

Colorado Renewable Energy Collaboratory

Madame Chair, Committee members, Senator Heath:

I am Dag Nummedal, testifying here on behalf of David Hiller, Executive Director of the Collaboratory. David apologizes for the fact that he is not able to present the testimony in person. I am the CSM 'institutional coordinator' for the Collaboratory and also the director of the Colorado Energy Research Institute (CERI) at CSM.

The Colorado Renewable Energy Collaboratory is a research partnership among the National Renewable Energy Laboratory and the Colorado School of Mines, Colorado State University, and the University of Colorado at Boulder. The collaboration takes place in several Collaboratory Research Centers. Two such centers are now fully functional, two will be publicly announced in the spring of 2009, and two more will be ready for launch before the end of the year.

- The Collaboratory's first research center, the Colorado Center for Biorefining and Biofuels, known as C2B2, was launched in 2007 and works to create fuels and other products from biomass. C2B2 has attracted more than 40 private members.
- The Center for Revolutionary Solar Photoconversion, launched in early 2008, aims to produce technological revolutions in solar energy. A total of 14 large and small businesses are now members of CRSP. The establishment of CRSP also created a powerful team of solar energy researchers who recently was awarded a very large, and very prestigious, grant from the NSF: a 12 million dollar REMRSC center, housed at CSM.
- The two centers to be launched this spring include the Solar Technology Acceleration Center and Center for Research and Education in Wind. The Collaboratory's final two research centers are:
- The Center for Carbon Management, which will research technologies to capture carbon dioxide and to safely and reliably store this CO₂ so that it is not released into the atmosphere.
- The Efficiency and Energy Management Center will help Colorado and the United States develop a smart electrical grid that will be more efficient, more reliable and more secure.

The Collaboratory's Education Task Force is also working with Colorado's community colleges, the Colorado Department of Higher Education, the Governor's Energy Office and private companies to provide training – and retraining – to prepare Coloradans for jobs in renewable energy careers.

Much of the Collaboratory's success to date is due to the support of the General Assembly. In 2006, the General Assembly appropriated up to \$2 million per year for three years for the Collaboratory to use as matching funds to attract research grants and contracts from federal and private sources for public research. Access to these funds requires joint proposals between the participating research institutions. This requirement in the bill that established CREC, is critical, and has changed the research culture in our

state. We now write proposals together and have already proven the greater success of those proposals, than efforts by individual Colorado universities – as we did them in the past. Companies are very much attracted to this new model, getting access to considerable depth as well as scope of relevant expertise, all in one place – through the Collaboratory.

We greatly appreciate your committee's willingness to consider extending matching funds. The matching funds already appropriated were allocated according to schedule and in support of the existing centers. However, no funding is presently available to support the new centers scheduled for launch in 2009.

It is essential that these new centers have state matching funds as they are launched in 2009. Colorado is only one of many states contending for leadership in renewable energy research and in attracting renewable energy companies. A loss of state matching funds to the Collaboratory in 2009 will therefore deal a serious blow to Colorado's renewable energy research leadership.

Again, the Collaboratory is very grateful for the General Assembly's 2006 appropriation. At this time, we believe that Senate Bill 31 offers an opportunity to provide the funding needed to keep Colorado ahead of the competition from other states. I respectfully, but urgently, ask you to support this critical legislation.

Thank you, Madam Chair and members of the Committee.

COLORADO RENEWABLE ENERGY COLLABORATORY
ECONOMIC DEVELOPMENT ACTIVITIES

The Collaboratory's three goals are: to create and rapidly commercialize renewable energy technologies; to serve as an economic driver for the State of Colorado; and to educate scientists, engineers and the renewable energy work force. Less than two years after its creation, the Collaboratory already has achieved many economic development successes:

- Received the 2008 Metro Denver Economic Development Council Chair's Award for Outstanding Efforts in Economic Development;
- Helped attract ConocoPhillips' technology and education center to Colorado, which will generate millions in redevelopment investment and create thousands of high-paying jobs ;
- Brought to Colorado \$1.6 M in private funds to support shared research programs and \$5 M in private funds for sponsored research
- Enrolled more than 30 corporations as members of the Colorado Center for Biorefining and Biofuels (C2B2), including many major American and multinational companies (listed below);
- Enrolled 14 corporations as members of CRSP, including major solar companies and major multinational manufacturers (listed below);
- Partnered with Abengoa Solar, the City of Aurora, Midwest Research Institute, SunEdison and Xcel Energy to build and operate the Solar Technology Acceleration Center, a world class solar technology demonstration and test center, near Denver International Airport;
- Cooperated with the Governor's Office and regional economic development agencies to bring R&D and manufacturing activities to Colorado, including Vestas and Siemens.

In explaining the selection of the Collaboratory to receive the MetroDenver EDC Chair's Award, Kittie Hook, senior vice president for corporate services for Fuller Real Estate and Chair of the Metro Denver EDC's board of governors, said: "Nowhere in the world has an asset such as this unique research partnership. Instead of marketing their individual programs and research, the four founding members present themselves to the world as one single entity through which sponsored research, public-private partnerships, and technical consultation are available."

Governor Ritter commented: "The Collaboratory deserves this honor. In a relatively short time, the Collaboratory has mobilized our new energy expertise housed at our excellent institutions and is delivering results. I also commend its efforts in offering education and job training opportunities to meet the workforce demand of our New Energy Economy."

The C2B2 corporate members include (major corporate members in bold): **Archer Daniels Midland Company**, ASD Inc., Aurora Biofuels, BioExx, Blue Sun Biodiesel, Catchlight Energy, Ceres, **Chevron**, Cobalt Biofuels, **ConocoPhillips**, **Dow Chemical**, **DuPont**, **Eco-Petrol-ICP**, Flad Architects, **General Motors**, Gevo, **Kimberly-Clark**, Korth O'Neil Engineering, LiveFuels, LS9, Mascoma, OpX Biotechnologies, PureVison Technology, Range Fuels, Rocky Mountain Sustainable Enterprises, San Juan Biodiesel, **Shell Global Solutions**, Solix Biofuels, **Suncor**, Sundrop Fuels, Symbios Technologies, **UOP**, **W.R. Grace**.

CRSP's corporate members are: **Applied Materials, Inc.**, Ascent Solar Technologies, Inc., **DuPont**, Evident Technologies, Inc., **General Motors**, Konarka, **Lockheed Martin**, **Motech Industries**, QuantumSphere, Inc., **Sharp**, Solasta, Inc., Sub-One Technology, **SunEdison**, **Toyota**.



**Summary of Commitments & Distributions
of Matching Funds Appropriated by HB 06-1322**

\$2M/yr for FY 2006-07, 2007-08, 2008-09

	2007	2008	2009	2010	2011	2012	2013
C2B2 – Colorado Center for Biorefining and Biofuels	\$500k	\$750 k	\$1 M				
CRSP – Center for Revolutionary Solar Photoconversion		1M com 417k dis 583k bal	1 M	1 M			
CREW – Center for Research and Education in Wind			500k	750k	83k		
SolarTAC – Solar Technology Acceleration Center			None	None	None		
EEMC - Energy Efficiency & Management Center			None	None	None		
CMC - Carbon Management Center			None	None	None		
<i>Matching funds released based on members' fees - Annual</i>	\$500k	\$1.167M	\$2.5M	\$1.75M	\$83k		
<i>Matching funds released – Cumulative</i>	\$500k	\$1.667M	\$4.167M	\$5.917M	\$6M		

1. All commitments of matching funds are made by the Colorado Renewable Energy Authority, pursuant to HB 06-1322. The Authority is an independent authority under Colorado law.
2. Matching funds are not distributed to centers until membership fees are committed.
3. Most commitments provide increased matching fund availability based on expected ability to increase membership and members' annual fees: Yr 1: \$500k; Yr 2: \$750k; Yr 3: \$1M, totaling \$2.25M over three years. All centers except CRSP provide 1:1 match for members' fees.
4. CRSP received commitments of \$1M/yr for three years to support CRSP's proposal for federal funding of \$7M/yr (1:7 match). However, the DOE program was not funded. CRSP reverted to matching private members' fees at 1:1 match. In 2008, CRSP raised \$417k in members' fees and received \$417k in matching funds out of the committed \$1M maximum, leaving an unused balance of \$583k. The unused funds will be applied to CREW's matching fund commitments for 2010 and 2011. But for these unused CRSP funds, CREW's matching fund commitment would be \$750k total, for 2009 and 2010. With the use of the unused CRSP funds, CREW will be eligible to receive up to \$1.333M over three years, still short of the preferred \$2.25M.
5. **NO MATCHING FUNDS ARE AVAILABLE FOR SolarTAC, CMC OR THE EEMC OUT OF THE 2006 APPROPRIATIONS. TO FUND THESE THREE CENTERS FOR 2009 ALONE, THE AUTHORITY/COLLABORATORY NEEDS \$1.5M IN APPROPRIATIONS FOR FY 2009-10.**

