

Sitting on the SIDELINES?

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One of the most irritating untruths that floats around Kentucky is that the state is somehow sitting on the sidelines, missing out on the “new green economy.” While I do not see a technically-feasible approach to moving our country away from fossil energy use anytime soon, I do see an expanding place for renewables. I am often asked what we at CAER are doing to help with this. The honest answer at the moment is that we’re making a huge mess! There are cars parking in a field, a 30’x30’ muddy pit surrounding a manhole in front of the Administration Building, construction trailers parked semi-randomly on the old soccer fields, and half the place (including the now off-limits parking lot) is surrounded by chain-link fence. We recently (more or less) finished the renovation of our high bay areas and moved the Environmental and Coal Technologies Group into its own Mineral Processing Building.

Why all this turmoil?

After 33 years in the same increasingly-cramped digs, we’re constructing a new laboratory building!

The groundbreaking for the ever-so-creatively titled “CAER Laboratory Building #2” was held in mid-October (see the sidebar on page 4), with substantial completion scheduled for next November. I realllllyyyyyyyyyyy



wanted to write last year’s end-of-year editorial about our chances of getting to build a new laboratory building at CAER. Unfortunately, while we were getting frequent requests for updated information (a very good sign), we were also getting constant notices that this did NOT mean we were getting funding and no announcements should be made. As it turned out, this carried into January, with perhaps the longest week of my life being the one in which we had been promised an announcement either way and then Washington DC closed for a week due to the blizzard.

The big announcement finally did come: CAER had won an \$11.8 million American Recovery and Reinvestment Act award from the National Institute for Standards and Technology to build a state-of-the-art renewable energy laboratory. This funding is matched by \$3.5 million from the Kentucky Energy and Environment Cabinet and \$1 million from the University. Timing could not have been better for CAER and Kentucky, in that this funding allows us to take the \$3.5 million set aside for fitting up labs for the Kentucky-Argonne Battery Manufacturing R&D Center and build much bigger, better, and more effective lab space for our shared use. These are not just your average labs either; the battery assembly space is essentially a giant sealed cooler, maintained at 72 °F and 0.5% humidity. It’s the couple-of-million-dollar room. Not only will we be gaining new space, but in doing so we free space in the existing building for carbon capture, biomass,

Fischer-Tropsch, and materials to continue to expand.

This new laboratory building will also be an experiment in energy-efficient design. Through the State Energy Plan program, the Department of Energy



Development and Independence has provided an additional \$3.5 million to allow us to plan and build for a LEED-Gold efficiency standard. The cooperation between the state, university, and our architect and engineer firms (Murphy+Graves and CMTA) are allowing us to use this facility to demonstrate new technologies for energy reduction and control on a laboratory building that would normally be a significant energy user. Things like geothermal systems for heating and cooling (buried under the parking lot, hence the big fence and muddy field full of cars); an enthalpy wheel to recover energy normally lost in venting building air through the exhaust hoods; and significant water-conservation techniques including a process-water loop tied to the geothermal system and a partial green roof. Along with this will be extensive informational displays, including an active display of the building energy management system and a comparison with our existing 1970s-era not-LEED-Anything building. Architect Tim Murphy will be discussing what went into selecting these design features in more detail (and with greater accuracy) in the next edition of *Energieia* as well.

Perhaps most exciting to me is what these new facilities mean for the future of CAER, energy research at UK, and in Kentucky. Not only are we undergoing a major upgrade in lab quality and



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Sitting on the Sidelines? (cont.)

capabilities, we’re doing so while transitioning from what has often been called “the coal lab” into a program reflective of the likely future energy mix in Kentucky. We’ll still be doing a lot of work in fossil energy, particularly looking at continued use of coal for power and fuels. But we will also be expanding our biofuels, energy storage, and energy-materials programs. (These research programs will be described in the next edition of *Energieia*). Probably the most significant new area will be the addition of a solar materials program with the relocation of Professor John Anthony’s program from the UK Department of Chemistry into dedicated space in the new lab building. I have to admit that knowing this was planned made it a lot easier to just smile and nod whenever confronted with the “you just hate solar” response on presenting what I see as legitimate current limits to useful implementation of these technologies.

As I’ve said, one of the most irritating untruths that floats around Kentucky

is that the state is somehow sitting on the sidelines and missing out on the “green revolution.” There are researchers, entrepreneurs, and major utilities all working to find which technologies will work in Kentucky and which are not going to be economical. With the instigation of the Kentucky-Argonne Battery Manufacturing R&D Center, Kentucky has pushed to the forefront in addressing the biggest impediment to any real use of wind and solar energy: the ability to store large quantities of power. Similarly, new batteries and capacitors will be at the heart of any electrification of our transportation systems (and offer substantial reductions in emissions). And as the third largest automotive state in the country, Kentucky is insuring it will remain competitive as this transition occurs.

The Commonwealth is not on the sidelines. It is most definitely in the game.