Chapter 4. Tracking progress in policy coherence for sustainable development

Sustainable Development Goal (SDG) target 17.14 calls on all countries to enhance policy coherence for sustainable development (PCSD). The purpose of this chapter is to support government efforts to monitor this target at the national level, as well as to contribute to the development of the global methodology for indicator 17.14.1. It applies the Framework for Policy Coherence for Sustainable Development to the five thematic SDGs under review by the United Nations High-Level Political Forum (HLPF) in July 2018. Specifically, the framework advises countries to consider three elements of the policy making process: institutional mechanisms; policy interactions; and policy effects on other countries and future generations. It also encourages them to identify different sets of indicators depending on national context, priorities and long-term policy objectives. The chapter concludes with three contributions by member institutions of the Partnership for Enhancing Policy Coherence for Sustainable Development that have developed or are using analytical tools for coherent implementation of the SDGs.

Introduction

Informed decision making is critical for enhancing policy coherence for sustainable development (PCSD). It requires monitoring systems that collect information about: 1) the performance of institutional mechanisms to co-ordinate policy and foster more integrated approaches for implementation; 2) critical trade-offs and synergies between policies in different domains; and 3) transboundary and long-term impacts of domestic actions.

Such monitoring systems would help decision makers address fragmented government action and adjust policies in light of their potential negative effects on sustainable development both domestically and abroad. Ultimately, they should aim to ensure that no one is left behind, the fundamental principle of the 2030 Agenda. This requires different benchmarks of progress and disaggregated data to show how parts of the population such as children, women, persons with disabilities and indigenous people are faring. This challenge, however, goes far beyond the policy coherence agenda: it needs to be kept in mind by everyone attempting to track progress in the implementation of the Sustainable Development Goals (SDGs). An important first step is to identify appropriate indicators at the national level. This is true also for SDG target 17.14, which calls on all countries to enhance policy coherence for sustainable development.

At the global level, progress on this target will be assessed against indicator 17.14.1, "Number of countries with mechanisms in place to enhance policy coherence for sustainable development" (UN, 2016[1]). But the 2030 Agenda also states that all global targets are aspirational, with each government setting its own national targets taking into account national circumstances.

The purpose of this chapter is to support government efforts to monitor SDG target 17.14 at the national level, while also contributing to the development of the global methodology for 17.14.1. Drawing on existing OECD measurement frameworks, it suggests indicators or indicator sets that are relevant for tracking countries' progress to enhance PCSD from a policy and institutional perspective. It also illustrates the need for each country to identify its own indicators and tracking methods in line with national priorities and contexts.

The chapter first presents **a three-part framework for tracking progress on PCSD** and provides examples of the types of indicators that can be used for assessing each element. It then explores ways to identify priority areas for PCSD and how to use combinations of indicators to track progress on PCSD in areas related to the goals under review by the United Nations High-Level Political Forum (HLPF) in 2018:

- SDG 6. Ensure availability and sustainable management of water and sanitation for all.
- SDG 7. Ensure access to affordable, reliable, sustainable and modern energy for all.
- SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable.
- SDG 12. Ensure sustainable consumption and production patterns.

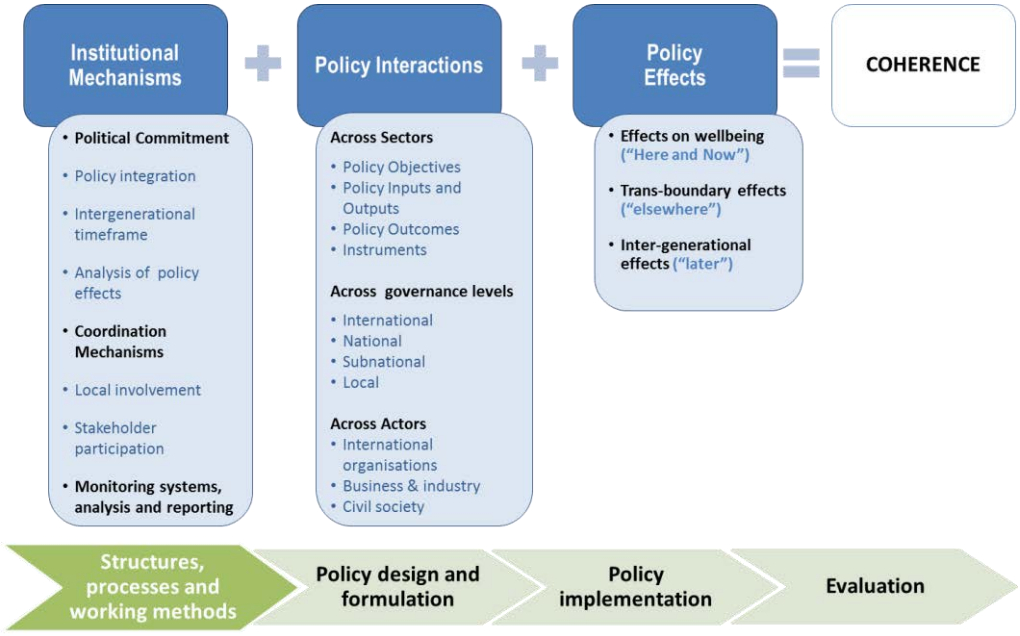
- SDG 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation.

The chapter concludes with inputs from three members of the Multi-stakeholder Partnership for Enhancing Policy Coherence for Sustainable Development (the PCSD Partnership), who are developing or using analytical tools for tracking progress in SDG implementation.

A framework for tracking progress on policy coherence

The PCSD Framework developed by the OECD (2016[2]) encourages countries to focus on three interrelated elements of the policy coherence cycle: 1) **institutional mechanisms**, to ensure that structures, processes and methods of work are conducive to higher degrees of policy coherence; 2) **policy interactions**, to examine how sectoral policies in different domains complement each other to achieve a larger goal; and 3) **policy effects**, to consider the economic, social and environmental impacts of policies on sustainable development "here and now", "elsewhere" and "later" (Figure 4.1).

Figure 4.1. Elements for tracking progress on PCSD



Source: OECD PCD Unit, adapted from (OECD, 2015[3]).

Indicators for assessing institutional mechanisms for policy coherence

The PCSD Framework emphasises the need to align existing institutional mechanisms for coherence with the nature and principles of the 2030 Agenda and the SDGs. It suggests considering how different institutional mechanisms are contributing towards higher degrees of policy coherence. This performance can be assessed in terms of **eight building blocks** presented in Chapter 2: 1) mobilising whole-of-government action; 2) balancing economic, environmental, and social concerns; 3) reconciling short- and long-term priorities; 4) addressing potential negative impacts of domestic policies beyond borders;

5) ensuring co-ordinated and mutually supporting efforts across sectors; 6) involving subnational and local levels of government; 7) engaging key stakeholders beyond the government; and 8) using monitoring and reporting systems to inform coherent policy-making.

These building blocks represent key institutional dimensions that underpin coherent SDG implementation. They refer to structures, processes and working methods conducive to higher degrees of policy coherence in governments, regardless of their different administrative and political traditions. The next step is to develop **process indicators** to assess coherence and track progress on each of these eight institutional dimensions. Table 4.1 proposes qualitative indicators that could be developed for this purpose together with a scale to illustrate degrees of performance.

A longer-term project could be to further develop this tentative set of indicators and integrate it into a **self-assessment tool** (i.e. dashboard) to illustrate how a country is enhancing PCSD at the national level in line with SDG target 17.14. These indicators could also serve to take stock of existing coherence mechanisms and identify institutional gaps, as well as to share information on country approaches, institutional practices and concrete measures applied to enhance and track progress on policy coherence.

Recent OECD work has applied a very similar approach in the area of water governance, resulting in the OECD Water Governance Indicator Framework (OECD, 2018[4]). The indicators for Water Governance Principle 3 on Policy Coherence could be drawn upon for tracking progress in institutional mechanisms for PCSD in the implementation of SDG 6 on Water. They could also inspire the development of complementary indicators beyond the water sector.

Table 4.1. Suggested indicators for assessing institutional mechanisms for policy coherence in SDG implementation

Building Block	Indicator	Degrees of performance	Rationale
Political commitment	The commitment to PCSD is formally incorporated into domestic law and/or national strategic framework and/or action plan.	**Low:** The government makes public, but not binding, statements supporting PCSD. **Medium:** A formal institutional "catalyst" (interministerial committees, centralised oversight body, ministry or unit) is mandated to promote PCSD. **High:** PCSD is explicitly included in the national strategy / plan / legislation. And/or: A time-bound plan for PCSD is developed, implemented and monitored through formal interministerial and multi-stakeholder mechanisms.	Experience shows that progress towards policy coherence starts with strong leadership and commitment at the highest level backed by clear mandates and time-bound action plans. Political commitment is needed to build ownership across institutions and guide whole-of-government action.
Policy integration	The government has mechanisms (interministerial, multi-stakeholder) with the power to take strategic decisions to influence and align planning, budgeting, legislation, sectoral programmes and policies.	**Low:** The mechanism can modify sectoral programmes and policies taking into account their interlinkages and/or sets out guidelines to integrate SDGs and PCSD. **Medium:** The mechanism can merge two or more sectoral programmes, considering synergies and trade-offs. **High:** The mechanism can integrate SDGs and PCSD into the mandate of each institution, involving budgetary processes, and develops multi-sectoral strategies or programmes.	Signatories to the 2030 Agenda emphasised that "the interlinkages and integrated nature of the SDGs are of crucial importance in ensuring that the purpose of the new Agenda is realised"… and "committed to achieving sustainable development in its three dimensions – economic, social and environmental – in a balanced and integrated manner". (UNGA, 2015[5]).
Inter-generational timeframe	The government has mechanisms in place to consider the long-term effects of policies and	**Low:** The government has a long-term vision/strategy for sustainable development as a framework for overall SDG implementation. **Medium:** The vision or strategic framework defines	A basic tenet of sustainable development is to balance the needs of current and future generations. Signatories of the

	take precautionary decisions and maintain commitment to SDGs and PCSD over time.	concrete long-term challenges and contains objectives, benchmarks and indicators related to economic, social and environmental inter-generational issues where policy coherence is required. **High:** The government has mechanisms to ensure sustained commitment and implementation efforts beyond electoral cycles, and provisions to ensure that future government programmes and budget preparations include SDG and PCSD considerations.	2030 Agenda committed to "implement the Agenda for the full benefit of all, for today's generation and for future generations"… and "to protect the planet from degradation… sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations" (UNGA, 2015[5]).
Policy effects	The government has mechanisms to systematically assess negative impacts of domestic policies on sustainable development at home and abroad, and develops measures to maximise synergies and mitigate negative effects	**Low:** The national strategic framework includes measures to address negative impacts of policies on other countries (particularly least developed countries, and globally) but has not yet established a mechanism to do so. **Medium:** Assessments of sustainable development linkages and potential positive and negative effects of policy proposals (including transboundary effects) and legislative proposals are regularly conducted before and after implementation. **High:** Policies are adjusted in light of new information on negative effects.	Experience has shows that mechanisms to anticipate, detect and resolve policy inconsistencies early in the policy-making process help exploit synergies and reduce incoherence between domestic policies and internationally agreed goals.
Coordination	The government has mechanisms that allow ministries and public sector agencies to share information, distribute responsibilities, allocate resources, and resolve conflicts of interest or inconsistencies	**Low:** Ministries and public sector agencies regularly share information on their programmes, plans and policies for SDGs. **Medium:** Ministries and public sector agencies align their implementation strategies, plans and policies based on common goals and targets, but work individually and with separate resources. **High:** Ministries and public sector agencies work jointly, based on systematic exchange of information and shared resources, to develop joint programs, plans and policies. The government has an arbitration mechanism to solve policy conflicts.	Co-ordination structures are needed in areas where policies are intrinsically cross-sectoral, such as in the implementation of integrated SDGs.
Local involvement	There is a mechanism that allows for systematic consultation, collaboration and alignment of efforts at the national, subnational and local levels	**Low:** National, subnational and local decision makers regularly share information on their respective efforts to achieve SDGs. **Medium:** National, subnational and local levels of government align their implementation plans based on shared information and work individually using their own resources to contribute to country's commitment towards the SDGs. **High:** National, subnational and local levels of government collaborate, considering their respective competencies and based on systematic exchange of information to develop joint action plans. There is an arbitration mechanism to solve conflicts of interest between different levels of government.	SDG implementation calls for aggregated actions at the local, subnational and national levels. The 2030 Agenda emphasises that "governments and public institutions will work closely on implementation with regional and local authorities" (UNGA, 2015[5]).
Stakeholder engagement	The government has mechanisms to ensure participation of stakeholders (civil society, business and industry, science and academia) in the development of plans and policies	**Low:** The government regularly organises public events involving multiple stakeholders to raise awareness and foster dialogue on PCSD/SDG implementation. **Medium:** The government has established mechanisms to consult and work directly with key stakeholders throughout the policy-making process. **High:** The government develops partnerships with stakeholders for SDG implementation.	The 2030 Agenda states that "all countries and all stakeholders, acting in collaborative partnership will implement this plan" (UNGA, 2015[5]). Stakeholders such as business and industry, civil society, science and academia have important roles to play ranging from resource mobilisation, provision of solutions and innovations, advocacy to voice the concerns and needs of underrepresented communities and helping to ensure accountability.

Monitoring and reporting	The government has monitoring and reporting systems that are used to inform changes in policy which maximise synergies and minimise negative transboundary effects and benefit developing countries	**Low:** The government has monitoring and reporting system in place, but there is no clear evidence of policy change. **Medium:** The government regularly reports on SDG17.14 and has monitoring and reporting systems with indicators for assessing institutional mechanisms for coherence and screening domestic and international policies that could adversely affect sustainable development in other countries or regions. There are mechanisms or provisions that allow the monitoring and reporting system to feed back into the decision making process. **High:** The government makes policy changes which address negative transboundary impacts.	Monitoring mechanisms are essential to ensure that sectoral policies supporting SDGs can be adjusted in light of potential negative effects identified during implementation or changing circumstances.

Source: Adapted from (Soria Morales and Lindberg, 2017[6]).

Box 4.1. OECD Water Governance Indicator Framework

Since the adoption of the *OECD Principles on Water Governance* in 2015, the OECD Water Governance Initiative has developed an implementation strategy based on: 1) an indicator framework to allow self-assessment of the governance system; and 2) a number of good practices to foster peer learning. The indicator framework does not investigate progress against a defined framework, nor is it intended to provide benchmarking across countries, basins, regions and cities, as governance responses are highly contextual and hardly comparable. Its primary objective is to stimulate dialogue across stakeholders on what works, what does not, and what should be improved. While indicators can be helpful in tracking and measuring relevant water governance dimensions, they are not the assessment itself and should be complemented by in-depth evaluations.

Principle 3 on Policy Coherence: Indicators and checklist

Indicators

3.a Existence and level of implementation of cross-sectoral policies and strategies promoting policy coherence between water and key related areas, in particular environment, health, energy, agriculture, land use and spatial planning.

3.b Existence and functioning of an interministerial body or institutions for horizontal co-ordination across water-related policies.

3.c Existence and level of implementation of mechanisms to review barriers to policy coherence and/or areas where water and related practices, policies or regulations are misaligned.

Checklist

- Is there a dedicated policy or high-level political support to water management as a driver to economic growth as called for in the SDGs?
- Are data and projections on water demand from agriculture, industry (including energy) and households available and guiding decisions about handling competing uses now and in the future?
- Is there an assessment of the distributional impacts on water management of decisions taken in other areas such as energy subsidies, spatial development,

agriculture or environment?

- Are costs due to absent/poor water-related policy coherence evaluated and available to decision makers?
- Are benefits from policy coherence and policy complementarities evaluated and communicated to decision-makers and key stakeholders?
- Are there provisions, frameworks or instruments to ensure that decisions taken in other sectors are water-wise?
- Are there horizontal co-ordination mechanisms at subnational and national levels?
- Are there conflict mitigation and resolution mechanisms to manage trade-offs across water-related policy areas?

Source: (OECD, 2018[4]).

Indicators for assessing policy interactions[1]

The integrated and indivisible nature of the SDGs calls for policies that systematically consider interactions between economic, social and environmental spheres. Policy coherence is essential to ensure that progress achieved in one goal area contributes to progress on other goals, and to avoid the risk that progress achieved on one goal or target occurs at the expense of another.

There is a vast range of economic, social and environmental indicators – many of them developed by the OECD – which can inform policy makers about the linkages, trade-offs and trends implied in achieving the SDGs. These include:

- **Resource indicators** related to capital stocks (i.e. natural, economic, human and social), which provide information on how countries are maintaining the asset base from which the well-being of current and future generations is derived;
- **"Flow" indicators** related to investment in and depletion of capital stocks, which provide information on how they are being used in countries;
- Indicators related to **policy responses**, which provide information on how public policies shape sustainable development outcomes.

Table 4.2 illustrates these indicators as they relate to natural capital (see Table 4.5 for additional indicators related to human, economic and social capital).

Table 4.2. Examples of indicators for capturing policy interactions

Natural asset base	Resource indicators	"Flow" indicators	Policy responses
Land	▪ Contribution of primary land cover types to total	▪ Conversion between primary land cover types ▪ Conversion from agricultural and semi-natural land cover classes to artificial land	▪ Land-use zoning ▪ Terrestrial protected areas
Forest	▪ Forest resource stocks	▪ Intensity of use and sustainable management certification of forest resources	▪ Sustainable forest management certification
Freshwater	▪ Total renewable freshwater per capita	▪ Freshwater abstractions per capita ▪ Total renewable freshwater per capita	▪ Robust water allocation regimes
Biodiversity	▪ Fish stocks within safe biological limits ▪ Threatened species	▪ Capture fisheries diversity index (change over time) ▪ Wild birds population index (change over time)	▪ Marine protected areas ▪ Terrestrial protected areas

Source: Adapted from (OECD, 2017[7]).

Using a combination of indicators helps to assess how sectors or policy priorities might be competing for the same resources, and to gauge whether the aggregate demand for satisfying sectoral priorities or human needs is within the constraints of ecosystems. For example, data on freshwater abstractions and total renewable freshwater provide an indication of water stress (or intensity of freshwater resource use) – an important measure for signalling over-abstraction due to human activities such as agriculture, industry and households. In turn, data on freshwater abstractions by sector can help to identify opportunities for more efficient water use.

Furthermore, countries are likely to prioritise and monitor interactions depending on their specific national contexts. A number of **tools for identifying and mapping SDG interactions** are currently available or being developed by different stakeholders; our work seeks to translate this research into government action, combining it with OECD data, evidence and policy advice.

One example, a seven-point scale of interactions proposed by Nilsson et al. (2016) and applied by ICSU (2017), provides an intuitive framework for mapping and identifying SDG interactions with high potential impact, including where synergies could be exploited and fundamental trade-offs need to be managed (Table 4.3).

Table 4.3. Goals Scoring

Interaction	Name	Explanation
+3	Indivisible	The strongest form of positive interaction in which one objective is inextricably linked to the achievement of another
+2	Reinforcing	One objective directly creates conditions that lead to the achievement of another objective.
+1	Enabling	The pursuit of one objective enables the achievement of another objective.
0	Consistent	A neutral relationship where one objective does not significantly interact with another or where interactions are deemed to be neither positive nor negative.
-1	Constraining	A mild form of negative interaction where the pursuit of one objective sets a condition or a constraint on the achievement of another.
-2	Counteracting	The pursuit of one objective counteracts another objective.
-3	Cancelling	The most negative interaction, where progress in one goal makes it impossible to reach another goal and possibly leads to a deteriorating state of the second.

Source: (ICSU, 2017[8]).

Indicators for assessing policy effects

Supporting the needs of present and future generations, as called for by the 2030 Agenda, will depend on how society uses and manages its natural, economic, human and social capital resources. The more efficiently and sustainably these resources are used and the better they are managed in the "here and now", the more capital is left for people "elsewhere" on the planet and "later" for future generations. Enhancing PCSD thus entails a more systematic consideration of the potential trade-offs between these three conceptual dimensions of sustainable development, which were first introduced by the Conference of European Statisticians (UNECE, 2014[9]).

Transboundary effects

National approaches to sustainable development usually offer limited insights into transboundary effects or the impact of countries on global sustainability. Domestic-level indicators need to be complemented by measures of economic, social and environmental externalities imposed beyond national borders. In a highly interconnected world, transmission channels are numerous – for example through financial flows, imports and exports of goods and services, migration or knowledge transfers – and countries' policies necessarily impact on one another.

In this sense, **economic externalities** might be captured by data on e.g. aid flows, trade, and domestic support measures; **social externalities** by data on e.g. foreign-born doctors and nurses; and **environmental externalities** by "footprint indicators", which calculate the environmental pressure attributable to consumption in one country on resources or conditions in another (Table 4.4). Water and carbon footprints are commonly used measures: they are discussed in more detail in the sections on SDG 6 on Water and SDG 7 on Energy. An ecological footprint, in turn, measures the *demand* on and *supply* of nature. As such, it is also an important indication of long-term (intergenerational) sustainability. The ecological footprint is discussed in more detail in the sections on SDG 11 on Sustainable Cities and Communities; SDG 12 on Responsible Consumption and Production; and SDG 15 on Life on Land.

When considering indicator development and data collection for a cross-border project or strategy – as well as its impacts – it is important to have a comparable set of measurements for both countries. A limited core set of indicators applicable to all local regions (and compatible with those at higher policy levels) can be combined with a more flexible set of indicators from which regions can choose additional indicators that best suit their situation (Martinez-Fernandez et al., 2013[10]).

Ultimately, any attempt to measure environmental impact at anything lower than a global scale should focus on consumption rather than production (OECD, 2013[11]). This is because of international trade flows (imports and exports), which are increasingly shaped by global value chains. For example, falling carbon intensity of production (due to e.g. a shift from manufacturing to services) needs to be compared with potentially increasing carbon intensity of consumption (due to e.g. increased imports of energy-intensive goods). This is discussed in more detail in the section on SDG 7 on Energy.

Table 4.4. Examples of indicators for capturing transboundary effects

Externality	Theme	Indicators	Related SDG targets
Economic	Development co-operation	▪ Official Development Assistance (ODA)	17.2
	International trade	▪ Data on tariffs and non-tariff measures ▪ Trade Facilitation Indicators (TFIs) ▪ Services Trade Restrictiveness Index (STRI)	2.b; 3.b; 8.a; 10.a; 14.b; 17.10; 17.11; 17.12
	Agricultural support	▪ Producer Support Estimates (PSE) ▪ National Protection Coefficient (NPC)	2.b
	Tax transparency	▪ Number of agreements on exchange for information for tax purposes between OECD and developing countries	17.1
Social	Migration	▪ Data on migration flows and stocks ▪ Share of foreign-born health workers ▪ Remittances	3.c; 10.7; 10.c
Environmental	Carbon footprint	▪ Consumption-based CO_2 emissions ▪ Consumption-based CO_2 productivity ▪ Food waste	8.4; 12.3
	Water footprint	▪ Imports of water-intensive products	6.4

Source: (OECD, 2017[12]).

Intergenerational effects

Monitoring the stocks and trends of resources that exist today but that are necessary to maintain well-being over time provides a first step towards understanding the prospects for future well-being. This implies looking at indicators that reflect **natural capital** (energy and mineral resources, land and ecosystems, water and air quality, climate), **economic capital** (physical, financial, knowledge), **human capital** (knowledge, skills, competencies and attributes embodied in individuals) and **social capital** (the quality of interpersonal relationships and institutions) (Table 4.5).

These different types of capital share a number of common characteristics. Each of them influence a broad range of well-being outcomes, have some degree of persistence over time, and require investment and careful management to be maintained. It is important to monitor the evolution of capital over time, as well as to consider information about inflows (e.g. investments), outflows (e.g. depletion or degradation of resources) and other risk factors that can affect the value of these capital stocks and their resilience to shocks. This provides insights on some of the levers through which decision makers can take action today to improve the prospects for well-being in the future (OECD, 2015[13]).

Table 4.5. Examples of indicators for monitoring resources for future well-being

Type of capital stock	Indicators related to the "stock" of capital	"Flow" indicators (investment in, and depletion of, capital stocks)	Indicators related to risk factors
Natural capital	▪ Exposure to $PM_{2.5}$ air pollution* ▪ Forest area ▪ Renewable freshwater resources ▪ Threatened species	▪ GHG emissions from domestic production ▪ CO_2 emissions from domestic production ▪ Freshwater abstractions	
Human capital	▪ Young adults' educational attainment (aged 25-34) ▪ Cognitive skills at 15* ▪ Adult skills* ▪ Life expectancy at birth*	▪ Educational expectancy	▪ Long-term unemployment* ▪ Smoking prevalence ▪ Obesity prevalence
Economic capital	▪ Produced fixed assets ▪ Intellectual property assets ▪ Household net wealth* ▪ Financial net worth of government	▪ Gross fixed capital formation ▪ Investment in R&D	▪ Financial net worth of the total economy ▪ Banking sector leverage ▪ Household debt
Social capital	▪ Trust in others ▪ Trust in the police ▪ Trust in the national government	▪ Volunteering through organisations ▪ Voter turnout* ▪ Government stakeholder engagement	

Note: * denotes indicators that are also included in OECD's indicator set for *current well-being*.
Source: (OECD, 2017[14]).

Applying the framework to identify national priorities and indicators for policy coherence

This section applies the monitoring framework to the five goals being reviewed by the 2018 UN High Level Political Forum. It complements the broader context-setting analysis in Chapter 1. For each goal, examples from both OECD and partner countries are used to illustrate the need to identify and use different indicators to track progress in PCSD, depending on national context, priorities and long-term policy objectives.

Goal 6. Water and sanitation for all

Sustainable Development Goal 6 calls on all countries to ensure availability and sustainable management of water and sanitation for all. There are multiple interactions between the water targets and with many other goals. Global competition for water is increasing among different uses and users, of which agriculture and electricity generation are the largest. Tracking progress in policy coherence in the implementation of SDG 6 requires monitoring these competing demands and considering their implications on water quantity and quality, both domestically and internationally. It also requires assessing the positive contributions that progress on SDG 6 can make towards the achievement of other goals, for example food security and agriculture, health, energy and biodiversity.

Countries' and regions' freshwater endowments and abstraction rates vary, implying different interactions and degrees of urgency to address them. A water scarce country will strive to maintain its total freshwater stock in the immediate- to short-term, aiming to ensure that it first and foremost satisfies basic human needs. A country with abundant freshwater resources, on the other hand, may focus on exploring the most water efficient

and least costly way to grow food or produce energy. Each PCSD challenge will require its own set of indicators for tracking progress. The following examples aim to illustrate this in practice. For relevant indicators and data sources, see Table 4.7.

In **Cape Town, South Africa**, ensuring that people have access to safe and affordable drinking water while not depleting freshwater stocks is a pressing issue. The ongoing water crisis has also highlighted the vast divide between rich and poor: wealthy people are able to pay for privately dug boreholes and wells, while poor people are dependent on government solutions that often take longer time to implement (Sieff, 2018[15]). For example, the increase in public dam water storage has not nearly kept up with the city's rapidly growing population, exacerbating the already severe impacts of climate change and severe droughts on all dimensions of sustainable development. Monitoring freshwater abstraction rates and freshwater storage capacity in parallel would therefore be critical for a PCSD assessment. It would contribute to more environmentally sustainable water management and also help to ensure a more stable water supply for all.

In the **US Southwest**, one of the world's most productive agricultural regions, almost 75% of total cropland depends on supplemental irrigation (Cooley et al., 2016[16]). This puts pressure on already scarce water supplies and calls for synergistic policy solutions that reduce water shortage risks for agriculture. Improving agricultural water-use efficiency, for example, contributes to maximising the productivity of limited water resources. Shifting from higher water-use to lower water-use crops is another way of keeping agricultural land in production with less total water demand. Data on agricultural freshwater withdrawals, irrigated land area, and irrigation water application rates – available as part of OECD's Agri-Environmental Indicators[2] – can support efforts to track progress in enhancing policy coherence for achieving more sustainable food production systems, while reducing water stress.

Considering transboundary water issues is important for identifying if actions in one country cause impacts in another. This can be linked to both quality (e.g. through pollution and climate change) and quantity (e.g. through dam construction or trade in virtual water). Rivers that flow across national boundaries create significant interdependencies between the riparian countries through which they flow. Countries down-river are vulnerable to the activities of those up-river in a variety of ways, from over-extraction of water or the building of dams (depriving countries down-river of water), or from pollution and water-borne diseases (depriving countries down-river of clean, safe water). Conversely, activities down-river can contribute to flooding up-river (OECD, 2013[17]).

The Nile is the longest river in the world, passing though eleven developing countries. The Nile Basin's population is expected to double in the next 25 years. This will further deplete the region's already scarce water supplies as demands from agriculture, industry and domestic use rise (Nunzio, 2013[18]). Monitoring each basin country's impact on the river could contribute to improving policy coherence in the region. The *Transboundary River Basins Assessment* uses indicators of "stressors" to provide a comprehensive picture of the state of transboundary waters, organised around five themes, as per Table 4.6 (UNEP-DHI and UNEP, 2016[19]).

Table 4.6. Core indicators for assessing the state of transboundary river basins

Thematic group	Indicators	Annotation
Water quantity	▪ Environmental water stress ▪ Human water stress ▪ Agricultural water stress	Stress indicators highlight competition for water between different sectors and between countries.
Water quality	▪ Nutrient pollution ▪ Wastewater pollution	Pollution indicators illustrate water quality issues in basins and their receiving coastal waters.
Ecosystems	▪ Wetland disconnectivity ▪ Ecosystems impacts from dams ▪ Threat to fish ▪ Exctinction risk	Ecosystems indicators represent pressures which can result in species extinction risk.
Governance	▪ Legal framework ▪ Hydropolitical tension ▪ Enabling environment	Governance indicators show e.g. the existence of basin treaties and ongoing or planned construction of new water infrastructure.
Socio-economics	▪ Economic dependence on water resources ▪ Societal well-being ▪ Exposure to floods and droughts	Socio-economic indicators identify basins where human vulnerability to a range of climate and development impacts is high.

Source: (UNEP-DHI and UNEP, 2016[19]).

Considering water management from a local, national or river basin perspective can be insufficient, however, since many water problems are linked to international trade. So-called footprint indicators can be used to shed light on how the impacts of trade in virtual water are generated and transmitted across borders. The virtual water content of a product (a commodity, good or service) can be defined as "the volume of freshwater used to produce the product, measured at the place where the product was actually produced" (Hoekstra and Chapagain, 2007[20]). This gives an indication of a country's water use and dependence on external water resources, helping governments to better understand the links between domestic water consumption, economic development, food security and international trade (http://www.waterfootprint.org). As such, it forms part of the broader discussion on SDG 12 on Sustainable Consumption and Production.

Virtual water trade generates water savings for importing countries, but also incurs "losses" for exporting countries. Many countries in the Middle East save their scarce water resources by importing water-intensive products, thus largely "externalising" their water footprint. **Jordan**, for example, imports five to seven billion m^3 of water in virtual form per year, to be compared with only one billion m^3 withdrawn annually from domestic water sources (Hoekstra, 2010[21]).

In contrast, Asian countries are the primary sources of global water use for crop supplies. Lee et al. (2016[22]) evaluated the virtual water export of several crops from Asia between 2000 and 2012 and found that the largest discharge of virtual water was derived from the wheat and rice trade, with more than 50 percent of it exported outside of Asia. **Thailand**, for instance, exported approximately 110.7 Gm3 (green water) and 22.8 Gm3 (blue water) to non-Asian countries, while 44.5 percent of the total virtual water export was traded within Asia via crop trades.[3]

The latter example shows that a PCSD assessment seeking to monitor and attribute water footprints in any one country must also distinguish between the virtual water export (the sum of the virtual water export from domestic resources and the re-exported virtual water of foreign origin) and the external virtual water rate, which indicates the amount of virtual water export outside a boundary (e.g. Asia).

Managing trade-offs and synergies will contribute to the long-term sustainability of the planet's freshwater bodies and wetlands. It can help restore and protect water-related ecosystems and halt or reverse freshwater biodiversity. Monitoring the different aspects of biodiversity (e.g. species, habitats) can help governments make informed decisions on resource use and protection (WWF, 2016[23]). For instance, data on the number of known and threatened amphibians are considered good bio-indicators as they provide early warning signs of deteriorating ecological conditions (OECD, 2017[7]).

Table 4.7. Indicators for tracking progress on PCSD in relation to SDG 6

SDG 6. Ensure availability and sustainable management of water and sanitation for all

	PCSD priorities	Relevant indicators	Data sources
Trade-offs	*Ensuring access to safe and affordable drinking water for all (SDG 6.1) without exceeding sustainable withdrawals of freshwater (SDG 6.4)*	▪ Freshwater abstractions per capita (1000m^3/capita) ▪ Freshwater storage capacity per capita (1000m^3/capita) ▪ Proportion of population using safely managed drinking water services (%)	▪ OECD Green Growth Indicators 2017 ▪ FAO Aquastat ▪ WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation
Synergies	*Improving agricultural productivity (SDG 2.3) by increasing agricultural water-use efficiency (SDG 6.4)*	▪ Agricultural yields (e.g. tonnes/hectare) ▪ Water abstraction per hectare (megalitres) ▪ Share of irrigated area in total agricultural area (%) ▪ Irrigation water application rates (megalitres per hectare of irrigated land)	▪ OECD Agriculture Statistics ▪ OECD Agri-Environmental Indicators
Transboundary policy effects	*Limiting the impacts of domestic water use on other countries' access to water (SDG 6.1)*	▪ Environmental water stress ▪ Human water stress ▪ Agricultural water stress	▪ Transboundary Waters Assessment Programme
	Minimising cross-border impacts of domestic water pollution (SDG 6.3)	▪ Nutrient pollution ▪ Wastewater pollution	▪ Transboundary Waters Assessment Programme
	Limiting the water footprint in exporting countries of domestic water-intensive imports (SDG 6.4)	▪ Water footprints (litres/kg) ▪ Water saving as a result of imports (m^3/year) ▪ Water loss as a result of exports (m^3/year) ▪ Ratio of net water saving to use of domestic water (%)	▪ Water Footprint Network ▪ Hoekstra, A. (2010)
Intergenerational policy effects	*Protect and restore water-related ecosystems (SDG 6.6)*	▪ Number of known amphibian species ▪ Percentage of amphibians threatened	▪ OECD Green Growth Indicators 2017

Note: These are illustrative examples. Each country will need to identify and monitor the interactions and policy effects that are most relevant to its own national context and sustainable development objectives.
Source: OECD PCD Unit.

Goal 7. Affordable and clean energy for all

Sustainable Development Goal 7 calls on all countries to ensure access to affordable, reliable, sustainable and modern energy for all. Energy production, supply and use have different environmental effects depending on energy source, with various impacts on air, land and water. Tracking progress in policy coherence in the implementation of SDG 7 requires monitoring the stocks, efficiency and productivity of these sources (e.g. fossil fuels versus renewables) and energy consumption by use (e.g. water distribution versus agricultural production), as well as assessing their positive or negative economic, environmental and social impacts domestically and abroad.

A country's energy profile is determined by several factors: its economic structure (e.g. presence of large energy-consuming industries); physical size (influencing demand from the transport sector); local climate (affecting demand for heating or cooling); and outsourcing of goods produced by energy-intensive industries (OECD, 2017[7]). Understanding this profile will allow policy makers to identify national PCSD priorities and select the indicators needed for tracking progress. The following examples aim to illustrate this in practice. For relevant indicators and data sources, see Table 4.8.

In a country like **Malawi**, where over 95% of the electricity supply is generated from hydropower and agriculture is the backbone of the economy (Malawi Water Partnership, 2016[24]), monitoring the relationships between energy, water and food production is critical for a PCSD assessment. Data on water use by sector and energy technology would allow policy makers to monitor competition for water between energy and other sectors, as well as to identify opportunities for more efficient water use within the energy sector itself. Such insights would also support Malawi's efforts to achieve food security for all: more water could be made available for growing food and freshwater bodies that supply fish would be less likely to dry out.

In the **Slovak Republic**, bioenergy is the biggest source of renewable energy. The growth in bioenergy use is driven by the country's energy targets for 2020 and supported by various policy incentives. The amount of wood used for energy purposes almost doubled between 2005 and 2015: in some regions consumption of wood for energy exceeds what can be supplied from sustainable sources such as waste wood from industrial processes or landscape management. As a result, more and more whole trees are being used for energy, thus raising concerns of deforestation (Birdlife Europe and Central Asia and Transport and Environment, 2016[25]). In this case, tracking progress in policy coherence would imply comparing national data on support schemes for bioenergy, the net change in CO_2 emissions, and developments in the stock and use of forest resources. A useful indicator for assessing the long-term viability of a country's forest resources more broadly is the intensity of use of forest resources, which relates actual harvest or tree fellings to the annual productive capacity of forests.

Access to clean energy, in particular for cooking, provides direct health benefits, but progress in many developing countries is slow. In **India**, for example, an estimated 780 million people still rely on biomass for cooking. Globally, the use of fuels such as kerosene, solid biomass and coal for cooking is responsible for an estimated 2.8 million premature deaths per year (IEA, 2017[26]).

The International Energy Agency defines energy access as "a household having reliable and affordable access to both clean cooking facilities and to electricity, which is enough to supply a basic bundle of energy services initially, and then an increasing level of electricity over time to reach the regional average".[4] Access to clean cooking is defined as "a household primarily relying on cooking facilities which are used without harm to the health of those in the household and which are more environmentally sustainable and energy efficient than biomass cook-stoves and the three-stone fires currently used in developing countries". Monitoring access to clean energy and reliance on various cooking fuels can support countries' efforts to reduce premature deaths from exposure to $PM_{2.5}$ and ozone. It can also inform synergies with other SDGs, e.g. on climate (via a reduction of GHG emissions) and women's empowerment (via a reduction in time spent collecting fuel wood).

Transboundary impacts from energy production and consumption can be captured by assessing a country's carbon footprint. Typically, emissions statistics are compiled according to production-based or territorial emission accounting methods, which measure emissions occurring within sovereign borders. However, these estimates do not reflect production chains that extend across borders: multiple countries may be responsible for emissions associated with the production of a given good and/or service. To account for the origins of CO_2 emissions embodied in final demand, policy makers need to also consider consumption- or demand-based carbon emissions. These refer to the distribution across economies of final consumption of embodied carbon that has been emitted anywhere in the world along global production chains (OECD, 2016[27]) (Wiebe and Yamano, 2016[28]).

Data shows that **OECD countries** in total are net importers of embodied carbon, while non-OECD countries are net exporters[5]. In other words, OECD countries "consume" more CO_2 than they actually emit within their own borders. Similarly, in many developed countries falling carbon intensity of GDP and lower emissions of other environmental "bads" in recent decades have been driven mainly by structural changes such as the shift from manufacturing to services. As a result, the carbon intensity of production in these countries falls while the carbon intensity of consumption rises, due to the increasing share of energy-intensive imported goods (OECD, 2013[11]).

This type of finding often fuels arguments that living standards enjoyed by people in the most developed countries come in part due to CO_2 emissions produced with less advanced technologies in less developed countries. Tracking such information can help raise awareness of the potential or actual transboundary impacts of domestic consumption patterns and inform policy making for sustainable development outcomes in all countries.

Since the 2000s, **China** has been a notable net exporter of emissions, as its industrial base has expanded to meet worldwide demand for its output (OECD, 2016[29]). Even so, despite its massive expansion of exports, China's emissions are still mostly due to domestic consumption. This yields a similar coherence problem at the national level: Feng et al. (2013[30]) finds that up to 80% of the emissions related to goods consumed in the country's highly developed coastal provinces are imported from less developed provinces in central and western China, where many low-value-added but high-carbon-intensive goods are produced.

Hence, consumption-based emissions are of critical importance for assessing transboundary impacts – both between and within countries – when tracking progress in policy coherence for the implementation of SDG 7. The OECD's Inter-Country

Input-Output (ICIO) Database[6], when combined with IEA's statistics on CO_2 emissions from fuel combustion and other industry statistics, can provide this information.

Incentives to use one energy source over another can have unintended negative impacts domestically and abroad. For example, biofuel support schemes (subsidies, mandates etc.) could lead to deforestation and biodiversity loss not only domestically, but also in other countries if the feedstock is imported. This is discussed in more detail in the section on SDG 15 on Life on Land. Increased biofuels production could also affect food prices. This is of particular concern for poor consumers in developing countries who spend a large share of their disposable income on food. The transmission channels are many and complex, however, and any correlation between support levels and food prices needs to be interpreted with care. Rather than suggesting attribution of impacts to one country or another, a PCSD assessment could aim to identify and raise awareness about the possible impact domestic biofuel policies could have on other countries.

Fossil fuel subsidies, in turn, not only undermine global efforts to mitigate climate change, but also aggravate local pollution problems, causing further damage to human health and the environment.

The OECD's Well-being Framework categorises CO_2 emissions from domestic consumption, together with GHG emissions from domestic production, as "flow indicators" for the depletion of natural capital. Fossil fuel combustion continues to be a leading contributor to global man-made GHG emissions – subsidies are thus inconsistent with the well-being of future generations and should be rationalised and phased out over time. To assist governments in their reform efforts, the OECD Inventory of Support Measures for Fossil Fuels[7] brings together the estimates of subsidies and other forms of support for fossil fuels that the OECD and the IEA regularly produce for a great number of countries around the world.

Table 4.8. Indicators for tracking progress on PCSD in relation to SDG 7

SDG 7. Ensure access to affordable, reliable, sustainable, and modern energy for all

	PCSD priorities	Relevant indicators	Data sources
Trade-offs	*Increasing access to energy for all (SDG 7.1) without limiting access to drinking water for all (SDG 6.1)*	▪ Water withdrawal by sector (e.g. energy production, agriculture, human consumption) (km^3) ▪ Water use by energy technology (litres/MWh)	▪ FAO Aquastat ▪ IEA Energy Access Outlook ▪ OECD Green Growth Indicators ▪ OECD-FAO Agricultural Outlook
	Increasing the production of bioenergy (as part of SDG 7.2), without increasing deforestation (SDG 15.2)	▪ CO_2 emission reductions from bioenergy use ($MtCO_2$ avoided) ▪ CO_2 emissions caused by land-use change (Mt CO_2) ▪ Intensity of use of forest resources (timber, ratio)	▪ OECD Environmental Outlook to 2050 ▪ IEA Renewables Statistics ▪ OECD-FAO Agricultural Outlook ▪ OECD Environment Statistics: Forest Resources
Synergies	*Reducing the number of deaths and illnesses from air pollution (SDG 3.9) by facilitating access to clean energy technologies (SDG 7.a)*	▪ Concentration of $PM_{2.5}$ and ozone ($\mu g/m^3$) ▪ Premature deaths from exposure to $PM_{2.5}$ and ozone ▪ Share of population with access to clean cooking (%)	▪ OECD Environment Statistics: Air and Climate ▪ IEA Energy Access Outlook
Transboundary policy effects	*Limiting the adverse impacts on other countries from domestic reliance on energy-intensive*	▪ Demand-based (consumption) CO_2 emissions	▪ OECD Inter-Country Input-Output (ICIO) Database ▪ IEA CO_2 emissions from fuel

	imports (SDG 7.b)		combustion data
	Ensuring that domestic biofuel subsidies (SDG 7.2) do not lead to higher food prices in developing countries	▪ Biofuel production from agricultural feedstocks (toe) ▪ Biofuels support levels (USD) ▪ Food prices (USD)	▪ OECD Agri-Environmental Indicators ▪ OECD Fertiliser and Biofuels Support Policies Database ▪ FAO Food Price Index ▪ Agricultural Market Information System (AMIS)
Intergenerational policy effects	*Reducing reliance on fossil fuels (SDG 7.2, SDG 12.c) to improve future well-being for people and planet*	▪ Share of energy from fossil fuels (%) ▪ CO_2 emissions from fuel combustion (Mt CO_2) ▪ Support to fossil fuels (USD)	▪ IEA World Energy Outlook ▪ OECD Environment Statistics ▪ OECD Inventory of Support Measures for Fossil Fuels

Note: These are illustrative examples. Each country will need to identify and monitor the interactions and policy effects that are most relevant to its own national context and sustainable development objectives.
Source: OECD PCD Unit.

Goal 11. Sustainable cities and communities

Sustainable Development Goal 11 calls on all countries to make cities and human settlements inclusive, safe, resilient and sustainable. This implies that the growth, jobs and service functions generated by cities must be balanced against the pressures they exert on natural resources, the climate and the environment. Similarly, cities' positive and negative effects on human well-being (e.g. accessibility versus congestion) must be taken into account. Tracking progress in policy coherence in the implementation of SDG 11 therefore requires assessing the costs and benefits of urban agglomerations and monitoring their long-term viability and impacts domestically and internationally. One challenge, however, is that cities and regions that want to transition to more sustainable growth paths and have stated objectives to this effect often lack the information and data needed to track the progress of this transition (OECD, 2013[11]).

Similar forces shape urbanisation across the world (OECD, 2015[31]). The OECD Metropolitan Database[8] provides a set of economic, environmental, social and demographic estimated indicators that are comparable across countries, and which offer useful information for a PCSD assessment (Table 4.9).

Table 4.9. OECD Metropolitan Database: Comparable urban indicators

Economic	Environment	Social	Demographic
GDP/capita (USD)	CO_2 emissions/capita (tonnes/inhabitant)	Labour force (persons)	Population density (people/km^2)
Labour productivity	Green area per million people (m^2 per million persons)	Unemployment (%)	Population growth (%)
PCT patent applications (count)	Avg. exposure to air pollution (PM2.5)	Crime statistics (to be developed)	Population share of national value (%)

Note: Data is available for 281 OECD metropolitan areas.
Source: OECD Metropolitan Database (OECD,(n.d.)[32]).

Yet, different countries have different urbanisation challenges (OECD, 2015[31]). For example, a highly urbanised developed country will face different sustainability challenges than a less urbanised developing country: this implies different PCSD priorities for which to track progress. The following examples aim to illustrate this in practice. For relevant indicators and data sources, see Table 4.10.

New Zealand is one of the least densely populated countries in the world, but also one of the most urbanised. Sustained population growth in all major cities is putting pressure on infrastructure and the environment, particularly in **Auckland**, the country's largest city. In one effort to halt this trend, the *Auckland Plan* sets out a long-term (30-year) direction for the region's land use, transport, housing and infrastructure in an integrated manner, and includes goals, principles and quantified targets that allow for tracking progress (OECD, 2017[33]). Many of the indicators used (e.g. waste generation, recycling rates) would need to be part of a PCSD assessment, aiming to ensure that the achievement of individual urban priorities does not impact negatively on others, on other societal objectives or on other countries and regions.

Africa has one of the highest urbanisation rates globally, although remains the least urbanised region in the world – with strong disparities in urbanisation levels across the continent (OECD, 2015[31]). Additionally, over 60% of Africa's urban population is packed into slums (Lall, Somik Vinay, J. Vernon Henderson, 2017[34]). Kibera in **Nairobi, Kenya**, is the largest urban slum in Africa, with serious water, sanitation and hygiene challenges. Comparing data on mortality rates attributed to unsafe water with shares of the urban population with access to an improved water source and/or connection to wastewater treatment can inform efforts to track progress in PCSD.

Sustainable and inclusive cities can contribute to the achievement of other SDGs. Ahrend and Schumann (2014[35]) show that between 1995 and 2010, **European regions** with large cities (>500 000 inhabitants) experienced significantly higher per capita GDP growth than regions without large cities once average national growth rates are taken into account. To track progress in PCSD, correlations between data on urban agglomerations, regional GDP and population, as well as travel time and distance, can be used to illustrate and monitor this positive relationship.

A city's ecological footprint is an important indicator for understanding and monitoring its sustainability and potential impacts on surrounding areas. The ecological footprint measures the land and water area a city requires to produce the resources it consumes and to absorb its wastes. Research by the Global Footprint Network shows that in many countries, large urban centres are major contributors to the national ecological footprint and also have higher per capita footprints than the national average. For instance, the resource demands of **Athens, Greece**, exceed the biocapacity of the entire country. The ecological footprint of **Moscow, Russia**, is 84.2 million global hectares[9], while the city itself has just 324,000 global hectares of biocapacity. In other words, Moscow demands 260 times as much from nature as nature within its borders can regenerate (Boev et al., 2016[36]).

On the other hand, cities can also present an opportunity to reduce individual footprints. For example, the carbon footprint[10] of household energy consumption in **Beijing's** urban areas is lower than that of its rural areas, since urban inhabitants have access to extensive public transportation systems and to central heating systems for their homes. In contrast, rural areas are challenged by energy demands for heating and cooling of individual homes, increasing use of private vehicles, and the difficulty of adequately serving dispersed rural populations through public transportation networks (Gong et al., 2012[37]).

The section on SDG 12 on Responsible Consumption and Production explores the ecological footprint concept in more depth.

Table 4.10. Indicators for tracking progress on PCSD in relation to SDG 11

SDG 11. Make cities and human settlements inclusive, safe, resilient and sustainable

	PCSD priorities	Relevant indicators	Data sources
Trade-offs	*Ensuring that urbanisation (SDG 11) does not impact negatively on waste reduction efforts (SDG 12.5)*	▪ Urban population growth (%) ▪ Municipal waste generation (kg/person/year) ▪ Urban recycling rates (%)	▪ Green Growth in Cities
Synergies	*Reducing the number of deaths and illnesses from water pollution and contamination (SDG 3.9) by upgrading slums (SDG 11.1) and improving access to safe and affordable drinking water (SDG61.)*	▪ Mortality rate due to unsafe water, unsafe sanitation, lack of hygiene (%) ▪ Share of urban population with access to an improved water source (%) ▪ Share of urban population connected to wastewater treatment (%)	▪ WHO Global Health Observatory ▪ World Development Indicators, World Bank
	Sustaining per capita economic growth (SDG 8.1) by enhancing inclusive and sustainable urbanisation (SDG 11.3) and transport systems (SDG 11.2)	▪ Per capita GDP growth rate (%) ▪ Inhabitants, metropolitan areas (thousands) ▪ Travel time and distance	▪ OECD National Accounts Statistics ▪ OECD Metropolitan Database
Transboundary policy effects	*Minimising the ecological footprint of a city on its surrounding regions*	▪ Ecological footprint (global hectares)	▪ Global Footprint Network
Intergenerational policy effects	*Expanding sustainable public transport (SDG 11.2) to reduce cities' carbon footprint over time*	▪ Public transport accessibility in cities (% of population within 1 km from public transport stops) ▪ CO_2 emissions from fuel combustion in the transport sector (% of total)	▪ International Transport Forum ▪ IEA CO_2 emissions from fuel combustion data ▪ OECD Environment Statistics

Note: These are illustrative examples. Each country will need to identify and monitor the interactions and policy effects that are most relevant to its own national context and sustainable development objectives.
Source: OECD PCD Unit.

Goal 12. Responsible consumption and production

Sustainable Development Goal 12 calls on all countries to ensure sustainable consumption and production patterns (SCP). This will require a strong national SCP framework that is integrated into national and sectoral plans, sustainable business practices and consumer behaviour, together with adherence to international norms on the management of hazardous chemicals and wastes (United Nations, 2017[38]). Identifying national PCSD priorities and indicators can help countries create more value using fewer natural resources in a way that does not compromise the needs of future generations. The following examples aim to illustrate this in practice. For relevant indicators and data sources, see Table 4.11.

Monitoring natural resources should be an important part of efforts to track progress in policy coherence for the implementation of SDG 12. This includes looking at the way natural resources are used in economic activity and contribute to economic outputs, and how their use impacts on the environment. Indicators based on Material Flows Analysis (MFA)[11] can be used to measure progress on resource productivity. They provide information on material inputs taken from the environment into the economy (e.g. resources extracted or harvested from the surrounding natural environment or imported from other countries), the transformation and use of inputs within the economy (from

production to final consumption) and material outputs from the economy to the environment as residuals (waste, pollutants) or to other countries in the form of exports. The data are compiled from available production, consumption and trade data and from environment statistics (OECD, 2014[39]).

A commonly used indicator is material productivity (or intensity), relating economic output to the amount of materials (or raw materials) used as inputs. It is defined as GDP per Domestic Material Consumption (DMC) or per Domestic Material Input (DMI)[12]. It can be derived from Economy-Wide Material Flow Accounts that cover the economy as a whole and distinguish between various material types and groups. Water as a resource is not covered in such accounts and needs to be reported separately (OECD, 2014[39]).

Reducing food loss and waste can contribute to positive environmental outcomes. The FAO has estimated that each year as much as one-third of all food produced in the world for human consumption is lost or wasted. This represents a missed opportunity for both the economy and food security, and a waste of natural resources used to grow food. For example, the total carbon footprint of food wastage is around 4.4 $GtCO_2$ equivalents per year globally – with the per capita footprint of high-income countries being more than double that of low-income countries (FAO, 2013). This type of quantifiable impact provides important input to a PCSD assessment and can help monitor interactions with other SDGs.

Policy coherence for sustainable consumption and production patterns also requires identifying and monitoring national footprints abroad. **Switzerland**, for example, performs better than the OECD average in terms of production-based resource productivity, but remains among OECD countries with a relatively high per capita consumption-based environmental footprint. It is the largest producer of municipal solid waste in Europe and among the highest per capita consumption-based carbon dioxide emitters in the OECD. Switzerland also has a large environmental footprint associated with unsustainable consumption patterns. As a result of the country's relative trade openness, it is estimated that one-half to three-quarters of its environmental impact results from the import of goods and services (OECD, 2017[40]).

Therefore, the indicator set identified by Switzerland to report progress against its Green Economy Action Plan (GEAP) contains absolute environmental demand-based footprints (e.g. greenhouse gas, biodiversity, material and energy) in addition to productivity-related metrics (Eidgenössisches Departement für Umwelt, 2016[41]). This allows Switzerland to address and monitor the environmental impact of its domestic consumption, in particular on developing countries.

The ecological footprint complements other footprint indicators. It measures how much area of biologically productive land and water an individual, population or activity requires to produce the resources it consumes and to absorb the waste it generates, using prevailing technology and resource management practices. The ecological footprint is usually expressed in global hectares (gha) – globally comparable, standardised hectares with world average productivity (Global Footprint Network[42]).

Because trade is global, an individual or country's ecological footprint includes land or sea from all over the world (Global Footprint Network[42]):

- The *Ecological Footprint of Consumption (EFC)* is defined as the area used to support a defined population's consumption. The consumption footprint (in gha) includes the area needed to produce the materials consumed and the area needed to absorb the carbon dioxide emissions.

- The *Ecological Footprint of Exports (EFE)* is the footprint embodied in domestically produced products which are exported and consumed in another country.
- The *Ecological Footprint of Imports (EFI)* is the footprint embodied in domestically consumed products which are imported from other countries.
- The *Ecological Footprint of Production (EFP)* is the sum of footprints for all of the resources harvested and all of the waste generated within the defined geographical region.

This means that if a population's ecological footprint exceeds the region's biocapacity, that region runs an ecological deficit and will need to import extra resources from other countries to meet its demand. Conversely, if a region's biocapacity exceeds its ecological footprint, it has an ecological reserve (Global Footprint Network[42]).

The per capita ecological footprint of high-income nations dwarfs that of low- and middle-income countries (WWF, 2016[23]). The Asia-Pacific's demand for resources has expanded particularly rapidly compared to most other regions. In **Korea**, for instance, the population's ecological footprint is eight times larger than the country's biocapacity per capita, representing a nearly five-fold increase in just over 50 years (WWF-Korea, 2016[43]). Imports require countries to also pay close attention to the ecological footprint and biocapacity of its trading partners, in order to ensure that any negative transboundary impacts can be identified and reduced. In Korea, one of the main importers of crops in Asia, trade structures are related to the exporter's water resources in terms of virtual water trade (the section on SDG 6 on Water identified Thailand, India, and Pakistan as the main virtual water exporters in Asia due to their rice trade).

The environmentally sound management of chemicals and hazardous wastes will contribute to the future well-being of people and planet. The chemical industry is one of the world's largest, with products worth more than EUR 4 000 billion annually. **OECD countries** account for about 60% of global chemical production and have a major responsibility for ensuring that chemicals are produced and used as safely as possible (OECD, 2013[44]).

Table 4.11. Indicators for tracking progress on PCSD in relation to SDG 12

SDG 12. Ensure sustainable consumption and production patterns

	PCSD priorities	Relevant indicators	Data sources
Trade-offs	*Achieving higher levels of economic productivity (8.2) without undermining the sustainable management and efficient use of natural resources (SDG 12.2)*	▪ Non-energy material productivity ▪ Domestic Material Consumption (DMC) ▪ Domestic Material Input (DMI) ▪ Environmentally Adjusted Multifactor Productivity (EAMP)	▪ OECD Environment Statistics: Material Resources ▪ OECD productivity Statistics ▪ IEA World Energy Outlook ▪ OECD Green Growth Indicators
Synergies	*Reducing CO_2 emissions (SDG 13) by halving per capita global food waste (SDG 12.3)*	▪ Food waste (tonnes) ▪ Food waste carbon footprint (kilograms of CO_2 equivalent)	▪ FAO Food Wastage Footprint (FWF) model
Transboundary policy effects	*Limiting the footprints on other countries from domestic consumption*	▪ Demand-based (consumption) footprints ▪ Ecological footprint of consumption (gha)	▪ Global Footprint Network
Intergenerational policy effects	*Achieving environmentally sound management of chemicals and wastes throughout their life cycles*	▪ Hazardous waste generated per capita and proportion of waste treated, by type of treatment	▪ UN Environment (forthcoming indicator; based on data from OECD, UNSD, Eurostat and BRS Secretariat)

Note: These are illustrative examples. Each country will need to identify and monitor the interactions and policy effects that are most relevant to its own national context and sustainable development objectives.
Source: OECD PCD Unit.

Goal 15. Life on land

Sustainable Development Goal 15 calls on all countries to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss. While countries will have different challenges depending on their geographic location, natural attributes and climate, the drivers of ecosystem change and biodiversity loss are the same: land use and cover change; air and water pollution; intensification of agriculture; climate change; introduction of alien species; and biofuel production/combustion technologies. These drivers or threats also interact, which can exacerbate the effects on species. For example, habitat destruction and overexploitation might compromise a species' ability to respond to climate change (Dirzo et al., 2014[45]).

Changes in land cover are considered the best available proxies for pressures on biodiversity and ecosystems. Ongoing work at the OECD seeks to develop policy-relevant indicators to measure land cover and land cover changes at national and sub-national levels (OECD, 2016[46]). In developing countries, where people rely on land-based resources to generate most of their income, implementing sustainable land use and management practices can also contribute to reducing poverty. An important part of tracking progress in PCSD for the implementation of SDG 15 will therefore be to assess competing demands for land, and the trade-offs between different land uses and the impacts they have on the environment (e.g. biodiversity), the economy (e.g. incomes) and society (e.g. well-being) both domestically and in other countries. The following examples aim to illustrate this in practice. For relevant indicators and data sources, see Table 4.12).

Agriculture and related support measures can have adverse impact on biodiversity and ecosystems. The unique geography in **Chile** results in a variety of climates, ecosystems and vegetation, and a large number of endemic species that are found nowhere else in the world. Many of its ecoregions are considered significant to global biodiversity, but are also under intense pressures from land-use change, fishery, mining, urban and infrastructure development. The use of fertilisers and pesticides, for example, poses considerable risks to soil and water. While support to Chilean farmers has declined and is modest compared to other OECD member countries, remaining support indirectly encourages agricultural production and increases the risk of overuse or misuse of water and potentially harmful inputs (OECD/ECLAC, 2016[47]). Here, tracking progress in PCSD would call for joint monitoring of the potentially most environmentally harmful agricultural support[13] on the one hand, and indicators related to biodiversity and biodiversity loss due to agriculture on the other.

Mexico faces similar problems: some national support programmes for farmers work against national REDD+ initiatives that aim to reduce emissions from deforestation and forest degradation (OECD, 2013[48]). In this case, tracking progress in policy coherence requires monitoring and balancing support to agriculture with support aimed at reducing emissions. Monitoring forest gains and losses through land-use change can help a government to gauge forests' ability to reduce net greenhouse gas emissions (FAO, 2016[49]).

Imports can lead to deforestation and/or desertification in exporting countries. It has been estimated that commercial agriculture accounts for almost three quarters of the destruction of tropical rainforests. (Lawson Sam, 2014[50]). This is closely linked to the earlier discussion on SDG 12 on sustainable consumption and production, with large impacts on people, welfare and carbon storage.

The **United Kingdom** – as the world's fifth largest economy – is a major importer and consumer of "deforestation-risk commodities". A recent study commissioned by the WWF and Royal Society for the Protection of Birds attempts to quantify the scale of the potential overseas impact linked to the UK's imports of seven commodities often linked with forest loss: beef and leather, cocoa, palm oil, pulp and paper, rubber, soy, and timber. Its findings suggest that supplying the annual UK demand for these seven commodities alone requires a land area more than half the size of the UK: a total of 13.6 hectares. More than 40 percent of the UK's overseas land footprint is in countries at high or very high risk of deforestation, weak governance and poor labour standards (Jennings, Sheane and Mccosker, 2017[51]).

A quantification of the proportion of imports that are environmentally certified would provide useful input to a PCSD assessment, but data are limited.

Illicit trade in wildlife products impacts negatively on countries of origin. Many criminal economies in **West Africa** centre on indigenous natural resources, including flora and fauna. Their diversion represents a loss of potential benefit to the region's citizens and challenges the region's ability to achieve its biodiversity goals and generate sustainable livelihoods (OECD, 2018[52]). Markets in Asia are frequently the destination economies for illegally trafficked species and wildlife products (including ivory and rhino horn), but OECD countries including countries such as Japan and members of the European Union and the United States are also are also involved as transit, destination, and even source countries for rare species and illegal products (OECD, 2018[53]).

Combatting illegal financial flows and protecting vulnerable populations from their damaging impacts calls for coherent and co-ordinated policy action across countries (OECD, 2018[52]). Data on illicit trade and associated policy responses is needed to track progress in policy coherence in order to limit negative transboundary impacts.

Indicators on terrestrial and marine protected areas can provide an indication of countries' conservation efforts**,** including for achieving the Aichi Targets and the SDGs. New work by the OECD seeks to develop a methodology for calculating the extent of terrestrial and marine protected areas by country, type and IUCN management categories. This will allow summarising the data on protected areas in a more detailed and harmonised way across countries than has previously been possible (OECD, 2016[46]). It will also aid efforts to track progress in PCSD in the implementation of SDG 15.

Table 4.12. Indicators for tracking progress on PCSD in relation to SDG 15

SDG 15. Protect, restore and promote sustainable use of terrestrial ecosystems

	PCSD priorities	Useful indicators	Data sources
Trade-offs	*Improving agricultural productivity (SDG 2.3) without impeding efforts to halt biodiversity loss (SDG 15.5)*	▪ Potentially most environmentally harmful agricultural support ▪ IUCN Red List Index	▪ OECD Green Growth Indicators for Agriculture ▪ International Union for Conservation of Nature
	Improving agricultural productivity (SDG 2.3) without impeding efforts to reduce emissions (SDG 13) from deforestation (SDG 15.2)	▪ Potentially most environmentally harmful agricultural support ▪ Support to REDD+ (USD) ▪ CO_2 emissions caused by land-use change (Mt CO_2)	▪ OECD Green Growth Indicators for Agriculture ▪ OECD Environment Statistics
Synergies	*Increasing the incomes of small-scale food producers (SDG 2.3) by restoring degraded land and soil (SDG 15.3)*	▪ Food production per unit of agricultural land (tonnes/hectare) ▪ Average income of small-scale food producers (forthcoming)	▪ OECD Agriculture Statistics ▪ FAO AGRIS Project
Transboundary policy effects	*Limiting deforestation (SDG 15.2) in producing countries resulting from domestic imports of e.g. palm oil/soybeans*	▪ Palm oil/soybean production (tonnes or cultivated area) ▪ Imports/exports of palm oil (tonnes) ▪ Rate of deforestation (%) ▪ Share of certified imports (%)	▪ Oil World Database ▪ OECD-FAO Agricultural Outlook ▪ National Trade Statistics ▪ FAO Global Forest Resources Assessments
	Reducing illicit financial flows to and from other countries resulting from trade in illegal wildlife products (SDG 15.7)	▪ Trade in e.g. elephant ivory and rhino horn (USD) ▪ Illicit financial flows (USD) ▪ General Trade-Related Index of Counterfeiting for products/economies (GTRIC-p and GTRIC-e)	▪ WWF-IUCN TRAFFIC Wildlife Trade Monitoring Network ▪ Global Financial Integrity ▪ The Economic Impact of Counterfeiting and Piracy (OECD, 2008)
Intergenerational policy effects	*Maintaining (or reversing the loss of) terrestrial biodiversity (SDG 15.5)*	▪ IUCN Red List Index ▪ Terrestrial and marine protected areas	▪ International Union for Conservation of Nature ▪ OECD Environment Statistics

Note: These are illustrative examples. Each country will need to identify and monitor the interactions and policy effects that are most relevant to its own national context and sustainable development objectives.
Source: OECD PCD Unit.

Contributions by Policy Coherence for Sustainable Development Partners

The opinions expressed and arguments employed in the contributions below are those of the author(s) and do not necessarily reflect the official views of the OECD or of the governments of its member countries

Adapting the Commitment to Development Index to new global realities

Anita Käppeli, Center for Global Development

Successful implementation of the SDGs requires reliable analytical tools. Putting such tools in place will enable stakeholders of the 2030 Agenda to learn from each other and track their progress in implementing the targets. We at the Center for Global Development (CGD) have experience with tracking countries' policies through our annually published Commitment to Development Index (CDI). In line with the 2030 Agenda for Sustainable Development, the CDI covers the three dimensions of sustainability: economic, social and environmental. Our experiences with the CDI provide some important lessons for actors involved in the implementation of the global goals. We highlight these lessons below, and describe how the CDI itself will change in the coming year.

Measuring countries' sustainable development policies

Since 2003, the CDI – a composite set of quantitative indicators – has been measuring the policy efforts of 27 OECD countries and how they impact the lives of people in lower- and middle-income countries. The CDI measures policy coherence in seven dimensions: aid, finance, technology, environment, trade, security and migration. With its annual ranking, it aims to provoke conversations and enable learning processes between civil society and policy makers within and among countries. The CDI highlights that high-income countries can support sustainable development globally in ways beyond generous and high-quality aid policies.

Through its scoring system, the CDI acknowledges countries that enable financial transparency and comply with the international investment framework. It encourages countries to invest in technological research and development, and to put in place policies that protect the environment and prevent overfishing. It also takes into account open trade policies, contributions to the global security regime and peacekeeping efforts, as well as open immigration policies. Scores are reduced for imposing barriers to sharing technology with or importing from developing countries, selling arms to poor and undemocratic nations, and for maintaining policies that harm global public goods.

In line with the SDGs, the CDI takes a holistic approach covering the economic, environmental and social dimensions of development. Its distinctive role is to assess *policies* rather than outcomes and looks at how these policies contribute to or hinder other countries' development. Consequently, the CDI highlights spillover effects of high-income countries' policies.

Lessons learnt from 15 years of the CDI

Fifteen years of publishing the CDI and tracking progress in countries' policy efforts enables us to share a few lessons learnt. Five recommendations could be applied to the way we deal with measuring and tracking progress in implementing the global goals:

- ***Transparency:*** Credibly tracking policies – or in the case of the SDGs, outcomes – requires transparency about methodology and data sources. Equally important is clarity regarding the comparability of results and dealing with the lack or sparsity of data.
- ***Comprehensibility:*** Many countries are willing to discuss their CDI results and learn from each other. However, to be valuable, compelling and used frequently by its target audience, this information should be easily comprehensible for all stakeholders.
- ***Awareness and communication:*** A set of composite indicators is an excellent tool to draw attention to critical policy issues and start conversations with possible agents for change. A communication strategy for effectively targeting the main audience should be put in place.
- ***Evidence:*** As data availability evolves and evidence improves on how best to achieve outcomes, there is a need to continuously adapt methods for tracking progress. The development of monitoring tools can itself foster more data collection and research.
- ***Interlinkages:*** Tracking the implementation of the SDGs raises questions regarding interlinkages between individual goals and targets. When dealing with CDI outreach we are often confronted with the question of interlinkages between different policy fields. While we are unable to provide a definite answer to the interlinkages between the SDGs, monitoring individual targets and raising awareness about policy coherence and trade-offs between different goals and targets can be a valuable contribution to the discussion about the 2030 Agenda. It raises awareness with decision-makers and decision-shapers about how individual policies and actions are linked to outcomes affecting the global goals.

How do we plan to adapt the CDI to new global realities?

For a decade and a half, the CDI has highlighted the policy efforts of powerful development actors and illustrated leadership in development efforts. While the CDI remains a valuable tool for measuring policy coherence, the environment in which it is produced has changed: the SDGs have replaced the MDGs, new global issues have appeared, and emerging middle-income countries have diversified the donor community. Also, protectionist sentiments have recently emerged in some countries, while global issues such as climate change, gender, inequality and migration are rightly receiving more attention. The Center for Global Development will revise the Index over the next three years to make sure it remains at the cutting edge of research. By involving leading thinkers, policy makers from both high-income and middle/low-income countries and interested civil society groups in our fundamental review process, we will ensure the inclusion of a variety of views and perspectives.

Achieving the SDGs and building resilient societies – the overarching theme of this year's HLPF – can best be achieved through a learning process fostered by communication of best practices and exchange of ideas between practitioners, policy makers and civil society, something we want to profit from in our review.

With these efforts, the new CDI will complement the SDGs rather than compete with them. In the spirit of leaving no one behind, the SDGs draw attention to each country's progress toward and path to sustainable development, rightly so. Still, within the

universal transformations envisaged in the SDGs, major economies – whose policies have the biggest spillovers to others – should have higher ambitions for their efforts and can expect increased scrutiny of their contribution. By tracking and comparing these policies consistently and comprehensively, the CDI will help accelerate progress on the SDGs.

Lessons learnt from applying network analysis to SDG 7 on Energy in Sri Lanka

Navam Niles, Janathakshan Gte Ltd and Karin Fernando, Centre for Poverty Analysis

Agenda 2030 and the Sustainable Development Goals (SDGs) are designed to be indivisible and interconnected amongst various dimensions. While their implementation is a global process, the main responsibility falls upon governments, thus requiring government action to achieve this purpose. Public policies are a central tool for implementation of Agenda 2030, and coherence between public policies will determine their effectiveness. In order to encourage governments and other entities to work towards policy coherence, it is necessary to provide background evidence, tools and processes to assist their efforts.

In Sri Lanka, the Centre for Poverty Analysis (CEPA) and Janathakshan Gte Limited experimented with a framework for studying interconnectivity and balance using network analysis. The study examined national policies linked to SDG 7 on energy and how they aligned to achieve the objective of "clean energy security".

As a first step, it was necessary to define the elements of clean energy security within the SDG agenda. This was done by linking literature on clean energy to the three dimensions of sustainable development. For the environmental dimension, elements used were: renewable energy (7.2), energy efficiency (7.3), and electrification. For the social dimension, elements used were: energy access (7.1) and energy affordability (7.1). For the economic dimension, elements used were: energy reliability (7.1) and efforts to reduce fossil-fuel subsidies. These formed the basis of the analysis to determine balance of the polices to the three dimensions of sustainable development. This was done by taking each policy statements in a set of selected policies related to energy and referencing the alignment of each statement with the clean energy elements. The exercise demonstrated the usefulness of defined criteria for clean energy security by which to assess the statements.

Furthermore the analysis also looked to establish interconnectivity with other SDGs. First, a baseline was developed by surveying the literature on interconnectivity (Le Blanc, 2015[54]) and balance (Cutter, 2015[55]). The baseline established a disproportionate balance between the environmental, social, and economic dimensions – 44%, 33% and 22% respectively. The baseline established a minimum interconnectivity with seven SDGs: 1, 8, 9, 10, 11, 12 and 13. Next, the set of policies were surveyed for alignment with various SDG targets.

The result showed that in the context of balance, the policies were distributed disproportionately across the environmental, social, and economic dimensions – 50%, 33%, and 17% respectively, similar to the baseline. In the context of interconnectivity, the policies were linked to all the expected SDGs but also other SDGs, such as SDG 2 and SDG 15.

The results and visualisation for this study was done using network analysis and it showed that this type of exercise can help policy makers identify crosslinks and ripple

effects. It demonstrates the need to examine the skew in the orientation of environment policy, for example, against economic elements that still rely on fossil fuels to meet energy reliability objectives. It thus highlights the importance for policy makers to use such coherence tools to help identify and promote synergies and, more importantly, recognise and reconcile trade-offs amongst the different dimensions of sustainable development.

The exercise also shows that existing policies are a good starting point from which to work on coherence, but that the strength of the analysis is dependent on the thoroughness of the policies. Policies made by different parties using different logic models and objectives provide varying depth and description that can limit the analysis. The exercise also shows the need for stakeholders, who are the implementers, to be involved in such scoring exercises in order for the analysis to be able to go beyond policy prescriptions and to ground the scoring in the practical aspects of operationalisation.

The study indicates that tools such as network analysis can be used successfully to identify crosslinks but require further work in order to improve the rigour of analysis and the practicality of its application.

This study was possible due to the support and guidance received from the Southern Voice Network on the post MDG Development Goals. The full paper, "Implementing the SDGs Responding to the Challenges of Interconnectivity and Balance" can be downloaded here. (http://southernvoice.org/implementing-the-sdgs-responding-to-the-challenges-of-interconnectivity-and-balance/)

Tracking SDG activity in national parliaments: a technological answer

Research Center on Policy Coherence for Development (CIECODE)

The cross-cutting nature of the Sustainable Development Goals (SDGs) presents a unique opportunity to approach the main social, environmental and economic challenges humanity is facing in a way which truly reflects their real complexity. At the same time, the transversality of goals and targets represents a challenge for the implementation, evaluation and monitoring of Agenda 2030 for public institutions, civil society organisations or media outlets that have organised their processes and structures according to the traditional "vertical" distribution of thematic policies.

In some countries, policy makers are not yet able to link the SDG goals to the public policies they work on due to a lack of knowledge and understanding of the thematic patchwork behind the Agenda. This complexity also hampers efforts to track and gather information on SDG-related political activity proposed or approved so far. The transversal nature of the SDGs is also likely behind the widespread lack of explicit references to the SDGs by the media, who have traditionally covered news related to issues included in Agenda 2030 (i.e. pollution, gender equality, food waste and forced labour, among others).

In many countries, this situation adds to the already problematic availability of and open access to relevant public information. Many public institutions have not yet understood their duty to proactively make accessible, in a reusable format, all data they produce. This complicates monitoring of countries' advances and setbacks in implementation of the SDGs and contributes to the disaffection and detachment of citizens from the basic functioning of decision-making processes related to the SDGs at the local, national and international levels.

Overcoming obstacles with technology

In order to help overcome these obstacles, CIECODE (a Spanish think-tank specializing in policy coherence for development) is adapting its innovative technological tool TiPi to the framework of Agenda 2030.[14] TiPi – which stands for Transparency, Information, Participation and Influence – gathers all SDG-related information published by the Spanish national parliament into a database and, through an automatic process of massive-tagging, classifies it according to linkages to specific SDG goals or targets. It then offers this information freely and openly through an online browser for users to search, find and download.

Through an intuitive and attractive interface, TiPi provides relevant information about parliamentarian SDG-related activity which might not be obvious at first sight. Which SDGs are affected by a certain legislative initiative? Which receive the most attention by MPs, and which are being left behind? Which MPs are most active in the implementation of the 2030 Agenda, and who is neglecting it? More importantly, TiPi provides a cost-efficient means of analysing political activity from a PCSD perspective by detecting all legislative initiatives related to a goal or target being proposed and discussed at the same time across different parliamentary committees.

TiPi combines advanced computer science – needed to scrap thousands of PDF files where legislation is published and transform them into a structured database – with the more traditional knowledge of policy makers, CSOs and academia, which is needed to build an SDG thesaurus that can automatically link political initiatives with their related goals and targets. By transferring this expert knowledge to users, TiPi helps them overcome the complexity of the SDG's structure and to observe political activity from a qualified perspective. TiPi also helps to close the existing gap between public information and accessible and useful information. With its online search engine, key information needed for monitoring and reporting of SDG-related policies will now be available, free and tidy, just one click away.

Open parliaments, policy coherence and the Agenda 2030

National parliaments have a key role in the SDG implementation process. They are the most relevant and best-positioned public institutions to ensure coherence with sustainable development in the hundreds of thousands of laws, legislative initiatives, public plans and budgets that will be passed in each country in the years to come. By opening and structuring the information of national parliaments, TiPi will facilitate this fundamental task and, at the same time, help CSOs, journalists and individual citizens hold national parliaments accountable for their responsibility to achieve it.

TiPi will also make it easier for the executive branch to evaluate the implementation of the SDGs in legislation. This potential has recently been acknowledged by the Spanish government, which will use TiPi as part of the official monitoring and accountability system that the country is currently designing to evaluate Spanish implementation of the SDGs. But TiPi could also expand outside Spain. The tool's code is open and published, and it has been built using open-source software, which will facilitate its replicability and adaptation to other national, subnational or supranational parliaments. Whether it is a country in another continent, a German Länder or the European Parliament who shows interest, TiPi could potentially be implemented in all these contexts and start tracking their SDG-related activity in a short period of time.

In conclusion, the goal behind TiPi is to foster public policies that will lead to the accomplishment of the Agenda 2030 at the regional, national and international levels. In order to achieve this, there are four indispensable ingredients which TiPi facilitates: 1) active, informed and demanding citizens; 2) empowered civic society organisations; 3) capable and critical media; and 4) responsible politicians and public servants, subject to public control. Through better access to information, TiPi helps citizens and CSOs strengthen their capacity to participate in and influence decision making processes. It also provides new specialised sources of information to media in order to foster informed public debate on the 2030 Agenda. Finally, TiPi creates an incentive system for politicians and public servants through the recognition of good practices and more exposure to public pressure and accountability.

Notes

[1] The two sections on policy interactions and policy effects are based upon the *Coherence for Development Report* "Tracking progress on policy coherence for sustainable development at the national level: What and how to measure?", published by the OECD PCD Unit in July 2017.

[2] The OECD Agri-Environmental Database includes indicators related to water resources; water quality; agriculture and land area; soil erosion; ammonia, NOx and SOx emissions; greenhouse gas emissions; energy use and biofuel production; pesticides sales; and farm birds index. The complete database can be accessed at http://www.oecd.org/tad/sustainable-agriculture/agri-environmentalindicators.htm.

[3] Green water is soil moisture from precipitation, used by plants via transpiration. It is part of the evapotranspiration flux in the hydrologic cycle. Blue water is freshwater (surface and groundwater), stored in lakes, streams, groundwater, glaciers and snow.

[4] For more on IEA's energy access methodology, visit www.iea.org/energyaccess/methodology.

[5] A country with higher production-based emissions than consumption-based emissions is a net exporter of emissions; a country with lower production-based emissions than consumption-based emissions is a net importer of emissions.

[6] The OECD's Inter-Country Input-Output (ICIO) Database is the principle source of the indicators produced under the joint OECD-WTO project to measure Trade in Value Added (TiVA). It also contributes to environmental analyses by being a main input into the measurement of CO_2 embodied in international trade. The Database can be accessed at http://www.oecd.org/sti/ind/inter-country-input-output-tables.htm.

[7] The complete data base on fossil fuel support can be accessed at http://www.oecd.org/site/tadffss.

[8] The OECD Metropolitan Database, as well as the OECD Regional Database, can be accessed at http://www.oecd.org/cfe/regional-policy/regionalstatisticsandindicators.htm.

[9] Globally comparable, standardised hectares with world average productivity.

[10] In ecological footprint accounts, CO_2 emissions associated with fossil fuel use are converted into biologically productive areas necessary to absorb them. The carbon footprint is added to the ecological footprint because it is a competing use of bio-productive space, as increasing CO_2 concentrations in the atmosphere is considered to represent a build-up of ecological debt (Global Footprint Network).

[11] Material flows accounts are part of the family of physical flow accounts described in the Central Framework of the System of Environmental Economic Accounts (SEEA), which covers measurement in three main areas (https://seea.un.org):

- Environmental flows. The flows of natural inputs, products and residuals between the environment and the economy, and within the economy, both in physical and monetary terms.
- Stocks of environmental assets. The stocks of individual assets, such as water or energy assets, and how they change over an accounting period due to economic activity and natural processes, both in physical and monetary terms.
- Economic activity related to the environment. Monetary flows associated with economic activities related to the environment, including spending on environmental protection and resource management, and the production of "environmental goods and services".

[12] DMI measures the material inputs into an economy, accounting for the domestic extraction of materials and imports. DMC measures the amount of materials consumed in an economy (i.e. the direct apparent consumption of materials). DMC is composed of two elements, namely the domestic extraction and the physical trade balance (which equals imports minus exports). DMC equals DMI minus exports.

[13] The potentially most harmful support to farmers comprises market price support; payments based on commodity output without imposing environmental constraints on farming practices; and payments based on variable input use without imposing environmental constraints on farming practices.

[14] Information about the adaptation of TiPi to the Agenda 2030 is available at: www.parlamento-ods.org.

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