# Teaching module: Smart metering. Social risk perception and risk governance Session 1: Smart Grids and Smart Meters

**Class plan Class time:** 3x45 min.

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| No. | Activity name | Procedure | Teaching guide | Method | Interaction type | Expected outcome | Materials | Overall time |
| 1. | Introductory lecture | 1. Definition of what IEM is 2. Examples of IEM in the world 3. Down-focus on Intelligent Energy Meters technology aspects as the subject matter of SG | Using the presentation, introduce the concept of Smart metering. Give the example of IEM and down-focus on it as the basis for the TM. | * Interactive lecture | T <-> Ss | * Better understanding of SG * IEM introduction * Understanding of IEM workings | * TM6-ST1-RM1-Smart metering - introductory lecture | 30 min |
| 2. | Presentation of end-user energy consumption data management | 1. Presentation how is energy usage/consumption calculated 2. Presentation of IEM data gathering methods 3. Presentation of a specific procedure | Introduce the concept of energy consumption cost. Present the basic equations how is energy consumption calculated. On a specific example, present the procedure of reading, calculating and managing energy consumption data of a specific end-user appliance. | * Guided lecture | T ->Ss | * Understanding of energy consumption | * TM6-ST1-RM2-End-user energy consumption | 20 min |
| 3. | End-user energy consumption data calculation | 1. Define the task (provide materials, give instructions) 2. Divide Ss into groups 3. Common assumptions 4. Ss calculations 5. Ss data evaluation 6. Whole class evaluation results discussion | The Ss are to calculate energy consumption on the basis of real life materials using multimedia for different energy providers in EU. Ss in groups establish common reference data. Allow the students to do the calculations and evaluate the results. Compare and discuss the group results on the whole class forum. | * Webquest * Project workshop * discussion | T -> Ss  Ss <-> Ss | * The skill to calculate and evaluate energy consumption | * TM6-ST1-RM3-Cost calculation exercise (blank) * TM6-ST1-RM4-Cost calculation exercise (CES - dishwasher) * TM6-ST1-RM5-Cost calculation exercise (Endesa - air conditioner) * TM6-ST1-RM6-Energy tariffs * TM6-ST1-RM7-Cost calculation example - instructions for students * TM6-ST1-RM8-Cost calculation example - instructions for teacher * TM6-ST1-RM9-Energy-label-air-conditioner-example * TM6-ST1-RM10-Energy-label-dishwasher-example | 50 min |
| 4. | Discussion on global energy consumption data management | 1. Discussion on the conclusions drawn from ex. 3 2. Discussion on how the data is gathered globally and managed by the companies. 3. Come up with ideas on “what if” something bad happens with the data. | Summarize the results obtained by groups of Ss in ex. 3 for individual end-users. Provide feedback are the results proper (if not correct). Ask the students to think how the data is processed in IoT (what and how happens to it). Draw ideas on what might happened if something wrong happens with the data. | * Panel discussion | T <-> Ss | * Understanding of the energy consumption information flow | * none | 35 min |
| 5. | Assignment with further work | 1. Find cases of smart metering 2. Familiarize with given material | Ss are asked to search and find examples of SM implementation and list discovered related risks. Ss are also asked to read the material introducing the case of Toronto Waterfront district. | * Webquest | S | * Practice of risk identification | * TM6-ST1-RM11-Toronto | - |

\* Interaction type:

**T** – teacher **S** – student **Ss** – students **->** - one way **<->** - two way