Course title: Climate, Energy & Carbon Markets			
Course code: PPM 221	**No. of credits:** 3	**L-T-P**: 26-04-00	**Learning hours:** 30
Pre-requisite course code and title (if any): N.A.			
Department: Policy and Management Studies			
Course coordinator:		**Course instructor(s):** Dr Gopal Sarangi	
Contact details:			
Course type: Core		**Course offered in:** Semester 2	

Course description

The energy sector is associated with significant contributions to a country's carbon emissions and there exists a strong nexus between energy and climate change. Several countries are party to the Paris Agreement (PA) and are supposed to report their emissions to UNFCCC on a regular basis and develop the GHG emissions inventories. In this course, the students shall be provided with an overview on global climate agreements, energy specific emissions, and tools and methodologies for accounting and reporting the emissions, importantly market-based mechanisms as evolved under Art. 6 of Paris Agreement. They shall be apprised on the Indian GHG inventory and the initiatives to reduce the same. Importantly, students will be appraised on the emerging Indian carbon market and India's experience in CDM and VCM markets. Carbon pricing and trading has been identified as a tool to reduce emissions. In this context, the students shall be taught about the various trading mechanisms operational worldwide along with their pricing structures.

Course objectives

- Understand and appraise the importance of market-based instruments for environment and climate change
- Get an overview on global climate goals, strategies and international agreements including those of market-based mechanisms and Indian climate policy, regulation and emerging carbon market architecture
- Understand and apply the energy related GHG emissions and carbon emissions and their estimation procedures
- Understand and apply the methods and tools of carbon footprint assessment for key sectors

Course content

Module	Topic	L	T	P
1	**Introduction to Market Failure and MBIs** Market failure: public bads and externalities, Basic regulatory instruments, Command and Control (CAC) versus, Market Based Instruments (MBIs), Different forms and typologies of MBIs, Understanding and estimation of Marginal Abatement Cost (MAC) and their importance in the context of carbon market	4	0	0
2	**Global climate change regimes and carbon market** Climate and energy nexus Global carbon budget distribution, and budget allocation issues Climate change and greenhouse gas (GHG) emissions Market mechanisms operated under Kyoto such as CDM, JI and IETs	6	0	0

	and Paris Agreements under Art. 6			
3	**Carbon pricing and markets** Different forms of pricing carbon (e.g., cap and trade, carbon tax, etc.) Carbon markets prevalent across globe Voluntary and compliance carbon markets Introduction to Internal Carbon Pricing (ICP) & Carbon labeling	5	2	0
4	**Carbon assessment techniques and methods** Gases, Sectors, and methodologies Estimation of carbon footprint and its assessments IPCC guidelines for National GHG inventories Case Studies from key sectors	5	2	0
5	**Indian policies and regulations around energy and carbon market** Existing market-based mechanisms for energy and climate change (e.g. PAT, REC) and non-market instruments (e.g. building codes, appliance standards) Commitments under UNFCCC and Paris Agreement NDC goals for mitigation, Accounting and Reporting Net-zero goal and pathways and market mechanisms Low carbon growth strategy of the country Emerging Carbon Market in India- context and future market design and market architecture, green credits	6	0	0
		26	**4**	**0**

Evaluation criteria

Classroom exercises 20%

Group Assignments/Presentations 30%

Major Exam 50%

Learning outcomes

After completing this course, students would be able to:

- Understand the various global climate regimes and MBIs as evolved and implemented in the climate change context.
- Understand and appraise the theoretical and practical basis of carbon market as a market mechanism and other carbon pricing mechanisms.
- Develop the ability to interpret, estimate and analyze the carbon footprint assessments and carbon pricing mechanisms
- Appraise, understand and apply the tools and techniques through the demonstration of case studies on carbon market in key sectors

Pedagogical approach

The course will be delivered through classroom lectures, assignments, classroom exercises with relevant case studies.

Material

Textbook

- Kolstad C.D. (2002) *Environmental Economics*, Oxford University Press.
- UNDP (2014) *Carbon Handbook,* United Nations Development Programme (2014)
- Gupta M. (2006) *Restricting Greenhouse Gas Emissions: Economic Implications for India,* New Delhi.
- S, Benjamin Stephan and R. Lane (2015) *The Politics of Carbon Markets*, Routledge
- Macinante, J. D. (2020) *Effective Global Carbon Markets,* Elgar Studies in Climate Law

Suggested readings/ Websites

- BEE (India) - National Carbon Markets Scheme
- MoEFCC (India) GHG Inventory
- NAPCC, India
- UNFCCC - National Inventory Submissions https://cdm.unfccc.int/about/index.html
- World Bank - State and Trends of Carbon Pricing (Annual Reports)
- Selected online readings on Carbon Pricing : https://eplibrary.libguides.com/CART/SR/carbon_pricing/e-books

Journals

- Energy Policy
- Energy Economics
- Applied Energy
- Climate Change Economics
- Climate Policy
- Energy
- Global Environmental Change
- Renewable Energy
- Review of environmental economics and policy
- Sustainable and Renewable Energy reviews
- Carbon Energy

Additional information (if any)

Student responsibilities

The students are expected to submit assignments in time.

Course reviewers

- Mr. RR Rashmi, IAS (Retd.), Distinguished Fellow and Director, Earth Science and Climate Change, TERI
- Prof. Sacchidananda Mukherjee, Professor, National Institute of Public Finance and Policy
- Dr Vaibhav Chaturvedi, Senior Fellow, Councial on Energy, Environment and Water (CEEW)
- Dr Aman Srivastava, Fellow, Climate Policy, Sustainable Futures Collaboratives (SFC) and Visiting Faculty, Kautilya School of Public Policy, Hyderabad