on the biased agenda with continuing debates about when the technology should be removed out. The topic has been renewed in 2007 due to the two reasons: Due to the political crash of the Russia- Belarus energy dispute. In 2011, after the Fukushima I nuclear accidents.

RENEWABLE ELECTRICITY

Renewable electric power formed in 2009 by source. In Germany the share of electricity created from the renewable energy has increased from 6. 3% of

the nationwide total in 2000 to over 26 percent in the first half of 2012.

Renewable energy distribute of gross electricity utilization rise from 11% in 2005 to 25% in 2011. Main renewable electricity sources were in the 1st half of 2012: hydropower 14. 7%, wind energy 36. 6%, photovoltaic's (solar) 21. 2%, biomass 22. 5% and biowaste 3. 6%. In 2010, fully investments totaling 26 billion euros were made in Germany's renewable energies sector.

Especially in small and medium sized companies, according to official figures there are only 370000 people in the Germany were employed in renewable energy sector in 2010. This is an increase of approximately 8 percent compared to 2009 around 339600 jobs and well over twice the number of jobs in 2004 around 160500. With reference to that three-fourth of these jobs are attributed to the Renewable Energy Sources Act. Germany has been known as " The World's Major Renewable Energy Economy". In first six month of 2012 25. 1% of Germany's electricity supply was created from renewable energy sources which is higher than the by nuclear power stations. There was a cumulative installed total renewable power of 66. 7GW in ending of 2011. Solar photovoltaic power is used extremely, even though Germany claims no high irradiation. At May 25, 2012 on Saturday, Solar power reached a latest record with feeding 25 GW, as much as nuclear stations, into German power grid, which made 60% of the nation's midday's electricity requirement on this day.

CHART 2: Activities been generated by Germany

COAL

Power mix in 2008 integrated with 291 TWh Coal (46% of total 631 TWh).

Germany was ranked in fourth position for Coal- produced power after China (2733 TWh), USA (2133 TWh) and India (569TWh).

Wind power

Major wind power suppliers in Germany up to 2009 were RE power System 9%, Enercon 60% and Vestas 19%. Wind power was installed in Germany 25. 777 GW at the end of 2009 and 27. 214 GW at the end of 2010. The contribution of wind power was in average 9. 4% of electricity requirement in the end of 2010. After Denmark (24% of electricity), Spain (14. 4% of electricity), Ireland (10. 1% of electricity) and Portugal (14% of electricity), this was fifth top in Europe.

Energy Consumption

Germany is one of the biggest clients of energy in the world. In 2009, it consumed energy from the given below sources: Oil 35. 6% Bituminous coal 11. 2% Lignite 11. 5% Natural gas 22. 7% Nuclear power 16. 0% Hydro and wind power 1. 7%

Others

As Germany imports about two thirds of its energy, Renewable energy is more present in the nationally produced energy. In the world, Germany is the fifth biggest consumer of Oil. Germany imports largest part of Oil from Russia, Norway and United Kingdom, in that order. Germany is the third

biggest consumer of natural gas in the world. Germany is the fourth largest consumer of coal in the world because of its location at the center of Europe.

Energy efficiency

The energy efficiency bottom- up index for the entire economy (ODEX) in Germany reduced by 18% between 1991-2006, which is same to an energy efficiency enhancement by 1. 2% per annum on average based on the ODEX, which calculates technical efficiency improvements. As the starting of the new century, though, the efficiency improvement measured by the ODEX slowed down. While between 1991-2001, a constant decrease by 1. 5% could be experienced, the reduce in the period 2001-2006 only amounted to 0. 5%, which is lower the EU-27 level. Germany projects a 25 % drop in electricity requirement by 2050.