

News--Fall 2001

CE-CERT Moves into New Facilities

AS PART OF THE BOURNS COLLEGE OF ENGINEERING'S ONGOING EXPANSION, THE College's Center for Environmental Research and Technology (CE-CERT) has moved into two custom-built buildings a short distance from campus.

The two new buildings are adjacent to CE-CERT's main laboratory building, which is rented from Bourns Inc. A two-story, 6,000 square-foot facility accommodates CE-CERT's new atmospheric chamber, the largest such facility in the world for studying the chemical processes that form pollutants in the air. Next door, a 20,000-square-foot building provides office and meeting space to accommodate CE-CERT's current staff, with room for future growth. The office building includes a seminar room that will be used for the Western Regional Modeling Center, a research and training facility operated by CE-CERT under contract with the Western Governors' Association. In the Modeling Center, CE-CERT is training the staff from state and tribal environmental agencies how to operate air quality models that are needed for preparing air quality improvement plans.



New CE-CERT Buildings.



Riverside Mayor Ronald Loveridge (center) with CE-CERT's Director Joe Norbeck (right) and Wayne Payson, Assistant to the Mayor (left).

Bourns Inc. donated the real estate for CE-CERT's new buildings. Private donations have assisted with construction. CE-CERT and the College are continuing to raise money for furnishings, equipment, and other items necessary for completion of the two buildings.

The CE-CERT operations are a cornerstone of a budding technology park being developed in the northern part of Riverside. A few buildings in the development already are occupied, and more are under construction. The office, industrial, and laboratory space a short distance from UCR's campus is expected to be attractive to growing high-technology companies looking for room to expand.

County Asks CE-CERT to Investigate Mira Loma Air Quality

ATEN-YEAR STUDY OF CHILDREN'S HEALTH RELEASED EARLIER THIS YEAR DETERMINED THAT THE MIRA LOMA AREA AT THE northwestern tip of Riverside County has the highest concentrations of particulate pollution in Southern California. The next questions to be answered: Where are the particles coming from, and how dangerous are they?

To answer these questions, CE-CERT has begun a project to capture particulate samples indoors and outdoors at homes and a high school in the Mira Loma area and analyze them. Mira Loma lies south of the Route 60 freeway and east of Interstate 15. Other sources of air pollution include the numerous dairies upwind in the Chino and

Ontario areas, industrial sources in Los Angeles and Orange counties, and local dust from agriculture and unimproved lands.

Before embarking on the study, CE-CERT's Director, Joseph M. Norbeck (the Yeager Families Professor of Environmental Engineering) and Assistant Professor David R. Cocker III conducted a series of town meetings with Mira Loma residents, county officials, and air quality agency staff. They analyzed the children's health study, which was prepared by researchers at the University of Southern California, and worked with all concerned to design a research program that would provide the needed data for planning an air quality improvement strategy for Mira Loma.

Residents are concerned that dramatic growth in the number of warehouses and goods transportation hubs in and around Mira Loma will result in greater pollution and more health risk. Because different types of particles have different "source signatures" that can be identified by laboratory analysis, this study will determine how much of Mira Loma's particulate problem now results from diesel engines, and thus the benefits of controlling these sources compared with other possible actions.

CE-CERT Selected for Study of Air Quality Impacts of California's Backup Power Sources

WHEN CALIFORNIA'S ENERGY SITUATION LOOKED DESPERATE LAST SPRING, THE STATE'S ENERGY COMMISSION CALLED ON CE-CERT to study the potential air quality impacts of using backup generators and other "distributed generation" resources for producing additional electricity. Although the state made it through the summer without blackouts, the project is continuing, pointing the way toward environmentally friendly energy choices for the state's future.

Many government buildings, hospitals, retail establishments, and banks have diesel-powered backup generators to provide electricity during emergencies. The Energy Commission has concluded that these generators could provide 5,000 megawatts of electricity in an emergency -- but only if their use does not worsen air quality at the local or regional level.

CE-CERT's \$1.3 million study, funded by the state's Public Interest Energy Research program, initially is focusing on quantifying the air quality impacts of backup generators and identifying how effectively these little-used systems could be outfitted with emission control technologies. Using CE-CERT's unique heavy-duty engine emissions measurement systems, the project is providing the first "real world" data on the pollutants that these generators produce, and on whether reformulated fuels, exhaust aftertreatment technologies, or even taller smokestacks can reduce their air quality impacts. CE-CERT is using the data to model the local and regional impact that distributed electricity production would have on air quality.

Second, the study is taking a broader look at the potential for incorporating other types of distributed generation - that is, electricity production at or near the point of use -- in California. Microturbines, waste heat recovery, and other technologies are included in this portion of the study.

2000-01 CE-CERT Student Awards

Undergraduate Scholarships:

- Ford Motor Company Scholarship -- Renee Cox, Electrical Engineering.
- Jim Guthrie Research Award -- Anthony Avila, Chemical Engineering.

Graduate Fellowships:

- Esther F. Hays Graduate Student Fellowship -- Brett A. Holmberg, Chemical and Environmental Engineering Graduate Program.
Development of a high-temperature Nafion-zeolite nanocomposite proton exchange membrane for application in transportation fuel cells.



Jim and Debbie Guthrie present Anthony Avila (center) with the 2000-01 Guthrie Research Award.

Discover Magazine Honors IntelliShare Project

A TEAM OF CE-CERT ENGINEERS THAT DEVELOPED INTELLISHARE, AN automated electric car-sharing program, was named a finalist in the Discover magazine 2001 Innovation Awards.

The awards honor scientists whose cutting-edge innovations have the potential to become common technologies. Awards and finalists are named in the categories of aerospace, communications, electronics, entertainment, environment, health and transportation.

IntelliShare, named one of three finalists in the transportation category, is a fleet of 15 Honda electric cars used by some 300 UCR faculty, students and staff for short trips around and near the campus. Matthew J. Barth, Associate Professor of Electrical Engineering and CE-CERT's Director of Transportation Systems Research, leads the team that developed the system in cooperation with Honda R&D.

The system began operating in April 1999 as a testbed for understanding how this kind of new transportation system can be implemented in urban areas, campus settings, tourism destinations, and other locales with high traffic volume and congestion. The 15 vehicles collectively average about 100 trips per day and displace between 500 and 1,000 miles of gasoline-powered travel per day.

CE-CERT plans to expand from the current three stations to five within the next few months, and to increase the vehicle fleet from 15 to 25. In the future, other types of electric vehicles may be added to the mix as well.

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