Industrial Policy for the Sustainable Development Goals

INCREASING THE PRIVATE SECTOR'S CONTRIBUTION

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Please cite this publication as:
OECD (2021), *Industrial Policy for the Sustainable Development Goals: Increasing the Private Sector's Contribution*, OECD Publishing, Paris, *https://doi.org/10.1787/2cad899f-en*.

ISBN 978-92-64-51311-2 (print)
ISBN 978-92-64-86807-6 (pdf)

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Foreword

In 2015, the Member States of the United Nations (UN) adopted 17 Sustainable Development Goals (SDGs). Devised as an agenda for global sustainable development, the SDGs reflect the commitment of stakeholders to eradicate poverty, respect human rights, empower women and girls, and bring prosperity and peace, while tackling climate change and working to preserve oceans and forests.

However, in its 2020 SDG report, five years after the adoption of the SDGs, the UN warned that the global response has not been sufficiently ambitious, despite progress in some key areas. There is therefore an urgent need to increase the pace of action from all stakeholders if the goal of achieving the SDGs by 2030 is to be met.

In the meantime, the world is increasingly facing global societal challenges (climate change, health, demographics, cybersecurity, etc.) that necessitate both a public impetus and large-scale private investment. The COVID-19 crisis has highlighted the urgency of tackling these issues and stresses the role of the private sector in overcoming these global societal challenges.

The *Industrial Policy for the Sustainable Development Goals* publication, supported by the Japan Ministry of Economy, Trade and Industry (METI), aims to support governments' efforts to foster the private sector's contribution to the SDGs.

This book investigates the contribution of firms to the SDGs, particularly through their core business, taking into account intersectoral linkages and global value chains, using novel techniques and data sources. Despite the fact that the private sector has the potential to contribute to a wide range of SDGs, and that many firms find it economically viable to develop sustainable products and services, firms still face significant hurdles in their sustainability transition. Based on this new evidence, this book provides some recommendations on the design of industrial policies to enhance the contribution of businesses to the SDGs.

The OECD Committee on Industry, Innovation and Entrepreneurship (CIIE) declassified the content of *Industrial Policy for the Sustainable Development Goals: How to Increase the Private Sector's Contributions to the SDGs* on 7 June 2021. The OECD Secretariat prepared the report for publication.

Acknowledgements

The *Industrial Policy for the Sustainable Development Goals* publication was prepared under the aegis of the OECD Committee on Industry, Innovation and Entrepreneurship (CIIE).

The principal authors were Guy Lalanne (Chapters 1, 2, 3, 5 and 6), Ali Alsamawi (Chapters 3 and 4) and Kohei Kitazawa (Chapters 1, 2 and 5) of the Directorate for Science, Technology and Innovation's Productivity, Innovation and Entrepreneurship Division (PIE).

The authors thank Francesco Cabras for his important contributions to this work. The authors are grateful to colleagues from the Japan Ministry of Economy, Trade and Industry (METI), for their advice and suggestions, to Sean Cruse for sharing the United Nations Global Compact (UNGC) data and to Bhavita Ragoo, Isabelle Desnoyers-James and Alana Baker for their excellent assistance to finalise the drafting of this report. We thank Chiara Criscuolo, Head of Division at PIE, and colleagues from the Permanent Delegation of Japan to the OECD for their support throughout this project and Márcio Carvalho, Annette Hardcastle and Charles-Édouard Van De Put for excellent editorial assistance. Angela Gosmann assisted greatly in the publication stage.

The authors would like to thank the CIIE delegates from Canada, Costa Rica, France, Germany, Korea and New Zealand for their help with the benchmarking exercise in Chapter 5.

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Acronyms, abbreviations and units of measure

AI	Artificial intelligence
ASEAN	Association of Southeast Asian Nations
ASX150	Top 150 Australian publicly listed companies
B4IG	Business for Inclusive Growth (OECD)
BEF	Black Entrepreneurship Fund (Canada)
BGA	National Agency for Women Start-ups Activities and Services (Germany)
BMBF	Federal Ministry of Education and Research (Germany)
BMWi	Federal Ministry for Economic Affairs and Energy (Germany)
BPA	Bioresource Processing Alliance (New Zealand)
CAD	Canadian dollar
CCUS	Carbon Capture Usage and Storage (Japan)
CEFIA	Cleaner Energy Future Initiative for ASEAN (Japan)
CFP	Corporate financial performance
CO_2	Carbon dioxide
CORE	Canadian Ombudsperson for Responsible Enterprise
CSR	Corporate social responsibility
CSV	Creating shared value
EaSI	Employment and Social Innovation (European Union)
EEN	Energy Efficiency Networks (Germany)
EIF	European Investment Fund (European Union)
EIGE	European Institute for Gender Equality (European Union)
EIT	European Institute of Innovation and Technology (European Union)
EMF	Enabling Māori Framework (New Zealand)
ESG	Environment, social and governance
ETS	Emissions Trading System (European Union)

EU	European Union
EU-OSHA	European Agency for Safety and Health at Work (European Union)
EUR	euro
F/S	Feasibility study
FDI	Foreign direct investment
G250	World's top 250 companies by revenue
GDP	Gross domestic product
GHG	Greenhouse gas emission
GI	Green Infrastructure (Japan)
GRI	Global Reporting Initiative
GVC	Global value chain
HS6	Harmonized System 6 Digit
IAEG-SDGs	Inter-Agency and Expert Group on SDG Indicators
ICIO	Inter-country input-output
INAMU	National Institute of Women of Costa Rica
IPCEI	Important Projects of Common European Interest
ISIC Rev.4	International Standard Industrial Classification of All Economic Activities Revision 4
ITP	Industry Transformation Plan (New Zealand)
JCM	Joint Credit Mechanism (Japan)
JETRO	Japan External Trade Organization
JICA	Japan International Cooperation Agency
K-SDG	Korean-tailored Sustainable Development Goal
KEITI	Korea Environmental Industry & Technology Institute
KfW	Kreditanstalt für Wiederaufbau (Germany)
KIC	Knowledge and Innovation Community (EIT)
KOSHA	Korea Occupational Safety and Health Agency
LCGG	Low Carbon and Green Growth (Korea)
LIFE	L'Instrument Financier pour l'Environnement (European Union)
METI	Ministry of Economy, Trade and Industry (Japan)
MHTIs	Medium- and high-tech industries
MINAE	Ministry of Environment and Energy (Costa Rica)
ML	Machine learning
MLIT	Ministry of Land, Infrastructure, Transport and Tourism (Japan)
NGen	Next Generation Manufacturing Canada
NGO	Non-governmental organisation

NPO	Non-profit organisation
NZ ETS	New Zealand Emissions Trading Scheme
NZD	New Zealand dollar
OECD	Organisation for Economic Co-operation and Development
PACTE	Plan d'action pour la croissance et la transformation des entreprises (France)
PIC	Protein Industries Canada
R&D	Research and development
RBC	Responsible business conduct
RIGHT	Research Investment for Global Health Technology (Korea)
RNE	German Council for Sustainable Development
ROC	Receiver operating characteristic
SA8000	Social Accountability 8000
SASB	Sustainability Accounting Standards Board
SDG	Sustainable Development Goal (United Nations)
SDG-BAI	Sustainable Development Goals Business Actions Identifier
SII	Social impact investment
SMEs	Small and medium-sized enterprises
STAN	STructural ANalysis Database (OECD)
TCFD	Task Force on Climate-related Financial Disclosures (G20/Financial Stability Board)
TiVA	Trade in Value Added (OECD)
UN	United Nations
UNGC	United Nations Global Compact
UNICEF	United Nations Children's Emergency Fund
US	United States
VC	Venture capital
WES	Women Entrepreneurship Strategy (Canada)

Executive summary

Firms should consider sustainability shifts as an intangible investment

The private sector has a significant role to play in the achievement of the Sustainable Development Goals (SDGs), along with other stakeholders. Firms are well placed to contribute to social goods by inventing new products, reducing negative externalities and by being channels for positive cross-border impacts.

Numerous firms consider it economically viable to develop sustainable products and services linked to their core business. As the SDGs draw more and more attention, this course of action may expand both business opportunities for companies and value added for society. Selected examples and survey data show that firms of all size categories can find a business case for aligning their core business with the SDGs. In fact, sustainability shifts can be understood as an intangible investment, complementary to other types of tangible and intangible capital.

However, the private sector's contributions remain insufficient to achieve the SDGs by 2030. The **tensions between financial and sustainability objectives** hamper firms' sustainability undertakings, leaving room for policy interventions to foster contributions to the SDGs.

Even among frontrunners, SDG actions differ widely across countries, sectors and firm size. The latter is found to be a major determinant of actions, development of SDG-related products and target setting. As for other types of intangible, **small firms may be at a disadvantage compared to large firms in the transition to sustainability**. Survey data also show that SDGs 3, 5, 8, 9, 12 and 13 are the most prioritised by firms, though not necessarily linked to their core business.

Sound policies for the SDGs require an effort on the measurement of firms' awareness, actions and impacts

The measurement of firms' awareness, actions and impact on the SDGs remains challenging, despite many initiatives aimed at providing a sustainability reporting framework for societal and environmental impacts.

This book contributes to this endeavour by offering several methodological contributions and providing new insights on firms' contributions to the SDGs. To promote a more systematic analysis of firms' actions, it presents a machine learning algorithm which automatically identifies the SDGs in a short text, trained on a set of around 6 000 labelled examples of firms' sustainability actions. This algorithm is applied to classifications of economic activities and products and allows the identification of the sectors whose core business is related to the SDGs.

The private sector has the potential to contribute to a wide range of SDGs. Using the aforementioned algorithm, a significant share of value added can be linked to SDG 9 and, to a lesser extent, to SDGs 2, 3, 8, 11 and 12. These results are confirmed when examining exports, with SDG 2 and 7 also being related to a non-negligible share of exported goods.

But firms' contributions to the SDGs are cross-sectoral and international in nature. Taking into account these linkages is of utmost importance when designing industrial policies for the SDGs. With the rise of global value chains (GVCs) in the last decades, firms' impact has to be assessed at the global level, taking into account networks of cross-border suppliers and customers. The OECD's Inter-Country Input-Output (ICIO) infrastructure allows uncovering the cross-border impacts of economic activities on SDGs. Focusing on four SDG indicators linked to the SDG framework, this book underlines potential impacts of the private sector.

On intersectoral linkages, the importance of upstream sectors in the attainment of the SDGs and the need for a whole-of-value-chain approach are highlighted. SDG-related activities rely on a network of domestic upstream suppliers, whose value added can account for up to 80% of that of SDG-related activities.

International trade provides opportunities for sustainable firms to contribute to the SDGs in other countries.

- The analysis reveals significant heterogeneity across countries, in terms of value added and exports linked to each SDG, pointing to strengths and gaps at the national level, but also shedding light on **the potential for mutually beneficial trade at the international level**.
- International trade takes a prominent role, and a country's final demand for **SDG-related activities often relies to a significant extent on foreign value added**.

Key recommendations

Industrial policies (including innovation and general business framework policies) can foster the contribution of firms to the SDGs through their core business. To that end, governments rely on a diverse set of policy instruments, justified by the multifaceted challenge of the SDGs. This requires an integrated approach to articulate them:

- **Regulations and taxes are key components of policy packages, but they need to be complemented with other types of policies as well**. They may fall short when it comes to stimulating the innovation required to develop the new technologies and solutions needed to overcome the global challenges.
- In particular, the development of innovative solutions to global challenges requires a vibrant ecosystem, relying on many start-ups and entrepreneurs. **Fostering the creation of innovative sustainable firms can be an effective tool** to promote the contribution of the private sector to the SDGs through their core business.
- **More generally, support to firms, and especially to small and medium-sized enterprises, is needed** to trigger the transition to sustainable business models, as the process entails significant costs and risks.
- Beyond core industrial policies, **adequate business framework conditions are needed**. The advent of a sustainable economy will necessitate a significant reallocation of resources towards more sustainable activities and firms. In particular, international trade – when associated with a level playing field on sustainability issues – can contribute to the SDGs by increasing the market size for sustainable firms. Finally, demand-side instruments may also be useful to create new markets for sustainable products and services.
- **Mission-oriented industrial strategies provide an appropriate structure** for consistently articulating policy instruments and establishing suitable governance. To limit the risks of policy capture, emphasis should be placed on the inclusion of all types of firms (including young and small ones), policy evaluation and regular refit.

1 Introduction

This chapter is an introduction to this book and sets out the motivation. It briefly introduces the role of firms in addressing the Sustainable Development Goals (SDGs), particularly through their core business and the expected role of industrial policies to foster the contribution of business activities to the attainment of SDGs.

In 2015, the member states of the United Nations (UN) adopted 17 Sustainable Development Goals (SDGs). Devised as an agenda for global sustainable development, they reflect the commitment of stakeholders to eradicate poverty, respect human rights, empower women and girls, and bring prosperity and peace, while tackling climate change and working to preserve oceans and forests.

However, in its 2020 SDG report, five years after the adoption of the SDGs, the UN warned that the global response has not been sufficiently ambitious, despite progress in some key areas. There is an urgent need to increase the pace of action from all stakeholders if the goal of achieving the SDGs by 2030 is to be met.

This urgency is amplified by the COVID-19 crisis, which highlights not only the need for sustainability and resilience, but also the importance of health. However, its effects may compromise our ability to reach the SDGs by 2030 (Ranjbari et al., 2021[1]). The impact of the crisis is likely to be particularly acute on sustainability investments in the business sector, which has seen its financial capacity significantly affected by liquidity constraints and increasing debt burdens.

This crisis is also triggering a new wave of policies and recovery plans, with the objective to "build back better". Some of these policy packages are clearly connected to the SDG agenda and acknowledge the need to support firms' investments in sustainability, especially regarding the environment (e.g. European Recovery Fund, Korean New Deal).

Figure 1.1. The 17 Sustainable Development Goals

Source: United Nations.

This book explores the role of firms in addressing the SDGs, particularly through their core business, and how industrial policies can foster the contribution of business activities to the attainment of SDGs. Through selected business examples and the use of survey data, this book provides evidence that numerous firms consider it to be economically viable to develop sustainable products and services. In addition, it addresses the measurement of firms' SDG orientation both by offering several methodological contributions and providing new insights. In particular, it proposes a methodology to identify SDG-related economic activities with the help of a machine learning (ML) algorithm trained to detect SDGs, and uses ICIO tables to uncover the cross-border and cross-sectoral impacts of SDG-related activities. Finally, this book examines how industrial policies (including innovation and general business framework policies) can foster the contribution of firms to the SDGs through their core business, thanks to a benchmark analysis of the existing policy landscape in a sample of seven countries plus the European Union, and a detailed analysis of the policy instruments.

Developments in the areas of corporate social responsibility (CSR) and responsible business conduct (RBC) show that firms are increasingly aware of their impact on SDGs. More recently, the rise of environment, social and governance (ESG) investing demonstrates the appetite of consumers, savers and financial intermediaries for more responsible firms and the need for increased transparency on corporate sustainability actions (Box 1.1).

Demand for social and environmental accountability of firms has been increasing over the last 30 years. Many stakeholders consider that the societal role of private companies is not only to maximise value for their shareholders, but also to contribute actively – along with governments, non-governmental organisations (NGOs), households and international organisations – to global social goods, such as the environment and societal outcomes. This engagement can take several forms; the activities of some firms are inherently and directly linked to SDGs (via the goods produced and/or services provided), while others focus on the mitigation of the negative impact of their daily operations on SDGs, or use the resources of the company to fund philanthropic organisations that contribute to the achievement of SDGs.

In line with this demand of increased accountability, previous works have focused on either promoting principles, standards and guidelines to help businesses manage their social and environmental risks or measuring the distance to the SDG targets at the country level (e.g. Box 1.2). However, the measurement of a firm's impact remains challenging. Whereas SDGs provide common goals, commonly agreed business indicators of sustainability remain a distant objective. At the firm level, measures are not only required by the firm's management to objectivise the impact and efficiency of the firm's actions, but also to provide indicators on which to index public policies (for instance, carbon dioxide emissions for climate change mitigation policies). Moreover, such indicators would also be required at the aggregate level to assess the achievements of the private sector and to build sound SDG policies.

This book contributes to bridging this gap by highlighting how firms can positively contribute to the SDGs, and by paving the way for measurement of the private sector's involvement in, or contribution to, the SDGs. It takes a transversal approach to the SDGs, although it sometimes focuses on some Goals or targets, as an illustration. Moreover, the analysis identifies the SDGs that firms prioritise or have an impact on. In addition, it distinguishes between core business-related SDGs and those that are pervasive in non-core business activities.

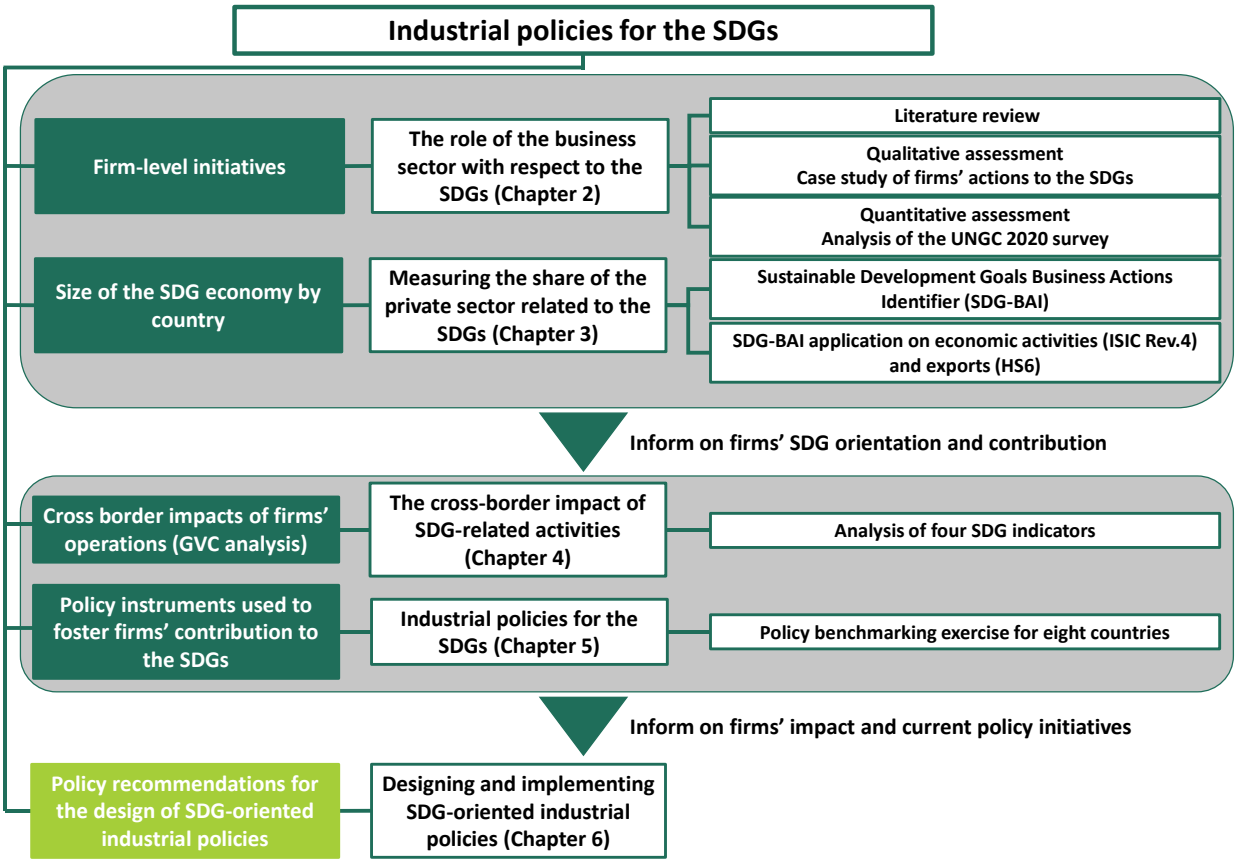
The recent literature emphasises the role of industrial policies (including innovation and general business framework policies), which often take the form of mission-oriented industrial strategies (Criscuolo et al., forthcoming[2]; Larrue, 2021[3]; Mazzucato, 2018[4]), directly target innovation and growth for overcoming societal challenges. This literature has often focused on green industrial strategies (Altenburg and Rodrik, 2017[5]; Tagliapietra and Veugelers, 2020[6]).

This book builds on this literature, which mostly focuses on climate change, and extends it to the SDGs, using evidence gathered on the firms' contributions to the SDGs and a benchmark analysis of the existing policy landscape in a sample of seven countries plus the European Union. It shows that governments are already using a diverse set of policy instruments to promote firms' sustainability, and emphasises the need for a comprehensive toolkit, as well as its adequate articulation and governance through mission-oriented industrial strategies.

Chapter 2 reviews the available information on the engagement of firms, relying on existing literature, examples of firms' actions, and survey data from the United Nations Global Compact (UNGC). The difficulty in measuring contributions to the SDGs at the firm level is evident, despite several frameworks in development by international initiatives (which are also summarised). Acknowledging the need for further work and harmonisation from the relevant standard-setting bodies regarding the contribution to SDGs at the firm level, Chapters 3 and 4 propose three methodological contributions regarding the measurement of SDG orientation in a cross-country setting: 1) the construction of an ML algorithm that automatically identifies the SDGs in a short text; 2) an experimentation with the identification of sectors and products inherently linked to SDGs using the aforementioned algorithm; and 3) the use of the OECD Trade in Value Added

(TiVA)/ICIO infrastructure to measure the cross-border impact of SDG-related activities on selected SDG indicators. Chapter 5 reviews the policies implemented in a sample of seven countries plus the European Union. Finally, building on the previous chapters, Chapter 6 examines how industrial policies can foster the contribution of firms to the SDGs through their core business.

Figure 1.2. Structure of the book



Note: SDG = Sustainable Development Goal; UNGC = United Nations Global Compact; SDG-BAI = Sustainable Development Goals Business Actions Identifier; GVC = global value chain; ISIC Rev.4 = International Standard Industrial Classification of All Economic Activities Revision 4; HS6 = Harmonized System 6 Digit.

Box 1.1. CSR, RBC, CSV, ESG and the SDGs

Corporate Social Responsibility (CSR) (1960s) is a management concept that allows firms to take into account social goods, going beyond the goal of mere profit maximisation of shareholders. It gears firms towards considering social and environmental responsibility and its voluntary integration into their business, beyond charity, sponsorships or philanthropy. The evaluation of CSR activity is often conducted by the firm itself and is publicised through an annual sustainability report and/or a dedicated section on its website.

However, several initiatives help firms enhance and communicate their sustainability performance, such as the Global Reporting Initiative (GRI) and the UNGC. Other initiatives provide standards for reporting, thus reducing the cost for third parties to access the information and compare firms (GRI, Sustainability Accounting Standards Board [SASB], ISO 26000) (Box 2.1).

Responsible business conduct (RBC) (1976)[1] are principles and standards that set out an expectation that businesses should avoid and address negative impacts of business activities, while contributing to sustainable development in countries where they operate. RBC means integrating and considering environmental and social issues within core business activities, including throughout the supply chain and business relationships.

Creating shared value (CSV) (2006), the concept introduced by Porter and Kramer (2006[7]) and Porter (2019[8]), distinguishes itself from CSR as a superseding and more narrow concept, emphasising the importance of jointly creating economic and social value, for instance by "reconceiving products and markets", "redefining productivity in the value chain", or "enabling local cluster development". Given the broad definition and usage of the CSR concept by firms across countries, which is not necessarily directly linked to the business strategy, the authors argue that CSV is more directly linked to a firm's profitability and competitive position in the market than is CSR. Some firms have progressively adopted the CSV concept and have used it to frame their contribution to SDGs (e.g. Nestlé (2021[9]) and section "How firms tackle SDGs in practice" in Chapter 2).

Table 1.1. Evaluation of CSR, RBC, CSV, ESG and the SDGs

	Perspective	Evaluator	Evaluation targets	Evaluation purpose	Information availability
CSR	Firm	Consumer, employee, investor or citizen through the information made available by the firm itself	Firm	Commitment to the community of stakeholders (consumers, employees, shareholders)	CSR/sustainability report (Mostly based on informal evaluation and information provided by the firm itself.) Reporting frameworks and platforms (ISO 26000, GRI, UNGC, Sustainability Accounting Standards Board [SASB], Voluntary Principles, SDG Compass…)
RBC	Multinational enterprise	Firm's stakeholders through the information made available by the firm itself	Multinational enterprise	To anticipate and prevent or mitigate negative impacts of businesses	Due-diligence report
CSV	Firm	Consumer, employee, investor or citizen through the information made available by the firm itself	Firm	To legitimise business by measuring societal value created	Annual report or sustainability report of individual firms
ESG	Investor	Investors, financial institutions, notably through specialised rating agencies	Firm	Screening for potential investments, active ownership by institutional investors	Rating agencies (through ratings or benchmarks)
SDGs	All kinds of stakeholders including firms	In general: Anyone For firms: Consumer, employee, investor or citizen through the information made available by the firm itself	All kinds of stakeholders including firms	In general: Measurement of progress towards SDGs targets and indicators For firms: Commitment to the community of stakeholders, or measuring firm's contribution to SDGs	Measurement of progress: Measuring distance to the SDGs targets (United Nations [UN], OECD) Firm involvement: CSR/sustainability reports, reporting platforms Prize winners: governments and NGOs (e.g. SDGs awards)

Environmental, social, and governance (ESG) (2006), is the concept widely disseminated by the Principles for Responsible Investment (PRI), defined as "a strategy and practice to incorporate environmental, social and governance (ESG) factors in investment decisions and active ownership" (PRI). Rating agencies, as a service provider to financial institutions, and investors as well as their target firms, all conduct the evaluation of the firms' ESG practices. Beyond some degree of reporting standardisation, ESG gave rise to quantitative assessments of firms' attitude and achievements, allowing the diffusion of sustainability concerns among financial institutions and investors.

Finally, the **Sustainable Development Goals (SDGs)** (2015) encompass key global challenges. It is a universal call to all kinds of stakeholders including firms, governments, households and NGOs to contribute to the achievement of 17 goals by 2030. With a broader coverage than the Millennium Development Goals (2000-15), they should allow firms in any industry to contribute, including non-listed and smaller firms that may consider themselves as outside the scope of ESG. Although the quantitative evaluation of an individual firm's contribution to SDGs remains especially challenging, initiatives such as the UNGC serve as an international platform to publicise firm's SDGs participation across countries. Governments and NGOs also promote SDGs by awarding prizes to the firms that have an outstanding contribution to SDGs (Chapter 5).

From the point of view of private companies, CSR, ESG and SDGs are inextricably interwoven (Table 1.1). CSR has integrated social and environmental concerns in firm's business operations and provided a framework to act in a more socially responsible way. ESG has introduced a somewhat measurable assessment of firms' contribution to environmental, social and governance factors. It has initiated the involvement of investors and financial institutions to direct more resources into sustainable business activities, although CSR measurement is not necessarily consistent across rating agencies and is rather focused on large ones. SDGs have been conceived as an overarching framework involving all types of stakeholders. While for some firms SDG and CSR are close substitutes, for some others sustainability is at the core of their business strategy and corporate culture (Ashrafi et al., 2018[10]). Beyond corporate responsibility, the contribution to SDGs is inherently linked to firms' activities (see Chapter 2 for examples).

1. First edition of the *OECD Guidelines for Multinational Enterprises* (OECD, 2011[11]).

Box 1.2. An overview of OECD work on the SDGs

The OECD is home to a number of initiatives and databases related to the SDGs. As part of its commitment to help implement the SDGs, the OECD endorsed an Action Plan that describes how the organisation can support their achievement (OECD, 2016[12]). It includes actions to "support countries as they identify where they currently stand in relation to the SDGs, where they need to be, and propose sustainable pathways based on evidence", "reaffirm [the] role [of OECD] as a leading source of expertise, data, good practices and standards" and "encourage a "race to the top" for better and more coherent policies that can help deliver the SDGs". This box lists the main initiatives under this aegis.

Measuring the distance to the SDGs' targets

The OECD Well-being Framework (via its *How's Life* publications (OECD, 2020[13])) provides a comprehensive view of what matters to people, the planet and societies. This Framework consists of 11 dimensions that are coherent with those in the SDGs, i.e. health, income and wealth, jobs, education, environmental quality etc.

As part of its commitment to help achieving the SDGs, the OECD developed a methodology to measure, for each country, the distance remaining to reach the SDG targets (OECD, 2019[14]), building on the *How's Life* work. Measuring distance to the SDG targets allows for better identification of priorities, and where countries should focus their efforts. These measures are based on the UN list of more than 200 indicators. Work in OECD (2020[15]) further measures the distance to the SDGs at the region and city level. In addition, many cities and regions from the OECD have already improved and implemented policy recommendations – developed under the OECD Programme on A Territorial Approach on SDGs – that involved private sector in their 2030 Agenda.

Responsible business conduct

The OECD is home to the main international standard on RBC and has developed guidance to help businesses manage environmental and social risks in their supply chains. RBC principles and standards set out an expectation that all businesses – regardless of their legal status, size, ownership structure or sector – should avoid and address the negative consequences of their operations, while contributing to the sustainable development of the countries where they operate. OECD work on RBC encompasses several work streams and legal instruments. The *OECD Guidelines for Multinational Enterprises* (OECD, 2011[11]) are the most comprehensive international instrument on what constitutes responsible business conduct. The Guidelines pertain to businesses operating in or from adhering countries, with the purpose to: ensure that business operations are in line with government policies; strengthen mutual confidence between businesses and the societies in which they operate; improve the investment climate and; to enhance the contribution of the private sector to sustainable development. Each adhering country sets up a national contact point tasked with promoting RBC and the Guidelines, as well as helping resolve issues in case the Guidelines are not observed.

A key element of RBC is risk-based due diligence – a process through which businesses identify, prevent and mitigate their actual and potential negative impacts, and account for how those impacts are addressed. RBC expectations are prevalent throughout GVCs and increasingly in international trade and investment agreements and national development strategies, laws, and regulations. The OECD has set out due-diligence guidance in several sectors to help businesses implement RBC principles and standards in their supply chains.

More recently, the OECD published a report in collaboration with the International Labour Organization, the International Organization for Migration and UNICEF to explore how child labour, forced labour and human trafficking (SDG Target 8.7) are linked with economic activity in global supply chains (ILO, OECD, IOM and UNICEF, 2019[16]).

Foreign direct investment quality indicators

As part of the OECD Action Plan on the SDGs, an FDI Qualities Toolkit was developed to measure the sustainable development impacts of foreign direct investment (FDI) on hosting countries. It highlights areas where FDI may have a positive impact towards achieving the SDGs, focusing on five themes: productivity and innovation, employment and job quality, skills, gender equality, and carbon footprint (OECD, 2019[17]). The Toolkit will allow policymakers to engage in detailed national or regional assessments to identify policies that harness FDI's potential for progress towards defined priorities.

Business for Inclusive Growth

Business for Inclusive Growth (B4IG)[1] is a platform developed by the OECD and business leaders to unite actions by businesses and governments around a common agenda for inclusive growth. B4IG plays an important role in advancing the G7 agenda to strengthen equality of opportunities; reduce income and gender inequalities; promote diversity and inclusion; and commit to advancing human rights in direct operation and supply chains. It focuses its actions around three key pillars: 1) advancing human rights in direct operations and supply chains; 2) building inclusive workplaces; and 3) strengthening inclusion in company value chains and business ecosystems. In addition, the coalition agreed to advance an impact measurement agenda that would seek to identify key metrics capturing the B4IG goals.

The Platform will also serve as an "incubator" for businesses and governments to test new policies and ideas to promote inclusive growth. Through a web portal and regular workshops and conferences, it provides a virtual and physical space to discuss, experiment, and test new ideas and policies on corporate governance models, business impact metrics and accounting standards, programmes and activities, and public-private partnerships.

Note: Parts of this box are taken from Shinwell and Shamir (2018[18]), "Measuring the impact of businesses on people's well-being and sustainability: Taking stock of existing frameworks and initiatives", https://dx.doi.org/10.1787/51837366-en.

1. https://www.oecd.org/inclusive-growth/businessforinclusivegrowth/.

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2 The role of the business sector with respect to the SDGs

This chapter explores the contribution of the business sector to the Sustainable Development Goals (SDGs) through three different angles. First, it reviews the academic literature on the role of firms in the provision of social goods, and their incentives to engage in such investments. Second, it gathers and describes examples of firms' actions related to the SDGs. Finally, it presents evidence on firms' prioritisation, actions and planning related to SDGs using the United Nations Global Compact survey data.

Key messages

- **Firms are well placed to contribute to social goods** by producing new products, reducing negative externalities (e.g. effect on biodiversity) and inducing positive cross-border impacts (e.g. eliminating child labour in their operations abroad, in-house or outsourced). However, the private sector's contributions to the Sustainable Development Goals (SDGs) remain insufficient.
- The uncertainty of financial returns on firms' sustainability investments is a substantial barrier to action. The **tensions between financial and sustainability objectives** hamper firms' sustainability advances, leaving room for policy interventions to foster contributions to the SDGs.
- Nonetheless, **numerous firms already consider it economically viable to develop sustainable products and services linked to their core business**. As the SDGs draw increased attention, **this may expand both business opportunities for companies and value added for society**. Selected examples and survey data show that firms of all size categories can find a business case for aligning their core business with the SDGs: the vast majority of firms are willing to take strategic action towards the SDGs by linking activities to their core business.
- **For these firms, sustainability shifts can be considered as intangible investments**, complementary to other types of tangible and intangible capital. As with any other type of capital, this "sustainability" capital can bear fruit in both the short and long run. However, shifting to sustainability requires a comprehensive approach and structural changes in the firm's culture. It entails the strong commitment of corporate leaders, a demonstration of the business case to stakeholders, the adaptation of the business model and an efficient communication with customers on sustainable strategies and practices.
- Even among frontrunners, **SDG actions differ widely across countries, sectors and firm size**. The latter is a major determinant of actions, target setting and development of SDG-related products, with small firms facing more obstacles. *SDG 3-Good Health and Well Being*, *SDG 5-Gender Equality*, *SDG 8-Decent Work and Economic Growth*, *SDG 9 Industry, Innovation and Infrastructure*, *SDG 12-Responsible Consumption and Production* and *SDG 13-Climate Action* are the most prioritised by firms.

Context

The degree of firm involvement in tackling the SDGs varies across firms and across countries for several reasons. First, there is no clear consensus among the business community about whether SDG action is economically viable, and beneficial for firms, or not. Second, some firms still struggle to align the SDG framework – and other sustainability-related business concepts (Box 1.1) – with their business operations. Third, the measurement of firms' contributions to the SDGs rests on the measuring of their impact through well-designed indicators. However, Shinwell and Shamir (2018[1]) review the available frameworks (Box 2.1) and stress the methodological challenges of these frameworks, and the use of different indicators jeopardising comparability across firms. They also conclude that the SDGs have resonated strongly within the business community, particularly through these initiatives.

To lay the groundwork for the analysis developed in the rest of this report, this chapter explores the contribution of the business sector to the SDGs through three different angles. First, it reviews the academic literature on the role of firms in the provision of social goods, and their incentives to engage in such investments. Second, it gathers and describes examples of firms' actions. Finally, it presents evidence on firms' prioritisation, actions and plans related to SDGs using the United Nations Global Compact (UNGC) survey data. These data allow for the comparison of the SDG awareness, orientation and, to some extent, actions, of firms across countries. They can also point to categories of firms and/or SDGs that deserve particular attention from policy makers.

Box 2.1. A few examples of sustainability reporting frameworks

- The **Global Reporting Initiative (GRI)** is a non-profit organisation (NPO) that helps governments and businesses worldwide understand their impact on critical issues related to climate change, human rights and social well-being. GRI standards are among the most widely adopted global standards for sustainability reporting. A mapping between GRI standards and the SDGs is available.[1]
- The **Sustainability Accounting Standards Board (SASB)** is an independent standards board that is accountable for the process, deliverables, and ratification of the SASB standards. The main focus of SASB is to establish industry-specific disclosure across environment, social and governance (ESG) topics that can facilitate the communication between companies and investors.
- The **Sustainable Development Goal Compass** is a framework that provides guidance for companies on how they can align their action towards the SDGs.
- **Social Accountability International** is a global non-governmental organisation (NGO) that works to advance human rights at work and develop multi-industry standards. These standards include Social Accountability 8000 (SA8000), TenSquared and Social Fingerprints. SA8000, for instance, is an auditable certification standard to develop, maintain and apply socially acceptable practices in the workplace. The SA8000 standard addresses workers' rights, workplace conditions and management systems and is as such related to the *SDG 8-Decent Work and Economic Growth*.

1. https://www.globalreporting.org/media/lbvnxb15/mapping-sdgs-gri-update-march.pdf.
Source: See Shinwell and Shamir (2018[1]), "Measuring the impact of businesses on people's well-being and sustainability: Taking stock of existing frameworks and initiatives", https://dx.doi.org/10.1787/51837366-en for a more exhaustive list of initiatives, including ESG ratings.

Firms can complement governments and households in the pursuit of SDGs

The literature on the social responsibility of businesses started following the provocative column from Friedman (1970[2]), in which he stated that firms should only maximise their value for shareholders.

The objective of Friedman (1970[2]) was probably not to say that firms should completely disregard their social responsibility. Indeed, shareholders, and more generally households may also value[1] the contribution of firms to social goods (Baron, 2007[3]). Rather, Friedman's column questions the role of private firms in the contribution to these social goods, and the channels through which they can contribute to them.

Indeed, the provision of social goods can be financed by several agents:

- households, contributing through charity giving or personal involvement in NGOs
- the government (and indirectly the households), through taxes
- firms, through their operations or the use of their profit.

If the three channels were perfect substitutes (as implicit in Friedman's thinking), it would probably be inefficient to fund social goods through the firms. However, there are several reasons to believe that the three channels are imperfect substitutes:

- The efficiency of the channels can vary depending on the social good considered, and firms may be more efficient in some instances:
  - Firms can be well placed to introduce new commercially viable products and processes that contribute to the achievement of SDGs.
  - For instance, for global challenges, multinationals may be better equipped than governments to address the issues, for example, child labour abroad (Bénabou and Tirole, 2010[4]).

  - Remedying some of the firms' negative externalities (e.g. impact on biodiversity) may be more costly than avoiding them (Hart and Zingales, 2017[5]).
- The cost of funding social goods through the different channels may be biased by the design of the corporate tax system.
- Firms may want to contribute to the social goods on a voluntary basis (Coase, 1960[6]; Costello and Kotchen, 2020[7]), in particular when the externalities can be easily attributable to the firm (e.g. local pollution with a rare chemicals).

The provision of social goods by the firm can be achieved in several ways, depending on the link with the operations of the firm. The contribution of the firm can be tightly related to the core business of the firm (e.g. producing new drugs), pervasive in the firm's operations although not directly related to its products (e.g. reducing greenhouse gas [GHG] emissions in the production process), or not directly related to the daily operations (e.g. using the firms human or financial resources to support NGOs).

Demand for the social and environmental accountability of firms has been increasing over the last 30 years. Bénabou and Tirole (2010[4]) cite four reasons for this trend: 1) the higher demand for social and environmental responsibility as standards of living are improving in developed countries; 2) the increased availability of information on companies' operations; 3) globalisation and the operations of multinationals in developing countries; and 4) the increased awareness on climate change.

Firms can benefit from sustainability efforts through several channels

Whereas the previous section made it clear that firms can have a role to play in funding social goods, it does not necessarily mean that they will indeed engage in this activity, or that they will not under-invest in sustainability.

Therefore, two cases can be distinguished:

- Sustainability efforts are in the financial interest of shareholders because it increases the value of the firm (strategic or win-win view (Baron, 2007[3]; Bénabou and Tirole, 2010[4]), also sometimes referred to as the triple bottom line approach).
- Sustainability efforts are not in the financial interest of shareholders but is valuable for the broader community of stakeholders (altruistic view).

This section first reviews the literature on the relationship between sustainability and financial performances. This review does not offer a clear-cut conclusion and this relationship heavily depends on the type of SDG action. The remainder of this section explores the channels through which the financial and sustainability objectives are either consistent or conflicting.

Do sustainability efforts increase the financial value of a firm?

The strategic view of sustainability efforts can only be supported if the contribution to social goods effectively and positively affects the corporate financial performance (CFP) of a firm.

Despite extensive research conducted across countries to explore the corporate social performance (CSP)-CFP relationship, it remains unclear. While positive CSP-CFP relationships are more commonly found in some meta-analyses (Margolis, Elfenbein and Walsh, 2007[8]; Orlitzky, Schmidt and Rynes, 2003[9]; Hermundsdottir and Aspelund, 2021[10]), other recent contributions do not find any correlation between corporate responsibility and CFP (Surroca, Tribo and Waddock, 2010[11]; Endo, 2013[12]). Another strand of research, mainly focused on listed firms, investigates the impact of incorporating corporate sustainability factors into investors' decisions, and usually corroborates a positive correlation between the ESG score of the portfolio and its financial performance (Hua Fan and Michalski, 2020[13]). These diverging results may be due to four different factors.

First, heterogeneous sustainability initiatives can be observed among firms. Different issues are addressed: environmental vs social; charity vs non-financial contributions; social issues linked to a firm's value chain vs social issues affecting the business in-house vs generic social issues (Porter and Kramer, 2006[14]). Firms also differ by their degree of involvement in sustainability, and some studies have found a U-shaped or an inverted-U shaped relationship between sustainability and financial performances (Boakye et al., 2021[15]; Grassmann, 2021[16]).

Second, the measurement methodology, and thus the evaluation of the firm's sustainability performance, are not standardised (Galant and Cadez (2017[17]) for corporate social responsibility [CSR]). While some evaluators measure only one aspect of sustainability initiatives (e.g. environmental aspect, amount of charity), others evaluate different or multiple aspects. The comparability of sustainability performance between firms remains challenging (Box 2.1).

Third, the relationship may instead be between CFP and the change in sustainability orientation. In theory, with perfect financial markets, the sustainability orientation of a firm should be priced, since inception and the CFP should only reflect subsequent changes in the firm's sustainability orientation. In that case, the relationship between sustainability efforts and CFP, as measured by the evolution of stock prices, would be blurred (Alexander and Buchholz, 1978[18]).

Finally, other studies also show that the relationship between CSP and CFP may be due to an omitted variable bias, namely the stock of intangibles (Surroca, Tribo and Waddock, 2010[11]) or financial constraints (Hong, Kubik and Scheinkman, 2012[19]).

Focusing on one dimension of sustainability can to a certain extent lessen the problem of the heterogeneity of business actions and the issue of their measurement. For instance, the link between environmental regulation and firm performance is usually referred to as the Porter hypothesis. The literature shows that, even if the environmental regulation fosters innovation and productivity, the net impact on competitiveness remains negative or close to zero in a majority of the studies (Ambec et al., 2013[20]; Dechezleprêtre and Sato, 2017[21]; Dechezleprêtre et al., 2019[22]).

In summary, the positive link between CFP and sustainability remains unclear at the aggregate level and is likely to depend on the characteristics of the targeted social good and the firm, as well as on the economic context.

The two following subsections focus first on the channels through which sustainability can foster the financial value of a firm and then on the tensions arising between financial and other objectives.

Through which channels can sustainability efforts positively affect the financial value of a firm?

Academic and business literatures cite a number of reasons why sustainable practices may have a positive impact on a company:[2]

- By decreasing "short-termism" (Bénabou and Tirole, 2010[4]). Introducing sustainability concerns may increase the long-term performance of companies. It can for instance help alleviate ineffective managerial incentives or a limited temporal horizon of managers. Bénabou and Tirole (2010[4]) cite the example of a firm reneging on an implicit contract with a supplier, thereby increasing its short-term profit but damaging goodwill and potentially the value that can be extracted from that relationship in the long run. In the same vein, increasing the managerial horizon can foster the internal incentives to innovation.
- By strengthening the commitment of stakeholders – in particular employees –, making their personal motivations more aligned with those of the company (Graafland and Noorderhaven, 2019[23]; Jones, 1995[24]; Hiller and Raffin, 2020[25]). More fundamentally, some authors even argue that sustainability is a major component of corporate culture. Corporate culture corresponds to the "glue that binds employees together" and contributes to explaining why firms emerge as an efficient way to organise production (Gorton and Zentefis, 2020[26]).

- By increasing the resilience of firms to various type of exogenous shocks:
  - Sustainability efforts decrease risk, for instance by avoiding costly lawsuits or scandals (Carroll and Shabana, 2010[27]; Hallikas, Lintukangas and Kähkönen, 2020[28]).
  - Firms with better environmental and social performances have a lower financial distress risk (Boubaker et al., 2020[29]).
  - This channel is also put forward during the COVID-19 crisis. Publicly listed firms with a higher pre-crisis investment in sustainability show a significant smaller decline in stock price, which is interpreted as the consequence of stronger ties with stakeholders more willing to make adjustments to support the firm's continuity (Ding et al., 2020[30]; Chintrakarn, Jiraporn and Treepongkaruna, 2021[31]).
- Through an improved corporate reputation and image:
  - Improving the perception of the firm can increase the demand for its products (Schuler and Cording, 2006[32]; Chuah et al., 2020[33]). For instance, Ricci et al. (2020[34]) show that the impact of digital innovations is magnified for more sustainable firms, perhaps because of a higher level of trust from their customers.
  - An improved image can increase the firms' attractiveness on the labour market (Albinger and Freeman, 2000[35]; Jones, Willness and Madey, 2014[36]), thereby improving the talent of its new employees.
  - Sustainability efforts can also be used as a signalling tool towards stakeholders, such as suppliers or investors.

As a result, sustainability practices are usually thought of as having a positive impact on innovation (Graafland and Noorderhaven, 2019[23]), and more generally on productivity. Examples of this in recent literature include:

- Graafland and Noorderhaven (2019[23]) who, using a large survey on a sample of European small and medium-sized enterprises (SMEs), show that the innovation motive for CSR is one of the most frequently cited by managers, especially for environmental CSR, with employee satisfaction also often cited as a motivation.
- Hoogendoorn, van der Zwan and Thurik (2020[37]) show that start-ups that put more emphasis on environmental values are more likely to innovate; perhaps because their leaders internalise the positive spillovers of their inventions on the environment.
- Liu, Sun and Zeng (2020[38]) show that, among Chinese firms, a higher employee-related CSR score spurs innovation.

Sustainability actions can thus be understood as an investment in intangible capital, complementary to other types of tangible and intangible capital. As with any other type of capital, this "sustainability" capital can bear fruits both in the short and long run, and needs to be maintained in order to compensate for its depreciation.

Tensions between financial and sustainability objectives may also arise

The literature review clearly shows that sustainability and financial objectives are not perfectly aligned (e.g. (Wannags and Gold, 2020[39]) for examples of tensions and trade-offs, mainly arising from the cost of the sustainability actions).

Porter and Kramer (2006[14]) distinguish between strategic CSR – which can increase the competitive advantage of the firm – and responsive CSR. Even in the case that responsive CSR can have a marginal positive impact on the financial performance of the firm, through a decrease in the risk of scandal or lawsuits, the authors argue that the effect is likely to be small in the long run, and outweighed by the costs of these actions. Responsive CSR includes the provision of generic public goods and the mitigation of harm caused by value-chain activities. Strategic CSR includes actions on social dimensions providing a competitive advantage to the firm directly (e.g. Toyota's comparative advantage on hybrid vehicles, which

contributes to the mitigation of GHG emissions), or through its supply chain (e.g. Nestlé's milk district in India, which provides infrastructure and knowledge to local farmers).

The uncertain financial return of sustainability investments, and the tensions between financial and sustainability objectives, tend to support the hypothesis of an under-provision of social goods by firms, and provides a case for policy interventions.

How firms tackle SDGs in practice

The inconclusiveness of the literature on the link between sustainability and financial performance calls for a more granular approach. This section provides some examples of firms' actions to explore the business case for being sustainable, and the underpinnings of firms' actions. It relies on more than 50 selected cases from the UNGC-KPMG industry matrices, the Global SDG Award, the UNGC and company websites.

Typology of firms' SDG actions

In line with the literature review in the previous section, the cases are classified according to two criteria into a four-by-four matrix (Table 2.1). The two criteria are defined by:

- **The objective of the action**, building on Porter and Kramer (2006[14]), classified into four categories. The first two categories are considered as strategic uses of SDGs (or creating shared value) (see Box 1.1), because they provide a competitive advantage to the firm (for instance through increased sales or margins, reduced costs, or higher resilience).
    1. **Strategic in-house contribution to SDGs**. Leveraging the ever-growing importance of SDGs, the objective is to increase revenues or profitability, notably by strengthening the involvement of the firms' stakeholders, including employees, customers, business partners, shareholders and local communities. Some firms set this contribution to SDGs central to their long-term business strategy.
    2. **Transformation of global value chains (GVCs) and reinforcement of business strategy**. Some firms that are involved in GVCs, either upstream or downstream, aim to contribute to SDGs by proactively and positively affecting their suppliers' and intermediate customers' well-being. This objective is close to the previous category (leverage on sustainability to increase or maintain the long-term business viability and profitability), but focuses on the supply chain rather than on in-house operations.
    3. **Mitigation of harm from GVCs**. Some firms undertake responsive actions towards their suppliers or employees in their GVC to minimise reputational risk and negative externalities arising from their business operations, sometimes regardless of whether there is a direct causality or not.
    4. **Generic social impacts/good citizenship**. Some firms simply try to do good for society (e.g. local communities), either by limiting the harm from their in-house operations, or in a way that is completely apart from their business. To some extent, this is close to the common understanding of CSR, and these actions do not have the direct objective of increasing revenues or profits.
- **The channel of action** is also classified into four categories, depending on the link with the other operations of the firm. The categories are as follows, based on the literature review of sections "Firms can complement governments and households in the pursuit of SDGs" and "Firms can benefit from sustainability efforts through several channels".
    1. **Core business**. Some firms develop new products or services close to their core business in order to contribute to the SDGs. Integrating the SDG contribution into their main business pillar, these firms proactively upgrade their business model, business strategy and even research and development (R&D) directions. As SDGs draw more and more attention of stakeholders, this course of action may expand firms' business opportunities, increasing their value added to the society and potentially their profits.

2. **Mitigating the impact of the daily operations of the firm**. Some businesses inevitably affect the surrounding society and environment. One way that firms can tackle SDGs is to minimise or offset this negative impact arising from the firms' business operations. This course of action affects the process of business operations rather than business products themselves. However, it may affect the firms' business positively, as consumers are also conscious of the impact of their consumer choice behaviour.
3. **Using firm's non-financial resources (e.g. human resources) for actions unrelated to the main operations**. Firms can use non-financial resources, such as employees, knowledge, technology, business networks and facilities to contribute to SDGs. Contrary to the first two channels, this one does not result directly in the development of new products, services or processes affecting the core operations of the firm. For example, some firms provide specialised technology or human resources for institutions that require it (e.g. NPOs, charities, other initiatives).
4. **Donation/charity/philanthropy**. Firms can contribute to SDGs by providing financial support to external organisations and activities such as NGOs, schools and environmental work. These contributions usually appear in firms' sustainability report, but not as part of their business.

Examples of firms' SDG actions

This subsection summarises the main lessons learnt from the analysis of 51 cases of firms' SDG actions. It relies on 51 selected cases from the UNGC-KPMG industry matrices, the Global SDG Awards, the UNGC and company websites. It also presents in detail a few flagship examples of strategic uses of SDGs.

The cases are chosen to reflect the diversity of the firms' contribution to SDGs. Some degree of representativeness of the sample is ensured through the survey design by setting quotas for different regions of the world, different sizes of firms and different industries (Annex A for the detail of the examples, and Box 2.4 for a focus on the financial sector). Even though this set of examples reflects the different objectives of firms, a particular emphasis is placed on strategic uses of SDGs. These examples, although not necessarily representative of the majority of firm's actions (Table 2.2 and Annex A), are of particular relevance for policy measures.

Table 2.1. Joint distribution of firms' objectives and channels

Objective/channel	1. Core business	2. Mitigating the impact of the daily operations of the firm	3. Using firm's non-financial resources for actions unrelated to the main operations	4. Donation/ charity/ philanthropy	**Total**
1. Strategic in-house contribution to SDGs	31	1	2	0	**34**
2. Transformation of GVC and reinforcement of business strategy	7	2	2	0	**11**
3. Mitigation of harm from GVC	0	1	0	0	**1**
4. Generic social impacts/good citizenship	0	3	0	2	**5**
Total	**38**	**7**	**4**	**2**	**51**

Sources: The cases were selected from UNGC and KPMG (2016[40]), "SDG Industry Matrix: Transportation", https://www.unglobalcompact.org/library/4831; UNGC and KPMG (2016[41]), "SDG Industry Matrix: Industrial Manufacturing", https://www.unglobalcompact.org/library/4351; UNGC and KPMG (2016[42]), "SDG Industry Matrix: Financial Services", https://www.unglobalcompact.org/library/4001; UNGC and KPMG (2016[43]), "SDG Industry Matrix: Food, Beverage & Consumer Goods", https://www.unglobalcompact.org/library/3961; UNGC and KPMG (2016[44]), "SDG Industry Matrix: Healthcare & Life Sciences", https://unglobalcompact.org/library/4341; UNGC and KPMG (2017[45]), "SDG Industry Matrix: Energy, Natural Resources and Chemicals", https://www.unglobalcompact.org/library/5061; firms' websites and sustainability reports; and SDG awards (Canada and Japan).

Table 2.1 summarises the joint distribution of firms' objectives and channels. While being mindful that that the 51 cases are not randomly selected, some interesting insights can be drawn. Unsurprisingly, the main insight is on the link between objectives and channels. The vast majority of firms willing to strategically use the SDGs, take actions linked to their core business, whereas other objectives can fit with any channel of action, including those that are not linked to the firms' daily operations. In detail:

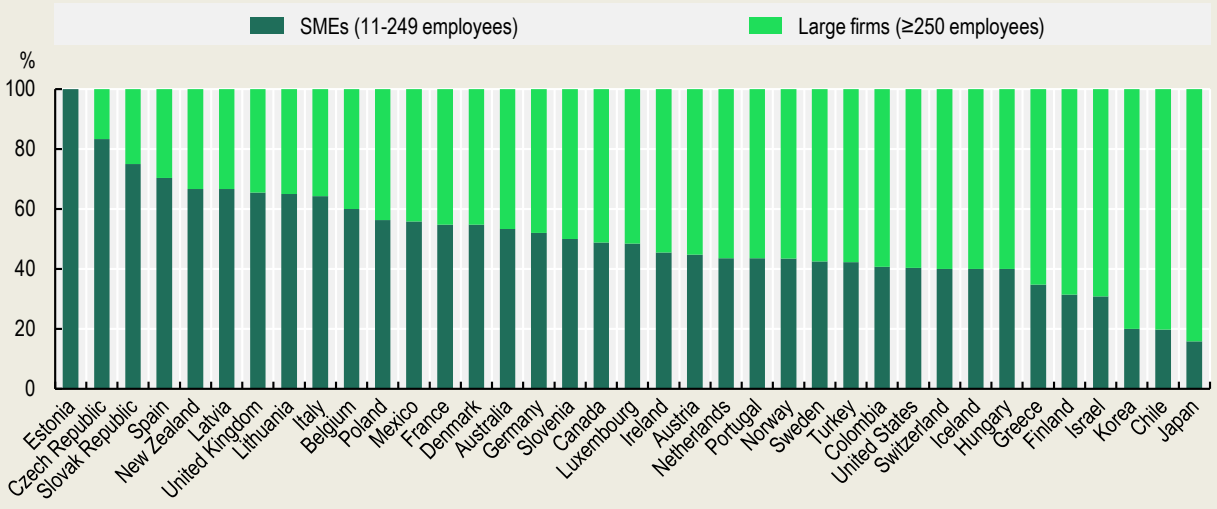
- "Strategic in-house contributions to SDGs (objective)" are highly associated with firms' "Core business (channel)". However, the reverse is not necessarily true. "Core business (channel)" also serve to achieve "Transformation of GVC and business strategy (objective)".
- "Transformation of GVC and reinforcement of business strategy (objective)" are associated with "core business (channel)", "Mitigating the impact of the daily operations of the firm (channel)" or "Using firm's non-financial resources for actions unrelated to the main operations (channel)".
- "Generic social impacts/good citizenship (objective)" are less likely to be linked to "Core business (channel)", but are either linked to "Mitigating the impact of the daily operations of the firm (channel)" or "Donation/charity/philanthropy (channel)".

Box 2.2. The United Nations Global Compact data

The UNGC is a voluntary initiative based on CEO commitments to implement universal sustainability principles and to take steps to support United Nations SDGs. The participants commit to embrace these principles and SDGs and to report on their progress. They benefit from networking and partnership opportunities, best practice guidance and a wide array of resources for advancing sustainability issues within their business. Rasche (2009[46]) describes the similarities and differences between the UNGC reporting and some other initiatives (GRI and SA8000). Van der Waal and Thijssens (2020[47]) show that UNGC participation is the main predictor of SDG involvement for the largest 2 000 listed businesses worldwide.

When discussing UNGC data, this book follows the regional, firm size and sectoral categories used by the 2020 UNGC survey. DNV GL and UNGC (2020[48]) provides descriptive statistics from this survey. The results may slightly differ from those provided in this book, which focuses on non-private sector organisations.

Figure 2.1. Firms' participation in the UNGC, by employment size, across OECD countries



Notes: SMEs = small and medium-sized enterprises; UNGC = United Nations Global Compact.The classification of firm size relies on the definition of the UNGC. The data is as of 9 April 2020.
Source: OECD calculations based on UNGC's participant list (not publicly available).

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Composition of UNGC participants

The UNGC is one of the largest sustainability reporting frameworks. As of 2020, there are 9 214 private firms currently participating in the Compact. The participation in the UNGC by employment size is very heterogeneous across countries, with the share of SMEs (11 to 249 employees) ranging from less than 20% to 100% depending on the country.

Limitations

Although the use of UNGC data is insightful, some limitations have to be kept in mind. First, the data are self-reported by participating firms. Second, UNGC participation is voluntary and, for some firms, based on the payment of a fee. Thus, all the firms that take decisive actions do not necessarily participate in the UNGC. Third, the participation in the UNGC is not comparable across countries, either because of national policies or the activity of the UNGC. For this reason, analysis mainly focuses on the composition of participants rather than on the number of participants per country. The 2020 UNGC survey had around 600 respondents, representing approximately 6.5% of all private-sector participants.

Box 2.3. Why firms participate in sustainability reporting frameworks: stylised facts on the strategic reasons to participate to the UNGC

UNGC data can be used to shed light on the reasons disclosed by companies for their participation in the UNGC. These results must be evaluated with the knowledge that participation in the UNGC is voluntary, and subject to a fee. The participation in the UNGC, and hence to this survey, may thus be subject to a selection bias, which may vary across country, sector or company size.

Information available from the 2020 UNGC Survey Data

The main information used in this box comes from the 2020 UNGC Survey, Section I, question 6, which was completed by 597 firms. The companies are asked to rank “the top 5 reasons for [their] participation in the UN Global Compact”. The proposed answers are listed in Figure 2.2.

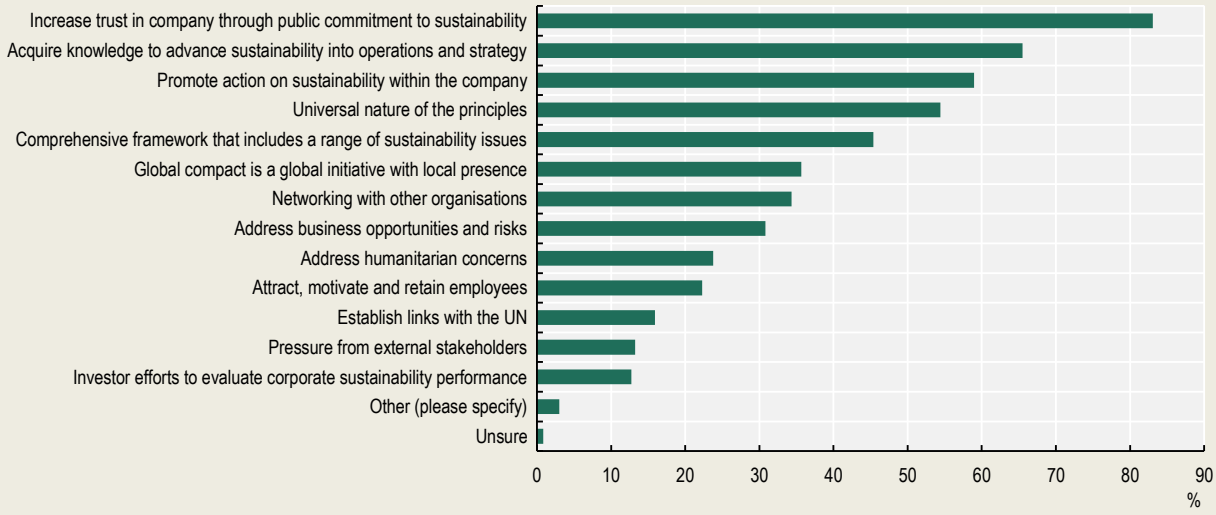
Although many reasons can be deemed strategic, this analysis focuses on the answers “Address business opportunities and risks” and “Attract, motivate and retain employees”, thereafter considered as strategic.

Most of the firms cite general reasons for participation in the UNGC. “Increase trust in company”, “acquire knowledge”, “promotes action on sustainability within the company” and “the universal nature of the principles” are cited by more than 50% of the firms as one the top five reasons for their participation. Each of the strategic reasons are cited by between 20% and 30% of the companies.

This pattern is even more striking when the analysis is focused on the top one or top two reasons, and is quite constant across time. The importance of strategic reasons even shows a slight decline over time, as firms become more eager to “acquire knowledge”, which was cited by only 30% of the respondents in 2010, compared to 65% in 2020.

There is a considerable heterogeneity across countries, with the share of firms citing strategic reasons varying from 0% to almost 80% (Figure 2.3). However, due to different size and sectoral composition across countries, it is difficult to draw firm evidence or conclusions from these graphs.

Figure 2.2. Share of firms mentioning each reason among their top five



Note: UN = United Nations.
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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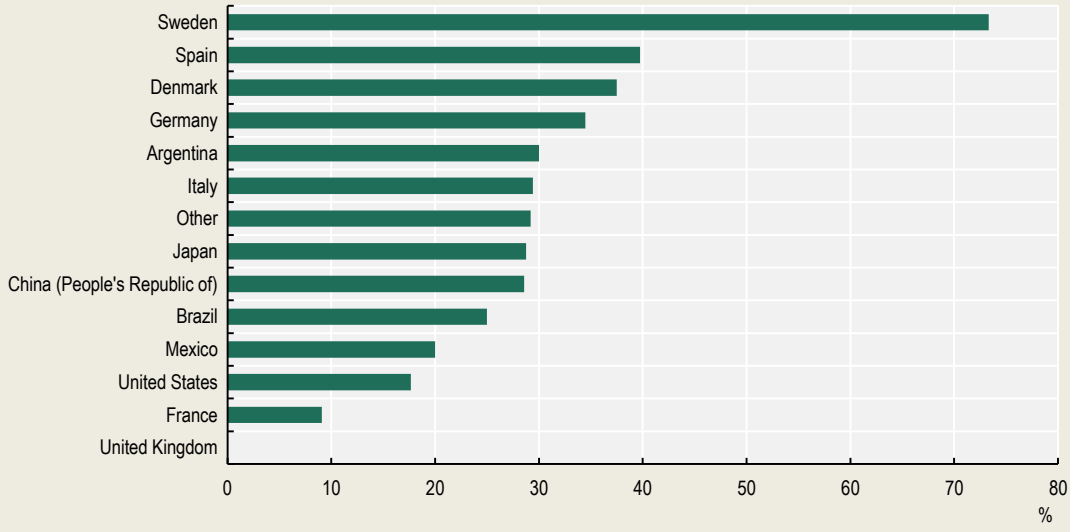
Figure 2.3. Share of firms citing "Address business opportunities and risks" as one of their top five reasons



Note: Only countries with more than ten answering firms are listed. The rest of the countries are collated in the "Other" category.
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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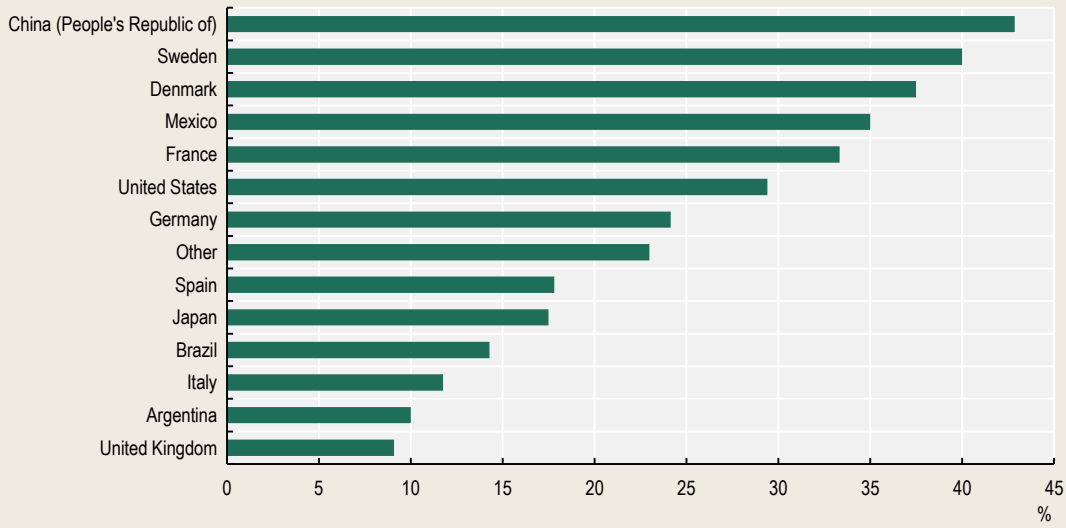
For this reason, a multivariate analysis is performed. The use of strategic reasons for UNGC participation is regressed on regional dummies, company size bins (headcount or turnover) and sectoral dummies. To account for the fact that the outcome variable is binary, a logit model is estimated. The following results stand out:

- Firm size does not matter. The share of firms citing strategic reasons never depends on firm size, once the other variables are taken into account.

- Firms in North America are three times less likely to cite a strategic reason than are European firms. This result is significant and robust across specifications. Other regions do not show a significantly different behaviour compared to Europe.

Firms in the "healthcare and life sciences" and "natural resources, energy and basic materials" sector are, respectively, three times and two times less likely to cite a strategic reason compared to firms in the manufacturing sector. This result is significant and robust across specifications. Other sectors do not show a significantly different behaviour compared to manufacturing firms.

Figure 2.4. Share of firms citing "Attract, motivate and retain employees" as one of their top five reasons



Note: Only countries with more than ten answering firms are listed. The rest of the countries are collated in the "Other" category.
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

StatLink https://doi.org/10.1787/888934274494

How firms are developing their business models around sustainability

These examples, along with an extant management literature, show that sustainability can be an economically viable option (circular economy, inclusive business models (Schoneveld, 2020[49]), gender equality (Bennett et al., 2020[50]), eco-innovation, etc.). Table 2.2 shows some of the most renowned and indicative cases of "strategic contributions to SDGs (objective)" through "core business (channel)" taken from the 51 cases. These strategic uses usually require structural changes. In particular, businesses need:

- **To show a strong commitment of corporate leaders**. They not only need to devise a vision and common values, but also show emotional commitment in order to involve all relevant stakeholders (Kantabutra and Ketprapakorn, 2020[51]). This strategy must then be translated at the operational level by a network of SDG-oriented managers (Wolff et al., 2020[52]), be instilled into the corporate culture (García-Granero, Piedra-Muñoz and Galdeano-Gómez, 2020[53]) and, when relevant, be incorporated into R&D strategy. Examples in Table 2.2 require long-lasting R&D efforts, which would have been impossible without strong leadership. For example, Dulas has been consistently producing solar powered vaccine refrigeration since 1982, investing in R&D and innovation, and is now considered as a business success.
- **To demonstrate the business case for sustainable investments**. Firms need performance indicators to track their return on investment and demonstrate that sustainability actions have a

positive financial impact (Hristov and Chirico, 2019[54]). This is particularly important to convince stakeholders that business sustainability can be considered an intangible asset rather than a cost.

- **To adapt the business models**. Sustainability must be embedded in a fully fledged business strategy (Rodrigues and Franco, 2019[55]). For instance, Blasi, Crisafulli and Sedita (2021[56]) put forward the example of firms willing to revisit their operations for more circularity. These firms often need to drastically change their business model, selling "solutions"[3] rather than products. They also need to include their suppliers in their strategy (Elia, Gnoni and Tornese, 2020[57]). For example, Sompo Japan Nipponkoa Holdings (Table A.4) has developed a new line of products related to agriculture, by creating weather index insurance in Southeast Asia to smoothen the impact of climate change on farmers.
- **To communicate with customers about their sustainable strategies and practices**. Communication is needed to advertise the impact of the company. Using a sample of Italian SMEs, Blasi, Crisafulli and Sedita (2021[56]) show that the promotional efforts of circular practice improve performance. The four firms in Table 2.2 clearly communicate their missions and SDG actions, either on their websites or in sustainability reports. But communication is also required to ensure that the new sustainable business model corresponds to the expectations of stakeholders, including – but not limited to – customers. Building on case studies, Bashir et al. (2020[58]) and Aminoff and Pihlajamaa (2020[59]) argue that the introduction of new sustainable products and services may require trial and error, a process which is made more fluid by communication with customers; for instance based on experiments and small-scale tests, and which can leverage on digital technologies (Gregori and Holzmann, 2020[60]). Firms are also expected to convey their sustainability strategy and corresponding SDG actions to their stakeholders, as they gain more roles and responsibilities in society. Finally, as many firms are trying to ride the wave of sustainability, firms' actions also need to be distinguishable from competitors doing "SDG-washing" (i.e. window-dressing actions that are not directly related to or motivated by sustainability, or communicating only positive impacts of the business while hiding the negative impacts).

Box 2.4. SDGs and the role of the financial sector

Sustainable development initiatives undertaken by the financial industry act as a catalyst to channel funds to the most sustainable companies and to encourage other industries to become more sustainable. Hence, sustainability initiatives in the financial sector, which often have cross-border influence, have a pervasive impact on other industries, countries and individuals.

As an intermediary between depositors/investors (e.g. households) and borrowers (e.g. firms), the financial sector has a crucial role in channelling savings to sustainable businesses. For example, large commercial banks (e.g. Standard Chartered and Banco do Brazil in Annex A) provide financing and technical assistance for microfinance.

This has been translated into several investment policies, notably ESG investing and social impact investment (SII). More generally, financial institutions are also proposing "sustainable" financial products. To that end, they rely on available non-financial information, for instance ESG rating (Box 1.1).

ESG investing aims to "better incorporate long-term financial risks and opportunities into their investment decision-making processes to generate long-term value." (Boffo and Patalano, 2020[61]).

SII, including both social investing and impact investment, "provides finance to organisations addressing social and/or environmental needs with the explicit expectation of measurable social and financial returns. It is a new way of channelling new resources towards the Sustainable Development Goals." (OECD, 2019[62]) For example, Aavishkaar Group (Table 2.2), a well-recognised frontrunner of SII, has incubated social entrepreneurs addressing 13 different SDGs and has indirectly benefitted more than 100 million underserved customers in South Asia, Southeast Asia and East Africa (D'Souza, 2020[63]).

Table 2.2. Indicative examples of SDG actions (core business strategic contributions to the SDGs)

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
United Kingdom	1. Energy, natural resources and chemicals	≤250	3	"Dulas Ltd has developed solar powered medical fridges that are used in remote regions across Africa, Asia, the Pacific Islands and Latin America to store blood and vaccines. The company is a major supplier of these fridges which are being used in numerous successful national immunisation programs in hospitals, clinics, health centres and remote medical stations around the world. These have been approved by the strict Performance, Quality and Safety protocol set by the World Health Organisation and feature independent freezer compartments and a durable sealed battery delivering continuous cooling to keep vaccines safe. The solar system provides secure constant power including a five day back up." (UNGC and KPMG, 2017[45]). Dulas encountered success, doubling its sales between 2015 and 2017 (Torres-Rahman, 2018[64]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	No
India	2. Financial services	>3 000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 17	Aavishkaar Group, known for building business that can benefit the underserved segments across Asia and Africa in sectors such as transport, healthcare, basic financial services and other services, comprises equity funds, a venture debt vehicle, a microfinance and advisory business including investment banking. Achievement of Aavishkaar Capital, the equity investment entity of Aavishkaar Group and one of the largest impact investors in Asia, includes 1) approximately 87% of its portfolio companies having Aavishkaar Capital as their first institutional investor, 2) 93 million people receiving improved access to essential products and services in the areas including education, healthcare, WASH (water, sanitation and hygiene) and financial services, and 3) investing into sectors that are aligned with the 13 SDGs. (D'Souza, 2020[63])...	1. Strategic in-house contribution to SDGs	1. Core business	No	No
Netherlands	4. Healthcare and life science	>3 000	2, 3, 7, 12, 13	"Royal DSMs NutriRice uses innovative hot extrusion technology with encapsulated micronutrients to preserve the nutrients typically lost during milling and food preparation. This is an important innovation given that rice is the staple food of more than half of the world's population, yet it contains few vitamins and minerals. NutriRice uses rice flour as a raw material and kernels are mixed with natural rice at a ratio of 0.5-2.0%. NutriRice kernels look, taste and behave exactly like normal rice. In a poor urban setting in Bangalore, India, DSM collaborated with the St. Johns Research Institute to conduct a trial to study the effects of NutriRice on school children aged 6-12 years. After six months the children's B-vitamin status had improved significantly and there was an improvement in physical performance, particularly physical endurance, among the children who consumed NutriRice." (UNGC and KPMG, 2016[44]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Italy	5. Industrial manufacturing	>250 and ≤3 000	4, 6, 7, 8, 12, 13, 15,	"Thanks to continuous research and collaboration with various stakeholders, in 2011, the Aquafil Group completed the transformation of Nylon 6 waste into regenerated ECONYL yarn, maintaining the same quality level and performance, but by significantly	1. Strategic in-house contribution	1. Core business	No	Yes

			16	reducing environmental impact. Regenerated nylon is used by a growing number of companies in the carpet and fashion sectors, including some of the world's leading fashion houses." (Aquafil, 2020[65]).	to SDGs			

Notes: SDG = Sustainable Development Goal; GRI = Global Reporting Initiative; UNGC = United Nations Global Compact. The table is organised by industry and country (alphabetical). The actions and corresponding SDGs only describe parts of the sustainability strategy of those firms.

Sources: The cases were selected from UNGC and KPMG (2016[40]), "SDG Industry Matrix: Transportation", https://www.unglobalcompact.org/library/4831; UNGC and KPMG (2016[41]), "SDG Industry Matrix: Industrial Manufacturing", https://www.unglobalcompact.org/library/4351; UNGC and KPMG (2016[42]), "SDG Industry Matrix: Financial Services", https://www.unglobalcompact.org/library/4001; UNGC and KPMG (2016[43]), "SDG Industry Matrix: Food, Beverage & Consumer Goods", https://www.unglobalcompact.org/library/3961; UNGC and KPMG (2016[44]), "SDG Industry Matrix: Healthcare & Life Sciences", https://unglobalcompact.org/library/4341; UNGC and KPMG (2017[45]), "SDG Industry Matrix: Energy, Natural Resources and Chemicals", https://www.unglobalcompact.org/library/5061; firms' websites and sustainability reports; and SDG awards (Canada and Japan).

SDG orientation of firms: Quantitative evidence from the UNGC participating firms

This subsection analyses firms' SDG orientation using the 2020 United Nations Global Compact (UNGC) annual survey results (see Box 2.2 on the description of the UNGC data). The 2020 version of the annual survey is well suited for this report because the questions related to SDGs are more specific than in previous years. A section of the annual survey is dedicated to the actions and impacts of companies that are related to the SDGs. It includes, for example, questions on firms' motivation for sustainability, the company's actions related to the SDGs, a self-assessment of the company's positive and negative impacts on the SDGs, the firms' stated prioritisation of the SDGs for their business, and more.

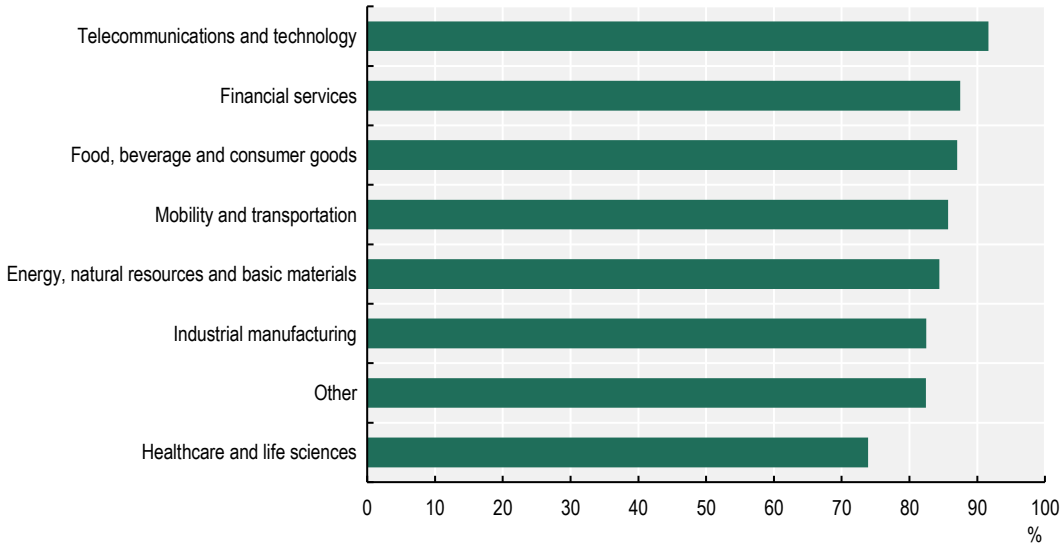
The results of the survey should not be over-interpreted, even though this is a valuable resource for policymakers and business community. The main caveat comes from the fact that answers reflect firms' own perceptions rather than an objective measure of reality. The sustainability reporting frameworks still suffer from the lack of a systematic and internationally standardised approach linking business actions and impacts with the SDGs.

SDG orientation of firms

This subsection presents quantitative evidence on the SDG orientation of firms, using the 2020 UNGC survey dataset, which was answered by 597 firms (hereafter the firms) from 78 countries, and excluded non-business organisations. The survey provides information on how firms perceive and tackle the SDGs, complementing the qualitative analysis on the typology and examples of firms' SDG actions in the previous subsection. It has some limitations and sample bias (Box 2.2); for instance, UNGC participating firms are more likely to be frontrunners in terms of sustainability.

The vast majority of respondent firms answered that they take actions to advance the SDGs (Figure 2.5). The highest share (92%) is found in the technology and telecommunications sector, and the lowest in the healthcare and life sciences sector (74%).

Figure 2.5. Share of firms taking actions to specifically advance the SDGs, by mega sector



Notes: SDG = Sustainable Development Goal. The original question was: "Does your company take actions to specifically advance the Sustainable Development Goals?".
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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On average, firms consider themselves to have a positive impact on each of the SDGs (Table 2.3). This is particularly so for *SDG 3-Good Health and Well-Being*, *SDG 5-Gender Equality*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure* and *SDG 12-Responsible Consumption and Production*, while less strong for *SDG 1-No Poverty, SDG 2-Zero Hunger*, *SDG 14-Life Below Water*, *SDG 15-Life on Land* and *SDG 16-Peace, Justice and Strong Institutions*. The results are relatively consistent across sectors. The healthcare and life sciences sector indicates a very positive impact for SDG 3. The mobility and transportation sector considers itself as having a high impact on SDGs 3, 8, 9, *11-Sustainable Cities and Communities*, and 12.

Table 2.3. Firms' self-evaluation of their impact on each of the SDGs

Average score of firm's self-evaluation of their current impact on each of the SDGs, by sector

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
All sectors	0.8	0.6	1.2	0.9	1.2	0.8	0.9	1.3	1.2	0.9	0.9	1.1	0.9	0.4	0.5	0.7	1.0
By mega sector:																	
Energy, natural resources and basic materials	0.7	0.6	1.1	0.7	1.0	0.8	1.0	1.3	1.2	0.8	0.8	1.1	1.0	0.4	0.6	0.6	0.8
Financial services	0.8	0.6	1.3	1.0	1.3	0.7	1.0	1.4	1.2	1.0	0.8	1.0	1.0	0.3	0.5	0.8	1.1
Food, beverage and consumer goods	0.9	0.8	1.3	0.9	1.2	0.6	0.6	1.3	1.0	1.0	0.7	1.1	0.7	0.4	0.6	0.6	1.1
Healthcare and life sciences	0.7	0.7	1.7	1.0	1.3	0.8	1.0	1.6	1.2	1.1	0.7	1.2	0.9	0.2	0.5	0.8	1.1
Industrial manufacturing	0.8	0.6	1.2	0.9	1.1	0.8	1.0	1.3	1.3	0.9	0.9	1.1	1.0	0.4	0.5	0.7	0.9
Mobility and transportation	1.0	0.9	1.2	0.9	1.0	0.7	0.8	1.5	1.3	1.0	1.3	1.3	1.1	0.7	0.6	0.5	1.1
Telecommunications and technology	0.6	0.4	1.1	1.0	1.3	0.5	0.7	1.3	1.3	1.1	0.9	1.1	0.9	0.3	0.4	0.7	1.0
Other	0.8	0.7	1.1	0.9	1.2	0.8	0.8	1.3	0.9	0.9	0.8	1.0	0.7	0.4	0.5	0.7	1.0

Notes: SDG = Sustainable Development Goal. The original question was: "From your perspective, what would you say is your company's current impact on each of the Global Goals?". A higher score corresponds to a more positive impact. On a scale of -2 to 2, where -2= Significant negative impact, -1= Somewhat negative impact, 0= No impact or not aware of the impact that our company has on this goal, 1= Somewhat positive impact and 2= Significant positive impact. The colours in the cells vary from blue (the largest value) to white (the value at the 50th percentile) to red (the lowest value).
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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In recent years, it became more common for firms to indicate their SDG prioritisation/orientation on their websites or in their sustainability reports. Table 2.4 shows the SDG prioritisation by firms in the UNGC 2020 survey, as well as in other surveys. In the UNGC 2020 survey, the most widely prioritised SDGs were *SDG 3-Good Health and Well-Being*, *SDG 5-Gender Equality*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure*, *SDG 12-Responsible Consumption and Production* and *SDG 13-Climate Action* (in numeric order). This ranking result is consistent with survey results of the world's top 250 companies by revenue (G250) and of the top 150 Australian publicly listed companies (ASX150), despite some differences in absolute share (KPMG International, 2018[66]; RMIT and UNAA, 2020[67]). Therefore, in Chapter 5, policies targeting these highly prioritised SDGs are particularly scrutinised.

Table 2.4. SDG prioritisation by firms

Share of firms prioritising each SDG, and ranking of perceived relevance of SDGs for the private sector

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
UNGC 2020 survey (%)	18	15	46	32	43	23	33	54	41	27	27	45	45	11	17	20	35
G250 survey (%)	28	21	55	51	52	34	48	59	48	39	46	54	64	18	26	32	34
ASX150 2019 survey (%)	11	5	26	20	31	15	25	37	27	25	25	31	37	9	17	17	19
SDG Barometer 2020 (ranking)	*14*	*17*	*2*	*8*	*7*	*12*	*6*	*1*	*3*	*9*	*10*	*4*	*5*	*16*	*13*	*15*	*11*

Notes: SDG = Sustainable Development Goal. The share of firms (%) prioritising each of the SDGs in three different surveys (UNGC 2020 survey, G250 survey and ASX150 2019 survey) is shown in roman type, and the ranking of perceived relevance of SDGs for the private sector (SDG Barometer 2020) is shown in italics. The original question in the 2020 UNGC survey was "Which of the following Global Goals does your company currently prioritise? Select all that apply". The colours of the cells vary gradually from red (the largest value) to white (the value at the 50th percentile) to blue (the lowest value) for the first three rows.
SDG Barometer 2020 represents 803 Belgian organisations, of which 60% are private sector. The results shown in the figure are restricted to the private sector and display their ranking of the SDGs (1 for the SDG deemed the most relevant to 17 for the one deemed the least relevant). The colours of the cells vary gradually from blue (the lowest value) to white (the value at the 50th percentile) to red (the largest value).
The colours are applied for each row to highlight the relative difference within each row.
Sources: OECD calculations based on the 2020 UNGC survey (not publicly available); KPMG International (2018[66]), "How to report on the SDGs", https://assets.kpmg/content/dam/kpmg/xx/pdf/2018/02/how-to-report-on-sdgs.pdf; RMIT and UNAA (2020[67]), "SDG Measurement and Disclosure 2.0: A study of ASX150 companies", https://www.unaa.org.au/wp-content/uploads/2020/08/UNAA-RMIT-ASX-150-SDG-Report.pdf; Antwerp Management School and the University of Antwerp (2020[68]), "SDG Barometer 2020", https://cdn.uclouvain.be/groups/cms-editors-ilsm/csr-louvain-network/documents/rv_stl_sdg_barometer_2020_EN.pdf.

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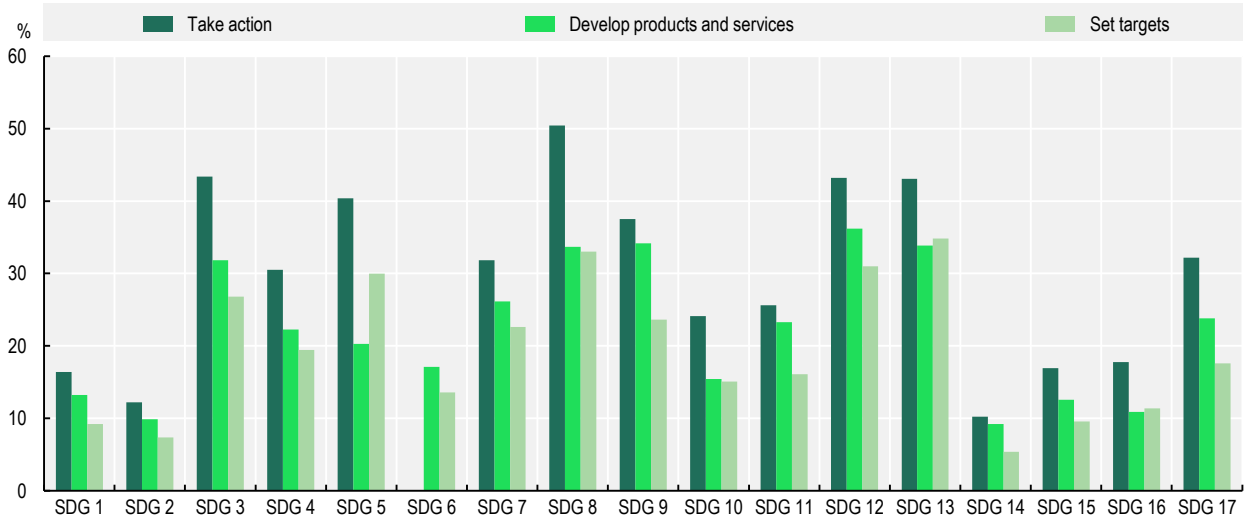
Similarly, in a recent survey of over 480 Belgian firms, the perceived relevance of SDGs for firms – which can be seen as a proxy for SDG prioritisation – indicated a similar pattern (Antwerp Management School and the University of Antwerp, 2020[68]). However, interestingly, this order differs significantly for government organisations, non-governmental organisations and educational institutions, confirming that firms have different roles than other organisations, as discussed in section "Firms can complement governments and households in the pursuit of SDGs".

The share of firms taking action varies across the SDGs, ranging from 10% (*SDG 14-Life Below Water*) to 50% (*SDG 8-Decent Work and Economic Growth*) (Figure 2.6). The share of firms that develop products and services related to that SDG (i.e. close to what is defined as "core business" in previous sections), is lower than the share of those taking action, as actions include broader business activities. Across SDGs, the share of firms setting targets is even lower, except for *SDG 5-Gender Equality*, *SDG 13-Climate Action* and *SDG 16-Peace, Justice and Strong Institutions*.

Among the respondents, the propensity to take action related to a given SDG is very heterogeneous across region, firm size and sector (Table 2.5). In order to disentangle the influence of these three characteristics, a logistic regression is conducted, using the answer to the question "Does your company take action on Goal X? (Yes/No)" as a dependent variable, and region, firm size and sector dummies as independent variables. As a result, for example, compared to European firms, Asian firms are less likely to act on *SDG 5-Gender Equality* and *SDG 16-Peace, Justice and Strong Institutions*. For *SDG 1-No Poverty*, firms in Africa, Asia and Latin America are more likely to take actions compared to European firms. Firms in the energy, natural resources and basic materials sector, financial services sector, food beverage and consumer goods sector, mobility and transportation sector, and other sectors, are more likely to take actions for SDG 1 compared to firms in industrial manufacturing sector.

Figure 2.6. Firms' actions and targets for each SDG



Notes: SDG = Sustainable Development Goal. For each SDG, the original questions were: "Has your company set targets to advance Goal X?", "Does your company develop products and services that contribute to Goal X?" and "Does your company take action on Goal X?". The data for "Take action (SDG 6)" are unavailable.
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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In general, the larger the firm, the higher is the probability to take action. Very large firms (>50 000) are more likely to take action on all SDGs except *SDG 3-Good Health and Well-Being*, *SDG 10-Reduced Inequalities*, *SDG 12-Responsible Consumption and Production*, and *SDG 15-Life on Land* than SMEs (<250). Large firms (5 000-50 000) are more likely to take action on *SDG 4-Quality Education*, *SDG 5-Gender Equality*, *SDG 7-Affordable and Clean Energy*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure*, SDG 10; *SDG 11-Sustainable Cities and Communities*, *SDG 12-Responsible Consumption and Production*, *SDG 13-Climate Action*, *SDG 16-Peace, Justice and Strong Institutions*, and *SDG 17-Partnerships for the Goals* than SMEs (<250). Firms in the financial sector are more likely to take action on SDGs 1, 8, 10 and 17 than are firms in the industrial manufacturing sector. While some of the patterns found in this analysis (e.g. the food, beverage and consumer goods sector's relative focus on *SDG 2-Zero Hunger*, and the energy, natural resources and basic materials sector's relative focus on SDGs 7 and 13) were expected, others (e.g. the financial systems sector's relative focus on *SDG 1-No Poverty* and the telecommunications and technology sector's relative focus on SDGs 5 and 10) were less so.

Although this result underlines that small firms may be at a disadvantage in the transition to sustainability, compared to large firms, it does not mean that SMEs' contribution to the SDGs should be overlooked. First, SMEs constitute the vast majority of firms and a sizeable share of economic activities in most OECD countries. Their impact on sustainable development is therefore of utmost importance. Second, the very existence of SMEs can contribute to the SDGs, for instance by providing employment to their founders and local communities.

As this book focuses on the firms' contribution to the SDGs particularly via core businesses, Table 2.6 provides very useful insights on firms' developments of products and services linked to SDGs. Table 2.6 also presents the results of a logistic regression, using the answer to the question "Does your company develop products and services that contribute to Goal X? (Yes/No)" as a dependent variable, and region, firm size and sector dummies as independent variables. The results are similar to the ones in Table 2.5, but also exhibit some interesting differences. For example, compared to the European firms, the Latin American firms are more likely to develop products and services on *SDG 1-No Poverty*, *SDG 4-Quality Education*, *SDG 8-Decent Work and Economic Growth*, and *SDG 16-Peace, Justice and Strong Institutions*. As for actions, the propensity to develop SDG-related goods and services increases with size for most of the SDGs.

Firms in the financial sector are more likely to develop products and services related to the SDGs 1, 4, *SDG 5-Gender Equality*, 8, *SDG 10-Reduced Inequalities* and *SDG 17-Partnerships for the Goals* compared to firms in the industrial manufacturing sector. The technology and telecommunication sector is more likely to develop products and services on SDGs 4, 8, and 10, but less likely on *SDG 6-Clean Water and Sanitation*, compared to firms in the industrial manufacturing sector.

Table 2.5. Firms' likelihood of taking action on SDGs

Odds ratio of firms taking actions for each SDG, by region, headcount and mega sector, compared to the benchmark categories

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
Region (benchmark: Europe)																
Africa	7.7															2.7
Asia	2.1				0.4		0.7								0.4	
Latin America	2.9															
MENA											0.3					
North America														4.4		
Headcount (benchmark: <250)																
250-4 999							2.2	1.6			2.4	2.0			2.2	1.6
5 000-50 000				2.4	1.9	2.1	4.2	3.8	1.8	2.2	3.4	4.5			3.6	2.8
>50 000		3.0		3.7	5.1	5.4	2.9	3.0		6.8		12.5			3.5	6.4
Megasector (benchmark: industrial manufacturing)																
Energy, natural resources and basic materials	2.4	3.4				2.4						1.9		2.4		
Financial services	3.2						2.3		2.1							2.4
Food, beverage and consumer goods	2.6	5.8				0.4		0.4								
Healthcare and life sciences						0.3										
Mobility and transportation	3.6															
Telecommunications and technology					1.8				2.5							
Other	2.3	2.6			1.7			0.5								

Notes: MENA = Middle East and North Africa; SDG = Sustainable Development Goal. This table is a result of a logistic regression model (blank squares indicate no statistically significant difference). For each SDG, the original question was: "Does your company take action on Goal X?". 597 firms were surveyed. Showing the statistically significant results only at p <.05 level. Asia includes Oceania. For each variable, the benchmark category is excluded from this figure. "Odds ratio = 1" means just as likely as the comparison group (small firms [<250]). The results are based on self-reported data by participating firms. The data for SDG 6 are unavailable. The colours of the cells vary gradually from red (the largest value) to white (not significantly different from 1.0) to blue (the lowest value).
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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Comparing to the relative likelihood of answering the question positively for very large firms (>50 000) compared to SMEs (<250) remains similar, and is even reinforced for *SDG 1-No Poverty*, *SDG 3-Good Health and Well-Being* and *SDG 10-Reduced Inequalities*, while it disappears for *SDG 16-Peace, Justice and Strong Institutions*.

Table 2.6. Firms' likelihood of developing products and services that contribute to SDGs

Odds ratio of firms developing products and services contributing to each SDG, by region, headcount and mega sector, compared to the benchmark categories

	SDG 1	SDG 2	SDG 3	SDG 4	SDG 5	SDG 6	SDG 7	SDG 8	SDG 9	SDG 10	SDG 11	SDG 12	SDG 13	SDG 14	SDG 15	SDG 16	SDG 17
Region (benchmark: Europe)																	
Africa	7.6																4.2
Asia	2.5		1.8														
Latin America	3.9			2.0				2.3								2.3	
MENA				3.2	2.6							0.3					
North America												0.2					
Headcount (benchmark: <250)																	
250-4 999				1.7								2.5					
5 000-50 000				2.6			1.8	2.7	3.4		2.2	2.7	2.9			2.6	1.8
>50 000	4.0	3.8	2.8	3.8	3.9		5.6	3.2	3.0	3.5	7.8		13.5				5.4
Megasector (benchmark: industrial manufacturing)																	
Energy, natural resources and basic materials		3.1					2.2						2.3				
Financial services	4.3				2.3			2.8		2.7							2.5
Food, beverage and consumer goods		5.6					0.4		0.2								
Healthcare and life sciences			3.7				0.2					0.2					
Mobility and transportation																	
Telecommunications and technology				2.2													
Other	2.6	3.3			2.4												1.9

Notes: MENA = Middle East and North Africa. This table is a result of a logistic regression model (blank squares indicate no statistically significant difference). For each SDG, the original questions was: "Does your company develop products and services that contribute to Goal X?". 597 firms were surveyed. This table shows the statistically significant results only at p <.05 level. Asia includes Oceania. For each variable, the benchmark category is excluded from this table. The colours of the cells vary gradually from red (the largest value) to white (not significantly different from 1.0) to blue (the lowest value).
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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Channel of firms' SDG actions

In section "Typology of firms' SDG actions", this book categorised firms' sustainability actions into four main channels:

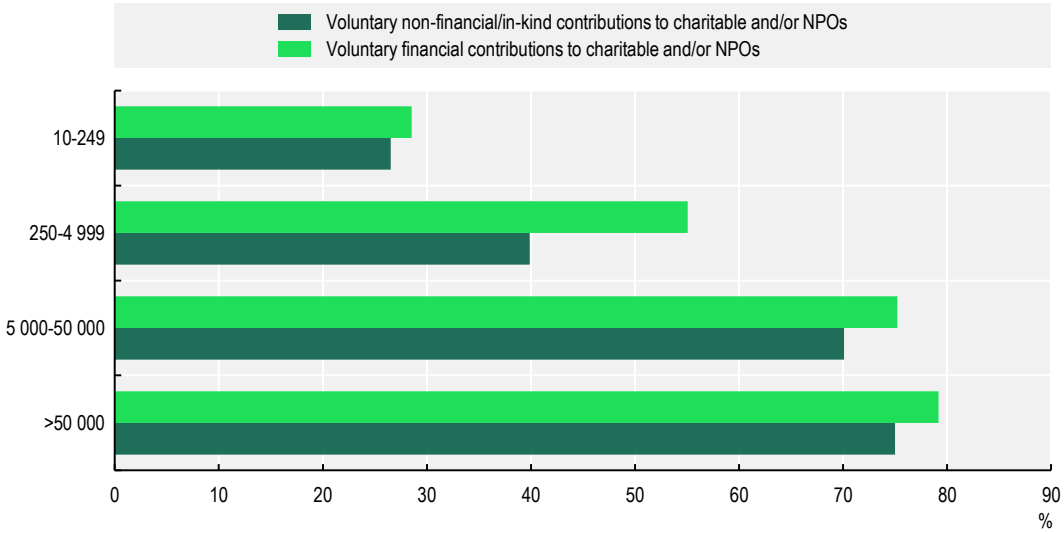
1. core business
2. mitigating the impact of the daily operations of the firm
3. using firm's non-financial resources (e.g. human resources) for actions unrelated to the main operations
4. donation/charity/philanthropy.

The UNGC survey also provides information on the channels of action used by companies (Figure 2.7), and this information can be linked to the four main channels distinguished in section "How firms tackle SDGs in practice". "Voluntary non-financial/in-kind contributions to charitable and/or non-profit organisations (NPOs)" can be considered as belonging to category "3. Using firm's non-financial resources for actions unrelated

to the main operations" and "Voluntary financial contributions to charitable and/or non-profit organisations (NPOs)" can be considered almost equivalent to "4. Donation/charity/philanthropy". The share of firms using these two channels increases with firm size, from 27% to 29% for SMEs (<250) to more than 75% for very large firms (>50 000). This pattern is confirmed by a logistic regression controlling simultaneously for firm size, region and sector. This regression shows no significant difference across regions nor sectors.

Figure 2.7. Share of firms providing financial and non-financial contributions to charity

Social investment and philanthropy actions, by employment size



Notes: NPO = non-profit organisation. The original question was: "How does your company take action to contribute to the Global Goals?". The legend lists the multiple-answer options.
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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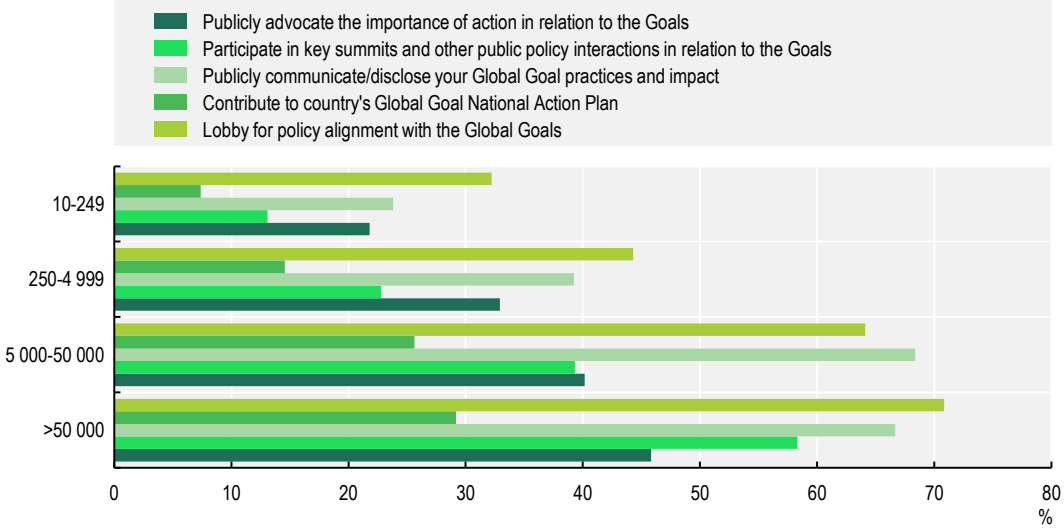
Figure 2.8. Share of firms taking advocacy and public policy actions, by employment size



Notes: The original question was: "How does your company take action to contribute to the Global Goals?". The legend lists the multiple-answer options.
Source: OECD calculations based on the 2020 UNGC survey (not publicly available).

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The survey also asks firms whether they undertake "Advocacy and public policy actions", which can correspond to most of the channels described in section "How firms tackle SDGs in practice", but is mainly linked to "3. Using firm's non-financial resources for actions unrelated to the main operations". The share of firms taking advocacy and public policy actions also increase by firm size (Figure 2.8). For example, "Publicly communicate/disclose your Global Goal practices and impacts" increases from 24% for SMEs (<250) to 67% for very large firms (>50 000). This pattern is confirmed by a logistic regression controlling simultaneously for firm size, region and sector. This regression shows no significant difference across regions nor sectors.

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Notes

[1] Through the market value of the firm, or if shareholders directly enjoy utility from the social impact of firms.

[2] See also Antwerp Management School and the University of Antwerp (2020[68]) for a survey of Belgian firms' main drivers for adopting SDGs.

[3] The firm for instance sells the use of a product rather than its property. In case of failure, the company may repair the product or replace it and guarantee its recycling.

3 Measuring the share of the private sector related to the SDGs

This chapter presents a novel methodology to measure the share of the private sector engaged in the production of goods or services that are related to the Sustainable Development Goals (SDGs). It relies on a mapping between sectoral and product classifications at a granular level and the 17 SDGs, based on a natural language processing/machine learning algorithm. This chapter also provides a complete view of the SDGs which can be linked to firms' activities, either to their core business or non-core business activities.

Key messages

Using a machine-learning (ML) algorithm to measure the share of the private sector whose core business is SDG-related yields that:

- **A significant share of value added can be linked to *SDG 9-Industry, Innovation and Infrastructure*** and, to a lesser extent, to *SDG 2-Zero Hunger*, *SDG 3-Good Health and Well-Being*, *SDG 8-Decent Work and Economic Growth*, *SDG 11-Sustainable Cities and Communities* and *SDG 12-Responsible Consumption and Production*. A non-negligible share of exported goods also relate to *SDG 7-Affordable and Clean Energy*.
- **There is significant heterogeneity across countries in terms of domestic SDG-related activities**. This unveils strengths and gaps at the national level, but also highlights the potential for mutually beneficial trade at the international level.
- **SDG-related activities rely on a network of upstream suppliers**, whose value added can account for up to 80% of that of SDG-related activities. This highlights the importance of upstream sectors in the attainment of the SDGs and the need for a whole-of-value-chain approach.
- **Firms mainly prioritise, or have an impact on, SDGs 2, 3, 5, 7, 8, 9, 11, 12 and 13**. The relationship between these SDGs and business activities are, however, heterogeneous. In particular, *SDG 2-Zero Hunger*, *SDG 3-Good Health and Well-Being*, *SDG 7-Affordable and Clean Energy*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure*, *SDG 11-Sustainable Cities and Communities*, *SDG 12-Responsible Consumption and Production* and *SDG 13-Climate Action* can be directly linked to the core business of firms. In addition, some SDGs are pervasive in non-core business activities (SDGs 3, *5-Gender Equality*, 8, 9, 12 and 13).

Context

This chapter presents a new methodology to measure the share of the private sector engaged in the production of goods or services that are related to the SDGs, and outlines the results of applying this methodology to a small sample of countries. The objective is to provide cross-country proxies of the extent to which the business sector is geared towards SDG-related goods and services. At an aggregate level, it measures the potential contribution of the private sector to SDGs through their core business (section “How firms tackle SDGs in practice” in Chapter 2).

To this end, this report develops a mapping between sectoral classifications at a granular level and the 17 SDGs, combining algorithmic and qualitative approaches. This mapping is then applied to detailed production and trade data to uncover the share of economic activity likely to be directly linked to SDGs across countries.

Beyond the cross-country comparison of sectoral SDG orientations, this chapter also participates in a better understanding of the firms’ contribution to SDGs. In particular, the algorithmic approach to identify SDGs could be extended to be applied to sustainability reports[1] and to build a firm-level measure of SDG orientation. Further projects could explore this possibility to build more precise cross-country measures of firms’ involvement in SDGs.

Mapping sectoral classifications into SDGs

This mapping is the result of three steps:

- Building an algorithm that automatically identifies the SDGs in a short text (Sustainable Development Goals Business Actions Identifier [SDG-BAI] algorithm).

- Applying the algorithm to a detailed description of sector or product classifications.
- Incorporating external information to improve on the automatic classification.

Sustainable Development Goals Business Actions Identifier

This project built an algorithm that automatically identifies the SDGs in a short text (SDG-BAI algorithm). Leveraging on previous OECD work aimed at the recognition of SDGs in Official Development Assistance documents (Pincet, Okabe and Pawelczyk, 2019[1]), the algorithm used in this report is tailored to identify business contributions to the SDGs. SDG-BAI is made of 17 sub-algorithms, each one providing a binary prediction of whether the short text is linked to a specific SDG.

ML is used to train these 17 classifiers. According to OECD (2018[2]), "ML normally refers to the branch of artificial intelligence focused on developing systems that learn from data. Rather than being explicitly told how to solve a problem, ML algorithms can create solutions by learning from examples (referred to as 'training' the ML algorithm)". This differs from other approaches that take a deterministic angle to this classification problem. For instance, Siris Academic[2] is using a controlled vocabulary to classify science, technology and innovation documents (e.g. patents and scientific publications) according to the 17 SDGs. For each SDG, they rely on a list of keywords, built from human expertise, to link documents to the relevant SDGs depending on the number of occurrences or co-occurrences of the keywords (Annex B).

The business actions used to feed the model are taken from UNGC documents, the SDG Compass, Global Reporting Initiative standards and from information available regarding the previous winners of the SDG action awards. The training set includes almost 5 950 original examples, among which around 70% were labelled, the rest having been labelled manually. The examples of firm actions include those in section "How firms tackle SDGs in practice" in Chapter 2 above, and in Annex A. In terms of the SDGs, the sample is close to balance (i.e. around 440 examples per SDG). Most examples are proper descriptions of firms' actions, but the data also include some general descriptions of possible contributions of the private sector to each SDG. To increase the robustness of the model, the training set is further enriched by the addition of 5 950 augmented copies of the original business action examples. The word augmentation technique used for this purpose draws on contextual word embedding (Annex B).

The chosen ML algorithm is called XGBoost (Extreme Gradient Boosting). This boosted tree algorithm is extremely fast (because it allows for parallelisation of computations) and provides a good performance in terms of accuracy. It rests on an ensemble of estimated decision trees. Using a series of tests on each observation, a decision tree provides a binary classification of whether an example is linked to a given SDG. Using majority voting over the ensemble of decision trees, the algorithm decides whether the example should be classified as linked to this SDG or not. During the estimation process, new trees are added to correct the errors made by the existing ensemble of trees, added sequentially until no further improvements can be made.

Of the examples, 90% are used for training the model, and the rest of the set is used to measure performance and regulate the level of different classification parameters. In the SDG identification problem, and given the structure of the training set, a particular emphasis is put on recall (i.e. the ability of the model to find all relevant cases and minimise the false negatives [see Annex B for a discussion]). The algorithm is able to correctly detect 76% of all the relevant cases in the validation set, while the precision (i.e. the ability of the model to avoid false positives), remains satisfactory (about 69% of the identified SDGs were actually labelled as such [Annex B]).

Using the algorithm to identify the sectors that are relevant for the SDGs

This subsection uses the automatic identification of SDG to measure the size of the SDG economy. The current algorithm is applied to sector descriptions, which correspond to short paragraphs of text describing the activity of a sector. Note that this use of the algorithm is demanding because although the size of the descriptions matches that of the examples in the training set, and although they both relate to firms operations, descriptions of the actions of a firm and the activity of a sector are not identical.

The algorithm is applied to both industrial (ISIC Rev.4) and goods classifications (HS6), in order to map sectors and goods to SDGs.

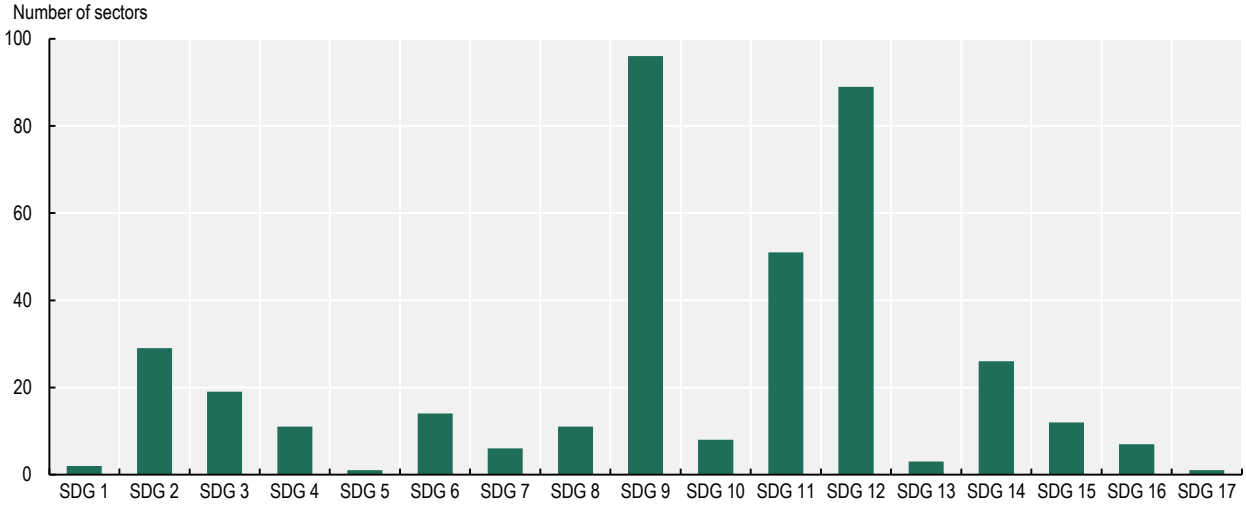
For instance, the description of the ISIC Rev.4 sector 8522 secondary education is:

> *technical and vocational secondary education typically emphasising subject-matter specialisation and instruction in both theoretical background and practical skills generally associated with present or prospective employment. The aim of a programme can vary from preparation for a general field of employment to a very specific job. Instruction may be provided in diverse settings such as the unit's or client's training facilities educational institutions the workplace or the home and through correspondence, television, internet or other means. This class includes technical and vocational education below the level of higher education […]; instruction for tourist guides; instruction for chefs, hoteliers and restaurateurs; special education for handicapped students at this level; cosmetology and barber schools; computer repair training; driving schools for occupational drivers e.g. of trucks, buses, coaches.*

Given the presence of many words related to schooling, the algorithm correctly links this description to *SDG 4-Quality Education*. However, it also points to *SDG 8-Decent Work and Economic Growth*, especially when taking into consideration Target 8.6 "Substantially reduce the proportion of youth not in employment, education or training". Finally, a more indirect albeit reasonable link is found with *SDG 10-Reduced Inequalities*, in particular Target 10.2 "Empower and promote the social, economic and political inclusion of all […]".

The algorithm links a significant number of sectors to SDGs (Figure 3.1). The most common SDGs are *SDG 9-Industry, Innovation and Infrastructure* and *SDG 12-Responsible Consumption and Production* with more than 80 sectors each, whereas other SDGs are more rarely encountered (*SDG 1-No poverty*, *SDG 5-Gender Equality* and *SDG 17-Partnerships for the Goals*).

Figure 3.1. Number of sectors linked to each SDG



Notes: SDG = Sustainable Development Goal. Out of a total of 416 four-digit sectors in the ISIC classification.
Source: OECD calculations based on the SDG-BAI algorithm.

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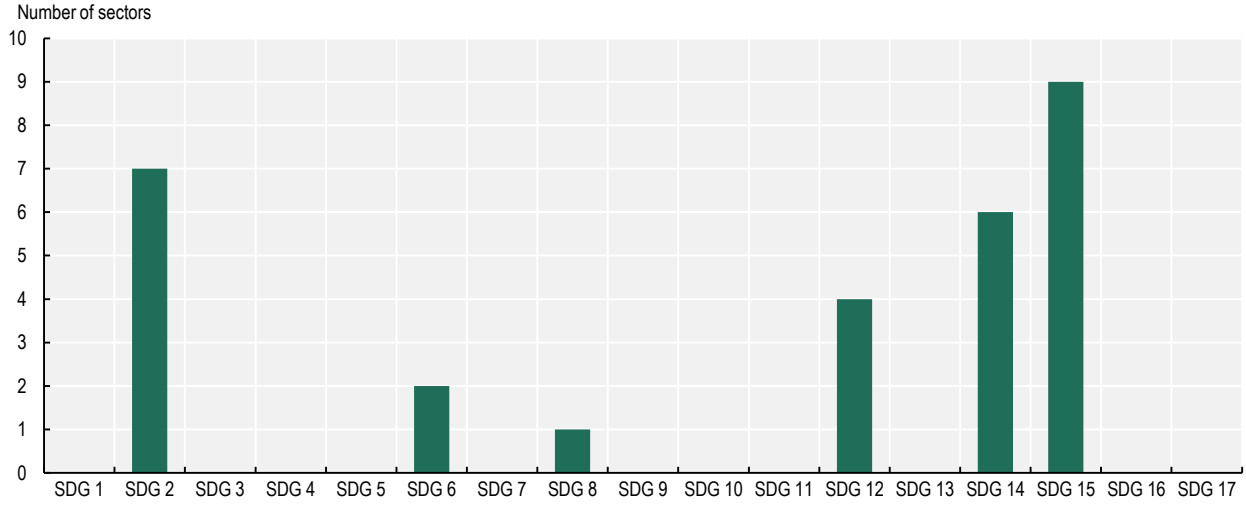
SDG-BAI is useful in drawing out hidden associations between sectors and SDGs. For instance, ISIC Rev.4 Sector "2021 – Manufacture of Pesticides" is obviously related to *SDG 9-Industry, Innovation and Infrastructure*, but the algorithm is also able to correctly draw a connection with *SDG 2-Zero Hunger.* Similarly, SDG-BAI links Sector "3 700 – Sewerage" (i.e. the infrastructure that conveys wastewater, including surface rainfall) with both *SDG 6-Clean Water and Sanitation* and *SDG 11-Sustainable Cities and Communities.* In other words, it detects the bond with water management (Target 6.5) and with reducing the adverse effect of water-related disasters (Target 11.5).

The picture remains consistent when focusing on a few mega sectors. Restricting the scope to "agriculture, forestry and fishing", the most frequently identified SDGs are *SDG 2-Zero Hunger*, *SDG 14-Life Under Water* and *SDG 15-Life on Land* (Figure 3.2). For manufacturing, instead, *SDG 9-Industry, Innovation and Infrastructure* is by far the most frequent (Figure 3.3).

Figure 3.2. Number of agricultural sectors linked to each SDG



Notes: SDG = Sustainable Development Goal. Out of a total of 38 four-digit agricultural sectors in the ISIC classification (divisions 01-03).
Source: OECD calculations based on the SDG-BAI algorithm.

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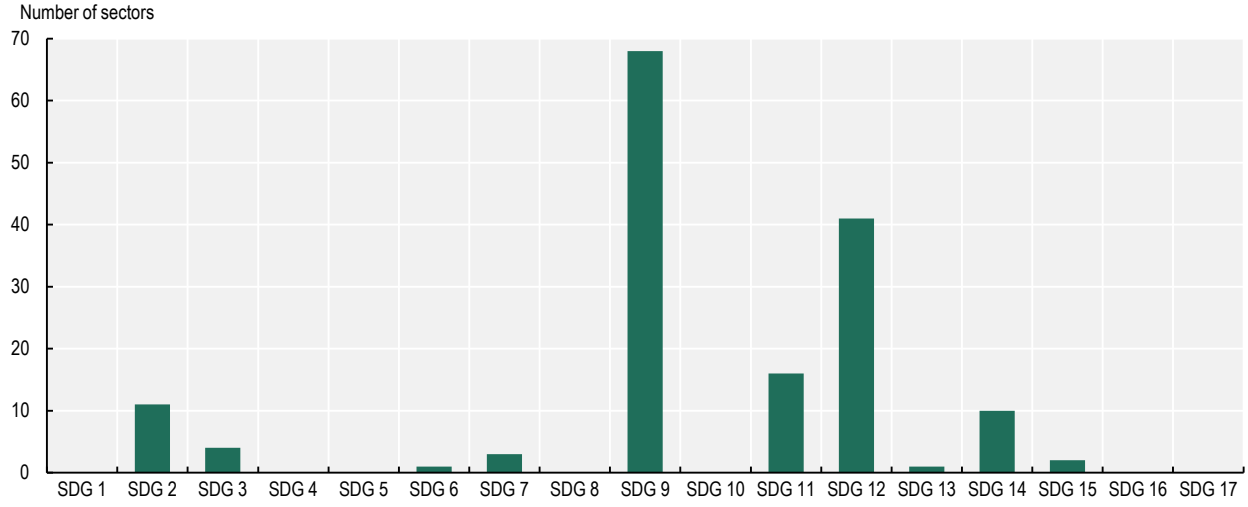
Figure 3.3. Number of manufacturing sectors linked to each SDG

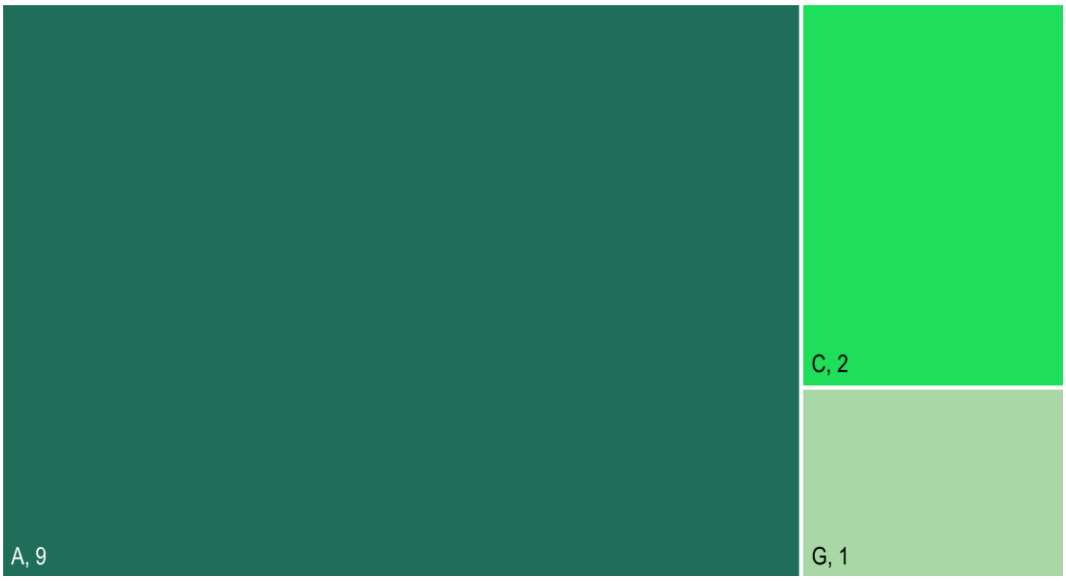


Notes: SDG = Sustainable Development Goal. Out of a total of 137 four-digit manufacturing sectors in the ISIC classification (divisions 10-33).
Source: OECD calculations based on the SDG-BAI algorithm.

StatLink https://doi.org/10.1787/888934274703

From a different perspective, it is also possible to understand which sectors could help achieve a given SDG. For instance, looking at *SDG 15-Life on land*, the strongest link is with "agriculture, forestry and fishing", as anticipated before (Figure 3.4).

Figure 3.4. Number of sectors identified as being linked to *SDG 15-Life on Land*, by macro-sector



Note: The letters relate to ISIC Rev.4 sections (see Table A B.2). The algorithm identifies that nine sectors in agriculture, forestry and fishing, two sectors in manufacturing and one sector in services are related to SDG 15.
Source: OECD calculations based on the SDG-BAI algorithm.

Incorporating external information to supplement the output of the algorithm

A qualitative adjustment to the results of the algorithm is performed using expert judgement, based on the detailed description of the SDG targets and indicators, as well as previous analyses (i.e. material footprints categories, Wiedmann et al. (2013[3])); Tourism Satellite Accounts and its characteristic industries; Structural Business Statistics; Eurostat (2016[4]); and the Sustainability Accounting Standards Board [SASB] linkage map).[3] Annex B presents the SDG-ISIC mapping used in the next section.

Caveats

Such a classification, and the resulting metrics, necessarily suffer from severe limitations and should be understood as a first step to stimulate work in this direction. First, extensive discussions with SDG and business experts go beyond the scope of this project, but could at a later stage enrich and improve the classification. Second, this approach identifies relationships between activities and SDGs with a descriptive rather than a normative angle. For instance, the “Manufacture of refined petroleum products” sector (ISIC 1920) is undoubtedly related to the *SDG 7-Affordable and Clean Energy*, even if deciding whether firms operating in this sector have a beneficial or detrimental impact on the achievement of the SDG 7 targets is out of the scope of this project. Finally, the binary nature of the classification is in itself a simplification as most sectors can, to different extents, be linked to a given SDG.

Measuring the share of the private sector contributing to the SDGs

The mapping of granular-level sectoral classifications with the 17 SDGs, when combined with detailed value added data, allows for the measurement of the size of the “SDG economy”. For each SDG, this demonstrates the value added of sectors that are closely linked to it.

In this report, a small number of countries (Canada, Denmark, Korea, Japan and New Zealand) have been chosen based on the list of countries selected for the policy benchmarking exercise (Chapter 5) as well as on data availability at a disaggregated level. The required granularity of the data prevents the use of cross-

country comparable datasets, such as the OECD's STructural ANalysis Database (STAN). This analysis rather uses detailed value-added data that some countries produce using their own classifications. Therefore, certain adjustments have to be made initially (i.e. aggregation or disaggregation of industries to match the ISIC Rev.4 classification).

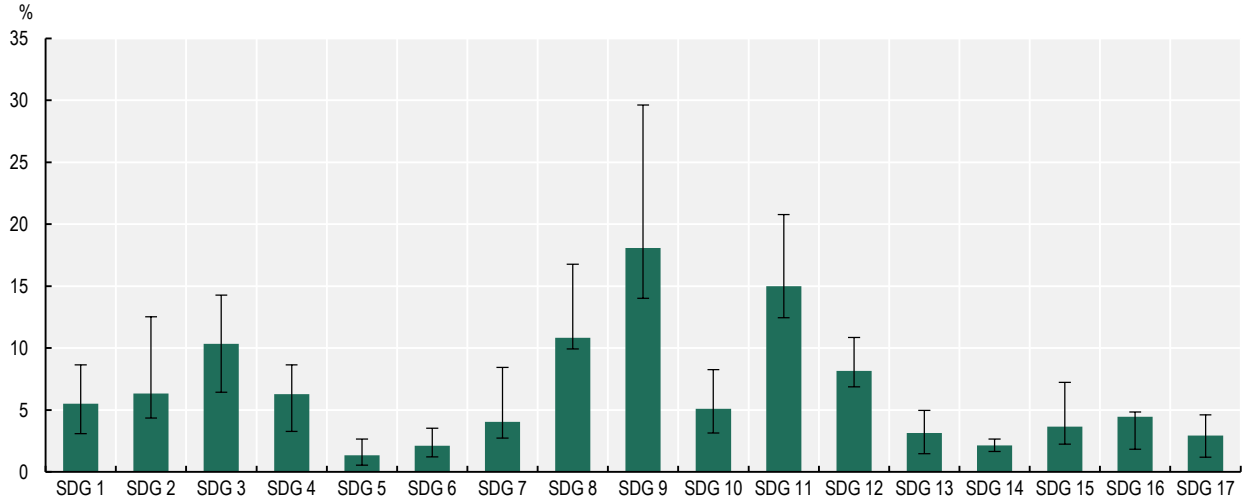
A significant share of value added can be linked to the SDGs, especially to SDG 9

Based on detailed value added data and the SDG-ISIC correspondence table developed in this chapter, Figure 3.5 shows the share of value added linked to each SDG on average in the sample of countries. A significant share of economic activities are linked to *SDG 9-Industry, Innovation and Infrastructure* as well as, to a lesser extent,[4] to *SDG 3-Good Health and Well-Being*, *SDG 8-Decent Work and Economic Growth*, *SDG 11-Sustainable cities and communities* and *SDG 12-Responsible Consumption and Production*. On the contrary, some SDGs are linked to a very small share of total value added (e.g. only around 1% to 2% of value added is linked to *SDG 5-Gender Equality*, *SDG 6-Clean Water and Sanitation* and *SDG 14-Life Below Water)*. The detailed results at the SDG and country level are available in Annex C.

Given the caveats described above, the results should be used with caution. In particular, although only a small share of value added is linked to some SDGs, this does not mean that firms are not concerned or involved in the corresponding societal challenge. For example, a very small share of economic activities is directly linked to *SDG 5-Gender Equality*, but most firms can act to promote gender equality.

Figure 3.5. Economic activities linked to each SDG, as a share of total value added (2015)

Average, minimum and maximum shares among the country sample



Notes: SDG = Sustainable Development Goal. Countries sampled are Canada, Denmark, Japan, Korea and New Zealand. The green bars show the average value added for all countries. The whiskers show the data of the two countries that have the highest/lowest share.

Sources: METI (2014[5]), *Extended Input-Output Tables*, https://www.meti.go.jp/english/statistics/tyo/entyoio/index.html; Statistics Canada (Statistics Canada, 2021[6]), *Symmetric Input-Output Tables*, https://www150.statcan.gc.ca/n1/en/catalogue/15-207-X; Bank of Korea (2020[7]), *2018 Updated Input-Output Tables*, https://www.bok.or.kr/eng/bbs/E0000634/view.do?nttId=10058883&menuNo=400069; Statistics Denmark (2021[8]), *Danish Annual Input-Output Tables*, https://www.dst.dk/en/Statistik/emner/nationalregnskab-og-offentlige-finanser/produktivitet-og-input-output/input-output-tabeller?tab=dok; Stats New Zealand (2016[9]), *National Accounts Input-Output Tables*, https://www.stats.govt.nz/information-releases/national-accounts-input-output-tables-year-ended-march-2013; OECD mapping between economic activities and the SDGs.

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There is a significant level of heterogeneity across countries

Beyond the average, the share of economic activities linked to the SDGs displays a significant amount of variation, despite the limited sample of countries. For instance, the share of economic activities linked to

SDG 9-Industry, Innovation and Infrastructure ranges from 14% in Japan and Canada to 30% in New Zealand. The rest of this subsection describes selected examples for some SDGs and countries.

For instance, in Korea, the contribution to SDGs is above the average for *SDG 4-Quality Education* and *SDG 9-Industry, Innovation and Infrastructure*. For SDG 4, this is due to a higher share of value added in the education services sector, whereas, for SDG 9, it is explained by a higher share of manufacturing activities (in particular, electrical equipment and motor vehicles).

In Denmark, the size of the social work activities contributes to explaining the higher than average share of economic activities linked with *SDG 2-Zero Hunger*, *SDG 5-Gender Equality*, *SDG 10-Reduced Inequality* and *SDG 16-Peace, Justice and Strong Institutions*. As for Korea, the size of the education services sector explains the high share of economic activities linked to *SDG 4-Quality Education*. Finally, the size of the water transport sector results in a higher than average share of economic activities linked to *SDG 14-Life Below Water*.

Japan displays a larger share of activities related to *SDG 3-Good Health and Well-Being* and *SDG 11-Sustainable Cities and Communities*, due to larger than average human health, residential care, and real estate sectors.

In New Zealand, the share of economic activities linked to *SDG 2-Zero Hunger* is higher than average due to the importance of the agricultural and food processing sectors. The size of the food processing sectors also contributes to a high share of the economy linked to *SDG 9-Industry, Innovation and Infrastructure*, along with financial services (excepting insurance and pension funding).[5] As expected, the large size of the electricity, gas, steam and air conditioning supply sector contributes to *SDG 7-Affordable and Clean Energy*.

The indirect contribution of upstream sectors can amount to close to 80% of SDG-related activities

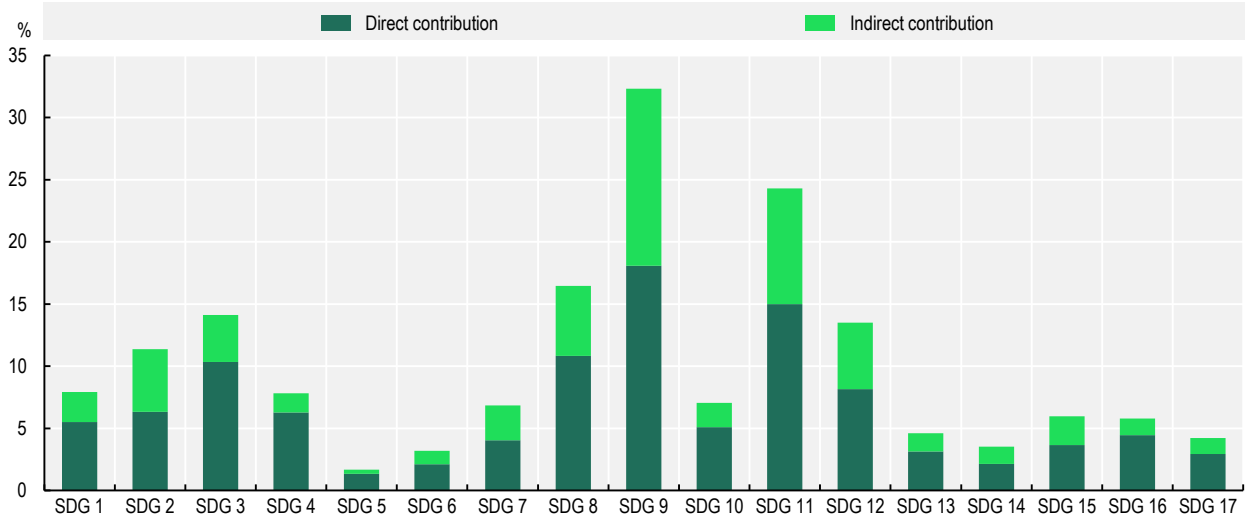
Figure 3.6 indicates that the share of SDG-related activities is significantly increased when taking into account the value added embodied in SDG-related goods but originating from upstream domestic sectors (indirect contribution). For instance, the main indirect contribution to activities related to *SDG 9-Industry, innovation and infrastructure* comes from transportation industry, professional, scientific and technical activities, and the agriculture sector, while for *SDG 12-Responsible Consumption and Production* the main contribution comes from the mining and energy industry (including coal and crude oil extraction), chemical and professional activities.

This indirect contribution usually represents a significant share of value added. For most of the SDGs, it is comparable to the value added directly linked to SDGs. For *SDG 2-Zero Hunger* and *SDG 9-Industry, Innovation and Infrastructure*, the indirect contribution represents almost 80% of the direct contribution, because the food processing sector (linked to SDG 2) and the manufacturing sector (linked to SDG 9) rely on a large quantity of inputs from upstream sectors. For *SDG 1-No Poverty* and *SDG 3-Good Health and Well-Being*, the indirect contribution represents approximately 40% of the direct contribution, given that the industries (in particular health and social activities) linked to these SDGs are less dependent on other upstream industries. Similarly, for *SDG 4-Quality Education* and *SDG 5-Gender Equality*, which are mainly linked to services sector, upstream activities are less important, with an indirect contribution representing less than 30% of the direct contribution.

These results underline the importance of having a vibrant economy in general, beyond SDG-related sectors. When designing industrial policies for the SDGs, governments should take into account these cross-sectoral linkages and ensure that policies include not only the development and the sustainable transition of SDG-related sectors, but also consider upstream sectors. The total (direct and indirect) value added linked to SDGs is above 10% for *SDG 2-Zero Hunger*, *SDG 3-Good Health and Well-Being*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure*, *SDG 11-Sustainable Cities and Communities* and *SDG 12-Responsible Consumption and Production*.

Figure 3.6. Direct and indirect value added linked to each SDG, as a share of total value added (2015)

Average across the sampled countries



Note: SDG = Sustainable Development Goal. Countries sampled are Canada, Denmark, Japan, Korea and New Zealand.

Sources METI (2014[5]), *Extended Input-Output Tables*, https://www.meti.go.jp/english/statistics/tyo/entyoio/index.html; Statistics Canada (Statistics Canada, 2021[6]), *Symmetric Input-Output Tables*, https://www150.statcan.gc.ca/n1/en/catalogue/15-207-X; Bank of Korea (2020[7]), *2018 Updated Input-Output Tables*, https://www.bok.or.kr/eng/bbs/E0000634/view.do?nttId=10058883&menuNo=400069; Statistics Denmark (2021[8]), *Danish Annual Input-Output Tables*, https://www.dst.dk/en/Statistik/emner/nationalregnskab-og-offentlige-finanser/produktivitet-og-input-output/input-output-tabeller?tab=dok; Stats New Zealand (2016[9]), *National Accounts Input-Output Tables*, https://www.stats.govt.nz/information-releases/national-accounts-input-output-tables-year-ended-march-2013; OECD mapping between economic activities and the SDGs.

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Exports and the contribution to the SDGs

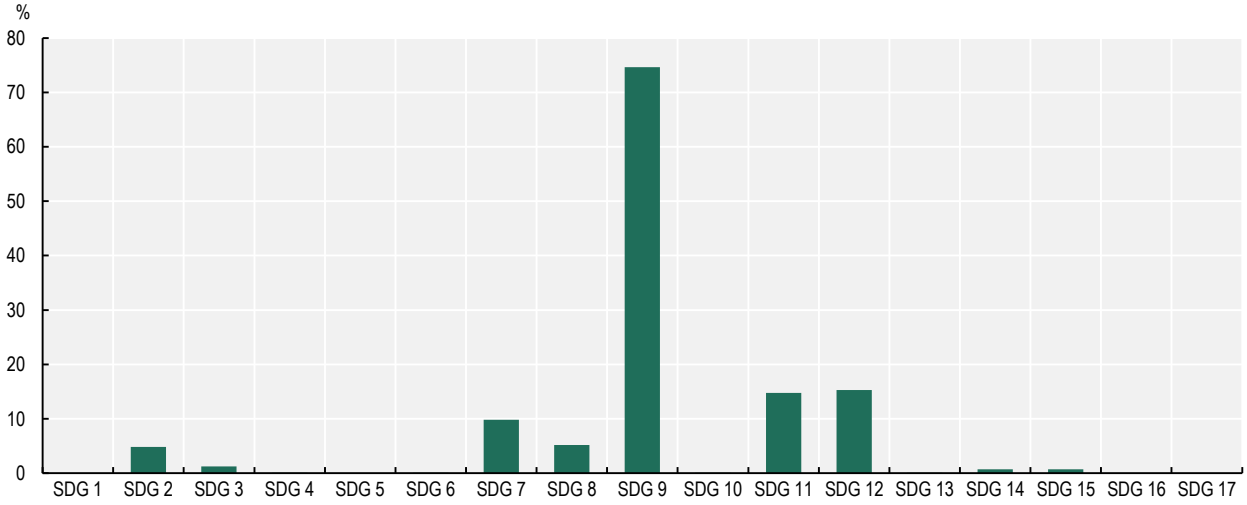
This section applies the same algorithm (SDG-BAI) to trade classification (HS6) and detailed trade data. This approach allows not only an expansion of the sample of countries, as detailed trade data are available on a wider basis, but also a better understanding of how the link between SDGs and value added is translated into export specialisation. It also constitutes a robustness check of the previous analysis. However, trade data focus on exchanges on goods and do not include services, whereas the value added approach in the previous section allowed to measure the role of services for the SDG economy.

This section presents the main results of the analysis, whereas Annex C presents the results by country and SDG. The list of countries selected in this section is based on the countries presented in the benchmarking exercise as well as the availability of granular trade data from UN Comtrade (International Trade Statistics Database) (United Nations Statistics Division, 2021[10]). In this section, the analysis is restricted to SDGs 2 to 4 and 6 to 15. The algorithm was able to link these SDGs with goods from the HS6 classification, whereas no correspondence was found with *SDG 1-Zero Poverty*, *SDG 5-Gender Equality*, *SDG 16-Peace, Justice and Strong Institutions* and *SDG 17-Partnerships for the Goals*. This is consistent with the previous section, according to which these SDGs were mostly related to services sectors.

The main SDGs linked to exports are the same as for value added, with some notable exceptions linked to the role of services. *SDG 9-Industry, Innovation and Infrastructure* remains the most frequent, and its importance is reinforced due to manufacturing goods, which are linked to SDG 9, representing a very significant share of trade. As for value added, *SDG 3-Good Health and Well-Being*, *SDG 8-Decent Work and Economic Growth*, *SDG 11-Sustainable cities and communities* and *SDG 12-Responsible Consumption and Production* are also linked to a non-negligible share of exports. Interestingly, *SDG 2-Zero Hunger* and *SDG 7-Affordable*

and Clean Energy are respectively linked to 7% and 13% of world trade, largely through agricultural products and commodities (including fossil fuels), but are linked to a much lower share of value added.

Figure 3.7. Exports linked to each SDG, as a share of world exports (2015)



Sources: United Nations Statistics Division (2021[10]), *UN Comtrade (International Trade Statistics Database)*, https://comtrade.un.org; OECD mapping between the Harmonized System classification and the SDGs.

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This approach confirms a significant degree of heterogeneity across countries. Annex C presents the revealed comparative advantage[6] by country and SDG. Despite significant differences in the underlying data and the scope, the value added and trade approaches display convergent results at the country by SDG level. For almost 80% of the country by SDG included, the results are consistent.[7]

Firms are contributing to a wide range of SDGs

The evidence gathered in Chapter 2 and in this chapter provides insight on the SDGs that the business sector is contributing to. As this information is scattered, this section lists the relevant SDGs and details their relationship with firms' businesses.

Chapter 2 shows that *SDG 3-Good Health and Well-Being*, *SDG 5-Gender Equality*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure*, *SDG 12-Responsible Consumption and Production* and *SDG 13-Climate Action* are prioritised by more than 40% of respondents to the 2020 United Nations Global Compact survey. More than 35% of respondents declare that they take actions to advance these SDGs.

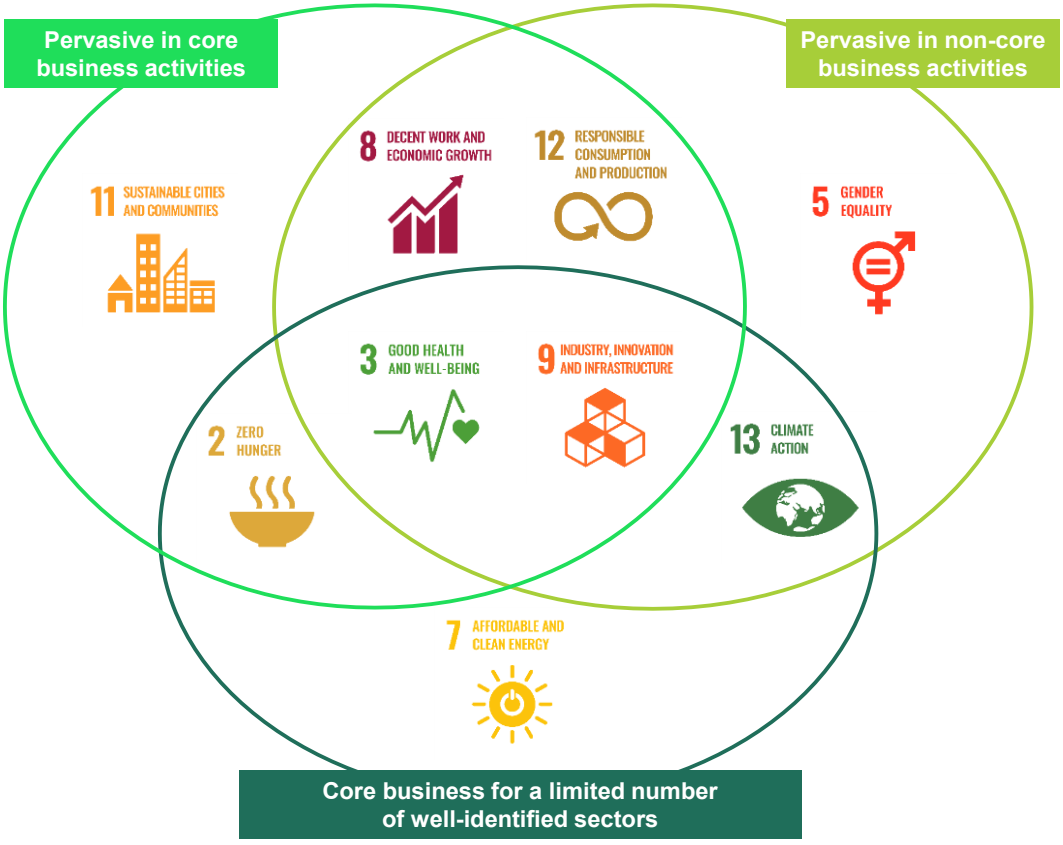
This chapter identifies the SDGs that can be linked to firms' core business activities. *SDG 2-Zero Hunger*, *SDG 3-Good Health and Well-Being*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure*, *SDG 11-Sustainable Cities and Communities* and *SDG 12-Responsible Consumption and Production* are shown to correspond to a significant share of value added. In addition, although linked to smaller share of value added, *SDG 7-Affordable and Clean Energy* is found to represent a non-negligible share of exports.

This information is summarised in Figure 3.8. Based on the previous results, SDGs are classified according to three criteria:

- Based on the results of Chapter 2, *SDG 3-Good Health and Well-Being*, *SDG 5-Gender Equality*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure*, *SDG 12-Responsible Consumption and Production* and *SDG 13-Climate Action* are considered as being a pervasive concern for firms. While survey data used in Chapter 2 do not necessarily refer to core business activities, the novel methodology used in this chapter to identify SDG-related economic activities and exports reveals complementary findings.
- Based on the results in this chapter, *SDG 2-Zero Hunger*, *SDG 3-Good Health and Well-Being*, *SDG 8-Decent Work and Economic Growth*, *SDG 9-Industry, Innovation and Infrastructure*, *SDG 11-Sustainable Cities and Communities* and *SDG 12-Responsible Consumption and Production* are shown to have a pervasive link with core business activities, as they are linked to a significant share of value added (direct contribution above 8% or total contribution above 10%).
- Finally, *SDG 2-Zero Hunger* and *SDG 7-Affordable and Clean Energy* are also shown to be related to core business activities, albeit for a limited number of well-identified sectors, as they can been linked to a significant share of exports. This sectoral angle is also evident for *SDG 3-Good Health and Well-Being* (health sector), *SDG 9-Industry, Innovation and Infrastructure* (manufacturing sector) and *SDG 13-Climate Action* (heavy emitters of greenhouse gases [GHGs]).

Figure 3.8 illustrates that some SDGs belong to several of the aforementioned categories. For instance, *SDG 13-Climate Action* is directly linked to the core business of (green) electricity production, but GHG emissions are also a concern for a wide range of companies. *SDG 9-Industry, Innovation and Infrastructure* is directly linked to the core business activity well-identified sectors (manufacturing) but also to a more diffuse set of sectors (e.g. those linked to infrastructure or research and development) and is more broadly a concern for a large number of firms (e.g. through innovation, integration into value chains).

Figure 3.8. SDGs and their relationship with firms' core business



Note: SDG = Sustainable Development Goal.

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United Nations Statistics Division (2021), *UN Comtrade (International Trade Statistics Database)*, https://comtrade.un.org/. [10]

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Notes

[1] See https://unstats.un.org/sdgs/metadata/files/Metadata-12-06-01.pdf for a list of sustainability report repositories.

[2] https://science4sdgs.sirisacademic.com/.

[3] The SASB linkage map links 26 sustainability-related business issues with the SASB' Sustainable Industry Classification System (SICS) that comprises 77 industries.

[4] These SDGs are linked to more than 8% of value-added.

[5] Target 9.3 indeed highlights "the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets".

[6] Following Balassa (1965[11]), the revealed comparative advantage of country X for SDG Y is defined as the ratio between the share of exports related to SDG Y in total exports of country X and the share of exports related to SDG Y in total exports of the world.

[7] For 78% of country X's SDG pairs, one of the three following conditions is met: 1) the size of the SDG-related activities deviates by less than 10% from the sample average; 2) the size of the SDG-related activities is 10% higher compared to the sample average and the country displays a revealed comparative advantage; or 3) the size of the SDG-related activities is 10% lower compared to the sample average and the country displays a revealed comparative disadvantage.

4 The cross-border impact of SDG-related activities

This chapter showcases how combining indicators from the OECD Inter-Country Input-Output tables and Inter-Agency and Expert Group on SDG can be used to draw insights on cross-border impacts of Sustainable Development Goal (SDG)-related business activities. The chapter focuses on four SDG indicators: manufacturing value added; medium- and high-tech industry value added; research and development expenditures; and agriculture and food processing industry value added.

Key messages

Combining data on inter-country input-outputs (ICIOs) and the Sustainable Development Goal (SDG) indicators can provide insights on selected indicators with regard to the regional and global dynamics of trade. Notably:

- Domestic firms' activities have significant cross-border impacts, **stressing the importance of taking into account intersectoral linkages and international trade when designing industrial policies for the SDGs**. Indeed, upstream sectors are of paramount importance, as SDG-related industries require reliable inputs.
- In particular, **trade provides opportunities for sustainable firms to contribute to the SDGs in other countries**, notably in developing economies: countries can develop comparative advantages in sustainability-related areas, while also relying on imports in some other sectors. In the latter case, however, industrial policies should incorporate resilience considerations and ensure that the supply chain is sufficiently diversified, in order to face and absorb different shocks.
- Regarding cross-border exchanges, **international trade takes a prominent role, and a country's final demand relies to a significant extent on foreign value added**. A notable exception is research and development (R&D), which remains largely domestic. International exchanges of R&D have, however, significantly increased over the 2005-15 period.

Context

In the last two decades, the structure of the world economy has changed significantly with the emergence of more complex trade relations and global supply chains. Technological change, reductions in costs, greater access to resources and digitalisation have enabled new collaborative business models. Today, about 70% of the global production of goods and services ripple across long and complex international supply chain networks (OECD, 2020[1]). Conventional trade statistics, therefore, cannot fully capture the interconnectedness of the global economy. The growing international fragmentation of production networks and the complexity of national economic systems require new measures to better understand the economic relations between countries and regions.

The contribution of firms to the SDGs is no exception. Firms' global impact on social goods, such as the environment, gender equality or energy transition has to be assessed at the global level, taking into account the network of suppliers and customers. Raising awareness – among firms, policy makers and other stakeholders alike – about firms' global impact is crucial for achieving and accelerating the achievement of the SDGs.

This chapter builds on OECD's ICIO tables (section "ICIO tables at a glance"), which underpin the development of Trade in Value Added (TiVA) indicators as well as other metrics related to global value chains (GVCs). Previous analyses have shown that accounting for GVCs is particularly important to fully understand the impact (or global footprint) of nations, and sectors within them that are associated with exporting and importing activities. For example, most of the child labour (93%) embodied in food products imported to Europe is associated with sectors whose goods and services are not directly exported, but are rather upstream industries, notably Agriculture (ILO, OECD, IOM and UNICEF, 2019[2]). Other analyses of this type include Trade in eMployment (TiM) (Horvát, Webb and Yamano, 2020[3]) and Trade in embodied CO_2 (Wiebe and Yamano, 2016[4]).

The objective of this chapter is to understand how the domestic economy contributes to the SDGs in partner countries, and how other countries contribute to the SDGs in the domestic economy. For instance, essential goods and services may be exported to a partner country where they are used in the production of SDG-

related goods and services, representing forward GVC participation. Alternatively, a country's final demand for SDG-related goods and services may rely on imports, representing backward GVC participation.

This analysis can be used by companies to assess the SDG contribution, risks and opportunities associated with their involvement in GVCs. It can also be used by investors, to identify where value is added in the complex production of goods and services, and where they can invest for more sustainable outcomes, and by customers to explore how their purchases contribute to sustainable development. Lastly, it can be used by local, national and global governments to gather reliable evidence for the development of policies to achieve the SDGs.

This chapter focuses on four SDG indicators, three of which come directly from the Inter-Agency and Expert Group on SDG Indicators (IAEG-SDGs): indicator 9.2.1 (manufacturing value added); indicator 9.B.1 (medium and high-tech industry value added); and indicator 9.5.1 (R&D expenditures). The fourth indicator is related to Target 2.4 (agriculture and food processing industry value added).

Three out of four indicators concern SDG 9 since it is one of the SDGs most related to firms' core business activities (Figure 3.8). The four indicators were also chosen because of their presumed ability to capture strong cross-border impacts. Manufacturing, medium- and high-tech, and agricultural value added are all heavily traded, and therefore indicators around these topics are important in an era of global interconnectedness. Availability of data on the selected indicators relative to others as well as the transversality of certain indicators such as the one on R&D[1] also influenced the choice of indicators.

The chapter showcases how combining data on OECD-ICIOs and the IAEG-SDGs can be used to draw insights on cross-border impacts of SDG-related business activities. Further work could be undertaken to expand this approach to other indicators. A few examples for which the data would probably allow such an extension are listed in Table 4.1.

Table 4.1. Selected SDGs and targets for further global footprint analysis

N° of Goal/Target /Indicator	Indicator	Description
2	Calories embodied in trade	Trade balance in calories. Use of ICIO and data on the calories for each type of food.
3.B	Share of R&D for vaccines and medicines in GDP	Use of the ICIO infrastructure to estimate these indicators combined with additional data from detailed national input-output tables and other sources.
5.A.1	Employment participation by gender	Use of ICIO framework combined with employment data by gender from Labour Force Surveys.
6.4	Virtual water	Estimate the amount of water associated with exported goods. Use of ICIO combined with water use by industry.
7.2	Renewable energy use (and other sources of energy)	Use of ICIO framework, with additional data from the International Energy Agency.
8.7	Child labour in global supply chains	Estimates of child labour in global supply chains using a global framework (ILO, OECD, IOM and UNICEF, 2019[2]).
9.4.1	CO_2 emissions per unit of value added	Carbon embodied with trade.
15	Land use indicators	Land use embodied in trade. Use of ICIO and land use data from the FAO and other sources.

ICIO tables at a glance

The OECD ICIO tables are matrices that describe the annual monetary flows of intermediate and final goods and services worldwide. Figure 4.1 illustrates a simplified example of an ICIO table with three countries and two industries. The diagonal blocks of the ICIO table represent the domestic flows of intermediate and final goods and services values, while the off-diagonal blocks refer to the exports and imports between countries and industries. Hence, the ICIO can provide information about the interconnection between sectors within and across countries.

Figure 4.1. Basic structure of OECD ICIO tables

		Intermediate demand						Final consumption and capital formation			Direct purchases by non-residents			Output
		Country A		Country B		Country C								
		Industry 1	Industry 2	Industry 1	Industry 2	Industry 1	Industry 2	Country A	Country B	Country C	Country A	Country B	Country C	
Country A	Industry 1													
	Industry 2													
Country B	Industry 1													
	Industry 2													
Country C	Industry 1													
	Industry 2													
Taxes less subsidies...		*...on intermediate products*						*...on final products*						
Value added														
Output														

Notes:
Light green = *Cross-border* flows of *intermediate* goods and services.
Dark green = *Domestic* flows of *intermediate* goods and services.
Light grey = *Cross-border* flows of *final* goods and services.
Dark grey = *Domestic* flows of *final* goods and services.

This chapter seeks to analyse the role of GVCs for SDG-related activities. To this end, OECD ICIO tables are used extensively to estimate the cross-border impacts of domestic production and the role of international trade for the SDGs. Tracing the origins of a final product, or even its components, requires capturing statistics not only in the market where the product is consumed or produced, but also along its supply chain. This task is beyond the scope of traditional survey and national accounting methods.

For example, ICIO tables (OECD, 2018[5]) shed light on the mix of inputs required from home and abroad, to generate one unit of output in a given industry and country. In, turn, it allows tracing the origin of the value added (*direct* and *indirect*) in a production process. *Direct* contribution captures the value added of a given industry in a specific country related to the production of goods or services for exports or final demand. *Indirect* contribution represents the value added of other upstream industries whose output enters into the production of the aforementioned goods or services for exports or final demand.

Manufacturing value added: Indicator 9.2.1

Manufacturing value added and the SDG framework

Target 9.2 of the SDGs is for countries to:

> *[p]romote inclusive and sustainable industrialisation and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries.*

Related to this target, the United Nations proposes two indicators that highlight the role of the manufacturing industry in the economy, namely the share of manufacturing value added to gross domestic product (GDP) per capita; and the share of employment in the manufacturing industry in total employment. Using the former indicator, this section seeks to shed light on the role of manufacturing in the achievement of the SDGs in the context of an increasingly interlinked global economy.

The manufacturing sector contributed 15% to total world GDP in 2019 (World Bank, 2021[6]) and is often cited as a key driver of economic growth and well-being for both developing and developed countries. Additionally, manufacturing is an essential source of employment that has accounted for approximately half a billion jobs worldwide in 2019, or an equivalent of about 14% of world employment (ILO, 2020[7]).

Manufacturing value added and employment are considered as having positive spillovers on society. The secular decline in output and productivity growth and the accompanying increase in productivity dispersion and wage inequality (Berlingieri, Blanchenay and Criscuolo, 2017[8]) put a special emphasis on the inclusiveness of economic development, and on the fate of some categories of the population, like low-skilled low-wage workers, people living in disadvantaged areas, or the middle class (OECD, 2019[9]). In some instances, the manufacturing sector can provide economic opportunities to these groups. Rodrik and Sabel (2019[10]), among others, argue that access to "good jobs", notably provided by the manufacturing sector, can reduce social costs and negative externalities (Autor, Dorn and Hanson, 2019[11]), and limit political polarisation (Autor et al., 2020[12]). Beyond direct jobs and value added, the manufacturing sector is often considered to trigger significant opportunities in upstream industries, including services sectors. In developing countries, industrialisation can also be an opportunity to stimulate the creation of formal employment and its related benefits (OECD, 2015[13]).

However, the impact of manufacturing activities on other SDGs (notably environment-related SDGs 7, 12, 13, 14 and 15) needs to be closely monitored and policies must accompany the transition to cleaner industrial production.

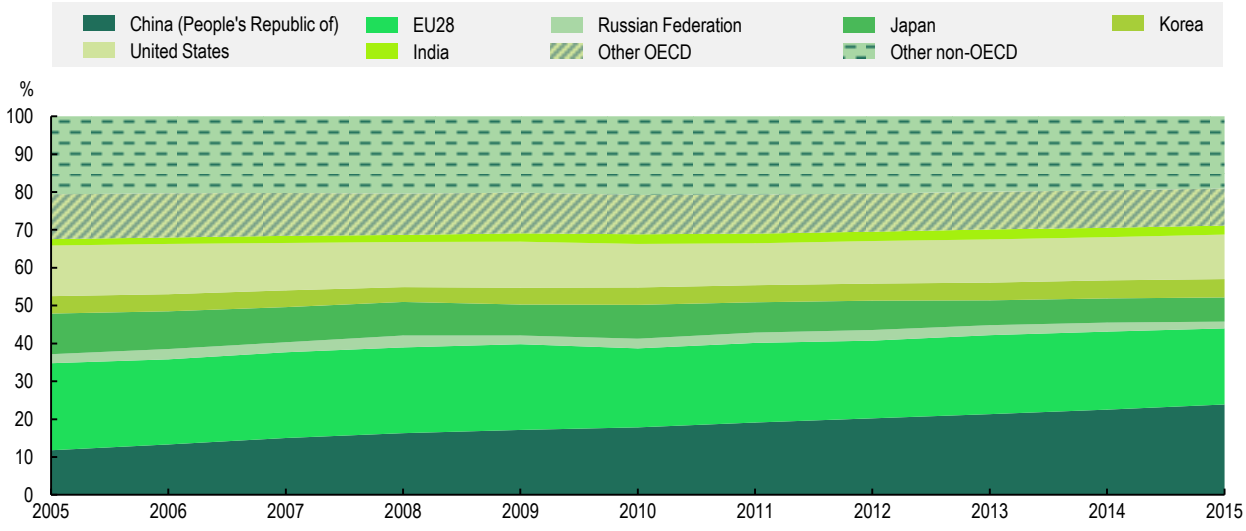
Manufacturing heavily relies on upstream and foreign activities

Manufacturing has largely evolved with increased globalisation, resulting in the splitting up of production processes across the GVCs. Notably, in 2015, more than 50% of trade in manufacturing involved intermediate products designed for additional processing in other countries (UNIDO, 2015[14]), providing cause for an in-depth analysis of the cross-border impact of manufacturing in achieving SDGs.

The 2005-15 period saw a relocation of manufacturing value added from developed to developing countries. Figure 4.2 illustrates that most countries faced a contraction of domestic manufacturing value added as a share of global manufacturing value added in the last two decades; the exception is the People's Republic of China (hereafter "China"), which experienced a significant expansion.

Figure 4.2. Domestic manufacturing value added

As share of global manufacturing value added



Sources: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020) and OECD (2021[15]), *Annual National Accounts (SNA) Database*, https://doi.org/10.1787/na-data-en (accessed in April 2020).

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As stated by the IAEG-SDGs, the share of manufacturing value added to GDP is an important indicator for measuring progress for inclusive industrialisation. However, this indicator does not give information on the interconnectedness through GVCs and the role of upstream industries.

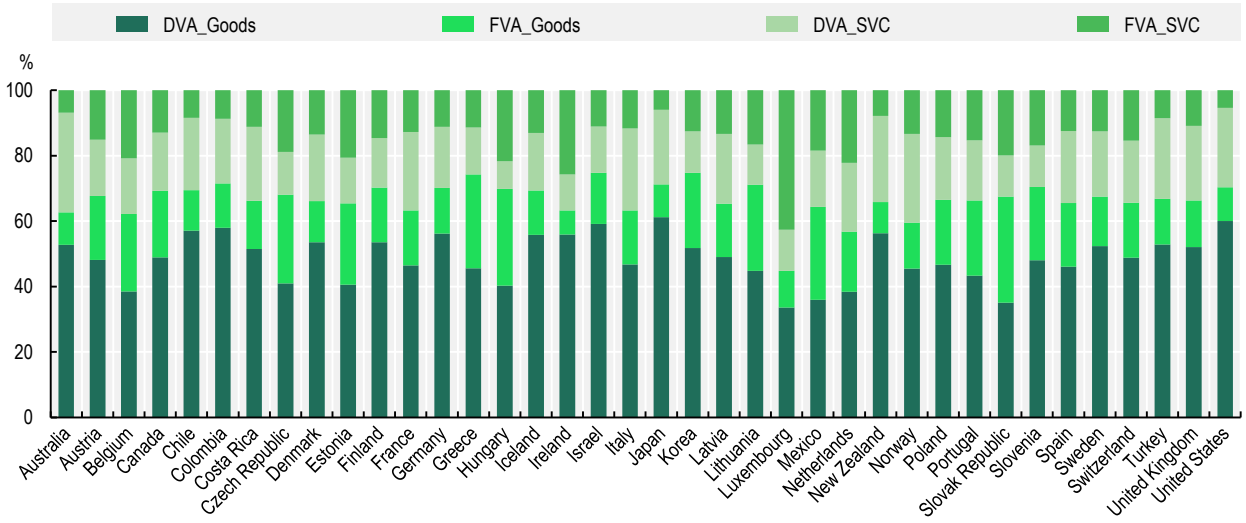
Understanding this interconnectedness provides granular insight into the linkages across industries and countries. It also helps build more resilience within supply chains and therefore contributes to the attainment of SDG 9. For example, Arriola et al. (2020[16]) find that in many countries, imports in general tend to have complex supply chains and be more diversified than exports, which in turn are highly concentrated in a few supply chains. Hence, a disruption in the manufacturing industry in one region could possibly ripple through to other regions across the world, through the global manufacturing value chain.

Figure 4.3 below shows that, although the largest contribution to exports in the manufacturing industry comes from domestic value added of goods within the industry, a significant share of foreign inputs is also embodied within manufacturing exports. Japan relies the most on its domestic value added of goods for its manufacturing exports (61%), followed by the United States (60%) and Israel (59%).

Figure 4.3 also shows that manufacturing exports embody a significant share of services value added. Australia, New Zealand and Norway rely the most on *domestic* value added of **services**. Ireland, Luxembourg and the Netherlands on the other hand have the highest *foreign* value added of **services** as a share of manufacturing exports. Similarly, Greece, Hungary and Slovakia rely the most on *foreign* value added of **goods**.

Figure 4.3. Domestic and foreign value added of goods and services in manufacturing exports (2015)

As percentage of total manufacturing exports



Note: DVA_Goods = domestic goods value added as a share of gross exports; FVA_Goods = foreign goods value added as a share of gross exports; DVA_SVC = domestic services value added as a share of gross exports; FVA_SVC = foreign services value added as a share of gross exports.
Sources: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020) and OECD (2021[15]), *Annual National Accounts (SNA) Database*, https://doi.org/10.1787/na-data-en (accessed in April 2020).

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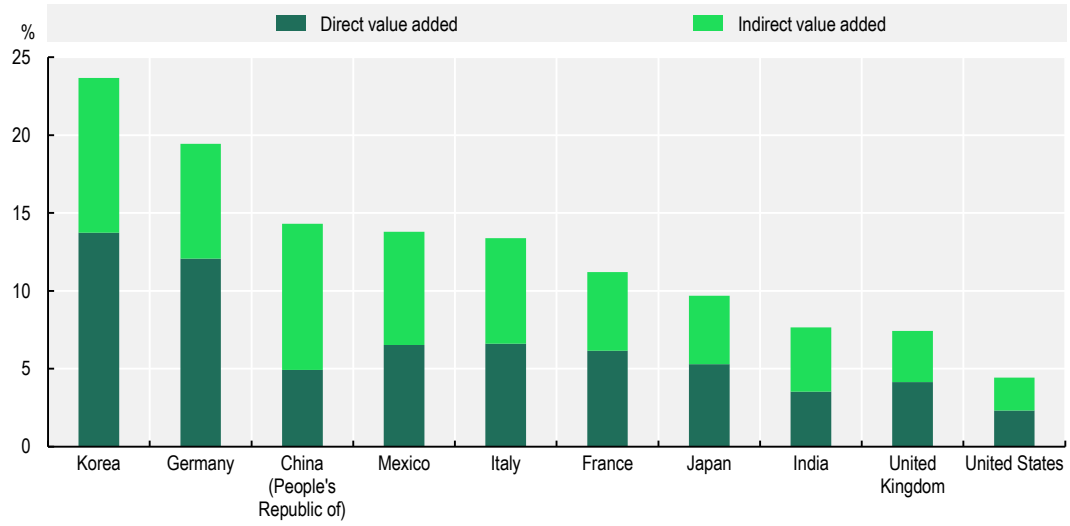
Manufacturing value added embodied in exports does not originate only from exporting sectors, but also from upstream manufacturing industries. Figure 4.4 shows the domestic manufacturing value added embodied in exports, as a percentage of GDP, distinguishing between the direct and indirect contributions. The results indicate that, among the top ten countries in terms of domestic manufacturing value added, between 38% and 66% of manufacturing domestic value added was through indirect contributions. In the case of China, for instance, approximately two thirds of domestic manufacturing value added embodied in exports originated from indirect contributions, in the upstream industries.

Figure 4.3 and Figure 4.4 show that indirect contributions are almost as important as direct contributions for manufacturing exports. Knowing this and adapting policies accordingly can play a crucial role in helping countries build a competitive and resilient manufacturing sector, thereby fostering industrial development for the SDGs.

Figure 4.4. Direct and indirect manufacturing domestic value added in exports of top ten countries (2015)

As a percentage of GDP



Note: GDP = gross domestic product.
Sources: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020) and OECD (2021[15]), *Annual National Accounts (SNA) Database*, https://doi.org/10.1787/na-data-en (accessed in April 2020).

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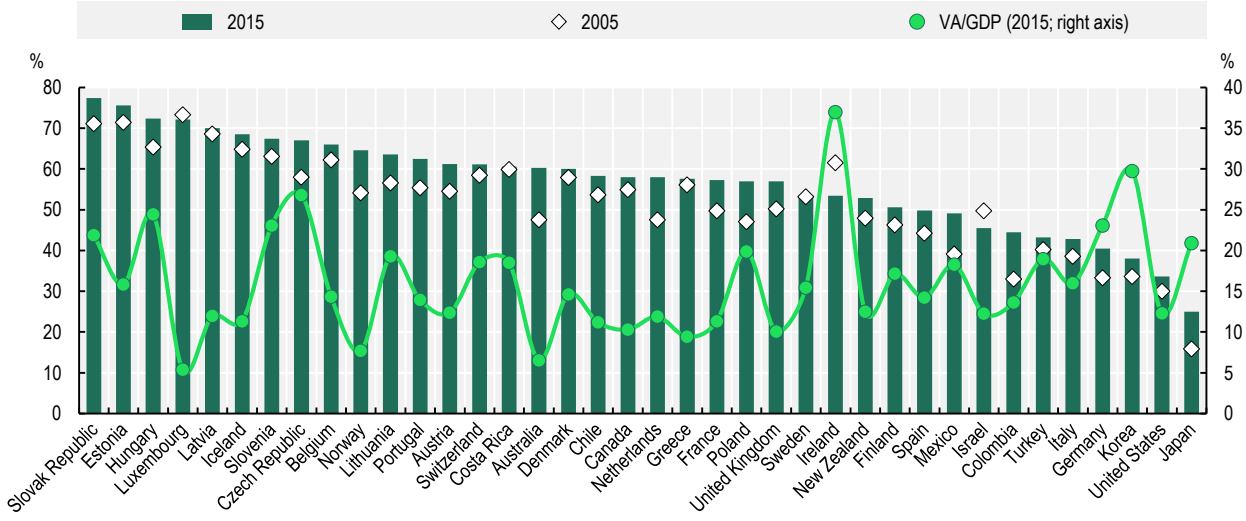
Figure 4.5. Foreign share of manufacturing value added in final demand



Note: VA = value added; GDP = gross domestic product.
Sources: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020) and OECD (2021[15]), *Annual National Accounts (SNA) Database*, https://doi.org/10.1787/na-data-en (accessed in April 2020).

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All countries rely significantly on foreign manufacturing goods, even countries with a large manufacturing base

Figure 4.5 shows that, on average across all OECD countries, foreign value added corresponds to approximately 58% of the manufacturing value added embodied in final demand in 2015. However, this share is not homogenous across countries, which can be explained, for instance, by the diverse resource endowments of countries, differences in socio-economic settings, and varying levels of industrialisation. Highly industrialised countries including Japan, Korea and the United States tend to rely more on their domestic value added to fulfil the domestic demand, while small and less industrialised countries including Slovakia, Estonia and Luxembourg are heavily reliant on foreign value added to satisfy their domestic demand.

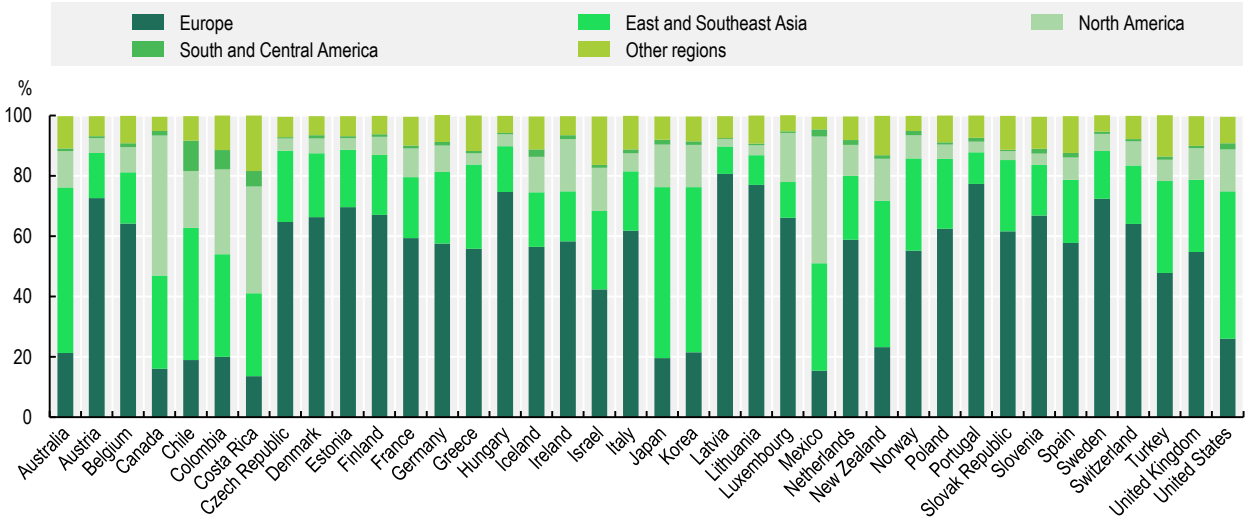
Although global, the integration also has a regional dimension

As foreign manufacturing value added plays a significant role in serving final demand for some countries, it is important to understand the composition of this foreign component by origin, uncovering the regional and global dynamics in GVCs.

Figure 4.6 shows, for each OECD country, the origin of foreign manufacturing value added by partner region. For example, approximately 50% of the foreign manufacturing value added embodied in the US final demand originates from the East and Southeast Asia, highlighting a global dimension to trade. Similarly, East and Southeast Asia contributes to more than 50% of foreign manufacturing value added in Japan's, Korea's and even Australia's final demand. Countries such as Latvia, Lithuania, Portugal and Hungary are highly dependent on imports from Europe – with a foreign manufacturing value added in final demand of more than 75% from that region. This corroborates the point that trade also has an important regional dimension.

Figure 4.6. Foreign manufacturing value added embodied in the final demand of OECD countries (2015)

By partner region



Notes: Receiving OECD countries are on the x axis and sourcing partner regions are on the y axis. See Annex D for the composition of regions.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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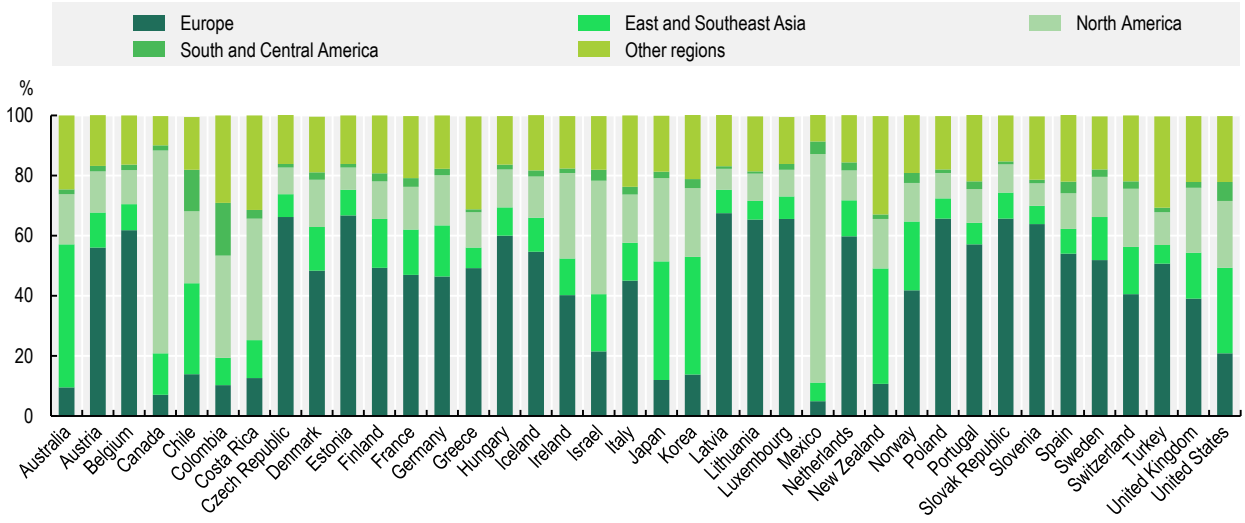
Taking the opposite perspective, Figure 4.7 illustrates the destination of domestic manufacturing value added embodied in exports by partner region. For instance, approximately 70% to 80% of Canadian and Mexican domestic value added of manufacturing industries is absorbed by the North American final demand (covering Canada, Mexico and the United States). However, in the case of the United States, the North American region represents only 20% of its domestic manufacturing value added embodied in exports.

Figure 4.7. Domestic manufacturing value added of OECD countries embodied in foreign final demand (2015)

By partner region



Notes: Sourcing OECD countries are on the x axis and receiving partner regions are on the y axis. See Annex D for the composition of regions.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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Medium and high-tech industry value added: Indicator 9.B.1

Medium and high-tech industry and the SDG framework

Target 9.B reads as follows:

> *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.*

The proposed indicator for this target by IAEG-SDGs is the "[p]roportion of medium and high-tech industry[2] value added in total value added".

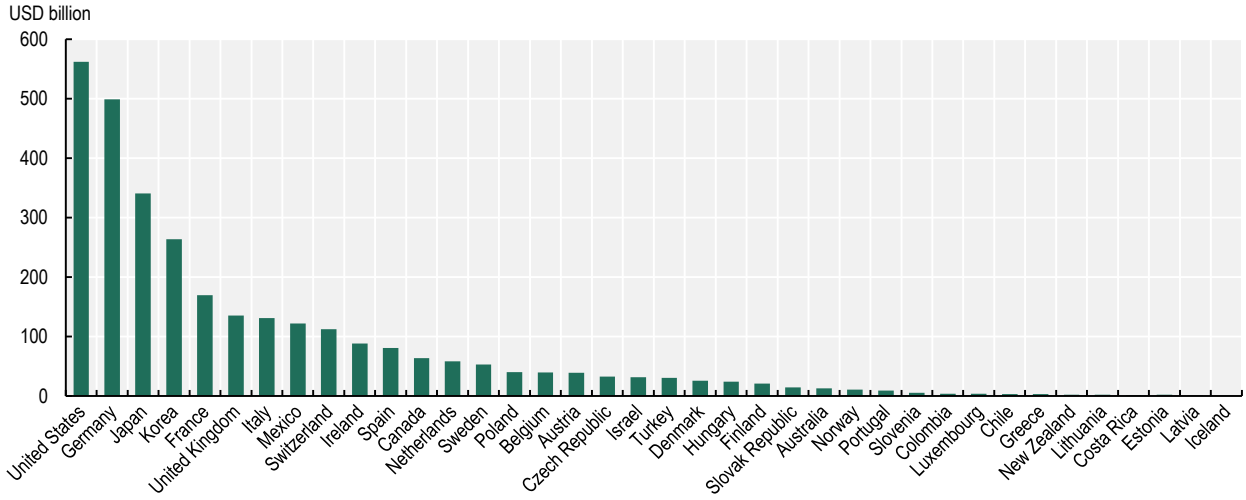
The spillovers from medium- and high-tech industries (MHTIs) are usually higher than those of less technologically intensive industries. This is because MHTIs usually provide more opportunities for the upskilling of labour and for innovation in production processes (UNIDO, 2019[17]). In this way, MHTIs contribute to increased competitiveness and productivity, within and across industries both at domestic and global levels. This is especially important for developing countries which will require an upscaling of their MHTIs to achieve industrial development in a sustainable and inclusive manner (UNIDO, 2017[18]), but also remains valid for advanced economies. Moreover, beyond production, consumption of MHTI goods is also likely to result in spillovers. In this respect, exports of MHTI value added from advanced economies to developing economies contribute to *SDG 9-Industry, Innovation and Infrastructure*.

In the context of this indicator, it is also important to take a GVC perspective, given how processes in MHTIs have come to be spread all around the globe. In other words, the length of the value chain, as characterised by the average number of processes across the value chain that a good has to undergo (Muradov, 2016[19]), tends to be longer for MHTIs. A classic example to illustrate this is Apple Inc. Although its headquarters are well established in Silicon Valley, Apple's processes are disaggregated and outsourced across the value chain; with R&D activities held upstream in the value chain and marketing activities and assembly performed downstream in the value chain (Mudambi, 2008[20]).

OECD countries significantly contribute to fulfilling the final demand of MHTI goods and services, including in other partner economies

In absolute terms, Germany, Japan and the United States are the three main contributors to exports of MHTI value added.

Figure 4.8. MHTI value added embodied in exports (2015)



Notes: MHTIs = medium-and high-tech industries.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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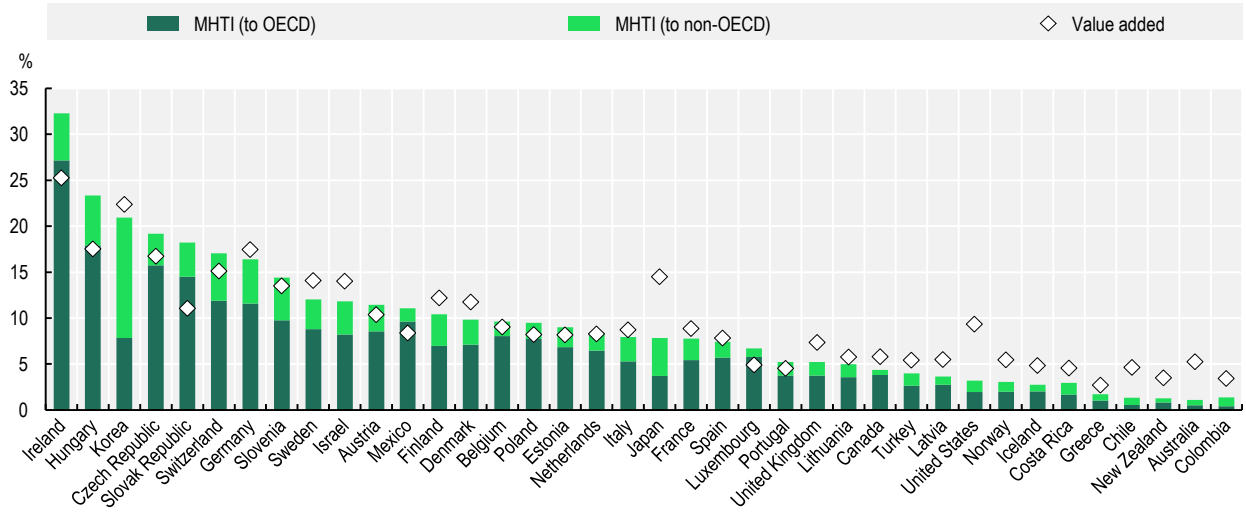
Figure 4.9. MHTI value added in exports and MHTI value added (2015)

As share of total value added



Note: MHTIs = medium- and high-tech industries.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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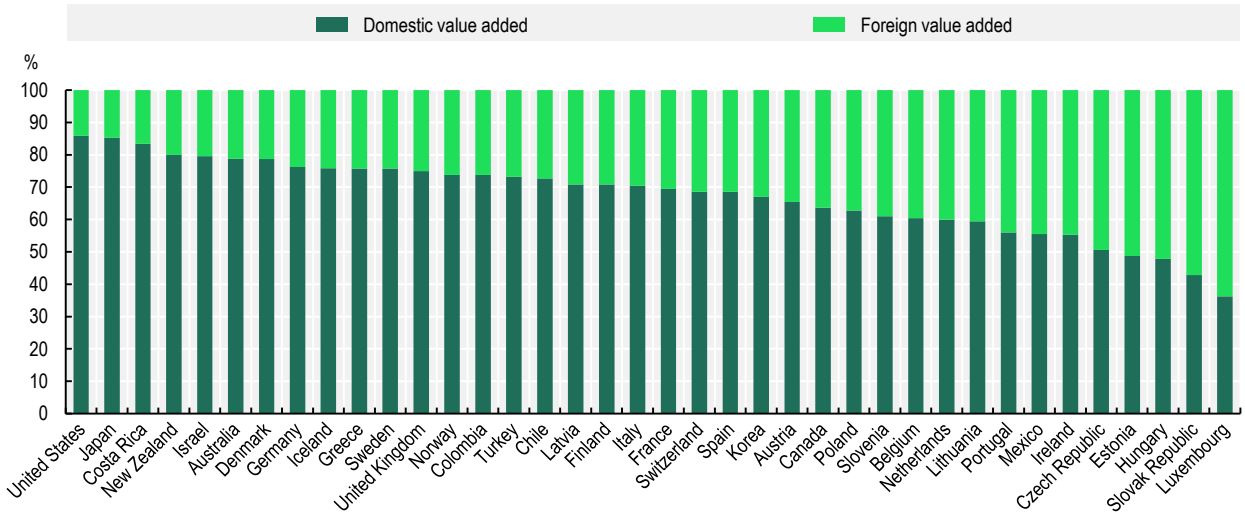
In relative terms, Figure 4.9 shows that the value added from MHTIs embodied in exports ranges from 32% of total value added in Ireland to 1% in Australia. For some countries, domestic MHTI value added embodied in exports is higher than MHTI value added a share of total value added (indicator suggested by

IAEG), suggesting that a significant proportion of MHTI value added is embodied in exports of downstream goods, whose production process uses MHTIs as an input.

Mexico and the European countries listed in Figure 4.9 mainly export to OECD countries, whereas Japan's exports of MHTI value added are evenly split between OECD countries and other partner economies. Korea on the other hand predominantly exports to other partner economies.

There is a significant degree of heterogeneity regarding countries' reliance on foreign MHTI value added. Figure 4.10 illustrates the domestic and foreign value added of MHTIs, as a percentage of domestic final demand. The United States and Japan are the two countries that rely the least on foreign content, with their domestic value added exceeding 80%. They are followed by Australia, Israel and New Zealand. In contrast, Luxembourg and Slovakia are the most reliant on foreign MHTI value added for their final demand.

Figure 4.10. Domestic and foreign value added of MHTIs embodied in domestic final demand (2015)



Note: MHTIs = medium- and high-tech industries.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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R&D expenditures: Indicator 9.5.1

R&D expenditures and the SDG framework

Target 9.5 reads as follows:

> *Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.*

The IAEG-SDGs indicators relevant to this target are: "Research and development expenditure as a proportion of GDP" and "Researchers (in full-time equivalent) per million inhabitants". OECD ICIO tables, TiVA indicators, OECD's Gross Domestic spending on R&D, and number of researchers have been used here to obtain estimates on the amount of domestic R&D in exports and final demand.

Research plays an important role in the achievement of SDGs (Fayomi, Okokpujie and Udo, 2018[21]), since it fosters innovation and the upgrading of processes across GVCs (OECD, 2017[22]). Indeed, R&D is explicitly mentioned in the targets of several SDGs (2, 3, 7, 9, 14).

R&D contributes to improving sustainability of firms, as discussed in Chapters 2 and 5 of this analysis. It is generally commonplace to assume a strong positive relationship between spending on R&D and productivity

growth. However, other than through productivity, R&D also allows firms to not only improve their production process, but also their product design. This sort of innovation adds to firms' knowledge-based capital and helps them remain competitive domestically and along the GVC (Marcolin and Squicciarini, 2017[23]).

Although the indicator used in this chapter captures cross-country linkages and trade in R&D, it is not without limitations. While the R&D embodied in traded products captures important linkages, this measure does not take into account the spillovers of such trade, nor the R&D spillovers occurring through other channels (e.g. publications, conferences, transfer of personnel) (Hall, Mairesse and Mohnen, 2010[24]; Bloom, Schankerman and Van Reenen, 2013[25]).

On average, R&D expenditures amount to 2.4% of OECD countries' GDP

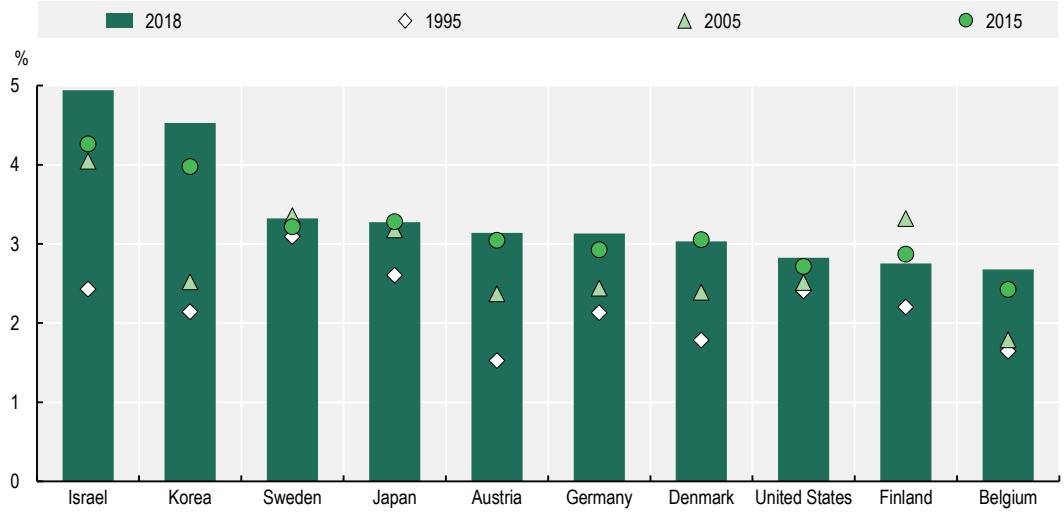
The OECD indicator on Gross Domestic spending on R&D is defined as:

> *the total expenditure (current and capital) on R&D carried out by all resident companies, research institutes, universities and government laboratories, among many options in a country. It includes R&D funded from abroad, but excludes domestic funds for R&D performed outside the domestic economy. This indicator is measured in USD constant prices using 2010 base year and Purchasing Power Parities (PPPs) and as a percentage of GDP.*

This indicator reveals a significant disparity in spending across OECD countries. In 2018, the lowest share of R&D spending as a percentage of GDP was for Colombia (approximately less than 0.3%), while Israel (approximately 5%) was the most R&D intensive. The shares of top ten countries in terms of spending in 2018 reveals that, along with Israel, Korea and Sweden form the top three countries with the highest gross domestic spending on R&D as a share of GDP (Figure 4.11).

Figure 4.11. Gross domestic spending on R&D total

As percentage of GDP for top ten countries



Note: R&D = research and development; GDP = gross domestic product.
Source: OECD (2021[26]), *Gross domestic spending on R&D* (indicator), https://dx.doi.org/10.1787/d8b068b4-en.

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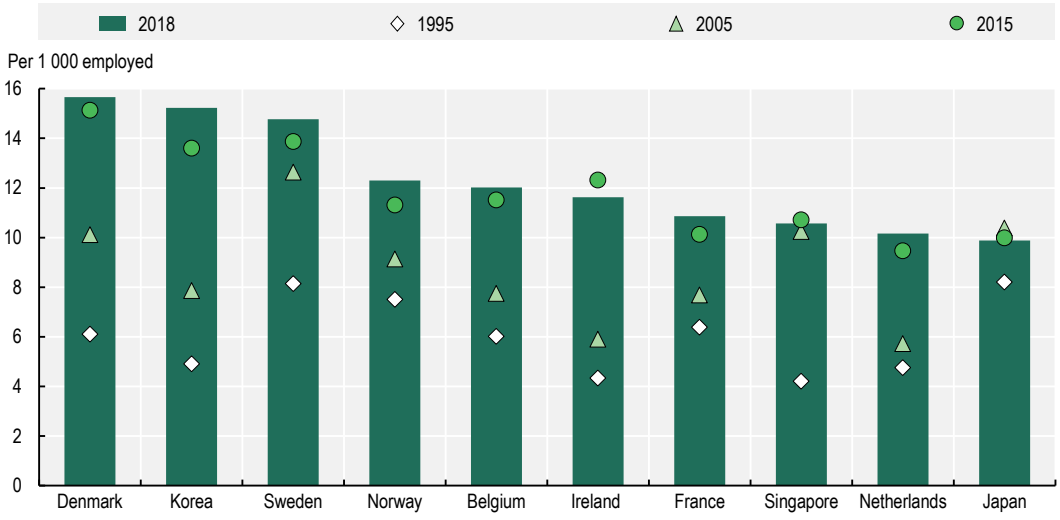
The number of researchers per 1 000 people employed represents the number of "professionals engaged in the conception or creation of new knowledge, products, processes, methods and systems, as well as in the management of the projects concerned". The trends are significantly correlated with the R&D spending, which in turn reflect that an increase in R&D spending would lead to an increase in the number of researchers. As illustrated in Figure 4.12, Denmark has the highest number of researchers per 1 000 people employed, followed by Korea and Sweden.

Figure 4.12. Total number of researchers in top ten countries



Note: Data for Israel, Austria and Finland (represented in Figure 4.11) are not available.
Source: OECD (2021[27]), *Researchers* (indicator), https://dx.doi.org/10.1787/20ddfb0f-en.

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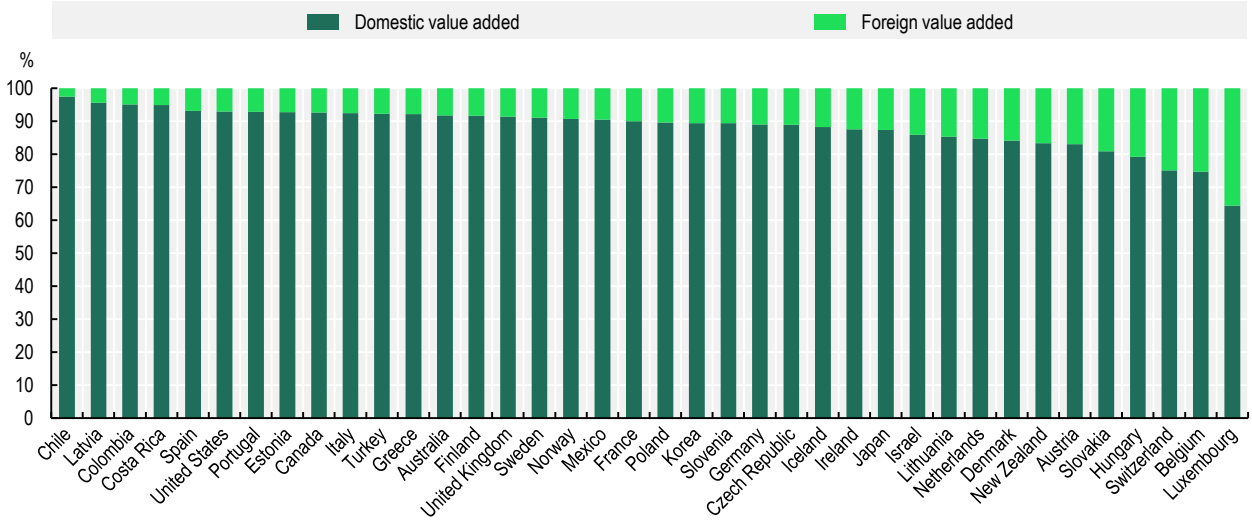
The share of foreign R&D value added in final demand is low

Figure 4.13 investigates the reliance of countries on domestic and foreign R&D value added[3] for their domestic final demand. Chile, Colombia, Latvia, Spain and the United States are the top five countries with highest domestic share of value added within domestic final demand, with over 90% domestic contribution therein. Luxembourg on the other hand tends to rely relatively more on imports of R&D – although the share of domestic value added is still around 75%. This share remains high compared to the corresponding results found for the previous indicators (manufacturing and MHTI value added).

Figure 4.13. Domestic and foreign value added of R&D embodied in domestic final demand (2015)



Note: R&D = research and development.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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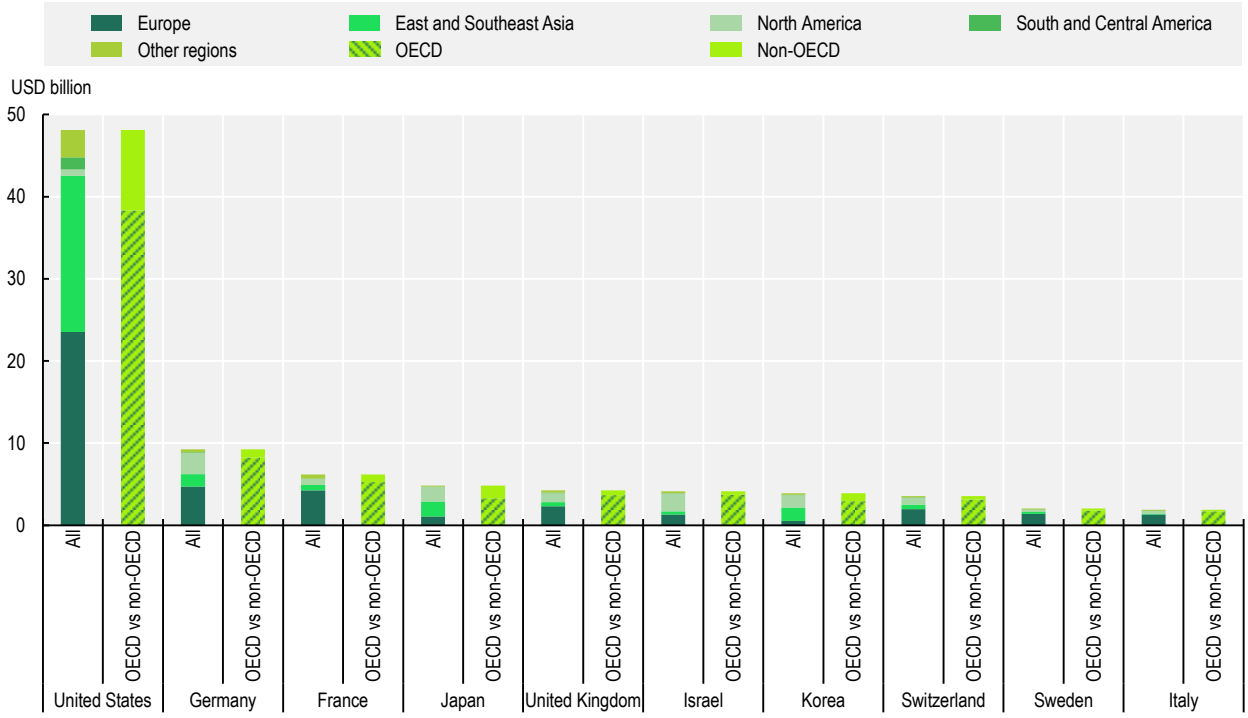
The United States represents more than 40% of the worldwide value added embodied in foreign final demand

The United States alone contributes to more than 40% of the worldwide R&D value added embodied in foreign final demand, with main destination regions being Europe and East and Southeast Asia.

Moreover, R&D is still traded regionally. For example, Europe seems to be one of the main destinations for R&D exports across many European countries, including, for example Switzerland and France, among others. In contrast, countries like Japan and Korea have a more diversified array of partner regions. For instance, among all OECD countries, Japan exported one third of its R&D to OECD partner economies. However, it is still noticeable that all of the OECD countries featured in Figure 4.14 seem to export mostly to other countries within the OECD area itself, implying some sort of collaboration and reliance between countries within the OECD.

Figure 4.14. Domestic value added of R&D embodied in foreign final demand, by country of origin and destination region (2015)

Top ten countries in terms of domestic value added



Notes: R&D = research and development. See Annex D for the composition of regions.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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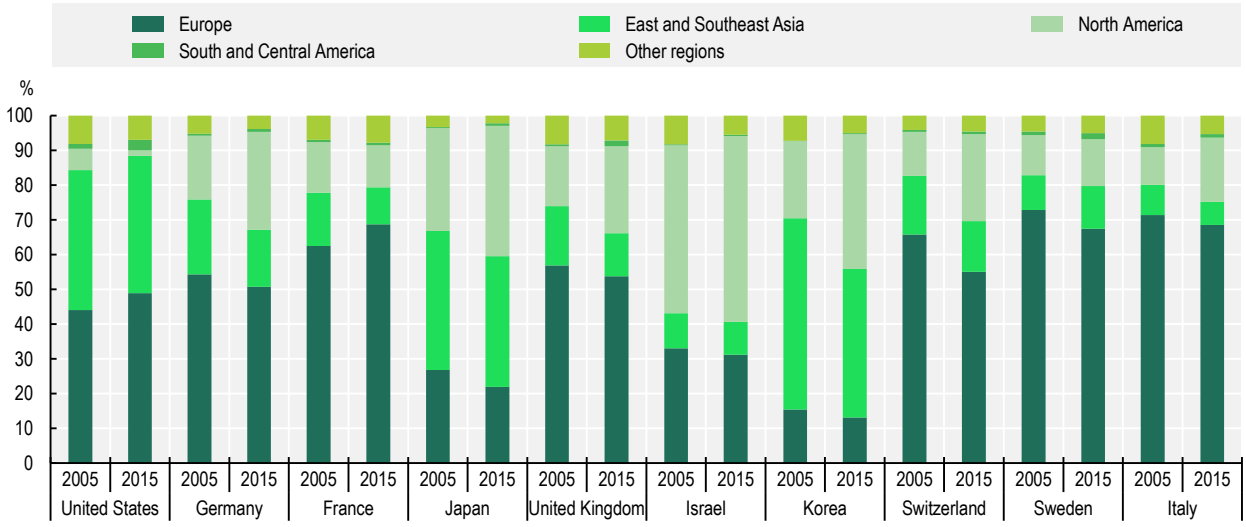
R&D value chains have become significantly more global between 2005 and 2015

Figure 4.15 illustrates the domestic R&D value added embodied in foreign final demand, by region of consumption. Between 2005 and 2015, most countries expanded their exports to regions that were not necessarily their main destination region in 2005. For example, many countries, including Germany, Sweden, the United Kingdom and the United States, expanded their exports of R&D to South and Central America between 2005 and 2015. Exports of R&D to North America also saw a rise, with Israel, Japan and Korea increasing their share of R&D embodied in exports to that region in 2015, relative to 2005. Interestingly, France stands out, with an increase in its share of R&D embodied in exports to Europe between 2005 and 2015.

Figure 4.15. Domestic R&D value added of top ten countries in terms of domestic value added embodied in foreign final demand (2005 and 2015)

By region of consumption



Notes: R&D = research and development. See Annex D for the composition of regions.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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Agricultural industry value added: Target 2.4

Agricultural industry value added and the SDG framework

Target 2.4 of the SDGs reads as follows:

> *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.*

The official IAEG-SDGs suggested indicator is the "Proportion of agricultural area under productive and sustainable agriculture". While this indicator sheds light on domestic food production systems, agricultural practices and their impact on the environment, it also has some shortcomings, because it does not capture the impact of domestic and cross-border trade on agricultural production. In the context of GVCs, it may thus be useful to analyse the global footprint of the agricultural industry,[4] due to the role it plays in the achievement of SDGs.

Over and above its role in achieving food security, and as a key source of employment across GVCs (Greenville, Kawasaki and Jouanjean, 2019[28]), the agricultural industry also has spillover effects on *SDG 3-Good health and Well-being*, as well as important implications for *SDG 13-Climate Action*, *SDG 14-Life Below Water* and *SDG 15-Life on Land*, respectively for the impact it has on carbon emissions, land quality, deforestation and biodiversity.

The expansion of this industry, and the increased need for agricultural trade in GVCs, can be attributed to an increasing world population, rising incomes and growth of developing economies. For example, the agricultural industry is a key driver of economic activity and trade in the Association of Southeast Asian Nations (ASEAN) region, with agro-food exports from the region having quadrupled from USD 31 billion in 2000 to USD 129 billion in 2015 (Greenville and Kawasaki, 2018[29]). Likewise, in West Africa, agriculture

contributed more than 20% to regional GDP in 2017 (African Development Bank Group, 2018[30]) and employed 66% of the regional labour force in 2018 (Allen, Heinrigs and Heo, 2018[31]).

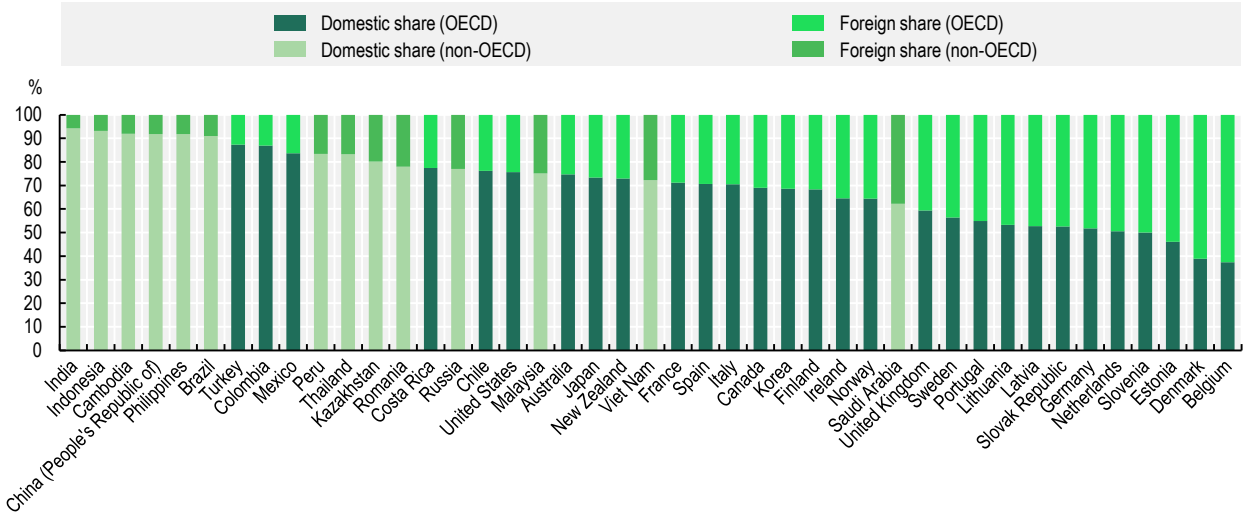
Trade is key for resilience in this industry and for food security. While there is a case for self-sufficiency to achieve food security in the face of price volatility (Clapp, 2017[32]), this has been debated (Margulis, 2017[33]; HLPE, 2011[34]), and trade in the agricultural industry remains crucial because not all countries are equipped with the resource endowments to engage in sufficient and diversified agricultural production.

Some countries are better equipped for agricultural production than others

Given the unequal geographical distribution of natural resources and arable land across the world, some countries are better equipped than others to engage in primary agricultural production. This leads to heterogeneity in domestic production of agricultural output and reliance of countries on trade of agricultural products. To explore this point further, this section uses the ICIO tables, which allow for cross-country comparison and for estimation of import intensities for agricultural and food products.

Figure 4.16 indeed shows that dependency on foreign agricultural industry is largely heterogeneous across countries.[5] Brazil, Cambodia, China, India, Indonesia and the Philippines all contribute domestically to more than 90% of their final demand for agricultural products. Belgium, Denmark and Estonia on the other hand are the countries that import the most agricultural industry value added to satisfy their domestic final demand. Although arable land and agricultural capacity plays a role, the countries that are the most reliant on foreign agricultural industry value added to meet their domestic final demand are OECD countries, compared to partner economies, including developing countries, which tend to rely more on their domestic production.

Figure 4.16. Domestic and foreign value added of agriculture and food processing embodied in domestic final demand of targeted countries, from OECD countries and partner economies (2015)



Note: These are the countries included in Chapters 3 and 5.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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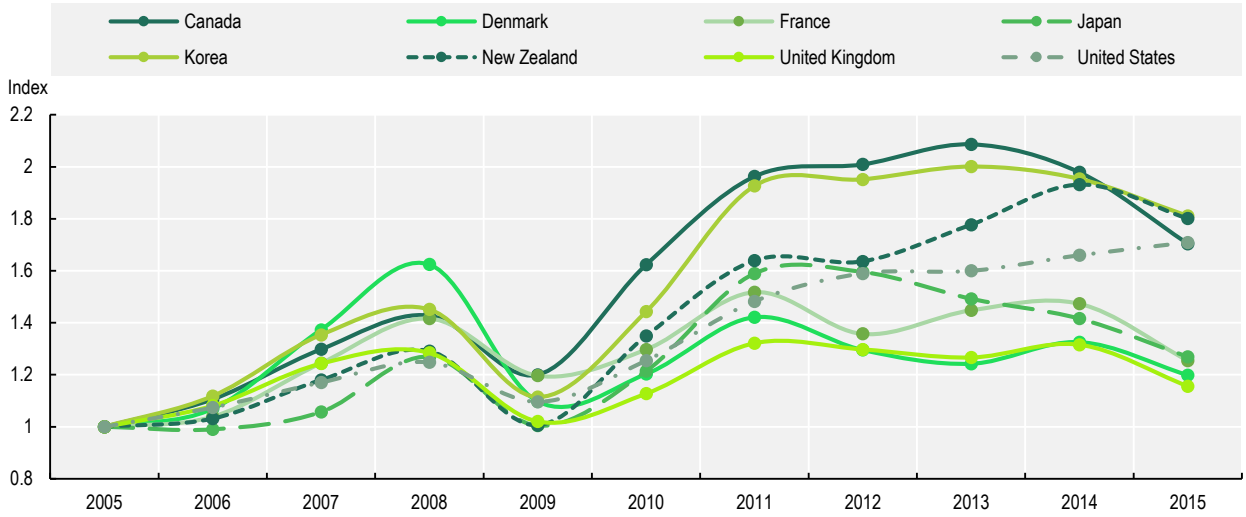
To illustrate the trend in trade of agricultural products, Figure 4.17 shows the growth in foreign agricultural industry value added embodied in final domestic demand for selected OECD countries.[6] Overall, all the countries listed have seen a rise in their foreign value added, relative to the baseline. Countries saw this figure fall in 2009, as a result of the agricultural market crisis, when prices saw a significant upsurge (Gurría, 2011[35]). However, to dampen the effect of the food price crisis, more than 80 governments around the world implemented measures to counter the negative impact of the crisis on food security, income and employment (Maetz et al., 2011[36]). This led to the rise in trade and hence imports of agricultural products again, post crisis.

By 2015, foreign agricultural industry value added was above its pre-crisis level in some countries, such as Canada, Korea, New Zealand and the United States. In the case of the United States, this sustained increased in imports has been attributed to a strong dollar, and an economy which at the time experienced a steady recovery after the 2008 financial crisis (Gardiner, 2016[37]). In Korea, this has been due to declining shares of cultivated land over the years, coupled with increased consumption of agricultural products such as livestock, for which the country is less autonomous in production of (Cho, 2018[38]).

Figure 4.17. Evolution of foreign agricultural industry value added embodied in final domestic demand

In value (2005 = 1)



Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

StatLink https://doi.org/10.1787/888934275064

Exporting countries contribute to meeting the final demand in other countries

Following the analysis from Figure 4.16 and Figure 4.17, it is evident that domestic production is not always be sufficient to guarantee sustainable food production systems and attain food security. Food imports may thus be required for meeting domestic demand and diversifying supply.

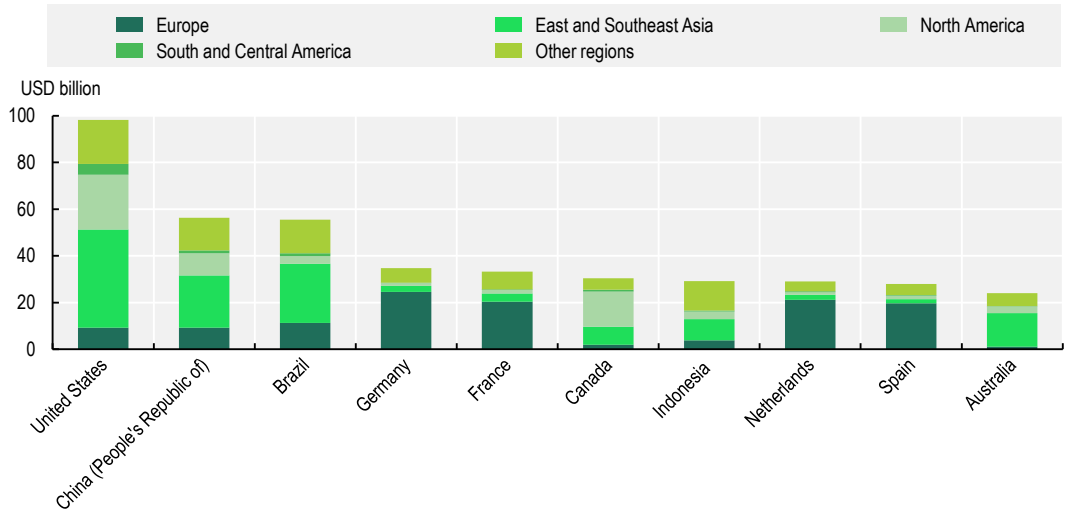
Figure 4.18 shows that in absolute terms, the United States had the highest domestic value added in exports of agricultural output in 2015, followed by Brazil and China. Across these three countries, the main destination region for the agricultural output was East and Southeast Asia. Furthermore, a large share of exports from the United States and Canada are targeted to North America, suggesting a regional dimension to trade. Similarly, as can be seen in Figure 4.18, France, Germany, Ireland, Italy, the Netherlands and Spain, export most of their domestic value added of agricultural output to Europe. In contrast, India and Indonesia export most of their domestically produced agricultural output to “Other Regions”.

Moreover, the largest importer region in 2015 was Europe (approximately 32% of total agricultural industry value added embodied in foreign final demand), followed by East and Southeast Asia (26%).

In addition to the analysis provided above, it may be useful to look into the different components of agricultural industry, distinguishing between agriculture and food processing. The specialisation between these two components differs across countries depending on the natural and technological resource endowments of countries. As seen in Figure 4.19, Belgium and Germany contribute mainly to food processing. In contrast, Cambodia, Latvia, Romania and Russia, which have more arable land, contribute more to agricultural products in their exports of agricultural industry value added. This highlights that even among OECD countries, some countries specialise more in agricultural products while others undertake more food processing.

Figure 4.18. Domestic value added of agriculture and food processing embodied in exports (2015)

By country of origin and destination region (top ten countries in terms of domestic value added)



Note: See Annex D for the composition of regions.
Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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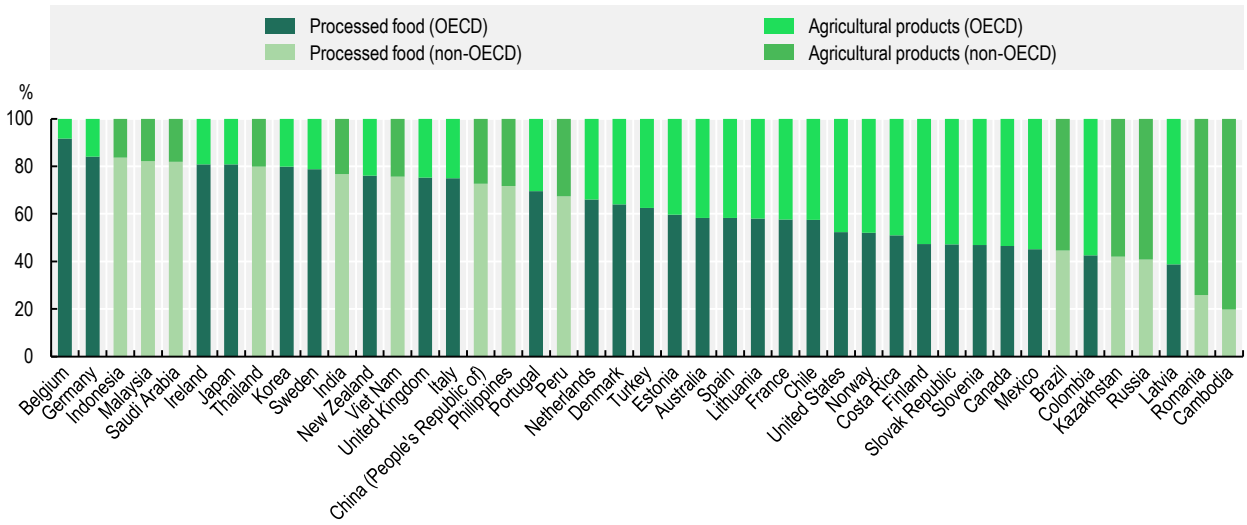
Figure 4.19. Shares of domestic value added in exports of agricultural products and processing food for targeted countries, from OECD countries and other partner economies (2015)



Source: Based on OECD (2018[5]), *Inter-Country Input-Output Database*, https://oe.cd/icio (accessed in April 2020).

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Notes

[1] In the UN framework, R&D, research or innovation are often cited as a lever to attain the SDGs. They are explicitly mentioned in the targets of SDGs 2, 3, 7, 9 and 14.

[2] Medium and high-tech industries (MHTIs) include both manufacturing and services sectors. It consists in the following economic activities: manufacture of chemicals and chemical products; manufacture of basic pharmaceutical products and pharmaceutical preparations; manufacture of computer, electronic and optical products; manufacture of electrical equipment; manufacture of machinery and equipment n.e.c.; manufacture of motor vehicles, trailers and semi-trailers; manufacture of other transport equipment; publishing; computer and related activities; and Scientific Research and Development. All are according to the International Standard Industrial Classification of All Economic Activities Revision 4 (ISIC Rev.4). This classification has been used widely in the OECD, e.g. in its STructural ANalysis Database (STAN).

[3] The rest of this section uses national accounts to measure R&D value added. Ideally, privately performed R&D would have been used to measure the private sector's contribution to the SDGs through R&D activities, but this indicator is unfortunately not available for a large number of countries.

[4] Agricultural industry refers to the agriculture and food-processing sectors.

[5] Some partner economies are represented on Figure 4.16 and Figure 4.18. They were chosen based on their size, their production and consumption of products from the agricultural industry.

[6] These are the countries included in Chapters 3 and 5.

5 Industrial policies for the SDGs

This chapter uses a policy benchmarking exercise in a sample of seven countries and the European Union to better understand the current policies that governments are implementing to target the Sustainable Development Goals (SDGs). It focuses on three main types of instruments, namely rewards and incentives; government assistance; and mandatory compliance. These instruments are then classified by target SDGs to shed light on the policy mix by SDGs.

Key messages

Industrial policies can foster the contribution of firms to the Sustainable Development Goals (SDGs) through their core business. Governments mainly rely on a diverse set of policy instruments:

- **rewards and incentives** (mainly subsidies, loans, or equity investments) to reduce the cost or the risk associated with investing in sustainability
- **government assistance** policies, which enable firms to access relevant information or provide a legal framework to foster firms' contribution to the SDGs
- **mandatory compliance** instruments, i.e. regulations to deter firms from producing excessive levels of negative externalities (e.g. safety at work requirements), oblige them to disclose information on the impact of their operations on SDGs or price negative externalities (e.g. carbon dioxide emissions or fuel taxes).

A policy benchmarking exercise conducted on seven countries and the European Union shows that:

- Some governments leverage **mission-oriented industrial strategies** to improve the consistency, comprehensiveness and governance of industrial policies.
- Policy packages often include **specific support to start-ups and innovative small and medium-sized enterprises** (SMEs) in SDG-oriented sectors.
- Beyond innovative firms, **governments also more globally support firms' sustainability actions**. This support is in general available for all firms, but some instruments especially target small ones, which may encounter more difficulties to undertake sustainability shifts.
- **Policy packages differ across policy objectives**, in particular regarding the balance between mandatory compliance measures and rewards and incentives. SDGs that can be easily linked to the core business of firms give rise to more instruments supporting innovation in the related sectors; whereas for those which are more pervasive and diffuse across firms (e.g. greenhouse gas [GHG] emissions, gender equality), policy instruments include a higher share of government assistance and mandatory compliance policies.

Which policies are likely to affect firms' commitment to SDGs?

Several policy tools can be used to foster the contribution of firms to SDGs

A wide array of policy instruments affect firms' behaviour and actions related to sustainability. Two distinctions are particularly useful. First, some industrial policies have broader objectives (e.g. productivity growth, innovation, competitiveness) and do not target sustainability, whereas others are specifically designed to contribute to the attainment of the SDGs. Second, policy instruments may affect firms through different channels, as detailed in Box 5.1.

Even if standard industrial policies do not specifically aim at promoting sustainability, they have the potential to indirectly incentivise firms to contribute to the SDGs. Such policies can be found in virtually any category of the taxonomy described in Box 5.1 (e.g. competition policies, provision of skills, product standards).

Beyond standard industrial policies, other instruments also directly target SDGs (e.g. promotion of social entrepreneurship, public disclosure of pro- and anti-SDG behaviours, targeted innovation subsidies, and green industrial policies). The next section reviews these policy initiatives in a sample of seven countries and the European Union. They can be classified into three types:

- **Rewards and incentives**. These policies aim to reduce costs or risks associated with starting/scaling a business or investing in sustainability (e.g. through subsidies, financing instruments). They can also promote best-in-class firms, for example through awards that help businesses attract customers,

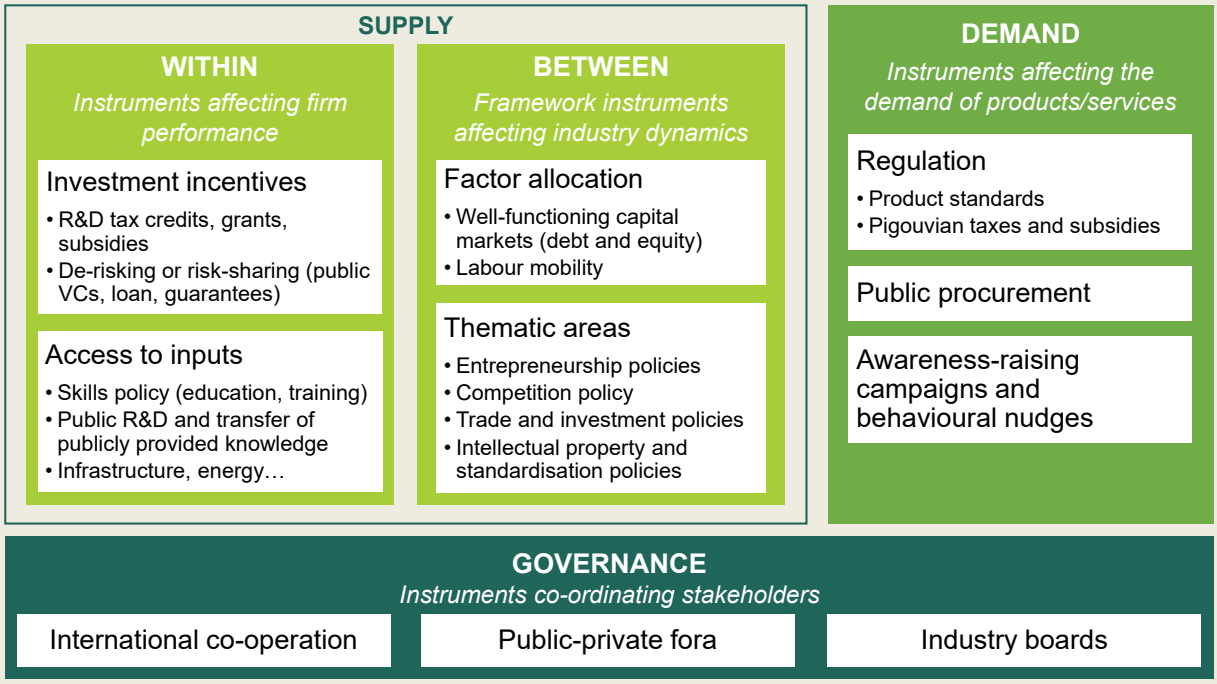
investors or employees, by promoting their achievements and credentials. Most of the policies of this type are "investment incentives" (Box 5.1). However, some instruments of this type can also be considered as affecting industry dynamics ("between" instruments). By promoting best-in-class firms, they can contribute to a reallocation of activity towards more sustainable businesses.

- **Government assistance**. These policies consist of various schemes that either enable firms to access relevant information (e.g. guidelines, toolkits, mentorship programmes, training, support for matching potential customer needs to technology seeds), provide legal frameworks, or remove regulatory barriers to foster contributions to the SDGs (e.g. designating mission-oriented firms). By reducing the cost to develop a sustainable production, they promote the development and the efficiency of sustainable firms. They can also tilt the playing field in favour of the most sustainable firms (for instance through support to social entrepreneurship).
- **Mandatory compliance**. These types of policies are most commonly regulations or taxes designed to ensure that firms reduce, or do not produce, negative externalities on society (e.g. non-financial disclosure or due-diligence requirements, health and safety or gender-balance requirements, cap-and-trade systems, carbon or fuel taxes). Most of the policies of this type are categorised as affecting firm efficiency ("within" instruments, Box 5.1). They are either "regulations of production", to ensure that firms avoid producing large negative externalities on society, or "access to inputs" instruments, which work by increasing the cost of some inputs (e.g. fossil fuel). Some mandatory compliance instruments can also be classified as "between", because they require firms to disclose their impact on the social goods and this may favour firms with more advanced sustainability strategies.

Box 5.1. Taxonomy of industrial policy instruments

The taxonomy of industrial policy instruments (Figure 5.1) developed in other OECD work (Criscuolo et al., forthcoming[1]) builds upon two essential distinctions.

Figure 5.1. Taxonomy of industrial policy instruments



Source: Criscuolo et al. (forthcoming[1]), "An industrial policy framework for OECD countries: Old debates, new perspectives".

First, it builds on the mainstream split between supply-side instruments and demand-oriented instruments (Edler et al., 2016[2]). Second, among supply-side instruments, the taxonomy further distinguishes between those that affect efficiency *within* firms and those that affect the allocation of production factors *between* firms, in the same spirit as in the productivity literature (Olley and Pakes, 1996[3]; Bartelsman and Doms, 2000[4]; Syverson, 2011[5]).

Distinguishing "between" instruments from "within" instruments explicitly accounts for Schumpeterian dynamics and the fact that productivity growth partly comes from creative destruction, in particular the reallocation of production factors from old firms to young firms with a superior technology (Aghion and Howitt, 1992[6]). This distinction is also useful when thinking about the growing contribution of firms to SDGs, which can channel through the "between" and "within" channels.

Governance is regarded as a necessary enabler of successful policy interventions. Therefore, "governance" instruments complement the three main categories of industrial policy interventions. Their role is to co-ordinate stakeholders in the business sector, the public sector and research institutions (e.g. industrial participants, ministries or universities (Larrue, 2021[7])) at both the national and the international level.

Source: Based on Criscuolo et al. (forthcoming[1]), "An industrial policy framework for OECD countries: Old debates, new perspectives".

From policy instruments to strategies

Beyond industrial policy instruments, governments rely on strategies composed of an array of coherent and complementary instruments targeting specific objectives (typically an SDG). For instance, many countries have now equipped themselves with explicit green industrial strategies (Criscuolo et al., forthcoming[1]; Anderson et al., 2021[8]) including carbon pricing instruments, subsidies for green technologies at various readiness levels (research and development [R&D], demonstration, deployment), regulations, and skill policies. Strategies are included in the policy survey described in the next section.

Previous OECD work distinguishes four types of strategies: sectoral, mission-oriented, technology-oriented and place-based. Although place-based strategies can be relevant to promote local economic development (OECD, 2020[9]), mission-oriented strategies are the most pivotal in achieving addressing societal grand challenges that require the commitment of many stakeholders from the private and the public sector (Box 5.2).

Box 5.2. Mission-oriented industrial strategies

Larrue (2021[7]) defines a mission-oriented innovation policy as a "co-ordinated package of research and innovation policy measures aiming to address societal challenges. They possibly span different stages of the innovation cycle from research to demonstration, and cut across various policy fields and are implemented in order to meet ambitious and concrete goals in a defined timeframe." Even though this definition is designed for innovation policies, it is straightforward to extend it to industrial strategies more generally.

Indeed, mission-oriented industrial strategies are increasingly popular and range from green strategies – in which emission targets or resource efficiency objectives apply to a vast range of industries through several policy instruments – to more targeted interventions, such as the ones in "Advanced Research Projects Agency (ARPA)"-type challenges (Azoulay et al., 2019[10]), the fight against infectious diseases or "moonshots" (a bold and precise objective requiring breakthrough technologies, e.g. the Apollo 11 mission). The European Commission (2018[11]) distinguishes between well-defined and narrow strategies (accelerators) and broad policies addressing complex multifaceted challenges (transformers).

Mission-oriented industrial strategies differ from standard industrial or innovation policies in that they are "transformation-oriented" (Weber and Rohracher, 2012[12]). This means that they address the direction of innovation rather than its level; and they require co-ordination across policy domains, and across stakeholders (consumers, government, research institutions). They should therefore include several policy instruments from the demand-side and governance categories (Figure 5.1).

Four types of arguments can justify the use of mission-oriented policies:

- **Social benefits**. In addition to the traditional knowledge spillovers, mission-oriented industrial strategies yield social benefits that are inherently linked to the issues that they aim to tackle (Rodrik, 2014[13]). It may thus be efficient to foster further innovation in order to reduce the cost of reaching the mission objective. Along this line, mission-oriented strategies do not aim at fostering innovation (Mazzucato, 2018[14]; Foray, Mowery and Nelson, 2012[15]; Mazzucato, Kattel and Ryan-Collins, 2019[16]), but rather at affecting its direction. In other terms, there are paths in economic growth that are preferable to others because they provide a higher level of well-being in the long term (Wanzenböck et al., 2019[17]).
- **Co-ordination failures**. Some projects may require several (compatible) simultaneous investments. For instance, complex products may need a vast network of suppliers (horizontal co-ordination), or products may go through a number of outsourced production steps through the value chain (vertical co-ordination). Co-ordination failures may be particularly severe when a mission requires simultaneous investments in different industries (Altenburg and Rodrik, 2017[18]). These failures are usually remedied through improved communication and co-ordination between stakeholders. They include "industry boards", but also standardisation initiatives or improvements of the intellectual property system. These remedies may emerge spontaneously from professional organisations (Romer, 1993[19]), or the public sector can play an active role as a third party or a stakeholder to make this co-ordination happen.
- **Acceptability of public investment**. Bloom, Van Reenen and Williams (2019[20]) provide a political economy argument in favour of mission-oriented strategies. They argue that, by articulating a political vision around the expenditures, mission-oriented narratives make extra resources for investment in new technologies more acceptable.
- **Regulatory uncertainty/imperfect commitment**. Firms' investment decisions rely on the discounted benefits over a long time span. If regulatory and policy uncertainty casts doubt on the ability to recover the costs of the investment, it may hamper innovation, as often argued in the green transition discourse (Popp, Newell and Jaffe, 2010[21]). In such a case, mission-oriented industrial strategies can play a role in sending long-term signals on the political willingness to reach the mission's objectives, and serve as a commitment device through public investments along private ones or targets set in the law.

OECD countries' policy experience in incentivising firms to contribute to SDGs

OECD countries' policy experience in incentivising firms to contribute to SDGs

This section presents the results of a benchmarking exercise covering industrial policy instruments and strategies that specifically target the SDGs in the European Union and seven countries (Canada, Costa Rica, France, Germany, Japan, Korea and New Zealand). These countries were chosen based on the interest and uniqueness of their SDG policies, and to achieve balanced geographical coverage. For the selected countries, government officials have contributed to and reviewed the results of the benchmarking exercise. Moreover, it also includes flagship examples from other countries when relevant.

More precisely, this benchmarking focuses on policies and initiatives of governments and other public entities that:

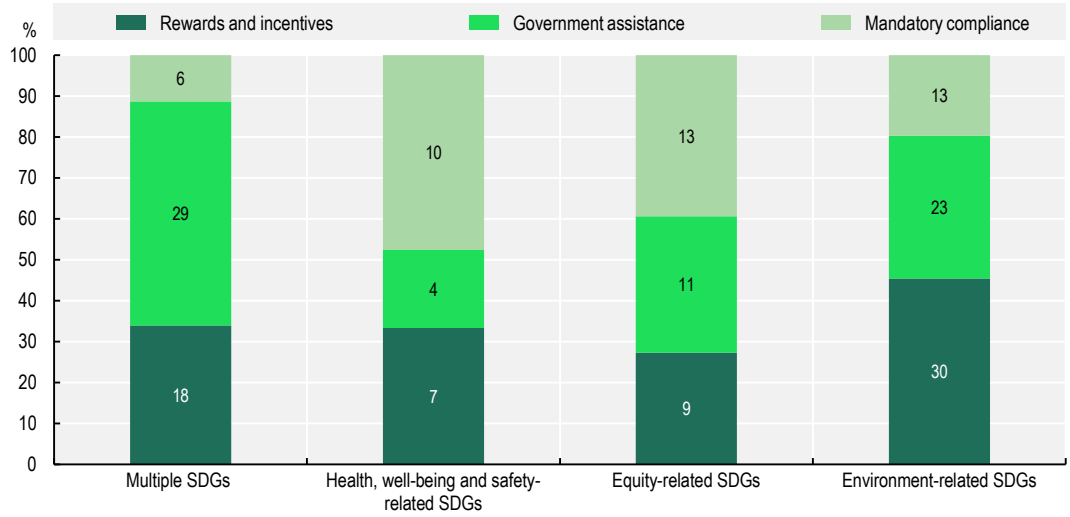
- target the private sector
- are designed to address one or several SDGs
- are at the national level (or at the European level for the European Union)
- are enacted or currently under discussion.

These policies are classified according to their type (rewards and incentives, government assistance and mandatory compliance) and broken down into four categories of goals (Table 5.1):

- those addressing multiple types of SDGs
- those addressing health, well-being and safety-related SDGs, notably *SDG 3-Good Health and Well-Being* and *SDG 8-Decent Work and Economic Growth*
- those addressing equity-related SDGs, notably *SDG 5-Gender Equality*
- those addressing environment-related SDGs, notably *SDG 7-Affordable and Clean Energy*, *SDG 12-Responsible Consumption and Production*, *SDG 13-Climate Action*, *SDG 14-Life Below Water* and *SDG 15-Life on Land*.

The three selected categories of goals correspond to the ones that are frequently cited as relevant by firms (Table 2.4 in Chapter 2), and for which public policies can easily be identified. Environment and health measures were selected due to being directly and frequently related to many firms' core business activities, and further because numerous policy instruments having to do with these are already in place in many countries. Policies regarding safety and equity are an important and growing concern for many firms, and therefore have been included in the scope of this survey despite rarely being directly related to core business activities.

Figure 5.2. Share of each type of instruments collected, by target SDGs



Notes: SDG = Sustainable Development Goal. The numbers in the bar refer to the number of policy instruments collected for each category.
Source: OECD, based on the OECD survey to seven countries and the European Union, and on governments' SDG action plans and websites (see Annex E).

StatLink https://doi.org/10.1787/888934275121

Table 5.1. Selected policy examples

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies	Horizon Europe (EU), European Recovery Fund (EU), High-Tech Strategy 2025 (Germany), Korean New Deal, Invest for the Future programme (France)		Women Entrepreneurship Strategy (Canada)	Environment Innovation Strategy (Japan)
Rewards and Incentives	Innovation subsidies: Innovation for SMEs/Central Innovation Programme for Medium-sized Companies (ZIM) (Germany) The National Science Challenges (New Zealand) SDG Awards: SDG Accelerators Awards (Canada) Cluster policies: Innovation Superclusters Initiative (Canada)	Innovation subsidies: Research Investment for Global Health Technology (RIGHT) Fund (Korea)	Fund: Black Entrepreneurship Fund (Canada), Enabling Māori Framework (EMF) (New Zealand) Gender-balance certification: Seal of Gender Equality (Costa Rica) Public procurement: "Eruboshi" firms (Japan)	Green innovation policies and research funds: New Zealand Green Investment Finance Limited (New Zealand) Grants: C-Prize (New Zealand) Insurance against carbon price fluctuations: Carbon Contracts for Difference (Germany)
Government assistance	SDG management guidelines/ toolkit/resource centre: The SME Sustainability Roadmap (Canada), The Guide for SDG Business Management (Japan) Governance measures/corporate forms: benefit corporation (United States), mission-oriented company status (PACTE Law) (France) Matching seeds to needs/overseas promotion initiatives: STI for SDGs Platform (Japan), innovationXchange (Australia) Assistance for entrepreneurship: J-Startup (Japan) Assistance for environment, social and governance (ESG) investment: Promoting ESG investment (Japan)	Overseas promotion initiatives : Overseas Expansion of the Healthcare Industry (Japan)	Mentorship programmes: National Agency for Women Start-ups Activities and Services (BGA) (Germany) Resource centres: Economic Autonomy Resources from the National Institute of Women of Costa Rica (INAMU) (Costa Rica) Overseas promotion initiatives: Support to women entrepreneurs with export potential (Costa Rica)	Assistance for going green: Growth Hub for the Environmental Industry (Korea), Energy Consulting for SMEs (Germany) Assistance for disclosure: Promoting disclosure of the climate-related information based on the Task Force on Climate-related Financial Disclosures (TCFD) (Japan) Green public procurement: Japan
Mandatory compliance	Non-financial disclosure: Directive 2014/95/EU Due-diligence requirement: Vigilance Duty Law (France)	Health and safety requirements: Health and Safety at Work Acts in most of the countries	Equal pay policies: Equal Pay Amendment Bill (New Zealand) Gender-balance requirements: Law for the Equal Participation of Women and Men in Leadership Positions in the Private Sector and the Public Sector (Germany)	Cap-and-trade system: European Union Emissions Trading System (EU ETS) (European Union), Cap-and-trade system (Korea) Energy taxes: in most of the countries Emission fees: Greenhouse Gas Pollution Pricing Act (Canada)

Notes: The complete set of policy instruments from the policy benchmarking exercise can be found in Annex E.
Source: OECD, based on the OECD survey of seven countries and the European Union, and on governments' SDG action plans and websites.

Figure 5.2 presents the number and share of policy instruments collected from this benchmarking exercise. In total, the benchmarking exercise collected 173 policy instruments (excluding strategies). The type of instruments used differ by target SDGs. For policies addressing multiple types of SDGs, the share of government assistance instruments is higher than other target SDGs. For policies addressing health, well-being and safety-related SDGs, the share of mandatory compliance instruments is higher than other target SDGs. For policies addressing equity-related SDGs, the share of rewards and incentives instruments is lower than other target SDGs. For policies addressing environment-related SDGs, the share of rewards and incentives instruments is higher than other target SDGs.

Table 5.1 presents selected policy examples from this benchmarking exercise, whereas the comprehensive list of relevant policies by country is available in Annex E.

The policy examples represented in Table 5.1 were chosen to illustrate the diversity of instruments available to policymakers. However, it does not constitute an attempt to identify best practices. Such a task is beyond the scope of the current report, and there is additionally a lack of evidence regarding the effectiveness of most of these policies. The rest of this chapter draws several conclusions from this benchmarking exercise and, confronting these with the evidence gathered in the previous chapters, the next chapter provides several recommendations for the design of SDG-related industrial strategies.

Main findings from the policy benchmarking exercise

Message 1: Some governments leverage **mission-oriented industrial strategies to improve the consistency, comprehensiveness and governance of industrial policies for the SDGs**. The narrative of these strategies aligns with the 2030 agenda of the SDGs and beyond (e.g. net-zero carbon emissions in 2050). Recently introduced industrial strategies include the High-Tech Strategy 2025 (Germany), the Horizon Europe (2021) and the Korean New Deal (2020). These strategies are considered as mission-oriented industrial strategies, as they are predominantly “transformation-oriented”. They primarily address the direction of innovation rather than its level, and co-ordinate across policy domains and stakeholders (Box 5.2). They usually include several policy instruments, including governance bodies (Figure 5.1).

More recently, some countries also designed their COVID-19 recovery packages along the lines of the SDGs (Korea, European Union and some of its member countries among others). For instance, the European Recovery Fund, a massive EUR 750 billion plan, aims to repair the economic and social damages caused by the COVID-19 crisis, while ensuring that their economies undertake the green and digital transitions to build a more sustainable and resilient economy.

Message 2: Policy packages often include specific support to start-ups and innovative SMEs in SDG-oriented sectors. Many policy instruments target promising and innovative young firms. For example, J-Startup initiative (Japan) and C-Prize (New Zealand) support start-ups that focus on innovative technologies linked to SDGs. Many of the innovation subsidy/grant programmes such as the European Social Innovation Competition target start-ups and innovative firms. Some governments provide funding to support R&D in innovative SMEs such as through programmes like KMU-innovativ and Zentrales Innovationsprogramm Mittelstand (Germany).

Message 3: Beyond innovative firms, governments also provide **more generic support to firms’ sustainability actions**. This support is in general available for all firms, but **some instruments especially target small firms, which may encounter more difficulties to undertake sustainability shifts**. As shown in Chapter 2, SMEs seem less likely to take action, and to develop products and services targeting many of the SDGs, compared to larger firms. Support measures include actions to help the most-advanced firms in terms of sustainability (SDG awards for frontrunners, new legal statuses for firms looking for a strong commitment device and export promotion policies for potential exporters), but also broader support for firms that are only starting their journey to sustainability.

- SDG awards to celebrate firms' actions in the area of sustainable development are becoming increasingly common. SDG awards are found in Canada, Japan, and the European Union. These initiatives help raise awareness of consumers and fellow firms, communicate on good examples and provide more visibility to the award winners. However, even if most of these awards reserve special prizes for SMEs, SDG awards mostly go to frontrunners (rather than firms in the infancy of their strategies).
- Governments have also created new corporate entity statuses to support the transformation of business models, such as benefit corporation (United States), mission-oriented company (*entreprise à mission*, France) and *società benefit* (Italy). These statuses can provide firms with legal protection to balance financial and non-financial interests when making decisions, and serve as both a commitment and communication device to support their sustainability orientation.
- Export promotion policies related to SDGs, such as support to women entrepreneurs whose businesses have export potential (Costa Rica), innovationXchange (Australia) and matching seeds to needs by agencies such as the Japan International Cooperation Agency (JICA) and the Japan External Trade Organization (JETRO) (Japan), can support firms (particularly SMEs). These policies help in finding the right product markets, matching seeds (technologies and innovations) of domestic firms to sustainable development-related needs overseas. Firms may be unaware of the potential demand abroad and benefit from matching mechanisms.
- In addition, governments provide various toolkits, guidelines, resource centres, and sustainability reporting tools to support firms' transformation of their daily operations into sustainable models, and to assist their related communication. For example, the Toolbox Human Rights (Belgium) provides a set of accessible tools to guide firms and their stakeholders in their human rights duties in the context of their daily business operations.[1] The Women Entrepreneurship Knowledge Hub (Canada) and Greening Your Business web portal (Canada) function as a resource centre taking a more thematic perspective. The government of Colombia has developed a national online platform for sustainability reporting.[2]

Message 4: Policy packages differ across policy objectives, particularly in terms of the balance between mandatory compliance measures and rewards and incentives. This heterogeneity comes from different: levels of acceptance regarding the deviation from the social norm, time horizons for societal change, and links between the SDG and the core business of firms (Figure 3.8). SDGs for which deviation from the norm is not accepted (e.g. gender equality or workplace safety) include more mandatory compliance instruments (particularly regulations), even if some countries also provide rewards, incentives and assistance to support firms' strategic in-house contributions to these objectives. Goals that can easily be linked to the core business of firms, or that have a more distant time horizon (e.g. health or energy) display more instruments supporting innovation in the related sectors. Conversely, for SDGs which are more pervasive and diffuse across firms (e.g. GHG emissions, gender equality), policy instruments include a higher share of government assistance and mandatory compliance policies:

- Health, well-being and safety-related SDGs. While there exist regulatory measures (e.g. Health and Safety at Work Acts) on the private sector's daily operation side, financial incentives for firms' R&D and innovation activities are commonly found, with the objective to support firms whose core business directly addresses health-related societal challenges.
- Equity-related SDGs. Mandatory compliance measures constitute the bulk of the instruments supporting gender equality in the workplace (e.g. equal pay acts and acts on Equal Participation of Women and Men in Leadership Positions in the Private and Public Sectors – Germany). Interestingly, some countries provide rewards, incentives and assistance for entrepreneurship and innovation targeting women, such as the EU Prize for Women Innovators, the Women Entrepreneurship Strategy (Canada) or the National Agency for Women Start-ups Activities and Services (BGA) (Germany). Others use public procurement as an incentive for firms to pursue gender equality such as Eruboshi certification (Japan).

- Environment-related SDGs. Both innovation policies and mandatory compliance measures play an important role. Innovation policies, such as the Green Innovation Funding (Canada) and the Sustainable Farming Fund projects (New Zealand), promote the firms' innovation activities by providing financial support. Mandatory compliance measures include both regulations and carbon pricing instruments such as energy taxes and emissions trading systems in many countries.

Message 5: Many mandatory compliance measures were recently introduced or are currently under discussion. The number of mandatory and voluntary compliance instruments on non-financial disclosure, particularly sustainability reporting provisions that often target large and listed firms, has been increasing, especially in financial services and heavy industries (Van der Lugt, Van de Wijs and Petrovics, 2020[22]). In terms of non-financial disclosure, the European Union has introduced Directive 2014/95/EU for large firms. Due-diligence requirements are also gaining traction domestically, for example the Australian Modern Slavery Act 2018 (No. 153, 2018), the UK Modern Slavery Act 2015 (2015 c.30), the French Act no. 2017-399 on the duty of vigilance of parent companies and instructing undertakings and the German Act on Corporate Due Diligence in Supply Chains passed in June 2021. The United Kingdom is also considering deforestation due-diligence law. A significant number of rewards and incentives, and government assistance measures, have also been enacted recently. However, it is difficult to assess whether these schemes replace older ones or are completely new. Hence, this policy benchmarking exercise, which is not meant to study the evolution of policies over time, does not allow for distinguishing between a general rise in the number of SDG-related industrial policies and a shift towards mandatory compliance measures.

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Notes

[1] https://business-humanrights.be/.

[2] https://www.ods.gov.co/es/sdg-corporate-tracker.

6 Designing and implementing SDG-oriented industrial policies

Building on the results of previous chapters, this chapter provides policy recommendations on the design of industrial policies for the Sustainable Development Goals (SDGs), aimed to increase the private sector's contribution to the SDGs through firms' core business activities. It studies the right policy mix between rewards and incentives, government assistance and mandatory compliance instruments, the importance of targeting small firms, new entrants and innovative firms and the design of industrial strategies for the SDGs.

Key messages

The diversity of policy instruments reflects the multifaceted challenge of the Sustainable Development Goals (SDGs) and requires an integrated approach to articulate them.

- **Mandatory compliance instruments are a key component of policy packages**, but they need to be complemented with other types of policies. They contribute to reducing excessive negative externalities (such as pollution) from firms' operations and to promoting sustainable behaviours. However, they can increase compliance costs and may fall short of stimulating innovative activities needed to overcome global challenges. The development of new solutions requires a vibrant ecosystem, notably of innovative sustainable start-ups and entrepreneurs, which can be effectively supported through rewards-and-incentives instruments to promote the private sector's contribution to the SDGs through their core business.
- More generally, because the transition to more sustainable business models entails significant costs and risks, more **support to firms, and especially to small and medium-sized enterprises (SMEs), is needed to trigger this transition and assist in the process**. This can be done through government assistance instruments.
- Beyond core industrial policies, **adequate business framework conditions are needed**. The advent of a sustainable economy will necessitate a significant reallocation of resources towards more sustainable activities and firms. In particular, international trade, when associated with a more level playing field on sustainability issues, can contribute to the SDGs by increasing the market size for sustainable firms. Demand-side instruments may also be useful in some instances to create new markets for sustainable products and services.
- **Mission-oriented industrial strategies provide an appropriate structure** for consistently articulating policy instruments and establishing suitable governance. To limit the risks of policies being unduly influenced by vested interests, as brought to light by previous waves of industrial policies, a particular emphasis should be placed on including all types of firms (but in particular young and small ones), policy evaluation and regular refit.

Based on the evidence gathered in previous chapters, this final chapter underlines five recommendations for the design of SDG-oriented industrial policies to foster the private sector's contribution to the SDG through core business.

Mandatory compliance instruments are a key component of policy packages, but they need to be complemented with other types of policies

Mandatory compliance instruments – in particular legal and regulatory standards – are a key component of policy packages. They contribute to avoiding inordinate or irreversible negative externalities from firms' operations. As shown in Chapter 5, many countries are implementing stringent standards regarding gender equality (in terms of positions and wages), workplace health and safety, or pollution. In these cases, deviation from social norms cannot be tolerated, and firms have to comply with regulations, incurring financial or non-financial sanctions if they do not. Combinations of regulations and sanctions have been shown to effectively reduce violations, not only for sanctioned firms, but also for the others.[1] The liability of stakeholders also reduces the negative impact of firms on the environment (Annex F).

Information disclosure also promotes virtuous behaviours. For instance, Christensen et al. (2017[1]) show that, in the United States, the mandatory disclosure of mine-safety records in their financial report decreased citations and injuries. In the People's Republic of China, Chen, Hung and Wang (2018[2]) showed that mandatory

disclosure of corporate social responsibility (CSR) activities reduced industrial wastewater and sulphur dioxide emissions.

Other mandatory compliance instruments may also serve as a signal to change behaviours. For instance, carbon pricing, which is now widespread among the countries surveyed in Chapter 5, is considered as an efficient way to reduce greenhouse gas emissions and trigger low-carbon investments. Mandatory compliance measures are effective in fostering innovation in environmental technologies, as measured by patents, favouring the adoption of green technologies, creating markets for green products and reducing emissions (Haščič et al., 2010[3]; Ambec et al., 2013[4]; Blind, 2016[5]; Popp, Newell and Jaffe, 2010[6]). Clear trajectories of gradually increasing carbon prices over the next decades make the business case for a low-carbon transition, and can provide forward guidance to investors and reduce uncertainty (OECD, 2020[7]). The carbon pricing example can be linked to the *SDG 7-Affordable and Clean Energy*, *SDG 9-Industry, Innovation and Infrastructure*, *SDG 12- Responsible Consumption and Production* and *SDG 13-Climate Action*, which are shown to concern firms' core business (Figure 3.8).

Mandatory compliance instruments also have the advantage of potentially involving affiliates abroad or arm's length suppliers, such as the German Act on Corporate Due Diligence in Supply Chains (Sorgfaltspflichtengesetz, passed in June 2021). As discussed in the previous chapters, taking a whole-of-supply chain approach increases the scope for action, and ensures that firms from OECD countries can contribute to the SDGs in developing countries.

However, by increasing production costs and the regulatory burden, mandatory compliance instruments may affect the competitiveness of do (Blind, 2016[5])mestic firms. Building on the above-mentioned examples, Christensen et al. (2017[1]) show that the decrease in mine-related citations and injuries is accompanied by a drop in labour productivity. Chen, Hung and Wang (2018[2]) demonstrate that the decrease in pollution took place at the expense of a decrease in profitability.

The impact of mandatory compliance instruments on competitiveness has been extensively studied with environmental policies, specifically via market instruments (feed-in tariffs, cap-and-trade schemes, carbon levies). Even if environmental regulation fosters innovation and productivity, the net impact on competitiveness remains negative or close to zero in a majority of the studies (Dechezleprêtre and Sato, 2017[8]; Dechezleprêtre et al., 2019[9]; Ambec et al., 2013[4]). OECD research shows that implementing more stringent environmental policies has had little aggregate effect on economic performance over the last three decades, despite achieving significant environmental benefits (OECD, 2021[10]). Yet, small average effects across the economy hide heterogeneous impacts across industries and firms. While more stringent environmental policies may negatively affect the performance of energy-intensive trade-exposed industries, at least in the short run (Aldy and Pizer, 2015[11]) and in least-productive firms, environmental stringency positively affects the productivity of frontrunner industries and firms and the exports of low-pollution industries. Carbon leakage is a possible consequence of unilateral carbon pricing policies and the resulting disparities in the price of carbon across countries, as part of the emissions avoided through domestic environmental regulations are shifted to other locations.

Moreover, stringent standards or price signals are unlikely to be sufficient, as global challenges require the development of new technologies and innovative solutions. These breakthroughs require research and development (R&D) funding, to incentivise and reduce risk for innovators, as a complement to mandatory compliance instruments, which help create a market for these innovations. This has been exemplified in recent years by the new paradigm of green industrial policies. It is now widely acknowledged that carbon pricing policies need to be supplemented by innovation subsidies, in order to foster the development of clean technologies (Altenburg and Rodrik, 2017[12]; Tagliapietra and Veugelers, 2020[13]). A policy portfolio including emission pricing and subsidies for low-carbon technology R&D and deployment can reduce carbon emissions at a significantly lower cost than any single policy alone (Fischer and Newell, 2008[14]).

Finally, the interactions between mandatory compliance instruments and firms' sustainability actions may not be trivial. While extrinsic motivation may crowd out the intrinsic motivation and reduce voluntary contributions (Gneezy, Meier and Rey-Biel, 2011[15]; Bénabou and Tirole, 2010[16]) or CSR (de Bettignies, Liu and Robinson,

2020[17]) (for instance by reducing reputational benefits of good behaviours), Costello and Kotchen (2020[18]) show that taxing emissions – by reducing the abatement cost – can encourage firms to go beyond expected emission reductions.

The development of new solutions to global challenges requires a vibrant ecosystem of start-ups and entrepreneurs

Beyond large and established firms, which are often the focus of mandatory compliance instruments, new solutions can also emerge from younger firms, which in many sectors disproportionately contribute to disruptive innovation. The entry and growth of new firms that replace old, unproductive ones is the engine of efficiency-enhancing reallocation and a major driver of aggregate productivity growth (Decker et al., 2017[19]). Moreover, start-ups are often seen as vehicles of radical innovation and, thus, of reallocation and productivity growth (Acemoglu et al., 2018[20]).

Using "rewards and incentives" to foster the creation of innovative sustainable firms, whose core business directly relates to the SDGs, can be an efficient tool to promote the transition towards a sustainable economy. The literature increasingly acknowledges the role of this channel (Terán-Yépez et al., 2020[21]; Keskin, Wever and Brezet, 2020[22]). The analysis in Chapter 3 confirms that a significant share of the economy is linked to the SDGs, showing the potential for sustainable innovation in these sectors. It also demonstrates that, for some SDGs, the corresponding industries remain at an early stage and might benefit from the entry of new firms.

Indeed, studies confirm that the early imprinting of sustainability concerns is key for the subsequent behaviour of firms, be it through sustainable entrepreneurship[2] or a more general commitment to the SDGs. Alakent, Goktan and Khoury (2020[23]) show that venture capital (VC)-backed firms are less likely than other comparable firms to adopt CSR practices. Even if the CSR record of VC-backed firms improves over their business life, it does so at a lower rate than for the other firms. However, firms that are backed by VC companies with a responsible investment policy have better CSR records than comparable non-VC backed firms.

Another strand of the literature emphasises the spillovers from sustainable entrepreneurs, and thus the policy rationale to support them. Building on interviews with sustainable entrepreneurs in Berlin and Lagos, Tiba, van Rijnsoever and Hekkert (2020[24]) show the lighthouse role of successful sustainable entrepreneurs, which contribute to attract other entrepreneurs and skills to create an SDG-oriented cluster. Cojoianu et al. (2020[25]) demonstrate how relevant local knowledge positively affects the entry decision of green entrepreneurs in Europe and the United States.

Mandatory compliance instruments, while having a positive impact on available funding for SDGs, do not seem to trigger entrepreneurship (Cojoianu et al., 2020[25]). Therefore, entrepreneurship and start-up policies should be seen as an important component of mission-oriented SDG strategies. Many countries support entrepreneurship, in particular innovative entrepreneurship such as the J-Startup programme (Japan) and the Women Entrepreneurship Strategy (Canada). When designing new entrepreneurship and start-up policies, introducing sustainability considerations into the schemes (e.g. public VC,[3] business plan competitions[4]) should be considered. However, particular attention should be paid to the impact of sustainability considerations on the funds' financial returns. Barber, Morse and Yasuda (2021[26]) show that the performance of impact-investing VC are two to three percentage points lower than traditional VC.

Support to firms, and especially SMEs, is needed to foster the transition to sustainable business models

As shown in Chapter 2, although sustainability constitutes a viable business case in many instances, the transition to a new business model is a sizeable and risky investment.

Larger firms may be better equipped than small firms for such an investment, as part of it can be considered as a fixed cost (e.g. communication on the actions undertaken). SMEs may also face a higher cost of capital, which increases the cost of sustainability efforts, and stronger information asymmetries, which can heighten the perceived level of risk.

In this respect, as for other types of intangible investments (e.g. R&D, software, marketing), small firms may be at a disadvantage compared to large firms in the transition to sustainability (Bajgar, Criscuolo and Timmis, forthcoming[27]).

In this context, countries have opted for more flexible regulation for small businesses. This is confirmed by the policy benchmarking exercise, with a significant share of mandatory compliance instruments focusing on medium and large firms (e.g. non-financial disclosure requirements, gender-balance requirements, carbon trading schemes, etc.).

At the same time, as small firms represent a significant share of economic activity in most OECD countries, policies need also to ensure that these firms have adequate incentives to shift to sustainability. This support is notably provided through government assistance instruments, the objective of which is to reduce the cost or the risk of sustainability investments. For example, the SME Sustainability Roadmap (Canada) provides guidelines and information on the transition to sustainable business models for firms (particularly SMEs). To increase the market size for sustainable firms, governments also implement “matching seeds toneeds” programmes to help small firms find suitable foreign markets for their sustainable products and services.

Support is provided by national governments, but local governments and other intermediaries (e.g. business networks) can also help in this respect (Kundurpi et al., 2021[28]; Cojoianu et al., 2020[25]; McCann and Soete, 2020[29]; Iizuka and Hane, 2021[30]), and complement public initiatives. In some industries, private-sector initiatives are already complementing policy instruments by the government. In the financial services sector, for example, environment, social and governance (ESG) and social impact-investing initiatives (Box 2.4) channel investment into small sustainable enterprises and start-ups. Other intermediaries, such as Global Compact Local Networks and business associations, support firms’ transition into sustainable business by providing toolkits, resource centres, seminars and networks.

Beyond core SDG industrial policies, framework and demand-side instruments are needed

The advent of a sustainable economy will necessitate not only the transformation of firms to sustainability, but also a significant reallocation of resources towards more sustainable activities and firms. Chapter 3 shows that SDG-related sectors represent a non-negligible share of the economy, but also that their size significantly differ from one country to another, which suggests a potential for growth in some jurisdictions. This requires a notable amount of reallocation, both between sectors and between firms in the same sector. Framework and demand-side instruments (Figure 5.1) are thus needed to form a coherent and comprehensive industrial strategy.

The reallocation of production factors, including capital, towards sustainable firms will require well-functioning labour and capital markets.[5] Moreover, promoting transparency for firms and institutional investors is likely to reinforce the pressure to deliver on SDGs, provided that information is available at a reasonable cost for firms and investors (Annex F). The effect, however, is likely to be muted for smaller firms, and governments need to be mindful about the potential adverse impact on the access to finance or the cost of external funds for these firms when instituting these policies.

More generally, maintaining a sufficient level of competition seems to favour the sustainability of firms. Even though tougher competition could reduce room to manoeuver for sustainability investments and efforts, the literature shows that competition fosters sustainability, because firms try to differentiate from their competitors (Annex F). Competition is also important because the transition to sustainable production could favour

large incumbents, at the expense of small and young firms, thereby increasing concentration and leading to entrenchment.

International trade can also contribute to the shift towards sustainability. Chapter 4 illustrates that cross-border contributions to the SDGs are significant and provide opportunities for firms. It creates an additional incentive by increasing the market size for sustainable firms. Trade rules and relevant measures on issues such as removal of barriers to trade and trade facilitation may contribute to this end. Nevertheless, openness to trade must be accompanied by a level playing field for firms. For instance, a recent study has identified the existence of below-market finance in sectors such as heavy industries and high-tech industries (OECD, 2021[31]). Addressing these through trade rules may strengthen the global value chains for SDG-related activities. Furthermore, unilateral climate efforts may increase costs for domestic firms (e.g. heavy industries), damaging their competitiveness and jeopardising emission reductions through carbon leakage. In this example, accompanying measures include the subsidisation of green technology adoption or carbon border adjustments (OECD, 2020[32]).

Finally, beyond supply-side instruments, demand-side instruments may also be useful in some instances to create new markets for sustainable products. For instance, OECD (2021[33]) shows that the definition of regulatory standards (e.g. minimum content requirements, regulation applied to scrap metal) and public procurement may be critical to help create markets for recycled products and synthetic and bio-based feedstock (*SDG 12-Responsible Production and Consumption* and *SDG 13-Climate Action*). Some countries have implemented SDG-oriented public procurement tools (e.g. Eruboshi firms and Green public procurement in Japan). However, the impact of this type of instrument on the cost of public consumption and the private sector's sustainability remain unknown.

More generally, it is also important to nudge and raise the awareness of the SDGs among consumers. This integrative approach (public and private consumption, supply and demand-side instruments) will support the creation of new markets that will be increasingly oriented towards sustainable products and services. Such instruments are important for the providing the basis for a circular economy with responsible consumption.

Well-designed mission-oriented industrial strategies provide an adequate framework to consistently articulate policy instruments

The complex set of market failures and policy objectives underlying SDG industrial policies calls for a carefully designed strategy relying on a consistent and articulated group of policy instruments, corresponding to the definition of mission-oriented strategies (Box 5.2).

Larrue (2021[34]) and Criscuolo et al. (forthcoming[35]) underline the importance of governance instruments in mission-oriented strategies. This is all the more crucial because, as previous waves of industrial policies attest, mission-oriented strategies also raise a number of questions and pitfalls that need to be closely scrutinised. In particular:

- Finding the right level of support can be challenging. As for any other industrial policy, critics have pointed to potential crowding out effects of public investment that might discourage rather than complement private investment. The risk of creating windfall profits to business for activities they would have undertaken anyway is real and needs to be carefully monitored and analysed.
- Industrial policies should refrain as much as possible from making bets on specific technologies. Indeed, the a priori techno-neutrality of mission-oriented strategies is one of their major appeals. They are "problem-led" pathways, rather than "solution-led" ones. However, remaining completely technology-neutral may prove difficult in practice. For instance, nobody knows exactly what mix of technologies will be required to reach carbon neutrality, even if informed guesses are possible and desirable.
- Finally, as shown by the policy benchmarking exercise, SDG-related industrial policies significantly resort to targeted investment incentives – the effectiveness of which remains largely unknown.

Despite renewed interest and a growing number of related publications, the available evidence regarding the effectiveness of these instruments in triggering new investments remains scarce (in particular for targeted investment incentives related to mission-oriented strategies), suffers from severe limitations and points to mixed conclusions (Criscuolo et al., forthcoming[35]). This assessment calls for efforts to evaluate these targeted incentives, rather than refraining from using them.

Moreover, selecting firms and projects to be supported requires gathering a vast amount of information on the expected returns, risks, spillovers and market failures for each option. Some argue that this information is not available (be it for the government or for any other actor), while others claim that it may be easier to access for businesses than for the government. Due to this potential asymmetry in information between public and private actors, there is a risk of capture and lobbying (Romer, 1993[36]). The ability of governments to stop supporting technologies that prove inadequate (Rodrik, 2008[37]) and the risk of lock-in, have also been questioned.

The industrial policy literature, however, points to solutions to overcome these pitfalls. To limit the risk of capture, and attenuate information asymmetries, it is necessary to put an emphasis on the governance of industrial strategies (Paic and Viros, 2019[38]; Romer, 1993[36]; Warwick, 2013[39]). In particular, it is necessary to:

- Favour inclusiveness by ensuring that all the relevant firms, including the young and small ones, are solicited to participate.
- Plan, at inception, scheduled assessments and evaluations.
- Allow for failure, and plan a regular refit of the policies. It is even more important when risks or "wickedness" (i.e. complexity) are high (Cantner and Vannuccini, 2018[40]; Wanzenböck et al., 2019[41]).

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Notes

[1] See for instance Shimshack and Ward (2005[48]) on the impact of fines for water pollutant violations and Johnson (2020[45]) on the impact of a "shaming" policy for workplace safety and health laws violations, both in the United States.

[2] "*Sustainable entrepreneurship is focused on the preservation of nature, life support, and community in the pursuit of perceived opportunities to bring into existence future products, processes, and services for gain, where gain is broadly construed to include economic and non-economic gains to individuals, the economy, and society*" (Shepherd and Patzelt, 2011[47]).

[3] See Bocken (2015[42]) and Vanderhoven et al. (2020[44]) for qualitative discussions on the role, advantages and limitations of public VC in supporting sustainable start-ups.

[4] See Fichter and Tiemann (2020[46]).

[5] For instance, Hong, Kubik and Scheinkman (2012[43]) show that the relaxation of financial constraints allow S&P 500 firms to improve their CSR scores.

Annex A. Examples of firms' SDG actions

Table A A.1. Breakdown of examples by sector

1. Energy, natural resources and chemicals	9
2. Financial services	7
3. Food, beverage and consumer goods	10
4. Health care and life science	8
5. Industrial manufacturing activities	11
6.Transportation	6
Total	**51**

Table A A.2. Breakdown of examples by firm size

≤ 250	>250 and ≤ 3 000	>3 000	**Total**
4	5	42	**51**

Table A A.3. Breakdown of examples by region of headquarters

North America	13
Europe	17
Japan	12
Rest of Asia	4
Rest of the World	5
Total	**51**

Table A A.4. Indicative examples of firm's SDG actions

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
Belgium	1. Energy natural resources and chemicals	>250 and ≤3 000	7, 11, 13	"Luminus is committed to measuring its carbon footprint every year. This is subject to certification by an independent third party. Measures are taken to limit or offset greenhouse gas (GHG) emissions. The results obtained are published in full transparency in the annual corporate social responsibility (CSR) report. Luminus is committed to developing its wind farm, with an ambitious target of 774 MW, to be built by 2023, an increase of 50% in four years." (Luminus, 2020[1]).	1. Strategic in-house contribution to SDGs	1. Core business	No	Yes
Brazil	1. Energy natural resources and chemicals	>3 000	2	"Braskem, a petrochemical company and leading biopolymer producer, produces resins for plastic films used in agriculture to cover soil, knows as mulches. In 2015, in partnership with EletroPlastic and the Federal University of UberIndia in Brazil, Braskem developed a field study on the use of mulching in coffee crops. After a year and a half of planting, the study found that crops with mulching had better results than control samples because mulching prevents the development of weeds, thereby reducing costs and the need for pre-emergent herbicides. The solution also saves significant amounts of water by reducing water evaporation, thereby allowing the area to remain moist with reduced irrigation." (UNGC and KPMG, 2017[2]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Brazil	1. Energy natural resources and chemicals	>3 000	6	"Odebrecht Ambiental S.A.'s Aquapolo Project is the largest reuse water production system in South America and the fifth largest in the world – recycling and transforming treated wastewater into industrial water under stringent requirements. As a partnership between Odebrecht Ambiental and SABESP (State Water Company of Sao Paulo), Aquapolo can provide 650 litres per second of high quality industrial water to Capuava Petrochemical Complex located in the Sao Paulo's metropolitan area in Brazil, with a maximum production capacity of 1 000 litres per second. The Aquapolo Project ensures that drinking water will not be used for industrial purposes and prevents natural water sources from being affected by the industrial activity in that region. The current projects capacity is equivalent to the water supply for 500 000 inhabitants, emphasising the projects importance for this water stressed metropolitan area." (UNGC and KPMG, 2017[2]).	1. Strategic in-house contribution to SDGs	1. Core business	No	Yes
Canada	1. Energy natural resources and chemicals	>3 000	2	"Teck, one of the world's largest producers of zinc, supports an innovative crop nutrition project with China's Ministry of Agriculture and the International Zinc Association to promote sustainable agriculture. Adding zinc to fertiliser has been demonstrated to increase crop output, improve food security and increase the nutritional quality of crops. Nearly 45% of children in China suffer from zinc deficiency and do not get enough nutrients in their diet. By reaching the company's target of increasing zinc usage in fertiliser by 20 000 tonnes in 2016, approximately six million children in China will see improved zinc nutrition. This initiative improves food security, nutrition and sustainable agriculture, in addition to creating a new market for one of Teck's products." (UNGC and KPMG, 2017[2]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
Finland	1. Energy natural resources and chemicals	>3 000	7	"Combustion emissions from Neste's Renewable Diesel fuel amount to zero because the renewable raw material absorbs the same amount of carbon dioxide as is released upon combustion. Neste renewable fuels can reduce greenhouse gas emissions by up to 90% compared to fossil fuels. In 2015, delivery company UPS and technology company Google started using Neste Renewable Diesel in their fleets. Both UPS and Google aim to reduce their carbon emissions and renewable diesel offers an easy way to reach that goal as it is completely compatible with the current engines and distribution systems." (UNGC and KPMG, 2017[2]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Japan	1. Energy natural resources and chemicals	>3 000	2, 12, 13, 14, 15	"Mitsubishi Chemical is in the process of commercialising the world's first bio-based Polybutylene Succinate (PBS), an environmentally friendly polymer, at its joint venture with PTT Public Company Limited. PBS, known for its superior bio-degradability, can add value to waste that would normally be landfilled or incinerated by allowing the waste to be turned into fertilisers through composting. Applications of PBS are growing rapidly, starting from items such as paper cups, cutlery, compost bags and mulching films for farming. Compared to the conventional fossil based polymer, bio-based polymers use sustainable resources which have a lower environmental impact and also provide new opportunities for the farming industry." (UNGC and KPMG, 2017[2]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Japan	1. Energy natural resources and chemicals	>3 000	3	"Sumitomo Chemical is expanding its research and development (R&D) to develop a full range of innovative vector control technologies, with the goal of helping to eliminate malaria and other vector transmitted diseases. Sumitomo Chemical has been making a substantial contribution to preventing malaria by supplying countries in Africa and Asia with Olyset Net, a long-lasting insecticidal mosquito net it developed in-house to protect people from malaria-carrying mosquitoes. The company has since launched Olyset Plus which is effective in controlling insecticide-resistant mosquitoes. The company is also developing and supplying new insecticides for the control of mosquitoes that transmit other infectious diseases, such as dengue or Zika fever. Olyset Net production operations have been established in Africa, thereby creating and maintaining local jobs while contributing to the growth of the regional economy." (UNGC and KPMG, 2017[2]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
South Africa	1. Energy natural resources and chemicals	>3 000	6	"In 2014, Gold Fields began a four-year program to improve water quality and access for communities in the direct area of influence of Gold Fields Cerro Corona mine in Peru and to promote, in partnership with government, remediation of legacy mining activities (not associated with the Company). The program involves building new potable water systems through the construction of a water pipeline from a well at Cerro Corona, identifying and repairing water leaks in the existing water infrastructure and remediation of environmental liabilities that are contaminating a local stream. As a result of the program, almost 90% of households in Hualgayoc now have access to sufficient clean running water. Apart from strengthening relationships between Gold Fields, the regulator and host communities, the remediation of legacy mining sites near Cerro Corona will significantly improve the quality of the water in the El Tingo River, on which communities depend for various uses. This strengthens	4. Generic social impacts/ Good citizenship	2. Mitigating the impact of the daily operations of the firm	No	Yes

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
				the company's social license to operate in a region in which other mining companies have experienced water-related conflict with local communities." (UNGC and KPMG, 2017[2]).				
United Kingdom	1. Energy natural resources and chemicals	≤250	3	"Dulas Ltd has developed solar powered medical fridges that are used in remote regions across Africa, Asia, the Pacific Islands and Latin America to store blood and vaccines. The company is a major supplier of these fridges which are being used in numerous successful national immunisation programs in hospitals, clinics, health centres and remote medical stations around the world. These have been approved by the strict Performance, Quality and Safety protocol set by the World Health Organisation and feature independent freezer compartments and a durable sealed battery delivering continuous cooling to keep vaccines safe. The solar system provides secure constant power including a five day back up." (UNGC and KPMG, 2017[2]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	No
Brazil	2. Financial services	>3 000	1	"Banco do Brasil started providing loans for small firms and entrepreneurs through a nationwide microcredit program (known locally by the acronym MPO), helping more people to open bank accounts, creating jobs and income, and combating poverty, as part of the federal Government's plan to end extreme poverty (Brasil sem miseria). The microcredit program is mainly for urban areas and has originated more than 45 000 loans totalling around USD 100 million. Around half of entrepreneurs reached are women." (UNGC and KPMG, 2016[3]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Canada	2. Financial services	≤250	1, 2, 4, 5, 7, 8, 9, 10, 16, 17	"Through our research, evaluation and advisory services in the emerging field of impact investing and innovative finance, E.T. Jackson and Associates generated widely disseminated knowledge products on how the private, public and non-profit sectors can mobilise and deploy increased blended capital to achieve the SDGs. Our focus, therefore, was on expanding our consulting practice in this area to contribute evidence, models, tools and other guidance for the formation of creative new partnerships in financing to implement SDG 8 for inclusive, sustainable economic development, small business growth, and decent work, particularly in Africa and Asia, and especially for women and youth. In so doing, our knowledge products (reports, briefs, presentations) also informed the actions of development agencies, foundations and non-profits to advance the implementation of other SDGs, including no poverty, no hunger, quality education, gender equality, innovation, reduced inequalities, and new partnerships in the regions where the majority of the world's poor live. In advancing SDG 8, our main contributions have been to promote the achievement of targets 8.3, 8.5 and 8.6." (Global Compact Network Canada, 2020[4]).	1. Strategic in-house contribution to SDGs	1. Core business	No	No
India	2. Financial services	>3 000	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 17	Aavishkaar Group, known for building business that can benefit the underserved segments across Asia and Africa in sectors such as transport, healthcare, basic financial services and other services, comprises equity funds, a venture debt vehicle, a microfinance and advisory business including investment banking. Achievement of Aavishkaar Capital, the equity investment entity of Aavishkaar Group and one of the largest impact investors in Asia, includes: 1) approximately 87% of its portfolio companies having Aavishkaar	1. Strategic in-house contribution to SDGs	1. Core business	No	No

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
				Capital as their first institutional investor; 2) 93 million people receiving improved access to essential products and services in the areas including education, healthcare, WASH (water, sanitation and hygiene) and financial services; and 3) investing into sectors that are aligned with the 13 Goals. (D'Souza, 2020[5]).				
Japan	2. Financial services	>3 000	2	"Sompo Japan Nipponkoa Holdings, Inc. offers agricultural insurance products in South East Asia to reduce climate related risks to agriculture. It launched weather index insurance in northeast Thailand in 2010 to alleviate losses borne by rice farmers when their crops are damaged by drought, and the sales area expands every year. In 2014, it launched Typhoon Guard Insurance in Mindanao Island, the Philippines, which aims to alleviate the losses borne by agricultural producers when they are affected by typhoons. It is also developing new insurance products, including one which will alleviate agricultural losses in Myanmar due to drought in the central dry zone, and similar products for Indonesia." (UNGC and KPMG, 2016[3]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Turkey	2. Financial services	>3 000	8	"Şekerbank continues to develop its founding community banking mission, seeking to address the challenge of approximately 15 million unbanked people in Turkey (35% of the population). Since 2006, Şekerbank has been continuously working on a microfinance project mainly to offer credit to individuals who have just established their own business and do not have sufficient funds, or to small business owners that have not yet become accustomed to banking services. Within this project, it has introduced over 26 000 craftsmen and farmers to banking services, 42% of which are females. Şekerbank is extending its microfinance project to reach more unbanked people." (UNGC and KPMG, 2016[3]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
United Kingdom	2. Financial services	>3 000	1	"Standard Chartered has committed to provide financing and technical assistance for microfinance institution (MFI) clients in Asia and Africa to enhance their capacity to extend loans to more people in its markets. From 2005 to 2014, Standard Chartered provided more than USD 1.6 billion in lending to 85 MFIs, impacting an estimated 10.4 million people." (UNGC and KPMG, 2016[3]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
United States	2. Financial services	>3 000	16	"MasterCard, in partnership with the Government of Nigeria, has rolled out a biometric National eID Card to more than 13 million Nigerians with electronic payment functionality. This program will reach more than 100 million Nigerians, making it the broadest financial inclusion initiative of its kind on the African continent." (UNGC and KPMG, 2016[3]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Denmark	3. Food, beverage and consumer goods	>3 000	4	"Lego has developed a number of products and educational programs focused on Science, Technology, Engineering and Mathematics (STEM) learning. Elementary STEM Programs seek to create environments where learning happens in a hands-on and motivational way, helping students discover their talents and cement learning using solutions such as LEGOs Simple Machines and WeDo. Middle School STEM programs aim to bring STEM concepts to life, using more advanced LEGO Education solutions as tools for engaging and motivating STEM learners and boosting student performance." (UNGC and KPMG, 2016[3]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	No

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
Japan	3. Food, beverage and consumer goods	≤250	2, 3, 7, 8, 12, 13, 17	"Japan Food Ecology Centre, Inc. (J.FEC) produces the liquid fermented eco-feed (animal feed produced from recycled food waste), and contracts 15 farmers to supply it. Their stock farm products are processed into good quality meat and sold in department stores and supermarkets under the brand names Yuton (superior pork) and Umakabuta (delicious, flavourful pork). The special characteristic of J.FEC is to form a loop of recycling through the use of food waste. It is the effort to reduce waste, and also the effort to create a recycling loop that involves farmers using the eco-feed. At present, the Japanese livestock industry relies heavily on the import of feed from overseas. This effort is expected to lead to improved feed self-sufficiency. This successful example in Japan is even getting attention from around the world." (Ministry of the Environment, 2020[6]).	1. Strategic in-house contribution to SDGs	1. Core business	No	No
Japan	3. Food, beverage and consumer goods	>3 000	2, 4, 7, 8, 9, 12	"Ito En has established a consistent production system 'From Tea Plantations to Used Tea Leaves' through our core green tea business and contributes to a wide range of targets including SDG 12 'Sustainable Production and Consumption'. Our efforts include the representative business Tea-Producing Region Development Project (New Tea Plantation Business), used tea leaves recycling system, health conscious products, Ito En Tea Tester certification recognised by the Ministry of Health, Labour and Welfare, the Ito En Oi Ocha New Haiku Contest, and 'Making Japan Beautiful Through Tea' project. These in particular create value throughout the value chain from procurement to manufacturing, logistics, product planning/development, and sales/marketing. In this way, we are working on each of the SDGs. We will continue with our aim of being a Global Tea Company and create value throughout the value chain by actively developing business with a focus on SDG 17 'Partnership", thereby contributing to solving social and local issues and working toward the creation of a sustainable society'." (ITO EN, 2017[7]).	1. Strategic in-house contribution to SDGs	1. Core business	No	Yes
Sweden	3. Food, beverage and consumer goods	>3 000	6	"H&M Hennes & Mauritz found that many workers at supplier factories in India lived in areas where clean water and safe sanitation were not always available. They teamed up with 15 supplier factories in this area and WaterAid to change this for the workers, their families and the surrounding community, promoting access to clean water and sanitation as well as health education. This has a positive effect on the wellbeing of workers, absence rates and their productivity. Globally, H&M and the H&M Foundation have set a goal to provide at least 500 000 people with safe water by 2016." (UNGC and KPMG, 2016[3]).	2. Transform GVCs and reinforce business strategy	3. Using firm's non-financial resource or actions unrelated to the main operations	Yes	Yes
Switzerland	3. Food, beverage and consumer goods	>3 000	2, 3, 16	"In July 2014, the Nestlé Commitment on Land and Land Rights in Agricultural Supply Chains was released. In this, the company has adopted the Food and Agriculture Organisations Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security, and committed to both zero tolerance for land grabs, and to holding suppliers accountable for community land rights. Nestlé commits to source its raw materials from land that has not been illegally or unfairly taken and will advocate for others to do likewise, working with a range of stakeholders to help the landless gain access to land, with a focus on tenure for women." (UNGC and KPMG, 2016[3]).	2. Transform global value chains (GVCs) and reinforce business strategy	1. Core business	Yes	Yes

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
Switzerland	3. Food, beverage and consumer goods	>3 000	8	"Tetra Pak developed the Dairy Hub concept to help its customers – local dairy processors – to access more locally produced, better quality milk. The overall aim of running a Dairy Hub project is to secure a long term supply of locally produced quality milk and at the same time help small holder milk farmers to move from subsistence farming to running milk production as a profitable business. In Bangladesh, for example, average milk yield per cow and day has increased by 110% and average income for the small holder has increased 145%. During 2014, there were also ongoing dairy farming development projects in Kenya, Sri Lanka, Nicaragua and Senegal." (UNGC and KPMG, 2016[3]).	2. Transform GVCs and reinforce business strategy	1. Core business	Yes	Yes
United States	3. Food, beverage and consumer goods	>3 000	2	"Cargills Nourishing India platform has reached 25 million customers with its edible oil brands, fortified with essential vitamins A, D, & E. In India, cooking oil is widely used, and therefore Cargill saw it as an opportunity to positively impact all income groups with minimal changes in eating habits. Through this change, Cargill was not only able to gain a competitive advantage, but also made an important contribution to tackling malnutrition." (UNGC and KPMG, 2016[3]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
United States	3. Food, beverage and consumer goods	>3 000	10	"Colgate-Palmolive has adopted measures to increase access to its products in less developed areas. The company has made products more affordable with smaller sizes, refill packs and various value options. The company takes the purchasing power of low-income consumers into account to ensure affordability of their products and also strategically balances its offerings of base and premier products depending on the region. The company has developed innovative models of distribution to reach more consumers in rural areas. For example, the company utilises branded motorcycles to distribute large quantities of products into retail environments in Cameroon. This has led to an increase of 500% in deliveries per week and a 43% increase in sales. The company has also engaged rural shoppers by participating in the village haat, an outdoor weekly market, where many people from rural areas congregate. The company sells its personal care products here in small, affordable packages, increasing levels of personal hygiene among the thousands." (UNGC and KPMG, 2016[3]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
United States	3. Food, beverage and consumer goods	>3 000	3	"Levi Strauss & Co has established a requirement that its key vendors integrate worker well-being programs into their manufacturing operations. In addition to benefitting workers in areas such as health and financial literacy, this program generates a 3 to 1 return on investment for vendors through reduced worker turnover, absenteeism and tardiness." (UNGC and KPMG, 2016[3]).	2. Transform GVCs and reinforce business strategy	1. Core business	Yes	No
United States	3. Food, beverage and consumer goods	>3 000	5	"Walmart launched a dedicated online space to give shoppers the opportunity to buy unique products while supporting small women-owned business around the world. It also launched a global women's economic empowerment initiative to harness the company's size and scale to empower women across the supply chain. By 2016 it aims to source USD 20 billion from women-owned businesses in the US and double international sourcing." (UNGC and KPMG, 2016[3]).	2. Transform GVCs and reinforce business strategy	1. Core business	No	Yes

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
Germany	4. Health care and life science	>3 000	1	"Fresenius Medical Care aims to develop innovative products that are not only of the highest quality, but are also affordable so that more caregivers and patients can benefit from them. Based on its experience in operating the company's own dialysis clinics, it does not consider these to be incompatible aims. Between 2013 and 2015, Fresenius has reorganised its research and development activities towards a more global approach which enables the company to respond even better to the demand for improved high-quality yet cost-efficient treatment methods. In doing so, the company continues to take regional market conditions into account by offering a differentiated product range in more than 120 countries. Its new R&D strategy is focused on improving the company's ability to deliver innovative competitive products on time and enhancing focus on developing countries." (UNGC and KPMG, 2016[8]).	1. Strategic in-house contribution to SDGs	1. Core business	No	Yes
Germany	4. Health care and life science	>3 000	4	"Karl-Storz GmbH & Co. KG, a manufacturer of endoscopes and other medical instruments, partnered with the World Gastroenterology Organisation (WGO) to develop three training centres in sub-Saharan Africa to improve standards in gastroenterology training and education. The company provided financial support, endoscopic equipment, and the expertise of its team to help establish the centres, driving significant progress in the field of gastroenterology in the region." (UNGC and KPMG, 2016[8]).	1. Strategic in-house contribution to SDGs	3. Using firm's non-financial resources or actions unrelated to the main operations	Yes	No
Japan	4. Health care and life science	>250 and ≤3 000	1, 3, 4, 8, 17	"Fuji Optical is one of UNHCR's (the UN Refugee Agency) longest-standing private sector partners. It has been working with UNHCR since 1984 to provide clear sight to thousands of refugees around the world, as part of its corporate vision: Good Vision, Good Life. As of July 2018, Fuji Optical had donated 162,960 pairs of glasses to people forced to flee, vastly improving their quality of life." (UNHCR, 2020[9]).	4. Generic social impacts/ Good citizenship	4. Donation/ charity/ philanthropy	Yes	No
Japan	4. Health care and life science	>250 and ≤3 000	3, 6, 12, 14, 15	"Saraya Co., Ltd. was established in 1952 and developed medicated hand soap and dispenser for the first time in Japan. Our liquid soap contributed to prevent people from spreading infectious diseases like diarrhoea in the period after the World War. Since then, we are leading the development of hygienic environment in Japan with evolving our products such as alcohol sanitiser and no-touch dispensers. On the other hand, about 16 000 children under five years-old are dead every day in developing countries, but they are mostly caused by preventable diseases. It is said that correct handwashing using soap is effective to prevent diarrhoea and pneumonia, and may save life of 1 million children. This is why we started "Wash A Million Hands!" project in 2010 which donates 1% of sales amount of specific products for supporting UNICEF's handwashing promotion activities in Uganda." (SARAYA, 2020[10]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	No
Japan	4. Health care and life science	>3 000	8	"Takeda Pharmaceutical Company Ltd.'s Sustainable Procurement Program develops economic opportunities for the communities in which the company and its employees live and work by purchasing goods and services from economically and socially diverse businesses, particularly small businesses and businesses owned by women, minorities, and others. As well as purchasing from these businesses, Takeda mentors small and diverse businesses and participates in trade shows and outreach events to identify small	2. Transform GVCs and reinforce business strategy	1. Core business	Yes	Yes

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
				and diverse prospective suppliers. In 2014, Takeda spent approximately USD 169 million with small US businesses including those owned by women, minorities and others. Supplier diversity provides overall value by giving Takeda access to new and innovative products and services while optimising price, quality, and availability, and is in keeping with its overall corporate commitment to responsibility and sustainability." (UNGC and KPMG, 2016[8]).				
Netherlands	4. Health care and life science	>3 000	2	"Royal DSMs NutriRice uses innovative hot extrusion technology with encapsulated micronutrients to preserve the nutrients typically lost during milling and food preparation. This is an important innovation given that rice is the staple food of more than half of the world's population, yet it contains few vitamins and minerals. NutriRice uses rice flour as a raw material and kernels are mixed with natural rice at a ratio of 0.5-2%. NutriRice kernels look, taste and behave exactly like normal rice. In a poor urban setting in Bangalore, India, DSM collaborated with the St. Johns Research Institute to conduct a trial to study the effects of NutriRice on school children aged 6-12 years. After six months the children's B-vitamin status had improved significantly and there was an improvement in physical performance, particularly physical endurance, among the children who consumed NutriRice." (UNGC and KPMG, 2016[8]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
United States	4. Health care and life science	>3 000	3	"Johnson & Johnson launched Janssen Global Public Health (GPH) in early 2014 to unify the company's commitment to addressing some of the world's most critical health issues. For instance, Janssen is partnering with Stop TB Partnerships Global Drug Facility and the US Agency for International Development to better facilitate access to its multi-drug resistant tuberculosis compound, SIRTURO (bedaquiline), for patients in more than 130 low and middle income countries, and to collaborate for continued evaluation of multi-drug resistant TB treatment regimens with SIRTURO. In addition, Janssen GPH is collaborating with Harvard Medical School to support research, policy and advocacy to address paediatric and adult drug-resistant TB treatment. To help treat and prevent HIV in at-risk individuals, Janssen GPH expanded its collaboration with the International Partnership for Microbicides to include worldwide development and commercialisation of dapivirine to prevent sexual transmission of HIV in women, strengthened country-level capacity, knowledge and action around the needs of HIV treatment-experienced children through the collaborative New Horizons Advancing Paediatric HIV Care initiative, and reduced the cost of its HIV medicine PREZISTA (darunavir), including paediatric formulations, by almost 20% for sub- Saharan Africa and least-developed countries." (UNGC and KPMG, 2016[8]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
United States	4. Health care and life science	>3 000	7	"Mylan uses natural gas, biofuel briquettes and other alternative fuels in many of its manufacturing facilities. Whenever possible, it sends waste from laboratories and manufacturing activities to waste-to-energy facilities or cement kilns that convert it into energy or steam used for heating. Some of Mylan's sites in India purchase electricity from third-party suppliers that utilise renewable energy, such as solar and wind power. In addition, one of the company's API plants generates steam from a mixture of coal and rice husks, producing up to 60% of its electricity. Mylan reports that four of its API manufacturing sites were the first in	3. Mitigate harm from GVCs	2. Mitigating the impact of the daily operations of the firm	Yes	Yes

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
				India to have met an internationally recognised benchmark, ISO 50001, for superior performance in managing energy responsibly and its other sites are introducing similar systems so that they too may receive this certification." (UNGC and KPMG, 2016[8]).				
France	5. Industrial manufacturing	>3 000	6	"Areva, a French industrial conglomerate, has installed a desalination plant in Wlotzkasbaken on the Namibian coast, to provide clean water to both the country's uranium mines and to local communities for domestic and industrial use. The plant is the first of its kind to be built in Southern Africa and it can supply all the water for Areva's Trekkopje uranium mine which is located in the desert. The plant removes salt from seawater taken from the Atlantic Ocean thereby eliminating the need to pump water from aquifers in order to preserve the country's groundwater reserves. A 48 km long aqueduct can carry 20 million cubic metres of potable water per year. Areva Namibia and the plant operator AvengWater encourage local and foreign stakeholders to visit the Erongo desalination plant and learn more about the process of producing potable water from seawater which involves ultrafiltration and reverse osmosis." (UNGC and KPMG, 2016[11]).	2. Transform GVC and reinforce business strategy	1. Core business	No	Yes
Germany	5. Industrial manufacturing	>3 000	5	"Volkswagen AG is aiming to have 30% women at all levels of the management hierarchy in Germany. In 2014, women accounted for around 22% of all apprentices in industrial or technical areas. To increase this number, the company specifically targets the recruitment of talented women, for example through the nationwide Girls Day which offers young women the opportunity to experience what a career with Volkswagen can offer. Additionally, the Lower Saxony Techntkum is a scheme in which Volkswagen offers female students a six month internship designed to stimulate their interest in studying a technical subject. The company has also set up mentoring programs for women and has established childcare facilities within or near the company in multiple locations." (UNGC and KPMG, 2016[11]).	4. Generic social impacts/ Good citizenship	2. Mitigating the impact of the daily operations of the firm	No	Yes
India	5. Industrial manufacturing	>3 000	3	"Tata Steel works in conjunction with the Thai government to ensure a Drug Free Workplace and offers support to prevent, as well as solve, drug addiction. Additionally, it regularly organises mobile clinics, influenza prevention campaigns and also works with non-governmental organisations (NGOs) and other philanthropic organisations like the Thai Red Cross Society as a part of its health initiatives, ensuring a productive workforce." (UNGC and KPMG, 2016[11]).	4. Generic social impacts/ Good citizenship	4. Donation/ charity/ philanthropy	Yes	Yes
Italy	5. Industrial manufacturing	>250 and ≤3 000	12, 13	"Thanks to continuous research and collaboration with various stakeholders, in 2011, the Aquafil Group completed the transformation of Nylon 6 waste into regenerated ECONYL yarn, maintaining the same quality level and performance, but by significantly reducing environmental impact. Regenerated nylon is used by a growing number of companies in the carpet and fashion sectors, including some of the world's leading fashion houses." (Aquafil, 2020[12]).	1. Strategic in-house contribution to SDGs	1. Core business	No	Yes
Japan	5. Industrial manufacturing	>3 000	12	"Fuji Xerox Co., Ltd. operates a closed loop integrated recycling system for its products, in which products released to the market are collected back after use, and the parts are either reused or recycled, thus reducing waste sent to landfill. The company has introduced recycling systems and take-back programs across Japan, Thailand, Chinese Taipei,	2. Transform GVCs and reinforce business	2. Mitigating the impact of the daily operations	Yes	No

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
				China, Korea, Australia, and New Zealand. Since 2010, the company has maintained a recycling rate of at least 99.5% across its operations." (UNGC and KPMG, 2016[11]).	strategy	of the firm		
Japan	5. Industrial manufacturing	>3 000	3	"Hitachi Proton Beam Therapy System is one example of healthcare innovation developed by Hitachi group companies working together to apply advanced technology in accelerators, irradiation, and control systems that they have developed over the years. Proton beam therapy is a more patient friendly cancer treatment, compared to conventional radiation therapy, because it precisely targets tumours thereby minimising the damage to surrounding healthy tissue. Hitachi has also developed spot scanning irradiation technology that can accurately target tumours that have complex shape and structure and apply high-energy proton beams to them. The company is currently developing a new system which could target and apply high dose proton beams to tumours that move due to a patient's respiration during treatment." (UNGC and KPMG, 2016[11]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Japan	5. Industrial manufacturing	>3 000	1, 3, 5, 6, 9, 17	"LIXIL has been conducting activities aimed at resolving the social and sanitation issues brought by a lack of toilet facilities through public-private partnerships and other initiatives to provide sanitary toilets to people around the world. This award recognises LIXIL's development of innovative and affordable SATO toilet products for developing countries, the establishment of a local production and sales structure for SATO and supporting employment based on the concept of a locally-rooted social business. The award also acknowledges LIXIL's measures in partnership with international institutions and NGOs to advocate for the establishment of sanitation infrastructure, as well as other contributions to addressing issues through its business activities, such as the Toilets for All campaign to donate one simplified toilet system for every shower toilet sold in Japan." (LIXIL, 2018[13]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
Korea	5. Industrial manufacturing	>3 000	8	"Hyundai supports small-scale suppliers in its supply chain as part of its pursuit of mutual growth, helping them to become more efficient, sustainable and competitive. Hyundai's support includes providing small and medium size suppliers with liquid assets to cover the cost of delivering goods and reducing suppliers purchasing costs through use of joint contracts. Hyundai also extends loans and other financial support to suppliers, helping them to normalise their regular operations, improve productivity and product quality, and make facility investments. In addition, Hyundai extends voluntary technical guidance and support developed for Tier 1 suppliers to smaller Tier 2 suppliers; this is mostly delivered by Hyundai retirees over three to twelve months on site with the supplier." (UNGC and KPMG, 2016[11]).	2. Transform GVCs and reinforce business strategy	3. Using firm's non-financial resources or actions unrelated to the main operations	Yes	Yes
Netherlands	5. Industrial manufacturing	>3 000	2	"Royal Philips City Farming Program works with universities and partners to develop indoor commercial farms using LED grow lights. Farming by this method can result in 20-25 harvests a year, with up to 85% less energy usage. Indoor growing systems based on LED lighting can maximise plant photosynthesis, while minimising energy use, for delicious and nutritious vegetables grown in a sustainable manner. Growing crops vertically makes it possible to grow more plants per acre than would be possible with a field farm, enabling more harvests per year, with little waste produced, less agricultural run-off and minimal greenhouse	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
				gases because the food is grown where it is consumed." (UNGC and KPMG, 2016[11]).				
United States	5. Industrial manufacturing	>3 000	6	"Ford reduced its total global water use by 62% between 2000 and 2014, or more than 10 billion gallons (equivalent to the water used for 1 billion five-minute showers). It also exceeded its global goal to reduce water use per vehicle by 30%, two years ahead of its 2015 target. It accomplished this by cutting the water it uses in everything from cooling towers, to washing parts, to paint operations. Ford has invested in numerous water-reduction technologies and process improvements. These include membrane biological reactors and reverse-osmosis processes to recycle water from on-site wastewater treatment plants in more arid regions, as well as Minimum Quantity Lubrication which uses a dry-machining process to lubricate cutting tools with a very small amount of oil (rather than the conventional wet-machining process that required large amounts of metal-working fluids and water to cool and lubricate the tools)." (UNGC and KPMG, 2016[11]).	1. Strategic in-house contribution to SDGs	2. Mitigating the impact of the daily operations of the firm	Yes	Yes
United States	5. Industrial manufacturing	>3 000	7	"Caterpillar entered a strategic alliance in 2015 with First Solar to develop and distribute Cat-branded photovoltaic modules for incorporation into micro-grid systems that can be utilised anywhere from remote villages to mining operations. This innovative technology will provide power to remote places where, before now, it has been either unavailable or unreliable. Caterpillar is also rapidly progressing energy storage systems which allow customers to capture surplus renewable energy and store it for later use. For example, leveraging its bidirectional inverter technology developed for mining trucks and hybrid tractors, Caterpillar offers a wide range of energy storage technologies, ranging from ultra-capacitors for short duration storage to long duration metal-air energy storage products." (UNGC and KPMG, 2016[11]).	1. Strategic in-house contribution to SDGs	1. Core business	No	Yes
France	6. Transportation	>3 000	7, 9, 13	"Airbus Group is supporting the development of sustainable fuels made from biomass feedstock that, through their lifecycle, emit less CO_2 than conventional fossil fuels. The Group has been working with a broad range of partners: universities, farmers, airlines, refineries and standard-setting organisations to act as an agent of change, helping to develop value chains that produce drop-in sustainable fuels that today's aircraft can burn without modification. Airbus aims to be a catalyst, sparking the search for production of affordable sustainable fuels, in sufficient commercial quantities to help the aviation industry reach its goals for minimising greenhouse gas emissions. Airbus currently has development partnerships in place in Australia, Brazil, China, Malaysia, Qatar and Spain." (UNGC and KPMG, 2016[14]).	2. Transform GVCs and reinforce business strategy	1. Core business	Yes	Yes
France	6. Transportation	>3 000	2	"Michelin, a global tire company, has developed low-pressure tires for heavy agricultural machinery in order to preserve soil lightness and stop its incremental compaction over time. This leads to a proven increase in agricultural yields and reduced pollution from agricultural land." (UNGC and KPMG, 2016[14]).	1. Strategic in-house contribution to SDGs	1. Core business	Yes	Yes
India	6. Transportation	>250 and ≤3 000	6	"An Indonesian passenger transport company, has reduced the quantity of groundwater used for washing taxis (as part of its commitment to the CEO Water Mandate). Absorption	4. Generic social impacts/	2. Mitigating the impact	No	No

Country	Industry	Employment size	SDGs	Description of the action	Objective of action	Channel of action	UNGC participation	Use of GRI standards
				wells with a natural filtering system were built at the company vehicle pools to treat wastewater and prevent the build-up of standing water. The water collected in these wells can be reused during the dry seasons. Biopores were filled with organic waste to enhance absorbability of water and growing conditions for plants and trees around the taxi sites." (UNGC and KPMG, 2016[14]).	Good citizenship	of the daily operations of the firm		
Japan	6. Transportation	≤250	1, 3, 4, 8, 12, 15, 17	"Kaiho Industry Co., Ltd. offers a solution that addresses waste treatment and management of ELV (end-of-life) vehicles. This Eco-Friendly Auto Recycling system is designed to address resource circulation society and environmental conservation. Essentially, it is a packaged automobile recycling system comprising three components, which are: 1) Installation of automobile recycling equipment and production system, 2) Installation of computerised business management system called KRA and 3) Provision of training on automobile recycling technologies and management skills. Kaiho Industry has developed a standard called the Japan Reuse Standard (JRS) for rating the quality of used engines for export. How end-of-life vehicles (ELV) are handled is a major concern in today's society, especially when you consider that 1.23 billion cars will become waste all over the world. Thus, there needs to be some kind of appropriate processing and recycling for cars of all kinds." (UNIDO ITPO Tokyo, 2019[15]).	1. Strategic in-house contribution to SDGs	1. Core business	No	No
United States	6. Transportation	>3 000	11	"FedEx, a global logistics company, embarked on a project with EMBARQ (a think tank) to identify sustainable public transport solutions in cities in Mexico, Brazil, and India. The three-year project reached out to over 1 600 transport officials and drivers, contributing to a reduction of 20 000 tonnes of carbon dioxide emissions. In addition, the program helped urban transport operators provide enhanced and more efficient services." (UNGC and KPMG, 2016[14]).	2. Transform GVCs and reinforce business strategy	2. Mitigating the impact of the daily operations of the firm	No	Yes
United States	6. Transportation	>3 000	4	"Fluor, an international construction firm, runs a vocational training school for unemployed and disadvantaged people in South Africa. Since its inception almost 35 years ago, more than 30 000 people have been trained in marketable trade skills and have secured employment as fitters, welders, electricians, pipefitters, and other building trades. The training program provides Fluor with access to a diverse talent pipeline." (UNGC and KPMG, 2016[14]).	1. Strategic in-house contribution to SDGs	3. Using firm's non-financial resources or actions unrelated to the main operations	Yes	Yes

Notes: SDG = Sustainable Development Goal; GRI = Global Reporting Initiative; UNGC = United Nations Global Compact. The table is organised by industry and country (alphabetical). The actions and corresponding SDGs only describe parts of the sustainability strategy of those firms.

Sources: The cases were selected and excerpted from UNGC and KPMG (2016[14]), "SDG Industry Matrix: Transportation", https://www.unglobalcompact.org/library/4831; UNGC and KPMG (2016[11]), "SDG Industry Matrix: Industrial Manufacturing", https://www.unglobalcompact.org/library/4351; UNGC and KPMG (2016[3]), "SDG Industry Matrix: Financial Services", https://www.unglobalcompact.org/library/4001; UNGC and KPMG (2016[16]), "SDG Industry Matrix: Food, Beverage & Consumer Goods", https://www.unglobalcompact.org/library/3961; UNGC and KPMG (2016[8]), "SDG Industry Matrix: Healthcare & Life Sciences", https://unglobalcompact.org/library/4341; UNGC and KPMG (2017[2]), "SDG Industry Matrix: Energy, Natural Resources and Chemicals", https://www.unglobalcompact.org/library/5061; firms' websites and sustainability reports; and SDG awards (Canada and Japan).

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UNGC and KPMG (2016), *SDG Industry Matrix: Food, Beverage & Consumer Goods*, United Nations Global Compact, New York, https://www.unglobalcompact.org/library/3961. [16]

UNGC and KPMG (2016), *SDG Industry Matrix: Healthcare & Life Sciences*, United Nationals Global Compact, New York, https://unglobalcompact.org/library/4341. [8]

UNGC and KPMG (2016), *SDG Industry Matrix: Industrial Manufacturing*, United Nations Global Compact, New York, https://www.unglobalcompact.org/library/4351. [11]

UNGC and KPMG (2016), *SDG Industry Matrix: Transportation*, United Nationals Global Compact, New York, https://www.unglobalcompact.org/library/4831. [14]

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Annex B. Performance of the SDG identification algorithm

Estimation of the algorithm

Several parameters govern the estimation of the boosted tree algorithm. The most important is *beta*, which parametrises the relative importance in the estimation process of type I errors (false negative) compared to type II errors (false positive).

Almost 80% of the training set is built such that the descriptions of firms' actions are considered as addressing only one Sustainable Development Goal (SDG), whereas in practice some of the SDGs are highly collinear (Pradhan et al., 2017[1]). As a result, the algorithm tends to be too conservative, and likely to generate too many zeros. To offset this bias, a higher weight is assigned to type I errors (i.e. the loss incurred with a false negative is considered a higher cost compared to the loss incurred with a false positive).

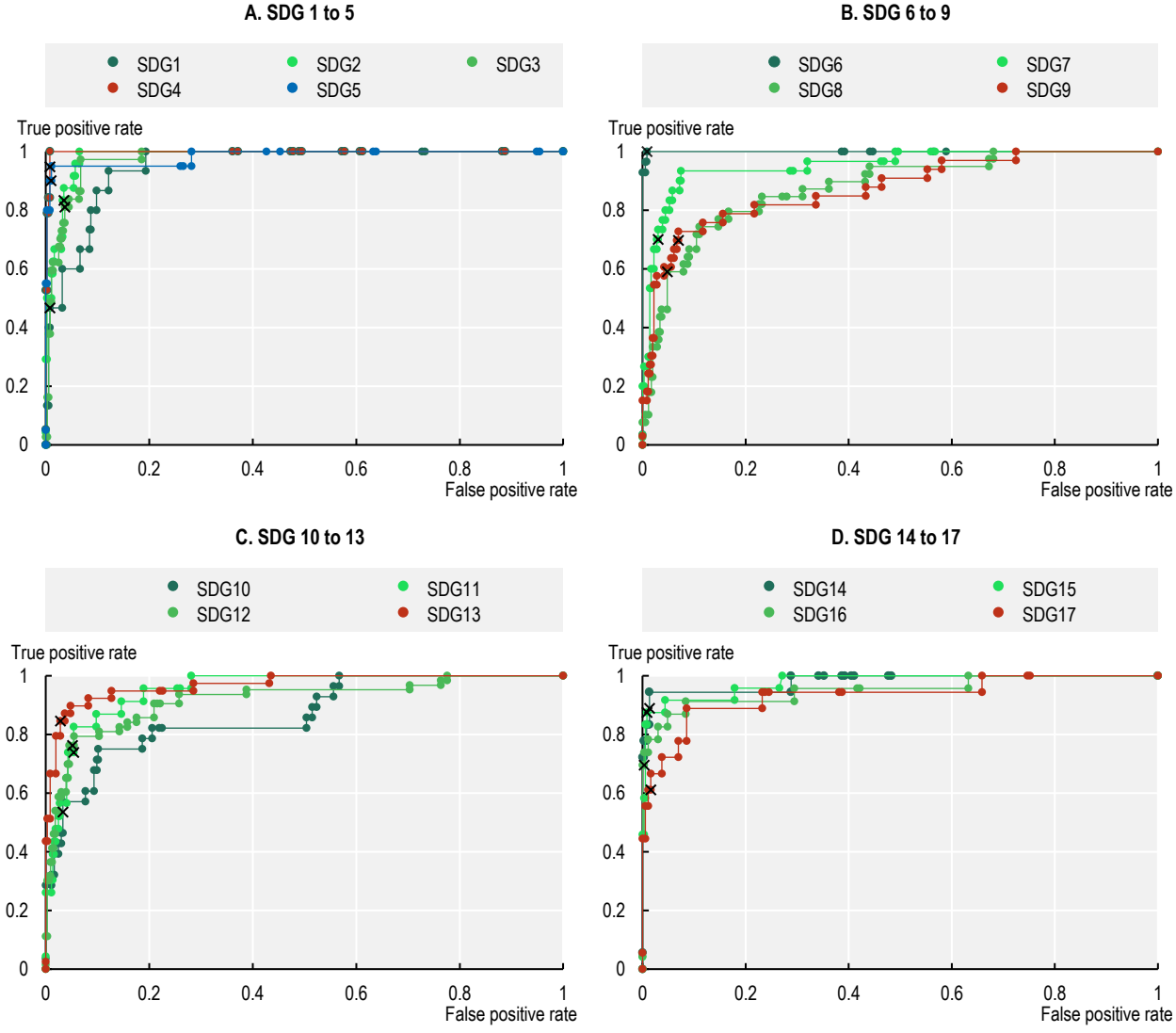
Choosing a value for *beta* boils down to picking a point on the receiver operating characteristic (ROC) curve. With a *beta* equal to 1, total accuracy is maximised, but moving slightly to the right of the ROC curve is more appropriate for the problem at hand – reducing false negative – while having a minimal impact on false positives. The final *beta* value corresponds to 1.2.[1] With a higher beta, the result would shift to the right in the curve, and to the left for lower values of beta (Figure B.1).

Table A B.1. Performance of the SDG-BAI algorithm

SDG	Precision	Recall
1	0.70	0.47
2	0.61	0.83
3	0.60	0.97
4	0.86	0.95
5	0.82	0.90
6	0.90	0.98
7	0.66	0.70
8	0.58	0.59
9	0.48	0.70
10	0.62	0.57
11	0.56	0.65
12	0.64	0.76
13	0.76	0.82
14	0.76	0.89
15	0.88	0.88
16	0.85	0.74
17	0.77	0.56

Note: SDG-BAI = Sustainable Development Goals Business Actions Identifier.
Source: SDG-BAI.

Figure A B.1. ROC curves for each SDG's identification problems



Notes: ROC = receiver operating characteristic; SDG = Sustainable Development Goal. The cross corresponds to the chosen estimation with beta = 1.2, except for SDG 3 (beta = 1).
Source: SDG-BAI.

StatLink https://doi.org/10.1787/888934275140

Other important parameters in the algorithm are chosen through parameter tuning using the validation set. The learning rate, which is the step size shrinkage used in update, is set to 0.3. The maximum depth of a tree (the higher this value the more complex the model) is set to 12. Finally, L1 regularisation is used on the parameters to make the model less prone to overfitting.

For increasing the size of the training set, despite the limited availability of descriptions of corporate sustainability actions descriptions, data augmentation is implemented. New observations are created by inserting new words inside the original text, taking into consideration the surrounding terms. This technique is used in order to reduce the generalisation error (i.e. the error computed on new and unseen observations).

In Table A B.1, performance (measured as precision and recall on the positive class) is summarised. It shows how the algorithm reaches a high level of performance for most of the classes. The performance is under average for classes that represent more general objectives (such as *SDG8-Decent Work and Economic Growth*, *SDG9-Industry, Innovation and Infrastructure* and *SDG10-Reduced Inequality*). Precision

and recall are measured on a validation set (10% of the observations are used for validation, but not for the estimation of the model parameters).

Robustness checks

To verify the relevance of the information derived from the training set, an experiment was conducted using the training set of Pincet, Okabe and Pawelczyk (2019[2]), composed of international aid projects. Adding these 22 000 examples to our original training set does not improve the performance of the algorithm. Interestingly however, performance is marginally improved when adding only a part of the alternative set of examples, around 40% to 60% of them, rather than the whole set. This can be explained by the fact that when the whole alternative set is added, the more meaningful information from business action examples gets "diluted". This experiment allows two conclusions to be drawn:

- The training set used in this report conveys a significant amount of information, despite a limited size, and adding further examples will not provide first-order improvements in the performance of the algorithm.
- The training set composed of business actions conveys different information from the training set of Pincet, Okabe and Pawelczyk (2019[2]). Gathering examples from business actions is necessary to build an algorithm able to identify the SDGs in texts describing private-sector initiatives.

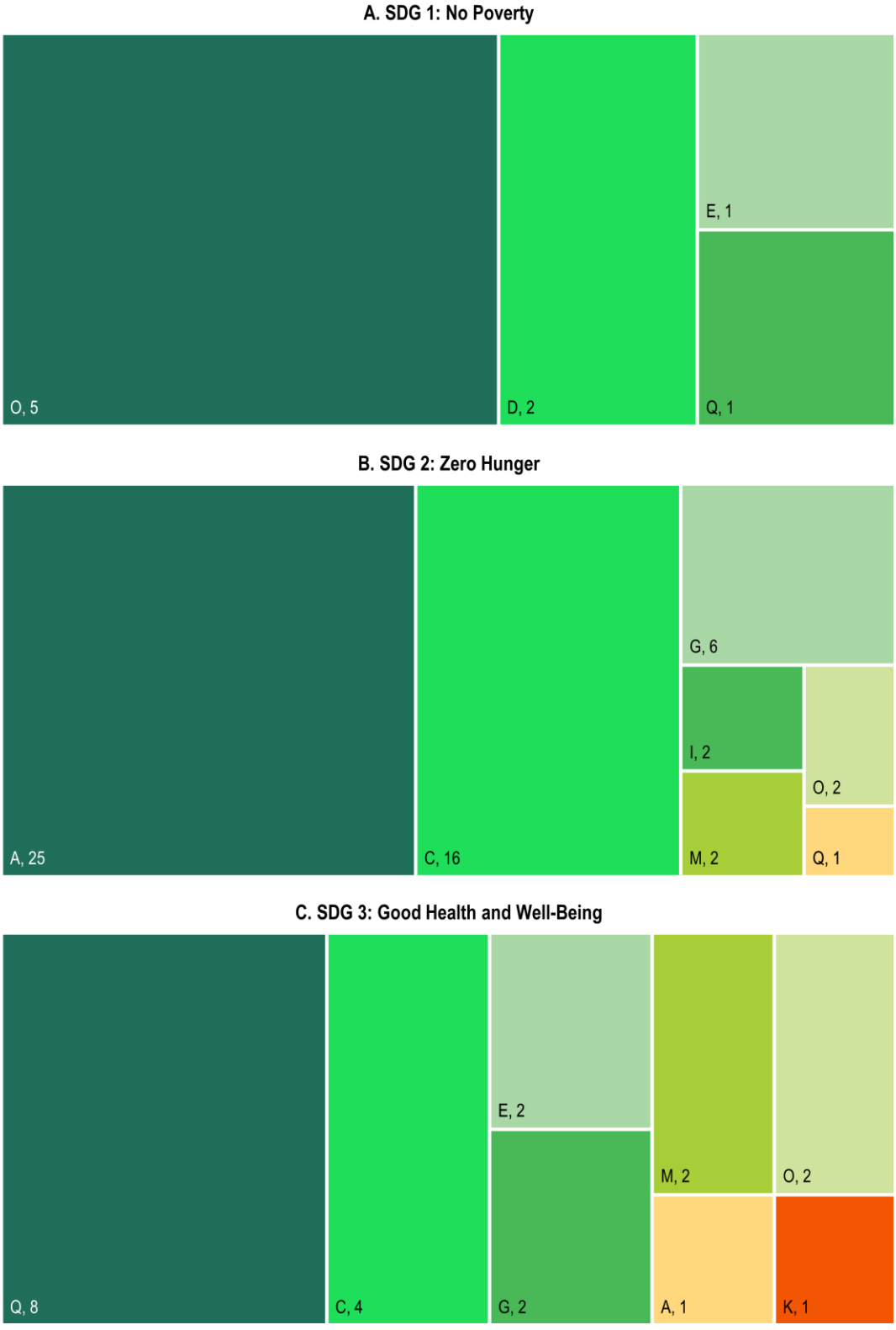
SDG-BAI over-performs two alternative approaches that have been tested:

- Fixed vocabulary. The appearance of a predetermined set of words is used to identify the SDGs. Performance is expected to be satisfactory when the classification problem can be solved with simple lexical rules. In the case at hand, SDG-BAI displays a superior performance compared to a fixed vocabulary approach, using the vocabulary developed by Siris Academic.
- Pre-trained neural network tailored to the dataset of corporate SDG actions. Universal Language Model Fine Tuning (ULMFiT) is a transfer learning method. The weights of the model are computed using not only information from the training set: the properties of the language have also already been captured during pre-training (on external information). Transfer learning is especially effective when the training set is small, and it is necessary to integrate that information from outside sources. However, deep learning methods add parameters and complexity to the task and this is likely to be reason for the inferior performance with respect to SDG-BAI.

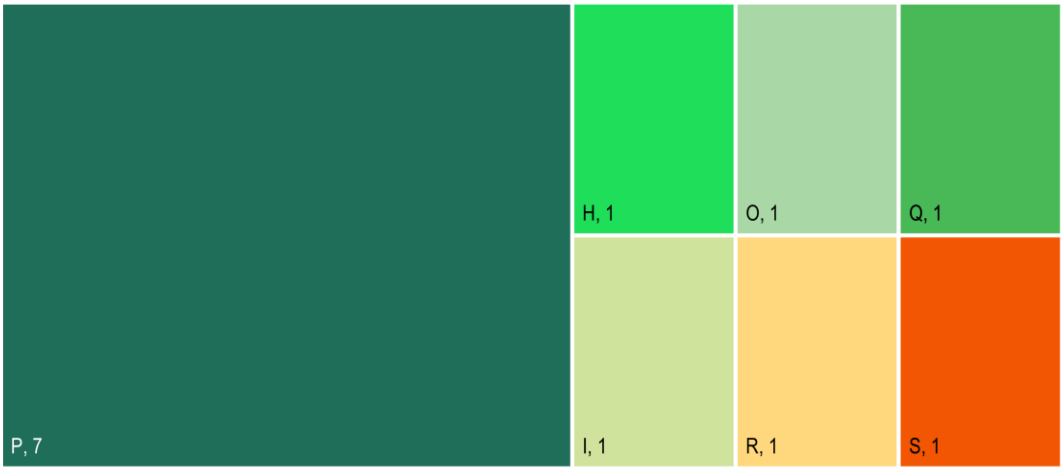
SDG-ISIC mapping after the incorporation of external information

The model is used to link the SDGs and the International Sector Industry Classification Revision 4 (ISIC Rev.4). Figure A B.2 displays the mapping between the SDGs and the four-digit sectors of ISIC Rev.4, grouped by mega sector, and after incorporating external information (see section "Incorporating external information to supplement the output of the algorithm").[2]

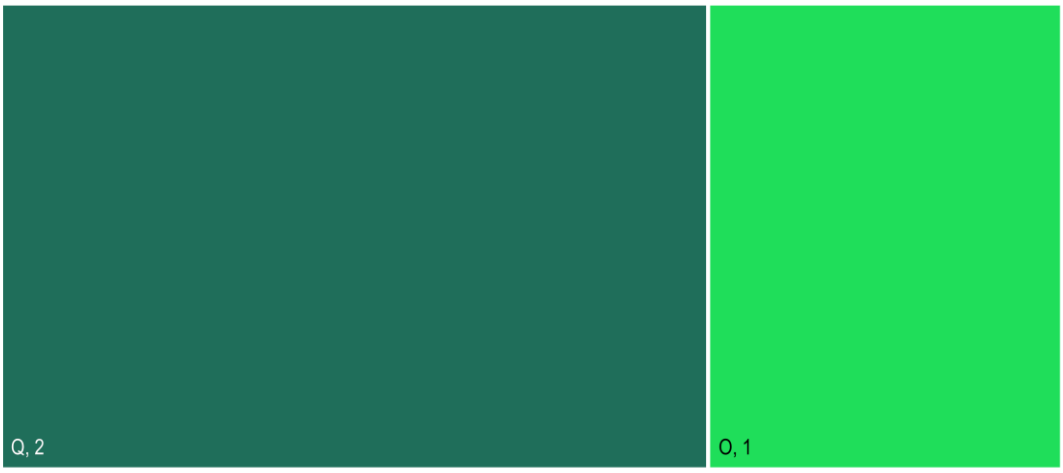
Figure A B.2. Number of sectors identified as being linked to SDGs 1-17, after qualitative adjustments



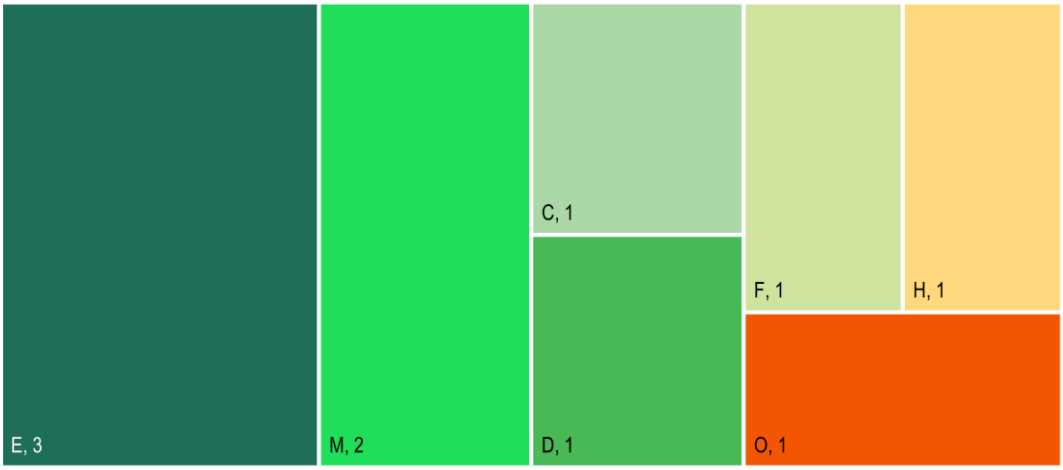
D. SDG 4: Quality Education



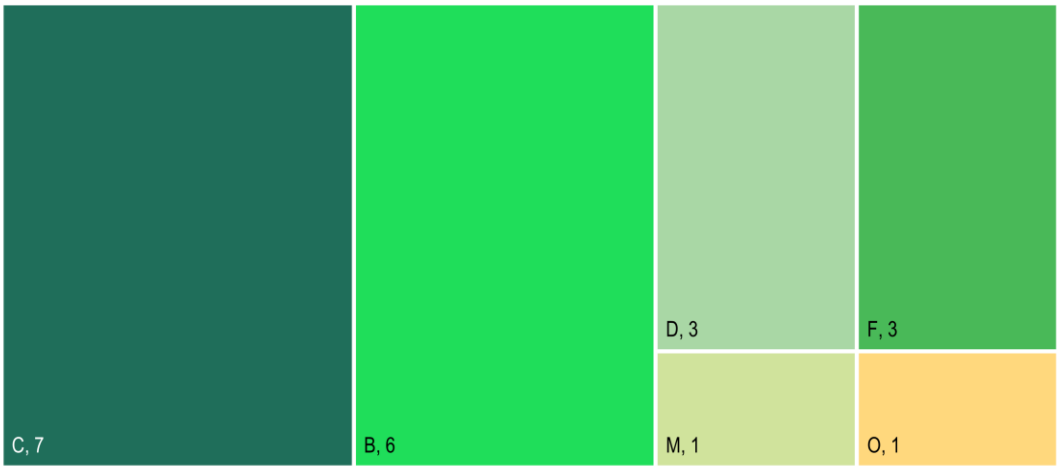
E. SDG 5: Gender Equality



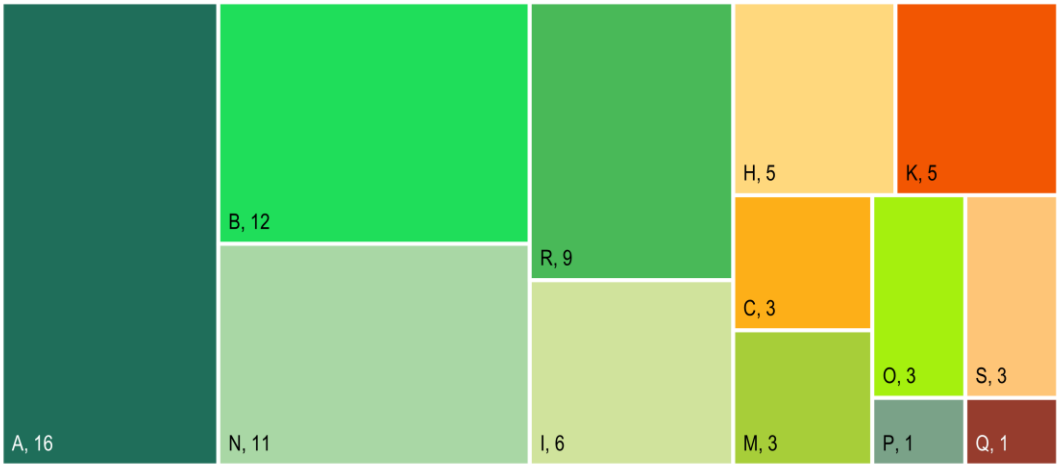
F. SDG 6: Clean Water and Sanitation



G. SDG 7: Affordable and Clean Energy

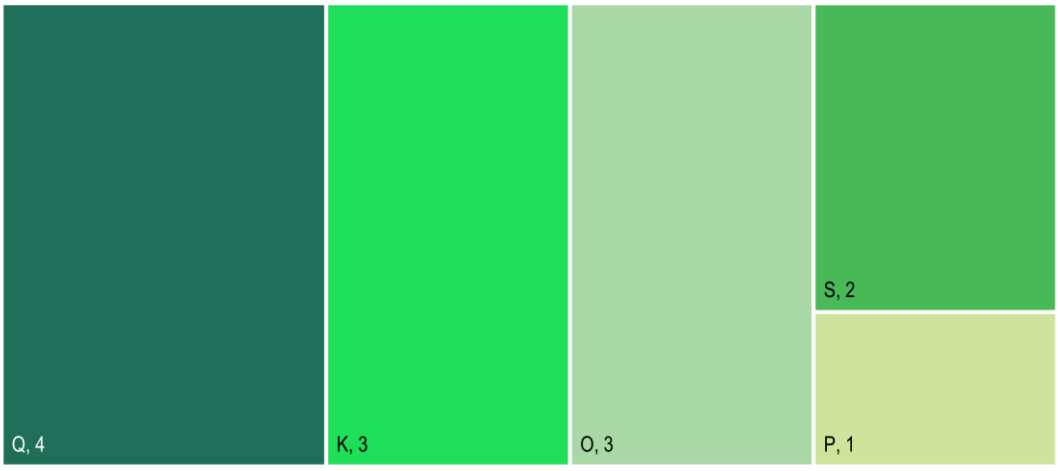


H. SDG 8: Decent Work and Economic Growth

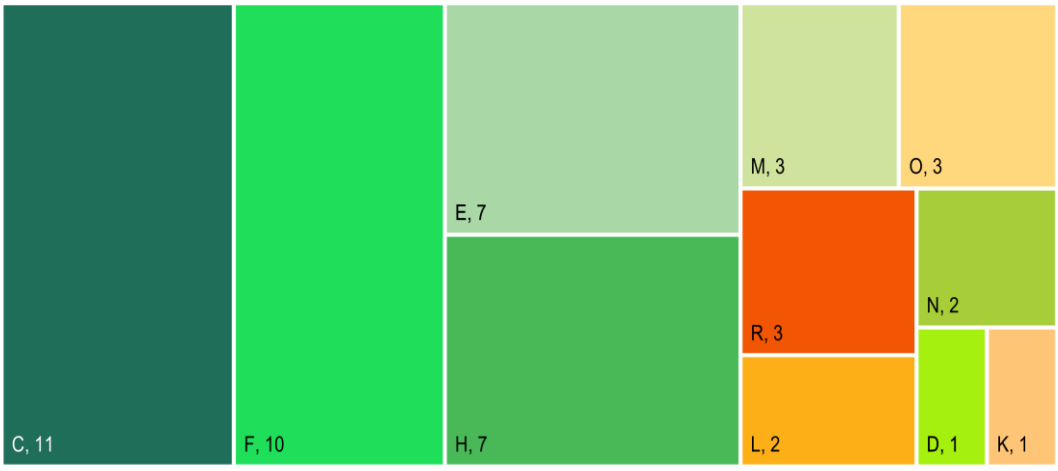


I. SDG 9: Industry, Innovation and Infrastructure

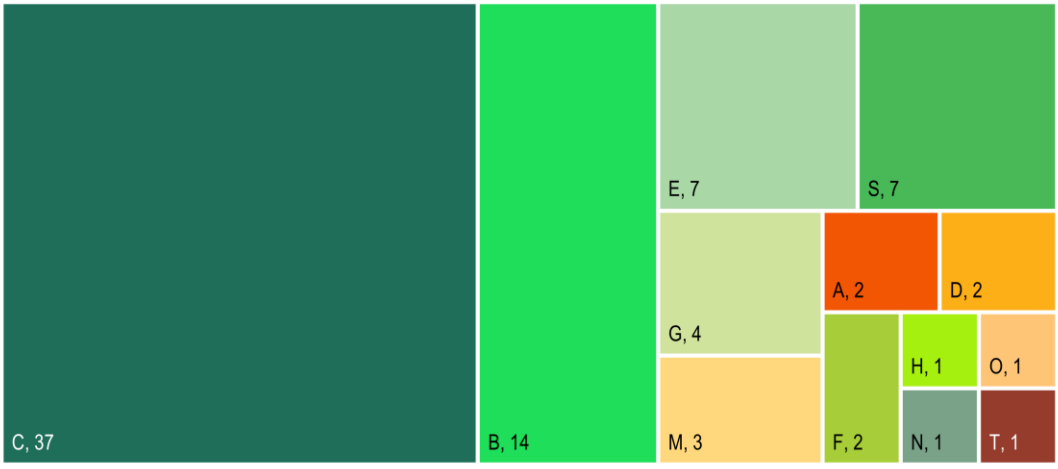
J. SDG 10: Reduced Inequalities



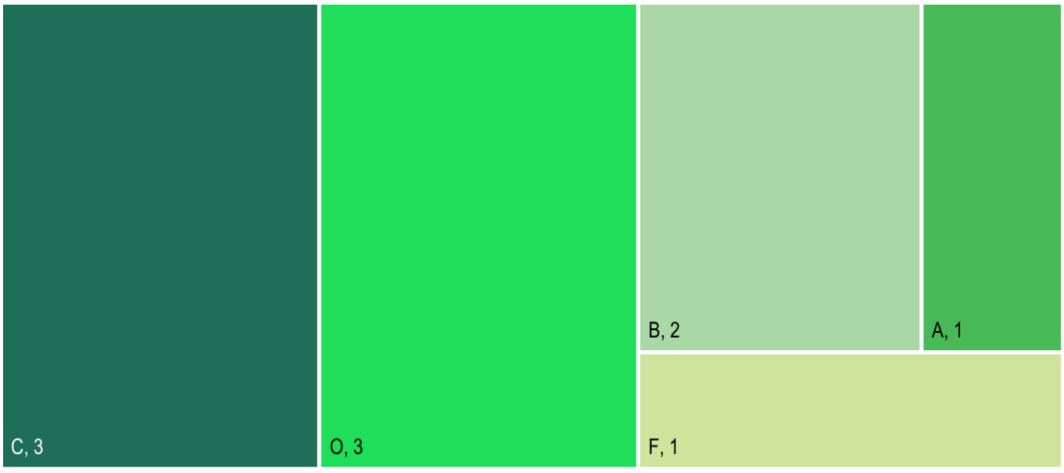
K. SDG 11: Sustainable Cities and Communities



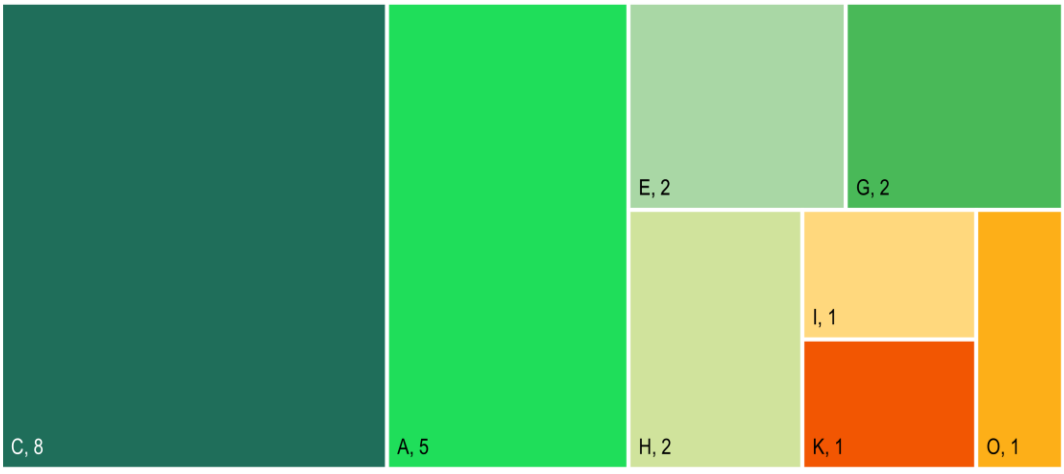
L. SDG 12: Responsible Consumption and Production



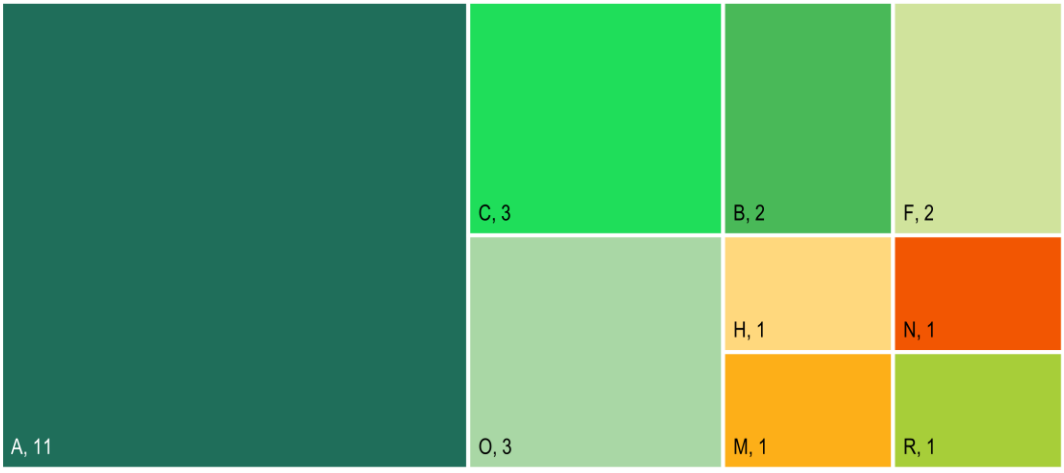
M. SDG 13: Climate Action



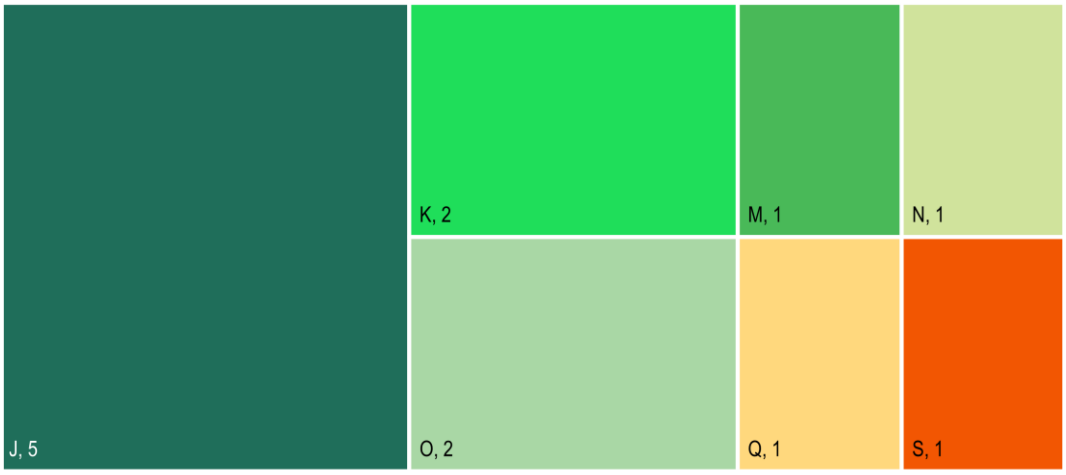
N. SDG 14: Life Below Water



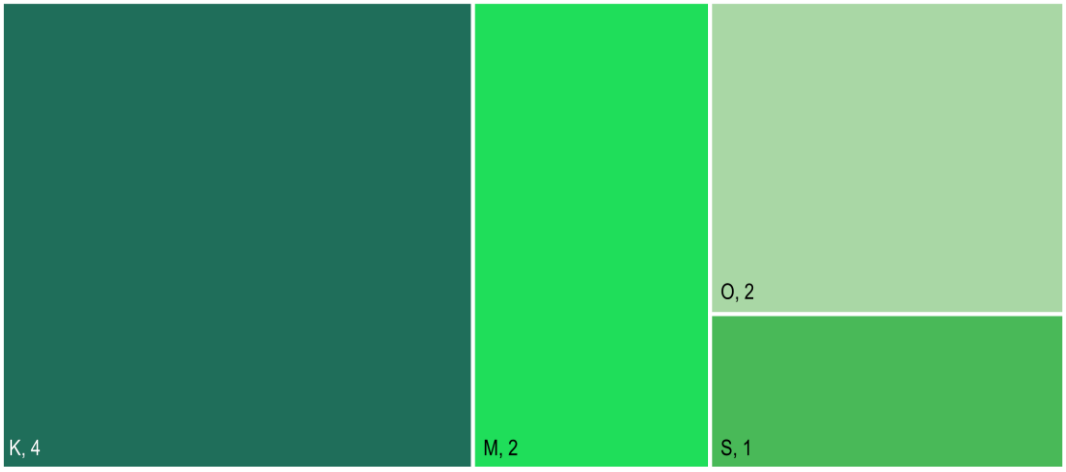
O. SDG 15: Life on Land



P. SDG 16: Peace, Justice and Strong Institutions



Q. SDG 17: Partnership for the Goals



Notes: SDG = Sustainable Development Goal. The letters relate to ISIC Rev.4 sections (see Table A B.2).
Source: OECD calculations, based on the SDG-BAI algorithm.

Table A B.2. Structure of ISIC sections

ISIC Rev.4 section	Label
A	Agriculture, hunting, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply; sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade, repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security

ISIC Rev.4 section	Label
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers; undifferentiated activities of households for own use
U	Activities of extraterritorial organizations and bodies

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Pincet, A., S. Okabe and M. Pawelczyk (2019), "Linking Aid to the Sustainable Development Goals – a machine learning approach", *OECD Development Co-operation Working Papers*, No. 52, OECD Publishing, Paris, https://dx.doi.org/10.1787/4bdaeb8c-en. [2]

Pradhan, P. et al. (2017), "A systematic study of Sustainable Development Goal (SDG) interactions", *Earth's Future*, Vol. 5/11, pp. 1169-1179, https://doi.org/10.1002/2017ef000632. [1]

Notes

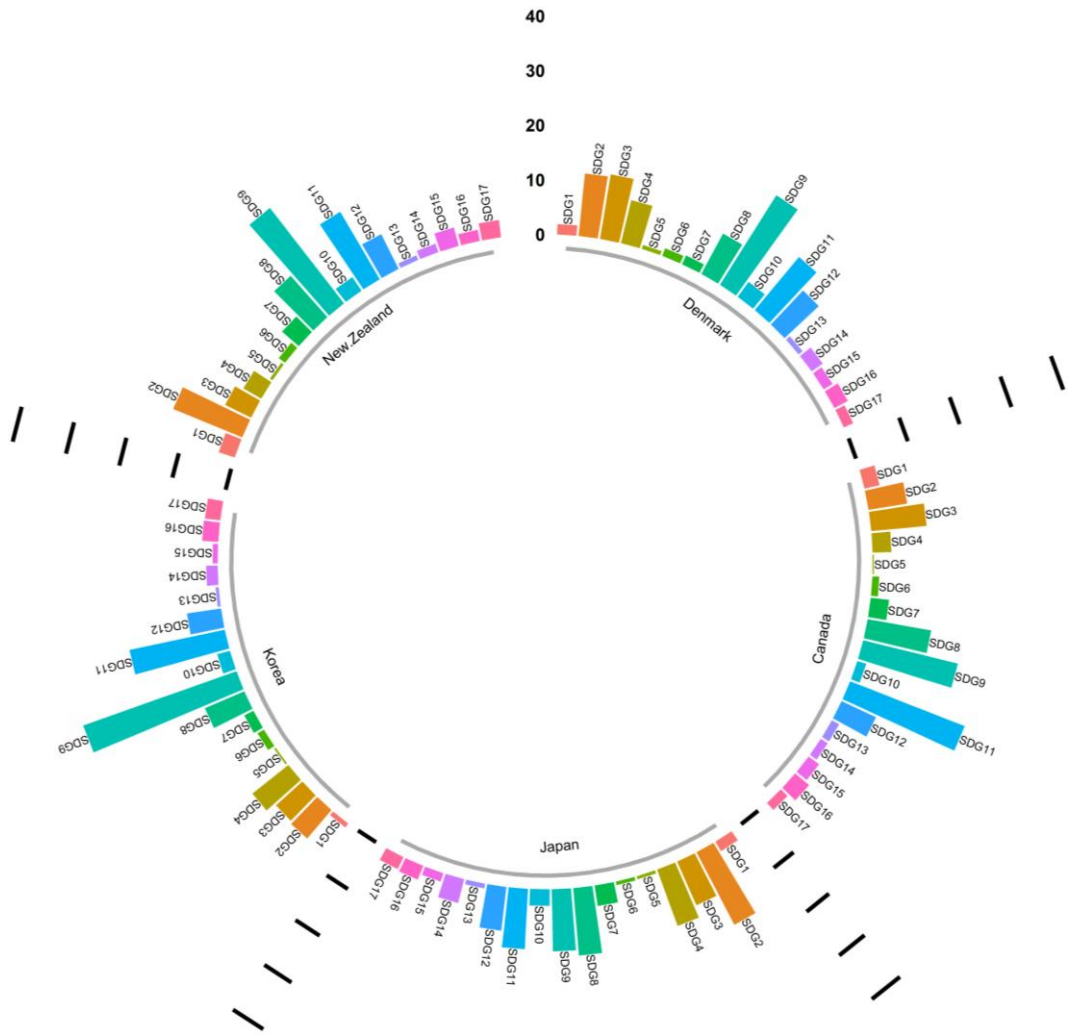
[1] Beta is set to 1 for SDG 3 because, based on out-of-sample predictions, the algorithm produced too many false positives with beta = 1.2.

[2] In contrast, Figure 3.1 to Figure 3.4 present the outcome of SDG-BAI, before the incorporation of external information.

Annex C. Detailed results: Measuring the contribution of the private sector to the SDGs

Figure A C.1. Domestic value added directly and indirectly contributing to SDGs

As a percentage of total value added



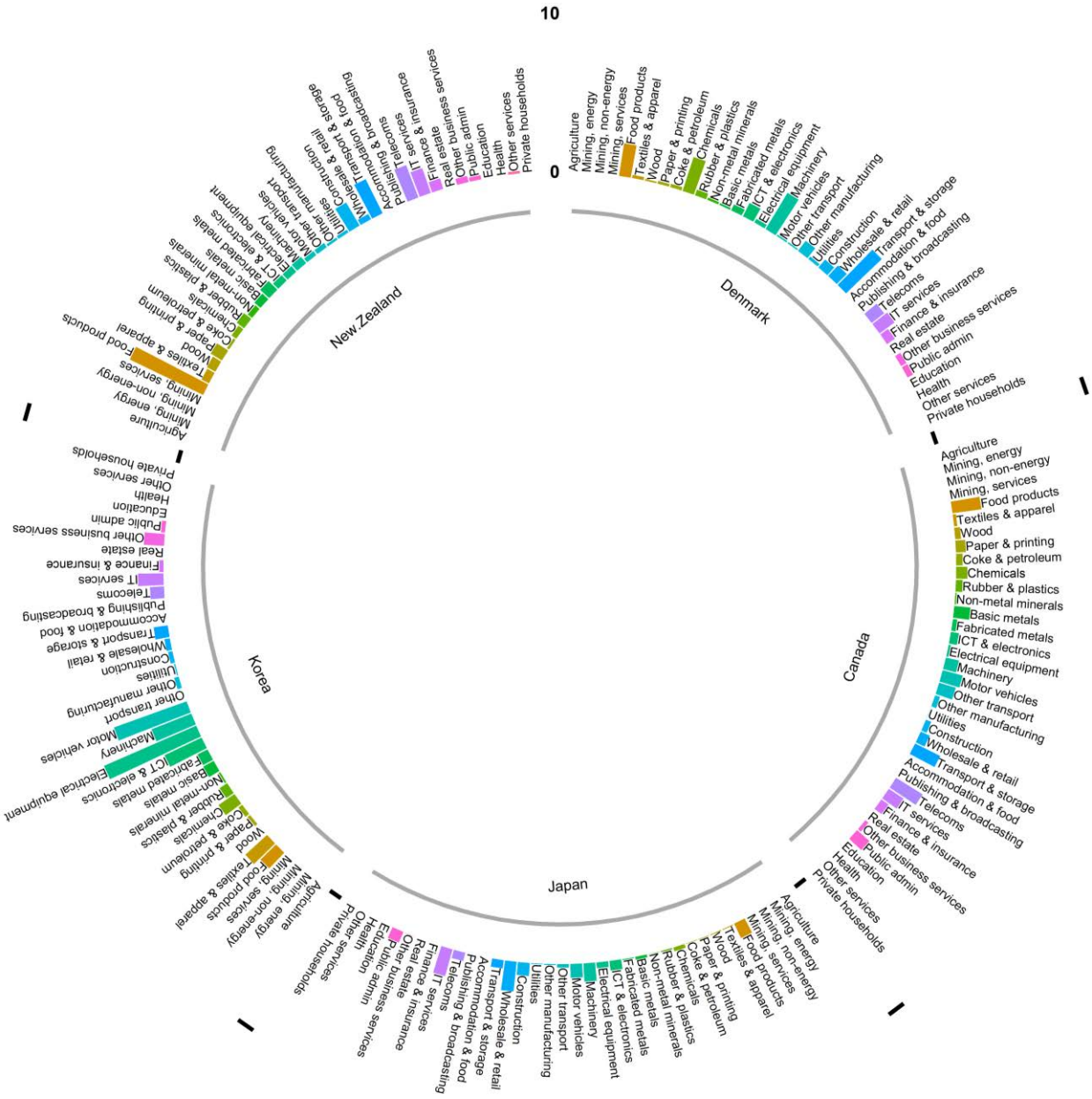
Note: SDG = Sustainable Development Goal.

Sources: METI (2014[1]), *Extended Input-Output Tables*, https://www.meti.go.jp/english/statistics/tyo/entyoio/index.html; Statistics Canada (Statistics Canada, 2021[2]), *Symmetric Input-Output Tables*, https://www150.statcan.gc.ca/n1/en/catalogue/15-207-X; Bank of Korea (2020[3]), *2018 Updated Input-Output Tables*, https://www.bok.or.kr/eng/bbs/E0000634/view.do?nttId=10058883&menuNo=400069; Statistics Denmark (2021[4]), *Danish Annual Input-Output Tables*, https://www.dst.dk/en/Statistik/emner/nationalregnskab-og-offentlige-finanser/produktivitet-og-input-output/input-output-tabeller?tab=dok; Stats New Zealand (2016[5]), *National Accounts Input-Output Tables*, https://www.stats.govt.nz/information-releases/national-accounts-input-output-tables-year-ended-march-2013; OECD mapping between economic activities and the Sustainable Development Goals (SDGs).

StatLink https://doi.org/10.1787/888934275159

Figure A C.2. Value added linked to *SDG 9-Industry, Innovation and Infrastructure*

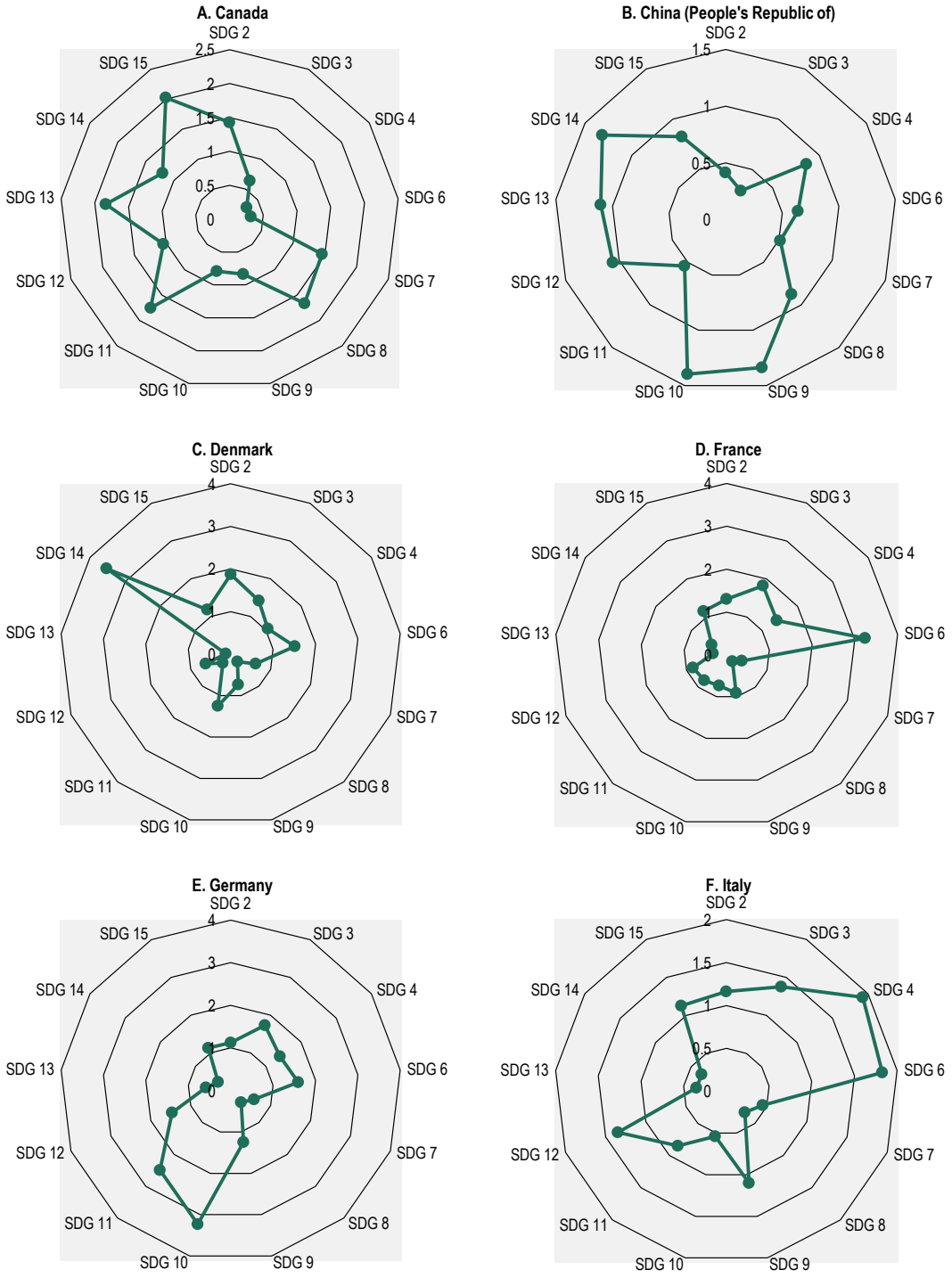
As a percentage of total value added

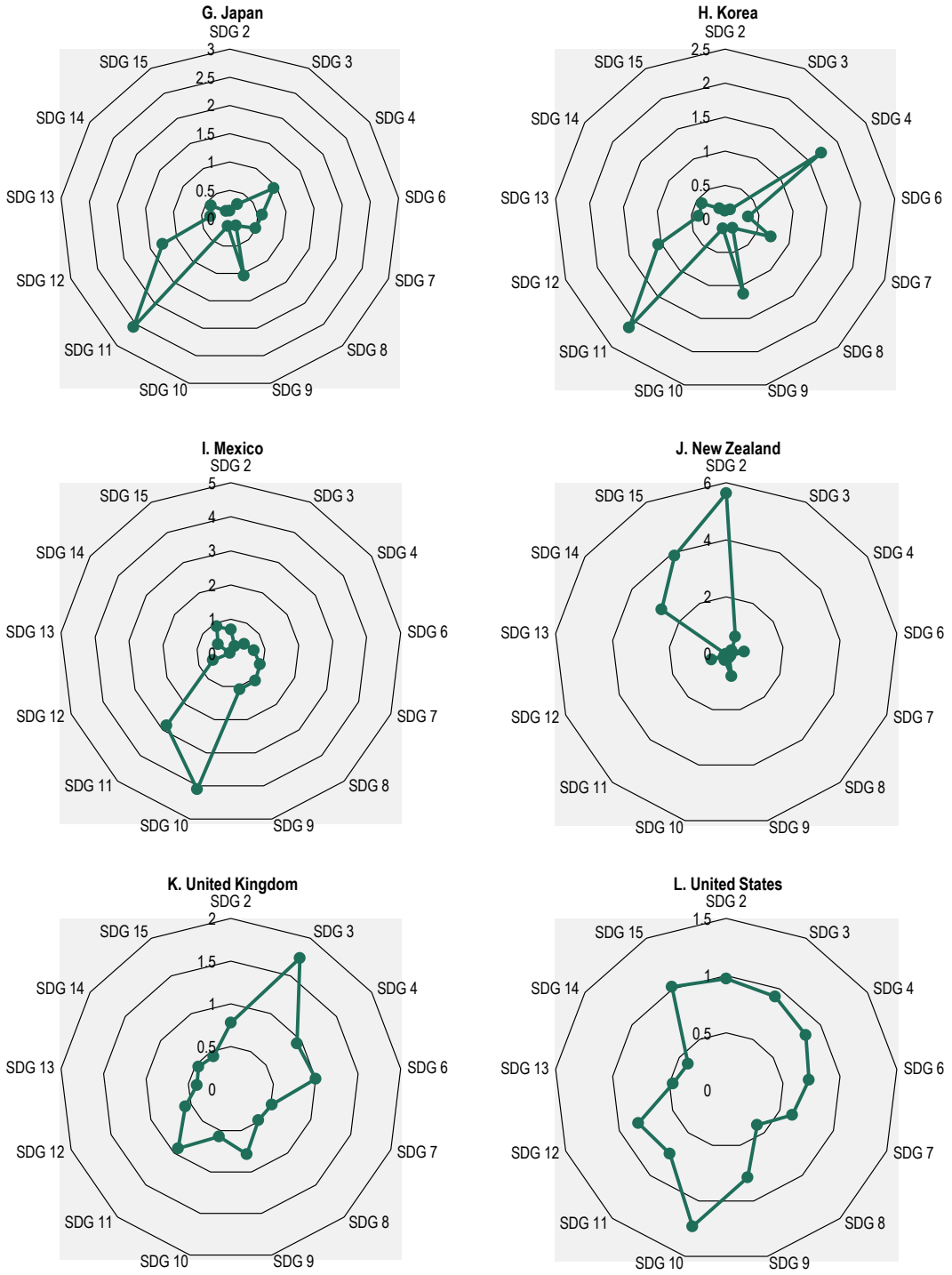


Sources: METI (2014[1]), *Extended Input-Output Tables*, https://www.meti.go.jp/english/statistics/tyo/entyoio/index.html; Statistics Canada (Statistics Canada, 2021[2]), *Symmetric Input-Output Tables*, https://www150.statcan.gc.ca/n1/en/catalogue/15-207-X; Bank of Korea (2020[3]), *2018 Updated Input-Output Tables*, https://www.bok.or.kr/eng/bbs/E0000634/view.do?nttId=10058883&menuNo=400069; Statistics Denmark (2021[4]), *Danish Annual Input-Output Tables*, https://www.dst.dk/en/Statistik/emner/nationalregnskab-og-offentlige-finanser/produktivitet-og-input-output/input-output-tabeller?tab=dok; Stats New Zealand (2016[5]), *National Accounts Input-Output Tables*, https://www.stats.govt.nz/information-releases/national-accounts-input-output-tables-year-ended-march-2013; OECD mapping between economic activities and the Sustainable Development Goals (SDGs).

StatLink https://doi.org/10.1787/888934275178

Figure A C.3. Revealed comparative advantage on SDG-related goods, by country

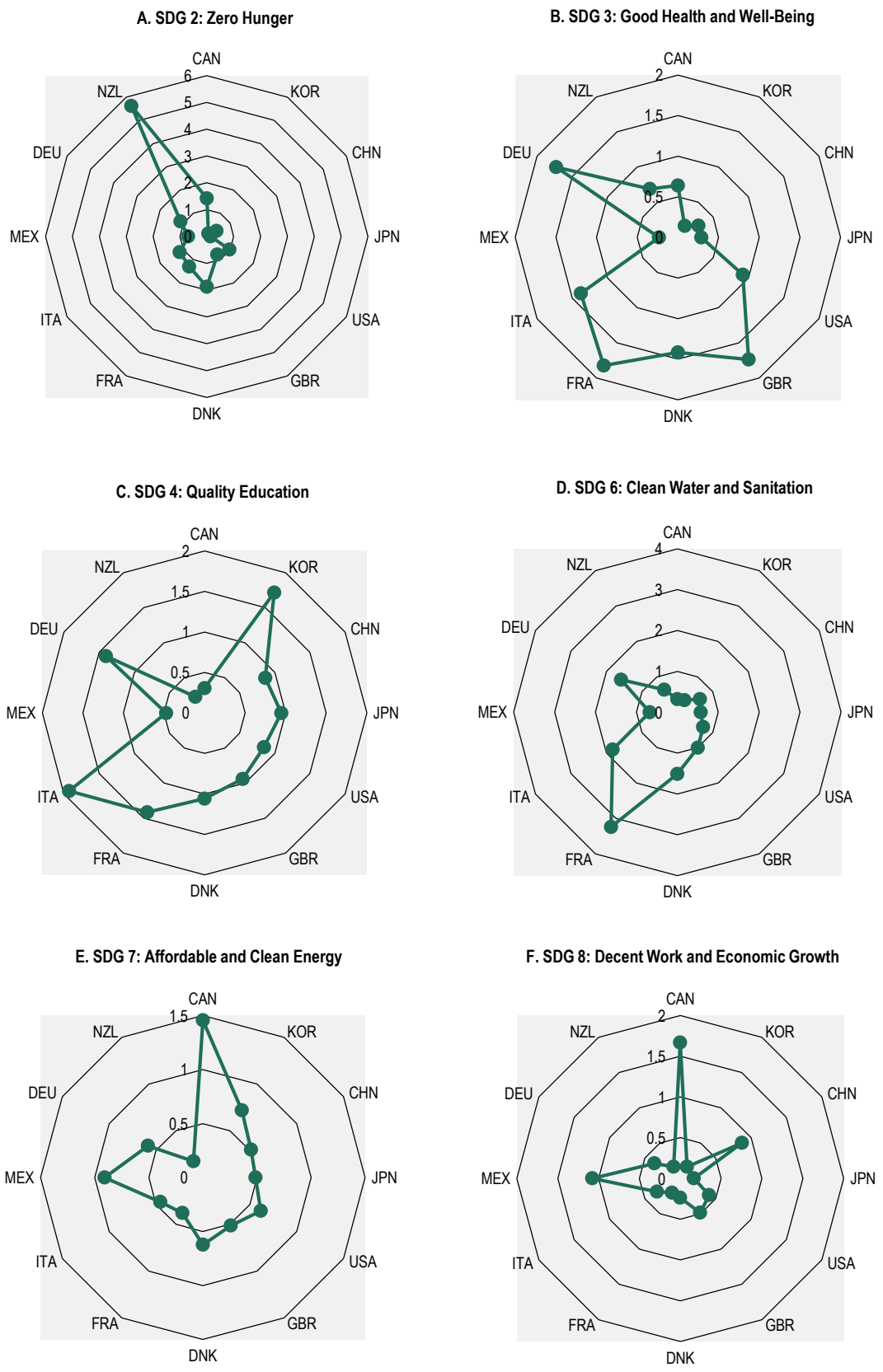




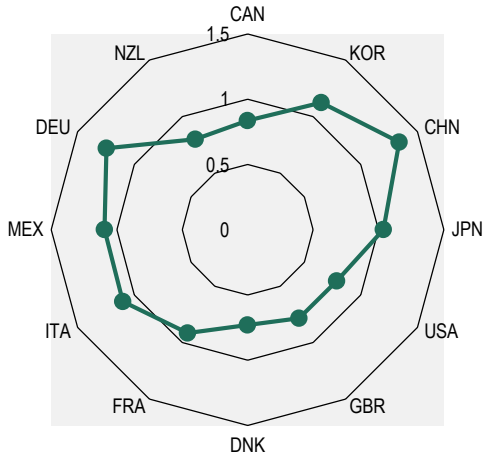
Notes: SDG = Sustainable Development Goal. SDGs 1, 5, 16 and 17 are not included as they have zero values.
Sources: United Nations Statistics Division (2021[6]), *UN Comtrade (International Trade Statistics Database)*, https://comtrade.un.org; OECD mapping between the Harmonized System classification and the SDGs.

StatLink https://doi.org/10.1787/888934275197

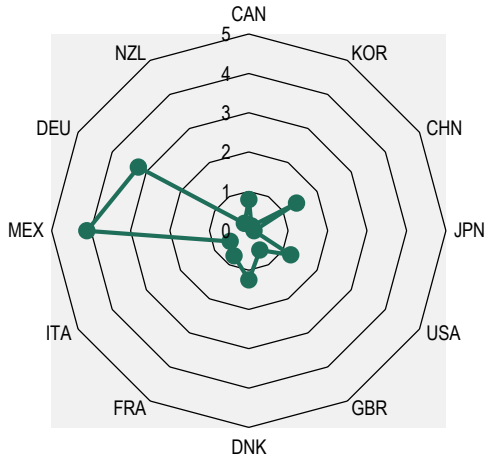
Figure A C.4. Revealed comparative advantage on SDG-related goods, by SDG



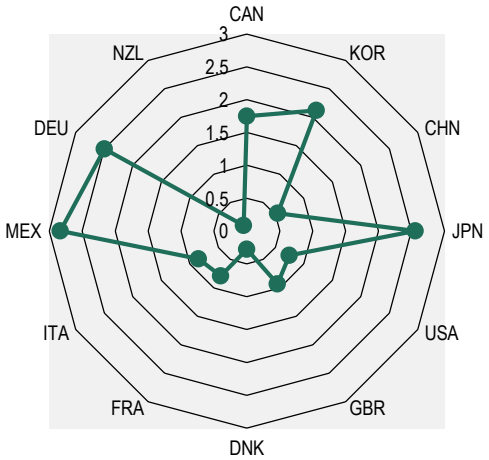
G. SDG 9: Industry, Innovation and Infrastructure



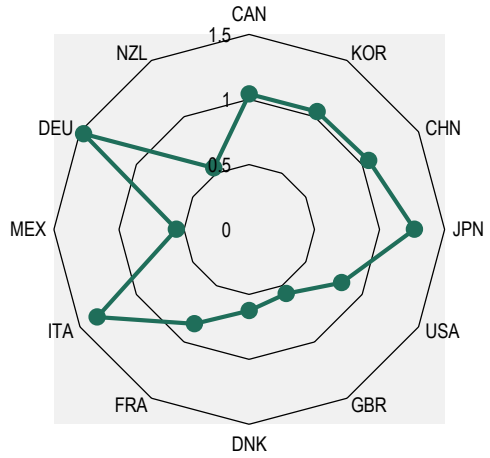
H. SDG 10: Reduced Inequalities



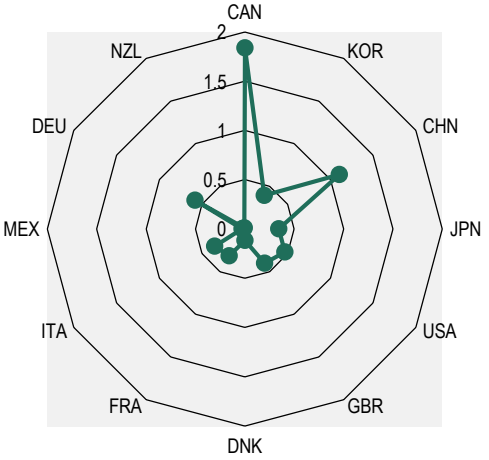
I. SDG 11: Sustainable Cities and Communities



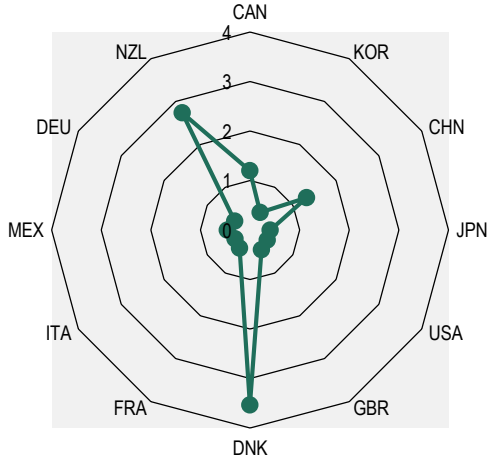
J. SDG 12: Responsible Consumption and Production



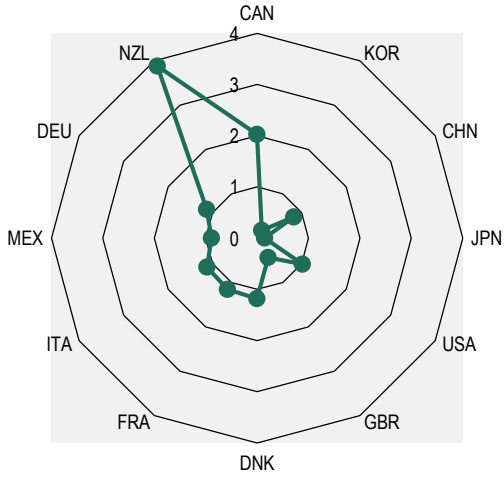
K. SDG 13: Climate Action



L. SDG 14: Life Below Water



M. SDG 15: Life on Land



Notes: SDG = Sustainable Development Goal. SDGs 1, 5, 16 and 17 are not included as they have zero values.
Sources: United Nations Statistics Division (2021[6]), *UN Comtrade (International Trade Statistics Database)*, https://comtrade.un.org; OECD mapping between the Harmonized System classification and the Sustainable Development Goals (SDGs).

StatLink https://doi.org/10.1787/888934275216

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METI (2014), *Extended Input-Output Tables*, Ministry of Economy, Trade and Industry of Japan, https://www.meti.go.jp/english/statistics/tyo/entyoio/index.html. [1]

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Statistics Denmark (2021), *Danish Annual Input-Output Tables*, https://www.dst.dk/en/Statistik/emner/nationalregnskab-og-offentlige-finanser/produktivitet-og-input-output/input-output-tabeller?tab=dok. [4]

Stats New Zealand (2016), *National Accounts Input-Output Tables*, https://www.stats.govt.nz/information-releases/national-accounts-input-output-tables-year-ended-march-2013. [5]

United Nations Statistics Division (2021), *UN Comtrade (International Trade Statistics Database)*, https://comtrade.un.org/. [6]

Annex D. Regional and country coverage

Table A D.1. Regions and country coverage, Europe

OECD countries		Partner economies
Austria	Latvia	Bulgaria
Belgium	Lithuania	Cyprus[1]
Czech Republic	Luxembourg	Croatia
Denmark	Netherlands	Malta
Estonia	Norway	Romania
Finland	Poland	Russian Federation
France	Portugal	
Germany	Slovakia	
Greece	Slovenia	
Hungary	Spain	
Iceland	Sweden	
Ireland	Switzerland	
Italy	United Kingdom	

1. Note by Turkey. The information in this document with reference to "Cyprus" relates to the southern part of the Island. There is no single authority representing both Turkish and Greek Cypriot people on the Island. Turkey recognises the Turkish Republic of Northern Cyprus (TRNC). Until a lasting and equitable solution is found within the context of the United Nations, Turkey shall preserve its position concerning the "Cyprus issue".
Note by all the European Union Member States of the OECD and the European Union
The Republic of Cyprus is recognised by all members of the United Nations with the exception of Turkey. The information in this document relates to the area under the effective control of the Government of the Republic of Cyprus.

Table A D.2. Regional coverage, rest of world

	East and Southeast Asia	North America	South and Central America	Other regions
OECD countries	Japan	Canada	Chile	Australia
	Korea	Mexico	Colombia	Israel
		United States	Costa Rica	New Zealand
				Turkey
Partner economies	Brunei Darussalam		Argentina	India
	China (People's Republic of)		Brazil	Kazakhstan
	Hong Kong (China)		Peru	Morocco
	Indonesia			Saudi Arabia
	Cambodia			Tunisia
	Lao People's Democratic Republic			South Africa
	Malaysia			Rest of the World
	Myanmar			
	Philippines			
	Singapore			
	Thailand			
	Chinese Taipei			
	Viet Nam			

Annex E. Results of the policy benchmarking exercise

Canada

Table A E.1. Policy instruments of Canada

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies			Women Entrepreneurship Strategy (WES)	
Rewards and incentives	SDG Accelerators Awards (Global Compact Network Canada) Innovation Superclusters Initiative Strategic Innovation Fund	Innovation subsidies	Black Entrepreneurship Fund (BEF)	Green innovation funding
Government assistance	Corporate social responsibility (CSR) toolkit SME Sustainability Roadmap The Canadian Ombudsperson for Responsible Enterprise (CORE)		Centre for Gender, Diversity and Inclusion Statistics	Greening your business
Mandatory compliance		Health and safety programmes	Canadian Human Rights Act 1977 and Canadian Charter of Rights and Freedoms 1982	Pricing carbon pollution from industry

Policies addressing multiple types of SDGs

Rewards and incentives

SDG Accelerators Awards[1] (Global Compact Network Canada, with the support of the Government of Canada). This award celebrates Canadian businesses and non-business sectors for their efforts towards SDG implementation. It provides businesses with opportunities to display their strategies or mechanisms that promote the SDGs, be recognised as leaders in this regard, and use this recognition to enhance their reputation and build trust with key stakeholders. There is no prize money. Global Compact Network Canada also offers various SDG programmes such as training courses, workshops, webinars and interactive sessions. It provides a community of practice for businesses to discuss and explore ways in which companies can advance the SDGs, business opportunities and, tools and information to demystify the SDGs and aid in implementation.

Innovation Superclusters Initiative.[2] Innovation, Science and Economic Development Canada (ISED) developed the "superclusters" initiative in 2018. The government department focuses on five superclusters in technology areas of Canadian competitive advantage: **Digital Technology, Protein Industries Canada (PIC), Next Generation Manufacturing Canada (NGen), Scale AI, and Ocean**. The aim of the programme

is to create a world-leading innovation economy, and is supported by CAD 950 million in public funding over five years, matched dollar for dollar by private investment. The initiative fosters large-scale collaboration among industry leaders, small- and medium-sized enterprises (SMEs), post-secondary institutions, researchers, academics and not-for-profit organisations as well as accelerators and incubators, and contributes to multiple SDGs (including 2, 8, 9 and 14). Canada's Superclusters are also helping to build a skilled and diverse workforce by:

- Creating opportunities for women, racialised Canadians, Indigenous communities and other under-represented groups. For example, Oceans supercluster has created dedicated opportunities for Indigenous peoples, providing meaningful work experience and exposure to more blue economy career options.[3]
- Committing to gender parity for all Supercluster Boards.[4]

Clean technologies and environmentally sustainable practices are also part of the Superclusters objectives:

- Oceans supercluster includes a marine renewable energy component.[5]
- NGen (one of the superclusters) includes the development of environmentally sustainable management practices.[6]
- Digital supercluster is developing a technology to help every part of Canada, and the world, harnessing data to protect supplies of freshwater and dependent ecosystems, fostering sustainable development and monitoring the impacts of climate change.[7]
- PIC (one of the superclusters) is working on the development of safe, nutritious and sustainable food.
- Scale AI supercluster works in the development of AI powered sustainable supply chains.[8]

Strategic Innovation Fund (SIF).[9] SIF provides funding for high-risk, large-scale, transformative and collaborative projects to spur innovation in Canada. SIF has funded 76 projects to date. Through SIF's new Net Zero Accelerator initiative, the programme will help drive decarbonisation projects with large emitters, scale up clean technology and accelerate Canada's industrial transformation across all sectors. SIF promotes the long-term competitiveness of Canadian industries through the advancement of Canada's strategic technological advantage, clean growth and gender diversity and inclusion. SIF helps meet a number of SDGs:

- *SDG 5-Gender Equality*. SIF requires companies receiving funds to develop and report on gender and diversity action plans. These plans include targets and objectives to promote gender equality in the workplace and enhance diversity among senior management and board members.
- *SDG 9-Industry, Innovation and Infrastructure*. SIF targets innovative, high-quality business investments in multiple sectors such as aerospace, telecommunication, automotive, and manufacturing. SIF also invests in emerging and dynamic sectors such as clean technology and batteries. SIF's funding has advanced technological development and enhanced technological capabilities and efficiency of the industry sectors. SIF supports industrial research and development (R&D) and technology demonstration and fosters innovation.
- *SDG 13-Climate Action*. SIF's newly announced Net Zero Accelerator initiative will bolster Canada's transition towards a low-carbon and green economy. A key objective of the initiative is to reduce greenhouse gas (GHG) emissions over the medium and long term, while helping high-emitting industries make large-scale decarbonisation investments and drive clean technologies innovations.

Government assistance

CSR toolkit.[10] This toolkit provides reports and guidelines on why and how to integrate sustainability-oriented practices into business operations. It covers governance for sustainability, structured decision making, human resources for sustainability, purchasing for sustainability and marketing for sustainability.

SME Sustainability Roadmap.[11] This is a tool to assist businesses in achieving their goals of sustainability.

Canadian Ombudsperson for Responsible Enterprise (CORE).[12] CORE receives and reviews claims of alleged human rights abuses arising from the operations of Canadian firms abroad in the mining, oil and gas, and garment sectors. CORE promotes the implementation of the UN Guiding Principles and the OECD Guidelines and advises Canadian companies on their practices and policies with regard to responsible business conduct.

Policies addressing health, well-being and safety-related SDGs, notably SDGs 3 and 8

Rewards and incentives

Innovation subsidies. Canada provides various innovation subsidies[13] related to health and medical research, alongside funding and advisory support for R&D, innovation and commercialisation projects. The Canadian Institutes of Health Research[14] provides grants and awards to health research activities.

Mandatory compliance and government assistance

Health and Safety Programmes. Firms are required to draft occupational health and safety protocol under legislation in most Canadian provinces. The Canadian Centre for Occupational Health and Safety[15] provides databases and courses/e-learning on their website[16] to help firms fulfil this requirement.

Policies addressing equity-related SDGs, notably SDG5

Strategies

Women Entrepreneurship Strategy (WES).[17] The WES is a CAD 5 billion initiative that aims to increase women-owned businesses' access to the financing, talent, networks and expertise they need to start up, scale up and access new markets. As part of the WES, the Women Entrepreneurship Fund[18] has provided a total of CAD 30 million to more than 300 women-owned and led businesses, to help them grow and expand to new markets. In addition, the WES Ecosystem Fund[19] has provided CAD 100 million to enhance entrepreneurial capacity within the Canadian entrepreneurship ecosystem for women entrepreneurs, including CAD 15 million in funding in response to the COVID-19 pandemic. The government has also established the Women Entrepreneurship Knowledge Hub[20] (WEKH) to support women in entrepreneurship. The Hub's activities include collecting, analysing and disseminating information and/or advancing research on women's entrepreneurship, supporting/sharing best practices and knowledge among women business support organisations and reporting on the progress of women entrepreneurs in Canada.

Rewards and incentives

Black Entrepreneurship Fund (BEF).[21] The BEF is a partnership between the Government of Canada, Black-led business organisations, and financial institutions. With an investment of up to CAD 221 million over four years, it will help Black Canadian business owners and entrepreneurs grow their businesses and succeed now and into the future. The programme includes the National Ecosystem Fund, the Black Entrepreneurship Loan Fund and the Black Entrepreneurship Knowledge Hub.

Government assistance

Statistics Canada Centre for Gender, Diversity and Inclusion Statistics. Statistics Canada provides easy access information[22] about education, families, health, immigration, labour and income from a gender, diversity and inclusion perspective.

Mandatory compliance

Canadian Human Rights Act 1977 and **Canadian Charter of Rights and Freedoms 1982**. These laws protect the right to gender equality, in terms of access to jobs and pay. Maintaining a difference in wages between male and female employees performing work of equal value is regarded as a discriminatory practice.

Policies addressing environment-related SDGs, notably SDGs 7, 12, 13, 14 and 15

Rewards and incentives

Green innovation funding.[23] The government funds green innovation through several schemes. These include programmes aimed at phasing out fossil fuels, such as the Clean Growth Program[24] (a CAD 155 million investment in clean technology R&D), the green infrastructure programme (investment for next-generation clean energy infrastructure) and the Energy Innovation Program (EIP)[25] and other additional funding opportunities/grants/incentives. Other funds are directed at the green transition, such as the Emissions Reduction Fund (support for the green transition of oil and gas firms by providing funds to invest in green solutions to reduce GHGs and protect jobs in the sector). Institutions such as Sustainable Development Technology Canada, the Business Development Bank of Canada and Export Development Canada finance the R&D, innovation and commercialisation of clean technologies.[26] The Clean Growth Hub[27] is a government-led one-stop resource centre to find funding opportunities for clean technology projects.

Natural Resources Canada (NRCan).[28] This federal government department launched The Hydrogen Strategy[29] in December 2020, after three years of consultation with stakeholders. The plan is part of Canada's commitment to become net zero by 2050 and is designed to position Canada as a world-leading producer, user and exporter of hydrogen. The plan recommends several policies that impact firms and related to the SDGs, including providing funding programmes, R&D expenditures, and the creation of new codes and standards to help mitigate barriers to entry.

Government assistance

Greening your business. This web portal[30] provides resources to help businesses improve environmentally, for example by increasing efficiency, reducing pollution and becoming more "green" overall.

Mandatory compliance

Pricing carbon pollution from industry.[31] To tackle climate change, Canada implements a tax on fuel (fuel charge) as well as a price on carbon for industry emitters (output-based pricing system). The goal of these policies is to cut pollution, reduce GHG emissions, promote innovation and maintain competitiveness by providing firms with incentives to foster energy innovation.

Costa Rica

Table A E.2. Policy instruments of Costa Rica

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies	National Pact for the Sustainable Development Goals			National Decarbonisation Plan of Costa Rica 2018-50
Rewards and incentives			Seal of Gender Equality Recognition of Best Labour Practices for Gender Equality	National Energy Award Green Growth Platform (Promotora del Comercio Exterior [PROCOMER])
Government assistance	Business Social Responsibility Policy National Policy for Sustainable Production and Consumption 2018-30 National Fund of Telecommunications (FONATEL) – including the Foundation for Sustainability and Equity (ALIARSE) National Family Farming Plan 2020-30	General Law N° 7771 on HIV/AIDS National Plan for Food Security, Nutrition and Hunger Eradication, 2025	Information for women and companies Segment 3. Action 3.13 Support to women entrepreneurs with export potential Public Policy Solidarity Social Economy 2021-25 National Policy for equality between women and men in training, employment and the enjoyment of Science, Technology, Telecommunications and Innovation products 2018-27	National Program for Carbon Neutrality (version 2.0) National policy for adaptation to climate change 2018-30 National Program for Sustainable Production and Consumption National Biodiversity Strategy (ENB2) 2016-25 National Strategy for the reduction of single-use plastics National programme to reduce GHG emissions National electricity system meter programme National Action Plan for the conservation and management of sharks in Costa Rica (PANT-CR 2020) Nationally Appropriate Mitigation Actions (NAMA) Coffee NAMA Livestock
Mandatory compliance		General Regulation for Occupational Safety and Hygiene General Law on Tobacco Control and its harmful effects on health N° 9028 Health legislation for general access to medicines	Law for the Promotion of Social Equality for Women Gender equality policy for inclusive development in the Costa Rican agricultural, fishing and rural sector 2020-30 action plan I	Fuel tax Law to combat plastic pollution and protect the environment N° 9786 Forest Law N° 7575 Law for the Integral Management of Waste N° 8839

Policies addressing multiple types of SDGs

National Pact for the Sustainable Development Goals.[32] [33] The Government signed the National Pact for the SDGs in 2016, together with heads of the three branches of the Republic: civil society, religious organisations, and businesses. The pact was signed to incentivise the participation of the private sector in the planning process for achieving the SDGs. The three most important entry points into the SDGs for Costa Rica are SDGs 1, 9, and 12.

Government assistance

Business Social Responsibility Policy.[34] This policy aims to integrate socially responsible practices into corporate governance. The policy is implemented through the Code of Responsible Practices – which is a voluntary self-regulation initiative concerning value chains (suppliers, distributors and consumers) – and through the National Social Responsibility Plan for Businesses – which raises awareness among firms about their responsibilities, as well as the social and environmental impacts of their operations.

National Policy for Sustainable Production and Consumption 2018-30.[35] This policy integrates sustainable production and consumption into the country's development agenda. It has a long-term vision that includes the participation of all the relevant stakeholders, in line with the Ten-Year Framework of Programs on Consumption and Sustainable Production (10YFP). It is expected to incorporate sustainability criteria in various sectors and in public purchases by the State. This would help boost the eco-competitiveness of the most important sectors of the national economy. With the implementation of the Policy, Costa Rica aims to promote, and disseminate information about, a sustainable lifestyle.

National Fund of Telecommunications (FONATEL).[36] This initiative combines the following programmes:

- **Connected Communities**. Building infrastructure (optic fibre networks, telephone towers, etc.).
- **Equipped Public Centres**. Seeking to provide computers and tablets with broadband connection to schools and public colleges, Intelligent Community Centres (CECIs), public child care centres and health centres and clinics of the Costa Rican Social Security Fund.
- **Connected Public Spaces**. Building a network of more than 2 175 kilometres of optic fibre nationwide.
- **Foundation for Sustainability and Equity (ALIARSE)**.[37] Initiative promoted by public institutions and private companies aimed at contributing to sustainability, social justice and national development. Its objective is to promote public-private participation in the management of sustainable development through advocacy on public policies and the formation of capacities for the management of public-private partnerships for development and public-private partnerships.

Costa Rica National Family Farming Plan 2020-30. Family farming offers a unique opportunity to ensure food security, improve livelihoods, better manage natural resources, protect the environment and achieve sustainable development, especially in rural areas.

Policies addressing health, well-being and safety-related SDGs, notably SDGs 3 and 8

Government assistance

General Law N° 7771 on HIV/AIDS. Regulates the actions of the Costa Rican State in promoting and guaranteeing a comprehensive response to the HIV epidemic, in public and private spheres. Through this Law, the National Council for Comprehensive HIV Care (CONASIDA) was created, which is an advisory body attached to the Ministry of Health, in charge of supporting public policies and action programmes related to HIV at the national level.

National Plan for Food Security, Nutrition and the Eradication of Hunger, 2025.[38] The general objective is to achieve significant improvements in the quality of life, aimed at the eradication of poverty, especially extreme poverty due to the impact it has on hunger. The programme aims at guaranteeing food security and nutrition, with a gender perspective and while respecting the diversity of eating habits.

Mandatory compliance

The **General Regulation for Occupational Safety and Hygiene** (Reglamento General de Seguridad e Higiene de Trabajo). This is a health and safety guideline and regulation for firms. It works alongside the Labour Code and specific regulations that address certain hazards or risks (e.g. pesticides, noise, radiation). It is issued and enforced by the Ministry of Labour and Social Security.

General Law on Tobacco Control and its harmful effects on health N°9028. Regulates the commercialisation of tobacco products (their content, the requirements for the regulation of emissions and contents, verification of compliance with international standards), advertising, promotion and sponsorship of tobacco products and their derivatives, their storage and distribution, sale and supply in certain places, as well as the creation of a specific tax for cigarettes and related products.

Health legislation for general access to medicines. These are regulations, norms and decrees that regulate access to medicines for human use, their health registration and importation, their commercialisation, whether imported or manufactured domestically, as well as their final disposal. They enable the control of narcotic and psychotropic drugs and the regulation of private pharmaceutical establishments.

Policies addressing equity-related SDGs, notably SDG 5

Rewards and incentives

Seal of Gender Equality (Sello de Igualdad de Género).[39] Firms can apply for the Seal of the National Institute of Women of Costa Rica (INAMU). This is a form of recognition of the company's efforts to ensure gender equality, and is given to firms whose gender equality management system meets the relevant standard (INTE G38: 2015).

Recognition of best labour practices for gender equality (Reconocimiento a Buenas prácticas laborales para la Igualdad de Género).[40] Recognition of good labour practices for gender equality is awarded by INAMU annually in order to celebrate firms that excel in this regard, and to motivate companies to implement measures that promote equal opportunities and close gender gaps. It promotes cultural changes within firms, develops management on gender equality and contributes to changing business ethics. Recognition categories are: 1) management of staff without gender discrimination; 2) comprehensive health approach (including mental and reproductive health, the fight against domestic violence and harassment); 3) practices that take into account caring for children and/or aging family members; 4) non-sexist language; and 5) changing practices in promotion of gender equality.

Government assistance

Information for women and companies.[41] INAMU provides information for firms and women about labour rights and best practices for gender equality.

Axis 3. Action 3.13 Strengthening of women entrepreneurs with export potential and their businesses for their insertion in the international market, within the framework of Women Export (Eje 3. Acción 3.13 Fortalecimiento de las mujeres empresarias con potencial exportador y sus negocios para su inserción en el mercado internacional, en el marco de Women Export) **(Action Plan 2019-22, PIEG)**. This initiative accompanies the international development of women-led firms, through a policy promoting inclusion, and the development of plans that promote the export or market diversification of companies led by women.

Public Policy Solidarity Social Economy 2021-25 (Política Pública Economía Social Solidaria 2021-25).[42] It is organised around three main actions: 1) Improve the institutional support to the Social Economy; 2) Complete revision of the regulatory environment; and 3) Promote the diffusion of the Social Economy knowledge, in particular through education.

National Policy for equality between women and men in training, employment and the enjoyment of Science, Technology, Telecommunications and Innovation products 2018-27.[43] Its objective is to achieve substantive equality between men and women in science, technology, engineering and mathematics. Support research efforts that allow establishing clear strategies for equality in school, family and work environments.

Mandatory compliance

Law for the Promotion of Social Equality for Women. According to article 14 of the law, women have the right to equal pay, both in the private and public sectors, for work of equal value under the same employer.

Gender equality policy for inclusive development in the Costa Rican agricultural, fishing and rural sector 2020-30 and Action Plan I. Its objective is to ensure adequate access for rural women to resources, comprehensive financial services, productive infrastructure, technology and innovation (which increase their possibilities for social mobility and business development to reduce gender gaps and inequalities in the sector). It also aims to promote institutional modernisation which guarantees the incorporation of the diversity of women's needs in programmes, plans and productive projects that allow the transformation of primary production, the generation of value added and the insertion in value chains and markets locally, nationally and internationally.

Policies addressing environment-related SDGs, notably SDGs 7, 12, 13, 14 and 15

Strategies

National Decarbonisation Plan of Costa Rica 2018-50.[44] Summarises the strategic actions that the Bicentennial Government has identified to implement the decarbonisation of the Costa Rican economy. Decarbonisation and resilience are recognised as the means to transform the current economic development model into one that is based on the bioeconomy, green growth, inclusion and enhancing the well-being of all citizens. This Plan proposes significant changes in: 1) its mobility offers and transport (public and private); 2) the management of their sources of energy; 3) sustainable constructions and in the country's industry; and 4) waste management. Guidelines to improve agricultural practices and land use, and avoid deforestation, are also part to the Plan. The Plan offers a road map to promote the modernisation of the Costa Rican economy, generate jobs and boost its growth based on a model that generates 3D (decarbonised, digitised and decentralised) services goods.

Rewards and incentives

National Energy Award (Premio Nacional de Energia).[45] This is an annual award, issued by the Ministry of Environment and Energy (MINAE), which recognises the efficient use of energy, substitution for better sources of energy, the use of renewable sources of energy, and good management of energy demand. There is no prize money, but a ceremony chaired by the President of Costa Rica is organised to honour the winners.

Green Growth Platform.[46] This programme promotes the transformation of production processes and improves the environmental sustainability of companies and their export profile. It supports the efforts of companies undertaking these initiatives. Through seed capital (non-reimbursable funds), micro, small- and medium-sized companies that work in agricultural, food, industry or services productive sectors (with the exception of tourism), and are interested in developing green productive transformation processes, will be able to invest in transformation-oriented technologies.

Government assistance

National Program for Carbon Neutrality (version 2.0) (Programa País Carbono Neutralidad (version 2.0)).[47] This is a national programme for carbon neutrality, led by the Directorate of Climate Change in MINAE. It provides a mechanism to recognise the proper management of GHG emissions. It also provides educational centres, organises events, and produces guidelines. If an organisation completes an inventory report that meets the reporting requirements, they can obtain recognition from the government and get a certificate issued by MINAE. With the certificate, businesses can display the carbon inventory symbol (or carbon reduction plus symbol if the business goes beyond the established requirement) on their business documents and webpages. Costa Rica also has a Voluntary Domestic Costa Rican Carbon Market (MDVCCR).

National policy for adaptation to climate change 2018-30. Its objective is to increase the resilience of Costa Rica to the effects of climate change, through the application of adaptation actions, based on communities and ecosystems.

National Program for Sustainable Production and Consumption. Seeks to increase the adoption of sustainable production and consumption patterns in Costa Rican society to promote business competitiveness

and more sustainable lifestyles. Some of the management instruments are: voluntary agreements for cleaner production (AVP+L), environmental labelling of products, certification of organic production, Sanitary Quality Seal Program, ISO 14001 Certification, Institutional Environmental Management Programs (PGAI, by its acronym in Spanish) and the Ecological Blue Flag Program.

National Biodiversity Strategy (ENB2) 2016-25.[48] It contributes to the conservation, sustainable use and resilience of biodiversity. It has a platform that provides information on its indicators, objectives, managers and the progress of its goals.

National Strategy for the reduction of single-use plastics. Its objective is to guarantee sustainable management of the country's jurisdictional waters by reducing single-use plastics.

National programme to reduce GHG emissions. Its aim is to contribute to carbon neutrality through the efforts of the forestry sector and other key sectors such as public transport and agriculture. It also promotes the participation of local governments to mitigate climate change.

National electricity system meter programme. It increases the number of smart devices, in order to improve competitiveness of domestic firms.

National Action Plan for the Conservation and Management of Sharks in Costa Rica (PANT-CR).[49] This plan was prepared under the recommendations established in the International Plan of Action for the Conservation and Management of Sharks (PAI-Sharks), in accordance with the Technical Guidelines for FAO Responsible Fisheries (FAO, 2000[1]). Between 2019 and 2020, the first plan was updated and the second National Action Plan 2020-25 for the Conservation and Management of Sharks in Costa Rica (PANT-CR 2020) was prepared. It is made up of four programmes: the Investigation and Monitoring Programme (itself composed of three subprogrammes: Biological-fishing Research Subprogramme, Onboard Observer's Subprogramme, Catch and Effort Monitoring Subprogramme); the Traceability Programme; the Outreach, Education and Training Programme; and the Socioeconomic Studies Programme.

Nationally Appropriate Mitigation Actions (NAMA) Coffee.[50] Its objective is to reduce GHG emissions and improve efficiency in the use of resources at coffee plantations and mills.

NAMA Livestock.[51] This programme is in charge of the National Livestock Program of the Ministry of Agriculture and Livestock. This mechanism is the product of a public-private agreement for the transformation of the bovine livestock industry towards eco-competitiveness. It promotes the use of practices, technologies and measures aimed at the development of a climate-smart, profitable, productive and socially sustainable livestock industry.

Mandatory compliance

Fuel tax (Impuesto Único Sobre los Combustibles). Costa Rica has different taxes for each type of fuel.[52] These are initially paid by the national petroleum company (RECOPE, by its acronym in Spanish), though they may be passed on to the final consumers.

Law to combat plastic pollution and protect the environment N° 9786. This law aims to prevent the improper management of waste – especially plastic – from impacting human health and ecosystems, polluting water, soil, air and contributing to climate change.

Forestry Law N° 7575. It establishes, as an essential and priority function of the State, to ensure the conservation, protection and administration of natural forests and the production, use, industrialisation and promotion of the country's forest resources.

Law for the Integral Management of Waste N°8839. This legislation regulates the integral management of waste and the efficient use of resources, through the planning and execution of regulatory, operational, financial, administrative, educational, environmental aned healthy monitoring and evaluation actions.

European Union

Table A E.3. Policy instruments of the European Union

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies	Horizon Europe, European Recovery Fund, Cohesion Policy			European Green Deal
Rewards and incentives	InvestEU European Sustainability Award/European Social Innovation Competition Social Business Initiative/ Sustainable Finance Action Plan/Social Impact Accelerator (SIA)/Employment and Social Innovation (EaSI) guarantee instrument/European Fund for Strategic Investment (EFSI) equity instrument Social Challenges Innovation Platform	EU Health Programme	EU Prize for Women Innovators	Innovation Fund/LIFE programme/European Business Awards for the Environment (EBAE)
Government assistance	Due-diligence ready! Social Procurement Program		EU Action Plan 2017-19: Tackling the gender pay gap European Institute for Gender Equality	
Mandatory compliance	Non-financial disclosure	European Framework Directive on Safety and Health at Work (OSH Directive)	Directive on Gender Equality	European Union Emissions Trading System (EU ETS)

Policies addressing multiple types of SDGs

Strategies

The European Commission's **Horizon Europe**, the next research and innovation framework programme following Horizon 2020, will feature direct government support for firms. Launching in 2021, the five missions of the EUR 100 billion programme are: 1) adaptation to climate change including societal transformation; 2) cancer; 3) climate-neutral and smart cities; 4) healthy oceans, seas, coastal and inland waters; and 5) soil health and food.[53]

Several projects funded by the previous research and innovation framework (Horizon 2020) target specific SDGs. For example, the European Institute of Innovation and Technology (EIT)[54] founded eight Knowledge and Innovation Communities (KICs), each of which focus on a different societal challenge. Two of these are EIT Health, which targets *SDG 3-Good Health and Well-Being* and EIT Climate-KIC, which targets SDG 13 (Climate Action). EIT Health works with approximately 150 partner organisations to address urgent health challenges, providing resources for both established and young companies. Funding goes towards the development of innovative products and services, support for start-ups and entrepreneurs, and health and innovation education.[55] EIT Climate-KIC works to accelerate the transition to a zero-carbon and climate-resilient society. By creating networks and providing funds to stimulate innovation, EIT Climate-KIC generates synergies to tackle climate change.[56] Other examples of actions funded through Horizon 2020 include:

- the IMI 2 Joint Undertaking, which targets *SDG 3-Good Health and Well-Being* through collaborating to advance the development of medicines (budget of EUR 5.3 billion)

- the European Innovation Partnership on Smart Cities and Communities (EIP-SCC) Marketplace, which targets *SDG 11-Sustainable Cities and Communities* through facilitating Smart City solutions
- the Clean Sky 2 Joint Undertaking, which targets *SDG 13-Climate Action* through developing innovative technologies to cut aircraft carbon dioxide (CO_2) emissions.[57]

The European Union's main investment policy, the Cohesion Policy, invests in all regions and empowers local authorities to manage funds. Five main investment priorities are outlined in the **New Cohesion Policy**, which is launching in 2021. These priorities are: 1) a smarter Europe; 2) a greener, carbon free Europe; 3) a connected Europe; 4) a social Europe; and 5) a Europe closer to citizens.[58]

In addition, the European Commission, the European Parliament and EU leaders have agreed on a EUR 1.8 trillion **Recovery Plan for Europe**, which has not yet been formally adopted. This plan aims to repair the economic and social damage caused by the COVID-19 crisis, and relates to a number of SDGs through supporting and expanding existing programmes such as Horizon Europe or InvestEU, and by launching new initiatives such as the Recovery and Resilience Facility, and EU4Health (*SDG 3-Good Health and Well-Being*). Approximately one third of the plan's funds are designated for the fight against climate change (*SDG 13-Climate Action*), with other priorities including gender equality (*SDG 5-Gender Equality*) and biodiversity protection (*SDG 14-Life Below Water* and *SDG 15-Life on Land*).

Rewards and incentives

Launched in 2021, the **InvestEU** Programme aims to boost investment, innovation and job creation through EUR 650 billion of additional public and private investment between 2021 and 2027. The fund will support four main policy areas: sustainable infrastructure; research, innovation and digitisation; small and medium businesses; and social investment and skills. Support for these will be provided through actions such as removing obstacles to investment, providing visibility and technical assistance to investment projects and making smarter use of financial resources.[59]

Another European Commission programme of note is the **Social Business Initiative**,[60] which launched in 2011 with the aims of helping social businesses by improving access to finance, providing more visibility and optimising the legal environment.

In 2018, the European Commission launched its **Sustainable Finance Action Plan**, aiming to redirect capital flows towards a more sustainable economy. A notable achievement of this plan was the June 2020 announcement of a taxonomy of sustainable activities.

A related initiative is the European Investment Fund (EIF) **Social Impact Accelerator (SIA)** "fund of funds",[61] aiming to support social enterprises (i.e. a self-sustainable SME whose business model serves to achieve a social impact). The EIF also operates the **Employment and Social Innovation (EaSI) guarantee instrument**,[62] which provides guarantees and counter-guarantees to financial intermediaries to invest in microfinance and social entrepreneurship projects. The EaSI also includes measures to help financial intermediaries build capacity for impact investing.[63] The EIF also operates the **European Fund for Strategic Investment (EFSI) Equity Instrument**, which included an "impact-investing initiative" in 2020.

The European Commission hands out **European Sustainability Awards**, which recognise the efforts of individuals, businesses and organisations towards addressing the global SDGs with concrete solutions and opportunities. The awards aim to raise awareness of the SDGs in the European Union.[64]

A similar initiative is the **European Social Innovation Competition**,[65] a challenge that calls on Europeans to come up with solutions to some of society's biggest problems. Three yearly winners receive a prize of EUR 50 000, and a pool of 30 semi-finalists remain eligible for another prize the following year, which goes to the ongoing project achieving the highest impact.

The **Social Challenges Innovation Platform**[66] is an online community in which people and businesses can discuss social and environmental challenges they are facing, and brainstorm solutions with a wider body of European innovators, start-ups and SMEs.

Government assistance

The European Union has set out due-diligence guidance in several sectors to help businesses – particularly SMEs – implement sustainable principles and standards in their supply chains. **Due diligence ready!** is an online portal with information, training materials and events, designed to help companies conduct proper due diligence on their supply chain.[67]

The European Union has also set up a **social procurement programme** to facilitate the uptake of socially responsible criteria in public procurement across the European Union.[68]

Mandatory compliance

Directive 2014/95/EU of the European Commission requires companies with more than 500 employees to disclose non-financial information on the way they operate and manage social and environmental challenges. Since 2018, companies have been required to include non-financial statements in their annual reports, including information about policies implemented on environmental protection, social responsibility and treatment of employees, respect for human rights, anti-corruption and bribery, and diversity on company boards (age, gender, and educational and professional background).[69]

The European Commission is considering a law requiring businesses to carry out due diligence to prevent human rights violations and environmental harm throughout their supply chain and has plans to develop a legislative proposal by 2021.[70]

Policies addressing health, well-being and safety-related SDGs, notably SDGs 3 and 8

Rewards and incentives

The **EU Health Programme** provides grants to public, non-governmental and private-sector bodies, which focus on current health issues and co-operation between member states. With a budget of nearly EUR 450 million for 2014-20, the programme aims to improve the overall health of EU citizens, reduce health inequalities, encourage innovation and increase the sustainability of health systems.[71] In 2018, 21% of the programme's beneficiaries were private organisations (Annual Report 2018).

Mandatory compliance

The **European Framework Directive on Safety and Health at Work (OSH Directive)** guarantees minimum safety and health requirements at work throughout Europe, and allows member states to maintain or establish stricter measures.[72]

The European Agency for Safety and Health at Work (EU-OSHA) has also published "Coronavirus: EU guidance for a safe return to the workplace" which outlines guidance for firms to ensure that workers can return in a safe and healthy environment. There are guidelines in several areas including risk assessment and appropriate safety measures, managing workers who are or have been ill, planning and learning for the future, staying well informed and information for sectors and occupations.[73]

Policies addressing equity-related SDGs, notably SDG 5

Rewards and incentives

The **EU Prize for Women Innovators** is awarded to women entrepreneurs that successfully bring new innovations to the market. The winners are awarded a prize of EUR 100 000, with an additional EUR 50 000 awarded to a Rising Innovator aged 35 or younger.

Government assistance

The **European Institute for Gender Equality (EIGE)** is an autonomous body of the European Union mandated to increase gender equality, ensure gender mainstreaming in EU policies and increase awareness

of gender issues. The EIGE provides research and data that support evidence-based decision making, toolkits and training guides, and the development of best practices.[74]

The European Commission **EU Action Plan 2017-19: Tackling the gender pay gap** has 24 action points addressing root causes of the gender pay gap. The Commission has also adopted recommendations on strengthening wage transparency and work-life balance.[75]

Mandatory compliance

The European Union requires equal pay for equal work. Employers must follow equal pay without discrimination based on gender. **Directive 2006/54/EC** of the European Commission consolidates directives on gender equality in employment with the case law of the Court of Justice of the European Union and supports implementation.

Policies addressing environment-related SDGs, notably SDGs 7, 12, 13, 14 and 15

Strategies

The European Commission is implementing the **European Green Deal**, with the goal of being "climate neutral" – reducing emissions and compensating for those still produced – by 2050. The action plan includes investing in environmentally friendly technologies, supporting industry to innovate, using cleaner and cheaper forms of private and public transport, decarbonising the energy sector, ensuring buildings are more energy-efficient and working with international partners to improve global environmental standards.[76] A central component of the European Green Deal is the Circular Economy Action Plan,[77] which implements sustainability initiatives along the entire life cycle of products.

Rewards and incentives

The **Innovation Fund** is a large funding programme for innovative low-carbon technologies, funded by revenues from the EU Emissions Trading System (ETS) (discussed more below). The programme targets *SDG 7-Affordable and Clean Energy* and is tightly linked to *SDG 13-Climate Action*. Projects with innovative technologies or that have the potential for significant emission reductions, in energy-intensive industries, or those having to do with renewables, energy storage, and carbon capture, use and storage are funded.[78] The fund's budget for 2020-30 is projected to be around EUR 10 billion (or EUR 1 billion per year on average), and comes from of EU ETS allowances (the price of which fluctuates on the market, making the exact budget uncertain).

Created in 1992, the **LIFE programme** is a funding instrument for environment and climate action. With a budget of EUR 3.4 billion for 2014-20, the programme offers funding opportunities for private entities, public bodies and non-governmental organisations (NGOs), in several environmental and climate-related areas. The LIFE programme publishes "best projects" and grants the LIFE Awards, which recognise the most innovative, inspirational and effective LIFE projects in climate action, environment and nature protection.[79]

The **European Business Awards for the Environment (EBAE)** celebrate private-sector leadership, specifically in companies at the forefront of eco-innovation, or that have environmental consciousness at the core of their business. Companies can apply in six categories: 1) management (micro and small companies); 2) management (medium and large companies); 3) product and services; 4) process; 5) developing country co-operation; and 6) business and biodiversity.[80] This award covers actions related to SDGs 13, 14 and 15.

Mandatory compliance

The European Commission has a common emissions system for CO_2 emissions, the EU ETS. The **EU ETS** operates in all EU countries plus Iceland, Liechtenstein and Norway, and works on the cap-and-trade principle. The cap on GHG emissions is also being reduced over time, so that total emissions fall.[81] Under the European Green Deal, the European Commission plans to raise the ambition of emission reduction.

France

Table A E.4. Policy instruments of France

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies	Innovation Council/Innovation and Industry Fund Invest for the Future Programme (Programme d'investissements d'avenir)			
Rewards and incentives	Social Business Act	Innovation subsidies and VC		Innovation subsidies and VC
Government assistance	CSR Platform CSR support Mission-oriented company status			
Mandatory compliance	Extra-financial reporting Vigilance duty law	Health and safety requirements	Wage Equality Index Copé-Zimmerman Law	Circular Economy Act (Loi anti-gaspillage pour une économie circulaire) Climate and Resilience Act (Loi climat et résilience) Excise taxes on fuel

Policies addressing multiple types of SDGs

Strategies

The **Innovation Council** (Conseil de l'innovation)[82] is an expert committee composed of six qualified members (experts in their field) and six ministers, as well as representatives of the administration. It provides strategic advice on innovation policy to the Prime Minister's Office, and proposes directions for subsidies financed by the **Innovation and Industry Fund** (Fonds pour l'innovation et l'industrie).[83] This fund provides around EUR 250 million per year in subsidies. EUR 120 million of this is earmarked for five challenges determined by the Council,[84] three of which are directly related to SDGs: energy storage for transport, artificial intelligence (AI) in medical diagnosis and biomedicines.

The **Invest for the Future programme** (Programme d'investissements d'avenir) is a multi-year investment plan, designed to increase growth over the long term. Three programmes have been launched under the plan since 2010, totalling EUR 57 billion in funding, and placing an emphasis on sustainability (see below for some actions related to health and the environment). A fourth programme was announced in September 2020 amounting to EUR 20 billion, part of which will direct to the post-COVID-19 recovery plan.[85] Part of this programme aims at supporting specific strategies focused on high potential technologies in the fields of health, sustainable development, digital technologies and agro-industries. These strategies are produced on an inter-ministerial basis, in connection with ecosystems (e.g. companies, start-ups, public laboratories).

Rewards and incentives

The **Social Business Act** (Pacte de croissance de l'économie sociale et solidaire) enacts measures to improve the financing of social businesses[86] including dedicated public venture capital (VC) funds (Fonds d'innovation sociale [FISO]),[87] incentives for investors and tax and social contribution rebates for social businesses. Social business account for 14% of private employment and 10% of gross domestic product, and 80% are for not-for-profit organisations, according to the French definition of social business.

Government assistance

CSR Platform (Plateforme RSE).[88] Under the umbrella of France Stratégie, a think tank linked to the Prime Minister's Office, this platform brings together trade unions, firms and NGOs to provide recommendations and advice on corporate social responsibility (CSR) to government and businesses.

CSR support. BPI France, a public sector development bank, provides support to SMEs willing to introduce a CSR dimension into their business.[89] It also provides training and consulting services.

In 2019 (Plan d'action pour la croissance et la transformation des entreprises [PACTE] Law),[90] France gave firms the option to include a "raison d'être" (non-financial objective) in their articles of incorporation, and to adopt a new legal status of "**mission-oriented company**" ("*entreprise à mission*"). Similar to "benefit corporations" in the United States (a type of non-profit corporate entity), mission-oriented companies must have a "raison d'être" and the actions taken in this regard are steered by a dedicated body, on which workers are represented. Mission-oriented companies do not benefit from any kind of preferential treatment (e.g. special tax provisions). Despite being recent, a significant number of large firms have adopted this new status (e.g. Danone,[91] MAIF [insurer], Camif [retail sale of furniture]) or are considering doing so, and some smaller firms are also embracing it (e.g. Faguo[92] [fashion]). The PACTE Law's evaluation committee is collecting quantitative data on these "mission-oriented" companies, which should be available before the end of 2021.[93]

Mandatory compliance

Various laws and decrees enacted since 2001 mandate an "**extra-financial reporting**" duty for firms.[94] Those with more than 500 employees, or which fall above combined thresholds for turnover and balance sheet size, have to report on 44 items pertaining to social, environmental and sustainability issues. This reporting follows a "comply or explain" principle; if some indicators are missing or are irrelevant for operations, firms have to provide an explanation as to why. Reports must cover subsidiaries and be certified by a third party.

France has enacted a **"vigilance duty" law** (Loi n° 2017-399 relative au devoir de vigilance des sociétés mères et des entreprises donneuses d'ordre). Large enterprises (>5 000 employees in France or >10 000 worldwide) are required to publish, follow and evaluate a vigilance plan covering the company, its subsidiaries, suppliers and subcontractors. The plan and its implementation report must be included in the annual management report,[95] and covers issues of human rights, environmental protection and safety. The objective of the vigilance duty law is to extend the responsibility of the firm to operations abroad, including to actions of suppliers. A recent evaluation[96] concludes that the law has had a positive impact, by increasing firms' awareness on the impact of their operations abroad. However, this evaluation also calls for improvements to governmental reporting support and alignment with other reporting requirements.

Policies addressing health, well-being and safety-related SDGs, notably SDGs 3 and 8

Rewards and incentives

BPI France is responsible for the administration of **several innovation subsidies** on behalf of the state. Several of these focus on innovation in health, medicine, or well-being, as discussed below:

- The "World Innovation Challenge" (Concours mondial d'innovation)[97] is a selective innovation programme that supports "champions" with subsidies and equity investments (depending on the phases of the challenge). The challenge is structured around seven "ambitions", two of which relate to SDG 3 (Ambition 5 "Individualised medicine" and Ambition 6 "Silver economy"). The challenge provided approximately EUR 300 million in funding during the 2017-19 period.[98]
- Other small-scale programmes include subsidies for the development of medical devices based on AI,[99] and for investment in flexible production facilities that can produce COVID-19 drugs, if needed.[100]

- Several VC funds are operated by BPI France, including:
  - The Fonds accélération biotech santé, which is funded by the Invest for the Future programme. Its objective is to finance spin-offs from public research in health and biotechnologies.[101]
  - The InnoBio fund, which is invested in by BPI France as well as main pharmaceutical companies operating in France. It funds start-ups in the biotech, medtech or diagnosis industries.
  - The innovative biotherapies and rare illnesses (Biothérapies innovantes et maladies rares) fund, which invests in new ventures to develop therapies for rare illnesses and discover new applications for more common pathologies.

Mandatory compliance

French law mandates that employers must ensure the **health and safety of workers** through prevention, information and training. Employers must also assess the occupational risks in workplaces, which are recorded in official documentation. Employers must provide (or be affiliated to) an occupational health service for employees.

Policies addressing equity-related SDGs, notably SDG 5

Mandatory compliance

Firms with more than 50 employees have to compute a **Wage Equality Index** on an annual basis and publish it on their website. The indicator also has to be communicated to the firm's Social and Economic Committee, on which trade unions are represented, and to Labour Inspection Services. Data are centralised by the Ministry for Labour and available online for firms with more than 1 000 employees.[102] The index is based on five indicators: the gender wage gap, the gender gap in pay rises, the gender gap in promotions (only for firms with more than 250 employees), the number of pay rises for women returning from maternity leave, and the gender balance of workers making the highest ten wages. If the total score awarded is less than 75 (on a 100 point scale), the firm has to take corrective measures to reach 75 within three years. If it does not, the firm is fined up to 1% of its wage costs.[103]

The **Copé-Zimmerman Law**, enacted in 2011, requires boards of directors have gender balance, with at least 40% of their members being women and at least 40% being men.[104] The PACTE Law recently increased the sanctions in case of breach, and introduced a new requirement for management boards that at least one candidate from each gender must be considered at each step of the recruitment process.[105]

Policies addressing environment-related SDGs, notably SDGs 7, 12, 13, 14 and 15

Rewards and incentives

The **Innovation Challenge (iNov)**, financed by the Invest for the Future programme and jointly run by Ademe (Agency for Ecological Transition), funds SME R&D and innovation projects (EUR 80 million per year). Four of the nine calls for projects in 2020 were related to the environment, having to do with the circular economy, environmental performance of the built environment, adaptation to climate change and hydrogen.

Ademe also runs other aspects of the **Invest for the Future programme** related to the environment, such as demonstrations and pilot solutions for the energy transition, green transport and mobility.[106] The **Ecotechnologies fund**, operated by Ademe as well as BPI France, is a EUR 150 million VC fund that targets innovative SMEs in the following sectors: renewable energy and green chemistry, circular economy, smart grids and vehicles of the future.

Mandatory compliance

The **Circular Economy Act** (Loi anti-gaspillage pour une économie circulaire),[107] passed in 2020, lays the ground for a more circular economy. For instance, it aims to end single-use plastic packaging by 2040 through a gradual ban (e.g. the manufacture and import of single-use plastic bags have been prohibited since 1 January 2021), increase recycling, reduce waste and at tackle planned obsolescence (i.e. deliberately ensuring that a version of a product will expire or become obsolete in a given time frame).

The **Climate and Resilience Act** (Loi climat et résilience),[108] inspired by the Citizen's Convention for Climate (Convention citoyenne pour le climat), was voted by the Parliament in July 2021. Many of the policy instruments belong to the mandatory compliance category (e.g. regulation of advertising for carbon-intensive products such as fossil fuels, a CO_2 score for products).

France levies an **excise tax on fuel** used for transport and heating (TICPE), with some sectoral exemptions. There are similar taxes on natural gas (TICGN) and coal (TICC).

Germany

Table A E.5. Policy instruments of Germany

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies	High-Tech Strategy 2025			Climate Action Programme 2030
Rewards and incentives	Innovation for SMEs (KMU-Innovativ)/Central Innovation Programme for Medium-sized Companies (ZIM)	COVID-19 special programme		International Climate Initiative (IKI) National Decarbonisation Programme Programme on CO_2 avoidance and use in primary industries Carbon contracts for difference Hydrogen for Climate Action IPCEI 7th energy research programme Research for Sustainability (FONA) Federal support for energy efficiency in the economy Kreditanstalt für Wiederaufbau (KfW)
Government assistance	German Council for Sustainable Development (RNE)/Regional Hubs for Sustainability Strategies (RENN)/Hub for Sustainable Finance (H4SF)		National Agency for Women Start-ups Activities and Services (BGA)	Energy Consulting for SMEs Energy Efficiency Networks
Mandatory compliance	CSR Directive Implementation Act/ Sustainability Code (DNK) The German Act on Corporate Due Diligence in Supply Chains (Sorgfaltspflichtengesetz)	Act on the Implementation of Measures of Occupational Safety and Health to Encourage Improvements in the Safety and Health Protection of Workers at Work	Act on Equal Participation of Women and Men in Leadership Positions in the Private and Public Sectors Transparency in Wage Structures Act Executive Board Requirements (under consideration)	Fuel Emissions Trading Act (BEHG) and EU ETS Energy tax

Policies addressing multiple types of SDGs

Strategies

The **High-Tech Strategy 2025** aims to leverage research and innovation to shape the future of Germany. The strategy includes firms as well as other organisations and stakeholders. It is organised around 12 “missions”, nine of which relate to the SDGs: two to health, six to the environment, and one to working conditions.

Rewards and incentives

Innovation for SMEs (KMU-innovativ), an initiative from Germany’s Federal Ministry of Education and Research, provides funding to support research in German SMEs. Since 2007, EUR 1.3 billion has been granted to 1 700 projects. Firms are able to apply and gain access to other services within a single platform. Areas of focus relevant to the SDGs include medical technology, resource efficiency and climate protection, among others.[109]

The Federal Ministry for Economic Affairs and Energy (BMWi) created the **Central Innovation Programme for Medium-sized Companies** (Zentrales Innovationsprogramm Mittelstand) **(ZIM)**, Germany's largest innovation programme for SMEs (EUR 559 million in 2019).[110] The programme funds innovative SMEs with business operations in Germany that want to develop or improve new products, processes or technical services. Firms within all sectors and fields of technology are eligible, provided that their projects are highly innovative, market-oriented and entail a substantial technological risk. Thousands of new projects are launched every year, including many relevant to the SDGs, such as recycling solar panels and sustainable agriculture.[111]

Government assistance

The **Hub for Sustainable Finance (H4SF)** is an open network comprised of financial market players and other relevant stakeholders working on solutions for mainstreaming sustainable finance in Germany. Established in 2017 by the German Council for Sustainable Development (RNE) and the Deutsche Börse Group, this resource allows firms to share experiences, and provides recommendations for policy and best practices.[112]

The **Regional Hubs for Sustainability Strategies (RENN)** are four regional networks of the RNE. They promote knowledge sharing and networking among firms and other stakeholders, with the aim of facilitating integration of environmental and societal concerns into business practices.[113]

Mandatory compliance

Directive 2014/95/EU of the European Commission requires companies with more than 500 employees to disclose non-financial information on the way they operate and manage social and environmental challenges.[114] On the basis of that EU Directive, Germany passed the **CSR Directive Implementation Act** in 2017, which requires some large companies (depending on their legal status), financial institutions and insurance companies to publish non-financial reports. The RNE developed a Sustainability Code (DNK) as a standard for disclosing the relevant information. The DNK is an internationally applicable reporting standard for topics related to sustainability and can be followed to ensure compliance with the CSR Directive Implementation Act.[115]

The Federal Ministry for Labour and Social Affairs and the Federal Ministry for Economic Cooperation and Development are drafting a **Due Diligence Act (Sorgfaltspflichtengesetz)**, a binding law to ensure corporate compliance with human rights and environmental standards.[116] The current National Action Plan encourages companies to voluntarily declare whether and to what extent they are committed to human rights and environmental actions within their supply chains.[117]

Policies addressing health, well-being and safety-related SDGs, notably SDGs 3 and 8

Rewards and incentives

The Federal Ministry of Education and Research (BMBF) put in place a **special programme** to fund the development of vaccines for SARS-Cov-2 (the virus that causes COVID-19). Firms are eligible to receive subsidies from a fund of EUR 750 million.[118]

Mandatory compliance

Germany's Act on the Implementation of Measures of Occupational Safety and Health to Encourage Improvements in the Safety and Health Protection of Workers at Work mandates measures that firms must take to prevent accidents at work and other occupational health risks. Regulations include ensuring decent working conditions and emphasises a preventive approach. Coverage extends to employees in the public and private sectors.[119]

Policies addressing equity-related SDGs, notably SDG 5

Government assistance

The **National Agency for Women Start-ups Activities and Services (BGA)**, sponsored by the Federal Ministry for Education and Research; the Federal Ministry for Family, Senior Citizens, Women and Youth;

and the Federal Ministry of Economy and Technology, offers information and services to women entrepreneurs in all phases of company foundation, consolidation and succession. Alongside information sharing and – in some cases – direct financial support, BGA offers several advisory services including a database of experts who can provide mentorship, support programmes and a hotline for expert advice.[120]

Mandatory compliance

Under Germany's Basic Law, women and men are equal and the state must promote gender equality. The Gender Equality Policy ensures equal pay for equal work and promotes pay transparency and women's equal access to leadership positions. Enacted in 2017, the **Transparency in Wage Structures Act** provides a clear legal basis for the principle of equal pay. Employees are entitled to information on wages, and firms must file reports on gender equality and are required to conduct internal pay reviews.[121]

The **Act on Equal Participation of Women and Men in Leadership Positions in the Private and Public Sectors**, enacted in 2016, requires large companies to reserve at least 50% of new board seats for women and (increased from 30%, in 2018). Medium-sized companies are required to set their own gender-balance requirements to increase the proportion of women in management, on supervisory boards and on boards of directors.[122]

Germany is currently considering a draft law, still to be voted on by the Bundestag (at the time of publication), which would require public companies to have at least one woman and one man on the executive board.

Policies addressing environment-related SDGs, notably SDGs 7, 12, 13, 14 and 15

Strategies

The **Climate Action Programme 2030** outlines Germany's target to cut GHG emissions by 55% of the 1990 level. The programme consists of several concrete steps including rewards for climate-friendly actions, pricing on CO_2 emissions in the transport and heating sectors, phasing out coal-fired power stations, increased R&D investment and the National Decarbonisation Programme.[123] This is supplemented with a National Hydrogen Strategy.[124]

Rewards and incentives

The **International Climate Initiative (IKI)** finances climate action in developing, emerging and transitioning countries through funding provided to Germany-based NGOs, business enterprises, universities and research institutes, among others (EUR 3.9 billion over 2008-19).[125] Areas of focus for project funding include mitigating GHG emissions, conserving natural carbon sinks (with a focus on Reducing Emissions from Deforestation and Forest Degradation [REDD+]), conserving biological diversity and adapting to the impacts of climate change.[126]

The **National Decarbonisation Programme**, part of the Climate Action Programme 2030, supports green technology development, demonstration and deployment via grants (EUR 2 billion over 2021-24). It aims to reduce process-related emissions and fossil fuel combustion in "hard-to-abate" sectors.

The **programme on CO_2 avoidance and use in primary industries** (Programm CO_2-Vermeidung und -Nutzung in Grundstoff-Industrien) (EUR 0.5 billion over 2021-25), which is also part of the Climate Action Programme 2030,[127] aims to further increase the technological readiness level of CO_2 capture, storage and utilisation (carbon capture and storage and carbon capture and utilisation) techniques in basic industries. This involves the entire value chain covering CO_2 capture, transport and storage.

A pilot programme for **Carbon Contracts for Difference**, focusing on the steel and chemical industries, is planned as part of the National Hydrogen Strategy published in June 2020 (EUR 0.5 billion for 2021-23). Companies engaging in low-carbon industrial production can sign a contract with the government, which provides insurance against carbon price fluctuations around a reference price (the strike price). If the

carbon price is lower than the strike price, the difference will be covered by the government. If the carbon price is higher than the strike price, companies must pay the difference.

As part of the National Hydrogen Strategy and within the context of the **Hydrogen for Climate Action** Important Project of Common European Interest (IPCEI),[128] the German government plans to fund the use of hydrogen in industry as well as the development and production of fuel cell systems (EUR 1.5 billion for the period 2021-26).[129]

In 2018, the BMWi published the **seventh energy research programme** under the heading "Innovations for the Energy Transition" (EUR 4.2 billion for project funding for the period 2018-22).

The BMBF developed an SDG-based strategy for **Research for Sustainability** (Forschung für Nachhaltigkeit) **(FONA)** in 2005. The fourth Framework Programme (FONA4) will be effective from 2020 to 2024 and has a total budget of EUR 4 billion. The calls for projects specifically target those having to do with green hydrogen, the circular economy, climate protection and the bioeconomy.

The **federal support for energy efficiency in the economy** (EUR 300 million in 2020) provides grants and loans in four areas: cross-cutting technologies (e.g. electric motors, pumps, fans), process heat from renewable energies, sensor technology and energy management software, and energy-related optimisation of plants and processes. The programme also makes use of a competitive tender, aiming to finance projects with the best cost efficiency (EUR 35 million in 2020).

Smaller programmes also target material efficiency and circularity. Examples include:

- **Technology Transfer Programme Lightweight Construction (TTP LB)**, EUR 60 million in 2020
- **Resource-efficient Circular Economy** (Ressourceneffiziente Kreislaufwirtschaft), EUR 150 million for 2018-23.

The **Kreditanstalt für Wiederaufbau (KfW)** is the German promotional bank. It provided EUR 77 billion of funds in 2019, of which 38% was linked to climate and environmental protection.[130] The KfW finances energy-efficiency investments of SMEs through preferential loans and the development of renewable energies.[131] It also contributes to the SDGs abroad, with EUR 8.8 billion invested in 2019 for the promotion of development and environmental actions in partner countries, via its KfW Development Bank subsidiary.[132]

Government assistance

SMEs are offered the support of qualified energy consulting within the framework of the BMWi programme **Energy Consulting for SMEs**. Consultants audit firms to identify potential strategies for energy savings and create proposals for energy-efficiency measures. The maximum funding amount per audit is EUR 6 000.

Energy Efficiency Networks (EEN) are networks of similar companies that set common energy efficiency and CO_2 reduction targets, designed to allow firms to learn from each other. After a successful pilot phase of the EEN concept in 2014, the German government implemented EEN as a main pillar of the National Energy Efficiency Action Plan (NAPE). There were 282 active networks in 2020. Companies participating in a network must conduct an energy audit and set an energy savings target.

Mandatory compliance

From 2021, a **national emission trading system for the built environment and transport** will be introduced in Germany based on the Fuel Emissions Trading Act (BEHG) and as part of the Climate Action Programme 2030. The measure will be complementary to the EU ETS.[133]

An **energy tax** applies to oil products, natural gas and coal and coke products, at rates differing according to whether the product is used as a transport fuel or for heating and process purposes.[134]

Japan

Table A E.6. Policy instruments of Japan

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies	Society 5.0 SDGs Implementation Guiding Principles			Carbon neutrality objective and initiatives Environment Innovation Strategy
Rewards and incentives	Japan SDGs Action Platform and Japan SDGs Award Subsidies for Monodzukuri	Innovation subsidies	Eruboshi firms Nadeshiko Brands The Best 100 Companies Engaged in Diversity Management	Green public procurement J-Credit Scheme International deployment of low-carbon and decarbonising technologies through the Joint Credit Mechanism (JCM) Loan Insurance for Green Innovation Promotion of international open innovation in the field of clean energy Innovation for the development of and conversion to plastic substitutes Safety restart of nuclear power plants and promotion of nuclear innovations Contribution to the realisation of "new daily life"
Government assistance	Promoting environment, social and governance (ESG) investment The Guide for SDG Business Management Matching seeds to needs STI for SDGs Platform The Japan International Cooperation Agency's (JICA) programmes to support sustainable business Support for Overseas Expansion of SMEs by the Japan External Trade Organization JETRO) Tripartite partnership agreement by the Japan External Trade Organization (JETRO), the Japan International Cooperation Agency (JICA) and the United Nations Development Programme (UNDP)	Overseas Expansion of the Healthcare Industry Assisting firms to develop water infrastructure overseas	Assistance for women's employment Demonstration Programs of Support Service for Working Women	Promoting disclosure of the climate-related information based on the Task Force on Climate-related Financial Disclosures (TCFD) The Promotion of Green Infrastructure Support for the development of environmentally friendly public transportation systems Project to Promote the Advanced Utilisation of Recyclable Resources as part of Strengthening the Integration of the Recycling System Promotion of the Cleaner Energy Future Initiative for ASEAN (CEFIA) for the Association of Southeast Asian Nations (ASEAN) Provision of business continuity planning guidelines

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
	Support for Overseas Expansion of SMEs by JETRO JETRO, JICA and UNDP tripartite partnership agreement to promote SDGs through successful business in Africa Support for starting a new business - The project-based "Regulatory Sandbox" system - J-Startup Support for feasibility studies (F/S) and capacity building for quality infrastructure development Achievement of "Connected Industries" Kansai SDGs Platform			
Mandatory compliance		Health and safety requirements (Labour Standards Act, Industrial Safety and Health Act)	Equal pay policies	

Policies addressing multiple types of SDGs

Strategies

Society 5.0.[135] Society 5.0 is defined as "[a] human-centred society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space." The concept envisions a sustainable, inclusive socio-economic system, powered by digital technologies such as big data analytics, AI, the Internet of Things and robotics.

SDGs Implementation Guiding Principles.[136] This tool, under the responsibility of the SDGs Promotion Headquarters of the Government of Japan, lays out the expected actions by local governments in advancing the SDGs. It includes: 1) co-operation with stakeholders both in Japan and overseas; and 2) a registration/ certification system for local business in order to create an Autonomous Virtuous Circle through "SDGs for Regional Revitalisation Finance." Currently, many regions of Japan are facing issues such as population decline and shrinking regional economies. The initiatives of local governments to achieve the SDGs should contribute to the resolution of these regional challenges.

Rewards and incentives

Japan SDGs Award. Under the Japan SDGs Action Platform, the Government of Japan established the Japan SDGs Award in 2017. The goal of the award is to promote a wide range of actions aimed at sustainable development. Companies, local governments and NGOs/non-profit organisations (NPOs) are eligible to apply. Although there is no prize money, winning organisations benefit from the recognition of their sustainability efforts by a wider audience, and can leverage a broad range of governmental communication channels.

The **Subsidy Program for Monodzukuri, Commerce and Services** (JPY 1.04 billion for FY2021). This programme supports capital investment for innovative service development, prototype development, and improvement of production processes that SMEs and small businesses are working on.

Government assistance

Promoting ESG investment. In 2016, the Japan Ministry of Economy, Trade and Industry (METI) formulated guidance for integrated corporate disclosure and company-investor dialogue. For the objective is to foster the creation of collaborative value, to encourage ESG integration into investment policy and to promote non-financial information disclosure. Furthermore, METI published a report and advocated a new concept, "sustainability transformation", which integrates corporate sustainability (sustainability of corporate business models) and social sustainability (future vision for and sustainability of society).

SDG Management guidelines/toolkit. METI published the Guide for SDG Business Management in 2019 to promote the integration of SDGs into the management strategies of Japanese companies. These guidelines explain the SDG framework to companies and investors, and outline how companies can integrate SDGs into their business management.

Matching seeds to needs:

- As part of Japan's Society 5.0, the STI for SDGs Platform aims to connect Japan's solutions (seeds) with global SDGs issues (needs). The platform seeks to connect Japan's accumulated knowledge in the realm of science, technology and innovation with needs in other countries (e.g. introduction of an advanced Japanese refrigeration system for improving the cold chain of the fishery industry in another country). The platform also highlights Japanese firms' SDG actions in foreign countries, and advertises firms' advanced technologies (seeds) to foreign firms and governments.
- Moreover, to improve the matching between seeds and needs, the Japan International Cooperation Agency (JICA) provides Japanese firms, particularly SMEs, with various programmes to support sustainable business[137] in partner countries, such as survey and analysis of foreign needs, feasibility studies (F/S) of technologies and products, and know-how to develop a business model or a proposal.

Support for Overseas Expansion of SMEs by the Japan External Trade Organization (JETRO). It utilises both local and foreign networks and partnerships with foreign companies, JETRO supports Japanese SMEs' and start-ups' overseas development. A variety of support tools are provided according to situation and needs of Japanese companies including offering information about foreign countries business environment, setting booths in exhibits and opportunities to talk with foreign companies followed by after-sales support. These supports are conducted both in-person and online seamlessly. This scheme is related to SDGs 8 and 17. By supporting SMEs, JETRO contributes to the revitalisation of Japan's regional economy, which is suffering from declining population and employment.

JETRO, JICA and the United Nations Development Programme (UNDP). These three entities signed a tripartite partnership agreement to promote SDGs through successful business in Africa. The three signatories have started to offer a platform to respond to the needs of Japanese companies, including SMEs, and to provide seamless support for various business activities ranging from the exploration of business opportunities to the expansion of business, by combining their existing support schemes and networks. The tripartite agreement will contribute to the economic and social development of Africa through support for Japanese companies to expand their operations in Africa. The Japanese government has high expectations for overseas markets amid the changing domestic market environment.

The project-based Regulatory Sandbox system. The Regulatory Sandbox system creates an environment where innovative technologies and business models can be demonstrated without the restrictions of existing regulations while making sure the participants and periods are limited, all to enable data collection for swift validation and regulatory reform. This initiative helps firms contribute to SDG 9.

J-Startup. Start-ups are selected based on their originality, growth potential and mission, in the fields of deep tech, platforms, and SDGs. J-Startup is an initiative to rally public and private resources to support selected start-ups that have a high growth potential. It provides useful information, networking opportunities to the selected start-ups.

Support for F/S and capacity building for quality infrastructure development (JPY 1.74 billion for FY2021). METI supports F/S for overseas infrastructure development projects with priority on digital transformation and carbon neutrality, in accordance with the "Infrastructure System Overseas Promotion Strategy 2025" formulated in December 2020. METI also supports capacity building for local human resources engaged in infrastructure development, utilising remote learning due to the COVID-19 pandemic.

Achievement of Connected Industries. METI aims to achieve Connected Industries that will create new value added and find solutions to various problems in society through connectedness of various facets of modern life, including humans (including our roles as consumers and suppliers), machines, systems, companies.

Kansai SDGs Platform. In response to the 2030 Agenda for Sustainable Development, the Kansai SDGs Platform was established as a body designed to bring together a wide range of stakeholders from the Kansai region, including the private sector, civil society, NPOs, NGOs, universities and research institutions, local administration and government agencies (Secretariats: JICA Kansai, METI-Kansai, Union of Kansai Governments). More than 1 100 organisations are participating in the platform as of January 2021.The Platform has two major objectives: 1) widely publicise the concept of SDGs as well as the importance of the SDGs for the private sector, civil society, NPO/NGOs, universities and research institutions, local administration and government agencies, and the people in the Kansai region; and 2) foster networking and collaboration among all stakeholders in order to accelerate activities in the Kansai region that aim to build a sustainable society and economic activities that generate high social benefits. Many activities related to SDGs are ongoing through events and subcommittees.

Policies addressing health, well-being and safety-related SDGs, notably SDGs 3 and 8

Rewards and incentives

Innovation subsidies. The Government of Japan, across ministries, provides various kinds of grants and subsidies for medical and pharmaceutical R&D, such as CiCLE[138] (JPY 55 billion for the period 2017-27, led by AMED). These grants are handed out to public research institutions, the private sector and universities. The government aims to put Japan at the forefront of medical technologies and services, and to improve the quality of medical care in other countries.

Government assistance

Overseas Expansion of the Healthcare Industry (JPY 410 million for FY2021). In order to contribute to solving healthcare issues in emerging countries, METI supports the overseas commercialisation of medical or elderly care and healthcare services by Japanese hospitals and companies.

Assistance to firms to develop water infrastructure overseas. METI promotes the following initiatives by providing assistance to firms that develop and expand water infrastructure projects abroad:

- Support the introduction of Japan's high-quality facilities of water infrastructure through F/S, public-private missions, policy dialogues with partner countries, and invitation of senior officials.
- Support project formulation utilising assets of local governments in Japan such as their know-how and strong ties with local governments in partner countries.
- Strengthen co-operation with public-private platforms.
- Upgrade and improve procurement systems for infrastructure in each country through an institutional and cross-sectoral approach.

Mandatory compliance

Labour Standards Act and Industrial Safety and Health Act. Enacted on 7 April 1947, the **Labour Standards Act** governs health and safety requirements, wages, working hours, industrial accident regulations, and the prohibition of child labour. The **Industrial Safety and Health Act**, in conjunction with the Labour Standards Act, promotes the safety and health of workers.

Policies addressing equity-related SDGs, notably SDG 5

Rewards and incentives

"Eruboshi" firms. Based on the **Act on Promotion of Female Participation and Career Advancement in the Workplace**, the Ministry of Health, Labour and Welfare encourages firms to be certified as eruboshi[139] (proactive in the promotion of women's participation in the workplace). The certification requires submitting information on gender balance at the firm level. Eruboshi firms benefit from practical advantages, such as priority in public procurement, as well as reputational advantages in recruitment and in doing business.

"**Nadeshiko Brands**". METI and the Tokyo Stock Exchange jointly launched Nadeshiko Brands consisting of selected listed companies that actively promote participation of women on boards and in other important positions. Companies are evaluated on efforts for diversity management and disclosure. Nadeshiko Brands (firms encouraging women's success in the workplace) labels provide a positive signal for potential investors.

The Best 100 Companies Engaged in Diversity Management. METI grants ministerial awards to outstanding companies that achieve innovation and enhanced productivity through diversity in their labour force. Moreover, among awarded companies, Prime Companies are those that exceed a threshold of female executive share and fulfil other prerequisites regarding diversity promotion.

Government assistance

Assistance for women's employment. The Government of Japan continuously provides assistance and mentorship for women's employment and reemployment. Initiatives and programmes, including seminars, job trainings and assistance for job applications, exist at all levels of government, including the Ministry of Health, Labour and Welfare.[140]

Demonstration Programmes of Support Service for Working Women. METI subsidises demonstration programmes provided by a consortium of "femtech" suppliers, employers, medical institutions and local governments, to help female employees reconcile their career and life events such as pregnancy. It aims to contribute to enhancing women's well-being as well as increase diversity in the workplace.

Mandatory compliance

Equal pay policies. The **Labour Standards Act** requires equal pay for equal work across genders. Employers must ensure equal pay without discrimination based on the type of employment contract. In addition, the Act on Improvement of Employment Management for Part-Time Workers was revised to prohibit unreasonable treatment gaps between part-time or fixed-term workers and regular employees in the same company. This revision entered into force in April 2020 and is effective from April 2021 onwards for SMEs. Although this law is not directly linked to gender equality, given the high share of women among non-regular workers, it aims to also contribute to reducing the gender pay gap.

Policies addressing environment-related SDGs, notably SDGs 7, 12, 13, 14 and 15

Strategy

Carbon neutrality objective and initiatives. In 2020, the Prime Minister of Japan set the goal of carbon neutrality at the national level by 2050. In addition, at the regional and local government levels, the Ministry of the Environment co-ordinates the "2050 Zero Carbon Cities in Japan" initiative,[141] under which 163 local governments (as of 20 October 2020) including Tokyo, Kyoto, and Yokohama announced their commitment to net-zero carbon emissions by 2050. These local governments already represent 58% of Japan's population, and the list of participants is expanding. This initiative involves many stakeholders, including local firms. It aims to increase firms' awareness of climate action and encourage their contributions to the goal by providing a long-term objective to plan and finance sustainability investment.

Environment Innovation Strategy. The Government of Japan provides various subsidies and research grants under the Environment Innovation Strategy[142] (JPY 289 billion for FY2020) across many sectors for green innovation, such as renewable energies and decarbonisation technologies:

- Renewable energy as the main power source. The aim is to make renewable energy the main power source by improving the productive and cost efficiency of photovoltaic systems with innovative materials and structures.
- Promotion of energy efficiency. METI supports the installation of advanced energy-efficient technologies in factories and buildings. The total budget of "Renewable energy as the main power source" and "Promotion of energy efficiency" is JPY 210.5 billion for FY2021.
- Accelerating the realisation of a hydrogen society (JPY 74.4 billion for FY2021). METI supports the construction of a consistent supply chain for hydrogen production, transportation/storage, and utilisation.
- Development of Technology and Assessment Techniques for Next-Generation Refrigerants with a Low Global Warming Potential (JPY 650 million for FY2021). The goal of this project is to set up a development infrastructure for green and other next-generation refrigerants as well as for equipment using these refrigerants. The project involves R&D aimed at establishing safety and risk assessment methods for refrigerants and the corresponding equipment, in particular household air conditioning devices. This project also aims at the diffusion of next-generation refrigerants and the corresponding refrigeration/air conditioning equipment.
- Research, Development and Demonstration Project for Carbon Capture Usage and Storage (CCUS) (JPY 6.03 billion for FY2021). Japan is implementing large-scale CCUS demonstration projects. In November 2019, the initial target of 300 000 tonnes of carbon injection was achieved, and the domestic CCUS technology was widely used. A number of R&D projects have been carried out for cost reductions and safety improvements, evaluations of environmental impacts due to the CO_2 capture process, and geological surveys to identify potential CO_2 offshore storage sites in Japan.
- Promotion of CCUS/Carbon Recycling (JPY 45.3 billion for FY2021). This scheme provides R&D to develop a special type of concrete that absorbs CO_2 (developing technologies to produce reinforced concrete products and reduce its cost). Depending on the product application, the support aims to have the new product be the same cost as the conventional product by 2030.

Rewards and incentives

Green public procurement.[143] The Ministry of Environment has led the green public procurement initiative since 2002. All governmental organisations are required by law to prepare green procurement policies.

J-Credit Scheme. The Government of Japan runs the J-Credit Scheme[144] to certify GHG emissions reductions through energy-saving investments, and provide compensation for land use change. Launched in 2016, the scheme is voluntary. Firms can easily advertise the amount of J-credits they obtained on their website and on their sustainability report.

International deployment of low-carbon and decarbonising technologies through the Joint Credit Mechanism (JCM). Implementation of F/S and demonstration projects in order to utilise the JCM. The JCM introduces low-carbon or decarbonising technologies to developing countries, quantitatively evaluates Japan's contribution to GHG emission reductions or capture and deduct it from Japan's emission reduction target.

Loan Insurance for Green Innovation. The Nippon Export and Investment Insurance, a government-owned insurance company, has launched Loan Insurance for Green Innovation in 2019 with an increased commercial risk coverage rate of 97.5%. Loans to projects in the field of environmental protection/climate change prevention are eligible for this insurance.

Promotion of international open innovation in the field of clean energy (JPY 12.46 billion for FY2021). METI launched a funding programme for Japanese research institutions, including consortia of private companies, to fund the joint R&D with foreign research institutions in the field of clean energy. Taking into

account the trend towards digitalisation in energy and smart city development, METI provides support through capacity building programmes, and promotes international demonstration projects and standardisation of Japan's advanced technologies and systems including renewable energy grid stabilisation, mobility (e.g. Mobility as a Service), energy management (e.g. storage batteries), and hydrogen.

Innovation for the development of and conversion to plastic substitutes (JPY 1.2 billion for FY2021). In order to solve the problem of marine plastic litter, METI supports the development of and conversion to plastic substitutes and encourages innovation in technologies and consumer lifestyles.

Safety restart of nuclear power plants and promotion of nuclear innovations (JPY 131.4 billion for FY2021). This project has three main areas. First, development of innovative nuclear reactors such as fast reactors and small modular reactors through co-operation with France and the United States. Second, strengthening of industrial foundations through support to essential suppliers of the sustainable nuclear industry. Third, steady support of nuclear host municipalities (development of regional resources considered with situations of host municipalities).

Contribution to the realisation of "new daily life" (JPY 114.6 billion for FY2021). This project supports the implementation of a small-scale, self-sustaining power system network (regional microgrid) that contributes to regional decentralisation and true local power production for local consumption (several dozen locations nationwide). It demonstrates control technology for utilising regional distributed power sources such as storage batteries for supply and demand adjustment of a wider regional grid.

Government assistance

Promoting disclosure of the climate-related information based on the Task Force on Climate-related Financial Disclosures (TCFD). The Government of Japan supports the use and further advancement of the framework led by the TCFD, which was set up by the Financial Stability Board (FSB), to promote disclosure of climate-related risks and opportunities for companies and investors. Japan launched the TCFD Summit in 2019 to raise awareness and to facilitate discussions of climate-related disclosure both in Japan and the world. It was followed by a second Summit in October 2020.

Promotion of Green Infrastructure. Green Infrastructure (GI) is defined as "sustainable and attractive community building, using the diverse functions of the natural environment in both a tangible and intangible aspect of the infrastructure and land use". In March 2020, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) launched the Green Infrastructure Public-Private Partnership Platform, gathering multiple stakeholders such as national and local governments, private companies, research institutes, NPOs and private citizens. This Platform is promoting the concept of GI among society, including through research techniques and financial methods. In addition, MLIT provides financial and technical support to multiple stakeholders (e.g. local governments, private companies).

Support for the development of environmentally friendly public transportation systems. Based on the "Infrastructure System Export Strategy", MLIT will support the development of public transportation systems, such as urban railways and public bus service networks in foreign countries to contribute to the upgrading of transportation means, the alleviation of serious traffic congestion, and the reduction of CO_2 emission in those countries.

Project to Promote the Advanced Utilisation of Recyclable Resources as part of Strengthening the Integration of the Recycling System. This project aims to maximise the effective use of Japan's resources, in particular the so-called "urban mines", and to promote common efforts in areas where efficiency and high value added can be achieved across sectors by taking advantage of recycling systems (e.g. home appliances, construction, automobiles, small home appliances).

Promotion of Cleaner Energy Future Initiative for ASEAN (CEFIA). The co-operative initiative named CEFIA was created at the 16th ASEAN+3 Meeting of Energy Ministers in Bangkok in September 2019, as a platform to facilitate collaboration between the public and private sectors to accelerate the deployment of cleaner

energy and low-carbon technology in the ASEAN region. The objective of CEFIA is to promote “business driven dissemination” of cleaner energy and low-carbon technologies in parallel with policy development.

Disaster risk management for firms. Japan’s Cabinet office provides guidelines to help firms draft their own business continuity and resiliency plans. It contributes to mitigating disaster risks for firms and employees, improving post-disaster business resilience and harmonising business continuity planning along supply chains. This scheme supports firms in achieving the SDG Target 13.1 “Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries”.

Korea

Table A E.7. Policy instruments of Korea

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies	The Korean New Deal Korean-tailored SDGs (K-SDGs)			National Strategy for Green Growth
Rewards and incentives		Research Investment for Global Health Technology (RIGHT) Fund (innovation subsidies)		
Government assistance			Mentorship programmes	The Framework Act on Low Carbon and Green Growth Growth Hub for the Environmental Industry
Mandatory compliance		The Occupational Safety and Health Act	Equal Employment Opportunity and Work-Family Balance Assistance Act	Korea Emissions Trading Scheme KETS)

Policies addressing multiple types of SDGs

Strategies

The National Council for Sustainable Development, in collaboration with other ministries and stakeholders, developed **Korean-tailored SDGs (K-SDGs)**. The K-SDGs outline five overarching objectives including: 1) creating an inclusive society; 2) preserving a clean environment for all generations; 3) ensuring economic growth that improves quality of life; 4) protecting human rights; and 5) building inter-Korean peace and global co-operation. The K-SDGs website provides educational and networking materials.[145] The National Council for Sustainable Development also promotes the performance of individual enterprises in the relevant field by showcasing successful firms and their contributions for sustainable development on the K-SDGs website.[146]

As a response to COVID-19, the government has developed the Korean New Deal, which addresses economic, environmental and social reform. Through the areas of the Digital New Deal and the Green New Deal, the strategy aims to recover from the COVID-19 pandemic and also foster the digital and green transformations.[147] The Green New Deal pillar includes green innovation-related investments.

Policies addressing health, well-being and safety-related SDGs, notably SDGs 3 and 8

Rewards and incentives

The **Research Investment for Global Health Technology Fund (RIGHT Fund)** was created in 2018 to support global health R&D. It is a partnership between the Government of Korea, Korean life science companies, and international funder (including the Bill & Melinda Gates Foundation). The RIGHT Fund serves as a platform for Korean industry to increase its contribution to global health, and advance discovery and development of new health technologies that meet the needs of low- and middle-income countries. The RIGHT Fund aims to cover up to 50% of the total project costs, in order to share the risk of developing products for public health. Current projects include COVID-19 diagnostic tests and vaccines.[148]

Mandatory compliance

The **Occupational Safety and Health Act** of Korea (1990) established standards on occupational safety and health, clarified the responsibilities of firms and outlined detailed requirements for documenting safety. In 2019, the Act was amended to increase penalties for infringement and expand employer obligations to

include contract employees. The Korea Occupational Safety and Health Agency (KOSHA) regulates companies through the Safety & Health Check and evaluates safety and health management systems for the KOSHA 18001 Certification. KOSHA also provides technical support, training programmes, and continuous R&D for workplace safety and health. KOSHA now also provides resources on COVID-19 prevention measures.[149]

Policies addressing equity-related SDGs, notably SDG 5

Government assistance

The Ministry of Gender Equality and Family facilitates professional and job-specific **mentorship for women**. The Ministry also facilitates educational programmes for managers to promote women into leadership positions.[150]

Mandatory compliance

Under Korea's **Equal Employment Opportunity and Work-Family Balance Assistance Act**, employers must provide equal pay for equal-value work. Further, employers failing to meet established industry-level equality standards are required to report their gender pay gap status and plans to improve it to the Minister of Employment and Labour.[151]

Policies addressing environment-related SDGs, notably SDGs 7, 12, 13, 14 and 15

Strategies

The **National Strategy for Green Growth** (2009-50) provides a comprehensive policy framework that addresses: 1) the mitigation of climate change and energy independence; 2) the creation of new engines for economic growth; and 3) improvement in quality of life and enhanced international standing. There are ten policy directions within the objectives that range from mitigation of GHG emissions to becoming a leading exporter in the area of green research and technology.[152]

Government assistance

Established in 2010, the **Framework Act on Low Carbon and Green Growth (LCGG Act)** co-ordinates policies on climate change, green growth and sustainable development. In accordance with the LCGG Act, the Ministry of Environment establishes a new sustainable development plan every five years. The LCGG also provided the framework for the Sustainable Development Act, which aims to ensure that present and future generations have a high quality of life and that international sustainable development is sought.[153] Through this act, Korea is embedding the SDGs into its legislative framework for domestic policies (OECD, 2018[2]).

The Korea Environmental Industry & Technology Institute (KEITI) created the **Growth Hub for the Environmental Industry**, which supports companies in expanding their domestic and international business on environmental technologies. KEITI also provides technology and policy information, and financial support for companies to register eco-label products. It also organises an award for outstanding environmental companies, allowing those recognised to access financial, export, human resources and marketing support.[154]

Mandatory compliance

In 2012, Korea passed the Act on Allocation and Trading of Greenhouse Gas Emissions Allowances, and in 2015 a mandatory system for CO_2 emissions was established. The **Korea Emissions Trading Scheme (KETS)** is East Asia's first countrywide mandatory ETS and the second largest system in scale following the EU ETS. A total number of emission credits are determined and allowances are allocated to companies. The system plays an essential role in achieving GHG reduction targets, including a 2030 nationally determined contribution target of 37% below business-as-usual emissions. The market covers 610 of the country's largest emitters.[155] Some changes to the system are expected in 2021, including allowing third parties, such as financial investment companies and private investors, to participate in the trading scheme.

New Zealand

Table A E.8. Policy instruments of New Zealand

	Multiple SDGs	Health, well-being and safety-related SDGs	Equity-related SDGs	Environment-related SDGs
Strategies	Industry Transformation Plans			
Rewards and incentives	The National Science Challenges	Health Research Council	Enabling Māori Framework Initiatives for entrepreneurship and innovation in the Māori community	New Zealand Green Investment Fund Ltd. Sustainable Farming Fund (SFF) projects C-Prize Government Investment in Decarbonising Industry (GIDI) fund Low Emissions Vehicles Contestable Fund Bioresource Processing Alliance
Government assistance	The Business of Human Rights: A guide for good corporate citizens			Government's Transition Hub Ara Ake
Mandatory compliance		Health and Safety at Work Act 2015	Equal Pay Act 1972/Equal Pay Amendment Act 2020 Domestic Violence Victim's Protection Act	New Zealand Emissions Trading Scheme

Policies addressing multiple types of SDGs

Strategies

Industry Transformation Plans (ITPs) involve working in partnerships between government, business, workers and Māori to develop long-term plans for key sectors. These sectors are: Agritech, Advanced Manufacturing, Digital Technologies, Food and Beverage, Forestry and Wood Processing, and Construction. The overarching aims of ITPs are to help drive the New Zealand economy towards increasing productivity and be more sustainable and inclusive by 2050. The principles guiding the development of ITPs share similarities with the SDG principles, including partnerships, sustainability and creating decent work with good wages and working conditions.

Rewards and incentives

The National Science Challenges:[156] The National Science Challenges programme invests in 11 grand challenges, including land and water and sustainable seas (investment of NZD 680 million for 2014-24).

Government assistance

The Business of Human Rights: A guide for good corporate citizens (Human Rights Commission, 2016[3])" gives a broad introduction to human rights, their relevance for businesses, and how they can increase opportunities for firms.

Policies addressing health, well-being and safety-related SDGs, notably SDGs 3 and 8

Rewards and incentives

The Health Research Council of New Zealand[157] provides grants and other types of funding to health research projects that apply to the Council. The aim is to improve New Zealanders' health and quality of life by investing in a broad range of health-related research.

Mandatory compliance

The **Health and Safety at Work Act 2015** governs how businesses manage work-related risks that could cause serious injury, illness or even death. It requires businesses to proactively engage with workers and enable businesses to manage health and safety risks of workers.

Policies addressing equity-related SDGs, notably SDG 5

Rewards and incentives

The **Enabling Māori Framework (EMF)** is a NZD 6.5 million fund to facilitate Māori economic development within the scope of New Zealand's ITPs, in line with He Kai Kei Aku Ringa (the Crown-Māori Economic Development Strategy) and New Zealand's Industry Strategy. The focus areas for the EMF in Financial Year 2020/2021 are digital technologies, construction and agritech.

A number of initiatives also directly target the Māori community and its business potential. For instance, three initiatives that directly support Māori entrepreneurs and innovators are the Māori Innovation Fund (NZD 3 million per year), the Māori Innovation Hub, and a business accelerator called Kokiri.[158]

Mandatory compliance

The **Equal Pay Act 1972** and **Equal Pay Amendment Act 2020** are the legal requirements governing gender pay equality. Employers cannot refuse to offer the same terms of employment based on sex. The Amendment Act 2020 improves the process of pay equity claims and prevents discrimination on the basis of sex in remuneration and employment terms.

The **Domestic Violence Victim's Protection Act**[159] is a legal protection in the workplace for people affected by domestic violence. Employees affected by domestic violence have the right to take at least ten days of paid domestic violence leave, ask for short-term flexible working arrangements, and cannot be treated adversely in the workplace because of domestic violence.

Policies addressing environment-related SDGs, notably SDGs 7, 12, 13, 14 and 15

Rewards and incentives

The **New Zealand Green Investment Fund Ltd**[160] was established as part of the government's commitment to addressing climate change, and to support New Zealand's goal of achieving a net-zero-emissions economy by 2050. Its objective is to accelerate low-emissions investment in New Zealand. It received a NZD 100 million capital injection from the government but operates independently.

Established in 2000, the **Sustainable Farming Fund (SFF)**[161] has supported more than 1 000 sustainability projects – tackling issues like land management and climate change – through NZD 150 million of investment.

Led by Callaghan Innovation, New Zealand's innovation agency, the **C-Prize**[162] is a call for innovations addressing grand societal challenges. The 2019/20 round focused on environmental issues.

Established in November 2020, the NZD 70 million **Government Investment in Decarbonising Industry (GIDI)**[163] **fund** aims to accelerate the decarbonisation of industrial process heat. The Energy Efficiency and Conservation Authority administers the fund.

The **Low Emission Vehicles Contestable Fund**[164] offers NZD 6.5 million a year to projects that will accelerate the uptake of electric vehicles and other low-emissions vehicles. Projects are co-funded with private and public sector partners.

The **Bioresource Processing Alliance (BPA)**,[165] funded by the Ministry of Business, Innovation and Employment, is a platform for firms and organisations involved in agricultural bioprocessing. The BPA invests NZD 2.4 million per annum in R&D projects with external research partners to increase export revenue through innovative, technical and industrial development.

Government assistance

The Ministry for the Environment[166] provides a web platform (**Government's Transition Hub**) to provide access to resources for firms to tackle climate change, and demonstrate examples of what firms are already doing. In July 2020 the government established a national new energy centre in Taranaki, called **Ara Ake**.[167] It focusses on future energy development and will collaborate across New Zealand's energy system to lead and facilitate development of low-emissions energy innovation and technology.

Mandatory compliance

The **New Zealand Emissions Trading Scheme (NZ ETS)**[168] puts a price on GHG emissions. This creates a financial incentive for businesses to reduce their emissions and gives landowners the ability to earn money through actions like planting trees to absorb CO_2. Landowners get "units" for CO_2 that is absorbed by their trees, which they can sell on the NZ ETS market. Businesses determined to have "surrender obligations" (legal obligations to hand over units) must then purchase enough units to balance their emissions.

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Annex F. Framework conditions and sustainability

Fostering the accountability of firms

Agency theory stresses that firms' sustainability behaviour is the result of internal and external pressures (Aguilera et al., 2007[1]). The impact and balance of these pressures heavily depends on the context (for instance the competitive environment, see below) and the governance structure of the firm.

The literature considers that three important factors are shaping the strength of external pressures: the liability framework (Alberini and Austin, 2002[2]; Akey and Appel, 2020[3]), the degree of transparency on the firms' actions and its ownership structure (Shive and Forster, 2020[4]).

The liability of stakeholders has been shown to significantly limit the negative impact of firms on the environment. Alberini and Austin (2002[2]) show that stricter liability reduces the frequency and severity of pollution releases in the United States. Shapira and Zingales (2017[5]) describe the impact of limited liability on the decision by DuPont to release C8 (a toxic chemical) and explore some policy options to improve incentives (notably regarding settlements, penalising delays between the damage and the penalty and personal responsibility of managers). Akey and Appel (2020[3]) demonstrate that the reduction of parent firms' liability for their subsidiaries in the United States resulted in an increase in toxic emissions by the subsidiaries and a reduced investment in abatement technologies.

The degree of transparency is likely to increase the prosocial behaviour of firms, as the available information increases the scrutiny on firms' actions and mitigates a moral hazard problem. Nevertheless, high-frequency reporting may increase the pressure to deliver financial and social performance rapidly, potentially sacrificing long-term results. Whereas, in theory, disclosure is likely to improve the outcomes under scrutiny, this may be more complex in practice (Dranove and Jin, 2010[6]). For instance, firms may boost their performance on the reported dimensions while evading or not addressing the others.

The ownership structure also matters. With a diffuse ownership, shareholders are less likely to consider themselves as responsible for a firms' social behaviour (Hart and Zingales, 2017[7]). The type of shareholders (e.g. individuals or mutual funds, public or private investors) and their board representation (Bolourian, Angus and Alinaghian, 2021[8]; Kim et al., 2019[9]) can also affect the intensity of external pressures.

As a consequence of these last two forces, the pressures are not necessarily higher on public firms as compared to private firms. Whereas the former are likely to provide more reporting, including on sustainability, the latter have a more concentrated ownership structure:

- Shive and Forster (2020[4]) show that US private firms emit less GHG than comparable public firms. Moreover, they confirm that public firms with a larger board or larger share of mutual funds ownership are found to emit less. In the same vein, public Turkish firms with a larger board, more independent members or institutional ownership are found to score higher in terms of corporate sustainability (Aksoy et al., 2020[10]).
- Cohn, Nestoriak and Wardlaw (2021[11]) show that private-equity buyouts of public firms reduce the workplace injury rate.

Whereas for larger firms, transparency and the ownership structure are pivotal for improving the social impact of firms, SMEs may face a lower level of external pressures because they have fewer external shareholders and stakeholders (e.g. consumers). In contrast, their commitment to social goods is instead determined by internal pressures, with a greater role of management (Brammer, Hoejmose and Marchant, 2011[12]) and of implicit contracts with employees.

The position in the value chain is also likely to affect the external pressure. For instance, some case studies show that upstream industries are less likely to report customers as a motivation to adopt innovations to reduce GHG emissions (Chappin, van den Oever and Negro, 2020[13]). It suggests that ensuring the transmission of external pressure from the consumers to upstream industries in the value chain may be a way to foster sustainability investments in these sectors.

Competition policies and sustainability

In theory, competition has an ambiguous impact on sustainability. Shifting to sustainability is a way to escape competition, as a factor of horizontal differentiation. However, tougher competition reduces room to manoeuver for sustainability investments and efforts. The relationship between sustainability and competition is therefore an empirical matter.

The literature finds a positive impact of competition on sustainability. Graafland and Noorderhaven (2019[14]) show that the level of technological competition perceived by managers increases the probability of CSR adoption. Fernández-Kranz and Santaló (2010[15]) and Flammer (2014[16]) find that a higher level of competition (for instance through an import shock) increases the CSR rating by a significant amount. Leong and Yang (2020[17]) confirm a positive impact of competition on social performance for US firms, but show that the positive impact only channels through reduced concerns, and not through positive actions. Ding et al. (2020[18]) show that, using a cross-country firm-level dataset, more stringent competition laws increase the CSR level of firms.

Even if the issue has attracted less scrutiny in the literature, sustainability can also affect competition, again with an ambiguous impact. While, by fostering innovation, sustainable behaviours can increase horizontal differentiation, by diversifying the firms' objectives, it can also increase the number of dimensions that firms are competing on.

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PRINT ISBN 978-92-64-51311-2
PDF ISBN 978-92-64-86807-6