Endorsed Books

The following books have been endorsed by the Industrial Transformation project of IHDP.

- **Technological transitions and system innovations: A co-evolutionary and socio-technical analysis**
  Frank W. Geels, Department of Technology Management, Einhoven University of Technology, The Netherlands
  January 2005, 336 pp, hardback

  Technological transitions and system innovations are long-term and large-scale transformations in the way societal functions such as transportation, communication, and housing are fulfilled. This involves not only technological changes, but also changes in user practices, regulations, industrial networks, infrastructure and cultural meaning. Understanding of such changes is also important to facilitate system innovations and transitions towards sustainability. The book develops a conceptual multi-level perspective to understand how shifts from one socio-technical system to another come about, using insights from evolutionary economics, sociology of technology and innovation studies. Major shifts take place through the alignment of multiple processes at different levels. System innovations are co-evolution processes involving mutual shaping of technology and society.

  The perspective is illustrated and refined with three historical case-studies: the transition from sailing ships to steamships, the transition from horse-and-carriages to automobiles, and the transition from propeller-piston engine aircraft to turbojets. The book further refines the multi-level perspective by distinguishing particular patterns and mechanisms.

- **System Innovation and the Transition to Sustainability**
  Edited by: Boelie Elzen, Univeristy of Twente, the Netherlands
  Frank W. Geels, Department of Technology Management, Einhoven University of Technology, The Netherlands
  Ken Green, Manchester Business School, University of Manchester, UK 2004, 336 pp, hardback

  Modern societies face several structural problems such as transport congestion and greenhouse gas emissions due to the widespread use of fossil fuels.To address these important societal problems and achieve sustainability in the broad sense, major transformations are required, but this poses an enormous challenge given the complexity of the processes involved. Such transformations are called ‘transitions’ or ‘system innovations’ and involve changes in a variety of elements, including technology, regulation, user practices and markets, cultural meaning and infrastructure.

This book considers two main questions: how do system innovations or transitions come about and how can they be influenced by different actors, in particular by governments.The authors identify the theories which can be used to conceptualise the dynamics of system innovations and discuss the weaknesses in these theories.They also look at the lessons which can be learned from historical examples of transitions, and highlight the instruments and policy tools which can be used to stimulate future system innovations towards sustainability.The expert contributors address these questions using insights from a variety of different disciplines including innovation studies, evolutionary economics, the sociology of technology, environmental analysis and governance studies.The book concludes with an extensive summary of the results and practical suggestions for future research.

- **Urban Energy Use and Greenhouse Gas Emissions in Asian Mega-Cities: Policies for a Sustainable Future** (pdf 3.3mb)
  Shobhakar Dhakal, Institute for Global Environmental Strategies, Japan

  Cities in rapidly industrialising regions of Asia are confronted with multiple tasks for economic development and environmental protection. They tend to give priorities to immediate and local issues, and consider global warming as a far-away issue. The nature of energy use and greenhouse gas emissions from cities is not well understood in Asia. In fact, municipal policies to reduce energy consumption bring multiple benefits to the community. It helps to solve air pollution and traffic congestion, and also facilitates the reduction of CO2 emissions.

  Energy management at city level was neither a priority nor an important issue until recently because energy related decisions are made at the national level. These days, citypolicy makers are under growing pressure to incorporate greenhouse gases, especially CO2 emissions into consideration while planning. But any policy measure solely for CO2 reduction is a distant possibility for cities in Asia, with the exception of selected and relativelydeveloped cities. Integrating energy consideration into policies, either by integrating energy concerns to overall urban development or by synergising measures to reduce air pollution and CO2 emissions, is important. Therefore, efforts should be directed towards providing support to cities in generating knowledge and in building their capacity to understand the problem and to find possible measures for implementing policies. The prerequisite for systematic action is the analysis of CO2 emission budgets of cities, their drivers and associated policy analyses.

  In this context, *Urban Energy Use and Greenhouse Gas Emissions in Asian Mega-Cities: Policies for a Sustainable Future* aims to quantify CO2 emissions from energy use and analyse their driving factors for selected Asian Mega-Cities—Tokyo, Seoul, Beijing and Shanghai. It presents discussions on the nature of future challenges. Further, it highlights the needs for taking into account the

overall energy and CO2 “footprint” of cities. Finally, it presents policy directions, policy challenges and identifies major opportunities and barriers for integrating CO2 considerations into local environmental policies.