

## **BUSINESS VEHICLES FOR ACCOMPLISHMENT**

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Good morning: I am pleased to be here to participate in another AHC Workshop, “Achieving Results”, and hope that I can contribute something of value to our discussion. Bruce Piasecki has asked me to talk as an entrepreneur about the creation and successful operation of the companies I have been associated with since my graduation from Rensselaer Polytechnic Institute as a civil engineer. Our discussion evolved into the purpose or mission of each of the businesses and the term business vehicles for accomplishment seemed appropriate to describe the various companies and partnerships I have been involved with.



**Job: Professional  
Employment**



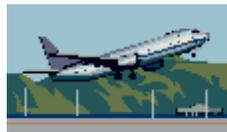
**Professional Engineering Corporation –  
SMITH & MAHONEY, PC**



**Business Corporation –  
ENERGY ANSWERS CORP.**



**Limited Partnership – SEMASS PARTNERSHIP  
Limited Liability Corp. – RENOVA  
LLLP – ST. CROIX RENAISSANCE LLLP**



**Public / Private Partnerships  
Business Partnerships / Alliances**

The vehicles shown represent the complexity of organization or business structure utilized to accomplish professional and business objectives. The more difficult the challenge, the more efficient and powerful the business vehicle must be to meet the challenge and accomplish the objectives.

Fresh out of school with some summer experience in the engineering and construction business, my goal was to learn and practice my engineering profession, to help design solutions to problems and to see those solutions built, and maybe in some small way, make our planet a better place to live. And for a few years that was my professional focus at a small engineering firm participating in the design of dams, reservoirs, water and wastewater systems. It gave me valuable knowledge, experience and exposure to a variety of projects. My professional goals were expanding and I began to place a great value on productive achievement, on solving problems and on implementing solutions. The evolution of the companies and other business vehicles which we established at Energy Answers closely follows my personal desire to utilize my talents, knowledge, and experience and networks of talented individuals to solve more and more complex problems.



## **Job: Professional Employment**

In 1970, after receiving my professional engineering license, I formed the engineering firm of Smith & Mahoney with Ben Smith, a renowned local engineer, who was the sole proprietor of the small engineering firm I first went to work for.



## **Professional Engineering Corporation – SMITH & MAHONEY, PC**

A full service surveying, engineering and planning firm dedicated to the implementation of efficient, innovative solutions to municipal and private sector infrastructure and site development problems.

Smith & Mahoney P.C. was the first business vehicle I created to expand my opportunities to solve problems. It was a professional corporation and we could assemble a team of professionals with expertise in numerous disciplines: Civil, Mechanical, Electrical and Environmental Engineering; Architecture; Urban Planning; Economics; Government Relations; etc. With the formation of a company, one intends to increase the opportunities for accomplishment and, at the same time, takes on a variety of risks – most seriously, the obligation to employees to keep them fully engaged and stimulated and to shareholders to keep the company profitable. But with those obligations comes the opportunity and resources to pursue solutions to more difficult and challenging problems.

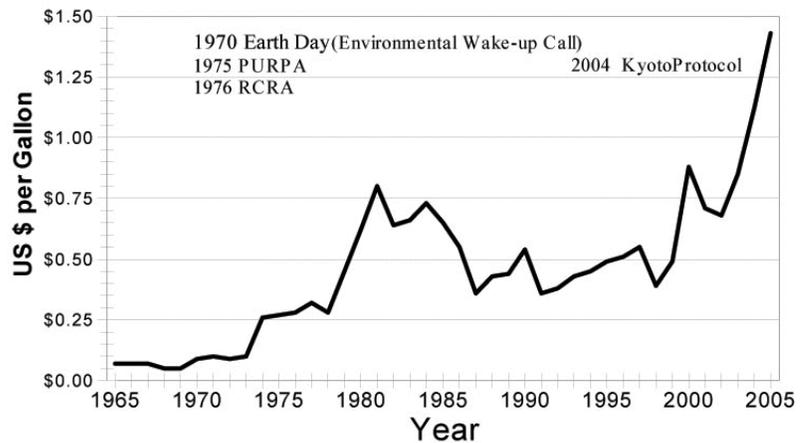
The engineering business grew to more than sixty productive, creative, employees. We accomplished a number of noteworthy projects and earned good profits for the shareholders. Smith & Mahoney received the Outstanding Civil Engineering Achievement in New York State in 1982 for a municipal waste-to-energy and materials recovery system, and also in 1984, the New York Governors and U.S. Department of Energy award for a “distinguished contribution” to the development of renewable energy resources.

The resource recovery project had been conceived in 1970 when the Mayor of Albany, Erastus Corning II, an avid conservationist, had asked us if we would evaluate the alternatives to landfilling for the City’s solid waste. Our conclusion at that time was that a resource recovery system including combustion for energy recovery and sale could reduce the need for landfilling by 90%, but the economics were not favorable, due to low fuel prices.

In 1973, that changed with the dramatic increase in the price of petroleum products as indicated on the #2 fuel price graph. During my presentation, I will refer back to this graph several times since the fluctuations in the price of fuel has had a dramatic impact on our economy and energy dependent businesses.

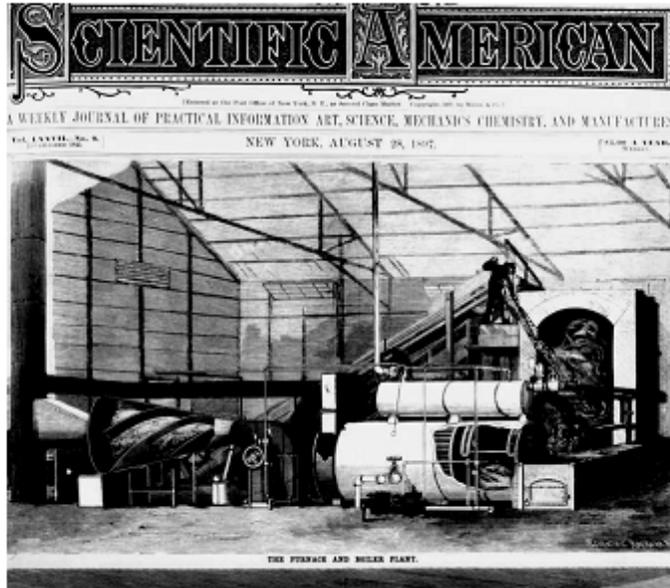
At Smith & Mahoney we had, in response to a client’s desire to recover resources rather than bury waste, developed some unique systems and filed several patent applications for those systems, the approach was a big step forward from incineration and even waste-to-energy in that the system was designed to efficiently recover materials as well. The resource recovery facility designed for Albany was the third generation of attempts to burn garbage for energy. Let me quickly describe the evolution of that industry since the technology developed at Smith & Mahoney became the reason for creating Energy Answers Corporation.

## No. 2 Heating Fuel Prices 1965-2005



## August 28, 1897 – NYC GARBAGE SOLUTION

The idea of burning waste to reduce volume and generate energy is not new. New York City had a heat recovery incinerator as early as 1897 and many urban areas followed suit as land became more valuable. Incinerators operated with virtually no air pollution control systems in the U.S. up until the early 1970's when concern over air pollution and potential health impacts prompted regulatory agencies to demand closure or the addition of air pollution control systems.



It wasn't until after the "Energy Crisis" of 1973, when fuel prices tripled, that municipal and commercial waste was again viewed as an energy source and the "waste-to-energy" industry was born. Many facilities were proposed and built and were essentially incinerators with heat recovery units and primitive air pollution control systems.

But, these facilities were, in many cases, not good neighbors and the local and environmental communities began to oppose "waste-to-energy". There were problems to solve and, at Smith and Mahoney, we had the good fortune to have a client who was committed to the "resource recovery" concept.

### Evolution of Resource Recovery PROBLEMS TO SOLVE

- Air Emissions
- Ash Disposal / Management
- Waste Water
- Maximize Energy Production
- Siting
- Public Concerns

After some effort as consulting engineers to market our engineering solution to communities with waste problems, it became apparent that the only way to advance the technology and design and build new facilities would be through an entity capable of taking the responsibilities and risks of design, financing, building, owning and operating. Our evaluation had indicated that the most likely and appropriate locations for these systems were locations where landfilling stood to contaminate public and water supplies, where energy prices were fairly high, and where there was adequate waste to justify a large scale system. Long Island, Florida and Southeast Massachusetts/Cape Cod were our targets and, because of documented landfill contamination of the sole source Cape Cod aquifer, that area became our Number 1 priority. No community or communities in that region were capable of assuming the risks of siting, designing, financing, building and operating a large facility and a Smith & Mahoney evaluation of this resource recovery opportunity commissioned by a private investor led to the formation of Energy Answers Corporation.

The Company was formed by Gordon Sutin (an experienced industrial engineer and an expert in materials handling and waste combustion), myself, and several socially conscious investors interested in environmental and energy investments which had a public benefit, as well as a profit opportunity. Energy Answers was formed in February 1981 as the vehicle to implement a resource solution on a large scale.

Our first project was the SEMASS Resource Recovery Facility which took five years to develop and 2 ½ years to build. Originally a 2000 ton/day system, it is now a 3000 ton/day, 80 MW facility that initially cost \$270 million to put into operation. The company had adequate capital through our investors and adequate talent to manage the numerous tasks required to design, finance, build, own and operate.

**Energy Answers Corporation**



1981

- Develop economically competitive, integrated solid waste solutions
- Build, own and operate facilities
- Maximize the recovery of resources in “waste”
- Minimize environmental impacts
- Utilize the recovered energy and materials efficiently
- Be a good corporate citizen



**SEMASS PARTNERSHIP**

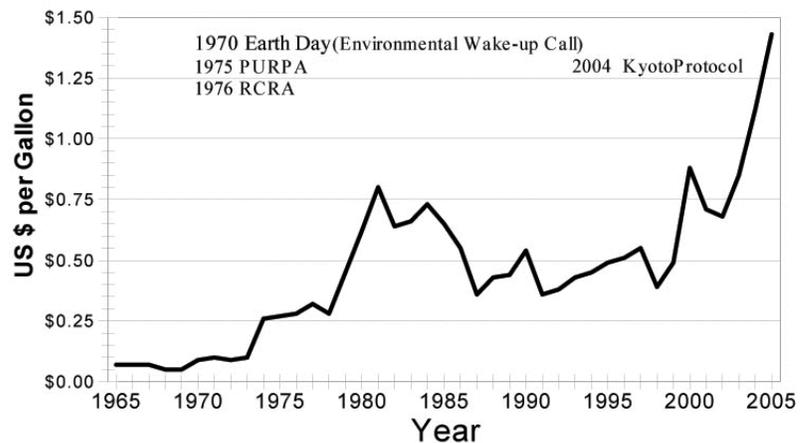
- **Energy Answers Corp. – Managing General Partner**
- **Florida Power & Light**
- **Bechtel Power**
- **Prudential**
- **Industrial Bank of Japan**
- **Stephens**
- **Joy Niro**




1986

After 50 years of stable energy prices, in less than a decade, we saw a ten-fold increase in energy prices. We were able to negotiate a 20-year power sale agreement with Commonwealth Electric which became the corner stone of the project. As always, high prices stimulate new development of energy and fuel sources, and low or stable energy prices tend to inhibit new energy and fuel source development. After the construction of our SEMASS project, energy prices would decrease and not reach 1982 prices again until 2004.

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The SEMASS Partnership (a limited partnership) was the vehicle we created to finance, build, own and operate the SEMASS Resource Recovery Facility. The price peak in the early 80's made it attractive for a number of the partners who were to be part of the SEMASS Partnership. This price peak also allowed Energy Answers, the 51% General Partner, to attract such financial giants as The Industrial Bank of Japan (at that time a AAA rated bank) and Prudential Power Funding, to provide debt financing for the project. The limited partners brought into the project provided the project equity and included:

### **Bechtel:**

A highly capable and financially strong contractor interested in developing a new business line in renewable energy facilities. Assumed design, build, construction cost, schedule and performance test risk, and invested some of their expected profits in the Partnership.

### **Stephens:**

An investment banking firm from Little Rock, Arkansas was primarily interested in energy and investment tax credits, which were made available by the federal government as their means of encouraging new energy generating projects to counter rising energy prices. Stephens contributed a large portion of the project equity for the majority of the tax credits.

### **Florida Power & Light:**

Wanted to build a "green" portfolio (to address criticism of environmental groups to two coal fired generators they were attempting to build in Florida). At about the same time, they invested in a large solar generation project and a large wind project. Their coal fired plants were approved and their appearance in the renewable energy arena was short lived.

**Joy Niro:**

The supplier of the dry scrubber for our air pollution control system. It was the first dry scrubber installed on a waste combustion facility and we required an investment from them to ensure their availability for several years after start-up, in case of problems in the performance of the new system.

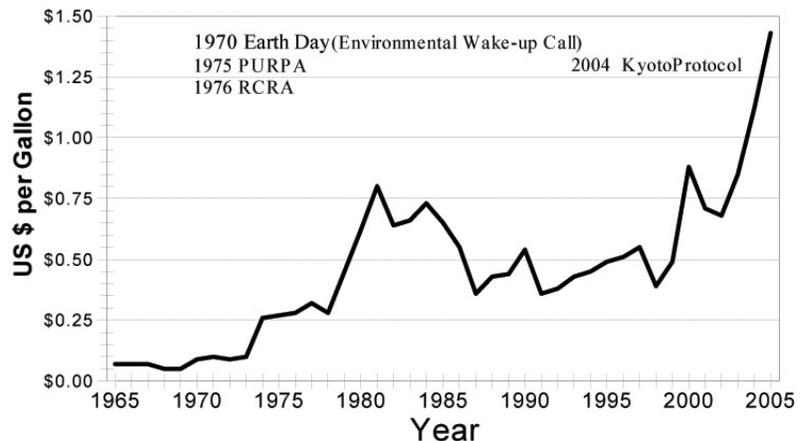
Thus the vehicle (a limited partnership), was created by Energy Answers Corporation to accomplish its goals. This partnership was much more complex, and included much bigger companies with a variety of objectives and goals of their own, which they in turn could accomplish through their participation in the SEMASS Partnership vehicle. The expansion of SEMASS to a 3000 tons/day, 80 MW Resource Recovery system was completed in 1995 and is the last major waste combustion facility built in the U.S. It has been an unqualified economic, technical and environmental success.

In comparison to the last 8 major resource recovery facilities built in the U.S., SEMASS has:

- Highest net energy generation rate in kwh
- Lowest tipping fee for municipalities
- Highest metal recovery rate
- Lowest ash production
- Highest ash recovery rate
- Lowest capital cost per ton/day of waste processed

If we look at the energy price graph again, we can see the declining fuel costs through the 80's and 90's; this was accompanied by falling disposal costs in the U.S. due to the permitting of mega landfills by the large waste collection companies. The two major revenue streams for our competitive private sector resource recovery approach to waste management had been significantly reduced and we had to either seek a new challenge or find ways to improve our project economics for resource recovery systems. We chose to focus on improvement of our product in all of the ways shown.

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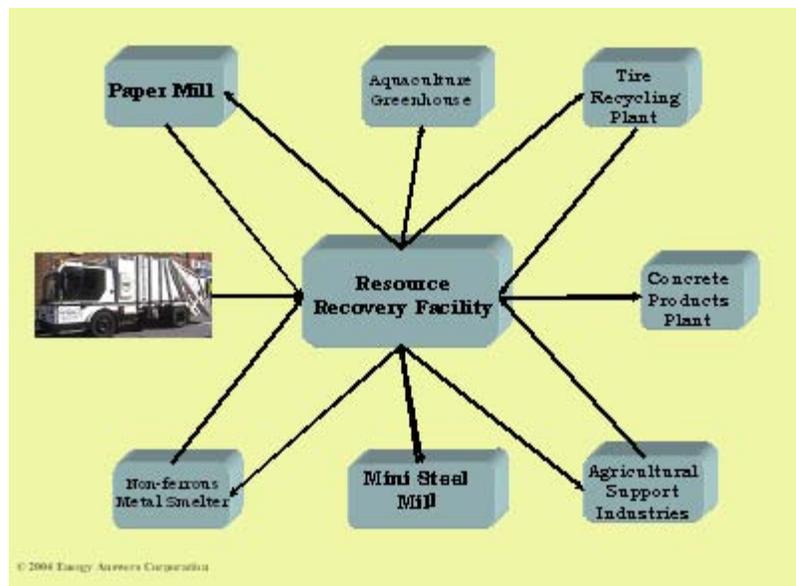


While our operations team focused on increasing efficiency, energy generation, and material recovery and looked for high value waste fuels, our technology development team focused on enhancements for the next generation plants, developed a patented sludge injection system for solid fuel boilers, and experimented with various technologies for making products out of ash from waste combustion systems, and we at the development company advanced the industrial ecology concept in island economics.

## Factors for Resource Recovery Market Improvement

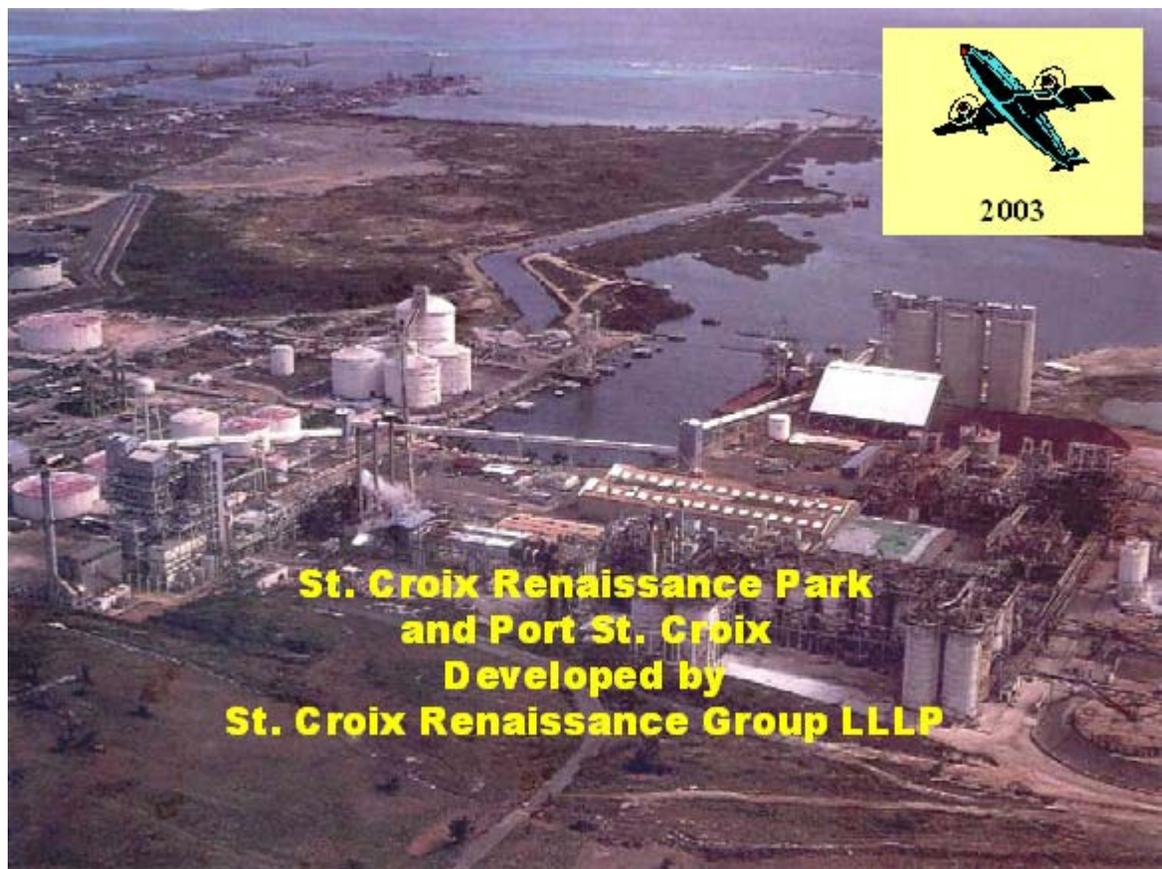
- Increase energy revenue
- Increase tipping fees
- Increase materials recovery, reuse and sales
- Monetize environmental benefits
- Reduce capital and O & M costs
- Seek innovative financing structures
- Develop industrial ecology concept
- Partner with energy and waste intensive industries
- Consider Island economies with high energy costs and high population densities

The industrial ecology concept holds that like nature certain industries have wastes that can be used to provide energy or create new products and some industries generate waste that can be used as feed stock for other industries. This was the basics for a major project we have proposed in Puerto Rico, the Renova Project. Our corporate philosophy of resource recovery starts with the sites for our facilities. We look for abandoned or underutilized industrial properties, quarries, landfills or functioning industrial properties with room for an energy generating and materials recovery system within the fence. Our proposed site in Puerto Rico includes an abandoned sugar mill and an abandoned paper mill; we have proposed to reactivate the paper mill. But that is another story for another time. The vehicle we created for that project was somewhat complex, in that we believe that to succeed in permitting a project such as this, we must have a strong local partner or partners. In this case our development partner is a Puerto Rican real estate development company owned by a Rensselaer Polytechnic Institute classmate of mine. Together Energy Answers and Interlink act as joint General Managers in a Limited Liability Corporation. The mix of shareholders in the Renova Project included the largest local bank, the largest local newspaper, several large contractors, the three largest food and beverage importers on the island, concrete products



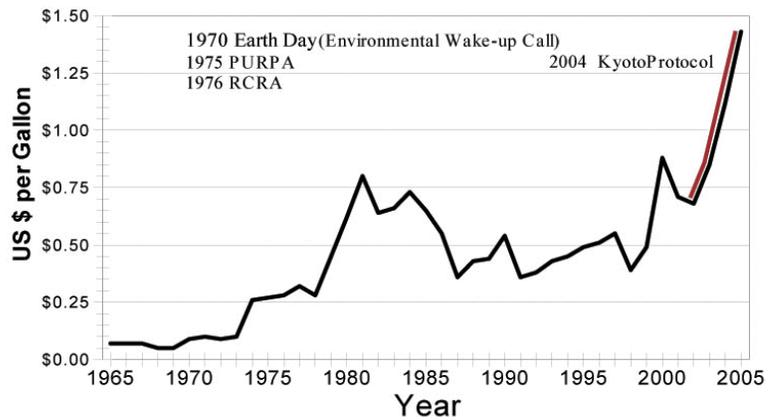


Another Island with a waste disposal crisis and high energy prices is St. Croix in the U.S. Virgin Islands. Retail energy price is close to \$0.25/KWh and EPA has mandated closure of the island's only landfill. On the island we identified a site and developed a master plan for converting a recently closed Alumina refinery into an eco-industrial park with a resource recovery facility at the heart of the redevelopment plan. The vehicle we chose for accomplishing our goals at St. Croix Renaissance is a Limited Liability Limited Partnership with Energy Answers and two other general partners, one local, as the management team for the project. The intent expressed in our master plan is to attract industrial tenants with high energy demands (preferably steam as well as electricity), and which can take advantage of the deep water port and cargo handling capabilities of the site. Ownership opportunity for major tenants is anticipated and the U.S. Virgin Islands has a great tax benefits program to help us attract equity partners.



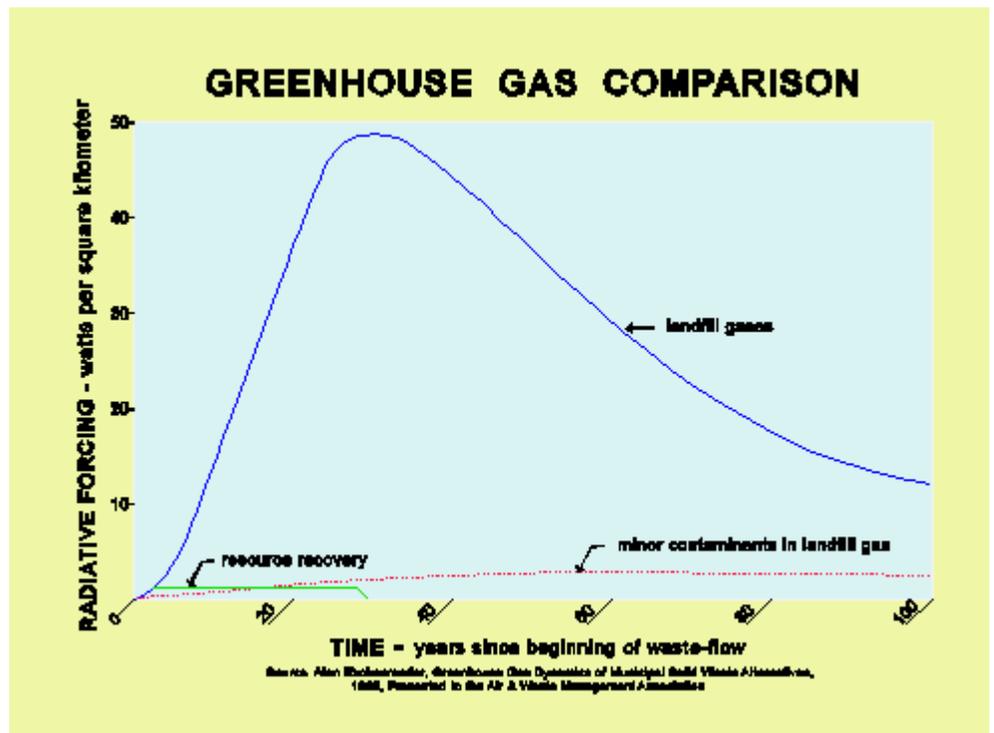
So that brings us to today and today's environmental and market conditions and the opportunities that the current conditions present. Let's return again to our fuel price chart, and as everyone in the room is aware, the price of crude oil has been above \$50/bbl for six months now and many are predicting that it will stay there - we'll see. But high energy prices stimulate consideration of other fuel and energy alternatives and government legislation and tax incentives which have historically stimulated private investment in energy solutions.

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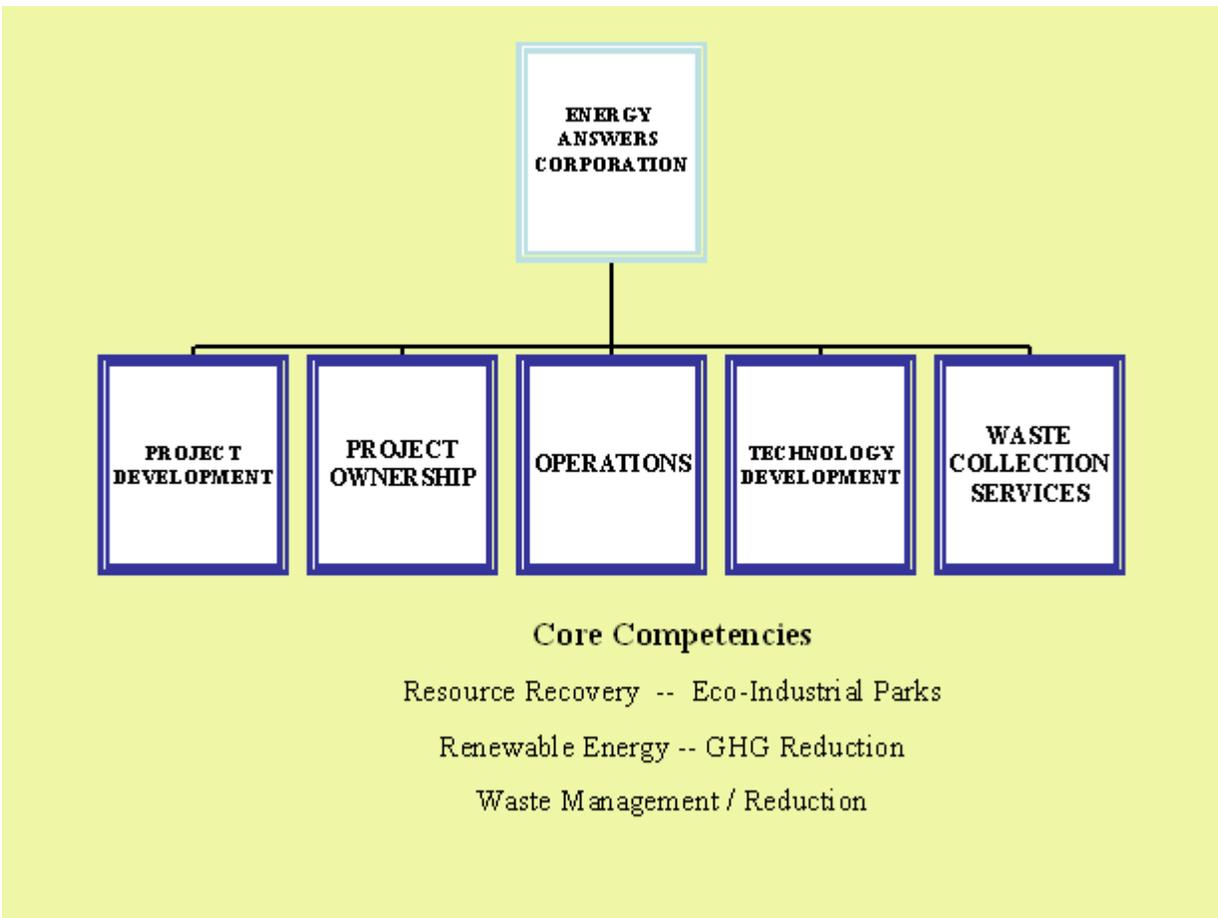
Another major factor now on the radar screen of all responsible corporate executives is the environmental and human health risks of conducting business. The impact of the success of the tobacco class action suits, the Kyoto protocol debate, production and manufacturing waste impacts on natural resources, and human health have made corporate governance much more complex. Our resource recovery system and the auxiliary technologies we have developed have enormous environmental benefits:

- Greenhouse gas reduction - (entire projected U.S. obligation could be satisfied with a change in policy from landfill to resource recovery)
- Air pollution emissions control and reduction
- Materials recover and reuse
- Land conservation



With the high energy costs and significant environmental benefits, Energy Answers is now looking to capitalize on the unique position we are in to offer new solutions and build new facilities.

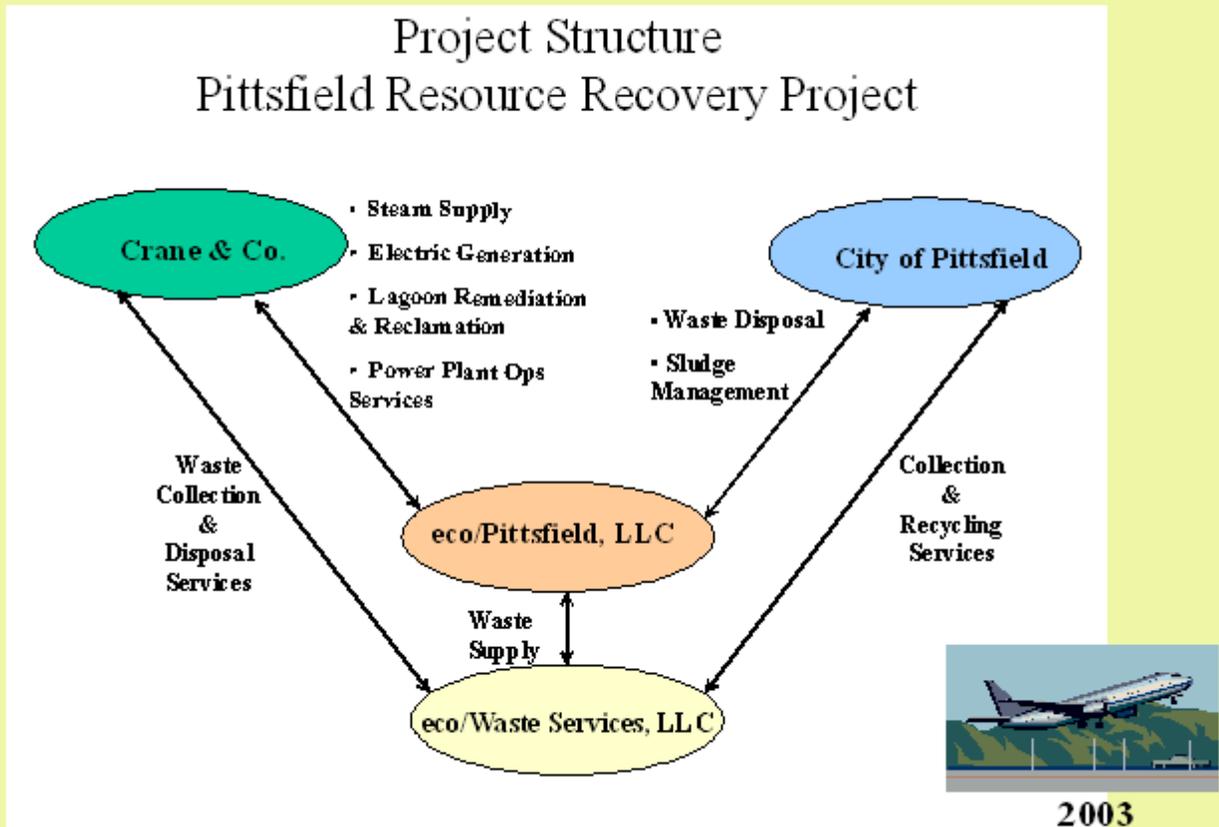
You likely have noticed that the more recent business vehicles all address corporate partners' desire to limit risk and liability. Limited Liability Corporations, Limited Partnerships, and Limited Liability Limited Partnerships all were created with the protection of participants in mind. Energy Answers Corporation in each case has taken the general partner or general manager's role, and in addition to project development and operating responsibilities are responsible for risk allocation and risk management. Our company has five subsidiaries which are designed to perform the functions we have chosen to offer and to excel at.



There are examples of new business alliances which are the most recent vehicles we have created or proposed to create to accomplish the objectives of multiple partners. Several years ago, we acquired the Pittsfield, Massachusetts waste-to-energy facility which was put into commercial operation in 1981 and was nearing the end of its originally expected useful life. Our operations and technology development team upgraded the facility, improved the efficiency of energy generation, and installed materials recovery and processing. Then we negotiated a new 10-year contract with the City of Pittsfield for waste disposal and renegotiated our energy sales agreement with Crane & Company, Inc. Crane & Co. is a high quality paper manufacturer which actually produces the paper for all U.S. currency as well as currency paper for other nations. Our Pittsfield Resource Recovery Facility provides them with their process steam.

In order to finance the improvements to the facility, we had to satisfy banks and our shareholders that we had long-term revenue streams under contract. In 2004, our Pittsfield facility received the ASME “Small Combustion Facility of the Year” award and is serving our partners well.

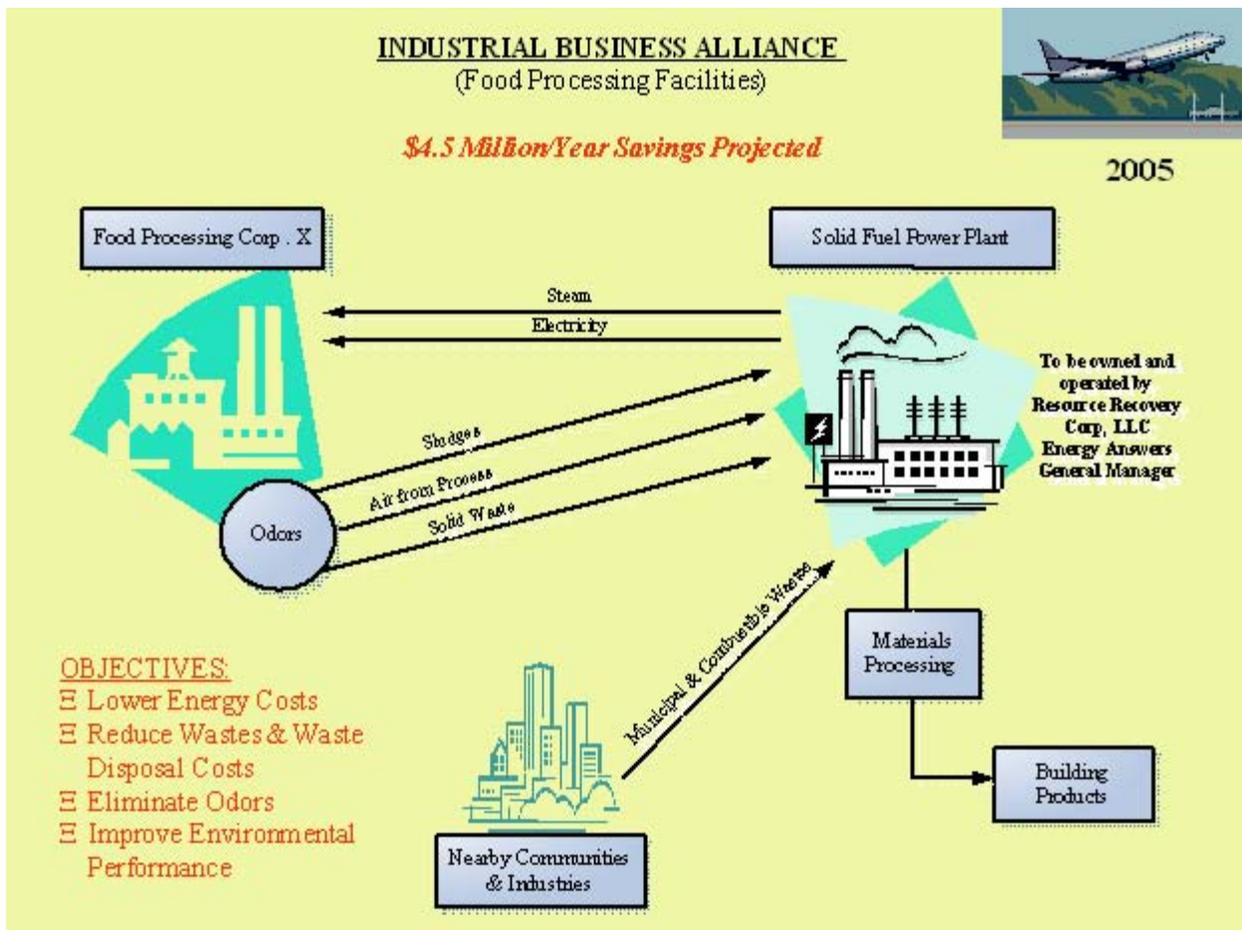
## Business Alliance – Public/Private Partnership



The second example is one of a potential project in the developmental process and so we cannot identify the potential partners or location. But, we can discuss the objectives of our industry partner and how we have proposed to structure a solution.

The potential partner is a major food processor with the objectives of responsibly addressing some pressing environmental issues including odors, solid waste and sludge management, along with the impact of rising energy costs.

After an evaluation of all issues, we have proposed a business alliance to address all of their issues, which we project will result in savings of more than \$4.5 million/year and a payback on the new facilities of less than 5 years. We would propose to structure this similar to our Pittsfield project where the business arrangement is contractual with both the industry, the municipality and with other parties. The ownership of new facilities will be a Limited Liability Corporation with Energy Answers as the General Manager and Operator.



Finally over the years of pursuing resource recovery opportunities, I have noticed what I believe to be positive trends away from public regulatory agency dictated solutions to environmental problems and a more proactive private sector role in addressing the real environmental issues.

Governmental regulation and actions have not worked well on a global scale so the concerned responsible environmentalists, some from within corporations, have begun to identify sources of environmental releases and to develop mechanisms to induce the private sector to make environmental issues a high corporate priority.

We recover \$1000/day in U.S. coins from the SEMASS boiler ash. It is symbolic of the unrecognized value in the materials our society discards and the level of recovery that can be achieved.

## Save \$ Through Materials Recovery

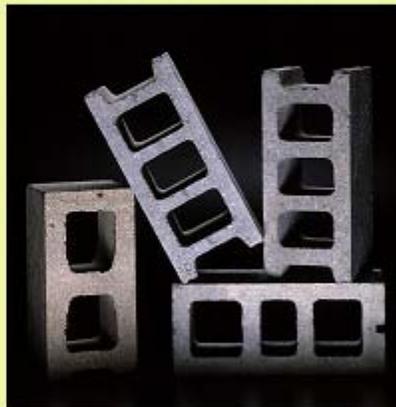
### Potential Industrial Partners

- Utilities
- Paper mills
- Pharmaceuticals
- Food Processors
- Chemical Plants
- Plastics Manufacturing



## Build a Foundation for Sustainable Development

- Waste Reduction
- Renewable Energy
- Alternative Materials
- Industrial Symbiosis
- Reuse Systems

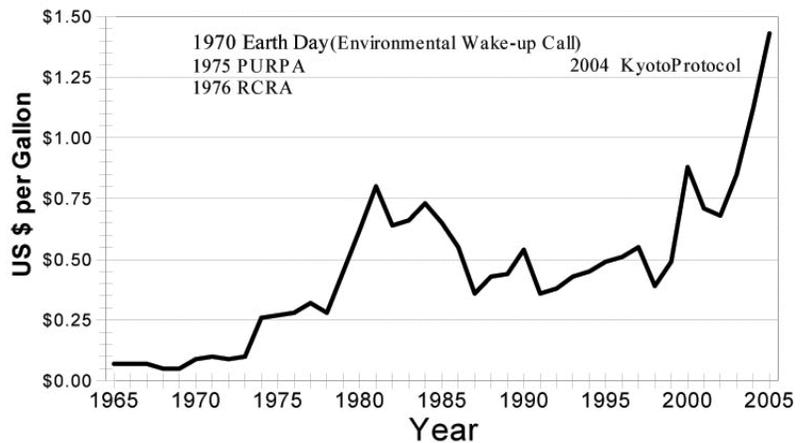


We have produced concrete products with superior characteristics (light weight/ high strength) from combustion residues after the removal of metals, and these are also symbolic of the foundation that a resource recovery approach to waste management and energy needs, provides for a sustainable future.

**Conclusion:**

At this point in time, with rising global energy demand, increased local concern for the environment, global warming mitigation agreements and government incentives for solving these problems, the prospects for the private sector solution providers to structure economically attractive alternatives is excellent. The vehicles we create to accomplish business objectives can be used to appropriately allocate the project risks, protect the participants, yield significant profits for all and provide an opportunity for major corporations to make significant contributions to improving our environment. We at Energy Answers look forward to the new challenges.

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Thank you for your time and attention.