

[The following white paper, while specific to a 1500-acre site near Savannah, GA, is applicable to any industrial/commercial site that wants to foster growth for renewable energy companies. Substitute local development agencies and educational institutions. You are free to adapt this paper to your own region – I only ask that you reference this document and me and send me an email to let me know.]

## Transforming the Megasite into a Regional Magnet for Renewable Energy Companies

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The Pooler Megasite (a 1500-acre parcel off I-16&I-95) has the potential to be transformed into a mixed-use commercial/industrial campus to attract a variety of Renewable Energy companies. They would form the core of a vibrant community that would bring to the region more companies that share the energy goals of the 21<sup>st</sup> Century.

The technologies involved include: solar, hydrogen, fuel cells, geothermal, micro hydro, urban wind, offshore wind, biofuels, biomass, and energy storage. These companies would also require professional support services.

The Megasite would be planned to become as energy self-sustaining as possible. For example: buildings would be constructed to meet LEED standards, geothermal installations would reduce demand, solar modules would be placed on rooftops and parking lot canopies, water conservation would include pervious paving, rainwater retention, and xeriscape plantings.

In addition to manufacturing and distribution facilities there would be office/warehouse buildings for installers of roof modules, hot water modules and geothermal systems; specialty plumbers and electricians, etc.

A two-story office building would house Executive Service offices and meeting rooms, educational facilities, a coffee shop, and act as an incubator for developing companies.

Incorporating a stocked fishpond, community garden, small fruit orchard, fitness trail, jogging path, picnic facilities, can strengthen the sense of community.

## **Background**

The timing is right to take advantage of the unfolding energy revolution in the private sector and forthcoming government policies and funding.

The term "energy revolution" brings with it certain science fiction skepticism. Yes, it may well be true that the amount of energy produced by the sun in one hour would provide all the energy the world needs for a year.

Yet critics immediately point to the fact that the oceans, or inaccessible jungles, or mountains cover most of the surface of the earth, and many latitudes receive less than six hours of sun daily. Besides, the sun doesn't shine at night or on cloudy days and the wind blows intermittently and frequently unpredictably.

All of the so-called "alternate energy" solutions (solar, wind, geothermal, biomass, biofuels, hydro, tidal, ocean currents) have their own set of limitations. It is precisely these limitations that, until now, have prevented the "gee whiz" breakthrough that demonstrates, once and for all, that renewable energy is real, and is the future of energy production.

But one person's idea of limitations is another's definition of challenges ... challenges that can, and must, be overcome.

In the next three to five years the work of thousands, perhaps tens of thousands, around the globe in research labs at universities, government facilities, corporations, and even the proverbial garage, will have overcome these challenges. Products and processes are already moving out of the experimental lab into test facilities and into commercial production.

This availability of multiple sources of cleaner energy will also bring with it a new appreciation of the concept of distributed energy production -- produce energy close to where it is needed. This is not a new concept, but it has been overwhelmed by the construction of large, centralized utilities, requiring distribution by long transmission lines, pipelines, railways and long-haul trucks.

Now it will be possible, for example, for whole communities to have their electricity supplied by regional solar and/or wind farms, for individual homeowners to make their own hydrogen to fuel their cars. Algae will be harvested locally for their oil while providing animal feed, or fueling biomass generators. Commercial buildings and many homes will have their own fuel cells to generate electricity and provide heat. Solar canopies will start sprouting up on parking lots.

Costs will start coming down as production moves from phase one of economies of scale -- increasing the productivity of individual manufacturing facilities -- to phase two -- where entire factories can be duplicated anywhere. [Phase 2 has just come to Georgia, with the announcement that German firm MAGE SOLAR GMBH has constructed a manufacturing campus in Dublin for solar modules -- starting at production levels of 40MW per year and expanding to 800MW per year by 2015]

The next three to five years will prove that alternate energy production is a commercially viable reality and that clean, inexpensive power is no longer in the realm of fiction.

### **Potential Companies Could Come From These Sectors:**

Solar Cell Manufacturer  
 Solar Photovoltaic Panel Manufacturer  
 Solar Hot Water Module Manufacturer  
 Micro Inverter/ Inverter Manufacturer  
 Black Box Grid-Tie Electronics  
 Specialty Glass Manufacturer or Distributor  
 Solar Lighting Equipment Manufacturer  
 Metal Fabricator for module frames, parking lot canopies and ground mounts  
 Solar Roofing Distribution Center  
 Manufacturers for export of solar cooker kits, solar lantern kits and solar charging kits  
 Urban Wind Systems Manufacturer  
 Micro Hydro Generator Manufacturer  
 Industrial-Grade Battery Distributor  
 Biodiesel (Algae, Nonfood Sources) and/or Cellulosic Ethanol Refinery  
 Biomass to Biogas/Hydrogen Facility  
 Hydrolyzer Manufacturer  
 Hydrogen Substation Manufacturer  
 Hydrogen Solid State Cartridge Manufacturer

PEM Fuel Cell Manufacturer or Distribution Center  
 Residential Fuel Cell Manufacturer  
 Solid Oxide Fuel Cell Manufacturer or Distributor  
 Geothermal Heat Pump Manufacturer/Distributor  
 Manufacturers of Components, Meters, Testing Equipment, Housings

Computer Software Developers

Office/Warehouse combinations for installers of roof modules, hot water modules and geothermal systems; specialty plumbers and electricians

**The Types of Jobs They Would Create include:**

**In the field of solar energy:**

photovoltaic engineer  
 manufacturing engineer  
 thin film engineer  
 solar mechanical designer  
 solar technical marketing manager  
 architect  
 photovoltaic panel installer  
 thin film module installer  
 residential solar sales representative  
 commercial solar sales representative  
 structural engineer  
 customer service  
 public information officer  
 marketing manager  
 human resource manager  
 administrative assistant  
 solar hot water installer  
 electrical systems design engineer  
 electrician  
 plumber  
 PV projects manager  
 PV systems design engineer  
 director of solar technology  
 solar system sales manager  
 CEO & VP development  
 solar panel manufacturing engineering manager  
 industrial engineer

project managers  
 global/technical product support engineers  
 project installations  
 process engineers  
 solar factory managers  
 worldwide marketing sales VO  
 wind project engineer  
 marketing technologist  
 manufacturing operations VP  
 senior process plasma engineers  
 equipment maintenance and repair  
 steam plant personnel  
 shipping department personnel  
 receiving department personnel  
 electrical contractors  
 solar shingle installers  
 research and development personnel  
 seminar leaders  
 instructors  
 accountants  
 consultants  
 quality control inspectors  
 shift supervisors  
 machine operators

**In the field of biofuels:**

(taken from recent Biofuel Jobs Listings)

Regional Food & Biofuel Expert  
 Chemical engineer  
 Operations Manager  
 Ethanol Marketing Manager  
 Development Manager Biofuels  
 Renewable Fuels Procurement Merchant  
 Attorney  
 Organizational Development Manager  
 Auto Technician  
 Environmental Service Manager  
 Senior Scientist - Wastewater/Biofuels  
 Analytical Product Manager  
 Experienced Accountant - Manufacturing Group  
 Manager Engineering  
 Maintenance Manager  
 Production Supervisor w/Grain Processing experience

Research Associate - Breeding and Development of Improved Biofuel  
Crops

Commercial Applied Phycologist

Grain Merchandiser

Plant Manager

Staff Scientist II

Process Engineer

State and Local Tax Manager

Grain Merchandising Manager

Project Manager

Sr. Process Dev Engineer/Scientist - Feedstock Pro

Bioprocess Development Scientist/Senior Scientist

Combustion Development Engineer

Plant Engineer

Scientist, Software Research

Process Engineer

Senior Scientist - Wastewater/Biofuels

Applications Scientist

Ethanol Plant Operating Coordinator

Manager Engineering

Chemist

Botanist/Plant Ecologist

Ecologist/Biologist - Entry to Mid-Level

Estimator Field-Erected Tanks

Business Development Lead

Senior Mechanical Design Engineer

Senior Sales Representative - BioDiesel

Director, Engineering & Development, Operations Ex

Operations Logistics Scheduler

Manager of the Biomass Science and Conversion Technology

Department

Electrical Engineer

EPA Compliance Director

Biochemist

Construction Project Manager

Biofuels Demand/Contract Specialist

Process Development Engineer

Fermentation Senior Scientist

Sr. Electrical Engineer

Genetics Scientist

Electrical & Instrumental Technician

Development Manager Biofuels

Electricity Program Manager

Ethanol Production Manager

Process Development Engineer  
 Manager of Commodity Procurement & Risk  
 Industrial Maint/Elect/Instr Tech  
 Production Coordinator  
 Energy Distribution Services Leader  
 Slip Form Concrete Superintendent  
 7-PWT Fuels / Biofuels Engineer  
 Electricians

### **First Action Steps**

1) Do a directory of companies and academic departments in the local area that are already involved in renewable energy and conservation. This establishes that the Savannah area has the infrastructure to support the Megasite renewable energy campus.

Involve SEDA and the Chamber of Commerce in making this directory. Perhaps SCAD students could be involved in designing a website.

2) Create a listing of companies that might be attracted to the Megasite

3) Establish the land use requirements for manufacturing and distribution

4) Provide a design competition for the planning of the Megasite

5) Prepare a **regional inventory of potential energy sources** to meet current and projected demand for both the built environment and new construction:

- renewable energy - hydrogen - fuel cell
- geothermal - new construction and retrofits / large scale
- solar rooftop/canopy potential/solar hot water
- solar farms - utility scale
- wind potential - wind farms, individual turbines, urban wind, offshore wind
- biofuels
- biomass
- algae
- tidal/wave/ocean current
- hydroelectric - micro hydro
- landfill gas

as well as **energy storage solutions**, including:

- solid state hydrogen
- hydrogen production
- pumped storage
- compressed air
- flywheel
- batteries
- ultracapcitors
- chilled water

The Mitsubishi Power Systems factory under construction has established the precedent of converting the site from one large installation to multiple tenants. It is utilizing less than 10% of the land area. Now is the opportune time to convert the Megasite into a renewable energy campus.

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