

Curriculum Recommendations – Energy Economics

Review of the existing curricula at the State Engineering University of Armenia (SEUA) and Yerevan State University of Architecture and Construction (YSUAC)

Suggestions for improvement regarding

AM-54: SEUA - Energy efficiency technologies in the energy and industrial sector

AM-55: YSUAC - Energy efficiency technologies in the design, construction and operation of buildings

AM-56: YSUAC - New technologies in the development and use of renewable energy sources (RES)

Project reference: INOGATE, New ITS project, Ad Hoc Expert Facility (AHEF), task AM-54.55.56

Review of the existing curriculum

- During the first mission to SEUA and YSUAC the curriculum followed discussed and reviewed.
- SEUA supplied an electronic copy of the text book for review.
- Review of the book showed that a broad coverage of energy subjects like energy sources, energy systems, energy management, energy project implementation and management are included.
- Discussion of the existing curriculum for BSc and MSc degrees with the YSUAC expert staff, led to the following findings:
 - The 4-year degree provides a comprehensive and detailed course on energy supply and the concepts of energy management.
 - The theoretical framework and technical content of the course notes provides a strong framework for students engaging in the study of energy as a profession.
 - Application of theory to practical use of the concepts after graduation was agreed as being an area of challenge, in common with many universities around the world.
- In view of this, it was agreed with the SEUA and YSUAC coordinators that the lecture content developed by the ITS Expert would focus on in-depth knowledge on profitability analysis and practical examples studied as case studies for EE and RES projects.
- This approach was agreed as being complimentary to the content of the existing curricula and expertise available among lecturing staff.

Learning Objectives

The lecture developed by the ITS Expert for energy economics aims at delivering the following learning objectives:

- To learn basics of Life Cycle Cost (LCC) feasibility analysis.

- To learn structured methodology for performing LCC analysis to develop bankable energy efficiency and renewable energy projects.
- To learn data collection and reality checks necessary for inputting to LCC analysis.
- To learn report writing techniques to convince investors of feasible projects.
- To understand case studies of economic analysis for energy efficiency/renewable energy projects.

Recommendations for lecture delivery

- The lecture material has been developed as a set of power point slides and an Excel based tool for conducting economic profitability analysis of RES and EE projects.
- 63 slides are prepared to deliver the lecture assuming an average of 1.5 minutes on each slide. Approximately half an hour will be spent on case studies on Excel sheets to analyze practical examples.
- Notes have been added to the slides, providing details on the slides' content and the basis of a narrative for the lecturer.
- The Excel based tool consists of four Excel sheets with one case study on each sheet. Two EE and two RES case studies are included. Practical assignments can be given to the students to use the Excel tool to calculate the feasibility parameters and conduct profitability analysis.
- Hand-outs can be easily printed out both for the power point presentation and the Excel sheets. These can act as a syllabus for students.
- It is recommended for the SEUA and YSUAC staff to consider using the Excel sheets to analyze results by playing with the input parameters for the calculations so that the student better understands the concepts, relations of parameters and effects on the result.