A Different Kind of Waste-to-Energy: The Case of Plastic to Crude

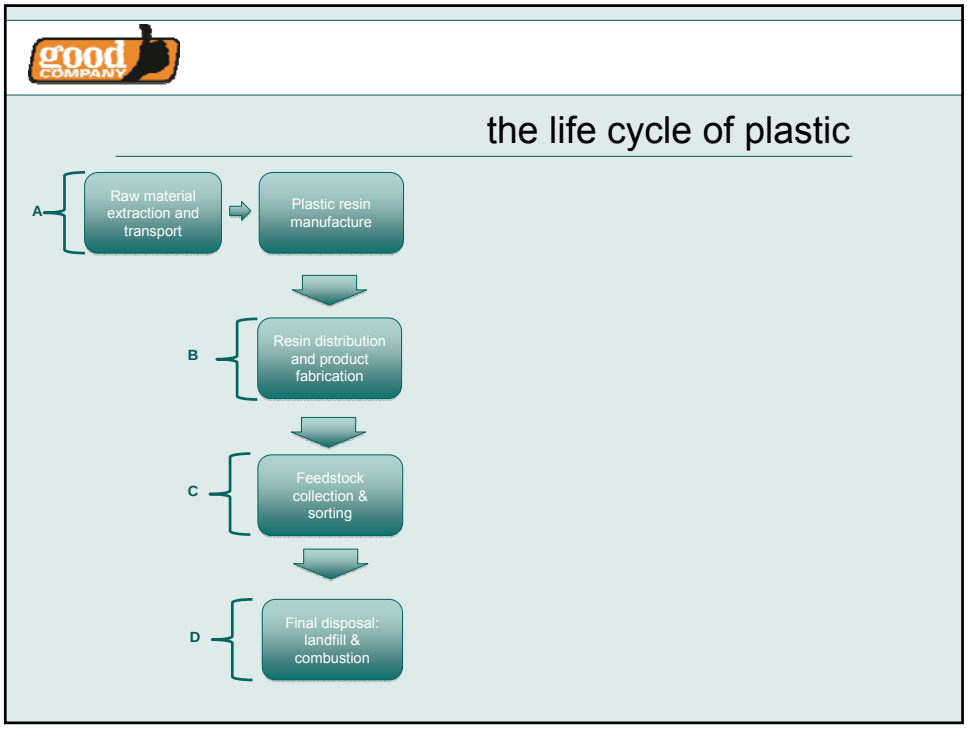
Session 4: Waste-to-Energy Opportunities and Barriers
presentation for ACCO Conference *Managing Waste*

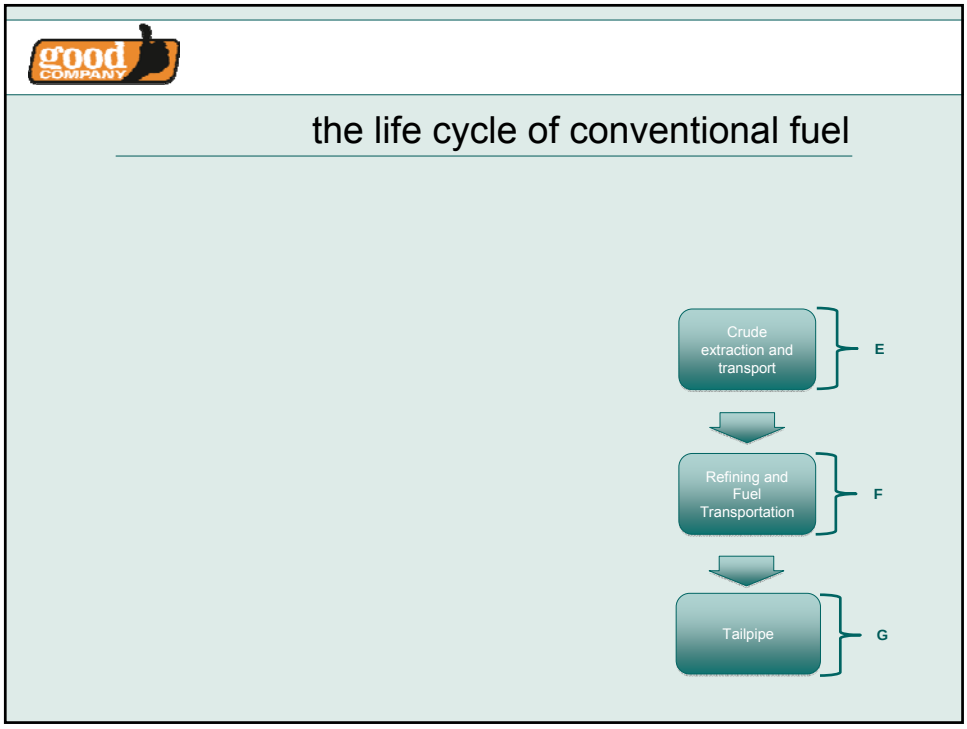
Portland, OR
October 19, 2010

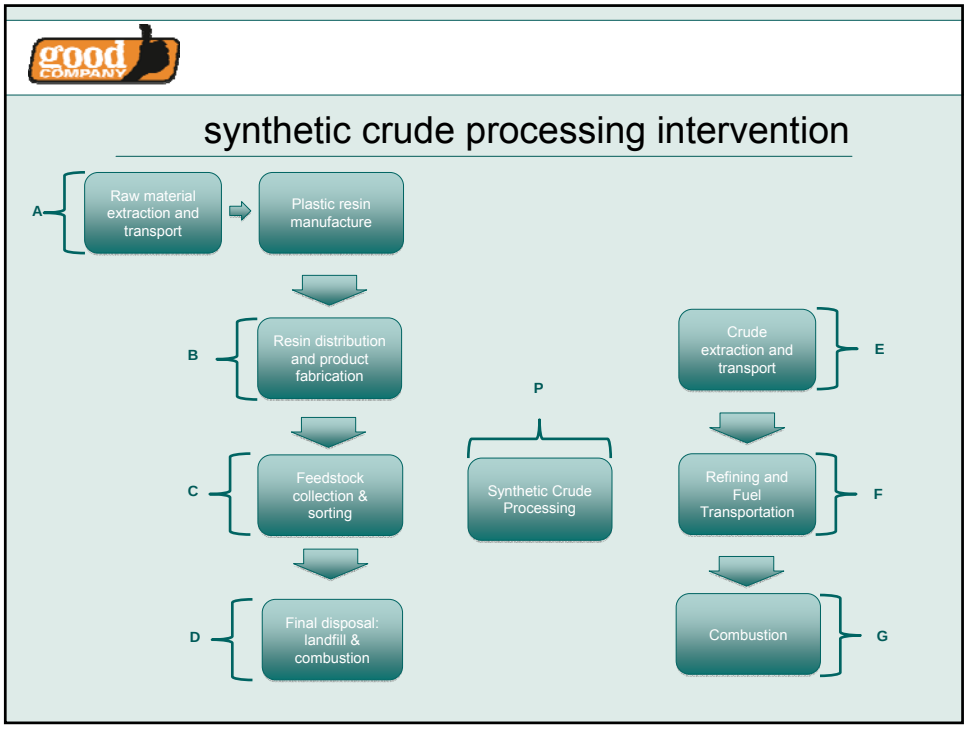
Joshua Skov
Principal
Good Company
Eugene, OR

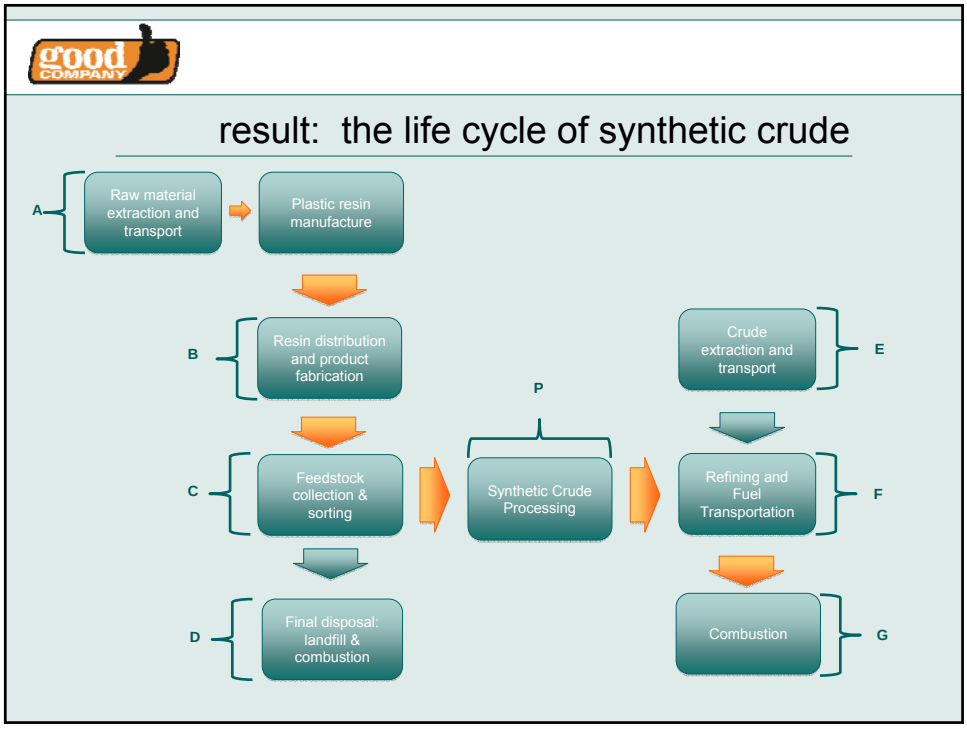
overview

- a particular version of waste-to-energy
- unconventional tech, unconventional method
  - careful boundaries, a different "functional unit"
  - sources and assumptions
  - key parameters
- quantitative punchlines
  - waste plastic derived synthetic crude oil is "better" than almost all alternative end-of-life scenarios for the waste plastic feedstock
  - the details are interesting and might matter for marketing, positioning and regional approaches


the life cycle of plastic
A
Raw material extraction and transport
Plastic resin manufacture
B
Resin distribution and product fabrication
C
Feedstock collection & sorting
D
Final disposal: landfill & combustion


the life cycle of conventional fuel
Crude extraction and transport
E
Refining and Fuel Transportation
F
Tailpipe
G


synthetic crude processing intervention
A
Raw material extraction and transport
Plastic resin manufacture
B
Resin distribution and product fabrication
C
Feedstock collection & sorting
D
Final disposal: landfill & combustion
P
Synthetic Crude Processing
Crude extraction and transport
E
Refining and Fuel Transportation
F
Combustion
G


result: the life cycle of synthetic crude
A
Raw material extraction and transport
Plastic resin manufacture
B
Resin distribution and product fabrication
C
Feedstock collection & sorting
D
Final disposal: landfill & combustion
P
Synthetic Crude Processing
Crude extraction and transport
E
Refining and Fuel Transportation
F
Combustion
G

evaluating the carbon benefit

Σ Plastic Life-cycle Emissions
\+ Σ Plastic Life-cycle Emissions
≤ Σ Synthetic Crude Life-cycle Emissions

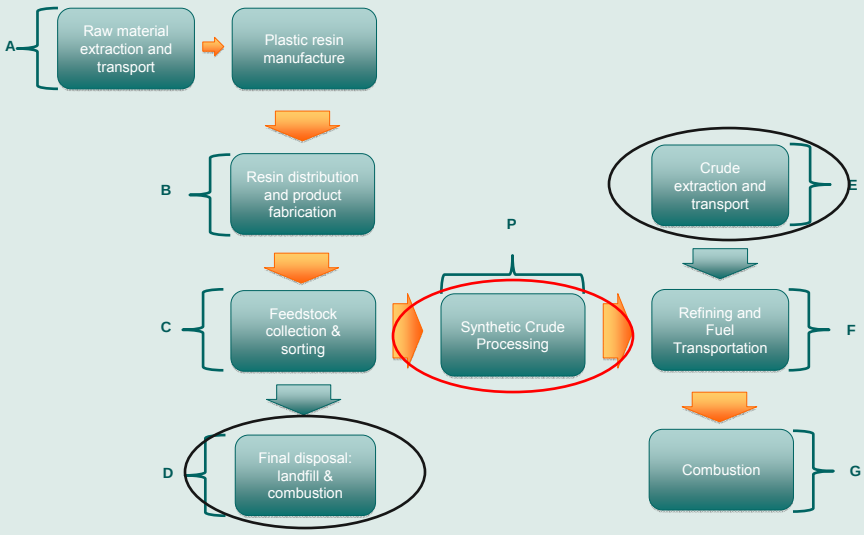
OR

$$(A+B+C+D)+(E+F+G) \leq (A+B+C+P+F+G)$$

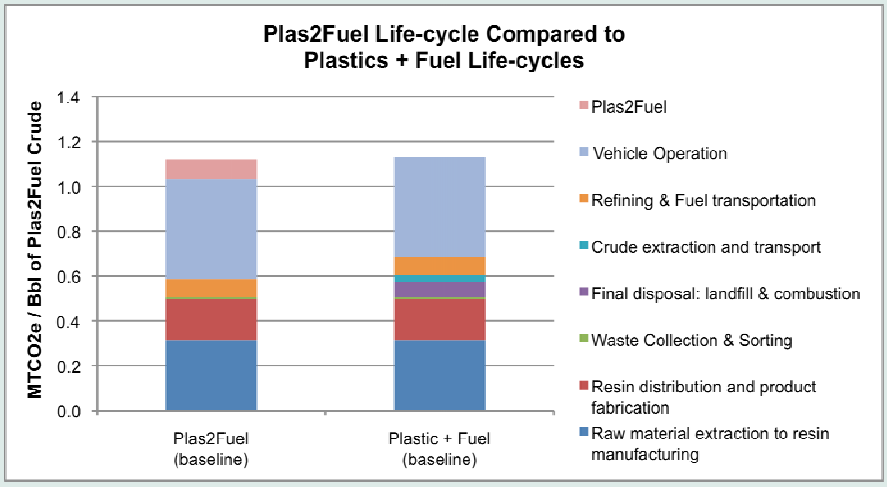
OR

$$D+E \leq P$$

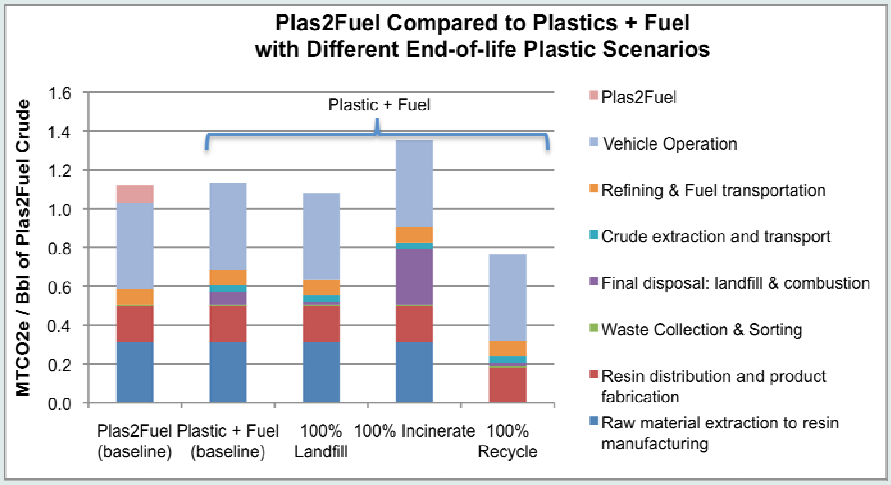
Life-cycle of synthetic crude



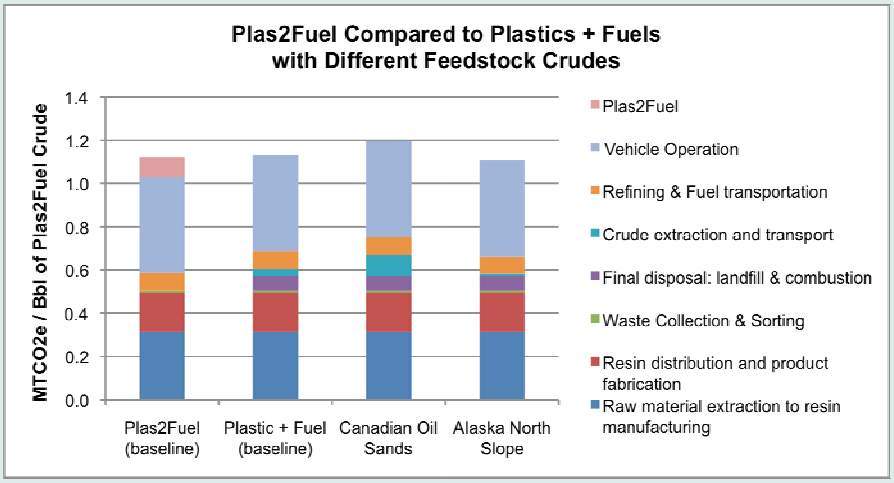
punchline #1: ~1% difference in base cases



punchline #2: variation in end-of-life matters



punchline #3: what you are displacing matters



summary points

- recycling is the best end-of-life scenario
- Plas2Fuel outperforms all incineration options
- landfilling looks better than Plas2Fuel with "carbon goggles" on, but only if nothing else matters
- oil sands crude strengthens Plas2Fuel's position, but even ANS doesn't change much


Thank you!
Joshua Skov
joshua.skov@goodcompany.com
(541) 341-GOOD (4663), ext. 211
www.goodcompany.com