



Latest Trends in Grease Market



Trinity Lubes &
Greases FZC (UAE).

Siddharth Grease &
Lubes Pvt. Ltd
(INDIA).



Agenda

- ▶ Lithium consumption and its price evolution
- ▶ Grease Market Survey – focus on Global & Europe
- ▶ Comparison of Grease Thickeners
- ▶ Summary
- ▶ Facilities
- ▶ Sustainability

Lithium Consumption 2010-2021

Details in MT	2010	2021
Lithium total consumption	23500	93000
Lithium in Grease	2350	2790
Lithium in Batteries	5405	68820



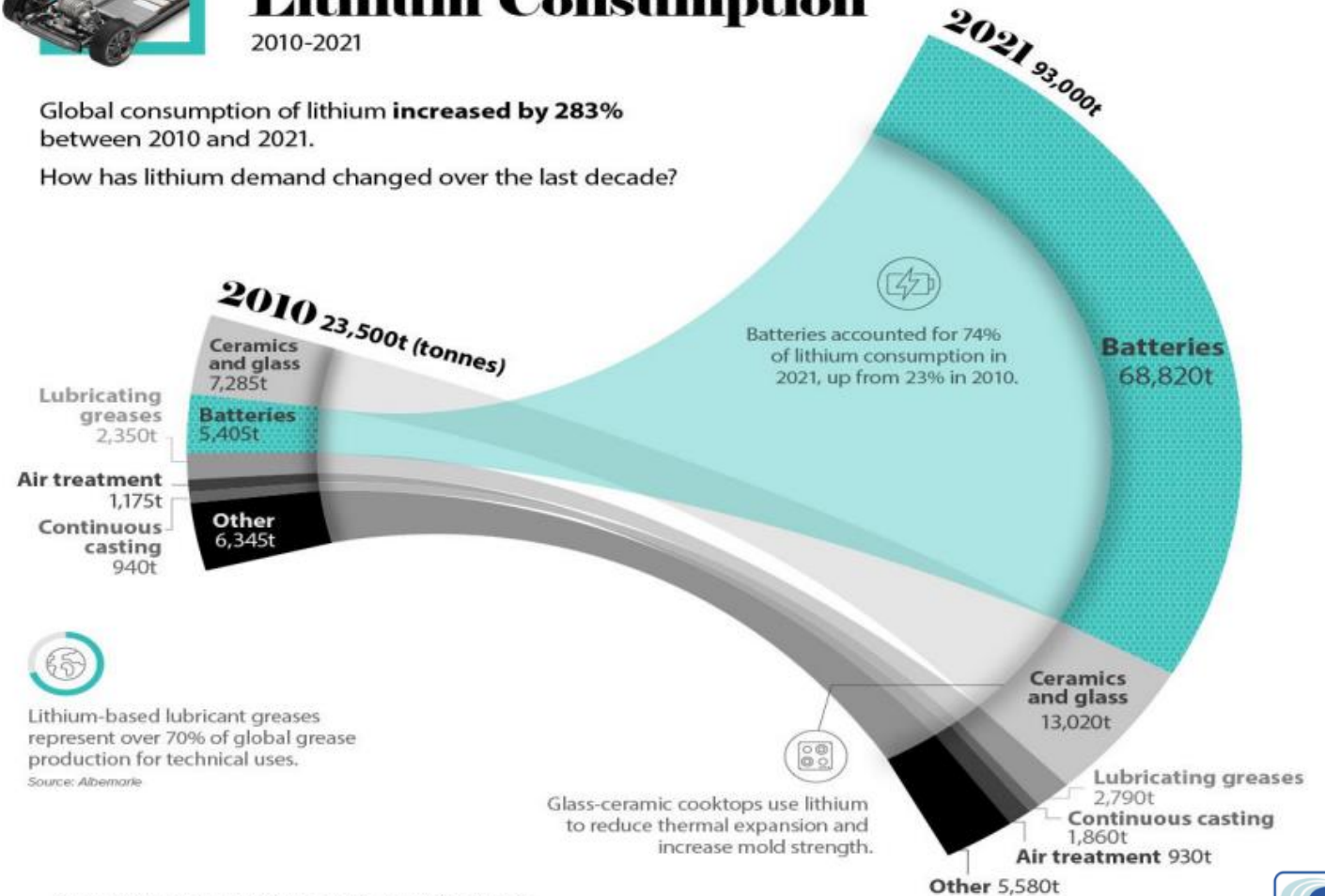
The Growth of Lithium Consumption

2010-2021

Global consumption of lithium **increased by 283%** between 2010 and 2021.

How has lithium demand changed over the last decade?

Source: <https://elements.visualcapitalist.com/lithium-consumption-has-nearly-quadrupled-since-2010/>



Marginal change in Lithium consumption in Greases.
Major consumption increase in Batteries

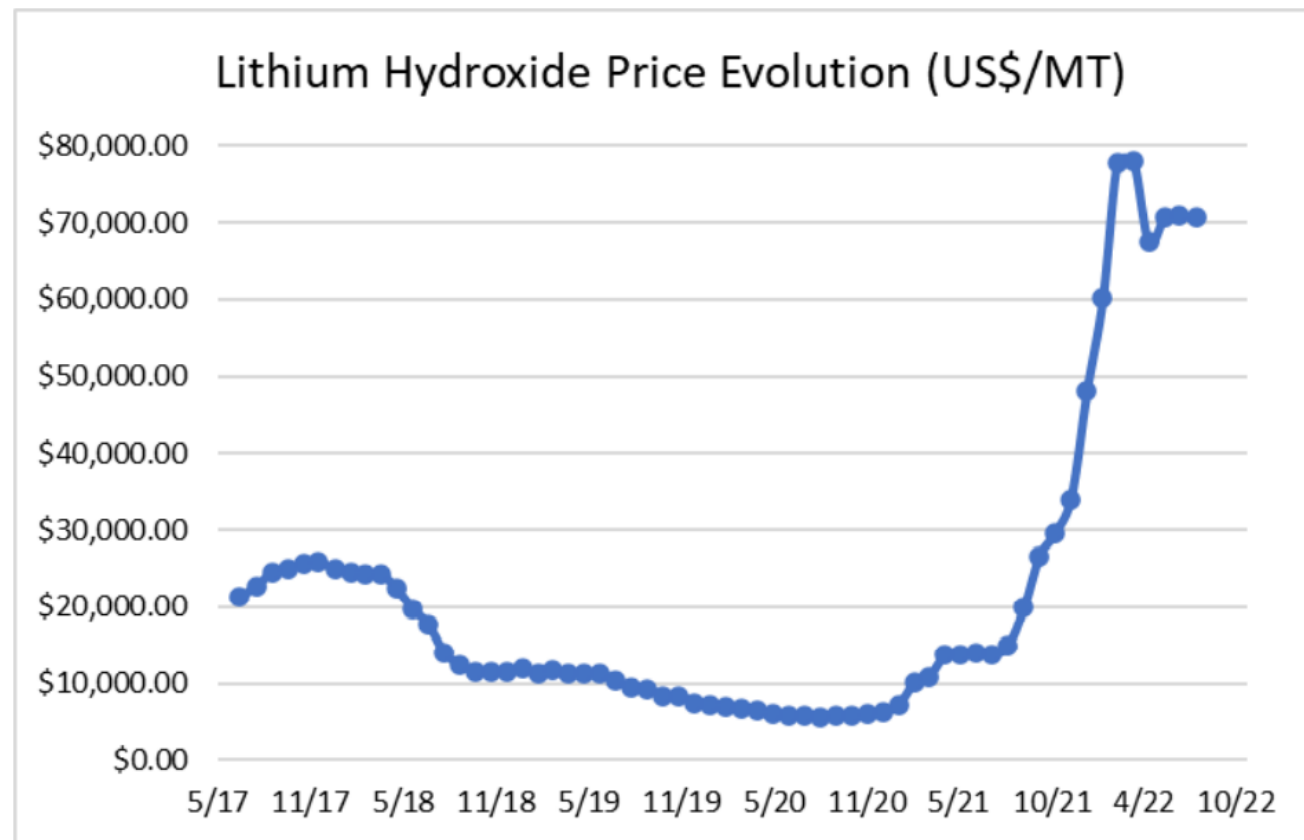


Siddharth



Global Lithium Cost Evolution (2021)

- ▶ 7-8 times cost increase in Lithium in last 4-5 years
- ▶ Need to search alternate for Grease business



*Source: Lithium 2017-2022 Historical Prices
www.tradingeconomics.com/commodity/lithium

Global Market Grease Production Report



NLGI Grease Production Survey



What is the NLGI Production Survey?

- Voluntary Submission of Annual Grease Production
- **Only as accurate and meaningful as the quality of data reported**

What does the NLGI Production Survey Provide?

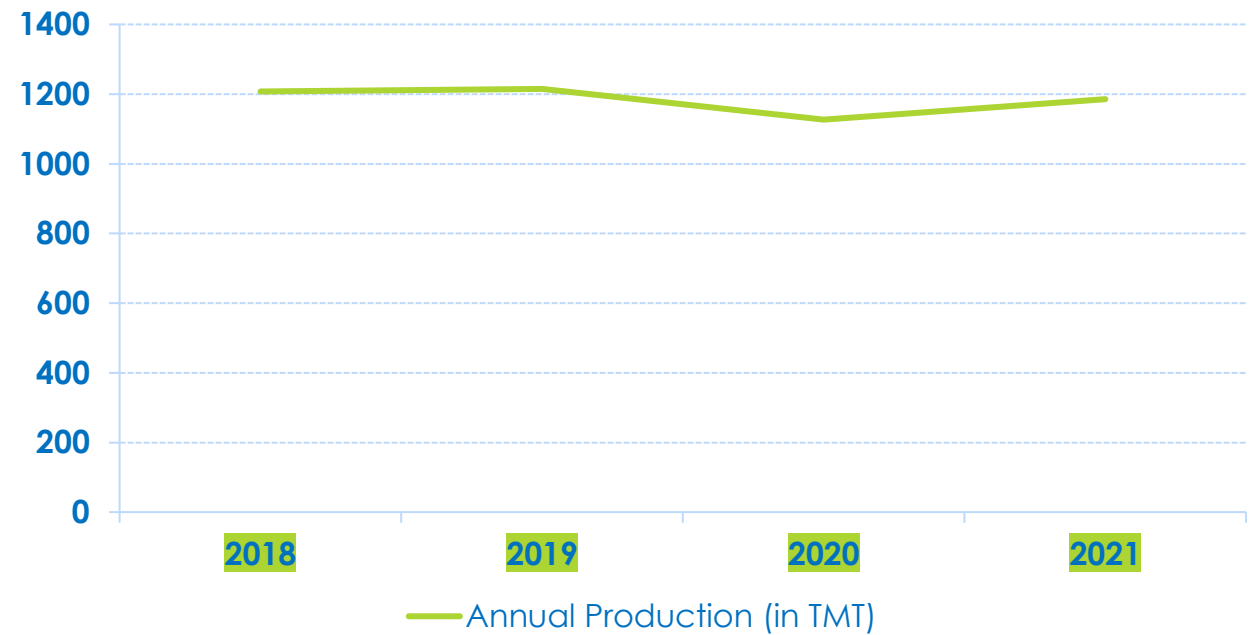
- Annual accounting of grease production globally
- The data is categorized in many useful ways
 - **By Geographic Region**
 - **By Thickener Type**
 - **By Year**
 - **By Base Oil Type (beginning in 2010)**



The Global Perspective

- ▶ Global production had been stable over this period, about 1.2 million MT

Annual Production (in TMT)



Region	Number of Companies Providing Production Data	Reported Number Of Grease Plants*	Total Lubricating Grease Reported (Pounds)	Average Production Pounds Per Reporting Grease Plant
North America	37	48	373,999,627	7,791,659
Europe	43	49	479,778,426	9,791,396
Caribbean, Central & South America	10	13	80,661,440	6,204,726
Africa & Middle East	13	13	115,961,287	8,920,099
India & Indian Subcontinent	14	28	209,555,939	7,484,141
Japan	15	15	177,604,427	11,840,295
Pacific & South East Asia	13	18	183,209,818	10,178,323
PRC	79	79	994,759,130	12,591,888
TOTAL	224	263	2,615,530,094	9,944,981

1186 TMT

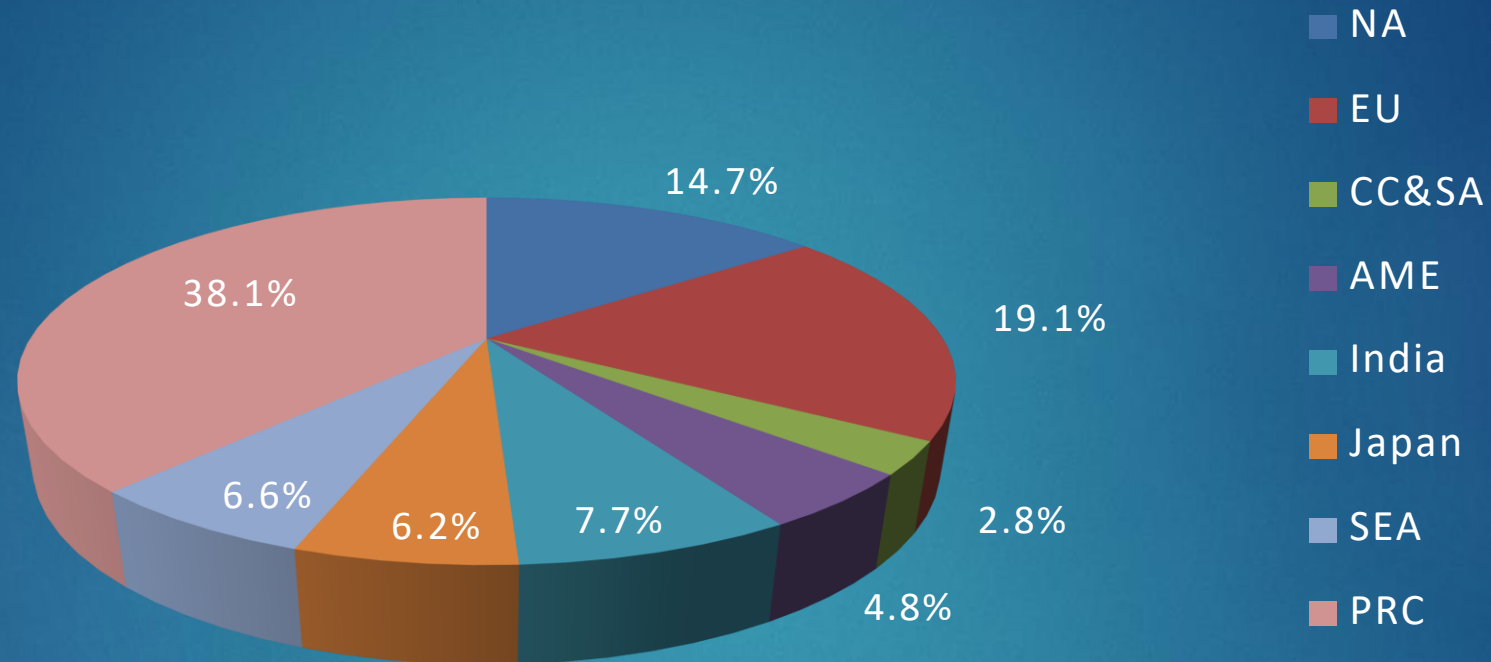
Ref: Grease Production Survey report 2021

The Global Perspective – By Region

2021 Production Survey Global Statistics

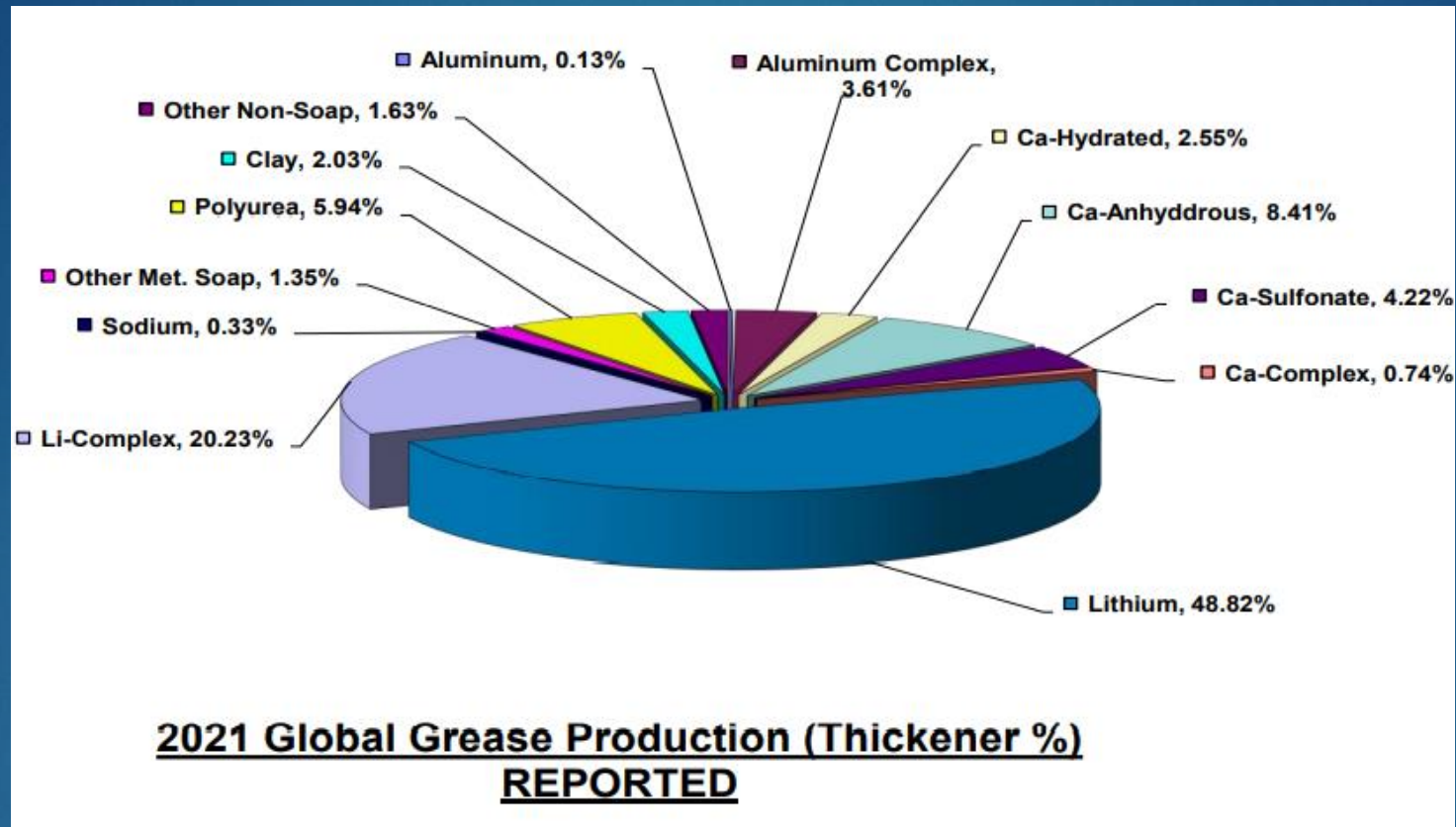


The Global Perspective – By Region



- People's Republic of China production continues to be greater than Europe and North America production combined

The Global Perspective – By Thickener Type



Source: 2021 Global Grease Production Survey

➤ Lithium plus Lithium Complex production represents nearly 69% of total global production



Recent Thickener Changes 2016 to 2021

❖ Volumes increasing

- ▶ Anhydrous calcium
 - Up 55000 MT mostly in China
- ▶ Aluminum complex
 - Up 7000 MT mostly in NA
- ▶ Calcium sulfonate
 - Up 19000 MT global effect

❖ Volumes decreasing

- ▶ Conventional lithium
 - Global migration to other soaps
 - Down from peak volume in 2016
 - Still biggest volume in India
- ▶ Sodium soap
 - Global volume down 50%

Other thickener system have largely remained static.

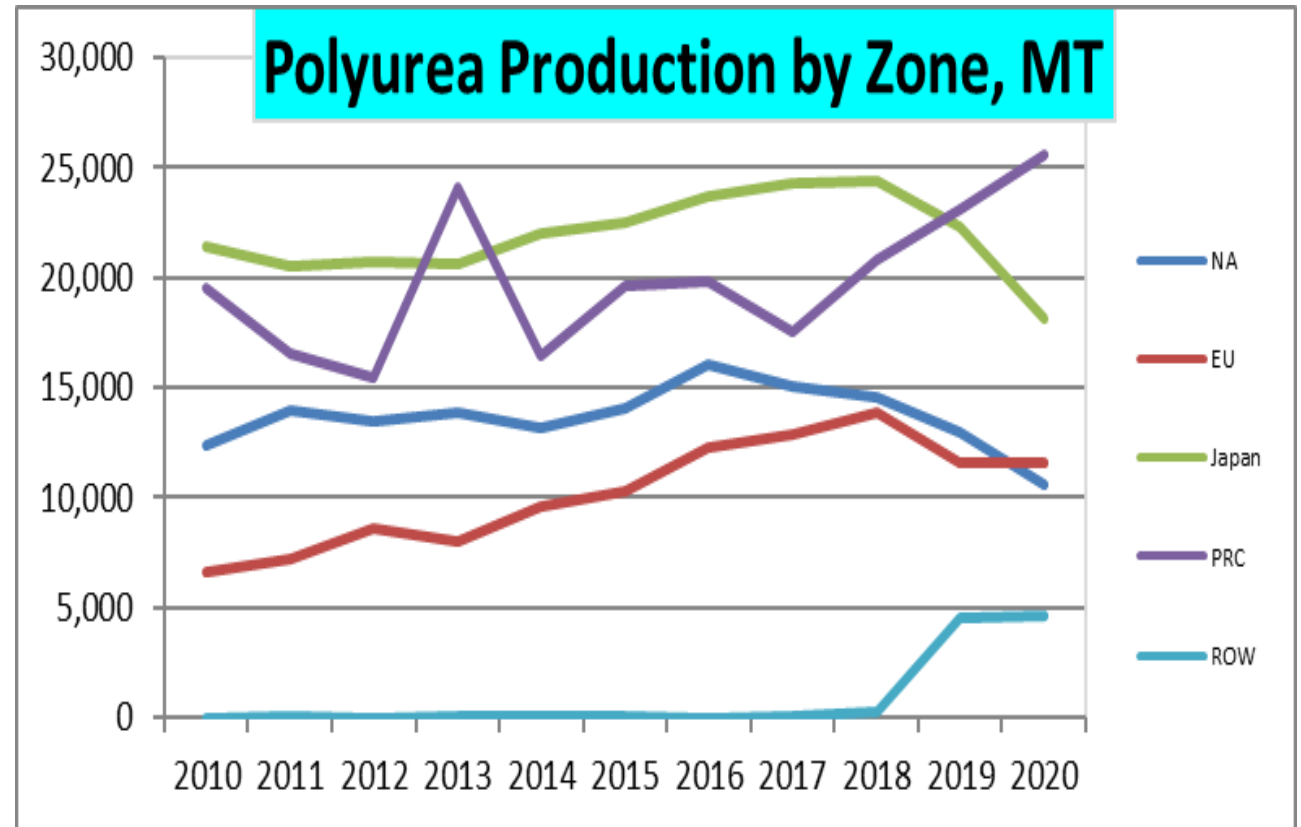
There are a few regional trends such as Urea grease production prominent in Japan

Comparison of Grease Thickeners

Thickener	Lithium complex	Calcium complex	Natural Calcium Sulfonate	Synthetic Calcium Sulfonate	Synthetic Calcium Sulfonate Complex
Advantages	Good thermal stability Good shear stability Ease of manufacturing	Lowest cost position Slight oil bleeding which helps with lubrication	Easiest to gel Good yields Good mechanical stability Good corrosion resistance	No issues with supply Excellent water resistance	Lowest cost sulfonate position Slight oil bleeding which helps with lubrication
Disadvantages	Rising raw material costs and increasing supply shortages Additives need to boost performance	Longer gelling times and complex manufacturing processes Poorer thermal stability	Rising raw material costs and increasing supply shortages Poorer water resistance	Poorer yields	Longer gelling times and complex manufacturing processes Poorer thermal stability Poorer pumpability

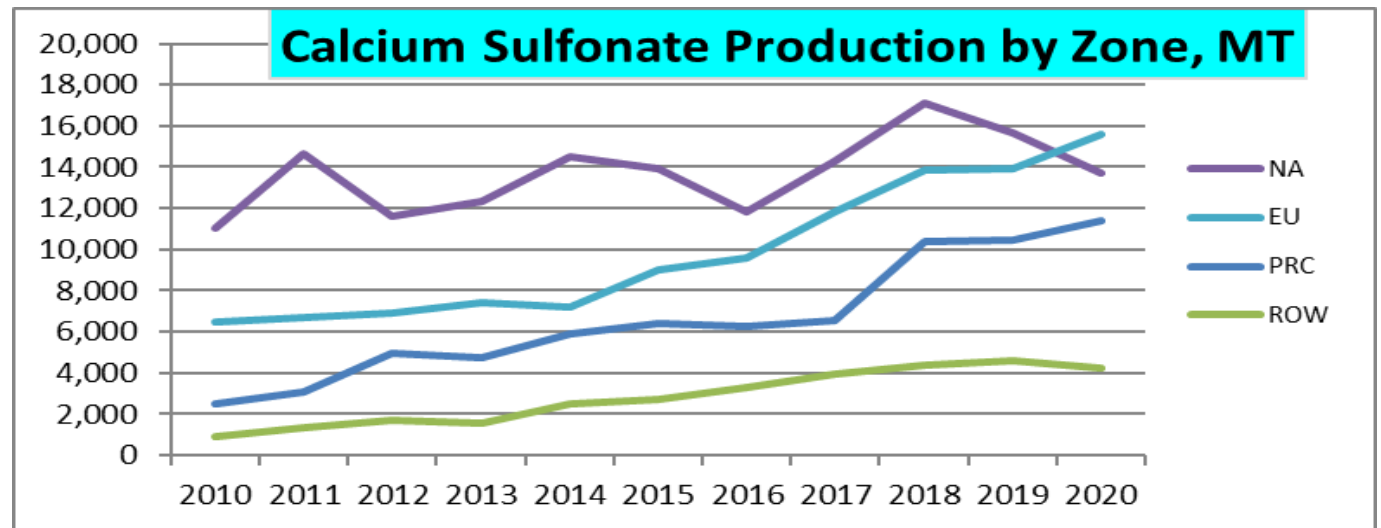
Trends by Thickener Type - Polyurea Details

- ▶ Polyurea greases continue healthy growth to over 6% of total production with a CAGR of 2.2% over the 10-year period
- ▶ Regionally, only China and Rest of World showed growth over 2019
- ▶ North American production has shown a steady decline since 2016, while production in Japan has decreased since 2019
- ▶ Europe had been steadily increasing until 2019

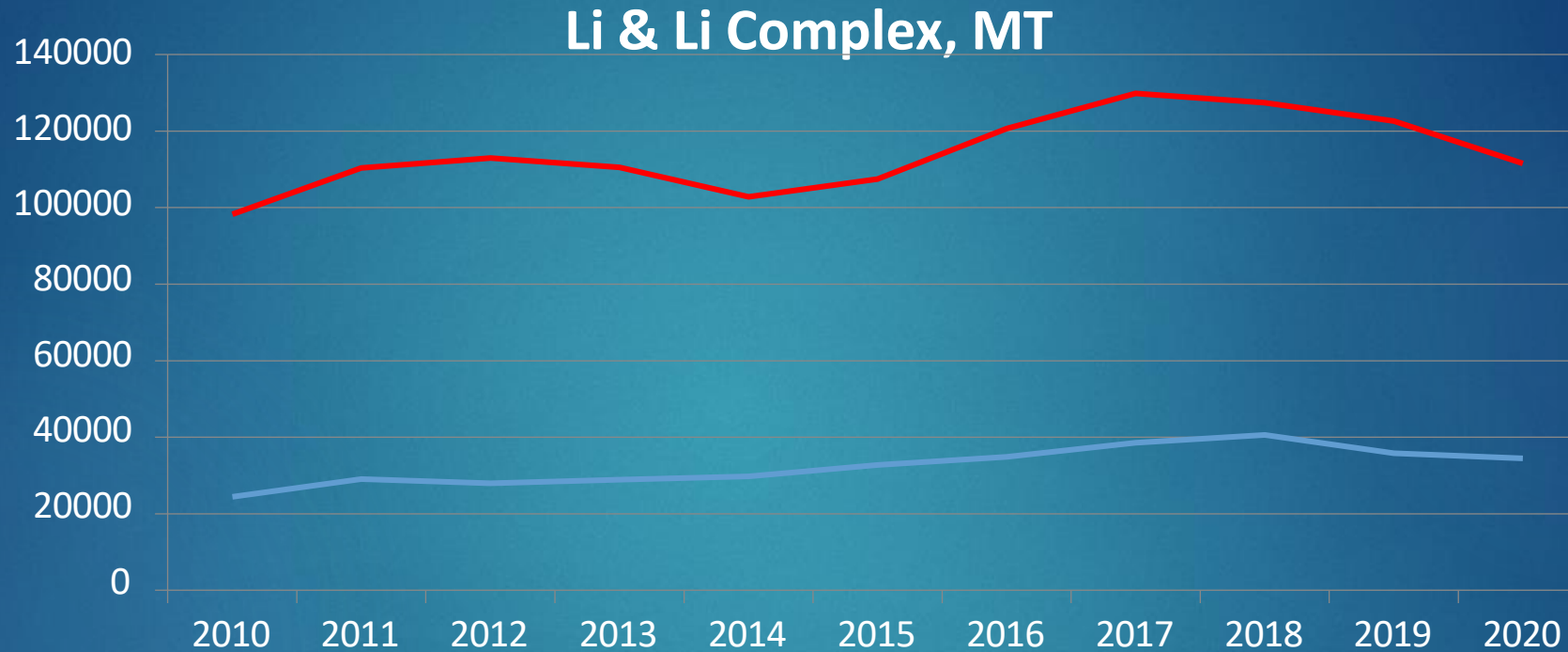


Trends by Thickener Type – Calcium Sulfonate Details

- ▶ Calcium sulfonate greases continue healthy growth to over 4% of total production with a CAGR of 6.4% over the 10-year period
- ▶ Regionally, only China and Europe showed growth over 2019
- ▶ North American production has shown a decline since 2018, while Rest of World is holding steady since 2018

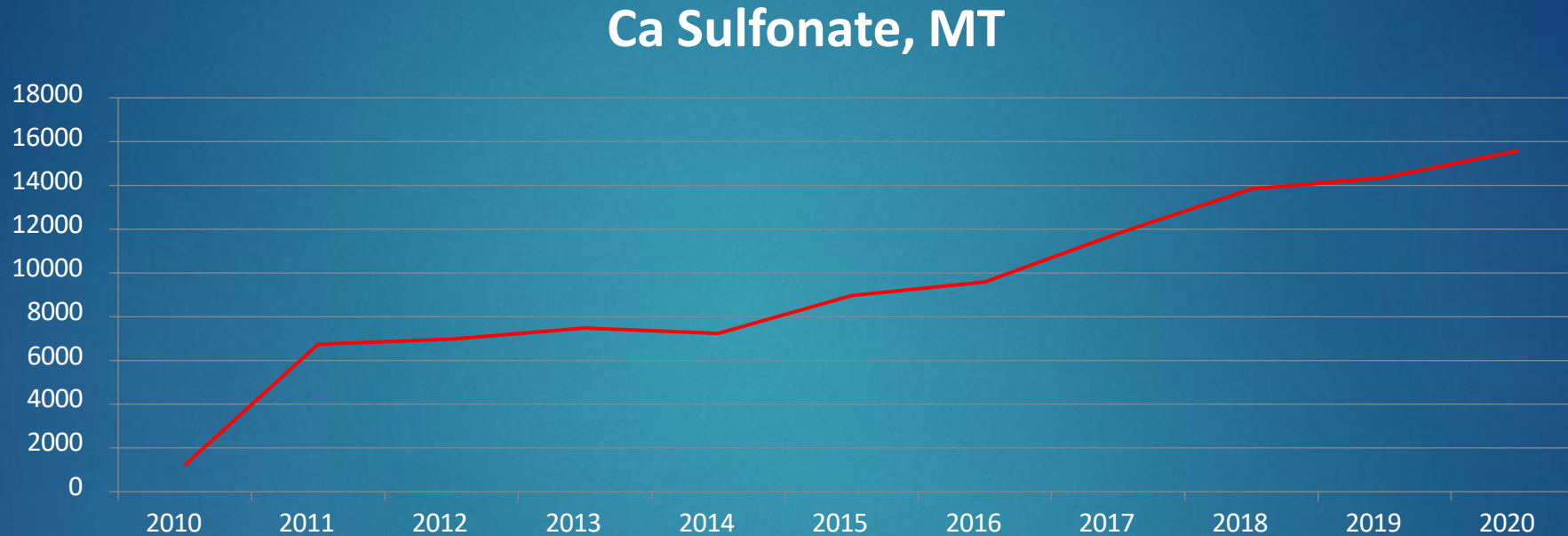


EU Trends – Lithium and Lithium Complex



- Lithium grease production has been declining since 2017
- Lithium Complex grease production was showing a steady increase since 2010, but declined in 2019 and 2020

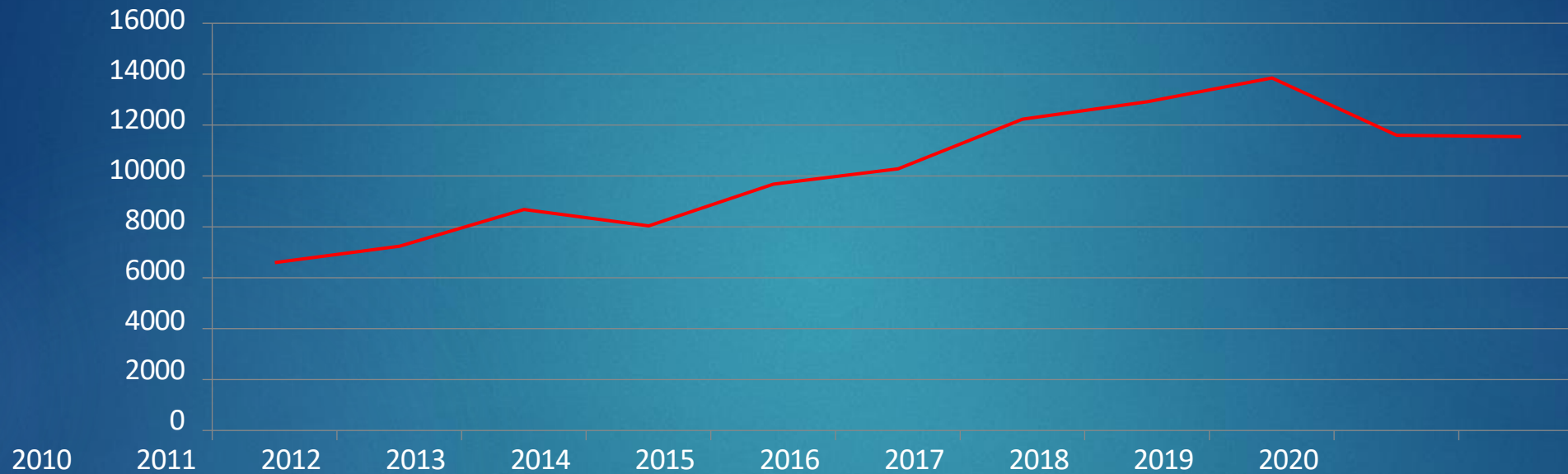
EU Trends – Calcium Sulfonate



- Calcium Sulfonate grease production increased over 12 fold since 2010
- EU accounts for over 30% of global Calcium Sulfonate production, surpassing NA in 2020

EU Trends - Polyurea

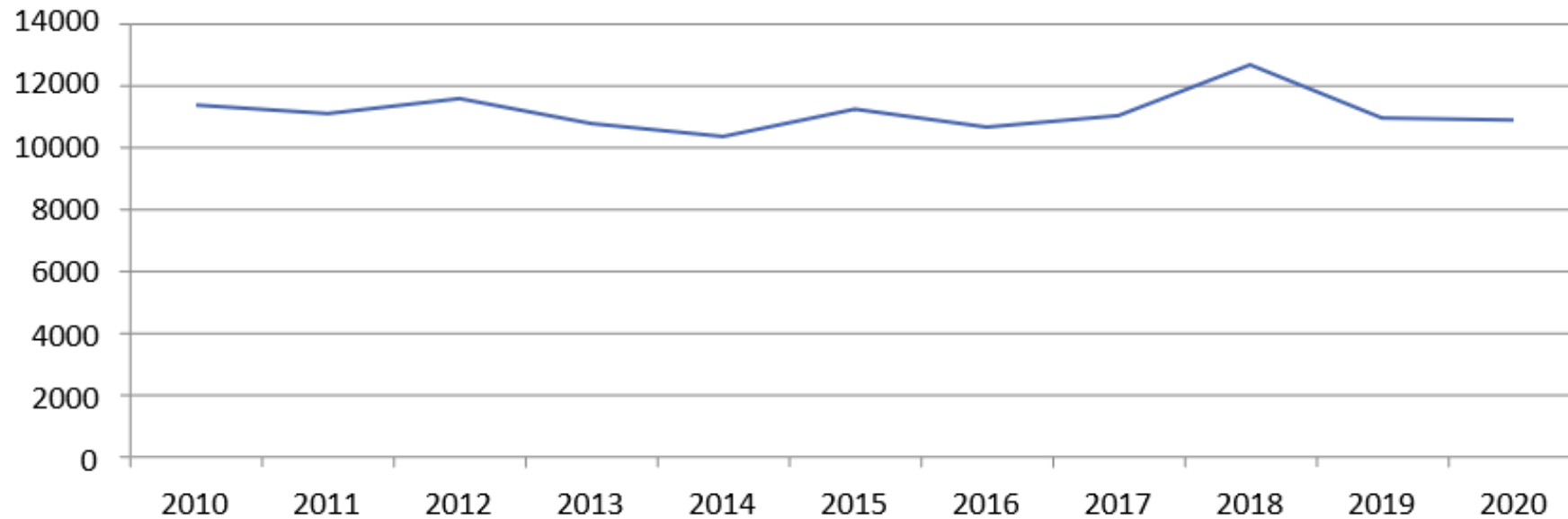
Polyurea, MT



- Polyurea grease production decreased in 2019, held flat in 2020, but still shows an 8-year trend of solid growth
- Over the period shown, the Compound Annual Growth Rate (CAGR) is nearly 6%

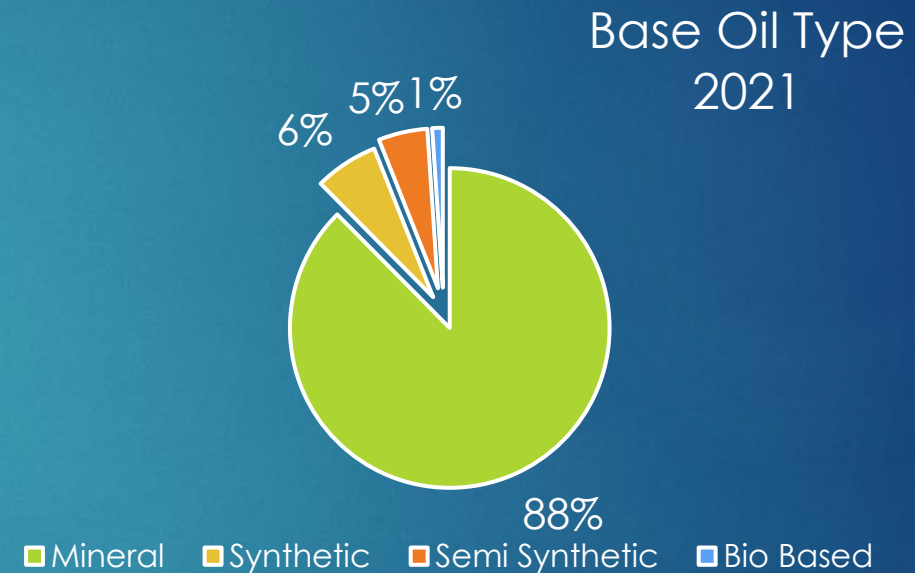
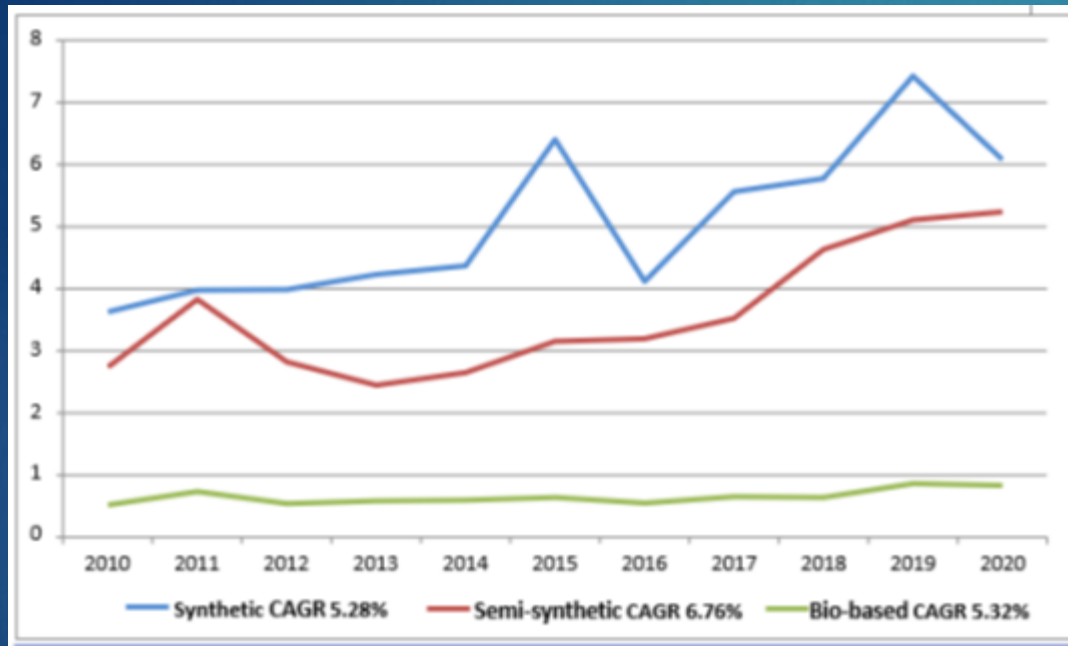
EU Trends – Aluminium Complex

Al Complex, MT



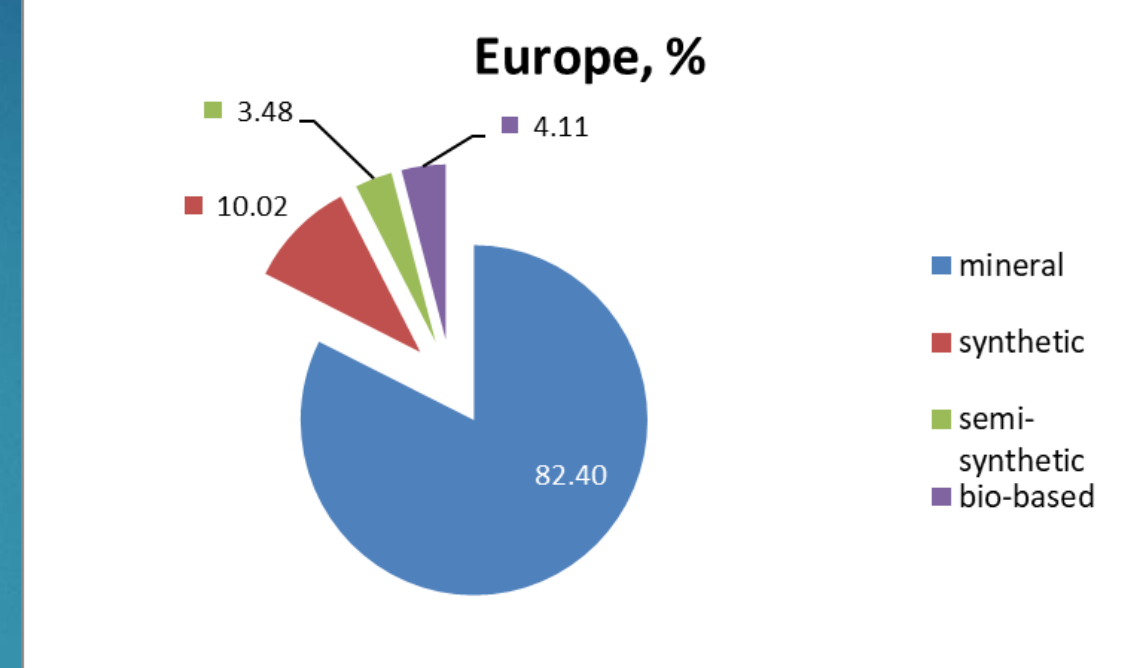
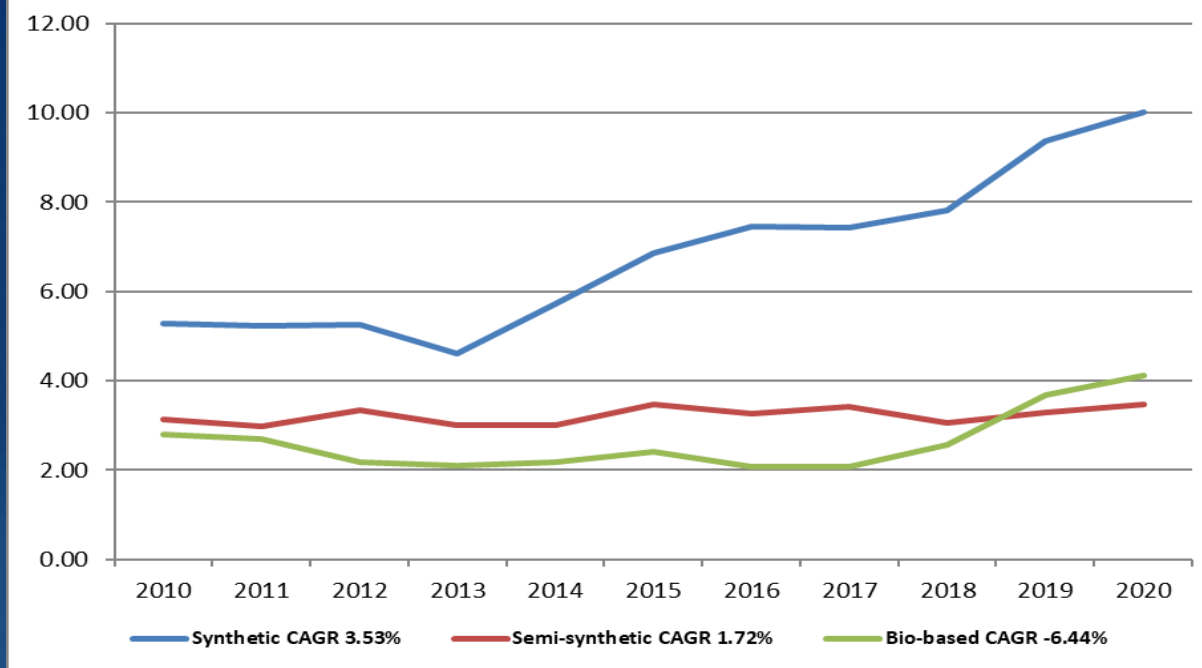
- Aluminum Complex grease production continues to show essentially no growth over the period
- Production over the period has been flat to down, with a CGAR of -0.4%

Usage of Base oils in Greases Globally



- Mineral base oil – 88% used in greases
- Usage of Synthetics, Sem-synthetic & Bio-based increasing gradually. 5.9% CAGR for fully synthetic base oils in last decade

Europe Base Oil Trends



- Conventional base oils represent 82% of EU grease production, down slightly, continuing a decline started in 2013
- Production using all non-conventional base oil types has increased over the past 10 years, synthetic oils showing the strongest growth
- The use of bio-based oils has started to increase since 2017, now over 4%

Summary

- The 2021 Production Survey has been completed and is now available
- Worldwide grease production was around 1200 TMT
- Lithium complex production dropped along with simple lithium production
- Polyurea production continues to grow in China
- Calcium sulfonate grease continues to show the most rapid and continuous increase compared to other thickeners, especially in China and Europe
Anhydrous calcium grease increasing gradually
- Use of all non-conventional base oils decreased slightly in 2021



Our Facilities





Our Facilities







SOLAR POWER

The renewable, non-polluting and abundantly available source at this part of the globe currently contributes to over 10% of SGL energy needs.

Natural Gas

SGL has completely shifted to use of natural gas from liquid fossil fuel for the energy need at the manufacturing facility at Manesar. Considering its overall environmental benefits it is another effort to boost our contribution to environmental safety.



ETP Plant

SGL has installed effluent treatment plant at Manesar factory, as we are committed to achieving zero effluent discharge through treating and recycling of all wastewater and harvesting of

rainwater on its properties. This not only has reduced freshwater intake but also boosted groundwater recharge, diminished runoff.

Rainwater Harvesting

Water is, undoubtedly, the top natural resource, to harvest rainwater, we have installed a rainwater harvesting system. We have innovative technique utilized to harvest rainwater from roofs and other above surfaces to be stored for later use.



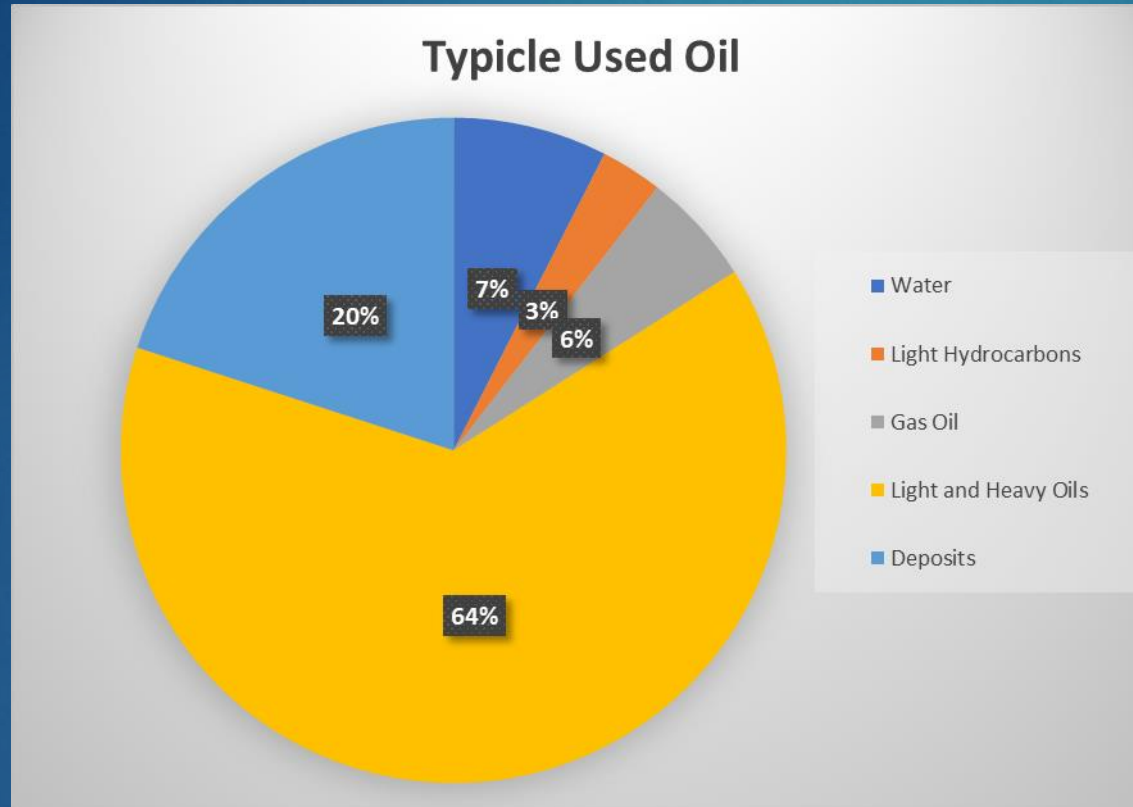
Sustainability



Circular Economy



Recycle and Reuse



- ▶ Oil is toxic, dirty and hard to dispose of.
- ▶ EPA in the USA suggests recycling oil
- ▶ Great Idea

Reduce

Getting more out of what we use.

Use Less

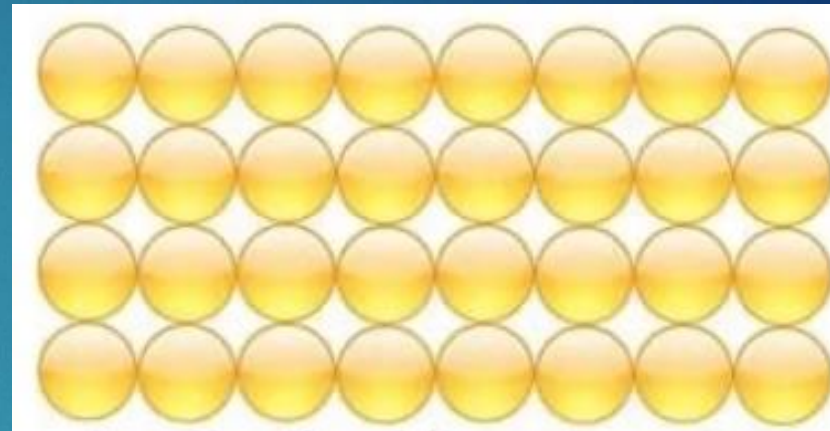
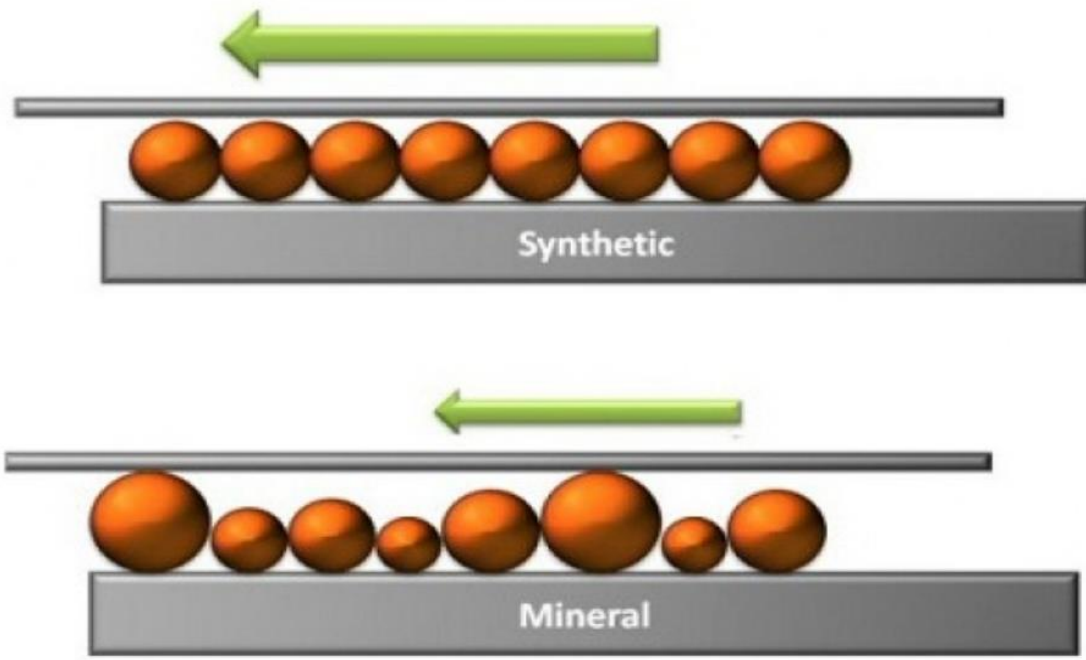
Use it Longer

Work it Harder



Mineral v. Synthetic

Mineral oil vs. synthetic oil



Another Way to Save is with Grease

- ▶ Grease is special
- ▶ Used where there is no sump
- ▶ Has to stay in place
- ▶ Difficult technology changing a liquid into a semi-solid



Work longer

- ▶ Automotive Grease is used at many points on a vehicle. Hubs, Axels and Bearings
- ▶ Grease has a normal life of 20,000km
 - ▶ Maintenance required
 - ▶ Taken off the road

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Think of the savings

- ▶ We have made New Long-Life Greases

40,000 Km

Think of the savings

- ▶ We have made New Long-Life Greases

80,000 Km

Think of the savings

- ▶ We have made New Long-Life Greases

120,000 Km



Think of the savings

- ▶ We have made New Long-Life Greases

200,000 Km

Think of the savings

- ▶ We have made New Long-Life Greases

500,000 Km!!

**25 Services needed for
500,000 KM**



1 Service in 500,000 KM



What Steps Can We Take?

- It starts with **US, You and Me!**



What Steps Can We Take?

- ▶ It starts with **US, You and Me!**
- ▶ We can wait for legislation and yes some is needed

HOWEVER

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▶ **SUSTAINABILITY** is the latest **BUZZ WORD**

What Steps Can We Take!

- ▶ It starts with **US, You and Me!**
- ▶ We can wait for legislation and yes some is needed

HOWEVER

- ▶ **SUSTAINABILITY** is the latest **BUZZ WORD**
- ▶ The **“LOOK AT ME!”** moment
- ▶ Concentrate on the **Cost of Ownership**

Thank you



TRINITY
TRINITY LUBES & GREASES FZC

