The Mission

The San Diego State University Center for Sustainable Energy, located in the heart of California’s Imperial Valley, America’s epicenter for renewable energy production, promotes excellence in renewable energy research, education, and training. Through its emphasis on synergistic public and private sector partnerships, the Center fosters cutting-edge renewable energy research, provides academic and professional education relevant to California’s energy future, and contributes to the social and economic development of Imperial County.
The Need

Imperial County, California, is a mainly rural area of 4,481 square miles. Its predominantly Hispanic population of some 174,000 is expected to grow by 60% during the coming decade, making it one of the fastest growing areas in the nation. The County is also one of the nation’s most distressed regions, with a high poverty and unemployment rates that are three times the national average, and income levels that lag well behind those found elsewhere in the U.S.

Whereas nationally some 30% of adult Americans hold a bachelor’s degree or higher, the figure in Imperial County is less than 12%; and statistics on local college and university attendance, persistence, and graduation suggest that students currently in the educational pipeline will earn the bachelor’s degree at an almost identical rate, meaning that the Imperial Valley will experience little improvement in overall educational attainment as additional cohorts move through the educational pipeline and take their place in the workforce. These obstacles to economic and educational development must be addressed, and we believe by far the most promising mechanism to tackle these challenges at present is using the prime resource of the region, renewable energy.
The Promise

Imperial County is one of the most renewable-energy rich locations in the United States and the world, with the potential to produce over 40,000 megawatts of renewable energy. Consider that:

- Imperial County is the second largest geothermal energy producing county in the nation
- It is ideally suited for solar energy production, with over 350 days of sunshine annually
- Abundant agricultural resources, combined with a year-round growing season, make it a prime location for biofuel production
- The Imperial Irrigation District currently operates several hydroelectric plants in the eastern portion of the County
- The western portion of the County possesses great potential for the development of wind turbines

Recent events have positioned Imperial County for a surge in renewable energy with its associated economic, social, and educational development. State law now requires California public utilities to provide a third of their power from renewable energy sources by 2020. Renewable energy technologies are rapidly evolving and are now being brought to the Valley on a commercial scale. The construction of the Sunrise Powerlink will deliver 1,000 megawatts of energy from Imperial County to markets in San Diego County. These circumstances are propitious for SDSU, the Imperial Valley’s only university. The establishment of the Center for Sustainable Energy (CSE) on SDSU’s satellite campus, Brawley, is intended to seize this opportunity.
The Concept

The six major elements of the CSE include:

- An Information and Exposition Center with cutting-edge and future technologies and concepts
- Demonstration Fields showcasing proven and proof-of-concept technologies
- A Laboratory and Housing Complex hosting basic and applied research by SDSU and industry scientists
- A Conference Center for conferences, information sessions, and industry training
- A Technology Park providing leased R&D space for renewable energy companies
- A Classroom and Training Building with smart classrooms and seminar rooms for workforce training, industry simulations, continuing education, and academic programs.
The Education

San Diego State University is a nationally respected research institute and the Top Small Research Institute in the country for the past five years. It is a leader in the development and deployment of renewable energy technologies in support of national priorities. Many SDSU faculty members are currently working in renewable energy-related areas, and the university offers numerous programs in the areas of renewable energy, sustainability, and environmental studies. The campus hosts a Center for Regional Sustainability, and there are various “green” clubs and societies operating throughout campus. SDSU’s Imperial Valley Campus (SDSU-IV) has two locations in Imperial County: Calexico and Brawley. The Brawley campus hosts an 11,000 sq. ft. building surrounded by 200 acres of agricultural fields zoned G/S (Government/Special Public Zone). Research development is a permitted use on the property, making it available for renewable energy training, research, and proof-of-concept and demonstration projects.

Under the CSE concept, the Brawley campus will be supported and outfitted with sufficient power supply, grid connection, and water and wastewater management processes to support a variety of renewable energy technologies. Educational goals for the CSE include developing new majors in collaboration with the SDSU main campus in the areas of Renewable Energy Management and Renewable Energy Systems.

Imperial Valley College (IVC), the region’s only community college, is currently redefining itself as an institution committed to sustainability and renewable energy. Working with community partners, IVC received a $940,000 grant to prepare students for careers in renewable energy. IVC offers “green” certificates, is developing an AS degree in renewable energy
systems, and has a series of majors relevant to the academic mission of the CSE such as pre-engineering, physical and life sciences, business management, and finance.

The CSE concept offers the opportunity for a number of collaborations with educational institutions and programs in the Imperial Valley and beyond. It will also create a large number of educational opportunities for our students, faculty, and community:

- Support for existing majors at SDSU-IV
- Development of new majors at SDSU-IV
- Support for existing majors and programs on the San Diego Campus
- Support for academic program development at Imperial Valley College
- Internships with energy-related organizations and utilities
- Thesis/Dissertation opportunities
- Energy education for non-technology oriented students
- E-Learning programs
- International collaborations.
The Research

The CSE offers many research linkages for both academic and industry researchers. These include:

- The Energy Engineering Institute allows engineering students and faculty to solve problems presented by industrial sponsors.

- The Solar Energy Laboratory permits students and faculty in the sciences and engineering to engage in laboratory testing a new type of solar technologies.

- The Center for Regional Sustainability focuses research attention on topics from water and energy to transportation and air pollution.

- The Computational Science Research Center brings together researchers in different areas with an interest in modern scientific computation to develop educational programs and industrial interactions.

- Industry Partnerships with firms such as Cal Energy, Ormat, and the Imperial Irrigation District will help increase local educational opportunities in STEM-related fields.
Workforce Development

The expansion of the renewable energy cluster in Imperial County represents a tremendous opportunity to reduce unemployment and bring new economic prosperity to the region, and a critical component of the CSE involves developing an effective renewable energy workforce development program. SDSU-IV already has experience in creating workforce training programs of relevance to the renewable energy industry, employing instructors such as engineers and chemists with extensive experience in the geothermal industry. Its Renewable Energy Fundamentals Course was developed in collaboration with geothermal companies, and plans call for developing a Renewable Energy Technician Certificate Program. Leveraging the participation of industry partners, the CSE will provide training in such essential areas as enterprise sustainability and environmental resource management, facilities energy efficiency, and clean energy generation.
The Benefits

The CSE in Brawley will emphasize synergistic public and private sector partnerships, bringing together a range of renewable energy interests in a region with an abundance of solar, wind, and geothermal activity. With educational and research facilities, with ample room for project testing from the initial stages through demonstration, the CSE will be a focus for research, academic programs, seminars, and conferences.

CSE will offer a site for the development of solar, geothermal, wind, biofuels, and other energy sources yet to be imagined. Purposively designed to advance the economic and social development of Imperial County, to address the renewable energy goals of the State of California, and to contribute to our nation’s energy independence, the CSE will firmly establish San Diego State University’s leadership role in the sustainable energy revolution-to-come.