MAPPING THE PLASTICS VALUE CHAIN: A FRAMEWORK TO UNDERSTAND THE SOCIO-ECONOMIC IMPACTS OF A PRODUCTION CAP ON VIRGIN PLASTICS

BACKGROUND CONTEXT AND PURPOSE OF THIS DOCUMENT

In March 2022, the United Nations Environment Assembly (UNEA) decided to forge a legally binding international agreement to end plastic pollution by 2040. The first proposed option in the current draft foresees the implementation of a global production cap on virgin primary plastic polymers.

The global plastics industry, represented by the International Council of Chemical Associations (ICCA), has expressed its commitment to ending plastic pollution, but believes the potential socio-economic impacts and other unintended consequences that may arise from the implementation of a production cap have not been fully evaluated. To this end, it commissioned Oxford Economics to undertake a research program to explore the socio-economic and environmental implications of policy interventions that could be used to support UNEA's objective.

A detailed description of our research findings and methodology can be found in the accompanying main report. This note summarises the major insights from our study.

UNPACKING THE PLASTICS VALUE CHAIN: MAIN INSIGHTS

There is currently no single unified data source describing the scale and structure of the global plastics industry economic value chain, which spans from primary plastic polymer production, to plastic product manufacturing, end use consumption, and finally recycled plastic production. Our research program has sought to rectify this and uncovered the following key points:

1. The plastics value chain is a major contributor to the global economy. In 2022, the primary polymers and plastic product manufacturing sectors jointly generated $1.7 trillion dollars in revenues and provided jobs for 6.2 million workers globally. The industry provides critical inputs in a range of applications, from packaging, building and construction, and transportation, to consumer products, healthcare, and emergency relief.

2. The final consumption of plastic products is much more internationally diversified than primary plastic polymer production. While a limited set of countries manufacture plastic polymers, finished goods containing plastics are consumed in all countries. Some countries that are relatively intensive consumers of plastics have very little associated primary or secondary (manufactured) production activities.

3. Most plastic products have medium- to long-term lifespans. The overall average lifespan of a plastic product is almost 10 years, though this ranges from the relatively short lifespan of packaging (which lasts about 6 months on average and makes up 31% of the total volumes of plastics used) to many decades for plastic applications in the construction sector (which have an average lifetime of 35 years and make up 16% of the total volumes consumed). Other widespread plastic applications

include transportation (14% of the total, with average lifespan of 13 years) and consumer products (10% of the total, with average lifespan of 3 years).

4. Absolute production levels are not predictive of economic dependence on the plastics industry. When describing the industry, emphasis is often put on countries that are large producers of plastics in absolute terms. Our analysis, however, demonstrates that the Middle East and Africa and Latin America are the regions that are most economically exposed to the primary sector when accounting for the revenues generated by the industry in relation to the size of their respective economies.

5. In regions with low incomes, consumers spend a higher fraction of their spending on plastic products. This is consistent with the fact that the final consumption of plastics by households is concentrated on packaging for products that represent essential staples of day-to-day life, most notably food.

6. Recycling rates for all materials are positively associated with GDP per capita, indicating that richer countries tend to recycle more intensively. It is estimated that 3 billion people worldwide still lack access to controlled waste disposal facilities. In many of these countries, the informal economy is a key driver of recycling activity, incentivized by the value of some of the plastics recovered.

THE EXPECTED IMPACTS OF A PRODUCTION CAP ON VIRGIN PLASTICS: HIGHER PRICES AND POTENTIAL UNINTENDED CONSEQUENCES

In addition to the value chain mapping, we have used economic theory to explore the expected implications of the production cap.

1. The implementation of a cap would push up the price of virgin plastic. It can be expected that the scale of this initial increase will depend on several factors including the size of the production cap, the availability, viability, and price of substitute products, and the extent of scale economies in production.

2. Higher prices of virgin plastic would ripple through the plastics value chain, pushing up costs and consumer prices. Higher prices of virgin plastic will raise production costs for first-tier manufacturers in the value chain. These can be expected to be passed on, to some extent, through the value chain, eventually leading to an increase in consumer prices.

3. Higher consumer prices will impose a disproportionate burden on low-income households. Since consumers in low-income regions spend significantly more on plastics as a share of their overall consumption, households in these regions can be expected to suffer disproportionately from higher prices. This trend would likely be exacerbated by the current variation in recycling rates internationally.

4. As the price of primary polymers increases, demand would shift towards alternative products, generating a risk of unintended environmental consequences, including increased GHG emissions and food waste. Part of the current popularity of plastics is that they are relatively light and, therefore, require less energy to manufacture and transport, all else equal. Moreover, since alternative materials are typically more expensive than plastics, a production cap risks further increases in manufacturers' production costs.

5. The extent of the price increase is likely to vary significantly for different polymers and seeking to exempt specific end uses from the cost increase would be practically infeasible. We would expect that price increases will be proportionately larger for polymer uses where the customer (converters) has fewer available commercial substitutes. Although the UN draft resolution currently considers three exemptions—for medical, emergency relief, and scientific research applications— the fact that polymers are not unique to specific applications implies there would be considerable practical hurdles to implementation.