

Process Oil in 2016

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Topics

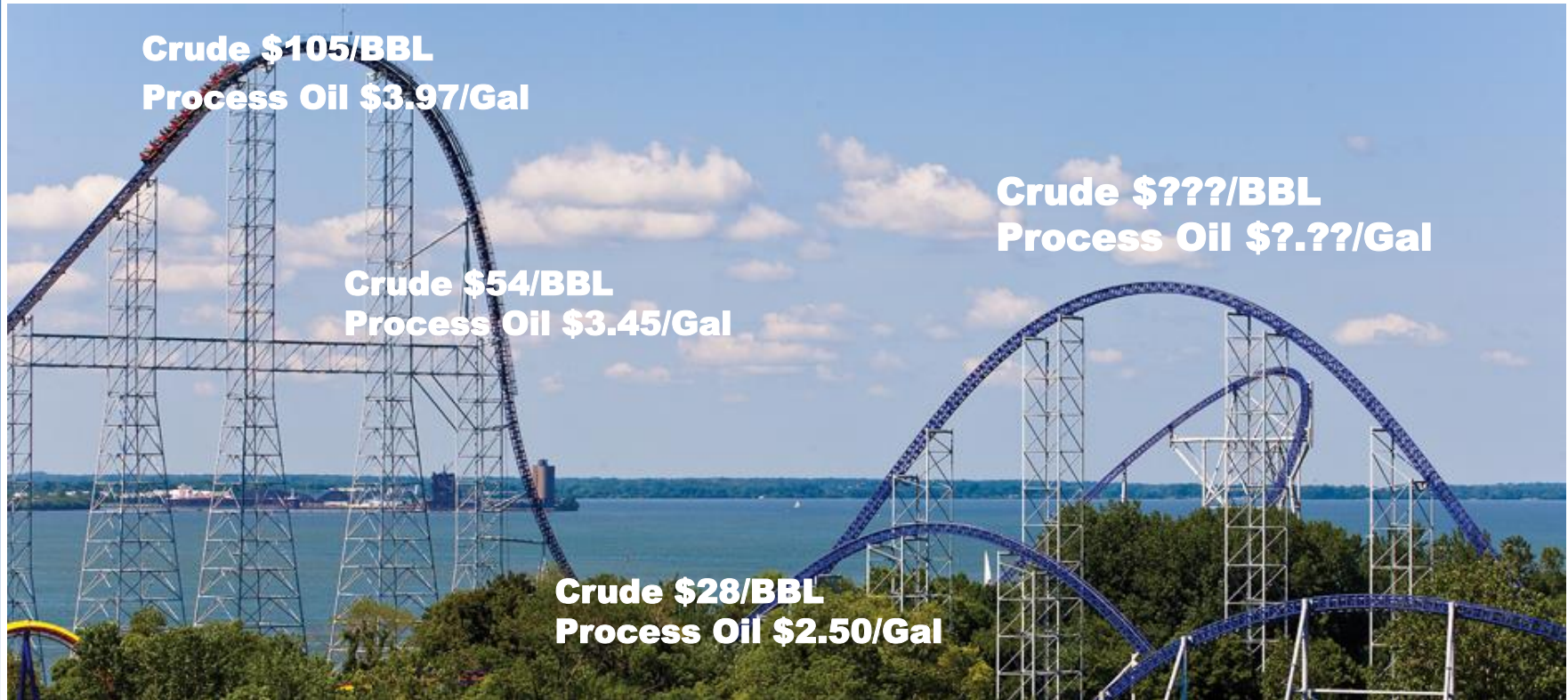
- Factors affecting cost and availability
- Oil Naming Conventions

Petroleum Pricing Roller coaster

- Crude oil
- Changes in transportation oils
- New base oil processes
- Change the materials produced
- New production puts competitive pressure on older oil production units.
- Inefficient plants close

Crude Oil Impact

Dollars Per Barrel/Gallon



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Crude Oil Impact

- Cyclical Pricing: Boom and Bust: Look at 2014 to 2016
- Crude price partially set by commercial value
- Geo-political influence
- Futures markets distort the highs and lows
- Crude pricing sets general market level
- Individual product prices follow supply and demand within market

Transportation Changes

- Changes in autos and trucks: smaller engines, run hotter, less cooling
- Bodies more aerodynamic and less air around power plant
- Need for oil that withstands heat better
- Improve oil stability

Basic Premises for Refining

- Refineries are built to supply fuels.
- Refineries are a series of plants which are intended to upgrade the value of the oil.
- Base Oil plants are generally built to supply transportation lubrication products.
- Law of supply and demand:
 - Full tanks downward price pressure
 - Empty tanks upward price pressure

Fuel Products Dominate a barrel of crude?

THE CUT

THE YIELD

THE USE

Gasoline

44 %

Cars

Jet Fuel

7 %

Planes

Distillate Fuel

25 %

Heat, Trucks

Residual Fuel

12 %

Heat, Machines, Ships

Petrochemical Feed (3%)

Chemicals, PP, PE

Lubricants (1%)

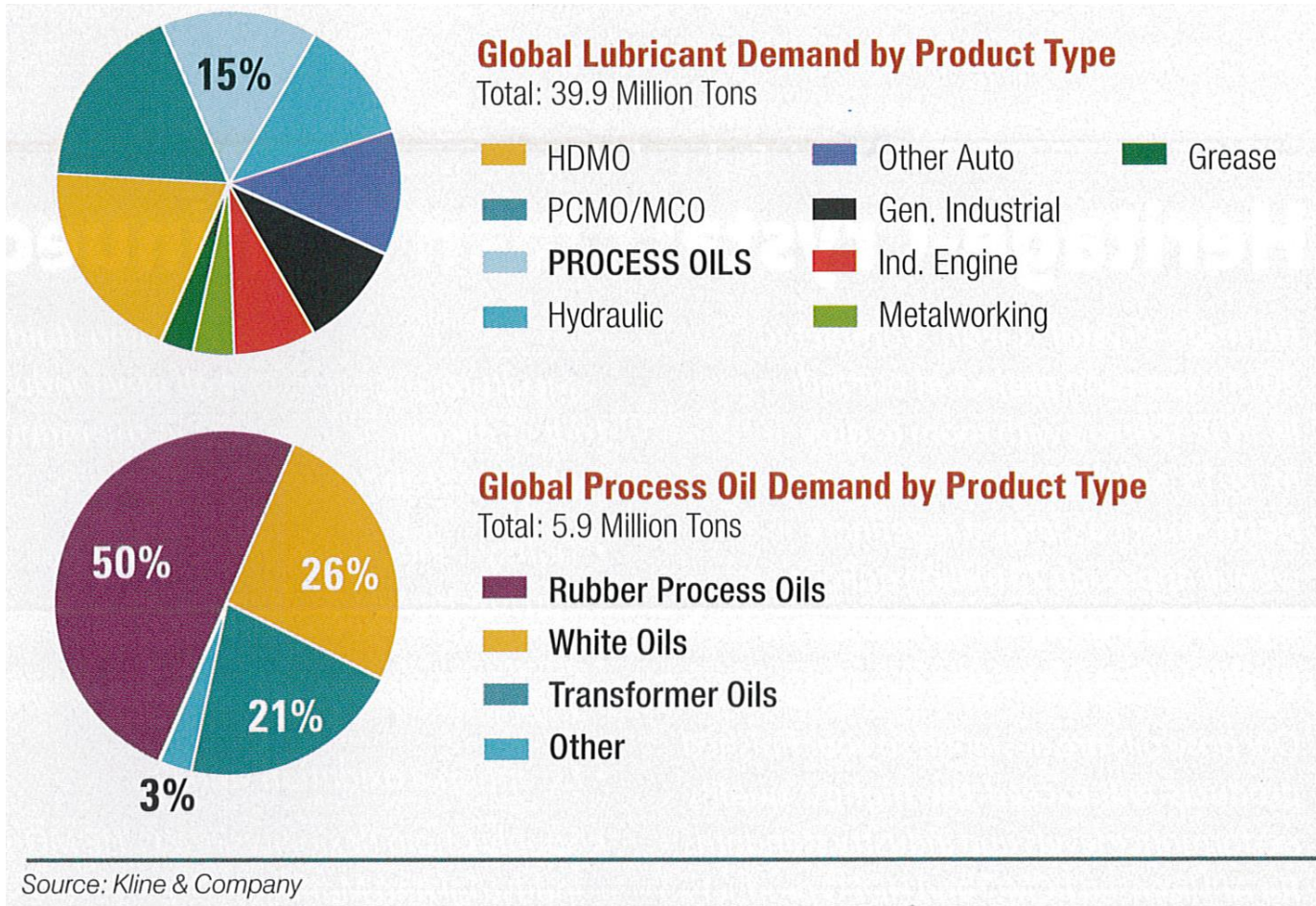
Process and Lube Oil

**Asphalt, Wax, Coke,
Aromatic Oil, Other**

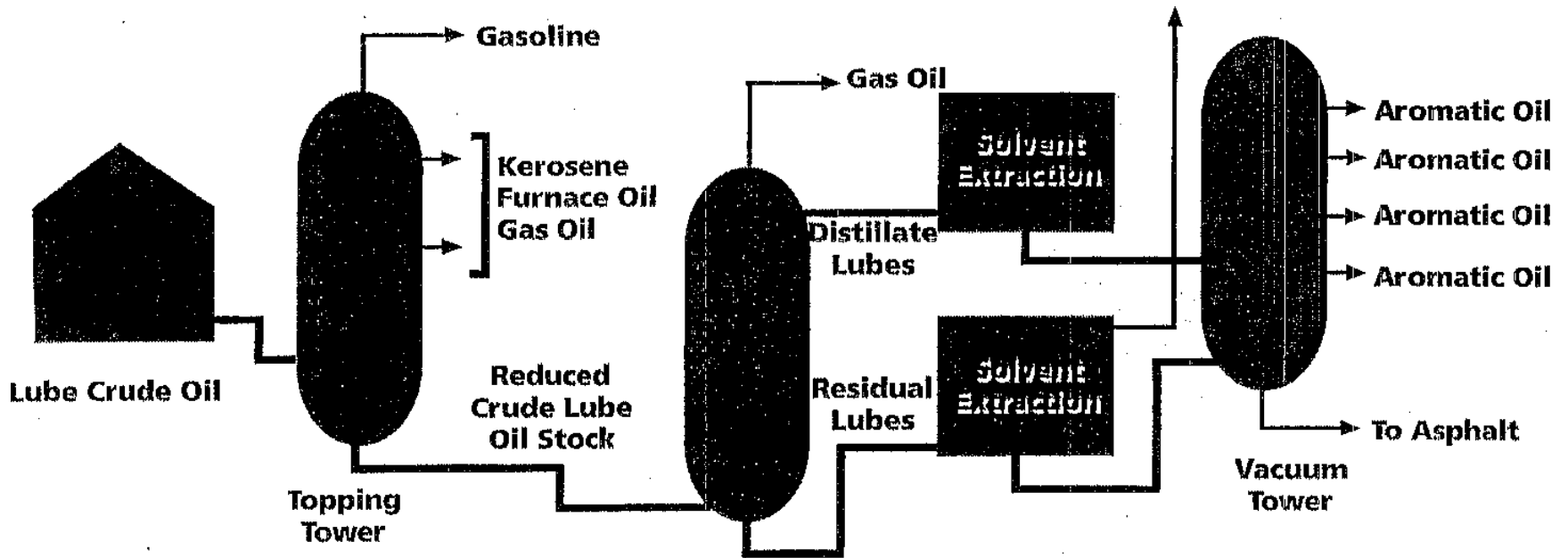
8 %

Wax, Asphalt, Etc.

How Lubricants' 1% Breaks Down



Process Oil Plant Silhouette



Shift in Paraffinic Technology

- Lube Oil Volatility Requirements
- Group II Base Oils
- Extraction, Catalytic Dewax
Hydro-cracking, Catalytic Dewax/ISO Dewax
- The good side: Very light, stable oils
- The Flip side:
 - Lower solvency
 - Highest Viscosity 600 SUS @100F (No Bright Stock)
 - No Aromatic Extracts
 - No Wax

Oil Selection Sweet Spot

Viscosity SUS@100F	Naphthenic	Rubber Grades	Transportation Grades	Solvent Extracted Group I Paraffinic	Group II Paraffinic
60/70	Yes			Yes	Yes
100	Yes	X	X	Yes	Yes
150	Yes	X	X	Yes	Yes
200	Yes			Yes	Yes
250	Yes			Yes	Yes
325	Yes			Yes	Yes
500/600	Yes	Nap- Gr Para-yel	X	Yes	Yes
1200	Yes	X		Yes	No
2400/ BS	Yes	X	X	Yes	No
Aromatic Extracts	Some	X		Yes	No
Wax	No	X		Yes	No

Naming Conventions for Process Oils

Process Oil Naming Conventions

Sunpar 2280 –

First number represents the approximate aromatic and polar percent as measured by Clay-Gel analysis. Add a zero and you have the percent 20%.

The next numbers represent the approximate viscosity as measured in SUS @ 100F if a zero is added. 2800 SUS @ 100F

Sundex 8125 –

First number represents the approximate aromatic and polar percent as measured by Clay-Gel analysis. Add a zero to 8 and you have the percent 80%.

The next numbers represent the approximate viscosity as measured in SUS @ 210F. 125 SUS @ 210F

Process Oil Naming Conventions

Calsol 8240 –

First number represents the crude oil type.

The next numbers represent the approximate viscosity as measured in SUS @ 100F if a zero is added. 2400 SUS @ 100F

Calsol P910 –

First Letter P signifies paraffinic

First number represents the crude oil type.

The next numbers represent the approximate viscosity as measured in SUS @ 100F if a zero is added. 100 SUS @ 100F

Process Oil Naming Conventions

Corsol 100

Number is SUS @ 100 F: 100 SUS @ 100F

HyPrene 100

Number is SUS @ 100 F: 100 SUS @ 100F

HyPrene P 150 BS

First letter stands for paraffinic

Number is SUS @ 210F: 150 SUS @ 210F

Raffene 2400

Number is SUS @ 100 F: 2400 SUS @ 100F

Raffex 90

SUS @ 210 F is the number: 90 SUS @ 210F

Valaro 130A

SUS @ 210 F is the number: 130 SUS @ 210F

Questions/Comments?