

FY11 Research & Development

Staff Summaries & Recommendations – May 2011

The Commission received 7 proposals for FY11 Research & Development funds by the April 8th due date requesting \$22 million.

| Req# | Organization Name | Project Title | Request Amount |
|------|---|---|----------------|
| 2320 | Institute for Advanced Learning and Research | Development of the Giant Reed (<i>Arundo donax</i>) as a Biofuel Corp for Southern Virginia | \$521,298 |
| 2321 | Institute for Advanced Learning and Research | Development of Renewable Energy R&D at IALR | \$5,000,000 |
| 2339 | Virginia Department of Business Assistance (VDBA) | Gasification of Waste to Generate Renewable Energy & Permanent Green Jobs | \$10,000,000 |
| 2319 | Region 2000 Research Institute | Integration of Push-to-Talk with Commercial Broadband (IPPCB) | \$500,000 |
| 2338 | The Rector & Visitors of the University of Virginia | Partnership for Design and Manufacture of Affordable, Energy-efficient Housing Systems | 2455000 |
| 2323 | Southwest Virginia Higher Education Center Foundation | Cavitated Fuel Oil and Water Emulsion for Energy Efficiency and Emissions Reduction | \$2,163,000 |
| 2322 | Virginia Foundation for Agriculture Innovation and Rural Sustainability | Integrated BioEnergy with Dedicated Energy Crops | \$1,340,000 |

Grant Total (7 request)

\$21,979,298

Institute for Advanced Learning and Research (IALR)
Development of the Giant Reed (Arundo donax) as a Biofuel Corp for Southern Virginia (#2320)
Chemtex International, Inc.
\$521,298 requested

The IALR is requesting \$521,298 on behalf of Chemtex International, Inc., a U.S. subsidiary of Italian parent Grupo Mossi & Ghisolfi. The IALR's Institute for Sustainable and Renewable Resources (ISRR) clearly has the requisite experience and personnel to effectively manage the three research components (i.e. development of tissue culture propagation methods, microbial screening to enhance biomass productivity, and mutation breeding work to enhance both yield and stress tolerance performance), and this project is precisely in line with the Commission's expectations for renewable energy research at the IALR. Virtually the entire match financing is in-kind and staff is not sufficiently expert to validate the contribution of Chemtex International, Inc. plant germplasm as match. Interim research milestones for each of the three years are well defined and verifiable. Commercialization potential for this biofuel feedstock (*Arundo donax*) is wholly dependent on its adoption at some future point in time as a preferred resource for ethanol production. The applicant makes no claim that this is being actively discussed, only that commercialization is possible within the Commission footprint. Note that a demonstration plant is under construction in Italy, and should this project go forward it should be with some sort of understanding that any next demonstration or commercial facility be constructed within the Commission footprint and not another U.S. location (i.e. Chemtex International, Inc. operates an Ohio R&D facility), or at least that no IP developed as an outcome of this project be available for use elsewhere. **Staff recommends referral to the VEDP for vetting.**

Institute for Advanced Learning and Research (IALR)
Development of Renewable Energy R&D at IALR (#2321)
Longbow (active prospect pseudonym, NDA in effect)
\$5,000,000 requested

The IALR is requesting \$5,000,000 "to expand capacity in renewable energy R&D capabilities" This request directly benefits the Sustainable Energy Technology Center (SENTEC) that would house a demonstration plant based on "acid hydrolysis process(es) to ... convert biomass into biofuels and bi-products..." The long-term commercialization opportunity is well-defined based on hardwood, forest residue and grasses as feedstock, and this is an active project with VEDP and the Commission at this time with very significant potential commercial outcomes. The Longbow initiative would in the short term provide for 60 jobs and very substantial private capital investment. Local biomass is the issue here, with longer-term commercial operations to benefit both southern and southwestern Virginia. \$8,200,000 matches the Commission investment which is largely limited to equipment and plant/infrastructure improvements needed to accomplish project objectives at the IALR. **Staff recommends an award of \$5,000,000 without VEDP vetting** on condition that Project Longbow is consummated, with no disbursement until this occurs.

Virginia Department of Business Assistance (#2339)
Gasification of Waste to Generate Renewable Energy & Permanent Green Jobs
EnerSol Technologies, Inc.
\$10,000,000 requested

The DBA is requesting \$5,000,000 on behalf of EnerSol Technologies, Inc. for Phase I design, engineering and construction of the PEGS waste management initiative. Phase II would involve a second request for \$5,000,000 to complete development of a 50 ton-per-day (TPD) facility. R&D Committee members will recall that this project was previously proposed for a northern Virginia location where necessary permits and operational “front-end” facilities already existed. The application was withdrawn when Covanta, Inc., EnerSol Technologies, Inc. commercialization partner, began negotiations for the sale of the northern Virginia operation where the demonstration plant was to be co-located. Members will also recall that EnerSol Technologies, Inc. committed to sourcing materials needed for the project from within the Commission footprint, at least to the extent possible. This commitment continues. The DOD financed earlier research and development related to the PEGS technology. The proposed 50 TPD demonstration facility, tentatively slated to be located in Pittsylvania County, is clearly post-proof-of-concept and is expected to lead to multiple large scale commercialization projects in Virginia. Such facilities are anticipated to involve on the order of \$150,000,000 in capital investment per facility, and it was the staff’s previous position that private sector beneficiaries of Commission financing for this PEGS demonstration should be required to commit to not fewer than two large scale facilities as the first two to be constructed. This stipulation should be maintained. Covanta Inc.’s commitment now appears somewhat opaque, and not all matching funds have been committed. Accordingly, **staff recommends referral to the VEDP for vetting** with the understanding that, should this project ultimately receive Commission approval, there shall be no disbursement until at least \$5,000,000 in matching monies are committed and available so that disbursement proceeds on a 1:1 basis.

Region 2000 Research Institute (CAER)
Integration of Push-to-Talk with Commercial Broadband (IPPCB) (#2319)
Catalyst Communications Technologies, Inc
\$500,000 requested

The CAER is requesting \$500,000 on behalf of Catalyst Communications Technologies, Inc., a Bedford County business, to facilitate continued collaboration with Verizon Wireless on the integration of Push-to-Talk radio communications with commercial broadband. The focus of this effort is on “first responder” capabilities and is linked through the “consortium” of Richmond area municipalities with federal ARRA funds. While the non-Commission financing appears solid, there are at present three problems with this project that preclude a staff recommendation for VEDP vetting. First, the application is silent on the potential for job creation and private sector capital investment within the Commission footprint. Reading that “if billions of dollars can be saved, then there must be a market for \$100’s of millions ...” is simply not responsive to the stated objectives of the R&D Program. Second, Commission funds are requested for purchase of a “special” license that would be held by Catalyst Communications Technologies, Inc. rather than the grantee. It may be possible to alter the budget such that Commission monies are used for equipment that would be owned by the CAER, and if so this objection disappears. Last, the private sector partner also

operates in Blacksburg with Virginia Tech, and the application is not clear what research and development will take place in Bedford County. Though not a fatal flaw, the R&D Committee needs to have a clear understanding of where work will be done. **Staff recommends that #2319 be tabled at this time.**

The Rector and Visitors of the University of Virginia (UVA) (#2324)
Partnership for Design and Manufacture of Affordable, Energy-efficient Housing Systems
Cardinal Homes, Inc. and SIPS of America, Inc.
\$2,455,000 requested

UVA is requesting \$2,445,000 on behalf of multiple public and private sector implementation partners for design and manufacture of affordable, energy efficient housing systems. Specifically, “this work focuses on research, development, testing and demonstration of... systems for disaster recovery and residential housing markets.” The page one application narrative identifies no fewer than eight partners in seven southern and southwestern Commission jurisdictions, and there have already been clear expressions of interest by FEMA and two foreign governments (i.e. Haiti and Japan). The South Boston/Riverstone Energy Centers are expected to play central roles. Matching funds totaling \$3,180,701 are committed and readily available for this project. The budget as revised appears appropriate and reasonable, though staff expects to explore the marketing components to insure that public funds are not being used inappropriately. Given the serious adverse impacts of the national housing crisis on the regional economies of southern and southwestern Virginia, combined with the urgency of national and foreign interest in post-disaster housing solutions, this project proffers a “perfect storm” opportunity. It is not unreasonable to imagine that this type of housing might replace the trailer approach FEMA now uses, or that manufacture on a significant commercial scale would occur within the Commission footprint. Accordingly, **staff recommends award of \$2,445,000 without VEDP vetting.**

Southwest Virginia Higher Education Center Foundation (SVHECF)
Cavitated Fuel Oil and Water Emulsion for Energy Efficiency and Emissions Reduction (#2323)

CavitroniX Corporation and KVK Precision Specialties
\$2,163,000 requested

The SVHECF is requesting \$2,163,000 on behalf of CavitroniX to undertake five interrelated applied research and product development activities that would demonstrate energy efficiency attributes and environmental efficacy of the E2C emulsion system in oil-fired furnaces and boilers. CavitroniX would establish headquarters operations, R&D and manufacturing operations in southwestern Virginia. Approximately 48 new jobs are anticipated by 2015 (i.e. 29 by 2013). CavitroniX further projects 8% market penetration within five years which would mean revenue approaching \$100M in year five. Non-Commission funds are available and committed, and assuming that any equipment, property and related improvements acquired using Commission funds accrue directly to the SWHECF there do not appear to be any problematic budget issues. **Staff recommends referral to the VEDP for vetting.** Staff also encourages CavitroniX Corporation to contact Piedmont Bioproducts, Inc., Gretna, Virginia to determine if there are mutually advantageous opportunities for research collaboration

Virginia Foundation for Agriculture Innovation and Rural Sustainability (FAIRS)

Integrated BioEnergy with Dedicated Energy Crops (#2322)

Mendel Bioenergy Seeds and Antares Group, Inc.
\$1,340,000 requested

FAIRS is requesting \$1,340,000 on behalf of two private sector partners for a “field to grid” demonstration project using both clonal (sterile) and seeded miscanthus varieties. This is performance research that would generate field data and testing of biomass with biopower end-users. The overarching objective is to prove supply chain and logistics for miscanthus production. Commission funds would be used for contractual services, property and improvements and modifications to off-take partners plants that will enable biomass combustion. An employment estimate of “280 agriculturally related permanent direct jobs can be created for every 50,000 acres of new energy crop production” is specified, though, of course, the scope of this initiative is limited to just 400 acres. Matching funds are in substantial measure “in-kind” or are off-take “credits” from the sale of biomass. Should the R&D Committee believe that the FAIRS project would advance the Commission’s often stated objective of providing the agricultural sector with supplemental income opportunities you will vote to recommend VEDP vetting. **Staff recommends no further action.**