

The slight difference

Political desires and directives do not match regulatory implementation and interpretation

Despite the high political profile of the “green” and “circular” economy, our portfolio companies still face many regulatory barriers for implementing and promoting green and circular economies. Especially in cases where certain feedstocks are considered a “waste”, regulatory barriers limit the use of that feedstock, since the company has to wait for an “end-of-waste” classification of the products made out of this feedstock. **By Rob van der Meij**



Let's start with an example: pig farmers have to clean the off-gas from ammonia from the stables. This can be done with a simple, small sulphuric acid wash, creating a dilute ammonium sulphate solution. Ammonium sulphate is a fertiliser currently used in the agricultural industry. This stream from pig farmers has too low a concentration of ammonium sulphate to be an effective fertilisation stream, and the streams are too small for cost-efficient recovery of the ammonium sulphate directly. By collecting this liquid and recovering the ammonium sulphate in a larger central installation with a low-temperature, low-energy consumption crystallisation process (by Cool Separations from the Netherlands), a solid, high-purity ammonium sulphate solid is produced that can be sold to farmers in bags as a fertiliser.

Implementing this process took a long time because of the local regulator's decision that the dilute liquid transport require a permit for waste removal, and that the

recovered ammonium sulphate was a waste since the feedstock was a waste. If the recovery had been done at each individual pig farm, resulting in much higher energy consumption and significantly lower recovery efficiency, having no economy of scale benefit, it would have been allowed. So here, the technology benefits the environment directly (ammonia emission from pig farms is a large contributor to harmful N emissions) and creates a sustainable and economically viable circular model, but it suffered significant delays in implementation and financing uncertainty due to the regulation. Even more frustrating is that in an industrial chemical plant, where fresh (fossil fuel-based) ammonia is used as an excess reactant, the excess ammonia is used to make ammonium sulphate, and not considered a waste and the resulting ammonium sulphate is also not a waste.

It seems regulators are missing an holistic overview. Many circularity-based options face this issue. We have seen it in car

tyres, plastics etc. Delays well over 12 to 18 months are not unusual. For start-up and scale-up companies, the monthly burn rate continues and creates high uncertainty for investors.

Use of regional and national funds

Many regional and national investment funds invest in specialised venture capital



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funds to leverage the specific sector expertise of such specialised VCs. This works very well on both sides. However, this seems to be limited to the funds of the home country of the fund manager. We see a large resistance, almost a taboo, to invest in foreign funds. This is viewed as politically sensitive. For specialist funds such as our Sustainable Chemistry Fund, this limits fundraising from regional development offices to the home country only. Investors who have an international scope and can bring innovative companies and technologies to any region in Europe and deploy them across country barriers are limited by national boundaries in fund-to-fund investments, despite plenty of examples of funds investing across different European boundaries.

Financing the scale-up phase

Financing the scale-up phase remains a difficult matter. The well-known valley of death is primarily a financing problem, not a customer acceptance issue. For industrial biotech and circular economy, the first plant finance is a difficult matter. Typically, still EUR 40 to 100 million capital is needed for a first plant. Despite significant experience gains in the industry over the past 15 years with industrial biotech and circular technologies, the perceived technology risk remains a very high barrier for financing. The EU finance institutions and national governments have recognised this and set up various equity-based instruments. Though the VC industry welcomes these instruments wholeheartedly, the missing factor in such financing remains debt. First plants are unsuited for strict project finance, which requires the absence of technology risk, long-term, rock-solid supply and off-take

agreements with take or pay provisions. The latter type agreements may be common in green electricity, but just aren't commonly applied in the chemicals industry. Yet, chemical supply and demand relations are typically of a long-term nature, often without formal agreements, and they provide pretty stable cash flows. And yet despite their “green finance” claims and offers to banks to double their interest margin on such projects, they choose not to play in this segment.

Lack of experienced people

Experts are often surprised by the lack of experienced technology and business people among investors in more generic funds. Very often, portfolio company managers have to deal with relatively inexperienced analyst staff with a purely economic or financial background who are extremely spreadsheet-focused. They are all bright, willing and have good intentions, but have been trained in very risk-avoidant industries (banking, accountancy). Most focus a lot (if not only) on the financial projections and potential 50+ variations one can make, rather than on the future business potential. Uncertainty is often mixed up with risk and there is very little trust in technology and business assessments. So they keep asking more and more questions, trying to find certainty, rather than trying to understand the business and market fundamentals and see the opportunity. There is a tendency for these types of investors to rely on the participation of current strategic players, such as a large chemicals corporates. Chemical corporates have almost exclusively “evolutionary” innovation such as product development and asset management. They are very good in these dimensions and market expertise. However, most of them lack experience in more disruptive innovations. Furthermore, the reliance in the opinion or interest of an existing industry in its future innovations is quite strange if you realise that the existing corporates are typically the ones missing their own industry transitions. No post offices were involved in email, no traditional phone company stepped in to mobile phones, the oil/gas-based energy companies were late to wind and solar and Tesla is of course the example of how the car industry did not believe in EVs. So

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Industrial biotech is one of the pathways to decarbonisation that can facilitate the transition.

how valuable is it really to ask the current industry players for their opinions?

Industrial biotech

As part of the drive to fully de-carbonise the European economy by 2050, a large challenge remains in the domain of the chemical industry where alternatives to fossil fuel-based compounds have not yet been widely developed to an industrial scale. The challenge is especially urgent for the Western Europe-based chemical industry, where several large chemical industrial complexes need to transition away from fossil fuel to renewable feedstocks within less than three decades.

Industrial biotech is one of the pathways that can facilitate this transition. It encompasses the use of living organisms and/or their products for industrial processes. Driven by the developments in genetic engineering, there is increasing activity in both scientific research and commercial R&D to develop new solutions for various applications. As this development matures, there will be an increasing need for enabling technologies and services (e.g. synthesis and process technology).

The early-stage venture phase provides a big opportunity to scout and invest in the most promising solutions for a market that is eager for sustainable products and services. Several large companies such as Cargill, Unilever, Nestlé, and DSM have publicly announced their intention to source 100% sustainable feedstock, some even within the next ten years. This has created a need for innovation and sustainable business models in the materials, energy, nutrition, and personal care market spaces.

Investing in new technology and new businesses is not about risk management, it is about opportunity management and de-risking the path. ■

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