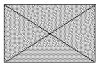
To: Hupp, Millan[hupp.millan@epa.gov]
From: Dean Alford
Sent: Thur 7/13/2017 7:50:32 PM
Subject: FW:
The Coal Win - Executive Summary 042617.doc
Coal Win Summary Statistics 121216.ppt
Augusta Wate to Energy Presentation 053117.pdf
C_Dean Alford_P E .vcf

Millan,

It was a pleasure meeting you last week at Gully Branch and I appreciated the opportunity to speak with Administrator Pruitt. Attached is a electronic copy of the material I gave you on the Coal Initiative we discussed. I have also attached a summary of the MSW-to-Energy Project for Augusta, Georgia I mentioned during our conversation. If possible, I would like to come to Washington and visit with the appropriate staff to discuss these projects. I believe both of these ideas are innovative and in line with the strategic thinking of Administrator Pruitt. I have attached my V-Card with all of my contact information.

Best regards,
Dean Alford



Municipal Solid Waste To Liquid Fuel and Bio Char

Augusta GEORGIA

Public/Private Partnership

ALLIED ENERGY SERVICES

Executive Summary

Project Summary

- **Current Situation**
  - 350,000 Wet Tons/Year of MSW
- **Proposed Approach**
  - 110,000 Wet Tons of MSW
    - Diesel Fuel: **8,485,265 Gallons/Year**
    - Bio Char: **14,279 Tons/Year**

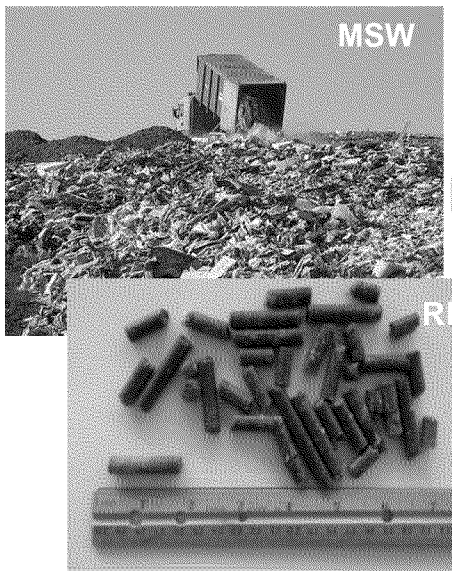
The Team

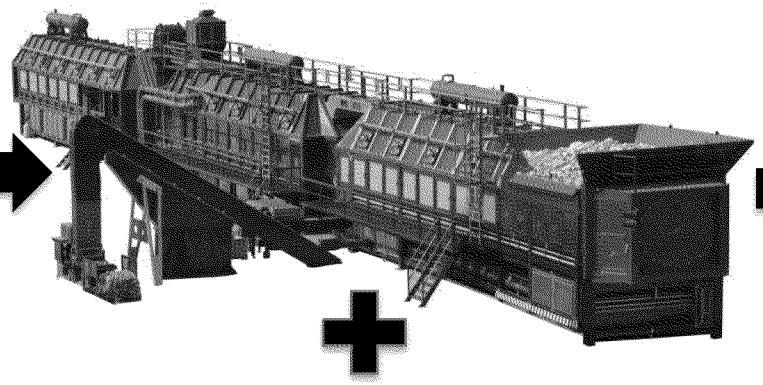
- ALLIED Energy Services, LLC
  - *Developer and Operator*
- Soukos Environmental USA, Inc.
  - *MSW Feedstock Technology Provider*
  - *Energy Conversion Technology Provider*
- AMEC Foster Wheeler
  - *EPC (Engineering, Procurement and Construction)*

Project Overview

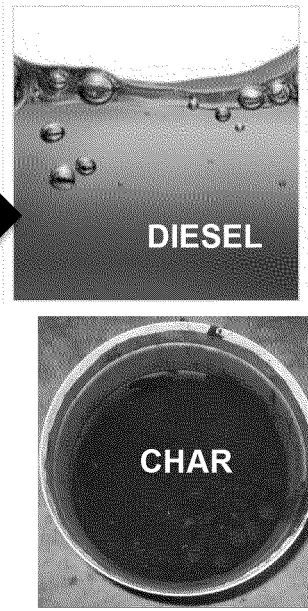
Soukos
AEOLUS & ARCHIMEDES

We take this…

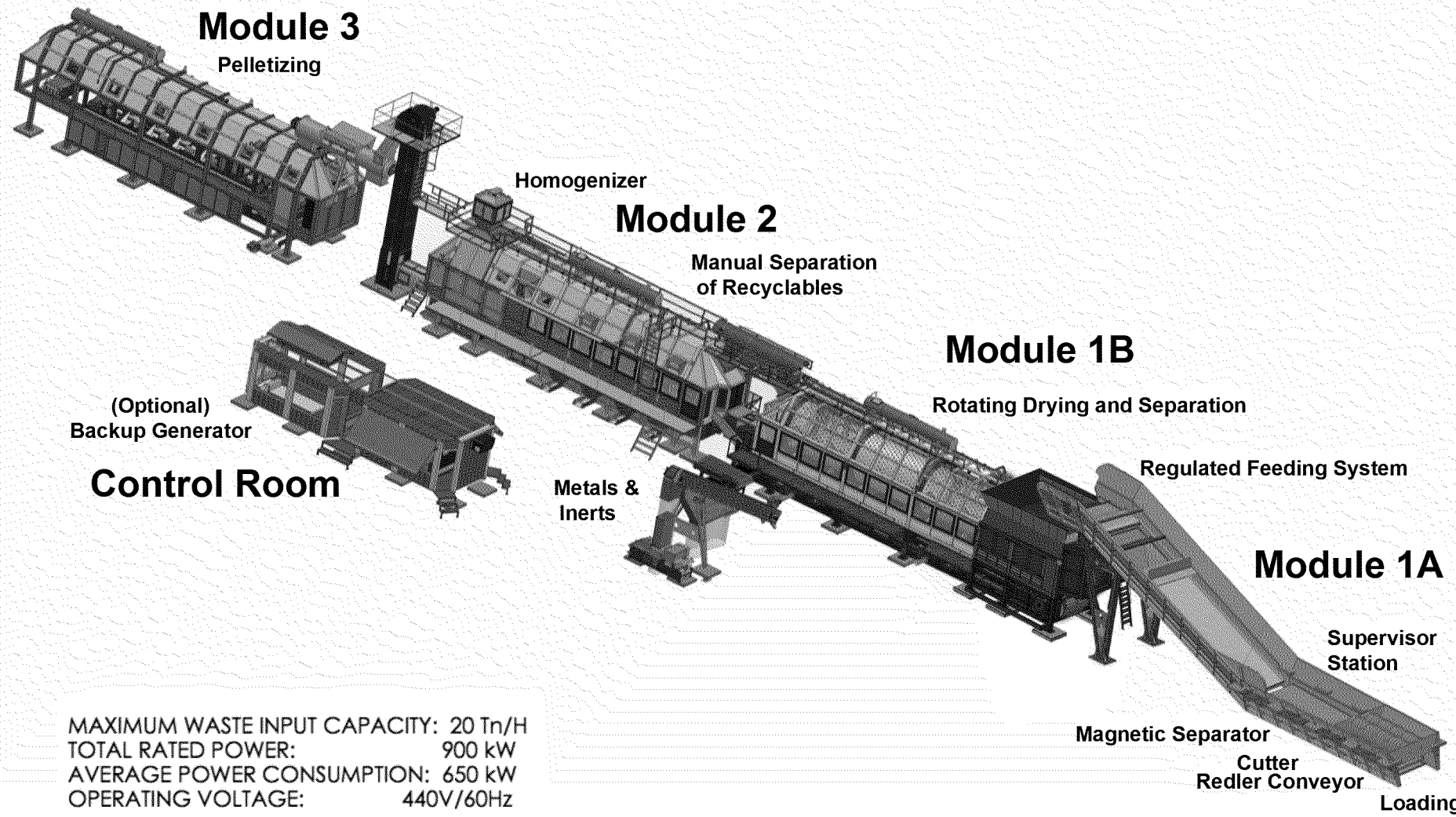




…and make this…

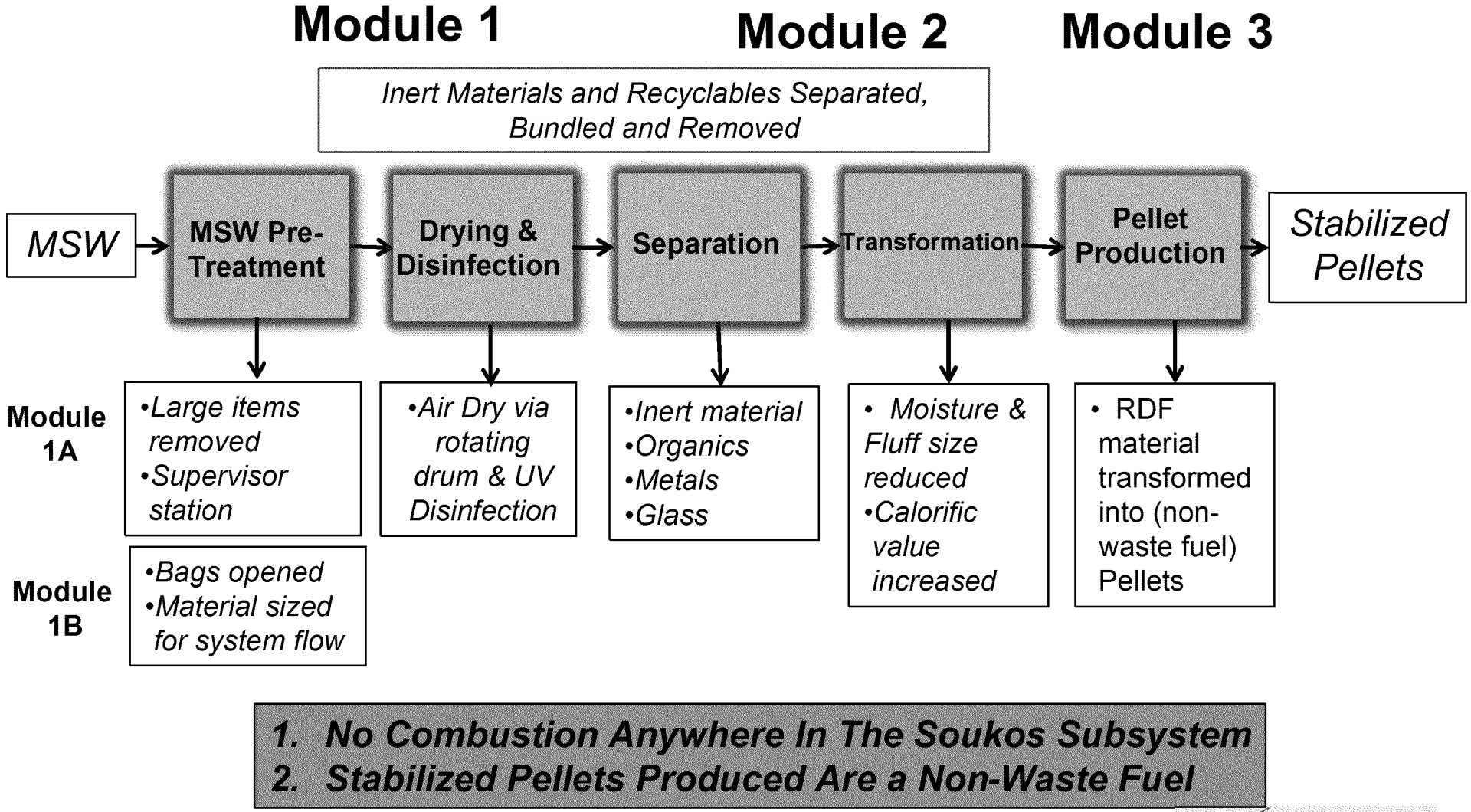


Soukos Environmental
Aeolus MSW to RDF Conversion



MAXIMUM WASTE INPUT CAPACITY: 20 Tn/H
TOTAL RATED POWER: 900 kW
AVERAGE POWER CONSUMPTION: 650 kW
OPERATING VOLTAGE: 440V/60Hz

Soukos Subsystem Process Diagram



1. No Combustion Anywhere In The Soukos Subsystem
2. Stabilized Pellets Produced Are a Non-Waste Fuel

Soukos AEOLUS Non-Waste Fuel

Soukos RDF Pellet Heating Value

Gross Heating Value 13,281 BTU/lb, 30.89 MJ/kg

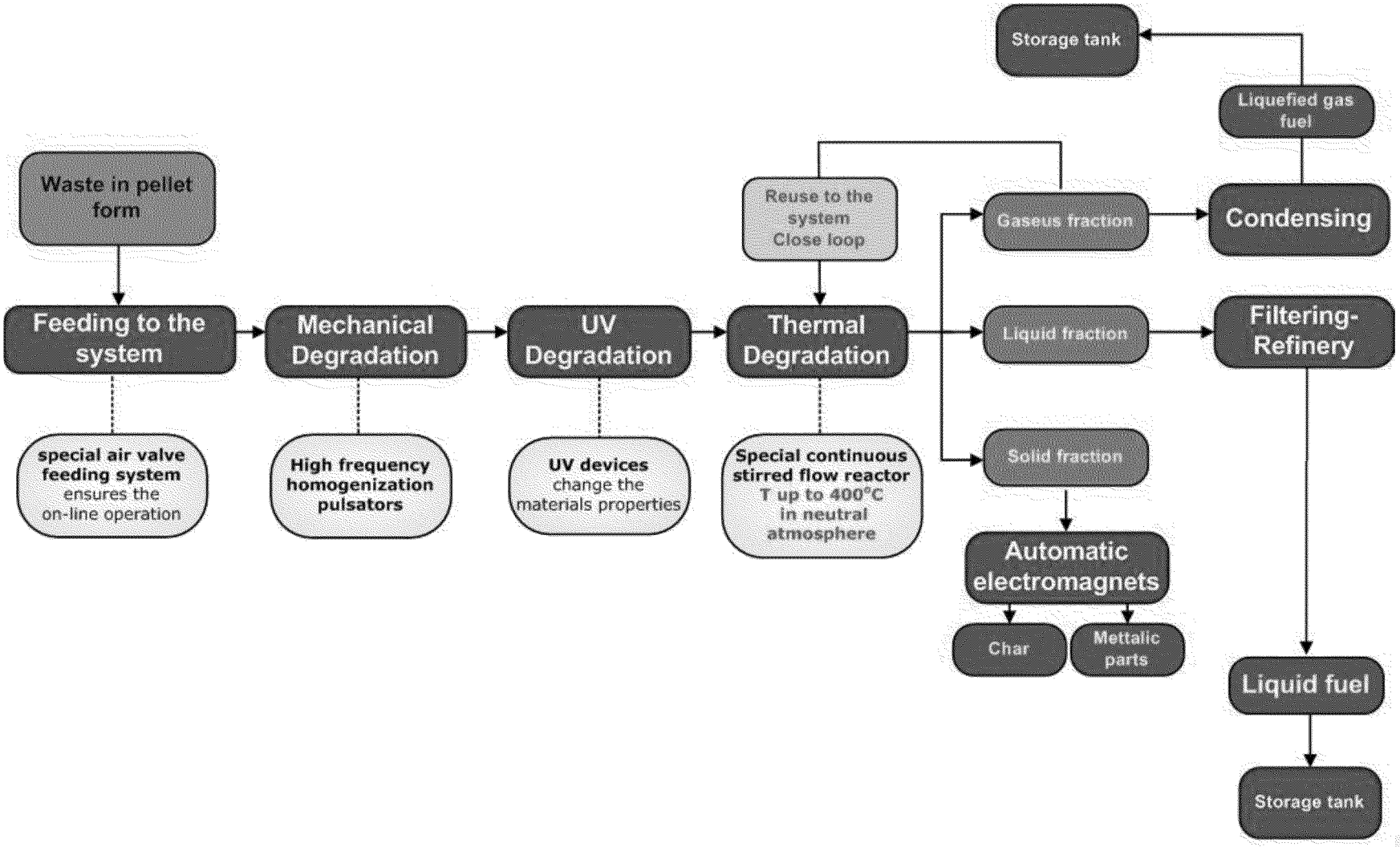
Net Heating Value 12,296 BTU/lb, 28.60 MJ/kg

*Based on testing at PPI on 10/26/16

Soukos Environmental ARCHIMEDES - Technology

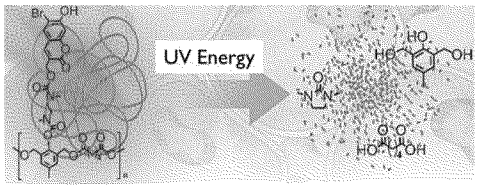
- RDF Pellet to Diesel Fuel System
  - Not a standard catalytic pyrolysis technology
  - Relatively low temperature process
    - MSW pellets with high plastics can be processed
    - This translates to high energy value fuel
  - No catalysts needed
    - No system shutdown to replace catalysts in reactor
  - High conversion rate
    - 60% MSW - pellet conversion
    - 45% by weight of diesel fuel produced with MSW pellets
  - 2 Modules plus Control Room

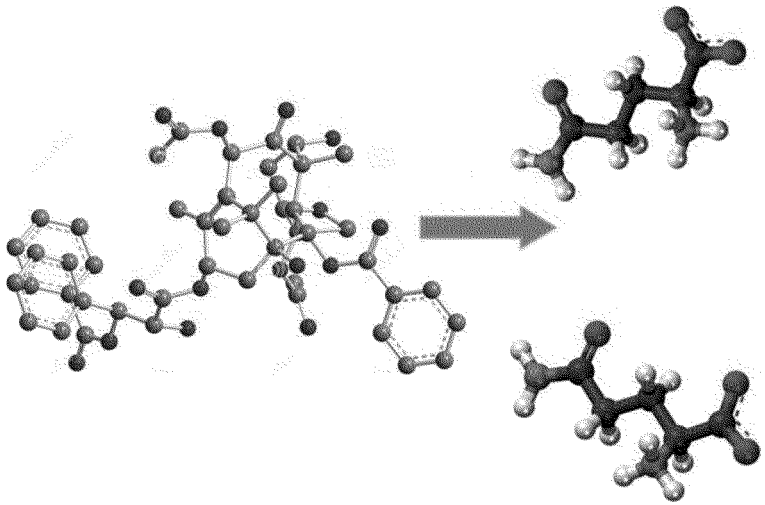
Soukos Environmental
ARCHIMEDES – Technology Flow Chart



ARCHIMEDES - Technology

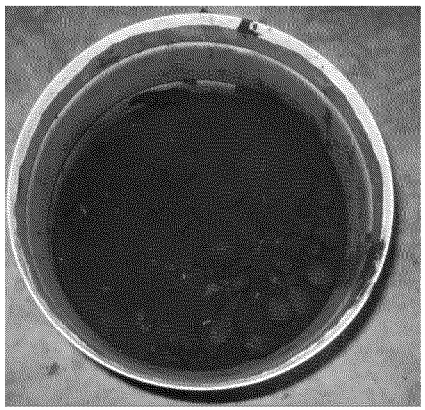
- Internal Unit Operations
  - Electromagnetic Energy Size Reduction of Pellets
    - High frequency energy applied to pellets
  - UV Degradation of Pellets
    - 170nm to 400nm wavelength breaks down chemical structure of organics
    - Imparts change of polymer molecular weights
  - Thermal Reactor
    - Continuous reactor
    - Neutral atmosphere
    - 250°C – 400°C
    - No catalysts
  - Condenser
    - Recovery of liquefied gas
  - Refining
    - Removal of high viscosity materials
    - Filtering of impurities



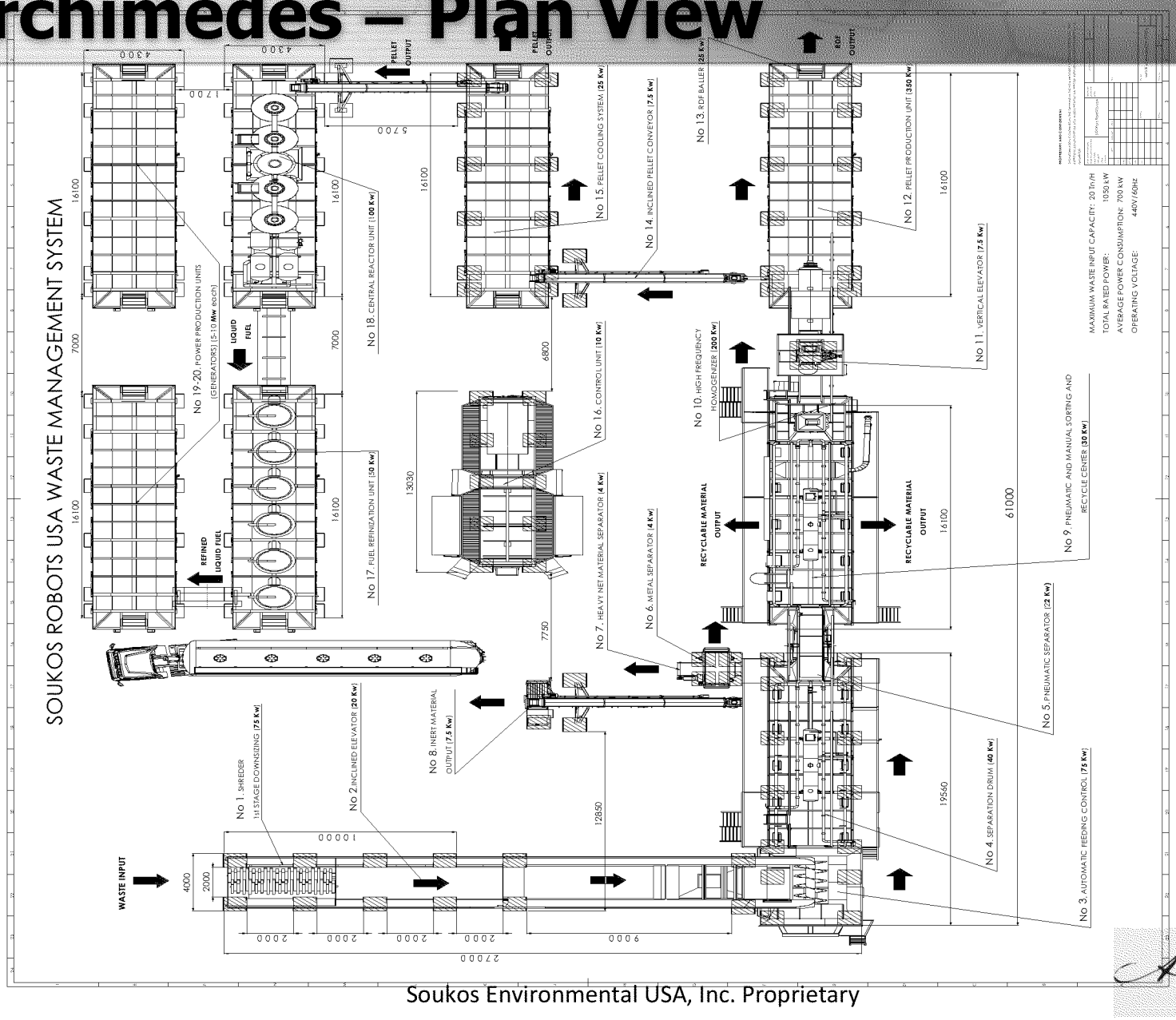


Soukos Environmental
ARCHIMEDES - Operations & Output

- Has operated in Burgas, Bulgaria for more than 4 years
- Syngas from process can be used to fuel reactor
- Continuous operations with minimal maintenance required
- 4 Operators & 1 Technician
- Diesel Fuel energy value of approximately 9,000 BTU/lb with MSW pellets
  - Diesel produced from biomass pellets will have a slightly lower energy value due to the lack of polymer materials
- Diesel Fuel produced in Bulgaria has been tested to ASTM D975 standards
- Char with commercial value



Soukos Environmental Aeolus & Archimedes – Plan View



The City of Augusta
Waste to Synthetic Fuel Facility

Total Site View

Project Benefits

- Jobs
- Environmental
- Environmental Services Operation
- Sustainability Objectives
- Education
- Economic
- Financial

Project Benefits

- **Jobs**
  - **65 Full Time Jobs/50 Indirect Jobs**
    - **Interns**
    - **Entry Level**
    - **Skill Labor**
    - **Engineers**
    - **Management**

Project Benefits

- **Environmental**
  - **Water Quality (Spirit Creek)**
  - **Air Quality (Non-Attainment Compliance)**
  - **Carbon Footprint**

Project Benefits

- **Environmental Services Operation**
  - **Landfill Reduction**
    - **110,000 Tons/Year**
  - **Air Space**
  - **Recycling Program**
  - **Landfill Gas for Electricity**
  - **Truck Washing and Dust Control**
    - **3,468,960 Gallons/Year**

Project Benefits

- **Sustainability Objectives**
  - Air Quality
  - Solid Waste
  - Renewable Energy

Project Benefits

- **Education**

- Skills Training – Quick Start
- Field Experience/Learning
- Certifications
- Internship
- Graduates

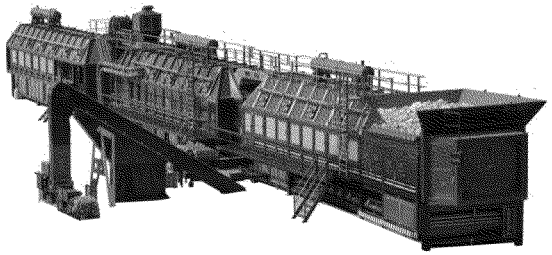
- Research
- Field Experience/Learning
- Internship
- Graduates

Questions?

Backup

Soukos Aeolus, Knossos & Archimedes MSW to Diesel Fuel and MSW to Products

Soukos Aeolus System

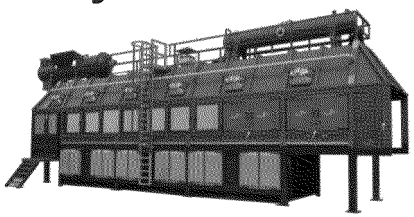


Municipality Landfill (MSW)

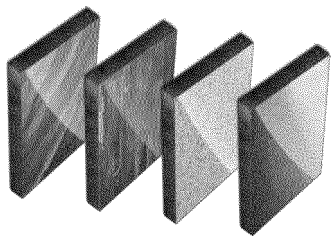
Output is RDF Pellets

Soukos RDF … let Heating Value
Gross Heating Val… 281 BTU/lb, 30.89 MJ/kg
Net Heating Valu… 96 BTU/lb, 28.60 MJ/kg
*Based on t… at PPI on 10/26/16

Soukos Knossos System

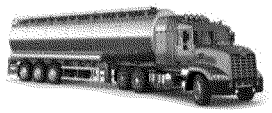


Output is Building Products



Soukos Archimedes System

Output is Diesel Fuel & Char

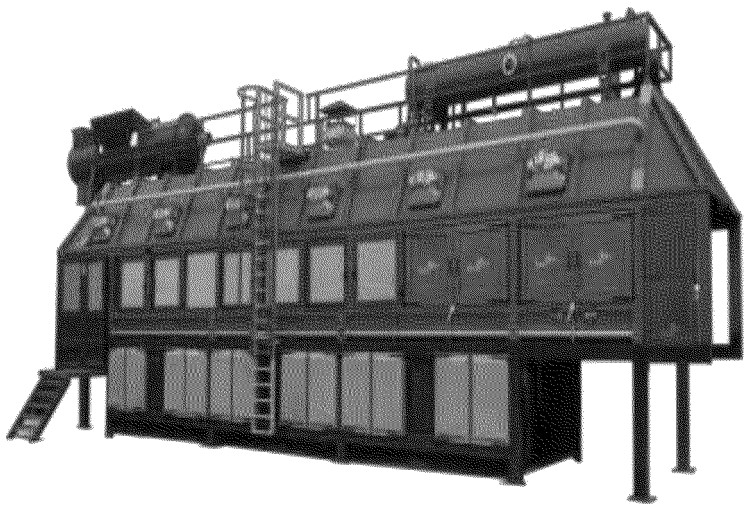


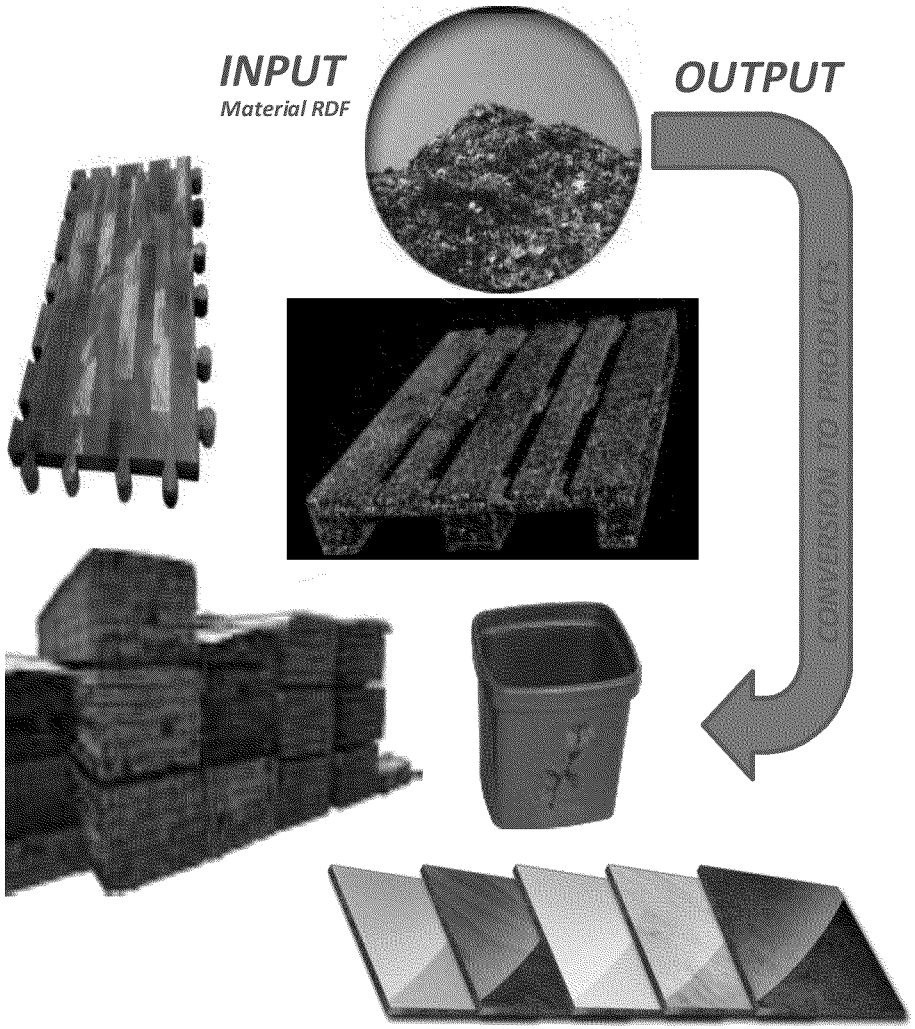
Oil Refinery

Knossos (RDF to Products)

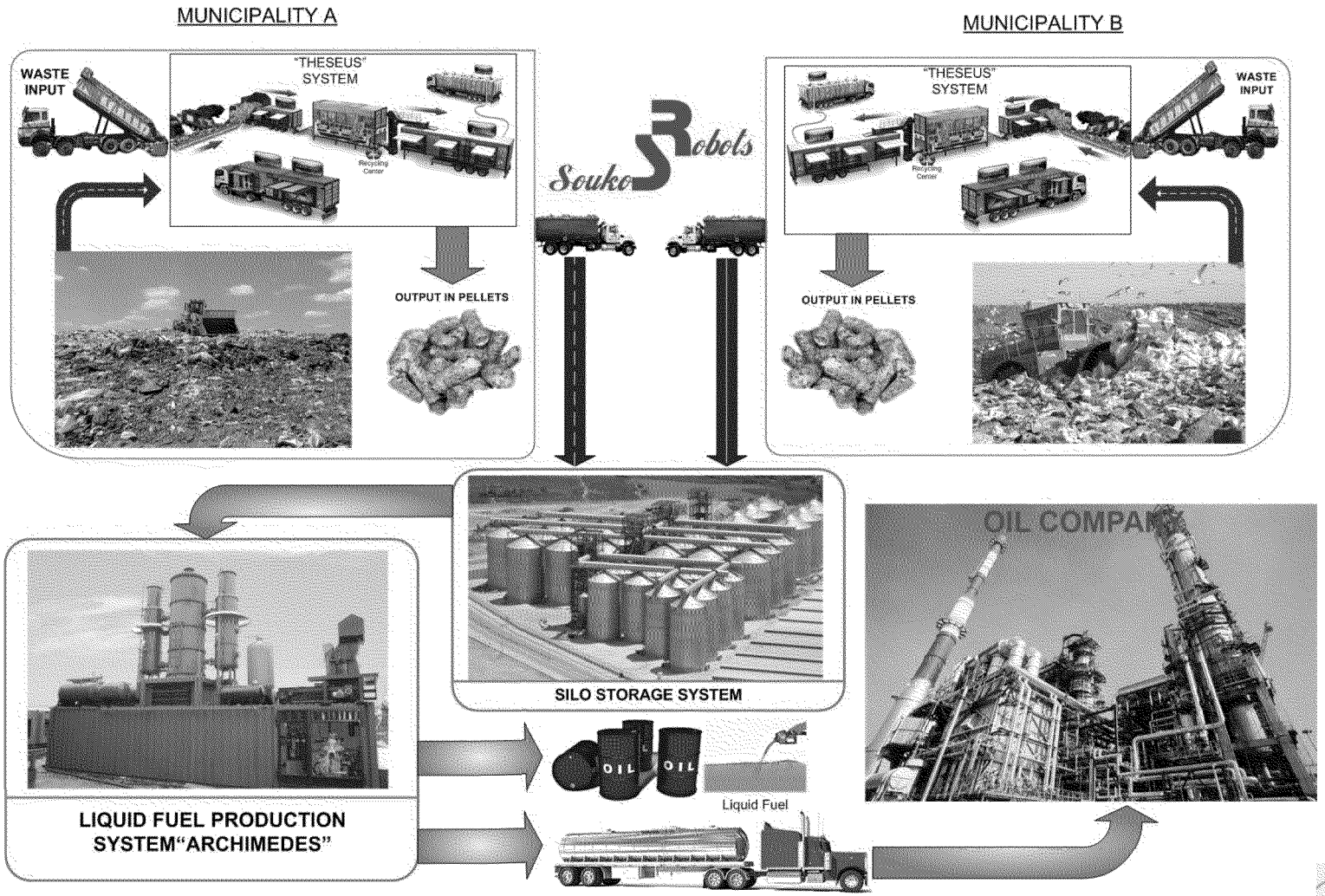
The "KNOSSOS" System is a mobile Unit, which utilizes the generated RDF material derived from the innovative Mobile MSW Treatment Systems "AEOLUS" of SOUKOS ROBOTS.

The system's capacity is maximum 10 ton/hr of incoming RDF materials





Soukos Aeolus & Archimedes
MSW to Diesel Fuel (Bulgarian Operation)



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X-MS-OL-DESIGN (CHARSET=utf-8)
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Last Revision
20170712T185929Z

Summary of Replacing Old Coal-fired Units with New "Plant Washington Clone" Units

Unit Size	>50MW	>100MW	>200MW
On-line Years	1950/60/70	1950/60/70	1950/60/70
No. Old Units	727	590	353
No. New Units	244	233	193
New MWs	207,400	198,050	164,050
Investment x $B	$585.6	$559.2	$463.2
No. Workers	390,400	372,800	308,800
Labor Wages x $B	$61.0	$58.2	$48.2

- We could replace the capacity of 727 power generation units (>50MW) built in 1950-60-70s with 244 "Plant Washington clones".
- This would require an investment of $585.6B.
- And would create 390,400 new jobs and $61.0B in construction wages.

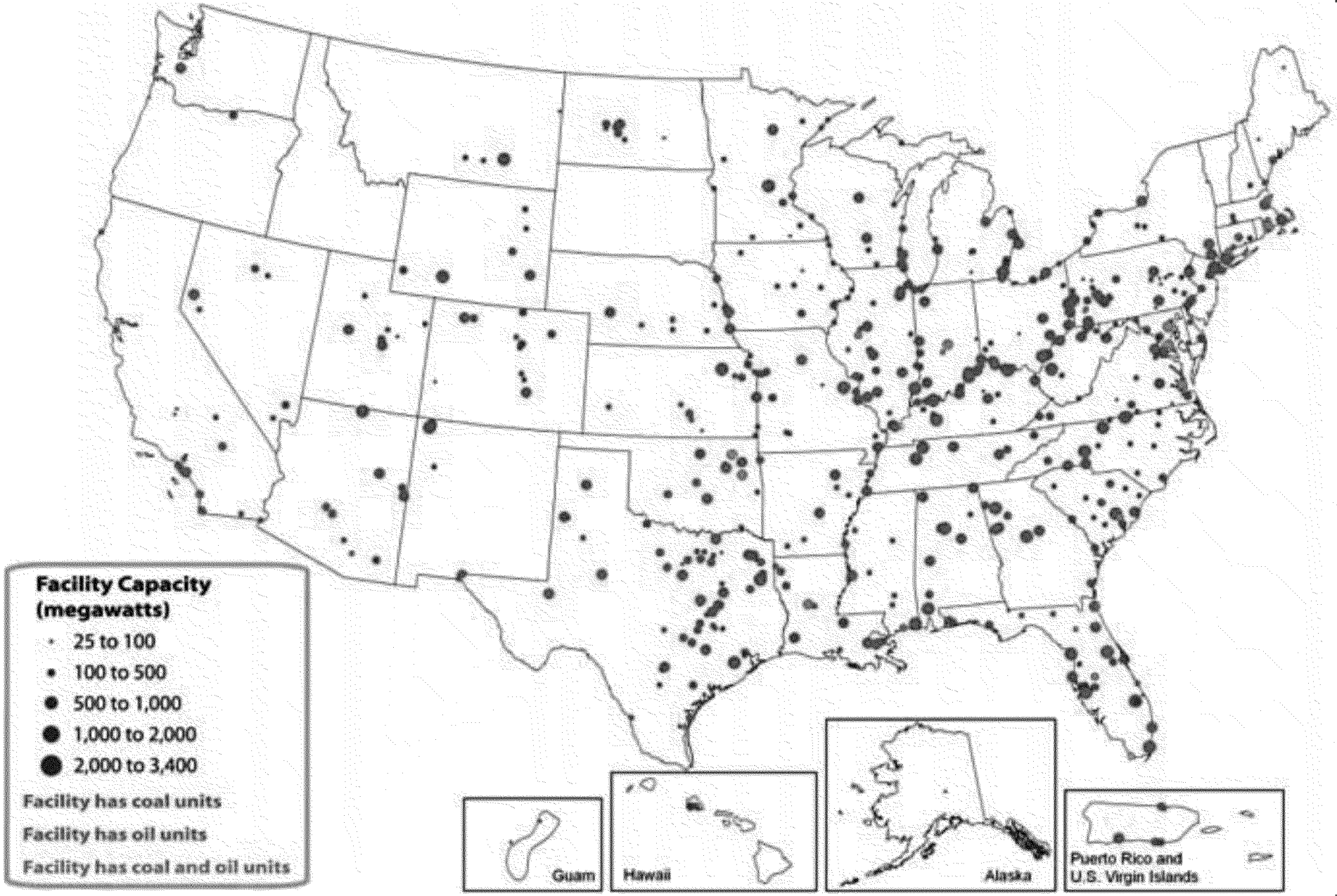
Reduction in Emissions Resulting from Replacing 727 Old Units with 190 New "Clone" Units

AFTER –Reduction in Emissions (Tons by Decade)							
Year On-Line	No. Clone Units	SO2 Tons Reduction by Decade	% Reduction by Decade	NOx Tons Reduction by Decade	% Reduction by Decade	CO2 Tons Reduction by Decade	% Reduction by Decade
1950	27	1,003,928	96.1%	208,995	85.7%	21,205,017	11.4%
1960	49	1,192,358	94.1%	323,750	83.8%	30,416,689	9.3%
1970	115	1,363,514	88.6%	501,069	77.2%	65,884,349	8.6%

AFTER –Reduction in Emissions (Cumulative)							
Year On-Line	No. Clone Units	Total SO2 Tons Reduction	% Reduction of Total (1950-2000)	Total NOx Tons Reduction	% Reduction of Total (1950-2000)	Total CO2 Tons Reduction	% Reduction of Total
1950	27	1,003,928	20.6%	208,995	11.3%	21,205,017	1.1%
1950+60	76	2,196,286	45.0%	532,745	28.9%	51,621,705	2.7%
1950+60+70	190	3,559,799	73.0%	1,033,813	56.1%	117,506,054	6.1%

Replacing 727 old units with 190 new "clone" units would remove from the atmosphere:

- **3.6 million tons SO2,**
- **1.0 million tons NOx**
- **117.5 million tons CO2.**


Facility Capacity
(megawatts)
25 to 100
100 to 500
500 to 1,000
1,000 to 2,000
2,000 to 3,400
Facility has coal units
Facility has oil units
Facility has coal and oil units
Guam
Hawaii
Alaska
Puerto Rico and
U.S. Virgin Islands

The Coal Win - Executive Summary

In order to stimulate and sustain the coal industry, a new national initiative – *The Coal Win* – needs to be launched that focuses on restoring and growing clean coal-fired electric generation as part of the country's energy portfolio. In his promise to *Make America Great Again*, President-elect Trump stated very clear goals of bringing industry back to the U.S., providing incentives to keep manufacturers from leaving the country, improving public infrastructure, facilitating growth and putting people back to work.

For long-term sustainability of his plan, aging coal-fired power plants must be replaced with clean coal generating facilities and the regulatory environment should help reinvigorate a coal industry that has been under attack for the past eight years.

Fulfilling President Trump's vision

An increase in America's energy generating capacity to meet growing long-term manufacturing needs is central to fulfilling Predident Trump's vision and coal is an essential component of the equation. It is the most abundant, reliable electric generating fuel supply in America and one of the most cost-effective. Supplies from U.S. mines are enough to meet the nation's needs for more than 300 years, making it much less vulnerable to supply shortages and price spikes than other baseload power sources.

Clean coal would stimulate the U.S. economy with a total investment of more than $585 billion in new facilities and would generate $61 billion dollars in new construction wages for 390,400 new jobs. In addition, hundreds of thousands of positions would be created and billions more in revenues realized across ancillary industries supporting new plant construction and plant operations.

Environmental impact

The problem at present is, most coal-fired facilities in the U.S. date to before 1980, meaning they were built to much lower emissions standards, and even after upgrades, are still inefficient and significant sources of air pollution. However, older coal generating plants being decommissioned can be replaced with clean coal technology that will extend the life of valuable utility assets and provide a broader societal benefit.

Clean coal plants reduce emissions and create electricity far more efficiently than their predecessors. At present, 727 coal-fired power plants are in operation that came online in the U.S. prior to 1980. Collectively they generate 207,673 megawatts of electricity. This entire capacity can be replaced by 190 clean coal power generation facilities.

A viable solution

This isn't pie-in-the-sky. The technology is proven and the blueprint exists in Plant Washington, a planned clean coal generation facility, permitted by the state of Georgia, which could serve as the first "replacement" plant and a model for the industry. The developer of Plant Washington proposes a national initiative in which the design criteria for the highly advanced facility would be shared in the public domain for use by utilities across the country.

Replacing older plants with facilities built to Plant Washington's specifications would produce more electricity using less coal with significant environmental benefits of cleaner air and water. Collectively, the replacement facilities would reduce annual emissions:

- Sulfur dioxide by 73%
- Nitrogen oxide by 56.1%
- Carbon dioxide by 6.1%
- Mercury by as much as 90%

Conclusion

Restoring coal to its rightful place in America's energy portfolio, in which all generation sources are essential, is a winning strategy for several reasons. It will help the president-elect follow through on his campaign promises to voters across America and in the swing states that proved decisive in his election. Coal miners will be returning to work and manufacturers will be moving foreign operations back to U.S. soil while corporations with plans to relocate overseas will stay home in large part because of access to affordable and reliable power.