

Economics of Renewable Energy Technologies

3 ECTS

Course description

Aim: To enable students to undertake a techno – economic evaluation of renewable energy projects.

Learning Outcomes: On successful completion of the course, the students should be able to:

- (a) Understand and apply time value of money formulae
- (b) Determine different measures of financial performance.
- (c) Use software for the financial evaluation of renewable energy technologies
- (d) Assess the financial feasibility of renewable energy projects

Contents:

Brief overview of renewable energy technologies; Economic considerations in designing renewable energy technologies; Identification and quantification of the 'Costs' and 'Benefits' of renewable energy projects; Time value of money, discount rate and equivalence formulae; Measures of financial/economic performance; Approaches for considering uncertainty in appraisal/evaluation of renewable energy projects; Incentives (including Viability Gap Funding, Soft Loan, Feed-in-Tariff, Renewable Purchase Obligation, Income Tax Credits, Carbon Credits etc.) for promoting renewable energy technologies;

Basic-Literature for preparation

Chan S. Park "Contemporary Engineering Economics", Fifth Edition, Pearson Prentice Hall (2011)

T. C. Kandpal and H. P. Garg, "Financial Evaluation of Renewable Energy Technologies" Macmillan India Ltd. (2003)

Relevant literature from Research Journals, Reports etc. (soft versions shall be made available to the students besides those of the presentations used for classroom discussion)

Financing of Renewable Energy Technologies

3 ECTS

Course description

Aim: To provide basic knowledge, understanding and application-oriented inputs on renewable sources of energy and technologies.

Learning Outcomes: On successful completion of the course, the students should be able to:

- (a) Understand the relevance of harnessing renewable sources of energy and also of renewable energy resource assessment
- (b) Describe the designs and basic principles of operation of different renewable energy technologies and discuss their relative merits and limitations

Contents:

Brief overview of renewable energy technologies and investment requirements; Need for financing of renewable energy technologies and relevant issues in financing; Debt and Equity modes of financing; Incentives (Feed-in-Tariffs, Renewable Quota Obligations, Investment and Production Tax Credits, Subsidies, Carbon Credits etc.) and their impacts on modalities and cost of financing renewable energy technologies; Assessment and allocation of Risk in financing renewable energy technologies; Power purchase agreements; Case studies on financing renewable energy projects

Basic-Literature for preparation

Relevant literature from Research Journals, Reports etc. (soft versions shall be made available to the students besides those of the presentations used for classroom discussion)

Mode of Performance Evaluation

(similar for each of the above three courses)

Written examination is conducted at the end (usually in the last week of about six-week duration of the courses). 90-minute duration examination is conducted for each course on the same day, one after another. The students interested in appearing in the examination(s) have to register for the same as per the standard procedure of Technical University of Kaiserslautern.