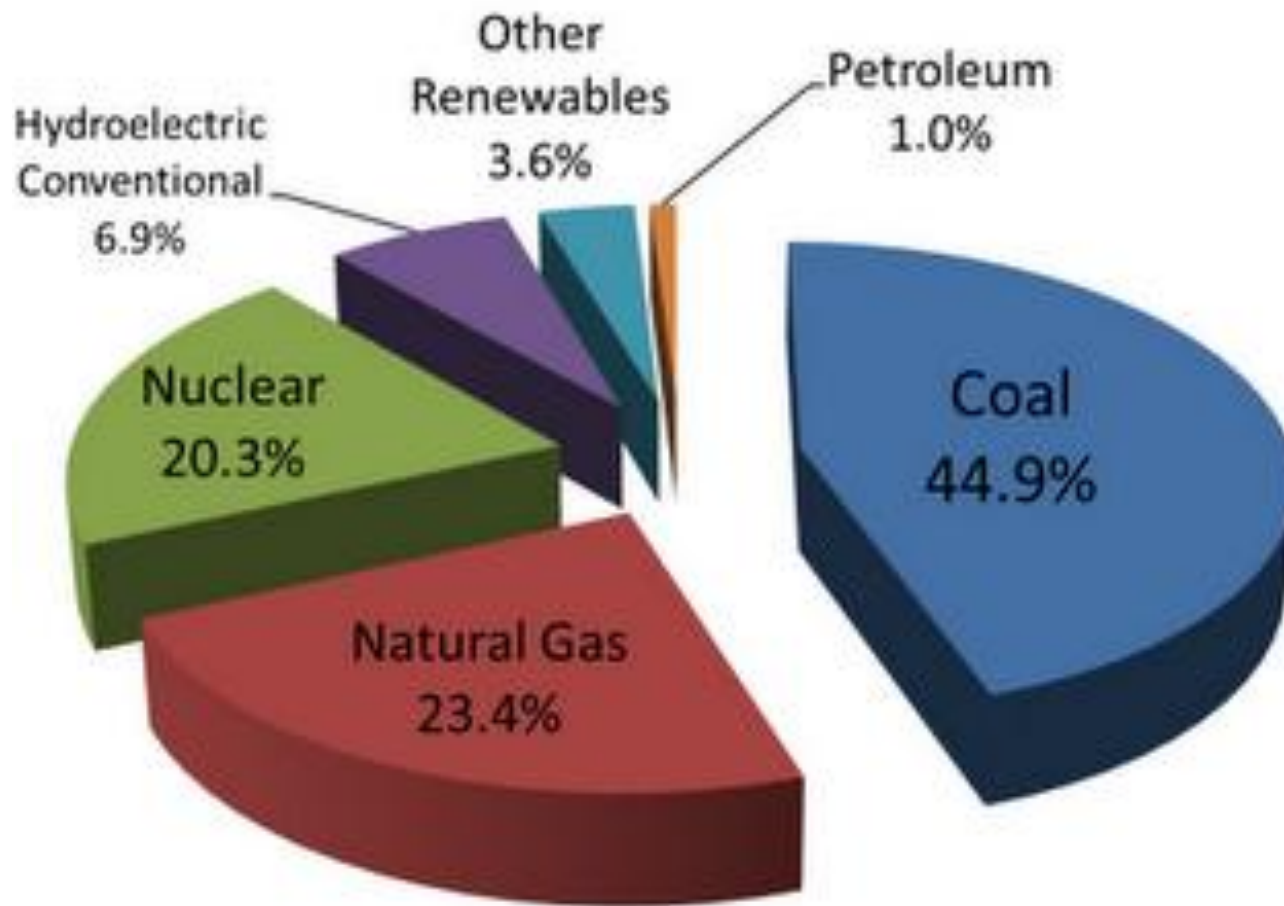


Voluntary Participation in Clean Energy Programs (and others) in the U.S.

Matthew J. Kotchen

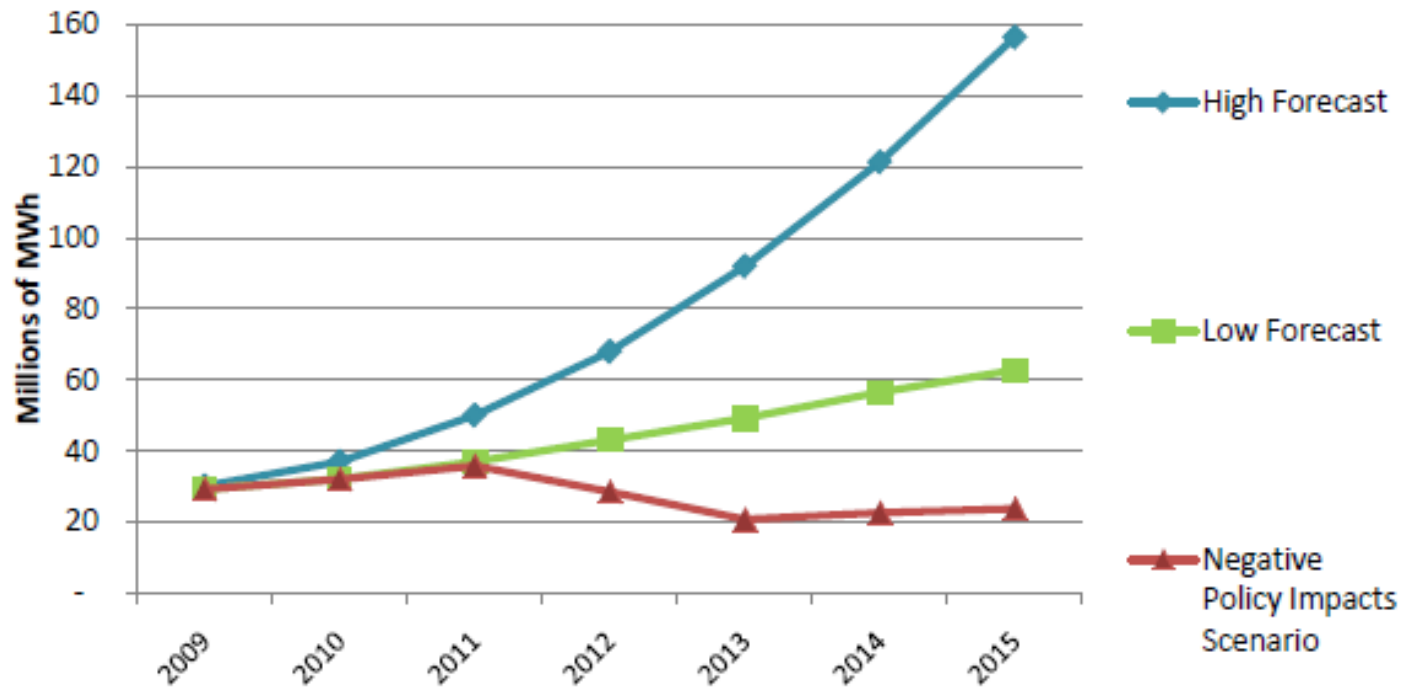
Yale University and
National Bureau of Economic Research

2009 U.S. Electricity Generation by Source



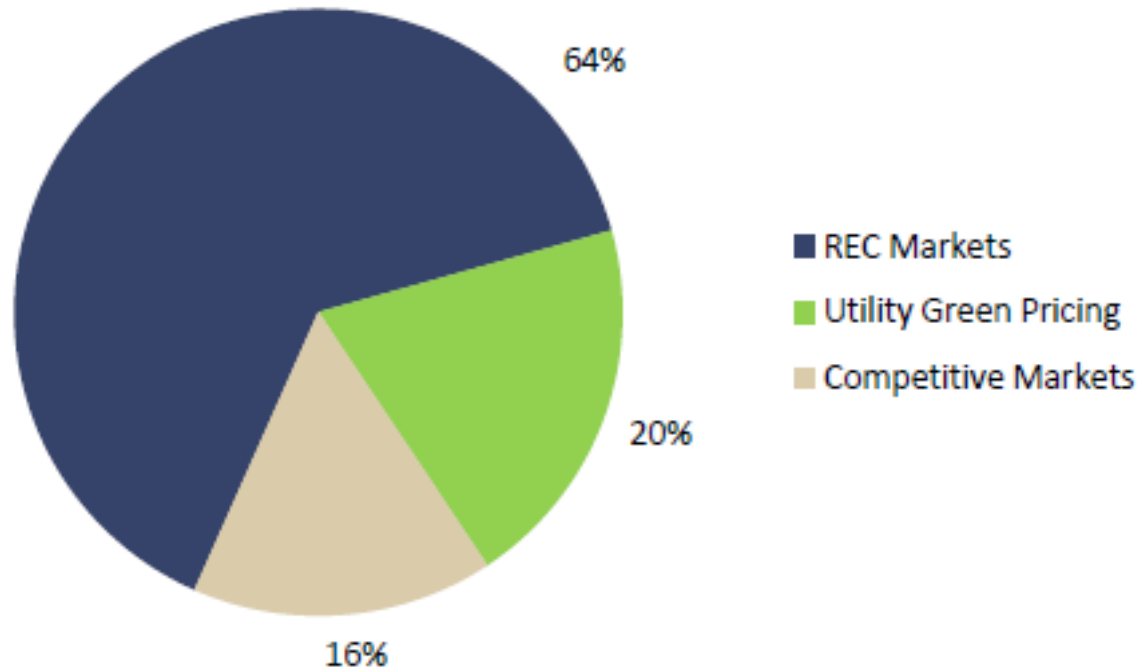
Source: Energy Information Administration

Voluntary Demand for Renewable Energy in the U.S.



Source: Bird, Holt, Sumner, and Kreycik (2010)

Share of Voluntary Green Electricity Sales by Market Segment



Source: Bird, Holt, Sumner, and Kreycik (2010)

Why Study Markets for Voluntary Green Electricity?

- Field studies on behavioral economics
 - Voluntary provision of a public good
 - Incidence of pro-environmental behavior
- Relatively small but not that small
 - About 1000 utilities offer programs
 - Real revenue and emission reductions
 - Close relationship to voluntary carbon offset market
- Policy
 - Many issues are the same as those for compliance markets
 - Want to ensure that environmental benefits are realized
 - Implications for public support of energy/environmental policy

Two Thematic Questions

- Why do households and companies participate in voluntary, price premium, green electricity programs?
- What, if any, are the behavioral responses (e.g., changes in electricity consumption) that occur upon participation?

What Motivates Pro-Environmental Behavior?

Economics

Psychology

Pure public good

- Environmental preferences
- Prices
- Income

Impure public good

- Private benefit(s)
- “Warm glow”
- Social approval
- Signaling/prestige

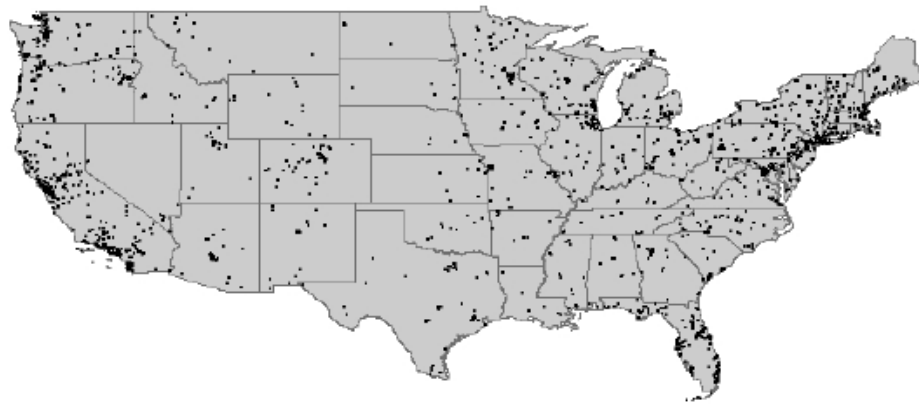
Norm activation

- Personal norm
- Awareness of consequences
- Ascription of responsibility

The “Convenient” Al Gore Effect

(Jacobsen 2011)

- Data set on monthly carbon offset purchases by zip code throughout the US from 2006 – 2008
- *An Inconvenient Truth* released June 2006



- Next 2 months offset purchases up 50% in near (treatment) areas compared to far (control) areas
- No difference one-year later upon offset expiration

What Affects Residential Participation in Voluntary Green Electricity Programs?

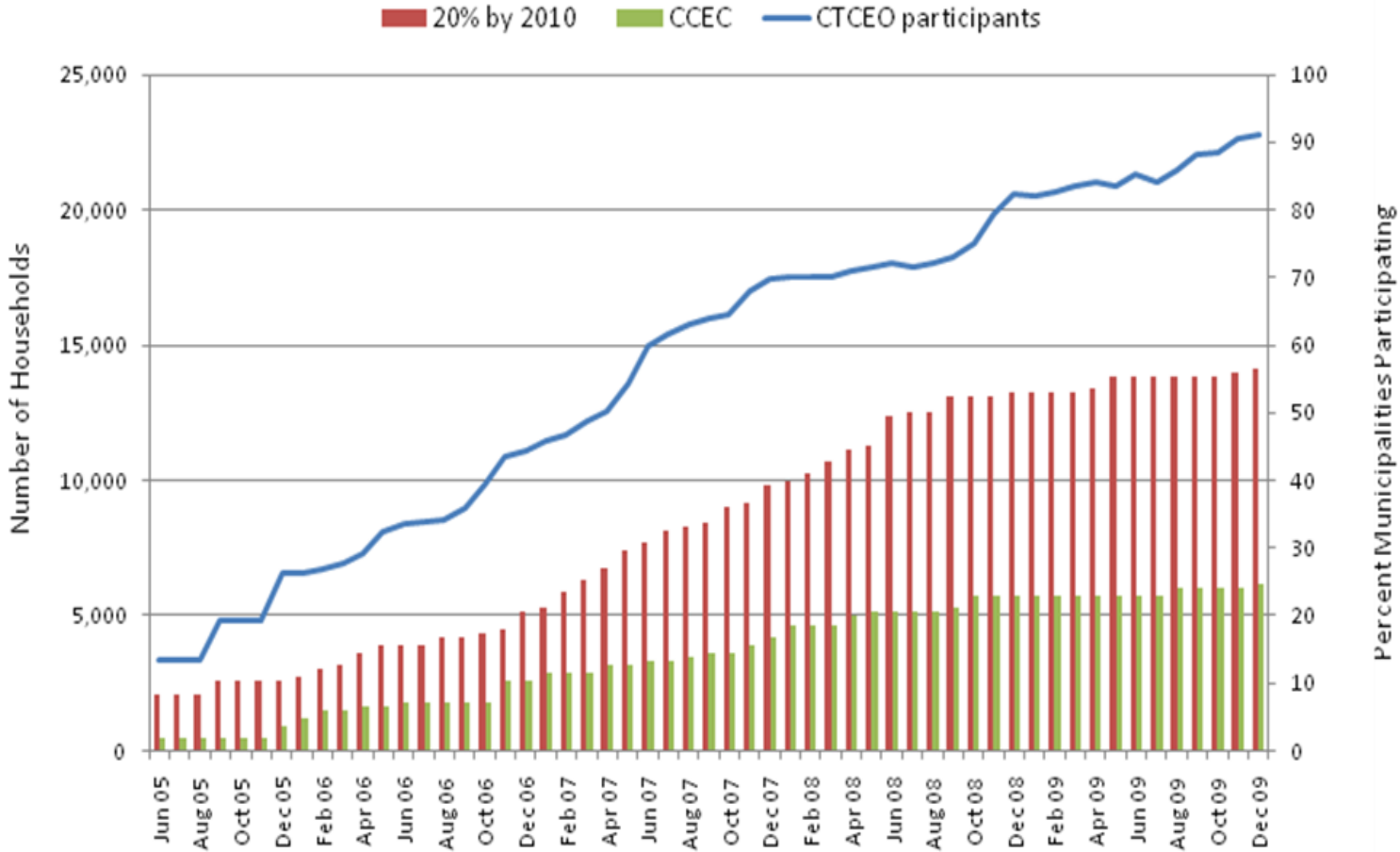
Participation mechanism

	Fixed monthly block (\$)	Green tariff (\$/kWh)
Environmental attitudes	+	+
Altruistic attitudes	+	+
Education	+	+
Income	?	?
Electricity consumption (kWh)	+	-

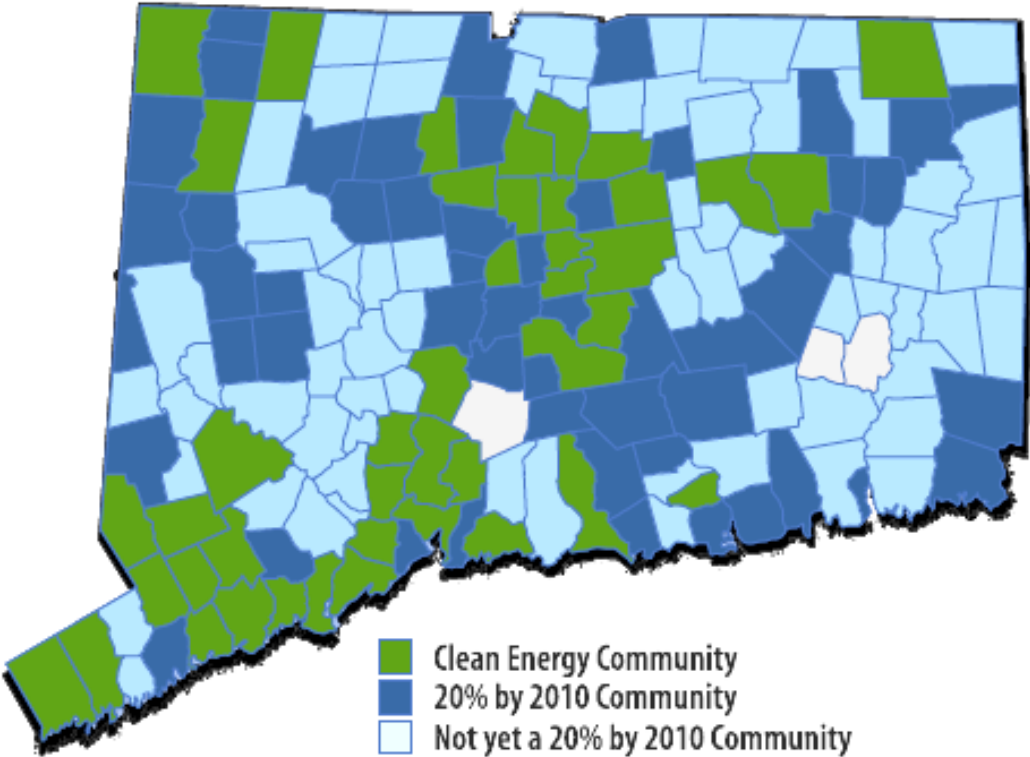
Connecticut Climate Change Action Plan

- *CT Clean Energy Options (CTCEO), '05*
 - Ability to purchase green electricity from one or two providers through utility company
 - 1.19 – 1.3 ¢/kWh, or about \$9/month for 100% sign-up
- **CT Clean Energy Communities (CCEC), '05**
 - Municipalities must qualify (100 or 10% households) and enroll
 - Receive free PV installations in proportion to number of CTCEO signups
 - Installed on town halls, schools, fire stations, police stations
- **20% by 2010 Clean Energy Campaign (20by2010), '03**
 - Official resolution pledging to 20% renewable energy by 2010
 - Receive advisory services from CT Clean Energy Fund
 - Prerequisite for qualifying as a CCEC

Household and Community Participation



Community Participation in December '09



Connecticut Program Results

- CCEC program provides symbolic matching grants
- CCEC increases voluntary purchases of green electricity
- 35% increase in participating municipalities or 31% of all participants
- Example of a social capital based “nudge”
 - Complement to social norm studies

Criticism of Voluntary Offset (Green Electricity) Programs



- More harm than good?
- Economics and psychology of behavioral responses
 - Rebound effect
 - Moral credentials

Change in Electricity Demand due to Participation in a Voluntary Green Electricity Program?

Participation mechanism

Green tariff (\$/kWh)

Fixed monthly block (\$)

Conservationists: no change

All participants: no change

Non-conservationists:
decrease in demand same
as if an exogenous price
increase

Buy-in households:
increase consumption 2.5%
(but still positive net
environmental benefits)

To what extent is
Corporate Social Responsibility (CSR)
an offset for
Corporate Social Irrresponsibility (CSI)?

*Do companies do more “good,”
when they do more “bad”?*

KLD Social Ratings Database

- 80 indicator variables for “strengths” and “concerns”

- Seven different issue areas:

- Community
- Corporate governance
- Diversity
- Employee relations
- Environment
- Human rights
- Product quality/safety

Strengths

Beneficial products/services

Pollution prevention

Recycling

Clean Energy

Transparency/communications

Other strength

Concerns

Hazardous waste

Regulatory problems

Ozone depletion

Substantial emissions

Agricultural chemicals

Climate change

Other concern

- Created CSR and CSI variables overall and for each issue area
- Combined with financial data for 3,100 publically traded companies for years 1991 – 2005

The Basic Statistical Model

- Within a company, how does last year's CSI affect this year's CSR?

$$CSR_{it} = f\left(\begin{array}{l} CSI_{it-1}, ROA_{it-1}, Debt_{it}, Asset_{it}, \\ Sales_{it}, Employees_{it}, \mu_t, \nu_i \end{array}\right) + \varepsilon_{it}$$

Overall CSR for CSI by Sector

	Sign of correlation
<i>All industries</i>	+***
Mining & construction	-
Food, textiles, apparel	+
Paper & publishing	+
Chemicals & pharmaceuticals	+*
Refining, rubber, plastic	-
Heavy manufacturing	+**
Computers & precision products	+*
Auto & aerospace	+**
Transportation services	+
Telephone & utilities	+*
Wholesale & retail	+*
Bank & financial services	+***
Hotel & entertainment	+*
Hospital management	+**

Within Category CSR for CSI

Corporate Social Responsibility (CSR)

Category of CSI	Corporate governance	Community	Diversity	Employee	Environment	Human rights	Product quality/safety
Corporate governance	+	+***	+***	+***	+**	+	+**
Community	-	+**	+	+*	-	+**	+
Diversity	+	+	-	+	-	-	+
Employee	+	-	+	-**	-	+	-
Environment	+***	-	-	+***	+***	-	-
Human rights	+	+	-	-	+	+**	-
Product quality/safety	+	+	+**	-	-	+	+

Final Thoughts

- Standards and certification for green-electricity programs
 - Additionality and verifiability
 - Caution about the buy-in effect
 - Green-E sets minimum buy-in to ensure net benefits
- Evidence on interplay between “good” and “bad” when it comes to social/environmental responsibility
- Green behavior and support for environmental policy?
 - Promotes awareness, education, personal agency
 - Might be important for building political support for non-voluntary initiatives
 - Question of complements or substitutes