Environmental Economics, Regulation, and Innovation

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This paper provides a primer on the economics of environmental innovation. Our intention is not to write a pure review paper, but to also provide an up-to-date textbook treatment on the issue. Thus, we start by defining the marginal costs of both emissions and of emissions abatement. We then analyze theoretically how innovation may affect marginal abatement costs. We also cover the different modelling choices with respect to how the innovation process is represented mathematically and how different environmental policy measures could affect environmental innovation. Our theoretical propositions are all illustrated with examples from the empirical literature. A special emphasis is placed on the recent literature on directed technical change and the potential impact of government intervention in the research and development choices of private firms.