## Models and scenarios for energy planning Prof. Evasio Lavagno

The lessons are aimed to supply the methodological background for describing and using the more diffuse models for energy planning at different territorial scale. In particular, bottom-up partial equilibrium LP models, their link with the economic macro-system for the exogenous demand projections and some applications are described and analysed. Practical work on modelling implementation is developed during the module

## Program:

General issues about the energy planning and interactions between energy, economy and environment The Energy Balance of a Country Reference Energy System, energy commodities, supply side and end-use technologies Environmental impacts and externalities of energy systems Technology database Models and scenarios Simulation and optimisation models Linear and non linear LP programming, stochastic approach Top-down and bottom-up approach Demand evaluation in partial equilibrium models General Equilibrium Models Some relevant applications of bottom-up Models using Markal-TIMES, approach.

## Organization:

Reports' preparation.

Applications of Linear Programming methodology to some energy systems

Depending on the number of students, it could be necessary that the students are divided into 2 teams for the development of the personal works.

Documentation is supplied by the teacher.

Discussion of the Reports made as personal work at the LAME Laboratory, written and oral exams.