Course title: Renewable energy policy and regulations			
Course code: ENR 154	**No. of credits:** 3	**L-T-P:** 16-20-12	**Learning hours:** 48
Pre-requisite course code and title (if any): NA			
Department: Department of Energy and Environment			
Course coordinator: Prof. Atul Kumar	**Course instructor(s):** Dr. P. C. Maithani		
Contact details: som.mondal@terisas.ac.in			
Course type: Core	**Course offered in:** Semester 2		

Course description

The course is meant to comprehensively impart knowledge on the overall policy and regulatory environment governing renewable energy development in the country. The students will also be sensitized to emergent trends competitive bidding in Solar and Wind based capacity addition.

The course will cover national and state policies, regulatory and legislative frameworks on Renewable Energy. Some of these policies and guidelines emanate from an overarching Act such as the Electricity Act or another overarching policy such as the National Climate Change Policy. The policies, regulations and guidelines determine electricity off-take approaches, tariffs, control period and even technical requirements like maintenance of grid frequency in a certain band etc. It is also important to have an understanding of the institutional architecture that enables implementation of the policies and regulation as much as the policies in force.

The course will present a policy and regulatory framework for renewable energy as it is practiced in India. However, similar frameworks either exist in other developing countries or certain elements can be adopted in other countries as well.

Course objectives

- To impart knowledge on the overall policy, regulatory and institutional framework on Renewable Energy
- To provide understanding of the main drivers that influence Renewable Energy policy formulation
- To provide insights on emergent policy trends with regard to procurement of renewable energy

Course contents

Module	Topic	L	T	P
1	**Introduction to policy parameters, regulatory bodies** Introduction to overall policy environment on energy sector and the parameters that drive policy formulation such as – per capita electricity Consumption, % electrification, GDP, total installed capacity, generation mix and the overall power sector structure, Entities – Consumers and their tariffs, generator, DISCOM, Regulators- CERC & SERC, Statutory bodies, SLDC, RLDC, NLDC, CTU, STU, CEA Typical issues of Indian power sector – Cross Subsidization, Theft of electricity, Transmission losses etc.	4	2	0
2	**Indian energy Policy** An Introduction to Indian Energy Policy, Electricity Act, National Tariff Policy, National Action Plan on Climate Change , National RE Policy, National Solar Missions, Wind Power, Regulatory Commissions, Grid Code, Green Corridor, Solar Parks, Hybrid Parks, Repowering, Offshore, Scheduling and Forecasting, Electricity Trading, Open Access, RPO Distributed Generation Regional Grid in the South Asian Region. Electrification and off grid status/scenario in India Scenario evolving with competitive bidding	8	6	0
3	**National grid, small grid and off grid policies** Scope and challenges in implementing off grid solutions Policy & regulatory Framework for rural electrification Micro and Mini grids Relevant policies and frameworks in other countries Recent off grid programs started by Govt. of India for enhancing the rural electrification	4	2	0

	through off-grid solutions DDG scheme under Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) Remote Village Electrification Program Village Energy Security Programme (VESP) Off grid programme under JNNSM			
4	**Seminar** For this part of the course the students can take up a case study and analyse its Policy framework, outcomes, advantages /disadvantages. Few of the case studies which students can take up are given in the reference list	0	10	0
5	**Simulation Lab/ Project** In this, the students can familiarise themselves with methods of computing net tariff after accounting for Deviation settlement under forecasting and scheduling and working with open access charges in inter-state and intra-state Tariff computation as per CERC guidelines	0	0	12
		16	**20**	**12**

Evaluation criteria

- Assignment/Lab: 50%
- Minor test: 20%
- Major exam: 30%

Learning outcomes

- Enhanced understanding of renewable energy policy environment
- Sound understanding of the institutional frameworks w.r.t. Renewable Energy
- Sound understanding of policy frame work for grid connected and off grid renewable energy

Pedagogical approach

A combination of class-room interactions, tutorials, assignments and projects.

Materials

Recommended readings

Reading Material

P R Krithika and Siddha Mahajan, Background paper: Governance of renewable energy in India: Issues and challenges
http://www.teriin.org/projects/nfa/pdf/working-paper-14-Governance-of-renewable-energy-in-India-Issues-challenges.pdf

ÇSE Presentation : Renewable Energy in India: Growth and Targets
http://cseindia.org/docs/photogallery/ifs/Renewable%20Energy%20in%20India%20Growth%20and%20Targets.pdf

Charles K Ebinger, India's Energy and Climate Policy Can India Meet the Challenge of Industrialization and Climate Change?
https://www.brookings.edu/wp-content/uploads/2016/07/india_energy_climate_policy_ebinger.pdf

Megha Kaladharan, Renewable Energy in India: An Analysis of the Regulatory Environment and Evolving Policy Trends.
file:///C:/Users/jami.hossain/Documents/COURSE/REEM%20CRS%2030-5-17/sem1/sem1/RE%20Policy/RE%20Regulatory%20and%20Policy%20Framework%20_26%20Aug.pdf

CEA : Draft Natioanl Electricity Plan 2016
http://www.cea.nic.in/reports/committee/nep/nep_dec.pdf

Gisele Schmid, The development of renewable energy power in India: which policies have been effective?
https://unige.ch/gsem/iee/files/3313/9574/8551/11103_v2.pdf

References

Electricity Act 2003
CERC Regulation on Renewable Energy
Comparative Study on Rural Electrification Policies in Emerging Economies: Keys To Successful Policies; International Energy Agency
Best practices of the Alliance for Rural Electrification: what renewable energy can achieve in developing countries; Alliance for Rural Electrification
Gokak Committee Report on DDG & Report on the Working Group on Power for Eleventh Plan (2007-12)

Journals and Magazines

The Zambian ESCO project
Sunlight Power Maroc (Morocco)
Solar Energy Supplies in Zimbabwe
Off grid solutions applied in various parts of India (e.g. LaBL- SMU, NTPC DDG, VESP, DESI Power, Husk Power, etc)
Case study - Qualified Third Party Model of Philippines
SHP in Nepal and Sri Lanka
IDCOL/Grammen Shakti model in Bangladesh
Solar PV and SHP 'fee for service' model in Laos PDR
SHP/Pico hydro in China and Vietnam
Gansu Pilot project (China)

Additional information (if any): NA

Student responsibilities

Attendance, feedback, discipline: as per university rules.

Course Reviewers

1. Mr. Chintan Shah, Suzlon
2. Mr. Dheeraj Jain, Regen
3. Mr. J Jethani, MNRE