



American
Forest & Paper
Association

AF&PA Mixed Waste Processing Economic & Policy Study







Brian Hawkinson
American Forest & Paper Association

Metropolitan Washington COG Recycling Committee
December 3, 2015

About AF&PA

- Advances a sustainable pulp, paper, packaging and wood products manufacturing industry
- Fact-based public policy and marketplace advocacy

AF&PA's 2020 Sustainability Goals

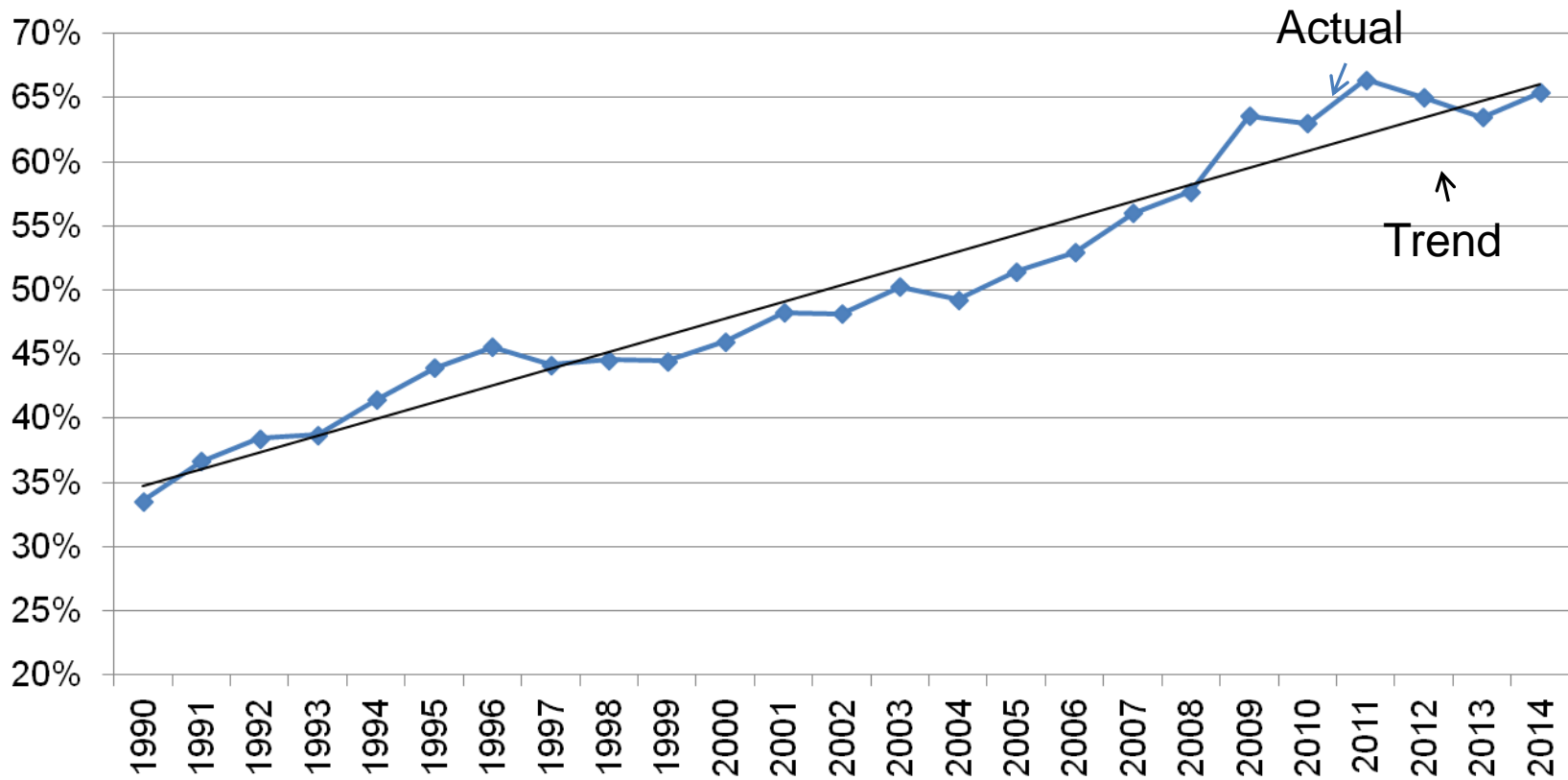
1. Paper Recovery  Exceed 70%
2. Energy Efficiency  Increase purchased energy efficiency by at least 10%
3. GHG Emissions  Reduce intensity by at least 15%
4. Forestry  Increase certified fiber procurement
5. Safety  Reduce incidence rate by 25%
6. Water  Reduce use in mills by 12%



BETTER PRACTICES
BETTER PLANET 2020
Continuing AF&PA's Commitment to Sustainability

Historical Paper Recovery Trend

U.S. Paper Recovery Rate 1990-2014



Source: AF&PA

Challenge to Increasing Recovery

- Mixed waste processing systems (MWP)
- Concept
 - Collect dry recyclable materials with wet & organic garbage
 - Separate recyclables on processing line
 - Residuals to WTE, RDF or landfill
- Increasing pressure on municipalities
 - Cost management
 - Meet diversion goals

Understanding MWP

- Research (2014)
 - 5 currently operating MWP systems
- MWP systems vary
- Key findings
 - Quality & quantity concerns justified
 - Sometimes fail to separate fiber
 - Usually produce lower quality fiber
 - Recover lower percentage of fiber
 - System type & participation drive quantity

Mixed Waste Processing Economic & Policy Study (2015)

- **Purpose**

- Is there a market-based economic case?
- Inform future decisions regarding engagement in objective manner.

- **Project Team**

- Burns & McDonnell Engineering Company

Project Overview

- Evaluated Single Stream (SS) & MWP processing systems
- Economic analysis based on several scenarios using a representative large city:
 - 250,000 residential households
 - 325,000 tons generated annually (refuse and recycling)
- Interviews with AF&PA members and MWP system operators

Scenarios Evaluated

- **Scenario 1** – Curbside SS collection and processing; refuse landfilled (2 carts)
- **Scenario 2** – Curbside SS with refuse hauled to MWP facility (2 carts)
- **Scenario 3** – All materials commingled and hauled to MWP facility (1 cart)
- **Scenario 4** – Similar to Scenario 3, but with refuse-derived fuel as by-product of MWP facility (1 cart)

Key Findings

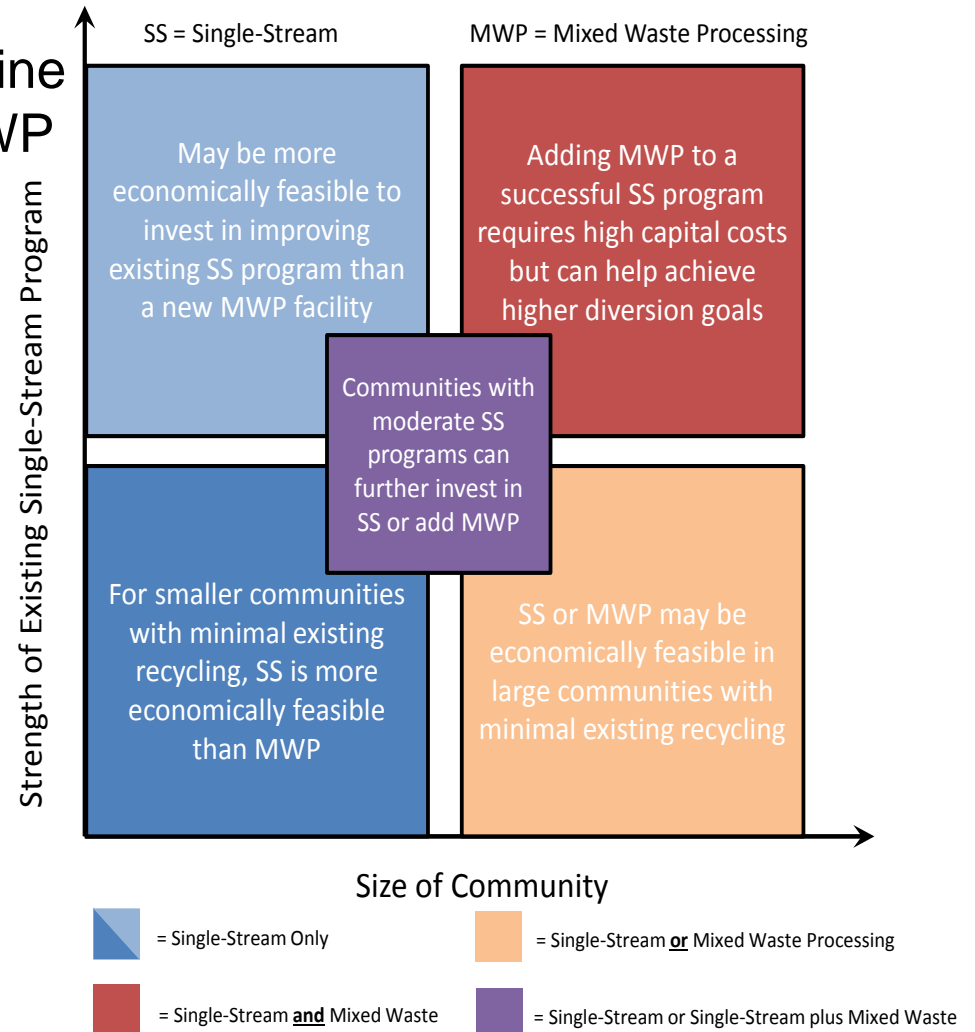
- Every Situation is Unique - No “one size fits all” solution
- Net cost to operating both Single-Stream (SS) and MWP systems
- SS systems focused on recovering more recyclable materials
- MWP more focused on recovering metal & plastic; less on paper

Key Findings (cont'd)

- MWP requires greater capital investment
- Economics favor SS as recovery rates increase
- High-performing SS system more economically viable than MWP
- MWP added to already successful SS (Scenario 2) present an option to achieve higher recycling rates

Every Situation is Unique

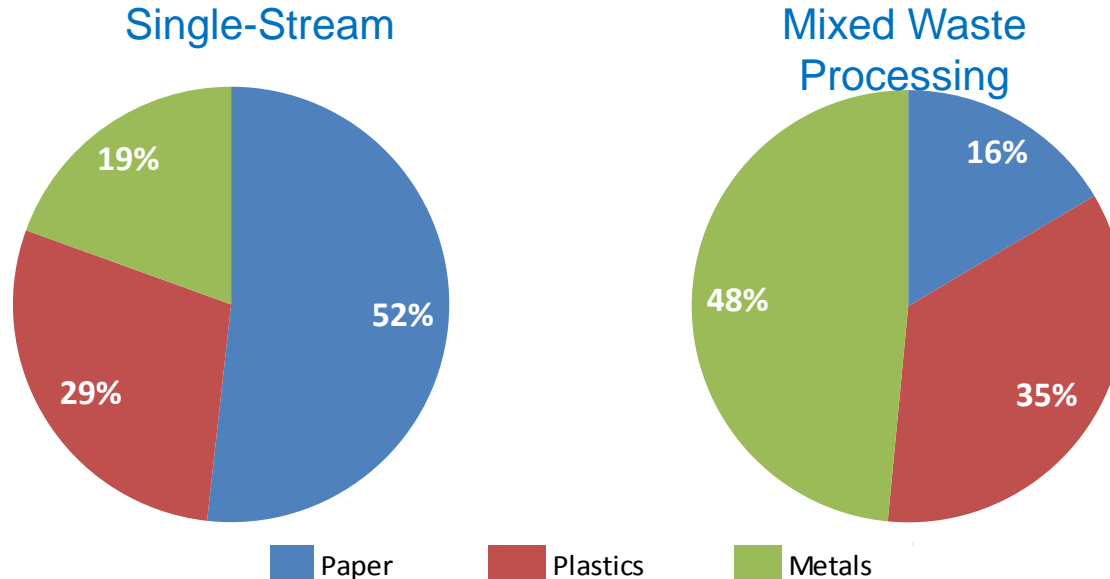
- A number of variables determine the economic feasibility of MWP versus SS
 - Success of existing single-stream program
 - Size of community
 - Recycling markets
 - Disposal costs
 - Policy and regulations
 - Others



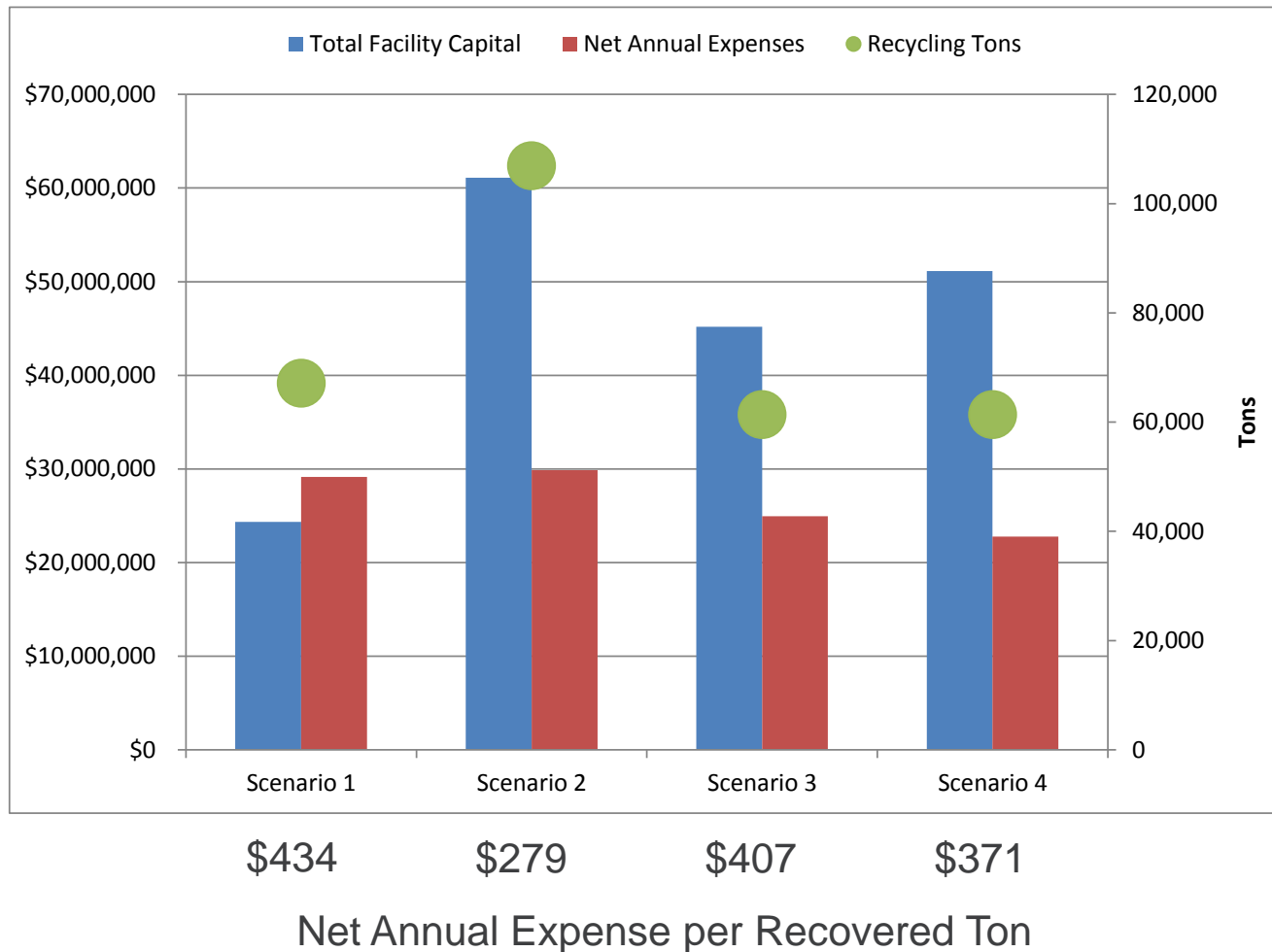
MWP Focused on Recovering Metal and Plastic

- Paper is worth more as clean recovered material than for use as waste-to-energy feedstock
- MWP facilities struggle to recover high percentages of clean paper
- MWP facilities depend more on revenue from plastic and metal
- MWP may use waste-to-energy to divert soiled paper

Breakdown of Recycling Revenue



Summary of Economic Analysis



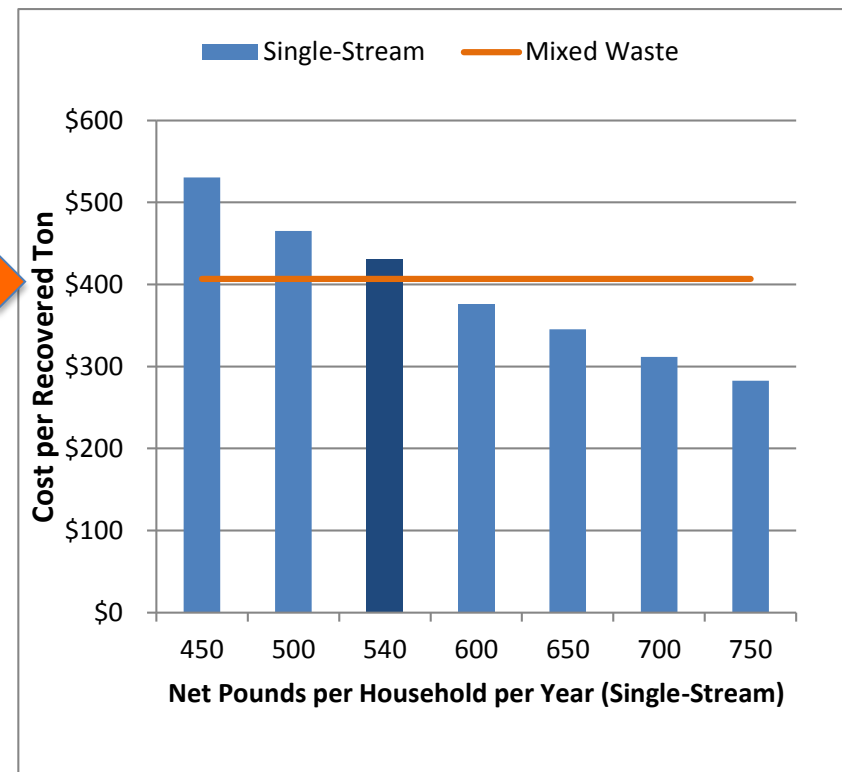
Net annual expenses includes:

- Amortized facility capital
- Facility operating costs
- Residual disposal/processing
- Collection costs
- Revenue from sale of recyclables
- Revenue from sale of refuse-derived fuel (Scenario 4)

Sensitivity Analysis

- Evaluated the impact of 4 variables on the economic analysis

Variable	Impact
Recycling Rate	The economics favor single-stream as recycling rates increase, such that high performing single-stream is more economically viable than MWP
Size of Community	The smaller the community, the less financially viable or practical MWP becomes
Recycling Market	A decline in market prices has greater negative impact on MWP facilities
Disposal Cost	As disposal prices increase, MWP becomes more financially viable



Conclusions

- Every situation is unique – no “one size fits all”
- Net cost to operating both SS & MWP systems
- MWP requires greater capital investment
- Economics favor SS as recovery rates increase
- MWP added to already successful SS system presents an option to achieve higher recovery rates
- Contamination from MWP big issue for paper industry (food packaging & other consumer items)

Thank You

Brian Hawkinson

Executive Director, Recovered Fiber

AF&PA

202-463-2776

brian_hawkinson@afandpa.org