PCC PET Project Update
Status of PET carpet recycling project.

- Brief PC PET recycle Market Review
- PET Carpet Identification Challenge
- IV Regeneration – Update
- Markets & New Potential Technologies - Update
- New Potential Technologies
Review PC PET Potential Markets

1. Fiber Market
   - Mechanical Processing
   - Typically Whole PET carpet
   - Carpet Processing Technology exists for next steps in end products

2. Pellet Market
   - Pure Single Polymer needed
   - Largest and most diverse portion of the market
   - Shearing presents most direct route
   - IV Enhancement technology is necessary

3. Chemical Modifications
   - Alter PET properties
   - Co-polymerize Dissimilar Materials (PET/PP)

4. Fuel Feedstock
   - Update
PET Carpet ID Challenge
Phazir Analyzer

Axsun Analyzer
PET Carpet Identification Challenge

1. ID Equipment In use Today
   - Microphazir Analyzer - Thermo fisher
   - Anavo Analyzer - Axsun

2. ID Challenge for PET collections
   - Axsun used did not distinguish PET from PTT
   - Microphazir CAN, but software library must be up to date
   - Working w/ Thermo Fisher: Provide Mohawk PTT Samples for library updates
   - Axsun very unresponsive so far.

3. ID Accuracy factors
   - Age of Units
   - Updated Libraries
   - Condition of Carpet (color, stains, moisture, etc)

4. Future Success hinges on PET/PTT distinction
1. Q4 – 2014 Gamma Trials failed
   - Unknown Low Melt material in PET melted entire batch
   - Took weeks to identify problem - Initially thought to be PP
   - Testing revealed PTT mixed with PET. ID equipment did not pick up
   - PET melt Temp. – 260 Deg. C.
   - PTT melt Temp. – 228 Deg. C.
   - At PET Solid State Temperature, everything melted together

2. Renewed IV work
   - After weeks - Secured new PET material
   - Tested via DSC for purity (100% purity)
   - Material at Gamma for IV regeneration.
Market Update – fiber Segment
Fibers Market

- **Armacell** - Sound Insulation - **Results did not pass.**
- **Fiber Composites** - Construction product - **PET line installing 2015 - 30 MM Lbs. to begin.**
- **Kela Energy** - Fuel Pellets - **Company out of business.**
- **Ecostrate** - Signage - **Update at BOD meeting.**
- **Nyloboard** - Construction - **After initial samples, no interest**
- **Honeywell** - Transportation - **Next phase of commercialization under way**
- **Aspera** - Unknown - **Abandoned after initial samples.**
- **V-Lap** - Unique Air Lay- pad making technology - **New Install in Carterville**
- **IC2** - U. of Texas- Unique insulation Material - **Intro during Entrepreneur meeting**
- **South bend Modern Molding** - Sound barriers - **Meeting Mar. 15/ Ron G. and Myself- Tinney California project**
- **Worn Again** - UK - **PET dissolution - Color removal - Lab tests successful**
Market Update Pellet Segment
Pellet Market - Many are food contact applications:

- **Sheets, Thermoforming, Packaging - 0.75 IV**
  - Nuvida Plastic Technology - IV Enhanced samples to be sent
  - Dart Container Corp - IV Enhanced Samples to be sent
  - Direct Pack Inc. - IV Enhanced Pellets to be sent
  - Genpack LLC - IV Enhanced Pellets to be sent
  - Par-Pack LTD - IV Enhanced Pellets to be sent
  - Plastic Ingenuity - Initial Contact; no agreement on samples yet

- **Strapping - 0.90 IV**
  - EAM-Mosca - Pilloti contact - IV Enhanced pellets to be sent
  - S&K Packaging Industries - IV Enhanced pellets to be sent
  - Signode - IV Enhanced pellets to be sent
  - Polychem Plastics - Initial Contact; No agreement on samples yet

- **Fabrics, Geotextiles, Non-wovens - 0.75 IV**
  - Freudenberg - IV Enhanced Samples to be sent - Variety of products from Nonwovens to Geo
  - Bonar - IV Enhanced Samples to be sent - Non-wovens
  - Mattex - IV Enhanced Samples to be sent - Woven Backings
  - Propex - IV Enhanced Samples to be sent - Woven Backings
  - Mohawk - IV Enhanced Samples to be sent - Confidential
**Chemical Modifications**

- **Dupont Performance Group** - More Ductile PET - Lab Work Finished: Results coming.
- **BASF** - More Ductile PET - No Interest
- **Kenrich Chemicals** - New chemical class Co-poly PET/PP - Technical work needs budget of $2000. PCE quote.

**Other**

- **Wellman** - Confidential no information
- **Shaw Industries** - Evergreen Ringgold - System being built - No information
- **PET RFP** - Initial Meeting with B. Peoples: Jan. 29, 2015

**Fuel Generation**

- **Clean Blue** - Still insist Diesel fuel plant is in the works in N.C. for late 2015.
Conclude IV Enhancement Work

Send IV Enhanced pellets to all companies identified

Report of results of all sample testing for next steps

Continue research for additional companies for potential markets

Investigate any and all new Technologies for feasibility

Continue working as facilitator and resource for companies as they develop