

## FLORIDA STATE UNIVERSITY

### *Experimental Investigation of Economic Incentives of Policies, Institutions, and R&D in Environmental Conservation*

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**Description:** Policies and institutions aiming at reducing pollution and battling climate change often do not reach desirable results because actual decisions of governments and economic agents deviate from those predicted by theory. We employ methods of experimental economics to find and explore such deviations and their causes, and use the findings to modify theory and design better policies and institutions. In this project, we construct a theoretical model of decisions in a dynamic environment with costs of pollution and climate change, while testing the theory in laboratory experiments with human subjects. We studied actual behavior and explore responses to changes in the environment, production technologies, investment in clean technology and institutions.

**Budget:** \$43,168.00

**Universities:** FSU

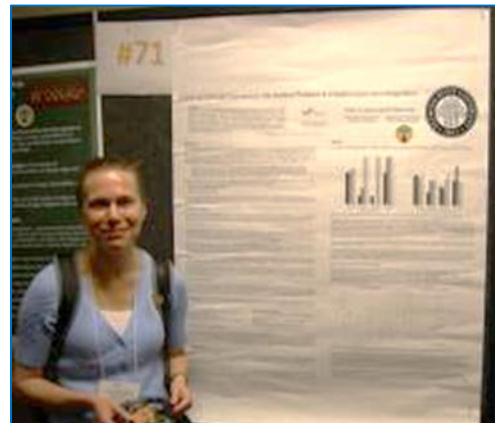
### Progress Summary

This project is the first, to the best of our knowledge, laboratory experimental study of the effects of environmental context, technological heterogeneity, and investment in clean technologies in an environment with a dynamic public bad. It also provides interesting and at times unexpected insights that have direct implications for policy or at least require a more detailed investigation. Specifically, we find that

- Environmental context and “green” framing, even if purely symbolic, have consequences for economic decisions.
- Under relatively low cost of pollution heterogeneous countries are less likely to achieve sustainability without external enforcement than under more severe costs of pollution and climate change.
- Common access to clean technology leads to higher investment in clean technology, lower levels of pollution and dominating payoffs. The results suggest that policies promoting research and development collaboration and technology sharing in combating environmental damage and climate change are effective.

### Impact:

The results point at several important directions in which the research should be extended to gain better insights into why subjects behave in a certain way, and to make the experimental design more applicable to policy. The first limitation of the presented design is in the implementation of the dynamic public bad. One of the problems policy makers face is the uncertainty (and ambiguity) of the extent and timing of costs associated with environmental damage and climate change. An alternative implementation of the public bad as an uncertain catastrophic event would provide a robustness check to our results in this direction. The second limitation is the implementation of clean technology.



Svetlana Pevnitskaya at the 2010 FESC Summit



The important property of research and development is the uncertainty of its outcome, both in terms of the very existence and timing of innovations, and in terms of its cost and efficiency. Additionally, technologies are durable, in the sense that once a technology is implemented it does not require new research and development investments. The implementation of these features will constitute an important robustness check for the results related to research and development collaboration and sharing of technologies that we plan to focus on. For policy applications, it is also of interest to interact heterogeneity in initial conditions with clean technology investment. One of the reasons international environmental agreements fail is the difference in the levels of technological development between countries.

**Funds leveraged/new partnerships:**

Faculty	Source/ Agency	Project Title	Date Submitted	Amount
Pevnitskaya, S., Ryvkin, D.	NSF	Experimental Study of Games with a Dynamic Public Bad and Applications to Environmental Policy.	2010-08-18	\$187,844

Also, a letter of intent was submitted for a DOE grant with UF scholars 3/25/2011.

