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■ SPECIAL REPORT ARTICLE REPRINT January 2024

The EPA is undermining the TSCA's potential to reduce plastic waste

BY LYNN L. BERGESON

No discussion of energy issues would be complete without some mention of the utility of used plastic as a feedstock in the production of fuels, energy and building block chemicals. In spring 2023, the US Environmental Protection Agency (EPA) released its Draft National Strategy to Prevent Plastic Pollution (Strategy) to identify voluntary actions to prevent plastic waste. Plastics recycling, including both mechanical and 'advanced', is core to achieving improved post-use plastics materials management. Given recycling's criticality, it is disappointing that the Biden administration is not supporting policies that promote responsible plastics recycling. This article explains how the

administration's implementation of the Toxic Substances Control Act (TSCA) fails to grow advanced recycling.

Advanced recycling

Pyrolysis and gasification technologies use heat and catalysts to jump-start chemical reactions that return post-use plastic to or near the original monomer, or to petrochemical feedstocks. Once the plastic is broken down, the resultant pyrolysis oils can be converted to the common molecules used to make plastic, chemicals like ethylene and propylene, to other petrochemicals, or converted into fuel.

Circularity goals have renewed investment in these technologies because they are designed to process biomass, post-

use plastics, tyres and other post-use materials to reduce or replace the use of fossil resources to make useful products, including building block chemicals, fuels and energy. These processes form the backbone of a new and promising generation of technologies essential to achieving plastics circularity and sustainability.

Advanced recycling could grow from 20 million to 40 million metric tonnes and meet up to 8 percent of polymer demand by the end of the decade. This growth reflects investment opportunities of approximately \$40bn and could effectively divert plastic from landfills and diminish the use of fossil resources – goals that align perfectly with the Biden administration's goal of achieving

circularity, preventing pollution and advancing sustainability.

Plastics recycling and the TSCA

Congress amended the TSCA in 2016 with the enactment of the Frank R. Lautenberg Chemical Safety for the 21st Century Act (Lautenberg). The EPA's implementation of Lautenberg has unfortunately confounded new chemical innovation, diminished research and development (R&D) investment in new chemicals and chemical technologies, and chilled the once-hot domestic advanced recycling market.

To understand how, some background is useful. Almost a half century ago, Congress tasked the EPA with creating a catalogue of chemicals believed to be in commerce and used for commercial purposes. Chemicals added to this chemical inventory were deemed 'existing' chemicals needing no EPA risk review as a condition of continued commercialisation. Chemicals not listed on the inventory were and are considered 'new' and require EPA pre-market review as a predicate to commercial manufacture or import.

Chemicals fall into two classes under the TSCA. Class 1 substances are single, defined substances and can be made by any means without changing the chemical identity of the substance. Class 2 substances reflect some degree of variability, including alkyl ranges, isomeric variability and so-called unknown or variable composition, complex reaction products and biological materials (UVCB). UVCB substances are named with the source of the chemical and process in the name or as part of the definition, which is part of the identity.

New chemicals, including those that use plastic waste as a feedstock, compete for market share with older, petroleum-based existing chemicals that rely on 'source-based' naming conventions. The EPA's hazard-based approach to new chemicals review causes most new chemicals to be regulated. This places newer chemicals and the technologies that produce them at a significant competitive disadvantage vis-à-vis older, generally riskier chemicals that will not undergo risk review for decades.

How is this relevant to advanced recycling? Pyrolysis oils themselves,

or hydrocarbon fractions made from a combination of petroleum and waste plastic pyrolysis, are often considered 'new' TSCA chemicals. This is because under the TSCA, chemicals produced from 'novel' feedstocks such as waste plastic would not fit with the name of any existing chemical. Making a hydrocarbon distillate from another source, such as biomass or waste plastic, means that the manufacturer of these distillates cannot identify the product using the petroleum-based identity. Manufacturers of those distillates are not able to rely upon the TSCA inventory listing of the petroleum-source chemical and must instead submit a premanufacture notification (PMN) for the circular-source distillate, even if the two chemicals are chemically indistinguishable.

Consequently, refineries wishing to repurpose plastic waste or biomass as a feedstock may not do so in most cases without preparing a PMN. Much has been written about the challenges PMN submitters experience today. Delays beyond the statutory 90-day review period are significant, often exceeding a year. More troubling is outcome uncertainty. Despite the explicit language in section 5 of the TSCA that the EPA evaluate substances against a risk-based standard, the EPA instead is regulating every substance that it concludes is not 'low hazard', regardless of the substance's relative hazard or sustainability benefits. The implementation delays and inconsistent and resulting overly conservative risk reviews stifle innovation in provable ways.

This overregulation matters. New chemicals compete with existing chemicals. All things being equal in terms of chemical profile and functionality, regulated entities will elect commercial pathways subject to the least amount of regulation. The paperwork burdens, reporting obligations and unfavourable optics that 'significant new use rules' (SNUR) invite are hard to sell to employees, downstream customers and commercial partners. If using circular-based feedstocks invites extraordinary market entry delays, significant paperwork burden and enhanced enforcement scrutiny, as is now the case, refiners will simply forgo greening their feedstocks.

Troubling policy initiatives

The foregoing provides context on how the TSCA nomenclature rules pose challenging impediments for manufacturers wishing to optimise waste plastic feedstocks. It is easy to forgive a collective lack of appreciation for the adverse effect nomenclature rules have on innovation of new chemicals. It is another matter, however, to justify new initiatives that frustrate pollution prevention.

The EPA announced in the Strategy its intention to require companies submitting new pyrolysis oil chemicals under the TSCA to conduct testing for impurities that could be present in the new chemical substance. On 20 June 2023, the EPA also proposed SNURs for the 18 chemicals that were the subject of the Order at issue in a lawsuit a citizen group filed against the EPA a few months earlier challenging SNURs for the 18 chemicals made from plastic waste-derived feedstocks. The proposed SNURs would, according to the EPA, ensure they are free from unsafe contaminants before they can be used to make transportation fuels. The proposed SNURs would require notification to and review by the EPA before the manufacturing or processing of the chemicals using waste-derived feedstocks that contain any amount of certain heavy metals, dioxins, phthalates, per- and polyfluoroalkyl substances (PFAS), and other chemicals. The proposed SNURs would designate as a significant new use manufacture of the PMN substances using feedstocks containing any amount of the identified contaminants.

The adverse comment on the proposal cautioned that if issued, the rule would effectively prohibit entirely the manufacture of the substances that include some variations of products derived from pyrolysis oils. The EPA provided no de minimis level below which the SNUR does not apply. This is problematic for manufacturers of any of the PMN substances because a manufacturer would be required to document the absence of all the specified substances in its feedstocks or risk violating the TSCA.

The EPA's proposed SNURs are disappointing. The proposal lacks

scientific justification. Presuming the EPA proposed the SNUR in response to the citizen petition filed, the exposure 'concern' widely reported appears to be premised on an erroneous reading of the EPA's risk assessment for one of the 18 substances included in the SNUR. The EPA predicted a high level of cancer risk in response to a speculative condition of use that even the EPA concedes will never happen. The hypothetical condition of use involves hypothetical emissions from the simultaneous use nationwide at airports of the biojet fuel in the Order. Even if this scenario were anything other than purely hypothetical, the potential risk is unrelated to the feedstock or to the production facility at issue.

In addition, if issued in final, the rule would prohibit what is contained in the feedstock plastic without regard to the chemical composition of the products. This is an unprecedented application of section 5 of the TSCA and inconsistent with the TSCA.

Finally, the clear message in the EPA's Strategy and subsequent proposed SNURs is soul crushing for entities wishing to optimise plastic waste in beneficial and safe manufacturing operations. Whether it was intentional or not, the SNURs would effectively ban the production of the notified substances from waste plastic because no converter can prove the absence of the contaminants. Whether the EPA's indifference to the fact that further processing in a refinery poses no difference between the petroleum- and plastic-based feedstocks is intentional, the result is the same, and the policy and proposal reflect bad science, bad law and really bad policy.

Policy suggestions

To achieve circularity, the EPA needs to interpret the TSCA to achieve sustainability and circularity. Three TSCA policy changes should be made. First, the EPA should consider broadening the TSCA exemption from section 5 reporting for imported non-hazardous solid waste, including plastics,

that is being used as a recycling or chemical feedstock as opposed to being disposed of as a waste.

Second, the EPA should develop a standardised approach to the PMN review process for crude pyrolysis oils and subsequent distillate fractions. A standardised approach would pose fewer burdens on the EPA and would expedite review.

Third, the EPA should suspend the source-based naming conventions for TSCA chemical identity purposes for refinery products made from pyrolysis oils (or biomass) rather than petroleum. While the pyrolysis oils are similar, but not equivalent, to petroleum converted in petrochemical facilities to other hydrocarbon streams, the waste-based substances become indistinguishable from the equivalent petroleum-based streams. ■

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