

Development Concept Plan

To Finance, Build and Operate an

E-MACROSYSTEM

MANUFACTURING FACILITY



*as a National Model for the Production of
Renewable Energy, Clean Water, Fresh Organic
Food and Cleantech Jobs*

**To be Developed in Partnership with
ARE Systems LLC, Equitech International, LLC
and the Metro East Citizens Land
Cooperative**

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Summary of Development Concept Plan

Introduction

The Development Concept Plan (Plan) presented herein articulates the primary mission of the project including the overall goals and objectives, value proposition, problems addressed and the preliminary economics and financial proforma estimated for the proposed advanced renewable energy system (ARES) project. A description of the features and benefits of the integrated technology is described along with the preliminary designs for the project, as well as the conceptual plan outlining how the project will be implemented in phases. The background, capabilities and experience of the management team are also provided. Most importantly, this Plan will aid the principals of EI/ARE Systems and MECLC in obtaining public and private financing and support from key stakeholders in the community.

Overview of Project

Equitech International, LLC, (EI) and Advanced Renewable Energy Systems, LLC (ARE Systems) are proposing to design and build an innovative energy conversion and manufacturing Facility on approximately 15 acres of industrial land in East St. Louis, IL. The Facility will be developed, financed and owned in cooperation with the Metro East Citizens Land Cooperative (MECLC). When it is built, the Facility, called an “E-Macrosystem” (E-M), will serve as a regional showcase and national model for sustainable energy, clean water, food production and economic development for local communities.

To this end, this novel Facility will involve the integration of proven ARES including solar photovoltaics (PV), fuel cells and advanced biofuels processes, as well as other appropriate water, food and waste management technologies. These technologies will be combined to create a stand-alone emissions-free power plant and manufacturing center that concurrently generates hydrogen biofuels from both farm and municipal biomass, green electricity, clean drinking water from captured rainwater and production of fresh organic fruits and vegetables using controlled environment agricultural techniques.

The Facility will be designed to house equipment to manufacture ARES components and subsystems used in the solar PV and fuel cell systems that are also embodied in operation of the Facility’s energy and utility systems. Moreover, these components will be fabricated and assembled for export and where such Facilities and E-Ms are replicated in other communities in the U.S. and abroad, thus creating local economic development and high paying jobs. The Facility will be managed and operated through a for-profit community investment corporation (citizens land cooperative) that has been formed as a unique legal vehicle for providing access to capital and expanded ownership of the performing assets that will be dedicated for the benefit of its citizen-shareholder owners in joint venture with EI and ARE Systems.

Value Proposition

The proposed project addresses many of the most pressing problems facing society in this nation and around the world including: the need for new jobs and sustainable economic development; the quest for national and local energy security; the desire to improve environmental quality where carbon emissions are in large part effecting climate change due to global warming; the growing interest in local markets of healthy fresh organic food; and, the demand for clean energy, clean water and reduction of landfill waste. All of these issues are brought to bear together through the comprehensive set of solutions offered by the proposed Facility and use of new emerging technologies embodied in the E-M. With implementation of the proposed Facility a host of new value propositions are created for the benefit of society, the local economy and environment.

The value propositions include:

- Potential creation of nearly 500 direct new jobs with both construction and permanent employees as well providing technical and educational training opportunities related to manufacture and operation of new technologies destined for the new energy economy;
- Additional job creation among construction materials manufacturers, machinery and equipment manufacturers (electrolyzers, steam reforming components, fuel cells, photovoltaics), and producer services, e.g. feedstock suppliers, public services, agriculture, forestry, medical, general services, retail, etc.
- Operation of the Facility that generates a substantial economic impact worth several billion dollars with the multiplier effect in the local economy income from the production, sale and on-site utilization of renewable energy and other by-products, as well as from leasing space within the Facility, the manufacturing and sale of clean energy products, and the salaries paid employees to make those products;
- Design and development of a Facility that will serve as a regional showcase and national model of sustainable community development with local ownership by citizens and employees;
- A working illustration of distributed renewable energy generation of power and biofuels (hydrogen and liquid transportation fuels such as diesel, gasoline, butanol, methanol) and green fertilizer (anhydrous ammonia) derived from renewable sources including solar, biomass from farm crop residuals and urban municipal solid wastes
- Demonstration of new emerging renewable energy technologies integrated into an innovative closed-loop system that simultaneously produces clean water, clean air and carbon sequestration, while reducing landfill disposal of municipal wastes; and,
- On-site production of fresh organic fruits and vegetables that offer healthy alternatives to imported processed foods while supporting local agriculture as a model of urban farming.

▪ **Revenue Sources**

Specific value from the Facility and associated E-Macrosystem (E-M) may be created in the form of revenue generated from sale of the following products and by-products:

1. clean renewable electricity
2. green hydrogen
3. medical-grade oxygen
4. fresh organic produce including tomatoes, cucumbers, leafy green vegetables
5. bottled fresh water collected from the solar roof and purified to drinking standards
6. nitrogen-free phosphate-based fertilizer or biochar
7. leasing income from tenants from rental of Facility space
8. carbon credits from sequestration and off-sets and renewable energy production credits

The total potential for gross revenue is estimated at \$31.8 million annually and \$250.1 million over 10 years from the beginning of the development project when all of these value propositions are combined. The total economic impact could be \$2.2 billion dollars or more over a 20-year lifespan when the multiplier effect of 4.0 is factored in. The majority of this money will be kept in the local economy as a sustainable community asset that continues to generate additional financial benefit when the concept spreads to other sites around the nation and world.

Features of the E-Macrosystem (E-M)

The proposed Facility will be created as a totally integrated closed-loop system that incorporates state-of-the-art renewable energy technologies in a super-efficient industrial building designed to LEED standards with

space to accommodate both office and light manufacturing, as well as systems to generate clean power, heat, cooling, biofuels, fresh water and organic food. As such, the concept will be the heart of the Facility, which envisions utilizing the following key technologies:

- roof-top solar PV array for power generation with heat recovery;
- electrolysis of water split into hydrogen and oxygen;
- high and low temperature fuel cells; and,
- steam reforming of biomass to generate hydrogen, power and other potential biofuels

Implementation

The project is planned to be designed and built over a 24-month timeframe with initial financing expected to take 6 months. Architectural and engineering design is expected to take 6 months including associated permitting and environmental assessments Summary. Actual procurement of equipment and construction of the Facility could take as long as 18 months with an additional 3 months for startup and 6 months or more for ramp-up to full-scale operations. Ramp-up for the manufacturing operations could take 12 to 24 months depending on how quickly targeted tenants lease space and install assembly equipment and train personnel to operate. All in all, it could take as long as two to three years to achieve full production and occupancy of the Facility once financing is secured for the project. Note that the financial projections associated with this Plan give consideration to this timeframe for implementation.

Economic Summary of Project

The project offers an attractive return on investment (ROI) given that it is a commercial demonstration Facility that represents the first-of-its-kind in the market place. With replication of this model in other markets throughout the U.S. and world, both capital and operating costs are expected to go down by 20% to 30%. Subsequent increases in revenue are expected as a result of improvements in efficiency and performance, as well as development in other regional markets where basic energy commodities have significantly higher consumer costs such as on the West Coast, Southwest and North East Coast. As a consequence, potential returns on investment should be considerably more attractive, not including the substantial positive impact on the local economy and tax base.

The following table presents the overall preliminary economic analysis and 10 year financial projections estimated for the proposed project. Behind these summary economics are detailed financial analyses that may be found in the section on Project Economics, as well as the detailed financial projections that may be reviewed in Appendix A of this document.

Table 1 - Summary of Project Economics – without Greenhouse Consumer of Electricity

EI/ARE Systems E-M for MECLC in E. St. Louis	
Estimated Project Cost	\$ 146,384,507
Less Grants & Investment Tax Credits	\$ 38,888,909
Net Capital Cost	\$ 107,495,598
Gross Revenue	\$ 31,827,914
Operating Expenses	\$ 7,922,113
Income (EBIDTA)	\$ 25,226,153
Simple Payback - Years	4.26
Simple Return on Investment	23.5%
Internal Rate of Return (over 20 yrs)	14.4%
Net Present Value (over 20 yrs)	\$ 294,471,098

Table 2 - Financial Projections Estimated for MECLC Proposed Project (000s)

Date: 06/20/2010	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Total Revenues	\$ -	\$ -	\$ 4,990	\$ 31,336	\$ 37,688	\$ 38,386	\$ 39,084	\$ 39,782	\$ 40,479	\$ 41,177	\$ 272,921
Total Operating Expenses	\$ -	\$ -	\$ 1,644	\$ 8,412	\$ 9,770	\$ 9,930	\$ 10,076	\$ 10,223	\$ 10,369	\$ 10,515	\$ 70,939
Gross Margin	\$ -	\$ -	\$ 4,677	\$ 26,652	\$ 32,082	\$ 32,676	\$ 33,270	\$ 33,864	\$ 34,458	\$ 35,053	\$ 232,733
Total SG&A	\$ -	\$ -	\$ 1,331	\$ 3,729	\$ 4,164	\$ 4,221	\$ 4,263	\$ 4,305	\$ 4,348	\$ 4,390	\$ 30,751
EBITDA	\$ -	\$ -	\$ 3,346	\$ 22,924	\$ 27,918	\$ 28,455	\$ 29,007	\$ 29,559	\$ 30,111	\$ 30,663	\$ 201,982
Less Interest & Depreciation	\$ -	\$ -	\$ 6,651	\$ 13,097	\$ 12,826	\$ 12,541	\$ 12,243	\$ 12,357	\$ 12,172	\$ 11,829	\$ 93,716
Income Before Taxes	\$ -	\$ -	\$ (3,306)	\$ 9,826	\$ 15,092	\$ 15,914	\$ 16,764	\$ 17,202	\$ 17,939	\$ 18,834	\$ 108,266
Tax Credits	\$ -	\$ -	\$ 39,498	\$ 1,705	\$ 2,903	\$ 2,957	\$ 3,011	\$ -	\$ -	\$ -	\$ 50,074
Taxes Due	\$ -	\$ -	\$ -	\$ 1,829	\$ 4,709	\$ 5,005	\$ 5,313	\$ 6,645	\$ 6,930	\$ 7,275	\$ 37,706
Net Income / (Loss)	\$ -	\$ -	\$ 36,193	\$ 9,702	\$ 13,287	\$ 13,866	\$ 14,462	\$ 10,557	\$ 11,009	\$ 11,558	\$ 120,634