UCLA Luskin School *of* Public Affairs

Luskin Center
FOR INNOVATION

2016

Greetings,

While the recent presidential election was distracting, the UCLA Luskin Center for Innovation has remained focused on producing knowledge, analysis and partnerships that advance smart policy at the local and state levels. The work of the Luskin Center and of our partners is more important now than ever before. Despite the political uncertainty of a new president, California will continue to be an engine for innovation in technology and policy, and a beacon to other states seeking to make progress.

Take climate change. In 2016, California legislators extended and expanded the state's commitment to climate action. In support of this, the Luskin Center began an ambitious project to measure the air quality and health co-benefits associated with the state's suite of climate polices. We have also been estimating job creation from California Climate Investments. Early in the year we published our analysis of California's Cap-and-Trade program and its financial impact on low-income households. We concluded that the state is effectively protecting the low- and moderate-income Californians during our transition to a clean energy economy. This message was covered in newspapers across the state.

Continuing the theme of protecting the most vulnerable, we have partnered with the State Water Resources Control Board to conduct research that will inform a low-income rate assistance program for household drinking water service. We are crafting policy options to make drinking water more affordable for low-income households which are increasingly dealing with rising water service costs.

More locally, we recently released the "Los Angeles River Greenway Guide" to support the transformation of the L.A. River and surrounding lands, from eyesore to community resource. The Guide features 14 case studies of collaborative projects that have created parks, pathways and bridges along and across the L.A. River.

We look forward to building more bridges–both figuratively and literally—as we together make progress for the health of people and the planet. We thank our many supporters for your recent gifts and grants. In particular, we appreciate Meyer and Renee Luskin for their generous support and foresight, which resulted in our beautiful office and inspiring team of researchers and student workers. Come visit us and please stay connected.

J.R. DeShazo
Director

Colleen Callahan
Deputy Director

CONTENTS

CLIMATE ACTION

TURNING WASTE CO_2 INTO A SUSTAINABLE BUILDING MATERIAL

Imagine a world with little or no concrete. Would that even be possible? After all, concrete is everywhere—in our roads, driveways, homes, bridges and buildings. For the past 200 years, it's been the foundation of human developed infrastructure in much of our planet.

But the production of cement, which when mixed with water forms the binding agent in concrete, is also one of the biggest contributors to carbon dioxide (CO_2) and other greenhouse gas (GHGs) emissions. In fact, about nine percent of the planet's CO_2 emissions comes from the production of concrete.

The Luskin Center is working with a team of interdisciplinary researchers at UCLA to develop a unique solution to reduce this source of GHGs as well as the largest source of GHGs in the world—flue gas emitted from power plants. The team, named Carbon Upcycling, is creating a closed-loop process that captures carbon from power plant smokestacks and uses it to create a new building material—CO_2NCRETE.

J.R. DeShazo, director of the Luskin Center, is providing the public policy and economic guidance for this research.

The scientific contributions have been led by Gaurav Sant, associate professor and Henry Samueli fellow in Civil and Environmental Engineering; Richard Kaner, distinguished professor of Chemistry and Biochemistry, and Materials Science and Engineering; Laurent Pilon, professor in Mechanical and Aerospace Engineering and Bioengineering; and Mathieu Bauchy, assistant professor in Civil and Environmental Engineering.

In October, the team advanced to the semi-finals of a global competition to reduce GHGs through groundbreaking scientific and technological innovation. Called the NRG COSIA Carbon XPRIZE competition, the UCLA team is now one step closer to its $15 million grand prize. Other semifinal teams from the U.S., Canada, China, India, Switzerland and Scotland have focused on turning carbon dioxide into products ranging from toothpaste to fish food.

The Carbon Upcycling team is creating a lab-scale version of their technology with an eye towards commercialization. The team is excited and optimistic about the possibility of reducing GHGs in the U.S. and abroad, especially in regions where coal-fired power plants are abundant.

Carbon Upcycling team, from left to right: Mathieu Bauchy, Bu Wang, J.R. DeShazo, Gaurav Sant, Chengwei Lin, Richard Kaner, Laurent Pilon, Louis Linden, Gabriel Falzone

INFORMING CALIFORNIA'S CLIMATE CHOICES 2.0

LUSKIN CENTER STUDY SHOWS CAP-AND-TRADE MAY HELP YOUR WALLET

Excerpted from an article by George Foulsham, Executive Director of Communications, Luskin School of Public Affairs

Is the state's Cap-and-Trade program to fight climate change hurting or helping Californians? A Luskin Center study reveals that Californians, low-income households in particular, benefit financially under Cap-and-Trade.

Low-income households inevitably are going to bear a stronger burden from regulation because they pay a higher percentage of their income to electricity, natural gas and gasoline bills. But, according to the study, "Protecting the Most Vulnerable: A Financial Analysis of Cap-and-Trade's Impact on Households in Disadvantaged Communities across California," the state has very effectively mitigated any disproportionate impact that might fall on low-income households. According to the researchers, protective measures implemented by the state could more than offset Cap-and-Trade compliance costs that are passed on to electricity, natural gas and gasoline consumers.

"We asked what are the Cap-and-Trade compliance costs for these three industries," said J.R. DeShazo, director of the Luskin Center. "What is the cost pass-through from the regulated industries to consumers and what are the mitigation measures to reduce those costs from Cap-and-Trade? And, finally, what is the net financial impact?"

"We actually see that, once you factor in mitigation measures, low- and moderate-income Californians receive a small but measureable benefit," said Colleen Callahan, deputy director of the Luskin Center and co-author of the report. "We found that electric utility customers could save $200 to $250 by 2020 and between $44 and $83 as natural gas utility customers. And for gasoline customers we are predict a bigger net benefit," Callahan said. "We estimate that our representative households could receive a cumulated, indirect benefit of approximately $350 to $700 by 2020."

"I think Cap-and-Trade has been a success because of the way California is implementing various price increase mitigation strategies for consumers, and low-income households especially, along with the Cap-and-Trade program," Julien Gattaciecca, lead author of the study and a Luskin Center researcher, said. "It is well made and well thought-out, and gives the rest of the world a leading path to follow."

Low- and moderate-income Californians could find extra dollars in their pockets by 2020, cumulatively, as customers of the following:

Electricity
$200 - 250 saved

Natural Gas
$44 - 88 saved

Gasoline
$350 - 700 saved

ASSESSING THE COSTS AND BENEFITS OF CALIFORNIA'S CLIMATE POLICIES

The passage of Senate Bill 32 in the fall of 2016 is ushering in the next generation of climate action in California. The state now has the opportunity to reflect on progress made during the past 10 years since passage of the bedrock climate legislation, Assembly Bill 32. In support, the Luskin Center is analyzing the state's measures to meet AB 32 and SB 32 mandated greenhouse gas (GHG) reduction targets.

The study will be the first of its kind to quantifiably estimate how policies and programs, such as the Low Carbon Fuel Standard, are reducing both GHG and criteria pollutants, how that translates to improved air quality at a local level, the associated avoided morbidity and mortality and the cost effectiveness of the measures.

The California Air Resources Board is sponsoring this research, as well as a complementary study on the employment impacts of Climate Investments (see below).

Julien Gattaciecca, Project Manager

James Howe, Researcher

Kelly Trumbull, Graduate Student Researcher

James Di Filippo, Graduate Student Researcher

MODELING THE EMPLOYMENT BENEFITS OF CLIMATE INVESTMENTS

Another Luskin Center study will model the employment benefits of California Climate Investments. Auction revenues from the state's Cap-and-Trade program are resulting in billions of dollars for Climate Investments, which are used to implement programs to reduce greenhouse gas emissions and provide local co-benefits, such as job creation. We will produce job estimates for the state as a whole as well as broken down by GGRF program, for disadvantaged communities, and by Legislative district. We will also compare the average job creation effect associated with Climate Investments to those of traditional sectors such a natural gas and oil refining.

CALIFORNIA CLIMATE INVESTMENTS THROUGH 2015

~ $2.7 billion appropriated

Over **2,500 projects** implemented to advance:

- Sustainable Communities & Clean Transportation
- Energy Efficiency & Clean Energy
- Natural Resources & Waste Diversion

Colleen Callahan, Deputy Director

Jason Karpman, Project Manager & Researcher

Weilong (David) Kong, Researcher

Britta McOmber, Graduate Student Researcher

LUSKIN CENTER PRESENTS AWARD TO CLIMATE CHANGE CHAMPION:
AN INTERVIEW WITH SENATOR FRAN PAVLEY

During her 14 years in the California Legislature, Senator Fran Pavley successfully authored landmark legislation on climate change and more that have become national and international models. With her soft-spoken nature, this native Angeleno and former school teacher has been extremely effective at passing innovative, health protective and economically feasible policies. Toward the end of her last term (she is termed out), the Luskin Center presented The Senator with an Award for Extraordinary Policy Innovation. She also spoke with Luskin Center consultant Mara Elana Burstein about her years as a champion of climate change legislation, what drove her and what comes next. The conversation below has been edited for length.

This year marks the 10-year anniversary of the passage of AB 32, the Global Warmings Solution Act of 2006.* What does it take to pass and implement effective climate policies?

**Editor's note post interview: 2016 now also marks the passage of Pavley's SB 32, which extends California's greenhouse gas (GHG) reduction targets to 2030. Both AB 32 and SB 32 are historic laws that established and now cement the state's international leadership in combating climate change while creating local co-benefits, such as job creation.*

Writing, passing and implementing effective climate change policies requires tenacity, research, collaboration and patience. Also, the policies must build upon each other.

For example, long before the passage and implementation of AB 32, I authored AB 1493, the Clean Car Standards. It was the first legislation to regulate carbon dioxide emission levels per mile traveled to reduce climate change pollution from the tailpipes of new passenger vehicles sold in California. The bill was signed into law in 2002, and led to the development of a national standard for cleaner fuel-efficient vehicles.

The purpose of AB 32 was to take the work we did regulating mobile sources and use it to create a multisource approach to reduce emissions. While it was perhaps a leap of faith in 2006, the market signals that we sent by putting a cap on emissions and rolling them back to 1990 levels provided strong incentives to invest and innovate in the field of clean technology.

A recent analysis of AB 32 implementation over the past 10 years demonstrates that we have reduced emissions, while growing the economy and population. You don't need to choose between the environment and the economy.

AB 32 set targets for 2020; this year you pushed for 2030 targets. Why?

AB 32's intent was to reach the 2050 goals, but we set the target at 2020, so we could pause, stop and asses our priorities, as well as identify how best to go from 2020 to 2030 to 2050. We need to know what technologies are commercially available now and which breakthrough technologies can be scaled up. This pause and review also helps educate and engage new legislators and policy experts.

What should policy experts be focused on in the near future?

There are three areas that are incredibly important to achieving targets:

a) Reducing short-lived climate pollution, including methane and other super pollutants.

California Senator Ricardo Lara's SB 1383, known as the Super Pollutant Reduction Act, will put into statute the goals to reduce emissions of black carbon by 50%, methane by 40% and hydrofluorocarbons (HFC) by 40% by 2030. If signed by Governor Brown, SB 1383 will be the most aggressive law to address short-lived climate pollutants in the nation.*

** Editor's note post interview: The Governor did sign into law SB 1383.*

b) Increasing the availability of alternative fuels.

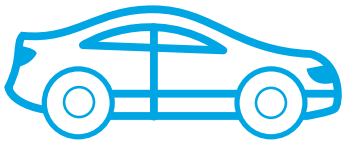
The Low Carbon Fuel Standard isn't in statute, although it should be. Biofuel companies need clear market signals to be extended past 2020. In the future, we won't see "gas stations," but fueling stations with a number of options for cleaner, lower carbon intensity fuels.

c) Addressing the connection between water and energy.

Twenty percent of all energy used in California is for moving, treating and heating water. We need to improve conservation, water recycling and be creative about using local renewable energy.

What is your vision for the future of Californians?

I'd like to see people off the energy grid: with solar panels on homes and an electric car in the garage. Perhaps we won't ever need to go to gas station or even pay energy bills at all.



2002

California Clean Cars Law
(AB 1493, Pavley). Sets first in the nation standards to reduce climate pollution from the tailpipes of new cars and light-duty trucks sold in California. Ultimately, 14 states adopt California's tailpipe standards.

2009-2011

National Fuel Economy Standards
Federal government adopts national fuel economy standards based on the California Clean Cars Law (54.5 mpg by 2025).

2006

California's Global Warming Solutions Act
(AB 32, Núñez-Pavley). Establishes a comprehensive effort to reduce greenhouse gas emissions from sources throughout California to 1990 levels by 2020. The law has since served as a foundation for California's now globally renonwned leadership on climate action.

2016

Extension of climate targets
(SB 32, Pavley). SB 32 codifies an economy-wide greenhouse gas reduction target of 40% by 2030.

ADVANCED TRANSPORTATION

INFLUENCING CLEAN VEHICLE POLICY IN CALIFORNIA AND BEYOND

The California Air Resources Board has recently improved several of its policies to increase the sales of electric vehicles and make them more accessible to lower-income Californians. Each of these policy changes was supported by research recently completed by the Luskin Center and our collaborators.

SHAPING THE LEGISLATIVE CONVERSATION ON CARPOOL LANE ACCESS FOR CLEAN VEHICLES

Policymakers have sought to spur consumer adoption of advanced clean vehicles by granting solo drivers of a clean vehicle access to carpool lanes, also called high-occupancy vehicle (HOV) lanes. A study by J.R. DeShazo and Tamara Sheldon offer the first causal evaluation of these policies that accommodate geographic variability in the magnitude of this policy's treatment effect. The study finds that roughly one quarter of California plug-in electric vehicle (PEV) registrations during 2010 to 2013 were a result of the HOV lane policy. This research is shaping the current legislative conversation about how to best extend HOV access in the future.

Richard Carson, Professor of Economics, UC San Diego

Tamara Sheldon, Assistant Professor of Economics, University of South Carolina

J.R. DeShazo, Director, Luskin Center

INCREASING CLEAN VEHICLE REBATES FOR LOW- AND MODERATE-INCOME DRIVERS

More Californians can now afford clean vehicles, in part thanks to research by Tamara Sheldon, J.R. DeShazo and Richard Carson. In the study, "Designing Policy Incentives for Cleaner Technologies: Lessons from California's Plug-in Electric Vehicle Rebate Program," researchers assessed the performance of various rebate design options for plug-in electric vehicles and compared these alternatives in terms of cost effectiveness and equity. They found that providing progressive rebate levels based on consumer income levels would provide effectiveness and equity benefits compared to the current system. Based in part on these findings, this year the state of California adopted a progressive rebate system in which low- and moderate-income drivers receive extra financial incentives (see below table) to purchase a clean vehicle. There is now also a cap based on income (households making over $500,000 are not eligible for most rebates).

INCENTIVES FOR CLEAN VEHICLES IN CALIFORNIA

	Hybrid (20 MPG+)	Hybrid (35 MPG +)	Plug-in Hybrid	Electric Vehicle
Low Income < 225% of the federal poverty level	$6,500	$7,000*	$9,500*	$9,500*
			$1,500**	$2,500**
Moderate Income 226% - 300% of federal poverty level		$5,000*	$7,500*	$7,500
			$1,500**	$2,500**
Above Moderate Income 301% - 400% of federal poverty level			$5,500*	$5,500*
			$1,500**	$2,500**

* Enhanced Fleet Moderization Plus Up Program for old vehicle scrap + upgrade to clean car less than 8 years old.

** Clean Vehicle Rebate Project for new vehicle purchases.

NEW POLICIES HELPING LOW-INCOME DRIVERS GET OUT OF POLLUTING CARS AND INTO CLEANER VEHICLES

Attaining California's aggressive air quality and climate change mitigation goals requires getting old, heavily-polluting cars off the road and replacing them with cleaner vehicles. In June 2015, the Enhanced Fleet Modernization Program (EFMP) Plus-Up pilot program was introduced to better connect retire and replacement incentives and give low-income households in the San Joaquin Valley and Los Angeles areas a greater opportunity to benefit. Low-income households may obtain up to a $12,000 rebate for a zero-emission vehicle (ZEV) from the combined rebate programs, as well as up to $2,000 for an electric vehicle charging unit.

Given the promise of the EFMP Plus-Up, the Luskin Center is now supporting a project, sponsored by the California Air Resources Board, to further expand opportunities for low- and moderate-income households to participate in California's transition to a cleaner transportation future. This work will both identify how existing state programs can overcome continued obstacles to lower-income households obtaining and driving ZEVs, and provide a roadmap for other parts of the state to implement the EFMP Plus-Up or similar programs in the long term.

Low-income households that participate benefit by reducing their transportation costs and increasing their vehicle's reliability while improving local air quality and supporting the state's environmental goals. So far, the program has proven wildly popular among residents in the San Joaquin Valley and the South Coast. Over 1,200 households have obtained a new clean vehicle. Continued funding is needed, however, to provide sustainable transportation options to a greater number of lower-income households.

ELECTRIC VEHICLE TRENDS IN CALIFORNIA

A new Luskin Center report, also supported by the California Air Resources Board, describes key trends in the adoption of plug-in electric vehicles (PEVs). It identifies the household, housing, geographic, market and public policy factors that are correlated with the sales of new PEVs.

California has more than

230,000

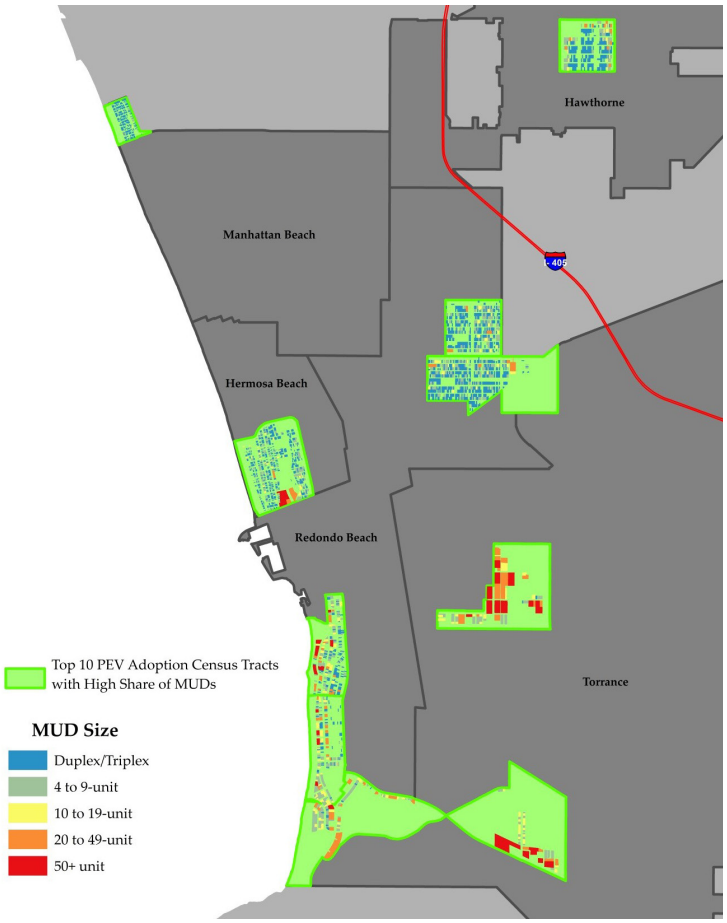
plug-in electric vehicles

Growth in vehicle sales is not evenly spread across neighborhoods. Neighborhoods ranked in the top 25% by socio-economic status had purchased over 10 times more PEVs than neighborhoods in the bottom 25%, a divergence that appears to be widening over time. Households' income, housing value, and the presence of single-family homes has a very large and positive correlation with PEV sales. A neighborhood's proportion of multi-family homes exhibited a negative correlation with PEV sales.

Los Angeles County and Orange County lead the state in total PEVs purchased, followed by the San Francisco Bay Area Counties and San Diego County. Residents of the Bay Area Counties have a higher propensity to purchase fully-battery electric vehicles relative to plug-in hybrids while the Los Angeles Region exhibits the opposite propensity.

The EFMP Plus-Up Program at work in the San Joaquin Valley.

OVERCOMING BARRIERS TO ELECTRIC VEHICLE CHARGING FOR APARTMENT RESIDENTS

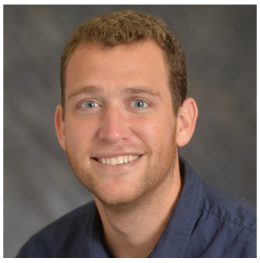


Census Tracts in the South Bay with High PEV Adoption and High Multi-Unit Dwelling Share

In order to reach California's goal of 1.5 million zero emission vehicles by 2025, residents of apartments, condominiums and other multi-unit dwellings (MUDs) need to be assured that they can charge an electric vehicle at home.

Using the South Bay sub-region of Los Angeles County as a case study, a Luskin Center report identifies MUDs that could be targeted for outreach because they exhibit high latent demand for plug-in electric vehicles (PEVs) and low-cost installation of charging equipment. This research carefully analyzed MUD building types and their electrical and parking systems, parcel by parcel.

For the numerous duplexes, triplexes and a significant subset of larger buildings within the South Bay sub-region, the report finds that Level 1 charging can be a viable, low-cost option. If Level 2 charging infrastructure investment is necessary, we recommend capitalizing on economies of scale by investing in multiple stations per location, sized to each building. Targeted outreach, rebates or PEV-ready new construction codes are likely required to reduce MUD-related barriers to PEV adoption.



Alex Turek, Project Manager

UNDERSTANDING WORKPLACE PEV CHARGING BEHAVIOR TO INFORM PRICING POLICY AND INVESTMENT DECISIONS

In an effort to better understand the usage and behavioral impact of workplaces investing in plug-in electric vehicle charging infrastructure for their employees and tenants, the Luskin Center supported the first project to quantitatively analyze almost a half million Southern California workplace charging sessions using data from project client, ChargePoint.

The research sought to determine what types of parking policies maximize both the availability and utilization of workplace charging infrastructure. The most efficient pricing policy is "graduated hourly pricing." It incorporates an initial hourly rate with an increased hourly rate after the first few hours. On the other hand, pricing only for the energy consumed, and not charging for the parking space, results in inefficient use of the charging infrastructure.

Ryan Winn, Researcher

BREAKING DOWN BARRIERS TO ADVANCE CLEAN VEHICLES AND CLEAN ENERGY

AN INTERVIEW WITH CPUC COMMISSIONER CARLA PETERMAN

After serving on the California Energy Commission, Carla Peterman was appointed to the California Public Utilities Commission in 2012. She is a champion of electric vehicles, energy efficiency, energy storage and other areas in which California has led the rest of the nation. We take a look at her accomplishments and advice for the next generation of clean energy advocates.

Having served on the Commission since 2012, what accomplishments are you most proud of?

I am generally proud that we have provided safe, reliable utility services. Also, we have brought forth different energy business models and leadership on advancing emerging clean technologies. Specifically, I'm most proud of two accomplishments.

1) In 2013, I authored the nation's first energy storage targets for investor-owned utilities: 1,325 megawatts by 2020, with installations required no later than the end of 2024. The guiding principles of the targets were grid optimization, renewable energy integration and greenhouse gas emissions (GHG) reductions, per California's goals. Oregon has since adopted a similar framework.

2) We have the largest electric vehicle charging pilots by electric utilities in the nation. These pilots will result in thousands of new charging stations throughout the state, including in disadvantaged communities. This should accelerate the adoption of electric vehicles by providing market certainty about infrastructure availability. Utility proposals are now considered on a case-by-case basis, preserving market competition and technology innovation. We are continuing to influence legislation in this direction which is necessary to reduce GHGs.

As a Commissioner, how do you balance competing priorities?

By providing a good, transparent process. There are many opportunities for stakeholders to provide their insight. And when they are provided in written form, everyone gets the same amount of attention. I pride myself and my staff on being open to all different perspectives. In the end, I may not do what you want, but I try to value different perspectives and address all major concerns. The key thing is to listen to people and not get closed in with a small circle of influence.

When it comes to working on emerging technology, it is important not only to set targets, but also off-ramps in case the economics don't come to fruition. We set regular policy check-ins to ensure we're on track based on the goals that were set when policy was adopted. If the policy is not working, we adjust. That's good policymaking.

Describe a challenging moment you experienced while in public office.

One of the most challenging moments while at the CPUC was when I was working on energy storage. We tried to model storage procurement on renewable procurement which sometimes did not make sense in practice. For example, we proposed contracts be standardized, like the solar industry, because we thought it would streamline procurement. However, stakeholders thought that this was premature for this market. We had to take a step back and really analyze storage proposals on a one-on-one basis. Sometimes we need to go slower so we can learn.

Where would you like to see yourself in five years?

In five years I would like to see the emerging initiatives I'm working on—such as electrified transportation, and energy storage—be relatively established in the utility market and become national models. California has aggressive goals for renewable energy and GHG reduction goals by 2030. I'm optimistic but the utilities can't do it alone. Reaching these goals will require broad customer and political acceptance. Time and time again when Californians sets environmental goals, we surpass them. Take the 10% renewable energy goals. Many thought it was impossible, but we met that goal ahead of schedule—same with the 33% renewable goal by 2020.

Do you have advice for young female professionals of color?

A lot of what's happening in energy and electric transportation policy is new to everyone—new technology, new business models. Don't be afraid to jump in, learn and contribute. It's a good time to be in this sector. The world is going to change based on our collective decisions over the next five years. Although the utility space is traditionally a male industry, we're seeing an increase of women and minorities over the last decade. I think diversity brings diversity of perspective and insight. Be optimistic about the contribution that you can make. Right now the CPUC board is majority women, and majority women of color. We make decisions on behalf of all California, so we need the regulatory body to look like the people. It's important for those from different backgrounds to rise to positions of leadership.


CLEAN
ENERGY

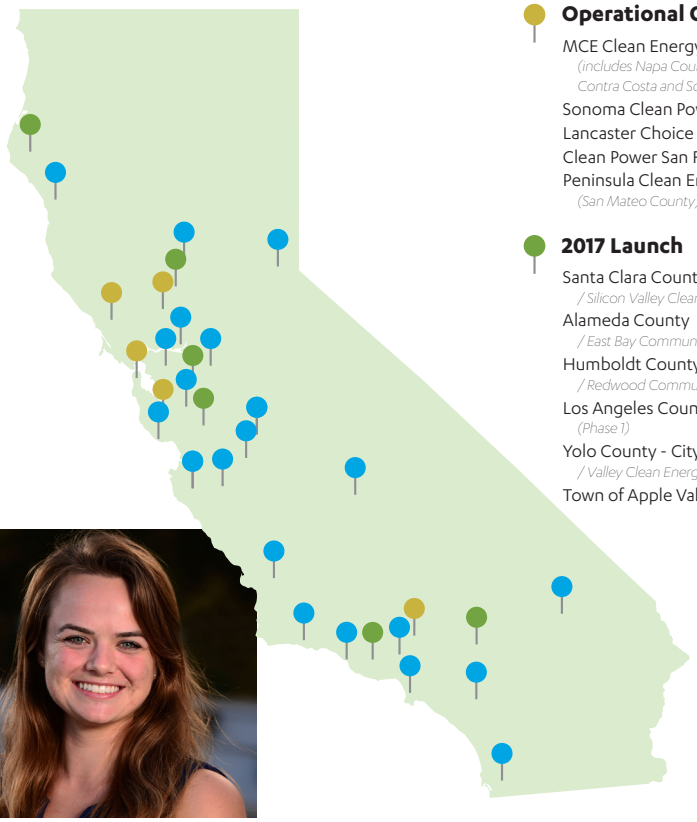
REVOLUTION IN LOCAL CONTROL OF ENERGY SWEEPING THROUGH CALIFORNIA

Want cleaner power? Want local control of energy decisions? Californians might soon be able to have both thanks to something called Community Choice Aggregators or CCAs.

Three investor-owned utilities (IOUs) have long served more than two thirds of the state, but now CCAs are giving ratepayers another option. In a CCA, a city, a county or a group of cities or counties become responsible for the procurement of electricity for their residents, businesses and municipal facilities. Compared to regional IOUs, CCAs could be described as more reflective of distinct community preferences and can tailor their energy content and price to local needs. Five CCAs currently exist in Marin and Napa counties, Sonoma County, San Mateo County, the City of San Francisco and the City of Lancaster. Los Angeles County, the Silicon Valley and other parts of the state are also exploring the possibility of forming a CCA.

The Luskin Center assessed the five existing CCAs and found that they provide a higher percentage of renewably generated electricity than their comparable utilities, at a very competitive rate, and sometimes even at a cheaper rate. For example, both Marin Clean Energy and San Francisco Clean Power offer more affordable rates than PG&E, with a higher amount of renewable energy in their portfolios. Also, each CCA provides their customers with the opportunity to increase to 100% renewable energy, for less cost than the equivalent option at PG&E.

While these are not radical changes for customers, CCAs could revolutionize the energy industry by opening up a market long dominated by private utilities whose business models have also been undermined by technological changes.



Operational CCAs

MCE Clean Energy
(includes Napa County, parts of Contra Costa and Solano Counties)
Sonoma Clean Power
Lancaster Choice Energy
Clean Power San Francisco
Peninsula Clean Energy
(San Mateo County)

2017 Launch

Santa Clara County
/ Silicon Valley Clean Energy
Alameda County
/ East Bay Community Energy
Humboldt County
/ Redwood Community Energy
Los Angeles County
(Phase 1)
Yolo County - City of Davis
/ Valley Clean Energy Alliance
Town of Apple Valley

Exploring / In Process

Butte County
City of Hermosa Beach
City of Pico Rivera
City of San Jacinto
City of San Jose
Contra Costa County
Fresno County
Kings County
Mendocino County
Monterey County*
Placer County
Riverside County
San Benito County*
San Bernardino County
San Diego County
San Joaquin County
San Luis Obispo County**
Santa Barbara County**
Santa Cruz County*
Solano County
Tulare County
Ventura County**

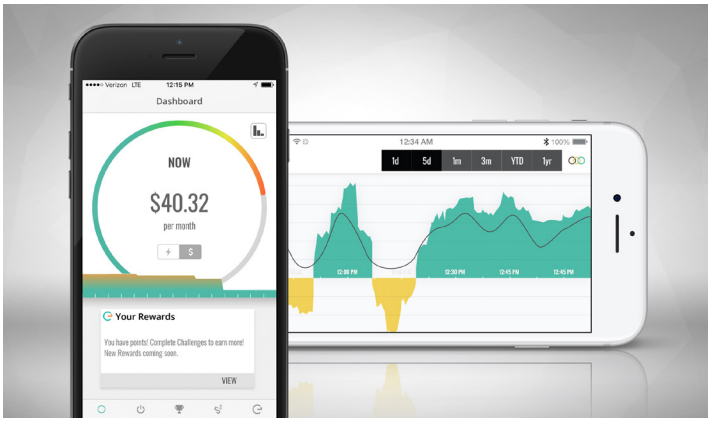
*Monterey Bay Tri-County
**Central Coast Tri-County

Julien Gattaciecca, Project Manager

Kelly Trumbull, Graduate Student Researcher

LUSKIN CENTER AND CHAI ENERGY TEST SMART ENERGY TECHNOLOGY IN THOUSANDS OF HOMES

What if you knew exactly when electricity prices increased each day and what to unplug or lower use of during those times to save money and help the environment? This might seem too good to be true for those of us accustomed to getting an energy bill without the details behind the costs. But new technology is making real-time energy information and "demand response" a reality, rewarding homeowners who make smart, informed energy-use decisions. This could include knowing when it makes financial sense to replace that old washing machine, or simply what time to use it based on when there is less demand on the power grid or when renewable energy is abundant.



Track Your Home's Energy Use and Lower Your Electricity Bill with Chai Energy SmartPhone Application

The California Energy Commission has awarded the Luskin Center and the start-up company Chai Energy more than $2 million for a pilot study to explore how to best message households to help reduce their energy use and costs during high energy use times. The study will test the effectiveness of innovative demand response programs using Chai Energy's behind-the-meter customer engagement platform.

Each of the demand response strategies will integrate a recent approach that energy researchers have shown to be effective in reducing customer consumption. These strategies include providing households with 1) tailored energy-analytic feedback, 2) aggregated versus single-period incentive information, 3) non-financial environmental-health benefit frames and 4) social comparisons.

Chai Energy will deliver and test these program designs on thousands of volunteering customers in utility districts throughout California. This large sample will enable researchers to also identify the best format, timing and content of demand response signals, including those with differing incomes, household structures, transportation and energy choices (some with plug-in electric vehicles and rooftop solar) as well as those who live in different climate zones.

The study will inform how best to design behavioral demand response strategies to help customers save money, reduce pollution and avoid costly technology upgrades associated with more structural demand response approaches.

If you are interested in participating in this study or want more information, please visit **chaienergy.com**, *or contact Julien Gattaciecca at jgattaciecca@luskin.ucla.edu. You could receive a free gateway device.*

THE ROLE OF POLICY INNOVATIONS IN THE FUTURE OF ROOFTOP SOLAR

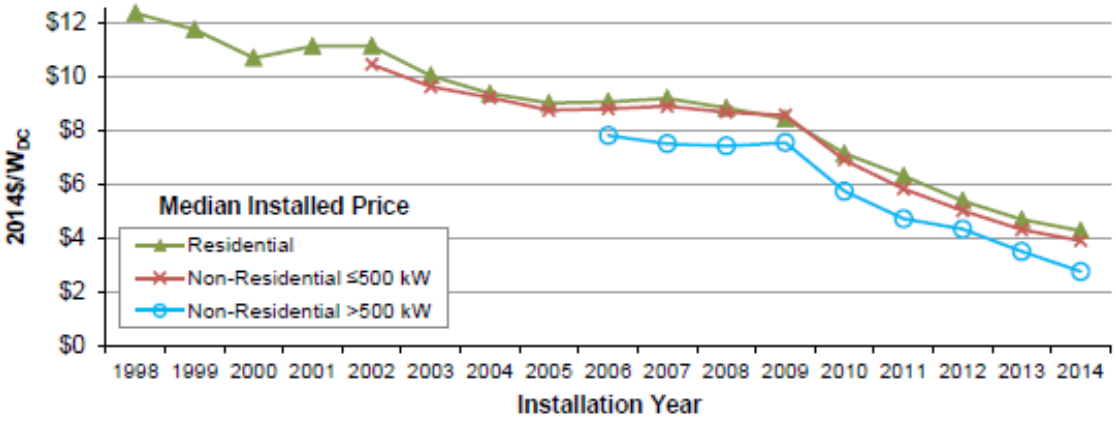
Rooftop solar costs are currently at a historic low: after a drastic drop in price during the past 10 years, photovoltaic technology now has the ability to compete against conventional energy sources for electricity generation. However, a changing policy landscape will soon affect the cost of installation and reduce its financial advantage. This is why the Luskin Center analyzed existing and future opportunities to further drive down the cost of rooftop solar before 2020.

A soon-to-be-released Luskin Center report analyzes the past, present and future evolution of solar cost components, while focusing on non-utility-scale rooftop solar installations in California.

We find that technology improvements are still necessary but remain limited in the near future. Instead, the largest cost reduction potential might come from local innovations that reduce soft costs (i.e. non-hardware costs, such as customer acquisition, installation and administrative costs.)

We identify existing and emerging solutions that could help achieve the national targets set by the Federal SunShot Initiative to reduce the soft costs of solar. For example, we documented that many municipalities and utilities are streamlining their permitting and interconnection processes to accelerate solar installations and decrease administrative costs.

The Luskin Center also proposes a new strategy to reduce costs and trigger full utilization of rooftop capacity. Called Community Energy Pooling, this strategy would link solar exporters (typically residential buildings that produce more solar than the residents consume) with energy importers (typically multi-story buildings like apartments and office buildings). It would enable long-term, peer-to-peer energy trading among customers within the same service area, and without any rooftop capacity limits. See the following article for details.



U.S. Solar Photovoltaic Costs Evolution over Time

Source: National Renewable Energy Laboratory

COMMUNITY ENERGY POOLING: A NEW SOLUTION FOR LOCAL DISTRIBUTED RENEWABLE ENERGY GENERATION IN TODAY'S SHARING ECONOMY

Q&A WITH LUSKIN CENTER'S J.R. DESHAZO

by Alyssa Curran

As Director of the Luskin Center and Professor at the Luskin School of Public Affairs, Dr. J.R. DeShazo is at the forefront of improving quality of life through environmental policy, planning and program development. His latest endeavor: Community Energy Pooling programs that would enable peer-to-peer energy trading.

What drew you into the world of the environment and sustainability?

I am attracted to problems that have large impacts on our daily lives. I am interested in water, vehicles and the natural resources that are the foundation of our lives. The environmental economist in me wants to know about the costs and benefits, while the urban planner thinks about community quality of life.

Investor-Owned Utilities have a mandate to procure 50% renewable energy by 2030 in California (per SB 350). What challenges do we face?

I think utilities' first instinct is to buy power from large solar farms located away from the urban core because it is cheaper and easier to monitor than 500 individual homes producing solar in a distributed fashion. However, we should also be focusing on local distributed generation. Rooftops are underutilized and we can avoid building new solar farms on land uses that were once wildlife habitat. It also creates local jobs, improves resiliency, cools buildings through thermal insulation and reduces energy transmission over often congested power lines.

How can we overcome these challenges?

If our goal is to create communities that are energy self-sufficient, we have to think about how to fully utilize the energy generation capacity within our communities. California's net metering program allows households to put a solar system on their rooftop that is just large enough to offset their annual energy consumption. This means that the typical single-family home only uses about 40% of their available rooftop space. That means 60% of generation capacity is left on the table. We need policies—like Community Energy Pooling—that incentivize full capacity generation, leverage it and incentivize the sale of surplus energy from one building to another.

What is Community Energy Pooling (CEP) designed to do?

Luskin's CEP proposal is designed to solve three problems:

1) It allows households to use all of their hosting capacity, bringing the cost per watt installed for the rooftop system down through economies of scale.

2) The CEP proposal incorporates the idea of bundling interested homeowners together. One of the most expensive things for solar developers right now is the cost of finding customers or "customer recruitment." So, if a city bundles 45 houses together, it would eliminate customer recruitment for developers, and reduce permitting and safety costs (i.e. scheduling inspections more rationally, communicating with one solar developer instead of about two dozen for 45 homes).

3) Costs are also driven down when solar developers can competitively bid for that bundle of homeowners.

How does CEP fit into the "sharing" economy?

More and more, individuals are sharing their homes (e.g. Airbnb), their rides (e.g. Uber) and other things in ways that are financially profitable. CEP is a sharing economy for energy: it's a trading market and policy platform to help meet energy needs. Based on Luskin Center analysis, we forecast that this type of design can drive costs down by a third to one-half. Allowing households to make a profit from the 60% of the rooftop that would generate surplus power, and selling it to other community members for cheaper than the utility's prices, provides a financial incentive to net meter above what is currently offered. With the federal solar incentive tax credit (ITC) progressively phasing down in future years, it might be that only community energy-type programs are financially viable without tax credits.

How quickly can communities enter into CEP programs?

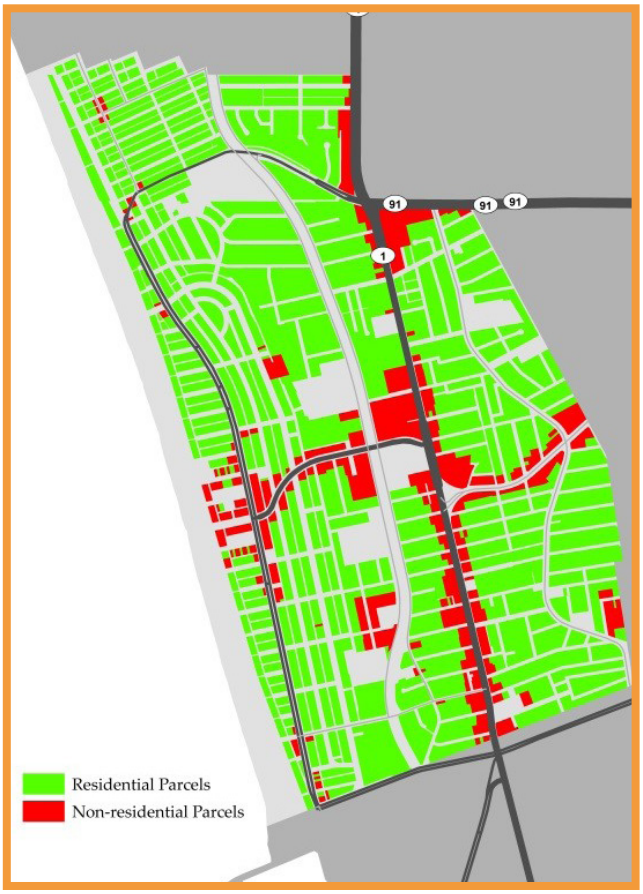
As a public university, the greatest challenge UCLA faces in introducing a new program or policy is that we are not an advocacy organization. We generate knowledge and we rely on partnerships and non-profit organizations to take our ideas and implement them. I'd like to see us piloting this program this year or next. We need a city, utility or Community Choice Aggregator willing to be a pioneer, and we need an accounting framework to track producers and consumers ("virtual metering"). The investor-owned utilities already have virtual metering within buildings; we just need to expand that to communities.

What is the role of CEP in helping cities like Los Angeles increase resiliency?

Here in LA, the question isn't "if", but "when" we are going to have an earthquake. One of the promises of CEP is creating buildings that are energy sanctuaries, so that we can couple solar systems with battery storage systems. That building can then be separated from the grid and used as an energy resource. A place where people can store refrigerated medicines and charge phones to communicate with family members during the emergency. CEP reduces our reliance on imported power from other states and seismic-vulnerable transmission lines.

What knowledge can you impart on IMPACT readers and the next generation of sustainability leaders?

We need to do this collaboratively. We have to be tenacious, smart and willing to listen and learn. And to the IMPACT Report readers: our call is always, bring us your problems, bring us your ideas, let's work together and think about solutions for the future.



Land Use Patterns of Hermosa Beach
(This example illustrates that in a CEP, energy exporters—in green—could be residential buildings that produce more solar than residents consume, and then sell excess electricity to energy importers—in red.)

DESIGNING A LOW-INCOME RATE ASSISTANCE PROGRAM FOR HOUSEHOLD DRINKING WATER SERVICE

The Luskin Center is sponsored by the California State Water Resources Control Board, via state Assembly Bill 401, to craft policy options for a state-wide, low-income drinking water rate assistance (LIRA) program. The envisioned LIRA program will enhance drinking water affordability for low-income households whom, as our research shows (see the following article), are increasingly dealing with rising water service costs.

Currently, the state's low-income households are entirely reliant upon their local water system for potential assistance. Yet only 25% of systems offer any assistance, and each maintains different eligibility rules and benefits. By contrast, the Center's study will demonstrate how many of the state's households should be eligible for assistance on the basis of need, explain the different types of assistance that could be offered, and estimate how water systems and their full customer base could be affected by providing financial assistance to their most vulnerable customers

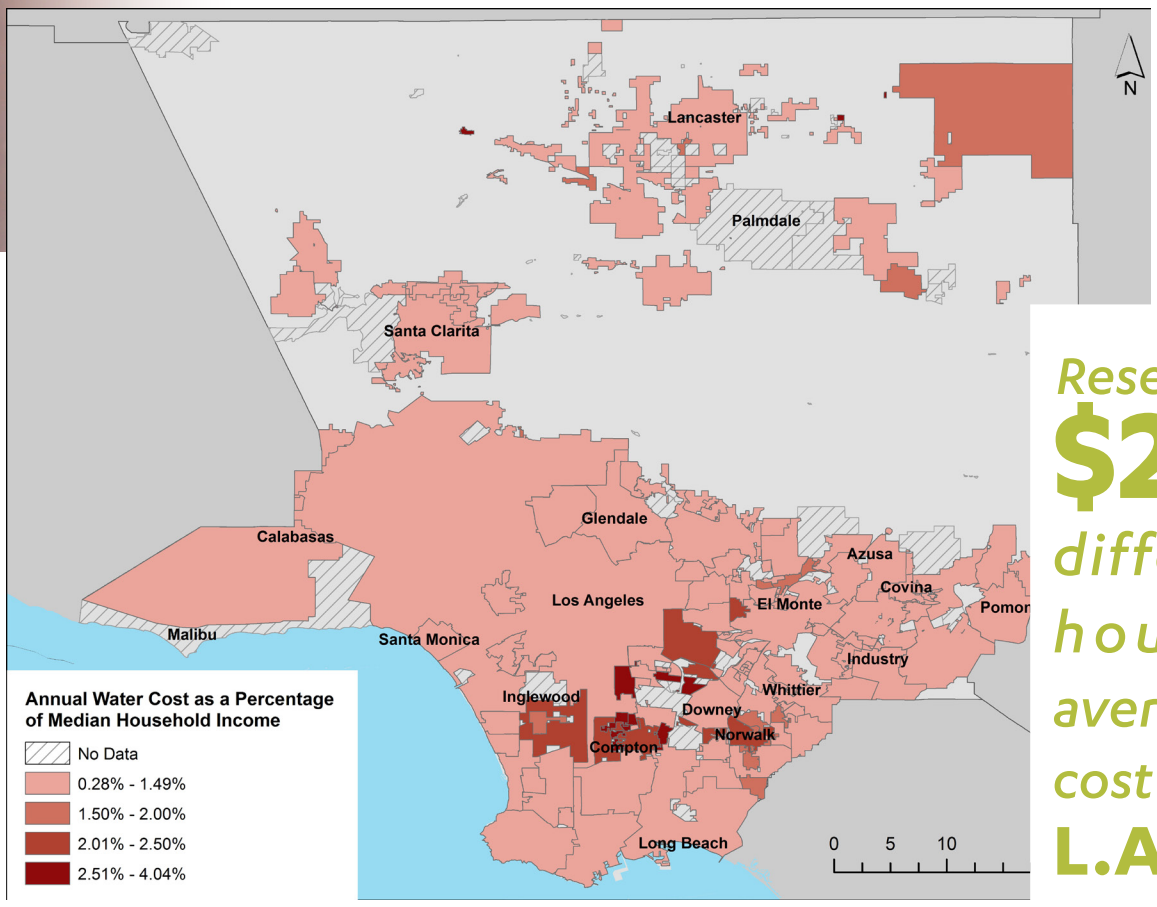
SECOND VOLUME OF WATER ATLAS AND POLICY BRIEF SHOWS DISPARITIES IN WATER SERVICE

Surprisingly little is known about the 228 government and private entities that deliverable potable water necessary for life in Los Angeles County. To correct this, the Luskin Center released the second and final volume of its comprehensive "Los Angeles County Community Water Systems: Atlas and Policy Guide." The Center also released a policy brief highlighting the enormous disparities in cost which residents of the county pay for the same amount of drinking water. The results have been presented to the State Water Board, the Public Health Alliance of Southern California and the Los Angeles Water Dialogues. Both publications focus on issues of affordability for households and accessibility of financial and conservation support programs.

We found that there is as much as a $2,000 difference in the average annual cost of water paid by different households across the county, depending on one's community water system provider. These systems range from major municipal water providers, such as the L.A. Department of Water and Power, to small private utilities serving mobile home parks and remote communities. Low-income rate assistance was provided by only 25% of systems. Access to conservation rebates—including lawn replacement and efficient indoor water fixtures—was more prevalent across systems. While nearly 50% offered these rebates, they were rarely available outside of systems supplied by the region's wholesale water distributor, Metropolitan Water District. Moreover, most residents of multi-family housing units were not eligible to receive either financial or conservation support.

The combined volumes of the Guide serve as a resource to enhance state and local policymakers' understanding of the challenges faced by community water systems and their customers. The Center is conducting further research and supporting initiatives for potential policy fixes to address each of these problems, at both local and state levels.

Gregory Pierce, Senior Researcher



Research finds a **$2,000** difference in households' average annual cost of water in **L.A. County**

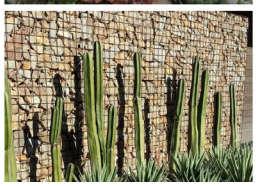
CITY OF L.A.'S TURF REPLACEMENT REBATE PROGRAM IS COST EFFECTIVELY SAVING WATER

With the ongoing severe drought, many water utilities across the state now offer programs that incentivize residents to replace their lawn with less water-intensive landscaping. Homeowners may be motivated to participate in turf rebate programs to save both water and money.

A report from the Luskin Center for the Los Angeles City Mayor's Office pinpoints what rebate levels are required to achieve the targeted levels of household participation in the turf replacement program offered by the Los Angeles Department of Water and Power (LADWP). The report also answers the question: is the LADWP turf replacement program a reasonably cost-effective investment for the utility and its ratepayers?

Kelsey Jessup, Project Manager

We found that the rebate level currently offered by LADWP—$1.75 per sq. ft. of turf replaced—is cost effective for both participants and utility ratepayers. Typical households make back their initial investment in the program and start saving money in less than 10 years, a timeframe considered to be the policy status quo and comparable to other investments, such as solar panels. The analysis also suggests that the current level of lawn replacement rebates is cost effective from the ratepayer and utility perspective.



A GUIDE TO TURN THE L.A. RIVER GREEN

Excerpted from an article by: George Foulsham, Executive Director of Communications

If you're looking for an example of what communities can do to take advantage of the land that adjoins the Los Angeles River, look no further than Marsh Park—3.1 acres of greenway in the Elysian Valley neighborhood of Los Angeles, not far from downtown.

The park features trees, green infrastructure, play and fitness equipment, a walking path, picnic tables and an open-air pavilion, all built around a large industrial building that houses a company that takes modular shipping containers and turns them into residences for the homeless.

The Park also serves as a gateway to the L.A. River and is one of the case studies presented by researchers from the Luskin Center in "Creating a Complete Los Angeles River Greenway: Stories and Guidance."

This L.A. River Greenway Guide consists of 14 case studies that highlight different parks, pathways, access points and bridges that have been constructed along the L.A. River. It looks at the history of various efforts, identifies the challenges faced and lessons learned leading to successful riverside projects that could be replicated.

The Guide was unveiled at a free event, "A Night at the L.A. River," organized in partnership with Friends of the Los Angeles River. Earlier events co-hosted by the Luskin Center and partners engaged community members and other L.A. River stakeholders to inform development of the Guide and get feedback on draft versions.

The L.A. River, which starts in the Simi Hills and meanders 51 miles to the Port of Long Beach, has been not only called one of Los Angeles' most ill-used natural treasures, but also a neglected eyesore that looks more like a deserted freeway than a river.

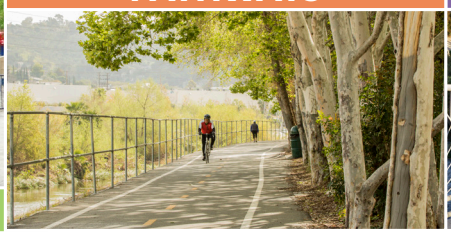
In recent decades, concerted efforts have sought to revitalize and repurpose the River and its adjoining greenbelt. Graduate student researchers and scholars at the Luskin Center are now working with stakeholders, communities and organizations in an attempt to create a new future for the River and its environs.

The Luskin students, guided by DeShazo, deputy director Colleen Callahan and project manager Kelsey Jessup, produced the Guide after receiving feedback from community leaders, nonprofits, government agencies, policymakers, businesses, and academics, researchers and students.

This project was made possible by the support of The Rosalinde and Arthur Gilbert Foundation, The David Bohnett Foundation and the California Endowment.


ACCESS


PARKS


PATHWAYS


BRIDGES


DIGITAL
TECHNOLOGIES

A ROAD MAP FOR ADVANCING WOMEN IN TECH

Excerpted from an article by George Foulsham, Executive Director of Communications

The importance of quality mentorships is one of eight key recommendations in a Luskin Center report about strategies for increasing diversity and retaining women in high-tech careers.

The Luskin Center report, "What Are We Missing? Rethinking Public, Private and Nonprofit Strategies to Advance Women in Technology," is a review of salient literature and a compilation of feedback from those who attended the 2015 Women in Tech conference at UCLA. The conference brought together 250 influential leaders in the public, private and nonprofit sectors to explore actions their sectors could take.

Eight overarching themes emerged from the literature review and crowd-sourced knowledge from UCLA's conference. These themes served to guide the report:

1. Using data to assess diversity
2. Providing female entrepreneurs with access to funding models that reduce bias
3. Focusing on the hiring process to reduce subconscious biases
4. Standardizing performance reviews
5. Increasing quality mentorship
6. Expanding public-private partnerships
7. Building upon mandate-driven public policies
8. Commitment to diversity at all levels of leadership

The research underscored that government programs and policies are limited and fragmented. Companies themselves still play the most direct role in addressing the diversity gap. Companies that make it a priority at all levels of leadership to counter systemic inequalities that limit their talent pool have significant success in doing so.

Google Inc. and Cisco Inc. were the lead sponsors of the Luskin Center hosted Women in Tech Conference, for which this report is the direct outcome.

Underscoring the importance of mentorship, many female students and recent graduates grew their network in the professional technology community through their involvement in the Luskin Center's Women in Tech initiative. This includes the following co-authors of the report: Rebecca Sadwick, Sophie Mako Tanaka and Adina Farrukh.

Becca Sadwick, lead co-author of the Luskin Center report

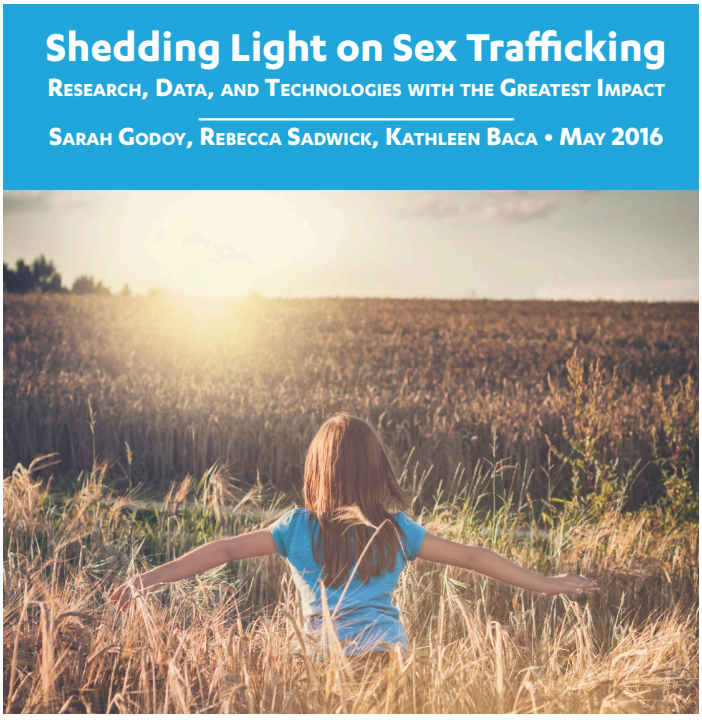
Davida Johnson, UCLA Office of Information Technology

Nancy Perlman, Office of L.A. Mayor Eric Garcetti, along with other conference participants

PUTTING A CRITICAL LENS TO CHILD SEX TRAFFICKING:
RESEARCH, DATA AND TECHNOLOGY WITH THE GREATEST IMPACT

Human trafficking is the fastest-growing criminal enterprise in the world. It is estimated that there are 21 million women, men, girls, boys and transgender individuals trafficked worldwide.

This and other startling statistics are highlighted in the Luskin Center report "Shedding Light on Sex Trafficking." The Luskin Center also created the website, humantraffickingdatabase.com, to provide users with a database containing pertinent literature and contact information for vetted service providers in the field.



Lead researcher and author Sarah Godoy critically analyzed more than 135 pieces of relevant literature on sex trafficking and conducted about 70 qualitative interviews. In doing so she identified significant data gaps. We do not have federal legislation, for example, that would allow for a national repository to input data on sex-trafficked individuals.

The report includes a series of recommendations to address the gaps, including technologies that might help with the anti-trafficking efforts around the world. These recommendations include:

Establishing a national database for FBI and local law enforcement to input, access and share pertinent information on human trafficking cases across jurisdictions.

Enhancing social media platforms to include a space for survivor leaders, more recent survivors and service providers to be used as an empowerment tool and healthy communication outlet.

Expanding existing mobile-based apps for survivors, social service providers and law enforcement personnel that provide vital information on local services available for survivors.

Including an emergency function in newly developed or pre-existing mobile-based apps commonly used by youth that instantly notifies specified contacts (caregivers, social workers, etc.) and/or local law enforcement with an urgent text message, email and/or phone call that indicates potential danger and includes geospatial information.

Creating a digital platform for vetted social service providers that bolsters safe and timely information sharing for multidisciplinary stakeholders providing rehabilitative services to survivors.

And conducting further research on the interplay of technology with the following populations: at-risk youth in schools and the child welfare system; mental and physical health of human trafficked victims and survivors; child labor practices; labor trafficking of adults and sex trafficking of adults.

Sarah Godoy, Project Manager

This project, as part of the Luskin Center's Digital Technologies Initiative, was supported by a gift from Google Inc.

WORD CLOUD FROM LUSKIN CENTER REPORT TITLES

This word cloud is populated with words that frequently appear in Luskin Center research report titles. Words that appear most frequently are illustrated by the largest text size.

WE THANK OUR 201

6 COLLABORATORS*

*This is not a complete showing of our collaborators.

FEATURED SPEAKERS FROM 2016

Hon. Kevin de León

The Senate President pro Tempore on the Future of Environmental Policy in California

Hon. Jimmy Gomez

The Assembly Member on Ensuring Climate Equity for Low-income Californians

Benjamin Barber

Strong Democracy

Jon Christensen

Environmental Bonds for Equitable Community Benefits

Mary Ellen Hannibal

Citizen Scientist: Searching for Heroes and Hope in an Age of Extinction

Baylen Linnekin

Biting the Hands that Feed Us: How Fewer, Smarter Laws Would Make Our Food System More Sustainable

Patt Morrison

Transforming the Los Angeles River

Andrew Revkin

Surviving the Anthropocene

James Salzman

Drinking Water: A History

Richard W. Willson

Parking Management for Smart Growth

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Craig Fox,
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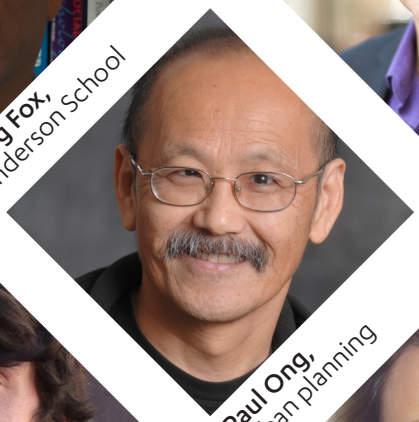

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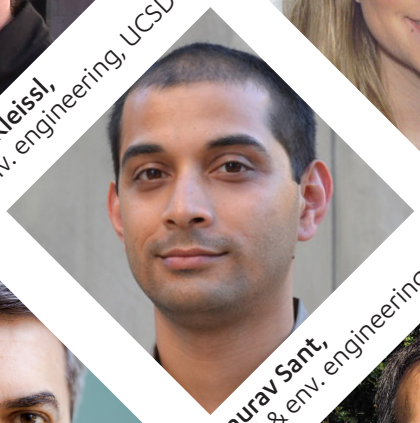

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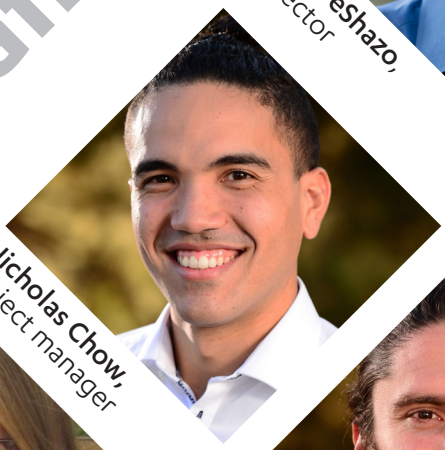

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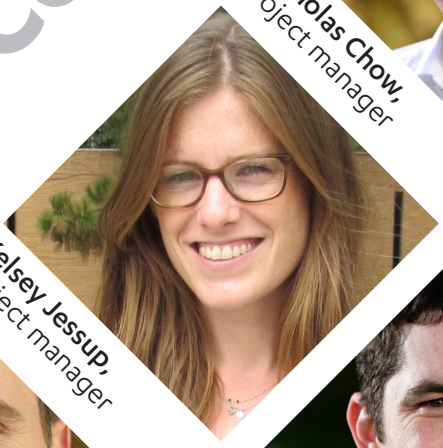

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