



## **MEMORANDUM OF UNDERSTANDING**

San Diego State University, University of California San Diego, and  
San Diego Gas & Electric Company

to establish a

Research and Educational Consortium  
in the Area of Emerging Energy Technologies

### **Background and Purpose**

Providing reliable, secure and environmentally sound energy options will be a critical area of research for the 21<sup>st</sup> century. In addition to conducting research on new and emerging energy technologies, it will also be necessary to train and educate the next generation of energy professionals, especially in the area of renewable and sustainable energy technologies.

The energy systems that emerge in the 21<sup>st</sup> century will profoundly affect the environment, economy and quality of life at the local, regional, national and global levels. It is therefore important that emerging energy systems incorporate the latest science and technology and be designed to have the least environmental impact possible.

By their very nature, universities are ideally suited to carry out the fundamental research and education needed to create the knowledge base for the development of sound energy systems. At the same time, applying this new knowledge requires close cooperation with entities that supply and distribute energy services, such as investor owned utilities.

Therefore, San Diego State University (SDSU), the University of California, San Diego (UCSD), and San Diego Gas & Electric (SDG&E), agree to cooperate in developing joint programs and conducting basic and applied research in the area of new and emerging energy technologies. These activities are entirely consistent with the research and educational missions of SDSU and UCSD, and with the responsibilities of SDG&E to provide safe and reliable energy services to its customers.

Cooperation among the three entities will be carried out by forming a consortium, to be called **The Energy Research Consortium (Consortium)**.

### **Potential Areas of Research**

The Consortium will explore cooperative and synergistic projects to include, but not be limited to, the following areas:

- Renewable energy technologies:
  - Concentrated solar power
  - Small scale wind
  - Biofuels/biomass generation
  - Ocean power – tidal and wave
- Distributed Generation (Renewable and Non-Renewable):
  - Photovoltaics
  - Integration of larger wind and solar
  - Microgrids
  - Advanced monitoring, communications and control
- Storage
  - Chemical storage (advanced batteries)
  - Small scale compressed air
  - Fly-wheel storage
- Other areas:
  - Transportation – electric vehicles and partial hybrid electric vehicles
  - Desalination technologies
- Economics and cost effectiveness of new and emerging energy technologies.
- Environmental impacts on air, water and land use of new and emerging energy technologies.

### **Steering Committee**

A steering committee, agreed upon by the three founding entities, will serve as the administrative coordinator for the consortium. At the current time the Steering Committee will consist of:

#### *SDSU*

Dr. Thomas Scott, VP for Research and CEO of the SDSU Research Foundation

Dr. David Hayhurst, Dean, College of Engineering

Dr. Alan Sweedler, Assistant VP for International Affairs, and Director of the SDSU Center for Energy Studies

UCSD

Dr. Frieder Seible, Dean, Jacobs School of Engineering  
Dr. Farrokh Najmabadi, Director of the Center for Energy Research  
Dr. Henry Abarbanel, Department of Physics

SDG&E

Richard Morrow, Vice President of Customer Service  
Arun Sharma, Technology Strategy Manager  
David Berokoff, Manager of Technology Development

**Additional Provisions**

1. Nothing in this MOU will be construed as a specific commitment of funding by SDSU, UCSD or SDG&E.
2. This MOU may be modified by addenda, when mutually agreed upon by SDSU, UCSD, SDG&E.
3. This MOU shall remain in force for five years from the date of signature by all of the three entities, at which time it may be renewed or renegotiated.
4. Any party may terminate participation in this agreement unilaterally, with at least 30 days advance notice to the other organizations.
5. All organizations will identify a point of contact for ongoing coordination and communications. Members will be provided notice of any changes in committee membership.
6. Each six months at minimum, the principals will review progress on the agreements covered in this document and make recommendations on how to continuously improve the effectiveness of the agreement.

Signatures:

SDSU



Dr. Thomas Scott 11/28/06  
Vice President for Research  
CEO, SDSURF

UCSD



Dr. Frieder Seible 12/4/06  
Dean  
Jacobs School of Engineering

SDG&E



Mr. Richard M. Morrow 11/21/06  
Vice President  
Customer Service - Major Markets