Abstracts for Tuesday, November 17

Spotlight Sessions

Copenhagen Negotiations
In 21 days the United Nations negotiation on climate change in Copenhagen begins - the culmination of two years of intensive work to implement the "Bali Action Plan" in the hope of achieving a global agreement to avoid dangerous climate change. These experts will discuss the status going into the Copenhagen meeting, what really matters in the negotiation, and what must happen after Copenhagen to advance effective global climate policy.

Moderator-Cymie Payne, Boalt School of Law, UC Berkeley
David Doniger, Natural Resources Defense Council
Sheri Goodman, Office of General Counsel, CNA Corporation

Behavior & Utilities
"Unleashing the Energy Efficiency Potential of Behavior Based Approaches"

Rebecca Craft, Con Edison
Gene Rodrigues, Southern California Edison Company
Mike Weedall, Bonneville Power Administration

Behavioral Economics
"Applying Behavioral Economic Findings to Address Climate Changes"

George Loewenstein, Social and Decision Sciences, Carnegie Mellon University
Jason Bordoff, Council on Environmental Quality, Executive Office of the President

Topic 3A Translating Ideas into Policies Panel

Office of Brian Baird
Kevin Hurst
David Hungerford

Topic 3B Transportation

Joshua Schank
Patrick DeCorla-souza
Robert Dunphy
Steve Winkleman

Allan Greenberg Federal Highway Adminstration	141	Designing Pay-Per-Mile Auto Insurance Regulatory Incentives	By converting fixed insurance costs to per-mile charges, pay-as-you-drive-and-you-save (PAYDAYS) insurance would encourage voluntary reductions in driving with concomitant decreases in congestion, air pollution, greenhouse gas emissions, crashes, and insurance claims. Public policies have at time been deployed to require or reward environmental performance in the sale of transportation-related products in the marketplace. For example, the National Highway Traffic Safety Administration (NHTSA) has issued both proposed and final fuel economy rules intended to maximize net benefits through the use of marginal cost-benefit analysis (NHTSA, 2006; NHTSA, 2008). This paper explores how an analogous benefit-maximizing rule could be structured to encourage adoption of PAYDAYS insurance. The key to designing such a benefit-maximizing rule is to: a) estimate the net benefits of every mile not driven (about 21.1¢); b) estimate the reduction in mileage that would result from PAYDAYS insurance (about 8%); and, c) apply these estimates to the calculation of net benefits of every PAYDAYS-insured mile (about 1.7¢). A mechanism by which the industry itself funds the incentive payments is described, as are alternatives. Companies would likely only offer such insurance—and the industry itself would only incur related expenses—if the 1.7¢-per-mile payment exceeded their costs of offering it.	

Topic 3C Workplaces & Organization

Paul Seo	Whose Job is it Anyway? Energy Managers Make Efficiency "Business as Usual"		A big barrier to saving energy on the job is that few people have it in their job descriptions. While some companies, like WalMart and REI, are going "green" on their own, others have limited resources and need help, especially with behavior change. Some pioneering programs provide technical and/or financial support for dedicated energy managers in businesses, schools, governments, and non-profits. These change agents rally co-workers to save 5-15% on bills, make the "C" level happy, energize the workforce, free up money for other uses, and change organizational culture. We will present program models, explore lessons learned and results achieved, and tell stories from the trenches from at least these programs: •BC Hydro's Power Smart Workplace Conservation Awareness program funds organizations to help them "create a culture that promotes and supports energy efficiency." Pilot program results show participants pursued conservation in highly innovative ways, tailored to their organizations. They created mascots (the aquarium's "Earl the Electric Eel"), instituted "green" leases, and organized scavenger hunts, lunch and learns, competitions, websites, blogs, and more. Most participants report cultural changes are taking place and that they've saved energy, with one large health organization reporting 13% savings.

•Puget Sound Energy's Resource Conservation Manager (RCM) program focuses on both behavioral and operational changes. The program funds RCM salaries which are then paid back through savings. In 2007 the program saved ".enough energy to meet the annual electricity needs of 5,500 households."

•Oregon's Department of Energy's and Washington State University's RCM programs provide technical support and have formed a network among RCMs. Case studies show even small organizations can benefit -- Crook County School District cut "15% off their utility bills, or $95,373 . . . [and] used the .savings [to restore] full funding for two teaching positions."

Brad Simcox
Puget Sound Energy

Creating Cultural Change from the Bottom Up, and Then Back Down

As a leader in meeting customer demand with environmentally responsible solutions, we at Puget Sound Energy recently found ourselves asking: what does it really mean to be green? Do those outside of the energy efficiency services (EES) recognize the value that EES brings? Do our executives truly understand why we put our efforts into demand side management? Two programs were created to help sell EES throughout PSE: the Ambassador Program and the Green Compass Team.

The Ambassador Program is a grassroots educational series that enables employees to be the face of PSE's energy efficiency services within their workgroups and communities. Employees learn about the "why" and "how" of energy efficiency, customer-scale renewable energy, and Green Power offerings, and the program serves to integrate EES throughout the organization by building relationships between Ambassadors and EES staff.

The Green Compass Team is an interdepartmental group that is charged to "navigate PSE towards greener business practices by providing a forum that will encourage and enable all employees to demonstrate leadership in environmentally-responsible behavior." The initiative grew out of EES with the belief that we need to be our own best customer. The team is striving to drive cultural change within our own four walls to be a greener, more energy efficient organization using a variety of strategies.

Both programs are creating cultural change among the ranks, which is filtering up the chain of command in the form of employee enthusiasm and back down as company value statements, policy support, and dedication of resources.

Maura Beard

Topic 3D Segmentation

Edward Maibach Jennifer Mitchell-Jackson Linda Dethman Dethman & Associates	271	Whose Job is it Anyway? Energy Managers Make Efficiency "Business as Usual"	A big barrier to saving energy on the job is that few people have it in their job descriptions. While some companies, like WalMart and REI, are going "green" on their own, others have limited resources and need help, especially with behavior change. Some pioneering programs provide technical and/or financial support for dedicated energy managers in businesses, schools, governments, and non-profits. These change agents rally co-workers to save 5-15% on bills, make the "C" level happy, energize the workforce, free up money for other uses, and change organizational culture. We will present program models, explore lessons learned and results achieved, and tell stories from the trenches from at least these programs: • BC Hydro's Power Smart Workplace Conservation Awareness program funds organizations to help them "create a culture that promotes and supports energy efficiency." Pilot program results show participants pursued conservation in highly innovative ways, tailored to their organizations. They created mascots (the aquarium's "Earl the Electric Eel"), instituted "green" leases, and organized scavenger hunts, lunch and learns, competitions, websites, blogs, and more. Most participants report cultural changes are taking place and that they've saved energy, with one large health organization reporting 13% savings. • Puget Sound Energy's Resource Conservation Manager (RCM) program focuses on both behavioral and operational changes. The program funds RCM salaries which are then paid back through savings. In 2007 the program saved ".enough energy to meet the annual electricity needs of 5,500 households." • Oregon's Department of Energy's and Washington State University's RCM programs provide technical support and have formed a network among RCMs. Case studies show even small organizations can benefit -- Crook County School District cut "15% off their utility bills, or $95,373 . . . [and] used the .savings [to restore] full funding for two teaching positions."

Topic 3E Empowering Home Management

Barbara Farhar

UNIVERSITY OF COLORADO	116	SmartGridCityTM Project: Community Context and Household Perceptions	Boulder, Colorado, passed the first U.S. kWh carbon tax collected through utility bills to support the City's Climate Action Program. Neighborhood climate action groups, which foster intensive, sustained education and action, have sprung up spontaneously in five areas of the city. Boulder County has financed $9.3 million worth of energy efficiency and renewable energy retrofits through issuing bonds with repayment of loans on property taxes. Reflecting citizens' active interest in energy, the City of Boulder established a task force to study municipalization of Boulder's electricity supply. Given this community context, the investor-owned utility has installed 15,000 smart meters and, in the summer of 2009, will roll out the SmartGridCityTM (SGC) project, an intelligent network transporting electricity and information between the utility and its customers. A key goal is peak-demand reduction. Household participation is voluntary. Face-to-face depth interviews with a purposive sample of approximately 50 smart-metered households addressed such questions as reasons homeowners have for volunteering to participate, the perceived advantages and disadvantages, and attitudes toward giving the utility control of thermostats during peak demand periods, variable pricing, and the value of real-time pricing, environmental signals, and social norming feedback. Findings are expected to illuminate the smart-grid attributes that customers value; perceptions of social norms regarding energy consumption, demand response, and climate change; the social context of SGC decisions; expectations for SGC and customers' responses to it; energy literacy; and key household demographic, knowledge, attitudinal, lifestyle and energy behavior characteristics.

Scott Pigg
Hal Knowles

University of Florida	173	Norms, Networks, and Negawatts: Conspicuity in a Carbon Constrained Future	Behavioral science in energy efficiency interventions suggests activating social norms through tailored feedback is a valuable strategy in utilities' demand-side management toolbox. Simultaneously, the smart grid is creating a pathway for providing this feedback. Yet, to date, these advances have been slow to market and are failing to address our built environment and its occupants as an interconnected holistic system. This presentation reviews the rational for, and functionality of, a transparent Web-based geospatial building performance, carbon footprinting, and social networking platform designed to address these systemic needs. Rooted in the social Web, with the potential to run parallel with and/or independent of the smart grid, this open source participatory tool allows both households and the marketplace to adapt and innovate based on a new paradigm of conspicuous reduction. In making the case for this collaborative platform, our interdisciplinary review suggests multiple synergistic findings including: (1) social norms are not fully activated by social networks of mere neighbors and may benefit from user choice in peer associations; (2) utilities, especially MOUs in states with open records laws, face a low risk of invasion of privacy liability for publicly sharing customers' monthly consumptive use data, though finer grained feedback such as smart meter time interval data is likely too detailed; and (3) third-party green building programs, such as the U.S. EPA ENERGY STAR® and the USGBC LEED Rating System, are based on modeled assumptions and may be overestimating true performance thus needing transparency in core metrics such as energy and water consumption.

Topic 3F Evaluation of Behavior

Louis-Gaetan Giraudet

CIRED	144	A behavior-oriented model of the demand for heating energy to explore the energy efficiency gap	The energy efficiency gap concept emerged by observing a huge difference between the energy savings theoretically achievable and effectively implemented. Although not trying to give a definitive explanation to that much discussed question, we try to quantify some of the behavioral failures underlying. We use a model of the heating energy demand in the French residential sector enabling us to simulate explicitely two kinds of behaviors: the investment in energy efficient technologies and the level of utilization of these capacitites. The efficiency of the energy carrier and the thermal insulation level are represented by energy class (from G to A, A being the most efficient). The household's choice for an efficient energy class is made according to its discounted life-cycle cost using logit functions. We evaluate the sensitivity of the model to parameters which are presumably part of the energy efficiency gap : the heterogeneous discount rates among decisionmakers (landlords vs. tenants) ; the type of expectations in the calculation of life cycle costs (myopic vs. forward-looking) ; the heterogeneity of preferences among consumers. Once the energy class has been chosen, we model its utilization rate by a behavioral cuvre built on data made recently availbale, linking it to the annual heating expenditure : the less efficient the energy class, ie the higher the annual expenditure, thus the more restrictive the behavior, and vice versa. This feature allows us to quantify the so-called rebound effect, where an increase in energy efficiency is followed by a reduction in energy consumption to a lesser extent. We evaluate the sensitivity of the model to these paramters using a principal component analysis on scenarios combining various assumptions for each. This analysis allows us to estimate what are the key determinants of the energy efficiency gap. We then model various policy instruments aimed at reducing energy consumption (CO2 and energy taxes, subsidies on energy-efficient goods, regulations) to estimate to which extent they can help overcome the main barriers previously identified. This model is hard-linked to the general equilibrium model IMACLIM-R, a global hybrid model aiming at providing a consistent framework to represent the interactions between macroeconomic mechanisms and the energy sector.
Leah Stokes			

Columbia University - SIPA	267	Integrating Psychology and Energy in Social Marketing Evaluation: Evaluating the University of Toronto Rewire Program	Recent campaigns to change energy behaviours have become increasingly sophisticated, using a diverse set of policy tools to target complex sets of human behaviours and emotions. However, the sophistication of evaluation metrics has not kept pace. Despite the wide support for community-based social marketing as a best-practice to drive community behavioral changes, few large-n studies have attempted to measure the concrete financial, psychological, and environmental effects of social marketing programs. The Rewire program, at the University of Toronto, has attempted to fill this evaluation gap. Rewire used a wide range of monitoring techniques to assess the efficacy of social marketing, including significant multi-year surveys on a wide variety of psychological and social measures, extensive floor-level electricity and energy metering in both experimental and control areas of the university, and sophisticated informant interviews. First, this paper briefly reviews the range of psychological metrics available to evaluate changes in behavior, with a particular focus on recent psychological advances. Effective ways to integrate energy metrics into psychological indicators are discussed, and the financial implications of a social marketing approach evaluated. The Rewire program is unique in its ability to dovetail psychological and financial assessments into an integrated monitoring scheme. Using the Rewire experience, a best practice set of metrics and monitoring techniques has been identified that can capture the important indicators of program success in a cost-effective way, and avoid common obstacles of integrated behavior change assessments.

Hunt Alcott

Measuring Changes in Energy Use Behaviors: Free Riders, Confounders, and Design for Evaluation	Randomized controlled trials, such as those used by the FDA to evaluate the efficacy of new drugs, are widely understood to be the “gold standard” of monitoring and evaluation: because people are randomly assigned to treatment or control groups, the difference in average energy use between the two groups must be the causal impact of the treatment program. This methodology allows precise estimates of energy price elasticities and program effects that are unbiased by previous concerns about “free riders” (which econometricians call “always-compliers”) and weather and other confounders. There is a perception, however, that it is costly and burdensome to design programs for randomized evaluation. Recent work in health, education, and microfinance in developing countries – and in energy pricing and conservation by some utilities in the U.S. – show that this need not be the case. The presentation begins by illustrating the importance of designing utility programs for evaluation: using randomized controlled energy conservation programs run by a company called Positive Energy with utilities in Minnesota and Southern California, we show how the previous approaches to evaluation give misleading results compared to the true impact of the program. Second, we discuss lessons from

randomized evaluations done in other industries on how to measure spillovers or leakage between treated and untreated groups, design cluster-level randomization, and address concerns about whether randomized programs are “fair.” Finally, we provide examples of how energy conservation and pricing programs can be designed for evaluation at low cost: we suggest how lotteries, scratch-off rebate cards, program phase-ins, and a technique called “randomized encouragement” can be used to cleanly measure the effects of programs like CFL rebates, air conditioner replacement, and real time electricity pricing.

Lunch Spotlight

Doug McKenzie-Mohr

Topic 4A Local & State Strategies

Thomas Jensen

SAIC	122	Opportunities for Leveraging the Capacity of Local Government to Advance Energy Efficiency	There is a high level of interest among utilities and other energy efficiency organizations in collaborating with local governments and community based organizations to deliver energy efficiency programs. This paper highlights the breadth of opportunities and identifies key advantages and disadvantages of different approaches to leveraging community resources. Strategies include targeting municipal energy use, green purchasing, and financing to motivate energy efficiency within communities. In addition, point of occupancy and sale strategies, code compliance, advanced codes and standards, sustainable subdivisions and communities, zero energy buildings and communities, and technology incubation and piloting opportunities are discussed. Strategies to integrate energy efficiency with broader sustainability and climate change initiatives are also presented. This paper suggests that levers to promote energy efficiency in local communities need to be carefully chosen with the characteristics and the capabilities of the communities in mind and with the recognition that the effectiveness of many of the levers is not well understood. The paper presents a capacity-based model to help evaluate community attributes and also offers a road mapping methodology as a tool for communities, utilities and state agencies to plan programs. The model is also useful in helping communities come up with strategies depending on their local characteristics to collaborate and partner among themselves, utilities and other organizations. The paper uses examples from communities including Montgomery County, Ann Arbor, San Antonio, Boulder, San Francisco, Oakland, San Diego, Portland and Seattle to illustrate findings. Finally, the paper presents policy strategies and specific recommendations for communities and others.

Andrea Denny
Ivan Urlaub
Catherine Squire

Topic 4B Feedback

Jennifer Robinson
Jon Froehlich
Paul Cole & Kevin Calligan

GroundedPower, Inc.	284	More than an Energy Monitor: GroundedPower's Approach to Creating Behavioral Change	More than an Energy Monitor: GroundedPower's Approach to Creating Behavioral Change Persistent behavioral change in residential usage of energy has been elusive for utilities offering simple real-time energy monitors or equipment rebate programs. The challenge is to give consumers the information and tools so that individual households can independently establish goals for energy consumption, identify tasks that contribute to energy savings and see themselves as part of a larger community committed to energy savings. While this approach might appear unreliable to utilities accustomed to equipment-based programs, an energy monitoring system that addresses social, economic and environmental motivators can produce significant results. Cape Light Compact has a 100 home pilot program on Cape Cod using the energy monitoring system from GroundedPower, Inc. In addition to providing real-time electricity usage data, the GP solution focuses on goal-setting, energy savings tasks, social comparisons and social networking. GP's innovation is a multi-disciplinary approach in helping people reduce their energy consumption. Rather than a gadget-heavy solution, GP engages the individual with psychology and user-centered design principals. This presentation will report on the first six months of the pilot. The pilot study correlates usage of the website with a household's reduction in electricity usage over a 6 month period. The study correlates attitudes and experience prior to the pilot with energy use reduction and website user statistics during the pilot.

Topic 4C Universities as Test Communities

John Petersen

Oberlin College	191	Employing multiple modes and scales of real-time feedback to engage, educate, motivate and empower electricity and water conservation	How do consumers respond when they are made immediately aware of the environmental and economic costs of personal and community-levels of resource use? Do different modes of feedback, graphical displays and degrees of data aggregation elicit different responses? To address these questions, researchers at Oberlin College, working in collaboration with Lucid Design Group, have been examining the role of socially and environmentally contextualized feedback as a mechanism for eliciting changes in feelings towards nature, attitudes and consumptive behaviors in residents of college dormitories. With a grant from the Great Lakes Protection Fund we are currently developing a novel system that will be used to examine how households and businesses within the City of Oberlin respond to socially-comparative and environmentally contextualized feedback on personal and community-scale water and electricity use. This presentation will summarize research frameworks, findings and plans. To date, research at Oberlin College has demonstrated that socially comparative web-based feedback combined with education and competition can result in short term electricity reductions of up to 56% in dormitories. We will also report on responses to “energy orbs”, that glow different colors depending on current consumption relative to typical consumption. Finally, we will discuss ongoing development of novel consumer and bioregional “Building Dashboards®” and other modes of feedback (including texting, orbs, email and social networks) within the City of Oberlin. The goal is to enable resource use decisions based on combined real-time information on personal consumption, aggregate city-wide electricity and water use and water quality in the local drainage basin.
Vanessa Schweizer Carnegie Mellon University	147	Deliberative Democracy to Create a Climate for Change	In Creating a Climate for Change, Moser and Dilling argue for the development of communication strategies that both motivate and sustain social change. Such strategies are necessary in the face of climate change due to the long lag times of natural and social systems. Regan suggests deliberative dialogue as a promising tool; however, her assessment of its potential is limited to those participating. Fishkin’s concept of a Deliberative Poll® takes deliberative dialogue to a new level, where it can not only transform participants but also impact policy decisions. Traditional polls that aim to inform decision makers about public opinion often do not reflect informed opinion. For issues with important scientific and technical details such as climate change, the public is often ill informed as to both the work of the scientific community and the details of policy options. Added to this lack of education is the lack of time that citizens have to review these details and the choices and trade-offs involved. In contrast, deliberative polls can create the conditions for a representative sample of a community to become well informed about an issue and thereby capture

			informed public opinion. Over the past 6 years, an interdisciplinary team has honed Fishkin’s protocol specifically for a university setting. In this presentation, the protocol will be introduced and the results of recent deliberative polls on climate change conducted at our campus will be described. Implications these case studies may have for larger deliberative polling initiatives and public policy will also be explored.
Dann Sklarew George Mason University	315	A Campus Model for Commuter-Facilitated, Renewables-Enhanced Smart Grid	Ubiquitous automobiles appear to be the scourge of combustible lifestyles in suburban America; yet cars could catalyze increasing sustainability in metropolitan areas. Upcoming commercial deployment of plug-in hybrid electric vehicles (PHEVs) provides a new opportunity to address twin challenges of deriving reliable power from intermittent renewable energy sources and reducing peak demand premiums. In essence, commuters' PHEVs could be linked through net metering to a local smart grid where renewable energy near parking spaces charges cars' batteries that are then tapped during peak demand or low renewable power periods. On a corporate or college campus, drivers and sponsors may benefit from incentives such as preferred spots, free recharge credits, or net meter-mediated permit refunds. George Mason University in Virginia provides a model for how this commuter campus-based smart grid could be implemented. Purchased electricity and permitted commuters jointly account for over 80% of Mason’s greenhouse gas emissions. Mason has committed to achieving climate neutrality, undertaking procedures to improve energy efficiency and environmental management. A moat of crowded parking lots surrounds the rapidly developing Fairfax campus. With a single transmission line entering campus, Mason's energy manager has real time access to power supply and usage on a building-by-building basis. The community is affluent with many social innovators, and hybrid vehicles abound. Still, there is virtually zero on-campus renewable energy production. We use Fairfax campus for a gendanken experiment testing the hypothesis that combining local smart grid, net metering and PHEVs could catalyze investments in and sustain returns from campus-based renewable power.

Topic 4D Messaging

Kirk Shanks

Dublin Institute of Technology

98

Irish energy-use behaviour intervention initiatives for mass media communication

The recent adoption of behavioural change policy aims, public interest in green living products and growing array of related public initiatives indicates an increasing acceptance of the role of behaviour in pursuing greater levels of energy efficiency. There are many different ways to approach influencing awareness and driving change at national levels across large populations. Where advertising campaigns have been reported to have little noticeable impact on large scale energy efficiency taking a tailored approach can prove effective at local level but cannot readily be extrapolated to the larger scale. This paper reports on two Irish mass media intervention initiaitives, under the National Energy Efficiency Campaign 'Power of One' and a national television series, which aimed to communicate behavioural issues through mass communication of tailored approaches. Whilst both initiatives generally addressed the same intervention actions and technical factors these were approached in different ways. This paper describes the framework of both initiatives reporting results and discussing implications of approaches and techniques used to design and implement each. The aim of these initiatives was to benefit from social marketing multipliers whilst also investigating the potential for self-learning with individual households. The experience of these interventions provides indications of key factors for scalability of behavioural change initiatives.

Cara Pike

In early 2008, global warming advocates came together to begin the process of developing an overarching narrative, or Common Message Platform, to identify the shared ideas, values and explanations that provide the foundation for a national conversation on global warming over the long term. The framing guide that has been developed, *Climate Crossroads: A Research-Based Guide, From and For Global Warming Advocates*, is informed by several sources, including the experiences of the environmental and climate communities, the thinking of strategic advisors, and a body of research conducted in recent years, as well as new research conducted specifically for this project.

David Juri Freeman

Skumatz Economic Research Associates Inc.	246	Doing More Without Much More: Getting the Biggest Bang from Outreach	The project provides an in-depth look into crafting the most effective education/outreach messages for increasing energy efficiency and recycling behavior. The researchers set aside three neighborhood groups (a control, a conventional, and an advanced outreach neighborhood) and measured the impacts of various outreach strategies. The advanced outreach neighborhood was subject to the latest methods including community based social marketing, prompts, normative behaviors, and viral marketing. These techniques, borrowed from the social sciences and marketing worlds, were pitted against conventional outreach materials and both were compared to the neighborhood with no outreach. To augment the quality and cutting-edge nature of the project, we bring in experienced social marketing professionals from the academic, product marketing, and environmental fields. Program records and surveys were used to measure impacts, costs, awareness / attitudes / behaviors / barriers and other data in a pre-post control / test mode. We gathered real-time feedback on the changes that occurred in each neighborhood as a result of the experiment. Pre-post surveys were used to understand the effects of the various outreach strategies. We examined the net impacts, cost-effectiveness of the efforts, and prepared tools addressing best practices, impact ranges, cost-effectiveness metrics, and developed recommendations for communities / utilities. The presentation shares the results of the project including the most effective outreach/education materials, the impacts of various outreach methods, and ways to maximize current outreach budgets to get the most out of your educational materials. New media, social marketing, and advanced outreach may be the key to kick-starting green behavioral change.

Topic 4E The Gap Between Attitudes & Action

Seth Robbins

Societal attitudes and beliefs that endanger our response to global warming: psychological analysis of what we don't want to know about ourselves

Any effective approach to understanding and influencing the behavioral mechanisms involved in minimizing climate change must extend beyond exploration of rational and conscious factors to include detailed examination of powerful non-rational, unconscious attitudes and beliefs on human behavior. Virtually all models of behavior change that are being applied to understanding issues related to climate change focus on knowledge, intention, and action. These models do not adequately address fundamental unconscious viewpoints and resistances to change which threaten to undermine our success. Contemporary psychoanalytic theory provides essential insights into understanding the nature of unconscious influences on the behavior of individuals and large groups, including communities and cultures. In this regard, over 100 years ago Carl Jung defined the psychological "complex" in individuals: a narrow or distorted emotional perspective arising from experiences early in life, which persists into later life and causes maladaptive perceptions, attitudes, and behaviors. Current theorists have developed the concept of the "cultural complex", whereby the idea of the complex in the individual has been extrapolated to describe unconscious influences active within large groups. This paper will postulate and examine cultural complexes active in our own society that serve to block accurate understanding of, and response to, this threat to global health. These include cultural complexes centered around narcissism (including individualism, entitlement, and power), materialism and beliefs about economic growth, technocentrism, and ignorance and denial about the fragility of the natural environment. Just as the psychological growth of individuals depends on the development of consciousness of the nature of one's personal complexes, the health of large groups (including societies and the world community) depends on bringing the maladaptive aspects of our shared complexes into our awareness at the collective level – especially among leaders and policymakers. This paper will also consider psychological defenses against emotional vulnerability that interfere with our ability to tolerate awareness of our shared biases and conceptual blind spots. Explication of these complexes and the psychological reasons we resist awareness of them is vital to our development of a clear-minded and objective strategy to address global warming.

Dorian Letvine
Connie Roser-Renouf

Center for Climate Change Communication, George Mason University	288	Choosing between Efficiency and Curtailment:Predictors of Emission-Reduction Actions	The most effective actions individuals can take to limit their greenhouse gas emissions are energy-efficiency improvements to their homes and vehicles. Reducing emissions, however, is often viewed in the unpopular light of curtailment – Jimmy Carter in his sweater telling us to turn down our thermostats. Studies have indicated that people are largely unaware of how much energy they save by the various actions that conserve energy, over-estimating the savings yielded by curtailment and under-estimating those yielded by efficiency improvements. Without that knowledge, cost barriers may lead the individual to choose shorter showers, rather than a new water heater, not realizing the disparity in their impacts. In this presentation we identify the most frequently taken efficiency and curtailment actions, using a nationally representative survey conducted in the fall of 2008 (N=2,164). We examine the characteristics of the people who are taking action – their demographics, values, civic engagement, perceptions of social norms, and beliefs about climate change and the effectiveness of their own actions in reducing it. We find that income, age and home ownership are strong mediators of both efficiency and curtailment actions – older, wealthier homeowners make more efficiency improvements if they are concerned about climate change, while younger, poorer renters are more likely to curtail their transportation energy use if they are concerned. Perceptions of an act's effectiveness in reducing climate change and belief that one's friends are taking similar actions are strongly related to taking most of the actions we examined. Implications for campaign design will be discussed.

Topic 4F Banking & Financial Models Panel

Joel Freehling
Stockton Williams
Peter Krajsa