

Greater Houston By-Product Synergy Project

Year Two, 1st Working Meeting Notes
April 26th, 2011

Introduction

The Greater Houston By-Product Synergy Project has two new participants: Goodwill and Procter & Gamble (P&G). While Goodwill was not able to attend, Marvin Sims, from P&G's Global Asset Recovery Purchases Program, gave an overview of P&G's sustainability work – including compliance with Extended Producer Recycle (EPR) requirements in Europe which drive smaller packaging. P&G just published their 2020 Sustainability Goals which include zero landfilling and zero waste as well as a commitment to renewable energy. P&G currently has nine zero waste manufacturing facilities worldwide. Asset Recovery Purchasing works on converting off-quality scrap materials into other products (ex: off-quality shampoo becomes car wash). P&G has a large list of materials available for potential synergies: dust fibers, spent fuels, paper cores, etc. P&G has joined the US BCSD and is participating in BPS at the National Level – all 42 of their plants will be part of the CIRBUS database.

Round Table:

Participants in the meeting went around and answered the following questions:

- Name top by-products and/or resource inputs that present the greatest challenges/opportunities
 - Description of material or resource
 - Estimated amount and frequency
 - Ideas for possible synergies

CEMEX, Greg Hein, Alternative Fuels Project Manager

CEMEX is focusing their energy on combustibles (anything with heat value) to replace primary fuels; the goal is to substitute 60-70% of fuel with alternative fuels. They have 14 plants and 21 kilns (11 currently operating) throughout US with a lot of capacity to increase operations. They're looking for very cost-effective solutions that are cheaper than conventional fuels. Right now, CEMEX is primarily looking for off spec tires for on site or off site processing into fuel. Current synergies include Cherry Demolition supplying CEMEX tires in whole form. Plans are to expand to off-spec chemicals, paper, and plastics. Biggest challenge has been the freight costs; bringing the material to Balcones, the closest CEMEX plant to Houston, is expensive.

Thompson and Knight, Bill McDonald

Thompson and Knight has clients who are interested in new Houston business opportunities. Examples include Dong Sung Group – a client who's developing new technology to convert tires to oil based product through pyrolysis is building a facility in Port of Lake Charles, with plans to build 20 US plants; and a company that helps refiners and oil field operators minimize waste.

Dixie Chemical, Matt Vicenik

Dixie is a batch company, so one challenge is that their waste streams lack regularity and are difficult to forecast. As a result, Dixie is targeting synergies with some of their nearly year round processes with foreseeable amounts of waste. They have updated CIRBUS with BTU content.

Anno Chemical, Chris Power

Anno works on solutions for off spec and overstock chemicals. They're specifically looking at liquid chemical products, especially solvents, and customers that can use the materials as they are.

Dow Chemical, Sheila Gombar-Fetner

Dow has 120 sites in US with a wide array of waste streams. A material they're focusing on is out of Deer Park – 84M lbs a year of an aqueous ammonium sulfate (20% ammonium sulfate). The material has some technical challenges: an ammonium cyanide component which has to be removed, but they will work with other party to process material as needed.

Texmark, Rebecca Rosas

Texmark takes materials people want to get rid of such as co-products from ethylene plants. They extract valuable components, including alcohol, and sell them in the non-prime markets and burn the lighter ends. One of their challenges is that the small volumes of materials offered that makes the economics difficult. Another challenge is permitting from the TCEQ for new processes; it can take up to 2 years. Water and freight is tough as well, but Texmark has a good location near the ship channel which provides lots of transportation options.

City of Houston Fire Department, John Brown

John wants to make the Houston Fire Department the most sustainable in the nation. So far they have recycled over 200 tons. Materials they have include tires, non-ferrous metals, biosolids from city departments, and waste fuels and oil from fleets. A challenge has been that permits take a long time. They have been working with Cemex, Cherry, and Walmart.

Cook Composites & Polymers, Steve Givens

CCP is a solvent and resin company. They make 3 different types: unsaturated poly resins, acrylic resins, and water based latex. They have off-grade materials (a lot of solvent streams- .5-1% solids) in each of those areas that can be used for dust control, dirt/new roads, tacking down grass on the sides of roads, etc. A challenge is that people are particular about what's in the materials.

Emergent, Paul Ducharme & Robert Gonzales

Emergent is a full service environmental company. They look forward to helping companies find uses for their headache materials; they're interested in ketones that go into paint, contaminated materials, and solvents. The challenge has been finding new uses for these materials where the economics make sense.

Shell, Claude Griffin

Shell has several chemicals as possible opportunities for synergies. They'll be posting them on CIRBUS. Additionally, Shell Aviation is looking at tires.

Port of Houston Authority, Roxanne Herrera

Port of Houston Authority has lots of dunnage and construction debris to manage. This includes wood from ships that is used for storing cargo, tires from big equipment, construction material, demolition debris, and concrete. They try to recycle as much as they can. They also own undeveloped property around the ship channel that can be utilized for dredge material placement areas.

Altiras, Todd Pencarinha

Altiras is a secondary chemical industry. They're trying to improve the lack of discipline in how materials are moved with technology, processes and experience. Altiras simplifies and streamlines.

Baker Hughes, Melanie Brooke-Lander

Baker Hughes supplies equipment, people, and materials for drilling wells. They need homes for materials related to manufacturing of tools like sandblasting sand and rubber strips. One material they're working with is an H₂S scavenger that changes characteristics in processing to a chemical that is a good corrosion inhibitor, but the challenge is that the chemical is not TSCA registered so it cannot be marketed and is currently being landfilled. Baker Hughes is continuing to study ways to reuse this material. Managing issues around changing regulatory frameworks is one of the challenges of byproduct synergies.

Year One BPS Presentations: LyondellBasell and Cherry Demolition

LyondellBasell, Caryn Brooks

LyondellBasell (LB) is a petrochemical company with plants all over the world. Caryn Brooks talked about the challenges of getting a big company to come to consensus on synergy projects, but when it is successful, "It's an amazing thing to have the environmental people bring in a paycheck." And waste minimization helps with their community relationships.

The process of internally making a synergy happen in LB includes:

- Opportunities are identified though a company directly contacting LB, through environmentalists saying 'get rid of this waste,' or through accountants saying 'this waste disposal is too expensive.'
- Then they have to convince stakeholders and make sure it's a viable opportunity, this includes waste management regulatory review, product stewardship, process safety risk assessment, management of change, and documentation. Toughest hurdle: getting through environmental scrutiny of end use, and finding a business unit to take ownership of this new "product," etc.

Q: how long from start to finish? A: one year, two years, never. "You have to have a champion" Most successful projects are when we have a site person on it who is watching the numbers go down.

LB is working with on synergies with DEA regulated substances and MRU where they're in the process of getting licenses. They also are working with a vinyl acetate synergy.

Cherry Demolition, Joe Rizzo

Cherry works with concrete, steel, construction debris. They recycle one million tons of concrete annually that goes into road bases. They grind composition roof shingles and have portable concrete crushers that give you a DOT spec material that beats price of transporting it. They have their own trucks and 10 trailers to move debris. They're putting another recycling center in Galveston for asphalt, concrete, and steel. Cherry has synergies underway. They have sent 8-9 truckloads of tires to Cemex. Fort Bend and Brazoria County have contracts to take their tires to Cemex. They also now recycle asphalt and will process Baker Hughes' material. US BCSD has just worked with Cherry to create a Certificate that roofing companies can give to their customers showing them the environmental benefits of recycling their shingles with Cherry.

Working Group Reports

Combustibles, Chair, Greg Hein, Cemex:

Current synergies/Action Plan

- City of Houston Tires/Meeting with Sustainability Director and City Attorney. John Brown will set up meeting.

- Baker Hughes Gasket Material/Cherry will process. Not enough volume for CEMEX. Cherry will follow-up with Melanie
- CEMEX has requested a permit alteration to take construction and debris material (C&D)

Chemicals, Chair, Sheila Gombar- Fetner, Dow:

Talked about the work process for getting synergies through decision process at a corporation and will continue to share best practices. By sharing and implementing best practices for internal synergy review, the group hopes to address major barriers for the chemicals group and reduce the lead time for synergy project completion.

Current Synergies/Action Plan

- Mixed Amines/Sheila to get information to Brokers
- 3rd party, Delta, Warehouse materials/Sheila to get information to brokers and will add to CIRRUS
- W. Virginia Acetone Oils bottoms, Ketone SR, Glycol bottoms/Sheila will get information to brokers
- LyondellBasell Warehouses/Caryn will get information to brokers and will add to CIRRUS

CIRRUS

Take advantage of CIRRUS. On the database, there are: 62 Companies, 245 resources available, 128 Resources needed, and 4 projects (Houston, Ohio, Kansas, Pacific Northwest). All the data is not in, and the list of projects will expand in the future.

PACE – Property Assessed Clean Energy

PACE is a unique way to finance synergy projects, energy retrofits, and renewable energy projects. Energy savings offset costs which are in the form of property tax increases

- Requirements: have to demonstrate energy and carbon savings
- \$10M projects identified in Ohio – air compressors, lighting, water recirculation, heat recapturing, pumps, drives and motors, etc
- Ygrene is administrator for PACE. They have partnered with US BCSD and Barclays Capital
- Currently working with Texas Legislature to demonstrate value – improves debt coverage ratio, economic stimulus, job creation, energy efficiency

Water Synergy Project

Applying the BPS facilitated work process to other areas like water. The water project is now funded (thanks to Entergy and ConocoPhillips). The pilot location has been selected - New Orleans to Baton Rouge Mississippi River corridor.

EPA

The EPA Solid Waste rule has been updated – more materials are considered solid waste which will change permitting requirements for waste to energy. Tires are exempted from this change. This rule could hamper some of the materials we were looking at.

Next Steps:

- Identify new members – industry peers, suppliers, partners, etc
- Update CIRBUS
- Schedule working group meetings

Year Two Meeting Schedule: Please note that the meeting dates have been changed to Thursdays. Email Susan if you're interested in being a meeting host!

1. July 21, 2011
2. October 27, 2011
3. January 26, 2012

Spring Meeting: Detroit, June 6-7, partnering with NESS

Fall Meeting: Tucson, October 17-18, partnering with National Association of Environmental Managers

MEETING PARTICIPANTS

	Name	Company
1	Chris Power	Anno Chemicals
2	Greg Hein	Cemex
3	John Brown	City of Houston Fire Dept
4	Steve Givens	Coos Composites & Polymers
5	Matt Vicenik	Dixie Chemical
6	Sheila Gombar-Fetner	Dow Chemical
7	Paul Ducharme	Emergent
8	Robert Gonzales	Emergent
9	Marvin Sims	P & G
10	Claude Griffin	Shell
11	Rebecca Rosas	Texmark
12	William McDonald	Thompson & Knight
13	Joe Rizzo	Cherry Demolition
14	Mark DeWitt	Cherry Demolition
15	Caryn Brooks	LyondellBasell

16	Susan Fernandes	US BCSD
17	Kieran Sikdar	US BCSD
18	Jamie Lippman	US BCSD
19	Melanie Brooke-Lander	Baker Hughes
20	Todd Pencarinha	Altiras
21	Roxanne Herrera	Port of Houston Authority