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Identifying Interactions for Sustainable Development Goal Implementation in Ireland

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Rialtas na hÉireann
Government of Ireland

ENVIRONMENTAL PROTECTION AGENCY
The Environmental Protection Agency (EPA) is responsible for protecting and improving the environment as a valuable asset for the people of Ireland. We are committed to protecting people and the environment from the harmful effects of radiation and pollution.

The work of the EPA can be divided into three main areas:

Regulation: *We implement effective regulation and environmental compliance systems to deliver good environmental outcomes and target those who don't comply.*

Knowledge: *We provide high quality, targeted and timely environmental data, information and assessment to inform decision making at all levels.*

Advocacy: *We work with others to advocate for a clean, productive and well protected environment and for sustainable environmental behaviour.*

Our Responsibilities

Licensing
We regulate the following activities so that they do not endanger human health or harm the environment:
* waste facilities *(e.g. landfills, incinerators, waste transfer stations)*;
* large scale industrial activities (*e.g. pharmaceutical, cement manufacturing, power plants)*;
* intensive agriculture *(e.g. pigs, poultry)*;
* the contained use and controlled release of Genetically Modified Organisms *(GMOs)*;
* sources of ionising radiation *(e.g. x-ray and radiotherapy equipment, industrial sources)*;
* large petrol storage facilities;
* waste water discharges;
* dumping at sea activities.

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* Overseeing local authorities' environmental protection responsibilities.
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* Working with local authorities and other agencies to tackle environmental crime by co-ordinating a national enforcement network, targeting offenders and overseeing remediation.
* Enforcing Regulations such as Waste Electrical and Electronic Equipment (WEEE), Restriction of Hazardous Substances (RoHS) and substances that deplete the ozone layer.
* Prosecuting those who flout environmental law and damage the environment.

Water Management
* Monitoring and reporting on the quality of rivers, lakes, transitional and coastal waters of Ireland and groundwaters; measuring water levels and river flows.
* National coordination and oversight of the Water Framework Directive.
* Monitoring and reporting on Bathing Water Quality.

Monitoring, Analysing and Reporting on the Environment
* Monitoring air quality and implementing the EU Clean Air for Europe (CAFÉ) Directive.
* Independent reporting to inform decision making by national and local government *(e.g. periodic reporting on the State of Ireland's Environment and Indicator Reports)*.

Regulating Ireland's Greenhouse Gas Emissions
* Preparing Ireland's greenhouse gas inventories and projections.
* Implementing the Emissions Trading Directive, for over 100 of the largest producers of carbon dioxide in Ireland.

Environmental Research and Development
* Funding environmental research to identify pressures, inform policy and provide solutions in the areas of climate, water and sustainability.

Strategic Environmental Assessment
* Assessing the impact of proposed plans and programmes on the Irish environment *(e.g. major development plans)*.

Radiological Protection
* Monitoring radiation levels, assessing exposure of people in Ireland to ionising radiation.
* Assisting in developing national plans for emergencies arising from nuclear accidents.
* Monitoring developments abroad relating to nuclear installations and radiological safety.
* Providing, or overseeing the provision of, specialist radiation protection services.

Guidance, Accessible Information and Education
* Providing advice and guidance to industry and the public on environmental and radiological protection topics.
* Providing timely and easily accessible environmental information to encourage public participation in environmental decision-making *(e.g. My Local Environment, Radon Maps)*.
* Advising Government on matters relating to radiological safety and emergency response.
* Developing a National Hazardous Waste Management Plan to prevent and manage hazardous waste.

Awareness Raising and Behavioural Change
* Generating greater environmental awareness and influencing positive behavioural change by supporting businesses, communities and householders to become more resource efficient.
* Promoting radon testing in homes and workplaces and encouraging remediation where necessary.

Management and structure of the EPA
The EPA is managed by a full time Board, consisting of a Director General and five Directors. The work is carried out across five Offices:
* Office of Environmental Sustainability
* Office of Environmental Enforcement
* Office of Evidence and Assessment
* Office of Radiation Protection and Environmental Monitoring
* Office of Communications and Corporate Services

The EPA is assisted by an Advisory Committee of twelve members who meet regularly to discuss issues of concern and provide advice to the Board.

Identifying Interactions for Sustainable Development Goal Implementation in Ireland

(2018-SE-MS-12)

EPA Research Report

Prepared for the Environmental Protection Agency

by

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ACKNOWLEDGEMENTS

DISCLAIMER

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Executive Summary

The purpose of the "Identifying Interactions for SDG [Sustainable Development Goal] Implementation in Ireland" (SDGs4I) project was to analyse the challenges faced in implementing the Sustainable Development Goals (SDGs) in support of the EPA's role under knowledge, regulation and advocacy for the environment. The project specifically addressed SDG target 17.14, to "enhance policy coherence for sustainable development" to reflect the fact that sustainable development is a multidimensional challenge. It entails harnessing synergies, managing trade-offs and policy conflicts, and addressing the potential transboundary and intergenerational policy effects of domestic and international action.

The project reviewed the policy coherence setting for Ireland and evaluated Ireland's portfolio of policy in relation to an environmental setting and alignment to the SDGs and targets based on the situation that existed at the time of publication of the 2018 "The Sustainable Development Goals National Implementation Plan 2018–2020" prepared by the Department of Communications, Climate Action and Environment. In partnership with the International Science Council (ISC) and the European Commission – Joint Research Centre (EC-JRC), the project sought to:

1. advance understanding of the importance of interaction analysis and its relevance to SDG implementation and priority-setting monitoring for Ireland to identify opportunities for policy coherence;

2. provide an online EnablingSDGs tool to support those involved in implementing policy within and across domains to address gaps in institutional arrangements for the integration of national policy with the SDGs and targets, and to assist evidence-informed policy development and implementation in national policy development; and

3. promote interactions between key stakeholders including scientists and policymakers to advance the SDGs and avoid the risk of the SDGs being seen simply as a reporting framework rather than an action framework.

The project focused its analysis on the relationship and interactions between environmental goals and targets and their integration with policy dimensions in the context of *Project Ireland 2040*, as the overarching policy and planning framework for the social, economic and cultural development of Ireland, and the *Climate Action Plan 2019* and *National Biodiversity Action Plan*, as key areas of Ireland's policy that address its environment and sustainable development. This analysis provides a contribution towards Ireland enabling the transformations called for by the SDGs, the Paris Agreement on Climate Change and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) global assessment.

Results from the project suggest that policy coherency and integration can be achieved by considering key strategic policy areas – climate and biodiversity action, and national development plans – thus providing a channel to connect the SDGs with the wider policy portfolio.

The outcomes of the project led to the following recommendations:

- To make the SDGs more relevant to Ireland, consideration should be given to:
  - prioritising SDG targets with reference to national priorities shaped by the national development plan (*Project Ireland 2040*), the *Climate Action Plan 2019* and the forthcoming *National Biodiversity Action Plan*; and
  - the 2030 Agenda, which provides provision for reframing targets to make them more relevant to the national context. Ireland should consider this as a way of making the SDGs more relevant and specific to its national context.
- The "EnablingSDGs tool" can be used by the SDG interdepartmental working group (IDWG) to enable policymakers to identify interlinkages between different SDGs, assess impacts of different policy choices, highlight second-order effects and potential unintended consequences of policy.
- Mapping of SDGs should review how interlinkages to other targets may lead to interactions with other areas of policy with possible synergistic/trade-off

outcomes. In this way, the interlinkages between SDG goals and targets can become a tool for policy coherency.

- Characterising SDG/policy interlinkages should emphasise drivers of policy and how they affect links between the environment and the social and economic aspects of sustainability.
- Means of implementation targets within the SDGs should not be viewed as essentially an area for foreign policy interests, but should also address

implementation of the 2030 Agenda within Ireland, as well as transboundary aspects of SDG implementation and Ireland's place in the world.

- Finally, although Ireland has taken steps to enhance horizontal policy coordination to implement the SDGs through the SDG IDWG, there is a continuing need for better mainstreaming of sustainability across all areas of decision-making to inform policy development and coherency.

1 Introduction

The year 2015 proved to be a decisive one, when there was global recognition of the severe and existential challenges facing humanity: growing ecological overshoot and worsening climate change as well as social and economic vulnerability (Bengtsson *et al*., 2018). This recognition was established through the adoption by the United Nations (UN) in that year of the 2030 Agenda, including the Sustainable Development Goals (SDGs), the Paris Agreement on Climate Change and the Sendai Framework on Disaster Risk Reduction together with the Addis Ababa Action Agenda.[1] The SDGs have been accepted by all governments as universal, integrated and transformative, and are to be implemented by all countries of the world (Box 1.1) (Cutter *et al*., 2015).

1.1 Project Context

The aim of the "Identifying Interactions for SDG Implementation in Ireland" (SDGs4I) project was to provide an analysis of the relationship of Ireland's policy portfolio to the SDGs and targets and recommendations in the context of adopting a "whole-of-government" approach to implementing the SDGs.

Box 1.1. The role of developed countries in SDG implementation

The text of *The Future We Want* (UN, 2012) emphasises the global character of the SDGs and, therefore, also addresses developed or industrialised countries. In the following paragraphs of the SDGs proposal, the importance of developed countries in the realisation of SDGs becomes evident:

- The global nature of climate change requires the widest possible cooperation by all countries. International participation in accelerating the reduction of global greenhouse gas emissions and protecting the climate system for present and future generations should be based on common but differentiated responsibilities and capabilities.
- The importance of development strategies is underlined in that each country has primary responsibility for its own economic and social development and that the role of national policies, domestic resources and development strategies cannot be overemphasised.
- The phrase "common and differentiated responsibilities and respective capabilities" stresses the different approaches, visions, models and tools available to each country, in accordance with its national circumstances and priorities in order to achieve sustainable development in its three dimensions.

After UNDESA (2014), OECD (2015a).

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1 The 17 Sustainable Development Goals are a universal call to action to end poverty, protect the planet and improve the lives and prospects of everyone, everywhere. They were adopted by all UN Member States in 2015, as part of the 2030 Agenda for Sustainable Development, which set out a 15-year plan to achieve the Goals (https://www.un.org/sustainabledevelopment/development-agenda/; accessed 16 June 2021). The Sendai Framework is a 15-year, voluntary, non-binding agreement that recognises that the state plays the primary role in reducing disaster risk but that responsibility should be shared with other stakeholders, including local government and the private sector (https://www.unisdr.org/we/coordinate/sendai-framework; accessed 16 June 2021). The Paris Agreement is the first universal, legally binding global climate change agreement, adopted at the Paris Climate Conference (COP21) in December 2015. The Paris Agreement sets out a global framework to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C. It also aims to strengthen countries' ability to deal with the impacts of climate change and support them in their efforts (https://ec.europa.eu/clima/policies/international/negotiations/paris_en; accessed 16 June 2021). The Addis Ababa Action Agenda establishes a strong foundation to support the implementation of the 2030 Agenda for Sustainable Development. It provides a new global framework for financing sustainable development by aligning all financing flows and policies with economic, social and environmental priorities (https://www.un.org/esa/ffd/publications/aaaa-outcome.html; accessed 16 June 2021).

This is in recognition of the fact that achieving the transformative change set out in the SDGs requires government to adopt new approaches to collaboration across departments, and also to facilitate innovative solutions. The role that the environment plays in ensuring social and economic resilience in Ireland is recognised across the three pillars of climate, water and sustainability that frame the Environmental Protection Agency (EPA) Research Programme and is reflected in Ireland's approach to sustainable development (EPA, 2016; Government of Ireland, 2012).

The project specifically addressed SDG target 17.14, to "enhance policy coherence for sustainable development", which recognises that the 2030 Agenda as a "plan of action for people, planet and prosperity" is an agenda that balances the three dimensions of sustainable development: the economic, social and environmental (Figure 1.1) (UN, 2015a). It calls for breaking out of policy silos and increasing capacities to identify, understand and manage interactions and interconnections among SDGs. The project

reviewed the policy coherence setting for Ireland and evaluated Ireland's portfolio of policy in relation to an environmental setting and alignment to the SDGs and targets based on the situation that existed at the time of publication of the *Sustainable Development Goals National Implementation Plan 2018–2020* (DCCAE, 2018). Understanding the linkages across and between SDGs can lead to adjusted structures and decision-making processes to effectively integrate SDGs into the mandate of existing institutions, and foster an administrative culture that promotes cross-sectoral collaboration sensitive to the need for global action. Such integration and transformations will have implications for cross-government activities, such as climate change adaptation and environmental protection, by enabling approaches that lead to transformations towards resilient societies. These considerations recognise that sustainability is a multidimensional challenge that requires strengthening policy coherence across sectors, actors, governance levels and timeframes to address the underlying and interconnected causes of vulnerability.
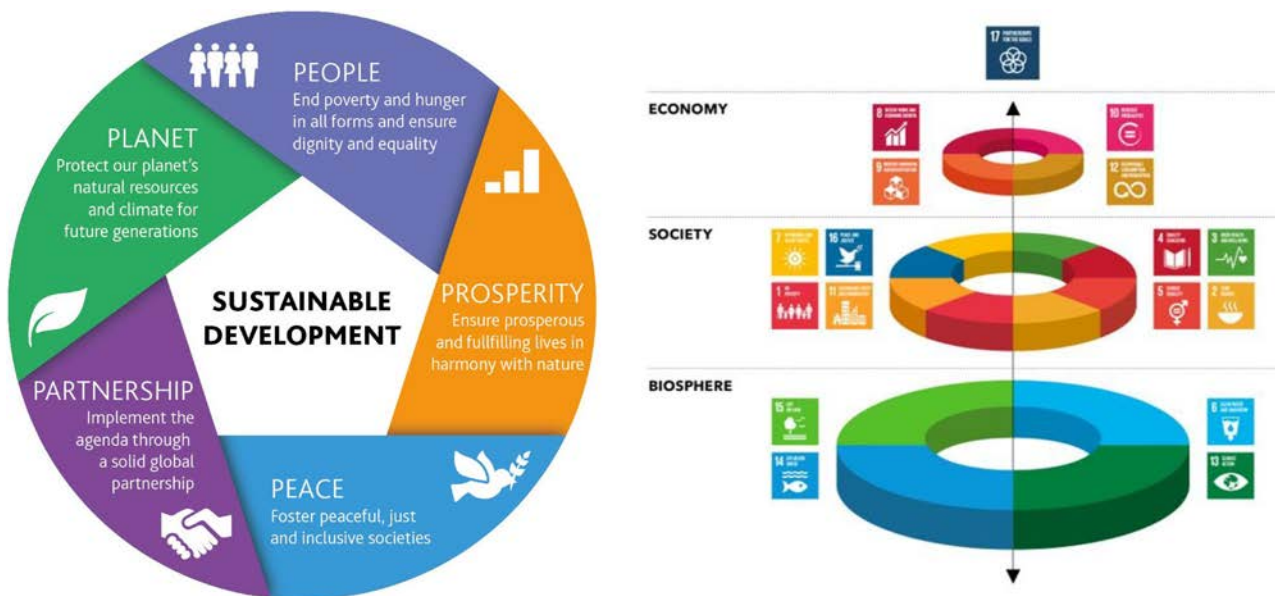
Figure 1.1. Left: the 2030 Agenda conceptualises a five-dimensional model of sustainable development, known as the "Five Ps" model of sustainable development: people – the social dimension; planet – the environmental dimension; prosperity – the economic dimension; peace – the ethical dimension; and partnership – a collective and collaborative approach (source: UN; from https://twitter.com/SustDev/status/647436962324942849/photo/1). Right: the SDGs arranged to illustrate their intertwined nature and bring a broader perspective to provide a focus of the biosphere underpinning social justice, economic development and sustainability (source: Folke *et al.*, 2016; https://www.dnvgl.com/feature/sdgs-business-action.html).

1.2   Context of the SDGs

Implementation of the SDGs is intended to address the UN's five pledges (Figure 1.1) underlying the concept of sustainable development, and balance the three dimensions of sustainable development: the economic, social and environmental in a context of ethics (balancing ideals and values such as equality, freedom, human dignity and justice) implemented by a global partnership (of all countries, all stakeholders and all people). The UN's 5Ps of "people, planet, prosperity, peace and partnership" for sustainable development thread together economic, social and environmental dimensions, while acknowledging that decisions and approaches are interlinkage related and have both synergies and trade-offs (UNSSC Knowledge Centre for Sustainable Development, 2015). The 5Ps shape a framework for the integrated, interlinked and indivisible 17 SDGs (Figure 1.1, left), which represent the ambition at national and international levels to end poverty and promote prosperity and people's well-being while protecting the environment by 2030. An understanding of the nature of SDGs and targets across the sustainable development dimensions – social, economic and environment or across the 5Ps – demonstrates that the environment is neither an add-on nor in opposition to sustainable development, but rather the base that underpins all other goals (Figure 1.1, right).

The 2030 Agenda for "sustainable development" has progressed to embrace a framework that focuses on the goal of socially inclusive and environmentally sustainable economic growth, and which overcomes perspectives that economic and social development are usually seen as happening at the expense of the environment (Jeremic and Sachs, 2014; Vasseur *et al.*, 2017). SDGs 1–16 have 109 outcome targets that capture the ambition of the relevant goal and translate it into concrete commitments. The outcome targets of each SDG are complemented by 43 means of implementation (MoI) targets that describe the specific actions needed for each goal to be achieved and by SDG 17 ("Strengthen the means of implementation and revitalize the global partnership for sustainable development") (Bartram *et al.*, 2018; UN inter-agency technical support team, 2014). Growing understanding of the dense interconnections, interactions and dependencies between ecosystems and resources within and across governed contexts (i.e. between

sectors and/or different areas of policy), and their reflection across the 17 SDGs and targets, has raised awareness of the importance of and need for coherent, integrated governance.

None of the topics covered by the 17 SDGs are novel and all are related to issues on which countries and organisations were already working before the SDGs were adopted. Their novelty, however, comes with the challenge of implementing them in an integrated and cross-cutting manner, which will require organisations to change from working in a "silo" or sectoral approach to finding integrated ways of working across sectors. Working across the boundaries of sectoral and organisational silos is necessary to address the way sustainability challenges are closely intertwined, including issues pertaining to air pollution, biodiversity loss, climate change, energy and food security, disease spread, species invasion, and water shortages and pollution. They are interconnected across three dimensions (organisational levels, space and time) but are often separately studied and managed (Liu *et al.*, 2015).

1.3   Summary and Objectives of the Identifying Interactions for SDG Implementation in Ireland (SDGs4I) Project

Ireland played a significant role in facilitating the negotiations leading to adoption of the 2030 Agenda and its 17 SDGs (DCCAE, 2018; Government of Ireland, 2018), and the 17 goals are all related to issues on which Ireland was already working before the SDGs were adopted (Government of Ireland, 2012). The SDGs, however, present challenges to all governments, requiring them to revisit the way organisations work and the way data and information are integrated to achieve integrated and coherent implementation (UN, 2018), which has been identified as a challenge across government in Ireland (Clark *et al.*, 2017). The originality of the SDGs comes with the challenge of interpreting them in the national context and implementing them in an integrated and cross-cutting manner (Biermann *et al.*, 2015, 2017; Glass and Newig, 2019). The intent of the SDGs and targets are integrated and indivisible; however, governments can adjust the targets, and adapt their indicators, to reflect their particular situation and circumstances to achieve the global intent at a national level. As a result, policy implementation

towards national strategies and SDGs raises a number of challenges:

- Many of the individual targets contribute to several goals and, although in some cases interactions can lead to synergistic outcomes, in other cases targets may conflict: actions to meet one target could have unintended consequences on other targets if such actions are considered in isolation (Elder *et al.*, 2016; Elder and King, 2018; Nilsson *et al.*, 2016a).
- The outcomes of individual policies intended to achieve one target may counteract (have a negative effect on) or, conversely, act in synergy with (have a positive effect on) the outcomes of policies that address other targets (Nilsson, 2016; OECD, 2015b).
- A particular policy may connect to multiple targets such that a focus on the effect of the policy on individual goals and/or targets could lead to perverse outcomes and progress across multiple elements of the 2030 Agenda (Independent Group of Scientists appointed by the Secretary-General, 2019; OECD, 2015b,c).
- Consideration needs to be given to how policies that are usually designed to address a specific sector purpose can be implemented in the context of a wider "systems" perspective as required by the SDGs (Dawes, 2019; ICSU, ISSC, 2015).

Achieving the transformative change set out in the SDGs requires government to adopt new approaches to collaboration across departments and to facilitate innovative solutions. The aims of SDGs4I project were twofold:

- By exploring Ireland's 2018 first SDG National Implementation Plan (NIP) (DCCAE, 2018), we aimed to characterise the challenges and opportunities for coherency arising from Ireland's policy portfolio in support of implementation of the SDGs, specifically:
  – to review how Ireland's existing policy portfolio is aligned to the 169 targets of the SDGs and focus on identifying the environmental context of SDGs within Ireland's policy setting;
  – to consider if the SDGs, which have cross-cutting themes, could be not only a reporting framework but also an action framework to support sustainable development in Ireland through connecting different areas of policy.

- We wanted to provide a "tool" to assist policymakers and researchers in Ireland to better use evidence-informed approaches to understand the implications of interlinkages between SDGs, targets and policy, and provide the means to identify:
  – the critical nodes for SDG implementation and the goals and targets that will be most influential in aligning with and delivering on the country's priorities;
  – the evidence–policy gaps and/or associated knowledge needs (where to focus the gathering of evidence and/or its translation into policy);
  – key intersections of policy domains and what needs to be measured to inform decision-making and monitor progress.

The SDGs4I project builds on work coordinated by the International Science Council (ISC, 2019), which presented a seven-point typology of interaction as a means to characterise the range of positive and negative interactions between SDGs (ICSU, 2017a; Nilsson *et al.*, 2016a). The typology is applied using an adaptation of a tool developed by the Stockholm Environment Institute (SEI) with the European Commission Joint Research Centre (EC-JRC) to provide a platform for interdepartmental engagement on SDG interlinkages in the context of Ireland's policy portfolio. Such analysis can allow the interpretation of SDGs in the context of national priorities and circumstances to facilitate integration of sustainability and environmental goals with those of social and economic development (ICSU, 2017a; Nilsson *et al.*, 2016a; Stewart, 2015).

These challenges are explicitly recognised through the MoI targets that are included with the first 16 SDGs and form all of the targets of SDG 17. The SDGs4I project specifically addresses SDG 17, target 17.14, to "enhance policy coherence for sustainable development", reflecting the reality that transforming societies and realising the SDGs is a multidimensional challenge: it entails harnessing synergies, managing trade-offs and policy conflicts, and addressing the potential transboundary and intergenerational policy effects of domestic and international action. The project has achieved this through an exploration of alignment of national policy with the SDGs and identifying opportunities for policy coherence, in particular, in the context of *Project Ireland 2040*

(DPER, 2018) and the *Climate Action Plan 2019* (Government of Ireland, 2019).

1.4 The Challenge of Implementing the SDGs

The SDGs do not exist in a policy vacuum, but are part of a complex portfolio of (national) policy and legislation that is increasingly driven by an international agenda, for example climate change reporting, and which addresses an increasingly interconnected national and international policy arena that often has to respond to short-term shocks, for example global risks (Brandi *et al.*, 2017; World Economic Forum, 2019). Recognition of the challenges posed by the 2030 Agenda and the SDGs has its origins in the Rio 1992 Agenda 21 action plan for sustainable development (UN, 1992), which called on countries to adopt national strategies for sustainable development that "should build upon and harmonize the various sectoral economic, social and environmental policies and plans that are operating in the country". This is further reflected in *The Future We Want* (UN, 2012), the declaration on sustainable development and a green economy adopted at the Rio+20 conference, which called for the negotiation and adoption of internationally agreed SDGs and which acknowledged, in paragraph 276, "the need to facilitate informed policy decision making on sustainable development issues and, in this regard, to strengthen the science–policy interface". A process that can enable and facilitate policymaking and decision-making through improved collaboration between policymakers, and between science and policymakers, frames the SDGs4I project. The SDGs have assumed a pre-eminent visibility across most (if not all) sectors, from education to research and in both public and private sectors (Government of Ireland, 2018; Stibbe *et al.*, 2018). Underpinning much of the research and implementation on SDGs is the explicit recognition that achieving long-term sustainability goals requires consideration of interactions, including trade-offs, co-benefits and transboundary effects, to transform societies', economies' and the environment's pathways for development to more sustainable trajectories (EEA, 2019; Glass and Newig, 2019; ICSU, 2017a; Langou *et al.*, 2020; Nilsson *et al.*, 2016b; Stafford-Smith *et al.*, 2017; Tosun and Leininger, 2017).

The importance of interlinkages between SDGs and their targets (Biermann *et al.*, 2015; Kroll *et al.*, 2019; Nilsson, 2016; Nilsson and Weitz, 2019; Nilsson *et al.*, 2018) has spawned a considerable body of research that has been comprehensively reviewed (Allen *et al.*, 2019a,b; Biermann *et al.*, 2017; Breuer *et al.*, 2019; SDG Knowledge Hub, 2016). This is, however, largely conceptual in outlook, and there are few publications of direct policy relevance, although there are some (Breuer *et al.*, 2019; Miola *et al.*, 2019; Weitz *et al.*, 2018). Studies have focused on subsets of goals and targets (e.g. Liu *et al.*, 2018), or network analysis across all goals (e.g. Le Blanc, 2015a; Vladimirova and Le Blanc, 2016), including on a country basis (e.g. Zhou and Moinuddin, 2017). Other studies have focused on progress made towards achieving the goals and targets (e.g. OECD, 2019a; J. Sachs *et al.*, 2019). Similarly, there has been considerable focus on the potential for synergistic and trade-off interactions between goals and targets (e.g. Coopman *et al.*, 2016; Nilsson, 2016), and how this is important for prioritising and implementing policies that maximise synergies between goals while navigating trade-offs (Pham-Truffert *et al.*, 2020). Interlinkages can be either unidirectional (either A can affect B or B can affect A) or bidirectional (A can affect B and B can affect A). Furthermore, interactions can lead to a multiplying effect whereby addressing one SDG/target could have a synergistic or trade-off effect on several other SDGs/targets or, conversely, the effect could be to buffer several synergistic or trade-off effects coming from other SDGs/targets (Messerli *et al.*, 2019; Pham-Truffert *et al.*, 2020).

Research and other forms of knowledge to support the implementation of the SDGs has been dominated by a techno–scientific–economic discussion (Cummings *et al.*, 2018; Independent Group of Scientists appointed by the Secretary-General, 2019). A basic search of Web of Science found that the terms "sustainable development goals" or "SDG" appeared in 24,709 publications (Figure 1.2). The vast majority, over 75%, of these publications are aligned to environmentally related fields, with less than 3% aligned to public administration and political sciences fields, suggesting a potential bias in research towards environmental rather than social perspectives.

In contrast, support for the administration and practice of implementing the SDGs has received less attention
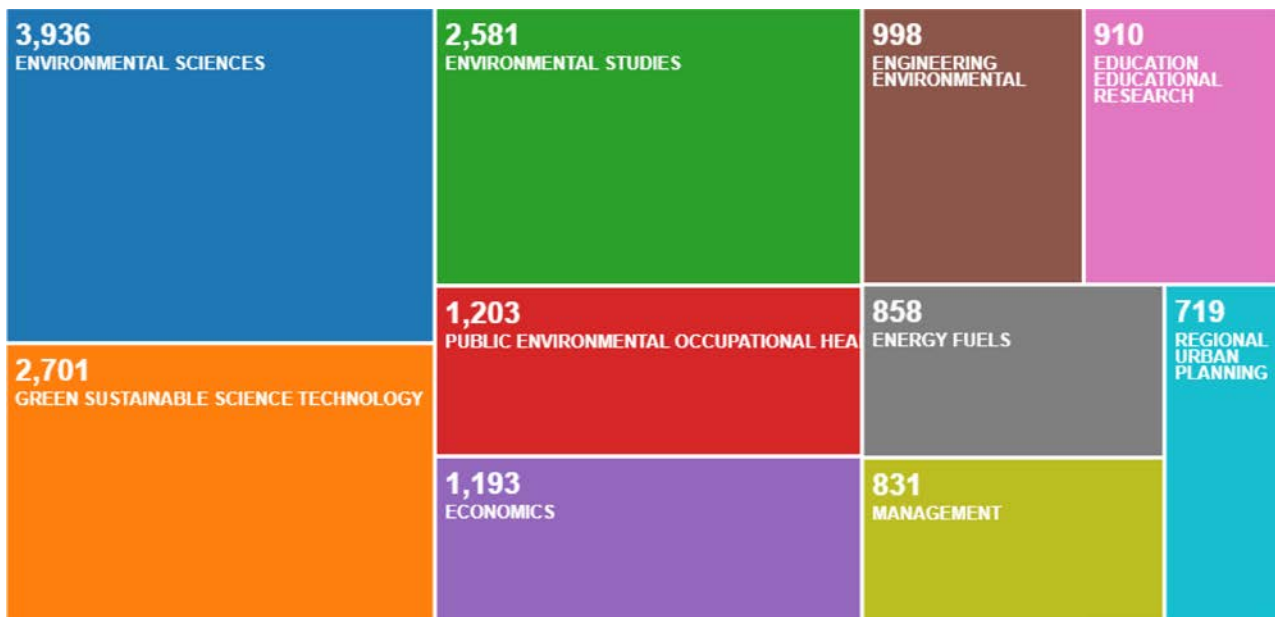
Figure 1.2. Treemap showing the top 10 Web of Science categories from a Web of Knowledge search of journal articles containing the term "SDG" or "sustainable development goals". Search carried out on 15 June 2020.

other than that associated with the Organisation of Economic Co-operation and Development (OECD) programme on policy coherence (OECD, 2019b). The national level will be critical for the achievement of the SDGs, as understanding how to adapt institutional frameworks to deliver integrated policies that effectively address existing interlinkages among the SDGs is essential if progress is to be achieved (UN, 2018). The 2030 Agenda emphasises the importance of the interlinkages and integrated nature of the SDGs (UN, 2015a). Acknowledging potential synergies and trade-offs between SDGs and targets is necessary to (1) balance allocation of resources and try to avoid actions intended to accelerate progress in one area from having unwanted side-effects on targets in other areas and (2) support more balanced development trajectories by ensuring more coherent action across all dimensions of sustainable development (Box 1.2).

Miola *et al.* (2019) identified 3490 interlinkages between SDG targets in an analysis of published literature, and 1119 European policies that relate to the SDGs. Importantly, they recognise that the available literature probably did not identify every possible interlinkage that may exist, and that linkages that do exist are not necessarily important in achieving the

> **Box 1.2. Defining integration in the context of policy coherence and the SDGs4I project**
>
> Promoting integration implies finding ways to foster cooperation and common approaches among institutions dealing with closely interrelated issues. In the context of the SDGs4I project, integration refers to systematically identifying relevant and important linkages of issues across the SDGs and to considering them in the implementation of existing policy and design of new policies.

SDGs. Furthermore, the nature of these interlinkages varies depending on country context, geography and governance arrangements (OECD, 2018a). However, from the results of Miola *et al.* (2019) it is clear that SDG targets can be grouped into a number of different domains – for instance, water, energy and food – which are interconnected and thus such targets can be addressed only if they are considered as fully interrelated and interdependent (Boas *et al*., 2016). This has led to arguments for a nexus[2] (i.e. cross-sectoral and dynamic) approach to the investigation of SDG and target interlinkages and institutional

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2   Nexus – a connection or series of connections linking two or more things.

arrangements (Boas *et al*., 2016; Weitz *et al*., 2014) and overcome the appearance that many goals still remain sectoral in their basic outlook (Boas *et al*., 2016; Le Blanc, 2015b).

In contrast to the results from research, the wording of the goals and targets is relatively weak, unstructured and not transparent in relation to these interlinkages (Box 1.3), and this has significant implications for the implementation of sustainability agendas (Boas *et al*., 2016), for instance the European Green Deal (EC, 2019a). Although the focused nature of the SDGs may be easier to communicate to public and policy audiences, a consequence of such an approach might be incoherent policymaking and eventually a general failure to achieve the SDGs targets in some domains because their interconnectedness has not been recognised (Boas *et al*., 2016). Comprehending the link between the SDGs and policy portfolios in a way that addresses priorities at national and/or regional level has led some to adopt a nexus approach, that is an approach that examines simultaneously interactions among multiple sectors (Liu *et al*., 2018; van Zanten and van Tulder, 2020). Such approaches

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Box 1.3. Examples of the siloed nature of SDGs

1. SDG 2, zero hunger, is connected to equality, health, climate change, disasters, ecosystem protection and infrastructure, concepts that are addressed in SDGs 5, 10, 11, 13, 14 and 15, yet does not explicitly refer to the interconnections with water and energy, which are addressed in SDGs 6 and 7.
2. SDG 6, clean water and sanitation, makes no explicit connection to food or climate change, which are addressed in SDG 12 and SDG 13, respectively.
3. SDG 14, life below water, focuses almost solely on environmental dimensions and makes only marginal connections with broader social and economic questions and other SDGs.

Based on Boas *et al*. (2016)

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can enable cross-sectoral institutionalisation of the SDGs and ensure that a strategy or policy from one domain does not undermine a goal from another policy domain, leading to unsustainable outcomes contrary to the principles of the 2030 Agenda and the SDGs (e.g. Boas *et al*., 2016; UNDESA, 2014; Weitz *et al*., 2014, 2015).

1.5 Structure of the Report

This final report assesses the outcomes from the project deliverables, and their implications and consequences for policy coherence and decision-making in coordinating the implementation of SDGs with national policy, specifically in the context of integrating environmental dimensions. An appreciation of the aspirations of social, economic and environmental development goals framed the design of a tool and workshop setting to enable and facilitate inter-departmental conversations for reconciling and resolving these multidimensional challenges.

In support of the project objectives outlined in section 1.3, the research has assessed the peer-reviewed, white and grey literature relating to the SDG interlinkages, policy coherence for sustainable development and tools supporting SDG implementation to produce two deliverables:

1. **International review of SDG interactions,**[3] which specifically addresses the 2030 Agenda from the perspective of the policy challenges faced by a sovereign government when implementing the SDGs, and the implications of the interlinked nature of individual goals, with a focus on the specific situation relating to Ireland and best practice for policy coherence. This is discussed in Chapter 2 of this report.

2. **SDG interactions in the context of Ireland's SDGs,** which focuses on the policy portfolio in Ireland in the context of the environmental setting of the 2030 Agenda and the SDGs, and analyses the context and organisation of the environmental dimension of the SDGs in Ireland. This is discussed in Chapter 3 of this report.

These deliverables establish the background and set out the opportunities for the SDGs4I project to support policymakers and decision-makers in

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3 All deliverables from the project are available at https://www.marei.ie/project/sdgs4i/ (accessed 17 June 2021).

advancing implementation of the SDGs in the context of environmental mainstreaming and policy coherence with national development.

The principal outcome of the project is a policy tool – "EnablingSDGs tool" – to locate Ireland's knowledge base with policy choices that (1) account for the spectrum of possible synergies and trade-offs that lead to the most sustainable outcomes and (2) strike a balance between short- and long-term needs across economic, social and environmental dimensions of sustainable development. The approach and development of the tool were detailed in the following project deliverables:

3. **Report on methodological tools for investigating SDG interactions**, which provides

an assessment of tools and methodologies used to assess the SDGs in support of balancing their environmental dimensions and the interlinkages between individual SDGs and their targets. This is discussed in Chapter 4 of this report.

4. **Guidelines for Toolkit**, which outlines the criteria for tool development as part of the SDGs4I project, focusing on frameworks that aim to help policymakers design more coherent and resource-effective approaches to generate progress on the 17 SDGs overall, and specifically those relevant to horizontal integration across government in the context of target 17.14 of SDG 17. This is discussed in Chapter 5 of this report.

2 The Role of Policy Coherence

Implementation of the SDGs demands a conducive policy environment that enables and facilitates a more integrated policy framework; promotes synergies between economic, social and environmental policies; identifies trade-offs; and considers transboundary and intergenerational impacts (ESDN, 2015; Nilsson, 2017; OECD, 2015a). Public administration is organised through sectoral departments and agencies to fulfil the need for specialised competencies and clear accountability relationships, but this can lead to a lack of coherency in policy actions (Le Blanc, 2015b). Insufficient understanding of, and accounting for, trade-offs and synergies across sectors have rendered policies siloed and incoherent, leading to diverging outcomes and trends across broad objectives for sustainable development (Pedercini *et al*., 2019). While there is an ever-growing literature regarding evidence- and science-based approaches to SDG implementation, policymakers face the challenge of interpreting and acting on this in a coherent and integrated manner (Allen *et al*., 2018). While it is generally understood that each of the goals and targets depends on and influences one another, it remains unclear exactly how these interlinkages work and what are their implications for policy coherence and linkages across sectors (Bizikova *et al*., 2018).

The 2030 Agenda mirrors aspirations that already exist at the national level to work across policy sectors and coordinate them better (Nilsson, 2017; Persson, 2018), and this is articulated through SDG target 17.14: enhance policy coherence for sustainable development. Policy coherence is not a new concept, and has been widely promoted to integrate the economic, social and environmental dimensions of sustainable development in Europe and by the OECD (EC, 2019b; Gregersen *et al*., 2016; Mackie *et al*., 2017; O'Connor *et al*., 2016; OECD, 2008, 2012; Risse, 2019). Policy coherence is a means for overcoming the often fragmented nature of governance as a consequence of individual government departments/agencies holding focused sectoral briefs. The fragmentation of governance has been cited as a critical barrier to achieving the SDGs (Biermann *et al*., 2015). Although the terms "coherence" and "integration" are often used as synonyms (UN, 2018), there is a significant difference, albeit small, between them: policy integration emphasises taking the objectives of other policy sectors into account (e.g. environmental integration in energy policy) or even merging objectives (UNESC, 2018). The promotion of horizontal policy integration and coherence implies ensuring logic and consistency among policies and preventing them from undermining each other and is critical for addressing the interconnected nature of the SDGs, including synergies and trade-offs across different goals and targets (Horan, 2020a; Langou *et al*., 2020; UN, 2018).

2.1 Overview of the OECD Programme on Policy Coherence for Sustainable Development

To help countries achieve the transition to sustainable development, a framework is required for the integration of economic, environmental and social policy and to exploit potential synergies and interrelationships between this wide range of competencies (Eppel, 1999). The 2030 Agenda introduces the new principle of Policy Coherence for Sustainable Development (PCSD) in target 17.14 as a means of implementation of the SDGs in an integrated and holistic manner. The OECD defines PCSD as:

> [a framework that describes] an approach and policy tool to integrate the economic, social, environmental and governance dimensions of sustainable development at all stages of domestic and international policy-making. (OECD, 2015a)

The OECD (2015a) has identified five complementary levels for implementing PCSD for the post-2015 agenda (Figure 2.1). Policy coherence requires a political choice by governments to establish supporting institutional structures and take specific initiatives. Enhancing PCSD as called for in SDG target 17.14 will depend on mechanisms to anticipate, balance and reconcile divergent policy pressures, including conflicting domestic and international priorities; opposing economic, social and environmental

Figure 2.1. The main elements of PCSD as defined by the OECD (2015a). Source: O'Connor *et al*. (2016); licensed under CC BY 4.0 (https://creativecommons.org/licenses/by/4.0/).

concerns; competing sectoral interests; and reconciling short-term priorities with the long-term policy direction integral to attaining sustainable development objectives.

Despite their basic similarity and semantic proximity, PCSD differs from policy coherence for development (PCD) by requiring policymakers to secure multidirectional coherence by pursuing multiple goals at the same time: PCSD has an internal (national) sustainability, as well as an external (international), interest. PCSD is an approach for integrating the economic, social, environmental and governance dimensions of sustainable development at all stages of domestic and international policymaking (Machingura and Lally, 2017; OECD, 2008, 2013, 2016a; Steurer and Berger, 2010). Its main objective is to fully engage the whole government by creating a three-part framework:

- An **analytical** part identifies policy coherence issues, and improves understanding of the interactions among SDGs and targets and their implications, and how certain policy actions might support or hinder the achievement of the goals and targets to address the spillovers of domestic policies on long-term development prospects.
- An **institutional** part aligns existing institutional mechanisms for policy coherence to the needs and vision of the 2030 Agenda for Sustainable Development to increase governments' capacities to identify trade-offs and reconcile domestic policy objectives with internationally agreed objectives.
- A **monitoring** part considers key elements for tracking progress on PCSD, with the aim of contributing to national efforts to monitor

and report progress on SDG target 17.14 to foster synergies across economic, social and environmental policy areas to support sustainable development.

Although much is written on the "what and why of policy coherence", *how* to engage with a methodology for policy coherence remains elusive. At present there is no structured evidence base or framework for unpacking interactions to establish a systems understanding of whether and when goals and targets are indeed "indivisible", or actually are to be traded off against each other (Nilsson, 2016).

2.1.1   *Review of policy coherence in Ireland*

Agenda 2030 states that: "Targets are defined as aspirational and global, with each government setting its own national targets guided by the global level of ambition but taking into account national circumstances". Each government will also decide how these aspirational and global targets should be incorporated in national planning processes, policies and strategies (UN, 2015a), and make domestic decisions on the implementation of the 2030 Agenda and the effective and efficient use of resources through policy coherence (Langou *et al*., 2020).

In Ireland, sustainable development has helped to accelerate the diffusion of new policy instruments, mechanisms and institutional designs. This has been part of a process to negotiate coherence and narrative consistency within the context of a multiactor, multisector, multilevel system of governance for sustainable development within the European Union (EU) (Mullally and Dunphy, 2015). However, studies

have shown that there are inconsistencies across sectors, highlighting the requirement to update certain strategy documents to raise the level of cross-sectoral coherence and avoid a "silo" mentality (Flynn and Ó hUiginn, 2019; Kelleher and Henchion, 2019).

2.2 The Connection between Policy, Cohesion and Interlinkages between SDGs

Policy coherence analysis can be understood as the governance expression of interlinkages, focusing on how instruments and actions to pursue one set of objectives affect the ability to pursue another set (Nilsson *et al*., 2016a; Tosun and Leininger, 2017). For policy and planning support, simply identifying a link is insufficient. In the SDG policy debate, therefore, much of the discourse has been around the existence of "trade-offs" and "synergies" (e.g. ICSU, 2017b; Nilsson *et al*., 2016a), representing whether an interaction is broadly beneficial or adverse. Similarly, institutional interaction and policy coherence literatures have often applied such a "binary" view (with variations in terminology) (e.g. Oberthür and Groen, 2017).

An integrated policy framework that reflects all development models and ensures policy coherence across goals is needed to assure that social, economic and environmental goals are mutually supportive. Policy coherence aims to increase governments' capacities to foster synergies across policy areas; identify trade-offs; reconcile domestic policy objectives with internationally agreed objectives; and address the spillovers of domestic policies. Policy coherence is fundamental to ensure that progress achieved in one goal contributes to progress in other goals, and to avoid the risk of progress in one goal being achieved at the expense of another. It can also shed light on critical sectoral interactions to achieve the 2030 Agenda and inform how efforts to attain a goal in one sector would affect, or be affected by, efforts in another: this is mirrored in the presence and nature of interlinkages across SDG goals and targets.

Although it is widely acknowledged that the SDG goals and targets can be viewed as a network in which targets may contribute positively (synergistically) to several other goals/targets, and some goals and targets may conflict with each other (Le Blanc, 2015b), acknowledgement of such trade-offs is often avoided (Nilsson and Weitz, 2019). Action to meet

one target could have unintended consequences on others if they are pursued separately so that there are important trade-offs among several goals and targets. For example, progress on ending poverty (SDG 1) cannot be achieved without progress on the food security target under SDG 2, macroeconomic policies related to targets on full and productive employment and decent work under SDG 8, reduction in inequality under SDG 10 and enhancing resilience to climate change under SDG 13. Mitigating such trade-offs will lead to better health and well-being, thus contributing to the achievement of SDG 3.

There are also important trade-offs between targets: for example, an increase in agricultural land use to help end hunger can result in biodiversity loss, as well as overuse and/or pollution of water resources and downstream (and likely negative) effects on marine resources, which in turn could exacerbate food security concerns (ICSU, 2017b; ICSU, ISSC, 2015). The key message in this debate is that different domains – for instance, water, energy and food – are interconnected and thus their challenges cannot be effectively resolved unless they are addressed as being fully interrelated and interdependent. Although this overall narrative is forcefully supported in the new UN 2030 Agenda for Sustainable Development and the 17 SDGs that are the main part of this agenda, many goals still remain sectoral in their basic outlook. For example, the goals on marine resources and ecosystem protection address primarily the environmental dimension and are only marginally connected with broader social and economic questions and other SDGs.

Therefore, the interlinkages between SDG targets are an opportunity to build on the strengths and functions provided by existing "siloed" institutional structures while making them more flexible, permeable, interactive and transparent for better policy integration to reinvigorate and improve horizontal coordination (Niestroy and Meuleman, 2016).

2.2.1 The SDGs as a mechanism to enable policy

Sustainable development concerns cross-cutting issues that, by extension, cross the remits of line departments; the SDG on health, for example, is linked to education (health education), the environment, water (reducing the number of deaths from water

pollution), inequalities (universal health coverage) and cities (transport safety) (Hege *et al*., 2019). The 2030 Agenda is more than the sum of measurable goals, targets and indicators (Independent Group of Scientists appointed by the Secretary-General, 2019), and can also be a guide for identifying and pursuing sustainable development priorities and creating coherence between policies and sectors by identifying cross-cutting entry points. In Ireland, such entry points can be provided by cross-cutting themes such as those included in the *Climate Action Plan 2019* (Government of Ireland, 2019) and *Project Ireland 2040* (DHPLG, 2018). The interlinkages that

are intrinsic to the SDGs provide a means to develop coherent approaches that go beyond addressing the 2030 Agenda and aligned policy documents as siloed individual goals and targets. Establishing clear responsibility for the implementation of specific SDG targets to ensure policy coherence across broad themes is crucial for successful SDG implementation. Studies, for instance in the Netherlands (Lucas *et al*., 2016), have indicated that the SDGs can be aligned within existing policy frameworks providing they are closely coordinated with national policy targets and responsibilities between various ministries.

3   Ireland's Response to Agenda 2030 and the SDGs

3.1   Introduction

The 2030 Agenda (Miola *et al*., 2019; UN, 2015a) recognises that each national government should (1) decide how the SDGs should be incorporated into national planning processes, policies and strategies and (2) set their own national targets guided by the global level of ambition, but taking into account national circumstances (IPU, 2016; IPU and UNDP, 2017). This requires an analysis of how well existing national and sectoral plans/strategies align with the comprehensive scope of the 2030 Agenda and SDGs to examine internal coherence between the different national policy structure levels to avoid "disconnects" and unintended consequences (Figure 3.1) (Scott *et al*., 2015). In Ireland, evaluation of policy is provided by the Irish Government Economic and Evaluation Service (IGEES), which delivers support to the government in progressing major cross-cutting policy challenges such as economic growth, social exclusion, enhancement of service delivery and better policy design. In regard specifically to the SDGs the principal reporting mechanism is the submission of voluntary national reviews (VNRs): Ireland submitted

its first VNR in 2018 (Government of Ireland, 2018), which recognised a "whole-of-government" approach to implementing the SDGs. This is in recognition of the fact that achieving the transformative change set out in the SDGs requires government to adopt new approaches to collaboration across Departments".

In common with other countries, it is unlikely that Ireland can address all 17 goals and 169 targets with the same degree of attention, and this will mean that some prioritisation will be necessary. Studies have suggested that, for developed countries, the three most transformational challenges to relieve the overall anthropogenic pressures on the planet and its natural systems are presented by the goals of sustainable consumption and production (SDG 12), sustainable energy (SDG 7) and combating climate change (SDG 13). Other goals involving significant transformational change in developed countries include the need to achieve more sustainable economies and growth pathways, the goal of greater equality and the goals to achieve better protection of the oceans and of terrestrial ecosystems (Osborn *et al*., 2015). Social problems of poverty, health,
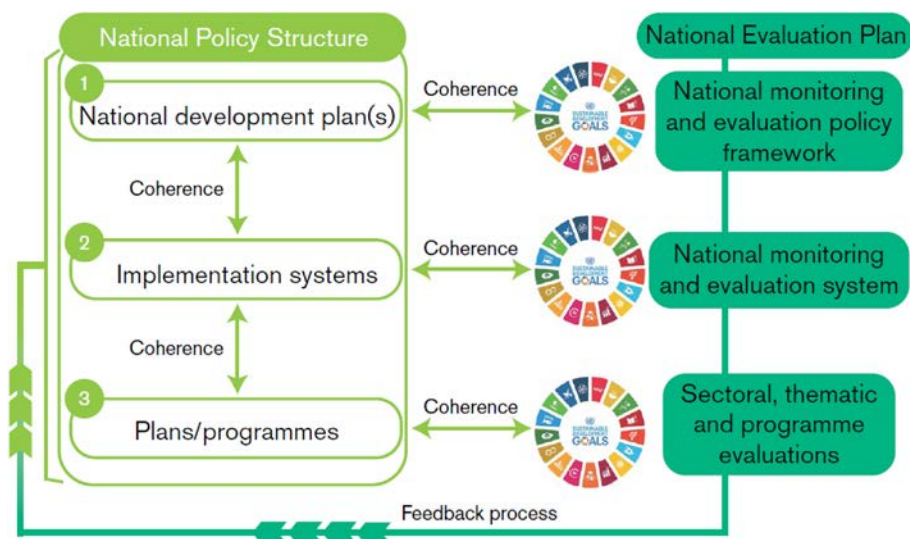
Figure 3.1. Conceptual schematic for integrating the SDGs into national evaluation plans to show how national policy can be linked to, and informed by, an evaluation plan aligned to the 2030 Agenda. The left side shows different levels of national policy and reform agendas. The right side shows the analogous components of a 2030 Agenda national evaluation plan. Source: Geoghegan *et al*. (2019); licensed under CC BY-NC-ND 4.0 (https://creativecommons.org/licenses/by-nc-nd/4.0/).

education and gender issues still persist in developed countries, as well as in developing countries (though to differing degrees), as do all the other issues covered by the SDGs. The universal applicability of the SDGs stresses the need to confront all of these issues comprehensively, while stating that national implementation should "build on existing planning instruments, such as national development and sustainable development strategies, as appropriate" and calling for "practicable ambitious national responses" (Weitz *et al.*, 2015).

3.2 Review of Ireland's Institutional Arrangements in the Context of the SDGs

In support of SDG implementation in Ireland, the Government of Ireland has published *The SDG National Implementation Plan 2018–2020* (DCCAE, 2018), which outlines a "whole-of-government" approach coordinated by the Department for Communications, Climate Action and Environment (DCCAE), now known as the Department of Environment, Climate and Communications (DECC).
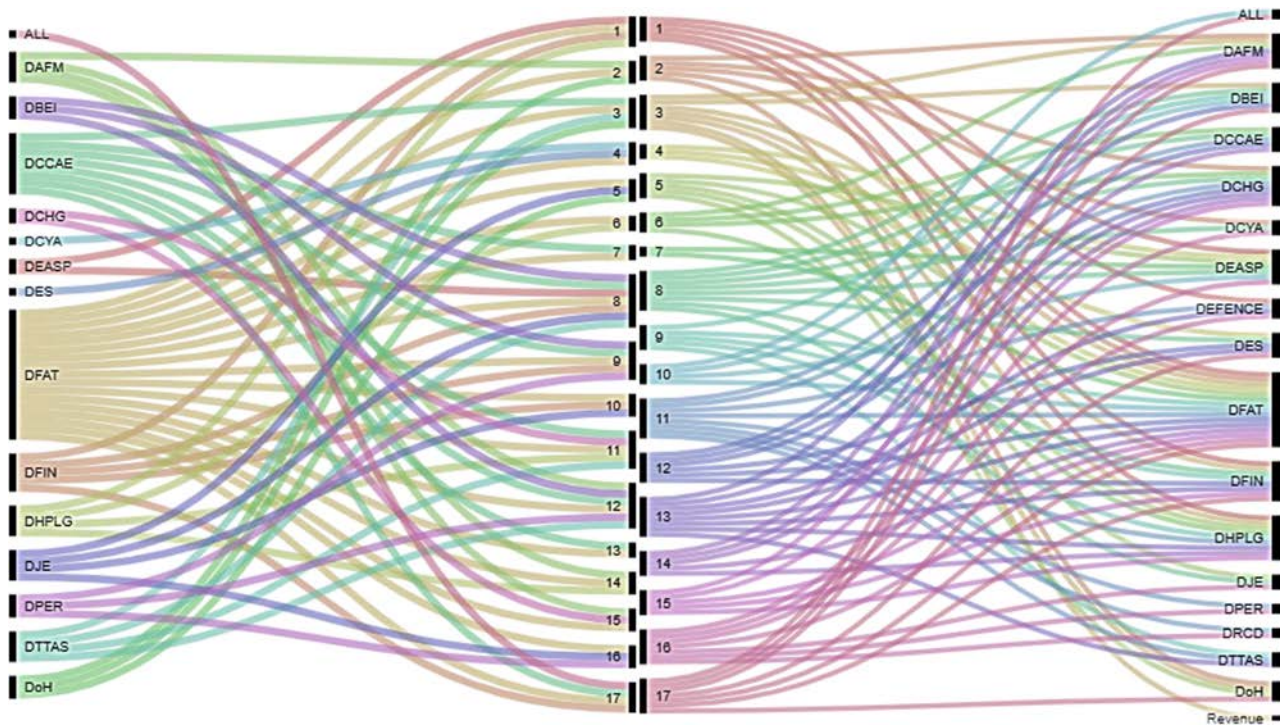
Figure 3.2. Lead government department (left) and stakeholder government departments (right) for each of the 17 SDGs (middle). A total of 14 out of 16 government departments are the lead for an SDG (the Department of Rural and Community Development and the Department of Defence are not a lead department for any SDG). All 16 government departments are represented in the stakeholder group. The Department of the Taoiseach is not included in this analysis as it has overarching responsibility across all 17 SDGs. Note that one SDG (SDG 17) under a "lead" heading and two SDGs under "stakeholder" (SDG 10 and 17) have "all" departments allocated to them for at least one of their targets. Source: authors' elaboration based on DCCAE (2018). DAFM, Department of Agriculture, Food and the Marine; DBEI, Department of Business, Enterprise and Innovation; DCCAE, Department of Communications, Climate Action and Environment; DCHG, Department of Culture, Heritage and the Gaeltacht; DCYA, Department of Children and Youth Affairs; DEASP, Department of Employment Affairs and Social Protection; DES, Department of Education and Skills; DFAT, Department of Foreign Affairs and Trade; DFIN, Department of Finance; DHPLG, Department of Housing, Planning and Local Government; DJE, Department of Justice and Equality; DPER, Department of Public Expenditure and Reform; DTTAS, Department of Transport, Tourism and Sport; DoH, Department of Health.

Ireland has defined a national vision of what constitutes sustainable development, a vision that supports policymaking across all sectors to ensure sound, cohesive and rigorous decision-making:

> Sustainable development is about ourselves. It is about inhabiting a place where there is economic stability based on a model of national progress and development that respects the three core pillars of sustainability: the environment, the economic, and the social. (Government of Ireland, 2012)

This is further elaborated by a 2030 Vision for Ireland that addresses equity and equality coupled with well-being for Ireland's citizens in a competitive, low-carbon, climate-resilient and environmentally sustainable economy contributing to a fairer, more just, more secure, more sustainable world (DCCAE, 2018). Each of the 169 SDG targets has been assigned to a lead government department, and other relevant departments have been identified as stakeholders, to ensure that each takes ownership of those SDGs most relevant to their remit (Figure 3.2).

3.2.1   Organisation

Ireland's implementation plan identifies policy coherence as a strategic priority, and the government has established a Senior Officials' Group on the SDGs, supported by an SDG Interdepartmental Working Group, to ensure coordination across government departments through a whole-of-government approach (OECD, 2019c). The SDG Interdepartmental Working Group aims to facilitate information-sharing, discussion and negotiation on a coordinated response to the SDGs to promote policy coherence. Under this arrangement, line departments retain responsibility for implementing the elements of the SDGs most relevant to their work (DCCAE, 2018).

Figure 3.3 shows that government departments do have both lead and stakeholder alignment to multiple SDG targets, with generally more alignments as stakeholder departments. This suggests that the NIP does attempt to ensure that interlinkages between targets are reflected in policy responsibilities. However, 52 targets (out of 169) do not have an aligned stakeholder department. Looking at the distribution of departments to SDG targets in more detail reveals that most targets have only one or two departments aligned to them, and only five targets are considered to be fully cross-government in outlook (Figure 3.4).

Breaking down this analysis to differentiate between lead and stakeholder departments (Figure 3.4) shows that the vast majority of SDG targets are aligned with only one lead department, and this is also the case for stakeholder alignment: what this outcome suggests
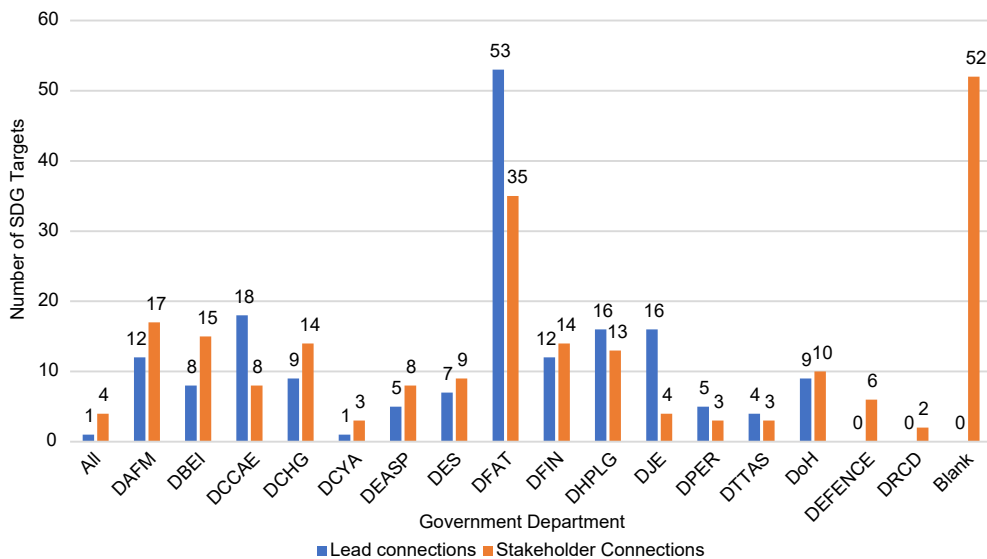
Figure 3.3. Distribution of number of SDG targets aligned to each Government of Ireland department as either the lead or a stakeholder. "Blank" indicates targets (52 out of 169) not aligned to any stakeholder department. "All" indicates targets aligned to all government departments as either the lead or a stakeholder. Source: authors' elaboration based on DCCAE (2018). See Figure 3.2 for expansion of department abbreviations.
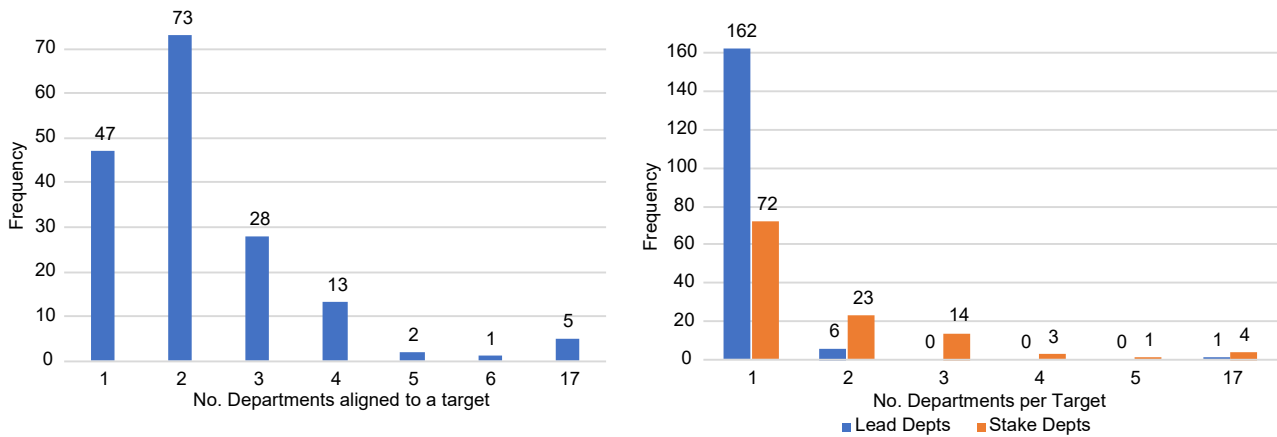
Figure 3.4. Frequency of (left) total number of lead and stakeholder departments aligned per target and (right) numbers of lead and stakeholder government departments aligned to a target. Source: authors' elaboration based on DCCAE (2018).

is that any given SDG target has policy relevance to the remit of, in general, only two or three government departments. When this is assessed against available information, this would appear not to reflect the possible number of policy-relevant interlinkages. For instance, SDG 15 (Life on Land), in theory, has a possible synergistic linkage with 14 other SDGs and trade-off linkages with all 16 other SDGs (Figure 3.5).

If this were taken into consideration in government policy in Ireland, then action to achieve this goal would involve virtually all government departments; however, in the NIP only five government departments are aligned to SDG 15 targets.

It is also relevant to consider how the alignment of departments relates to the pillars of sustainable development, as illustrated by the wedding cake
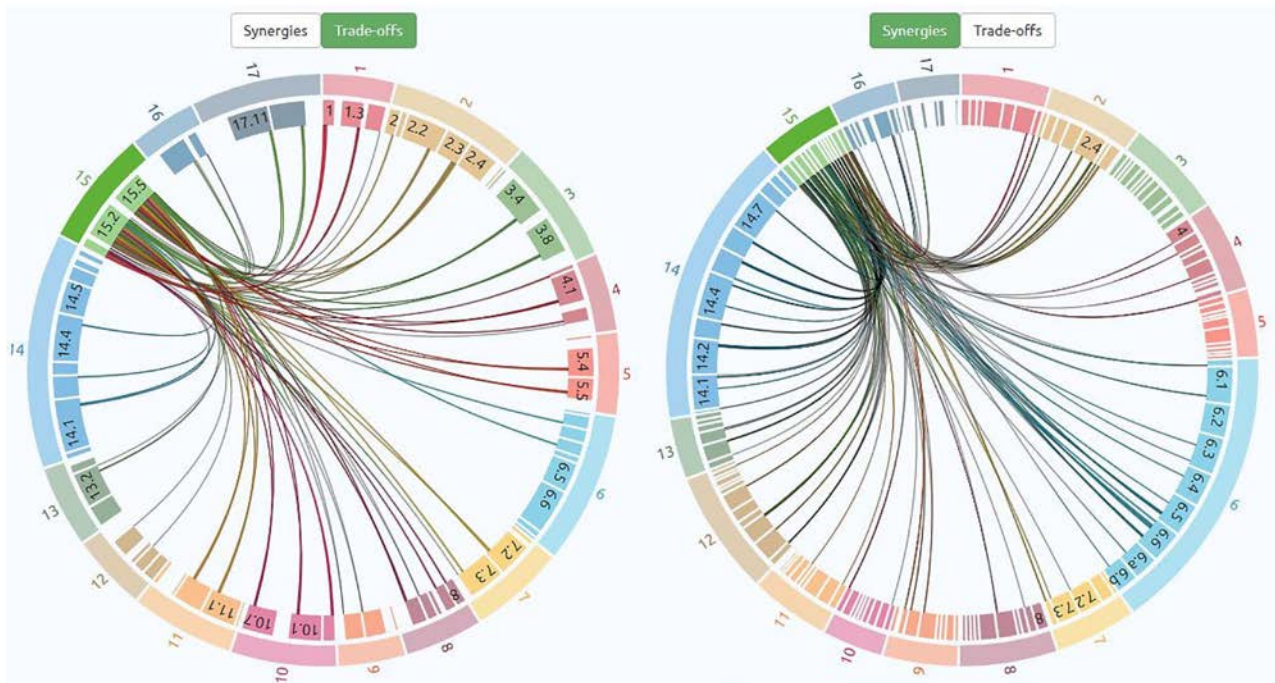
Figure 3.5. The synergistic and trade-off linkages between SDG 15 and its targets and other SDG targets based on a survey of literature. The number of potential linkages illustrates how policies aimed at improving a specific dimension can generate impacts in other dimensions, with a large set of possible cascading positive or negative effects. Interlinkages can be context dependent or general, and can apply locally, nationally or globally. Source: The KnowSDGs platform (http://knowsdgs.jrc.ec.europa.eu/).
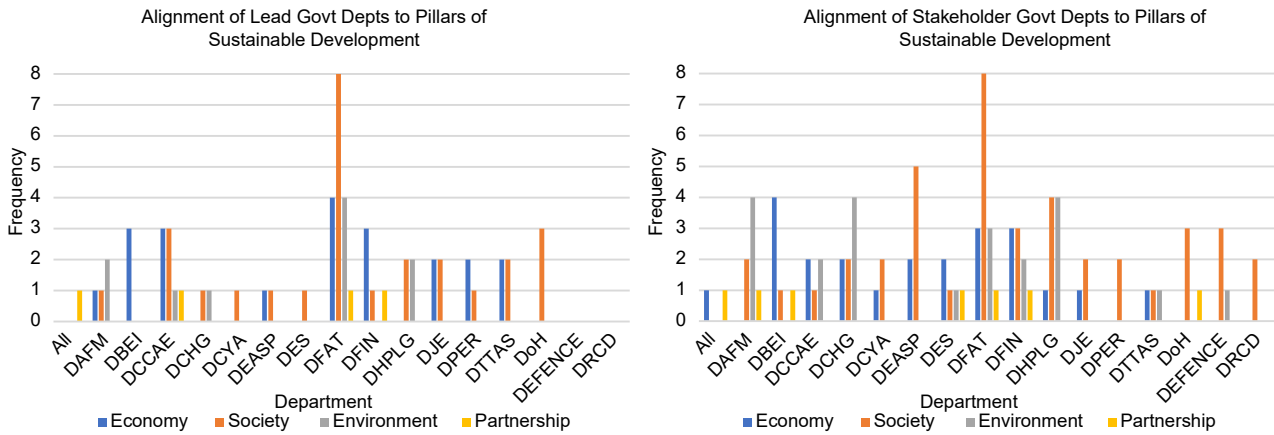
Figure 3.6. The frequency of alignments of (left) lead and (right) stakeholder government departments to the dimensions of sustainable development indicated by the wedding cake arrangement of the SDGs (see Figure 1.1). Source: authors' elaboration based on DCCAE (2018). See Figure 3.2 for expansion of department abbreviations.

organisation of the SDGs (Figure 1.1). Here, analysis shows (Figure 3.6) that economic and societal goals feature more strongly in alignment of departments in lead or stakeholder roles, with the number of departments aligned to these goals being two to four times the number aligned to environmental SDGs and targets.

3.2.2 Policy

Ireland's NIP (DCCAE, 2018) identifies those policy documents that have been assessed to have relevance to the implementation of each of the 169 SDG targets. Although most of the policy documents do not reference the SDGs, as they predated the adoption of the 2030 Agenda, there is a commitment that, when relevant sectoral policies are developed or reviewed, Ireland's commitments under the SDGs will be considered.

In conjunction with the alignment of departments to SDGs and targets, some 118 policy documents have been identified as containing objectives that intersect with the ambition outlined by SDG targets (Annex 2 of DCCAE, 2018). This includes all plans, programmes, strategies and legislation from 16 (out of the 17) government departments and some EU legislation (directives) and regional and international obligations [e.g. the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) and Convention on Biological Diversity (CBD), respectively]. Some of these policy documents specifically address the national setting whereas

others, such as *The National Biodiversity Action Plan*, are an overarching policy document that has actions to implement various EU directives and other national policies, as well as to meet international commitments, some of which are also listed separately for SDG targets.

The alignment/allocation of policy documents and number of departments at target level is variable (Figure 3.7), with variances found in relation to (1) the number of policy documents aligned to any given target; (2) the number of departments aligned to any given target; and (3) the number of departments aligned to any given target with and without policy documents. For instance, in the case of five SDG targets, all departments are identified as relevant stakeholder departments, but none has aligned policy documents, and there are only 11 targets for which all identified departments have aligned policy documents. More often, there is only one policy document aligned to a SDG target even if more than one department is aligned to that target. This suggests that, in most cases, stakeholder departments have an interest in the "outcome" of the implementation of any given SDG target, but this is not necessarily reflected in their departmental remit. It may also mean that there is little facility for a lead department to be able to assess the impact of how its policies affect other policy areas. This shows that, across the two dimensions of alignment to SDG targets, each target is aligned mostly to one or two departments and/or policy documents, restricting the opportunities for integrated and coherent policy linkages across government departments.

No. Policy documents per SDG Target

Frequency of number of Govt. Depts with and without policy documents aligned to Targets
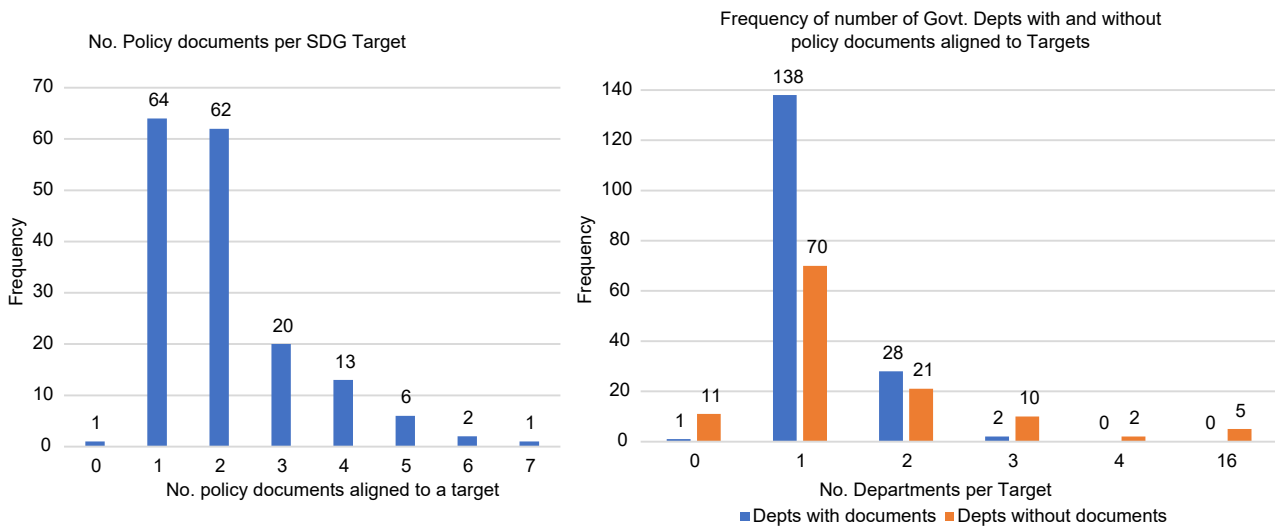
Figure 3.7. Left: The number of policy documents that are aligned to each SDG target. The one instance of zero policy documents reflects the fact that, although the Department of Justice and Equality is identified as a lead department aligned to target 16.3, no policy document is aligned to that target. Right: Alignment of policy documents to SDG targets across both lead and stakeholder departments. In this analysis, "0" (blue) reflects the fact that target 16.3 has a lead department but no policy document identified and (orange) reflects that in only 11 instances are there both lead and stakeholder departments that have policy documents aligned to the target. "A" reflects the number of targets where no stakeholder department is identified against a target. "2" reflects the fact that there are 28 instances where stakeholder departments have a policy document aligned to a target in addition to the lead department. However, in 138 instances ("1") only the lead department has policy documents aligned to the target. Source: authors' elaboration based on DCCAE (2018).

The analysis demonstrates that some targets have only a single responsible department and, although some individual policy documents have very specific alignment to a defined target, others have alignment to multiple SDGs and targets. Implicit in policy coherence is that any given objective should have oversight from more than one policy organisation and/or instrument, otherwise there may be no check whether its action has either a synergistic or trade-off outcome on another objective. In effect, the implementation of any goal is difficult, if not impossible, if it remains the responsibility of one department. It is important to understand how and to what extent policy documents align to more than one SDG and/or target, and whether alignments lead to synergistic or incompatible (trade-off) outcomes, in order to determine how policy coherence can be achieved. The nature of the alignment will also shape whether or not outcomes are beneficial across environmental, social and economic pillars of sustainable development.

A further distinction in the allocation of departments and policy documents to the SDG targets is between their alignment to "outcome" and alignment to "means

of implementation" (MoI) targets (Elder *et al*., 2016). A total of 107 out of the 169 targets are "outcome" oriented, that is they specify the expected outcome to be achieved and circumstances to be attained in terms of real change in people's lives, in the structure and functioning of society and in the health of the planet (Bartram *et al*., 2018; OECD, 2016b). The remaining 62 targets (all SDG 17 targets and 43 targets designated by letters across the other 16 SDGs) are MoI targets, which are process targets, that is targets to do with the means of implementation and the measures to be implemented to facilitate outcomes (UNDP, 2017). The UN defines MoI as the "interdependent mix of financial resources, technology development and transfer, capacity-building, inclusive and equitable globalisation and trade, regional integration, as well as the creation of a national enabling environment required to implement the new sustainable development agenda" (UN inter-agency technical support team, 2014). In Ireland, the distribution of government departments to either outcome or MoI targets shows that, whereas outcome targets are aligned across a diversity of government

departments, MoI targets are predominantly aligned to the Department of Foreign Affairs and Trade (DFAT) and/or the Department of Finance (DFIN) (Figure 3.8). This may reflect a legacy perspective of the Millennium Development Goals (Kindornay, 2019) and a distinction between national-level development, which is often viewed as a predominantly "technical" challenge, and international aspects of development, which are the domain of DFAT; this, in turn, suggests an absence of a strong convergence in recognition of the transboundary impacts of development and the transboundary nature of the SDG framework (Niestroy *et al*., 2019).

3.2.3 *Connection between policy to address SDGs and national planning*

Governments have traditionally reacted to policy problems by proposing and adopting specialised policy measures (Tosun and Lang, 2017) that capitalise on existing policy expertise. The SDGs demand a more integrated response that balances "siloed" policy expertise with a need to link policy areas that lead to coordinated and integrated solutions that exploit

synergies and optimise trade-offs (Persson, 2018). For example, policies aimed at mitigating climate change would be short-sighted if they included only climate policy measures; instead, approaches must also take measures from adjacent policy areas, such as agriculture, development cooperation, economy, energy, environment, trade and transport. The principles of universality and indivisibility of the 2030 Agenda and the SDGs demand such policy integration.

Context for the implementation of the SDGs is provided by *Project Ireland 2040* (DPER, 2018), although explicit alignment between the 10 objectives and the SDGs and targets have yet to be made. As an overarching and cross-cutting strategy for a national development plan, which aims to promote social and economic development alongside environmentally sustainable development, it is disposed towards the SDGs as an enabling and facilitating instrument for policy coherence. This is because policy coherence is oriented towards finding shared ideas or objectives that fit with the SDGs as a network of goals (Le Blanc, 2015b; May *et al*., 2006; Tosun and Lang, 2017; Tosun and Leininger, 2017).
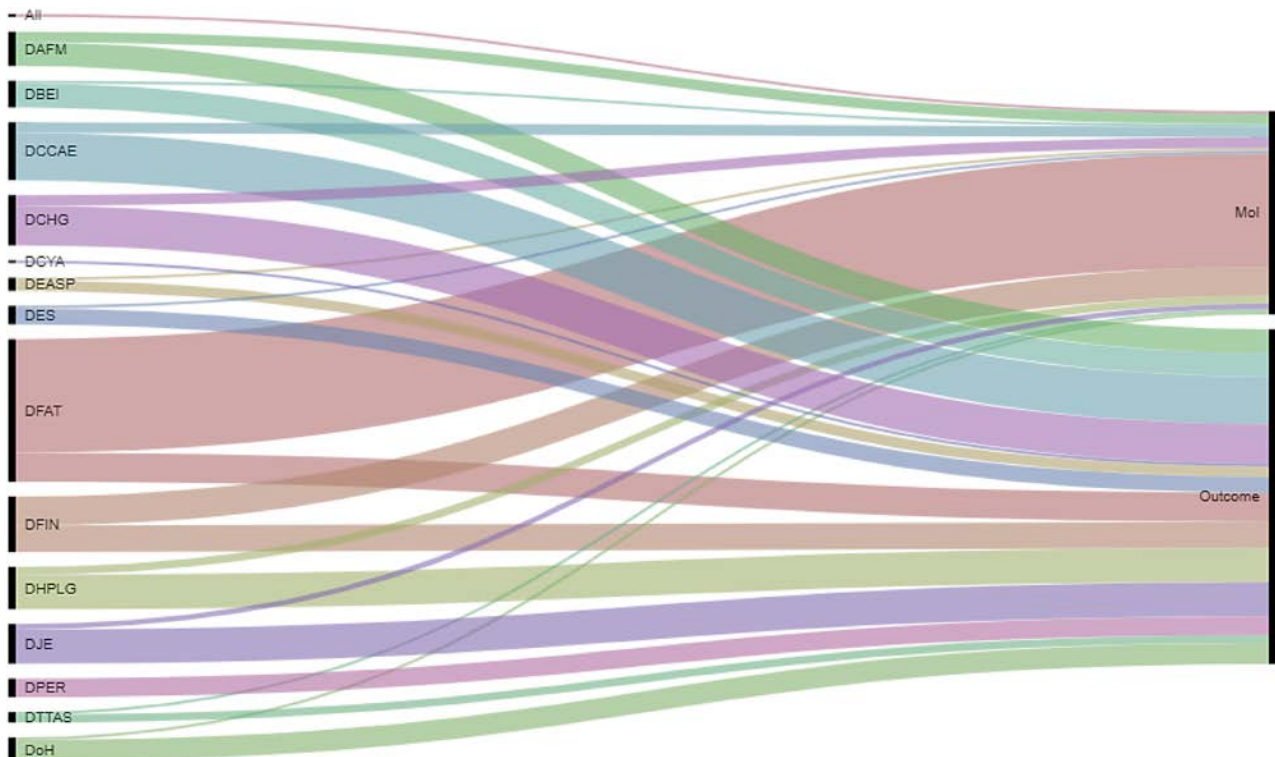
Figure 3.8. Allocation of departments with policy documents to either "outcome" oriented SDG targets or MoI targets. The analysis shows that MoI targets are primarily aligned with DFAT and DFIN, with a more distributed alignment of other departments across "outcome". Source: authors' elaboration based on DCCAE (2018). See Figure 3.2 for expansion of department abbreviations.
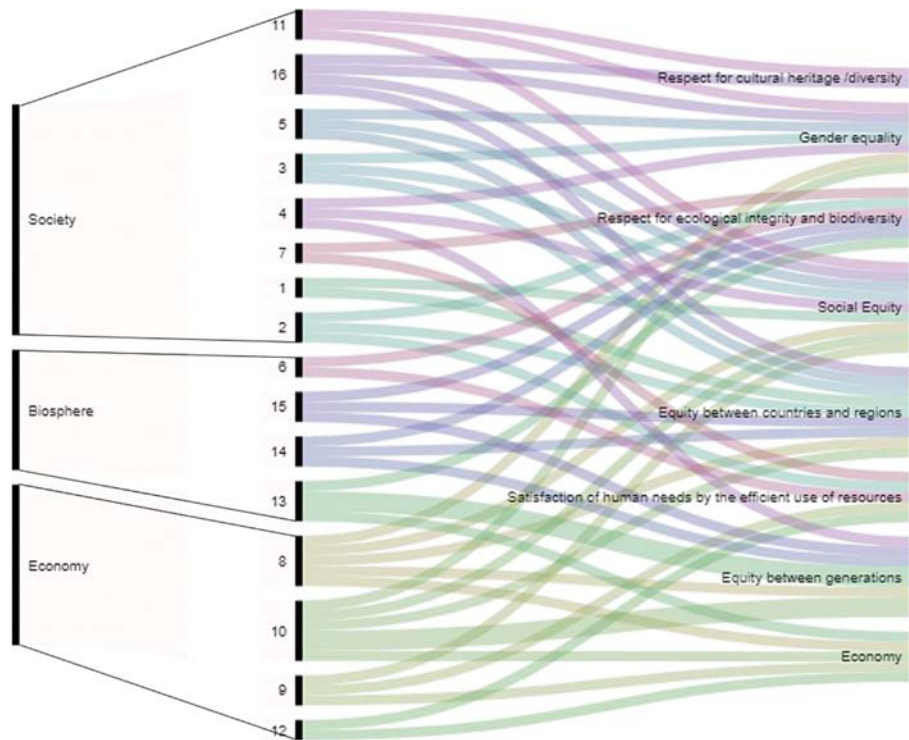
Figure 3.9. Association of SDG wedding cake configuration into economy, society and biosphere categories with SDGs and the categories of sustainable development identified in *Our Sustainable Future: A Framework for Sustainable Development for Ireland* (Government of Ireland, 2012). Source: authors' elaboration based on DCCAE (2018).

The complex equation of synergies and trade-offs across the whole spectrum of policy areas and individual department portfolios covered by the SDGs requires prioritisation and negotiation involving all parts of government (OECD, 2017a) to address increasingly complex economic, social and environmental challenges. In response to this challenge, the SDGs can provide a reference framework for governments to enable them to monitor and assess public policies in the light of the three dimensions of sustainable development, as well as their interrelationships (Giller *et al*., 2018; J. Sachs *et al*., 2019; J.D. Sachs *et al*., 2019). Thus, in terms of use, the cross-cutting nature of the SDGs calls for the creation of "new governance mechanisms". Potentially, it is also an opportunity to generate more actionable knowledge about the interconnections between issues (Hege *et al*., 2019; Moore *et al*., 2013). For instance, taking Ireland's existing strategy for national sustainable development and mapping the eight sustainability objectives to the SDGs and their organisation against economy, social and biosphere labels demonstrates the potential utility of the SDGs to act as an integrator across Ireland's policy instruments where such mechanisms do not currently exist. Figure 3.9 demonstrates how the SDGs can integrate across sustainable development categories. For instance, respect for ecological integrity and biodiversity is linked through SDG 13 to "equity between generations" and "economy". In the same vein, the biosphere grouping of SDGs integrates across five sustainable development categories.

4 The Environment in the Context of the SDGs

4.1 The Environmental Dimensions of the SDGs

The goals in the SDGs contain a variety (or mixture) of targets with varying emphasis across the sustainable development dimensions. The environmental dimension plays a pivotal role in lifting people out of poverty, in ending hunger, in growing economies, in building peaceful, just and inclusive societies, and in promoting the health of our people and this planet (Figure 4.1) (UNEP, 2016). This is reflected in the organisation of the SGDs into a wedding cake configuration (Figure 1.1), whereby the biosphere SDGs underpin and form a foundation for SDGs that have a principally social or economic focus. The integration of environmental policy in the context of policymaking in non-environmental policy sectors, as well as decisions around priorities between environmental and non-environmental sectors, has been reviewed by Boas *et al.* (2016). It is increasingly recognised that there are absolute limits to the planet's carrying capacity, as evidenced by planetary changes in terms of global warming, climate change and biodiversity loss (Hoff, 2017; Steffen *et al*., 2015;
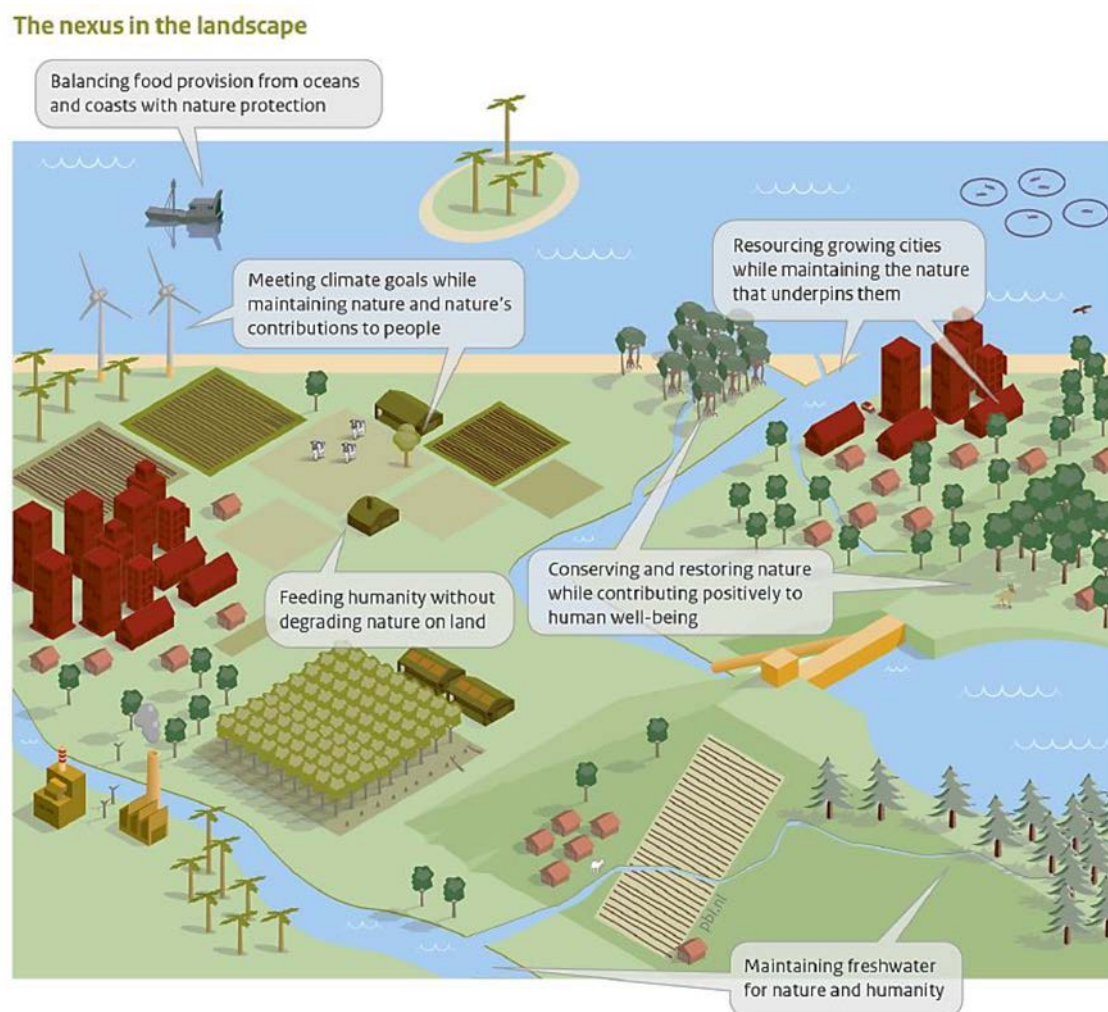
Figure 4.1. The complementary perspectives of the contribution of biodiversity and the environment to sustainability goals and targets (especially the UN's SDGs and the CBD's Aichi targets). Source: IPBES (2019a); licensed under CC BY-NC-ND 4.0 (https://creativecommons.org/licenses/by-nc-nd/4.0/).

UNESCAP, 2015) and Earth's overshoot day[4] (Lin *et al*., 2018; Wackernagel *et al*., 2019). Hence, it has long been recognised that environmental objectives should be integrated into the policy of non-environmental policy sectors (Dalal-Clayton *et al*., 1994; OECD, 2001, 2006), and such objectives are now viewed as essential to ensuring the coherence of the 2030 Agenda and complementarity to existing national and international processes, frameworks, plans and strategies (Zeng *et al*., 2020). Nevertheless, it is also the case that other, shorter-term, social and economic objectives are considered more important than environmental concerns (Lafferty *et al*., 2004; Lafferty and Hovden, 2002, 2003; Moore *et al*., 2013). From the perspective of the environment, synergies and trade-offs in the context of the SDGs arise from issues such as the tragedy of the commons; the fact that it takes a long time to realise environmental benefits compared with short-term goals; the absence of policy coordination and coherence; and scientific uncertainty and stakeholder expectations (Boas *et al*., 2016; Müller *et al*., 2015).

It would be a mistake to think that the SDGs with headline goals addressing water and sanitation (SDG 6), climate change (SDG 13), life below water (SDG 14) and life on land (SDG 15) are the only goals focusing on environmental issues. There remains variation in the literature with respect to the designation of the environmental dimension of the SDGs (e.g. should it include only those targets/ indicators related to the state of the environment or should it also include those related to access to natural resources and/or interactions between environmental indicators and the attainment of other social and economic indicators?). The environment is explicitly recognised in the four SDGs representing the biosphere (SDGs 6, 13, 14 and 15) whereas the recent Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) assessment has considered seven of the SDGs as nature based (SDGs 2, 3, 6, 11, 13, 14 and 15) (IPBES, 2019a). Other SDGs embed a strong environmental dimension (EEA, 2019), for instance in relation to agriculture (SDG 2), health (SDG 3), energy (SDG 7), tourism (SDG 8), infrastructure and industry (SDG 9), cities (SDG 11) and consumption and production patterns (SDG 12). There is variation

in the precise connection between biodiversity and environmental dimensions to the SDGs and targets; Elder and Olsen (2019) identified 73 targets across goals 1–9 and 11–15 as "environmental", whereas UNEP (2019) has identified 72 targets across goals 1–9 and 11–17, the CBD considers that 56 outcome targets across all 17 SDGs have an environmental focus (Secretariat of the CBD, 2016) and the OECD has identified 22 targets across nine SDGs (OECD, 2016b). There is also some variation in which SDGs and what terminology is considered to represent the "environment"; for instance, the "wedding cake" depiction of the SDGs (Figure 1.1) identifies SDGs 6, 13, 14 and 15 as constituting the biosphere elements (Folke *et al*., 2016). The analysis by Elder and Olsen (2019) demonstrates that, in addition to SDGs that reflect the underpinning role of the biosphere to sustainability, the environment has a role in achieving seven of the society goals and three out of the four economic goals. In the context of Europe, 41 out of the 169 targets are considered to address the quality of the physical environment, either directly or indirectly (EEA, 2019).

Recent SDG status reports indicate that implementation of the SDGs with a stronger environmental focus shows limited progress (Figure 4.2) (ADB, 2019; Custer *et al*., 2018). There is a need to better comprehend the impact of policies on the environment, the contribution the environment can make to other sector policies and the importance of delivering the SDGs as an integrated whole. For instance, meaningful action to achieve SDG 12 on "Responsible consumption and production" requires action on environmental goals and targets – such as SDG 14 on "Life below water" and SDG 15 on "Life on land" – and significant strengthening of national responses to meet them. Taking a whole-of-government approach is a key mechanism to avoid trade-offs between environment and socioeconomic priorities and ensure that the environment plays a pivotal role in lifting people out of poverty, in ending hunger, in growing economies, in building peaceful, just and inclusive societies, and in promoting the health of people and the planet (Scharlemann *et al*., 2016; UNEP, 2016).

The review of Ireland's portfolio of policy documents, as identified in the 2018 Ireland NIP (DCCAE,

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4   https://www.overshootday.org/ (accessed 13 July 2021).
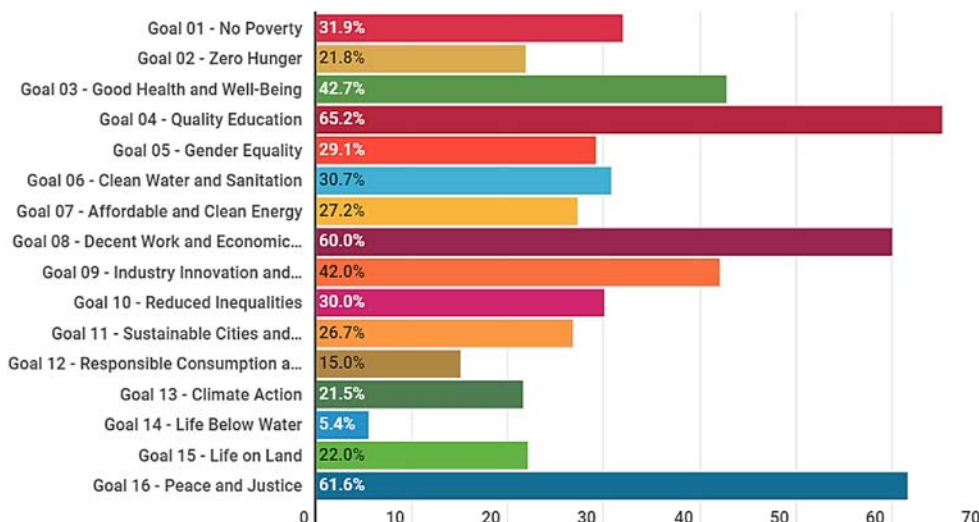
Figure 4.2. How frequently does a global goal appear in leaders' top priorities? Percentage of respondents who identified a goal as one of their top six priorities. Source: Custer *et al*. (2018).

2018), is that, across all SDGs, 18 of Ireland's policy documents, three EU directives, one regional instrument and four international agendas administered by nine (out of 17) government departments (five as both lead and stakeholder and four others as stakeholder only) align with the environmental (biosphere) SDGs 6, 13, 14 and 15 (Figures 4.3 and 4.4). In addition:

- There is a relatively even spread of alignments across the "environment" departments of the Department of Agriculture, Food and the
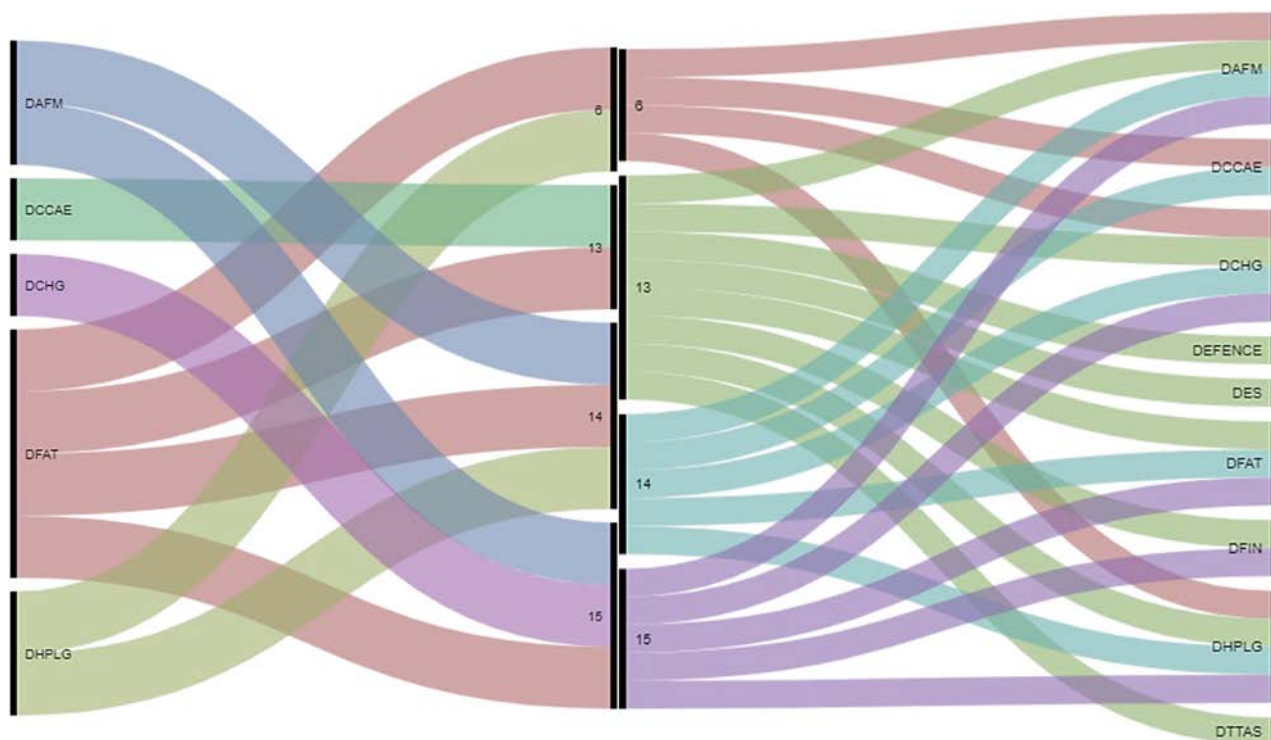
Figure 4.3. Distribution of the five lead departments to the four environmental (biosphere) SDGs (left) and the nine stakeholder departments (right). Source: authors' elaboration based on DCCAE (2018). See Figure 3.2 for expansion of department abbreviations.
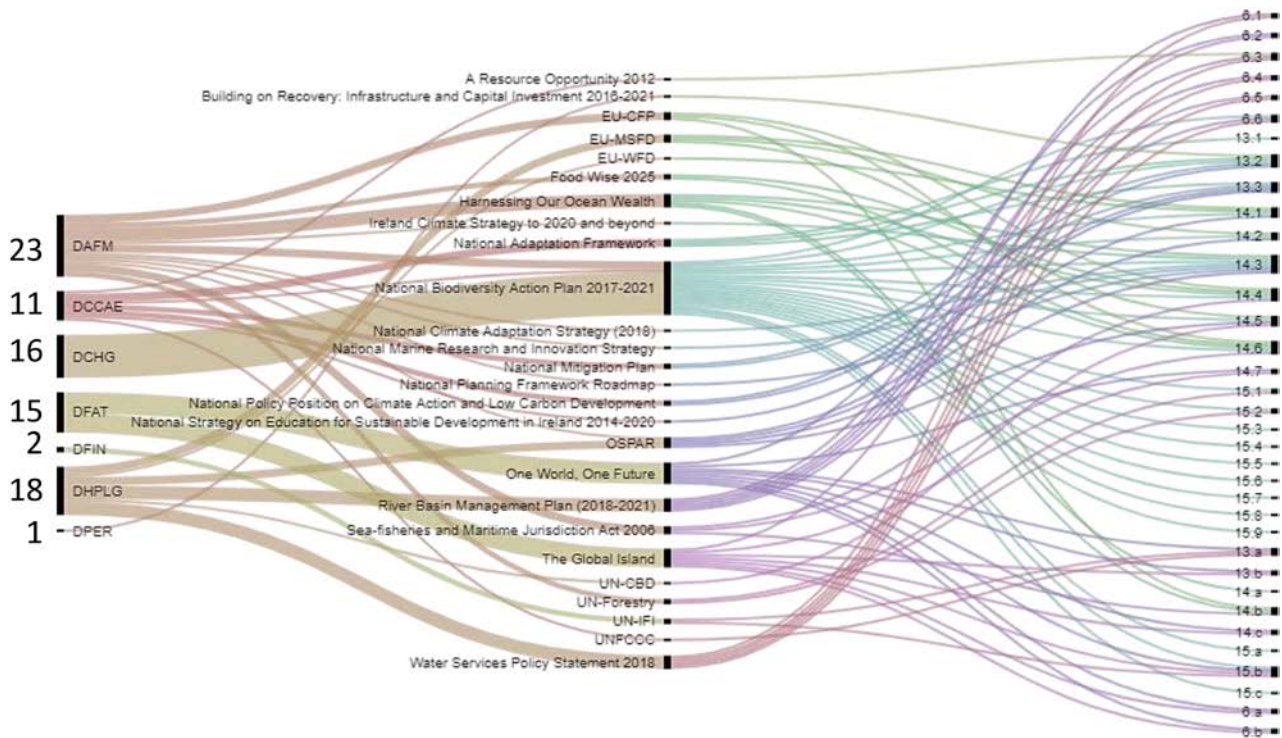
Figure 4.4. Alignment of Government of Ireland policy documents and their responsible departments with the four biosphere SDGs. The numbers indicate the number of targets aligned to each government department. Source: authors' elaboration based on DCCAE (2018). See Figure 3.2 for expansion of department abbreviations.

Marine (DAFM), Department of Communications, Climate Action and Environment (DCCAE), Department of Culture, Heritage and the Gaeltacht (DCHG) and Department of Housing, Planning and Local Government (DHPLG).

- The Department of Foreign Affairs and Trade (DFAT) is predominantly aligned with MoI targets.
- The *National Biodiversity Action Plan 2017–2021* has the most connections (20) to SDG targets – all others have fewer than eight connections across the 35 targets that comprise SDGs 6, 13, 14 and 15.
- Two stakeholder-only departments have policy documents aligned to the biosphere targets.
- Most policies (nine) are connected to only one target: only five policy documents from three departments and the EU Common Fisheries Policy are aligned to outcome and MoI targets.

To fully inculcate the environment as part of an analysis of the SDGs it is necessary to look beyond the biosphere SDGs and consider how the environment influences, and is influenced by, other SDG targets. Using the analysis of Elder and Olsen (2019), who identified 73 targets as

"environmental", 63 policies or policy instruments implemented by 12 government departments are aligned to the implementation of environmental dimensions of the SDGs (Figures 4.5 and 4.6). The analysis shows that, in common with the biosphere SDGs, the distribution of alignment of policy documents and government departments to targets is uneven and most alignments are one to one.

It is important to extend any analysis of SDGs and the environment across the full suite of SDGs to recognise how the environment supports social and economic objectives, as well as how social and economic objectives can have an impact on the environment (Stafford-Smith *et al*., 2017). Such bidirectional association requires an understanding of the interlinkages and interdependencies across SDGs, otherwise perverse outcomes may arise whereby human development may undermine the long-term viability of the planetary system to support humanity (Stafford-Smith *et al*., 2017). The presence of 42 MoI targets across 16 of the goals and a 17th goal entirely devoted to MoI recognises the need for systemic implementation. Mapping associations and relationships between SDGs, targets, policy documents and assigned government
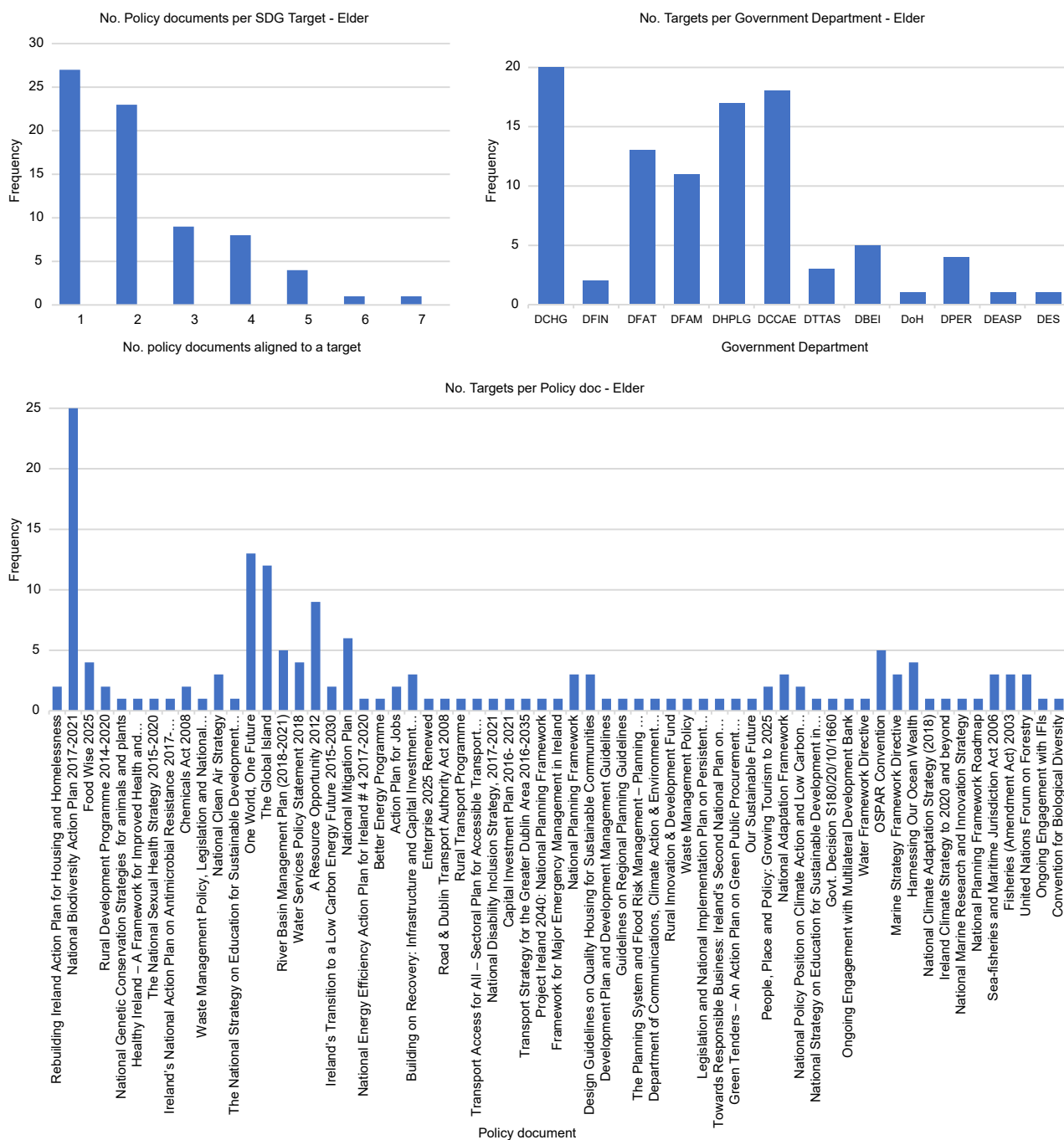
Figure 4.5. The number of policy documents aligned to each of the "environmental" targets (top left), the number of targets aligned by each government department (top right) and the frequency each policy document is aligned to targets (bottom). Based on the analysis by Elder and Olsen (2019). See Figure 3.2 for expansion of department abbreviations.

departments requires a deeper analysis to support more coherent and effective decision-making, and to better facilitate follow-up and monitoring of progress (ICSU, 2017a). Understanding possible trade-offs as well as synergistic relations between the different SDGs is crucial for achieving long-lasting sustainable development outcomes. Recent publications have also stressed the need to address the SDGs in the context of policy pathways at the national level and across

multiple dimensions (Moyer and Bohl, 2019) to avoid tensions and trade-offs that will hinder the achievability of the SDGs (Allen *et al.*, 2019b).

4.2   Identifying the Biosphere in SDG Targets Relevant to Ireland

The SDGs do not exist in a policy vacuum, and it is important that their implementation, including
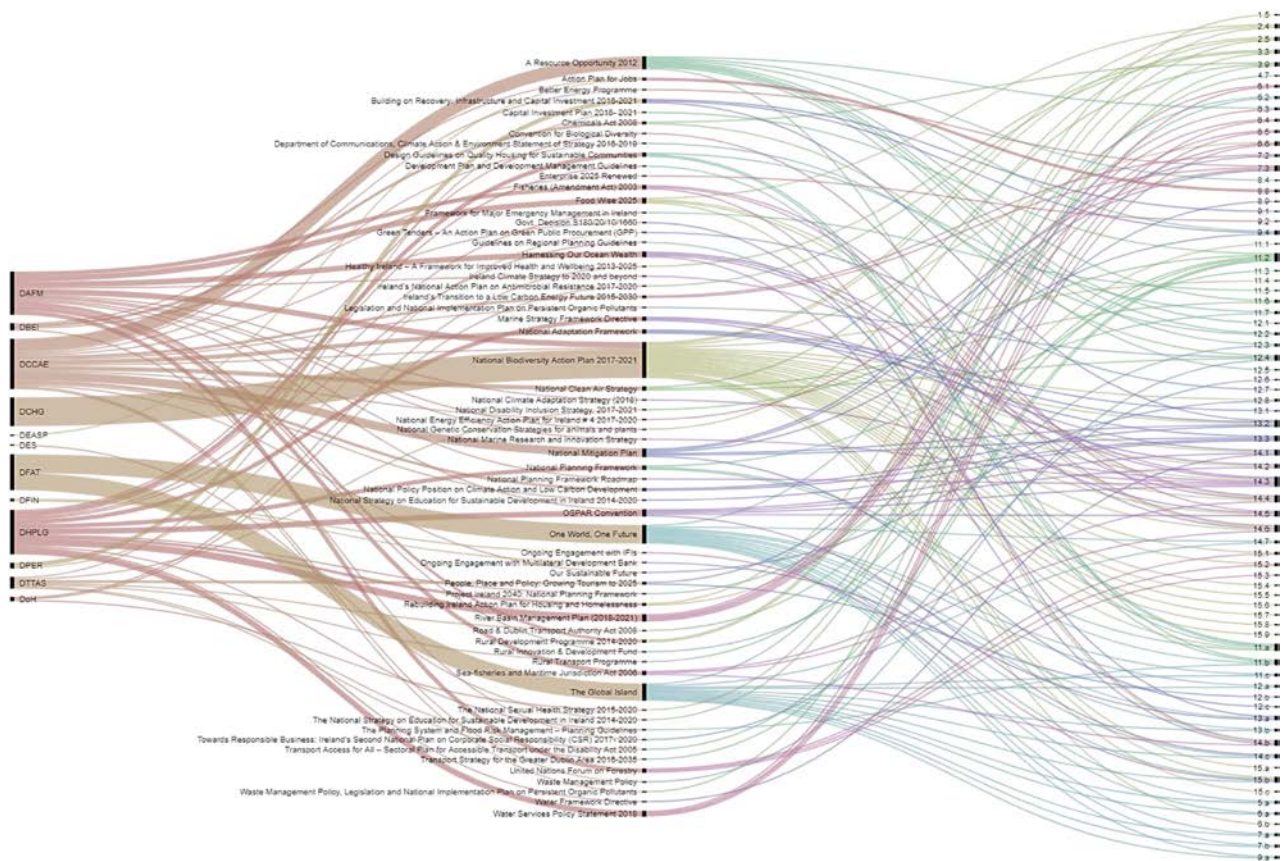
Figure 4.6. Government departments/agencies with a role in implementing 73 "environmental" SDG targets and the policies they operate, which are mapped to those targets (after the analysis of Elder and Olsen, 2019). Source: authors' elaboration based on DCCAE (2018). See Figure 3.2 for expansion of department abbreviations.

those aspects that derive from and contribute to environmental SDG targets, takes cognisance of the national development context. The SDGs are relevant to the context of *Project Ireland 2040* (DHPLG, 2018; DPER, 2018), which demonstrates significant alignments in areas such as climate action, clean energy, sustainable cities and communities, and economic growth, although a detailed mapping exercise has not yet been undertaken. The SDGs have also been shown to be an important enabler of countries' obligations under the Paris Agreement.

To explore how the environment interacts with meeting objectives of national planning and climate action, the SDGs4I project identified a subset of SDG targets, *Climate Action Plan 2019* actions and *Project Ireland 2040* objectives that are relevant to the environmental setting and context of Ireland. The subset of SDG targets could be used to explore the nature of their interlinkages to each of the policy areas to begin a process whereby each of the SDG subset targets can be interrogated as a policy enabler and determine

whether or not aligned policy instruments support these cross-cutting national plans for development and climate action. To support this process, a tool has been developed to facilitate consultation between policymakers and decision-makers; this tool is outlined in Chapter 5.

Consultations with the DCHG and EPA has identified a preliminary core set of SDG targets that are relevant to the environmental setting and context of Ireland (Figure 4.7 and Table 4.1). The list includes outcome targets from society SDGs (2, 7 and 11), economic SDGs (8 and 9) and the four biosphere SDGs, but no MoI targets, and is dominated from a policy context by two policy documents, namely the *National Biodiversity Action Plan 2017–2021* and *A Resource Opportunity 2012* (Ireland's waste management policy), as well as climate action-focused documents (Figure 4.8). These documents, respectively, reflect the support services that originate from biodiversity and the impact of socioeconomic activity on maintenance of biodiversity services as well as the longer-term threats framed
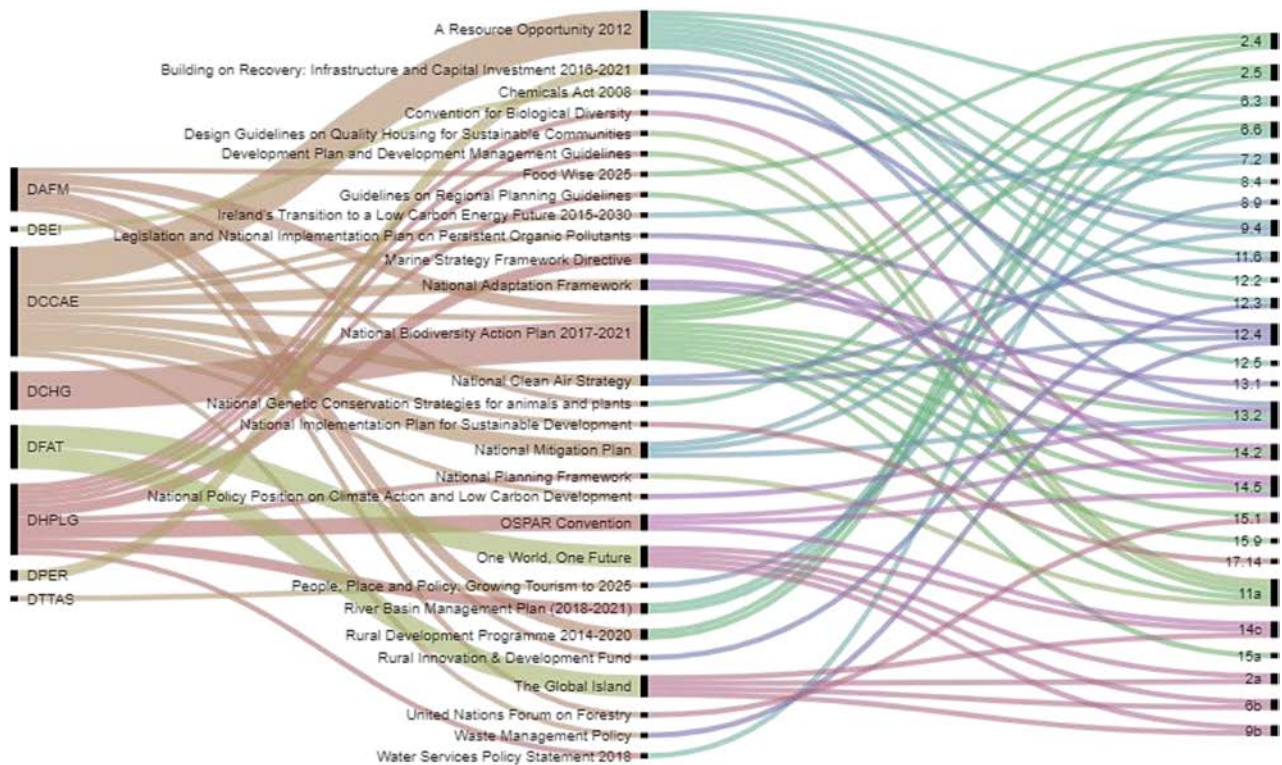
Figure 4.7. Departments and policy documents aligned to SDG targets identified as having relevance for an environmental context in Ireland. Source: authors' elaboration based on DCCAE (2018). See Figure 3.2 for expansion of department abbreviations.

by climate change. It should be noted that, since the publication of the NIP, a number of new policy documents have been published, especially in the area of climate action and international development, and those on climate action have been included in subsequent analysis by the project.

This portfolio of SDG targets with the addition of relevant MoI targets that influence national implementation of SDGs, namely 2a, 6b, 9b, 11a, 14c, 15a and 17.14, could form the basis for future analysis of the role the environmental plays in relation to development plans and other areas of policy in Ireland. The absence of some MoI targets directly connected to identified outcome targets reflects the fact that there is often a weak connection between outcome targets and MoI targets (Bartram *et al*., 2018), especially in relation to national-level implementation of SDGs and the connections between SDGs and targets (Liu *et al*., 2018). This core set of selected SDG targets also matches the significant literature that has explored the water–energy–food nexus with sustainable development (Al-Saidi and Elagib, 2017; Kurian, 2017; Terrapon-Pfaff *et al*., 2018; Weitz *et al*., 2014, 2017).

Identifying specific SDGs and targets relevant to a national context, and their connection to policy, provides an opportunity to explore how the SDGs connect across "traditional" social, economic and environmental policy domains, thereby offering a prospect to demonstrate how activity in one policy domain leads to either synergistic or trade-off outcomes in another policy domain. Such an approach is addressed in the following subsections using Ireland's *Climate Action Plan 2019* and national development plan (*Project Ireland 2040*) as examples.

4.2.1 Using the SDGs to demonstrate the role of the environment in Ireland's climate action

The environment, and its constituent elements of biodiversity and ecosystems, has a complex circular relationship to climate change; these elements provide natural solutions that build resilience to the impacts of climate change and contribute to the wider objectives of the SDGs (Korn *et al*., 2019; Midgley *et al*., 2012), while climate change is recognised to have a significant impact on biodiversity change from local to

Table 4.1. SDG outcome targets identified by the DCHG-NPWS and EPA as being relevant to the environmental context of Ireland with MoI targets identified by the SDGs4I project

Target number	Description	Department (lead/stakeholder)
2.4	By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	**DAFM**/DFAT and DCHG
2.5	By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilisation of genetic resources and associated traditional knowledge, as internationally agreed	**DAFM**/DFAT, DCHG
6.3	By 2030, improve water quality by reducing pollution, eliminating dumping and minimising release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	**DHPLG**/DCCAE
6.6	By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	**DHPLG**/DAFM, DCCAE and DCHG
7.2	By 2030, increase substantially the share of renewable energy in the global energy mix	**DCCAE**
8.4	Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-year framework of programmes on sustainable consumption and production, with developed countries taking the lead	**DCCAE**/DFIN
8.9	By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	**DTTAS**/DCHG
9.4	By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	**DCCAE**/DFIN and DBEI
11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	**DCCAE**/DTTAS and DHPLG
12.2	By 2030, achieve the sustainable management and efficient use of natural resources	**DCCAE**/DCHG
12.3	By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	**DAFM**/DCCAE and DFAT
12.4	By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimise their adverse impacts on human health and the environment	**DCCAE**/DBEI
12.5	By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	**DCCAE**
13.1	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	**DCCAE**/DHPLG, DFAT, DEFENCE and DCHG
13.2	Integrate climate change measures into national policies, strategies and planning	**DCCAE**/DAFM, DTTAS, DHPLG and DCHG
14.2	By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	**DHPLG**/DCHG and DAFM
14.5	By 2020, conserve at least 10% of coastal and marine areas, consistent with national and international law and based on the best available scientific information	**DHPLG**/DCHG and DAFM
15.1	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	**DAFM**/DCHG
15.9	By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts	**DCHG**
2a	Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	**DFAT**/DAFM
6b	Support and strengthen the participation of local communities in improving water and sanitation management	**DFAT**/DHPLG

Table 4.1. Continued

Target number	Description	Department (lead/stakeholder)
9b	Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, *inter alia*, industrial diversification and value addition to commodities	**DFAT**
11a	Support positive economic, social and environmental links between urban, periurban and rural areas by strengthening national and regional development planning	**DHPLG**/DCHG
14c	Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS, which provides the legal framework for the conservation and sustainable use of oceans and their resources, as recalled in paragraph 158 of *The Future We Want*	**DFAT**/DAFM and DHPLG
15a	Mobilise and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems	**DCHG**/DAFM
17.14	Enhance policy coherence for sustainable development	**DCCAE and DFAT**/All departments

See Figure 3.2 for expansion of department abbreviations.

NPWS, National Parks & Wildlife Service; UNCLOS, United Nations Convention on the Law of the Sea.

global scales (Sala *et al*., 2000; Willis and Bhagwat, 2009).

Climate change is a threat multiplier that exacerbates change across many of the SDGs, as well as compromising the contribution that environmental factors make towards them (Ansuategi *et al*., 2015; IPCC, 2018). Climate change is a direct driver of changes in nature and its contributions to people that will increase in coming decades (IPBES, 2019b). Scenarios show that meeting the SDGs and the 2050 Vision for Biodiversity depends on taking into account climate change impacts in the definition of future goals and objectives. To achieve the 2050 Vision for Biodiversity (CBD, 2017; Gonzales-Zuñiga *et al*., 2018) and SDG targets, implementation is likely to be more effective, and could be enhanced, if the impacts of climate change are factored into actions of both (Hammill and Price-Kelly, 2017; Stechow *et al*., 2016; UNDP, 2018). The 2030 Agenda complements the Paris Agreement by linking climate mitigation and adaptation with other sustainable development challenges across its 17 goals (Brandi *et al*., 2017; Dzebo *et al*., 2017, 2019; Shine, 2018). Many of the SDGs, not just SDG 13, include text and targets that are relevant to addressing climate change such that the SDGs and their targets can be regarded as enablers of policy integration because they address cross-sectoral and policy linkages that can bring shared benefits (Le Blanc, 2015b; Murphy, 2019; Murray *et al*., 2017; UNCC and UNDESA, 2019; Shine, 2017; UNFCCC, 2017) (Figure 4.9). The Intergovernmental Panel on Climate Change (IPCC)

report on 1.5°C pathways indicates robust synergies, particularly for the SDGs 3 (health), 7 (energy), 12 (responsible consumption and production) and 14 (oceans). For SDGs 1 (poverty), 2 (hunger), 6 (water) and 7 (energy), there is a risk of trade-offs or negative side-effects from stringent actions taken to minimise the damage caused by climate change by keeping the level of global warming to 1.5°C (Roy *et al*., 2018).

The deep socio-technological transformation implied by strong climate action (SDG 13) could slow economic growth, negatively change industrialisation and exacerbate inequality and poverty (*Nature Climate Change*, 2019). International climate change policies, as exemplified by the Paris Agreement, and the 2030 Agenda, are fundamentally pursuing the same objective – a better, healthier and more resilient life for present and future generations. SDG 13 (climate action) has interactions and interlinkages with many targets of other SDGs, as well as alignment to features of the Paris Agreement and the Sendai Framework (Murphy, 2019; UNDESA, 2019). The link between SDGs and climate change reflects the fact that many global goals, from poverty eradication and ending hunger to conserving biodiversity and protecting our oceans, will be unattainable if climate change mitigation, adaptation and resilience building fail (UNCC and UNDESA, 2019). These interdependencies present a challenge to the reconciliation of policy agendas aimed at achieving and sustaining high standards of well-being with the need to move swiftly and decisively to decarbonise

Policy docs per Target - NPW

No Targets per Govt Dept - NPW

No SDG Targets per Policy document - NPW
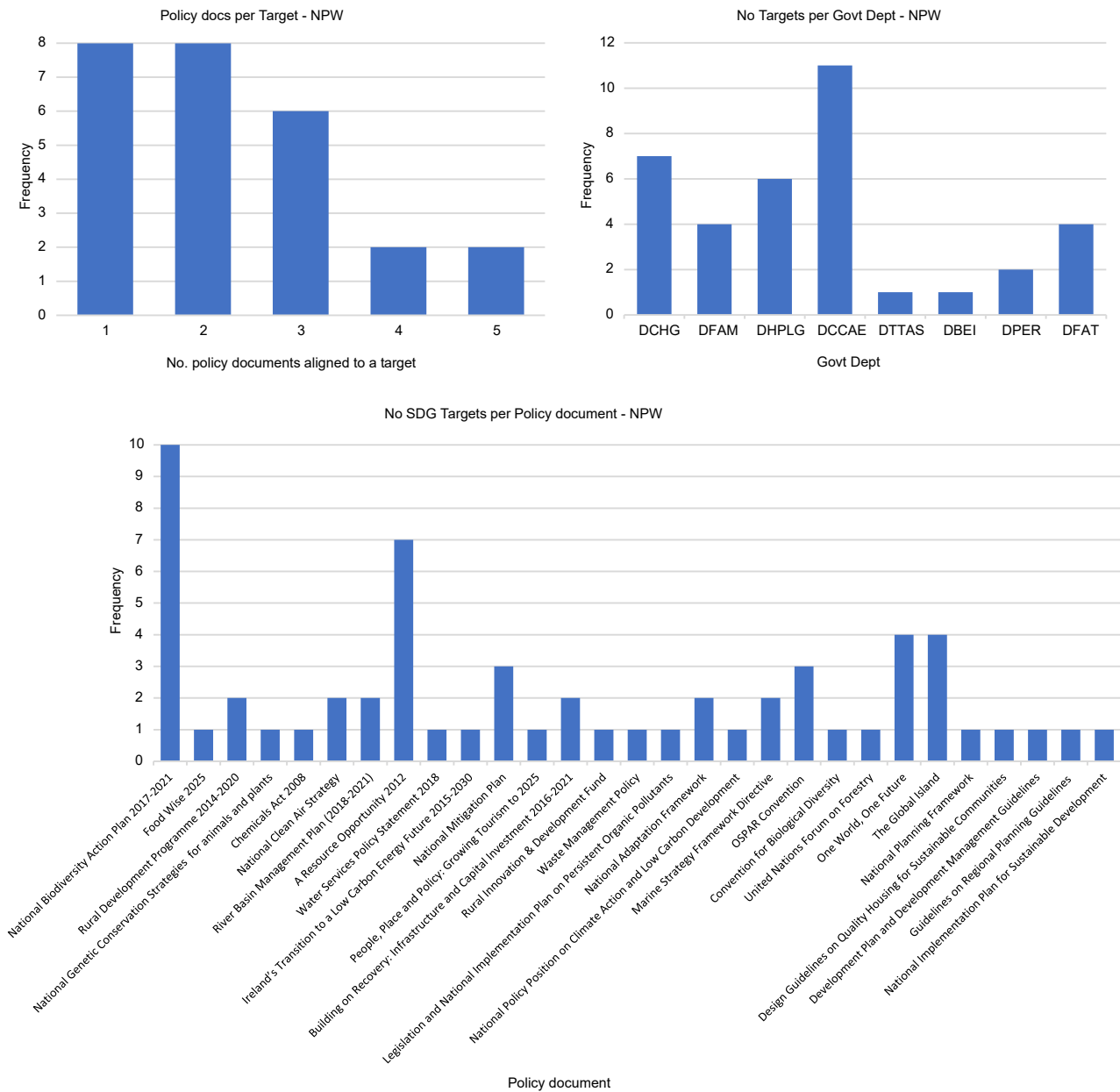
Figure 4.8. The number of policy documents aligned to "environmental" targets considered to be most relevant to Ireland by DCHG-NPWS (top left), the number of targets aligned by each government department (top right) and the frequency with which each policy document is aligned to targets (bottom). Source: authors' elaboration based on DCCAE, 2018. NPWS, National Parks & Wildlife Service. See Figure 3.2 for details on department abbreviations.

economies and take other measures to protect the health of the planet in the interest of future generations. In most cases, progress towards specific socioeconomic goals and targets reinforces progress towards climate goals, and vice versa, but in some cases there may be difficult trade-offs to be addressed (e.g. providing universal, affordable energy access while transitioning rapidly away from carbon-based energy; expanding transportation infrastructure without increasing greenhouse gas

emissions apace). An example of how climate change is inculcated in the structuring of the SDGs is provided by target 8.1, which emphasises strong economic growth performance, which, if pursued without regard for other targets under SDG 8, would most likely drive increased carbon emissions. SDG target 8.4, on the other hand, calls for the decoupling of growth from environmental degradation, which would moderate, if not neutralise, emissions growth. This emphasises how issues around agriculture, energy and water are
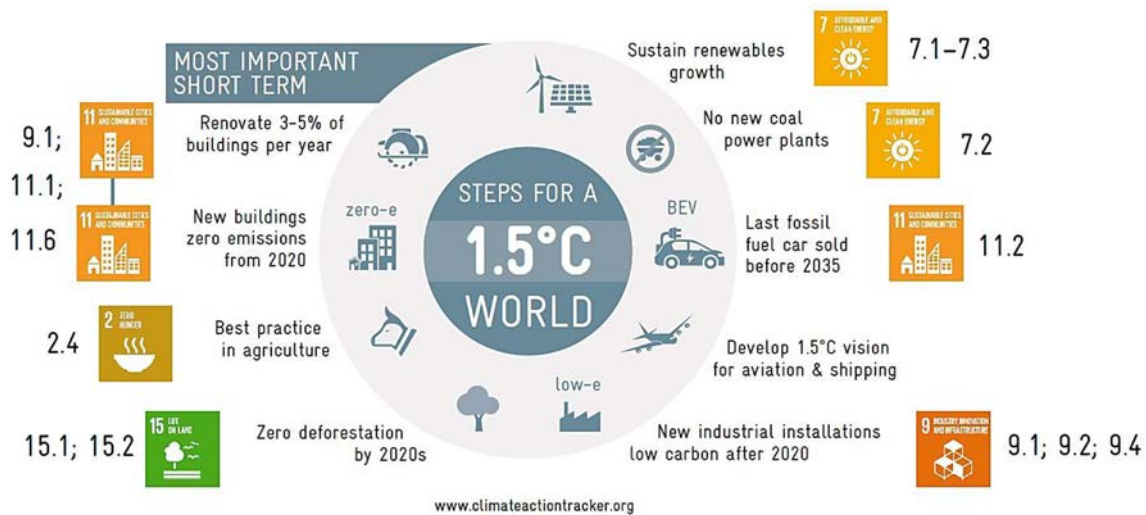
Figure 4.9. Short-term connections between possible climate mitigation and adaptation options with SDG implementation. Source: https://www.wri.org/publication/connectingthedots-ndc-sdg (accessed 18 June 2021); licensed under CC BY-NC-ND 4.0 (https://creativecommons.org/licenses/by-nc-nd/4.0/).

key for combating climate change and sustainable development. The same is true for SDG 11, which reflects the importance of urbanisation both for achieving the 2030 Agenda and for the success of the Paris Agreement, with over 70% of all greenhouse gas emissions generated by towns and cities (Dzebo *et al*., 2017, 2019).

Ireland's *Climate Action Plan 2019* (Government of Ireland, 2019) sets out the national response to the diverse impacts being experienced now and into the future for Ireland's environment, society, economy and natural resources. The plan also reflects Ireland's commitment to achieving the SDGs and SDG target 13.2 to "Integrate climate change measures into national policies, strategies and planning" and identifies 182 actions to be undertaken. In support of developing a better understanding of how these actions interact with the environment, a subset of 15 actions have been identified by the DCCAE to have particular relevance in the context of SDG targets aligned to Ireland's environment supporting a coherent approach to dealing with development and sustainability challenges (Table 4.2).

4.2.2 Using the SDGs to demonstrate the role of the environment in Ireland's national planning

Ireland's commitment to the 2030 Agenda and the SDGs (DCCAE, 2018; Government of Ireland, 2018), in common with that of many other countries

(CDP, 2019; Chimhowu *et al*., 2019), recognises both the challenge and opportunity for integration into national policy frameworks and planning. The 2030 Agenda (UN, 2015a) calls for each government to "decide how these aspirational and global targets should be incorporated into national planning processes, policies and strategies" and states that "cohesive nationally owned sustainable development strategies, supported by integrated national financing frameworks, will be at the heart of our efforts". One lesson learned from the first cycle of VNRs was the need for an increased focus on interrelations between goals (UNHLPF, 2019), which requires national planning systems to bring together information on themes corresponding to each of the SDGs and identify areas where policies need to work better together, for instance, the possible impact of a national biofuel target on agricultural markets and land use.

Ireland's vision for economic, environmental and social progress in the context of a growing population through 10 strategic outcomes is articulated in *Project Ireland 2040. National Development Framework* (DHPLG, 2018) and *Project Ireland 2040. National Development Plan 2018–2027* (DPER, 2018) (Figure 4.10). The plan recognises that transforming the socio-technological systems that underpin production and consumption patterns in sectors such as agriculture, transport and energy is essential if human activities are to be brought back within ecological boundaries (Meadowcroft, 2009). This

Table 4.2. Environmentally connected actions from the *Climate Action Plan 2019*

Action number	Description
Carbon pricing and cross-cutting policies	
Action 9	Reform the Public Spending Code to increase the shadow price of carbon and introduce more robust consideration of climate impacts in project appraisal
	a) Review the operation of the revised Public Spending Code and evaluate the scope for further environmental reforms
Action 10	Develop a strategy on mobilisation of private sector investment to meet our climate targets
	a) The Ireland Strategic Investment Fund will work with the food and agriculture sectors to evaluate the role agriculture can play in achieving our climate change targets, including new technologies, farming practices and assessment of solutions that are proven in other countries, such as anaerobic digesters
Action 15	Implement the National Planning Framework (NPF)
	a) Continue to deliver all other national policy objectives set out in the NPF, to work towards achieving the 10 shared national outcomes as part of *Project Ireland 2040*
Electricity	
Action 25	Facilitate the development of offshore wind, including the connection of at least 3.5 GW of offshore wind, based on competitive auctions, to the grid by 2030. We will establish a top team to drive this ambition
	a) Finalise drafting of a common planning procedure for all DCCAE policy area development within the scope of Marine Planning and Development Bill
	b) Use the National Marine Planning Framework and associated processes to resolve conflicts between competing sectoral objectives (e.g. including renewable energy and others)
Built environment	
Action 65	Develop and establish a climate action toolkit and audit framework for local authority development planning to drive the adoption of stronger climate action policies in relation to the patterns and forms of future development
	a) Develop the *Project Ireland 2040* implementation report and project tracker to include progress in supporting climate action objectives
	b) Publish updated statutory guidelines under Section 28 of the Planning Act on local authority development plans setting out the appropriate requirements for integration of climate action considerations in the preparation of the plan
Agriculture, forestry and land use – Irish agriculture vigorously adopting carbon abatement opportunities and the food industry encouraging this transformation	
Action 101	Bring forward proposals for the introduction of measures to implement the full suite of options set out in the June 2018 Teagasc report *An Analysis of Abatement Potential of Greenhouse Gas Emissions in Irish Agriculture 2021–2030*
Action 103	Support the maximum possible environment and climate ambition in the post-2020 Climate Action Plan
	a) Preparation of SWOT analysis on the basis of internal, external *ex ante* evaluation and SEA for input to the development of the CAP Strategic Plan
Action 110	Actively engage all stakeholders to develop a roadmap to ensure that the future development of the agriculture and land use (including forestry) sector will be built on environmental sustainability, and contribute fairly to Ireland's climate, air and energy targets
	a) Develop roadmap building blocks: vision, mission, principles and targets
Agriculture, forestry and land use – promoting diversification of land use, part of gradual transition	
Action 115	Implement and review roadmap for achieving afforestation rates as outlined in the *Programme for Government and Forestry Programme Mid Term Review*
	a) Initiate a review of recommendations outlined in the 2018 *COFORD Forest Land Availability Implementation Group* to identify measures required to remove barriers and increase levels of afforestation. Address potential for additional afforestation on state-owned land and forest estate access requirements
Action 117	The National Bioeconomy Implementation Group to examine sectoral coherence, network and awareness-raising, research and innovation and the circular bioeconomy potential of harnessing the value from side-streams from both agriculture and forestry
	a) Identify additional opportunities for inclusion of wood based products and derivatives in the bioeconomy
Action 124	Support regional assemblies to identify areas of potential growth in the bioeconomy
	a) Regional assemblies to complete their regional spatial and economic strategies

Table 4.2. Continued

Action number	Description
Agriculture, forestry and land use – waste and the circular economy	
Action 137	Develop a new National Waste Prevention Programme and regional waste management plans that will guide our transition to a circular economy by the EPA and local authorities
	a) New waste management plans
Public sector leading by example	
Action 145	Develop a strategy to achieve at least a 30% reduction in CO_2 eq. emissions by 2030 and a 50% improvement in public sector energy efficiency
	a) Prepare report on the optimal sectoral approach, having regard to capacity and cost-effectiveness
Adaptation	
Action 181	Build sectoral resilience to the impacts of climate change through delivery of sectoral plans as required under the NAF

CAP, Common Agricultural Policy; CO_2 eq., carbon dioxide equivalents; COFORD, Council for Forest Research and Development; NAF, National Adaptation Framework; SEA, Strategic Environmental Assessment; SWOT, Strengths, weaknesses, opportunities and threats.

Figure 4.10. The national strategic outcomes outlined in Ireland's national development plan. Source: DPER (2018).

plan recognises the value of biodiversity, includes a commitment to the UN SDGs, and objectives to support the transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050 (DCCAE, 2013; Government of Ireland, 2015). Ireland's first VNR identified *Project Ireland 2040* as one means through which Ireland will achieve the SDGs (Government of Ireland, 2018); however, it was specifically aligned with only two SDG targets, and how the two will be fully

integrated is not clear. Although not explicitly stated, *Project Ireland 2040* is effectively an operational framework for Ireland's approach to sustainable development as set out in *Our Sustainable Future* (DECLG, 2015; Government of Ireland, 2012), which also recognises the importance of biodiversity and climate action to social and economic resilience and achieving sustainable development. Biodiversity and ecosystems contribute significantly to climate change adaptation, mitigation and disaster risk reduction

while, at the same time, climate change is a major and growing driver of biodiversity loss. Despite such recognition, through global to local scales, achieving sustainable development is compromised by natural resource degradation and scarcity, and climate change affecting human quality of life (Bradshaw *et al*., 2010; Steffen *et al*., 2007).

To explore the connection between Ireland's Project 2040 with SDG targets that have a strong connection

to and from the environment, three strategic outcomes from the national development plan could be selected as a focus:

- outcome 3: strengthened rural economies and communities;
- outcome 8: transition to a low-carbon and climate-resilient society;
- outcome 9: sustainable management of water and other environmental resources.

Table 4.3. Environmentally connected national policy objectives

Objective number	Description
NPO 6	Regenerate and rejuvenate cities, towns and villages of all types and scale as environmental assets that can accommodate changing roles and functions, increased residential population and employment activity and enhanced levels of amenity and design quality, in order to sustainably influence and support their surrounding area
NPO 15	Support the sustainable development of rural areas by encouraging growth and arresting decline in areas that have experienced low population growth or decline in recent decades and by managing the growth of areas that are under strong urban influence to avoid overdevelopment, while sustaining vibrant rural communities
NPO 21	Enhance the competitiveness of rural areas by supporting innovation in rural economic development and enterprise through the diversification of the rural economy into new sectors and services, including ICT-based industries and those addressing climate change and sustainability
NPO 23	Facilitate the development of the rural economy through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bioeconomy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting the natural landscape and built heritage, which are vital to rural tourism
NPO 25	The Department of Rural and Community Development, the Department of Agriculture, Food and the Marine, and other relevant departments and agencies will continue to invest in rural Ireland, including through the Rural Regeneration and Development Fund, and will work together to establish a mechanism to coordinate structures for funding rural development to align with other national strategies
NPO 33	Prioritise the provision of new homes at locations that can support sustainable development and at an appropriate scale of provision relative to location
NPO 41a	Support the sustainable growth and development of the maritime economy and continue to invest in the seafood sector and our fishery harbour centres, particularly in remote rural coastal communities and islands
NPO 41b	In line with the collective aims of national policy regarding climate adaptation, address the effects of sea level changes and coastal flooding and erosion and support the implementation of adaptation responses in vulnerable areas
NPO 52	The planning system will be responsive to our national environmental challenges and ensure that development occurs within environmental limits, having regard to the requirements of all relevant environmental legislation and the sustainable management of our natural capital
NPO 53	Support the circular and bioeconomy including, in particular, through greater efficiency in land management, greater use of renewable resources and by reducing the rate of land use change from urban sprawl and new development
NPO 54	Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for greenhouse gas emissions reductions
NPO 56	Sustainably manage waste generation, invest in different types of waste treatment and support circular economy principles, prioritising prevention, reuse, recycling and recovery, to support a healthy environment, economy and society
NPO 58	Integrated planning for green infrastructure and ecosystem services will be incorporated into the preparation of statutory land-use plans
NPO 63	Ensure the efficient and sustainable use and development of water resources and water services infrastructure in order to manage and conserve water resources in a manner that supports a healthy society, economic development requirements and a cleaner environment

ICT, information and communications technology.

From these three strategic foci, the following national policy objectives (NPOs) could be considered to have an environmental connection (Table 4.3).

Such analysis demonstrates the interconnectedness of environmental, social and economic dimensions of the SDGs and targets within Ireland's policy portfolio, and reinforces an outlook whereby the SDGs provide a means to integrate across sustainable development to promote policy coherency and integration (see Figure 3.9). This suggests that, rather than addressing each individual SDG–policy link in isolation, exploring connections across key strategic policy areas – for example climate plans and national development plans – provides an opportunity to connect the SDGs with the wider policy portfolio.

5 The Application of Tools to Explore SDG–SDG and SDG–Policy Interlinkages

5.1 Introduction

Since the inception of the 2030 Agenda and the SDGs, many tools and guides have been developed and are freely and widely available. There are numerous SDG implementation initiatives[5] under way that seek to bring expertise, tools and approaches to support countries' and stakeholders' efforts in implementing the SDGs through provision of technical solutions for the implementation of individual SDGs and targets. Core to the governance challenge for implementing the SDGs is how to address the complex linkages between economic, social and environmental aspects (EEA, 2019; Independent Group of Scientists appointed by the Secretary-General, 2019) that should be taken into account in policy formulation to ensure the effective and efficient implementation of the 2030 Agenda. Chapter 4 has illustrated that, in a national context, implementing the SDGs in a coherent fashion is a matter of not only identifying the interlinkages between SDGs and targets but also reflecting on their relationships with national policy. Understanding linkages not only between SDGs but also with other agendas and national policy portfolios presents an opportunity to capture co-benefits of action on each while avoiding negative trade-offs due to conflicting targets or actions (Ochs *et al*., 2020; Weitz *et al*., 2019a). Tools that enable and facilitate engagement across multiple areas of government and policy to exploit benefits and opportunities arising from SDG synergies, while mitigating trade-offs, are less common. Such engagement tools are necessary to address sustainability challenges facing all countries (Osborn *et al*., 2015), and the way this presents fundamental tests to existing established governance structures and processes has received less attention (OECD, 2017a).

In relation to implementing the SDGs, their structure includes elements identifying resources required or enabling environments, and a greater focus on the interlinkages and synergies among goals could enhance the effectiveness of implementation (Elder *et al*., 2016). This requires strong horizontal cooperation and coherence to mainstreaming the broad array of environmental, social and economic development objectives in contrast to traditional sector-specific policymaking and implementation processes (Dalal-Clayton and Bass, 2009; Dalal-Clayton *et al*., 1994; OECD, 2018b). As a basis for smart policy design and implementation, effective tools are needed to analyse not only the interlinkages between individual SDGs and targets but also their connection to the policy that will frame sectoral implementation processes.

Environmental pressures affect every country, and climate change, pollution and the loss of natural habitats undermine prosperity and security nationally and internationally, for instance threatening food and freshwater supplies and contributing to the spread of disease. Humanity is hosted within a closed biosphere and is entirely dependent on provisioning and regulatory processes of planetary ecosystems to sustain life. Given this background, and Ireland's recognition of the importance and place of the environment in its future, themes of biodiversity, climate change threats and the environment have framed the SDGs4I project.

5.2 Tools in Support of Environmental Dimensions of SDG Implementation

The fundamental underpinning role of biodiversity and the biosphere in sustainable development and the SDGs has been widely promoted (Anon., 2019; Folke *et al*., 2016; Pesce *et al*., 2020; Schultz *et al*., 2016; Secretariat of the Convention on Biological Diversity, 2016; Seddon *et al*., 2016; SIDA, 2016; Wood *et al*., 2018), and in Ireland is reflected in the

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5   See, for instance, https://sdghelpdesk.unescap.org/toolboxes (accessed 18 June 2021), the Sustainable Development Goals Help Desk, a one-stop online service providing access to SDG-related tools, knowledge products, data portals, expertise and advice.

Our Sustainable Future theme of respect for ecological integrity and biodiversity (Government of Ireland, 2012) and Ireland's Biodiversity Plan (DCHG, 2017, 2019). Biodiversity and healthy ecosystems are central to many economic activities (e.g. SDGs 8, 9 and 12) and societal objectives (e.g. SDGs 1, 2, 3, 5 and 7), and are directly affected by climate change (SDG 13), as well as providing significant mitigating potential.

The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) has produced a compendium of 134 tools related to the integration of environment into policy and planning to deliver sustainable development in the Asia and Pacific region (UNESCAP in partnership with ESCWA and OICT, 2018) and this has been expanded to 143 tools in a joint Asian Development Bank and UN Environment Programme tool compendium (ADB and UNEP, 2019). Both publications include tools that support an integration process to SDG implementation and tools specifically relevant to SDGs 12 (responsible consumption and production), 13 (climate action), 14 (life below water) and 15 (life on land), as well as environmental dimensions across all SDGs. A framework that is increasingly applied to environmental dimensions of the SDGs is a nexus or integrated approach to managing and governing natural resources, such as land, water and energy, to address not only environmental sustainability, but also climate and human and political security (Boas *et al*., 2016; Fader *et al*., 2018; Hoff *et al*., 2019; Kettunen *et al*., 2018; Liu *et al*., 2018; SDG Knowledge Hub, 2016; SEI, 2015; UN, 2015b). Based on the idea that policy objectives in different domains are often "intrinsically connected", the nexus approach singles out issues with particular interdependencies to support research on those linkages and possible solutions for integrated policymaking (van Zanten and van Tulder, 2020). While this has gained traction in academic circles, from a practical perspective implementation of such an approach is constrained by strong sectoral silos, insufficient incentives for integrated planning and policymaking at all levels and limited vision, knowledge and experience (Hoff *et al*., 2019). The UN Development Group produced a reference guide and tools (UNDG, 2016) to support adaptation of the global SDGs to national contexts, and mainstreaming them into national development plans and planning processes including horizontal policy coherence. A conclusion from the reports and tools available is that

interlinkages between the SDGs and their targets are not only unavoidable because of biophysical and socioeconomic interactions, but can also be employed to improve integrated decision-making, policy effectiveness and efficiency of the measures taken to achieve the SDGs.

5.3 Tools to Support SDG Implementation and Interlinkages

Numerous tools have a very specific themed focus that allows for a deeper understanding of certain aspects and features of the SDGs but do not consider the interlinkages between the SDGs and how to address these interactions in setting out policies across different sectors and by different departments as part of building a more coherent policy climate. An assortment of tools and frameworks, some bespoke and others adapted from pre-existing ones, have been advocated in support of SDG implementation and an integrated agenda for national and international development (Breuer *et al*., 2019; Grainger-Brown and Malekpour, 2019; UNESCAP, 2015). A number of these tools and frameworks are focused on the type of future that may emerge from the successful implementation of the SDGs (e.g. qualitative scenario building) – and specifically addressing links between the economic, social and environmental dimensions of investment, trade and related economic activity (e.g. input–output analysis) (UNESC, 2015; UNESCAP, 2015). The SDG Interlinkages Analysis & Visualisation Tool developed by the Institute for Global Environmental Strategies is an example of a tool that does specifically address the interlinkages between SDGs. It identifies and visualises these linkages, identifies potential synergies and trade-offs, and compares country progress and performance over time (Zhou and Moinuddin, 2017), but it does not have the facility for direct user interaction. A further example is a Joint Research Centre technical report that enables the identification of interlinkages in a systemic way as a pivotal element of science supporting policy coherence for SDGs implementation (Miola *et al*., 2019). Both tools provide a web-based visualisation (see https://sdginterlinkages.iges.jp/visualisationtool. html and https://knowsdgs.jrc.ec.europa.eu/ interlinkages-visualization, respectively).

Efforts to develop a better understanding of the linkages among the SDGs, both at the goal level and

among their targets, have focused on the intersections (meeting points) and complex causal relationships to model the network of interlinkages and analysing clusters of issues (SDG Knowledge Hub, 2016) (Table 5.1).

Notwithstanding the development of such tools and frameworks, there remain key gaps in terms of the assessment of interlinkages, trade-offs and synergies between targets to avoid "siloed" or "linear" methods that have characterised approaches to sustainable development (Allen *et al*., 2018).

To help decision-makers identify and address existing interdependencies and interactions, a multitude of quantitative and qualitative methods and tools have been developed (Ochs *et al*., 2020). These tools serve different functions and provide a wide range of services, such as descriptive analysis of potentials, scientific methods for quantifying and qualifying interactions, and guidelines for integrated policymaking. However, owing to the lack of systematic mapping and the large variety of available tools, as well as their complexity and different qualities, it is

Table 5.1. Examples highlighted by the SDG Knowledge Hub as approaches and tools available to analyse and understand linkages, and to examine the impacts of specific policies and strategies on interlinked issues

Source	Details	References
UN Department of Economic and Social Affairs (DESA)	Network mapping technique derived from social network analysis to provide a map of direct references in SDG targets to other SDGs, based on the wording of the targets.	Le Blanc (2015a,b)
	The result is a visual representation of the references between SDGs and targets to make linkages explicit for institutions whose work often focuses on issues within a specific goal.	
The Stakeholder Forum	Classification of type and nature of SDG interlinkages by defining eight types of interactions that are grouped into three categories: supporting, enabling/disenabling and relying.	Coopman and Osborn (2016), Coopman *et al.* (2016)
	The analysis suggests that identifying the type of interlinkage can help policymakers amplify the impact of policies and identify "missing linkages", so that policymakers can consider ways of creating such linkages through national policies that ensure further integration of SDG implementation in accordance with national priorities and circumstances.	
The Millennium Institute	The Integrated Sustainable Development Goals Planning Model (iSDG) is a simulation tool to help policymakers understand the interconnections among the SDGs and their targets, enabling them to design synergistic strategies for SDG implementation. The model includes a broad selection of tools to conduct an in-depth analysis of the simulated outcomes, including a Synergy Assessment Tool to assess the contribution of each policy within a broader SDG strategy and reveal the synergies or trade-offs that might emerge from interactions among different policies.	https://www. millennium-institute. org/isdg
	For each SDG, the model offers a range of interventions that are expected to affect progress towards that goal. Policymakers can select different levels of investment for each intervention and see how the country's progress towards that goal and all other SDGs changes.	
The Organisation for Economic Co-operation and Development (OECD)	The OECD New Framework Policy Coherence for Sustainable Development aims to assist countries in updating current institutional mechanisms, processes and practices towards policy coherence to ensure they are "fit for purpose" for SDG implementation that can be adapted to national circumstances.	OECD (2016a)
	The PCSD screening tool includes options for monitoring data, indicators modelling tools and other approaches available to track institutional mechanisms, policy interactions and policy effects.	
	The OECD's *Measuring Distance to SDG Targets* uses indicators aligned with the UN Global Indicator List and assesses 105 out of 169 targets at country level, and for only 87 of these it has been possible to assess whether indicators have been moving towards the target levels, or away from them.	OECD (2019a)
	The assessment is based only on what can be measured at present. Data coverage is poorest on some of the planet-related goals, such as oceans and sustainable production, and best in relation to goals on health and education.	

Source: SDG Knowledge Hub (2016).

often not clear to policymakers which tool can be useful for which policy issue.

5.4   Tools to Support Policy Coherency and SDG Integration

Since the adoption of the 2030 Agenda for Sustainable Development, attention has focused on how to deliver the SDGs and targets as an "indivisible whole", with the objective being to propose viable methods and tools for integrated planning of implementing SDGs and meeting targets (Figure 5.1) (IAEG-SDGs, 2019; McCollum *et al*., 2018; McGowan *et al*., 2018; UNESCAP, 2017). Such efforts are critical if we are to overcome traditional compartmentalisation of government organisation, which leads to conflicts of interest, different interpretations of sustainable development and decreases coherence and opportunities for transformative policy implementation (Cejudo and Michel, 2017; D'Errico *et al*., 2020; EEA and FOEN, 2020; Nash *et al*., 2020). To support the process and provide a framework for policy coherence, the OECD has developed guidance and tools to analyse, enhance and track progress on policy coherence in the implementation of the SDGs (OECD, 2015c, 2016a).

There are a growing number of tools introduced to explore interactions and interlinkages between SDGs and targets to assist implementation of existing policy, as well as design of future policy, to meet the aspirations of the 2030 Agenda, and sectoral implementation processes are required (e.g. Breuer *et al*., 2019; Ochs *et al*., 2020). These tools address such aspects as descriptive analysis of potentials and scientific methods for quantifying and qualifying interactions, as well as guidelines for integrated policymaking. However, there is currently no tool that enables and facilitates conversations between policymakers around how SDG interactions affect their own policy area, or how existing and planned policy in a national context interacts with the SDGs and their targets.

Many tools only report against existing data and/or activities (Grainger-Brown and Malekpour, 2019; Ochs *et al*., 2020) and cannot be used as an interactive tool for discussion and exploration of possible linkages between different SDGs and/or between the SDGs and
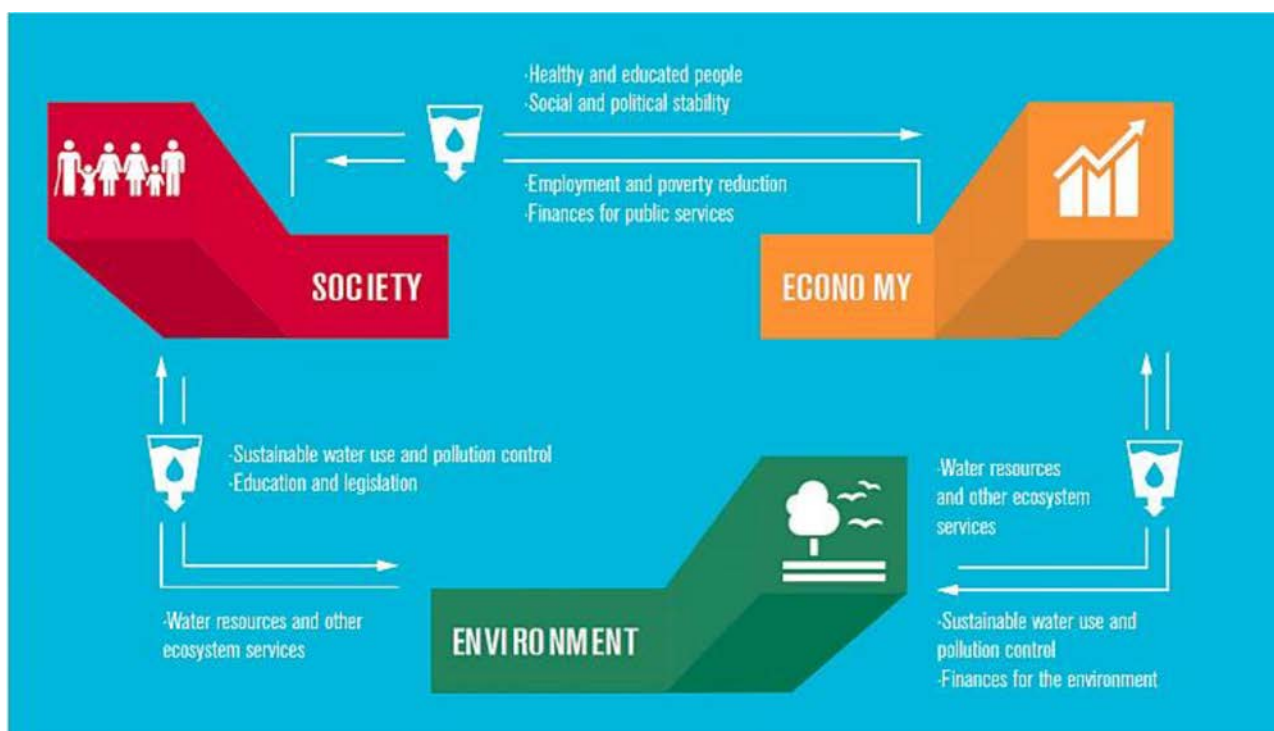

Figure 5.1. Interlinkages based on the three dimensions of sustainable development using SDG 6 (water) as an example of how healthy and resilient ecosystems, including freshwater resources, are vital for the social and economic dimensions of sustainable development. Source: UN-Water (2016).

existing or planned policies. Integration between SDGs and with national-level planning and policy is important to fulfil the ambition of the 2030 Agenda of "achieving sustainable development in its three dimensions – economic, social and environmental – in a balanced and integrated manner" (UNESCAP, 2015), but the "how" of integration has not been well defined. In the context of integration, a key requisite is a mechanism for policy coherence (IRP, 2015; Nash *et al*., 2020; Ochs *et al*., 2020; OECD, 2017b; SDG Knowledge Hub, 2016) that is able to capture and align interests and perspectives of potentially disparate interest groups and formulate policy that offers synergistic benefits and mitigates trade-offs. Equally, such mechanisms need to avoid shortcomings that foster conflict and prevent the timely inclusion of knowledge.

5.5 Design Principles for a Toolkit to Support SDG Implementation in Ireland

In practice, meeting nationally defined priorities and sustainability solutions is a highly contested space (D'Errico *et al*., 2020; EEA and FOEN, 2020; Wong and van der Heijden, 2019), and a tool that promotes dialogue and understanding across sectors and policy areas, using the SDGs as a framing mechanism, could lead to better outcomes. Achieving policy coherence means moving away from business-as-usual, narrowly focused policymaking and towards more integrated approaches (Breuer *et al*., 2019; Pham-Truffert *et al*., 2020; van Kerkhoff, 2014; West *et al*., 2019) that recognise that policy is driven not solely by science and technical expertise but also by perspectives and values of policymakers (Nilsson and Weitz, 2019). Coherence also means avoiding a situation in which sector-specific standpoints dictate perspectives, as can happen with the nexus approach (cf. Bengtsson *et al*., 2018; Fader *et al*., 2018; Simpson and Jewitt, 2019), notwithstanding rhetoric around indivisibility and integration. The implementation of the SDGs will necessarily require policymakers to find balances between, at times, competing goals and to identify where trade-offs and synergies exist (OECD, 2017a). This requires not only tools that convey scientific/technical understanding of the SDGs and their interlinkages, but also tools to help government departments to work together when considering trade-offs, to identify and reinforce synergies between goals

and, ultimately, to integrate actions and achieve policy coherence (OECD, 2018a).

From the 1990s, the OECD has had a programme on policy coherence for development (OECD, 2013), which in 2015 evolved into a programme for PCSD (OECD, 2015b) specifically linked to the SDG framework. In the context of the SDGs, policy coherence means developing mutually reinforcing policies across all relevant sectors to effectively achieve national SDGs, minimising the negative impacts that policies in one area can have on policies in another area. However, most national programmes and reporting are focused on the global targets and their indicators, with few addressing the connectivity of, and interlinkages between, national policy and the SDGs and targets. Neither have national governments addressed the relationship between national priorities and contexts with interactions between national policy objectives and targets and those of the SDGs. Despite the burgeoning literature available on the SDGs, a relatively small proportion exists to guide practitioners on "how" to develop policy coherence and implement the SDGs in the context of national goals and circumstances as an indivisible and universal set of goals as called for by SDG target 17.14. The OECD framework suggests that to achieve PCSD countries need to consider three interrelated elements of the policymaking cycle: (1) institutional mechanisms, (2) policy interactions (synergies and trade-offs) and (3) policy effects "here and now", "elsewhere" and "later" (Figure 5.2) (OECD, 2015b, 2019e).

In principle, an approach to the SDGs that views them as a network of goals that are integrated and indivisible constitutes a good means to address policy coherence (Le Blanc, 2015b; UN, 2015a). From this, it follows that the synergies and trade-offs between individual SDGs require a systematic analysis (Stafford-Smith *et al*., 2017; Weitz *et al*., 2018) within the context of a country's policy setting (Allen *et al*., 2019a; Horan, 2020b; Nilsson and Weitz, 2019). A tool to support such aims should contribute to a framework that identifies and assesses synergies and trade-offs to enhance coherence in decision-making through understanding policy interactions (input), integrating policy making (process) and assessing *ex ante* policy decisions (output) (DCHG, 2019). Pragmatically, this means that any interaction between SDG target and policy requires interrogation to design policy interventions that consider the environmental, social,
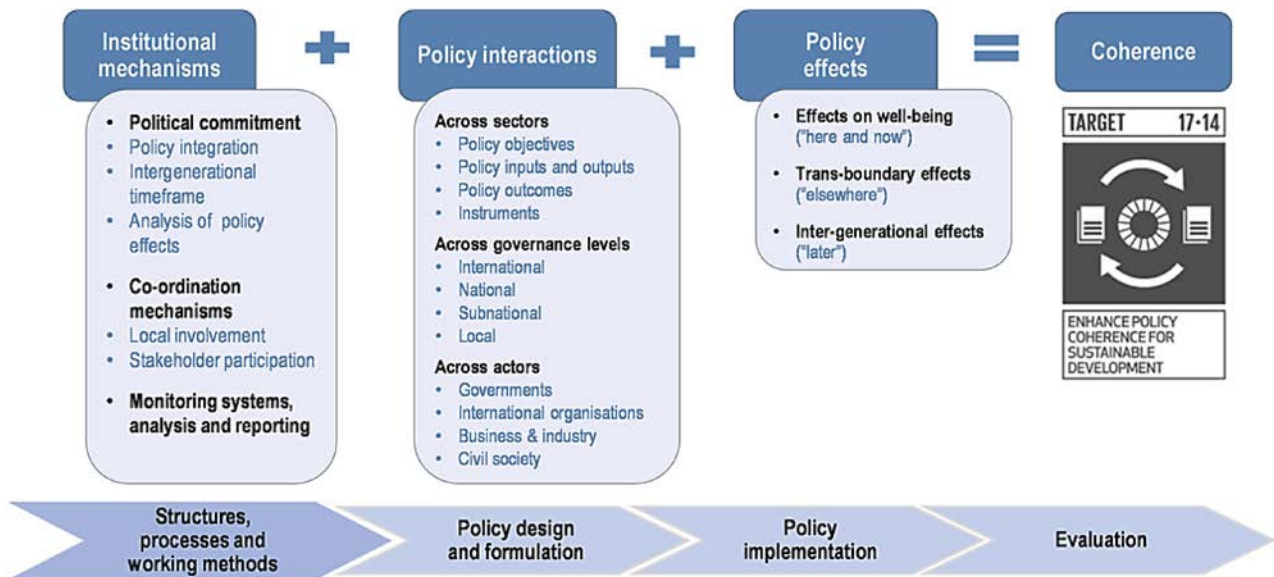
Figure 5.2. Elements for tracking progress on PCSD. Source: reproduced from OECD (2019d), with permission.

economic and governance dimensions of human activities, which are interconnected in many ways (EEA, 2019).

The SEI has developed a scoring framework and cross-impact matrix to explore the integrated nature of the 2030 Agenda in the context of policy, which has evolved into a programme and partnership facilitated by the International Science Council (ISC) addressing SDG interactions as a national policy driver (ICSU, 2017a; ISC, 2019; Nilsson, 2017; Nilsson *et al*., 2016a).

5.5.1   Scoring interactions

Linkage relationships can be either synergistic (interactions have a positive outcome) or trade-offs (interactions with negative effects and that hinder or reverse sustainable development) (Donoghue and Khan, 2019; Fader *et al*., 2018). To better understand the nature and dynamics of those interactions, ISC (formerly ICSU) and Nilsson and coworkers (Nilsson, 2016; Nilsson *et al*., 2016a,b) use a seven-point ordinal scale, indicating the type of the interaction with other targets and the extent to which the relationship is a positive or a negative one (Figure 5.3).

The scoring scale extends beyond the common but overly simplified dichotomy of synergies versus trade-offs categorisation to one that supports policy coherence by an assessment of interlinkages that focuses on the degree to which instruments and

actions to pursue one set of objectives affect our ability to pursue another set (Nilsson *et al*., 2016a; Weitz *et al*., 2018). The scale is intuitive and relatively easy to use as a first level of assessment of the interlinkages at the level of SDG, targets, or at the level of policy interventions and instruments to determine potential synergies and trade-offs. The scale can also help "organise evidence and support decision-making about national priorities […] to help policymakers to identify and test development pathways that minimise negative interactions and enhance positive ones" (Nilsson *et al*., 2016b). The magnitude of the score, in whichever direction, provides an indication of how influential a given SDG or target is on another or, if the interaction is neutral, a score of 0 ("consistent") is assigned.

5.5.2   Cross-impact matrix

The seven-point scale is applied in conjunction with a cross-impact matrix approach developed by Weitz *et al*. (2018) that asks of each matrix cell, "If progress is made on target *x* (rows), how does this influence progress on target *y* (columns)?" (see Figure 5.4 for an example). The cross-impact matrix allows analysis across SDGs through a structured assessment of direct positive and negative interactions between the SDG targets not as a scientific assessment methodology but as a tool to support policymaking, with a high degree of transparency and opportunity for
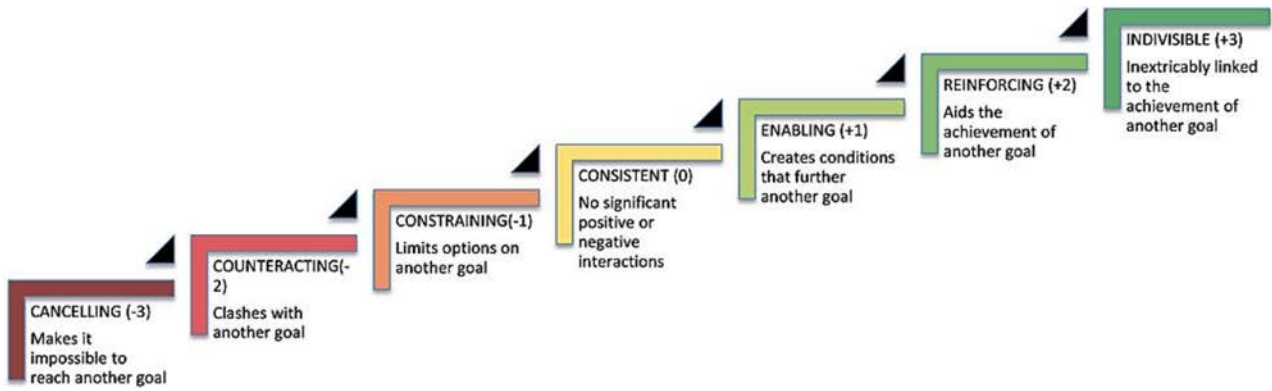
Figure 5.3. Seven-point typology of SDG interactions that captures both positive and negative interactions and permits a more detailed assessment of interactions that goes beyond current tendencies to analyse interactions only in terms of synergies and trade-offs. Source: Weitz *et al*. (2019a); licensed under CC BY 4.0 (http://creativecommons.org/licenses/by/4.0/).

Figure 5.4. Example of a cross-impact matrix of 34 targets and their interaction in Sweden. Colour according to the scale in Figure 5.3 from dark red (–3/cancelling) to dark green (+3/indivisible). The net influence from a target on all other targets is shown by the row-sum and the column-sum shows how much a target is influenced by all other targets in total. Source: Weitz *et al*. (2018); licensed under CC BY 4.0 (https://creativecommons.org/licenses/by/4.0/).

engagement (Allen *et al*., 2019a; Weitz *et al*., 2018, 2019b).

Rather than focus on individual interactions, it is more likely that clusters of interacting targets reflect where cross-sectoral collaboration will have more policy relevancy for priority-setting (Weitz *et al*., 2018, 2019b). To visualise where clusters of interactions exist, and the degree to which they lead to positive (synergistic) or negative (trade-off) outcomes, a cross-impact matrix tool designed for analysing relationships between variables, factors, events, etc. associated with policy instruments is used (Weitz *et al*., 2018, 2019b). The use of a cross-impact matrix allows policymakers from multiple areas of government to maintain a comprehensive view of the 2030 Agenda to account for systemic effects rather than focusing on a specific entry point and one-on-one interactions from one sector to others (Coopman *et al*., 2016; ICSU, 2017a). The application of the cross-impact matrix, using the scoring scale to categorise individual cells, provides a strongly systemic and visual tool for understanding how SDG targets interact and can be interrogated in the context of specific policy areas and choices. A key aspect for completing the matrix is that the scoring can be engaged with in a cross-sectoral/departmental collaborative manner to foster holistic discussion for priority-setting and assessing existing and new policy pathways across not only the 2030 Agenda but national policy portfolios. For instance, targets that have a strong positive influence on many other targets (taking into account both direct and indirect interactions), or ones that are supported by progress in others, or where one negatively affects progress in others can be identified and prioritised for policy support to enhance synergies and address potential trade-offs and negative spillover effects (Weitz *et al*., 2018).

5.6 Development of the Enabling SDGs Tool

The SDGs4I project, in partnership with the ISC and the EC-JRC Global Conservation and Development Knowledge Management Unit, has further evolved the tool to directly allow comparison between SDGs and their targets and specific policy objectives. This provides a facility that enables sectors to look outside silos and consider how their actions influence, and are influenced by, others (Weitz *et al*., 2018). It can

also bring scientific knowledge into the policymaking process (using scientific data to underpin the scores) in a highly aggregated way, which is suitable in a policy context. The tool addresses the principles of the OECD PCSD framework (Risse, 2019) to structure an analysis of the way different SDGs interact and interlink with each other and can be used to take this into account.

The tool has been incorporated as part of the EC-JRC KnowSDGs (Knowledge base for the Sustainable Development Goals) platform (https://knowsdgs.jrc. ec.europa.eu), which provides tools and organises knowledge on policies, indicators, methods and data to support the evidence-based implementation of the SDGs (Figure 5.5).

The EnablingSDGs tool (https://knowsdgs.jrc. ec.europa.eu/enablingsdgs and Figure 5.6) is designed to support SDG implementation in the context of national policy instruments and provides assessment methods to explore systemic and contextual interactions of SDG targets, using a typology for scoring interactions in a cross-impact matrix (ICSU, 2017a; Nilsson, 2016; Nilsson *et al*., 2016a,b; Weitz *et al*., 2018, 2019b).The utility of the matrix and scoring tool lies not in the scientific assessment of data relating to either specific SDG targets and/or policy actions they provide, but in the support afforded to policymaking, with a high degree of transparency and opportunity for engagement compared with modelling approaches (Weitz *et al*., 2018). Scoring is predominantly qualitative and judgment based from the expertise and knowledge held by those responsible for implementing relevant policy areas under investigation. However, scoring can also be informed by relevant datasets [e.g. the EPA geoportal (http://gis.epa.ie/), relevant EPA reports (http://www.epa.ie/irelandsenvironment/stateoftheenvironmentreport/ and https://www.epa.ie/publications/ and https://www.epa.ie/publications/research/), the Environmental Sensitivity Mapping (ESM) Webtool for decision-support for Strategic Environmental Assessment and planning processes in Ireland (https://www.enviromap.ie/) and Ireland's Central Statistics Office (CSO) SDGs data hub (https://irelandsdg.geohive.ie/)]. A resultant matrix shows patterns of relative frequency of positive and negative interactions that point to where implementation of policy linked to those areas could lead to synergistic or trade-off outcomes.

Figure 5.5. Front page of the EC-JRC KnowSDGs web platform. Source: https://knowsdgs.jrc.ec.europa.eu/ (accessed 18 June 2021).
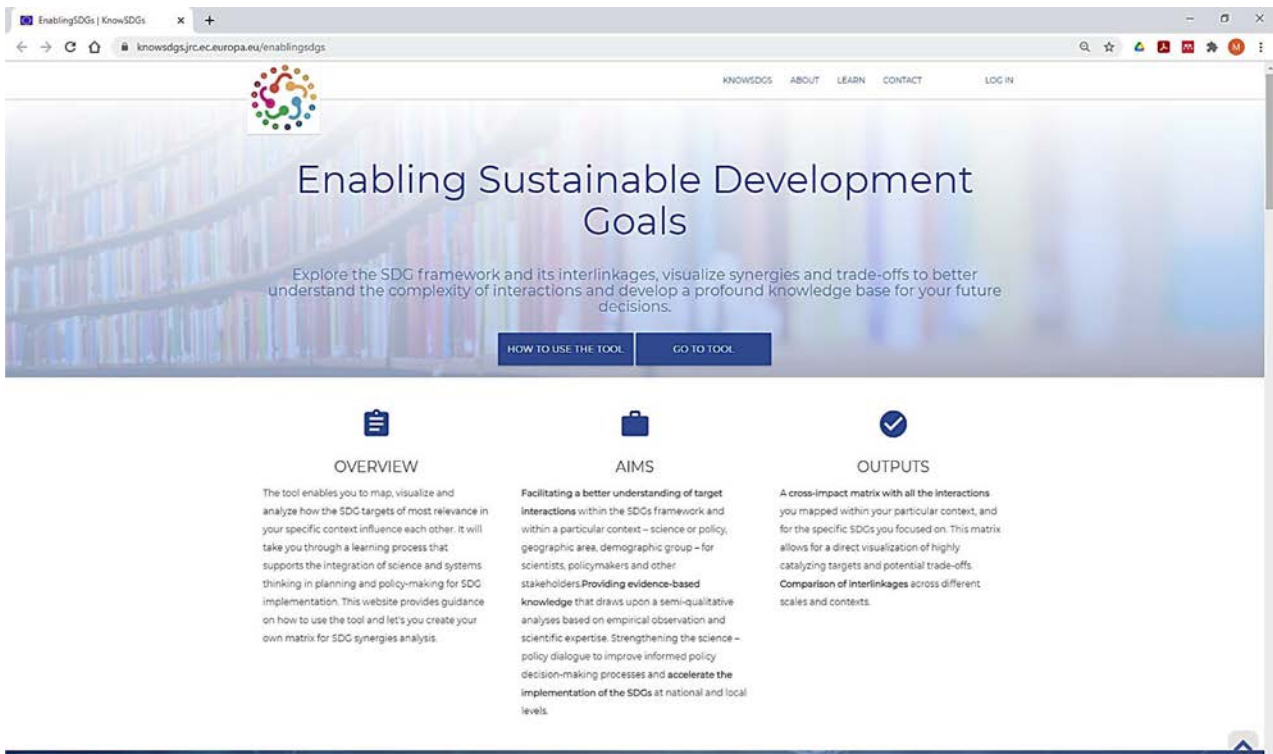
Figure 5.6. The EnablingSDGs home page. Source: https://knowsdgs.jrc.ec.europa.eu/enablingsdgs (accessed 18 June 2021).

A development of the current project from the original matrix design of SEI is that it is possible to make an assessment between goals and targets with existing policy instruments to directly provide a policy perspective. For instance, a department could evaluate whether or not a policy action focused on one target affects additional targets and, thereby, where collaborations are needed for cooperation with policy instruments linked to those additional targets. Such an approach can enable "whole-of-government" approaches for SDG implementation and foster policy cohesion by indicating which existing policies are dependent on each other, and where decision-makers should collaborate across policy areas. The EnablingSDGs tool is accompanied by guidance documents (Figure 5.7) for workshop organisers and for workshop participants (available at https://knowsdgs.jrc.ec.europa.eu/enablingsdgs and https://www.marei.ie/project/sdgs4i/).

The EnablingSDGs tool and the supporting documentation can be used in either a face-to-face or remote (virtual) setting, and an interactions matrix can be completed through a group or individual activity. The creation of a common matrix and dialogue between actors from different constituencies (scientific,

policymaking, civil society) provides the opportunity for workshop participants, all of whom have an interest in the 2030 Agenda, to work collectively to construct a single SDG interactions matrix (Figure 5.7), and explore the interaction between SDGs and specific policy areas. The tool allows a workshop organiser to arrange participants into groups (for instance according to background, e.g. policymaker, scientist, civil society) and provides a number of basic analytical functionalities to view outputs (e.g. mean and variance matrices) from group inputs. This can facilitate conversations within and between not only departmental groups, but also other stakeholder groups. The tool can also be amended at any stage to better capture input from specific groups. The development and design of the tool have been refined and adjusted through dialogue with potential users to address specific needs and requirements for its application.

Application of the EnablingSDGs tool focuses on raising awareness on the range of potential synergies and trade-offs between policy and the SDGs and targets. Through a set of more structured and intentional interactions, the process can identify and resolve differences of opinion, leading to the

Figure 5.7. The EnablingSDGs cross-impact (interactions) matrix and scoring system. Source: https://knowsdgs.jrc.ec.europa.eu/enablingsdgs (accessed 18 June 2021).

construction of an iteratively vetted SDG interactions matrix that can identify synergies and trade-offs across different policy areas. The expectation is that this can assist with setting priorities within national development planning processes and overcome a situation whereby policymakers and scientists inevitably look at potential SDG interactions through different sectoral lenses. Such a process enables policymakers to make better informed choices for meeting domestic objectives that balance social and economic dimensions with environmental dimensions within the SDG framework.

5.7 Application of the SDGs4I–EC-JRC Tool to Ireland's Environmentally Linked SDG Targets and Ireland's Policy Portfolio

An overarching challenge for government is to overcome an absence of dialogue for the coordination of policy to avoid policy design that is focused on single programmes and misses dependencies on other programmes as a consequence (Peters, 2018). Taking all 17 SDGs and 169 targets leads to a possible

28,392 (169 × 168) interlinkages, and it is necessary to narrow the scope of analysis and address a subset of targets relevant to a particular policy focus (Nilsson, 2016, 2017). In the context of exploring the role that the natural environment plays in the context of achieving the SDGs in Ireland, and how the SDGs can demonstrate the importance the environment can play supporting national policy objectives, the SDGs4I project has identified a subset of environmental SDG targets (Table 4.1) and a subset of policy actions/objectives from the *Climate Action Plan 2019* and *Project Ireland 2040* (Tables 4.2 and 4.3, respectively). Identifying these subsets of SDG targets and two key areas of government policy provides a conduit into all areas of government that can enable the necessary transformations called for by both the SDGs and Paris Agreement on climate change while respecting the interlinkages across the 17 SDGs (J.D. Sachs *et al*., 2019; TWI2050, 2018; West *et al*., 2020). A key outcome of the project is the development and application of a tool to support those involved in implementing policy within and across domains. This tool can assist in addressing gaps in institutional arrangements for the integration of national policy with the SDGs and targets (UNDESA, 2020).

6   Concluding Remarks and Recommendations

Given Ireland's recognition of the importance and place of the environment in future national developmental planning, the environment, biodiversity and climate change have been chosen to frame the SDGs4I project. The fundamental role of biodiversity and the biosphere to underpin sustainable development and the SDGs has been widely promoted, and is reflected in the "respect for ecological integrity and biodiversity" theme of *Our Sustainable Future* and in Ireland's Biodiversity Plan (Government of Ireland, 2012). Biodiversity and healthy ecosystems are central to many economic activities (e.g. SDGs 8, 9 and 12) and societal objectives (e.g. SDGs 1, 2, 3, 5 and 7), and are directly affected by climate change (SDG 13), as well as providing significant mitigating potential.

The SDGs4I project has explored the opportunities that the SDGs present for policy coherence towards implementation of national strategies, and how development objectives are connected to environmental sustainability, and found that this presents a number of challenges:

1. Many of the individual targets contribute to several goals and while, in some cases, interactions can lead to synergistic outcomes, in others goals and targets may conflict whereby action to meet one target could have unintended consequences on others if they are pursued separately.

2. Individual policies that connect to one target could lead to an outcome from that target that then has negative (or conversely synergistic) outcomes on other targets.

3. Individual policies may connect to multiple targets such that a focus on its action on individual goals and/or targets could lead to perverse outcomes and progress across multiple elements of the 2030 Agenda.

4. How can policies that are usually designed to address a specific sector purpose be implemented in the context of a wider "systems" perspective as required by the SDGs?

The SDGs4I project has reviewed the policy coherence setting for Ireland and evaluated Ireland's portfolio of policy in relation to an environmental setting and alignment to the SDGs and targets. This analysis has been placed into the context of the institutional arrangements for implementing the SDGs in Ireland and recognised an awareness that the SDGs are nationally differentiated and should be delivered through policy instruments that reflect the national context and priorities, notwithstanding the rhetoric of universality and indivisibility around the 2030 Agenda (McGowan *et al*., 2018). Exploring the connection of policy to the SDGs identified the relational complexity that exists between Ireland's existing policy portfolio and SDG targets. Rather than address each individual SDG–policy link, the project has suggested that policy coherence and integration can be achieved through key strategic policy areas – climate and biodiversity action plans and national development plans – providing a channel to connect the SDGs with the wider policy portfolio. Exploring the connection of SDGs to policy has identified that the SDGs connect across "traditional" social, economic and environmental policy domains, thereby offering the prospect of demonstrating how activity in one policy domain leads to either synergistic or trade-off outcomes in another policy domain. The purpose of the EnablingSDGs tool is to provide a platform for dialogue and coordination between different areas of policy to realise interconnections between SDGs and policy, and vice versa, thereby assisting coherence in implementation of both.

The key emerging messages from this project that affect a coherent approach to SDG implementation are [for each observation (bullet) a suggestion of the implications and consequences of the finding is identified in *italics*]:

● There is an absence of policy association between lead and stakeholder departments with each SDG target.
This could mean that activity by any given department enacting policy under its jurisdiction could compete with that from other departments.

- Targets are predominantly aligned with policy and strategy documents (noting that policy can be relatively fluid) rather than legislative instruments. *This could mean that the relative emphasis between targets implemented through legislation rather than policy could lead to a form of emphasis in outcome that is not the intended consequence of the target.*

- There is a disconnect between alignment of lead departments between outcome and MoI targets – this is not always addressed by the assignment of stakeholder departments. *This could mean that there is likely to be weak institutional mechanisms to ensure "joined-up" delivery of the SDGs.*

- MoI targets are predominantly associated with Ireland's non-domestic contribution towards achieving global goals. *This could mean that there is a disconnect between the management of an activity with actions designed to achieve its desired outcome. This could mean that transboundary aspects (the link between domestic activity on non-domestic outcomes) are missing.*

- Most stakeholder departments do not have any direct policy connection (i.e. not identified in the NIP) with the target to which they are aligned. *This could mean that stewardship of any given target is not widely spread and, given that an interest has been identified, could lead to a breakdown in supporting institutional mechanisms (e.g. an absence of policy integration) and policy interactions (e.g. contrasting policy objectives).*

- Most targets are aligned with fewer than three policy documents and/or lead departments. *This may lead to unequal association of connection with any given target and assessment of policy commitment, interactions and effects.*

- A preliminary analysis of the association of SDGs with the eight objective areas of Ireland's sustainable development policy has identified that the biosphere, social and economic subsets of SDGs cross-cut multiple objectives. *This could mean that the SDGs provide an opportunity for policy coherence across implementation of Ireland's policy portfolio (i.e. more than a reporting structure).*

- The potential complexity and direction of interactions between SDGs and targets, and between SDGs/targets with policy, has important implications for how policy integration and coordination is enacted to ensure that the desired policy impacts and outcomes are achieved. *This could mean that beyond setting in place reporting requirements, for example for periodic VNRs, it is important that the desired policy outcomes are known in order to design processes that lead to the desired policy impacts. Desired policy impacts can be aligned to or prioritised in accordance with either the SDGs themselves and/or national policy objectives.*

- A preliminary review has noted that many policy documents have a fixed timeline so could become redundant, revised and/or replaced by new policy, wholly or partly (e.g. climate action, international foreign policy, national biodiversity plan). *This could mean that existing policy alignments could become null and void, and it is not clear how new policy will become integrated into SDG implementation, especially where "new" policy alignments may be associated with different departments.*

As Ireland begins a process to develop a second version of its NIP, a better understanding of how different areas of policy interact with each other affords an opportunity to maximise the potential the SDGs present in providing pathways to achieve national goals over and above a reporting obligation to the international community. These data, presented as a part of Ireland's SDG Geohive (https://irelandsdg. geohive.ie/), could also be used to evaluate the implementation of different components of Ireland's policy portfolio through the lens of the SDGs to achieve greater policy impact and coherence, and leads to the following recommendations:

- To make the SDGs more relevant to Ireland, and to account for the reality that not all 169 SDG targets carry the same priority for Ireland, consideration should be given to:
  – prioritising SDG targets with reference to national priorities to which they are aligned and shaped by the national development plan (*Project Ireland 2040*) (DPER, 2018),

the *Climate Action Plan 2019* (Government of Ireland, 2019) and forthcoming biodiversity action plan,[6] and

– the 2030 Agenda that provides provision for reframing targets to make them more relevant to the national context. Ireland should consider this as a way of making the SDGs more relevant and specific to its national context.

● The EnablingSDGs tool developed by this project can be used by the SDG Interdepartmental Working Group (IDWG) to enable and facilitate policymakers to identify interlinkages – synergies and trade-offs – between different SDGs, to assess impacts of different policy choices and to highlight second-order effects and potential unintended consequences of policy. This tool allows policymakers, scientists and other stakeholders to engage and map the key interactions across SDGs (synergies and trade-offs) with reference to a specific policy context. The identification of interlinkages is key to recognising impacts of different policy choices and to identifying areas where an assessment of implementation gaps needs to be conducted.

It can also identify contexts in which research is needed either to understand an interaction or to develop appropriate interventions.

● Mapping of SDGs to responsible lead departments must extend beyond simply identifying stakeholder departments and the policy set linked to each target to also characterise how the nature of the linkages between targets interacts with stated policy goals and intent.

● Characterising SDG/policy interlinkages should emphasise drivers of policy and how they affect sustainability and not just measurable outcomes.

● MoI targets within the SDGs should not be viewed as implementation elsewhere but also address implementation within Ireland and transboundary aspects of SDG implementation and Ireland's place in the world.

● Finally, although Ireland has taken steps to enhance horizontal policy coordination to implement the SDGs through the SDG IDWG, there is a continuing need to better mainstream sustainability such that it helps inform policy development and coherence and is more than a reporting obligation.

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6   https://www.npws.ie/legislation/national-biodiversity-plan (accessed 21 June 2021).

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Abbreviations

5Ps	People, planet, prosperity, peace and partnership
CBD	Convention on Biological Diversity
DAFM	Department of Agriculture, Food and the Marine
DCCAE	Department for Communications, Climate Action and Environment
DCHG	Department of Culture, Heritage and the Gaeltacht
DFAT	Department of Foreign Affairs and Trade
DFIN	Department of Finance
EC-JRC	European Commission - Joint Research Centre
EU	European Union
IDWG	Interdepartmental working group
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
ISC	International Science Council
MoI	Means of implementation
NIP	National Implementation Plan
OECD	Organisation for Economic Co-operation and Development
PCSD	Policy Coherence for Sustainable Development
SDG	Sustainable Development Goal
SDGs4I	Identifying Interactions for SDG Implementation in Ireland
SEI	Stockholm Environment Institute
VNR	Voluntary National Review
UN	United Nations

AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL

Tá an Ghníomhaireacht um Chaomhnú Comhshaoil (GCC) freagrach as an gcomhshaol a chaomhnú agus a fheabhsú mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ó éifeachtaí díobhálacha na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialú: *Déanaimid córais éifeachtacha rialaithe agus comhlíonta comhshaoil a chur i bhfeidhm chun torthaí maithe comhshaoil a sholáthar agus chun díriú orthu siúd nach gcloíonn leis na córais sin.*

Eolas: *Soláthraímid sonraí, faisnéis agus measúnú comhshaoil atá ar ardchaighdeán, spriocdhírithe agus tráthúil chun bonn eolais a chur faoin gcinnteoireacht ar gach leibhéal.*

Tacaíocht: *Bímid ag saothrú i gcomhar le grúpaí eile chun tacú le comhshaol atá glan, táirgiúil agus cosanta go maith, agus le hiompar a chuirfidh le comhshaol inbhuanaithe.*

Ár bhFreagrachtaí

Ceadúnú

Déanaimid na gníomhaíochtaí seo a leanas a rialú ionas nach ndéanann siad dochar do shláinte an phobail ná don chomhshaol:
- saoráidí dramhaíola *(m.sh. láithreáin líonta talún, loisceoirí, stáisiúin aistrithe dramhaíola)*;
- gníomhaíochtaí tionsclaíocha ar scála mór *(m.sh. déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta)*;
- an diantalmhaíocht *(m.sh. muca, éanlaith)*;
- úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe *(OGM)*;
- foinsí radaíochta ianúcháin *(m.sh. trealamh x-gha agus radaiteiripe, foinsí tionsclaíocha)*;
- áiseanna móra stórála peitril;
- scardadh dramhuisce;
- gníomhaíochtaí dumpála ar farraige.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil
- Clár náisiúnta iniúchtaí agus cigireachtaí a dhéanamh gach bliain ar shaoráidí a bhfuil ceadúnas ón nGníomhaireacht acu.
- Maoirseacht a dhéanamh ar fhreagrachtaí cosanta comhshaoil na n-údarás áitiúil.
- Caighdeán an uisce óil, arna sholáthar ag soláthraithe uisce phoiblí, a mhaoirsiú.
- Obair le húdaráis áitiúla agus le gníomhaireachtaí eile chun dul i ngleic le coireanna comhshaoil trí chomhordú a dhéanamh ar líonra forfheidhmiúcháin náisiúnta, trí dhíriú ar chiontóirí, agus trí mhaoirsiú a dhéanamh ar leasúchán.
- Cur i bhfeidhm rialachán ar nós na Rialachán um Dhramhthrealamh Leictreach agus Leictreonach (DTLL), um Shrian ar Shubstaintí Guaiseacha agus na Rialachán um rialú ar shubstaintí a ídíonn an ciseal ózóin.
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Uisce
- Monatóireacht agus tuairisciú a dhéanamh ar cháilíocht aibhneacha, lochanna, uiscí idirchriosacha agus cósta na hÉireann, agus screamhuiscí; leibhéil uisce agus sruthanna aibhneacha a thomhas.
- Comhordú náisiúnta agus maoirsiú a dhéanamh ar an gCreat-Treoir Uisce.
- Monatóireacht agus tuairisciú a dhéanamh ar Cháilíocht an Uisce Snámha.

Monatóireacht, Anailís agus Tuairisciú ar an gComhshaol
- Monatóireacht a dhéanamh ar cháilíocht an aeir agus Treoir an AE maidir le hAer Glan don Eoraip (CAFÉ) a chur chun feidhme.
- Tuairisciú neamhspleách le cabhrú le cinnteoireacht an rialtais náisiúnta agus na n-údarás áitiúil *(m.sh. tuairisciú tréimhsiúil ar staid Chomhshaol na hÉireann agus Tuarascálacha ar Tháscairí)*.

Rialú Astaíochtaí na nGás Ceaptha Teasa in Éirinn
- Fardail agus réamh-mheastacháin na hÉireann maidir le gáis cheaptha teasa a ullmhú.
- An Treoir maidir le Trádáil Astaíochtaí a chur chun feidhme i gcomhair breis agus 100 de na táirgeoirí dé-ocsaíde carbóin is mó in Éirinn.

Taighde agus Forbairt Comhshaoil
- Taighde comhshaoil a chistiú chun brúnna a shainaithint, bonn eolais a chur faoi bheartais, agus réitigh a sholáthar i réimsí na haeráide, an uisce agus na hinbhuanaitheachta.

Measúnacht Straitéiseach Timpeallachta
- Measúnacht a dhéanamh ar thionchar pleananna agus clár beartaithe ar an gcomhshaol in Éirinn *(m.sh. mórphleananna forbartha)*.

Cosaint Raideolaíoch
- Monatóireacht a dhéanamh ar leibhéil radaíochta, measúnacht a dhéanamh ar nochtadh mhuintir na hÉireann don radaíocht ianúcháin.
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha.
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíoch.
- Sainseirbhísí cosanta ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Faisnéis Inrochtana agus Oideachas
- Comhairle agus treoir a chur ar fáil d'earnáil na tionsclaíochta agus don phobal maidir le hábhair a bhaineann le caomhnú an chomhshaoil agus leis an gcosaint raideolaíoch.
- Faisnéis thráthúil ar an gcomhshaol ar a bhfuil fáil éasca a chur ar fáil chun rannpháirtíocht an phobail a spreagadh sa chinnteoireacht i ndáil leis an gcomhshaol *(m.sh. Timpeall an Tí, léarscáileanna radóin)*.
- Comhairle a chur ar fáil don Rialtas maidir le hábhair a bhaineann leis an tsábháilteacht raideolaíoch agus le cúrsaí práinnfhreagartha.
- Plean Náisiúnta Bainistíochta Dramhaíola Guaisí a fhorbairt chun dramhaíl ghuaiseach a chosc agus a bhainistiú.

Múscailt Feasachta agus Athrú Iompraíochta
- Feasacht chomhshaoil níos fearr a ghiniúint agus dul i bhfeidhm ar athrú iompraíochta dearfach trí thacú le gnóthais, le pobail agus le teaghlaigh a bheith níos éifeachtúla ar acmhainní.
- Tástáil le haghaidh radóin a chur chun cinn i dtithe agus in ionaid oibre, agus gníomhartha leasúcháin a spreagadh nuair is gá.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an ghníomhaíocht á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóirí. Déantar an obair ar fud cúig cinn d'Oifigí:
- An Oifig um Inmharthanacht Comhshaoil
- An Oifig Forfheidhmithe i leith cúrsaí Comhshaoil
- An Oifig um Fianaise is Measúnú
- Oifig um Chosaint Radaíochta agus Monatóireachta Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag comhaltaí air agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

Identifying Interactions for Sustainable Development Goal Implementation in Ireland

epaResearch

Authors: Martin Le Tissier and Hester Whyte

Summary

This report addresses how understanding of interlinkages between the Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 and Ireland's policy portfolio can advance understanding to meeting SDG targets and a "whole-of-government" approach to policy implementation. In partnership with the International Science Council and the European Commission – Joint Research Centre, the project designed an online toolkit to assist policymakers and other stakeholders exploring the SDGs and policy interactions to design and implement evidence-informed policy.

Identifying Pressures

The SDGs require a step change in the integration of national social, economic and environmental policy in Ireland. SDG target 17.14 to "enhance policy coherence for sustainable development" reflects the reality that transforming societies and realising the SDGs is a multidimensional challenge; it entails harnessing synergies and managing trade-offs and policy conflicts. The individual targets of the SDGS are indivisibly interlinked, which is equally reflected in the intertwined nature of policy interactions. This can mean that action in one policy area can lead to unintended outcomes in other areas if they are pursued separately. Working towards the SDGs provides an opportunity for governments to consider how an understanding of how SDG targets are interlinked can be used to break out of policy silos and to identify, understand and manage policy interactions and interconnections.

Informing Policy

The novelty of the SDGs comes with the challenge of interpreting them in the national context and implementing them in an integrated and cross-cutting manner, which calls for revisiting the way organisations work and the way data and information are integrated. This challenge requires organisations to change from working in a "silo" or purely sectoral approach, and to work across sectors instead. Enabling this cross-sectoral approach is notoriously difficult and has been identified as a potential issue for Ireland. However, understanding the linkages across and between SDGs can lead to adjusted structures and decision-making processes to effectively integrate SDGs into the mandate of existing institutions and foster an administrative culture that promotes cross-sectoral collaboration sensitive to the need for global action. Such integration and transformations will have implications for other cross-government activities, such as climate change adaptation, by enabling approaches that lead to transformations towards resilient societies.

Developing Solutions

The SDGs provide a valuable tool for policymakers to use the nature of interactions between SDGs and targets – both positive and negative – to plan and drive coherent and efficient policy design and implementation. This project, "Identifying Interactions for Sustainable Development Goal Implementation in Ireland", adopted an analytical approach to identify how interlinkages between SDG targets could be used to identify key intersections of policy domains in Ireland. This understanding was used to provide an online toolkit allowing policymakers to engage across policy domains to better use evidence-informed approaches to address the multiple challenges they face. In this way, the SDGs can be more than a reporting framework; they can also provide an action framework that leads to greater policy coherency. This, in turn, can lead to not only developing alignment of national policy with the SDGs, but also identifying opportunities for policy coherence in the context of national planning and development initiatives, such as Project Ireland 2040.

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