



# Accelerating progress on tackling the climate crisis through data collaboration

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Open Data Institute

# Introduction

December 2020 marked the fifth anniversary of the Paris Agreement. The agreement reached in 2015 saw countries committing to substantially reducing greenhouse gas emissions in an effort to keep the increase in global average temperature to well below 2°C above pre-industrial levels while pursuing means to limit the increase to 1.5 °C. Five years later, the UN Secretary-General, António Guterres, described the fight against the climate crisis as the ‘defining task of the 21st century’<sup>1</sup>.

As with other significant challenges we face, effective action in response to climate change can be supported by access to high-quality, relevant data, presented in ways that are both easy to understand and useful for decision making<sup>2</sup>. Various types of environmental data<sup>3</sup>, for instance, are used by cities across the world to reduce emissions and manage risk across a range of sectors such as energy, agriculture, industrial processes and product use, forestry and other land use, and waste. Climate data can also contribute to ‘granting voice and agency to people at risk, as long as it is accessible, understandable, and connected to local problems that affect communities’.<sup>4</sup>

No single organisation holds or controls all the relevant data, or alone has the resources and skills needed to use data in tackling the significant climate issues of our time. People, organisations and communities therefore need to coordinate and collaborate around the collection, use and sharing of data.

The Open Data Institute (ODI) and Microsoft’s [ongoing partnership](#) seeks to advance the cause of open, trustworthy data sharing and collaboration, such that any organisation of any size can more easily collaborate around data and realise its benefits. The partnership is designed to support Microsoft’s wider [Open Data Campaign](#), launched in April 2020.

As part of this work, the ODI conducted research between July and December 2020 to identify priority areas within climate change where there is an opportunity to accelerate progress by increasing collaboration around data. From an initial long list of topics, together with Microsoft we prioritised [six areas](#) to focus on, using criteria such as the potential impact that data collaboration could have to address them. We then carried out more in-depth research, working with experts in these areas to understand the [data ecosystem](#) for each, and begin to assess the types of data collaboration that might be required.

This paper presents the highlights of our research, summarising key findings on the gaps we have found in how data is currently shared and used for decision-making,

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<sup>1</sup> United Nations Secretary-General (2020), ‘[Secretary-General's address at Columbia University: "The State of the Planet"](#)’, <https://www.un.org/sg/en/content/sg/statement/2020-12-02/secretary-generals-address-columbia-university-the-state-of-the-planet-scroll-down-for-language-versions>

<sup>2</sup> Open Data Institute (ODI) (2020) ‘[Data infrastructure for common challenges: why is it important?](#)’, <https://theodi.org/project/data-infrastructure-for-common-challenges/>

<sup>3</sup> CDP Open Data Portal (2021), ‘[Cities](#)’, <https://www.cdp.net/en/cities>

<sup>4</sup> Open Data Charter (2019), ‘[Open data is needed for collaborative climate action](#)’, <https://opendatacharter.medium.com/open-data-is-needed-for-collaborative-climate-action-f2423c9ac96c>

ongoing efforts to address these gaps, and subsequent opportunities for further data collaboration to tackle these pressing climate issues.

We intend for this overview to be used by governments, corporations, civil society organisations, scientists and citizens to inform their decisions affecting the climate. The ODI and Microsoft are also looking for partners across the public, private and third sectors, globally, who are interested in supporting data collaboration in these areas.

If you work on any of the six issues, hold or use relevant data, or have feedback or questions on this paper or the research behind it, please get in touch at [diana.szasz@theodi.org](mailto:diana.szasz@theodi.org).

# Achieving net-zero value chains through better tracking of scope 3 emissions

## The data ecosystem

Human emissions of carbon dioxide and other greenhouse gases are a primary driver of climate change. Countries, cities and companies across the world are setting net-zero targets to demonstrate their commitment to climate action.

For countries, a net-zero commitment implies ‘deep reductions in emissions, with any remaining sources being removed from the atmosphere with greenhouse gas removals’<sup>5</sup>. For businesses, the [Science Based Targets initiative](#) (SBTi) has proposed a working definition of net zero as: ‘achieving a state in which the activities within the value-chain of a company result in no net impact on the climate from greenhouse gas emissions’<sup>6</sup>. To achieve net-zero targets, companies, therefore, have to look beyond their direct emissions of greenhouse gases (‘scope 1’) and their indirect emissions from the generation of purchased energy (‘scope 2’), and develop strategies to reduce the emissions generated within their value chain, both upstream and downstream (‘scope 3’). The upstream part of a company’s value chain includes all of the materials, people and environmental factors that contribute to its product and services.<sup>7</sup> The downstream part of the value chain looks more closely at the customers, consumers, re-users and recyclers.<sup>8</sup>

Scope 3 emissions can account for ‘the largest source of emissions for companies and present the most significant opportunities to influence greenhouse gas reductions’<sup>9</sup>. Reducing these emissions requires, first of all, an accurate assessment of these emissions. This relies on, among other things, effective data sharing between suppliers and the companies purchasing products from them globally.

The Greenhouse Gas Protocol, managed by the World Resources Institute, provides guidance in its ‘Corporate Value Chain (Scope 3) Accounting and Reporting Standard’<sup>10</sup> for calculating scope 3 emissions. However, according to the Carbon Disclosure

<sup>5</sup> The Carbon Trust, ‘[What we do – Net Zero](https://www.carbontrust.com/what-we-do/net-zero)’, <https://www.carbontrust.com/what-we-do/net-zero>

<sup>6</sup> *ibid*

<sup>7</sup> Sustainable Business Council, ‘[The SBC Value Chain Guide – Upstream Value Chain](http://www.sbcvaluechain.org.nz/upstream-value-chain)’, <http://www.sbcvaluechain.org.nz/upstream-value-chain>

<sup>8</sup> Sustainable Business Council, ‘[The SBC Value Chain Guide – Downstream Value Chain](http://www.sbcvaluechain.org.nz/downstream-value-chain)’, <http://www.sbcvaluechain.org.nz/downstream-value-chain>

<sup>9</sup> World Resources Institute and World Business Council for Sustainable Development (2011), ‘[Corporate Value Chain \(Scope 3\) Accounting and Reporting Standard Supplement to the GHG Protocol Corporate Accounting and Reporting Standard](https://files.wri.org/s3fs-public/pdf/ghgp_corporate_value_chain_scope_3_standard.pdf)’, [https://files.wri.org/s3fs-public/pdf/ghgp\\_corporate\\_value\\_chain\\_scope\\_3\\_standard.pdf](https://files.wri.org/s3fs-public/pdf/ghgp_corporate_value_chain_scope_3_standard.pdf)

<sup>10</sup> *Ibid*

[https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard\\_041613\\_2.pdf](https://ghgprotocol.org/sites/default/files/standards/Corporate-Value-Chain-Accounting-Reporting-Standard_041613_2.pdf)

Project (CDP)'s 'Global 500 Climate Change Report 2013', 'Current reporting of indirect scope 3 emissions does not reveal the full impact of companies' value chains.'<sup>11</sup> Also, according to CDP's 2016 Climate Change Report, '[Tracking Progress on Corporate Climate Action](#)', nearly all emissions are in 2 of the 15<sup>12</sup> categories scope 3 emissions are broken down into: category 1 (purchased goods and services) or category 11 (use of sold products).<sup>13</sup>

Currently, most companies find it difficult to calculate scope 3 emissions. Collecting data on these emissions that are not 'owned' by companies involves multiple stakeholders and data sources, and the accuracy depends on whether those stakeholders calculate their emissions in a consistent way.<sup>14</sup> When calculated, companies often use secondary data to estimate the emissions that go into products and services, such as weighted averages across the industry, rather than primary supplier emission data. This results in rough approximations rather than a real picture of emissions in the supply chain, lacking the granularity that would allow companies to effectively identify and measure the impact of supply chain actions that can help reduce emissions.

## Increasing collaboration around data

There is an opportunity to build on the interest from companies in making these calculations more efficient as well as the growing attention from governments and investors on company disclosures of environmental impact. Standard setting bodies are also taking steps towards the harmonisation of existing metrics such as the recent release of the [ESG reporting metrics](#) by the five environmental, social and corporate governance (ESG) standard setting organisations (the Carbon Disclosure Project, the Climate Disclosure Standards Board, the Global Reporting Initiative, the International Integrated Reporting Council and the Sustainability Accounting Standards Board) along with the World Economic Forum.

**A global data collaboration for better tracking scope 3 emissions produced in the supply chains of technology products** could serve as a pilot to inform data collaboration practices among companies and their suppliers in other sectors of the economy. A data collaboration could focus on developing appropriate governance mechanisms, ie how decisions would be taken around what data is shared, how and with whom; and open data standards to support the process of combining data from different suppliers of technology companies – for example those that mine minerals for products, or transport companies that ship products/materials around the world.

Working towards calculating scope 3 emissions more efficiently will not only help companies to understand where the majority of their emissions are coming from throughout their supply chain, but also allow them to identify where there are opportunities within their supply chains to reduce emissions.

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<sup>11</sup> PWC (2021), '[Sustainability and climate change](#)', <https://www.pwc.com/gx/en/services/sustainability/publications/carbon-disclosure-project.html>

<sup>12</sup> Science Based Targets, 'Guidance For ICT Companies Setting Science Based Targets Mobile Networks Operators, Fixed Networks Operators And Data Centres Operators', [https://sciencebasedtargets.org/resources/legacy/2020/04/GSMA\\_IP\\_SBT-report\\_WEB-SINGLE.pdf](https://sciencebasedtargets.org/resources/legacy/2020/04/GSMA_IP_SBT-report_WEB-SINGLE.pdf)

<sup>13</sup> CDP (2018), '[How can companies address their scope 3 greenhouse gas emissions?](#)', <https://www.cdp.net/en/articles/companies/how-can-companies-address-their-scope-3-greenhouse-gas-emissions>

<sup>14</sup> Ecoact (2016), '[Good value chain: overcoming the challenge of collecting Scope 3 emissions](#)', <https://eco-act.com/scope-3/good-value-chain-overcoming-the-challenge-of-collecting-scope-3-emissions/>

There are opportunities to complement or inform existing work in this area, such as the work done by the [World Business Council for Sustainable Development \(WBCSD\)](#) on providing guidance on reducing value chain emissions<sup>15</sup>, as well as other initiatives we learned about through our research such as the [Transform to Net Zero Initiative](#) and the [Open Footprint Forum](#).

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<sup>15</sup> WBCSD (2020), '[EcoVadis and WBCSD join forces to reduce scope 3 emissions](https://www.wbcسد.org/Overview/News-Insights/General/News/EcoVadis-and-WBCSD-join-forces-to-reduce-scope-3-emissions)', <https://www.wbcسد.org/Overview/News-Insights/General/News/EcoVadis-and-WBCSD-join-forces-to-reduce-scope-3-emissions>

# Supporting a ‘green’ recovery from Covid-19

## The data ecosystem

A sustainable recovery from the coronavirus (Covid-19) pandemic is vital to addressing climate change. To shape both a short- and long-term economic recovery from the Covid-19 pandemic that also supports efforts to drive transformation to a net-zero emissions economy, decision makers require more frequent and more accurate data about local, national, and global scales of economic activity and their impacts on the environment.

Policies that support ‘green’ or environmentally sustainable sectors at a country level, eg renewable energy and electric vehicles, have been outlined by governments in policy documents such as the Green New Deal<sup>16</sup> in the United States (supporting infrastructure investment, job growth, and low to no impact on the environment) or the [European Green Deal](#)<sup>17</sup>. Other policies might be specific to a region or city, such as installing pedestrian walkways or cycling pathways in place of roadways, or transitioning energy consumed by a local government more towards renewable energy.

In many cases there [can be huge gaps](#) between a policy commitment, its implementation, and its impact – whether due to interceding issues over the long timespan of policy implementation, due to policies not being binding (thus without penalty if commitments are not met), or other factors. Data about plans and implementation is often not gathered in consolidated ways, making measurement or benchmarking of sustainable economic recovery difficult. The data needed to measure these impacts has a lot of overlap with the data used to inform the policies in the first place, but also may only extend to data on promised vs. realised commitments, lacking more detailed data on impact. Gathering the right data on economic performance – current and future – and environmental impact is therefore incredibly challenging.

One hurdle specific to economic data is that the quality and timeliness of this type of data are somewhat contested. Quality comes down to both accuracy of a specific datapoint to measure a particular type of impact, and alignment of data as produced from various sources (particularly as methodologies often differ). For example, while Global Domestic Product (GDP) is a commonly shared metric, some experts state that it does not properly account for modern economic norms in a globalised world – for example, companies headquartered in one country with high activity in another country. It is particularly contested as a means of measuring sustainable economic growth, both financially and in the context of the environment<sup>18</sup>.

<sup>16</sup>The New York Times (2019), ‘[What Is the Green New Deal? A Climate Proposal. Explained](https://www.nytimes.com/2019/02/21/climate/green-new-deal-questions-answers.html)’, <https://www.nytimes.com/2019/02/21/climate/green-new-deal-questions-answers.html>

<sup>17</sup> European Commission (2019), ‘[A European Green Deal Striving to be the first climate-neutral continent](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)’, [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)

<sup>18</sup>Journal of Cleaner Production (2020), ‘[Going beyond Gross Domestic Product as an indicator to bring coherence to the Sustainable Development Goals](https://www.sciencedirect.com/science/article/pii/S0959652619341022)’, <https://www.sciencedirect.com/science/article/pii/S0959652619341022>

Timeliness is a factor because of the lack of automated processes for gathering data covering the full spectrum of the economy. Real-time data showing job losses, revenue from sales, and many other factors shaping the global economy are few and far between. Economic data is often backward-looking and focused on longer time spans, notably financial quarters.

The challenges of measuring environmental impact as tied to economic activity are similar. Real-time data on the environment is also limited and not common; data is often only available as modeled impact, due to a lack of access to proprietary systems, or because related stakeholders (such as governments) are unwilling to share data because of potential reputational impacts<sup>19</sup>.

Together, these hurdles of identifying, finding, and accessing data that is accurate, reliable, and timely, make assessing the impacts of economic recovery incredibly challenging.

## Increasing collaboration around data

Given the scale of the gaps that exist in relevant data on both economic activity and environmental activity, hyperlocal collaborations focused on particular sustainable economic policies, their resultant economic activity, and intended vs. actual environmental impact could have the best chance of delivering a better understanding of what sustainable economic recovery may look like and how it can be brought about.

Pilot data collaborations bringing together relevant stakeholders in a US city or one of the other G20 countries may benefit from data that already exists through the [Energy Policy Tracker of the International Institute for Sustainable Development](#), which tracks real-time data on approved public finance and policy measures targeting energy generation and consumption to stimulate economies in response to the Covid-19 pandemic. These country-level datasets are gathered and hosted by a number of organisations, including the International Institute for Sustainable Development (IISD), Overseas Development Institute, Columbia University in NYC, Instituto Tecnológico Autónomo de México (ITAM), and many more.

There also appear to be opportunities to amplify the work of [C40](#) – a network which brings together data sources from various entities to inform economic and environmental efforts in cities – on a green and ‘just’ recovery<sup>20</sup>; or other initiatives such as [Icebreaker One](#) in the UK, which is bringing together data to inform sustainable economic policies and investment through its [Project Cygnus](#) initiative.

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<sup>19</sup> The Global Partnership for Sustainable Development Data, United Nations Statistics Division, World Bank, Sustainable Development Solutions Network (2019), [Real-Time Data For The SDGs: Accelerating progress through timely information](https://www.data4sdgs.org/sites/default/files/2019-05/Real-time%20Data%20for%20the%20SDGs_Concept%20Note.pdf), [https://www.data4sdgs.org/sites/default/files/2019-05/Real-time%20Data%20for%20the%20SDGs\\_Concept%20Note.pdf](https://www.data4sdgs.org/sites/default/files/2019-05/Real-time%20Data%20for%20the%20SDGs_Concept%20Note.pdf)

<sup>20</sup> [C40 Knowledge \(2020\). ‘The Case for a Green and Just Recovery’.](https://www.c40knowledgehub.org/s/article/The-Case-for-a-Green-and-Just-Recovery?language=en_US) [https://www.c40knowledgehub.org/s/article/The-Case-for-a-Green-and-Just-Recovery?language=en\\_US](https://www.c40knowledgehub.org/s/article/The-Case-for-a-Green-and-Just-Recovery?language=en_US)



# Reducing energy consumption in commercial buildings

## The data ecosystem

Buildings account for around a third of global energy related to carbon emissions, due to the use of energy needed to heat, cool and power them.<sup>21</sup> Global estimates of energy consumption and use by real estate or buildings range significantly, complicated by a lack of disaggregation among stated estimates (eg separating out construction from building, or distinguishing residential from commercial). For example, in 2018 the UN Environment Programme claimed building energy usage came in at about 36% of the final energy use globally<sup>22</sup>, in contrast to the US Energy Information Agency's estimate of real estate representing 20% of global delivered energy consumption<sup>23</sup>. Estimates of emissions connected to commercial real estate hover around 40%.

Many individual building operators, owners, investors, and other stakeholders have acknowledged these impacts and have committed to, or expressed interest in, reducing energy consumption and related emissions<sup>24</sup>. However, understanding and improving operational energy efficiency in commercial real estate portfolios is currently prevented by fractured operations management setups. Common models of managing the physical footprints of commercial real estate are often decentralised. This means that lessees of a specific square footage within a broader footprint often have limited to no requirement or mechanism to gather or share data on their energy consumption practices with broader building management or ownership operations. Energy consumption and efficiency data is also often not digitised, low-tech or non-automated. The data from utilities often comes on an infrequent basis, eg monthly billing, which is often not enough to inform better practices. All of this results in a lack of good-quality, high-frequency data on building operations management.

The data available varies based on factors such as regional legislation or reporting mandates<sup>25</sup>, incentives for data sharing, available certifications, and related contexts. For example, some national and regional governments have begun to roll out incentives, certifications, and/or partial mandates requiring energy efficiency ratings –

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<sup>21</sup>UNEP Finance Initiative (2016), '[Sustainable Real Estate Investment](https://www.unepfi.org/publications/investment-publications/property-publications/sustainable-real-estate-investment-2)', <https://www.unepfi.org/publications/investment-publications/property-publications/sustainable-real-estate-investment-2>

<sup>22</sup> UN Environment Programme (2019), '[2019 Global Status Report for Buildings and Construction Sector](https://www.unenvironment.org/resources/publication/2019-global-status-report-buildings-and-construction-sector)', <https://www.unenvironment.org/resources/publication/2019-global-status-report-buildings-and-construction-sector>

<sup>23</sup>EIA (2019), '[Global energy consumption driven by more electricity in residential, commercial buildings](https://www.eia.gov/todayinenergy/detail.php?id=41753)', <https://www.eia.gov/todayinenergy/detail.php?id=41753>

<sup>24</sup>World Green Building Council, '[The Net Zero Carbon Buildings Commitment](https://www.worldgbc.org/thecommitment)', <https://www.worldgbc.org/thecommitment>

<sup>25</sup> Energy Sector Management Assistance Program (2014), '[Improving Energy Efficiency in Buildings Energy Efficient Cities](https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/ESMAP_Energy_Efficient_MayoralNote_2014.pdf)', [https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/ESMAP\\_Energy\\_Efficient\\_MayoralNote\\_2014.pdf](https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/ESMAP_Energy_Efficient_MayoralNote_2014.pdf)

notably in the US with [EnergySaver's Portfolio Manager](#) (for voluntary reporting of building energy efficiency) and Australia's [NABERS](#) (an initiative supporting mandated reporting of building energy consumption). Some regionally-focused firms that manage large commercial real estate portfolios are rolling out their own targets and encouraging or supporting customers in adhering to them.

The data gaps that remain prevent key decision makers from implementing necessary changes, such as:

- Owners and operators changing operational practice in order to consume less energy;
- Policymakers developing effective reporting mandates or transparency mechanisms, such as Display Energy Certificates<sup>26</sup> (DECs) or frameworks such as the [Global Real Estate Sustainability Benchmark](#) (GRESB); and
- Investors, policymakers, and other stakeholders with access to funding committing financing or providing related incentives.

Collating data on building characteristics and energy use more efficiently and to a higher standard, coupled with new technologies for energy control and management, could drive significant reductions in their energy consumption. For any such effort, the risks associated with the collection of more granular, real-time data from buildings that can potentially be used to identify people need to be considered and mitigated accordingly.

## Increasing collaboration around data

**Local data collaborations between utility companies, energy services companies and companies owning or leasing commercial real estate to incentivise data sharing and increase data interoperability and digitisation of data streams** could help move the industry towards a future where data that is currently siloed across real estate footprints is used more efficiently. More frequent, comparable and better quality data can support better target-setting, benchmarking and measurement of progress in energy efficiency by different constituents.

Given the often regional scope of commercial real estate portfolios and the niche legislative contexts of different regions, pilot data collaborations on this issue would likely be most successful on a **local or national level**. The best place to start would be to test out some models in **regions where local governments are already mandating and enabling data sharing** in this realm, such as in Australia (with its NABERS initiative and related policies that spawned it) and the US (such as [in New York City](#)). The launch of the new Renovation Wave Strategy by the European Commission to improve the energy performance of buildings<sup>27</sup> also creates a conducive environment for such collaborations in European cities.

Data collaborations focused on informing reductions in building energy consumption could also build on the efforts of organisations such as the [Berkeley Lawrence National Laboratory](#) in the US that produced a modeling tool for operational energy

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<sup>26</sup>Aldersgate Group, The UK Green Building Council (2017), '[Energy efficiency in the UK's buildings: key priorities for the new government](#)', <https://www.ukgbc.org/wp-content/uploads/2017/09/UK-GBC-Aldersgate-Energy-Efficiency-Briefing.pdf>

<sup>27</sup> European Commission (2020), '[Renovation wave | Energy](#)', [https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave\\_en](https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en)

efficiency improvements, the Better Buildings Partnership in the UK or the Building Efficiency Accelerator initiative of the [World Green Building Council](#).

# Improving water resource management

## The data ecosystem

Water is a shared resource but is often managed in silos. In the face of climate uncertainty and a growing global population, coordination and agreement across the multiple sectors and stakeholders involved in how water use is managed is becoming more crucial.

The biophysical conditions of water are traditionally tracked through metrics such as water availability, consumption, scarcity and groundwater levels; with increasingly good quality data available on each of these dimensions<sup>28</sup>, through for instance the World Resources Institute's [Aqueduct tools](#), the International Water Management Institute's (IWMI) [Water Data Portal](#) or the [U.S. Geological Survey](#). However, to fully understand and manage water risks, decision makers need access to a variety of local datasets that describe both the biophysical parameters of water as well as how water resources are managed by relevant stakeholders.

Diverse stakeholders, including corporations across all sectors, are already coming together to help support water conservation efforts. Technologies like the Internet of Things (IoT) and artificial intelligence (AI) are offering new opportunities to improve water quality and efficiency.

The lack of granular level data poses a challenge to local coordination efforts, resulting in corporations and other water users, eg agricultural and industrial, making decisions without access to the right data. There are initiatives looking at filling this gap in local data, such as the World Resources Institute's efforts<sup>29</sup> to improve public water management by encouraging private sector companies to share the data they gather over time on the status of public water management. However, opportunities remain to increase the sharing of other data related to water use and water system resilience. As a [2019 report](#) by the International Water Association notes, 'there is openness and a willingness to share information within the water sector and utilities should actively seek out these insights'<sup>30</sup>.

There are also significant regional differences with regards to the availability of data across the world. In some countries, eg in the US and Australia, data is available both at the local and national level. In many developing countries, data scarcity is a challenge even with regards to the physical side of water, although it is being

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<sup>28</sup>World Resources Institute (2018), '[Mapping Public Water Management By Harmonizing And Sharing Corporate Water Risk Information](#)', <https://files.wri.org/s3fs-public/mapping-public-water-management-harmonizing-sharing-corporate-water-risk-information.pdf>

<sup>29</sup>World Resources Institute (2018), '[Mapping Public Water Management By Harmonizing And Sharing Corporate Water Risk Information](#)', <https://files.wri.org/s3fs-public/mapping-public-water-management-harmonizing-sharing-corporate-water-risk-information.pdf>

<sup>30</sup>CNBC (2020), 'Water has become a big issue for Big Tech. But Microsoft has a plan', <https://www.cnbc.com/2020/10/13/water-has-become-a-big-issue-for-big-tech-but-microsoft-has-a-plan.html>

mitigated by the increased use of remotely sensed data. A partnership between the [International Water Management Institute](#) (IWMI) and [Digital Earth Africa](#), for example, uses satellite imagery with the aim to ‘create easy to interpret data sets for governments, and others, to make more informed decisions about how to allocate water’.<sup>31</sup>

## Increasing collaboration around data

As more companies are making water commitments, there is an opportunity to strengthen public-private sector partnerships to improve water management at a local level through increased collaboration around data. Increased availability of this data could not only enable companies to better prioritise where they invest in efforts to reduce their water use in their operations and where they engage in replenishment efforts, but could also inform other actors – whether public or private – in their water management efforts. This would then contribute both to reduced emissions and increased resilience of water systems and users.

**Local data collaborations between utility corporations, regulators and other water users in water-stressed river basins to pilot water system resilience frameworks** such as the one under development by the [CEO Water Mandate](#), could help review and improve existing models for the data infrastructure that best supports decision-making in the water sector.

Such data collaborations could build on the work of existing initiatives at global, national and local levels, such as:

- the [UNEP-DHI Centre on Water and Environment](#) mandated to measure the global status of water resources management,
- the [World Water Data Initiative](#),
- the [Water Resilience Coalition](#),
- the [Alliance of Water Stewardship’s International Water Stewardship Standard \(AWS Standard\)](#) that provides guidance for businesses as well as public sector agencies to understand their water use and impacts,
- [The Nature Conservancy’s](#) efforts to bring together corporate and public sector interest,
- the [India Water Tool](#) developed by WBCSD in collaboration with WRI, or
- the [California Water Action Collaborative](#).

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<sup>31</sup>Devex (2020), ‘[How satellite images could improve water management in Africa](https://www.devex.com/news/how-satellite-images-could-improve-water-management-in-africa-96807)’, <https://www.devex.com/news/how-satellite-images-could-improve-water-management-in-africa-96807>

# Reducing the climate impact of urban transportation

## The data ecosystem

The transport sector is a major contributor to climate change — it accounts for about 14% of annual emissions (including non-CO2 gases) and around a quarter of CO2 emissions, which come from burning fossil fuels<sup>32</sup>. Cities around the world are developing solutions to transition towards climate-friendly mobility systems.

To support this transition, public and private sector stakeholders need access to the large amounts of data generated and held by different actors in the sector – including the new datasets enabled through the deployment of sensing devices – to inform planning, delivery and management of transport services. While public authorities often lack the ability to monitor and control the use of this data (data from transport providers has been described as ‘patchy’<sup>33</sup>), the share of mobility data collected by the private sector is growing steadily. Public authorities could therefore benefit from a sliding scale of data access initiatives that reflects their needs and capabilities. This does not necessarily mean sharing raw data; some agencies might be well-served through a dashboard overview of key indicators, while others might want to access the raw data to carry out their own analysis. In other sectors, we can already observe different types of data access initiatives that are set to solve different problems with different solutions and timescales<sup>34</sup>. Yet, they have the same underlying objective: building or strengthening the data infrastructure as part of their work<sup>35</sup>. New data access and sharing initiatives are therefore much needed, to enable public and private interactions in sourcing, accessing and co-creating the data required to manage transport activities in a more sustainable way.

New data-sharing models between public transport authorities, operators and industry leaders in the technology and automotive sectors are already emerging in an effort to deliver the right level of insights to identify and execute interventions that can improve the efficiency of urban mobility solutions, drive innovation in the field and reduce transport-related emissions. In 2020, the new [European Green Deal](#) has helped push forward many European cities in their efforts to become greener, and roll out cleaner, cheaper, and healthier forms of private and public transport<sup>36</sup>.

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<sup>32</sup>World Resources Institute (2019), [‘Everything You Need to Know About the Fastest-Growing Source of Global Emissions: Transport’](#), <https://www.wri.org/blog/2019/10/everything-you-need-know-about-fastest-growing-source-global-emissions-transport#:~:text=1.emissions%20from%20burning%20fossil%20fuels>.

<sup>33</sup>Green Alliance (2020), [‘Smart and green Joining up digital and environmental priorities to drive the UK’s economic recovery’](#), [https://www.green-alliance.org.uk/resources/Smart\\_and\\_green.pdf](https://www.green-alliance.org.uk/resources/Smart_and_green.pdf)

<sup>34</sup>OECD/ITF (2016), [‘Data-Driven Transport Policy’](#), <https://www.itf-oecd.org/sites/default/files/docs/data-driven-transport-policy.pdf>

<sup>35</sup>ODI (2020), [‘What do we mean by data access initiatives?’](#), <https://theodi.org/article/what-do-we-mean-by-data-access-initiatives/#:~:text=At%20the%20ODI%20we%20focus%20for%20the%20collaboration>

<sup>36</sup>European Commission (2019), [‘A European Green Deal Striving to be the first climate-neutral continent’](#), [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)

The global Covid-19 pandemic has also led to societies rethinking certain aspects of how they operate their cities, including plans to adopt more sustainable mobility systems, framed around equity of access, efficiency, safety and green mobility<sup>37</sup>. Many new networks, initiatives and partnerships born in response to the pandemic have data and data sharing at their core<sup>38</sup>.

Disparities exist between developed and developing countries with the former outperforming the latter on most mobility policy goals according to the Global Roadmap of Action Toward Sustainable Mobility<sup>39</sup> produced by the Sustainable Mobility for All Initiative in 2019. This suggests that at this point in time developed countries might offer a more conducive environment for implementing data-sharing initiatives.

## Increasing collaboration around data

**Bringing relevant datasets together**, such as emissions data from transportation, data on public transport journeys and data on the use of various modes of transportation, **could help stakeholders better understand the impact of various government policies or investments**, for instance in areas such as cycle infrastructure, on transport practices and related emissions. The areas of highest impact to tackle climate change through better data collaboration, based on our desk research<sup>40</sup> and stakeholder consultations, appear to be:

- multimodal transportation solutions
- Electric Vehicles (EV) charging
- journey planning apps and services
- Mobility as a Service (MaaS) model

There are **opportunities to strengthen existing initiatives around data sharing, such as the work of the WBCSD around enabling data sharing for transforming urban mobility**<sup>41</sup>, that will scale and replicate data sharing between global public and private sectors in mobility. Targeted pilots can support the creation and adoption of trustworthy data-sharing models.

**Western Europe seems to be an ideal geographical focus for piloting data collaboration initiatives** given the maturity of existing legislation and anticipated

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<sup>37</sup>Sustainable Mobility for All (2019), '[Global Roadmap of Action Toward Sustainable Mobility](http://pubdocs.worldbank.org/en/350451571411004650/Global-Roadmap-of-Action-Toward-Sustainable-Mobility.pdf)', <http://pubdocs.worldbank.org/en/350451571411004650/Global-Roadmap-of-Action-Toward-Sustainable-Mobility.pdf>

<sup>38</sup>ODI (2020), '[Call for Proposals: A review of public-private mobility data sharing in response to the Covid-19 pandemic](https://theodi.org/article/call-for-proposals-a-review-of-public-private-mobility-data-sharing-in-response-to-the-covid-19-pandemic/)', <https://theodi.org/article/call-for-proposals-a-review-of-public-private-mobility-data-sharing-in-response-to-the-covid-19-pandemic/>

<sup>39</sup>Sustainable Mobility for All (2019), '[Global Roadmap of Action Toward Sustainable Mobility](http://pubdocs.worldbank.org/en/350451571411004650/Global-Roadmap-of-Action-Toward-Sustainable-Mobility.pdf)', <http://pubdocs.worldbank.org/en/350451571411004650/Global-Roadmap-of-Action-Toward-Sustainable-Mobility.pdf>

<sup>40</sup>Transport Systems Catapult (2015), '[The Transport Data Revolution Investigation into the data required to support and drive intelligent mobility March 2015](https://ts.catapult.org.uk/wp-content/uploads/2016/04/The-Transport-Data-Revolution.pdf)', <https://ts.catapult.org.uk/wp-content/uploads/2016/04/The-Transport-Data-Revolution.pdf>

<sup>41</sup>WBCSD (2020), '[Enabling data-sharing: Emerging principles for transforming urban mobility](https://www.wbcd.org/Programs/Cities-and-Mobility/Transforming-Mobility/Transforming-Urban-Mobility/Resources/Enabling-data-sharing-Emerging-principles-for-transforming-urban-mobility)', <https://www.wbcd.org/Programs/Cities-and-Mobility/Transforming-Mobility/Transforming-Urban-Mobility/Resources/Enabling-data-sharing-Emerging-principles-for-transforming-urban-mobility>

regulatory and legislative developments as part of the European Green Deal<sup>42</sup>, as well as the adoption of digital technologies that bring about a vast amount of new datasets.

Data collaborations in this area could also build on the work of organisations such as the [SLOCAT partnership](#), the [Connected Places Catapult](#) in the UK<sup>43</sup>, the [London Data Commission Electric Vehicle Charging initiative](#) or the work around the creation of [mobility hubs](#) in cities where different sustainable and shared transport modes are connected with each other.

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<sup>42</sup>The Guardian (2020), '[What is the European Green Deal and will it really cost €1tn?](https://www.theguardian.com/world/2020/mar/09/what-is-the-european-green-deal-and-will-it-really-cost-1tn)', <https://www.theguardian.com/world/2020/mar/09/what-is-the-european-green-deal-and-will-it-really-cost-1tn>

<sup>43</sup>Transport Systems Catapult (2015), '[The Transport Data Revolution Investigation into the data required to support and drive intelligent mobility March 2015](https://ts.catapult.org.uk/wp-content/uploads/2016/04/The-Transport-Data-Revolution.pdf)', <https://ts.catapult.org.uk/wp-content/uploads/2016/04/The-Transport-Data-Revolution.pdf>



# Reducing waste

## The data ecosystem

Waste not only pollutes our ecosystems, but its creation, distribution and disposal also contributes to greenhouse gas emissions. As per the UN Environment Programme, an estimated 11.2 billion tonnes of solid waste is collected around the world every year, and ‘the decay of the organic proportion is contributing about 5 percent of global greenhouse gas emissions’.<sup>44</sup>

Reducing emissions originating from the generation of waste requires better tracking of different types of waste – including hazardous, electronics and construction waste. As Microsoft President Brad Smith acknowledged in a 2020 blog, ‘Today, there is no consistent, high-quality data about the amount of waste, the type and quality, where it is generated and where it goes. [...] Waste data needs a standardized methodology, better transparency and higher quality.’<sup>45</sup>

Municipal waste data is generally more available in the Global North through the wide-spread use of scales and weighing systems, while cities in the Global South often seem to lack data on the volume of waste and its breakdown by types of material. Nevertheless, even in the Global North there is space for improving the consistency of reporting on waste data by the different stakeholders involved, including corporations and waste management companies.

Electronic waste, or ‘e-waste’ - ‘items of electrical and electronic equipment and its parts that have been discarded by its owner as waste without the intent of re-use’<sup>46</sup>, is of prime concern to a large extent due to the materials involved. E-waste can contain up to 60 different metals and chemicals, which, if disposed of incorrectly, can expose people to toxic substances or soil contamination. Currently only about 20% of e-waste is formally recycled.<sup>47</sup> ‘The United Nations University predicts e-waste could nearly triple to 120 million tonnes by 2050 if nothing changes.’<sup>48</sup> ‘There is [also] little data on what happens to the rest, which for the most part ends up in landfill, or is disposed of by informal workers in poor conditions.’<sup>49</sup> At the same time, due to the gold, copper, platinum and other rare earth elements present in e-waste, it is estimated to present an ‘opportunity worth over USD \$62.5 billion per year, more than the GDP of most countries and three times the output of the world’s silver mines.’<sup>50</sup>

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<sup>44</sup> UN Environment Programme, (n.d.), ‘[Solid waste management](https://www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/cities/solid-waste-management)’, <https://www.unenvironment.org/explore-topics/resource-efficiency/what-we-do/cities/solid-waste-management>

<sup>45</sup> Microsoft (2020), ‘[Microsoft commits to achieve ‘zero waste’ goals by 2030](https://blogs.microsoft.com/blog/2020/08/04/microsoft-direct-operations-products-and-packaging-to-be-zero-waste-by-2030/)’, <https://blogs.microsoft.com/blog/2020/08/04/microsoft-direct-operations-products-and-packaging-to-be-zero-waste-by-2030/>

<sup>46</sup> The Global E-waste Statistics Partnership (GESP), ‘[What is e-waste](https://globalewaste.org/what-is-e-waste/#:~:text=Electronic%20waste%2C%20or%20e%2Dwaste,the%20intent%20of%20re%2Duse.)’ <https://globalewaste.org/what-is-e-waste/#:~:text=Electronic%20waste%2C%20or%20e%2Dwaste,the%20intent%20of%20re%2Duse.>

<sup>47</sup> WBCSD (2019), ‘[UN, WEF, WBCSD and partners come together to address e-waste challenges](https://www.wbcsd.org/Programs/Circular-Economy/News/UN-WEF-WBCSD-and-partners-come-together-to-address-e-waste-challenges)’, <https://www.wbcsd.org/Programs/Circular-Economy/News/UN-WEF-WBCSD-and-partners-come-together-to-address-e-waste-challenges>

<sup>48</sup> *ibid*

<sup>49</sup> WEF, PACE (2019), ‘[A New Circular Vision for Electronics Time for a Global Reboot](https://docs.wbcsd.org/2019/01/A_New_Circular_Vision_for_Electronics.pdf)’ [https://docs.wbcsd.org/2019/01/A\\_New\\_Circular\\_Vision\\_for\\_Electronics.pdf](https://docs.wbcsd.org/2019/01/A_New_Circular_Vision_for_Electronics.pdf)

<sup>50</sup> WBCSD (2019), ‘[UN, WEF, WBCSD and partners come together to address e-waste challenges](https://www.wbcsd.org/Programs/Circular-Economy/News/UN-WEF-WBCSD-and-partners-come-together-to-address-e-waste-challenges)’, <https://www.wbcsd.org/Programs/Circular-Economy/News/UN-WEF-WBCSD-and-partners-come-together-to-address-e-waste-challenges>

These materials are also essential for the transition to renewable energy as they are crucial for wind turbines, solar panels and electric car batteries<sup>51</sup>. This provides an incentive for key stakeholders to work together to better track e-waste and make sure the materials are reused.

## Increasing collaboration around data

As more companies are making ‘zero waste’ commitments and pledges to get better at reusing, repurposing and recycling the waste they produce<sup>52</sup>, there is an opportunity to increase collaboration in multiple areas.

One area where collaboration around data could help spur progress is around corporate general waste. There is an opportunity to **improve reporting on the weight of commercial waste and its breakdown as per the different materials in it through collaboration between waste haulers and companies in different sectors** of the economy. **Pilots focused on a specific sector**, for instance the technology sector, **and specific locations, for example a European or North American city** that have generally better data availability, could help develop models for consistent tracking of commercial waste, contributing to better decision making by all stakeholders involved in the waste management process.

Another area to explore is around **measuring and improving the circularity of products, of the materials in them, and their packaging**. This can help companies work towards various commitments around circular product design and the use of more recyclable packaging<sup>53</sup>. Data collaborations around these different aspects will require participation from a slightly different set of stakeholders. For example, in the realm of e-waste, mineral companies will be essential for setting up collaborations around tracking the materials in technology products. **Specific objectives may include the development of open data standards for circular transition indicators for electronics, either focused on the products themselves or their packaging, or the development of a circular ID approach for better tracking the materials in electronics**. The latter may be developed through a collaboration between technology companies and electronics recyclers. Similar approaches already exist in the fashion industry<sup>54</sup> and the building sector, allowing us to learn from their experiences in the area<sup>55</sup>. These data collaboration efforts are likely to be best executed at a global level.

There may also be an immediate **opportunity to boost the work of WBCSD on the circular economy<sup>56</sup> and in particular on the development of circular transition indicators<sup>57</sup>**.

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<sup>51</sup> Bangkok Post (2020), ‘[UK report shines a light on e-waste](https://www.bangkokpost.com/opinion/opinion/2036171/uk-report-shines-a-light-on-e-waste)’, <https://www.bangkokpost.com/opinion/opinion/2036171/uk-report-shines-a-light-on-e-waste>

<sup>52</sup> Microsoft (2020), ‘[Microsoft commits to achieve ‘zero waste’ goals by 2030](https://blogs.microsoft.com/blog/2020/08/04/microsoft-direct-operations-products-and-packaging-to-be-zero-waste-by-2030/)’, <https://blogs.microsoft.com/blog/2020/08/04/microsoft-direct-operations-products-and-packaging-to-be-zero-waste-by-2030/>

<sup>53</sup> Ibid

<sup>54</sup> Vogue Business (2019), ‘[H&M, Microsoft, PVH Corp collaborate in circular fashion initiative](https://www.voguebusiness.com/technology/circular-id-eon-sustainability-blockchain)’, <https://www.voguebusiness.com/technology/circular-id-eon-sustainability-blockchain>

<sup>55</sup> Madaster Origination, (n.d.), ‘Material Matters’, <https://www.madaster.com/en/about-us/why-a-materials-passport>

<sup>56</sup> WBCSD, ‘[Circular Economy](https://www.wbcسد.org/Programs/Circular-Economy)’, <https://www.wbcسد.org/Programs/Circular-Economy>

<sup>57</sup> WBCSD, ‘[Circular Transition Indicators \(CTI\)](https://www.wbcسد.org/Programs/Circular-Economy/Factor-10/Metrics-Measurement/Circular-transition-indicators)’, <https://www.wbcسد.org/Programs/Circular-Economy/Factor-10/Metrics-Measurement/Circular-transition-indicators>

The above opportunities can help inform not only company policies and practice but also long-term government policies across the world on the reuse and recycling of products and their packaging. Countries like the UK – which is reported to have the second largest amount of e-waste, after only Norway, and is ranked as ‘the worst offender of the 1/3 million tonnes of undocumented e-waste estimated to be exported from the European Union every year’<sup>58</sup> – could benefit from better data to track various aspects of their transition to a circular economy.

Data collaborations in this space could also build on the efforts of organisations such as [The Global E-Waste Statistics Partnership](#) to monitor developments of e-waste over time, or the [Capital Equipment Coalition](#) of the Platform for Accelerating the Circular Economy (PACE).

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<sup>58</sup>Bangkok Post (2020), ‘[UK report shines a light on e-waste](https://www.bangkokpost.com/opinion/opinion/2036171/uk-report-shines-a-light-on-e-waste)’, <https://www.bangkokpost.com/opinion/opinion/2036171/uk-report-shines-a-light-on-e-waste>

# Annex

## Contributors

We would like to thank those who have supported our research and provided their insights on the challenges of data sharing and opportunities for data collaborations to address significant climate issues, including representatives of:

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- International Water Management Institute (IWMI)
- Lawrence Berkeley National Laboratory
- Open Environmental Data Project
- Open Standards for Linked Organisations (OSLO)
- Climate Action Tech
- Gold Standard
- Global e-Sustainability Initiative
- Pacific Institute
- Responsible Business Alliance (RBA)
- Spend Network
- The Nature Conservancy (TNC)
- University of Melbourne
- UN Conference on Trade and Development (UNCTAD)
- World Business Council for Sustainable Development (WBCSD)
- World Economic Forum (WEF)
- World Resources Institute (WRI)
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