The Importance of Oil Refineries to the Chemicals Sector and the UK's Industrial Strategy

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Oil refineries are widely recognised for their role in processing crude oil into fuels for transport and heating. However, this narrative, while accurate, is incomplete. The combustion of these fuels contributes significantly to CO_2 emissions and Climate Change — yet the story of what refineries produce and enable extends well beyond fuel. A lesser-known but critically important dimension of refinery output is its role in underpinning the UK's chemicals sector and, by extension, the UK's broader Industrial Strategy.

Beyond Fuel: The Chemical Output of Oil Refineries

While fuels represent approximately 85% of an oil refinery's output, the remaining 15% plays a pivotal and often overlooked role in the UK's manufacturing economy. Crude oil is first separated into key refining fractions — principally Naphtha and Propane/LPG — each of which serves as a critical feedstock for downstream chemical production. This fraction of output is used to produce chemicals and subsequently a wide range of products in which carbon is embedded rather than emitted into the atmosphere.

Linking Refineries to the UK's Key Manufacturing Sectors

The diagram below (Figure 1) illustrates how oil refinery outputs feed directly into the UK's Chemicals sector, which in turn supplies the key chemicals and materials used across the UK's Industrial Strategy (IS) 8 priority sectors.

These Sankey diagrams make clear the systemic and structural importance of oil refineries to the UK's industrial base — not merely as energy providers, but as essential feedstock suppliers to advanced manufacturing, clean energy industries, creative industries, defence sector, life science even digital and technologies.

Beyond the platform chemicals, two further critically important by-product streams are produced during refining: Sulphur and Petroleum Coke (Petcoke). These are not waste products, they are essential industrial materials that underpin key global supply chains, as illustrated in Figure 2.

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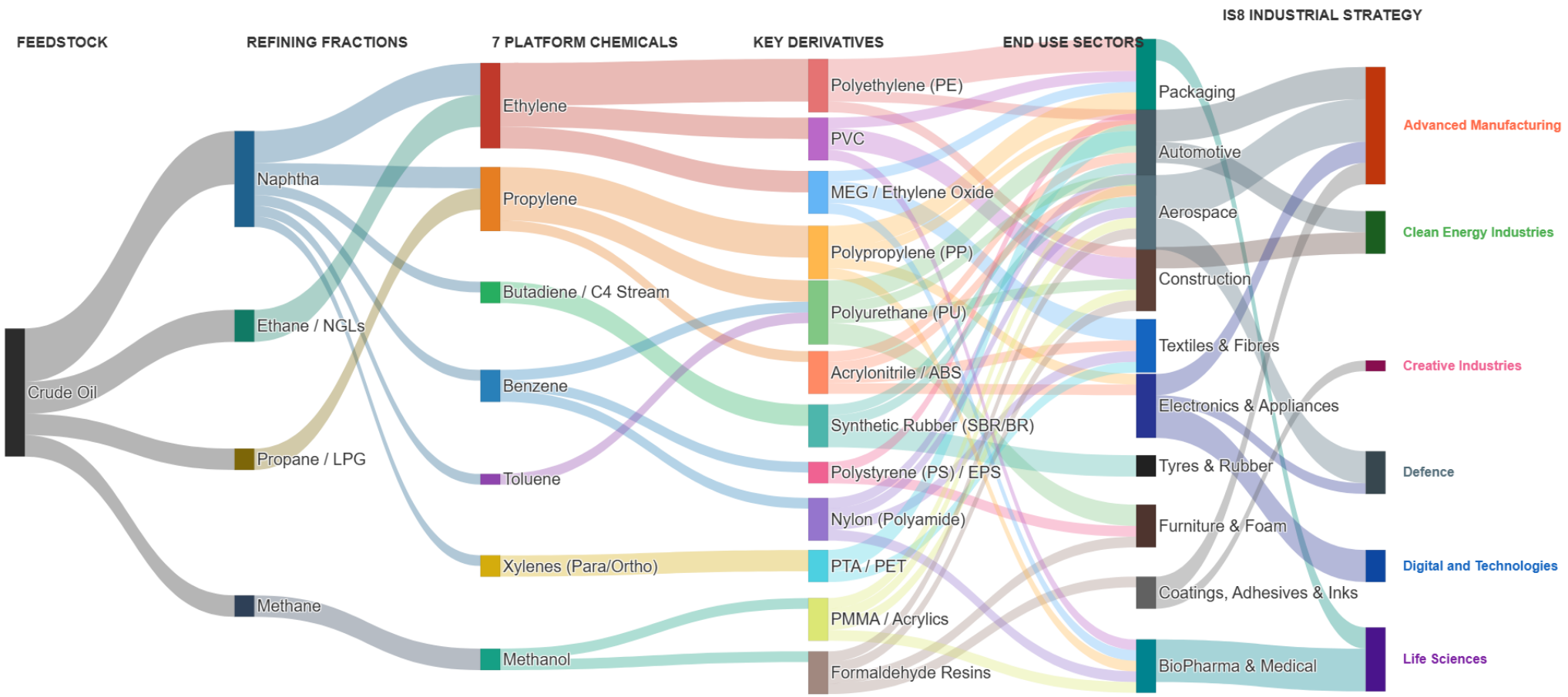

Figure 1: Illustrative mapping of chemical value-chain linkages. The diagram is therefore intended as a high-level representation of sectoral relationships rather than a quantitative flow analysis (DBT, 2026; ICIS, 2025; Petrochemicals Europe, 2025; Levi and Cullen, 2018).

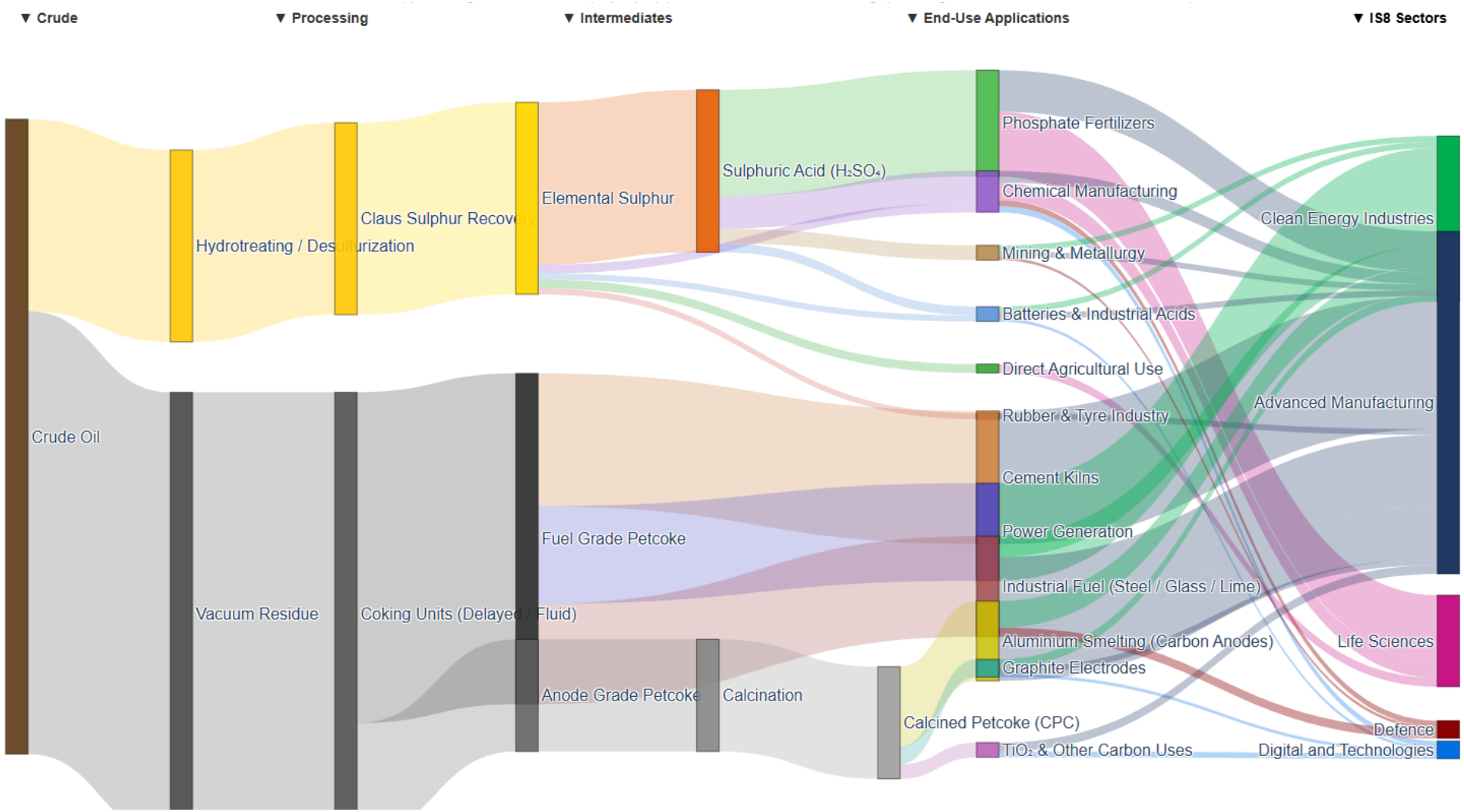

FIGURE 2. Illustrative global reference flows for sulphur and petroleum coke derived from crude-oil processing, showing their downstream applications and direct linkages to UK Industrial Strategy sectors. Values are approximate annual global volumes and do not represent UK production, consumption or trade flows (DBT, 2026; ICIS, 2025; Petrochemicals Europe, 2025).

Economic Significance and National Resilience

Oil refinery operations are not only central to the UK's Industrial Strategy today, but also they represent a high-value economic asset. Oil refineries offer the second highest Gross Value Added (GVA) per hour worked in the UK economy, making them among the most productive industries in the country and a source of high-quality employment. Beyond economics, they are a key component of UK growth and national resilience, requiring nurturing and strategic support to remain competitive on the world stage.

The Decarbonisation Challenge

Notwithstanding their economic and industrial importance, we must remain fully cognisant of the urgent need to **decarbonise the UK economy** in support of climate change goals and energy security. This is where the challenge becomes acute.

Technically viable and scalable alternatives to the production of the **seven platform chemicals**, sulphur derivatives, and petcoke-based materials currently derived from oil refineries **do not yet exist at the scale required**. These processes remain the subject of active research, and continued investment in this area must be strongly encouraged.

Some alternatives do exist in principle:

- Sulphur and its derivatives can be produced via other means — for example, sulphuric acid can be obtained as a by-product of smelting sulphide ores such as Copper. However, such operations no longer exist in the UK, making domestic alternative sourcing currently unfeasible
- Calcined petcoke alternatives for aluminium smelting and graphite electrode production remain at early research stages, with no scalable substitutes currently available
- Alternative carbon sources derived from biomass are possible, but often cannot meet the required material properties, and the UK faces significant scalability challenges due to a lack of indigenous biomass production

The Case for a Thoughtfully Managed Transition

Figures 1 and 2 underscore the importance of a carefully and thoughtfully managed transition of fossil fuel-based refineries towards future, fossil-fuel free solutions. This transition must be designed so that the UK can:

- Continue to meet its growth needs across all IS8 priority sectors
- Balance the imperative to address climate change and ensure energy security
- Maintain supply chain resilience during the transition period
- Invest in research to develop technically viable and scalable ways to produce the 7 Platform Chemicals, sulphur, and carbon from non-fuel sources

Specifically, this requires a transition plan whereby refineries continue to serve the non-CO_2 emitting carbon and sulphur needs of the UK's manufacturing sectors in support of the Industrial Strategy, whilst simultaneously investing in research to develop technically viable and scalable ways to produce the 7 Platform Chemicals, sulphur, and carbon from non-fuel sources.

Conclusion

Oil refineries occupy a unique and strategically vital position in the UK's industrial ecosystem — one that goes far beyond their conventional association with transport fuels. From ethylene feeding the packaging and automotive sectors, to Sulphuric Acid underpinning fertiliser and battery production, to calcined petcoke enabling aluminium smelting for clean energy infrastructure, the threads connecting oil refineries to the UK's most strategic industries are numerous, deep, and not easily replaced.

As the UK navigates its path to net zero, policymakers must ensure that the transition away from fossil fuels is managed with full awareness of these chemical, material, and industrial dependencies. A balanced, evidence-based approach — one that supports decarbonisation while safeguarding industrial competitiveness and national resilience — is not just desirable, it is essential.

Reference List:

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