12 Monitoring performance over time

Monitoring helps users assess whether a policy is on track and being implemented as planned. This chapter provides guidance on how to (1) monitor the performance of a policy over time by tracking the progress of key indicators, (2) collect data needed for ex-post assessment and (3) prepare a monitoring plan.

This chapter is relevant to users who want to:

- determine whether policies are being implemented as planned and having the desired effects across the identified impact categories, to improve implementation and inform future policy design

- assess progress towards achieving SDGs, to adjust current efforts and inform future goal-setting

- collect data needed for ex-post assessment of impacts.

Checklist of key recommendations

- Define indicators that will be used to track performance of the policy over time for each impact category included in the assessment
- If estimating impacts ex-post, collect data needed for ex-post assessment
- Create a plan for monitoring indicators
- Monitor each of the indicators over time, in accordance with the monitoring plan
- Separately monitor indicators for different groups in society, where relevant
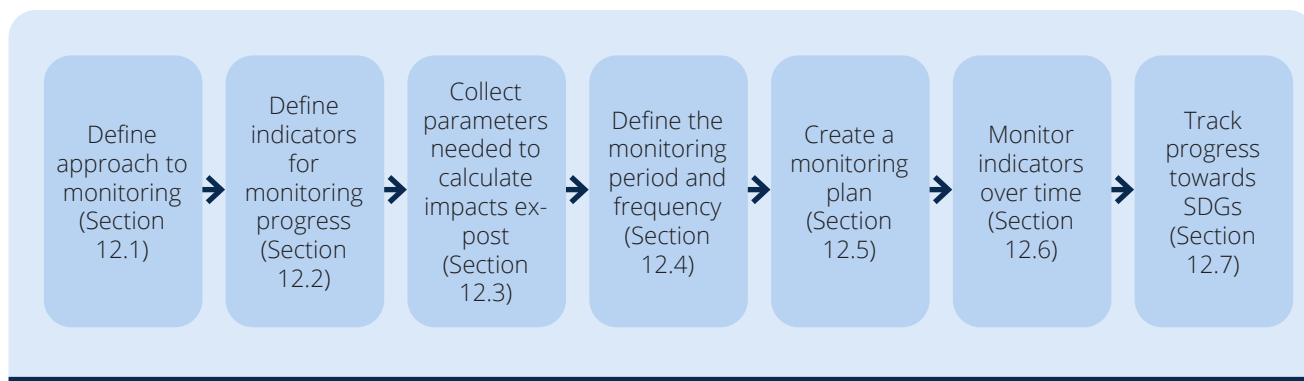
12.1 Define approach to monitoring

Monitoring during policy implementation serves two distinct objectives:

- Monitor performance of the policy. Track key indicators over time in relation to historical values, goal values and values at the start of policy implementation to understand whether the policy is on track and being implemented as planned.

- For ex-post assessment of impacts, collect data on the indicators and parameters needed (if applicable).

FIGURE **12.1**

Overview of steps in the chapter

| Define approach to monitoring (Section 12.1) | Define indicators for monitoring progress (Section 12.2) | Collect parameters needed to calculate impacts ex-post (Section 12.3) | Define the monitoring period and frequency (Section 12.4) | Create a monitoring plan (Section 12.5) | Monitor indicators over time (Section 12.6) | Track progress towards SDGs (Section 12.7) |

Users can collect data to meet one or both objectives. The first objective requires the tracking of indicators only, while the second objective may require tracking a broader set of parameters. Indicators are metrics that can be monitored over time to enable tracking of changes towards targeted outcomes. Parameters are additional data needed under certain circumstances to calculate the impact of a policy on indicators that cannot be directly monitored.

Monitoring key indicators is useful for understanding progress over time; understanding whether indicators of interest are moving in the right direction; and tracking progress towards meeting goals, such as sustainable development goals at the international, national or local levels. Monitoring key indicators over time is generally simpler and less onerous than estimating impacts, and can provide a low-cost way of understanding policy effectiveness by tracking trends in key indicators. If progress of key indicators is not on track in relation to goal values, monitoring can inform corrective action.

Key indicators can be monitored over time relative to historical values, goal values and/or values at the start of policy implementation. Each is described below and illustrated in Figure 12.2:

- **Relative to historical values.** Monitor the trend in a given indicator over time to see whether it is moving in the right direction in relation to past values.

- **Relative to goal values.** Monitor the trend in a given indicator in relation to goal values (defined ex-ante) to see whether goals for that indicator are being achieved.[40]

- **Relative to values at the start of policy implementation.** Monitor the trend in a given indicator before and after a policy is implemented to see whether the policy is having the desired effect.

However, monitoring indicators is not sufficient to estimate the impact of a policy. Monitoring trends in indicators can show a correlation between desired outcomes and the implementation of the policy, but it does not demonstrate causation or allow changes in indicators to be attributed to policies. Changes in indicators could be a result of factors other than the policy being assessed. Attributing impacts to specific

FIGURE **12.2**

Monitoring indicators relative to historical values, goal values and the date of policy implementation

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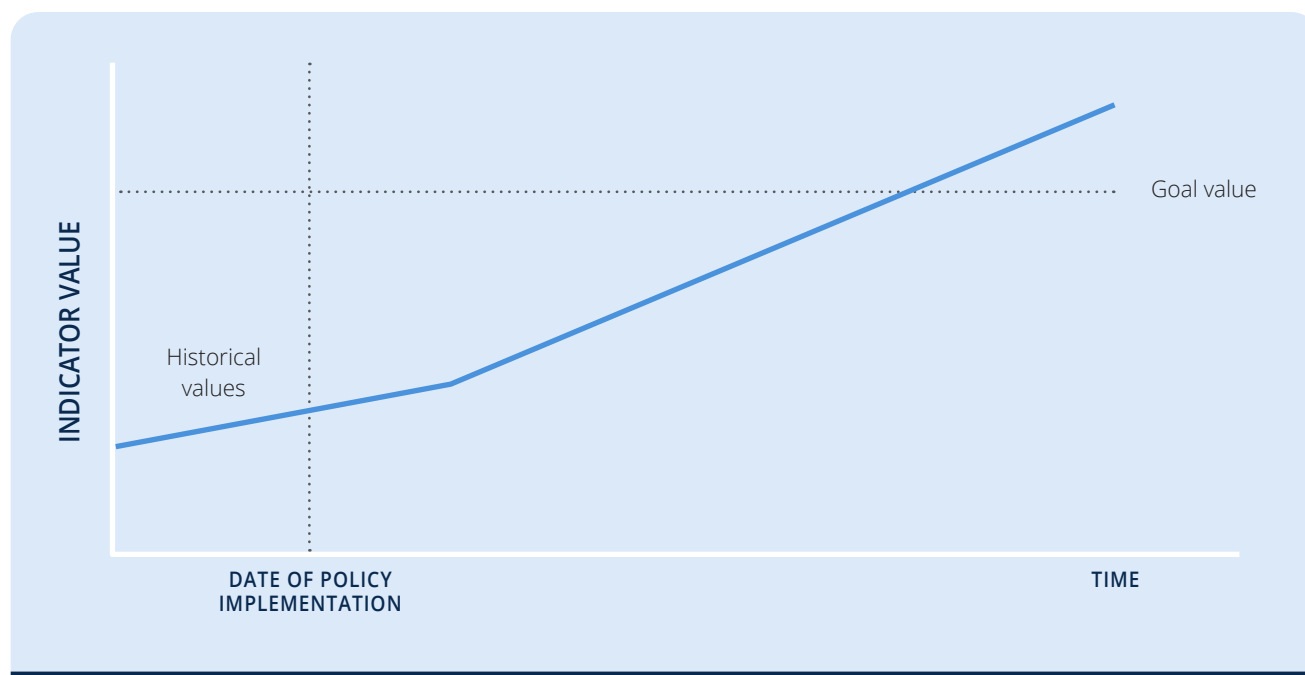
[40] Tracking of indicators over time may still be useful even if there are no defined goal values for the selected indicator.

policies requires a baseline scenario, as discussed in Chapters 8–10. Depending on how indicators are defined, it may be possible to infer causation. For example, a user can monitor the number of new jobs created from discrete projects resulting from a policy to demonstrate the additional jobs created.

Users who are estimating the impacts of a policy ex-post should collect data on the broader range of parameters that are needed to calculate the ex-post policy scenario and ex-post baseline scenario. The types of parameters that need to be collected should be informed by the ex-post estimation method that will be used. To ensure an accurate assessment, data collection should begin before or at the beginning of the policy implementation period and continue throughout the policy implementation period.

12.2 Define indicators for monitoring progress of a policy

It is a *key recommendation* to define indicators that will be used to track performance of the policy over time for each impact category included in the assessment (as defined in Chapter 5).

Examples of indicators are provided in Table 5.5. For further guidance and examples of indicators that can be used, see:

- United Nations SDG website[41]

- United Nations SDG indicators website,[42] including the global SDG indicators database[43] and list of indicators[44]

- United Nations *Indicators of Sustainable Development: Guidelines and Methodologies*.[45]

When selecting indicators, users should consider the intended objectives of monitoring, the nature of the policy, the impact categories being assessed and any related goals, stakeholder priorities, and data availability. All relevant indicators should be clearly described. The selected indicators should be monitored in accordance with the monitoring

plan (see Section 12.5), and in relation to historical values and/or goal values, and to values at the start of policy implementation. The selected indicators from each impact category should be discussed in an inclusive stakeholder consultation process to obtain stakeholder perspectives and make the assessment more complete. Chapter 8 of the ICAT *Stakeholder Participation Guide* provides more information on how to conduct consultations.

Users tracking progress towards SDGs may reference the relevant SDG goal and, if applicable, the relevant SDG target(s) for each selected indicator (as described in Section 12.7).

Table 12.1 provides an overview of possible impact categories and referenced SDGs, indicators, and brief explanations of the indicators for a solar PV incentive policy.

12.3 Collect parameters needed to calculate impacts ex-post (if relevant)

For ex-post quantitative impact assessments, it is necessary to identify and collect parameters needed to calculate impacts of the policy on each indicator being quantified. If estimating impacts ex-post, it is a *key recommendation* to collect data needed for ex-post assessment. Parameters should be collected, as needed, for each impact category and each selected indicator included in the assessment boundary (as described in Chapter 5).

Parameters are additional data needed under certain circumstances to calculate the impact of a policy on indicators that cannot be directly monitored. For example, to estimate the impact category of cost savings from a solar PV incentive policy that replaces kerosene use (in the baseline scenario) with solar electricity, the indicator could be household savings (money). Money saved is not monitored directly. Instead, the parameters needed to calculate the amount of money saved include the cost of kerosene and the amount of kerosene savings. These parameters are needed to calculate the impact on the selected indicator (money saved) but not the indicator itself. Parameters can be collected from various sources, such as statistics collected at the jurisdiction level or surveys.

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[41] https://sustainabledevelopment.un.org/sdgs

[42] http://unstats.un.org/sdgs

[43] http://unstats.un.org/sdgs/indicators/database

[44] http://unstats.un.org/sdgs/indicators/indicators-list

[45] Available at: https://sustainabledevelopment.un.org/content/documents/guidelines.pdf.

TABLE **12.1**

Example of selected indicators and referenced SDGs for a solar PV incentive policy, and explanations of chosen indicators

Impact category	Indicator	Explanation of chosen indicator
Energy (SDG 7)	• Solar capacity installed (MW) • Electricity delivered from solar PV installations (MWh)	These indicators will track the quantity of renewable energy installed and generated from the solar PV incentive policy.
Health (SDG 13)	• Emissions of $PM_{2.5}$, PM_{10}, SO_2 and NO_X • Number of premature deaths due to air pollution • Number of health clinics electrified	The policy will improve health of people by avoiding burning of kerosene/paraffin, which causes severe indoor air pollution by emitting noxious fumes and soot. Kerosene lighting is hazardous, and is responsible for many burns and deaths. The policy will also improve health-care conditions by providing lighting and refrigeration for health clinics.
Quality of life (SDGs 1, 2, 16)	• Number of households having access to clean, reliable and affordable electricity	The policy will provide more reliable lighting conditions, allowing children to study at home, which has a significant impact on improving child education in rural families and future employability. With a more reliable light source, adults can pursue productive activities in the house after nightfall.
Access to clean energy/energy security (SDG 7)	• Share of people having access to reliable electricity services	In the absence of reliable grid electricity, people depend mostly on diesel generators and kerosene/paraffin lamps for lighting. The policy will make people less dependent on expensive fuels and reduce the need to purchase fuel. The policy will enable use of local energy sources, independent of geopolitical uncertainty.
Empowerment of women (SDG 5)	• Share of female entrepreneurs	The policy will create opportunities for new income-generating activities for women and women's associations.
Employment/job creation and income generation (SDG 8)	• Number of people (men/women) in jobs • Household income	The policy will encourage new job-creating and income-generating activities related to renewable energy supply and installation, mini-grid operation, awareness raising, and marketing and accounting, thereby creating many new jobs. The generation of income will enhance economic growth and provide the means to afford electricity.
Economic productivity (SDG 8)	• Number of households with improved economic productivity	The policy will foster productivity, increase production efficiency and enable added-value activities.
Food security (SDG 2)	• Number of households with improved food security	The policy will reduce food waste by improving refrigeration. It will also promote better food processing, adding value to agricultural products.
Safety (SDG 3)	• Number of people affected by hazardous conditions	Kerosene/paraffin lighting is hazardous and is responsible for loss of property through fire, as well as burns and death. The policy will foster the implementation of safety measures such as street lighting, security lighting, remote alarm systems, electric fences and road signs.

12.4 Define the monitoring period and frequency

Next, users should define the monitoring period and monitoring frequency.

12.4.1 Monitoring period

The monitoring period is the time period over which the policy is monitored. At a minimum, the monitoring period should include the policy implementation period. Where possible, monitoring should also include pre-policy monitoring of relevant activities before implementation of the policy and post-policy monitoring of relevant activities after the policy implementation period. For example, a solar PV incentive policy that has a policy implementation period of 2015–2025 may have a monitoring period of 2013–2027. Depending on the impact categories and indicators being monitored, it may be necessary to monitor some indicators over different time periods than others. In general, the longer the time series of data that is collected, the more robust the assessment will be.

12.4.2 Monitoring frequency

Users can monitor indicators at various frequencies, such as monthly, quarterly or annually. In general, users should collect data with as high a frequency as is feasible and appropriate in the context of objectives. The appropriate frequency of monitoring should be based on the needs of decision makers and stakeholders, the type of impact categories and indicators being monitored, cost, and data availability. In general, the more frequently data are collected, the more robust the assessment will be. The monitoring frequency should, in general, be fixed ex-ante for the duration of the monitoring period.

12.5 Create a monitoring plan

A monitoring plan is important to consistently track progress of indicators over time in relation to goals. It is a *key recommendation* to create a plan for monitoring indicators.

A monitoring plan should include the following key elements:

- brief description of each indicator

- source of data for each indicator and parameter (if applicable)

- monitoring period

- monitoring frequency (fixed ex-ante during the monitoring period)

- measurement or data-collection methods (such as survey or census)

- historical value (baseline value)

- goal value

- entity(ies) or institution(s) responsible for monitoring the respective indicator and collecting parameter(s), if applicable.

Additional information may include:

- methods for generating, storing, collating and reporting data

- level of uncertainty of data and how this uncertainty will be accounted for

- databases, tools or software systems to be used for collecting and managing data

- procedures for internal auditing, quality assurance and quality control, including record keeping and internal documentation procedures, and length of time data will be archived

- whether data are verified and, if so, verification procedures used

- roles and responsibilities of relevant personnel involved in monitoring

- competencies required and any training needed to ensure that personnel have the necessary skills.

Before monitoring begins, users should identify the entity or institution responsible for collecting data during the monitoring period. The responsible entity should establish a database based on the monitoring plan. See Box 12.1 for more information on institutional arrangements for monitoring.

Table 12.2 provides an example of a template that can be used for a monitoring plan. The table includes goal values and historical values for each previously identified indicator for a solar PV incentive policy. Historical values were determined through interviews with the communities that will benefit from the policy. Goal values should be estimated

BOX **12.1**

Institutional arrangements for coordinated monitoring

Information on key performance indicators and parameters can be dispersed among different institutions. Given the wide variety of data needed for impact assessment and the range of stakeholders involved, strong institutional arrangements serve an important function. They play a central role in coordinating monitoring. A technical coordinator, or a coordinating team or body is often assigned to lead monitoring, reporting and verification (MRV) processes in which responsibilities have been delegated to different institutions. Since data can be widely dispersed between institutions, the coordinating body oversees the procedures for data collection, management and reporting.

Countries may already have institutions in place as part of a national MRV system. In this case, users can consider expanding the national MRV system to monitor the impact of the policy. Where strong institutional arrangements do not yet exist, countries can determine the governmental body with adequate capacity and authority to be responsible for the MRV system, and to establish the necessary legal arrangements. Institutional mandates help to strengthen the procedures and the system, and may also help secure funding from the government to ensure the continuity of the process. Users can refer to the UNFCCC *Toolkit for non-Annex I Parties on Establishing and Maintaining Institutional Arrangements for Preparing National Communications and Biennial Update Reports*,[45] as well as other sources, for support on establishing or improving the institutional arrangements for a robust MRV system.

through inclusive consultations with a wide variety of stakeholder groups, such as beneficiaries, government representatives, technical experts, businesses, NGOs and local representatives of international organizations.

Box 12.2 presents an example of a monitoring plan in South Africa.

If surveys are used and/or sampling procedures are applied, users should develop a statistically sound sampling plan as part of the monitoring plan. Users should follow internationally recognized standards for sampling. Before including the sampling plan in the monitoring plan, users should familiarize themselves with different standards and required sampling sizes to ensure statistically sound results.

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[46] Available at: http://unfccc.int/files/national_reports/non-annex_i_natcom/training_material/methodological_documents/application/pdf/unfccc_mda-toolkit_131108_ly.pdf.

TABLE **12.2**

Example of a monitoring template for selected indicators and parameters for a solar PV incentive policy

Indicator	Source of data	Monitoring frequency	Measurement method	Responsible entity or institution	Historical value in 2015	Goal value for 2022
Rooftop solar capacity installed	Government statistics	Monthly	Name plate showing installed capacity; ground verification on a random sample basis	Ministry of Energy		
Electricity delivered from solar PV installations	Government statistics	Monthly	Electricity meters; ground verification on a random sample basis	Ministry of Energy		
Number of health clinics electrified	Survey	Annual	Community-level assessment	Health Ministry		
Number of households having access to clean electricity	Survey	Annual	Community-level assessment	Ministry of Energy		
Number of people having access to electricity services	Survey	Annual	Community-level assessment	Ministry of Energy		
Number of female entrepreneurs	Survey	Annual	Community-level assessment	Ministry of Social Affairs		
Number of people in jobs, disaggregated by gender	Government statistics	Monthly	Community-level assessment	Ministry of Social Affairs		
Money saved through replacement of kerosene by solar energy (which requires further parameters to calculate cost of kerosene, and amount of kerosene saved	Statistics and/or survey	Biennial	Sector-level assessment (cost of kerosene); community-level assessment (amount of kerosene saved)	Ministry of Energy		

BOX **12.2**

Defining indicators and a monitoring plan in South Africa

The draft White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity is a strategy to address biodiversity protection and sustainable utilization in South Africa. The white paper identifies six goals that cover environmental, social and economic impacts. It lists 175 policy interventions to achieve these goals. The policy interventions include controls on conservation and sustainable use of biodiversity, improving knowledge, direct biodiversity conservation or rehabilitation activities, coordination and cooperation processes, relationship building and conflict resolution, capacity-building, and monitoring. The Energy Research Centre at the University of Cape Town conducted an ex-ante qualitative assessment of the strategy. As part of the assessment, the centre provided examples of indicators that can be tracked as part of a monitoring plan (Table 12.3).

TABLE **12.3**

Example of a monitoring template for a biodiversity policy in South Africa

Indicator	Source of data	Monitoring frequency	Measurement method	Responsible entity or institution	Goal value for year Y
Areas protected (ha, km, km²)	Provincial conservation authorities, South Africa's Scientific Authority	National Biodiversity Assessments are updated every 7 years	Land survey	SANBI, with support of DEA and CSIR	By 2028, in protected areas: 10.8 m land-based hectares, 353 km inshore; 210,000 km² marine offshore in EEZ plus 93,300 km² marine offshore in Prince Edward Islands EEZ
Percentage of threatened species conserved ex situ	Provincial conservation authorities, South Africa's Scientific Authority	Every 4 years (monitoring processes being developed by 2020)	Counts of threatened species (IUCN Red List)	SANBI and Botanical Society of South Africa	60% of threatened plant species by 2020
Percentage of species with ex situ collections active in restoration programmes	SANBI	Every 4 years	Reported	DEA, with support from SANBI's zoological and biological gardens	1% of plant species by 2020
Threat status of ecosystems	Provincial conservation authorities, DEA, DAFF, CSIR, research institutions	National Biodiversity Assessments are updated every 7 years	Four datasets (ecosystem types, ecological conditions, protected areas, biodiversity targets); local data sets where possible, otherwise global with some ground truthing	SANBI	Minimum 60% of each ecosystem type in good ecological condition

BOX **12.2,** continued

Defining indicators and a monitoring plan in South Africa

TABLE **12.3,** continued

Example of a monitoring template for a biodiversity policy in South Africa

Indicator	Source of data	Monitoring frequency	Measurement method	Responsible entity or institution	Goal value for year Y
Protection level of ecosystems	Provincial conservation authorities, South Africa's Scientific Authority	National Biodiversity Assessments are updated every 7 years	As above	SANBI	Minimum 20% of each ecosystem
Benefit sharing: patents that exist for products made from local biodiversity, or that use local or indigenous knowledge, and that have benefit-sharing agreements	International patent registry; agreements registered under South Africa's Bioprospecting, Access and Benefit-Sharing Regulatory Framework	Every year	Desktop review	DEA	By 2025, benefit-sharing agreements exist for patents that are commercialized. Benefit-sharing agreements have been reviewed
Percentage of SDFs, integrated development plans and land-use schemes that include biodiversity considerations	All national, provincial and municipal departments responsible for development planning and monitoring; Department of Rural Development and Land Reform	Every 5 years	Reporting progress on the Mid Term Strategic Framework	Presidency	By 2020, 100% of SDFs include maps for critical biodiversity areas and control development
Increase in average annualized GDP growth rate of the South African bioprospecting and wildlife sectors	StatsSA	Every year	NBES	DEA	By 2030, 10% increase compared with 2020

Abbreviations: CSIR, Council for Scientific and Industrial Research; DAFF, Department of Agriculture, Forestry and Fisheries; DEA, Department of Environmental Affairs; EEZ, exclusive economic zone; IUCN, International Union for Conservation of Nature; NBES, National Bio-Economy Strategy; SANBI, South African National Biodiversity Institute; SDF, spatial development framework; Stats SA, Statistics South Africa

12.6 Monitor indicators over time

Once indicators and parameters have been defined, it is a *key recommendation* to monitor each of the indicators over time, in accordance with the monitoring plan. Indicators should be monitored in relation to historical values, goal values and values at the start of policy implementation to understand the performance of the policy over time.

It is a *key recommendation* to separately monitor indicators for different groups in society, where relevant. Examples of different groups are men and women, people of different income groups, racial or ethnic groups, people of different education levels, people from different geographic regions, and people in urban versus rural locations. This allows users to understand distributional impacts on different groups, and manage trade-offs in cases where policies have positive impacts on some groups and negative impacts on others. Users should report distributional impacts on different groups to identify and manage potential trade-offs.

If monitoring indicates that the assumptions used in the ex-ante assessment are no longer valid, users should document the differences and take the monitoring results into account when updating the ex-ante estimates or when estimating impacts ex-post. Users should also determine whether the assumptions on key indicators in the ex-ante assessment (from Chapters 8 and 9) remain valid.

12.7 Track progress towards SDGs

In addition to monitoring progress of individual policies (described in previous sections), users may also want to track overall progress towards SDGs and/or related national or subnational sustainable development goals, especially goals related to the policy assessed. Tracking national progress, for example, involves defining national indicators for each goal and tracking progress of these indicators over time by comparing historical values (if data are available) to desired goal values in a future year.

Many countries are developing their own national implementation plans, and in the process selecting targets, indicators and methodologies. In principle, targets, indicators and methods used to track progress towards SDGs should be aligned with those used for existing and emerging national frameworks, and, as far as possible, with those used for NDCs. Table 12.4 provides illustrative examples of selecting national indicators for tracking progress, relating to

both an individual policy and broader national goals. Box 12.3 shows an example of developing a plan to monitor progress towards SDGs by cities in Bolivia.

Across the 169 targets defined for the 17 SDGs, there are a mix of quantitative targets (e.g. Goal 3, Target 3.1: "By 2030 reduce the global maternal mortality ratio to less than 70 per 100,000 live births") and qualitative targets (e.g. Goal 15, Target 15.9: "By 2020, integrate ecosystem and biodiversity values into national and local planning, development processes …"). Therefore, indicators should be defined either quantitatively or qualitatively, depending on the target.

Although top-down national statistics and indicators are useful to monitor overall country progress towards SDGs, progress towards achieving the SDGs is made by implementing policies on the ground. To ensure that these policies are effective, a national MRV system should be established to collect data relating to individual policies, and their impact and effectiveness should be assessed using the previous sections in this methodology.

Box 12.4 shows an example of identifying SDG targets and indicators that are relevant to a policy assessed in Kenya, which can help link the results of a policy assessment with monitoring progress towards SDGs.

TABLE **12.4**

Examples of indicators that may be used by a country to track progress towards SDGs

Examples of goals	Examples of corresponding targets	Indicator	Source of data	Monitoring frequency	Measurement method	Responsible entity or institution	Historical value	Target value
Examples of SDGs relating to a renewable energy policy								
SDG 3: Ensure healthy lives and promote well-being for all at all ages	Target 3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	Number of health clinics electrified	Survey	Annual	Community-level assessment	Health Ministry	75	250
SDG 5: Achieve gender equality and empower all women and girls	Target 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	Share of female entrepreneurs (%)	Survey	Annual	Community-level assessment	Ministry of Social Affairs	10	30
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all	Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services	Share of people with access to electricity services (%)	Survey	Annual	Community-level assessment	Ministry of Energy	58	85
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value	Share of people (men/women) in jobs	Survey	Annual	Community-level assessment	Ministry of Social Affairs	65	85

Examples of indicators that may be used by a country to track progress towards SDGs

Examples of goals	Examples of corresponding targets	Indicator	Source of data	Monitoring frequency	Measurement method	Responsible entity or institution	Historical value	Target value
Examples of other SDGs in a country								
SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture	Target 2.3: By 2030, double the agricultural productivity and the incomes of small-scale food producers	Rice yield growth (kg/ha)	National rice information system	Annual	Combined remote-sensing/ crop modelling approaches	Ministry of Agriculture	2125 kg/ha in 2010	2700 kg/ha by 2020
SDG 3: Ensure healthy lives and promote well-being for all at all ages	Target 3.1: By 2030 reduce the global maternal mortality ratio to less than 70 per 100,000 live births	Reduction in the national maternal mortality rate	Survey, civil registration systems	Annual	Large population-based surveys, counting	Health Ministry	300 in 2010	50 by 2030
SDG 6: Ensure availability and sustainable management of water and sanitation for all	Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking water for all	Proportion of population that has access to a sustainable, safe water supply and hygienic sanitation in the household	Survey	Annual	Large population-based surveys	Health Ministry	75% in 2015	100% by 2030
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all	Target 7.2: By 2030, increase substantially the share of renewable energy in the global energy mix	Share of renewable energy in national energy mix	National energy information system	Annual	Calculation based on MW of renewable energy installed	Ministry of Energy	65% in 2016	85% by 2027

Examples of indicators that may be used by a country to track progress towards SDGs

Examples of goals	Examples of corresponding targets	Indicator	Source of data	Monitoring frequency	Measurement method	Responsible entity or institution	Historical value	Target value
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	Target 9.1: Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	National Construction Code for buildings takes into account extreme wind events	National Construction Code	Once (in 2018)	Presence/ absence of features on extreme wind events in National Construction Code for buildings	Ministry of Construction	In 2014, National Construction Code for buildings does not take into account extreme wind events	By 2018, National Construction Code for buildings includes features on extreme wind events
SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	Target 15.2: By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	Reduction in the deforestation rate	National environment statistics	Annual	Remote-sensing modelling approaches	Ministry of Agriculture/ Ministry of Environment	Defore-station rate of 1.29% in 2015	Defore-station rate of 0% by 2030

BOX 12.3

Monitoring progress towards SDGs by cities in Bolivia

Cities and local governments, in addition to other non-governmental stakeholders, are recognized as key implementers of the SDGs as the core of the 2030 Agenda for Sustainable Development. The Cities Footprint Project in Bolivia has the goal of promoting low-carbon and climate-resilient development in Latin American cities. In an assessment using the ICAT *Sustainable Development Methodology*, Servicios Ambientales S.A. developed a monitoring plan for the Bolivian cities of La Paz, Cochabamba, Santa Cruz, El Alto and Tarija. The aim was to initiate monitoring and reporting processes towards the SDGs, which will inform the cities' development efforts to achieve the SDGs. Table 12.5 provides an example of the monitoring plan for one selected SDG goal (Goal 6); the complete SDG monitoring plan includes many different SDG goals, targets and indicators. In Table 12.5, target values are still to be established by the municipal governments, and the monitoring frequency is monthly.

TABLE 12.5

Example of SDG monitoring plan for cities in Bolivia for an SDG goal

SDGs or other goals	Corresponding targets	Indicator	Level of data collection	Source of data	Responsible entity or institution	Measurement method
Goal 6: Ensure availability and sustainable management of water and sanitation for all	Target 6.4: By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of fresh water to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.1: Change in water-use efficiency over time	General Sources	National Statistical Office (INE), particularly for economic data. Administrative data collected at country level by the relevant institutions, either technical (for water and irrigation) or economic (for value added). These data are then compiled by FAO, World Bank, UNSD and other international institutions; harmonized; and published in sectoral databases such as AQUASTAT (FAO), Databank (World Bank) and UNdata (UNSD).	WHO, UNICEF, Vice-Ministry of Water and Irrigation	Water-use efficiency is defined as the value added for a given major sector divided by the volume of water used. The unit of the indicator is value/volume (commonly $/m^3$). Services' water supply efficiency is calculated as the service sector value added divided by water used for distribution by the water collection, treatment and supply industry, expressed in $/m^3$.
			City of La Paz	Report from Public Social Enterprise of Water and Sanitation of La Paz (EPSAS)	Municipal government water and sanitation directorate (EPSAS)	

BOX **12.3,** continued

Monitoring progress towards SDGs by cities in Bolivia

TABLE **12.5,** continued

Example of SDG monitoring plan for cities in Bolivia for an SDG goal

SDGs or other goals	Corre-sponding targets	Indicator	Level of data collection	Source of data	Responsible entity or institution	Measure-ment method
Goal 6, continued	Target 6.4, continued	6.4.1, continued	City of Cochabamba	Report from Cochabamba Municipal Service of Drinking Water and Sanitation (SEMAPA)	Municipal government water and sanitation directorate (SEMAPA)	
			City of Santa Cruz	Report from Drinking Water and Sanitary Sewer Service (SAGUAPAC)	Municipal government water and sanitation directorate (SAGUAPAC)	
			City of El Alto	Report from Public Social Enterprise of Water and Sanitation of El Alto (EPSAS)	Municipal government water and sanitation directorate (EPSAS)	
			City of Tarija	Report from Co-op for Water Services and Sanitation Tarija (COSSALT)	Municipal government water and sanitation directorate (COSSALT)	

Abbreviations: UNICEF, United Nations Children's Fund; UNSD, United Nations Statistics Division; WHO, World Health Organization

BOX **12.4**

Identifying SDG targets and indicators relevant to a policy assessed in Kenya

UNEP DTU Partnership conducted an ex-ante assessment of the sustainable development impacts of a policy to promote solar PV mini-grids in Kenya. Ten impact categories were assessed qualitatively, ranging from accessibility and quality of health care to gender equality and empowerment of women. Four impact categories were assessed quantitatively: climate change mitigation, air pollution, human toxicity and resources depletion. To identify SDG indicators that are relevant to the solar PV mini-grid policy, the study first identified SDG targets that are directly connected with the impact categories and specific impacts analysed in the assessment. The study explains the reason why the assessed impact categories are connected with specific SDG targets (Table 12.6).

BOX 12.4, continued

Identifying SDG targets and indicators relevant to a policy assessed in Kenya

TABLE **12.6**

Examples of linkages between impact categories and SDG targets for the solar PV mini-grid in Kenya

Impact category assessed	SDG target	Rationale
Climate change mitigation	9.4: By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities 13.2: Integrate climate change measures into national policies, strategies and planning	9.4: The impact on climate change mitigation of the policy increases resource-use efficiency. It consists of adoption of clean and environmentally sound technology. 13.2: The policy is a climate change measure.
Accessibility and quality of health care	3.8: Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	3.8 The specific impacts of "Improved access to health care due to better service in health centres and longer working hours" and "Improved access to health care due to the possibility of storing vaccines" are connected with accessing quality essential health-care services and vaccines for all.
Gender equality and empowerment of women	5.6: Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences 11.7: By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	5.6 Through the specific impact "Knowledge on health and family planning", the action will support access to sexual and reproductive health. 11.7 By increasing "Mobility at dark hours", the action will provide access to safer public spaces, particularly for women and children.

Based on the identified SDG targets, a list of relevant indicators for each target can be found in the United Nations Global SDG Indicators Database as well as Kenya's National SDG Indicator Framework (a nationally defined subset of indicators agreed to be tracked in the country). The United Nations Global SDG Indicators Database also provides historical values for these indicators in Kenya. Using these indicators, progress can be tracked towards specific SDG targets.

13 Reporting

Reporting the results, methods and assumptions used is important to ensure that the impact assessment is transparent, and gives decision makers and stakeholders the information they need to properly interpret the results. This chapter presents a list of information that is recommended to be reported. This information can also be useful to inform reporting under the Paris Agreement.[47]

Checklist of key recommendations

> • Report information about the assessment process and the sustainable development impacts resulting from the policy (including the information listed in Section 13.1)

13.1 Recommended information to report

It is a *key recommendation* to report information about the assessment process and the sustainable development impacts resulting from the policy (including the information listed below). For guidance on providing information to stakeholders, refer to the *ICAT Stakeholder Participation Guide* (Chapter 7).

General information
- The name of the policy/action assessed

- The person(s) or organization(s) that did the assessment

- The date of the assessment

- Whether the assessment is an update of a previous assessment, and, if so, links to any previous assessments

Chapter 2: Objectives
- The objective(s) and intended audience(s) of the assessment

Chapter 3: Overview of key concepts and steps
- Whether the assessment consists of a qualitative impact assessment, a quantitative impact assessment and/or tracking progress of indicators over time

- Opportunities for stakeholders to participate in the assessment

Chapter 4: Describing the policy
- A description of the policy, including the recommended information in Table 4.1

- Whether the assessment applies to an individual policy or a package of related policies; if a package is assessed, which policies are included in the package

- Whether the assessment is ex-ante, ex-post, or a combination of ex-ante and ex-post

Chapter 5: Choosing which impact categories and indicators to assess
- A list of impact categories included and excluded from the assessment boundary, with justification for exclusions of impact categories that may be relevant, significant or identified by stakeholders

- Indicator(s) selected for each impact category included in the assessment boundary

Chapter 6: Identifying specific impacts within each impact category
- A list of all sustainable development impacts identified, using a causal chain and/or table format

Chapter 7: Qualitatively assessing impacts
- The assessment period

- A description of each specific impact

- The outcomes of the qualitative assessment for each impact (including likelihood,

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47 For example, when providing information necessary to track progress on the implementation and achievement of policies and measures implemented to address the social and economic consequences of response measures (paragraph 78 of the modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement).

magnitude and whether it is positive or negative), including which identified impacts are significant, and the methods and sources used

- A summary of the qualitative assessment results for each impact category, including impacts of the policy on different groups in society, where relevant

Chapter 8: Estimating the baseline
- For users following a quantitative approach:

  - » A list of impacts and indicators included in the quantitative assessment boundary and a list of any impacts that are not quantified, with justification
  - » A description of the baseline scenario for each indicator being estimated and a justification for why it is considered to be the most likely scenario
  - » The methods, assumptions and data used to estimate the baseline scenario for each indicator being estimated, including the source of the baseline scenario if adapted from a previous analysis
  - » The baseline values for each indicator being estimated over defined time periods, such as annually over the assessment period, if feasible
  - » The methods, assumptions and data sources used to calculate baseline values
  - » A list of policies, actions and projects included in each baseline scenario, with justification for any implemented or adopted policies, actions or projects with a potentially significant impact that are excluded from a baseline scenario
  - » A list of non-policy drivers included in each baseline scenario, with justification for any relevant non-policy drivers excluded from a baseline scenario
  - » Which planned policies are included in the baseline scenario, if any
  - » Justification for the choice of whether to estimate new baseline values and assumptions or to use published baseline values and assumptions
  - » If it is not possible to report a data source, justification for why a source is not reported

Chapter 9: Estimating impacts ex-ante
- For users estimating impacts ex-ante:

  - » The estimated net impact of the policy, for each indicator, over defined time periods,

such as annually and cumulatively over the assessment period, if feasible
  - » The total in-jurisdiction impact and, separately, the total out-of-jurisdiction impact, for each indicator, if relevant and feasible
  - » Justification for why any impacts in the assessment boundary have not been estimated, with a qualitative description of the impacts
  - » The assessment methods used
  - » A description of the policy scenario for each indicator being estimated
  - » The policy scenario values for each indicator being estimated, and the methods, assumptions and data sources used to calculate policy scenario values
  - » Distributional impacts on different groups in society

Chapter 10: Estimating impacts ex-post
- For users estimating impacts ex-post:

  - » The estimated net impact of the policy, for each indicator, over defined time periods, such as annually and cumulatively over the assessment period, if feasible
  - » The total in-jurisdiction impact and, separately, the total out-of-jurisdiction impact, for each indicator, if relevant and feasible
  - » Justification for why any impacts in the assessment boundary have not been estimated, with a qualitative description of the impacts
  - » The assessment methods used
  - » The policy scenario values for each indicator being estimated, and the methods, assumptions and data sources used to calculate policy scenario values
  - » Distributional impacts on different groups in society

Chapter 11: Assessing uncertainty
- The method or approach used to assess uncertainty

- A quantitative estimate or qualitative description of the uncertainty and sensitivity of the results, to help users of the information properly interpret the results

Chapter 12: Monitoring performance over time
- A list of indicators used to track progress over time and the rationale for their selection

- Sources of indicator data and monitoring frequency

- The performance of the policy over time, as measured by the indicators, and whether the performance of the policy is on track relative to expectations

- Whether the assumptions on key indicators within the ex-ante assessment remain valid, if applicable

- Trends in indicators for different groups in society

13.2 Additional information to report (if relevant)

- The impact of the policy on different groups in society, such as men and women, people of different income groups, people of different racial or ethnic groups, people of different education levels, people from different geographic regions, and people in urban versus rural locations

- A range of likely values for the net change in each indicator, rather than a single estimate, when uncertainty is high

- Historical values for the indicators included in the assessment

- Sustainable development goals of the implementing jurisdiction

- The contribution of the assessed policy towards the jurisdiction's sustainable development goals

- How the policy is modifying longer-term trends

- Any potential overlaps with other policies

- Any limitations in the assessment not described elsewhere

- The type of technical review undertaken (first, second or third party), the qualifications of the reviewers and the review conclusions (further guidance on reporting information related to technical review is provided in Chapter 9 of the ICAT *Technical Review Guide*)

- Other relevant information

Box 13.1 provides an example of how the assessment results can be used to report progress made in achieving SDGs for a country.

BOX **13.1**

Using the assessment results to report progress towards SDGs in Kenya

UNEP DTU Partnership conducted an ex-ante assessment of the sustainable development impacts of a policy to promote solar PV mini-grids in Kenya. Ten impact categories were assessed qualitatively, ranging from accessibility and quality of health care to gender equality and empowerment of women. Four impact categories were assessed quantitatively: climate change mitigation, air pollution, human toxicity and resources depletion.

One objective of the study was to link the policy's impacts to progress in achieving the SDGs. Similar to the case study shown in Box 12.4, the first step was to link specific impacts identified in the assessment with SDG targets. The study then used two different approaches: one for qualitatively assessed impacts and one for quantitatively assessed impacts.
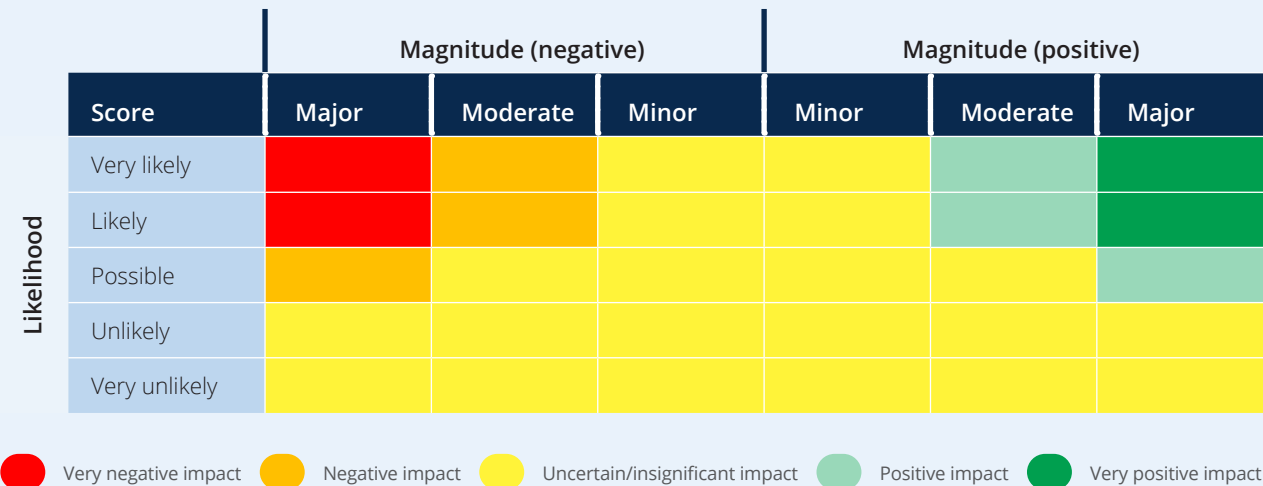
For qualitatively assessed impacts, the study used the colour coding in Figure 13.1 to classify each impact as having a very negative, negative, uncertain/insignificant, positive or very positive impact on each SDG target.

BOX 13.1, continued

Using the assessment results to report progress towards SDGs in Kenya

FIGURE **13.1**

Colour coding scheme for qualitative impacts

		Magnitude (negative)			Magnitude (positive)		
Score	**Major**	**Moderate**	**Minor**	**Minor**	**Moderate**	**Major**
Very likely						
Likely						
Possible						
Unlikely						
Very unlikely						

(Likelihood is the vertical axis label)

● Very negative impact ● Negative impact ● Uncertain/insignificant impact ● Positive impact ● Very positive impact

For quantitatively assessed impacts, the study calculated the relative improvement for each impact category by using either equation 13.1 or equation 13.2, depending on the impact category. For each impact category, an indicator was defined, such as $PM_{2.5}$ (t/year) for air pollution and CO_2e (kg/year) for climate change mitigation. The study then used Figure 13.2 to classify each impact as having a very negative, negative, uncertain/insignificant, positive or very positive impact on each SDG target, based on the results of the equation.

Equation 13.1: For impact categories where the goal is to increase the indicator value (e.g. jobs)

$$\text{Relative improvement (\%)} = \frac{\text{Policy scenario impact} - \text{Baseline scenario impact}}{\text{Baseline scenario impact}}$$
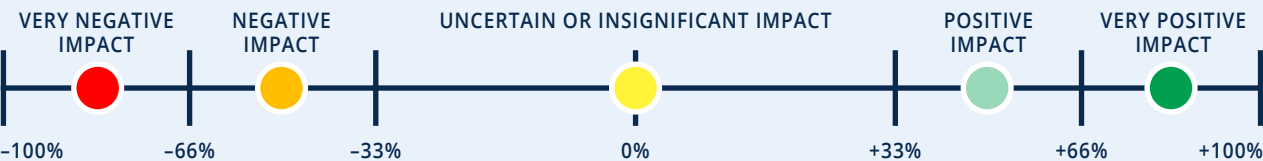
Equation 13.2: For impact categories where the goal is to decrease the indicator value (e.g. air pollution)

$$\text{Relative improvement (\%)} = \frac{\text{Baseline scenario impact} - \text{Polio scenario impact}}{\text{Baseline scenario impact}}$$

Note: The equations can be applied either annually or cumulatively over the assessment period.

FIGURE **13.2**

Colour coding scheme for quantitative impacts

VERY NEGATIVE IMPACT	NEGATIVE IMPACT	UNCERTAIN OR INSIGNIFICANT IMPACT	POSITIVE IMPACT	VERY POSITIVE IMPACT
●	●	●	●	●

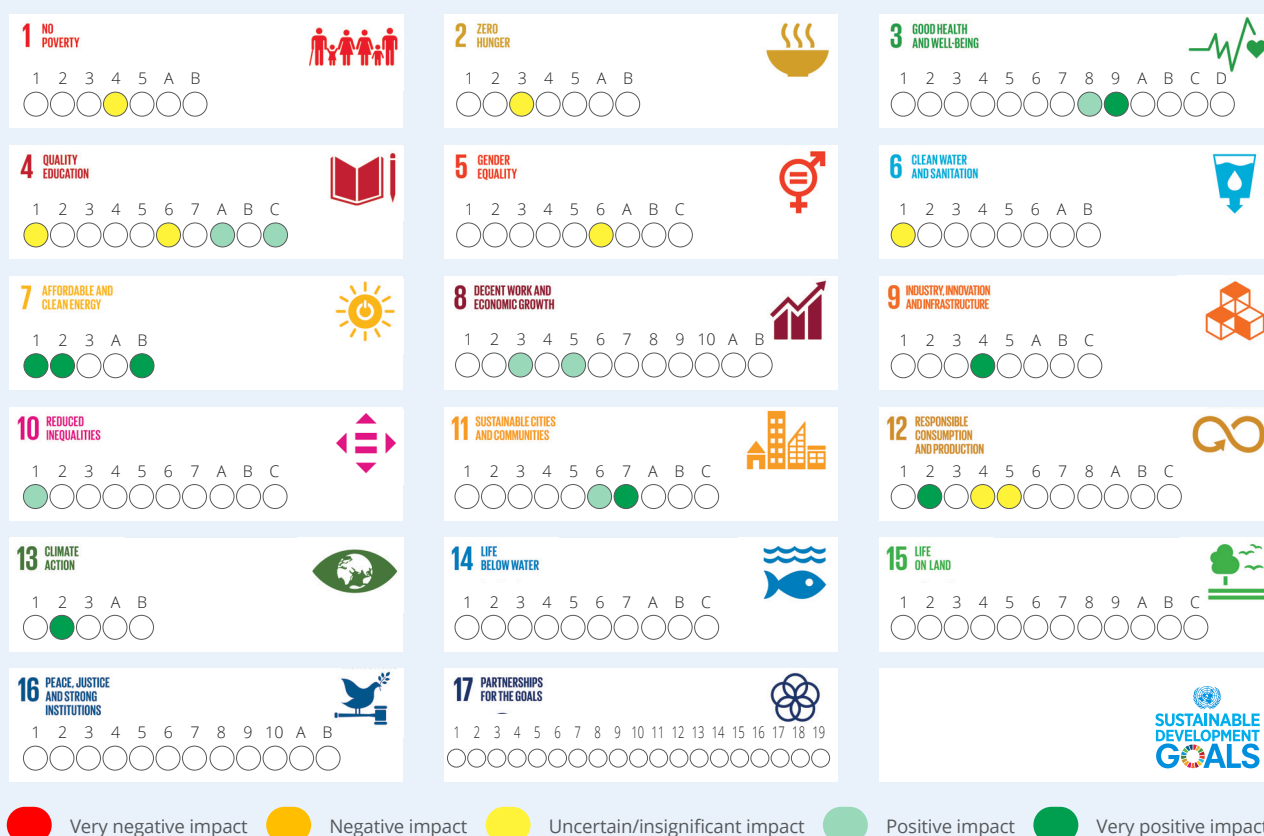–100%   –66%   –33%   0%   +33%   +66%   +100%

BOX **13.1,** continued

Using the assessment results to report progress towards SDGs in Kenya

The study then used Figure 13.3 to give a visual representation of the policy's impacts on the various SDG targets, combining both the qualitative and quantitative results. The figure shows where the policy has a positive, negative or uncertain impact on the various SDG targets. The individual circles in the SDG boxes represent the 169 SDG targets.

FIGURE **13.3**

Impacts of the policy on the SDG targets

BOX 13.1, continued

Using the assessment results to report progress towards SDGs in Kenya

Additionally, the study used Figure 13.4 to report the quantitative results as relative improvements in each SDG target, based on the results of and .

FIGURE **13.4**

Quantified impacts of the policy on SDG targets