Basic Premise of BPS

Waste = Food = Value = Profit
Classical definition of BPS

“By-product synergy is the matching of under-valued waste or by-product streams from one facility with potential users at another facility to create new revenues or savings with potential social and environmental benefits.”

USBCSD 1997
Traditional Manufacturing Process

Company A

Material A
Energy
Water

Product A
Waste

Disposal
Manufacturing with BPS

Network of Companies

Company A
- Material A
- Energy
- Water
- Output from A
- Processing?
- Resource?
- Product A
- Disposal
- Product B
- Disposal
- Waste

Company B
- Energy
- Water
- Disposal
At first glance, it's hard to imagine how anyone could get excited about slag, a by-product of the steel-making process. But when managers of Chaparral Steel got together with their counterparts at a Texas Industries Inc. (TXI) cement plant, they came up with a surprising discovery: Steel slag could be converted into a valuable raw material for cement production.

Together, they developed a patented process, now being marketed worldwide, that uses steel slag in a cement kiln to create high-quality Portland cement. The partnership has increased profits for both companies, cut energy usage, and reduced greenhouse-gas emissions.
Steel & Cement Synergy

- 5-15% production increase
- $8/ton slag to $70/ton cement
- 10% CO2 reductions
- 25-45% NOx reductions
- 2 EPA climate change awards

8.8 MM tons of CO2 annual reduction potential if applied to entire US cement production
Barriers to Synergy

- Legal
- Regulatory
- Technical
- Perception
- Communication
- Economic
- Geographic
- Time

Note: Availability of online interactive database will help reduce barriers to synergy
The Ohio BPS Network

- Provides a **collaborative network** to address sustainability related issues important to member companies
- Provides a **structured process** through which companies can identify and vet partners
- Helps **companies identify and implement synergies** where wasted resources at one facility are used at another
- Provides **tools** for the management of materials and synergy data
The Key to Unlocking Synergies

- Signed agreements set up confidential consortium
- Data collection allows understanding across fence lines
- Regulators engaged from the beginning
- Diversity of participants
BPS Work Process

USBCSD / OSU Tools

Project Launch → Data Collection → Synergy Identification & Analysis → Barrier Analysis → BPS Project Charter

Materials Database → Initial BPS Benefits Estimates → Detailed Benefits Analysis → BPS Benefit Tracking & Reporting

Approximately 1 year

Working meetings approximately every 2 months
The following two questions at a BPS Network meeting:

What do you need to make your product or provide your service?

What do you throw away that some other organization could use?
BPS Analysis Methodology

Savings = Base Case - BPS Case

- **Cost savings**
  - Transportation
  - Landfill fees
  - Virgin material purchasing

- **Environmental savings**
  - Direct CO₂ emissions
  - Landfill + transportation
  - LCA impacts
    - CO₂ emissions
    - Water conservation
    - Energy consumption
    - Non-renewable resources

- LCA
  - Synthetic fertilizer manufacturing
Eco-Flow™ Graphical Interface
BPS Metrics

Direct Metrics
- Landfill diversion
- Offset virgin material
- Hazardous waste reduced
- Water conserved
- GHG Emissions (scope 1 & 2)
- New sales revenue
- Cost savings
- Energy conserved

Indirect Metrics
- Job creation/retention
- Private capital investment
- Return on dollar invested

Life-Cycle Metrics
- Water, energy, GHG
- Air emissions
- Land use
- P and N discharges
- Mineral & fossil fuel consumption
Locations of Former and Current Ohio BPS Members
BPS Today
Networks are Networked
BPS Networks are Good for Communities

- Stimulates economic development
- Supports job retention and growth
- Reduces impacts to local infrastructure
- Improves air quality
- Improves environmental conditions

Greater Houston Region
- $4.5 million+ annual cost savings
- Annual reduction of 19,000 metric tons CO$_2$e and 32,000 metric tons of non-renewable resources

Chicago
- $5.5 million per year in economic impact
- Reduction of 50,000 tons/yr CO$_2$e emissions

Kansas City
- 33,650 tons of solid waste per year from local landfills
- Reduction of 19,000 tons CO$_2$e

Ohio BPS Network
- Avoidance of approximately 30,000 tons/yr. of waste to the landfill
- Avoidance of approximately 660,000 metric tons/yr. of greenhouse gas emissions
- Approximately $3.5 million/yr. in cost savings

Stimulates economic development
Supports job retention and growth
Reduces impacts to local infrastructure
Improves air quality
Improves environmental conditions
BPS Networks lead to Operational Improvements

- Reduces waste management and disposal costs
- Reduces procurement costs
- Reduces air emissions at facility level
- Reduces environmental impacts
- Provides opportunity to collaborate with peers to solve complex waste and materials issues

October 4, 2011
General Motors is making about $1 billion a year from selling scrap byproducts, waste reduction manager John Bradburn told the Corporate Recycling & Waste Conference in Orlando.
BPS Networks Help Corporations Meet CSR Commitments and Obligations

• Investing in BPS demonstrates progress toward GRI goals
  • Economic Indicators (EC6, EC8, EC9)
  • Environmental Indicators (EN1, EN2, EN3, EN5, EN6, EN8, EN10, EN12, EN14, EN16, EN18, EN21, EN22)

• Participating in BPS reduces impacts on ecosystems material to operations
  • Reduced virgin material consumption
  • Reduced water consumption
  • Reduced energy consumption
The Ohio BPS Network and the Circular Economy

Network

Company A
- Raw Material
  - By-Product
  - Product A
- By-Product
  - Disposal

Company B
- Raw Material
  - By-Product
  - Product B
- By-Product
  - Disposal

Company C
- Raw Material
  - By-Product
  - Product C
- By-Product
  - Disposal

Company D
- Raw Material
  - By-Product
  - Product D

Communication

BPS is the matching of under-valued waste, transportation, energy and other by-product streams from one facility with potential users at another facility.
Next Meeting

Tuesday, December 6, 2016

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