

The Future of the European Petrochemical Industry

Abstract for a presentation at the Renewable Materials Conference 2024 on 11-13 June 2024 in Siegburg, Germany.

Storyline:

1. Operation emissions, renewable feedstocks and circularity are the main sustainability issues that the European chemical industry faces this decade.
2. The European petrochemical companies are not equally well positioned for a circular future.
3. The European petrochemical industry is not in good financial shape.
4. There will be winners and losers among the European petrochemical sites.
5. We looked at 8 variables when we compared the European petrochemical industry to distinguish winners and losers.
6. Becoming a winner is essential for all local derivative units and downstream activity.

1. Operation emissions, renewable feedstocks and circularity are the main sustainability issues that the European chemical industry faces this decade.

- The Chemical industry provide essential products built from carbon and hydrogen, traditionally from fossil sources.
- For many years, pressure has been increasing from legislation and customers for the industry in Europe to reinvent itself based on renewable carbon and hydrogen feedstocks, and a circular business model.
- This is particularly important for the olefin steam crackers, which are the workhorses of the industry, producing the building blocks from which most plastics and chemicals are derived, and have the largest energy consumption and emissions in the value chain.
- There's been a lot of activity, disclosures, strategies, technology developments and announcements, with 2030 a key mid-term target for all due to the EU fit for 55 strategy and the Emissions Trading System. But to what effect?

2. The European petrochemical companies are not equally well positioned for a circular future.

- At New Normal we've been doing analysis of a subset of European steam crackers sites, looking at their progress in decarbonization of operations and developing circular and renewable feedstocks. We've looked at the enablers for transition, which are good corporate governance with support for net zero, the economic robustness of the cracker, and positive factors in the external environment, like renewable power and higher levels of municipal waste recycling. We're also evaluating progress, looking at the materiality of the sites plans, its access to technologies and partnerships, and implementation of projects at the site.
- A common theme is that the one turnaround between now and 2030 is the single shot for most to reduce their scope 1 emissions. But beyond this, there's no clear pathway for these players for a meaningful reduction of scope 3 emissions.

- It appears that about half the capacity is relatively well-positioned to make the transition, and that's the half where the enablers are evident. There's a big question mark about the way forward for those lacking enablers, being weak on targets and implementation.
- **However, we are increasingly concerned that developments are plateauing and the announcements for high technology readiness leading to scale-up are not coming.**

3. The European petrochemical industry is not in good financial shape.

- In the meantime, European chemical industry faces **very low profits** due to high costs for feedstock and energy together with a faltering local demand as well as declining prices due to increasing import volumes.
 - Chemicals and polymers from the Middle East and the US are no longer needed in a self-sufficient China and are now destined for Europe, leading to an additional loss of sales volume by local manufacturers, on top of the volume already lost through a declining local demand and fierce competition in the export markets.
 - The Middle East and the US are benefitting from lower feedstock and energy costs and are pushing down pricing in Europe's historical markets, sometimes below European cash costs.
 - Until 2030, importers of polyolefins and chemicals have unfettered access to the European markets whereas the costs for European producers will rise because of ETS
- Massive investment is needed IBL as well as OBL to secure access to non-fossil sources of carbon and hydrogen for European manufacturers at the same time that petrochemical margins have turned negative and closure of assets loom, these investments are under pressure as it is unlikely that sufficient profitability will return this decade.

4. There will be winners and losers amongst the European petrochemical sites.

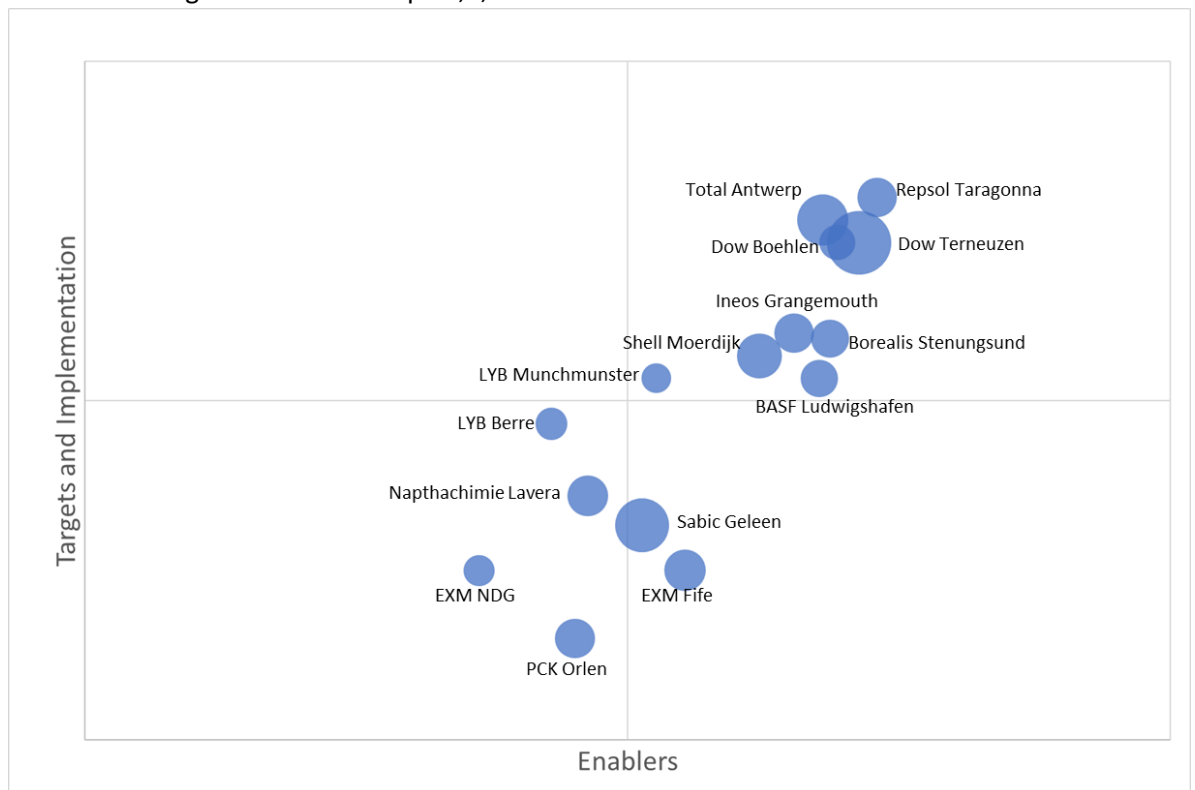
- Given the above it is possible that the European Petro-Chemical Industry will soon enter a phase of closures and restructuring due to the recent increase of imports of monomers and polymers from overseas countries with less strict greenhouse gas emission targets compared to Europe.
- In this landscape European winners (surviving petrochemical sites) and losers (closing petrochemical sites) will emerge and gaining insight in who might be strong, and who will be weak, becomes important for investors and downstream consumers alike.
- Winners will have effectively won the race against high feedstock and energy costs and ever increasing ETS costs competing against importers that have unfettered access to the European markets, using low costs energy and feedstock and not hindered by ETS in their home countries.
- However, during the early 30's, it is almost certain that importers will be starting to pay the same ETS costs as local producers (introduction of CBAM for chemicals) which will add to the strength of the European winners. After a number of very difficult years there could be a time, early thirties, that the surviving low-fossil European Petrochemical industries will actually be advantaged against old style fossil-based importers.

- Unfortunately, many sites may at that time no longer exist in case they are closed in the difficult economic conditions of the twenties.

5. We looked at 8 variables when we compared the European petrochemical industry to distinguish winners and losers.

- The landscape we've been looking at is essentially leading indicators – are the external conditions supportive? Does the site have a plan and project announcements? As we approach 2030 the acid test will be to what extent sites are succeeding in reducing their absolute scope 1 and 2 emissions and carbon intensity.
- We come to 2 main conclusions, and one question.
 - The disclosure of Scope 1,2 emissions data remains generally immature at site level. Where we can assess progress, it is mostly disappointing to date.
 - As for scope 3, none of the players we are looking at publish at site level, and corporate level data is not providing us any room for optimism.
 - Is progress still being made? the first wave of developments appears to be over. The question is why? And what can be done about this?

Slide illustrating readiness for scope 1,2,3 emissions reduction for 15 olefin cracker sites



- For a site to be a potential survivor we looked for a high score for targets (what are they aiming for) and implementation (what are they accomplishing) and compared that to the local Enablers (infrastructural projects to enable circularity like green electricity and hydrogen availability) A high score for both increases the chance for future survival A low score increases the chance for closure.

6. Becoming a winner is essential for all local derivative units and downstream activity.

- The corporate strategy to decarbonize of the owner of the site must be strong.
- The site must be economically robust.
- The local economic interest in the survival of the steam cracker site to continue must be strong enough to generate the cash flow needed for the large investments.
- The investment in the reduction of scope 1 and 2 CO2 emissions must reduce ETS costs effectively.
- Local governments must be supportive and investing in the infrastructure for the new utilities and raw materials needed to sustain the future of the site.
 - Hydrogen.
 - Green electricity.
 - Bio based feedstocks.
 - Returned plastic waste.
- Technology developments must be funded and accelerated as such that deadlines can be met.