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## Program

9:00am – Coffee

9:30am – Ron Chan: Regulatory Spillover and Climate Co-benefits: Evidence from the New Source Review Lawsuits

10:45am – Break

11:15am – Paola Labrecciosa: A Dynamic Analysis of Pollution Abatement with Endogenous Number of Contributors: Loose vs Tight Cooperation

12:30pm – Lunch

13:30pm – Laura Taylor: Utility-Scale Solar Farms and Agricultural Land Values

14:45pm – Break

15:15pm – Daniel Kaffine: Emissions, Transmission and the Environmental Value of Renewable Energy

16:30pm – End

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18:30pm – Dinner (invitation only)

# MONTREAL ENVIRONMENTAL AND RESOURCE ECONOMICS WORKSHOP

## April 3<sup>rd</sup>, 2020

CIRANO,  
1130 Sherbrooke West,  
#1400



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# RON CHAN

UNIVERSITY OF MANCHESTER

## Regulatory Spillover and Climate Co-benefits: Evidence from the New Source Review Lawsuits (with Y. Christy Zhou)

Policies on greenhouse gas emissions have been shown to generate benefits in reducing local pollutants such as SO<sub>2</sub> and NO<sub>x</sub>, but spillover benefits in the reverse direction have not been well studied. This paper estimates one such spillover by examining the impact of New Source Review lawsuits for violating SO<sub>2</sub> and NO<sub>x</sub> standards on the CO<sub>2</sub> emissions of US power plants. We model the ambiguity of NSR regulation by using a discrete-time duration model to estimate and predict the likelihood of being named in a lawsuit as a continuous treatment variable. We find that a one percent increase in the NSR lawsuit probability (0.2 standard deviations) reduces CO<sub>2</sub> emissions by 0.5 percent, an effect comparable to a \$10/ton carbon tax. Further decomposition analysis suggests that most of these carbon co-benefits arise from the temporary shutdown of coal-fired-only power plants in responses to the NSR regulations.



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# PAOLA LABRECCIOSA

MONASH UNIVERSITY

A Dynamic Analysis of Pollution Abatement with Endogenous Number of Contributors: Loose vs Tight Cooperation

(with Luca Colombo and Ngo van Long)

We propose a dynamic model of climate change abatement in which the number of contributors is endogenous and thus may differ between two modes of cooperation, namely, loose vs tight. In the tight mode of cooperation, each member is prescribed a specific target, whereas in the loose one, members choose their own abatement levels as Nash players. Conditions exist such that the incentive to free ride is lower and the number of contributors is higher in the loose cooperation framework, and this can lead to higher welfare, both in the steady state and along the transition path. Our theoretical results suggest that the loose coalition mode, such reflected in the spirit of the Paris International COP21 Conference on Climate Change, by attracting more participants, could turn out to be more effective in reducing emissions than the Kyoto Protocol.



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# LAURA TAYLOR

GEORGIA TECH

## Utility-Scale Solar Farms and Agricultural Land Values

(with Nino Abashidze)

Solar PV capacity in North America has grown from less than 1GW in 2010 to more than 70GW of installed capacity, enough to power more than 13 million homes. Industry estimates indicate another 45GW of utility-scale, ground-mount solar farms are planned for construction. Utility-scale solar farms are primarily located in rural areas, often on agricultural land. In recent years, local opposition to these facilities has increased in regions across North America with agricultural communities raising concerns about the loss of farmland and the potential negative property value impacts of solar farms. This research provides evidence on how utility-scale solar farms impact neighboring land values using a comprehensive database of agricultural land sales and a census of solar farm installations in North Carolina. A difference-in-differences style approach is used within a hedonic property value model to examine changes in agricultural land values in response to the construction of nearby solar farms. Results indicate that utility-scale solar farms have no direct positive or negative spillover effects on nearby agricultural land values. However, results also indicate that agricultural land that is also proximate to electric infrastructure (transmission lines) is more positively valued after a solar farm is constructed nearby.



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# DANIEL KAFFINE

UNIVERSITY OF COLORADO, BOULDER

Emissions, Transmission, and the Environmental Value of Renewable Energy

We examine how transmission congestion alters the environmental benefits provided by renewable generation. Using hourly data from the Texas and Mid-Continent electricity markets, we find that relaxing transmission constraints between the wind-rich areas and the demand centers of the respective markets conservatively increases the non-market value of wind by 31% for Texas and 13% for Mid-Continent markets. Much of this increase in the non-market value arises from a redistribution in where air quality improvements occur when transmission is not constrained, wind offsets much more pollution from fossil fuel units located near highly populated demand centers.



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