CALIFORNIA STRATEGIC GROWTH COUNCIL

CLIMATE CHANGE RESEARCH PROGRAM

GRANT AWARD

CALIFORNIA CLIMATE INVESTMENTS — Cap and Trade Dollars at Work

LAWRENCE BERKELEY NATIONAL LABORATORY

CAL-THRIVES: A CALIFORNIA TOOLKIT FOR HEAT RESILIENCY IN VULNERABLE ENVIRONMENTS

PRINCIPAL INVESTIGATOR: **Max Wei**, Research Scientist, Sustainable Energy & Environmental Systems Dept., Energy Analysis & Environmental Impacts Division

PROJECT GRANT	PRIORITY RESEARCH AREAS
$1,000,000.00	☑ Supporting and Protecting Vulnerable Communities from the Impacts of Climate Change
Duration: 24 Months	☑ Increasing Data Accessibility and Planning Support for State, Local, and Regional Climate Change Planning
	☑ Accelerating and Supporting Transitions to Climate Start Communities

This interdisciplinary project addresses two research and deployment needs described in the California 2015 Climate Change Research Plan: (1) it will help the most vulnerable—e.g., low-income individuals and families, individuals who are incarcerated or have been incarcerated, individuals with disabilities, children, youth and young adults, seniors, immigrants, and refugees—in disadvantaged communities (DACs) to better weather the increasingly extreme heat brought on by climate change, and (2) it will help California's power sector reduce greenhouse gas (GHG) emissions. It will operate in two of Fresno's DACs.

PARTNERS:	➢ City of Fresno ➢ Indicia Consulting ➢ University of Southern California ➢ West Fresno Family Resource Center
RESEARCH ACTIVITIES	Assess the potential for fail-safe, zero-energy, passive retrofit measures to provide cooling and improve building resident safety and comfort during heat waves. Weigh the potential for innovative, low-GHG active cooling measures to reduce energy consumption during heat waves and improve residents' safety. Utilize the state-of-the-art urban building simulation tool CityBES to map extreme heat vulnerability within two DAC neighborhoods. Evaluate the current effectiveness of community cooling centers.
FACILITATES GREENHOUSE GAS EMISSIONS REDUCTIONS:	Currently, about 15% of residential air conditioning energy is consumed by low-income homes. The saturation of conventional air conditioning equipment in low-income homes is 25% less than in higher-income homes. Increasingly frequent heat waves induced by climate change could drive low-income homes to install and use air conditioning at a higher rate, increasing their annual GHG emissions about 33%. The combination of zero-GHG passive cooling measures and low-GHG active cooling measures may reduce emissions from residential air conditioning by 50%.
BENEFITS DISADVANTAGED AND LOW INCOME COMMUNITIES:	Provides policy guidance for planning, policy, program, and government investments to mitigate damage and enable communities to quickly recover from natural disasters. Spatially maps the extreme-heat hazard in DACs. Passive cooling measures can also reduce equipment costs by downsizing or even eliminating some residential air conditioners. These outputs will help guide financial and technical assistance for utility-sponsored weatherization programs, retrofit packages for city public housing, deployment efforts by community-based organizations, and policies from public health departments.
ENGAGEMENT ACTIVITIES	The research team will collaborate with the City to identify and engage with two DACs. Surveys conducted will characterize occupancy, operation, construction, and equipment characteristics of homes, and understand needed improvements. Social scientists will gather information through in-depth home interviews and focus groups to assess residents' attitudes toward heat waves, their use of passive cooling strategies, their cooling equipment options, and their use of community cooling centers.