

Civic Participation and Local Actions to Address Climate Change

Ion Bogdan Vasi
Columbia University

EDF-Alliance Executive Workshop

10.18.12

Thought experiment

- Think about civic participation and social movements; what images comes to mind?



Civic groups and social movements can contribute to green-tech innovation!

How Does Civic Participation (Social Movements) Matter For:

1. Addressing global climate change at the local level
2. Building the local infrastructure for electric cars
3. Adopting and implementing green power programs

Back to the classics...

“As soon as several inhabitants of the United States conceive an idea that they want to produce in the world, they seek each other out; and when they have found each other, they unite. From then on they are no longer isolated, but a power one sees from afar, whose actions serve as an example; a power that speaks, and to which one listens”



Alexis de Tocqueville

1. Addressing global climate change at the local level

- Cities for Climate Protection (CCP): more than 500 adopters on 5 continents between 1991-2002



CCP Adopters

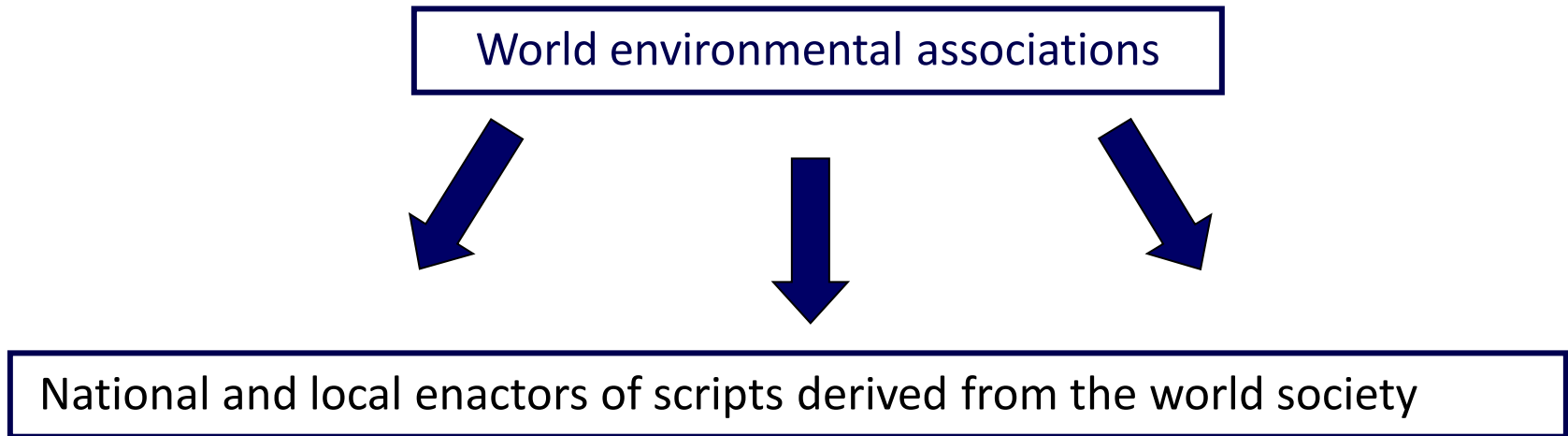


CCP Non-Adopters

Why some cities adopt the CCP program and others do not?

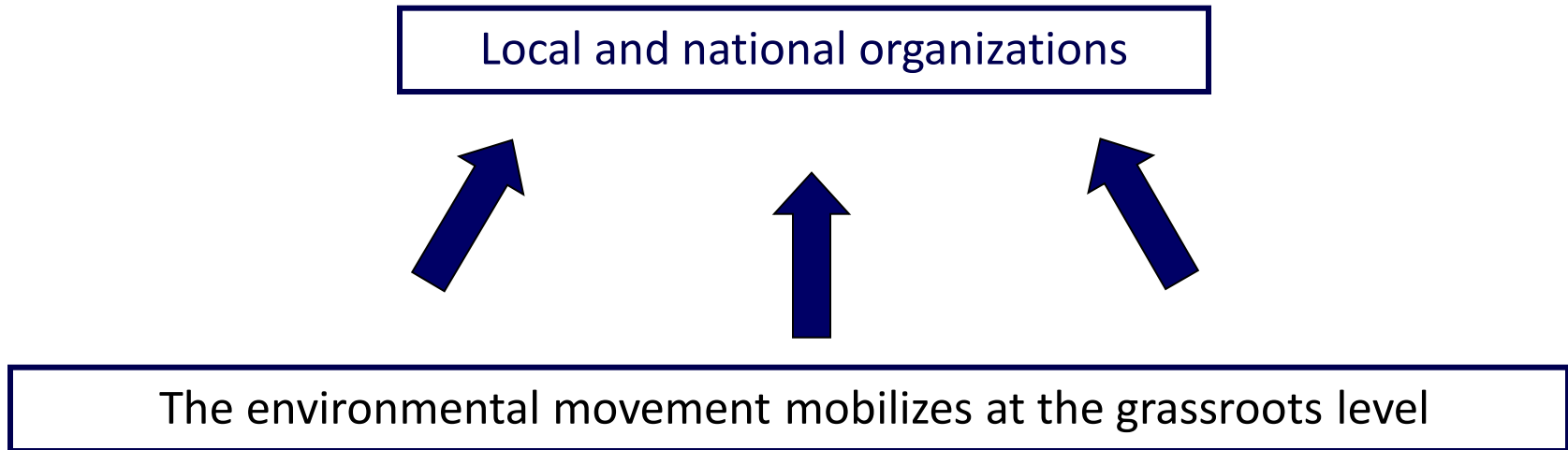
The Top-Down Diffusion Model

- Environmental practices diffuse **top-down**, from the world environmental regime to organizations with dense ties to the “rationalized world society”



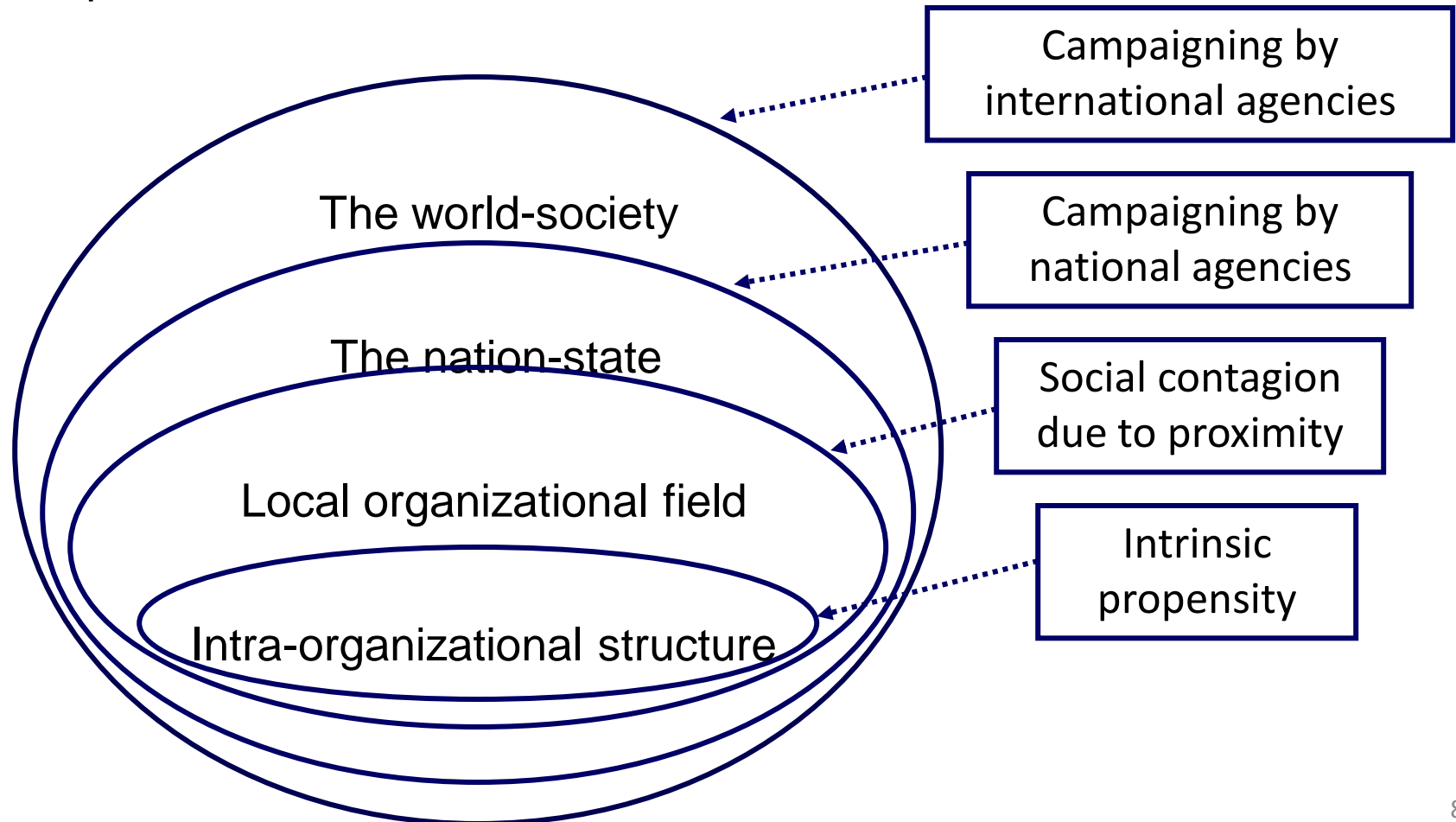
The Bottom-Up Diffusion Model

- Environmental practices diffuse **bottom-up**, from domestic social movement mobilization.



The Multi Institutional Levels Diffusion Model

Multiple institutional levels:



1. Addressing global climate change at the local level

CCP Diffusion: Research Hypotheses

- The CCP program should diffuse at a faster rate to communities that:
 1. Have many environmental NGOs
 2. Are geographically and socially proximate to previous adopters
 3. Are closely linked to national environmental change agencies
 4. Are closely linked to global environmental change agencies

Quantitative and Qualitative Methods and Data

1. **Event History Analysis:**

Adapted multiplicative heterogeneous diffusion model

- Dependent Variable:

Hazard of adoption for cities in US, Australia, Canada

2. **Qualitative Analysis:** 71 semi-structured interviews

Results

	Model 1
Controls	x
Environmental NGOs	.193** (.047)
Participation in CCC	1.153*** (.192)
Participation in ReAm	.665*** (.170)
County proximity	.414*** (.066)



American “exceptionalism”...

- Powerful fossil fuel lobby and conservative movement **delegitimated the global warming issue** and banned the use of federal funds for the “back door implementation” of the Kyoto Protocol
- Mandatory actions against global climate change are “**an anti-American effort**” (R-Texas) or “**the first major step toward the deindustrialization of this country**” (D-Pennsylvania)
- Climate change is “**the greatest hoax ever perpetrated on the American people**” (R-Oklahoma)
- “**Carbon dioxide is your friend.** Far from polluting the planet, CO₂ emissions are greening the Earth, enhancing biodiversity and global-food availability.” (Competitive Enterprise Institute, 2004)

The Cities for Climate Protection Program

- CCP program's diffusion depends on receiving legitimating accounts from various sources:
 - Organizational structures
 - Proximate adopters
 - Global *and* national change agencies
- All institutional levels are important, *but*.
 1. The world environmental regime is important mainly for *jump-starting diffusion*, or for identifying pioneers who “think globally”
But:
 2. Local environmental activism is important for *regional diffusion*, or for stimulating grassroots mobilizations to “act locally”

Environmental Activism

- “I had an internship with a local environmental organization and they like their interns to get involved in some kind of independent project and I suggested that I work on getting our city involved in the CCP program.... I contacted ICLEI right away and this woman remembered that there was a particular councilor that has been kind of interested so I just contacted him first and, through networking and a lot of meetings up in city hall and with the council, after about two months of supplying a lot of information and talking with people and showing examples of other communities that have participated, the city council passed a resolution to join the program.”
- “We have a basis and a history of environmental ethic and action in our community, so it’s just a lot easier to get things going when you are in an atmosphere like that... Unfortunately that does not manifest itself at the federal level here in the U.S., because of the strength of the fossil fuel economy, whether we have a Democratic or Republican president.”

2. Building the local infrastructure for electric cars

- The reinvention of the car: over 5,000 patent applications in EV technology between 2007-2011 (#1: Toyota; #2 Nissan-Renault)



Electric cars

- In 1900 approximately 2,400 automobiles existed in the U.S.; about 800 were powered by electricity and only 400 were powered by gasoline –the rest were powered by steam.



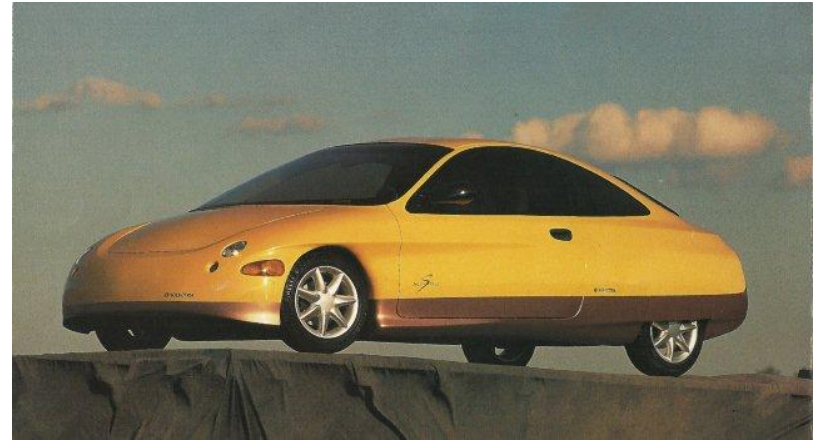
The death and resurrection of EVs

- The lack of infrastructure for electricity (among other things) → The demise of the EVs by 1915.
- EV made a comeback starting in the mid 1990s (Tropica, Solectria Sunrise, EV-1, etc)
- EVs and PHEVs could reach a 10% market share worldwide sometime between 2020 and 2030 (International Energy Agency 2011)

EV reemergence (mid 1990s)



Tropica (1995)



Solectria Sunrise (1995)



EV-1 (1996)



ICE conversions (as early as 1970s) 18

2. Building the local infrastructure for electric cars

EV charging stations

- By 2012 virtually all major automobile manufacturers either produced or planned to produce an EV or a PHEV
- Many cities built the infrastructure for the coming “EV revolution”
- EV charging stations reduce “range anxiety” –the adoption of public charging stations is essential for EVs’ diffusion.



The adoption of EV charging stations by 2012



2. Building the local infrastructure for electric cars

Activism and diffusion

- Largely missing from studies of the diffusion of technological innovation is an account of the role of activism.
- Two different types of activism:
 1. Hobbyist activism
 2. Social movements activism

Hobbyist activism

- Hobbyist associations play an important role for entrepreneurship.
- Rao (1994, 2009) shows that automobile enthusiasts were crucial for the emergence of the automobile industry because they organized a good roads initiative, lobbied for driver licensing, and organized reliability competitions that enabled firms to develop reputations for dependability.
- Yet, the processes through which hobbyist associations influence the diffusion of technological innovations remain relatively poorly understood.

Electric Auto Association (EAA)

- Electric Auto Association –founded in 1967 in California
- Through regular EAA meetings EV enthusiasts and the general public had a chance to “learn about electric vehicles and how to get involved with them, from buying one to leasing to completing a do-it-yourself. Members and others also get a chance to exchange information on the latest technology surrounding electric vehicles and politics of electric vehicles, as well as a chance to interface with others with similar experiences and interests.”



- ***Hypothesis 1.*** *The stronger the Electric Vehicle Association in a community, the greater the extent to which the community subsequently adopts electric vehicle charging technology.*

Social movement activism

- Social movements frame new technologies as desirable, create an opportunity structure for entrepreneurs, and mobilize recruits by lobbying for new rules, provide certification, and constitute the feedstock for new ventures and organizations
- Local social movement mobilizations contribute to the emergence of community-specific institutional logics that influence a diverse set of organizational outcomes
- But: what is the role of social movement activism for the diffusion of technological innovations?

Environmental NGOs

- The NRDC published an influential report that showed that the widespread adoption of EV technology would result not only in improved air quality but also in fewer greenhouse gas emissions.
- The Union of Concerned Scientists launched a campaign to support electric vehicles with the motto: “*The Revolution will not be televised... it’ll be driven. The future is now for electrified vehicles – the start of a revolution to end our addiction to oil.*”



- **Hypothesis 2.** *The stronger the environmental movement in a community, the greater the extent to which the community adopts electric vehicle charging technology.*

Data and methods

- *Dependent variable*: the annual number of EV charging stations between 1995 and 2011 –from the Alternative Fuels Data Center at the U.S. Department of Energy.
- *Hobbyist activism*: EAA
- *S.M. activism*: ENGOS
- Interviews with EAA and ENGOS

Results

	Model 2	Model 3	Model 4
<i>Covariates</i>	X	X	X
<i>H1: Hobbyist associations</i>			
Electric Auto Association	.139*** (.024)	.133*** (.024)	.183*** (.038)
<i>H2: Environmental organizations</i>			
Environmental NGOs		1.133*** (.338)	1.238*** (.337)
Constant	-3.745*** (.361)	-3.751*** (.361)	-3.767*** (.361)
Wald (chi-sq)	1940.1***	1952.8***	1949.5***
N (observations)	8092	8092	8092
N (groups)	476	476	476

EAA's power



Electric Auto Association
Promoting Electric Vehicles Since 1967

1. Exchange of information

“The EV associations like ours, their members, and the many people who have converted and built their own electric cars have kept the dream of the electrification of transportation alive these many years.”

2. Demonstration events

“In early 1981 [...] we started to 'Educate, Demonstrate, and Proliferate' the use of EVs through rallies, long distance EV contests, EV car shows, public speaking, and basically teaching the benefits of electric cars to anyone who would listen”

EAA's power

- Use fancy sports cars, which attracted public's and media's attention
“We figured if you're going to build an electric car, why not do it with some style! The first automobiles built back in the 1800's were powered by electricity, so we think it's very fitting that an all-electric DeLorean is really going 'Back to the Future!' [...] We have taken it to various clubs and meetings where it won first prizes. We also won the prestigious 'Charles Muffley award for Engineering Excellence' at the 2008 DeLorean Car Show.”



EAA's power

3. Advocacy:

“Plug-In America got together with the Puget Sound Economic Development Council, with input from our members and various utilities. They produced the first roadmap in nation on charging infrastructure, signage, briefing local officials on local laws and regulations that have to do with EVs and EV charging. This document is being used throughout the United States now by other municipalities as a roadmap on how to best proceed with charging infrastructure. Also, there was lobbying for eliminating sales taxes for EVs, which is a big thing. We got several members in our club who work on lobbying –they go back and forth between Seattle and Olympia, our capital.”

EAA's power

4. Advice to innovation champions:

“Understanding how city government works is very important and most decisions like this have to be voted on by the City Council. One of the ways we enabled cities to install infrastructure through the system was finding out where the pockets of the funds are. For example, specific air quality rules in California take a percentage of vehicle registration and gave it to the city that the vehicle was registered in and stipulated they can only use it for air quality improvement efforts, be it ride sharing or EVs, whatever. Most cities had these pockets of money they didn't know where there and didn't know how to spend them. Yet, if they didn't use that it would have to come out of the general funds. Nobody wants to ask a city councilman for anything out of the general fund. So we were able to create these little heroes just by teaching them about funds like these, and then they could develop these green projects without having to ask for money. This is a tiny nuance, yet, it is a huge part of cities installing charging stations.”

Environmental movement's power

- Cultural impact –value compatibility
“An idea that is incompatible with the values and norms of a social system will not be adopted as rapidly as an innovation that is compatible. The adoption of an incompatible innovation often requires the prior adoption of a new value system, which is a relatively slow process.” (Rogers 1995: 15)
- Environmentalists have been wary of “Big Oil” since the 1970s’ oil crises and many promoted the use of “alternative” fuels and “hypercars” (Rocky Mountain Institute) → Solectria Sunrise was the first hypercar

Implications for Technological Innovation

- Activism is important for diffusion of technologies, particularly in the early stages
- Hobbyists have legacy and direct effects on the spread of technologies. They may also explain why industries vary in ‘take-off times’ – not necessarily due to lower prices, but because supply and demand curves shift outwards due to increasing acceptance of technology

3. Adopting and implementing green power programs

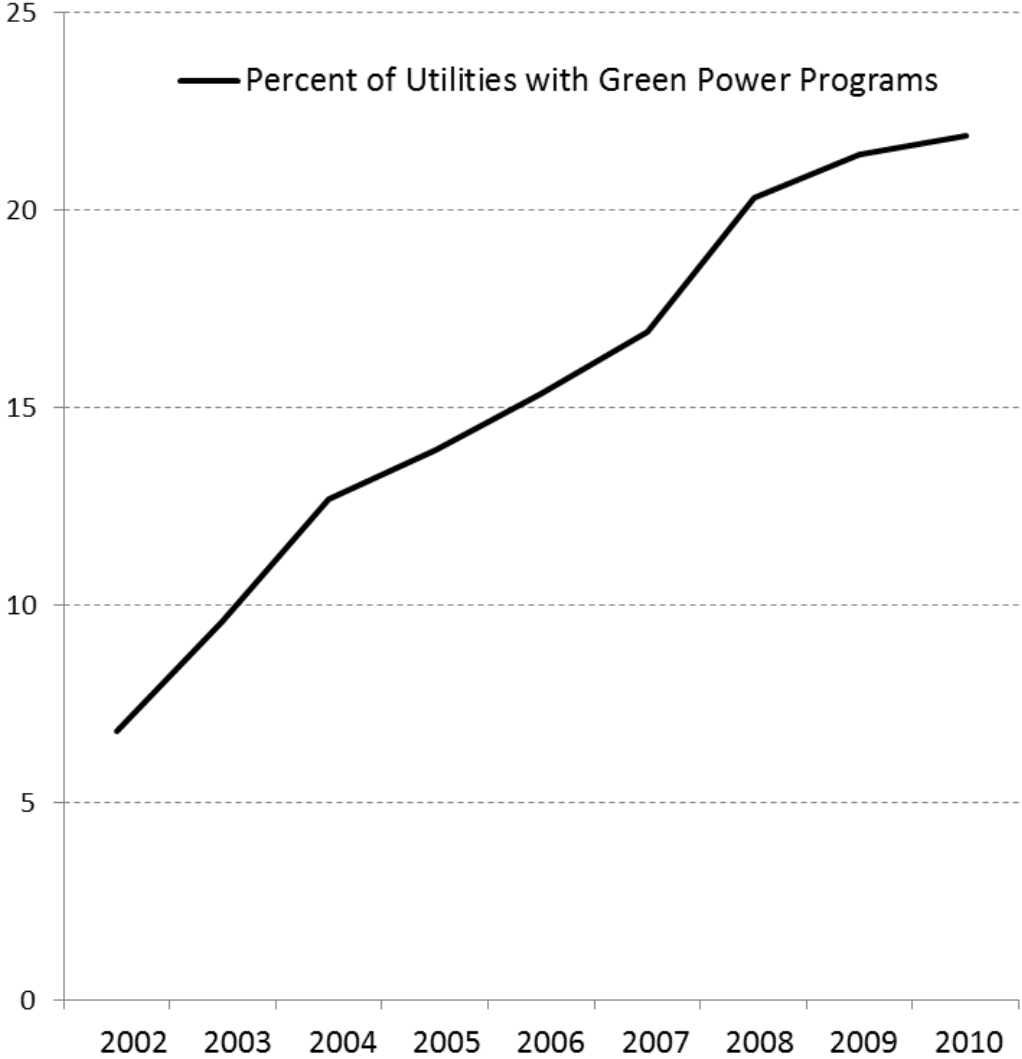
- “For a hundred years, it has been assumed that electricity and the delivery of it were inevitably intertwined: like an egg baked into a cake, you could not go back and reconstitute the egg once the cake is mixed. But if it is possible to define and separate the transport service, so that it can be provided separately from the electricity itself, electricity becomes a product that can be bought and sold and transported from place to place, much as any other product. Electricity markets are opened to alternative producers and alternative purchasers.”

(Hunt and Shuttleworth 1996)



- It is possible to create a separate green power market by distinguishing between “green” electrons produced from renewable energy and “brown” electrons produced from fossil fuels.

Adopting and implementing green power programs



The “negawatt paradigm”

- “It took decades of struggle by legions of citizen advocates and hundreds of experts to embed the negawatt paradigm in U.S. utility planning. But while we were accomplishing that, inexorably rising fossil fuel use here and around the world was overwhelming Earth’s ‘carbon sinks,’ causing carbon dioxide to accumulate in the atmosphere at an accelerating rate [...] The energy arena of old was local and incremental. The new one is global and all-out. With Earth’s climate, and the world as we know and love it, now imperiled, topping off the regional grid pales in comparison to the task at hand. In the new, ineluctable struggle to rescue the climate from fossil fuels, efficiency and ‘renewables’ must all be pushed to the max.”

Hypotheses: environmental groups

- Environmental organizations can influence utilities' decision to invest in green power production by using both confrontational and non-confrontational tactics.
- *Hypothesis 1a*: Electric utilities located in communities with numerous environmental NGOs are more likely to adopt green power programs.
- *Hypothesis 1b*: Electric utilities located in communities with numerous environmental NGOs are more likely to successfully implement green power programs.

Results: Adopting green power programs

	Model 1	Model 2
<i>Controls</i>	x	x
<i>H1a: Environmental movement</i>		
Environmental NGOs	.643*** (.172)	.623*** (.170)
<i>H2a: Comm. Ec. Profile</i>		
Oil and gas extraction		-.357*** (.077)
Coal extraction		.096 (.144)
Constant	-8.677*** (.637)	-8.522*** (.629)
Chi sqr.	357.27***	367.67***
Nr. of observations	21498	21137

Results: Implementing green power programs

	Model 1	Model 2
<i>Controls</i>	x	x
<i>H1b: Environmental movement</i>		
Environmental NGOs	.377* (.169)	.376* (.166)
<i>H2b: Comm. Ec. Profile</i>		
Oil and gas extraction		-.110 (.063)
Coal extraction		-.067 (.188)
Constant	-12.907*** (.942)	-12.880*** (.946)
Chi sqr.	288.89***	301.24***
Nr. of observations	25401	25011

Environmental groups' influence

1. *Confrontational tactics*, such as organizing protests against coal power plants or filing lawsuits against utilities that invest in fossil fuels.



3. Adopting and implementing green power programs

Environmental groups' influence

2. *Non-confrontational tactics*, such as forming “collaboratives” with utilities for reducing energy consumption or negotiating investments in renewable energy.

“The prominence of environmentalists as the driving force behind the collaboratives suggested that this group of stakeholders had gained elevated standing. Contesting traditional utility strategies for more than two decades, environmental advocates effectively cultivated public opinion and exploited provisions of new legislation. They also convinced regulators and power company executives that conservation policies could reduce construction expenditures and allow utilities to earn handsome profits.”

(Hirsh 1999)

Environmental groups' influence

3. *Marketing.*

Example: Xcel Energy formed a partnership for community based marketing with a number of environmental organizations such as Western Resources Advocates. As WRA organizers argued, environmental groups' strong involvement in the Windsource program contributed decisively to the fact that this program was number one in the country for a few consecutive years, despite the fact that Xcel spent less than other utilities on marketing (Vasi 2011).

Conclusions

- Civic participation/social movements mattered for the adoption of municipal programs to address global climate change, for the adoption of electric car charging stations, and for the adoption and implementation of green power programs by U.S. utilities.
- Businesses could benefit from recognizing the importance of civic participation and engaging social movement groups.
- Environmental activists and businesses are usually perceived as antagonists –but my research shows that collaborative processes are possible and can be mutually beneficial.

Thank you!