Bio-products are an important part of our future….

COSMO
BIO-REFINERY

About Cosmo Specialty Fibers

Former Weyerhaeuser Dissolving Pulp Mill located in Cosmopolis, WA

Closed in 2006. Purchased by a private equity firm in 2010, commercial Production of 140,000 tons of pulp began in May 2011

155 family-wage jobs, profit sharing, $150MM/year into the WA State economy

Currently produce viscose pulp for Chinese rayon fabric markets

Aiming at acetate pulp qualifications from major chemical companies

COSMO
BIO-REFINERY

Bio-products at Cosmo should meet the following criteria:

- We will not consider anything that will be invasive or deleterious to the core direction of the mill to get to acetate;
- We will not pioneer any technology. We understood that enzymes and technology used in bio-products are constantly improving in cost and yield, but we can't afford to be an R&D guinea pig.
- We can't take the position of "build it and they will come". We have to feed into an established market with a stable price umbrella.

COSMO
BIO-REFINERY

Bio-Products Options from Residuals

Source	Derivatives	End Use Options
Cellulose Lignin (Spent Pulping Liquor Sawdust, Hog fuel, cull Combined rejects)	Sugars Glucose, Fructose, Xylose, Arabinose, Lactose, sucrose	Glycols: Renewable plastics, resins (Tide, Sierra Antifreeze) PLA: Compostable food, packaging industries Sugar sales to bio-chem. processers
Evaporator Condensate	Acetic Acid, Methanol Specialty Acids (Isovaleric, Pyruvic, Formic)	Organic: vinegar, condiments, salad dressing Industrial: paints, solvents, lubricants, adhesives, resins
C02 Emissions Post-Recovery Boiler; Pre-Scrubber Tower	Formic Acid	Animal feed, food technology, leather industry Potential: hydrogen storage material of vehicles powered by fuel cells

COSMO BIO-REFINERY

Our Bio-Commercialization Journey

- Started looking at selling residual bio-products in 2011 (COEL liquor)
- Began working with universities to determine analytical data for residual materials to determine value for commercialization into secondary products (ethanol, sugars, alcohols, lignin, etc.) in 2012.
- Worked with Department of Commerce for marketing study to determine value for residual co-products (2013-2014).
- Piloted 3 projects on residuals for feasibility (2013-2014)
  - Lignosulfonate
  - Acetic Acid
  - CO_2
- Worked with Washington State University students to determine study for regional biomass facility in the Pacific Northwest Region (2014) to incorporate items like sawdust, hog fuel, wood waste, yard waste, etc.

COSMO BIO-REFINERY

Bio- Commercialization (Cont.)

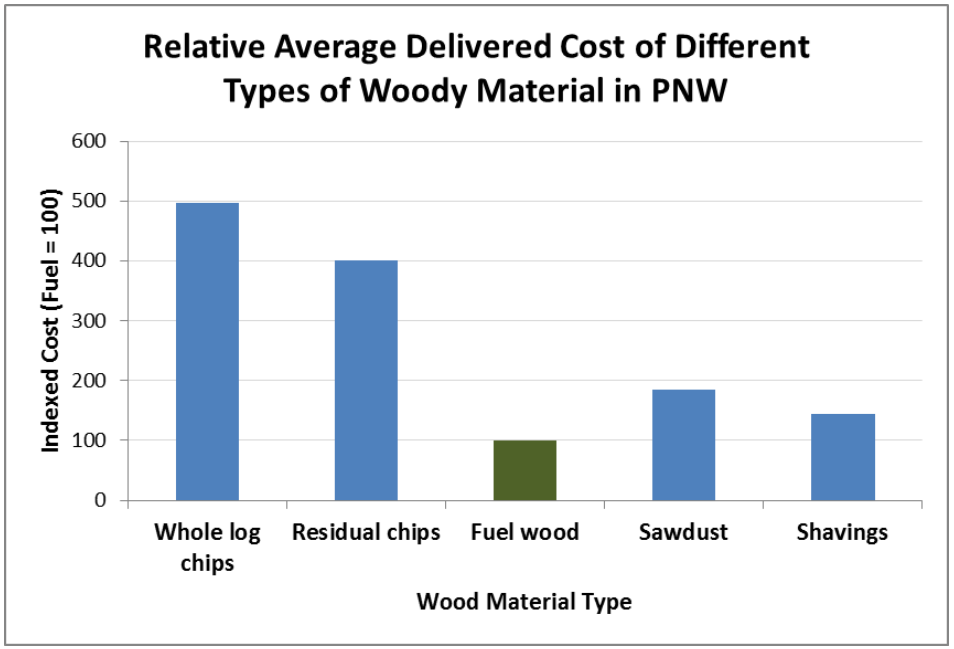
- Currently working to provide NARA with feedstocks for commercial biofuels bio-jet fuel project (2015-2016) – utilizing combined rejects
- Began marketing primary residual products which include:
  - Lignosulfonate
  - Combined rejects
  - Sawdust
- Other residual co-products projects (requiring capital investment partners) are also under consideration:
  - Acetic Acid
  - Methanol
  - Ethanol
  - Formic Acid
  - Pyruvic Acid
  - Poly Lactic Acid (PLA)
  - CO_2

COSMO BIO-REFINERY

Critical Issue For Wood Biomass Supply

Relatively high cost of woody material with uses other than fuel

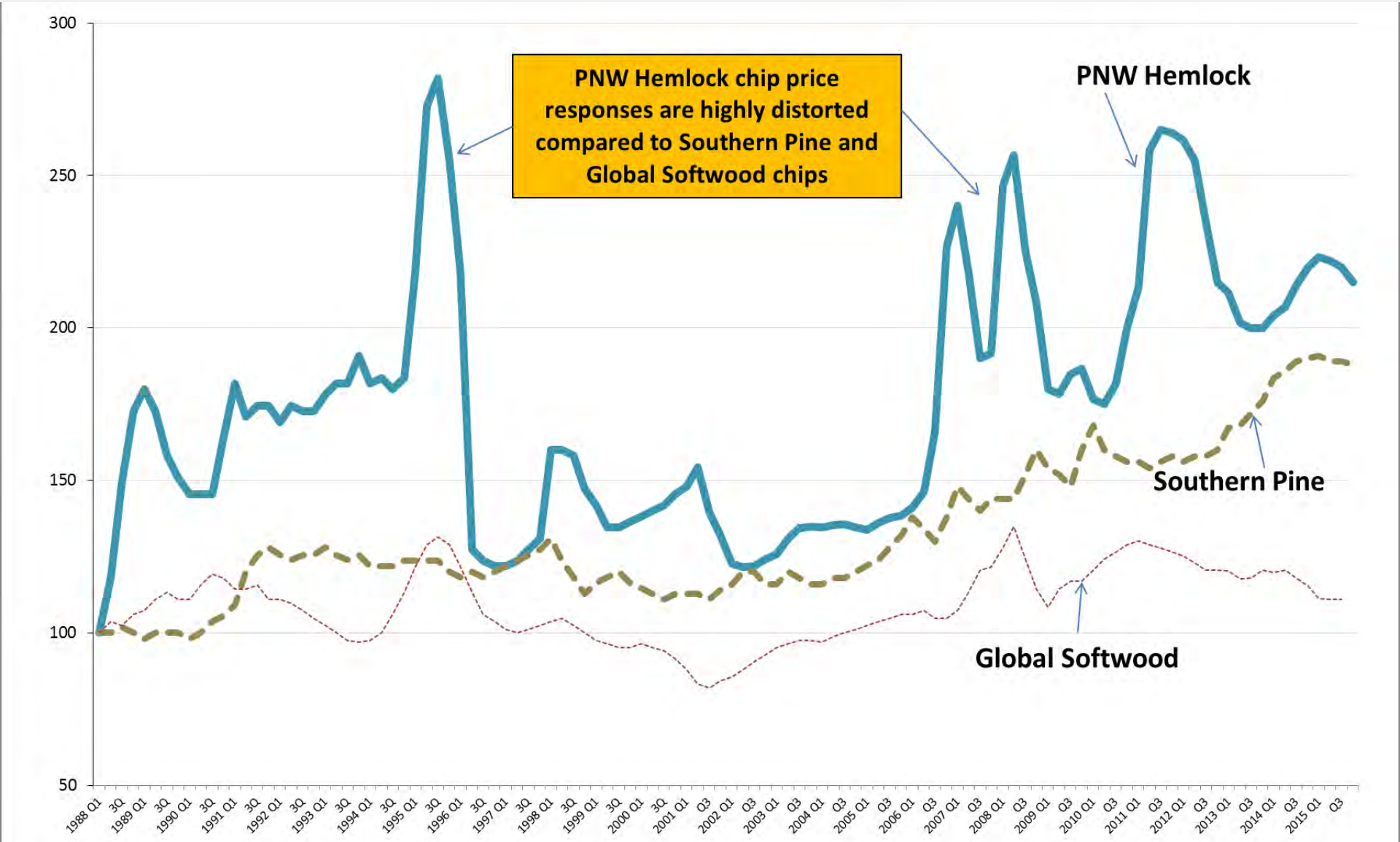
- Wood markets in the PNW are much more fragile than in other regions
- 50+% reduction in wood chip supply has led to closure of an average of one pulp mill every two years over the past 25 years
- Woody material supply is complex and dependent upon dozens of macro factors
- Fuel wood, sawdust, and shavings are sometimes oversupplied, but not always



Cost of higher value woody material makes biomass sourcing critical—must focus on underutilized material

COSMO SPECIALTY FIBERS INC

Indexed Delivered Chip Prices
PNW Hemlock, Southern Pine, and Global Softwood
1988 - 2015 (Q1 1988 = 100)



Sources: Chip Prices from Wood Resources International LLC, North American Wood Fiber Review

Key Variables Affecting Fiber Sourcing Strategy

Timber Resource

- Timber age distribution (affects harvest level)
- Growth vs. harvest volume (affects long term supply)
- Geographic variability (species, ownerships, operability)

Forest Ownership

- Forest ownership distribution (public / private)
- Landowner motivation to sell timber

Harvest Activity

- Lumber and veneer production (generates residual chips)
- Whole log chip production (determines stumpage pressure)
- Log export activity (generates pulp logs for chipping and can compete for pulp logs)

Cost Components

- Stumpage (driven by supply/demand)
- Logging (declining labor pool)
- Transportation (fuel cost / mode of transportation)
- Handling and processing

Risk Tolerance (to supply interruptions)

- Competitors'
- Suppliers'

Supplier Characteristics

- Business model; product mix (e.g. whole log vs. residuals)
- Species mix and volume variability (can vary significantly)
- Supply certification
- Financial health
- Strategic alliances with fiber customers
- Quality orientation

Competition

- Fiber competitor strategy and actions
  - Species, inventory, geographic distribution, quality requirements
  - Businesses integration / strategic supply alliances
- Pulp and paper market strength
- Transportation mode(s)
- Market share / fiber volume consumed, by species

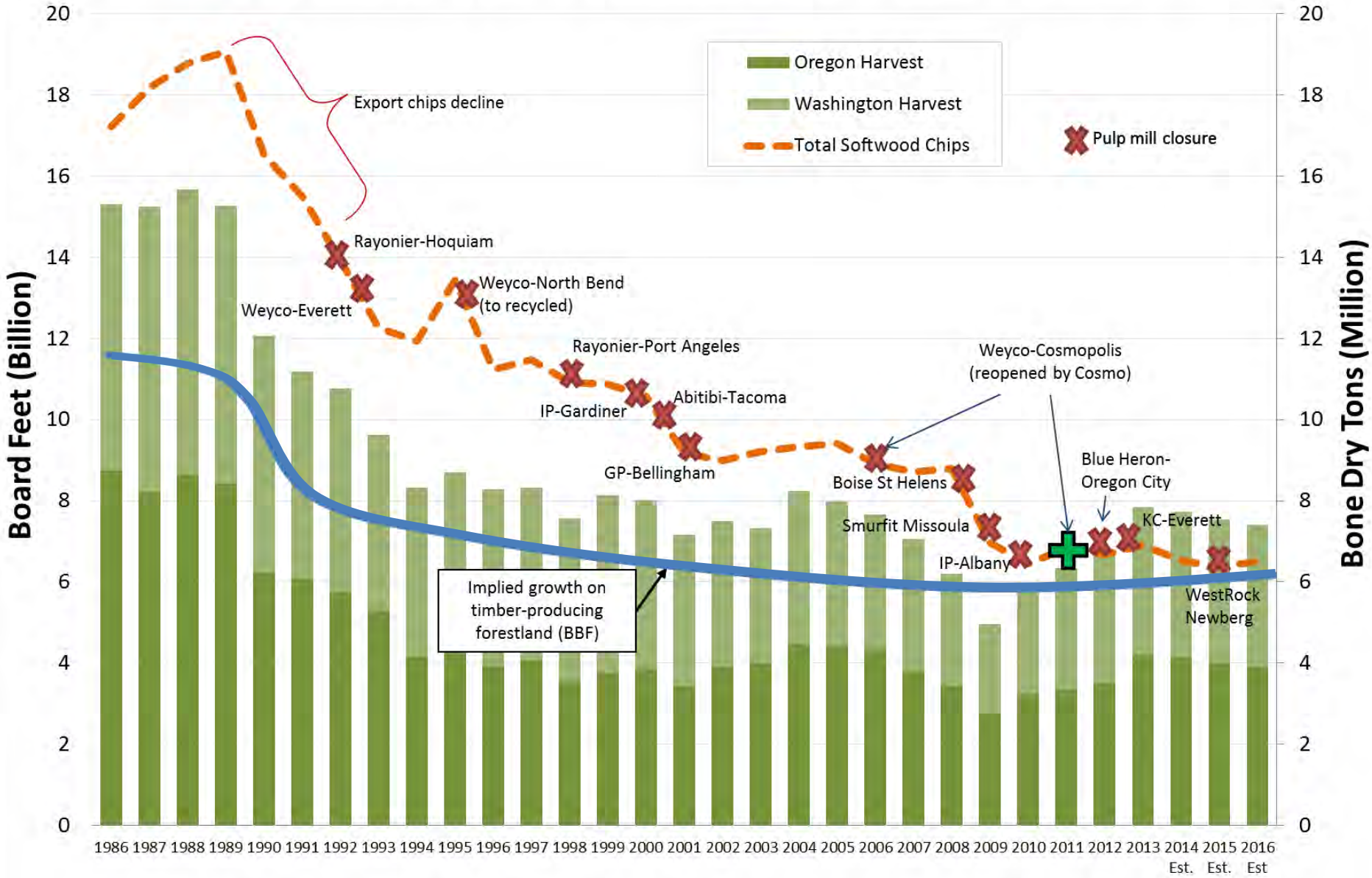
Short-Term Events

- Weather-related interruptions
- Chip and pulp log inventory levels (affects supply pressure)

Public Policy

- Public timber availability (thinning, salvage logging)
- Logging / trucking regulation

Pulp Mill Closures vs Chip Production, Timber Harvest, and Estimated Timber Growth



Sources: Timber Harvest—WA DNR & OR DOF; Chip Receipts—Forest Resources Association

Bio- Commercialization Consideration Points

- Bio Skill sets not necessarily on-site, as they are not within the core values of the company
- No established distribution chains may exist within the immediate area
- Bio-products are very dependent on efficient mill operations for feedstock volumes
- Specs and qualification period for bio-products need to be considered
- Processing costs too high for small volumes
- Fiber supply can't be impacted (see previous slides)
- C02 conversion technology could transfer right into WA State
- Bio strategies help diversify and increase company revenue streams.
- Can help unload waste water treatment ponds by about 1/3 for BOD loading
- Reduces bio-pond chemical costs, and also water/ power costs at certain production levels
- May reduce bio-pond sludge and providing thermal benefit to the Recovery Boilers
- Attractive to future mill investors – mill seen as progressive, well positioned in bio-chem and pulp markets
- Positions the mill with environmental public policy makers both in terms of new policy and resolving current issues
- May help give a "Distressed County" a new life
- May help attract and retain employees.

COSMO BIO-REFINERY