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Science Based Targets: on target?

Jannik Giesekam, Jonathan Norman, Alice Garvey & Sam Betts-Davies

University of Leeds

25/03/2021

Recently published journal article

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Article

Science-Based Targets: On Target?

Jannik Giesekam *, Jonathan Norman, Alice Garvey and Sam Betts-Davies

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Abstract: Companies are increasingly seeking to align their actions with the goals of the Paris Agreement. Over 1000 such companies have committed to the science-based targets initiative which seeks to align corporate carbon reduction targets with global decarbonisation trajectories. These 'science-based targets' are developed using a common set of resources and target-setting methodologies, then independently assessed and approved by a technical advisory group. Despite the initiative's rapid rise to public prominence, it has received little attention to date in the academic literature. This paper discusses development of the initiative based upon a quantitative assessment of progress against each component of the science-based targets set by 81 early adopters, using information gathered from company annual reports, corporate social responsibility websites and Carbon Disclosure Project (CDP) responses. The analysis reveals a mixed picture of progress. Though the majority of targets assessed were on track and, in some cases, had already been achieved, just under half of the companies assessed were falling behind on one or more of their targets. Progress varied significantly by target scope, with more limited progress against targets focused on Scope 3 emissions. Company reporting practices were highly variable and often of poor quality. This paper concludes with a range of recommendations to improve the transparency, consistency and comparability of targets within this key agenda-setting initiative.

Keywords: climate; climate change mitigation; science-based targets; corporate social responsibility; emissions reduction; mitigation target; greenhouse gas accounting; corporate; reporting; sustainability

check for updates

Citation: Giesekam, J.; Norman, J.; Garvey, A.; Betts-Davies, S. Science-Based Targets: On Target?. *Sustainability* **2021**, *13*, 1657. https://doi.org/10.3390/su13041657

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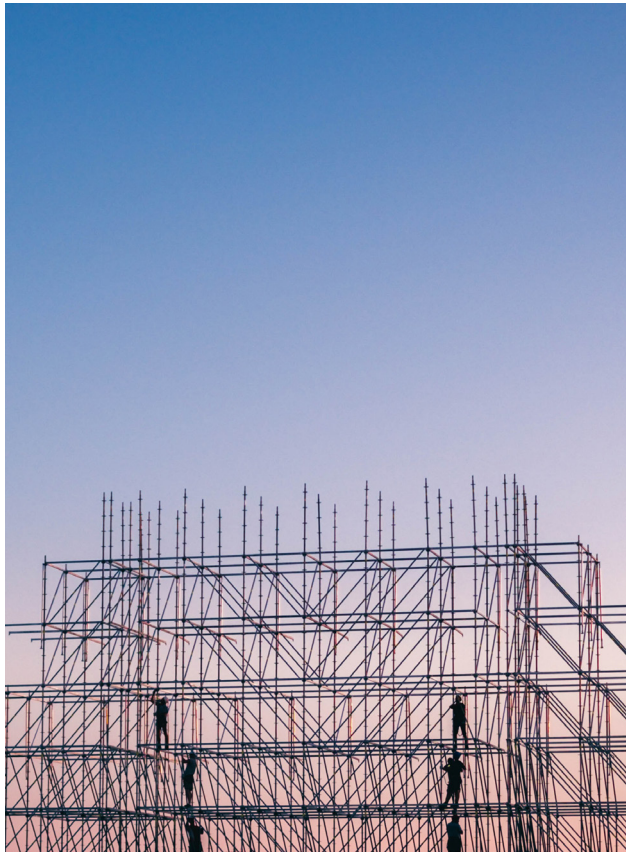
1. Introduction

The 2015 Paris Agreement saw most nations commit to limiting global warming to well below 2 °C above pre-industrial levels by ensuring a balance of greenhouse gas (GHG) sources and sinks in the second half of this century [1]. This will require rapid reductions in GHG emissions in excess of current international mitigation commitments [2]. Yet, despite increased mitigation efforts from a range of actors, global emissions increased in subsequent years prior to the COVID-19 pandemic [3]. Subnational and non-state action can complement, catalyse, and reinforce national climate action, helping governments go further and act faster to reduce emissions, potentially realigning emissions with a Paris Agreement-compatible trajectory [4].

Corporate actors are increasingly disclosing information on their carbon emissions and committing to different forms of climate action including commitments on renewable energy, energy efficiency, carbon pricing, protection of land and investment in green bonds. CDP (formerly the Carbon Disclosure Project) is a not-for-profit organisation providing support for company and city level environmental impact disclosure. In 2019, 8361 companies, representing over 50% of global market capitalisation, disclosed climate change information through CDP, compared with just 220 in 2003 [5], suggesting significant growth in corporate reporting. However, much of this increased disclosure has been criticised for "corporate-centric", "self-laudatory" reporting with "disclosure for the sake of disclosure", and performance primarily assessed against self-referential indicators that provide an inadequate assessment of true sustainability [6]. A key question arising from the corporate

Overview

1. **Introduction to Science Based Targets initiative**
2. Methods
3. Results
4. Comparison with initiative's progress report
5. Recommendations & next steps



Common critique of corporate carbon targets

Proliferation of *corporate-centric*, *self-laudatory* reporting with *disclosure for the sake of disclosure*, and *self-referential targets* which do not reflect true sustainability

Recent response

Adoption of **context-based approaches to corporate sustainability** using absolute environmental sustainability assessment methods, resilience based targets etc.

Sounds like a *rigorous*, *robust* and *defensible* way of *spurring ambition*

Sounds like *voodoo economics* and a *costly distraction* from net zero

What is the Science Based Targets initiative?

The Science Based Targets initiative (SBTi) champions science-based target setting as a powerful way of boosting companies' competitive advantage in the transition to the low-carbon economy.

SCIENCE BASED TARGETS

PARTNER ORGANIZATIONS

CDP
DRIVING SUSTAINABLE ECONOMIES

UN GLOBAL COMPACT

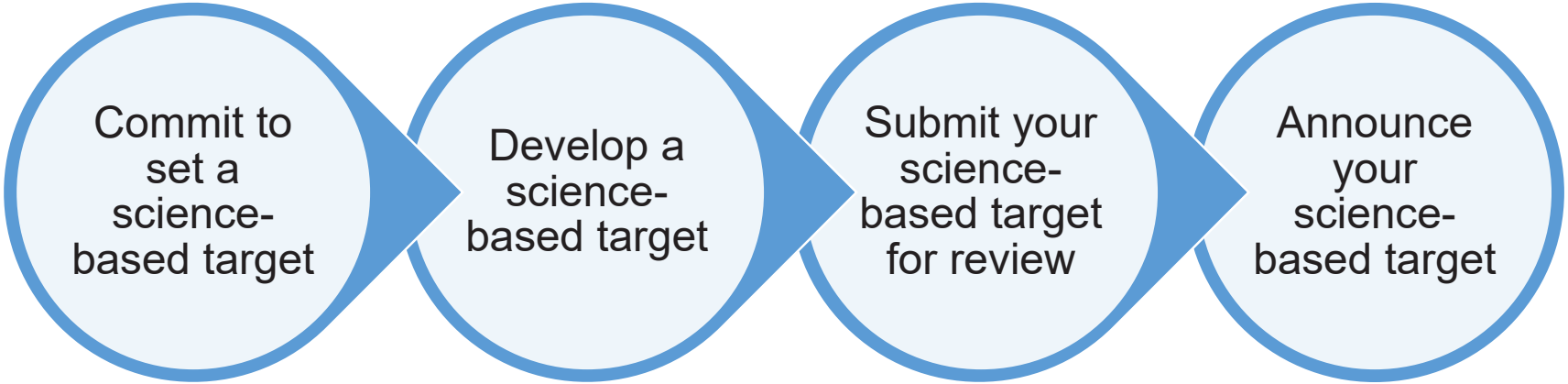
WORLD RESOURCES INSTITUTE

WWF

IN COLLABORATION WITH

WE MEAN BUSINESS

Four step process



Basic approach

Carbon budget
Taken from climate reports *e.g. IPCC 5th AR*

Emissions scenario
How the budget is distributed over time *e.g. IEA B2DS*

Allocation approach
How the budget is distributed between companies
e.g. on a contraction or convergence basis

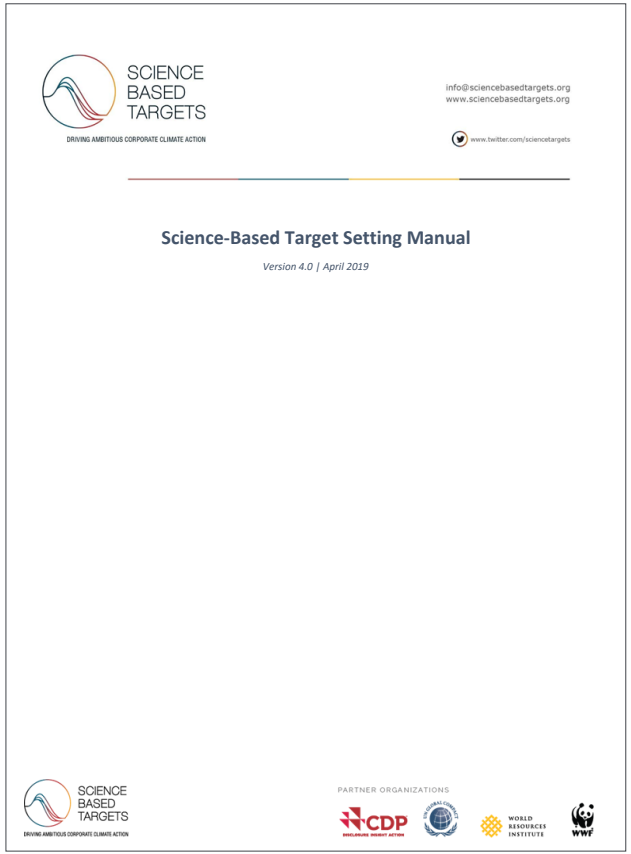
Target setting methods

Choose between

Sector-based approach
Based on sector-specific carbon budgets determined by mitigation/technology option & activity projections

Absolute-based approach
Based on absolute emissions reductions determined in climate reports (e.g. 49-72% reduction in IPCC 5th AR)

Economic-based approach
Based on the average emissions reductions determined in climate reports per projected economic output



Validation criteria

Boundary
Covers Scope 1 & 2 + Scope 3 where screening suggests greater than 40% of company total

Timeframe
Commitment covers period of 5-15 years aligned with longer term pathway

Level of ambition
Previously aligned with 2˚C, must be “well-below 2˚C” from October 2019, 1.5˚C encouraged

Reporting
Must disclose emissions inventory on an annual basis


SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

info@sciencebasedtargets.org
www.sciencebasedtargets.org

www.twitter.com/sciencetargets

SBTi Criteria and Recommendations

TWG-INF-002 | Version 4.0
April 2019

SCIENCE BASED TARGETS
DRIVING AMBITIOUS CORPORATE CLIMATE ACTION

PARTNER ORGANIZATIONS

CDP

WORLD RESOURCES INSTITUTE

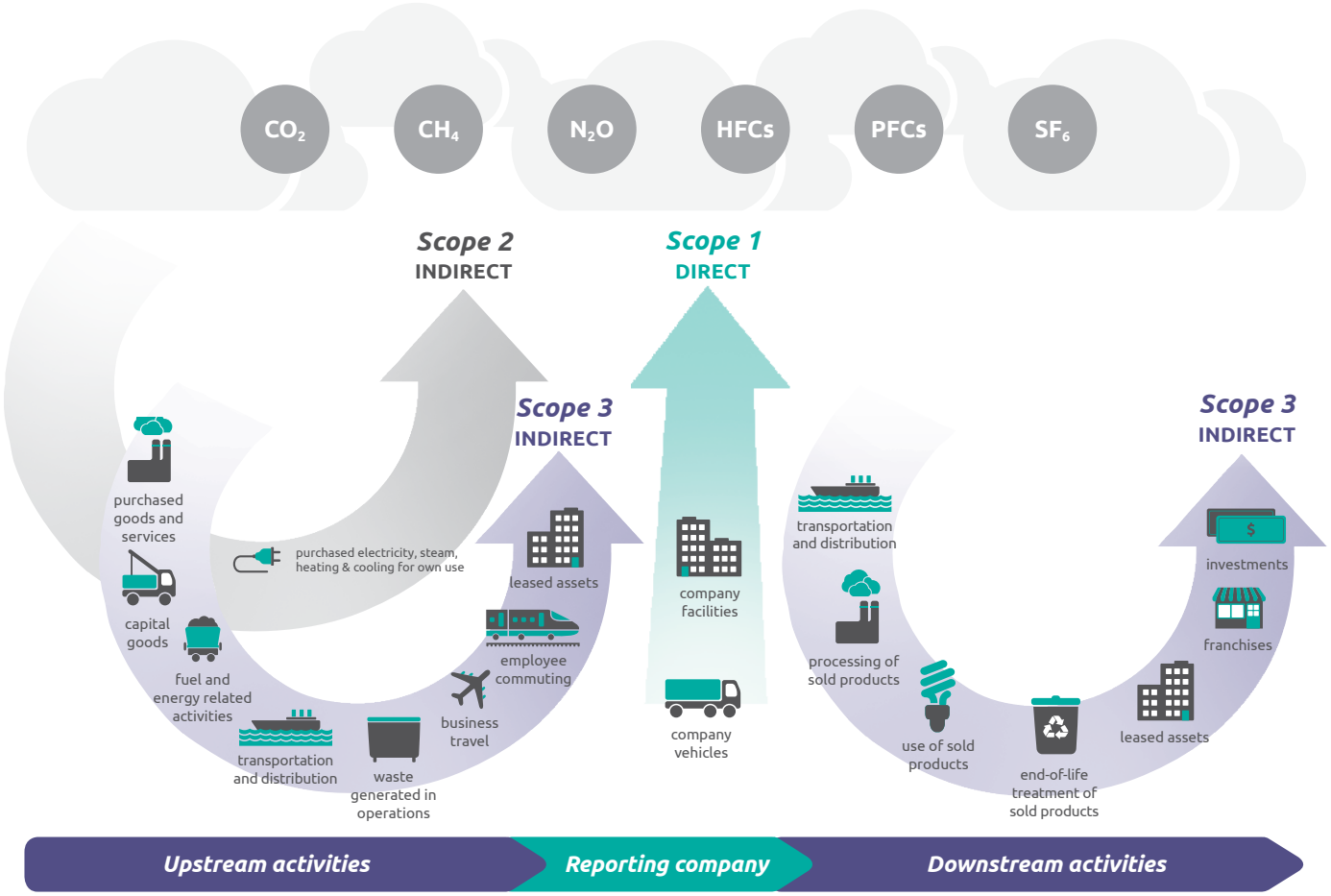
WWF

CREDS

UK Research and Innovation

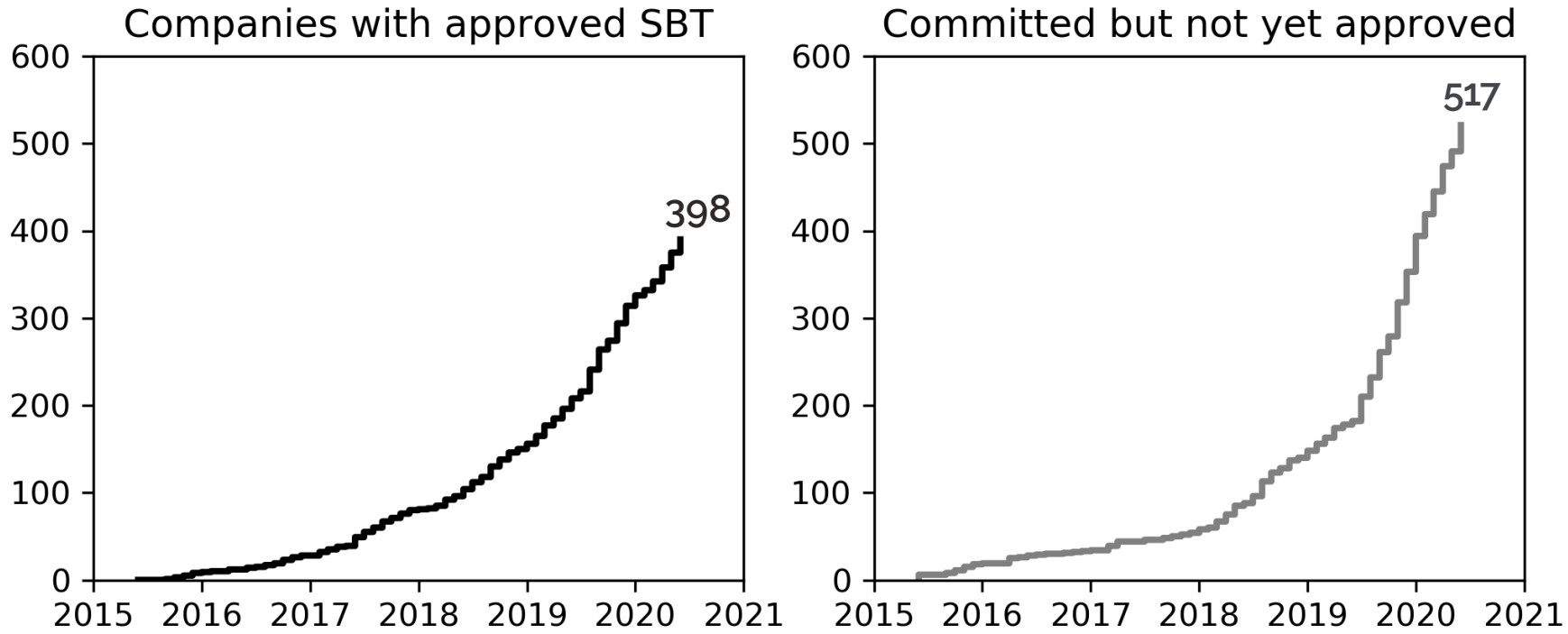
Full criteria available at: **sciencebasedtargets.org/resources/**

Scopes


CO_2
CH_4
N_2O
HFCs
PFCs
SF_6
Scope 2
INDIRECT
Scope 1
DIRECT
Scope 3
INDIRECT
Scope 3
INDIRECT
purchased goods and services
capital goods
fuel and energy related activities
transportation and distribution
waste generated in operations
business travel
employee commuting
leased assets
purchased electricity, steam, heating & cooling for own use
company facilities
company vehicles
transportation and distribution
processing of sold products
use of sold products
end-of-life treatment of sold products
leased assets
franchises
investments
Upstream activities
Reporting company
Downstream activities

Uptake - 915 companies committed by June 2020*

SBTi companies now make up nearly **20% of total global market capitalization**



C R E D S

UK Research and Innovation

*Numbers in paper as of 29/06/20 - since increased to 1245 companies by start of March 2021

Research questions

1. **‘Are companies on track to achieve emissions reductions consistent with their science-based targets?’**
2. ‘Is target achievement influenced by the scope of the target, or the target metric used?
3. ‘Is target achievement a sign of strong action or poor ambition?’
4. ‘How could the reporting of targets be improved?

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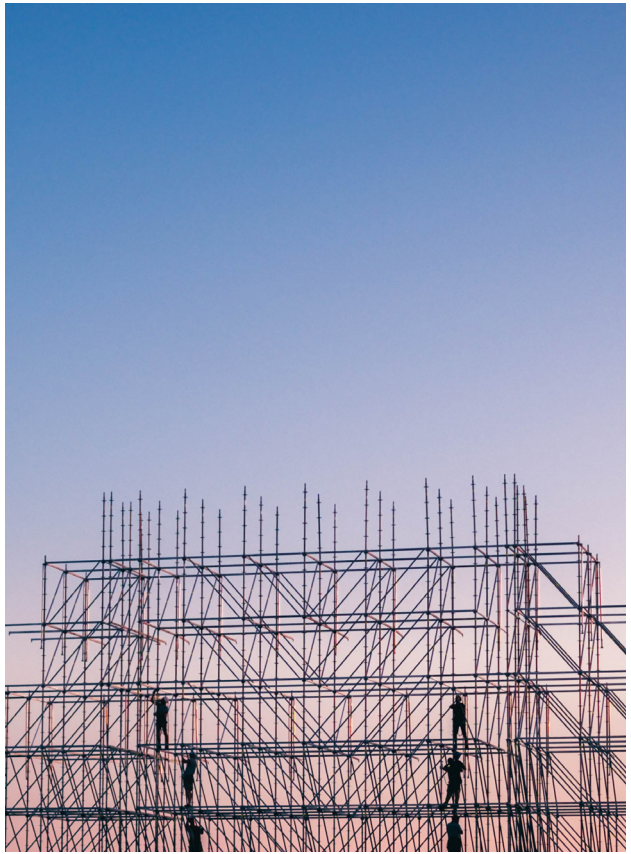
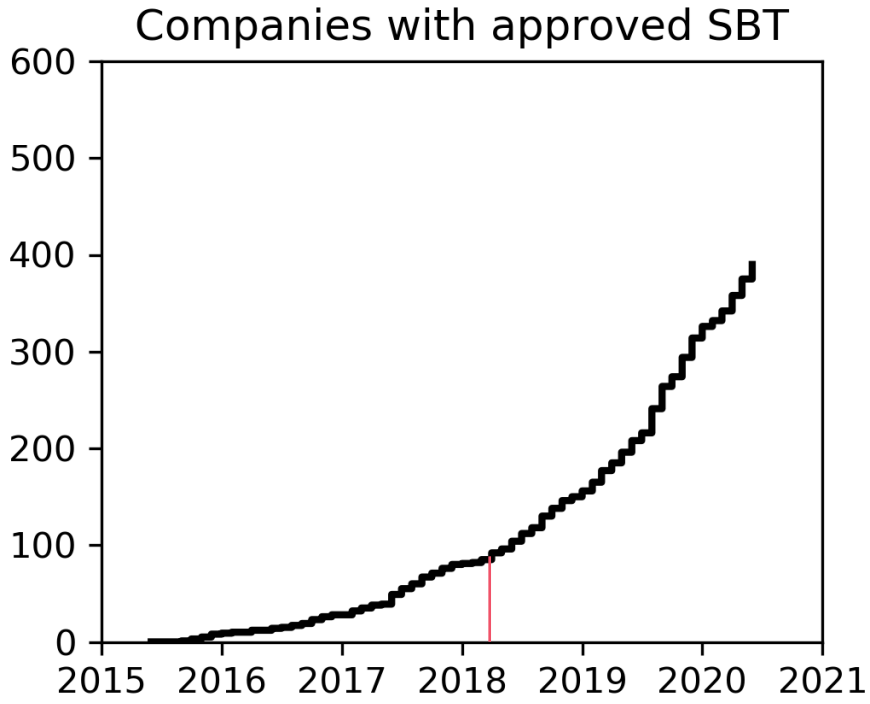


Sample screening

Initially considered all 92 **companies with SBT approved before March 2018** (i.e. those with at least two years of reporting against their target)

Screened down to **81 companies** due to mergers, acquisitions and insufficient data to assess progress



Data gathering

From:

Company websites

Annual reports

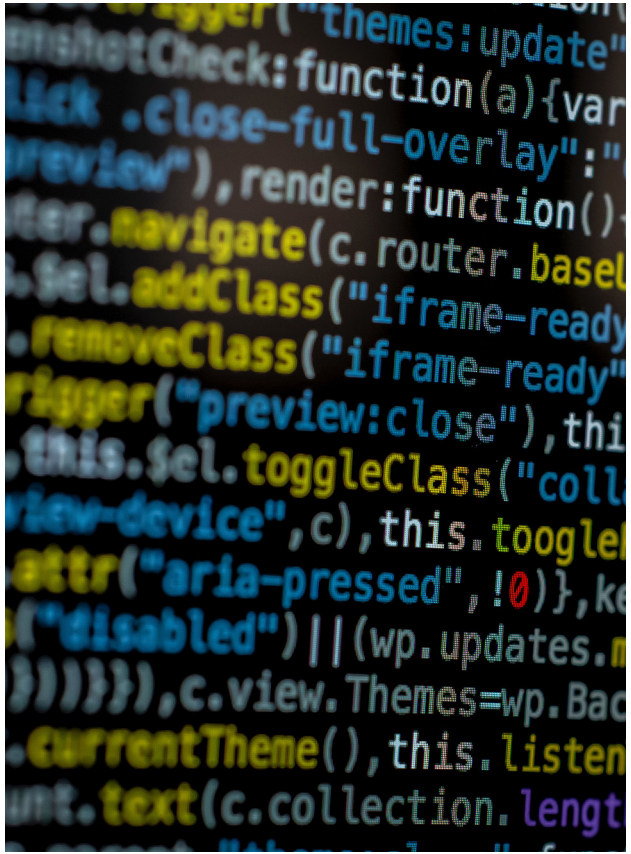
Sustainability reports

CDP responses

Included:

Emissions data

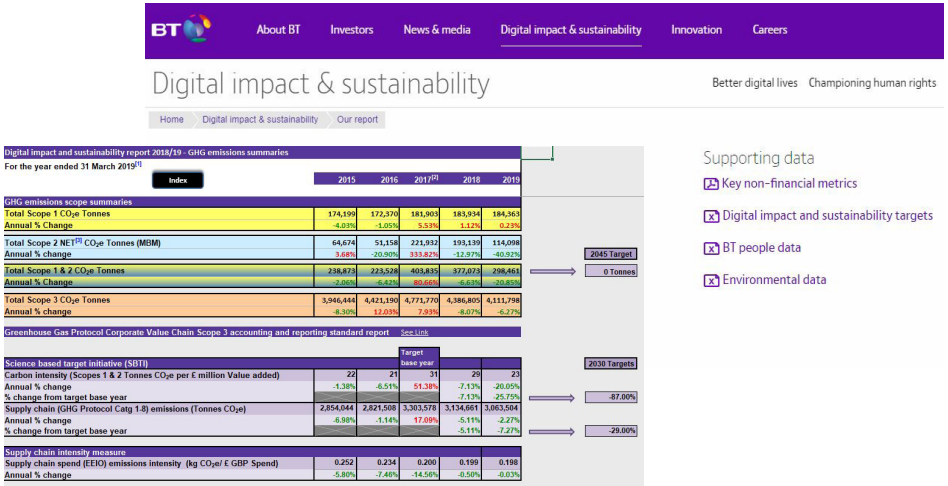
Range of other parameters (e.g. latest CDP score)



Mixed reporting

Good practice example:

Includes detailed breakdown, absolute & intensity figures, time series with baseline, reports directly against SBT & conforms with GRI



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Digital impact & sustainability

Better digital lives | Championing human rights

Home > Digital impact & sustainability > Our report

Digital impact and sustainability report 2018/19 - GHG emissions summaries

For the year ended 31 March 2019[1]

Index

	2015	2016	2017[2]	2018	2019
GHG emissions scope summaries					
Total Scope 1 CO_2e Tonnes	174,199	172,370	181,903	183,934	184,363
Annual % Change	-4.03%	-1.05%	5.53%	1.12%	0.23%
Total Scope 2 NET[2] CO_2e Tonnes (MBM)	64,674	51,158	221,932	193,139	114,098
Annual % change	3.68%	-20.90%	333.82%	-12.97%	-40.92%
Total Scope 1 & 2 CO_2e Tonnes	238,873	223,528	403,835	377,073	298,461
Annual % Change	-2.06%	-6.42%	80.66%	-6.63%	-20.85%
Total Scope 3 CO_2e Tonnes	3,946,444	4,421,190	4,771,770	4,386,805	4,111,798
Annual % change	-8.50%	12.03%	7.93%	-8.07%	-6.27%
Greenhouse Gas Protocol Corporate Value Chain Scope 3 accounting and reporting standard report	See Link				
		Target base year			
Science based target initiative (SBTi)					
Carbon intensity (Scopes 1 & 2 Tonnes CO_2e per £ million Value added)	22	21	31	29	23
Annual % change	-1.38%	-6.51%	51.38%	-7.13%	-20.05%
% change from target base year				-7.13%	-25.75%
Supply chain (GHG Protocol Catg 1-8) emissions (Tonnes CO_2e)	2,854,044	2,821,508	3,303,578	3,134,661	3,063,504
Annual % change	-6.98%	-1.14%	17.09%	-5.11%	-2.27%
% change from target base year				-5.11%	-7.27%
Supply chain intensity measure					
Supply chain spend (EEIO) emissions intensity (kg CO_2e/ £ GBP Spend)	0.252	0.234	0.200	0.199	0.198
Annual % change	-5.80%	-7.46%	-14.56%	-0.50%	-0.03%

2045 Target → 0 Tonnes

2030 Targets → -87.00% → -29.00%

Supporting data

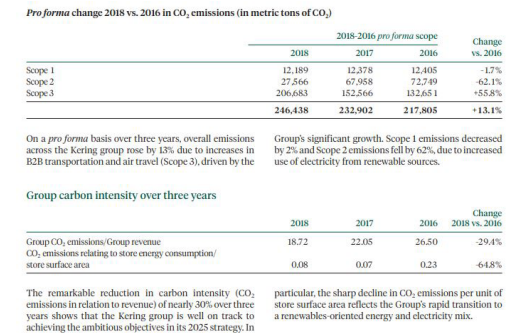
- Key non-financial metrics
- Digital impact and sustainability targets
- BT people data
- Environmental data

Bad practice example:

Totals vary by two thirds for same year across reference docs & CDP responses, most recent reporting does not include baseline year or SBT intensity metric, impossible to assess progress

KERING

Reference document 2018



***Pro forma* change 2018 vs. 2016 in CO_2 emissions (in metric tons of CO_2)**

	2018-2016 *pro forma* scope			Change
	2018	2017	2016	vs. 2016
Scope 1	12,189	12,378	12,405	-1.7%
Scope 2	27,566	67,958	72,749	-62.1%
Scope 3	206,683	152,566	132,651	+55.8%
	246,438	**232,902**	**217,805**	**+13.1%**

On a *pro forma* basis over three years, overall emissions across the Kering group rose by 13% due to increases in B2B transportation and air travel (Scope 3), driven by the Group's significant growth. Scope 1 emissions decreased by 2% and Scope 2 emissions fell by 62%, due to increased use of electricity from renewable sources.

Group carbon intensity over three years

	2018	2017	2016	Change 2018 vs. 2016
Group CO_2 emissions/Group revenue	18.72	22.05	26.50	-29.4%
CO_2 emissions relating to store energy consumption/ store surface area	0.08	0.07	0.23	-64.8%

The remarkable reduction in carbon intensity (CO_2 emissions in relation to revenue) of nearly 30% over three years shows that the Kering group is well on track to achieving the ambitious objectives in its 2025 strategy. In particular, the sharp decline in CO_2 emissions per unit of store surface area reflects the Group's rapid transition to a renewables-oriented energy and electricity mix.

Anatomy of a Science Based Target (SBT)

SBT typically features multiple elements e.g. 1 *SBT* composed of 4 *targets*

> "Hewlett Packard Enterprise commits to reduce scope 1 and 2 greenhouse gas emissions 25% by 2025 from a 2015 base year. *In addition, the company commits to increasing the energy performance of its product portfolio 30x within the same time-frame, which equates to reducing the greenhouse gas emissions per operation by over 95%. Also, HPE commits to reduce emissions from purchased goods and services 15% within the same time-frame.* HPE commits that its manufacturing suppliers covering 80% of spend will set science-based targets by 2025"

Classification developed by authors:

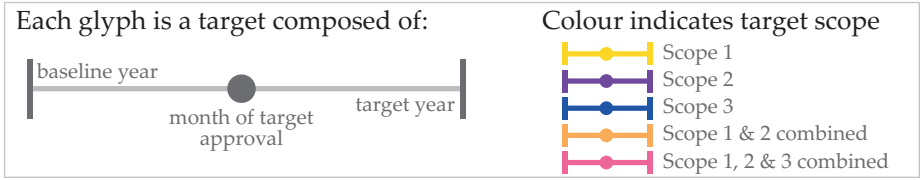
Primary / *Secondary* / Tertiary target

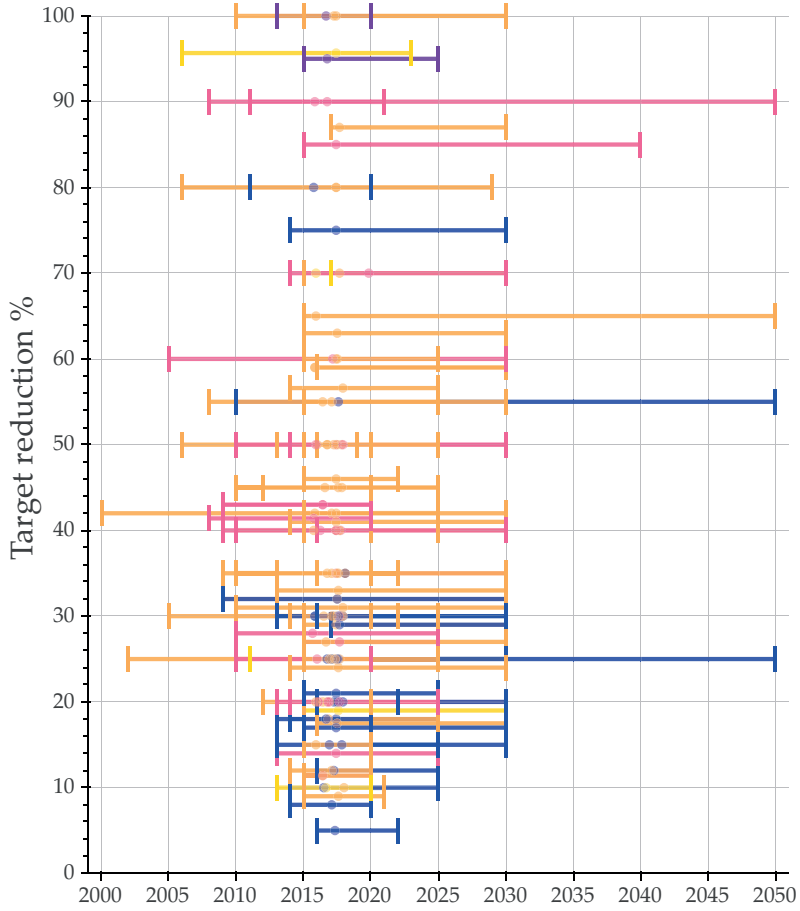
Absolute / Intensity metric

Sample targets

81 primary, 52 secondary, 22 tertiary

98 absolute, 35 intensity-based metrics (of which 26 physical & 9 economic using 35 different units)





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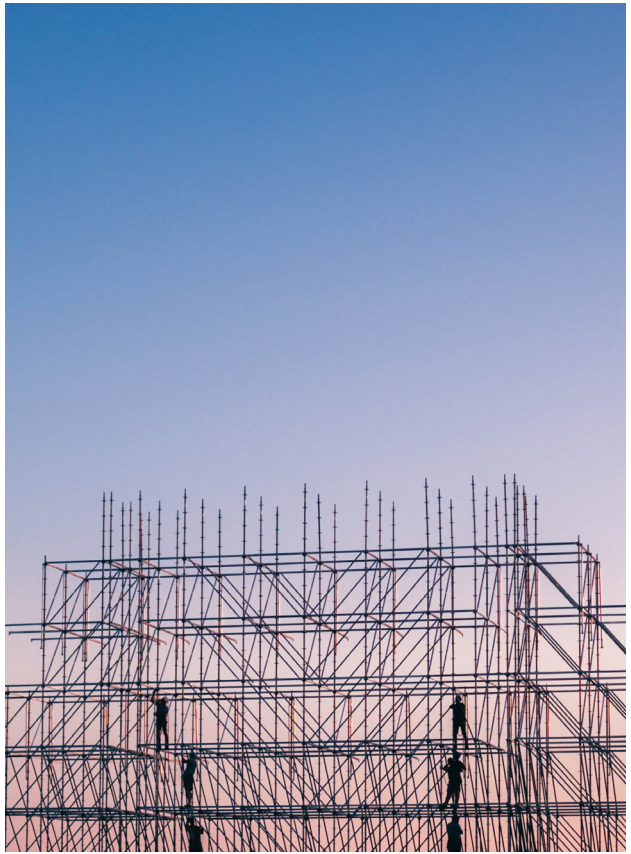
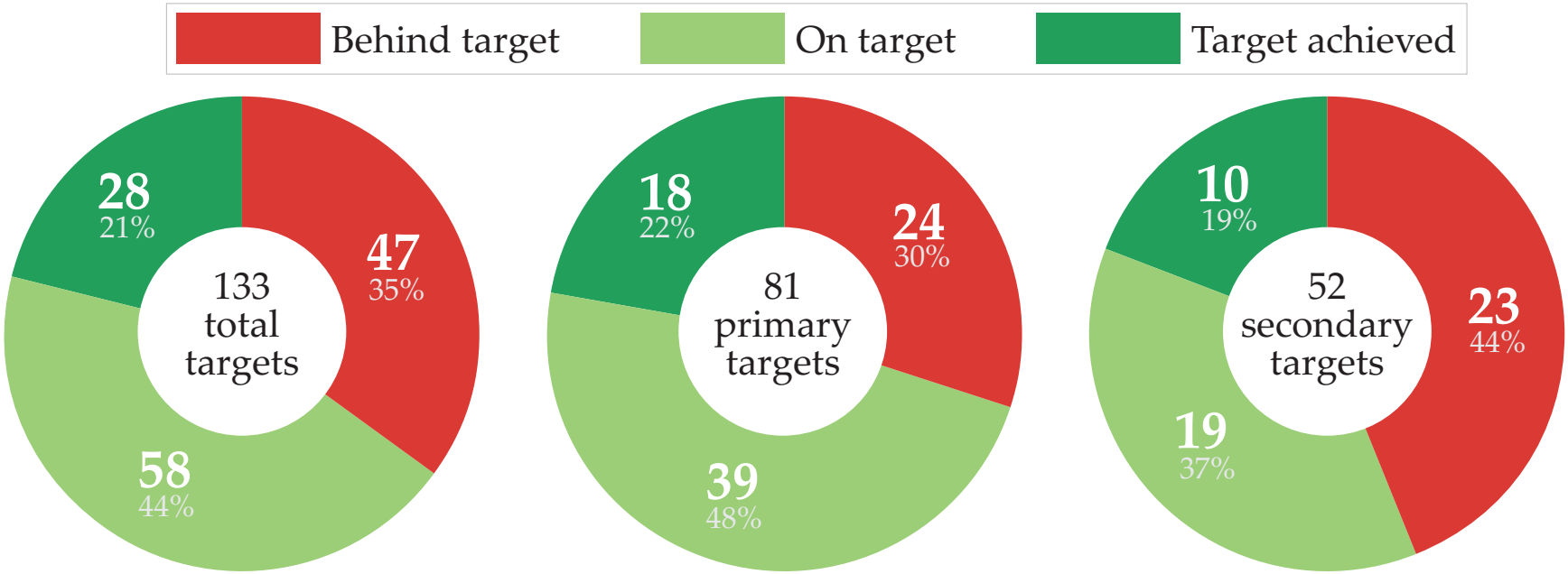
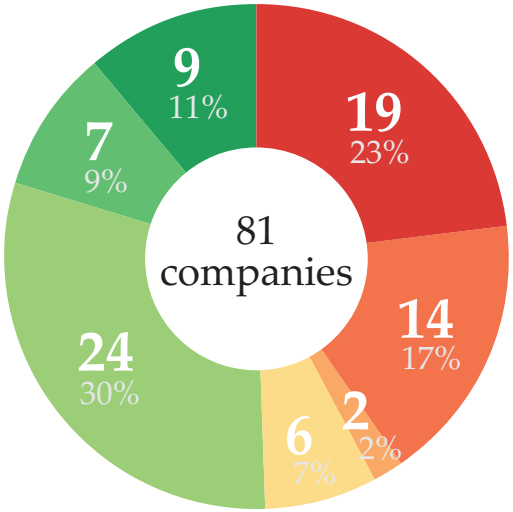


Progress by target classification

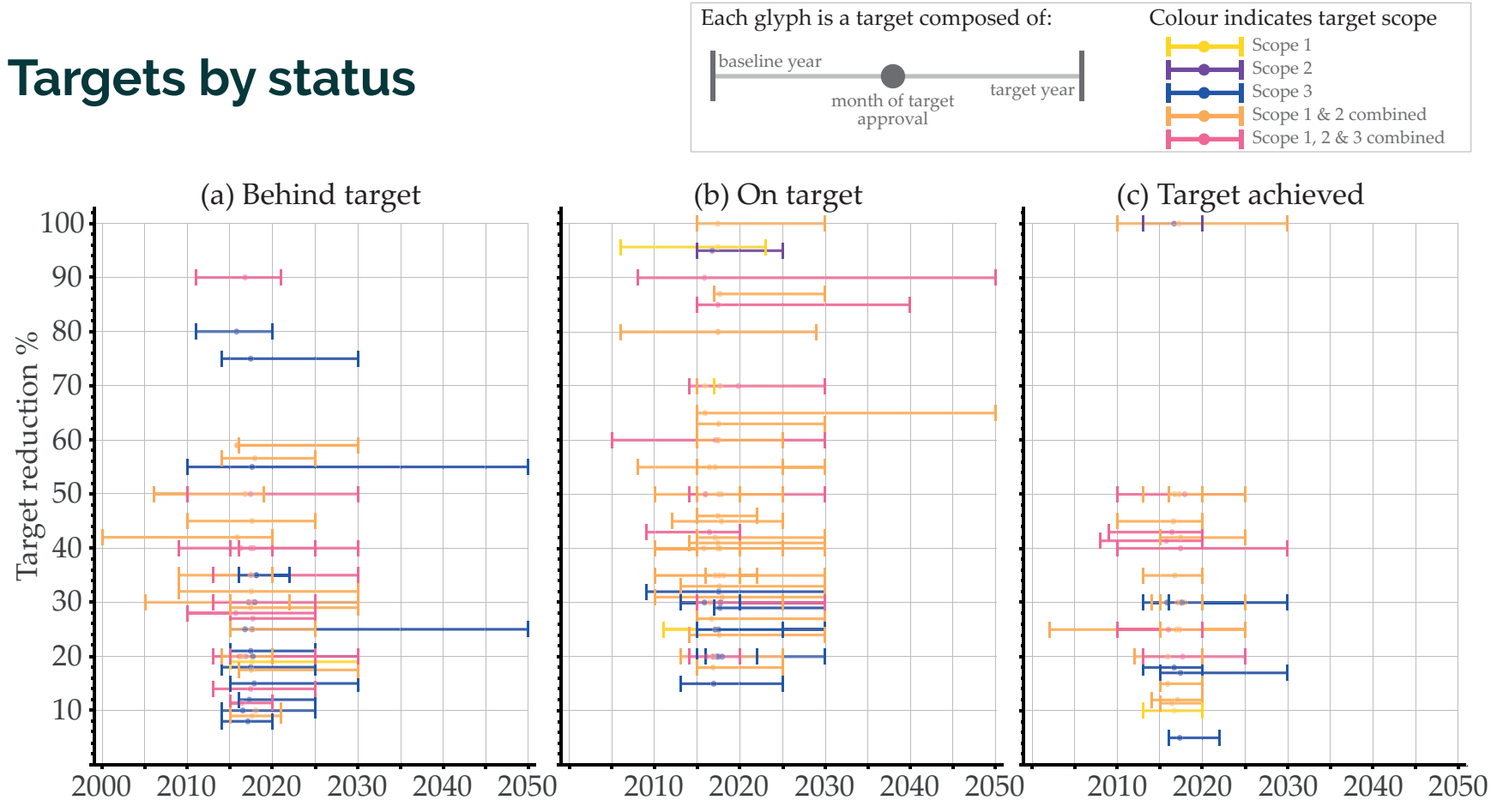


Company progress

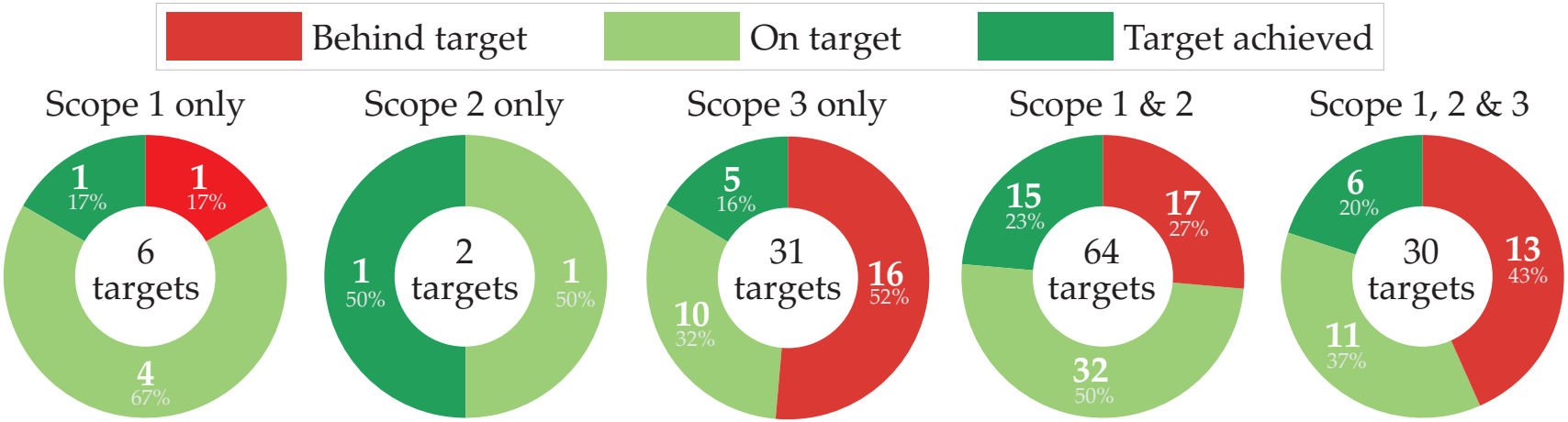


- Behind on all targets
- Behind on 1+ target & on target for 1+ target
- Behind on 1+ , on target for 1+ & achieved 1+ target
- Behind on 1+ & achieved 1+ target
- On target for all targets
- On target for 1+ & achieved 1+ target
- All targets achieved

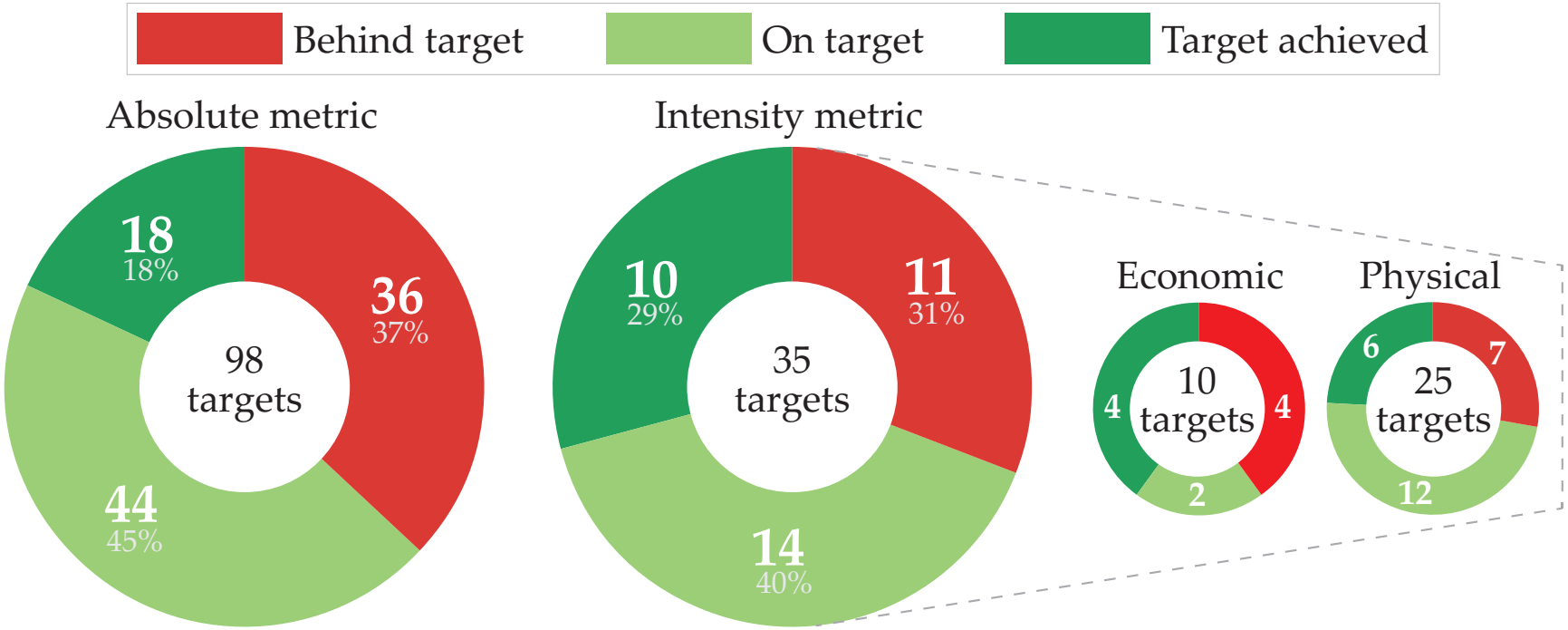
Targets by status



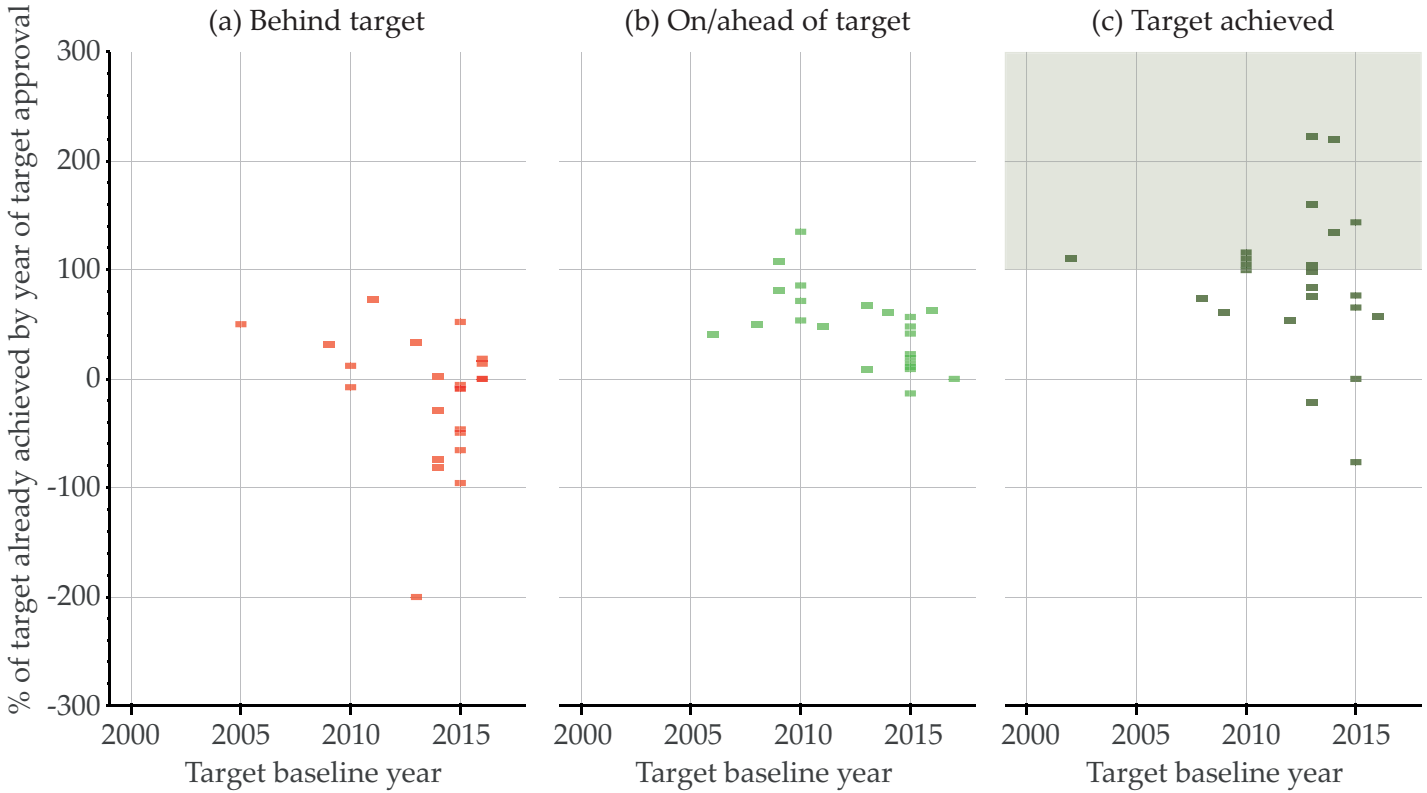
Progress by scope



Progress by metric classification



Impact of baseline year & progress prior to target approval



Other parameters

See paper & SI for results by:

CDP score, Region, Sector etc.

sustainability

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Article

Science-Based Targets: On Target?

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Sustainability Research Institute, School of Earth and Environment, University of Leeds, Leeds LS2 9JT, UK; earjnor@leeds.ac.uk (J.N.); ee17amg@leeds.ac.uk (A.G.); unisbet@leeds.ac.uk (S.B.-D.)
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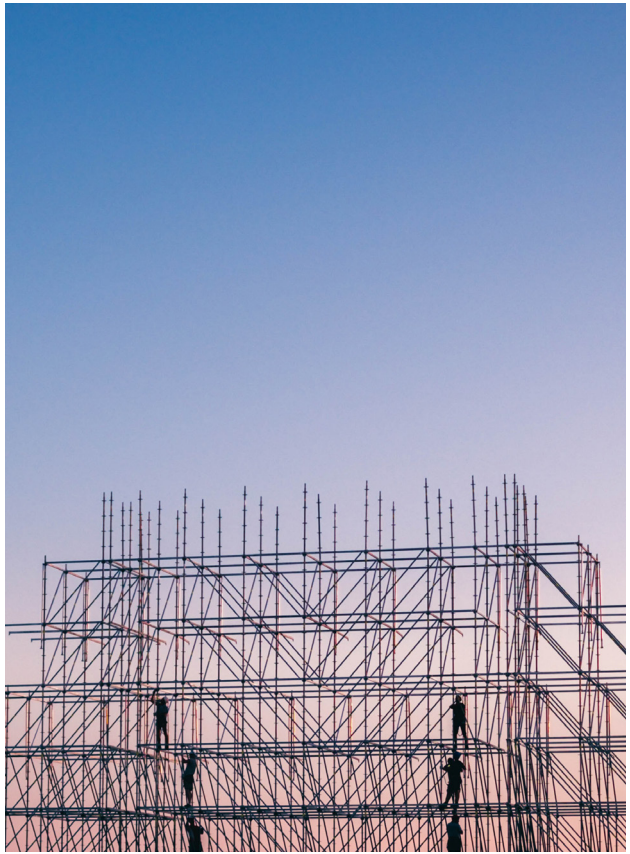
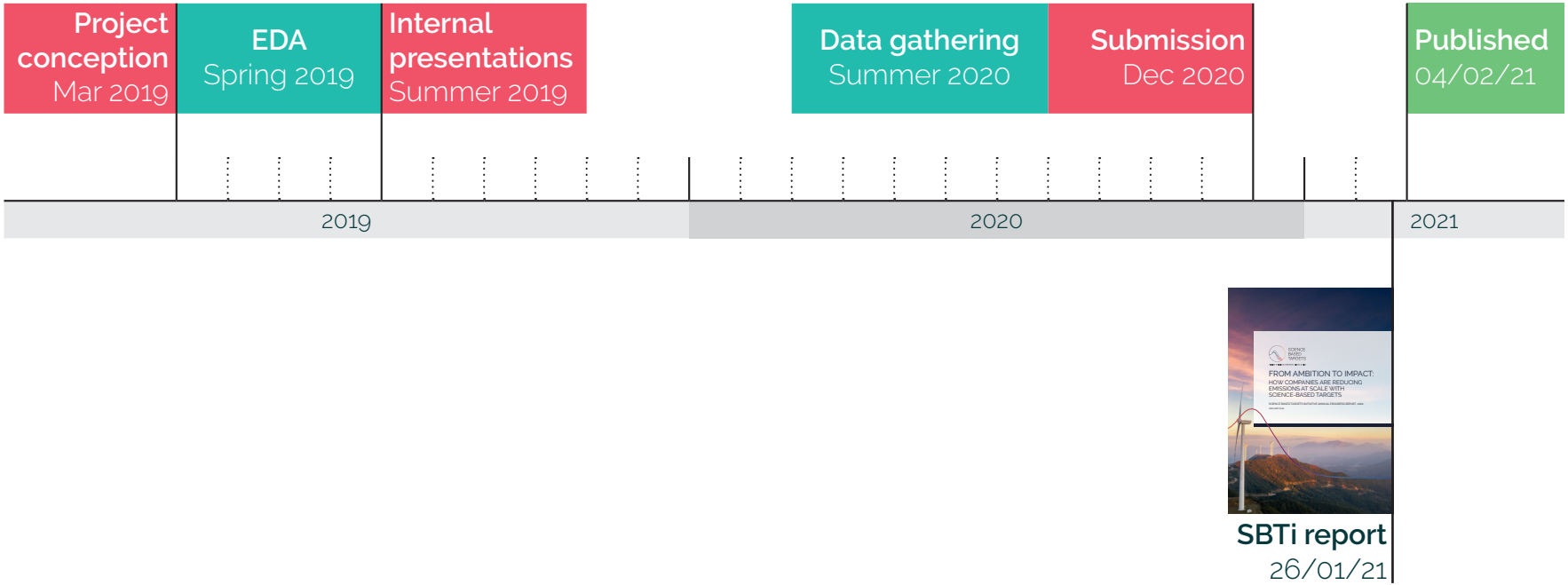


Paper timeline



Initiative's progress report

Increasing trend towards adoption of 1.5˚C pathways

Sample of 338 out of 478 approved companies

Sample companies had collectively reduced emissions by 25% between 2015-2019

87% of companies reporting in some form, with only 45% reporting fully against target goals

Announced intention to develop new MRV guidance

Sample differences


sustainability
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Science-Based Targets: On Target?
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Our sample

All targets that were >2 years since approval (i.e. before March 2018) for which performance data could be located

SBTi sample

Targets active as of 31/10/20 that could be matched with 2020 CDP questions C4.1a, C4.1b, C4.2a & C4.2b. Excludes targets from SMEs; companies not responding to CDP; those that *"do not fit well into the format"* of SBTi's results table *"and/or targets for which progress cannot be tracked and presented at this time"*. i.e. all tertiary targets, targets for which data could not be easily matched etc. According to SBTi *"about 34% of targets lacked any matching publicly reported data"*, a further 15% were located but not included in their report Appendix.

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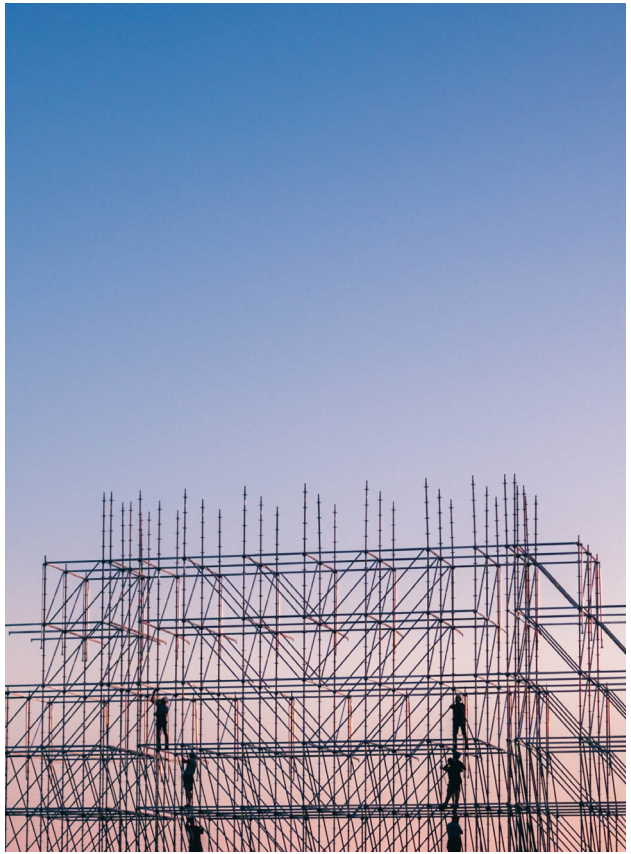

Recommendations

Introduction of mandatory reporting component

Variety of changes to nuts & bolts of reporting *(paper includes list)*

Strengthening criteria for target setting to ensure greater consistency *(e.g. common baseline years)*

Reception & next steps

Distributed paper to team at SBTi & others

Discussed ideas for follow up papers
(e.g. exploring consistency of targets with national commitments)

Input to upcoming SBTi MRV guidance & net-zero target setting methodology

Open to further collaborations

Photo by Gantas Vaičiulėnas on Unsplash

CENTRE FOR RESEARCH INTO
ENERGY DEMAND SOLUTIONS

Thank you

Please get in touch with any ideas

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