

Critical Role of California's Cap and Trade Program in Support of

LOCAL CARBON REDUCTION INITIATIVES

By David Gershon
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EXECUTIVE SUMMARY

California's Global Warming Solutions Act of 2006 (AB 32) directs the California Air Resources Board (ARB) to reduce carbon emissions 20 percent from 1990 levels by 2020 and 80 percent by 2050. A series of market mechanisms have been adopted by ARB to aid implementation of AB 32. Central to these market mechanisms is the nation's largest cap-and-trade system.¹ Implementation of cap-and-trade in California will result in revenues managed by both the California Public Utilities Commission (PUC) and ARB. PUC will manage funds generated from utility ratepayers. ARB will manage funds from industrial sources.

The expenditure of cap-and-trade revenue must demonstrate a strong nexus to effective carbon reduction. In early 2012 the PUC and State Legislature will determine the criteria for cap-and-trade revenue expenditures, which could approach a billion dollars per year.

The effective use of cap-and-trade revenue for local carbon reduction initiatives will be crucial to AB 32's success. This is because 60%² of state GHG emissions are generated from the residential sector, which represents between 50 and 90%³ of a city's carbon footprint. It is also the low-hanging fruit because households can make immediate reductions in their carbon footprint without any quality of life diminishment and it saves them money. In addition, local initiatives can provide the critical co-benefits of demand driven local green economic development while buying us needed time for the longer-term technology and renewable energy solutions to scale-up

The problem however is that local carbon reduction initiatives aimed at getting people to adopt low carbon lifestyles are hard to do and that is why most GHG reduction solutions target the supply side. But if there is no demand, there is no market, and the best supply-side solutions will fall upon barren soil. Of course this is not an either/or proposition. We must bring about change on the supply *and* demand side, as they are synergistic. But for policy makers to fully avail themselves of this synergy they need to better understand how to activate the demand-side of the equation. Providing that understanding is a key goal of this white paper.

¹ See www.arb.ca.gov/cc/capandtrade/capandtrade

² From Max Wei of Lawrence Berkeley National Laboratory: "About 44% of California's direct GHG emissions are from the residential sector (passenger vehicles, residential power, residential heat). Residential demand and purchases/food are closely intertwined with industry and agriculture/forest production but the Air Resources Board does not break out direct and indirect emissions by residential, commercial, government, and other sectors. Adding indirect emissions due to purchases and food would push residential to well over 50% maybe to 60 or 70%."

³ Based on Empowerment Institute's research working with many cities across America.

Residential Retrofits: A Key Lever to Achieve GHG Reduction

The most high leverage opportunity to influence the demand side are local initiatives targeting residential retrofits, since both greenhouse gas reduction and the development of a clean energy economy must pass through this gateway. Buildings represent the lion's share of carbon emissions, expensive renewable energy installations only make economic sense when a building is insulated, and retrofits enable the creation of green jobs and green economic development. As a consequence building retrofits were targeted for ARRA stimulus funding, with single-family homes the priority since they can be as much as 70% of the residential sector carbon emissions.⁴ The Obama administration recognized the importance of this intervention and called it "recovery through retrofit."

To take advantage of ARRA funding and assist in the implementation of AB 32 and California Public Utility Commission's "Energy Efficiency Strategic Plan," Energy Upgrade California was created with an investment of \$229 million dollars. Its goal was to retrofit 130,000 homes by the end of 2012.

Although data is hard to come by at this point in time about the actual results being achieved, in speaking with several people in leadership roles with Energy Upgrade California and the US Department of Energy, the consensus is that this program is struggling mightily. In one part of the state the goal was 13,000 retrofits and they are hoping to get to 15% of this number. The typical conversion rate, when this data can be found, from people directly approached in their homes to actual energy upgrades is 1 to 2%. And in one report shared with me in confidence by a large state energy agency responsible for home retrofits, they determined that their marketing and administrative costs *before* an energy upgrade took place were \$3,500!

If we are to unlock the great promise of energy efficiency retrofits to enable GHG reductions and catalyst a clean energy economy, we need to better understand what the barriers are and how we might transform them. Research done by Empowerment Institute, which I head up, has demonstrated promising results for overcoming many of these barriers to participation.

In a pilot in San Antonio 41% of the 205 households participating in a peer-support group called an EcoTeam and using a structured behavior change program did some form of energy efficiency retrofit. Combining these results with Empowerment Institute's neighbor-to-neighbor block-based recruitment rate of 25%⁵ indicates that this approach is capable of achieving 5 to 10 times the conversion rate that is currently being attained. Further, because the household recruitment and support is done on a voluntary neighbor-to-neighbor basis, this approach in comparison to major marketing campaigns is quite cost-effective. And it is scalable.

This whole system approach, which I describe in more detail later in this paper, is embedded in an initiative, called the "Cool City Challenge," to scale up Empowerment Institute's proven behavior change and community engagement methodology in Davis, Palo Alto and Sonoma and then disseminate it statewide. The goal of this initiative

⁴ From Max Wei, Lawrence Berkeley National Laboratory

⁵ Based on working with 20,000 people in 9 cities. Results also included substantial natural resource and financial savings per household. See chapter 2 in *Social Change 2.0* for a case study.

however is not just an uptake of retrofits, but substantial household carbon reduction.⁶ This behavior change methodology is based on two decades of rigorous research that has demonstrated how peer-to-peer commitment and clear, simple action set in the context of a compelling and achievable community vision, move citizens to act. Key co-benefits of the initiative include local economic development/green jobs, neighborhood-level disaster preparedness, strengthening of the social connectedness of neighbors, and a new model for interaction between citizens and their local governments.

Desired Outcome for California

This white paper makes the case for the importance of investing significant resources from cap-and-trade revenue into scalable local initiatives capable of engaging citizens in achieving substantive GHG reductions. These types of initiatives can meet the major demand-side need currently unmet by building and vehicle efficiency programs. Effective local carbon reduction initiatives that could be adopted by the Legislature and implemented by ARB include:

Cool City Challenge: This initiative, as outlined above, will start in 2013 with the goal over three years of mobilizing between 25% and 75% of each community's residents to reduce their carbon footprint by 25% with at least 40% of these program participants doing home energy retrofits. Each city will also develop a low carbon economic development strategy around the increased residential demand generated by the campaign for low carbon goods and services, energy efficiency retrofits, and renewable energy. Further, in collaboration with Lawrence Berkeley National Laboratory and local universities (UC Davis, Stanford and Sonoma State) each community will create a plan to become carbon neutral by 2025. At the completion of this demonstration phase the Cool City Challenge model will be rolled out to communities across the state. To accelerate this scaling process interested communities will be supported through a one-year web-based preparatory program. ARB's Cool California website and community outreach program could assist in this process.

Carbon Reduction Information Management System: Building on ARB's Cool California carbon calculator, develop a robust on-line platform for all cities in California to track the carbon reduction and participation activities of all sectors of their community. This would also allow a city to compare their climate action plan implementation efforts to comply with AB 32 with other cities and exchange learning to accelerate the dissemination of best practices. Moreover, this on-line tool would provide a simulator to help a city visualize the environmental, economic and social benefits at different levels of GHG reductions and participation to help motivate the community to take vigorous action.

Along with helping to provide the programmatic and policy justification for local carbon reduction initiatives, this paper also outlines how those described above could be implemented. I was requested by California State Senator Lois Wolk to prepare this white paper because of my expertise in this field. I wish to thank Max Wei of Lawrence Berkeley National Laboratory, Joe Krovoza, Mayor of the City of Davis, and Mitch Sears, Sustainability Manager for the City of Davis for their contributions.

⁶ Empowerment Institute's *Low Carbon Diet* program enabled a 25% carbon footprint reduction per household based on data from 1,500 households in Portland, Oregon and communities across the states of Vermont and Massachusetts.

THE POTENTIAL GHG REDUCTION IMPACT OF LOCAL INITIATIVES

“The world’s cities are responsible for up to 70% of harmful greenhouse gases while occupying just 2 per cent of its land. They have become the real battleground in the fight against climate change. What goes on in cities, and how they manage their impact on the environment, lies at the core of the problem.”

“Hot Cities: Battle Ground for Climate Change” – UN-HABITAT’s 2011 Global Report

An Opening for Change

With international and national climate change legislation failing to get traction, the responsibility for addressing global warming in the United States has devolved to states and communities. California, with its tradition as the trend-setting state for progressive environmental legislation in America, has stepped into this vacuum with the passage of its groundbreaking legislation, AB 32, and a cap-and-trade system to support its implementation. But now the work begins—actually getting substantive GHG reduction in a timely manner.

To just get California to its first benchmark of 20% GHG reduction by 2020 against 1990 levels will require a speed and magnitude of change well beyond the traditional experience of government. Its primary policy tools of command and control and financial incentives, at their best, enable slow, incremental change. Moreover the goals of 2020 are only the starting point for a much longer-term process of reducing GHG emissions 80% against 1990 levels by 2050.

If the social change tools of carrots and sticks alone are unlikely to meet AB 32’s needs, what else is available? Are there assumptions we might rethink about what motivates people to change? Taking a page from Thomas Jefferson’s playbook, might we be able to motivate people to change because of a dream that inspires their imagination, enlivens their sense of possibility, and lifts their spirit as human beings? Or to ask this question in a more tangible way, how might we empower individuals, communities and organizations to voluntarily adopt new behaviors that help them operate at a higher level of social value, which in this context is the reduction of GHG emissions?

I have been attempting to answer this question over the past three decades, at the individual, local, national, and international levels; working with government agencies, nonprofit organizations, corporations, and ad-hoc community groups; in developed and developing countries alike, and around a multiplicity of issues.

My research has taught me that *people are willing to change if they have a compelling vision and are provided tools to help them bring it into being*. The vision must touch their core to engender the necessary passion and commitment needed to overcome the inevitable obstacles on the path of realization. They need others of like mind going on the journey with them to stay motivated. And with a well-designed transformative change platform that is replicable, these behavior changes can be widely disseminated throughout a community, organization, state, country, and across the planet.

I have also seen that when individuals become personally part of the solution it creates a new dynamic in the way we tackle large societal challenges. We are able to see beyond

the traditional social change formula of business as the problem and government as the solution, with nonprofits lobbying government for better regulations against business and citizens sitting on the sidelines complaining about the coziness between politicians and business.

When citizens are empowered to adopt socially beneficial behaviors, such as a low carbon lifestyle, an opening can occur for traditionally adversarial relationships to establish new arrangements of cooperation and collaboration in service to this new voting constituency and purchasing community. When all the parts of a system begin working together and there is no “other” to combat or protect against, more innovative and generative solutions start to emerge.

The model of social change that I have been describing represents what systems theory calls *second-order change* – change that transforms and reorganizes a system to a higher level of performance and social value. When the easier-to-implement change solutions are exhausted and prove inadequate for the magnitude of change required, the system goes into stress and must either evolve or breakdown. This white paper represents an attempt to expand the parameters for social change solutions so that we can evolve our social systems. I call it “Social Change 2.0.” It stands on the shoulders of “Social Change 1.0” – command and control, financial incentives, and protest – because it could not function optimally without these. But it is designed to go beyond the constraints of these more incremental approaches to change.

The Social Change 2.0 framework aspires to tread in the territory where some have thrown up their hands and wondered if change was really possible. It addresses issues that are complex and require many people to change in fundamental ways; issues for which there are no easy solutions and those that exist are exceedingly difficult to implement and require the cooperation of the whole system; issues which if not adequately addressed will cause an ecological or social system to break down. These issues include global warming, depletion of our nonrenewable natural resources, chronic poverty, disease epidemics, terrorism, ethnic and racial animosity, the disenfranchisement of women and minorities, and overpopulation.

Global warming, the focus of this paper, is a prime example of the need for a second-order change solution. Jim Hansen, NASA’s chief climate scientist, says we have at most ten years to start turning global warming around or “suffer a planet that is not conducive to human life.” The *New York Times* says the “climate crisis is at its very bottom a crisis of lifestyle. The Big Problem is nothing more or less than the sum total of countless little choices. Most of them made by us (consumer spending makes up 70 percent of our economy) and most of the rest of them made in the name of our needs and desires and preferences.”

In a democratic society we can’t legislate the kind of lifestyle change that would be necessary to have a major impact on global warming. Passing a law that commands people to lower their carbon footprint and then penalizing them if they don’t is not acceptable or practical. Offering people financial incentives to reduce their GHG emissions is sending the right signal, but people are still free not to avail themselves of these incentives. If people are not already predisposed to changing, financial incentives have a limited effect.

Social protest is a gift of our democracy that has allowed Americans to speak out against injustice and government policies with which we disagree. It contributed to ending an unpopular war in Vietnam and furthering the civil rights of disenfranchised members of our society. But as important as social protest has been and always will be in a democratic society, it is reactionary and defined by the problem. It is a great tool for objecting to what is wrong in society, but not for creating what is right. Saying no to global warming and lamenting the lack of bold and effective national political leadership are very different from providing a viable alternative.

I have no pretensions to believe that the Social Change 2.0 design principles and practices described in this white paper are the solution to the enormous challenge of GHG reduction that the State of California has boldly committed to addressing with its landmark AB 32 legislation. The nature of this problem defies any single approach to change. And this framework is still very much a work in progress. But I have seen enough evidence applying these tools over the past thirty years to believe that they can make a contribution, either in whole or in part, to tackling any issue that requires fundamental transformative change. And global warming is certainly such an issue.

So where do we begin? Where are the high leverage intervention points for addressing GHG reduction? Certainly it makes good sense to work with power suppliers, and much has already been done in the AB 32 legislation and its cap-and-trade program to accomplish this. But an undeveloped strategy is the power-users who actually create demand for these supplies of energy. This is a relatively untapped part of the change equation with huge potential. Further, if we can influence change from the demand side we will have developed a long-term solution. For example, when utilities pass on the costs of buying additional renewable energy to the consumer in the form of a higher price for the green energy option, it is still the end user who decides if they wish to pay more for it. And currently the vast majority of people are not choosing this option.

Of course this is not an either/or proposition. We must bring about change on the supply *and* demand side, as they are synergistic. But for policy makers to fully avail themselves of this synergy they need to better understand how to activate the demand-side of the equation. Providing that understanding is a key goal of this white paper.

What kind of potential are we talking about? As noted earlier, cities generate 70% of the planet's carbon emissions with citizens living in these communities responsible for between 50 and 90% of its carbon footprint. And in California, the residential sector generates 60% of the state's GHG emissions. It is also the low-hanging fruit because households can make immediate reductions in their carbon footprint without any quality of life diminishment and it saves them money. And from a societal change point of view, this buys us needed time for the longer-term technology and renewable energy solutions to scale-up.

What would it look like if we were able to scale up a robust demand-side intervention in California's communities? Here is a future scenario for a project I am spearheading, the Cool City Challenge, in the three California communities of Davis, Palo Alto and Sonoma. It is scheduled to begin in 2013 and it aims to look just like this. Hopefully it will.

A Vision of Possibility: Dateline 2016

In 2013 three of the most progressive California cities and their citizens embarked upon a bold adventure to develop a game changing social innovation around greenhouse gas reduction. Its goal: rapid and substantial carbon reduction in the short-term and carbon neutrality in the long-term, with vibrant livability and resiliency for its citizens, and green prosperity for its businesses. And they are succeeding! Here's how they did it...

Over a three-year period citizens substantially lowered their carbon footprints and in so doing built demand for green products and services; and as a result local low carbon economies emerged. With this carbon literacy and sense of self-efficacy, these empowered citizens continued pushing the envelope and advocated to their local politicians to become carbon neutral cities by 2025, which they heartedly accepted. Carbon neutral cities became the new "cool" in California. And the race began to achieve the coveted title of the first city in California to become carbon neutral. It also did not hurt that an "X prize" was established that awarded ten million dollars to the first city to accomplish this audacious goal.

These communities sent a profound message to the world that citizens in the highest per capita greenhouse gas emitting country were willing to lead the way in reducing their high carbon-emitting lifestyles for the sake of the greater good. But paradoxically, rather than this being a sacrifice, they discovered it opened up a whole new set of amazing and unexpected benefits. People now knew their neighbors, their neighborhoods had become more resilient and livable, and civic participation had become the new coin of the realm for people young and old.

And at the community level, to the delight of the community economic development agencies and chambers of commerce, many green businesses had sprouted up and were flourishing. And with them, numerous high paying green jobs were being created. This was because 75% of the citizens of these communities were now engaged in reducing their carbon footprint by an average of 25% on the path to carbon neutrality, entire blocks were becoming carbon neutral, and each of these cities was reinventing its technological infrastructure to become carbon neutral. These cities were realizing the potential that many communities had talked about, but few had come close to achieving – a thriving local low carbon economy.

Knowledge about the amazing success of these three cities began to spread and soon other California cities came to learn from them. This was not only because they wanted to replicate this success in their communities, but also because the state of California had wisely decided to invest a portion of their cap-and-trade revenues in helping its communities make these types of changes. The universities in these cities became repositories for these learnings and best practices and played a key role in their dissemination to the visiting cities. These universities also attracted many students who wished to be part of a real-world social innovation laboratory around an issue so vital to their future. The students were fully integrated into the community-organizing aspects of the program and a number of them built green businesses that grew out of the first-hand knowledge they gained about services needed to meet the burgeoning demand for carbon reduction.

All this success spawned a strong sense of confidence, civic pride and a can-do spirit in these communities. Combining this with the new competencies they had learned in how to engage the whole community and design transformative social innovations, engendered an outpouring of social inventiveness. These cities were now not just devising new ways to reduce their GHG emissions, but generating solutions to a wide variety of social, environmental, and economic issues as well. They were living the maxim, “many hands make light work.”

After several years, knowledge of the bold social experiments taking place in these three pioneering communities—who were now actively exchanging best practices and collaborating with one another—had spread far and wide across the state, country and world. Many communities had come to learn and were now beginning to replicate this success in their cities. And California – it had once again served its role well as the planet’s premier social laboratory for courageous and visionary public policy initiatives. But this time it had gone after the biggest challenge and opportunity facing humankind and delivered!

Meeting the Challenge and Seizing the Opportunity

While getting people to reduce their carbon footprint is the low-hanging fruit to CO₂ mitigation, will we be able to pick it? Can we empower citizens to get out of their comfort zones and adopt low carbon lifestyles? Will cities be willing to get out of their comfort zones and learn the skills necessary for engaging their citizens in behavior change? And if both cities and citizens are willing to make these changes, can such an initiative be brought to scale?

In 2006 [Empowerment Institute](#)—a pioneer in environmental behavior change and community engagement strategies—began attempting to answer these questions by creating a community-based behavior-change program called [Low Carbon Diet](#). The program consists of twenty-four actions to reduce one’s carbon footprint by at least 5,000 pounds in thirty days and to help others do the same. It is based on two decades of experience working with several million people in hundreds of cities around the world who are organized into neighborhood-based peer support groups of 5 to 8 households called EcoTeams.

The Low Carbon Diet program helped empower the movement that had been building in America around personal action and community-based solutions, and immediately took off. It was driven by the many local governments committed to the issue of climate change who were wishing to engage their citizens; faith-based groups like Interfaith Power and Light representing some 5,000 congregations, wishing to engage congregants; and environmental groups, like Al Gore’s Climate Project, which gave the book to the 1,000 people he trained to lead his “An Inconvenient Truth” slide show. This interest resulted in the development of a community engagement strategy called a [Cool Community](#).

There are now over 300 communities in thirty-six states across America, including 46 in California, who received training in how to deliver the Low Carbon Diet program and Cool Community strategy. Participants using Low Carbon Diet are achieving a 25 percent carbon footprint reduction and reaching out to fellow citizens to accomplish the same. Low Carbon Diet and the Cool Community model has also been translated and culturally adapted for China, Japan, South Korea, Australia, Canada and the United Kingdom.

But wide proliferation of these tools is not the same as effectively applying them. After five years of watching many cities dive into this behavior change and community engagement process with gusto, but fizzle out after they bumped up against the hard work and deep knowledge required to be effective, it became apparent to me that we had gone a mile-wide and an inch deep. Having an effective carbon reduction tool and community engagement strategy was just the first step; we now needed to help communities skillfully deploy them if we wished to realize the potential of a demand-side GHG reduction strategy.

It also became clear that this next phase was going to take a very special city – one with a very strong commitment to carbon reduction and determined political and civic leaders. This endeavor was not for the faint of heart. My search for the right cities eventually led me to California because of the political commitment of the state to GHG reduction as demonstrated by AB 32. To a specific part of the state, Northern California, because of the widespread sustainability ethic that permeated cities and citizenry in this region. And eventually to three cities that had demonstrated early adopter credentials around GHG reduction and were a manageable size for such an innovative endeavor.

One of those early adopter cities, Davis, first showed up on my radar screen in 2008. They had sought out Empowerment Institute’s Low Carbon Diet and Cool Community methodology after they determined that 75% of the community’s carbon footprint was being generated by the residential sector. They concluded that their “climate goals could not be met without the community becoming the primary driver of local GHG emission reduction.”

From October 12, 2008, through November 10, 2008, the city organized 150 households to participate in Low Carbon Diet EcoTeams. Participation included the city council and staff; University of California, Davis, administrators, faculty, staff, and students; local businesses; and community members at large. Results were received from 65 percent of the households who reported reducing their carbon footprint an average of 5,516 pounds.

Inspired by these results, they reworked their Climate Action and Adaptation Plan in 2010 to have the city become carbon neutral (the first city in America to make this an official city policy) and committed to engaging 75% of Davis households by 2015 to participate in household GHG reduction.

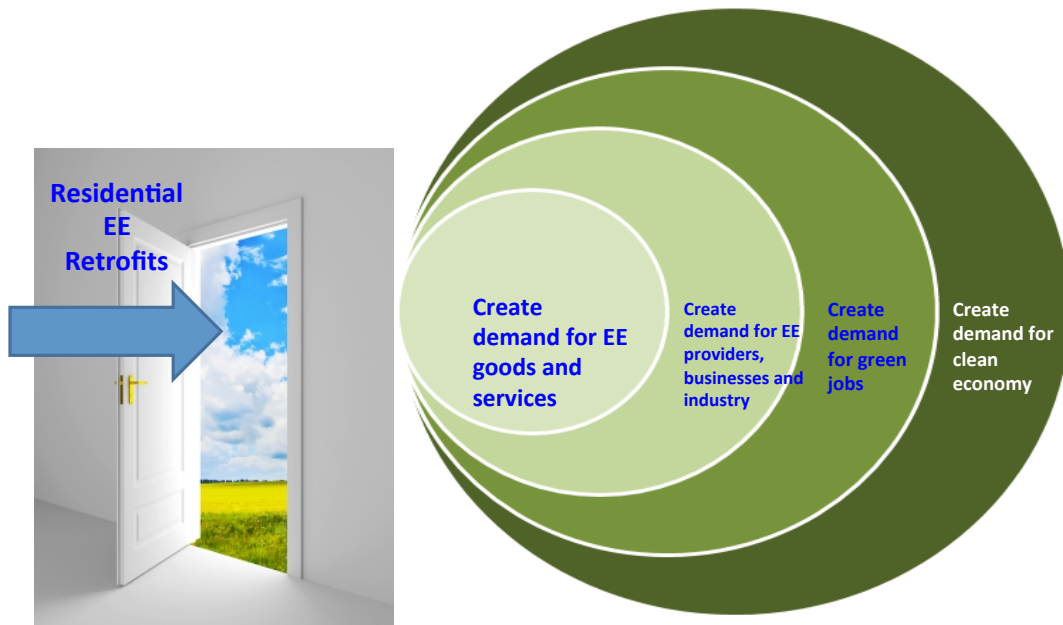
However, when they tried to scale up the pilot program, their lack of expertise in this behavior change and community engagement methodology combined with limited financial resources led to several unsuccessful efforts. But undaunted and now more cognizant about just what it takes to be successful, they sought out the Empowerment Institute for help. In many ways it is Davis’ aspiration to push the envelope around bold carbon reduction and citizen engagement, and their can-do spirit that led to the development of the Cool City Challenge, which will bring them the expertise and resources to meet their fire.

But before we get to the Cool City Challenge, it is important to gain insight into a central component of a demand-side GHG reduction strategy—residential energy retrofits—and the current state of play in California and nationally.

DRIVING DEMAND FOR RESIDENTIAL RETROFITS

Both greenhouse gas reduction and the development of a clean energy economy must pass through the gateway of energy efficiency retrofits. Buildings represent the lion's share of carbon emissions, expensive renewable energy installations only make economic sense when a building is insulated, and retrofits enable the creation of green jobs and green economic development. As a consequence building retrofits were targeted for ARRA stimulus funding, with single-family homes the priority since they can be as much as 70% of the residential sector carbon emissions.⁷ The logic of this strategy, which the Obama administration called "recovery through retrofit," is illustrated in the schematic figure below from Lawrence Berkeley National Laboratory.

Residential energy efficiency retrofits are a key lever to unlock and enable a clean, prosperous 21st century economy
(Courtesy of Lawrence Berkeley National Laboratory)



To take advantage of ARRA funding and assist in the implementation of AB 32 and California Public Utility Commission's "Energy Efficiency Strategic Plan," Energy Upgrade California was created with an investment of \$229 million dollars. Its goal was to retrofit 130,000 homes by the end of 2012.

Although data is hard to come by at this point in time about the actual results being achieved, in speaking with several people in leadership roles with Energy Upgrade California and the US Department of Energy, the consensus is that this program is struggling mightily. In one part of the state the goal was 13,000 retrofits and I was told they would feel fortunate if they could get to 15% of this number. But this struggle to get people to participate in residential retrofits is not limited to California, its endemic across the

⁷ From Max Wei, Lawrence Berkeley National Laboratory

country and the United Kingdom, even with large financial incentives. The typical conversion rate, when this data can be found, from people directly approached in their homes to actual energy upgrades is 1 to 2%. And in one report shared with me in confidence by a large state energy agency responsible for home retrofits, they determined that their marketing and administrative costs *before* an energy upgrade took place were \$3,500!

If we are to unlock the great promise of energy efficiency retrofits to enable GHG reductions and catalyze a clean energy economy, we need to better understand what the barriers are and how we might transform them. Research done by Max Wei at Lawrence Berkeley National Laboratory describes four major barriers that exist and suggests how the type of whole system approach developed by Empowerment Institute can help in overcoming them.

Whole system approach to mitigate home retrofit barriers

(courtesy of Lawrence Berkeley National Laboratory)

Home Retrofitting Barriers	Whole System Approach
<p>(-) Energy efficiency is not a priority for people and as a result it is difficult to interest them.</p>	<p>(+) Provide a program that delivers broader and more appealing benefits (conserving resources for the sake of our children, getting to know neighbors, and creating safer and healthier block).</p>
<p>(-) Traditional approaches of engaging people through advertising and websites are scattershot, costly, and have proven to be ineffective.</p>	<p>(+) Engage people through the trusted messenger of a neighbor who presents the appealing co-benefits described above.</p>
<p>(-) Transaction costs are too steep: time consuming and complicated paper work for rebates, difficulty finding a qualified contractor, disruptions in house and life, making a major cash outlay with a long and perhaps uncertain payback period.</p>	<p>(+) Use EcoTeam to create a new social norm around lowering carbon and environmental footprint to motivate deep retrofit actions. Use EcoTeam to assist in implementation through shared leadership responsibility to reduce the time burden on any one person and bundling audits/retrofits for contractors to reduce costs.</p>
<p>(-) Retrofits as a stand-alone benefit are a narrow basis for expansion and scaling community-wide.</p>	<p>(+) Program's co-benefits appeal to a wide segment of the population. Broad community benefits can attract civic, public and private sectors, making going to scale feasible.</p>

Preliminary research done by Empowerment Institute applying the whole system approach described above to residential retrofits has demonstrated promising results. In San Antonio 41% of the 205 households participating on an EcoTeam, without any prompts, did some form of retrofit. Combining these results with Empowerment Institute's neighbor-to-neighbor block-based recruitment rate of 25% indicates that this approach is capable of achieving 5 to 10 times the conversion rate that is currently being attained. It is also expected that both the participation level and retrofit quality can be increased with a more intentional focus and seamless integration with financial incentive programs. Further, because the household recruitment and support is done on a voluntary neighbor-to-neighbor basis, this approach in comparison to major marketing campaigns is quite cost-effective. And it is scalable.

It is important to stress that while these results are promising, they are quite preliminary and have not fully been put to the test. Also there are a number of other factors involved in making all this work including the quality of the contractors, access to financial incentives, and ease of use of the whole rebate system. The good news is that these factors have benefitted from the ARRA investment and many best practices have emerged. We will be working to fully assess this whole system approach and part of that evaluation will be through the Cool City Challenge in the cities of Davis, Palo Alto and Sonoma. So let's now turn to the Cool City Challenge.

COOL CITY CHALLENGE

The goal of the Cool City Challenge is to not only increase the uptake of energy efficiency retrofits, but to achieve substantial household carbon reduction in the short term, carbon neutral cities in the long-term, and robust local low carbon economies, all while creating a more livable, resilient and socially engaged community. In other words, bringing to life the vision of possibility described earlier.

At its core, the Cool City Challenge is bringing to scale Empowerment Institute's proven behavior change methodology and community engagement systems. It is centered on household level GHG reduction and uses the existing social infrastructure present in neighborhoods, community organizations, and businesses. The strategy is based on two decades of rigorous research that has demonstrated how peer-to-peer commitment and clear, simple action set in the context of a compelling and achievable community vision, move citizens to act. Key co-benefits of the program include neighborhood-level disaster preparedness, local economic development/green jobs, strengthening of the social connectedness of neighbors, and a new model for interaction between citizens and their local governments.

Empowerment Institute and its team of content experts will support each city to achieve the following over a three-year period.

1. Engaging between 25% and 75% of their residents to reduce their carbon footprints by a minimum of 25% with a minimum of 40% of these program participants doing home energy retrofits.
2. In collaboration with Lawrence Berkeley National Laboratory and their local university (UC Davis, Stanford and Sonoma State) developing a plan to become carbon neutral by 2025.
3. Developing a low carbon economic development strategy around the increased residential demand generated by the campaign for low carbon goods and services, energy efficiency retrofits, and renewable energy.
4. Redeploying the social capital generated through EcoTeams to enhance the resiliency, sustainability and livability of the community's neighborhoods.
5. Creating a whole system solution through engaging and building the transformative leadership and community organizing capacity of the city's local government, civic and faith-based groups, university and high school students ([Cool Community](#))

- [Corps](#)) and businesses ([Cool Corporate Citizen](#)). This approach will not only enable the campaign to accomplish its EcoTeam recruitment goals, but leave a legacy of enhanced community leadership, strengthened community partnerships, and a deepened environmental stewardship ethic.
6. Document, measure and evaluate the GHG reductions, retrofits, community participation levels, economic and social outcomes, and community engagement processes to assist in future dissemination of the Cool City Challenge. The lead research partner for this is Lawrence Berkeley National Laboratory.
 7. Design and build an information management system for carbon aggregation and participation tracking in all sectors of the community. Additional features include comparison and analysis of participating cities climate action plans and results in attaining AB 32's goals, a cool city simulator that demonstrates success of the program at different levels of scale and carbon reduction, a community of practice for program implementation, and program management software. This information management system will serve as the backbone for the campaigns and for scaling up the Cool City Challenge initiative statewide. UC Berkeley's Renewable & Appropriate Energy Lab (developers of the Cool California carbon calculator) will assist in the design of this information management platform.
 8. Encourage and recognize extraordinary carbon reduction accomplishment of these cities, and those that will follow in their footsteps, by establishing three incentive funds. One incentive fund is in recognition of achieving 25% carbon reduction at each of these three levels of community participation – 25% of households (silver), 50% of households (gold) and 75% or more of households (platinum). Another incentive fund is in recognition of establishing a minimum of five carbon-neutral neighborhood blocks in a city. A final incentive fund is for those cities that achieve the ultimate goal of carbon neutrality by 2025.
 9. At the completion of the three-year Cool City Challenge disseminate this methodology throughout California, nationally and internationally. In the interim, provide interested cities with the on-line tools to prepare themselves for participation in the Cool City Challenge. Based on available funding, provide seed capital to interested cities that meet the participation criteria. This preparatory effort could be supported by ARB's Cool California web tools.

To impact global climate change the Cool City Challenge needs to be taken to scale internationally, and in particular, in the emerging high growth countries where much of the planet's future carbon will be generated. To that end the Cool City Challenge demonstration phase will also be taking place in three Sao Paulo, Brazil neighborhoods of comparable size to the California cities. The objective is to help them move toward low-carbon, environmentally sustainable lifestyles that leapfrog over America's high carbon, environmentally unsustainable lifestyles. The ultimate goal of the Cool City Challenge is to develop a game changing intervention around greenhouse gas reduction starting in these four cities and then spreading across the state of California, nationally and internationally.

CONCLUSION

Achieving AB 32's goal of reducing carbon emissions 20 percent from 1990 levels by 2020 will be difficult without some sort of game changing social innovation or multiple social innovations. And California's GHG reduction trajectory goals get significantly steeper thereafter. The social change policy tools of command and control and financial incentives, as we have seen with residential retrofits, just don't move that fast; all the more so when addressing a second-order change problem like GHG reduction. However, given the state's ability to invest up to a billion dollars of cap-and-trade revenues per year in carbon reduction activities brings a new variable into the system – *this funding can be used to catalyze the needed social innovation and bring it to scale.*

As I have been sharing throughout this paper, I believe the place where the greatest potential exists for spawning such social innovation are California's many progressive communities because they are bubbling with talent in the form of creative people, community-based organizations, small businesses, and local governments. And by bringing all these sectors of a community together many new points of intersection can occur and as a consequence more intelligent solutions can be generated. Further, when we cast a wide net, particularly among people and organizations that are looking at this issue with fresh eyes, all manner of imaginative new possibilities can be born.

With limited resources and a small window of time before 2020, each dollar spent needs to be invested in social innovations capable of producing significant short-term GHG reductions and be brought to scale relatively quickly. Because the residential sector of a community is the source of so much available GHG reduction and cities are networked for rapid diffusion of best practices, again they are a natural choice for investment.

Finally, it is wise to make these investments in a manner that can also stimulate California's economy. Since the low hanging fruit for both substantial GHG reduction and green economic development both rely on home energy retrofits, investing in cities who wish to deploy the sort of whole system solution described in this paper is a smart choice.

As the UN HABITAT 2012 report stated, "cities have become the real battleground in the fight against climate change. What goes on in cities lies at the core of the problem." Unleashing the potential of California's cities and citizens to become part of the solution significantly increases our chances for success.

David Gershon, one the world's foremost experts in environmental behavior change and community engagement, is the author of eleven books including the award-winning Social Change 2.0: A Blueprint for Reinventing Our World and best-selling Low Carbon Diet: A 30 Day Program to Lose 5,000 Pounds. Mr. Gershon has lectured at Harvard, MIT and Johns Hopkins and served as an advisor to the White House and United Nations. He is CEO of Empowerment Institute and co-directs its School for Transformative Social Change. For more information on the Cool City Challenge or the community-based whole system solutions described in this white paper contact David Gershon at dgershon@empowermentinstitute.net or visit www.empowermentinstitute.net and www.socialchange2.com.