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Sustainability Through Innovation™ That’s the Shaw Green Edge®
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At Shaw, we look at waste...
...as an opportunity.
waste is beautiful

Sustainability Through Innovation™
That’s the Shaw Green Edge®
• High-level Overview
• Shaw’s Justification for Carpet to Energy
• The Economics of Carpet to Energy
• Assumed Environmental Attributes
• Inputs and Value-added By-products
• The Future of Carpet to Energy for Shaw
What is Re2E?

- Steam plant with cogeneration of electricity
- The first energy plant completely fueled by carpet materials
  - 84 million pounds of carpet fuel annually (phase I)
  - Post-industrial and post-consumer materials
- Will provide almost all steam for Shaw’s Plant 80 carpet mill (50,000 lb/hr)
- Cogeneration will supply half of the electricity to power the fuel processing building (3.5 million kWh annually – *equivalent to 300 households*)
• Conventional technologies being utilized
  • Multi-stage shredding
  • Contaminant removal and recycling
  • Multi-stage fuel cleaning
  • Fines recovery processes
  • Automated material handling
  • Extensive dust collection systems
  • Solid fuel hybrid boiler system with economizers
  • Advanced pollution controls

*It’s not what we have; it’s how we have it*
(Re2E) reclaim-to-energy process
Shaw Plant 80 Dalton, Georgia

It is estimated that the plant will convert approximately 42,000 tons of post-industrial and post-consumer carpet waste into steam for Plant 80 and electricity to power the shredding process. Developed independently, this process allows Shaw to address three main priorities: energy cost stability, landfill diversion, and growth of our post-consumer carpet reclamation network.
Why Re2E?

• Main priorities:
  • Energy cost stability
  • Landfill diversion (90% PI waste to be diverted by 2011)
  • Strengthen and grow the PCC collection network
  • Support CARE diversion goal

• Additional priorities:
  • Support Shaw’s alternative energy goal – 10% by 2017
  • Offset use of fossil fuels – use what’s already been extracted
  • Valuable component recovery – fines & ash

• Another innovative, significant solution to support our reclamation efforts
Innovations from Post Consumer Carpet Materials Recovery

N6 Carpet & EcoWorx
Carpent to Carpet

N6,6
Carpet to Other Products

All Fiber Types, Byproducts

All Carpet Types
Carpet to Energy
Economics of Carpet to Energy

- Not the typical economic model of justification
  - Must be about more than just traditional financial return
    - Energy costs will rise long-term
    - Decoupling from fossil fuels
    - Not an immediate payback

- Costs can easily be in tens of millions, depending on chosen technologies and infrastructure needed

- Recovery of by-products is key to generating additional value
Environmental Attributes

• Pollution Controls:
  • Multiple cyclone fly ash separator
  • Flue gas recirculation
  • High-efficiency fine particulate bag house
  • Configured for additional controls, if needed

• Continuous Emissions Rate Monitoring (CERM)
  • Enables optimal fuel mixing
  • Enables testing of additional alternative fuels

• Phase I reduces sulfur emissions, particulates and fossil fuel use at the site

• Phase II expands these reductions to an adjacent site

• Removed #6 fuel oil as backup fuel from the site

• Fuel processing building targeted to be LEED certified
• Carpet fuel Input: ~7 tons per hour of 40% PIW and 60% PCC
  • PCC proportion will grow due to less internal waste
  • Long-term potential for PCC consumption: 160+ MM lbs

• Boiler Input: 3½ tons per hour of shredded fluff mixture

• By-products
  • Fuel prep: ~3 tons per hour of fines
  • Boiler: ~800 pounds per hour of ash

• All materials will be recycled; no landfill
  • Developing internal and external recycling options
Where do we go from here?
- Re2E Phase II – 80+ million pound expansion of PCC consumption
- Evaluate Re2E vs. Shaw’s existing WTE gasifier
  - Environmental impacts
  - Total economics
  - Technology comparison
- Complete an LCA (Life Cycle Assessment)
- Expansion to additional sites where value could be derived
- We aren’t ruling out the potential to work with like-minded companies in and outside of our industry

Incentives are needed stimulate to further development
Construction Cam