



Your waste ... my gold

Converting waste materials
into
Clean Fuel

Jeff Surma
May 19th, 2009

Agenda

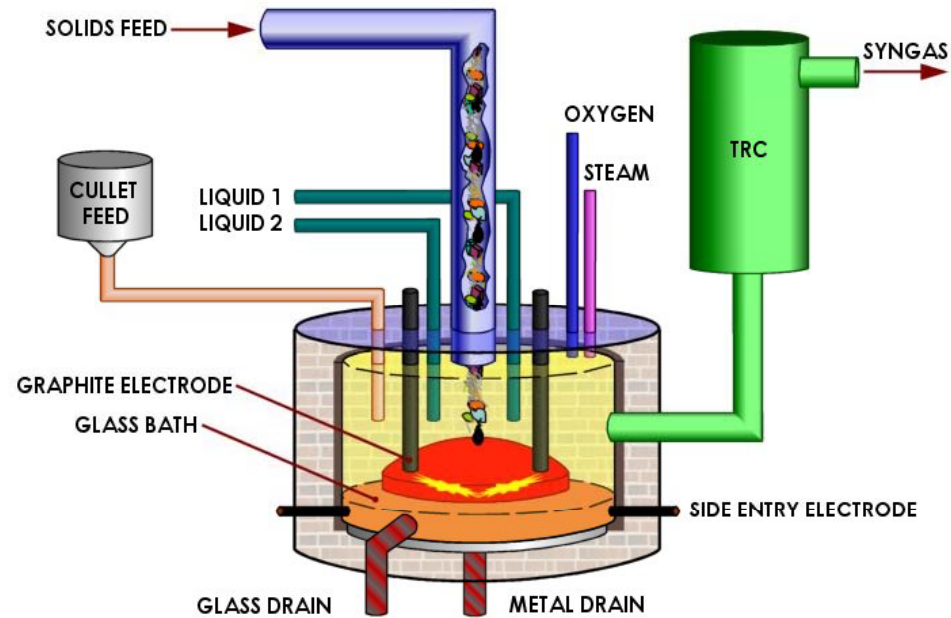
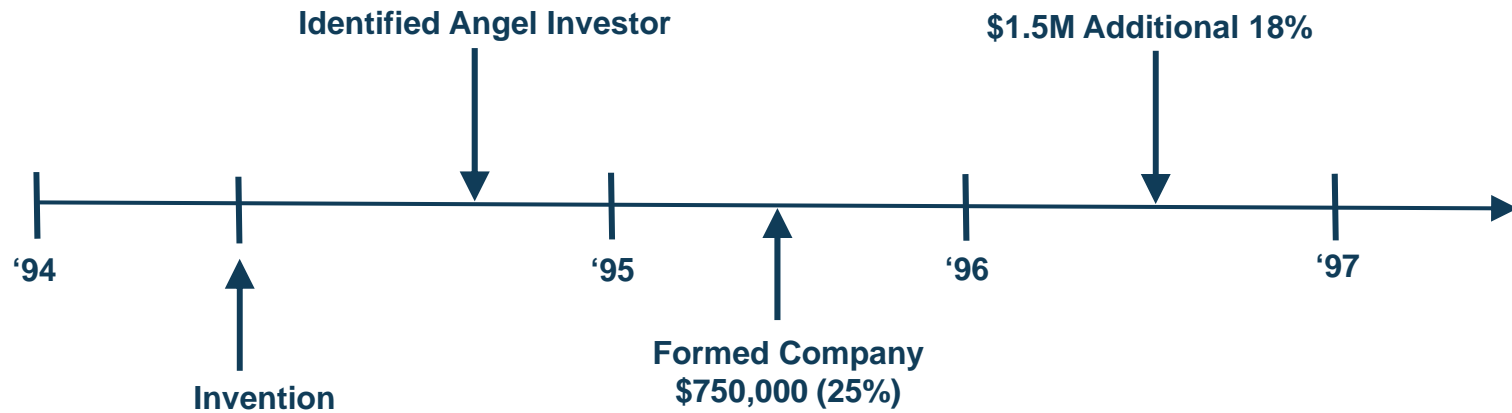
- InEnTec's timeline
- InEnTec' technology
- The waste-fuel business
- InEnTec's Business now and future

Who is InEnTec LLC

- Founded in 1995; (formerly Integrated Environmental Technologies LLC)
- Exclusive license for Plasma Enhanced Melter™ (PEM™) technology
- InEnTec has over 42 patents on PEM™ related technology
- PEM™ builds on 15 year \$300 million dollar DOE-sponsored research conducted at the Pacific Northwest National Laboratory (PNNL) and MIT

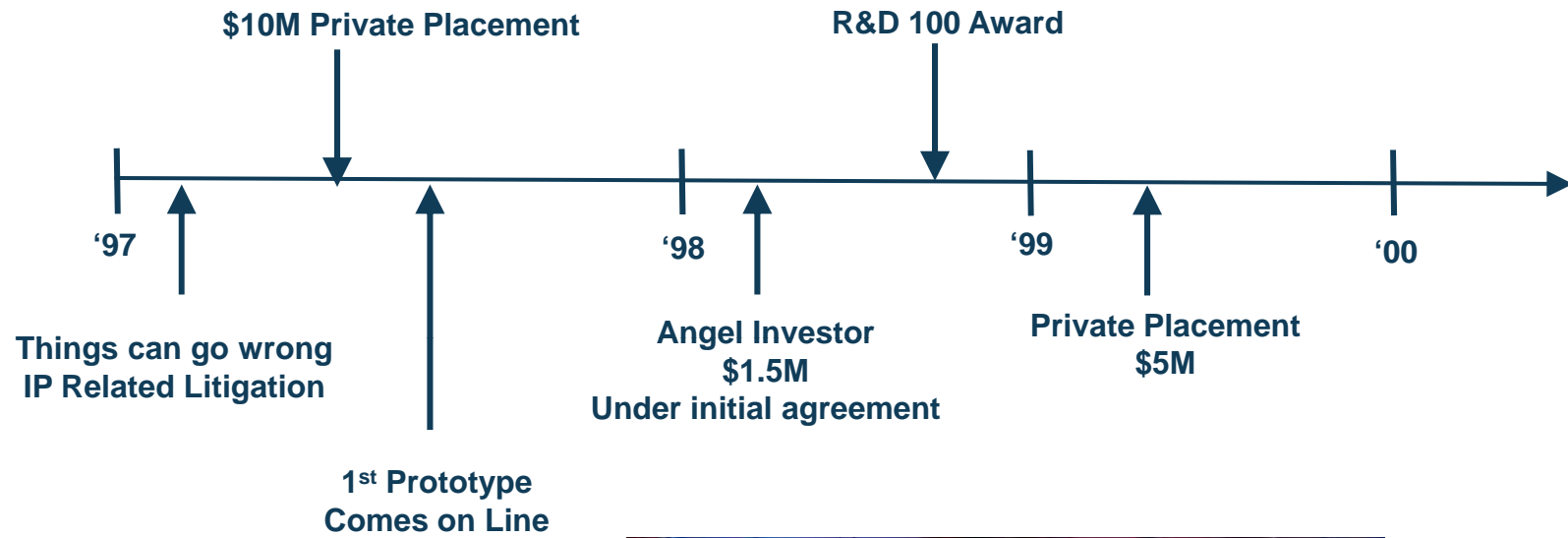
InEnTec History

(Company formation and seed capital stage)



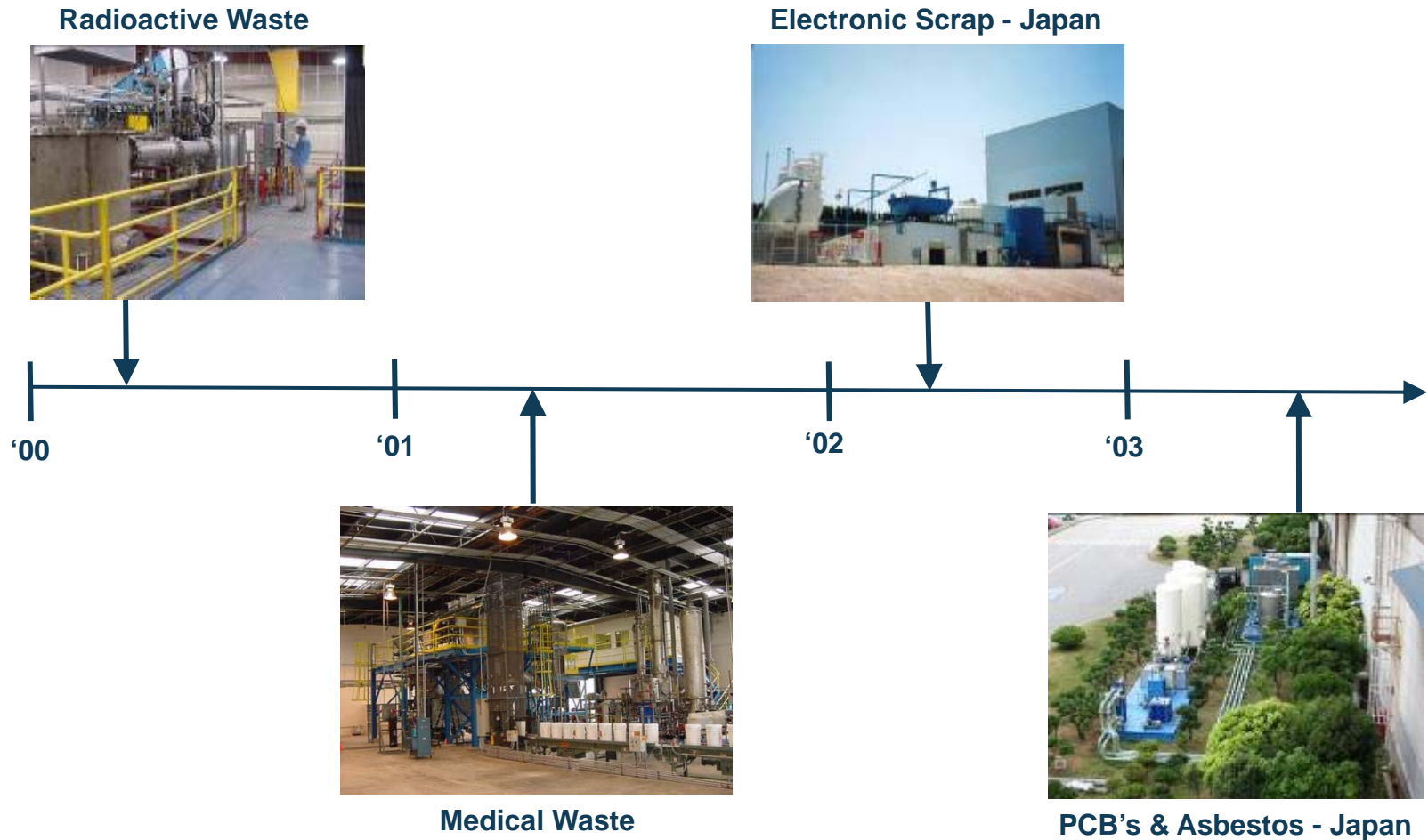
InEnTec History

(R&D stage)



Early Commercialization

(Equipment Sales and Licensing Business Model)

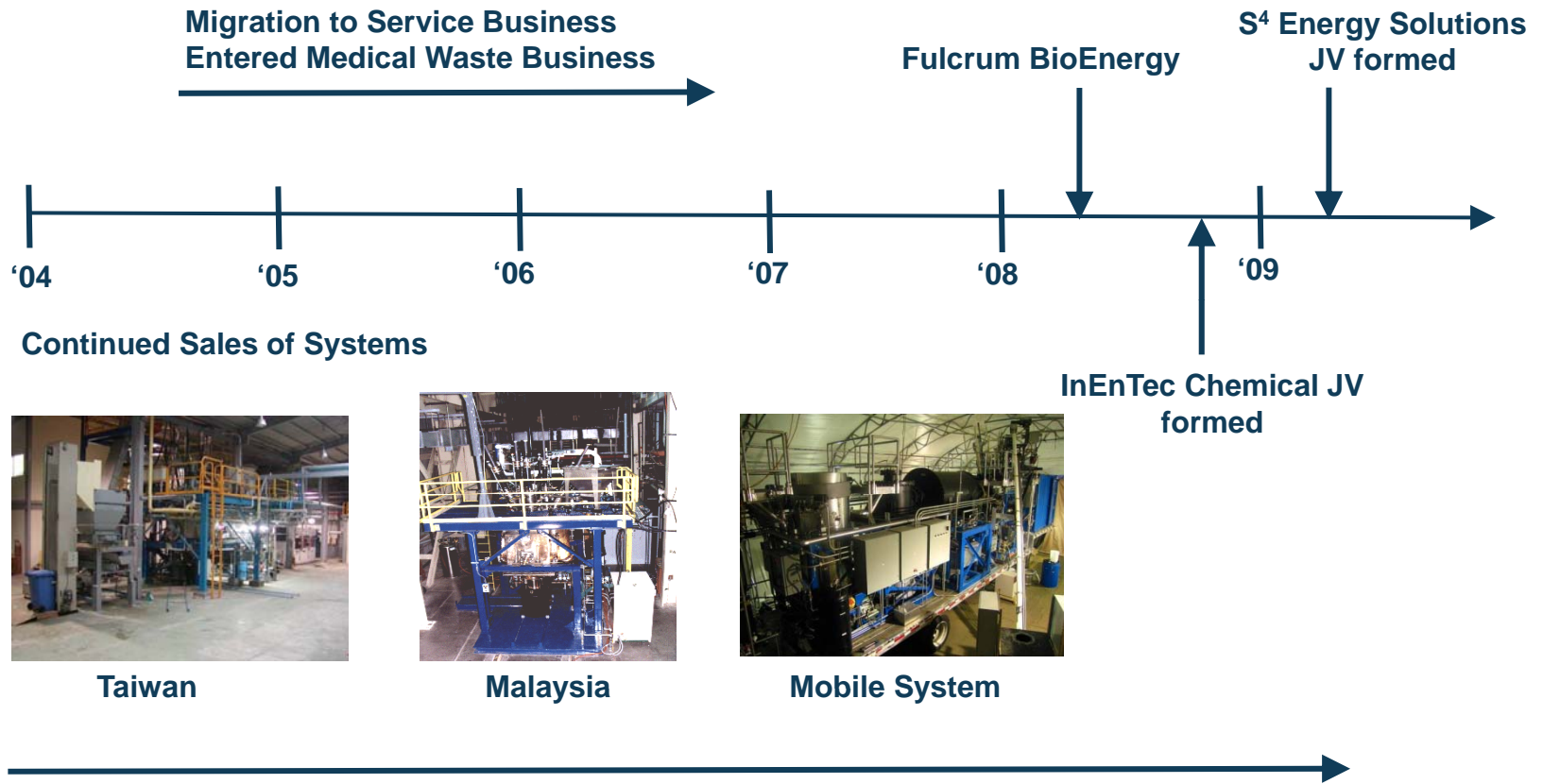


What Can Go Wrong Will Go Wrong

- Allowed customers to make decisions for us during early commercial deployment
- Did not maintain control over technology
- Restructured future contracts to maintain technical oversight on all sales
- Continued sale of equipment business model

InEnTec History

(Transitional Phase)



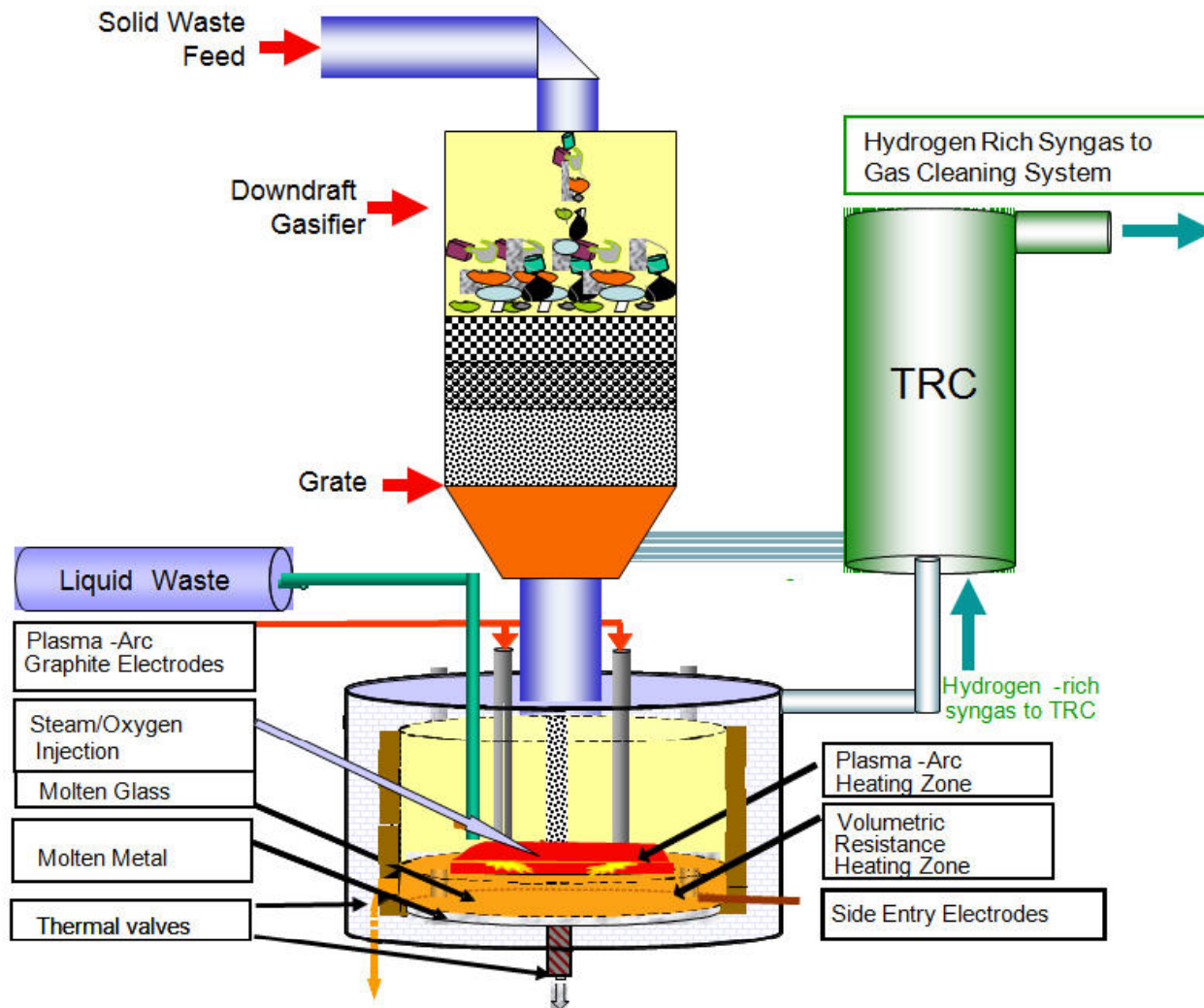
Raised an additional ~\$23 million for a total of \$42 million to date

InEnTec's Technology

Plasma Gasification

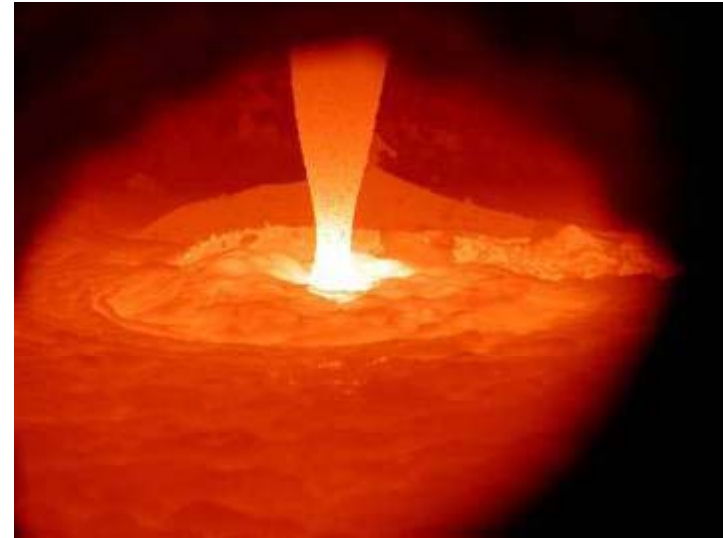
- Plasma is the 4th state of matter, heated, ionized, electrically charged gas resulting from an electrical discharge (e.g. lightning, the sun)
- Plasma gasification is a process by which carbonaceous materials are converted into clean synthesis gas (syngas), by exposing the material to extreme temperatures, between 3000°C and 14000°C, in an oxygen deprived environment. At these temperatures the materials break down to their elemental form, creating a syngas composed primarily of Hydrogen (H₂) and CO. The syngas can then be converted into a wide variety of energy products

InEnTec PEM™ Gasifier System



Waste Materials Tested in the PEM™

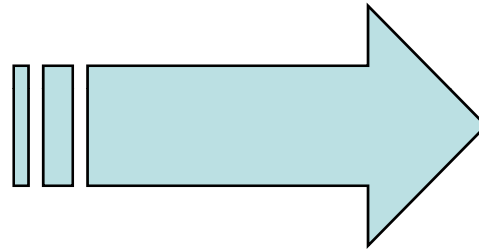
- Municipal Solid Waste
- Non-Hazardous Materials
 - Electronic Waste
 - Medical Waste
- Chlorinated hydrocarbons
- Non-chlorinated hydrocarbons
- PCB
- Mercury, Lead, and Cadmium containing wastes
- Inorganic material
- Batteries
- Asbestos
- Autoshredder residue
- Ash



Waste volume reduction . . .



1 Ton = 182 Cu Ft



2 Cu Ft
Recycled

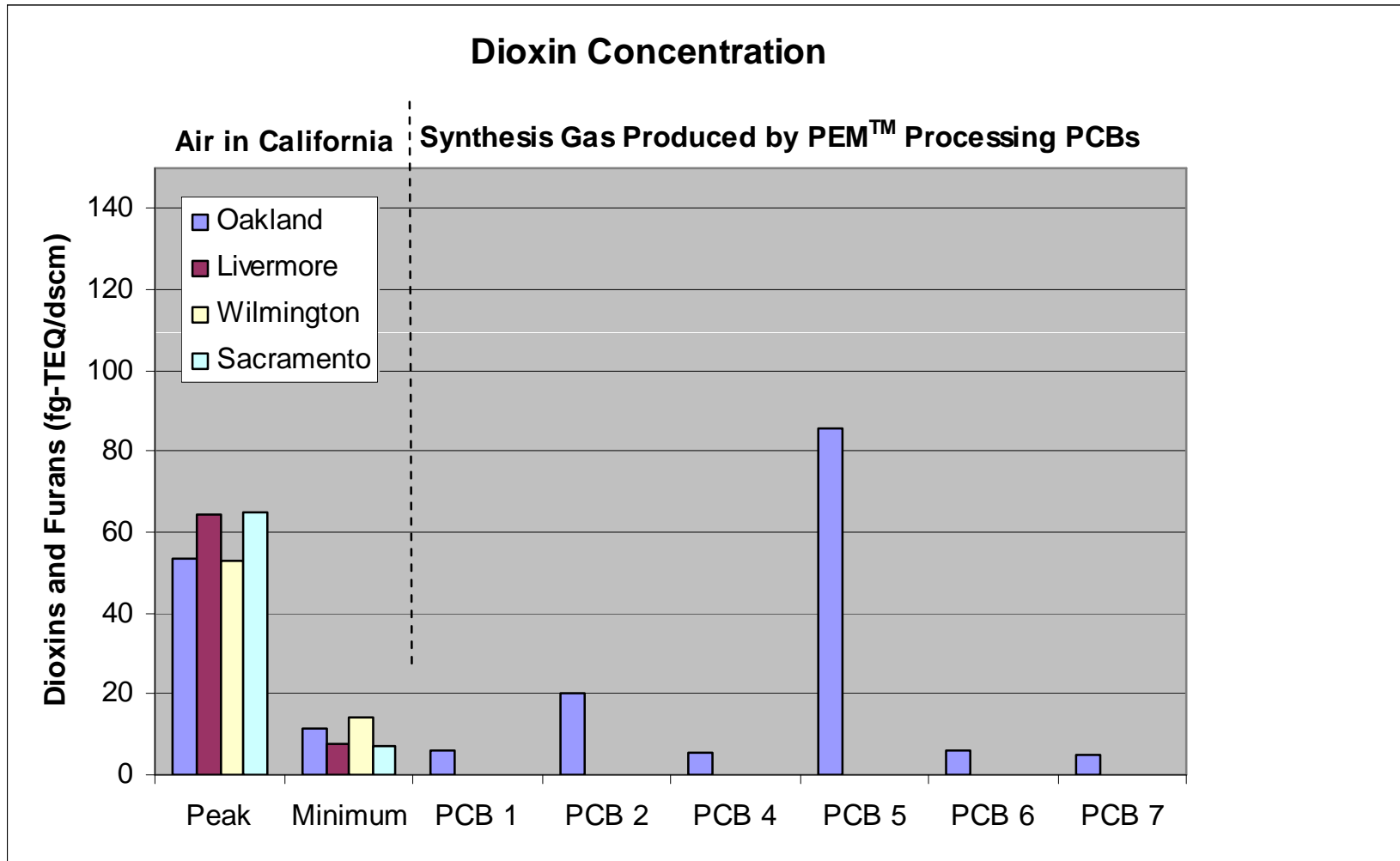
Glass and Metal Products



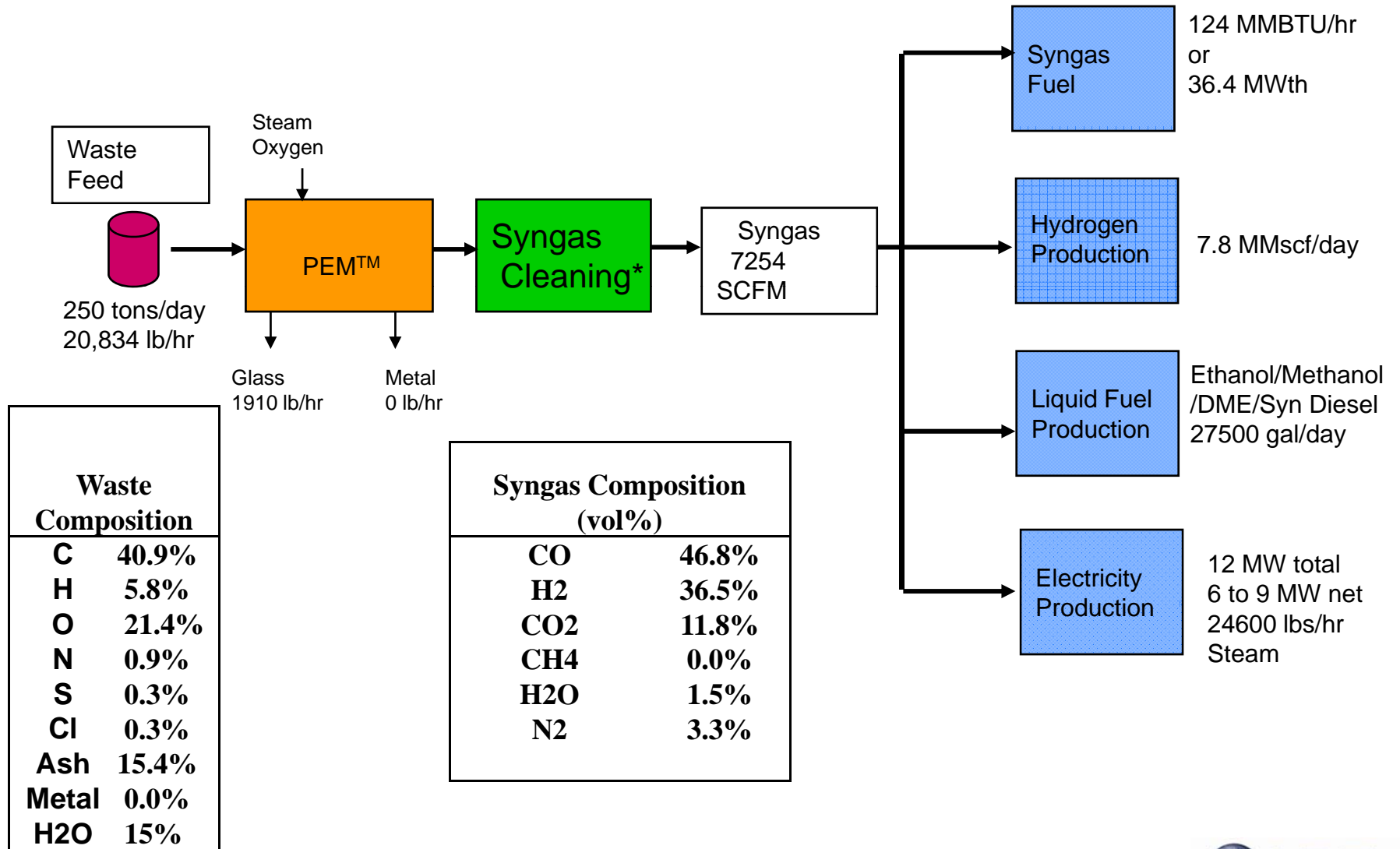
Environmental Performance

- Demonstrated Destruction and Removal Efficiency (DRE) >99.999999% for chlorinated hydrocarbons
- Met EPA performance requirements by large margins (DRE, Dioxins, Metals, etc)
- No need for permits in certain applications

Syngas Dioxin Levels Similar to Ambient Air



Waste to Fuels via Gasification



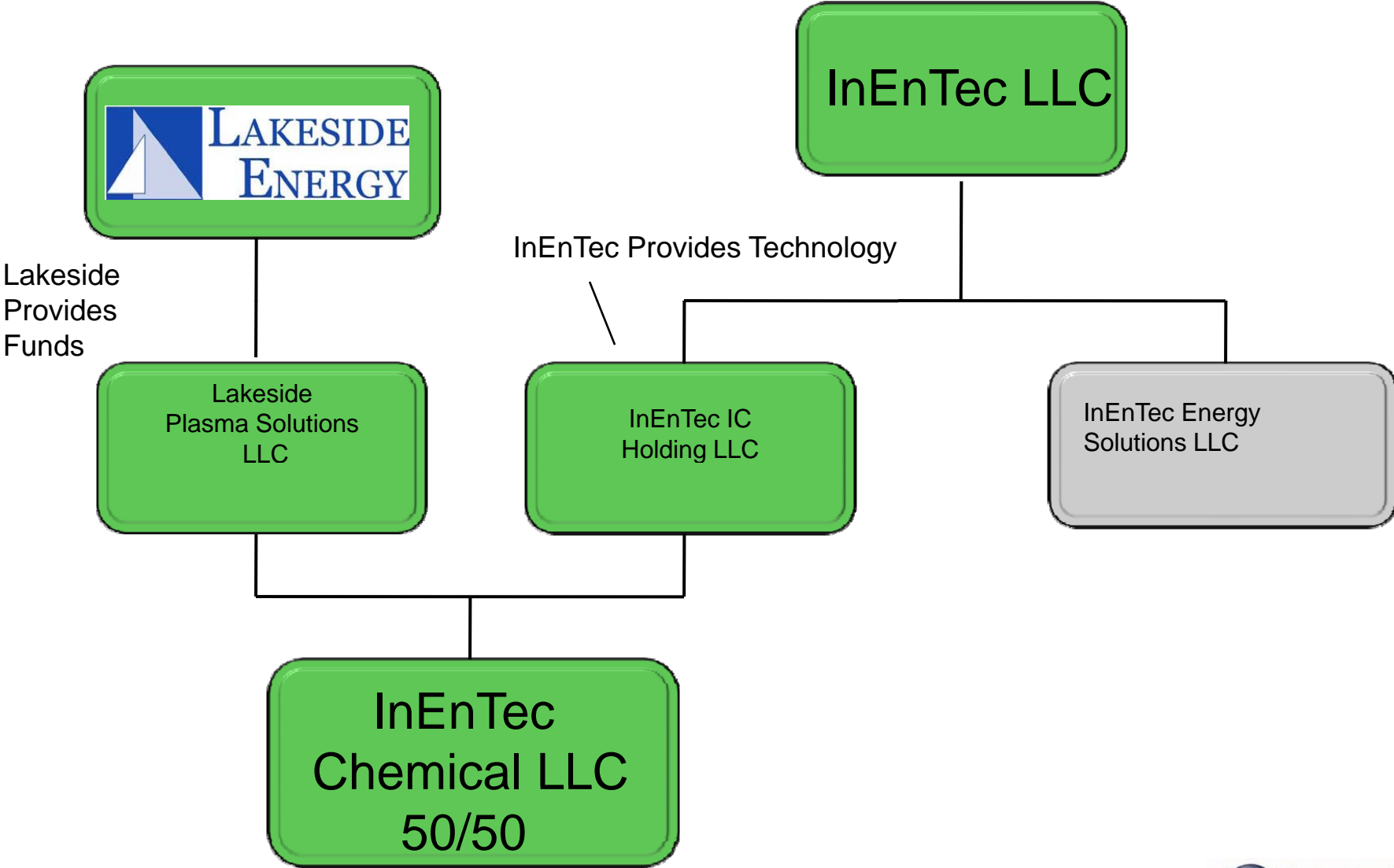
Large Renewable Feedstock Supply

- US Municipal Waste
 - Non-recycled: 160 million tons per year
 - Alcohol Product Potential: 16 Billion Gal/yr
 - H2 Production Potential: 13,000 MMSCFD
- US Industrial Waste
 - 6.9 Billion tons per year total (~500 million tons suitable for conversion)
 - Alcohol Product Potential: 50 Billion Gal/yr
 - H2 Production Potential: 40,000 MMSCFD

InEnTec Company Structure Today and



InEnTec Chemical LLC – JV with Lakeside





Vision: To create a paradigm shift in the global chemical industry. What once was considered "waste" is now thought of as valuable product, and InEnTec Chemical is the undisputed leader in residual value recovery in the worlds chemical markets.

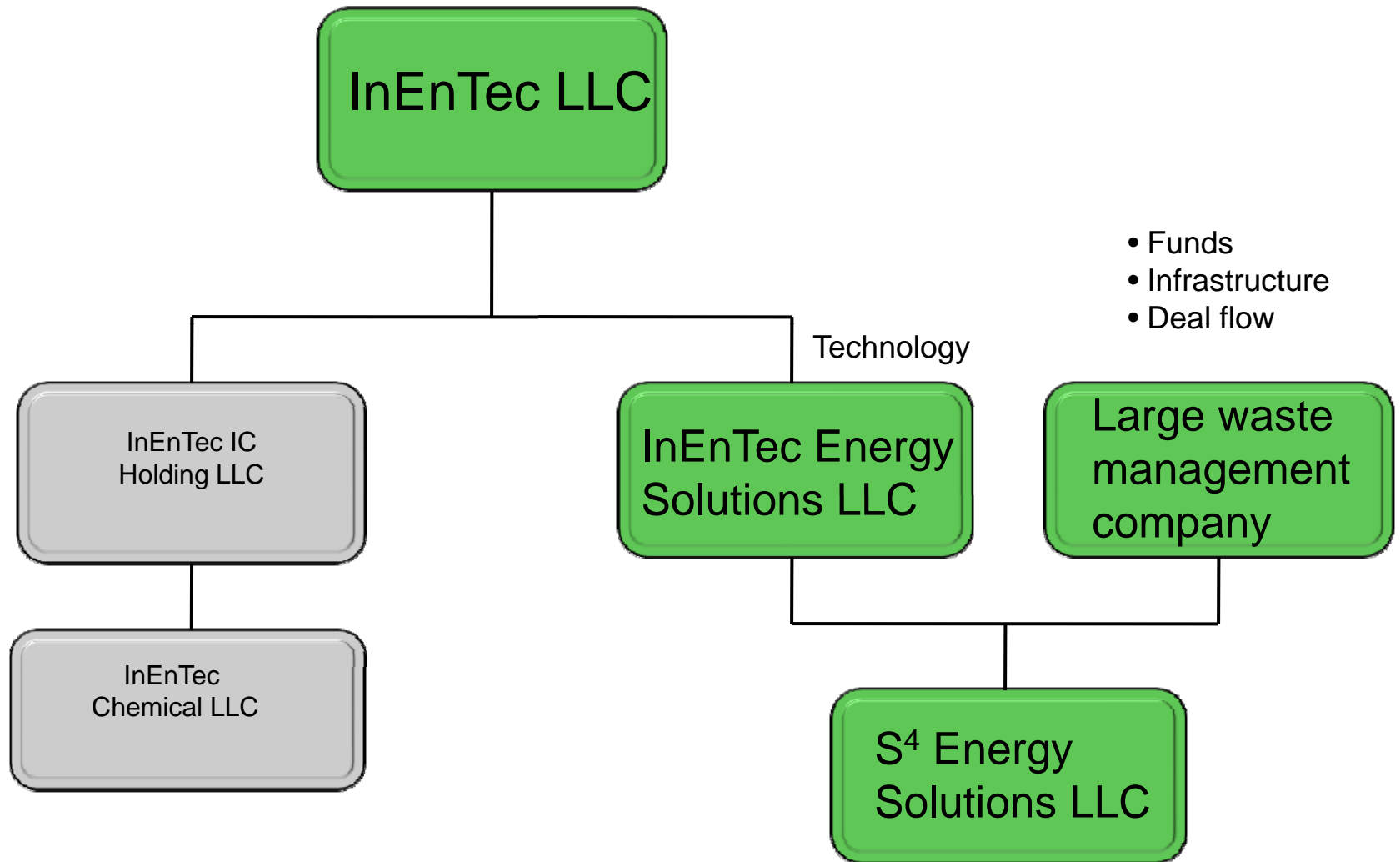
InEnTec Chemical Midland – Construction April 8th





S⁴ Energy Solutions will build, own and operate facilities using Plasma Enhanced Gasification™ for the conversion of waste and biomass into clean alternative fuels reducing the nations dependence on foreign oil while dramatically reducing harmful environmental emissions and GHG emissions.

Joint Venture with Large Waste Management Company



S⁴ Energy Solutions – Diversified Options

- S⁴ Energy Solutions Energy Conversion options
 - Conversion of waste into clean transportation fuels (i.e. ethanol, methanol, DME, etc)
 - Conversion of waste into hydrogen for large hydrogen consumers (i.e. refining industry)
 - Conversion of waste into clean syngas fuel
 - High efficiency electrical production
 - Efficient Energy storage at Power Plants
 - Mixed fuels facilities (i.e. coal, biomass, MSW)
 - Distributed conversion of stranded electrical production (i.e. wind energy into liquid fuel)

Fifth Scale Demonstration (Richland, WA)

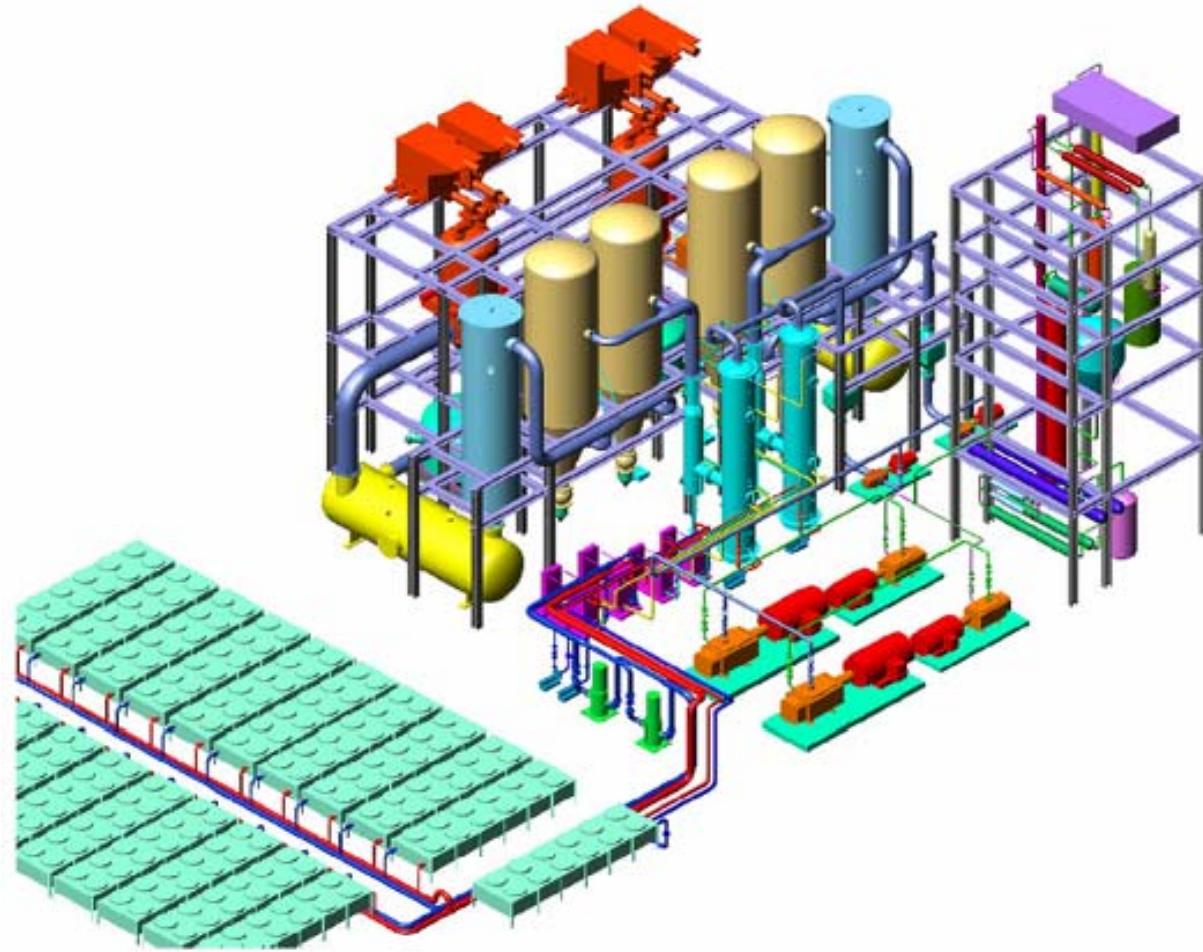
- System capacity = 25 tons per day of feed materials
- Equivalent alcohol production capacity of about 1 million gallons per year



Fifth Scale Demonstration



InEnTec 250 Ton Per Day System



Lessons Learned

- Odds have it ... it will take longer than you ever thought
- Take the money when you can!!!
- In a crowded IP field, plan for IP related issues
- Do not let your customers guide your business ... stay focused
- Control the technology during early stage commercialization
- Don't be afraid of sharing in the success ... a smaller part of something is always better than a large part of nothing

The End