SESSION 1.3 (LOW CARBON INNOVATION)

Urban Mobility System in Transition: a Case of Delhi City

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Abstract: The paper begins with a research question, why Delhi city has become an entry point of urban transition thinking? It attempts to argue the need to focus on the neglected part of transition studies, regional context of transition. Although this field has attended maturity in the European settings, geography of transition has been emerging as a new line of research. The existing literature has been mainly confined to the national focus of transition while neglecting the concept of spatial location in the transition processes. In this background, Transition theory what so called Multi Level Perspective (MLP) has been applied to explain the experimentation of urban mobility in India. Methodologically, Case study has been selected in the Delhi city to understand the historical transition of CNG from Petrol/Diesel in the heart of the city. It argues that the region of Delhi has become a significant spatial location where radical innovation, experimentation and upscaling of CNG technology take place in niche. The case study has found that compressed natural gas (CNG) urban mobility in Delhi city narrates a successful story of urban mobility transition in India and Asia, thereby brining urban solutions of air pollution and climate change in the city, also this case might be significant if will become introduction of possible mobility transition system in India.

Analysing energy induced technological changes in Indian economy: A sectoral study

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Abstract: Recognizing the nexus between growth and energy use, a fast growing country like India, is an ideal case for empirical assessment of increasing energy use in terms of

consumption pattern driven by shifts in demand and technological changes. While the introduction of new technology contributes to lower energy use due to improved efficiency, the introduction of energy consuming machinery itself may cause an increase in energy use. Therefore, it is important to explore the sectoral dynamics of development. We study the relative contributions at the sector level in an economy-wide framework using the hybrid Input-Output model for structural decomposition analysis. Results for the overall economy show that changes in the production technology have been energy saving with a lagged response of non-energy inputs, as compared with energy inputs. Comparison of the changes in energy use from final demand shifts highlights the need to drive final demand expansion towards less energy intensive sectors. Or, at the least increasing energy use from final demand should be compensated with a corresponding technological improvement.

Sustainable innovations for inclusive development: A study of domestic biogas plants and solar lighting systems

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Abstract: In the context of large developing economies sharing a crucial role in the international climate discourse, sustainable development has soon come to be their new development agenda. While India, proposes to design '*sustainability'* to co-benefit its growth and development goals, this paper throws light on small scale green energy applications- domestic biogas plant and solar home lighting systems- to tackle energy poverty. Technological innovations and the capacity building for the same ought to align with the physical, economic and socio-cultural norms of the final users to not only determine its usage in the present point of time, but its evolution and applicability in changing times. We examine this under the following heads: actors, networks and their interactions, financing innovation and innovation outcome and way forward. India's goal to emerge as global solar energy leader and thus progress in photovoltaic technology generated an 'atmospheric affect' and thus indirect benefit to solar lighting systems. However, we have observed institutional rigidities in the technological advancements that are particular to off-grid lighting systems. On the other hand, though it offers possibilities for technological advancements, existing system for capacity building and interactive learning in domestic biogas technology is highly fractured.

Low Carbon Energy Transition: Case of Gandhinagar model solar city

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Abstract: This paper begins with research questions, where radical niche innovation from below takes place in the ongoing renewable energy transitions in Gujarat? and why Gandhinagar known as model solar city makes an entry point of urban low carbon transition thinking? Transition theory, what so called Multi Level Perspective (MLP) are not able to answer this question because of their national focused approach thereby neglecting the advantages, conflict and tensions of key actor's and their networks in the innovation activities in a particular uneven geographical location. Therefore this study challenges the shortcoming of MLP by proposing Multi-Scalar MLP that explicitly addresses the concept of spatial space in Gujarat where radical innovation, experimentation and upscaling of solar technology takes place in niche. Transition happens when there is an interaction between actors, institutions and economic structures across the nested level of hierarchy (landscape, regime and niche) basically known as MLP. It is a systemic change from one socio-technical system to another. In this background, analyzing the significance of spatial space introduced in the Gandhinagar city and examining the role of niche actors and institutions in the transition processes of solar technology are the main objectives of the proposed work. It also attempts to explore the learning process, network of various actors and their expectation of upscaling new solar technology to the mainstream markets.