“The Methodologies, tools and potential contribution of Forecasting in energy related-related decision-making.”
Forecasting the electricity demand in Greece

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Aims and Objectives:

The aim of the current project is to find the appropriate methodology in order to create accurate and precise forecasts on energy matters, such as future electricity demand.

Towards this aim, a set of **objectives** has been established, as listed below:

An appropriate methodology for creating forecasts will be chosen and discussed

Data for energy consumption over the past years will be collected, analysed and explained

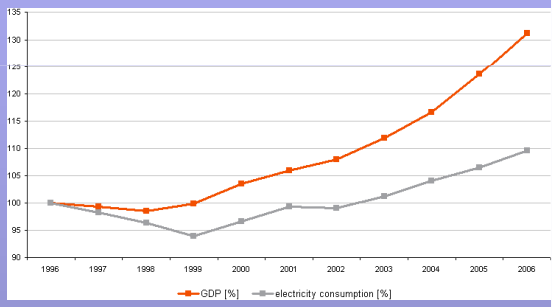
A stochastic model based on regression analysis or, maybe, time series analysis will be presented

Results from data applied on the forecasting method chosen will be illustrated

Finally, the accuracy of the forecasts will be checked and evaluated

Methodology:

For starters, all the forecasting methods will be presented. There are two main categories of reaching a forecast, either by “asking the experts” or by analysing historical data. Each of the two categories will be examined further giving their sub-categories or forecasting techniques. Each technique will be described and shortly discussed whether it is appropriate for our case (electricity demand) or not. Techniques which will not suit the case will receive no additional study, but the ones which might be the key to our problem will be discussed supported by scientific bibliography. Finally, after selecting the most appropriate technique, data on previous energy consumption will have to be collected and applied to the specific forecasting method. Data analysis will follow, as well as check of the accuracy of the forecasts and analysis of the results found.



http://www.cez.cz/edee/content/file/energie-a-zivotni-prostredi/dostavba-ete/hdp-vs-spotreba-en.gif

Background Description

Forecasts may be broadly classified into qualitative and quantitative techniques. Qualitative or Subjective methods are intuitive, largely educated guesses that may or may not depend on past data. Usually these forecasts cannot be reproduced by someone else, since the forecaster does not specify explicitly how the available information is incorporated into the forecast.

Forecasts that are based on mathematical or statistical models are called quantitative. Once the underlying model or technique has been chosen, the corresponding forecasts are determined automatically; they are fully reproducible by any forecaster.

A. Methods of Subjective Forecasting: the methods of subjective forecasting depend on the expert’s judgment on the object of forecasting. Experts may be regarded: a. special researchers of a specific object e.g. technical engineers in a car manufacture company that investigate the opportunity of constructing an engine that uses Hydrogen instead of fossil fuels, b. retailers of products under research that have direct contact with the purchasers and know their demands and future trends, c. the consumers which use the products and know if they cover their needs absolutely or have to undergo some improvements. Crucial prerequisite of the successful “subjective forecasting” is the ability and experience of the coordinator that will conduct the relative survey

B. Methods of Mechanical Forecasting: or often called quantitative or statistical methods of forecasting, rely on historical facts and data that are edited through mathematical analysis to produce forecasts. Quantitative methods can be further classified as deterministic or probabilistic (also stochastic). In deterministic models the relationship between the variable of interest (Y) and the predictor variables (Xi) is determined exactly: $Y = f(Xi; \beta i)$, where the function f and the coefficients βi are known with certainty. In the social sciences, however, the relationships are usually stochastic. Measurement errors and variability from other uncontrolled variables introduce random (stochastic) components. This leads to probabilistic or stochastic models of the form: $Y = f(Xi; \beta i) + \text{noise}$, where the noise or error component is a realization from a certain probability distribution.

CONCLUSIONS

Upon completion of the dissertation:

•A quantitative forecasting technique will be used for the subsequent analysis.

•Energy consumption is predicted to rise in the following years

•Measures for effective consultancy will be provided to avoid problem occurring from unexpected rise in consumption.

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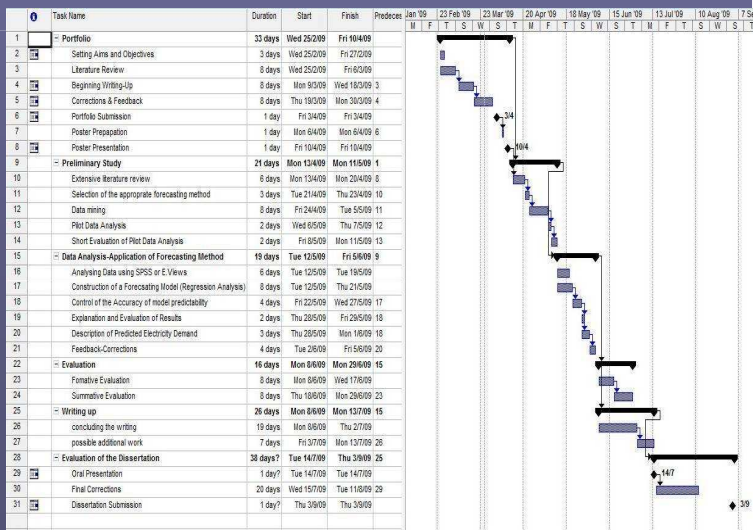
PROJECT MANAGEMENT



	Task Name	Duration	Start	Finish	Predeces
1	Portfolio	33 days	Wed 25/2/09	Fri 10/4/09	
2	Setting Aims and Objectives	3 days	Wed 25/2/09	Fri 27/2/09	
3	Literature Review	8 days	Wed 25/2/09	Fri 6/3/09	
4	Beginning Writing-Up	8 days	Mon 9/3/09	Wed 18/3/09	3
5	Corrections & Feedback	8 days	Thu 19/3/09	Mon 30/3/09	4
6	Portfolio Submission	1 day	Fri 3/4/09	Fri 3/4/09	
7	Poster Prepapation	1 day	Mon 6/4/09	Mon 6/4/09	6
8	Poster Presentation	1 day	Fri 10/4/09	Fri 10/4/09	
9	Preliminary Study	21 days	Mon 13/4/09	Mon 11/5/09	1
10	Extensive literature review	6 days	Mon 13/4/09	Mon 20/4/09	8
11	Selection of the appropriate forecasting method	3 days	Tue 21/4/09	Thu 23/4/09	10
12	Data mining	8 days	Fri 24/4/09	Tue 5/5/09	11
13	Pilot Data Analysis	2 days	Wed 6/5/09	Thu 7/5/09	12
14	Short Evaluation of Pilot Data Analysis	2 days	Fri 8/5/09	Mon 11/5/09	13
15	Data Analysis-Application of Forecasting Method	19 days	Tue 12/5/09	Fri 5/6/09	9
16	Analysing Data using SPSS or E.Views	6 days	Tue 12/5/09	Tue 19/5/09	
17	Construction of a Forecasting Model (Regression Analysis)	8 days	Tue 12/5/09	Thu 21/5/09	
18	Control of the Accuracy of model predictability	4 days	Fri 22/5/09	Wed 27/5/09	17
19	Explanation and Evaluation of Results	2 days	Thu 28/5/09	Fri 29/5/09	18
20	Description of Predicted Electricity Demand	3 days	Thu 28/5/09	Mon 1/6/09	18
21	Feedback-Corrections	4 days	Tue 2/6/09	Fri 5/6/09	20
22	Evaluation	16 days	Mon 8/6/09	Mon 29/6/09	15
23	Formative Evaluation	8 days	Mon 8/6/09	Wed 17/6/09	
24	Summative Evaluation	8 days	Thu 18/6/09	Mon 29/6/09	23
25	Writing up	26 days	Mon 8/6/09	Mon 13/7/09	15
26	concluding the writing	19 days	Mon 8/6/09	Thu 2/7/09	
27	possible additional work	7 days	Fri 3/7/09	Mon 13/7/09	26
28	Evaluation of the Dissertation	38 days?	Tue 14/7/09	Thu 3/9/09	25
29	Oral Presentation	1 day?	Tue 14/7/09	Tue 14/7/09	
30	Final Corrections	20 days	Wed 15/7/09	Tue 11/8/09	29
31	Dissertation Submission	1 day?	Thu 3/9/09	Thu 3/9/09	