Industrial Ecology Open Online Course (IEooc)

Part III: Application

Application part 4: Energy and Sustainability

http://www.teaching.industrialecology.uni-freiburg.de/

IEooc_Application4_Exercise4: Energy Demand Scenarios

Goal: *Conduct back-of-the-envelope calculations, estimate energy demand by sector, identify scenario drivers, becoming comfortable with dealing with very large numbers.*

Task: Create an energy demand scenario for a country/region of your choice for 2040! The scenario should be a likely one according to your judgement. Choose a meaningful and feasible scope of your analysis (i.e., which sectors and energy carriers you consider)!

You are free to work in groups if you like! Focus on understanding a few key sectors properly instead of trying to cover all energy usages in an aggregated manner!

Questions:

1) Sectors: Which sectors and devices (in industry, households, etc.) are the major energy consumers and thus determine society's energy demand? From your findings, determine the scope of your scenario exercise (i.e., which sectors/technologies and energy carriers you consider), and which country/region you focus on!

2) Demand drivers: What parameters are needed to estimate future energy demand in the sectors you chose?

3) What are the main differences when trying to estimate energy demand for let's say 2020 compared to 2040?

4) Provide some rough energy demand estimates for selected key sectors in the year 2040 for a country/region of your choice. Break down your estimate into different sectors and energy carriers where possible! Which sector/energy carriers show the highest demand? What are the main parameters/mechanisms to consider when estimating future energy demand? If you don't have much time, focus on a single sector!

For additional information, see

World Energy Outlook:

http://www.iea.org/publications/freepublications/publication/world-energy-outlook-2015.html

Current and future population:

https://esa.un.org/unpd/wpp/DataQuery/