

Financing Sustainable Development in Ireland Symposium

Sustainable Industrial Development: Enterprise Policy and Financing Decarbonisation

Joseph Cummins
Department of Enterprise, Trade and Employment

(read before the Society, 20th April 2023)

Keywords: industry, decarbonisation, ESG, sustainability, Green Transition, industrial policy, corporate finance
JELs: G0, G3, G38, H0, L10, L60, L61, L66, P1, P2

1. INTRODUCTION

Irish Enterprise Policy has been going through a short but intensive moment of reflection and horizon scanning. Following a tumultuous period of reactive policy making in response to the external shocks of Brexit, COVID-19, and more recently an energy price spike, it is now useful and necessary to assess how Ireland's enterprise and employment base is positioned in the early part of this decade; a decade in which considerable change will take place as a result of several economic and societal 'headwinds'. With more people employed than at any time in the State's history, and near all-time low unemployment rates, the resilience of our enterprise sector and strong, broad-based economic indicators portray an economy in good health. Notwithstanding well-known challenges such as a high concentration-risks in our FDI sector and corporate tax revenues, alongside serious capacity constraints in housing and infrastructure delivery; Ireland is faced with an historically unusual opportunity to engage in pro-active, rather than reactive, medium-term enterprise policy development.

In 2022, on the instruction of then Tánaiste, Leo Varadkar TD, the Department of Enterprise, Trade and Employment published a White Paper on enterprise policy.¹ The White Paper sets out to articulate a "vision...for Irish-based enterprise to succeed through competitive advantage founded on sustainability, innovation and productivity, delivering rewarding jobs and livelihoods." The paper sets out the national and international economic context, the changes and trends that can be identified in global trade, and the framework conditions required for Ireland to navigate a new set of challenges. The paper posits that the change to Ireland's enterprise policy and economic model should be "one of adaption rather than a major departure from the proven and consistent approach we have pursued to date." Evolution rather than revolution. The core areas of focus for enterprise policy makers for the coming decade are informed by an analysis of available data alongside an assessment by Dr David Skilling of the industrial policy and enterprise policy in small, advanced economies. Dr Skilling sets out how "a group [of] small, advanced economies have out-performed larger advanced economies over the past few decades in terms of economic outcomes as well as broader social outcomes". While the economic model of these highly globalised small economies has outperformed in recent years, they are also prone to risks that more diversified economies, with stabilising domestic consumption of scale, and vertically integrated value chains, might not be exposed to. In his analysis,² Dr Skilling in particular highlights shifting patterns of globalisation, technological disruption, the changing role of the State, digitalisation and the transition to a net zero economy as key external dynamics likely to have oversized impacts on small, open economies. Dr Skilling suggests that the "key reason that small, advanced economies have been able to sustain superior performance is

¹ White Paper on Enterprise 2022 – 2030, Department of Enterprise, Trade and Employment:

<https://enterprise.gov.ie/en/publications/publication-files/white-paper-on-enterprise-2022-2030.pdf>

² Review of Industrial & Enterprise Policy in Small Advanced Economies and Implications for Irish Enterprise Policy, Dr David Skilling (2022): <https://enterprise.gov.ie/en/publications/publication-files/review-of-industrial-and-enterprise-policy-in-small-advanced-economies-and-implications-for-irish-enterprise-policy.pdf>

that they adapt to a changing context quickly”. In that vein, the White Paper on enterprise proposes focussed evolution in a small number of core policy areas, to give impetus to that agility and to address the known global shifts already underway.

2. ENTERPRISE POLICY AND THE TRANSITION TO A NET ZERO ECONOMY

The White Paper marks a step-change in enterprise policy as it relates to the environment and decarbonisation. The first of seven key objectives set out, recognises that “Embedding decarbonisation into enterprise policy is no longer a choice but an environmental and economic imperative. Failing to do so would not only jeopardise our ability to meet our climate action commitments but would also be detrimental to our competitiveness.” The Paper goes on to commit that enterprise policy “will incorporate carbon abatement as an objective equal to and alongside employment and value added” and to setting carbon targets for the Department’s enterprise development agencies, Enterprise Ireland and IDA Ireland. The commitments come alongside a recognition of the legal framework set out in the Climate Action and Low Carbon Development (Amendment) Act 2021, which establishes binding emission targets and defines the level of emissions abatement needed to be achieved by different sectors in the Irish economy. The Government has legislated under the Act to bind itself to achievement of net zero greenhouse gas emissions by 2050 and halving emissions by 2030. The ‘Sectoral Emissions Ceilings’ provided for in the Act, require a 35% reduction in emissions arising in industrial manufacturing sectors, while businesses will also be required to contribute to sectoral ceilings with implications for the emissions impacts of their buildings, transport and supply chains. These are challenging and substantial targets. They will impose costs on Government, businesses and wider society in order to achieve them. Enterprise policy will therefore also need to concern itself with the resilience of sectors that face high transition costs, and those whose business models will be overtaken by new technologies or efficiencies created through ‘circular’ use of key resources.

The EU Commission’s ‘Green Deal’ package of legislation, alongside the REPowerEU package that followed Russia’s invasion of Ukraine, further represents a sea-change in the regulatory environment for many sectors. Agreed, or nearly agreed, proposals including the Renewable Energy Directive III, the Industrial Emissions Directive, the revisions to the Emissions Trading Scheme, the Ecodesign for Sustainable Products Regulation, the Construction Product Regulation, the Energy Performance of Buildings Directive, and initial electricity and gas market reforms, provide for a significant deepening and broadening of the EU’s regulatory framework as it relates to the environmental impact of the Union’s industry, energy systems and product regulations. The EU Taxonomy of Sustainable Activities further provides a policy signal for businesses, capital markets and national policy makers. While the full effects of this EU-level regulatory agenda will take a number of years to become embedded in the business environment, their direction of travel is clear, and they will drive changes in how products are designed, manufactured and used, how services are delivered, and how countries plan and invest in infrastructure such as energy and transport.

The daunting scale of European and national targets notwithstanding, Ireland is far from alone in prescribing this accelerated decarbonisation of industry, and the estimated global investment in decarbonisation is to be in the trillions of euro annually before the end of the decade.³ Investment at this scale, and the likely role of R&D, digital services and renewable energy investments in achieving decarbonisation globally, presents globalised and research-focussed economies like Ireland with opportunities to develop a role providing niche products, services and broader ‘solutions’ for that global market. For example, Ireland has one of the world most progressed electricity systems for integrating intermittent renewables alongside traditional baseload power stations – the system operators, and the businesses that serve it can innovate to very high-levels of renewable penetration (such as the Government’s 80% Climate Action Plan target) based primarily on wind and solar technologies. The expertise developed in this endeavour will have a global marketplace. Ireland is also pursuing the integration of traditional and cutting-edge food and nutrition value chains; while the country’s large agricultural sector (compared to other small, advanced economies) faces a biogenic methane reduction challenge. These challenges also provide opportunities for significant product and process development and innovation that can inform decarbonisation pathways globally. If Ireland can employ the agility that Dr Skilling proposes as the strength of small, globalised economies, the transition to a net zero economy offers substantial new opportunities; as he puts it “Countries and firms that can operate in a low emissions manner will strengthen positions of competitive advantage, and vice versa: this creates substantial challenges and opportunities across small, advanced economies.”

³ The net-zero transition: Its cost and benefits, McKinsey & Company: <https://www.mckinsey.com/capabilities/sustainability/our-insights/the-net-zero-transition-what-it-would-cost-what-it-could-bring>

Enterprise policy must find the balance between securing the resilience of our enterprise base through this transformative technological transition, while investing in the R&D, clustering initiatives and business decarbonisation grants that can unlock new opportunities.

3. PATHWAY TO DECARBONISE IRISH MANUFACTURING

A perennial frustration directed at policy makers is that decarbonisation targets are set, but without the tangible operational detail that would allow production managers, energy buyers and chief operating officers take pragmatic action. Though the Department of Enterprise, Trade and Employment will later this year publish decarbonisation ‘Roadmaps’ for both our manufacturing sector and the commercial buildings stock, it is incumbent in any discussion of decarbonising the complex manufacturing processes of Irish industries, to at least briefly dwell on what the pathway to net zero looks like in practice. While much of the detail is already set out in Climate Action Plans from 2021⁴ and 2023⁵, the scope of those Plans requires that some of the operational detail is necessarily condensed. The SEAI’s National Heat Study⁶ provides a detailed and robust analysis across a range of scenarios that provides a sound basis to set out at a high-level what that pathway looks like. Ultimately, each manufacturing process owner, and facility manager will need to assess and oversee the correct interventions that efficiently and effectively decarbonise their production.

Decarbonising Irish manufacturing will essentially require five concurrent phases of process redesign. The first two phases will be closely related, and on many sites happen simultaneously. They are:

- i) Efficiency gains from reducing heat needs. Steps such as removing over heating and over cooling, re-using waste heat, better heat storage, and using heat-pumps to balance concurrent heating and cooling requirements.
- ii) Electrification of all process requiring heat below roughly 130 degrees Celsius. This will require installation of significant numbers and energy volumes of heat-pump technology, alongside process redesign to get the maximum efficiency from heat-pumps installed.

Mass electrification will be the ‘heavy-lift’ technology to decarbonise the majority of industrial heat needs. While not straight-forward on any particular site, it is an established and cost-competitive technology used globally. While Ireland’s manufacturers have previously been slow to electrify their heating processes (encouraged, most likely, by the low historical price of natural gas), there is momentum behind projects, nationally and internationally, amongst large industrial manufacturers seeking to electrify their processes. That temperature limit will likely rise over time, as higher temperature heat-pumps become increasingly efficient. However, a further fuel source that may play a role in the mid-temperature heat needs is:

- iii) Biomass – primarily where there is an on-site or close by source of renewable biomass feedstock, consistent with the Renewable Energy Directive sustainability requirements.

Having addressed temperature needs up to 130-150 degrees Celsius through electrification and some biomass, the more challenging high-temperature heat needs will likely require a different solution. Though some technologists suggest that industrial heat pumps, or electric furnaces may in time be efficient at a much higher temperature, it is nonetheless likely that a decarbonised gas will be required in some processes. The fourth phase is therefore:

- iv) Biomethane and biogas use in high-temperature processes, potentially being replaced by green hydrogen during the 2030s.

Finally, a sector specific approach is required in Ireland’s cement sector, with a number of interventions required. Firstly, significant progress can be made in reducing the quantum of cement used in most construction projects, with lower carbon design principles, greater use of recycled construction materials, modern methods of construction such as off-site fabrication, and much greater use of alternatives to steel and cement in construction including through using timber. Nonetheless, cement will continue to be a key input in construction of infrastructure and housing. While policy can drive construction product diversification and design for a lower carbon lifecycle of projects, progress will also be required in decarbonising the cement product itself. There are a range of ways in which the carbon impact of cement production can be reduced, including through fuel switching in the heating of cement kilns, alternative fillers to reduce the clinker content of cement and even synthetic binders to reduce or remove clinker altogether. While innovation in this space is still developing, most analysis still proposes that the sector will likely still require:

⁴ Climate Action Plan 2021, Government of Ireland: <https://www.gov.ie/en/publication/6223e-climate-action-plan-2021/>

⁵ Climate Action Plan 2023, Government of Ireland: <https://www.gov.ie/en/publication/7bd8c-climate-action-plan-2023/>

⁶ National Heat Study, SEAI: <https://www.seai.ie/data-and-insights/national-heat-study/>

- v) Carbon Capture, Use and Storage, to remove residual industrial process emissions from clinker production in cement kilns. Likely required in order to fully reach net zero emissions from industrial manufacturing in Ireland.

These pathways all require an activated, motivated and well-financed industrial sector, with capacity and willingness to make large investments to decarbonise their production. The costs may include both capital investments and, in some sectors, a higher operating cost. Production processes generally have a 15-year lifespan or more, meaning early movers will need to be incentivised, both to make progress towards the national decarbonisation targets, but also to build the expertise, skills and supply chains required to deliver projects at scale over the coming decade and beyond.

4. FINANCING THE DECARBONISATION OF IRISH MANUFACTURING

It's difficult to estimate the total investment need to fully decarbonise the Irish manufacturing base, and much will depend on the investment appetite of Irish businesses to move quicker than, or follow, their competitors' investments in decarbonised manufacturing processes. What is clear is that investment will be required on-site in manufacturing processes, and also in the supporting national infrastructure – in the electricity grid and biomethane supply, as examples – to enable them to make these investments. Further, the market dynamics of the electricity price, and its current connection to the wholesale gas price, may need regulatory or policy intervention to ensure that energy users, and large energy users such as manufacturers in particular, face good incentives to decarbonise rather than maintain a fossil fuel-based production process. While exchequer funding will provide for some infrastructure investment, and project supports where grant aiding conditions allow, it is clear that both public and private funding is going to be necessary to drive the scale and speed of investment in decarbonising manufacturing processes, consistent with meeting the Government's sectoral emissions ceiling for industry.

In order for private financing to deliver a significant portion of industrial decarbonisation projects, clear investment signals and an understood future policy trajectory are required. Investors will allocate capital where they see good future alignment with policy, and therefore reliable returns both in financial payback but also in reduced carbon costs. This trend is already well-established, as Dr Skilling puts it “A combination of the changing economics and changing preferences are leading to substantial amounts of capital flowing into renewable energy and other green technologies, a dynamic accelerated in the post-Covid world.”⁷ Particularly for larger manufacturers, the source of a majority of Ireland's industrial emissions, the price of carbon in the EU Emissions Trading Scheme provides a tangible future cost of carbon, that well-designed investments can seek to avoid. Policy can provide clarity on the types of investments that are aligned with policy – and the EU Taxonomy of Sustainable Activities is an attempt to do precisely that. Greater consistency in reporting and monitoring of industrial emissions, and decarbonisation approaches can also help allocate private capital where it can be most impactful, and the Corporate Sustainable Reporting Directive provides a framework for that, alongside proposed regulation on ‘green claims’ by manufacturers and better consistency and oversight of purported green investment funds or ‘sustainable’ finance instruments. By making the future clearer for investors through robust policy commitments, detailing the steps to get there by providing market signals such as carbon pricing and regulation, and ensuring a reasonable payback on decarbonising investments through grant supports and product differentiation, private capital can be most effectively deployed. Climate change and adaptation, as well as technological breakthroughs, are likely to be non-linear and markets will respond in real-time. As Mark Carney put it in a key speech on aligning financial markets with climate action needs, “Changes in policy, technology and physical risks could prompt a reassessment of the value of a large range of assets as costs and opportunities become apparent.”⁸ The role of policy should be to make the transition to net zero as predictable as possible for all sectors, and therefore remove some of the volatility from the financial markets that will fund it.

The exchequer will also have to play a role in funding projects that drive forward the speed and ambition of industrial decarbonisation. Careful management of public monies requires a robust and consistent approach, ensuring that the taxpayer gets value for money and that deadweight is minimised. Businesses will likely require assistance to assess the right intervention to decarbonise their specific operations – up to including design and feasibility study type projects – and then appropriate levels of financial contribution to the project, necessary to facilitate a reasonable return on investment where interventions will otherwise have a long payback period. The State should also ensure a significant portion of project financing comes from the company itself, to garner senior management attention and buy-in. A number of policy tools will make project assessment and, ultimately, Government allocation of resources as robust and effective as possible. These include detailed pre-assessment of

⁷ Review of Industrial & Enterprise Policy in Small Advanced Economies and Implications for Irish Enterprise Policy, Dr David Skilling: <https://enterprise.gov.ie/en/publications/publication-files/review-of-industrial-and-enterprise-policy-in-small-advanced-economies-and-implications-for-irish-enterprise-policy.pdf>

⁸ Breaking the Tragedy of the Horizon Speech, Mark Carney, 29th September 2015: <https://www.bankofengland.co.uk/-/media/boe/files/speech/2015/breaking-the-tragedy-of-the-horizon-climate-change-and-financial-stability.pdf>

carbon abatement from manufacturing investment projects, both brownfield and greenfield, with post-project monitoring of projects performance. A evolving value-for-money assessment as to what grant aid may be required to incentivise investment and the relative scale of carbon abatement opportunities across companies and sectors, ultimately arriving at a range of euro-per-tonne-CO₂ equivalent benchmarks to guide industry about where state support will be provided, and to inform industry supporting agencies such as SEAI, Enterprise Ireland and IDA Ireland to assess the most economically effective projects to reach our carbon abatement targets. Further, a national shadow price of carbon, implemented through the Public Spending Code for example, can be used to assess the likely emissions impacts of public spending across a range of sectors including infrastructure delivery, social welfare, enterprise development and more. Government can then take decisions on the future climate impacts of its spending with greater insight, and compare carbon abatement costs across areas of the economy.

The Department of Enterprise, Trade and Employment has begun to implement a number of the above mechanisms, including a ‘Climate Appraisal Model’ for assessing the impacts of state supported decarbonisation projects by manufacturers. Work is also underway in designing a carbon budgeting mechanism to allow policy makers and enterprise development agencies assess the strategic trade-offs between decarbonising our existing enterprise base, while also looking to continue to attract new investments in Irish industry. Policy will seek to minimise our industrial carbon emissions while facilitating sustainable development in new and existing businesses, with a particular focus on regional employment creation and R&D.

The Government already supports industrial decarbonisation through financing both project development and capital investment in low carbon manufacturing processes through the ‘Green Transition Fund’ and the Environmental Aid Scheme, available through Enterprise Ireland and IDA Ireland. Further, through auctions for renewable energy supports and targeted challenge programmes for funded R&D, the Irish State has already demonstrated a willingness to use a range of funding and policy support mechanisms to incentivise industrial innovation to address the opportunities of global decarbonisation. Moreover, private financing arrangements for decarbonisation have shown to be significant in recent years, with Energy Performance Contracts and Corporate Power Purchasing Agreements for renewable energy now commonplace. Further innovations seem likely, with Carbon Contracts for Difference, and rigorously evidenced carbon sink investment opportunities (as opposed to inscrutable ‘offsetting’ financial products), emerging as strong potential investment vehicles to provide new avenues for private funding of industrial development.

5. CONCLUSIONS

Enterprise policy, as articulated in the White Paper published in 2022, now requires and contains a credible national plan to achieve net zero emissions. Access to a low carbon energy system, and infrastructure to deliver on that net zero objective will be a central theme of industrial development in the coming decade and a competitive differentiator that informs investment location decisions. While Ireland’s Climate Action Plan and Enterprise White Paper set out the objectives and policy trajectory, policy implementation occurs in a world of changing technologies, energy market dynamics and political priorities. The medium-term challenge for policy makers acting to ensure public and private finances are available to fund the decarbonisation of Irish industry will be to stay sufficiently agile to this changing context – while also providing policy certainty, regulatory market signals and sufficient exchequer support to activate the right types of long-term capital investment projects required to deliver it.