

FERRO SILICON – OVERVIEW , MARKETS & OUTLOOK

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PRESENTATION SCOPE

- Introduction = The Global Uncertainty
- Ferrosilicon Applications
- Ferrosilicon Markets & Outlook
- Whats Next

INTRODUCTION = THE GLOBAL UNCERTAINTY

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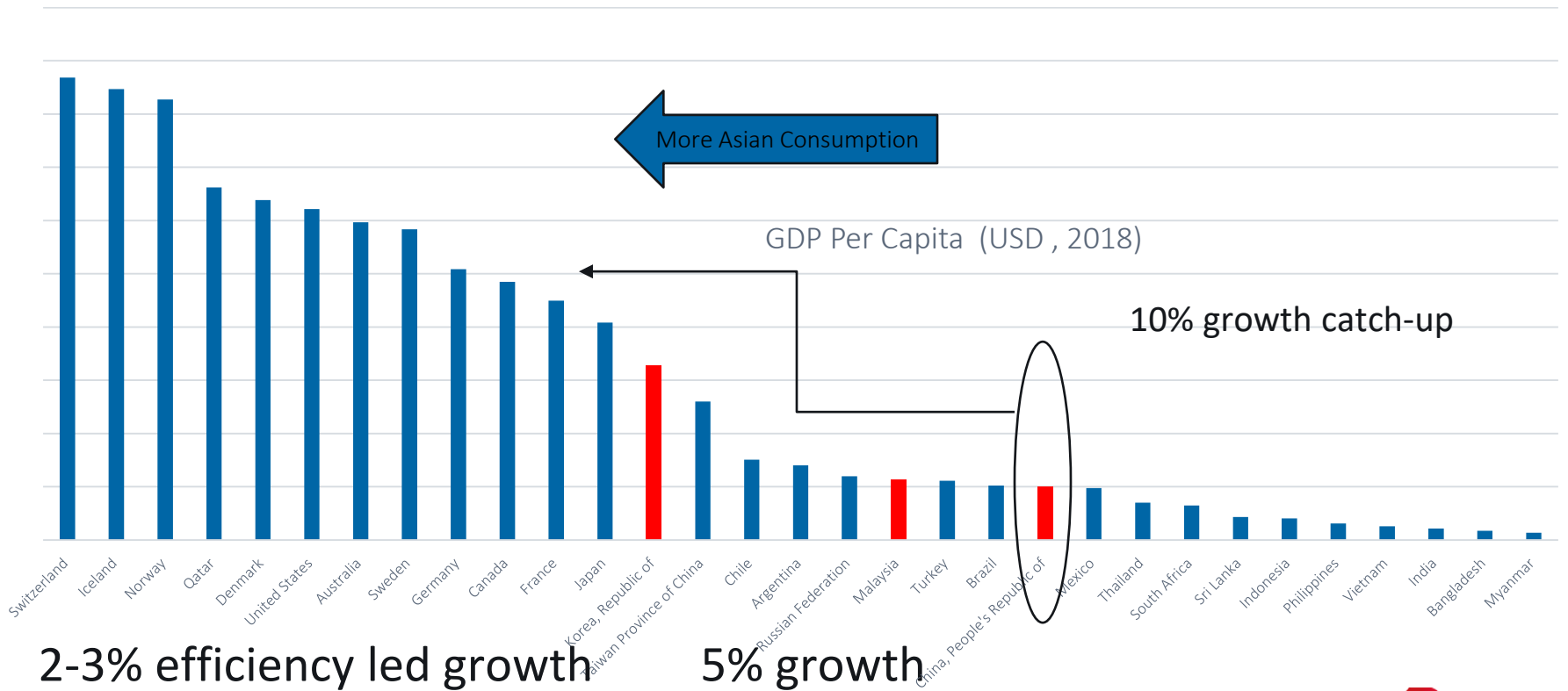
Introduction = The Global Uncertainty

- Nationalism /Regionalism
- Protectionism
- Trade Wars
- Political Risks
- Currency Risks
- Volatile , Uncertainty , Complexity, Ambiguity (VUCA)

Introduction

=

Economic Growth Engines



Thucydides Trap – Finance is important

	Period		Ruling Power	Rising Power		Result
1	First half of 16th century		France	Hapsburgs		War
2	16th–17th centuries		Hapsburgs	Ottoman Empire		War
3	17th century		Hapsburgs	Sweden		War
4	17th century		Dutch Republic	England		War
5	Late 17th–early 18th centuries		France	Great Britain		War
6	Late 18th–early 19th centuries		United Kingdom	France		War
7	Mid-19th century		United Kingdom, France	Russia		War
8	19th century		France	Germany		War
9	Late 19th–early 20th centuries		Russia, China	Japan		War
10	Early 20th century		United Kingdom	United States		No war
11	Early 20th century		Russia, U.K., France	Germany		War
12	Mid-20th century		Soviet Union, U.K. France	Germany		War
13	Mid-20th century		United States	Japan		War
14	1970s–1980s		Soviet Union	Japan		No war
15	1940s–1980s		United States	Soviet Union		No war
16	1990s–present		United Kingdom, France	Germany		No war

- Emergence of rising power has historically ended in war 12/16 times or 75%.
- Now will it be US & China



FERRO SILICON APPLICATIONS

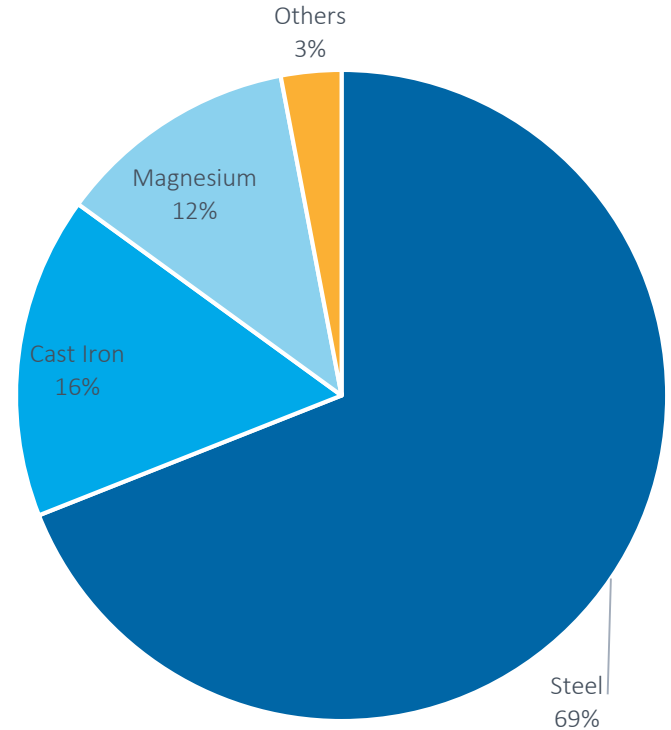
FERRO SILICON USAGE

- Deoxidizing Steel as well as other ferrous alloys.
- Manufacture of Other Ferro Alloys
- Manufacture of Magnesium (Pidgeon Process – Mg from Dolomite)
- Foundry Industry – (Ferro Silicon Alloys)
- Specialty Steels
- Welding Consumables

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Ferro Silicon Consumption by Application



FERRO SILICON MARKETS & OUTLOOK

GLOBAL MEGATRENDS



Rapid urbanisation



Demographic and social change



Climate change and resource scarcity



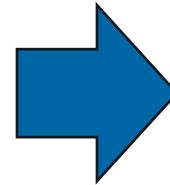
Shift in global economic power



Technological breakthroughs

Creating Specific Needs /Products

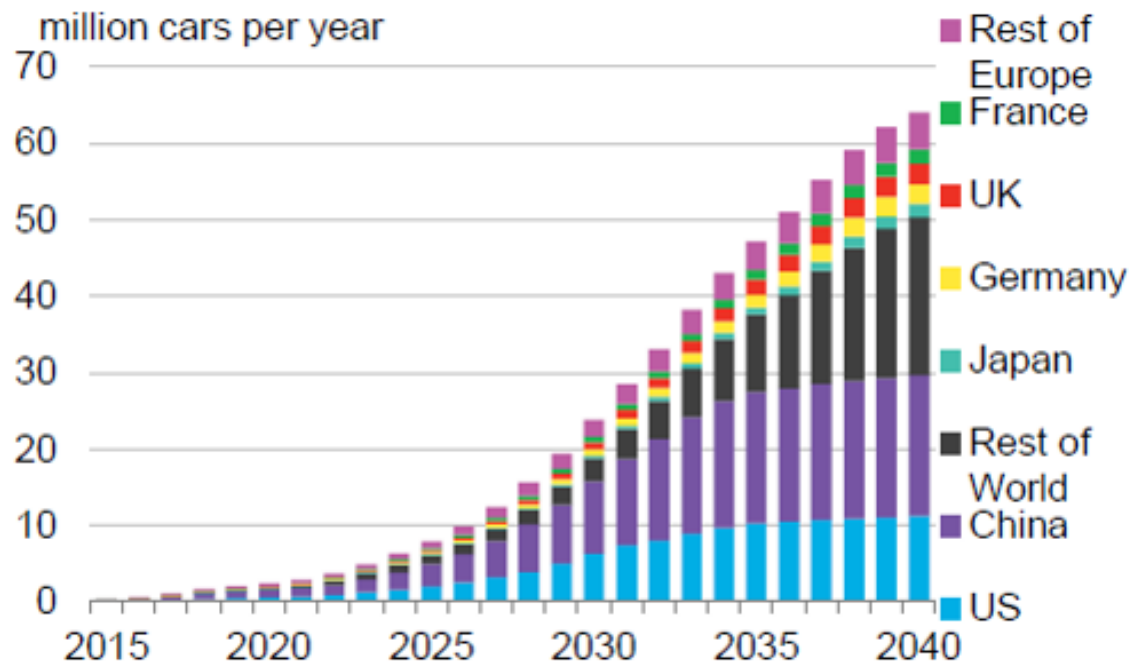
Focus on



- Sustainability
- Energy
- Infrastructure
- Living Standard/Ageing Population
- Digitalization

ELECTRICAL VEHICLES

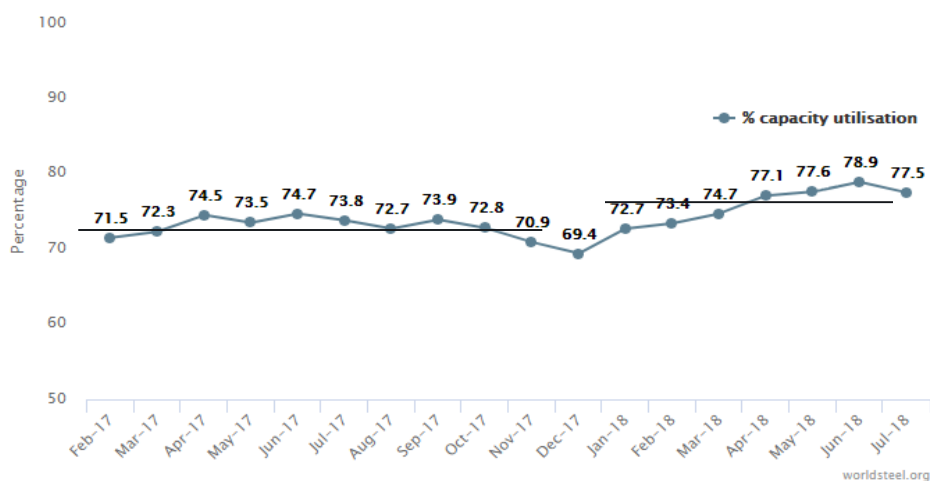
Annual global EV sales by market



Source: Bloomberg New Energy Finance.

World Steel

World steel capacity utilisation



World Steel 2017 = 1.67 Bill MT (Asia =1.15 bill of which china 831 Mill MT)

Ferro Silicon > 60 % in China

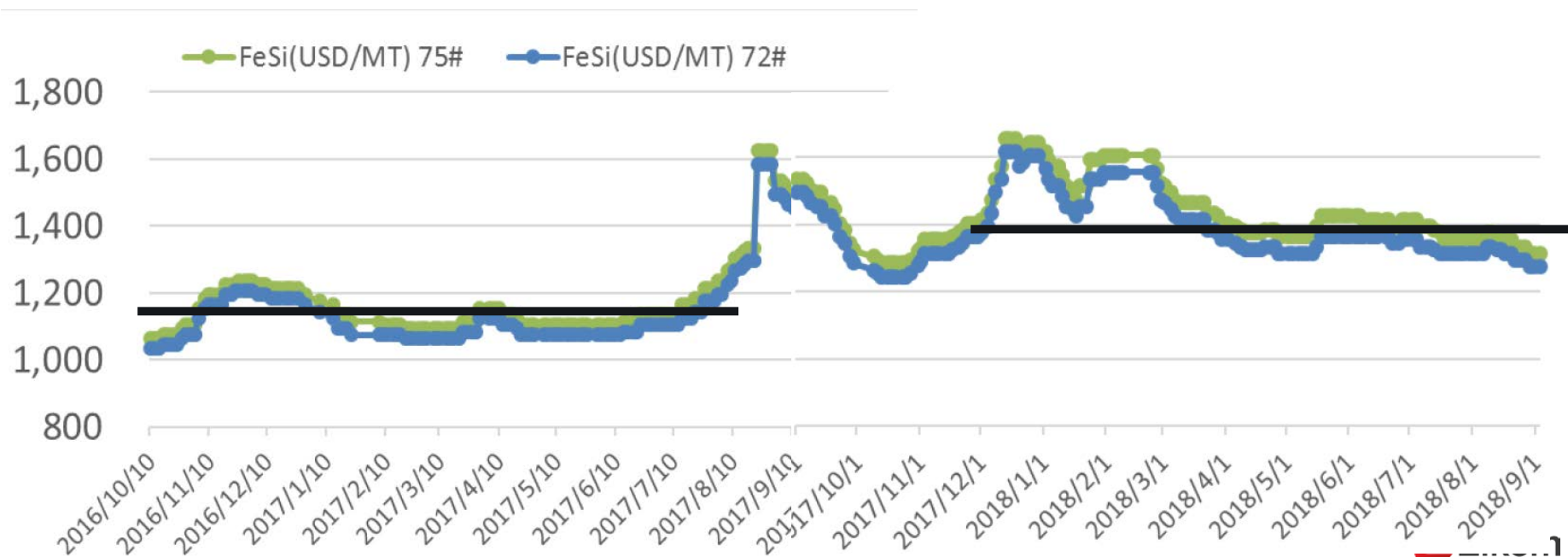
	2017 Vs 2016	YTD Jul (2018 Vs 17)
European Union	4.1%	+2%
Other Europe	13.1%	+3.6%
CIS	0.0%	+2.6
North America	4.8%	+2.8
South America	8.7%	+4.5
Africa	15.9%	+8.8
Middle East	11.8%	+15.8
Asia	5.7%	+5.6
Total World	5.5%	+5.0%

Conclusion : Demand vs Supply

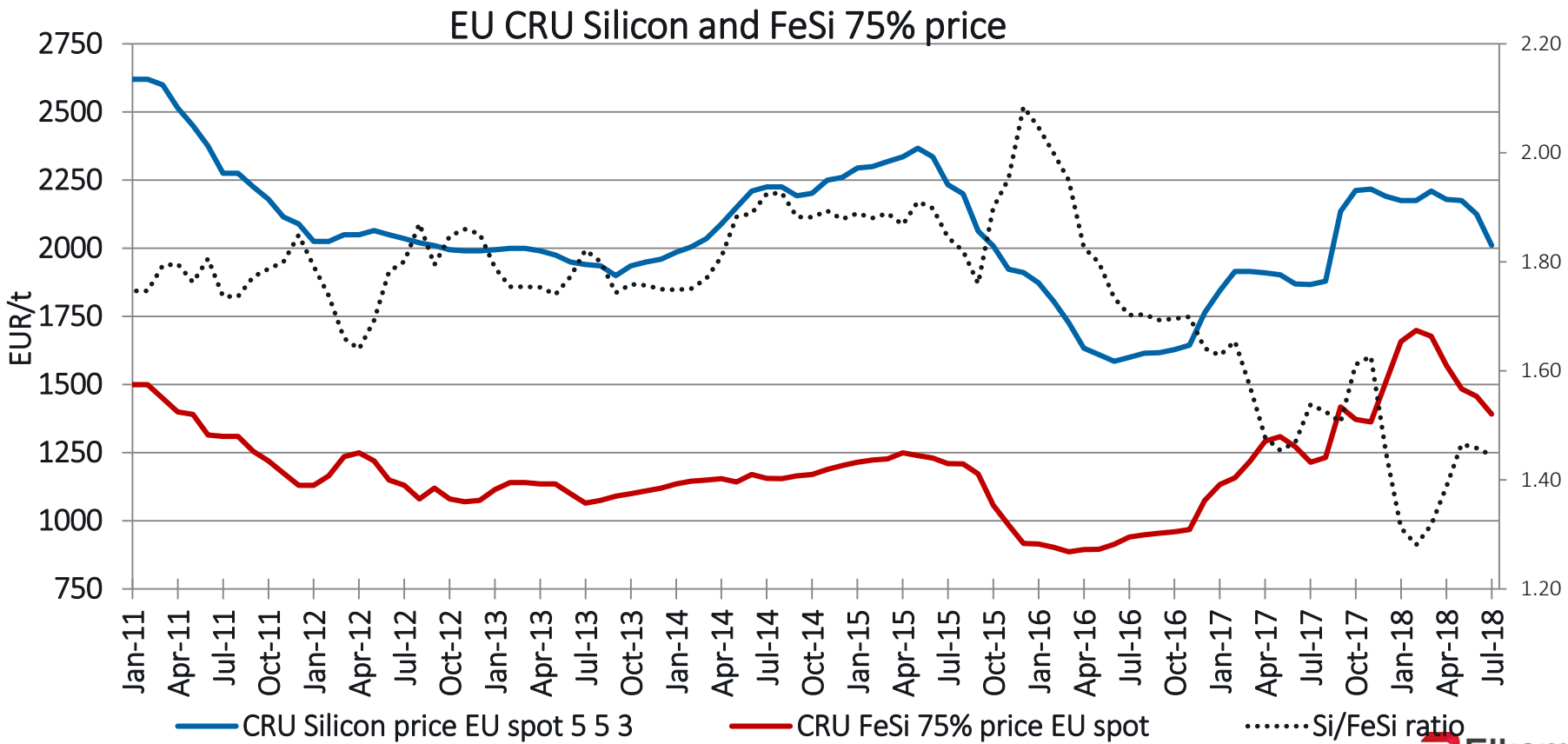
- INCREASING DEMAND
- UNCERTAIN SUPPLY

THE RESULT FESI PRICES – FOB CHINA

PRICES STILL AT A HIGH LEVEL COMPARED TO 2016



Whats happening in Europe





WHAT is IN STORE FOR FESI

**Those who have knowledge, don't
predict. Those who predict, don't
have knowledge.**

Lao Tzu

Conclusion : Demand vs Supply

- DEMAND WILL CONTINUE TO INCREASE
- POWER PRICES CRITICAL
- OLD INEFFICIENT PLANTS WILL CLOSE
- ENVIRONMENTAL NORMS WILL CONTINUE TO BE STRICTER
- CHINA EFFECT
- SEASONAL VARIATION DUE TO POWER PRICES
- UNCERTAIN SUPPLY
- EUROPE ADD
- AMERICA - ADD

Environmental Protection Regulation

MEE(Ministry of Ecology and Environment of China) published a regulation on “Action Plan of Air Pollution Control in 2018-2019 Autumn and winter in Beijing/Tianjin/Hebei and Surrounding Area”

Period: Oct.01,2018 to Mar.31,2019 for six months;

Areas covering: “2+26” cities(Beijing, Tianjin + 26 cities surrounding)

Main measures on production restrictions:

Steel: Restriction in Production for 4 months (30-50%) by shut down of facilities

Primary Aluminium – 30% capacity shutdown

Carbon - 50% Shutdown of capacity

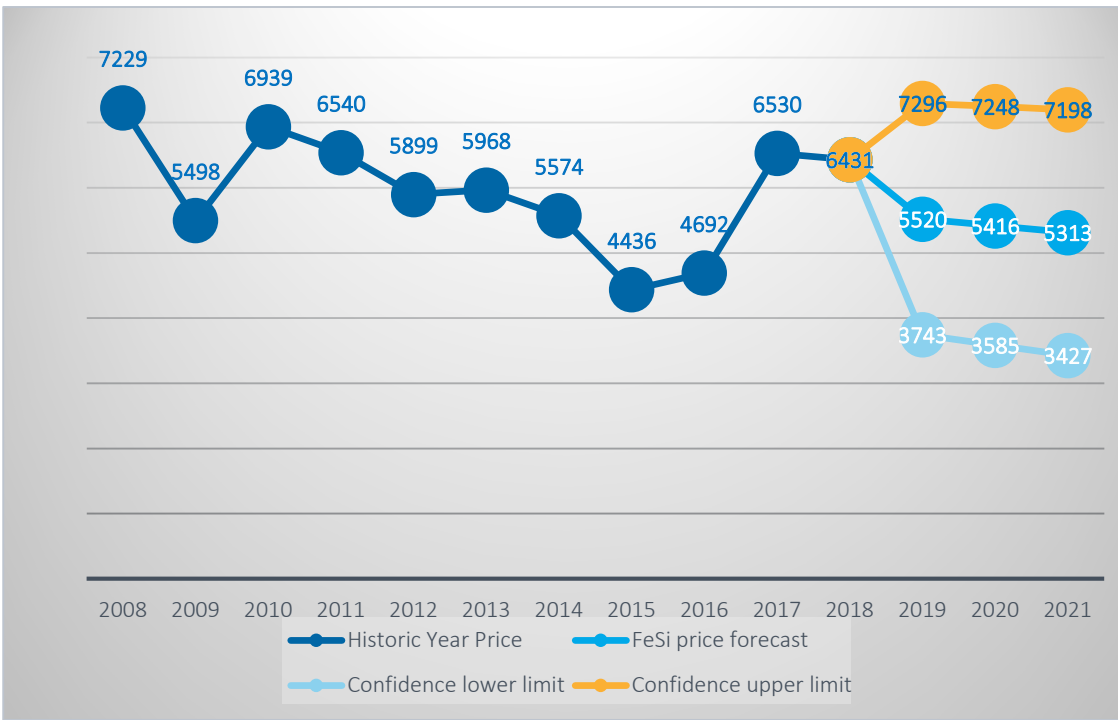
Non Ferrous Casting – 50% Shutdown

FeSi Futures and Yearly Forecast

FeSi75 Futures K Line from Jul to Aug in China



FeSi72 Historic yearly price and theoretical forecast (confidence coefficient 95%)



ABOUT ELKEM



Elkem

More than 110 years of history as a technology provider

Founded in 1904 by Sam Eyde

Listed on **Oslo stock exchange** since March 2018



**27 PLANTS
WORLDWIDE**

Headquarter
in Norway



>400 R&D PEOPLE

R&D centres
in Norway, France and
China



**~6.100
EMPLOYEES**

Worldwide



21,4 BNOK

Total operating
income in 2017

Elkem's divisions

Elkem operates through four divisions, all with global scale, leadership positions and global footprint.

Silicones

One of the foremost fully integrated silicones manufacturers in the world



Silicon Materials

Global producer and provider of silicon, microsilica and specialty materials



Foundry Products

Leading producer of specialty-alloys for the foundry and steel industries



Carbon

Leading producer of electrode paste and other carbon products





- Production site
- Sales Office
- HQ

Elkem business system – our management philosophy

Focus on predictable and stable processes provides results that satisfy the customer



Vision and values

To contribute to a sustainable future by providing advanced silicon, silicones and carbon solutions, adding value to our stakeholders globally.

- Respect
- Involvement
- Precision
- Continuous improvement



Elkem's growth strategy



Providing solutions to meet demand driven by global “megatrends”

CLEAR GLOBAL “MEGATRENDS”...

...CREATE SPECIFIC NEEDS...

...DRIVING DEMAND FOR ELKEM'S SOLUTIONS



Sustainability



- Lightweighting of cars
- Greater fuel efficiency
- Reduced emissions



Energy demand growth



- Growing use of solar panels and wind energy
- Increased energy storage



Rapid urbanisation



- Improved solutions for construction and infrastructure



Increased standard of living



- Higher quality products
- Textiles / clothing
- Affordable comfort and personal care



Ageing and growing population



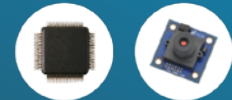
- Healthcare
- Well-being



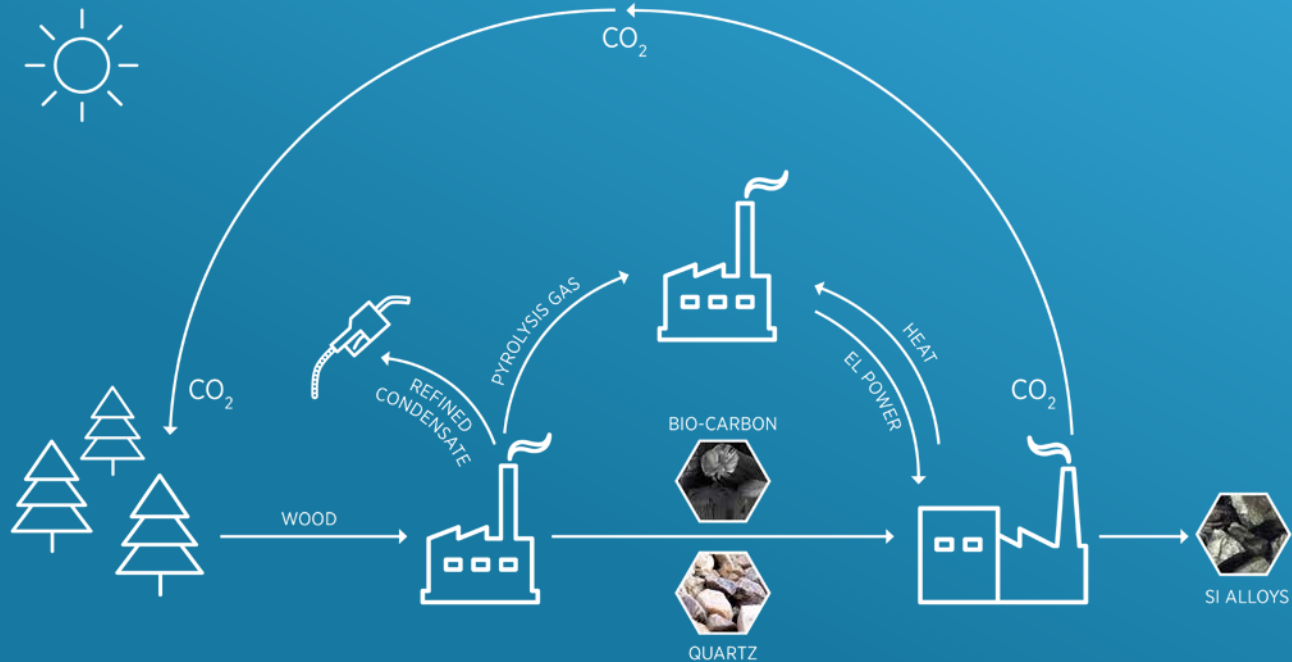
Digitalisation



- Connected home, work and city
- Sensor tracking technology



Sustainability in own processes: carbon neutral metal production



Somebody loves you
– think safety!



DELIVERING YOUR POTENTIAL

