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Energy systems modelling

Tutorial 5

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Modelling a 3-node system

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Homework

7. Calculate NTC hourly utilization rates.

8. What is the marginal value of NTC constraint? What is the economic meaning of this value?

9. Calculate which power plant owner benefits the most from the trade.

In class

10. How does trade affect the total costs (objective function)?

Implementing DSM

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Demand Side Management (DSM)

- DSM generally can be understood as the ‘modifications in the demand side energy consumption pattern to foster better efficiency and operations in electrical energy systems.’ (Behrangrad, 2015)
- DSM can be classified as
  - Energy efficiency
  - **DR (Demand Response)**
- The consumers modify their behavior in a lot of different ways

Implementing DSM

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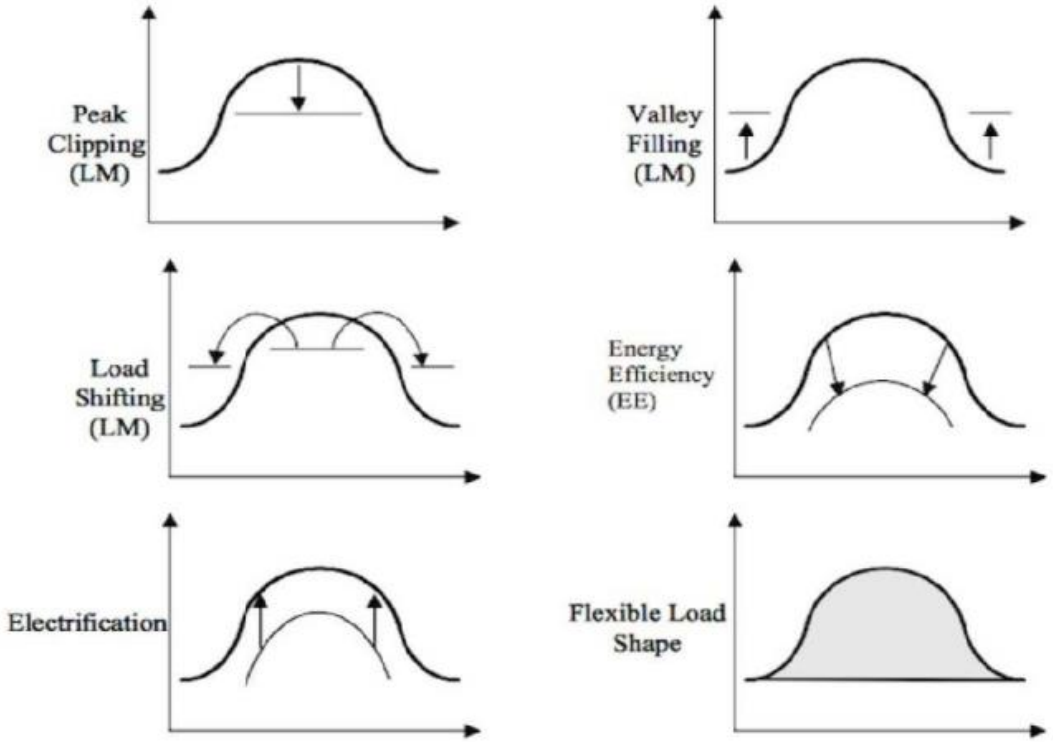
- DSM can be implemented in different ways

- The most classic form of demand response is the peak load clipping

  that can be modelled in a linear formulation by using the value of lost load (VOLL) parameter of the consumers



Source: Gellings and Chamberlin (1993)

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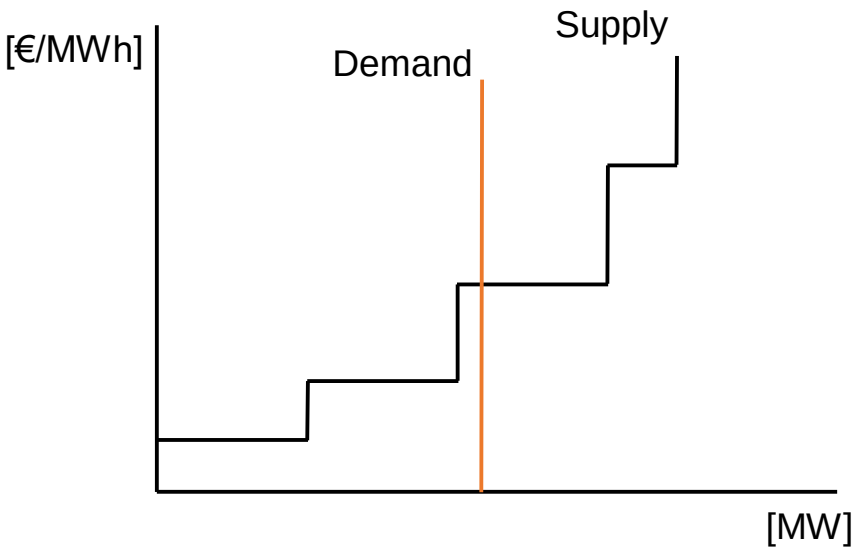
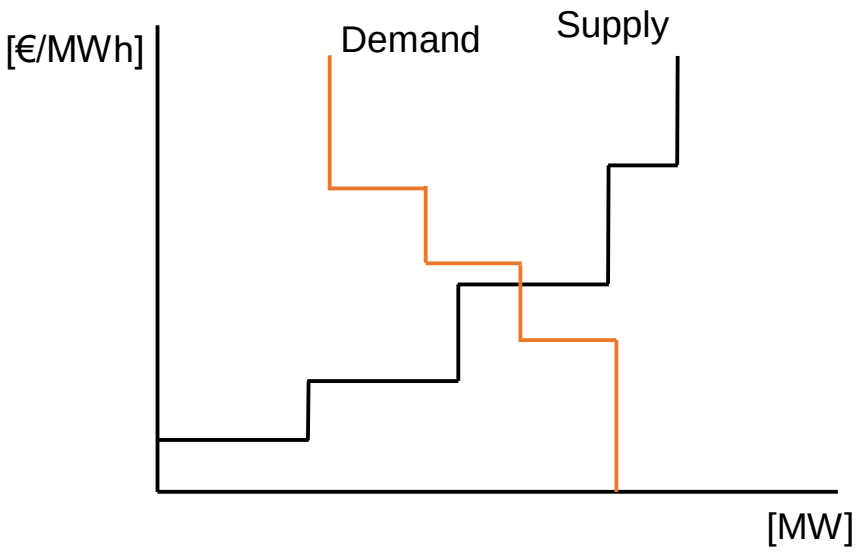
Load shedding at different price levels (e.g. for different consumers) converts the constant demand curve to a step function

Constant demand



Demand curve including DSM



See you next class!