FY09 Special Projects R&D Centers - Pending Requests

Request #	Organization Name	Project Title	Request Amount	Staff Recommendation
1666	Blue Ridge Crossroads Economic Development Authority	Blue Ridge Energy Research Center	$354,600	**$0**
1669	Concerned Friends for Tobacco	Bioenergy/Bioproducts Demonstration Site Process Development	$873,745	**$873,745**
1667	Halifax Educational Foundation	Advanced Manufacturing, Modeling and Simulation Research and Development Program	$8,000,000	**$8,000,000**
1670	Institute for Advanced Learning and Research	Sustainable Energy Technology Center Building (SENTEC)	$8,077,378	**$8,077,378**
1668	Old Dominion University Research Foundation	Algal Fuel and Engine Performance Laboratory (AFEPL)	$7,999,970	**$0**
1663	Region 2000 Research Institute	Region 2000 Nuclear Energy Research Center	$7,692,400	**$7,692,400**
1665	Southwest Virginia Higher Education Center	Southwest Virginia Clean Energy R&D Center	$8,000,000	**$8,000,000**
1664	Wise County IDA	Appalachia America Energy Research Center	$4,000,000	**$4,000,000**
8 Requests		Total	$44,998,093	**$36,643,523**
		Balance Available	$40,000,000	*$3,356,477*

Blue Ridge Crossroads Economic Development Authority
Blue Ridge Energy Research Center (#1666)
$354,600 requested

Funds are requested to conduct a feasibility study; legal and financial management; planning for collegiate and educational interface; to evaluate new and emerging fuel energy technologies; to evaluate energy companies compatibility to the Center; for the evaluation of proposed Center sites; for modeling and simulation; for web site development; and for facility design associated with the development of the Blue Ridge Energy Research Center. The Center is an alliance of private businesses (e.g. Red Birch Energy), educational partners (e.g. Virginia Tech and community colleges) and agricultural networks to optimize energy production focusing on liquid fuels research and production with state-of-the-science municipal solid waste, biodiesel production from canola and

"brown grease", and cost effective ethanol production. The Center will also house an educational complex as well as a common laboratory space.

The applicant estimates that biodiesel production from canola oil and "brown grease' would result in annual revenues and net income of $1.16 million and $630,000 respectively for a 1-million gallon per year biodiesel plant and $7.08 million and $4.5 million respectively for a 5-million gallon plant. Initial private capital investment for a 1 million gallon per year biodiesel production facility capital cost will be approximately $800,000 or $3.1 million for a 5-million gallon facility with annual labor costs of $426,000 or $888,000.

Estimates for ethanol production using locally available cellulosic fibers show that a proposed facility with a production of 35 million gallons will have expected revenue of $62 million annually with a gross profit of no less than $18.6 million (30%). Initial private capital investment for a facility producing 20-35 million gallons would be at least $50 million and the facility could support 40 highly skilled technical jobs at full production.

Total project cost is $446,600. Other funds include: Carroll County Industrial Development Authority $10,000 for initial technical and managerial support, The Crossroads Institute $2,000 for office space, Blue Ridge Crossroads Economic Development Authority Small Business Development Center $80,000 for business plan (in-kind).

Prior funding history: none specific to this project.

Staff comments and recommendation: Project appears more closely poised to result in development of a bio-refinery (a positive outcome better suited to other TICR grant funds for job-creating private investment projects) than to focus on research, which currently includes multiple potential paths. The primary focus on renewable plant feedstocks and research partnerships with Virginia Tech lead to the notion that these efforts ought to be coordinated/integrated with the IALR SENTEC efforts. **Staff recommends no award.**

Concerned Friends for Tobacco
Bioenergy/Bioproducts Demonstration Site Process Development (#1669)
$1,011,870 requested

Phase II funds requested by non-profit applicant to further evaluate feedstock and plant performance characteristics of the production and conversion of bio-based crops into bio-diesel and other value added products located at the Windy Acres Nursery, a privately-owned business in Gretna, VA. Previous TICR funds have been used to develop the "proof of concept" testing and demonstration, and funds are now requested for preparation of the pre-commercial and construction of a commercial refinery. The applicant suggest that an individual refinery site would directly employ 25-30 people, require support by 30-50 farmers, and require $30-$40 million in private investment. Phase II project activities include improving the conversion process, performing emissions testing, evaluating feedstocks, and product marketing and value enhancement. TICR funds would be used for lab analysis services, technical expertise, equipment purchases, plant improvements, and travel.

Project activities also include support assistance from Virginia Tech in demonstrating and evaluating the production of green diesel through the gasification of bio-oil by constructing an oxygen blown/steam gasifier to be used with the current ROI pyrolysis unit at the Gretna test site.

Activities would allow for the development of a protype biorefinery unit capable of converting biomass into green diesel and would assess the economic and technical feasibility of producing green diesel from various feedstocks grown by tobacco region farmers. TICR funds would be used for equipment, VT research engineer(s), commercial lab analysis, and travel.

Total project cost is $1,199,870. Other funds include: $100,000 CIT Innovation grant ($76,000 balance) for commercialization of Piedmont BioProducts; $112,000 in-kind from Windy Acres Nursery/Piedmont BioProducts for land, equipment, and technical expertise.

Prior funding history: $1,140,000 FY06 Special Projects to Virginia Tech in part for production of bio-diesel from plant feedstocks conducted at Windy Acres Nursery; $162,000 FY08 Agribusiness for test facility construction and three-phase power.

Staff comments and recommendation: Project will build on demonstrated progress achieved in establishing feedstock crop tests and biorefinery equipment at Windy Acres. Project now includes an additional focus on higher value products and a recently-established growers cooperatives to retain producer earnings in tobacco region. **Staff recommends award of $873,845 (excluding cost of Virginia Tech research assistance).**

Halifax Education Foundation
Advanced Manufacturing, Modeling and Simulation Research and Development Program (#1667)
$8,000,000 requested

Funds are requested for the creation of the Innovation Center for Advanced Manufacturing Technologies to be housed in the recently donated American Tobacco Warehouse which is located on the Southern Virginia Higher Education Center (SVHEC) campus and owned by the Halifax Education Foundation (HEF). The Center would house a program focused on design and advanced manufacturing technology R&D with emphasis initially on wood products and later in metals, fabrics, and plastics. Additionally, the center will provide training in areas of CAD/CAM, CNC manufacturing, semi-automated factory environment, and computer-based skills for design and manufacturing. The applicant proposes that the Center would support the creation of new technologies and products with commercial application, development of lower manufacturing energy costs, and development of a skill regional workforce in advanced manufacturing technologies. TICR funding of $6 million would specifically be used for the design and renovation of the historic warehouse.

The applicant also proposes to create, in partnership with Virginia Tech's Modeling and Simulation Center, a Renewable Energy Incubator Center at Building One in the Riverstone Technology Park (owned by the Halifax IDA) to research, develop, and evaluate energy systems and technologies in settings such as parks, military applications and commercial opportunities to support a demonstration of lower energy costs, new renewable energy technologies, and new scientific application for commercial development. Targeted research areas for demonstration may include wind energy, solar energy, bioenergy-gasification energy, fuel cell storage energy, human energy, combined energies, and environmental technologies supporting the power generation industry. TICR funding of $2 million is requested for the purchase of equipment, software, technology integration, instrumentation and support contracts.

The Centers are proposed to improve the quality of the STEM workforce, increase attraction and retention of STEM workforce and companies, and expand opportunities in the advanced manufacturing and energy sector.

Total project cost is $13,754,903. Other funds include: $700,000 estimated from the U.S. Department of Energy, USDA, and/or U.S. Park Service for demonstration and research; $1,850,903 estimated from Halifax County, South Boston and HEF for support; $2,535,000 secured from tax credit and corporate contributions for renovation and support; $669,000 in process from corporate contributors for program support.

Prior funding history: $1,196,532 FY08 SSED (full balance) to Virginia Tech for the "Modeling and Simulation Center for Excellence – Environmental and Energy Sector"; $330,000 budgeted within the $1.5 million FY07 Education award to the SVHEC for development of a wood science degree program.

Staff comments and recommendation: Request builds on previous Commission grants to coordinate development of an advanced skills wood sciences educational program by Danville and Southside Community Colleges, Southern VA Higher Education Center and Virginia Tech, and to create environmental modeling and simulation capacity at Riverstone in cooperation with multiple private sector partners. **Staff recommends award of $8,000,000.**

Institute for Advanced Learning and Research
Sustainable Energy Technology Center Building (SENTEC) (#1670)
$8,077,378 requested

Funds requested for design and construction of the two-level 27,225 square foot Sustainable Energy Technology Center (SENTEC) to be located on the existing IALR campus in Danville, VA. The facility will be LEED "green" certified (Leadership in Energy and Environmental Design) and will include 8 planned labs, offices, open cubicle areas, and small meeting space designed for flexibility and scalability. SENTEC will build on IALR's existing plant biology research capabilities, the Cooperative Extension network and emerging regional bio-energy industry to develop, test and commercialize advancements in sustainable energy technologies, including bio-based fuels. Previous TICR funds have been used to contract RTI to perform a feasibility and economic impact as well as to complete design. A staff of 10-12 is anticipated in early years, growing to 18 researchers by year five. The completed RTI study indicates that the facility will generate $7.1 million annually in R&D expenditures and induce spin-off firms providing approximately 85 new jobs and $3.8 million in wages. Projections also indicate the potential for three new invention disclosures, two new patent applications, one new license executed and $200,000 annually in licensing income. The center is being developed in partnership with universities and federal programs.

Total project cost is $9,296,602. Other funds include: $148,642 IALR in-kind for project management; $150,000 pending private contributions for donated services; $296,398 awarded from Department of Energy for construction; $149,184 committed from City of Danville for site development and construction admin; $75,000 proposed from American Public Power Association for building upfits; $400,000 committed from Pittsylvania-Danville Regional Industrial Facility Authority for infrastructure, curb & gutters, and broadband.

Prior funding history: $400,000 FY08 Special Projects for contracted services to develop business plan and architecture/engineering.

Staff comments and recommendation: Equipment and operating funds are not requested of TICR (federal and state appropriations will be sought). Target measures are clearly defined in terms of dollar volume and employment in research, number of students earnings degrees etc. and potential impacts have been quantified using IMPLAN model. Economies of scale can be achieved by using IALR facilities and staff, and programs can be initiated while construction is ongoing, using IALR's existing facilities. **Staff recommends award of $8,077,378.**

Old Dominion University Research Foundation
Algal Fuel and Engine Performance Laboratory (AFEPL) (#1668)
$7,999,970 requested

Funds are requested by ODU's nonprofit foundation to build and operate the Algal Fuel and Engine Performance Laboratory (AFEPL) for the research, development and commercialization of biofuels from algae co-located with a fuels characterization/engine emissions test and certification facility and an engine performance lab. The applicant requests assistance to secure a site and for the construction of a 40,000 square foot facility with labs, greenhouse, business incubation space and adjacent algae cultivation and growth raceways. The proposed facility will be located adjacent to the Virginia International Raceway (VIR) in Halifax County and will focus on the development on an additional and high yielding fuel source (algae) that does not impact the cost or availability of food and adds the research and commercial test capability for performance validation, emissions and long term durability testing. The project builds on ODU's current work in the VA Coastal Energy Research Consortium (VCERC – see www.vcerc.org) and ongoing research to produce energy and fertilizers from a wastewater remediation process using power plant emissions. The project will immediately generate 10 new high-salaried jobs on site plus an additional 20-30 throughout the community. Eventually it could create 50-75 high salaried jobs and will generate annual property taxes ranging from $28,000-$40,000. Using the James Madison University economic impact formula, the economic impact is projected to be 9 direct jobs plus 8-9 additional annually. Local expenditures will total around $3 million annually. ODU will also expand educational opportunities through its existing Teletechnet facilities and motorsports educational partner institutions (e.g. New College Institute and community colleges).

Total project cost is $8,974,220. Other funds include: Old Dominion University $747,260 (internal funds) for faculty release time and salary for Facility Director, $226,990 (internal funds) for equipment for the fuel testing laboratory.

Prior funding history: portion of $1.36 million FY06 Special Projects for VIPER motorsports research; $432,470 pending Special Projects VIPER request.

Staff comments and recommendation: Personnel funds are being requested ($1.4 million). Request would add fuel and engine performance testing capabilities to VIPER's stable of research services. However, given ODU's focus on a promising renewable plant feedstock (algae) and its existing VIPER partnership with IALR, this research track should be coordinated and potentially integrated with IALR SENTEC proposal. **Staff recommends no award.**

Region 2000 Research Institute (dba Center for Advanced Engineering & Research)

Region 2000 Nuclear Energy Research Center (#1663)

$7,692,400 requested

Funds requested to finalize design, then construct and equip a 24,500 square foot Center for Advanced Engineering and Research (CAER) to be located in the New London Technology Park in Bedford County. The facility will be LEED "green" certified (Leadership in Energy and Environmental Design) and will provide space dedicated for education/professional development, technology wings, offices, and an auditorium. CAER will provide applied research capability, commercialization support and workforce training to the region's nuclear power and wireless industries, which include health physics, non-destructive examination, wireless, modeling and simulation, welding, materials science, mechanical and electronics. The facility will also serve as a workforce resource center to the UVA/CVCC undergraduate engineering degree program, Commonwealth Graduate Engineering Program, Energy Systems Technology & Education Center and the training and continuing education needs of the region scientists, engineers and workers. Previous TICR funds have been used to establish CAER in recent years, to contract RTI to perform a feasibility and economic impact as well as to begin design of the facility. The completed RTI study indicates that the facility within 5 years of completion will attract $5 to $10 million in research contracts, 77 additional jobs generated from spin-off firms, and $3.5 million in additional wages. Projections also indicate the potential for three new invention disclosures, two new patent applications, one new license executed and $182,000 annually in licensing income. The center is being developed in partnership with local industry (Areva, B&W, IWT etc.), research universities (UVA & VT) and federal programs (DoD, DoE, NSF etc.).

Total project cost is $8,985,950. Other funds include: $140,000 pending CAER budget approval for operating expenses; $380,000 in-kind from local industry (AREVA, TYCO, B&W, others) for specialized lab equipment and design services; $773,550 in-kind from Bedford County for land and site prep.

Prior funding history: $495,000 FY06/07 Special Projects for CAER start-up and equipment; $400,000 FY08 Special Projects for contracted services to develop business plan and architecture/engineering; $366,871 SSED for New London Tech Park site development.

Staff comments and recommendation: Regional resources have been marshaled to create CAER over the past several years and a five year operational plan is in hand. Strong industry and educational partners are on board and agreements are in place to establish an educational pipeline with school districts, CVCC, UVA and VT. Target measures are clearly defined in terms of dollar volume and employment in research, number of students earnings degrees etc. and potential impacts have been quantified using IMPLAN model. Areva illustrates the nexus of intended outcomes by committing to provide educational tuition and employment for students. TICR grants have also supported the high-quality New London Park that will be the CAER site. No operational funds are requested of TICR. **Staff recommends award of $7,692,400.**

Southwest Virginia Higher Education Center
Southwest Virginia Clean Energy R&D Center (#1665)
$8,000,000 requested

Funds are requested to design, construct and equip the Southwest Virginia Clean Energy R&D Center to be located at the Southwest Virginia Higher Education Center in Abingdon. The 16,000 square foot Center will address the growing research and workforce needs of the energy industry by focusing on applied research for technologies, policy, and infrastructure issues, along with the brokering of key workforce needs while systematically connecting industry with education and research resources. A Carbon Management Institute will conduct applied research coordinated with the VA Center for Coal & Energy Research and Southeast Regional Carbon Sequestration Partnership. The Center proposes to have $8-10 million of university and industry-led research projects and a staff of 20 by its third year. A needs assessment and business and operational plan, produced by RTI International, used an economic model (IMPLAN) to predict the impact such a facility would have on the area. Using an expenditure of $10 million to represent the potential construction cost of the Center, RTI derived estimates showing that the one-time direct and indirect economic impact associated with construction would be $15 million regionally and $17 million statewide. In addition, RTI estimated that the economic activity associated with this impact would generate 191 new jobs. Of the R&D Center's ongoing operational budget of $7.4 million, $2.8 million is allocated for salaries and benefits, $.5 million for equipment, $3.5 million for program operations, and $.6 million for administrative overhead. Inputting these expenditures into the IMPLAN model the combined ongoing annual direct and indirect economic impact associated with operational expenditures would be $11.2 million regionally, and $13.5 million statewide and would generate approximately 127 new jobs. RTI also predicted that it is possible that the $7.4 million in sustained R&D expenditures would over time generate spin-off firms that will provide up to 88 additional jobs and $4 million in additional wages for the region.

Total project cost is $9,975,613. Other funds include: Southwest Virginia Higher Education Center $128,713 (budgeted expenditures, pro-rata) for salaries, benefits, equipment, and furnishings, Southwest Virginia Higher Education Center $349,440 (yet to be received) for salaries, benefits, space rental, fees for service, "to be determined" $565,000 for salaries, benefits, space rental, fees for service, supplies, "to be determined" $68,000 for salaries, benefits, space rental, fees for service, "industry to be determined" $300,000 for salaries, benefits, furnishings, space rental, fees for service, Virginia Highlands Community College $565,000 (in kind – to be committed) for land and parking lot.

Prior funding history: $400,000 FY08 Special Projects for contracted services to develop business plan and architecture/engineering.

Staff comments and recommendation: Site and operating funds are yet to be committed but are not requested of TICR (proposed site is state-owned parcel adjacent to SwVHEC). Business/operational plan has been completed and economic impact study using IMPLAN is referenced above. Target measures are defined in terms such as dollar volume and employment in research, the number of students/workers receiving training and funding leveraging. An Energy Industry Advisory Council that met to plan the Center will be expanded and will continue to advise on operations. Economies of scale can be achieved by using SwVHEC staff as managers of the Center, and programs can be initiated while construction is ongoing, using SwVHEC's existing facilities. **Staff recommends award of $8,000,000.**

Wise County Industrial Development Authority
Appalachia America Energy Research Center (#1664)
$4,000,000 requested

Funds are requested to design, construct and equip the Appalachia America Energy Research Center, a 24,825 square foot expandable facility, to be located in the Lonesome Pine Technology Park in Wise. The facility will be a regional multi-tenant research center, capable of accommodating up to 5 (projected) companies and research partners in the field of energy, with a focus on clean coal technology and coal to liquid fuels. In addition, the center will address research in the field of environmental remediation measures as it applies to the use of coal as a national energy resource. Specifically, this will include the remediation of mercury in the coal burning process, reduction of sulfur from coal, and the removal of impurities in the use of coal for new energy products. The research center will also explore non-coal related energy opportunities, including renewable energy research in the use of nano-partical yellow iron oxides for the production of hydrogen gas, coal gasification, and applications of proprietary technologies for enhanced solar conductivity, which can enhance fuel cell technology. The center's initial tenant, Pulaski-based NanoChemonics Corporation, has committed to locating in the facility, and to conducting outreach efforts with universities in Virginia and other states (KY, PA) involved in energy research, as well as corporate partners in the mining and energy industries (e.g. Dominion Power Hybrid Center in Wise). NanoChemonics has committed to an initial staff of 6 for the facility, and has provided written support of the Wise County Enterprise Zone designation noting that with a prototype production facility for coal to liquid fuels, up to 200 jobs could be created in the immediate region. A key feature of the facility will be a 40 foot tall research "fractionating column."

Total project cost is $7,885,000. Other funds include: $885,000 Wise County Industrial Development Authority for road access, site development, and site donation (available), Virginia Coalfield Economic Development Authority $2 million (application pending) for contractual facility services and research equipment purchases.

Prior funding history: $1,000,000 TICR FY08 SWED for site development, $175,000 TICR FY01-04 SWED for Park development.

Staff comments and recommendation: No operating funds are being requested of TICR (NanoChemonics has committed to a contribution of operating funds). A preliminary architectural feasibility report, a geotechnical engineering study and an economic impact study proposal are in hand. **Staff recommends an award of $4,000,000.**