Transition towards low carbon societies in a changing world

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Economics of mitigation in sectors with long-lived capital stock And implications for climate policies

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Mitigation investments in long-lived capital stock (LLKS) differ from other types of mitigation investments in that, once established, LLKS can lock-in a stream of emissions for extended periods of time. Moreover, historical examples from industrial countries suggest that investments in LLKS projects or networks tend to be lumpy, and tend to generate significant indirect and induced emissions besides direct emissions. Looking forward, urbanization and rapid economic growth suggest that similar decisions about LLKS are being or will soon be made in many developing countries.

In their current form, carbon markets do not provide correct incentives for mitigation investments in LLKS because the constraint on carbon extends only to 2012, and does not extend to many developing countries. Targeted mitigation programs in regions and sectors in which LLKS is being built at rapid rate are thus necessary to avoid getting locked into highly carbon-intensive LLKS. Even if the carbon markets were extended (geographically, sectorally, and over time), public intervention would still be required, for three main reasons. First, to ensure that indirect and induced emissions associated with LLKS are taken into account in investor’s financial cost-benefit analysis. Second, to facilitate project or network financing to bridge the gap between carbon revenues that accrue over time as the project/network unfolds and the capital needed upfront to finance lumpy investments. Third, to internalize other non-carbon externalities (e.g., local pollution) and/or to lift barriers (e.g., lack of capacity to handle new technologies) that penalize the low-carbon alternatives relative to the high-carbon ones.