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‘Houston, we have a problem’

Industry can no longer rely on China to absorb vast volumes of petrochemicals. Instead it must reinvent itself with new business models focused on recycling

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“Houston, we have a problem.” This famous phrase, alerting the world to the problems on the 1970 Apollo 13 moon mission, aptly describes recent developments in the petrochemicals industry. Not only Houston, but all those cities and countries who rely on exports to China, are wondering what happens next? Is China’s import demand about to suddenly recover? And if not, what options do they have?

Since 2009, China has been the growth engine of the chemicals industry and the global economy. Its slowdown, and rapid moves to self-sufficiency, are raising critical questions over the outlook. As John Richardson of ICIS has warned, global levels of over-capacity in the six ‘building block’ value chains (ethylene, propylene, butadiene, benzene, toluene and xylene), are now set to double from 95m tonnes in 2010 to 218m tonnes this year. Already profits have begun to tumble along with margins, as the Q1 results season confirmed.

And signs of the ‘demand recession’ are multiplying under the impact of today’s higher inflation and interest rates. Current demand levels are very weak, even though this is one of the seasonally strongest times of the year.

The key issues are highlighted in the two charts on the next page, showing the development of China’s polyethylene (PE) and polypropylene (PP) markets since 2005, based on Trade Data Monitor stats. Back in 2005, China was a relatively small market for both products. Total demand for both PE and PP was just 12m tonnes/year. Around half of this demand was supplied by domestic producers, as China began to ramp up construction of world-scale refineries.

Then came the US subprime crisis: 24m Chinese people were reportedly unemployed by the end of the Lunar New Year festival in February 2009, as exports to the US dried up. And so Q1 saw the government begin the largest stimulus programme in history. Lending doubled from \$10tr in 2008 to \$20tr in

2009. Unsurprisingly, polymer demand took off like a rocket. PE demand jumped to 18m tonnes/year, and PP demand to 15m tonnes/year. Domestic producers also expanded, to maintain their share of both markets.

After this, it was “all systems go” in terms of demand growth until last year. Real estate was the key focus, as in the US subprime bubble before 2008. Essentially, China’s stimulus became ‘subprime on steroids’ as the real estate market grew to become 29% of GDP – easily a record level for any major economy – as lending reached \$51tr in 2022. Naturally, polymer growth rates also soared. And demand for virgin polymers had a further boost after the government banned imports of recycled plastic in 2017. PE demand rose to 40m tonnes/year by 2020 before plateauing. PP demand reached 31m tonnes/year in 2022.

Naturally, companies searched for an explanation of what was happening. Few had really followed China before 2008, and so most were happy to accept the Asian Devel-

opment Bank's 2011 commentary that suggested the:

"Majority of households in the People's Republic of China have become middle class by 2007, which is especially impressive given that around 40% of households were still considered poor in 1991."

The problem with this statement was in its definition - which undermined its basic proposition:

"Using \$2-\$20 (purchasing power parity) per capita daily income as the definition of middle class."

Very few people would accept that \$20/day (\$7,300/year) represented a middle class lifestyle, let alone \$2/day (\$730). But the image stuck - highlighting the risk with relying on headlines. Today, too late, many are now realising that this extraordinary growth was due to stimulus rather than domestic consumption. Essentially as Prof Michael Pettis of Peking University has warned:

"One of the points I have been making for years is the intense pro-cyclicality of a growth model that relies so heavily on infrastructure and property investment to generate growth..."

"China's slowdown is the almost automatic result of problems that have been building up for over a decade, and at a very minimum it will take a huge shift towards radically new policies to prevent growth from slowing much, much more."

PE, PP in the eye of the storm

Unfortunately, PE and PP markets are now in the eye of the storm. On the demand side, China's leadership have been trying to deflate the real estate bubble since 2017, when President Xi warned that "Houses were for living in, not for speculation". But their efforts were slowed by President Trump's decision to launch a trade war. This changed the basis of US-China relations from co-operation to competition. And so China began to rapidly expand its own capacity in petrochemicals and plastics. Based on Q1 data, China's self-sufficiency level in PE is likely to reach 70% versus just 51% in 2020. And in PP, it will likely reach 96%.

We are now at a critical decision point for the industry. As with the Apollo 13 rescue, we have limited time available to achieve the transformation that is required

Today, companies have begun to realise they were fooled by the stimulus programme into thinking that demand would continue to grow for decades, and at double-digit rates. Essentially, as Prof Pettis has warned, they have over-invested in new capacity, based on over-optimistic assumptions about future demand. For the moment, the full impact is being hidden by the inflationary impact of the Ukraine war. But it is increasingly clear that we are now moving, for the first time in living memory, into a 'demand recession'.

No 'business as usual' solution

So what is to be done? As with the Apollo 13 rescue, there is no 'business as usual' option. China's move to achieve self-sufficiency is not the only problem on the horizon. Closer to home, the industry is under increasing pressure from investors, governments and brand owners on the issue of single-use plastic and plastic waste. This is another game-changing development, as single-use plastic accounts for more than half of PE demand and around one-third of PP.

It confirms the urgent need for companies to adopt new, forward-looking, business models based on Net Zero needs. The good news is that this has proved a successful strategy for the auto industry, one of our industry's key customers. Auto manufacturers could have wasted years trying to fight the move away from gasoline and diesel fuels. But instead, it chose to reinvent itself by developing electric and autonomous vehicles, with great success.

The chemical industry now needs to similarly reinvent itself to achieve similar exponential growth. The focus needs to be on overcoming the key challenges that are currently

holding back the use of recycled plastic as a major feedstock:

- One key issue is the need to dramatically increase the collection and sorting of waste plastic. This will transform today's problem of waste plastic and marine pollution into a valuable feedstock for the future.
- Secondly, managements need to task their technical and manufacturing colleagues with resolving today's problems with pyrolysis and other potential recycling technologies. Only the majors have the resources and expertise to do this.
- Thirdly, their commercial teams need to work with waste companies, local and national governments, as well as brand owners and retailers, to implement a more circular business model for the industry.
- Fourthly, finance teams need to begin raising the investment needed to fund roll-out of the new business model on the scale required. Local waste centres need to become recycling centres, linked with existing petchem infrastructure wherever possible.

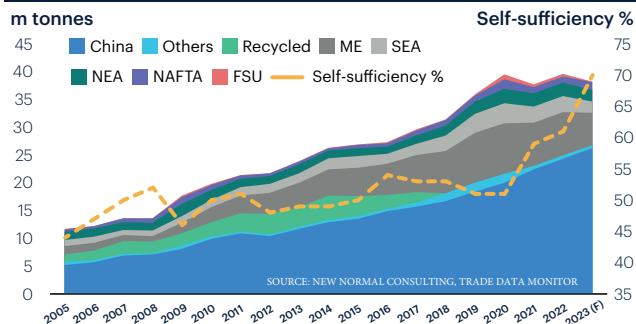
We are now at a critical decision point for the industry. As with the Apollo 13 rescue, we have limited time available to achieve the transformation that is required. Inevitably, as we have argued here in the past (ICB 13-19 August 2021), winners and losers will now emerge. This will mirror developments in the 1960s, when visionary leaders decided to stop using coal-based feedstocks and adopt a new global business model, based on oil and gas.

Their decision set the scene for decades of profitable growth, as the new products transformed living standards around the world. Today, it is also now clear that 'business as usual' is no longer an option. Instead, the potential winners of the future are already focused on repositioning their businesses to exploit the new opportunities developing in the New Normal world. ■



Paul Hodges is chairman of [New Normal Consulting](#) and the Advisory Board for Infinity Recycling. He publishes *The pH Report* and writes the *ICIS Chemicals & the Economy Blog*.

China polyethylene demand and sources, 2005-2023 (F)



China polypropylene demand and sources, 2005-2023 (F)

