

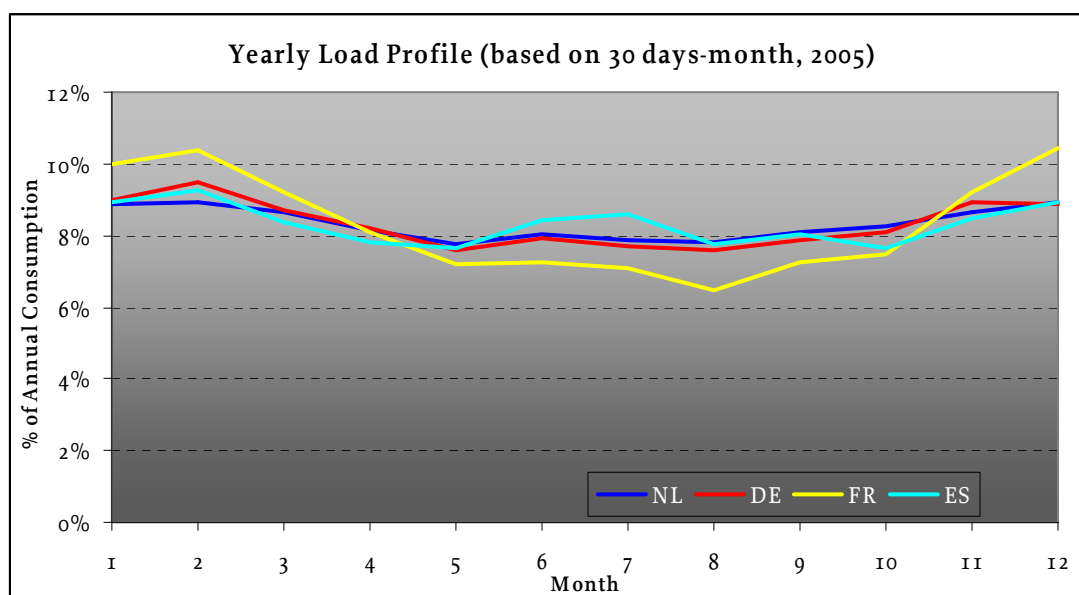
Introduction to the Power Market

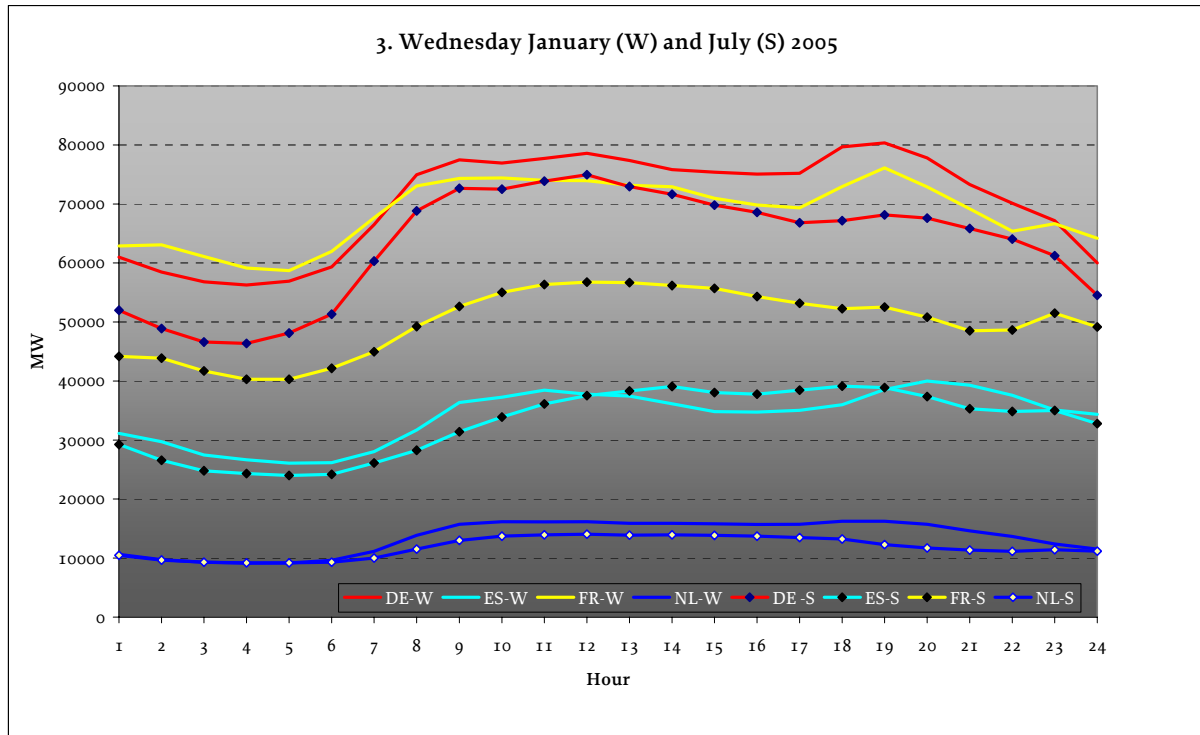
1 Introduction

Electricity is a secondary energy source and it is made from the conversion of primary energy. Electricity can not be stored, demand and supply has to be matched simultaneously. Due to the high cost of transportation almost all Electricity is generated and consumed either domestically or regionally. This results in highly volatile prices spot market prices.

2 Electricity Demand

Electricity is consumed in a wide variety of domestic, commercial and industrial applications. The main drivers of electricity demand are industrial applications, the weather, daily and seasonal variations. Industrial demand is usually stable and predictable and follows industrial processes, there is minimal variation in this demand segment. Domestic and commercial demand are less predictable and follows heating/cooling loads, lighting loads, and other miscellaneous uses such as television schedules etc. Domestic and commercial loads vary within the day, across the week and throughout the year. The use of electricity for heating purposes varies a lot from country to country. For example in the Netherlands only 3% of houses use electricity for heating whereas in Spain and France it is widely used (70%, 25%). The typical yearly demand profile for a sample of European countries is shown below.

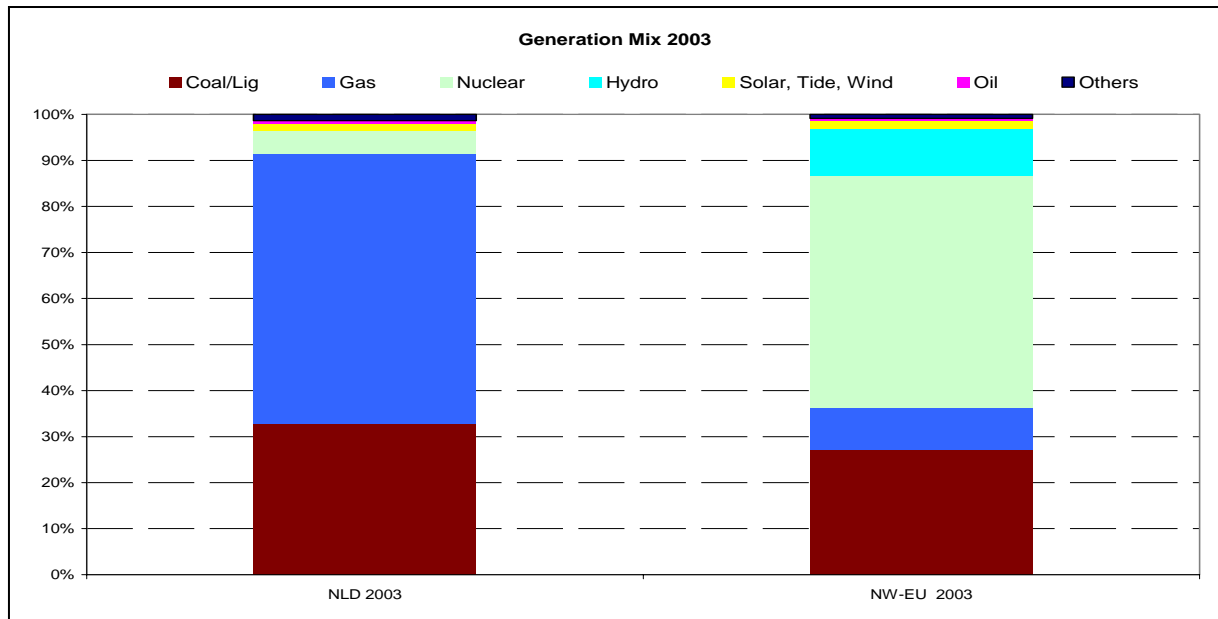




3 Electricity Supply

Electricity is generated from a variety of sources ranging from fossil fuels (gas, oil, hard coal and lignite), to nuclear and renewable source such as hydro, wind, biomass. Each generating fuel type has specific characteristics including investment costs, cost of generation, operating characteristics and constraints and environmental impact.

Almost all the electricity generation infrastructure in Europe was commissioned during the era of nationalisation. The electricity generation mix was chosen to maintain security of supply by diversifying the fuel mix and to utilise the available natural resources within the country. The political interpretation varied across various countries. For example the Dutch fuel mix is largely dominated by gas fired generation as the Netherlands is endowed with large gas resources. After the first oil price shock France made the decision to invest heavily in nuclear power plants, whereas German electricity production rely on hard coal and lignite as a domestic fuels. In contrast Norway's power production is 99% hydro driven.



NW-EU consists of CH, FR, DE, NL, AU, BE, LU/ Source: IEA Electricity Statistics 2005

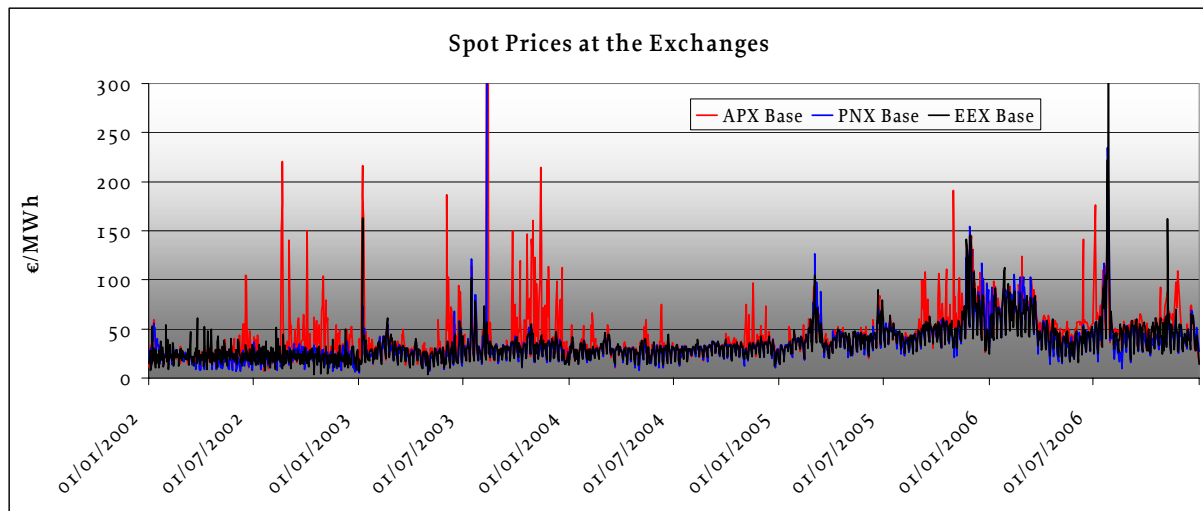
Due to the different generating fuel mixes in the various countries, the cost to generate electricity varies from country to country and is driven by different factors. For example average prices are higher in the Netherlands than in German as gas prices are higher than coal prices.

4 Interconnections

The high voltage electricity transportation network also known as the transmission grid in the individual European countries is interconnected with neighbouring transmission grids to form an integrated meshed grid across Europe.

Following the liberalization of the European electricity market and the unbundling of electricity sector (separation of the vertically integrated industry into generation, transmission distribution and supply), the "[Union for the Co-ordination of Transmission of Electricity](#)" (UCTE) was established. The aim of the UCTE was to coordinate the operation, integration and development of the electricity transmission grid from all the 23 member countries.

So far the cross border capacities within the UCTE are not sufficient to allow full price convergent. There are still several bottlenecks like UK /FR, ES/ FR, NL <-> DE/BE/FR, CH/ IT which lead to persistent price differences between the different countries (see graph which shows the spot prices at the Dutch Exchange (www.apxgroup.com) and German Exchange (www.eex.de) and French Exchange (www.powernext.fr)).



5 Trading market

The trading market usually refers to power which is delivered on high voltage network and does not include distribution network charges. Electricity markets have been set up in majority of the EU member countries to buy and sell electricity. The traded contracts range from day-ahead up to several years ahead. Deals can be done over-the-counter (OTC) and via exchanges. Majority of electricity traded is for physical delivery.