Making ResourceFull Use of Industrial Waste:

Enhancing Your Triple Bottom Line

Association of Oregon Recyclers (AOR) Forum

Kennedy School

March 21, 2018

Agenda

- Who is here?
  - Manufacturers? Commercial? Government?
  - Non-Profit? Education?
- What is ResourceFULL Use?
- ResourceFULL Use and Climate Change?

ResourceFULL USE is *Industrial Ecology, Industrial Symbiosis, ByProduct Synergy*…

Definition: 'the synergy among diverse industries, agriculture, and communities resulting in profitable conversion of by-products and wastes to resources promoting sustainability'

~ World Business Council for Sustainable Development and the US Environmental Protection Agency

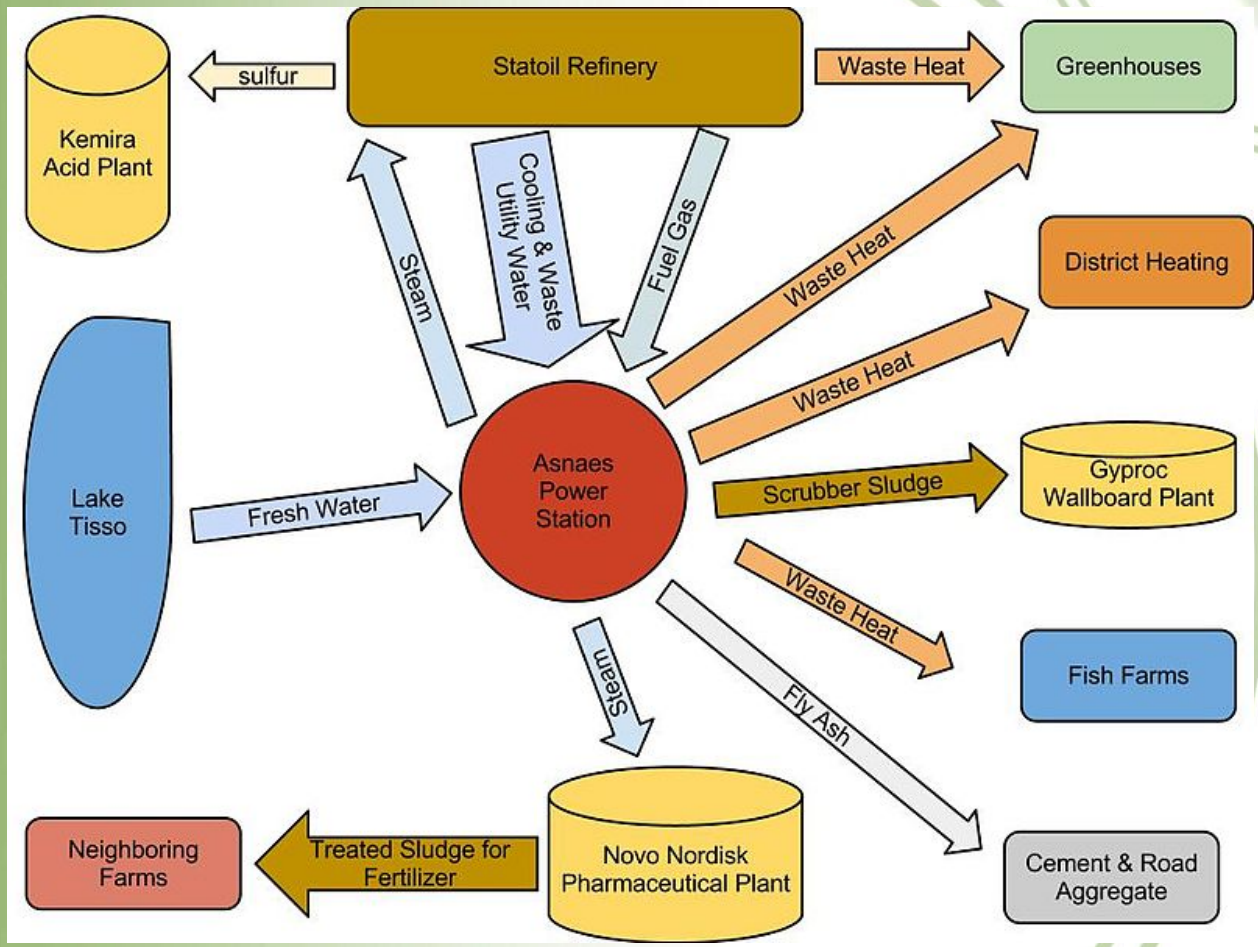
Roots in Kalundborg

Danish Eco-Industrial Park

- Developed over 20 years
- Network including:
  - power station, two big energy firms, a plaster board company, and a soil remediation company and more
- Resource exchanges included:
  - Waste heat to district heating facility
  - Effluent cooling water to power plant
  - Excess refinery gas to plaster board business
  - Fly ash to cement manufacturers
  - Bio sludge to farms

Roots in Kalundborg

Eco-Industrial Park



Get materials into the hands of businesses that can use them.

Like Rumplestiltskin, spinning straw into gold!

Anne Anderson, illustrator. *Anne Anderson's Old, Old Fairy Tales*. Racine, Wisconsin: Whitman Publishing Company, 1935.

ResourceFULL Use

- 12 Years and Counting!
- “Project”
- Three Partners:
  - Corky Collier- Columbia Corridor Association
  - Dorothy Atwood- Int’l Society of Sustainability Prof
  - Debra Taevs- Exceed Enterprises
- Support from
  - The Boeing Company
  - Metro
  - PSU
  - -Port of Portland
  - -DEQ
  - -The Locals

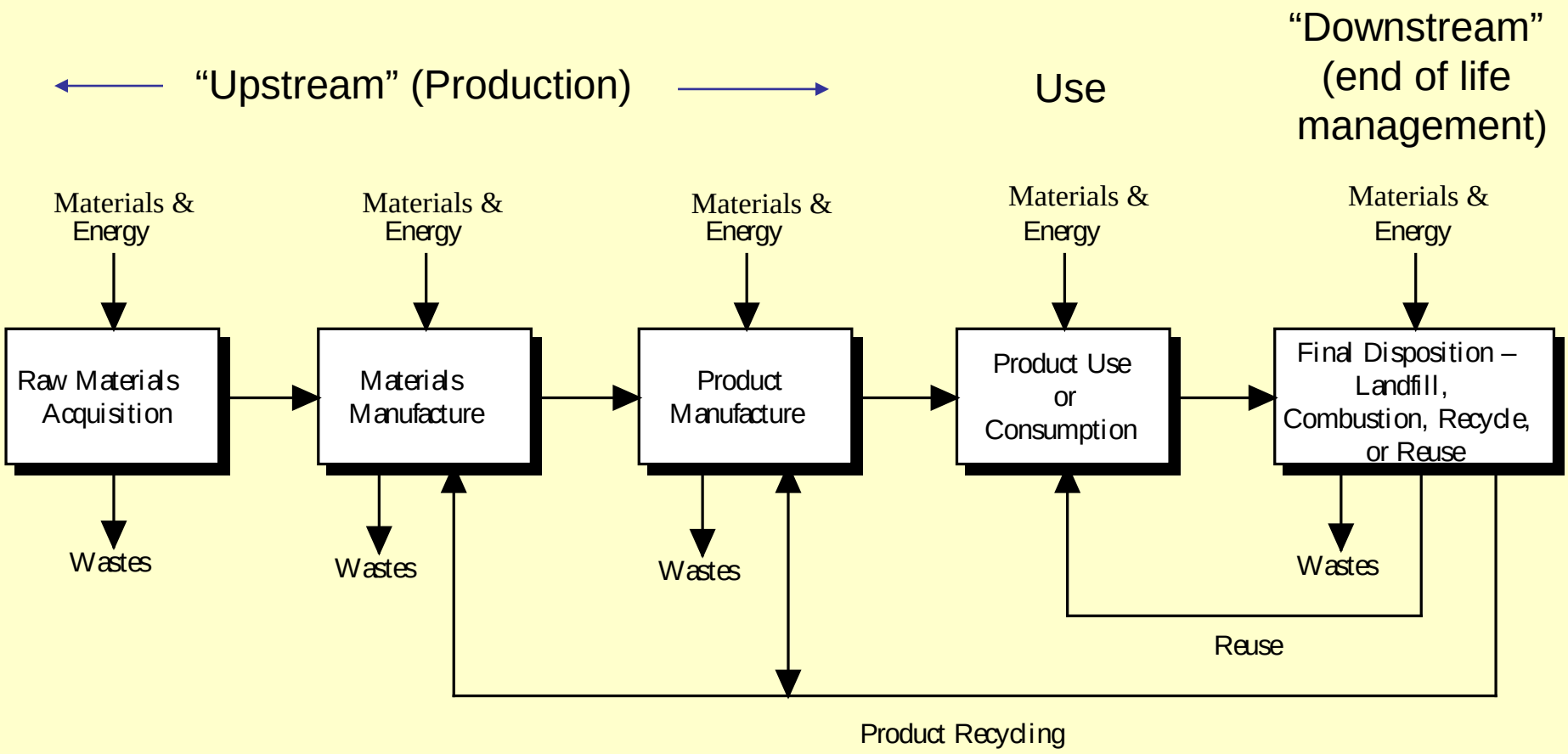
ResourceFULL Use

- Facilitate Exchanges of Industrial Materials
  - Free! Workshops
  - Case Studies
  - Networking- across industries
  - Online Exchange Website/FaceBook
  - Moving towards more “Concierge” Service
  - Calculation of Greenhouse Gas Impacts
    - For ResourceFULL Use
    - For other reuse organizations

ResourceFULL Use Principles

- Stuff has a lot of embedded energy
- Reuse and repurposing is **hugely** better than recycling
  - Importance of upstream
- Less consumption is “more”
  - More money
  - More environmental benefits (e.g. green house gas reductions)
- Can’t do by-product synergy alone
  - cross industry

Life Cycle Stages



Downstream Impacts

- Energy and pollution associated with collection and transportation of waste and recyclables
- Leachate from landfills
- Methane and other air emissions from landfills
- Emissions from incineration
- Liner failure
- Land, air, and water quality impacts of burning, stockpiling, and illegal dumping of garbage (not well quantified)

Upstream Impacts

- Extraction and harvesting of raw materials
  - Energy use
  - Habitat impacts
  - Pollution and wastes
- Product/packaging manufacturing
  - Energy use
  - Consumptive water use
  - Pollution and wastes
- Transportation of raw materials, products
  - Energy use
  - Pollution

Comparison: Reduction (Prevention) and Recycling

- Recycling reduces upstream impacts.
- Prevention (not consuming) eliminates upstream impacts.

Comparison: Reuse and Recycling

- Reuse = using a product in its original form.

  Benefits of **reuse** are typically **greater**

  - Reusing a personal computer saves 5 - 20 times more energy.
  - Reusing a corrugated box saves 3 - 4 times more energy.

Participants

- Port of Portland
- Siltronic
- Air Water and Soil Technologies
- Malarky Roofing
- SAPA Inc.
- Rockwest Training
- Precision Cast Parts (PCC)
- City of Portland
- Waste Connections
- Metro
- Stevens Printing
- Oregon Canadian Lumber Products
- Portland State University
- CCI Enterprises
- Aloft Hotel
- Columbia Steel
- Pavement Maintenance, Inc.
- Waste Xpress Environmental
- GEO Design
- Altec Industries
- Solar World USA
- Association of OR Nurseries

Examples

- Tillamook County and SCRAP
  - Reflective signs and file cabinets
  - 1,350 lbs 1,710 lbs of Greenhouse Gas
- UbiVac and Union
  - Borosilicate lab glassware
  - 27,843 lbs 16,706 lbs of Greenhouse Gas
- Gerber and Portland Knife Company, Andy and Bax
  - Nylon knife sheaths
  - 27,000 lbs and 80,000 lbs of Greenhouse Gas
- Exceed Enterprises and Various
  - Plywood reels
  - 1,968 lbs and 1,122 lbs of Greenhouse Gas

ResourceFull Use- Metrics

- One-time Exchange of 250 gallons of yellow traffic paint destined for a hazardous waste landfill.
- Dollars saved by businesses
  - Cost of Paint - $2,000 for 250 gallons
  - Cost of disposal - $750 (assume $150/drum to haz waste landfill)
- Pounds of waste prevented: 2,500 lbs (assume 10lb/gallon)
- Gallons of transportation fuel saved: 1.6 gallons of diesel fuel

  (Transport to Haz waste site in Arlington)
- Estimates of Greenhouse gas reductions:
  - Estimate from manufacturing of paint: 6,300 pounds CO_2
  - Estimate from fuel saved: 42 pounds of CO_2

Next Workshop

Mylar Reuse Thursday, May 8 or 10?

9:30-11:30 am (9am for coffee and conversation)

Location: **Widmer Brothers**: 929 N Russell St, Portland

ResourceFULL Use Washington County, May 24

9:30-11:30 am (9am for coffee and conversation)

Location: **Acumed** 5885 NE Cornelius Pass Rd. Hillsboro

ResourceFullUse.org

Contact:

Dorothy Fisher Atwood
International Society of Sustainability Professionals
(503) 699-7834
datwood99@comcast.net

Debra Taevs
Exceed Enterprises
(503) 889-6488
debrat@exceedpdx.com

Corky Collier
Columbia Corridor Association
(503) 287-8686
corky@columbiacorridor.org

RESOURCEFULL USE

Agenda

- Introduction
- By-Product Synergy 101
- Resource Exchange Brainstorming
- Lessons Learned
- Other Models