

<b>Stony Brook University</b>	
<b>The Graduate School</b>	
Doctoral Defense Announcement	
<b>Abstract</b>	
Technological and Socio-economic Feasibility of Climate Mitigation: A Focus on Developing Economies	
By	
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<p>The Paris Accord is hailed as a turning point in global climate policy governance (Hale, 2016). The bottom-up approach of this climate agreement allowed developing for the first time in the history of the Conference of Parties to frame their “national determined contributions” (NDC) to climate stabilization. The NDC have renewed and spurred the discourse “on how developing economies can contribute to climate mitigation without compromising their legitimate aspirations for development” (IPCC, 2014). This dissertation contributes to this policy dialogue by assessing the salient technology and economic pathways, critical for developing nations to contribute to cost-effective climate mitigation.</p>	
<p>The first two studies of the dissertation benchmarked the existing and projected energy system decarbonization challenges and opportunities related to developing economies. Both studies applied an index decomposition analysis to explore the proximate drivers of emission under plausible assumptions of socio-economic, economic, technology, and climate trends. Using an integrated global energy-economic-climate model called Global Change Assessment Model (GCAM), the third and final studies explored the feasibility of climate mitigation under non-ideal assumptions of the availability and deployment of low-carbon technologies.</p>	
<p>The findings show that developing economies are disproportionately faced with a higher mitigation burden compared to developed economies. This due to the current stages of emission and economic growth decoupling and strong future projections of socio-economic trends. Modeling the low-carbon technology investment asymmetry - arising from the limited competencies and deployment lag - reaffirmed the critical role of developing economies in climate stabilization. The results indicate that the status-quo of national low-carbon technological capabilities can lead to a significant global low-carbon investment gap for a near-to-medium term stringent climate pathway. At the regional level, the decrease in low-carbon investments is significant among developing economies. Further, the findings show that for high reference socio-economic projections - the delay in the adoption of novel low-carbon technologies by developing economies could undermine the regional mitigation flexibility and cost-effectiveness. Herein, the insights of this dissertation fill a critical research gap - by providing relevant policy insights about the formulation of low-carbon technology policies for developing economies.</p>	
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