



Strategic Action Plan

“A Plan to Support Revitalization of the South Carolina I-95 Corridor through Clean Energy and Biotechnology”

**Final Report to the U. S. Department of Agriculture,
Rural Development**

Cooperative Agreement No. RBS-11-08

September 28, 2012

Strategic Action Plan

I-95 Corridor, South Carolina

SCRA, September 28, 2012

Primary Objective: *Provide opportunities for economic development and job growth in the 17 county I-95 corridor by focusing on local resources available to support emerging markets in renewable energy and other value added markets from agriculture and forest resources, algae production for biofuels and environmental cleanup, aquaculture, and bioremediation of brownfield sites.*

I. Overview

The SCRA, a non-profit applied research and development corporation, received grant funds from the United States Department of Agriculture, Rural Development (RD) to develop a Strategic Action Plan for revitalization of the I-95 Corridor based on the development of bioenergy and biotechnology from agriculture, forestry, and other biomass resources.

The Strategic Action Plan follows a background analysis of potential agricultural and forest resources available in the I-95 Corridor to support a bioenergy and biotechnology industry. The report titled "I-95 Corridor, South Carolina: Resources to Support Revitalization through Clean Energy and Biotechnology," (hereafter referred to as the Phase 1 report) was conducted by SCRA and financed by the U. S. Department of Commerce, Economic Development Administration (EDA) with matching funds from SCRA. The report to EDA was completed on March 29, 2012 and provided the basis to move forward with the Strategic Action Plan.

The I-95 Corridor in South Carolina consists of seventeen (17) counties that either touch or lie within about thirty miles of interstate highway 95. This area is economically distressed and typically characterized by small rural towns, lower incomes, high unemployment rates, higher levels of poverty as compared to other regions of the state, poorer schools and educational attainment levels, and a general lack of opportunities.

The I-95 Corridor project seeks to find ways to enhance economic prospects, raise income levels, and improve the general condition of this long suffering area by building

a sustainable industry in bioenergy from existing resources in the Corridor and exploring opportunities in new and emerging technologies. It seeks to integrate available resources with applicable technologies. Implementation of this plan would broaden agricultural and forestry opportunities in new markets and technology. It introduces potential for aquaculture, algae production and bioremediation of brownfield sites.

The overall I-95 Corridor project is a collaborative effort led by SCRA and supported by area Councils of Government, academic institutions, research institutions, and federal, state and local governments. The project addresses strategic priorities of job growth, business expansion and innovation while promoting economic development opportunities in alternative energy with an emphasis on environmental concerns and sustainability.

The Strategic Action Plan presented here complements the most recent USDA Strategic Plan with emphasis on sustainable economic development, renewable energy opportunities from biomass, support for research to develop competitive agricultural systems for biofuel development, support for development of regional food systems, and inspection of recreational opportunities on rural lands. The South Carolina plan provides a road map with identified priorities to move the effort closer to the ultimate goal of implementing strategies to bring additional economic activity to the I-95 Corridor in South Carolina thereby improving economic conditions and providing new opportunities.

II. Methodology

This Strategic Action Plan relies heavily on the previous work in Phase 1 of the project and information provided in the Phase 1 report to EDA. This report provides the background information and data to help identify and justify objectives in the Strategic Action Plan. The Phase 1 report is well documented revealing clearly the sources of information and data gathered in the report.

The SCRA project team made the Phase 1 report available to partners, relevant entities, academics, leadership in the Corridor, federal/ state/local officials and others to solicit response and input on Phase 2, the Strategic Action Plan. The project team researched a multitude of websites, reports, and other sources for relevant information on renewable energy, aquaculture, algae production, and bioremediation. Entities providing information or consultation included the following:

Partners

- Santee-Lynches Regional Council of Government
- Pee Dee Regional Council of Government
- Lowcountry Council of Governments
- Francis Marion University
- Penn Center

Other Councils of Government

- Lower Savannah Council of Government
- Central Midlands Regional Council of Government
- Berkeley-Charleston Council of Government
- Waccamaw Regional Council of Governments
- Catawba Regional Council of Government

Other Universities

- Clemson University
- University of South Carolina
- South Carolina State University
- Claflin University

Other Research Institutions

- Savannah River National Laboratory
- Hollings Marine Laboratory
- Oak Ridge National Laboratory

Federal Agencies

- U. S. Department of Commerce, Economic Development Administration
- U. S. Department of Agriculture, Rural Development
- U. S. Department of Agriculture, Farm Service Agency

- U. S. Department of Agriculture, Natural Resources Conservation Service
- U. S. Department of Agriculture, National Agricultural Statistics Service
- U. S. Department of Agriculture, Forest Service
- U. S. Environmental Protection Agency
- U. S. Department of Energy

State Agencies

- South Carolina Department of Agriculture
- South Carolina Forestry Commission
- South Carolina Energy Office
- South Carolina Department of Natural Resources
- South Carolina Department of Commerce
- South Carolina Department of Health and Environmental Control
- South Carolina State Ports Authority
- South Carolina Department of Parks, Recreation and Tourism

Economic Development Groups

- North Eastern Strategic Alliance (NESA)
- Southern Carolina Regional Development Alliance
- Orangeburg County Development Commission
- Central SC Economic Development Alliance
- Palmetto Economic Development Corporation

Other Entities

- South Carolina Biomass Council
- South Carolina Farm Bureau Federation
- Palmetto Agribusiness Council
- South Carolina Forestry Association
- South Carolina Clean Energy Business Alliance
- Southeast Agriculture & Forestry Energy Resources Alliance

- South Carolina Bio-Enterprise Science and Technology Alliance
- 25 X 25 Initiative
- New Carolina, SC Council on Competitiveness
- Palmetto Institute
- South Carolina Association of Community Development Corporations
- Lowcountry Biomass, LLC.
- Agri-Tech Producers, LLC.
- ArborGen
- Technical College of the Lowcountry

The SCRA project team with assistance from the area councils of government conducted three focus group meetings in three different areas of the I-95 Corridor. These meetings provided input from local government officials and citizens. An agenda and background information were provided in advance. The project manager provided a power point presentation with an overview of the project and expectations followed by an open forum for discussion and recommendations. Recommendations were considered and where applicable incorporated in the plan.

The first meeting was held on August 8, 2012 in Sumter in conjunction with the Santee-Lynches Regional Council of Government. The second meeting was held on August 13, 2012 in conjunction the Lowcountry Council of Governments at offices near Beaufort. The third meeting was held in Florence on August 15, 2012 in conjunction with Francis Marion University and the Pee Dee Regional Council of Government. Each of these meetings had in excess of thirty participants.

III. Strategic Objectives

A. Objective 1 – Develop a sustainable renewable energy cluster in the South Carolina I-95 Corridor based on biomass resources from agriculture and forestry.

1. Rationale

The Phase 1 report provides data indicating that the I-95 Corridor is positioned well with significant agricultural and forestry resources to support emerging

markets in clean, renewable energy. Current biomass feedstocks available from agricultural and forest residues exceeds 2.3 million tons annually in the I-95 Corridor counties. Research on energy crops suitable to South Carolina soils finds that significant potential exists for dedicated energy crops such as switchgrass, sorghum, energy cane, miscanthus, and fast growing trees. Adding value to these agricultural and forestry resources through bioenergy production or other products improves the economic base for the I-95 Corridor and provides much needed jobs and investment sustained by existing resources in the Corridor.

The data in the Phase 1 report indicates 2,278,126 acres of existing agricultural lands and 4,394,403 acres of existing forest lands in the Corridor. In addition the report identifies more than 320,000 acres of fallow/idle cropland available for production of energy crops without competing for land currently used for food production.

The Phase 1 report provides mapping tools to identify land covers and help locate prime areas for developing biomass resources through further processing.

2. Actions

- Identify and make available existing feedstocks from biomass resources. Work closely with farmers, foresters, landowners and wood processing firms to identify more specifically the existing and more easily attainable feedstocks for bioenergy applications.
- Continue research and development of dedicated energy crops suitable to SC soils and adaptable for energy production. Work closely with researchers to determine those energy crops that have the most immediate potential to impact the growth of a bioenergy industry in the Corridor.
- Continue the development of biomass to energy technologies and recruit pilot projects to the Corridor to demonstrate viability.
- Determine the best combination of energy alternatives relevant to Corridor assets; (e. g., biobutanol, wood pellets, ethanol, biodiesel or others). Build on existing and planned operations related to wood fuel for export to the United Kingdom and Europe.

- Explore marketing strategies that focus on segments of the renewable fuels industry that might be appropriate for SC such as aviation fuels and military applications.
- Facilitate the collection, analysis, and interpretation of data on trends in the demand for biofuels and alternative energy products. Make sure that efforts are following along the track with the best opportunity to succeed.
- Investigate value-added by-products that can be derived from biofuel production.
- Develop bulk export facilities at the Port of Charleston to improve the competitive advantage of SC bioenergy production.
- Partner with economic development officials to recruit renewable energy industries to the Corridor. Follow the example of MIT-RCF, a SCRA-supported company, which leveraged personal, private, state and federal resources to develop a viable business plan and locate in the Corridor.
- Assist in educating land owners, public officials, and policy makers on opportunities in the renewable energy cluster.

3. Timeframe and Milestones

- Within two years develop a framework for moving the actions recommended in this report forward.
- Within five years have working bioenergy and/or value added enterprises up and running in the Corridor and employing area citizens.
- Within ten years have a viable, growing and sustainable bioenergy industry established in the Corridor supported by area resources.

4. Obstacles to Overcome

Numerous well-intentioned ideas, proposals, and economic development initiatives have been introduced in this area over the years, but the lack of follow-through and limited successful outcomes have produced a general skepticism within the Corridor that must be overcome. Many studies of the area have provided useful insights only to end up unused on a shelf. This lack of follow through has led to marginal success with little or no viable economic

impact. This history makes it all the more important that this plan not follow its predecessors onto a shelf, but instead be used as a guideline for taking action to turn its recommendations and strategies into tangible progress on the ground.

B. Objective 2 – Develop an effective mechanism to execute strategic objectives and actions identified in the project and focus on acquiring necessary federal, state, local, and private support and resources.

1. Rationale

With the completion of the Strategic Action Plan, the I-95 Corridor Project moves to the execution/implementation stage. To maximize effectiveness in executing the strategies and actions laid out in the plan, a relevant organizational consortium should be developed to provide the leadership necessary to move forward, putting priorities into action and generating progress on the ground. An initial advisory group could resolve organizational and funding issues and help find the proper leadership consortium to move implementation forward. In turn, the consortium would provide guidance on the daily operational approach, assist with management of the overall project, and provide assistance in coordinating funding sources and/or accessing private investment.

2. Actions

- Develop a relevant consortium or management structure that would become the implementation agent for follow-on work.
- Appoint an Advisory Board to lead the effort in developing an appropriate entity to move the execution effort forward.
- Explore viable business models that provide the best opportunities to transition the rural economy in the Corridor to a renewable energy cluster, focusing on initiatives that can deliver sufficient return on investment to attract private investment.
- Investigate potential funding sources (federal, state, private foundation and others) including grants, loans, and performance-based contracts.

3. Timeframe and Milestones

- Within one year have an effective consortium organized to begin execution of the Strategic Action Plan.
- Within one year secure funding to support initial efforts.
- Within two years secure long term funding for effectively and systematically implementing the remainder of the comprehensive plan.

4. Obstacles to Overcome

Identifying and securing funding sources can become an obstacle to this strategy in the short-term. Access to federal and state grant funds are inhibited by slow application and award cycles, matching requirements that disadvantage Corridor-based entities, and ongoing public sector budget constraints. Over time initial successes that can be achieved should improve the Corridor's ability to attract follow-on funding from these sources, as well as private venture capital sources.

C. Objective 3 – Support continued research and development of potential for algae production, aquaculture production, and bioremediation.

1. Rationale

The Phase 1 report identifies significant potential for algae production, aquaculture production, and bioremediation activities within the Corridor. Algae production has potential as a biofuel feedstock and as a means for environmental cleanup. Research and development work continues at the research universities, the Savannah River National Laboratory, the Hollings Marine Laboratory, the South Carolina Department of Natural Resources, and at the South Carolina Department of Health and Environmental Control.

The Phase 1 report established that as the technology advances for algae and aquaculture production, the I-95 Corridor is in an excellent position to take advantage of commercial opportunities. The development of algae and aquaculture production would provide additional opportunity for small landowners to build high value small businesses on small tracts of land. These

production systems could be developed on lands that are not viable for other uses.

Bioremediation of brownfields and other degraded landscapes benefits the area with new opportunities to recapture these sites for productive uses. It benefits citizens by cleaning up contaminated properties and providing a safer, cleaner environment.

Research in these focus areas need to continue in view of potential economic opportunities and the large base of knowledge already attained.

2. Actions

- Focus on locating algae demonstration projects in the Corridor.
- Look for opportunities for pilot projects in the Corridor to demonstrate viability of new technologies for environmental cleanup.
- Take advantage of existing technologies in aquaculture production to develop commercial operations.
- Assist in educating producers through technical assistance as technologies develop.

3. Timeframe and Milestones

- Within one year secure additional funding for research entities to further research on algae production.
- Within two years deploy at least one pilot project on bioremediation.
- Within two years attract at least one new or expanded commercial venture in aquaculture production.
- Within two years develop an educational program to assist landowners in understanding the potential benefits to them in aquaculture.

4. Obstacles to Overcome

Technology for commercialization of algae as a competitive biofuel continues to lag. Current “open pond” technology favors South

Carolina. However, if technology leads to more closed systems, this advantage could disappear.

Systems for aquaculture production are fairly well developed. The obstacles to further development are related to marketing and competition from inexpensive imports. Some producers have found niches in higher value markets that have an interest in locally produced product. More marketing attention to this area could help overcome some of the import issues.

Though programs exist to address liability and risk, these two issues remain a concern when reclaiming contaminated sites through bioremediation. In addition, reclaimed sites often have a stigma that keeps certain investors from considering these sites for certain types of development. Additional incentives could help overcome this obstacle.

D. Objective 4 – Create new value-added marketing opportunities from agriculture and forestry resources.

1. Rationale

The Phase 1 report provides data indicating that some 2,278,126 acres of land in the corridor currently are in agricultural production. The value of the production on that land at the farm-gate level before any processing or further value added activities exceeds \$770 million. The report also indicates that land in forest production is 4,394,403 acres with a farm-gate value of more than \$120 million. Combined this value exceeds \$890 million. This represents significant raw material that if further processed within the I-95 Corridor could provide additional jobs and economic impact in the area.

In addition to bioenergy, agricultural and forestry production provide opportunities in value added enterprises such as chemicals, feed from by-products, and new forest products in building materials. All of these possibilities and more would bring good jobs and investment opportunities to the I-95 Corridor sustained by the resources in the area.

The South Carolina Department of Agriculture's *50 by 20* plan indicates that opportunity exists in the local food market to satisfy consumer demand for

more locally grown product both in retail stores and restaurants. Programs exist at the state and federal level to assist producers in adapting to local food market opportunities and to brand products as locally grown. Grant programs such as the specialty crops block grant program can provide funds to meet certain quality and food safety concerns. USDA also has programs to assist cooperative ventures where appropriate.

2. Actions

- Access existing programs and marketing efforts at USDA and SCDA.
- Develop local and regional food systems. Work with established food hubs to help satisfy needs of consumers unable to find adequate supplies of local product. Work with these groups to improve awareness of opportunities.
- Encourage cooperative enterprises where appropriate.
- Assist in educating producers on food safety issues and requirements to service the local food market.
- Work with economic development groups to recruit agricultural and forest related processing firms to the Corridor.
- Explore opportunities in agriculture and forestry related tourism. Take advantage of programs with the Heritage corridor project, South Carolina Department of Parks, Recreation, and Tourism and the South Carolina Department of Agriculture.

3. Timeframe and Milestones

- Within one year develop informational systems to educate Corridor farmers and landowners of relevant programs to assist in local marketing systems and food safety information.
- Within two years achieve at least one new and significant processing enterprise that locates in the Corridor.
- Within two years develop a tourism plan based on agricultural and forestry sites of interest.

4. Obstacles to Overcome

There is a general lack of knowledge about the potential for local food markets to meet the needs of consumers interested in local production and desiring more knowledge of the origins of food products. The I-95 Corridor primarily has been an area that produced traditional agricultural crops, and many producers have not explored the potential that exists with higher value fresh products. The interest in locally grown food is a national phenomenon that has been slow to catch on in the Corridor area.

Producers in the area have not made efforts to organize in such a way as to improve economies of scale that allow for more consistent offerings of local product, which in turn causes fragmented markets with inconsistent supply, quantity, and quality of products.

Education and information systems are available but not well organized to provide specific knowledge in new production techniques, food safety requirements, and agri-tourism opportunities.

E. Objective 5 – Develop policies and incentives to maximize the establishment of a competitive biofuels industry, and to expand production, infrastructure systems, and workforce initiatives to support the industry.

1. Rationale

South Carolina needs to update policies, incentives, and credits for renewable energy to stay competitive with surrounding states in developing a sustainable renewable energy industry. Tax credits for biofuel production and distribution have helped other states get an edge in renewable fuel production and marketing.

South Carolina has incentives for establishment of manufacturing and processing firms that would apply to renewable energy production. These incentives and other policies need to be reviewed and compared to other states that are having success in building a renewable energy industry.

The South Carolina Technical colleges have been excellent in providing trained workers for other industries in the state. These colleges should undertake

initiatives to begin addressing training needs for the renewable energy industry to provide well trained workers with skills needed to support the industry.

2. Actions

- Explore potential tax incentives to encourage private investment in the industry.
- Take advantage of existing incentives for locating processing industries in SC and develop appropriate targeted incentives for locating in the I-95 Corridor.
- Determine legislative needs to provide a path for development of a biofuels industry in the I-95 Corridor.
- Develop relationships with local technical colleges for education and training initiatives.

3. Timeframe and Milestones

- Within the next legislative session, work with existing organizations such as the South Carolina Clean Energy Business Alliance and the South Carolina Biomass Council to introduce legislation to focus on tax credits and incentives to help move the industry forward. Explore the interest in special incentives for industries that locate in the Corridor and provide employment to local citizens.
- Within one year, meet with technical education leaders to lay out a comprehensive training program that could be easily adopted as the needs arise.

4. Obstacles to Overcome

Working through the political process can be difficult, and success requires individuals willing to champion the ideas and policy initiatives offered. The current political climate and economic conditions may make it difficult to overcome the existing obstacles in moving tax credits and incentives forward.



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