Chemical Recycling and the Circular Transition: Strategic Imperatives for the Plastics Industry

Ian Temperton
CEO of Plastic Energy

Andrew Thomson
Client Partner at Pedersen & Partners

Plastic waste remains one of the most pressing environmental challenges of our time. Global plastic production already exceeds 400 million tonnes annually and this figure continues to rise. Yet recycling rates remain low at only 9% globally, and most flexible packaging and contaminated plastics are unsuitable for mechanical recycling. Incineration and landfill remain the dominant outcomes, raising concerns around carbon emissions, pollution, and resource inefficiency.

Against this backdrop, chemical recycling has emerged as a potential game changer. By breaking down waste plastics into chemical feedstocks, it enables the creation of virgin-quality materials suitable for sensitive applications such as food and medical packaging. This technology offers a pathway to close the loop in one of the hardest-to-abate sectors, but success will depend not only on technical feasibility, but also on scaling infrastructure, mobilizing capital, aligning regulation, and securing leadership talent.

In a recent session hosted by **Andrew Thomson**, Client Partner and member of the **Industrial Practice Group** at **Pedersen & Partners**, **Ian Temperton**, **CEO** of **Plastic Energy**, shared insights into the Company's journey, its operational track record, and the strategic challenges facing the industry as it seeks to accelerate the circular transition. An engineer by training with extensive experience in finance, renewables, and corporate development, Ian joined Plastic Energy seven years ago as Chief Investment Officer before progressing to CEO, bringing a unique blend of technical, financial, and leadership expertise. He highlighted the Company's mission to turn hard-to-recycle plastics into high-quality feedstock while reducing environmental impact. As he put it, "*Our goal is not just to recycle, but to rethink the entire lifecycle of plastics, closing the loop sustainably.*"

Closing the Loop on Plastics

Plastic Energy specializes in chemical recycling through their patented TAC™ process, which converts contaminated and mixed plastic waste into recycled oils, called TACOIL™. These oils are then supplied to major petrochemical companies, which use them to produce new plastics of identical quality to virgin material.

This ability to handle waste streams that mechanical recycling cannot process — particularly supermarket films and flexible packaging — addresses a critical gap in the market. Ian explained, "*We complement mechanical recycling rather than compete with it, ensuring more plastic stays in the system instead of becoming waste.*"

Operational Proof and Scaling Up

Ian also emphasized that what sets Plastic Energy apart is its decade of operational experience. The Company has been running successfully two plants in Spain – in Almeria and Seville – since 2016/17, safely and efficiently processing highly variable waste streams. This experience has provided both an operational 'proof point' and a strong foundation for scale.

The next step for Plastic Energy is expansion through partnership with two petrochemical majors:

- A joint venture with SABIC in the Netherlands, which delivered its first "TACOIL™" in the summer of 2025 and is in its commissioning stage
- A second project with TotalEnergies near Paris, which is also currently in its commissioning phase.

Both facilities are directly integrated with existing petrochemical infrastructure, providing a cost advantage and seamless integration, demonstrating technical viability, and also offering a scalable blueprint for wider adoption. Andrew highlighted the fact that, "*Plastic Energy is showing the industry that with the right strategy and partnerships, chemical recycling can be scaled responsibly and efficiently.*"

Plastics, Climate, and Hard-to-Abate Sectors

Plastic is increasingly recognized as one of the hard-to-abate industries alongside steel, cement, and ammonia. As other sectors decarbonize, plastics are projected to make up a growing share of global emissions.

Plastic Energy's life-cycle analysis shows a 78% reduction in emissions compared to conventional disposal. Yet Ian stressed that recycling is no longer a free pass. "*We're now working to decrease our own direct emissions as much as possible. The bar is rising, and stakeholders expect accountability,*" he said.

Regulation as a Driver and Constraint

Policy is shaping the pace of adoption. The EU's Packaging and Packaging Waste Regulation (PPWR) sets mandatory recycled-content targets, moving demand from voluntary corporate pledges to regulatory requirements. Ian noted, "*Clear regulation helps everyone plan with certainty, but uncertainty today can slow investment and innovation. Much of the detail still needs to be worked through. What is clear is that the demand for recycled content is increasing, and chemical recycling can provide a much needed solution to fill this gap in the market.*"

National policies are also emerging, with countries like Germany and the Netherlands beginning to mandate green content targets. For Plastic Energy and its peers, regulatory clarity will be decisive in driving scaled deployment.

Industry Collaboration and Talent Challenges

The transformation of plastics requires two industries to evolve in parallel:

- Waste management — building infrastructure for collection, sorting, and pre-treatment.
- Petrochemicals — integrating recycled feedstock into established supply chains.

Ian highlighted talent gaps, noting, "*Many plants are managed by an aging workforce. Attracting younger talent requires a mission-driven approach, showing engineers and operators the impact they can make.*" Technological advances in AI and robotics are also supporting progress, particularly in sorting systems that enhance feedstock quality and efficiency.

Strategic Imperatives for Leadership

As the industry matures, leadership talent will be decisive. Executives must be able to:

- Drive technology integration into existing petrochemical value chains.
- Navigate evolving regulatory frameworks with speed and agility.
- Lead complex, multi-stakeholder projects under conditions of resource scarcity.
- Build cross-sectoral partnerships between waste management, chemicals, logistics, and government.

Andrew emphasized, "*Leadership in this sector is about more than technical expertise. It's about vision, collaboration, and the ability to turn ambition into tangible outcomes.*"

Plastic Energy's strapline — Powering the Circular Transition— reflects both the opportunity and urgency. The technology is proven, the partnerships are in place, and regulatory frameworks are developing. The challenge now is speed: scaling infrastructure, mobilizing capital, and aligning stakeholders to close the gap between ambition and execution.

As Mr. Temperton concluded, "*The plastics challenge is solvable. But success requires innovation, investment, and skilled leadership to translate vision into impact.*"

Pedersen & Partners continues to monitor developments across the circular economy and industrial sectors. The future of plastics will be shaped as much by leadership as by technology.