2019 Resin Outlook

October 25, 2018

Welcome to the Webinar

Attendees will be in listen only mode

Questions can be asked using the question section of your control panel

A recording of this presentation and the slides will be available on the APD Website

Jeoff Burris

Principal, Advanced Purchasing Dynamics

- >30 years manufacturing purchasing experience
- Founded APD in 2004
- Helps clients make their investment in purchasing a competitive advantage

Today's Presenter:

Matt Kaufman

Principal, Advanced Purchasing Dynamics

- 25 YEARS OF EXPERIENCE

- Global Plastics Industry Serving Automotive and Packaging Sectors
- Pricing Analysis and Savings
- Strategic Planning / Sourcing
- Price & Risk Mitigation through Arbitrage & Hedging

Today's Producer:

Jon Homrich

Client Support,
Advanced Purchasing Dynamics

- Project Management Leadership for Consulting and ProcureForce Implementation
- Helps clients make their investment in purchasing a competitive advantage

Introducing APD

Execution

Implementing projects that improve the bottom line

- Savings roadmaps with specific cost savings actions for each commodity
- Should-be cost model development
- Strategic sourcing implementations for sustainable savings

Technology

Unlocking savings with big data analytics for purchasing

- E-sourcing tool simplifies quoting and supplier management
- Develops should-be cost models for side-by-side quote comparison
- Identify opportunities for savings based on variance analysis of supplier quotes

People

Enhancing the capabilities of your purchasing team

- Purchasing Placement (direct hire or contract)
- Buyer skill development training:
  - Strategic negotiations
  - Commodity leadership
  - Understanding and managing costs

Customized solutions; There is no one size fits all approach.

We Help Clients Implement Knowledge-Based Cost Management in Three Ways . . .

1. **Turn-key Projects** that provide the maximum leverage of our expertise and time

2. **Execute-and-Mentor** where we deliver the early stages and guide the client's staff to complete the project while internalizing capabilities

3. **Technology Transfer** approach that relies on the client organization to execute

Strategic Cost Negotiations

- Thursday November 8th

  9:00 am - 5:00 pm

- $495

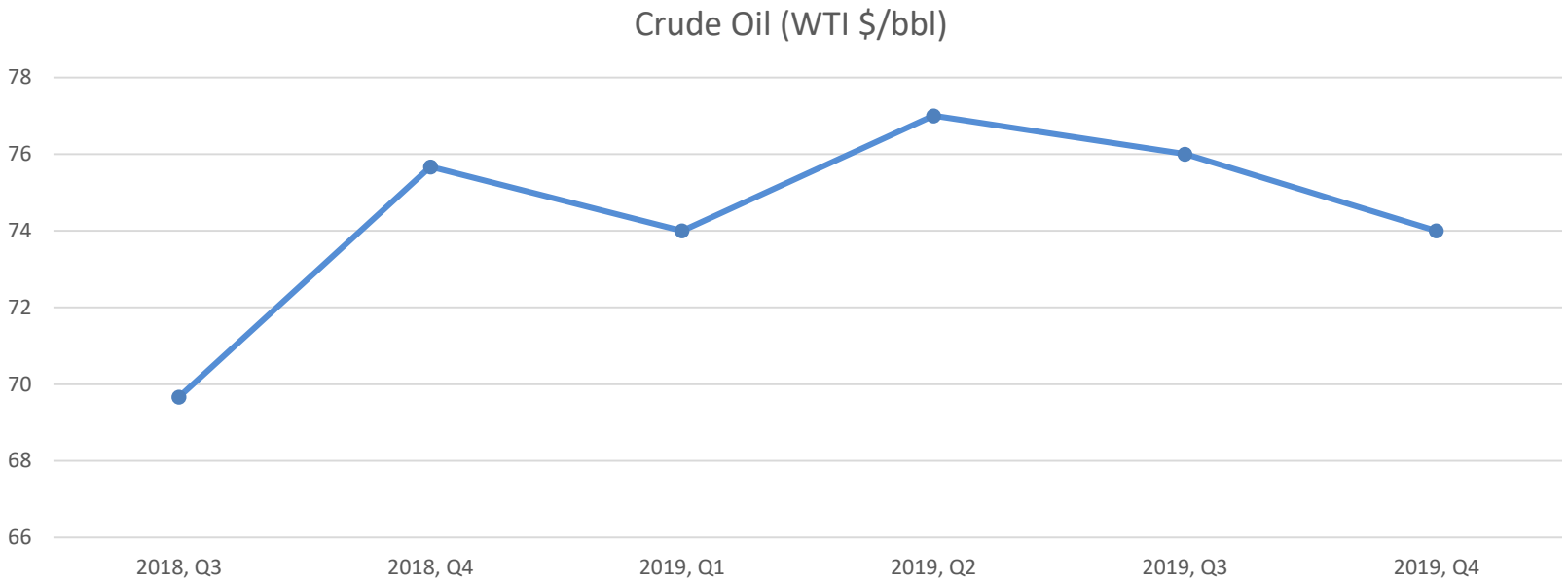
- Learn:
  - Best practices in the design of cost breakdowns
  - Proven approaches for successfully negotiating supplier pricing
  - Strategies to ensure adoption of cost breakdowns by suppliers

http://www.procureforce.co/event/strategic-cost-negotiations/

Today's Agenda

- 2019 Resins Opportunities and Risk
- Using Feedstock Cost Models

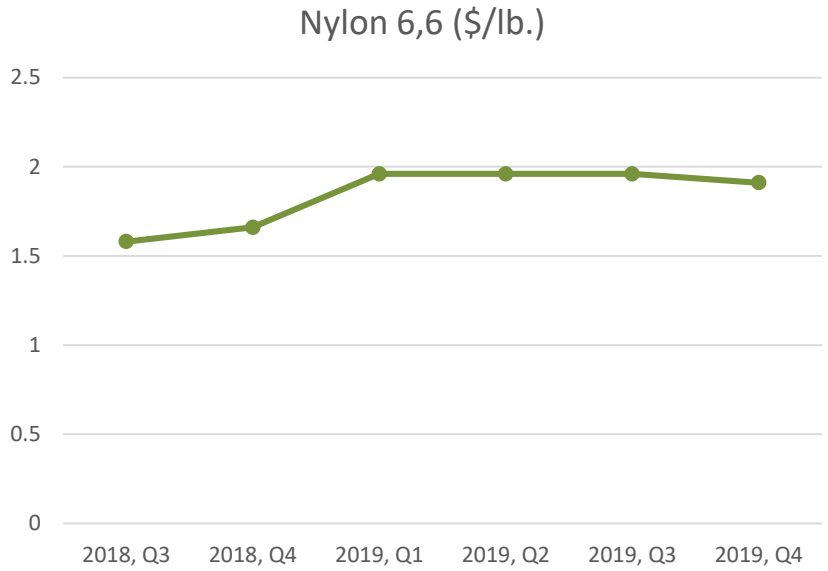
Current Bench Price Crude Price Outlook



Crude Oil (WTI $/bbl)					
2018, Q3	2018, Q4	2019, Q1	2019, Q2	2019, Q3	2019, Q4
70	76	74	77	76	74

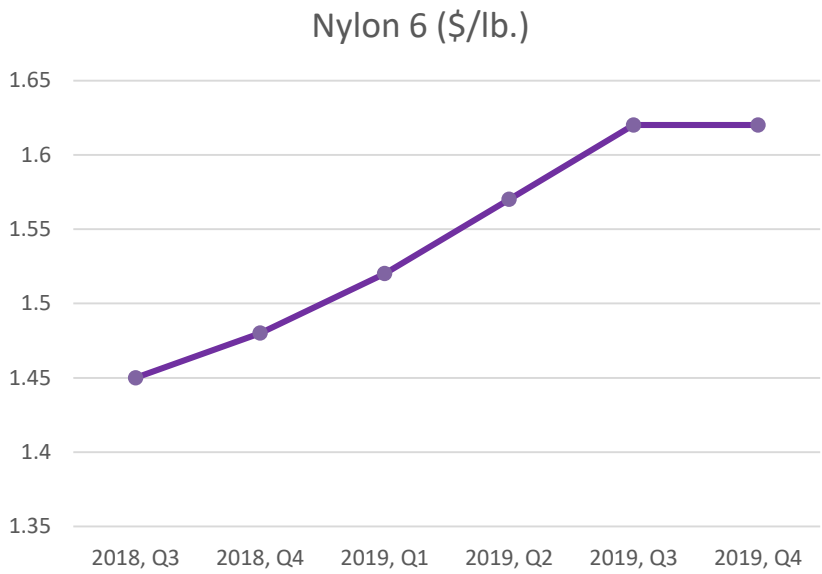
Nylon 66

- Globally in short supply
  - Production issues in Europe and US
  - General demand has increased
- 2019 Outlook
  - Availability still and issue
  - Pricing will continue to move upwards
  - Many users trying to reengineer products to use Nylon 6 instead of 66
- 2020 and beyond – additional capacity will come on line



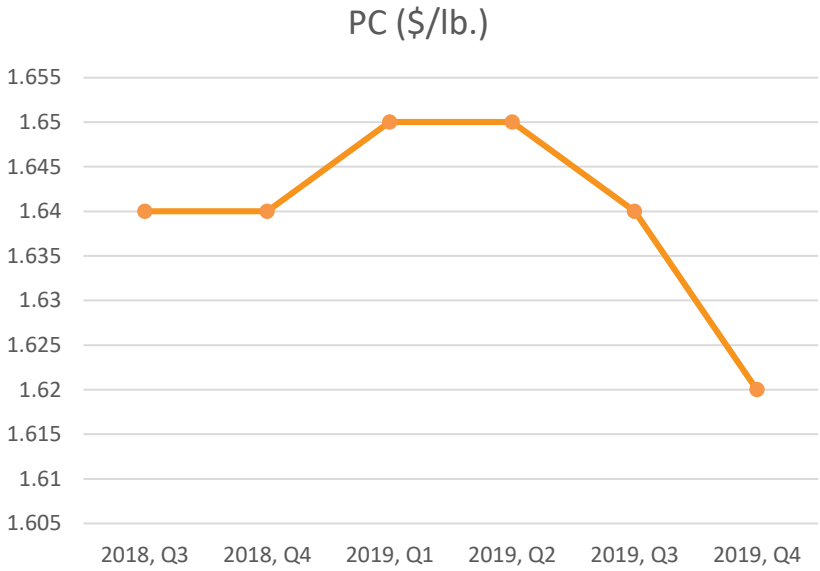
Nylon 6

- Excess capacity exists.
- Conversion of components from 66 to 6 is increasing demand.
- Pricing will continue to provide conversion opportunities.
- However, pricing for existing components using at risk.



Polycarbonate

- Excess capacity exists from capacity expansions in China and Korea
- Impacted by Oil (60%)
- May present buyers in Asia and Europe with opportunities – especially if oil prices ease.
- To a lesser extent us.



Others

- ABS – flat
- PVC – flat
- Polypro – flat in 2019 but maintaining increases experienced in 2018

Engineered Resins

- 2019 outlook is heavily dependent on buyer/seller strength in the market place

Favors Buyer	Favors Seller
Multiple resins approved for application	Single resin approved for application
Non-safety or performance critical	Safety critical requiring vehicle testing to change
Commodity compounded resins – example 30% glass filled polypropylene (bracket)	Highly engineered -- polypro with rubber modifiers (air bag chutes)
Spec'd by buyers engineer	Spec'd by OE engineers

Feedstock/Should Be Cost Models

Why Develop “Should Be” Cost Models

- Provide an insight into cost versus price
- Identify key cost drivers
- Provide cost comparisons between similar grades of plastic
- Are an ideal negotiation tool
- Track performance price v model

Two broad kind of Plastics

- **Thermosets:** Never soften when they are originally molded

Not covered in this discussion

- **Thermoplastics**: Soften when they are heated
  - "Neat/Base Plastics" are produced in a reactor
  - Compounded Plastics are produced with an extruder
  - Thermoplastics are then typically extruded, injection, or blow molded

    into it's final form

Types of “Neat or Base” Plastics

- Polyethylene (HDPE, LDPE,LLDPE)
- Polystyrene
- Polypropylene
- Polyvinylchloride (PVC)
- Polycarbonate
- Polyamide (Nylon 6, Nylon 6/6, Nylon 12)

“Neat or Base” Plastics Cost Model Inputs

- Capital Cost (Greenfield or Brownfield)
- Capacity
- Depreciation
- Labor
- Catalysts
- Energy: Electricity and Natural Gas
- Raw Materials: Propylene, Adipic Acid, Ethylene, Etc.

Types of Compounded Plastics

- ABS
- PBT
- PP with 30% Short Glass
- Nylon 6 with 20% Mica

Compounded Plastics

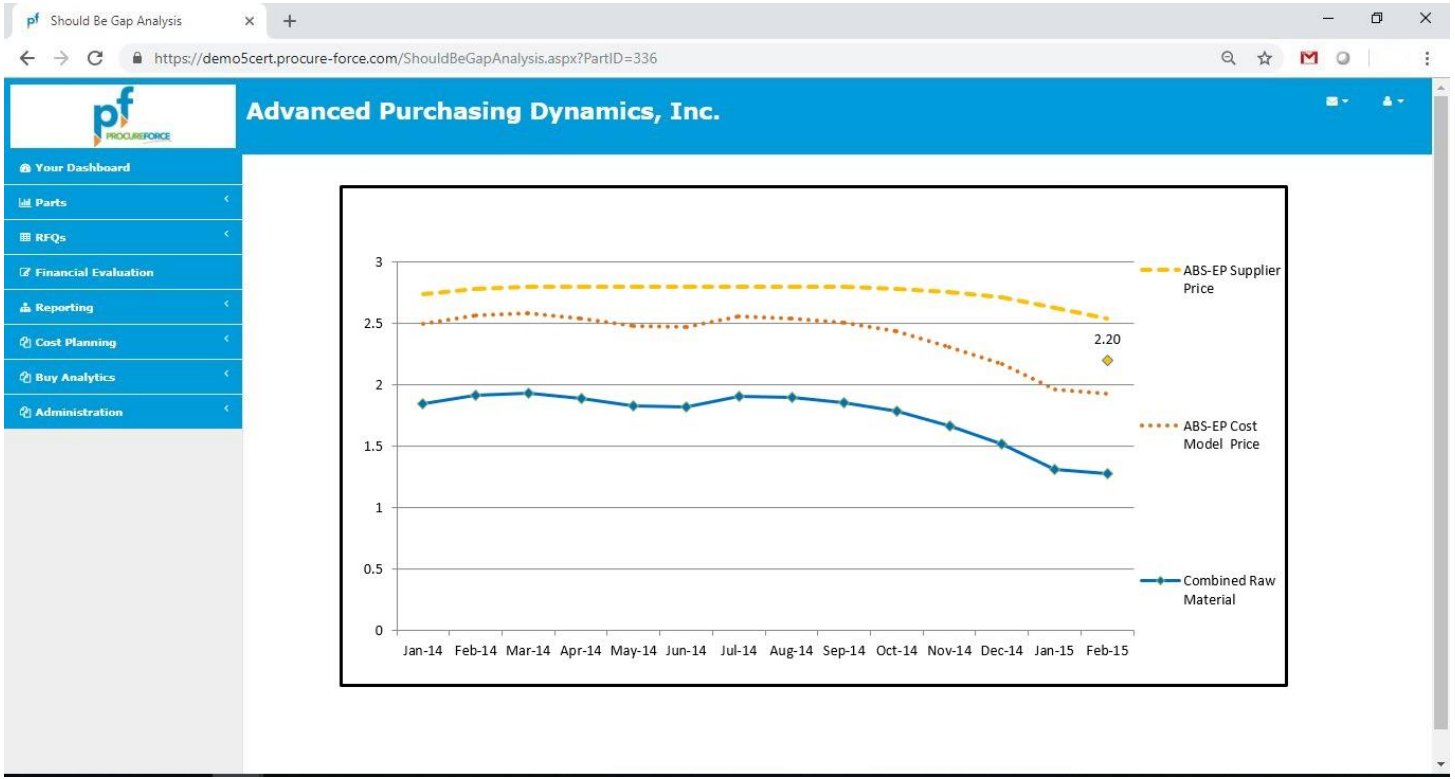
- Capital Cost (Greenfield or Brownfield)
- Capacity
- Depreciation
- Labor
- Energy: Electricity
- “Neat/Base” Plastics: Polypropylene (PP), Nylon 6, etc.
- Compounding Additives: Glass, Mineral, Talc, Colorants, UV additives,

  Heat Stabilizers, Anti-Stat, etc.

Example of Compounded Plastic Cost Model

					Aug-18	Sep-18
					NA	NA
Engineered Resins "Should Be" Cost Model					$/lb.	$/lb.
					Compounded	Compounded
Manufacturing Site Assumptions: Nameplate Capacity (MM lbs.)					100	100
Capital Cost($ MM)					110	110
Total Manufacturing Costs ($/lb.):Includes Operating(Variable) and Fixed Costs					0.13	0.13
REACTOR: RAW MATERIALS and ADDITIVES	**18-August Index**	**18-August Index less discount**	**18-September Index**	**18-September Index less discount**		
Compounding: Base Poglmers-$/lb						
Base PP	0.86	0.69	0.85	0.68	0.4472	0.442
Formulation					20% Talc, Heat Stabilized, Black color additive	20% Talc, Heat Stabilized, Black color additive
Compounding: Additives-$/lb.						
Talc	0.11	No Discount Assumed	0.11	No Discount Assumed	0.022	0.022
Heat Stabilizer	3.75		3.75		0.15	0.15
Margin					**0.175**	**0.175**
Freight and Deliverg:						
Bulk Truck						
Box					0.06	0.06
Bag						
TOTAL COST: "SHOULD BE" COST MODEL REACTOR SHOULD BE PRICE= TOTAL OPERATING COST+TOTAL BASE RM COST+ MARGIN + FREIGHT; **SHOULD BE COST MODEL COMPOUNDED PRICE=TOTAL OPERATING COST +COMPOUNDED PLASTIC+ADDITIVES+MARGIN+ Freight**					**1.100**	**1.100**
CURRENT PRICE-DDP(Delivered Duty Paid)					**1.21**	**1.21**

Example of "Neat or Base" Plastic Cost Model



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