

CHAPTER 11

IRISH INDUSTRIAL POLICY AND ECONOMIC CLUSTERS – AN ANALYSIS OF THE GREEN WAY⁵⁰ (DUBLIN’S CLEANTECH CLUSTER)

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Introduction

This chapter⁵¹ situates the debate about industrial policy, and in particular the notion of local industrial policy and the fostering of industrial clusters, in the context of three distinct but overlapping dynamics:

- The debate about the appropriate role for the state in the development of Ireland’s economy;
- The crises recently – and to some extent still being - experienced by Ireland⁵²;
- The ongoing reform of Ireland’s local government system.

In doing so it examines the relative paucity of robust public discourse regarding appropriate policy interventions in the economy and the lessons that can be drawn from one of the state’s more recent innovations in local industrial policy. The purpose of this chapter, while addressing definitions of industrial policy and the various aspects of industrial policy, is to focus on how The Green Way relates to other components of Irish industrial policy and whether the spatial level at which it operates and the institutional environment that

⁵⁰ The Green Way has merged with the Green International Financial Services Centre (Green IFSC) to form Sustainable Nation Ireland, www.sustainableireland.ie.

⁵¹ Earlier iterations and specific components of the chapter were presented at the Political Studies Association of Ireland (PSAI) Annual Conference in Dublin October 2013, the Irish Congress of Trade Unions Annual Conference in Dublin in April 2014, the Association of European Schools of Planning (AESOP) Annual Conference in Utrecht in July 2014 and the TASC Commission on Industrial Policy (2013-2014). The authors are grateful for the feedback from colleagues.

⁵² The book uses the term ‘crises’ rather than ‘crisis’ because of the multi-stranded and separate nature of the economic, political and regulatory challenges facing Ireland (see Chapter 1 and Ó Riain, 2014:4-5).

facilitates its development provide lessons for other potential industrial policy initiatives at local level.

The chapter has a number of components. Section one outlines a working definition of industrial policy and details the reasons that this exercise is not as straightforward as one might think. Section two examines the complex nature of the debate around industrial policy and reviews a number of important elements of the discourse on industrial policy, including the link to tax policy, the role of MNCs, and the system of innovation in Ireland. Section three reviews the international evidence on local clusters and industrial policy and section four presents the experience of The Green Way, an initiative the authors view as an innovative industrial policy intervention at local level. The chapter concludes with a number of broad recommendations for local governments, including executive staff and elected councillors, and relevant regional and national agencies.

What is 'Industrial Policy'?

Up to the mid-1980s industrial policy (IP) was generally understood to refer to the direct intervention of the state, both in relation to production in general but also in relation to support for particular industries. Johnson's (1984:8) definition makes this clear: "Industrial policy means the initiation and coordination of governmental activities to leverage upward the productivity and competitiveness of the whole economy and of particular industries in it". Such industrial policy included elements of what had become a pejorative term for infant industry support, namely 'protectionism'. Import duties and quantitative import restrictions on certain goods were the most important of these elements. Others, like Harrop (1989), saw industrial policy as most appropriately excluding this kind of specific intervention and defined it as a creation of conditions – an economic environment – allowing business to flourish. This latter definition was inherent in the "Washington Consensus" that has been the dominant system of thinking about economics since the end of the 1970s. As we shall see, these two perspectives on what should constitute IP remain; directly interventionist on one hand and influencing only the environment of business on the other.

There had always been – and for developing countries there still is (Chang, 2003; Turok, 2007; Fine, 2013) – some backing for the idea that the state in late-industrialising countries might have to support certain

industries in order to catch up to more developed economies. In the 1980s a substantial revision occurred to what had been the accepted wisdom in international economic theory and this provided further support for industry or sector-specific support. Krugman, 2008 Nobel prize-winner in Economics, proved that economies of scale and product differentiation were key factors – sometimes more important than the traditional comparative advantage, based on costs of production – in determining international competitiveness (e.g. Krugman, 1987). This led to what came to be called ‘strategic trade policy’ which was really the use of trade policy to encourage the development of particular sectors or sub-sectors, and not that different from what had previously been called ‘industrial policy’, at least in the way that for example Johnson (1984) understood that term. To illustrate, included in strategic trade policy would be the policy of the EU to support Airbus, and America’s policy, in turn, to support Boeing. It could not be called industrial policy because, as Stiglitz (another Nobel prize-winner in Economics) and his co-authors have written, the market fundamentalism of the Washington Consensus made industrial policy “bad words not to be spoken either in public or in private by respectable people” (Cimoli *et al.*, 2009:1).

More recently Mazzucato (2013) has gone even further, unhesitant in her use of such bad words as “entrepreneurial state”. She shows that the state is a key producer of innovation, not just through policy to influence company behaviour, but also directly through state-owned organisations like the National Institutes of Health in the US and the Medical Research Council in the UK. She also shows how the success of many of the giant companies – including Google and Apple – in the current phase of the information and communication technology (ICT) revolution, is built on state funding. Both policy and practice by the state have been essential in removing the risk and uncertainty that in many cases constitute insurmountable hurdles to private investment.

There is much other evidence and argument that alternatives to the neo-classical underpinnings of the Washington Consensus can provide a better basis for an understanding of IP. Pitelis (2006:435) shows this, providing a very broad definition – “a set of measures taken by a government and aiming at influencing a country’s industrial performance towards a desired objective”. He also argues that the direction of change in EU industrial policy is appropriately more consistent with evolutionary, rather than neo-classical, economics. He

acknowledges the problem of differentiating between industrial, technology, regional and other policies and suggests that identification rest on what governments themselves define as their industrial policies. In an elaboration of his earlier discussion, Pitelis (2015:18) defines “developmental industrial policy” (DIP) as going beyond IP, “in that it involves purposive strategic intent, planning, and actions by the public sector to shape, extend, create, and co-create markets and ecosystems, as opposed to merely setting the ‘rules of the game’ (institutional framework), or focusing on solving ‘market failures’”. Cimoli *et al.* (2009:2) more narrowly define IP as including infant industry support, “trade policies, science and technology policies, public procurement, policies affecting foreign direct investments, intellectual property rights, and the allocation of financial resources”. As Coates (2015:57) argues, “More focused industrial policy is back in vogue”.

It is interesting to note that despite this broad re-acceptance in recent years of more interventionist IP, there remain differences among those in favour of such IP. This is clear, for example, from Mazzucato’s (2013) emphasis on state support for high tech R&D in contrast to the economic geographers’ emphasis on economies of agglomeration. In addition, there is a continuation of influential argument against interventionist IP. Thus Chang (2016:1), while calling for more detailed analysis of the results of SME (small and medium enterprise) policy in Korea, seems to accept that the essential objective of policy is to “correct market failures”. We have already shown that Pitelis wants DIP to go beyond solving market failures. DIPs, he argues (2015:18), “can even often create ‘market failures’, so as to foster a wider developmental perspective”.

In the Irish context, the first step in an analysis of IP must be an examination and categorisation of policies in terms of their impact on industry, broadly defined. This is so because, firstly, there is some doubt about whether there is such a thing as industrial policy in Ireland. There is a DIP, and has been since the end of the 1950s, with little change to its central plank. This, the heart of the Irish strategy for development is, and has been for half a century, to encourage inward foreign direct investment. The state agency in the pursuit of this policy is the Industrial Development Authority (IDA). There is also an agency with responsibility for implementation of policies supporting locally owned firms, Enterprise Ireland (EI), and a number of government projects and policies for example the various National Development

Plans, the annual Action Plans for Jobs, and Action Plan for Jobs “Disruptive Reforms”. But there is little evidence that all these, and all other elements mentioned above, fit together with strategic consistency. That they all affect how industry (broadly defined to include business services) develops, there can be no doubt; so in this new, expansive view of what constitutes IP, Ireland definitely has one.

The very fact that such a range of policies exists in Ireland suggests a need for assessing and evaluating them as a totality. The approach of Stiglitz and his colleagues (in Cimoli *et al.*, 2009), like that of Pitelis (2006), builds on the evolutionary approach, asserting that the “accumulation of knowledge and capabilities, at the levels of both individuals and organizations” are essential to the emergence into sustainable development (Cimoli *et al.*, 2009:2).

For the purposes of this chapter, the first task is to show that there is an industrial policy in Ireland and to identify a variety of aspects of that policy. This will involve pinpointing the role and relevance of both policies and organizations. It should be emphasised, however, that given the scale of the task, the chapter that follows does no more than review certain aspects of industrial policy in Ireland, its primary focus is on the potential offered by coherent strategic policy interventions at local level⁵³. Given the evidence presented here of lack of strategic coherence, there is a need for a major study of policy for economic development in Ireland, across all sectors. This is all the more essential now in the aftermath of the crises, the consequences of which were exacerbated by the structural excesses of the construction and banking sectors.

Industrial Policy is Complex

A critical issue in any debate about industrial policy is grasping the complexity of the area and the difficulties involved in providing simple or easy to implement recommendations. Any robust intervention must take account of:

⁵³ It is also worth noting the very idea of industrial policy has been politically problematic in much of the developed world. It has been called the “most controversial policy of our time” (Chang, 2003:7). Despite having a very significant number of policy tools available to policy makers there has been a clear and marked reluctance to acknowledge that the state implements an industrial policy. That we implement a poorly co-ordinated, and at times conflicting industrial policy, is a matter of academic debate, but the substantive matter that the state is implementing an industrial policy is the subject of considerable political reticence.

- The important role institutions play;
- State investment in industrial support;
- The role of tax policy;
- The position of MNCs in relation to the existing industrial policy of the state;
- The structure and functioning of the existing innovation system.

The analysis of these linked issues raises serious questions about how the state's existing industrial policy operates and suggests key areas where improvement may be achievable⁵⁴.

Institutions

A first approach is provided by Sean Ó Riain (2013), whose work on states and markets in industrial development, in general (2000; 2004a) and in Ireland (2004b; 2013), have provided a framework for a constructive critique of industrial policy. He shows that a whole variety of other policies impact on industry and that industrial policy itself is thus multi-faceted. Policies, agencies and institutions in such areas as education, skill development, innovation and research could and perhaps should be seen in terms of how they relate to industrial development.

Providing a particular interpretation of recent economic development in Ireland, Ó Riain provides evidence of the sustained impact of government on development, not just in Ireland but in such unlikely stalwarts of market-based societies as the United States. He points out, for example, that federal government laboratories are important providers of technological innovations. Other federal funding contributes to R&D and to inter-firm networks.

On the basis of this focus, he argues that in two areas in particular there is potential for the state in Ireland to contribute to an improvement in the prospects of the Irish economy, in research and innovation and among non-exporting firms. In relation to the first, state expenditure on research and innovation increased sharply during the late 1990s. The question is whether this expenditure was effective, whether it contributed to an increase in the innovativeness of Irish

⁵⁴ There now follow summaries of some of the key chapters in TASC's Commission on Industrial Policy, published as *The Nuts and Bolts of Innovation: New Perspectives on Irish Industrial Policy* (Jacobson 2013).

economy and society. Ó Riain (2013) suggests that the way this question is approached in Ireland is inappropriate. Rather than focusing only on whether and how research contributes to new products and processes, on the direct commercialisation of the results of research, we should be concerned with the broader question of the system of innovation, including the institutional mechanisms through which people, public organisations and firms interact in the formation and application of innovative capabilities to the development of firms. A remaining issue, raised by Ó Riain (2013) and awaiting comprehensive research, is the processes through which innovation is generated, applied and diffused in the system of innovation in Ireland.

A second area in relation to which Ó Riain (2013) has suggestions, is that of non-exporting, mainly indigenous firms. These include low and medium-tech firms, in manufacturing and services, that supply local consumers and both local and exporting businesses. The emphasis of the industrial support agencies on exporting firms, he shows, leaves relatively unaided the import-competing firms. They can be, and in many cases are already, important elements in inter-firm networks that may include exporting firms; a more integrated perspective on the development of a competitive Irish economy is therefore essential. Some evidence of the relevance of these topics for Ireland can be found in Heanue and Jacobson (2002; 2008). They are raised and analysed in some detail for other countries in Europe and beyond in two recent books, Hirsch-Kreinsen and Jacobson (2008) and Robertson and Jacobson (2011). Key issues arising for Irish industrial policy are how to identify potentially successful non-exporting indigenous firms, how to support them and, if and when they do become successful, what policy should be towards acquisition of them by foreign companies.

One element of state support for indigenous firms in Ireland is funding. Ó Riain (2013) argues that there are weaknesses in the patterns of organisational capability in the banking system. These make it unlikely that, even after the worst of the financial crisis is behind us, the banks will be able to perform the function of financing development of indigenous firms that is required. There is a case, therefore, for a state investment bank to co-ordinate the integration of various agencies' support schemes with the raising of finance from the private sector.

State Expenditure on Industry Support

While Ó Riain addresses the complexity of industrial policy through the institutional context, Paul Sweeney (2013) shows that if industrial policy is understood in terms of all government activity that impacts on firms, then another approach is to follow the money. Sweeney's previous work has focused on state-owned companies (Sweeney, 1990; 2004) and, more broadly, on the explanations for and limits of Ireland's Celtic Tiger successes (Sweeney, 1998; 2008). His recent work (2013) examines in some detail expenditure out of the public purse that has an impact, directly and indirectly, on enterprise sector activities. What this shows, among other things, is that taxpayers contribute euros in the order of hundreds of millions to the enterprise sector in Ireland. This funding by the taxpayer of businesses of various kinds and in all sectors is both direct, in the form of grants and subsidies, and indirect, through the budgets of agencies like Enterprise Ireland and the Industrial Development Authority. Sweeney (2013) also addresses the issue of tax expenditure, where taxes are foregone in an attempt to provide incentives to investors to create jobs.

A clear example of such tax expenditure aimed at creating jobs is provided in the reduction of income taxes for high paid executives of multinational companies (MNCs) in the first 2012 budget. Thirty per cent of their salaries of up to €500,000, were made exempt from income tax. There was a proposal prior to the next (December 2012) budget to increase the Universal Social Charge (USC) for high earners. This was rejected, according to the head of the IDA, because "not increasing the USC on top earners was necessary for Ireland to remain competitive in attracting foreign direct investment (FDI)"⁵⁵. Over and above not increasing the USC, the Minister for Jobs, Enterprise and Innovation, Richard Bruton, proposed a further reduction in the income tax of highly paid executives of foreign companies, claiming that this would result in more subsidiaries of MNCs setting up in Ireland, and more jobs being created as a result⁵⁶. The Minister for Finance, Michael Noonan, decided not to incorporate the proposal into his budget. From an equity perspective, this decision is obviously positive; even leaving aside the question of how many – or few! – jobs might have been created by this tax expenditure, it would have been an extremely

⁵⁵ Ronan McGreevy, "Bruton says Budget won't be changed", *The Irish Times*, 7th December, 2012.

⁵⁶ Carl O'Brien, "Bruton sought multinational tax breaks", *The Irish Times*, 7th May, 2013.

problematic signal for all those facing reduced wages and increased taxation in the context of the Troika bailout budgets. From the perspective of industrial policy, the key issue here is the absence of analytical argument, based on empirical evidence, that this tax expenditure would indeed have had a net impact on job creation.

Sweeney's (2013) work provides many other examples of both direct and indirect subsidies to private enterprise. He makes clear that, as with the example of reduction of income tax for the benefit of MNC executives, the impact of many of these is not known, not calculated and not sought. The decisions on the tax expenditures and other elements of policy that together make up broad industrial policy are based to a greater extent on politics than economics.

Corporate Taxes and Industrial Policy

It is already clear from the above that there is a relationship between tax policy and industrial policy. The sustained effort of the Minister for Jobs, Enterprise and Innovation, Richard Bruton, to reduce income tax levels for high paid executives of MNCs⁵⁷, reflects the focus on encouraging foreign direct investment (FDI) as the main plank of industrial policy. Many other policies, including income tax rates, are seen as secondary to, and having to be tailored for, the policy of incentivising FDI.

Jim Stewart has long been among the main analysts of fiscal policy and FDI and has contributed much to an understanding for example of profit switching transfer pricing (Stewart, 1989). More recently he has focused, among others, on policy for enterprise development (2005). Recent work focuses directly on the question of the importance of the corporate tax rate to industrial policy in Ireland. There are a number of targets in his critical examination of corporate tax rates. First, there is the question of the rate itself and whether it is too low. This is not to accept that the nominal rate is the actual, or effective rate, and certainly for many companies the effective rate is much lower than the nominal rate. Moreover, the effective rate paid by many companies in other countries, even countries with high nominal rates, is also very low. Indeed, it can even be argued that we should have a higher rate so that we can encourage particular activities (like R&D) by offering "clawbacks" where there is expenditure on those activities.

⁵⁷ Pamela Newenham, "Bruton criticises high income tax rate", *The Irish Times*, 8th April, 2013.

The recent controversy surrounding the statement by American Senators Levin and McCain that Ireland is a tax haven – rejected by Irish Ambassador Michael Collins – addresses many of the issues raised in Stewart’s (2013) recent work. What seems to be missed in the debate, but made clear by Stewart, is that it is not a question of corporate tax rates. Rather it is the regulatory fiction of companies operating in one jurisdiction, but being liable for taxes in another jurisdiction. How this is done is generally through MNCs having a multitude of identities, those in the lowest tax regimes declaring the greatest profits.

What Stewart’s work on corporate taxation in Ireland shows is that, as a result of the use of corporate tax regulation to encourage FDI, there is a huge amount of time, skill and effort expended in tax “consultancy”. Much of this actually influences the tax system itself, because the key sources for information on how to change tax rules and regulations are the same organisations that advise MNCs – and others – on how to minimise tax payments. If this time, skill and effort were instead expended on development of indigenous firms, their products and services, the consequences would be far more positive for the growth of the Irish economy. Corporate tax policy is a key element in Irish industrial policy, but it emerges from Stewart’s work that the particular set of policies and regulations around corporate taxation in Ireland is a relatively ineffective, and certainly inappropriate, means of achieving industrial development.

The System of Innovation

The literature on Ireland’s system of innovation provides a number of indications of possible strengths and weaknesses, both in what policy focuses on, and in the capabilities of the system. There is little doubt that in Ireland – as in many other countries (Hirsch-Kreinsen and Jacobson, 2008; Robertson and Jacobson, 2011) – there has been an over-emphasis in policy on high-tech innovation. This is not to say that high-tech innovation is not important, but that innovation incorporates a great deal more than, for example, patents emanating from advanced scientific research. A firm, district, region or economy that is productive in terms of patents, is not necessarily successful, whether success is measured by profits, growth, exports or even survival. Even firms that undertake R&D frequently produce non-research-based innovations to a greater extent than patents (Arundel and Robertson,

2012). The dynamic capability of firms, districts regions and economies is a far more important characteristic than the ability to produce patents, though of course the two are not mutually exclusive. Dynamic capability is more important because it is the ability to create new, and access existing knowledge, and to apply it in new ways or in new combinations. It includes the ability to identify whether existing or new knowledge is necessary. It is thus more comprehensive, a higher order capability, than the ability to undertake R&D. Arguably, by finding ways through policy of enhancing dynamic capability, we would do more than improve R&D; we would generate the ability to distinguish between the need for R&D and the need for other, non-research-intensive ways of innovating. By so doing, we would enhance efficiency in the production of all innovation.

In relation to existing efficiency in the system of innovation in Ireland, recent research (Jacobson, 2013) provides very tentative evidence that Ireland is in some sense better at producing non-R&D-based innovation than R&D-based innovation. There is a great deal more work to be done in this area, for example using the complete data set from the EU's Community Innovation Survey. However, if these tentative findings are borne out by subsequent research, the policy implications are that more innovation would be generated by euros supporting other innovation-producing activities than by euros supporting R&D.

The inadequacy in both data on and analysis of different policies and projects supporting innovation is also pointed out by Jacobson (2013). Improvement in this area would also facilitate better decision making in relation to expenditure of the scarce funding for innovation in Ireland. In addition to questions on the types of innovation being supported, some attention also must be focused on the types of firms receiving support for innovation. Jacobson (2013) raises questions associated with industrial and business service sectors and sub-sectors, but size of firm and whether it is Irish or foreign owned, and whether it is part of a local or international cluster, are also relevant for future research.

MNCs and Irish Firms: Export Performance

As is already clear, MNCs are a fundamental element in Irish industrial policy. The question of the extent to which industrial policy should rely on foreign investment goes back at least to the discussions on the policy

regime to replace protectionism in the 1950s. The Department of Industry and Commerce, for example, while supporting the tax incentives to encourage foreign investment, also insisted on maintaining elements of the Control of Manufactures Acts on the grounds that complete repeal of these acts "...would permit of the unfettered investment of outside capital in unsuitable as well as suitable cases" (quoted in Barry and Daly, 2011:166)⁵⁸.

Apart from political economy issues of governance and the location of power and control, economic behaviour and performance differences between MNCs and Irish-owned firms are important in industrial policy. For the years up to the end of the 1970s these have all been the subject of comprehensive review by Eoin O'Malley for the National Economic and Social Council (O'Malley, 1980). More recently he contributed to a paper on the characteristics and performance of indigenous and foreign firms in Ireland (Barry, Bradley and O'Malley, 1999). He has also focused on competitiveness (O'Malley, 2004:2013).

O'Malley (2004) shows that contrary to the view that Ireland's Celtic Tiger performance of the 1990s was the result primarily of the growth of the foreign-owned sectors, many indigenous sectors also experienced faster growth in output, employment and exports than their competitors in the EU. Rather than in terms of relative costs, O'Malley (2013) defines competitiveness in terms of ability to compete in open markets. The evidence, when it is measured in this way, is that Ireland actually gained in competitiveness over the period 2000 to 2008, with greater gains more recently. There are some significant differences, within this overall positive picture, between manufacturing and services, and between foreign-owned and indigenous sectors. In manufacturing, in relation to foreign and indigenous firms in particular, the data indicate that Irish firms' improvement in competitiveness began from 2005 while that of MNCs began later, in 2008. This diversity underlines the argument against a focus on national price and wage data as a means of determining whether or not the Irish economy is competitive. Overall, his research calls for a much more careful examination of the factors generating competitiveness than the usual focus on wage costs alone.

It follows from even such a surface review of issues in industrial policy addressed in this chapter that Ireland has an industrial policy.

⁵⁸ The question of local vs foreign ownership had already been raised in relation to the first MNC in Ireland, the Ford motor company (Jacobson,1977).

Among the aspects of this industrial policy addressed here are policies on MNCs, on corporate taxation, on public expenditure, on R&D and innovation, and on environmental protection. What is clear is that there is a disconnect, in the sense that these different aspects of industrial policy are frequently not seen as relating to one another. There is at least a potential for tension between policies supporting foreign direct investment and rigorous environmental protection. Given the differences between MNC and Irish firms' export performance, policies to support industrial (and service sector) development must be amenable to subtle distinction. Given the vast amounts being spent in public expenditure on enterprise support of various kinds, a clear analysis of the net effect of these different kinds of support is essential. The next sections of the chapter review previous international efforts to foster industrial clusters and the recent experience of The Green Way in Dublin.

International Efforts to Foster Industrial Clusters

Rosenfeld (2002) provides a helpful framework for evaluating efforts to foster industrial clusters. In his work for the Directorate General for Regional Policy and Cohesion of the European Commission he identified a number of key ingredients of successful local industrial policy aimed at fostering cluster development. These include:

- Establishing and/or recognising cluster organisations;
- Facilitating external linkages;
- Encouraging cluster communications channels;
- Developing human capital;
- Including social equity as an aim;
- Successfully directing investment towards cluster R&D.

Rosenfeld's analysis suggests that these characteristics tend to be present in successful initiatives because they address the critical barriers facing underperforming local and regional economies:

Various historic under-investments limit clusters in less favoured regions from gaining new, or holding onto existing, competitive advantages. Most can be traced to a weak infrastructure; lack of access to technology, innovation, and capital; regional insularity and

isolation; low educational levels and low skilled work force; absence of talent; and an overly mature or hierarchical industry structure. Social exclusion exists in places with large and isolated underprivileged and undereducated populations; technological exclusion exists in places with poor access to sources of technology and benchmark companies; and economic exclusion is a result of weak links to benchmark regions and markets (2002:9).

Recent research by the OECD builds on Rosenfeld's work and details a number of the critical issues facing policy makers and how they can be addressed (Potter *et al.*, 2012). They note the important role played by policy in the emergence of cleantech clusters in Sweden, Denmark, and California, USA. In each of these cases, the emergence of the cleantech cluster was driven by the meeting of "strange attractors" at path interdependent crossroads, which subsequently mutated into cluster-platforms of related variety industry. This occurred despite differences in their national and regional political and economic contexts.

In every case illustrated, cleantech clusters emerged from something else and combined capabilities from diverse industries – from agro-engineering to wind turbines, from pulp and paper to organic cotton, and algae biofuels to ICT and biotechnology.

How can policy foster such developments? Potter *et al.* (2012:34-35) contend that there are two major points. The first point is that policy has a role to play in facilitating the collaboration among cluster firms that can lead to innovation. It can achieve this by offering three benefits to firms and other agents that actively comply with the new designation of cluster member. All of them are to be seen openly in the Swedish "co-ordinated market" model.

New Cluster Members

The first is to have the opportunity of meeting new members in their own market segment, or more importantly, different but related market segments to exploit the known innovation and development potential from recombinant knowledge across industry interfaces. This also includes "the prospect of forming relationships with larger customer firms seeking to strengthen innovation networks and supply chains" (Potter *et al.*, 2012:34).

Transversality

Second, the “transversality” initiatives underpinning the development of the embryonic Sustainable Business Hub and Training Regions clusters in Sweden were induced by the offer of incentives to companies for participation in innovation projects. Transversality occurs where clusters are seen as modules to be integrated with different clusters to generate innovations and meet higher goals. The incentives take the form of medium-term innovation projects involving teams displaying “difference but compatibility” (Ibid.).

An output of this induced transversality is “green packaging”, which brings together food companies (in fact organic food firms) that cannot be affordably serviced by large firms such as Tetrapak but who seek a packaged branding that shows they are organic and act sustainably. A more technical example relates to milk packaging, which requires perfect sealing from its “bioplastic” (starch-based) packaging. This has been developed through exploitation of nanotechnology expertise from the new materials cluster. The transversal initiatives supporting the development of cleantech clusters in Sweden have also been facilitated by subsidised cluster management teams, which promote collaboration and broker joint innovation projects across cluster firms.

Access to Other Clusters

The final incentive that cluster members receive for participating in clean-tech cluster programmes is access to other clusters in different as well as similar industries. This affords a spreading of good practice knowledge of technological and developmental business paradigms elsewhere, including abroad, and experience of what, in support terms, may work in one place or industry while being unknown elsewhere. Such advantages would not come easily through market engagement alone.

The second lesson for policy makers is that in the best cases cleantech cluster emergence is a product of a political process in which learning occurs on the upper and lower levels of the multi-level governance system, involving both national and local policy makers. The OECD refer to Västra Götaland in Sweden as an excellent example of “the implementation of a regional green strategy” (2012:5) from the beginning of the 2000s involving the integration of the European

Union's "Gothenburg Model of the Lisbon Strategy" into its regional development strategy. The learning can also occur in the opposite direction, from regional to national level. California was long used to its state anti-pollution policies being templates for later federal regulations as embodied in various Clean Air Acts. In Denmark "active concertation between regional industry groupings and national ministries has produced generations of useful regulation and incentive that helped reinforce the regional cleantech clusters" (Potter *et al.*, 2012: 36).

*The Green Way*⁵⁹ – Dublin's Cleantech Cluster

Irish policymakers' interest in the concept of industrial clusters dates back to the Culliton Report, which recommended the promotion of industrial clusters focused on niches of national competitive advantage. This view of agglomeration economies based on industrial clusters derives largely from the work of Michael Porter (1990). The Culliton report elicited widespread agreement that Ireland should seek to develop clusters of deep competitive advantage. Culliton's central policy recommendation was that a network programme was a valuable first step towards this development. The term network refers to a group of firms, with restricted membership, who agree to co-operate in certain activities for a mutual gain.

A follow-up report by NESC argued that Irish development policy should move from state responsibility and state provision to a partnership approach. Irish policy in a number of areas - macro-management, local development and long-term unemployment - has been moving in this direction in recent years. The proposed network programme would reinforce this trend. Irish industrial policy initiatives which incorporated a cluster development component include:

- Strategic Research Clusters;
- Centres for Science, Engineering and Technology;
- Competence Centres;
- Technology Transfer Offices;
- Industry-Led Networks Pilot Programme;

⁵⁹ The Green Way has merged with the Green International Financial Services Centre (Green IFSC) to form Sustainable Nation Ireland, www.sustainablenation.ie.

- Innovation Partnerships;
- Applied Research Enhancement (Institute of Technologies);
- Skillnets;
- Fusion (ITI).

In this rich and diverse range of initiatives a number of stakeholders in North Dublin have developed and implemented what might best be termed as a number of place-linked industrial policy initiatives (Peck, Connolly, Durnin and Jackson, 2013). The stakeholders include Dublin City Council, Dublin City University, Fingal County Council, Dublin Airport Authority and a number of smaller organisations including the North Dublin Chamber of Commerce and the local development agencies operating in the region. These initiatives included:

- Task Force on Knowledge-based Development (2002);
- Developing Sustainable Industrial Clusters in North Dublin (Jacobson and McGrath, 2004; Willams and Shiels, 2004; McGrath, 2008);
- Accelerated Skills Development Programme (Logan and Ó Broin, 2004);
- North Dublin Venture Capital Fund (2006).

The Green Way follows in a similar manner and brings together many of the same partners. It was established in early 2010 as *An tSlí Ghlas* - The Green Way, aiming to be a green economic corridor stretching from Dublin's city centre along a north-city spine via Ballymun to Dublin Airport, and potentially much further afield. It was initially established as an entrant into the internet-based 'Your Country, Your Call' competition, an initiative led by Martin McAleese (RTÉ, 2010).

From its establishment The Green Way, conscious of the complex political climate it operated in, portrayed itself as Dublin's cleantech cluster, focused on "attracting inward investment, supporting indigenous firms and creating a world-class centre of excellence" (Ernst and Young, 2012:42). In this regard it proved very successful and consolidated its position as "a good example of a project building on Ireland's R&D expertise in the cleantech space to attract foreign investment" (Ernst and Young, 2012:29).

In what follows, the work of Rosenfeld (2002), the OECD (2012 and 2013) and Hilliard and Jacobson (2013) is used to map and review The Green Way's development.

Institutional Capacity

Rosenfeld (2002:10) observes that clusters depend on social institutions for "a variety of things they cannot do internally or get from other companies". Successful clusters use such institutions for "information about and help with advances in technologies, economic scans, brokering, and education and training at all levels in their industries". The Green Way stakeholders quickly established a legal entity and staff complement to drive the initiative. This entity was, in turn, quickly recognised by key government departments and relevant public agencies. The critical issue becomes what assets and resources the cluster organisation is able to leverage from its relationships. Clusters are defined by relationships. Ultimately, they are self-selecting based on how individual employers and institutions in a region "define their missions, set their priorities, use their region's resources, and form relationships" (Rosenfeld, 2002:6). In the case of The Green Way the relationships were initially and predominantly with public institutions. The leadership of each of the key public institutions displayed considerable commitment to the initiative and senior staff from all of the public institutions engaged in a variety of considered and resource intensive ways. In addition the SME representatives through the North Dublin Chamber made very significant contributions to the work of The Green Way and a number of Chamber representatives were given considerable leeway for their employers to work with The Green Way in its establishment phase. Unfortunately this was neither sufficient nor sustainable in the medium term. This will be discussed in more detail below.

Facilitating External Linkages

The Green Way was accepted as a member of the Global Cleantech Cluster Alliance⁶⁰ (GCCA) in November 2010 and hosted the GCCA

⁶⁰ The Global Cleantech Cluster Association is a non-profit association that creates conduits for companies to harness the tremendous benefits of international cleantech cluster collaboration in an efficient, affordable, and structured way. Global cleantech provides a gateway for established and emerging Cleantech companies to gain exposure

Awards in Dublin in 2011. In addition, the Green Way actively engaged with EcoCluP⁶¹, the European equivalent. Furthermore, The Green Way, building on its links with DCU and DIT, developed a series of strategic links with the key enterprise support and economic development agencies, the IDA and Enterprise Ireland.

Encouraging Cluster Communications Channels

Communications proved to be quite problematic. Davies (2013:1290) observes that “the cleantech sector in Ireland is characterised by a small number of large players (e.g. Intel and Siemens) and a large number of SMEs, a few of which are considered highly innovative with strong international growth potential”. As a result the ability of The Green Way to meaningfully contribute to intra-sector communications was constrained. For many SMEs their primary communications link was with Enterprise Ireland and possibly a research link with a university or institute of technology. Such SMEs rarely engaged with local business networks, e.g. Chambers of Commerce, and MNCs such as Intel or Siemens were much more likely to communicate directly to the IDA and central government while having a research relationship with a university or institute of technology.

Facilitating Collaboration among Cluster Firms that can lead to Innovation

As noted above clusters can offer three benefits to firms:

- The opportunity to meet new members in their own market segment, or more importantly, different but related market segments;
- Incentives for companies to participation in innovation projects;
- Access to other clusters in different as well as similar industries.

to potential investors, new markets, influential networks, innovative technologies and best practices.

⁶¹ EcoCluP is the first pan-European partnership of cluster organisations focusing on the eco-innovative industries. The partnership represents most of Europe’s key clusters with a strong environmental portfolio with cluster organisations participating from Austria, Denmark, Finland, France, Germany, Hungary, Ireland, the Netherlands, Spain, Sweden and the UK. The overarching goal of the EcoCluP project is ‘to adapt, test, validate, and implement services and tools supporting the growth and internationalisation of eco-innovative companies organised in environmental clusters across Europe.

A key constraint hampering the success of The Green Way relates to the nature and stage of development of the cleantech sector in Ireland. Both Davies (2013) and Ernst and Young (2012) note that despite the success of other technological sectors in Ireland, the cleantech sector did not receive similar levels of “attention, focus and support” (2013:1290). In addition the “weakly developed green procurement policy” of large public agencies was identified by SME representatives, in particular, as a critical barrier to expansion of the sector. From the North Dublin Chamber of Commerce’s perspective it was very difficult to advocate the economic logic of cleantech and work to persuade member SMEs to examine the potential offered by the sector when the largest purchasers of products and services, i.e. government and public agencies, had a very poorly thought through approach to such matters. In addition the decision to centralize many public procurement activities through the Office of Government Procurement made it increasingly difficult for SMEs to engage with public procurement contracts (Flynn, Davis, McKeivitt and McEvoy, 2012; Flynn and Davis, 2015).

The Green Way was constrained in its ability to incentivise company participation in innovation projects. This relates to its limited funding and to, a significant extent, the perception by companies that they should be grant-aided to do it. Newman (2014:242-243) notes the considerable history of grant support to the manufacturing sector in Ireland and it is important to note that many SMEs and MNCs continue to attract significant support from public agencies for a variety of activities. As a result there is an expectation that there will be some inducement or incentive to engage in the type of activity The Green Way was attempting to encourage.

However, there were considerable successes. For example, The Green Way successfully drew down funding for SMEs through its involvement in Climate-KIC, the EU’s main climate innovation initiative⁶², and funding through Enterprise Ireland to develop a Living

⁶² Climate KIC (Knowledge Innovation Community) is part of the European Institute of Innovation and Technology (EIT), with a mandate to enhance Europe’s ability to innovate in the low-carbon sectors. Climate-KIC is one of Europe’s largest public-private innovation partnerships focused on climate change. It integrates education, entrepreneurship and innovation resulting in connected, creative transformation of knowledge and ideas into economically viable products or services that help to mitigate climate change. This activity has represented Ireland’s first formal relationship with EIT-KICs. Through participation in Climate KIC, both The Green Way and Energy Cork secured, for 2015, almost €290,000 in direct support for Irish organisations innovating in

Lab programme, essentially test-beds for clean technologies, services and processes across a number of targeted themes.

Linked to this was the expectation that research and development resources of the founding higher education institutions would be freely available, or at a nominal cost, to be utilised. This was a source of considerable confusion for many SMEs. There was little appreciation of the considerable costs borne by higher education institutions and the limited capacity to engage in projects without appropriate external funding.

In relation to member companies' access to clusters in different as well as similar industries, a critical constraint was the lack of organisations similar to The Green Way. As a result the type of cluster-to-cluster interaction one might expect wasn't possible. Consequently the "offer" to potential members of the cluster was restricted in comparison to some of its counterparts in the EU.

Industry Leadership

The authors previously noted that institutional capacity in a region is a critical success factor for cluster establishment and consolidation. In the case of The Green Way the public institutions and the SME representative organisation, the North Dublin Chamber, worked very closely together to establish and drive the work of the cluster. However, a substantial body of evidence suggests that "behind every successful cluster is a group of innovative firms led by people, who value learning, are committed to their community and, therefore, are willing to work toward a collective vision for their industry" (Rosenfeld, 2002:9). These leading companies may have a niche or rapidly growing market that is not threatened by competition, or may face such intense global competition that the benefits of mutual support and learning outweigh concerns about confidentiality (Rosenfeld, 2007). The "key to building and sustaining a cluster organisation often rests with the support of these benchmark companies" (Rosenfeld, 2002:9). Unfortunately the establishment of The Green Way coincided with economic and financial crises in Ireland and many of the leading companies one would expect to take early stage leadership positions in the work of The Green Way did not become involved. This contrasts

the low-carbon sector. Funding up to 100% will be available to participants to facilitate a series of education, training, incubation and entrepreneurship programmes for practitioners involved in the low carbon sector.

with the Copenhagen Cleantech Cluster where significant commercial stakeholders, e.g. Dong and Vestas, were involved from the outset, or Stryia in Austria where a new cluster organisation was developed from existing industrial networks and led by key industry leaders (MacNeill and Steiner, 2010; Temouri, 2013).

Regulatory Environment

Hilliard and Jacobson (2013) provide evidence for the Irish context to support an earlier argument by Porter and Van der Linde (1995) that rigorous environmental protection can improve competitiveness. They also show that enterprise development is important for innovation and should therefore be a focus of industrial policy. There is a close analogy between the dynamic capability that firms require for responding to improved environment protection regulation, and the dynamic capability that firms require for innovation in general. And innovation in this context should include new forms of inter-firm relationships. A consequence of all this for the analysis of the Green Way may be that if the environmental regulation were more rigorously inspected and implemented, and if the dynamic capabilities of the organisations involved had been better developed, the project would have been more successful. A green criterion in procurement is an example of the former, and innovative forms of training for inter-firm/inter-organisational networking an example of the latter.

Conclusion

Industrial policy in Ireland has a complex and at times contested lineage. The role of the state in fostering economic development has been relatively successful, though the evidence suggests that some of the instruments employed often undermine the effectiveness of others. The recent work of Ó Riain (2013), Stewart (2013), Jacobson (2013), O'Malley (2013) and Hilliard and Jacobson (2013) details the complexity that arises in this context. The role of local government is, in some ways, even more problematic for a number of reasons:

- Local government in Ireland tends to be under-researched (Kirby, 2008);
- The type and nature of economic development the local state has engaged in has tended to be related to property, e.g. working with

- the IDA to develop sites for MNCs or the building and management of enterprise centres with Enterprise Ireland;
- The policy instruments available to local governments are limited;
 - The importance of economic development as a core competence of local government is relatively recent and the legal and policy framework is still being established, e.g. the drafting and implementation of the new City and County Local Economic and Community Development Plans;
 - The localness of innovative economic activity tends to remain unappreciated by national policy makers; place is important.

In this context the authors believe that policy makers, industry leaders and political representatives can learn a great deal from the experience of The Green Way. It came to fruition in a time of crises and in a gap in the national policy framework. It was an innovative partnership and achieved considerable success. Furthermore, its failings were not of its making, but reflect problems with national-level approaches to local economic development. For example, one of the consequences of using a low corporation tax rate as an instrument of industrial policy is that a culture of expectation develops among companies, both SMEs and MNCs. This undermines efforts to develop jointly funded partnerships between public, private and civil society stakeholders.

The experience of The Green Way suggests that a considerable number of challenges face Irish local governments when working to nurture clusters. These challenges primarily relate to place-sensitivity, building capacity, improving institutional knowledge and managing relationships with other key institutions, e.g. universities.

To a certain extent local governments are already responding to these challenges and the opportunities provided by the recent legislative reforms. Economic development is being institutionally recognised as a key area of activity. This is a welcome development and bodes well for the future. Furthermore, the need for greater place-sensitivity in Irish industrial policy and consideration of the role that local governments should play in the design as well as delivery of national and local economic strategies appears to have been addressed. The legislative and public policy framework has been put in place to facilitate such an approach but it will be some time before it is clear how successful this has been.

With regard to improving institutional knowledge, Rosenfeld refers to a need to be able to formulate and implement “unconventional public policy” (2007:20), policies that shift the focus of attention from an individual place or individual firm to a region and clusters of businesses. In this regard it is important that local governments learn how businesses interact and how clusters work. As noted above clusters are driven by relationships, not just their constitutive elements. Building this tacit knowledge base inside local governments is vital. There are significant constraints, including the employment embargo and the organisational culture of mobility between policy areas and subsequent promotional prospects for generalists. However, international evidence (e.g. UK and Canada) suggests that the recognition of economic development as a professional area/discipline will improve the capacity of local governments.

The final challenge for local governments relates to managing relationships; previous research by the authors (Ó Broin and Jacobson, 2010) suggests that such relationships tend to be based on individuals rather than organisations. There has been considerable improvement since then and The Green Way is an example of one type of institutional partnership of which there is more successful evidence in other countries. An explicit incorporation of the importance of sustainability into industrial policy formulation (see Aiginger, 2015) would certainly enhance the likelihood of building sustainable local economies in Ireland.