Changing Landscape of Roto PE Supply in Europe - Challenges and Opportunities

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Pioneers of Polyolefins: Ziegler & Natta

Scientists **Karl Ziegler** and **Giulio Natta** won a **Nobel Prize in Chemistry in 1963** due to the breakthrough discoveries in the creation of polyethylene and polypropylene

Importance of Polyethylene (PE) in Rotomoulding

- 97% of Roto is Polyethylene
- Versatile and Tough
- Wide processing window & easy moulding
- Food and Water approvals
- Non-hazardous
- Chemical Resistance
- Recyclable

Global Polyethylene Market

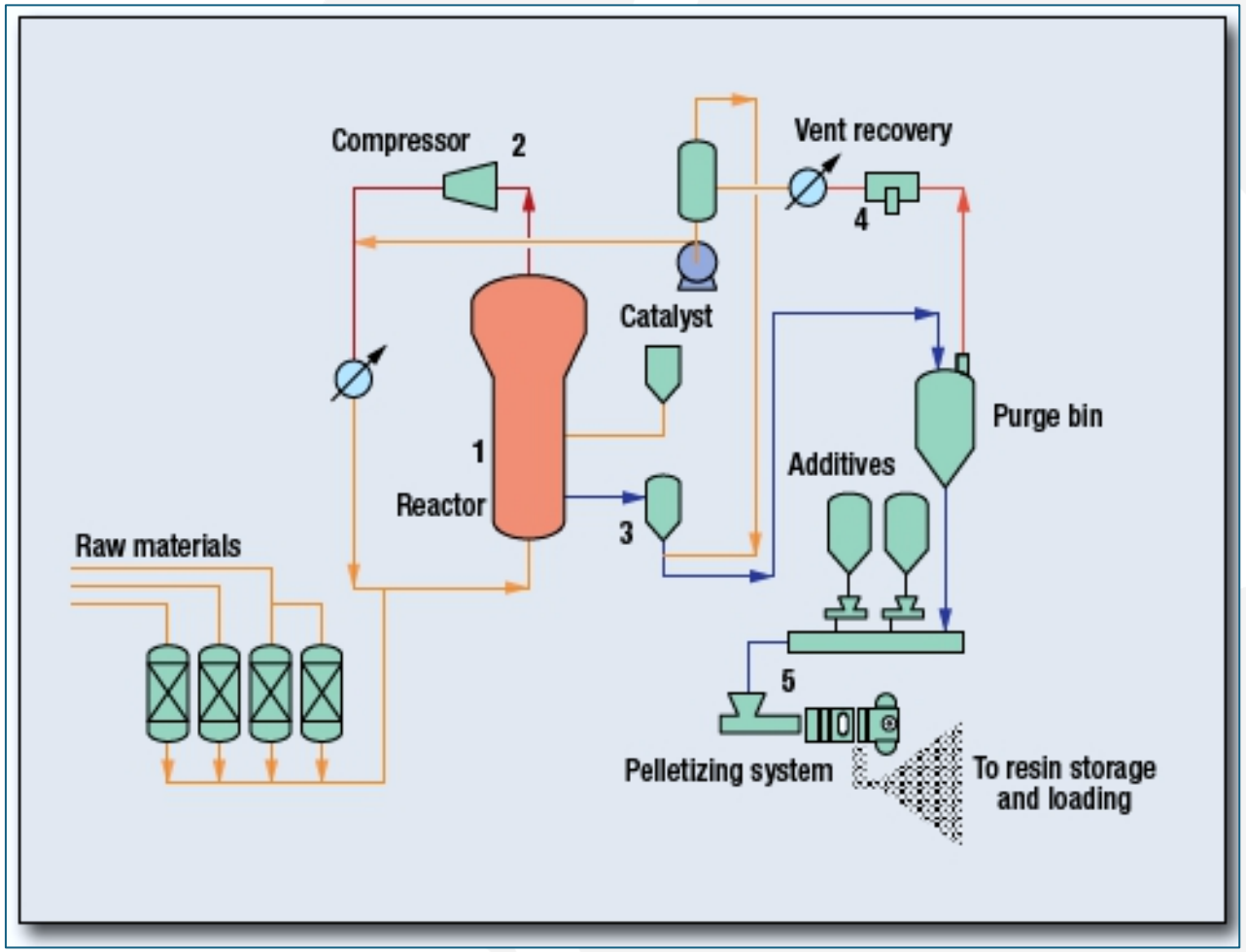
- PE is largest Polymer market – 130+ million MT
- Invented in the UK in 1933
- Early commercialisation in Europe & N America
- Globalisation of Polyethylene production
- Technology Licensing – from Europe, N America & Japan
- Roto is less than 2% of Global PE

Image courtesy of PTT Global Chemical

Feedstock Affects Economics

- Polyethylene is made from the Polymerisation of Ethylene

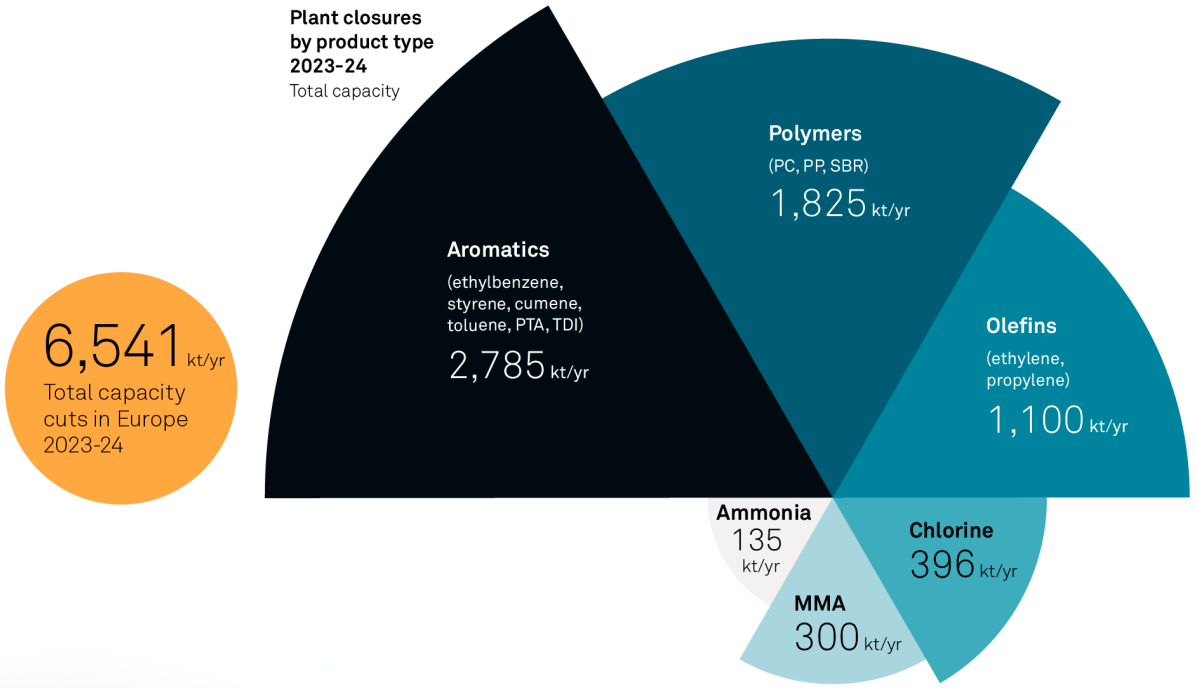
- Ethylene can be produced from –
  - Oil (Naphtha)
  - Gas (Ethane)
  - Coal
  - Renewables (Ethanol)

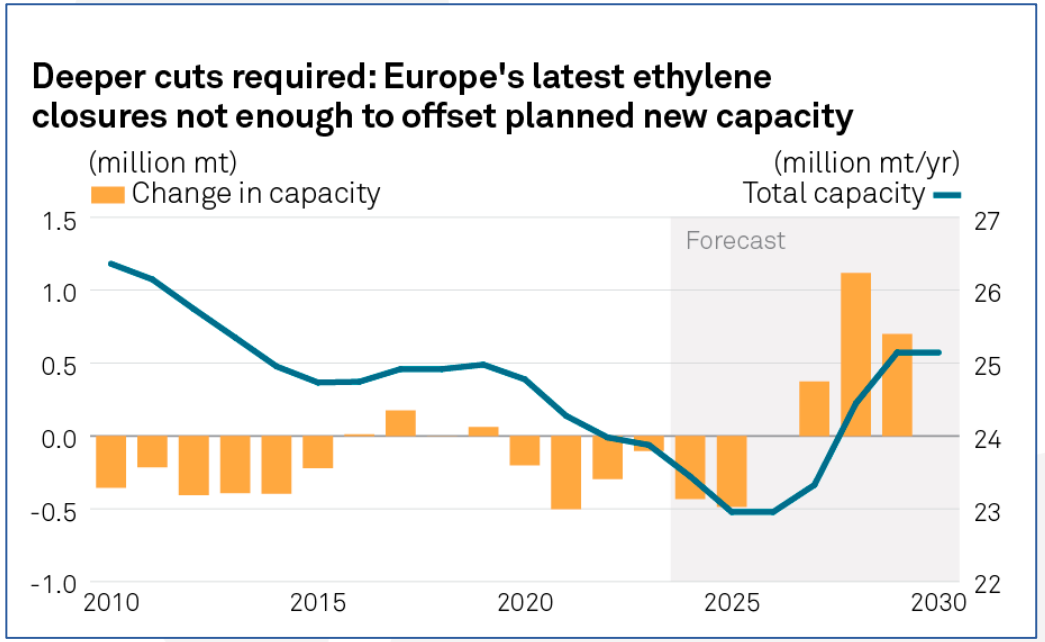


Megatrends in PE Capacity Growth

- 1990's to early 2000's – **Middle East** based on very low-cost gas
- 2010's to now – **North America** based on shale gas
- 2020's – **China** based on political drive for self-sufficiency

European Ethylene & Polyethylene Market Update





Source S&P Global Commodity Insights

European PE Production

- Many old & small plants
- High-cost power & environmental regulations
- Ethylene mostly from Naphtha (i.e. oil) feedstock
- Many European PE producers making heavy losses
- Plant closure announcements & strategic reviews
- Europe moved from net exporter to **net importer** of PE
- Increasing lower cost imports from North America, North Africa and Asia

European Ethylene & Polyethylene Market Update

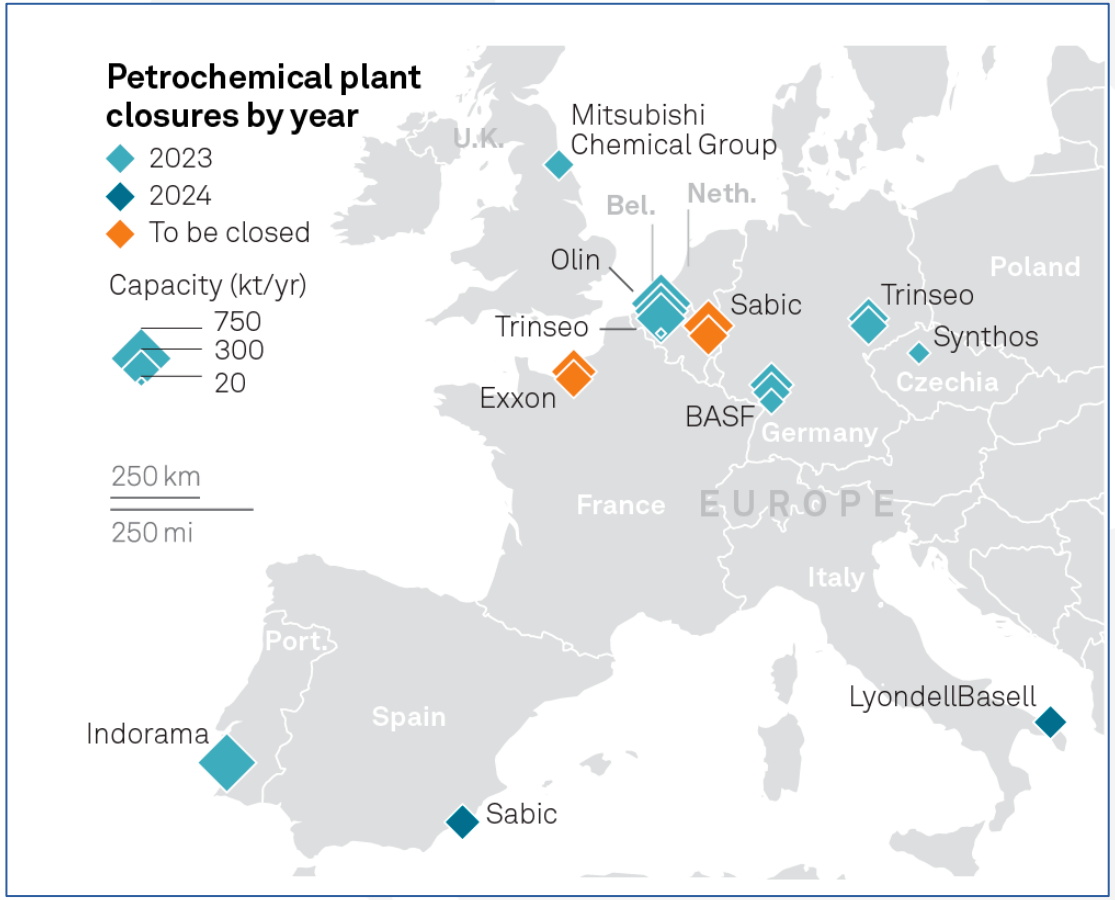
Key Drivers

- ❑ Soaring energy and feedstock costs
- ❑ Weak demand in construction and consumer goods
- ❑ Shift toward de-carbonisation and circular economy targets
- ❑ Global overcapacity and imports from lower-cost regions

European Ethylene & Polyethylene Market Update

Strategic Reviews

- TotalEnergies – Reviewing European PE assets for profitability and decarbonisation targets
- Borealis – Strategic assessment of older polyethylene units in Austria and Belgium
- SABIC – Announced internal review of cracker operations amid energy cost pressures
- Braskem Europe – Exploring partnerships or potential asset divestitures



Challenges & Opportunities

- Big increase in trader activity – spot volumes
- Generic trader knowledge of Roto is small - <2% of PE market is Roto
- Provenance (e.g. Iranian & Russian PE)
- Unreliable Country of Origin documents
- Lack of UV & A/O grades
- Many Rotomoulders are having hard times & attracted by cheap offers
- Wider range of materials available

What is Matrix Doing?

- Strengthen our European partnerships & long-term supply by creating an added value proposition
- ***Designed for Roto*** programme

Revolve 4068/N-250

First high flow material in EU

0.935/7.0 C4 UV8

Revolve 5056/N-307 –

Multiple international approvals and certifications for the tank industry

0.939/3.5 C6 UV15

What is Matrix Doing?

Leveraging our global reach to build strategic relationships with PE producers in:

- **North America** – Focus on **Hexene & Octene** polymers
- **Asia** – Supporting growth through our **Designed for Roto** programe

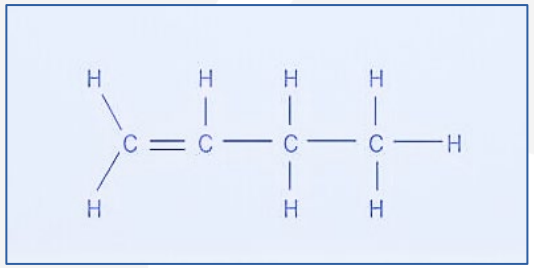
What is Matrix Doing?

This innovative approach is opening new opportunities for our customers and expanding our material portfolio – now including Octene-based polymers to complement our existing range of Hexene and Butene grades.

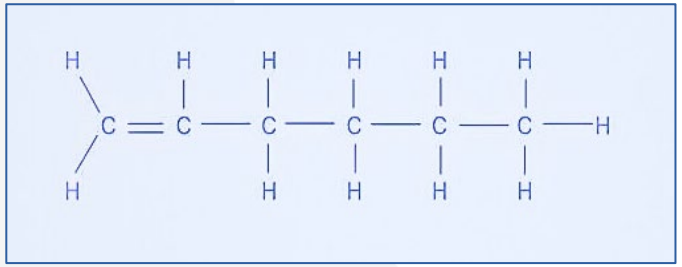
New Range of Octene materials

- Octene (C8) co-monomer
  - 2 Carbon atoms is called ETHYLENE – C2
  - 4 Carbon atoms is called BUTENE – C4
  - 6 Carbon atoms is called HEXENE – C6
  - 8 Carbon atoms is called OCTENE – C8
- Superior toughness and ESCR
- Enhanced long term properties vs. Hexene
- Down-gauging & product improvement

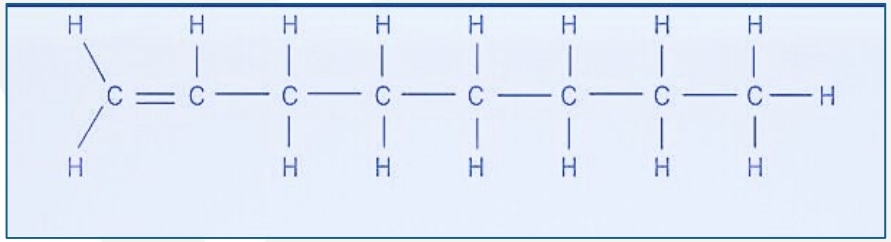
BUTENE – C4



HEXENE – C6



OCTENE – C8



An Established Choice for all Demanding Applications

Octene based PE are not so common in rotomoulding applications

We see them as complimentary to our offer

Unlocking Opportunities for High Performance Applications

Summary of Materials

Grade Reference	Co-monomer	Density	MFI	UV Rating
Revolve N-245	C8	0.945	1.7	>22
Revolve N-341	C8	0.941	3.5	>22
Revolve N-539	C8	0.939	5.2	20

Summary

- Roto market conditions remain tough versus a Global PE market over-supplied
- Creating more opportunities by balancing European and non-European materials
- Matrix leveraging global business and introducing new materials to the European market

THANK YOU!

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