

*The Hong Kong Polytechnic University*  
*Department of Logistics and Maritime Studies*  
*Research Seminar*

**Green Technology Development and Adoption: Competition, Regulation,  
and Uncertainty  
-- A Global Game Approach**

by

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**Date: 29 January 2016 (Friday)**

**Time: 10:30am - 11:30am**

**Venue: N116, Block N**

**The Hong Kong Polytechnic University**

**(Conducted in English)**

**Abstract:**

When a government agency considers tightening a standard on a pollutant, the agency often takes into account the proportion of firms that are able to meet the new standard (what we refer to as the industry's "capability index"), because a higher proportion indicates a more feasible standard. We develop a novel model of regulation in which the probability of a stricter standard being enacted increases with an industry's capability index. In addition, our model allows the benefit of a new green technology to be both uncertain and correlated across firms. Because payoffs are correlated, firms need to form beliefs about other firms' information and decisions when deciding whether to develop or adopt a new green technology. Moreover, firms' decisions exhibit both strategic substitutability (because the marketing benefit of a new green technology decreases as more firms adopt it) and complementarity (because the stricter standard is more likely to be enforced as more firms adopt it). To analyze this strategic interaction among firms' decisions under correlated uncertain payoffs, we use the global game framework recently developed in economics. Our analysis shows that regulation that considers an industry's capability index, compared with regulation that ignores it, can more effectively motivate development of a new green technology. Surprisingly, uncertainty in the payoff can also help promote development of a new

green technology. Finally, we find that more stringent regulation (a higher probability of enforcing a stricter standard for a given capability index) encourages more firms to adopt a green technology once it is invented, but may discourage a firm from developing it in the first place.

**Bio:**

Xin Wang is a Ph.D. candidate at the Tepper School of Business, Carnegie Mellon University. His research interests include supply chain management, sustainable operations, and the interface between operations and theoretical accounting. His work has been accepted for publication by Management Science. Prior to his doctoral studies, he received a B.E. from Tsinghua University and an M.S. from the University of Texas at Austin, and he worked as an engineer in Cisco Systems and NVIDIA Corp.

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**All are welcome!**