SCAN (SDG & Climate Action Nexus) tool: Linking Climate Action and the Sustainable Development Goals

Key findings note

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SCAN (SDG & Climate Action Nexus) tool:

Linking Climate Action and the Sustainable Development Goals

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1 Background

In 2015, leaders from the member states of the United Nations agreed on objectives to shift all economies and societies toward sustainable and decarbonised development through the adoption of the Agenda 2030 on the Sustainable Development Goals (New York, September 2015) and the Paris Agreement on limiting climate warming to well below 2°C (Paris, December 2015). Both frameworks are highly interlinked, thus failure in one process could undermine the success of the other. This interdependency can be seen as an opportunity to move away from the discourse of two competing agendas; and instead pursue their implementation in a way to maximise mutual benefits. In some cases, interactions between the two may be mutually reinforcing, while in other cases action in one may undermine the achievement of the targets in the other. Understanding this can enable coherent policy planning and increase implementation efficiency, in particular when considering limited institutional capacities.

2 Objectives

The objective of the study was to develop a tool that helps stakeholders identify links (both synergies and trade-offs) between mitigation and adaptation actions and the SDGs. In this context, we developed the SDG Climate Action Nexus tool (hereafter referred to as the 'SCAN-tool'). The SCAN-tool aims to be user-friendly and practical and it is meant to support policy makers across different departments and state levels, to achieve greater policy coherence, to enable the achievability of multiple goals and to improve the efficiency of implementation by providing them with an initial indication of which climate actions may impact -positively or negatively- specific SDG targets. The SCAN-tool can potentially inform the process of putting forward increasingly ambitious pledges of climate action, required every five years under the ambition mechanism of the Paris Agreement. A better understanding of how climate action can reinforce the achievement of SDG targets may increase countries' confidence to put forward more ambitious NDCs and improve political buy-in.

3 Approach

The SCAN-tool for mitigation covers actions across seven sectors: electricity and heat (including a deep-dive to map potential linkages in greater detail, transport, buildings, industry, waste, agriculture, and forestry. The SCAN-tool for adaptation covers actions across eight sectors: agriculture, costal zones, forestry, ecosystem management, energy, health, transport and urban. The tools were populated using existing literature that collects data from several studies on the nexus between climate action and specific development areas. All links are classified as either positive (where the mitigation action is likely to reinforce the SDG target) or negative (where there may be a potential trade-off for the SDG target). The tool does not assess the magnitude of the link. Potential links to SDG 13 (Climate action

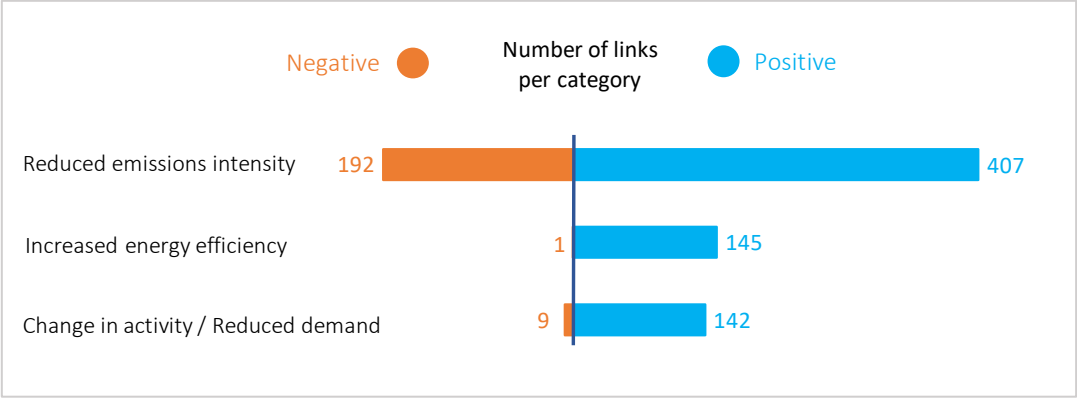
and SDG 17 (Partnerships for the SDGs) are not assessed in the tool. For more information on the methodology used, please read the methodology paper available at: ambitiontoaction.net/scan_tool

4 Key findings: SCAN-tool for mitigation

As it can be seen in the summary table below, the number of synergies outweighs the trade-offs found for most of the SDGs. This table shows that there are interactions between sector specific mitigation actions and most of the SDGs, suggesting a high potential for tackling both agendas simultaneously at the action level.

- Synergies outweigh trade-offs for most of the SDGs. In fact, 76% of linkages identified in the tool are positive.
- There are many linkages between mitigation actions and the SDGs, across all sectors. This highlights the opportunity and need to approach implementation in an integrated manner (see also Iacobuta and Höhne, 2017). For some SDGs, the links are more pronounced, and certain SDGs show few or no linkages (specific sector findings are presented in the following sub-section). In total, 886 linkages were identified between sector-specific actions and SDG targets, with a further 30 identified between general interventions and SDG targets.
- Where few or no linkages to SDGs have been identified, this can generally be attributed to the transversal nature of the SDGs (and their targets). For example, SDGs related to education, gender equality, reducing inequality, peace and justice are difficult to attribute to individual sectors but are relevant to consider across all sectors when designing or implementing mitigation actions.

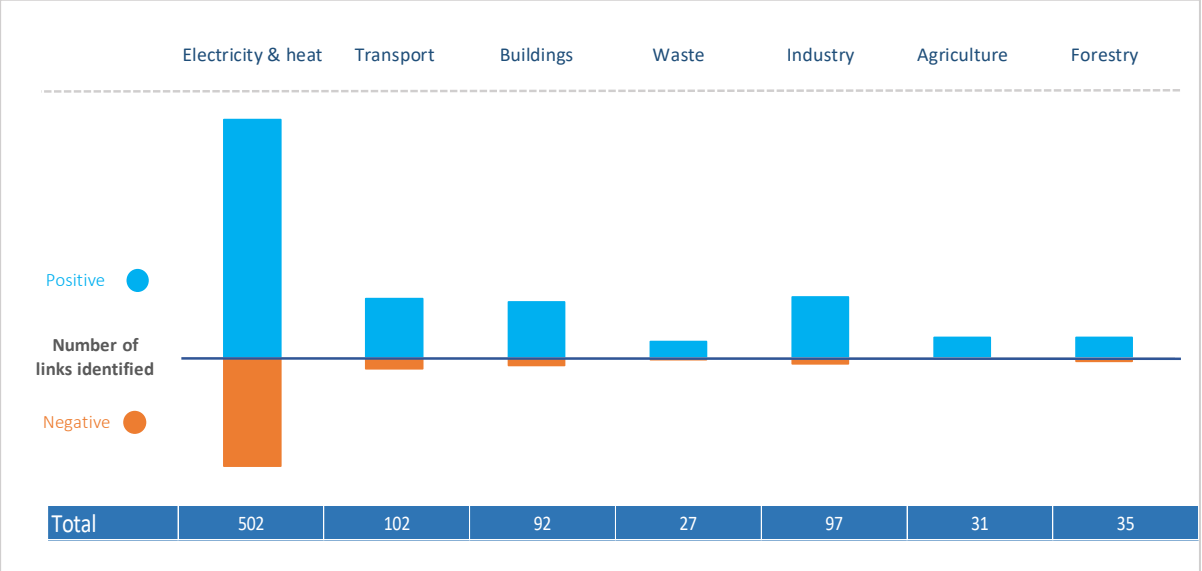
- Analysis of links to SDG 13 (climate action) and SDG 17 (Partnerships for the SDGs) is not included in the tool. Potential links to SDG 13 are not listed as the SCAN-tool is designed to help identify linkages between climate actions and other development areas, thus these links are implicitly represented in the assessed sectoral mitigation actions. SDG 17 is not included in the analysis because it is about mobilization of international resources to achieve the SDGs and is not a development area comparable to the other SDGs.
- The SDG agenda in itself is extensive and complex, comprising a total of 167 targets under the 17 goals. In many cases the targets overlap or even duplicate, thus complicating their attribution to individual subsectors and mitigation actions. Potential benefits or trade-offs in some SDGs may therefore also impact the achievement of other SDG targets (Pradhan *et al.*, 2017). This complexity and inter-relatedness within the SDG agenda are difficult to capture in a simplified tool.
- Of the three categories of sector mitigation actions, 'reduce emissions intensity', which contains actions that reduce the emissions produced per unit of activity, showed significantly more potential trade-offs (or negative links) than the other two categories ('Changing activity' which refers to actions that reduce the underlying demand for an emissions-intensive activity and 'Increase energy efficiency' which includes actions to reduce the amount of energy required per unit of activity). One explanation for this is that actions that reduce emissions intensity can involve introducing new technologies such as renewables, nuclear and CCS, which have a range of potentially negative impacts on the environment, human health and may involve job losses in displaced sectors, whereas the other two categories mainly lead to a reduction in current activities that have harmful impacts (such as pollution from fossil fuel use in power, heating and transport).



- In addition to the impacts a mitigation action may have on the SDGs, the interventions used by government to stimulate those mitigation actions will also impact the achievement of the SDGs. Policy makers should thus consider the impacts at two levels: the impacts of the final action taken by the target audience (e.g. the adoption of electric vehicles) and the impacts of any interventions they may put in place to encourage that action (e.g. taxes on liquid fossil fuels; innovation / demonstration programmes).

- The way these interventions are used by governments (for example, the choice of policy instrument and its particular design) can determine whether these actions will support or undermine achieving the SDG and its associated targets. Interventions that minimise potential negative impacts can be chosen or designed to protect specific groups (e.g. poorer or more vulnerable groups) from being disproportionately affected by e.g. pricing measures.
- Many or perhaps all of the linkages are ultimately very context specific. The precise conditions in a country or sub-national region may mean that a linkage that is very important in one location could be far less important in another. It is not possible to capture these subtleties in a general tool. **To understand and manage the synergies and trade-offs, countries will need to undertake a systematic review of individual mitigation actions in their specific context.** The tool helps indicate where to start with that exercise.

From the analysis of sector specific linkages between mitigation actions and the SDGs the following key findings are highlighted. It must be noted that the number of links identified in each sector may reflect the amount of literature available on this topic for the sector. However, the general trend (e.g. ratio between positive and negative links) can inform on what policy makers could generally expect when implementing mitigation actions in their sector.



- The **electricity and heat sector** presents linkages (synergies or trade-offs) with all SDGs covered by the tool. Most linkages are related to Good health and well-being (SDG 3), Decent work and economic growth (SDG 8), Industry innovation and infrastructure (SDG 9), Sustainable cities and communities (SDG 11) and Life on land (SDG 15). Only for this sector, a deep dive analysis was undertaken to map potential linkages in greater detail, aiming to provide more granularity on

potential synergies and trade-offs of specific mitigation actions with SDG targets. The main findings are listed below:

- At the mitigation action level, it becomes evident that not all renewable energy technologies will have similar impacts on the SDGs. For example, some are not yet commercially mature (ocean, BECCS) and deployment could increase electricity prices and worsen poverty (SDG 1) or energy affordability (SDG 7). Similarly, bioenergy can compete with food crops, a potentially negative linkage with e.g. SDG 2, which most other renewable technologies do not incur.
- In the same way, links to human health from air pollution vary across different renewable technologies. While all renewable energy technologies can displace pollution from fossil fuel power generation, some create new pollution impacts such as water pollution from geothermal, and supply chain pollution from biofuels agriculture.
- Water related impacts are amongst the most relevant indicators for many countries, and this again can vary significantly across renewable technologies: solar PV and wind reduce water pollution (thermal and non-thermal) when displacing thermal FF generation but geothermal and CSP can also lead to thermal and non-thermal water pollution. Bioenergy can also lead to pollution from both operation and lifecycle pollution from agriculture. Moreover, solar PV and wind (and also ocean) use very little water during operation and thus can reduce water consumption in the power sector when displacing thermal technologies, however other renewables such as CSP and geothermal use much more water during operation (e.g. for cooling) and in some cases this can even be comparable to fossil fuel thermal plants.
- Finally, expanding off-grid applications leads to particularly positive linkages to e.g. SDGs 1 (No poverty) and SDG 2 (Zero hunger) by increasing access to basic services, which increases economic opportunity, where many renewables are negative due to e.g. land access or increased cost impacts. Similarly, expanding off-grid renewables could lead to potential synergies to SDGs 4 (Quality education), SDG 5 (Gender equality) and SDG 10 (Reduced inequalities) because of enabling effects allowing more study time, reduced women's chores and basic services and economic opportunity for remote communities.
- While expanding CCS, nuclear and gas power generation will contribute to displace more polluting fossil fuel power generation, these technologies can also lead to other potentially significant environmental and economic impacts. For example, deploying CCS or nuclear energy is likely to be very expensive in most country situations due to huge infrastructure costs which may lead to increased energy prices. Regarding environmental impacts, although CCS can contribute to reduce certain types of emissions (PM, CO2, SOx), it also increases in NOx and NH3 emissions. Similarly, risk of nuclear power plant failure and nuclear leakage have proven catastrophic and transport and storage of nuclear waste pose an additional threat to habitats if not handled with care.

- Mitigation actions in the **transport sector** link to 11 of the SDGs, with most linkages shown in the targets related to Good health and well-being (SDG 3), Decent work and economic growth (SDG 8) and Sustainable cities and communities (SDG 11). Overall both the category "changing activity" as well as "increased efficiency" show mainly potential synergies. Reducing emissions intensity in transport includes adoption of electric vehicles and biofuels in transport, both of which show some negative linkages (for example biofuel production threatens food security and can lead to other environmental impacts).
- Similarly, actions in the **building sector** show most linkages to goals for Decent work and economic growth (SDG 8), Industry innovation and infrastructure (SDG 9) and Sustainable cities and communities (SDG 11). In particular "increased efficiency" presents significant potential synergies and there are comparatively few negative linkages from actions to reduce emissions from buildings.
- The **waste sector** is less well covered in the consulted literature although a number of potential linkages to ten of the SDGs were identified by expert review. Most linkages were related to the Decent work and economic growth goal (SDG 8), Sustainable cities and communities goal (SDG 11) and Responsible consumption and production (SDG 12).
- Mitigation actions in the **industry sector** show mostly potential synergies across nine SDGs, with more frequency to goals on Decent work and economic growth (SDG 8), Industry innovation and infrastructure (SDG 9) and Responsible consumption and production (SDG 12). Again, efficiency shows a high number of synergies as also noted in the efficiency related activities in the other sectors, and non-energy mitigation actions (e.g. actions to reduce process or fugitive emissions) showed only positive linkages.
- Actions in the land use sectors, both **agriculture and forestry**, link to 11 SDGs each. Most of the mainly positive synergies were related to Zero hunger (SDG 2) and Life on land (SDG 15). Overall only six potential trade-offs were identified between the two sectors.

5 Key findings: SCAN-tool for adaptation

Based on the linkages identified, several key observations are presented below:

- Strong positive linkages were found between all the adaptation sectors and SDG 1 (No poverty). Poverty is affected by a wide range of sources, from food production, access to social services, and productivity – all of which are threatened by worsening climate change. As Hallegatte et al. (2016, p.2) aptly wrote: "climate change represents a significant obstacle to the sustained eradication of poverty, but future impacts on poverty are determined by policy choices: rapid, inclusive, and

climate- informed development can prevent most short-term impacts whereas immediate pro-poor, emissions-reduction policies can drastically limit long-term ones".

- SDG 4 on access to quality education is supported by actions that also correspond to other sectors, such as energy access (energy sector) which is needed in building and maintaining educational facilities, as well as infrastructure (transport sector) that allows for access to educational facilities.
- Adaptation actions, particularly on physical protection, can take two forms: adaptation through natural means or artificial means. Policy makers will benefit from further study on the costs and benefits of these in relation to ecosystem management. For instance, in coastal zone protection, adaptation to sea-level rise could be in the form of planting mangroves or creating a sea wall. While both help shield against rising levels of sea water, they each have different impacts in terms of supporting biodiversity.
- In establishing linkages to adaptation actions, we recognize the uncertainty in these linkages, which depend not only on the quality of both planning and implementation of these actions, but also human responses to these actions. We found that for each of the negative linkages identified in the sector sheets, there are corresponding solutions that could negate these possible negative impacts without altering the action itself. For instance, the perceived health risk of water recycling can be resolved by using "reclaimed water in place of fresh water for existing uses can free up existing water supply system capacity to cater for new water needs" or "Drinking water supply sources are subject to close monitoring to ensure that the supply is safe" (Anderson, 2003). The concept of relocating households to reduce exposure has a perceived negative impact in the idea that this may cause a lost sense of cultural identity. A study by Nielsen and Reenberg (2010) has shed a different light to this, claiming that culture sometimes acts as a barrier to embracing four of the most successful livelihood strategies: labour migration, working for development projects, gardening, and the engagement of women in economic activities. Furthermore, short-run negative impacts such as a slight reduction in fishing catch from sustainable methods, may be offset by positive impacts in the long-run.
- While the SCAN-tool for adaptation identifies positive and negative linkages between adaptation actions and the SDG targets, due to uncertainties between the intention of taking action and realizing results, this tool should not be used as a qualifying or disqualifying factor in implementing adaptation actions. As is the case for the mitigation tool, it can help policy makers develop an initial understanding of how actions they are considering could link to the SDGs. Stakeholders will benefit from further support on the following:
    - Assessing if the linkages identified are relevant in their country context and whether they are likely to be strong or weak;

- Assessing which adaptation actions, whether they show positive or negative linkages, are appropriate for their country-specific needs and institutional capacity
- Effective design and implementation of actions to maximise the positive linkages identified and minimise trade-offs.

6 Summary and next steps

Generally, the number of synergies found for most of the SDGs outweighs the trade-offs and our results show mitigation and adaptation actions can directly impact 15 out of 15 SDGs assessed, although with a more significant number of links across sectors in 12 of them, suggesting a high potential for tackling both agendas simultaneously at the action level. It is important to emphasize that the way a mitigation or adaptation action is implemented has a strong influence on whether this will create synergies or undermine the achievement of the SDGs. The scope of this study included mostly direct impacts, however, a few indirect links were taken into account in cases where an impact was considered evident but could not be directly linked to the target objectives (see methodology note for details).

The SCAN-tool provides users with an initial, high-level 'scan' of the links between mitigation and adaptation actions and the SDGs. It is a first step in a journey that policy makers at the national and sectoral levels will need to take to maximize sustainable development benefits while minimizing trade-offs as they design and implement mitigation and adaptation activities. Further country-specific analyses will be necessary to fully understand the linkages and to provide robust information on their magnitude, before countries can exploit synergies and manage potential trade-offs in a comprehensive way. Ultimately, better understanding of where mitigation actions can reinforce the achievement of SDG targets can increase countries' confidence to put forward more ambitious NDCs.