

# Energy Answers International's Fairfield Renewable Energy Power Plant and Resource Recovery Project

Energy Answers International is developing the Fairfield Renewable Energy Power Plant on the industrial-zoned, former FMC site located on the Fairfield Peninsula in Baltimore, Maryland. The 160 MW combined heat and power plant is designed to provide wholesale energy to help meet regional demands, as well as reduced priced retail energy as an attraction for energy intensive industries to co-locate at an Eco-Industrial Park to be developed on the 90-acre "brownfield" site.



The project will:

- Generate energy from renewable and alternative fuels
- Increase regional recycling rates
- Recover valuable materials for commercial reuse
- Reduce landfilling and associated greenhouse gas emissions
- Redevelop a "brownfield" site into an Eco-Industrial Park
- Create over 180 permanent "green collar" jobs and opportunities for hundreds more
- Create an average of 400 union construction jobs over a 3 year period.
- Provide new industrial services facilities in the neighboring communities to service the Fairfield Renewable Energy Power Plant needs.

## **Power Plant**

The Power Plant will utilize Processed Refuse Fuel™ (PRF) derived from the post recycling municipal solid waste stream as its primary fuel source.

The PRF will be produced from source separated municipal, commercial and light industrial waste streams and will be processed at multiple Fuel Production Facilities. These Facilities will be located at existing permitted solid waste management sites in and around Maryland but remote from the Power Plant site. PRF may be supplemented on an as-needed basis, with other high BTU value pre-processed waste components such as urban wood waste, auto shredder residue and chipped tires. The fuel will then be utilized in an efficient spreader-stoker industrial boiler which will generate steam from an optimum blend of these fuels.

There will be no solid waste, unprocessed waste, or hazardous materials received at the Project site, and all fuel will be delivered in enclosed vehicles. In addition to the generation of steam and electricity, the Fairfield facility will

recover ferrous and non-ferrous metals from the combustion residue for recycling and produce Boiler Aggregate™ for use in concrete products and other construction materials.

The Renewable Energy Power Plant has received all major permits and approvals and construction is expected to begin in the fourth quarter of 2010, with completion and commencement of commercial operations by the fourth quarter of 2013.

### **Fuel Production Facilities**

The PRF production will occur at existing, permitted solid waste management facilities such as landfills, transfer stations and recycling centers where significant volumes of municipal solid waste are now being accepted (500 tons per day or more). Energy Answers will buy or lease these facilities for at least 20 years and perform any necessary retrofitting or upgrades. Facility operations will extract valuable materials from the waste (ferrous metals and other marketable materials) and shred the remainder into small particle sizes for efficient transport to the Fairfield Renewable Energy Power Plant for combustion. All operations at these facilities will take place indoors where dust and odor will be virtually eliminated. This will be a significant upgrade at each of these sites and provide for the complete recovery of valuable materials and energy from the waste.



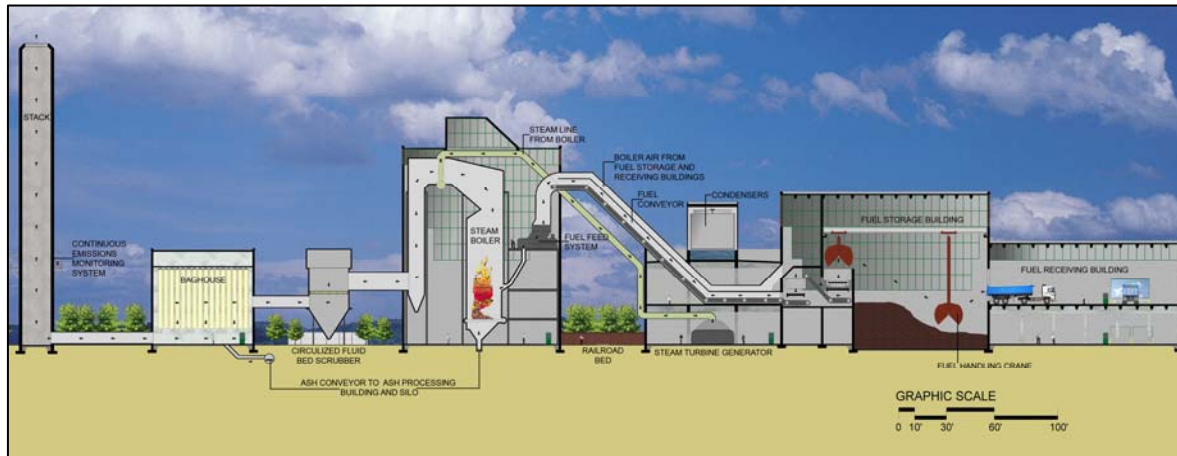
### **Renewable Energy Sales**

With the Fairfield Renewable Power Plant online, 160 MW of new, baseload renewable energy (combined heat/power) will be generated and injected into one of most energy congested areas of the region. The production of power is expected to begin 2<sup>nd</sup> quarter 2013 with full production by 4<sup>th</sup> quarter 2013. Low pressure steam will also be available at start-up to attract and serve new tenants in the Eco-Industrial Park. This will optimize energy recovery efficiency and stimulate the location of new energy intensive industries at the Fairfield Peninsula.

Multiple power sales agreements are currently being secured with Maryland public entities; and communities committing waste to the Fuel Production Facilities will be given a preference to purchase renewable energy. In response to a RFP issued by the Baltimore Regional Cooperative Purchasing Committee (BRCPC), Energy Answers was selected as a preferred provider for 25MW of energy with an option for BRCPC and its members to purchase an additional 100 MW of renewable energy. Sales of renewable energy to Baltimore City can also be satisfied through the BRCPC contract and through an agreement with Maryland Department of General Services.

The Power Plant will generate its own power for internal use and not require any power from the grid. Another source of clean energy generation at the Power Plant will come from the incorporation of state-of-the-art solar membrane technology on the rooftops of the primary operations and support buildings to provide additional power

for the LEED-certified buildings. The power generating Facility and support buildings as currently designed will qualify for the City of Baltimore's Gold LEED Certification.



### **Permitting and Approvals**

The Project has received siting and zoning approvals from the City of Baltimore; has received a CPCN approval for a renewable energy power plant, which includes the approval of MDE and EPA; has received approval from the Critical Area Commission; and continues to receive strong community support, documented by the execution of an MOU with three surrounding community groups and regular task force meetings to plan for employment and service industry opportunities in Brooklyn and Curtis Bay.

A full CPCN application was submitted to the Maryland Public Service Commission (PSC) and approved on August 6, 2010. The MD PSC, is responsible for the management and coordination of the state and federal permitting requirements of all power plants locating in Maryland. All permits are now in place for a second quarter 2011 construction start.

### **Federal/State/City approvals**

*Board of Municipal and Zoning Appeals* - BMZA adopted a resolution permitting this Project by unanimous consent of the Board at its meeting on March 3, 2009.

*Urban Renewal Area* – The Baltimore Development Corporation has said, "The City of Baltimore is enthusiastic about Energy Answers' innovative renewable heat and power project being proposed for the Fairfield peninsula. This project is aligned with the Fairfield Urban Renewal Plan's economic development and sustainability objectives. The proposed clean energy power plant will be sited on a vacant brownfields site providing an opportunity to revitalize key industrial real estate and could provide an economic stimulus for other industries to locate on the Fairfield area."

*Critical Area Overlay District* – On July 7, 2010, The State of Maryland Critical Area Commission Chesapeake and Atlantic Coastal Bays approved with conditions, Energy Answers International's proposal to the Public Service Commission (PSC) to construct a renewable fuel-fired power plant within Baltimore City's Critical Area at the Fairfield site. Information presented to the Critical Area Commission as a partial basis for this approval included Energy Answers International's generated preliminary design and layout drawings for the Eco-Industrial Park.

*Critical Area Regulations* – Has been finalized, presented, and approved and a 100-foot buffer along the 3500' of industrial waterfront of the FMC site will recognize green space and a walking path as part of our Critical Area approval. The full board of the Critical Area Commission met on July 7, 2010 and approved the Fairfield Renewable Energy Power Plant.

As a condition of the critical area approval, Energy Answers must provide by July 7, 2011 a detailed critical area 100-foot buffer management plan. This plan will integrate critical area requirements into detailed port and Eco-Industrial Park design requirements.

Following the State's acceptance of the critical area buffer management plan, the detailed planning phase of the Eco-Industrial Park will commence. Industries with high energy demands that are capable of contributing to an overall reduction in environmental impacts through energy and waste interchanges with the Power Plant and other park industries will be encouraged to work with Energy Answers in securing tenancy in the Park.

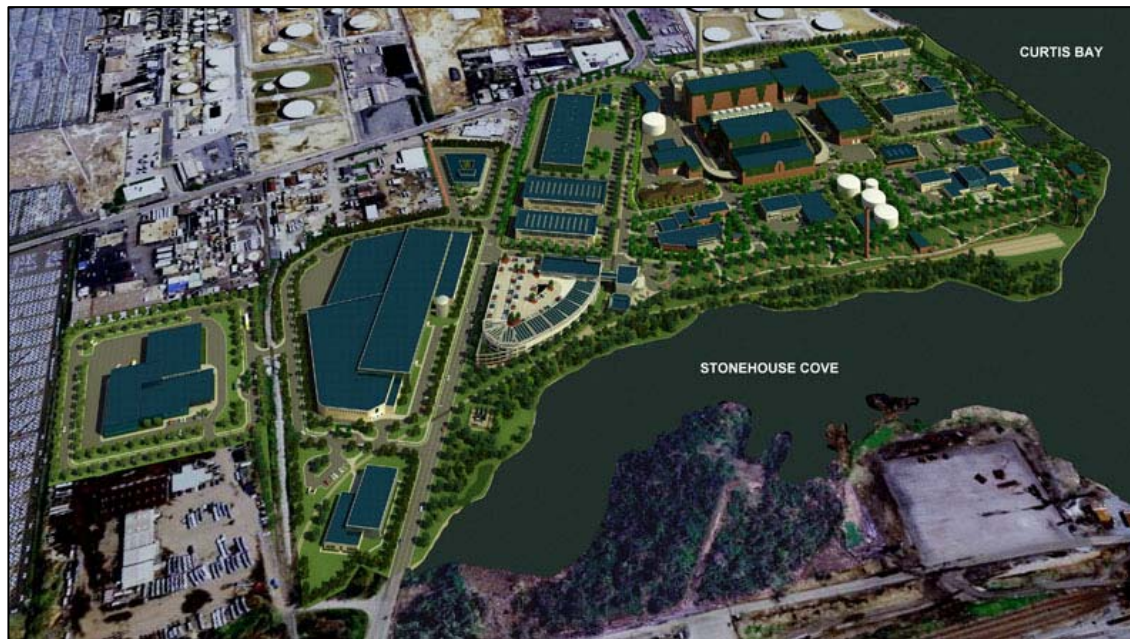
*Traffic Impact Study* - The TIS was completed, 1<sup>st</sup> Quarter 2010 showing that the Facility Site is located in excellent proximity to major, high capacity roadways such as Patapsco Avenue. The Facility uses a local M-3 zoned road and has easy access to a number of major highways such as I-895 and I-95. The area was once a thriving industrial site with significantly more traffic than this development will generate. The traffic from this project will have minor impacts which are expected to be largely confined to East Patapsco Avenue. The Baltimore City Department of Transportation, by letter of August 3, 2010 to Energy Answers, has approved the Traffic Impact Study Mitigation for the Power Plant, stating that there are “no substantial negative impacts to the transportation network”.

*Certificate of Public Convenience and Necessity (CPCN)* – The CPCN was approved by the Maryland Public Service Commission on August 6, 2010.

*PJM Interconnection* – The feasibility, system impact, and facility impact studies are all complete. The Project has executed construction and service agreements for the interconnection with PJM at the Baltimore Pumphrey Substation.

**Eco-Industrial Park**

It is Energy Answers’ intent to utilize this project to facilitate the development of an Eco-Industrial Park at the 90-acre FMC “brownfield” site. Once the Renewable Energy Power Plant is in place, it is envisioned that the addition of sustainable and compatible industries such as concrete products manufacturing, recycled paper milling, bio-fuels production, climate controlled warehousing or research laboratories would provide recycling opportunities and exchanges of energy and materials with the Power Plant.



## **Aerial of Fairfield Eco Industrial Park**

The FMC “brownfield” site was chosen for a number of reasons, including:

- Good highway access to regional and interstate system, with a good internal road network;
- Internal rail track with superb rail access and the CSX switching yards as a neighbor;
- Electrical grid access, existing steam line, existing usable infrastructure;
- City water mains and sanitary sewers to site;
- Heavy industry zone, BDC empowerment. and enterprise zone with existing site permits;
- Highly skilled local industrial workforce; and
- A need for both steam and electric power in this market location.

### ***Environmental Report Card***

Energy Answers has proposed the lowest emission limits in the Country for the municipal waste combustor category. The Fairfield Power Plant will have the lowest mercury emission limits in the entire country for this type of facility. A new mercury limit of 17ug (down from 28ug) will allow MDE to eventually lower mercury emissions of other Maryland facilities, and gain an estimated net 150 lbs mercury reduction state-wide not considering the 2-3000 pounds of mercury being removed from landfills each year. Lower emission limits also being set for: PM, PM<sub>10</sub>, PM<sub>2.5</sub>, NO<sub>x</sub>, SO<sub>2</sub>, and Lead. All other pollutants match the lowest applicable national standards.

To reach these limits, independent air quality control systems are proposed for each boiler, consisting of:

- An activated carbon injection system, used as needed, to remove heavy metals ( including mercury) and dioxins/furans;
- A Turbosorp® Dry Circulating Fluid Bed Scrubber system to remove acid gases from the boiler flue gas with lime injection;
- A fabric filter (baghouse) to control particulate emissions (including metals); and
- A regenerative selective catalytic reduction (RSCR) system to reduce emissions of NO<sub>x</sub>.

Continuous Emissions Monitoring Systems will be designed and operated in conformance with the performance specifications of 40 CFR 60, Appendix B as referenced from 40 CFR 60, Subpart Eb. A dedicated computer will accumulate and process monitoring data from the stack gas monitors and boiler operating data. It will be instrumental for preparing reports of stack gas emissions as required by the USEPA and the MDE.

*Emissions Reductions* - The Facility will be fueled by PRF and will effectively operate as a carbon sink significantly reducing potential greenhouse gas (GHG) emissions in the region. It will also help the state achieve its renewable energy portfolio standards at an early date. The Facility will reduce the emissions associated with trucking municipal waste, in addition to methane emissions from landfilling municipal waste, the replacement of fossil fuels in power generating, and the use of steam. Additionally, the purchase of Emissions Reduction Credits will permanently reduce emissions in Maryland.

### ***Sustainability***

In the past few decades, world environmental leaders have begun to look at the long-term impact of projects and activities on the carrying capacity of the planet’s eco systems. At a regional and/or local level, governments and large corporations have established divisions to monitor their activities toward achieving a sustainable level of impact on the environment (Sustainable Maryland is an outstanding example of this effort). One of the major benefits of the Project is its significant positive impact on the goal of sustainability not only for Baltimore, but for the State and region as well. In defining “sustainability”, which has become an international goal, we generally evaluate the impact of a project on land, water, air and natural resources, but also consider the impact on local standard of living and quality of life. In all of these categories, the Project has a very positive impact even beyond sustainable and to the point of having a strong restorative impact on our environment and eco-systems.

**The benefits of the Fairfield Renewable Energy Project go beyond “sustainable” to “restorative” and include:**

**LAND:**

- 90 acre “brownfield” site recovery and redevelopment
- landfill use reduction – the waste converted to fuel will save 115 acres of landfill space 15’ deep each year
- 1 ton reduction per ton of waste converted to fuel

**AIR:**

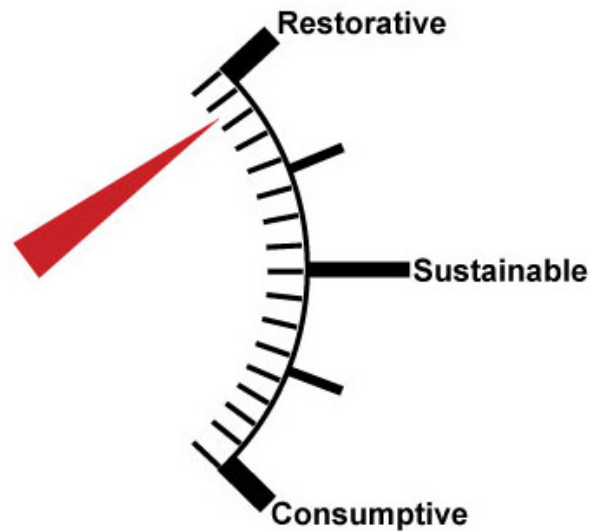
- GHG emission reductions
- overall emissions reductions
- long haul waste transport emission reductions
- criteria pollutants reductions

**WATER:**

- treated water use reduction
- use of 3 MGD of treated wastewater effluent for cooling
- industrial wastewater elimination
- landfill leachate elimination

**NATURAL RESOURCES:**

- reduction of need for extraction of natural resources (metals and aggregate recovery)
- fossil fuel use reduction -75 gal. of fuel oil saved with each ton of PRF
- new project development using recovered materials – LEED certified buildings
- existing buildings and infrastructure to be reused
- solar collectors on new building roofs



*Energy Use Reduction* - The Power Plant will generate its own power for internal use and not require any power from the grid. Another source of clean energy generation at the Power Plant will come from the incorporation of state-of-the-art solar membrane technology on the rooftops of the primary operations and support buildings to provide additional power for the LEED-certified buildings.

*Waste Minimization* - The Project will generate clean renewable energy from fuel derived from waste that might otherwise be landfilled. In this case, it is being combusted to generate electricity and recover valuable materials from the residual ash streams.

*Reuse and Recycling* - In addition to the generation of steam and electricity, the Project will recover ferrous metals pre-combustion, and ferrous and non-ferrous metals from the combustion residue for recycling. The recovered metals can be counted toward an individual county’s recycling rates that utilize the Fuel Production Facilities. Boiler Aggregate™ (BA™) will be produced for use in concrete products and other construction materials. BA™ has been demonstrated to have useful applications as a substitute for conventional aggregate in asphaltic underlayment and other construction related products. The bottom ash processing system enables nearly 100% bottom ash recovery, reuse or recycling.

***Patapsco Waste Water Treatment Facility***

The Patapsco Waste Water Treatment Facility is located less than ½ mile from the Fairfield Renewable Energy Power Plant and there are several unique opportunities to improve performance efficiency and sustainability at both

facilities. For example, rather than use potable water for cooling tower use, Energy Answers proposes to use rainwater and groundwater collection systems, and storm water and grey water from the POTW to condense the steam. Energy Answers proposes to make a significant investment in the Patapsco Wastewater Treatment Plant to utilize the storm water and grey water rather than have it discharged to the Bay by installing a Remote Pumping Station and Transfer Line. Engineering design and construction for the piping, pump station, and control systems is underway and expected to be completed this year. Reduction of energy costs through a direct electric service and a low pressure steam line from the Power Plant is also being evaluated, along with a much more efficient sludge management system.

### ***Jobs / Workforce***

In April of 2009, an analysis of the economic and fiscal impact of the Project was completed by Grant Thornton, LLP. This assessment was done to estimate the effect the Project will have on the local and regional economy.

*Construction* - There will be thousands of direct and indirect construction jobs created by the Project, including union construction jobs with approximately 1300 craftsman jobs over the 3 year construction period. A Letter of Intent has been signed with the Baltimore Building & Construction Trades Council for the Project's construction needs.

*Operations* – The United Steelworkers represented the hourly workers at the FMC site for many years and worked diligently with FMC to try to keep the chemical plant open. There will be over 180 direct new green operating jobs at the Project's facilities with indirect jobs adding an additional 600 statewide. A Letter of Intent has been signed with the United Steel Workers for the representation of the Power Plant's operators. Compensation through direct and indirect jobs will inject millions of dollars into the local communities, City, and State on an annual basis.

*Eco-Industrial Park* – It is expected that the Eco-Industrial Park could easily provide over 600 additional permanent jobs and thousands of construction jobs.

### ***Community Participation and Support***

At the outset of the Project, Energy Answers worked to develop a Community Advisory Task Force. From that relationship, a cooperative Memorandum of Understanding (MOU) with three local community groups, government representatives and developer representatives was signed early in the development process. This MOU allows for on-going proactive dialogue to share information and provide feedback regarding local concerns about the project, employment, new business opportunities and other issues of concern. Some of the items the community wanted were as simple as scheduling regular progress meetings, having the truck traffic routed outside the communities and confined to the interstates and major thoroughfares, giving preference to locally-based contractors, using enclosed buildings to minimize dust and a jobs clearinghouse for job opportunities at the Project. Each of these is discussed at the Task Force meetings.

The community leaders have been proactive, have had constructive suggestions from the beginning, and have become well informed advocates for the Project and the benefits it will bring to their communities.

Energy Answers has committed to local recruitment and training and by working with the Mayor's Office of Employment Development (MOED), and through the Community Task Force, hopes to link housing opportunities in Curtis Bay and Brooklyn with Project employment opportunities, bringing the work force closer to the job site.

As well as the positive economic impact created by employment and payroll earnings, the Project also generates substantial economic output in the form of vendor and supplier purchases, from construction through to long term operation. The company is already working with the community to identify suitable locations for vendors and suppliers to locate within Brooklyn and Curtis Bay.

The following list of business relationships anticipated at the Fairfield Project could include: uniform and shoe suppliers; tires and repair services; machinery and equipment; restaurants and catering services; printing, office

supplies and services; landscaping; safety equipment and supplies; industrial and cleaning supplies and services; electricians, carpenters, plumbers; and many more. Energy Answers has been working with the local community task force to identify local businesses that could provide services or supplies to the Project.

Energy Answers values the input and support received from the local communities and looks forward to participating in the revitalization of those communities.

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