



Mind the Science - Methodology



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Introduction

The Mind the Science report is composed of 2 components: an executive summary report that highlights the business case for setting science-based targets and provides examples of some of the leading companies adopting long-term science-based targets; and an interactive web infographic that summarizes the analysis carried on a sample of companies. In the near future, CDP intends to publish also company specific information related to companies' emissions, intensity and targets, in order to make the basis of the analysis as transparent as possible and contribute to the discussion around setting science-based targets. CDP also expects to be able to expand the number of companies under this analysis.

Sample Selection

The analysis of the Mind the Science report was done on 70 companies from four different sectors included in the SDA: cement, aluminum, electrical utilities, and chemicals. These sectors were chosen due to their carbon intensive nature and varied reduction paths in the Sectoral Decarbonization Approach (SDA). Not all sectors were selected due to time constraints. CDP intends to continue to assess companies following this methodology (or improved versions of it) and it will cover more companies and more sectors in the future.

The companies included in the analysis were chosen to be the largest (per activity) listed companies within their sectors. The starting point was to look for companies in the specified sectors within the Global 500 sample and then further expand that group based on which companies have the highest share of global activity within each sector. Constraints on time availability have naturally capped the amount of companies under analysis. For all sectors aside from electric utilities the top ten companies based on greatest activity indicator were chosen (see Table 1). For the electric utilities sector 40 companies were chosen. Electric utility companies have the steepest decarbonization pathway in the SDA and great variation in emissions intensity between companies and region so more companies were included in the sample. The 70 companies were chosen using third-party industry rankings available to the general public and based on previous internal work by CDP. It is CDP intention to continue to expand the sample in order to cover a bigger number of companies.

Table 1 Sectors included in the analysis and activity indicators

Sector	Activity Functional Unit
Aluminum	Tonne aluminum produced
Cement	Tonne cement produced
Chemicals	\$ value-added ¹
Electrical Utilities	Kilowatt-hour generated

Scope of the Analysis

The following paragraphs clarify what aspects have and have not been considered in the analysis.

Activities considered

If a company is active in multiple sectors, only some activities might be considered in the analysis. For example, if an electric utility also does gas exploration and the emissions from gas represent a significant portion – more than 20% of overall emissions - that activity was not analyzed. This means, that for some companies (identified in Annex 1), not all of their emissions might be analyzed.

Emission scopes considered

In this analysis, only direct (scope 1) emissions have been assessed as to the target ambition. This means that all indirect emissions – both scope 2 and the several scope 3 categories – have not been considered in assessing if companies have science based targets or not. The scope 2 emissions of a company are the scope 1 emissions of a utility company. For practical reasons (time and complexity) and to avoid double counting in the analysis, the emissions boundary was limited to scope 1 emissions for all sectors. For certain companies this will represent a short-come in terms of their full emission responsibility. It is our intention in future versions of this report to also look at scope 2 targets of companies, when deemed a significant component of their overall responsibility.

Scenarios considered

The decarbonization scenario considered in the application of the SDA is the IEA 2DS scenario of its Energy Technology Perspective 2014. This scenario follows a peak and decline model and absolute emissions are allowed to increase up to around 2020. As a consequence some companies in certain sectors that are setting short-term targets within that period, might be identified as having science based targets even though their emissions are still allowed to increase.

¹ For homogeneous sectors, activity data are defined as physical production of the core product of each sector. Physical activity better correlates to emissions than the monetary value of the activity which may change quickly over time based on market variations and serves as a better metric to compare different geographic regions. However, for heterogeneous sectors such as chemicals, value-added had to be used in order to enable comparisons. Value-added can be defined as gross profit, operating profit, or Earnings Before Interest, Tax, Depreciation, and Amortization (EBITDA) plus employee compensation.

Methodologies considered

The methodology used for assessing companies target was the new SDA as proposed by CDP, WWF, WRI and UNGC under their Science Based Targets Initiative. This was due to the fact that this methodology considers sectoral differentiation, is the one best understood by the team and, at the same time, is the one that we are trying to best understand, by testing it on real company data.

Data used for analysis

The application of the SDA implies that certain key data is available for each company under analysis. This data comprise:

1. Sector of activity;
2. Activity data, this is electricity, cement, aluminum (etc) produced;
3. Emissions data resulting from the activity;
4. Emissions target data
5. Projections of future activity by the company.

Sector of activity

The sector of activity of a company was checked using the GICS classification and other public available information. The most relevant aspect was to confirm to what extent all the emissions of the company came from one single activity as represented in the SDA or from several. For this, the CDP reports that can contain appropriate breakdowns as well the company website, CSR report or annual report were used. As mentioned before, if a company had significant activity outside its SDA sector activity under analysis, the target was considered looking only at the SDA activity and disregarding the other emissions. Some companies, like diversified mining companies, will encompass several activities, some of which have not been evaluated. The "sector" shown in the table format of the website, is the SDA sector for which companies have been evaluated.

If emissions were not deemed significant, then all company emissions would be considered. For example, many cement companies do provide products and services that go beyond the production of cement. These products and services will also produce direct (scope 1) emissions, but will generally be deemed as non-significant and of auxiliary nature. So, in looking at the company target using the SDA they were added to the emissions of producing cement. This explains why the ratios tCO_{2e}/t cement as obtained in this analysis might differ from published by the companies, with the ones under this analysis being slightly higher.

Activity Data

Historical activity data were pulled from reports published by the companies using sources such as: annual reports, sustainability reports, 10K filings, companies' websites and press releases. Activity data were occasionally disclosed in CDP questionnaires. In the majority of cases activity figures were readily available in the aforementioned sources; however, in some cases data were estimated from company revenue figures. For example, if the company reported its revenue from the sectoral activity and the average price of the activity's functional unit then the activity indicator could be determined. Provided that the company

was not heavily engaged in trading or stockpiling, sales could serve as an approximate proxy for production. This was done on a very limited amount of companies.

Emissions Data

Scope 1 emissions data were taken from public CDP questionnaire responses where available. Most company responses to CDP questionnaires were for years between 2009 and 2013, but a few companies responded to questionnaires between 2006 and 2009. Some companies that were active in more than one sector filled out higher-resolution sections of the CDP questionnaires which allowed emissions to be disaggregated into just those from the sector under analysis. If a company did not respond or provided incomplete responses to CDP, then emissions data were taken from the company's publically available resources, for example: company statistics webpages, sustainability reports, annual reports, and other press releases. Sometimes contradictory information was observed between CDP reports and other company reports. Whenever this was observed the root cause for the differences was further investigated and a decision was made as to what appropriate set of numbers would be most accurate for the purpose of the analysis. In a few cases companies only reported their emissions intensity, but not their scope 1 emissions. In these cases company emissions had to be extrapolated from the emissions intensity and total activity. There were a few companies for which no emissions data were found. These companies either have not reported historical emissions or did not report them in a manner accessible to English speaking public.

Targets

Company emissions reduction targets were first taken from CDP questionnaires if the company responded and completed the appropriate sections. The targets from the most recent questionnaire were used if contradictory numbers were reported in different annual responses. If a company did not report targets to CDP, or if the reported target was set to expire before the end of 2015, then targets would be taken from publically accessible company resources such as webpages, sustainability reports, annual reports, and press releases. If no target could be found or if the target expired in 2013 or further in the past, the company was listed as not having a target. It is possible the company has a target that is not publically disclosed or that is public but could not be found with reasonable effort and the project team welcomes any correction to that effect.

Given that the analysis is focused on direct emissions, only targets for scope 1 emissions are relevant. Some companies have multiple targets. Targets that cover a larger portion of scope 1 emissions, had more ambitious reductions, and more distant target years were given preference because they were more relevant to the analysis. For example, a target covering only 5% of scope 1 emissions is deemed irrelevant and could thus be excluded from further analysis. In some cases, if it was possible with the data provided, different targets could be consolidated into a single target. Some company targets also had to be converted to match the units used in the analysis, for example, a corporate target that aimed to reduce emissions compared to an activity indicator index could be converted to an intensity target.

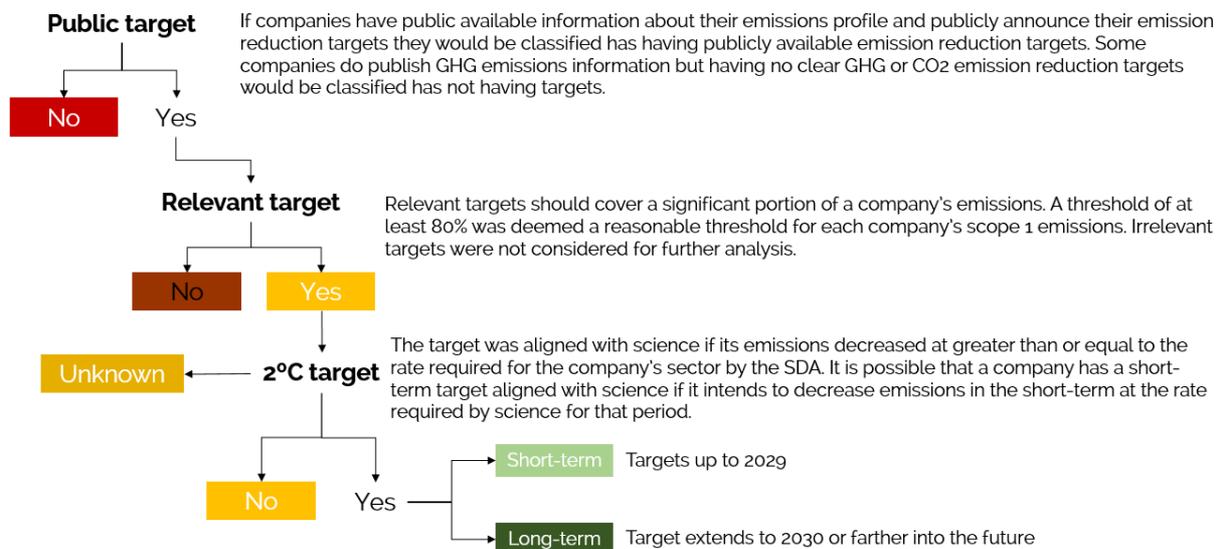
Many companies had carbon reduction targets that covered both scope 1 and scope 2 emissions without disclosing how the distribution of reductions between the two scopes happens. Targets such as these could not be analyzed as disclosed because the analysis

covered only scope 1 emissions. For sectors such as electric utilities and cement scope 1 emissions represent the vast majority of total emissions (i.e. more than 90%) a scope 1+ 2 target would encompass mainly scope 1 emissions. For the chemical and aluminum sectors scope 2 emissions can represent a much larger proportion of the companies' total emissions.. In these cases, the % between scope 1 and 2 could be determined and an assumption made that both scope 1 and 2 would be reduced at the same pace and by the same percentage. This hypothesis is optimistic in the sense that it will tend to produce more companies assessed as having science based targets.

Analysis method

A Microsoft Excel tool was developed to analyze how companies' emission reduction targets compared to science-based targets using the Sectoral Decarbonization Approach (SDA) methodology (CDP, WRI, WWF, and Ecofys, 2015, Expected). The tool incorporated sectoral activity growth projections using information from the International Energy Agency's 2°C Scenario (IEA 2DS) model, the historical data described above, and decarbonization pathways from the SDA (IEA, 2014). The electric utilities sector included different activity growth rates for different geographic regions due to its less fungible nature than the other sectors. These were also derived from the (IEA, 2014). The base year used for all companies was 2010 unless activity and/or emissions data were missing for 2010 in which case the closest year for which data were available was used. In the case of mergers and acquisitions, where jumps in emissions and activity can occur, if it happened was after 2010 a post-2010 base-year is used, otherwise the analysis would considerably deviate from current configuration of the company. The tool was able to demonstrate each company's specific 2°C pathway in relation to their carbon reduction targets for both absolute emissions and emissions intensity. Using the tool, it can be easily seen that the choice of the based year can have profound implications in the resulting absolute or intensity pathway. As a result, when targets were close to being science based targets – but were not there yet – or when there were significant variation in the historical series, several base years were tried out. In general, the attitude was towards a more lenient approach favoring the positive appreciation of companies has having SBT if, for example, choosing a different base year than 2010 would produce that result. All company targets were assumed to have linear reductions from the base to target year, though it is noted that this is not always the case in practice.

Based on the companies' reported data and the results from the tool, we classified companies relative to their targets has per diagram below.



Defining the Samples' Proportion of Emissions

Emissions data was not publicly available for all companies and thus figures reported by the companies could not be immediately included in the sample's share of emissions. In such cases, very simple and rough estimates of emissions were developed. In the case of power production, if there was an indication of the main fuel type used and production, emissions would be calculated by using a conservative emission factor or the specific fuel type. If there was a range of fuels used, the emissions would be obtained by multiplying production by an average sector emission figure calculated from the companies in the sample. If a company lacked activity data, capacity data would be used – as it was found in all cases. The generation capacity was then multiplied by a country average capacity utilization figure to get an estimate of activity (production). This was then multiplied by the sector intensity average to get an estimate of emissions that was added to the sample total.

In other sector (e.g. cement), production figures were multiplied by average emission factors or that region and, if no production figures existed, but capacity was found, a country specific production factor was used to obtain production, additionally to the average emission figure.

When a series of data points existed for a company, the average for the years between 2009 and 2013 was used to determine a "representative" company's emissions. Outliers or recent jumps in emissions - up or down - of a company were also considered, so the most representative emission figure were used. Once a suitable representative figure was found the figures were summed to get the sample population's representative total scope1 emissions.

The total scope 1 emissions of the sample companies was divided by two global emission figures to determine the percentage of global emission covered by the sample. The first figure was from the IEA and covered CO2 emissions only from sectors covered by the SDA

for 2011 (X MtCO₂). The second figure was from the IPCC and covered all CO₂ emissions globally for 2011 (38 Gt CO₂) and this was the reference figure used to communicate % in the Executive report.

In addition, emissions from each company were compared to the sum of the total population to determine how large of a share of emissions each company produced within the sample. The representative emissions of a company was used in conjunction with the sample sum of emissions to find each company's share.

Assumptions

A number of assumptions had to be made to complete the analysis – which is only as good as the data available to the public:

1. Company emissions and activity data were assumed to accurately reflect the actual emissions and the actual activity of the company as no verification was possible. In some instances it was apparent that the company was not following standardized reporting procedures, particularly for emissions.
2. In some cases a company reported scope 1 and 2 emissions as a single value for which no reasonable disaggregation method was available without better data. In these cases emissions intensity will appear higher than is actually the case.
3. Company's activity projections were calculated using IEA growth rates reported in IEA ETP 2014, starting in last year for which activity data existed. No consideration was given as to recent trend in production, either were they indicating stable productions, declines or increases. Company activities trends could also be dramatically altered by changes in the company's business structure e.g. through mergers or acquisitions. These changes cannot reasonably be anticipated and so were not considered.
4. Some companies are involved in multiple business sectors, but did not disaggregate emissions by business sector. In these instances emissions had to be used for the whole company which resulted in higher emissions intensities for the reported activity than is actually the case. For example, many cement companies have other sources of emissions beyond the clinker production sources – which represent the bulk of their emissions. These emissions were considered in their intensity ratios which will be, in general, higher than the ones reported by the companies.
5. Similar problems to point 4) can occur if activity data could not be disaggregated from other sector activities.