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SBTi Finance Temperature Scoring & Portfolio Coverage Tool User Guide

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Introduction

Based on the [temperature scoring method](#), developed by CDP and WWF, the Science Based Targets initiative (SBTi) has developed a data agnostic Python library, primarily for integration into commercial and homegrown decision support and portfolio management systems, but that can also be run as a standalone solution. This tool helps companies and financial institutions to assess the temperature alignment of current emission reduction targets, commitments, and investment and lending portfolios. They can for instance use this information to develop their own GHG emission reduction targets for official validation by the SBTi, develop engagement strategies and help with strategic security selection and allocation decisions.

This document provides a non-technical introduction and overview of what the tool is for, the types of outputs it delivers, what data is required, how it works, and where you can find more information and documentation to start implementing and using the tool.

Why has SBTi built the Finance Tool?

1. The need for temperature scoring

There has been a growing interest in methods to measure the alignment of companies and investment portfolios with the Paris Agreement. The success of the SBTi has seen a rapid growth in the number of companies with emission reduction targets approved by the SBTi, and therefore, a growing number of companies claiming alignment to the long-term temperature goals set out in the Paris Agreement.

2. Why this methodology - translate all targets to single temperature metric

We use the temperature scoring methodology as it enables the translation of all types of GHG emissions reduction targets to a single common and intuitive metric that is linked to the long-term temperature outcomes. The temperature rating method and tool were created to expand this assessment and rate corporate ambition (from any public GHG emission reduction target) against a wider range of temperature outcomes (0–4°C), e.g. Company A's GHG emission reduction target of X% reduction in absolute emissions by 2025 implies their ambition is aligned to a Y°C world.

3. The importance of scale and embedding the code with data providers and financial institutions

The SBTi has developed a codebase to function as a calculator for the portfolio coverage and temperature scoring methods. This tool is fed with the necessary data to generate temperature scores at the company and portfolio level, in addition to providing analytics on target setting and company emission reduction ambitions. It also gives users access to what-if analysis to aid decision-making. The

code reflects the logical steps that are outlined in the publicly available [temperature scoring methodology](#), developed by [CDP](#) and [WWF](#).

The tool was created to enable the widespread implementation of the method by data providers and financial institutions, to work with any data source and in most IT environments. For each method, the tool provides the following outputs:

- Portfolio coverage: generate the % of the portfolio currently covered by SBTi-approved targets; and
- Temperature scoring: generate the current temperature score of the portfolio (in addition to the individual temperature scores of the portfolio companies). It also enables the generation of a series of what-if scenarios to showcase how this temperature score could be reduced.

Why have we built the tool in this way?

To help financial institutions fight climate change, SBTi wants the tool to be accessible, useful, and used by as many finance professionals and other users as possible. If it is easy to access, not seen as a compliance tool only used once a year, but a tool to support the investment process, it is more likely it will be utilized widely. Therefore, when SBTi started the development process we set up a list of requirements for the tool. Some of the high-level requirements were:

- Distribution – most investment professionals should have easy access to the tool;
- Transparent – with full output audit trail and open methodology;
- Data agnostic – to be used with any data provider or an institution’s own data lake;
- Any infrastructure – to be integrated with service providers’ or homegrown decision support solutions;
- Workflow tool – to be integrated in investment professionals’ daily workflow;
- Data security – to make sure financial portfolio data is not compromised;
- Scale – be able to use the tool at scale for many portfolios and aggregated on financial institution level; and
- Continued development – ensure enhancement of the method and tool for future requirements.

Given these requirements, the SBTi determined an open-source Python-based solution to be most appropriate. Such tool can be integrated into existing solutions, in many cases making use of the same secure infrastructure as in-house or commercial applications. As the tool pulls data from existing integration of data providers and/or internal data lakes, there is no need to go outside of this infrastructure to access or deliver necessary data. Hence, no data that is not already within the institution’s domain needs to enter or exit the institution to use the tool. The approach brings the model to the data, rather than the other way around.

The SBTi launched an RfP for building the codebase to turn the methodology into a calculation engine early 2020. The selected SBTi Finance tool development project partners are Ortec Finance and the OS-Climate.

To make sure we built a tool that from the outset could work in as many different environments and for as many different users as possible, we reached out to users and data and service providers and invited them to work with us in our project team. This gave both users and data providers the opportunity to influence the development process and to prepare and develop their own solutions, data, and processes to work with the tool. This has been very helpful in getting their perspectives, to make sure the tool work with as many data providers' data as possible and that it fits with many users' existing workflow.

A strong confirmation of the various tool use cases is that fact that a number of data- and service providers have developed or are in the process of developing various solutions based on the tool and the methodology for their clients. This collaboration also gives the SBTi Finance tool a wider reach than what the SBTi could have achieved otherwise. The tool should be available natively in their existing infrastructure for a significant proportion of the financial institutions globally. This integration should also ensure that the tool can be used at scale, to help large and small financial institutions alike to quickly analyze all their portfolios' and constituents' temperature scores.

The open-source nature of the codebase means that any user, data- or service provider can use the code to build their own applications around the Tool. It also means that it is available for any user to integrate into their own infrastructure, without any licensing cost. This should also ensure that the code continues to be developed both by the SBTi, data and service providers and the open source community.

The tool also provides full transparency with regards to how the tool and methodology fit together through the open-source nature of both the codebase and the methodology. We also have provided easy to use functionality to extract every single data point generated by the tool, to provide a full audit trail and transparency into how the temperature score is calculated.

During Summer 2020 we ran a public beta-testing phase open to any organization or individual. The beta-testing phase included more than 110 registered beta-testers. Users provided feedback on the tool's functionality, documentation requirements, performance, and usability. This feedback has been incorporated in the final release version.

Altogether, our conversations with users and data providers and the feedback from 110 beta testers indicates that the development process and the structure of the SBTi Finance Tool has the potential to become an integrated experience and that it could become as natural for a portfolio manager or analysts to use as their DCF model or attribution report. In turn, this should ensure that portfolio and company temperature scores stay top-of-mind for finance professionals and that this ultimately leads to more efficient engagement processes and GHG emissions reductions in the real economy.

What can you use the tool for?

The SBTi Finance Temperature Scoring and Portfolio Coverage Tool enables analysis of companies, sectors, countries, investment strategies and portfolios to understand how they contribute to climate change. You can for example:

- Measure your portfolio's current temperature score;
- Identify the biggest contributors on an individual company, country, and sector basis;
- Use the tool as an aid for strategic allocation and securities selection decisions;
- Analyze what effect changes in your portfolio might have on the portfolio temperature score;
- Model impact of engagement on your temperature score, that is, how your score can improve if you are able to convince an investee company to set or improve GHG emissions reduction targets;
- Identify which company engagements would have the biggest impact on your portfolio's temperature score;
- Plan engagement strategies based on your modelling;
- Fulfil regulatory reporting criteria, e.g. Article 173 in France and the EU Disclosure regulation, regarding current portfolio alignment with Paris Agreement; and
- Help you to create an action plan for reaching your emission reduction target.

Given these possible insights, as confirmed by our beta testing survey, the tool is relevant for a wide range of stakeholders. For instance:

- Portfolio managers - to support strategic allocation decisions and input into ESG discussions with corporate management;
- Financial analysts - to use the temperature score as an input into the cost of capital for valuation modelling;
- ESG analysts - to plan and execute corporate engagement strategies;
- Risk managers – for input into climate related risk models;
- Compliance officers – for EU Disclosure regulation and Article 173 reporting;
- Data and service providers – to provide company temperature scores and portfolio analytics for their users;
- CIOs – to help to understand the portfolios' ESG position; and
- NGOs – for further research to enhance climate related methodologies.

What are the outputs the tool generates?

The temperature score can be calculated for all timeframes (short, medium, long term) and scope (Scope 1, 2, 3) combinations covered by the SBTi methodology. Table 1 provides an overview.

Table 1. Six Categories for Each Company Based on GHG Emission Scope Coverage and Target Time

	Short-Term 2021-2024	Mid-term 2025-2035	Long-term 2035-2050
Scope 1+2	Temp score	Temp score	Temp score
Scope 3	Temp score	Temp score	Temp score

The temperature score calculation is available for the following levels:

- Portfolio temperature score: the aggregated score over all companies in the portfolio;
- Grouped temperature score: using the “group by” option, the user can get the aggregated temperature score per category in a chosen field (e.g. per region or per sector); and
- Company temperature score: the temperature score of an individual company.

Figure 1 provides illustrative outputs for grouped temperature scores by region and sector. These insights help inform use cases such as more targeted engagement strategies, aiding securities selection decisions, etc.

Figure 1. Illustrative Output of the Temperature Score on Portfolio Level, Grouped by Region and Sector

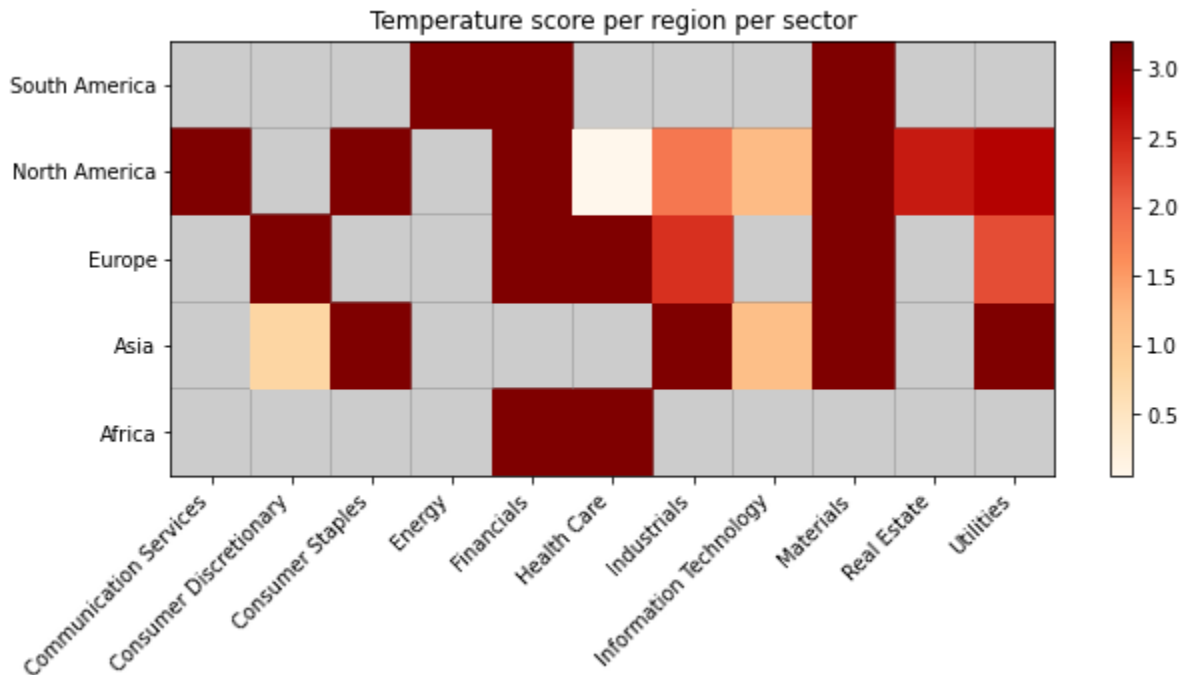
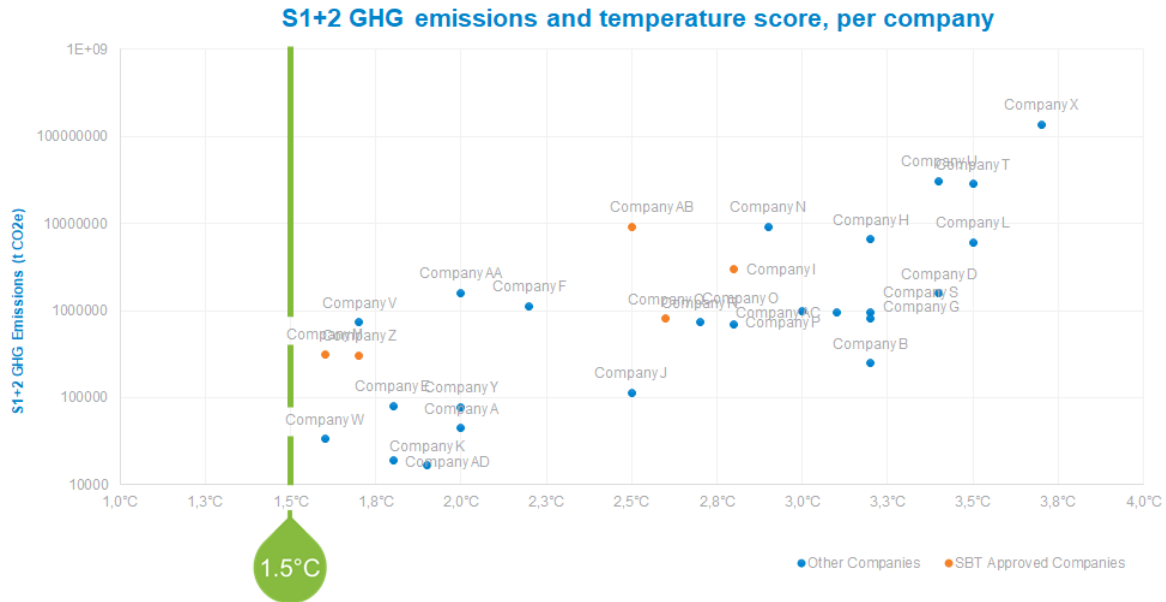


Figure 2 provides a visualization of the outputs when looking at the temperature score per company. This level of granularity of the tool enables users to zoom in on individual scores for, e.g. informing engagement and/or monitoring temperature score progress of investees.

Figure 2: Illustrative Visualization of the Temperature Score Outputs Per Company



For the portfolio temperature score and the grouped temperature score, additional more granular information is reported about the composition of the score:

- Contributions: the level to which each company contributes to the total temperature score based on the chosen aggregation method. This value is split up into company temperature score and relative contribution (for example the weight of the investment in the company relative to the total portfolio when using the WATS aggregation method).
- The percentage of the score that is based on targets vs. the percentage based on the default score
- For the grouped temperature scores: the percentage each group contributes to the portfolio temperature score. For example: how much each region or sector contributes to the total score.

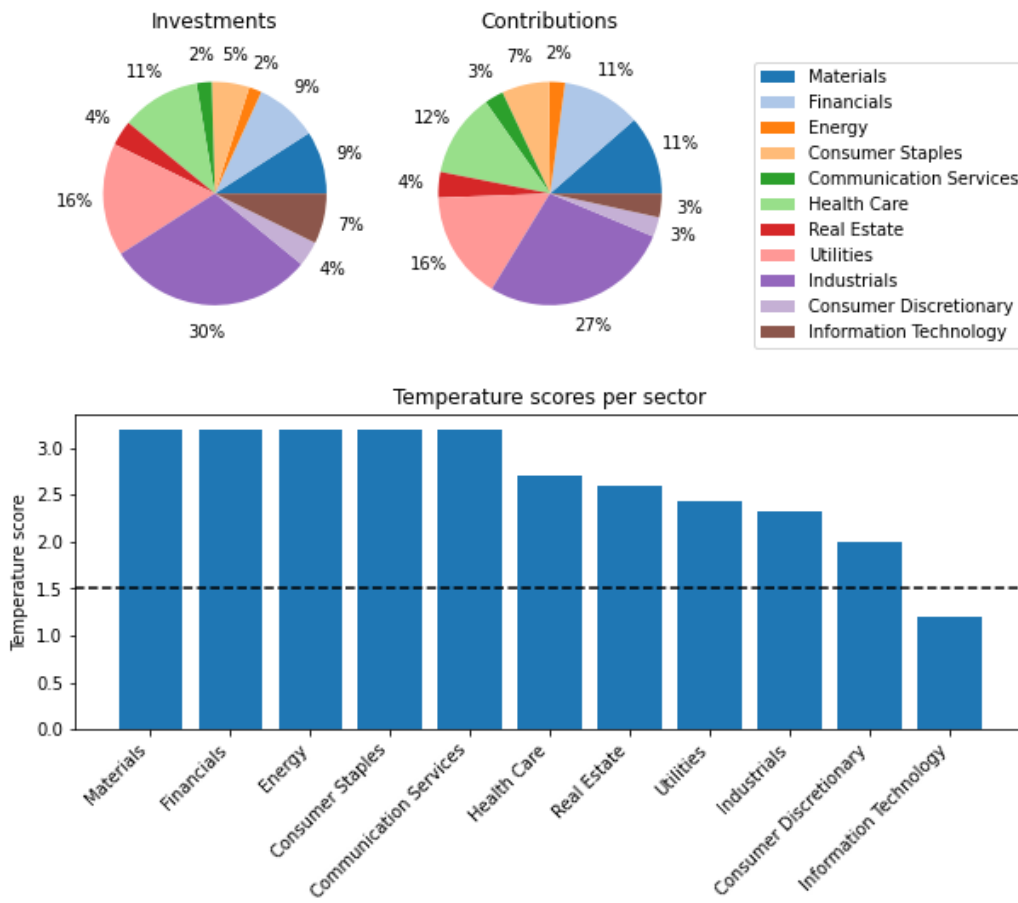
Table 2, taken from a Jupyter Notebook implementation of the tool (see <http://getting-started.sbti-tool.org/> for executing your own rungs of the Jupyter Notebook), highlights the companies with the highest contribution to the portfolio temperature score and at the same time displays ownership and portfolio weight to give the user an indication of where an engagement may be more successful, purely from a quantitative perspective.

Table 2: Illustrative Output Table of the Temperature Score and Contribution Analysis on Company Level

company_name	sector	contribution	temperature_score	ownership_percentage	portfolio_percentage
Company N	Health Care	9.541310	3.20	0.189087	7.818182
Advanced Micro Devices, Inc	Industrials	4.926672	2.03	0.334454	6.363636
Company Q	Communication Services	2.662691	3.20	4.811121	2.181818
Dell Technologies	Financials	2.218909	3.20	0.290669	1.818182
Company AE	Industrials	2.218909	3.20	0.213551	1.818182
Company I	Consumer Staples	2.218909	3.20	0.328780	1.818182
Company AF	Consumer Staples	2.218909	3.20	0.974571	1.818182
Company F	Industrials	2.218909	3.20	0.109647	1.818182
Capgemini Group	Consumer Discretionary	2.218909	3.20	0.323925	1.818182
L'Oréal	Utilities	2.218909	3.20	0.400563	1.818182

Figure 3 depicts similar analysis in a more visual format. What can be seen in the figure is the relative contributions to the sector temperature scores.

Figure 3: Illustrative Visualization of the Temperature Score Outputs and Contribution Results Grouped per Sector



For the company temperature scores, you can let the tool generate all underlying data, which provides full transparency and gives the user the full audit trail for how the final temperature score has been calculated. This data output provides:

- Portfolio data;
- Financial data;
- GHG emissions;
- Used target and all its parameters; and
- Values used during calculation such as the Linear annual reduction (LAR), mapped regression scenario, and parameters for the formula to calculate the temperature score.

You can also anonymize the output data, which removes all names and identifiers. This is particularly useful for sharing results of your temperature score without having to reveal your holdings, for example for submitting your temperature score to the SBTi Target Validation Team to get your own GHG emissions reduction target approved. At the same time, it provides the opportunity to audit the scores during the validation process.

For a more detailed examples please see Jupyter notebook examples found on <http://getting-started.sbti-tool.org/>.

What data is needed to use the tool?

The tool itself is data agnostic and has no built-in databases. This means that users need to import all needed data to perform the analysis and can use any data source with the necessary data available. This data can come from a variety of sources but must be inputted in the required formats. The data providers that we have worked with during the development have built or are in the process of building solutions to help with this process. Four types of data are needed to run the tool. These are described in Table 3.

Table 3: Overview of Data Inputs

Portfolio holdings	<ul style="list-style-type: none"> • Company name • ISIC (International Standard Industrial Classification) sector classification, and • ISIN and/or FIGI, if available. Other company identifier can also be used together with ISINs or FIGIs and are required to match identifiers from the three data sources below. • Market value of portfolio position for each company, using one common portfolio currency
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Corporate GHG Targets	<p>This refers to the data required to analyze a corporate GHG emissions reduction targets, including:</p> <ul style="list-style-type: none"> • Target types (absolute/intensity) • Base year • Target year • Scope coverage • Boundary coverage within scope • % achieved • Intensity activity (if applicable)
Corporate GHG Emissions Data	Scope 1+2 and scope 3 emissions data, reported or modelled.
Corporate Financial data	<p>Seven weighting option are currently available to aggregate company scores to produce portfolio scores. Depending on the option chosen, the following data may be required:</p> <ol style="list-style-type: none"> a. Invested value (holdings) b. Market capitalization c. Enterprise value d. Cash and equivalents e. Total assets f. Revenue

Refer to the data requirements-section at <http://getting-started.sbti-tool.org/> for full documentation. Also refer to the full methodology for [temperature scoring](#).

Where can I find the data?

Commercial data providers such as Bloomberg, CDP, ISS, MSCI, TruCost and Urgentem can provide some or all the data needed for the SBTi Finance Tool.

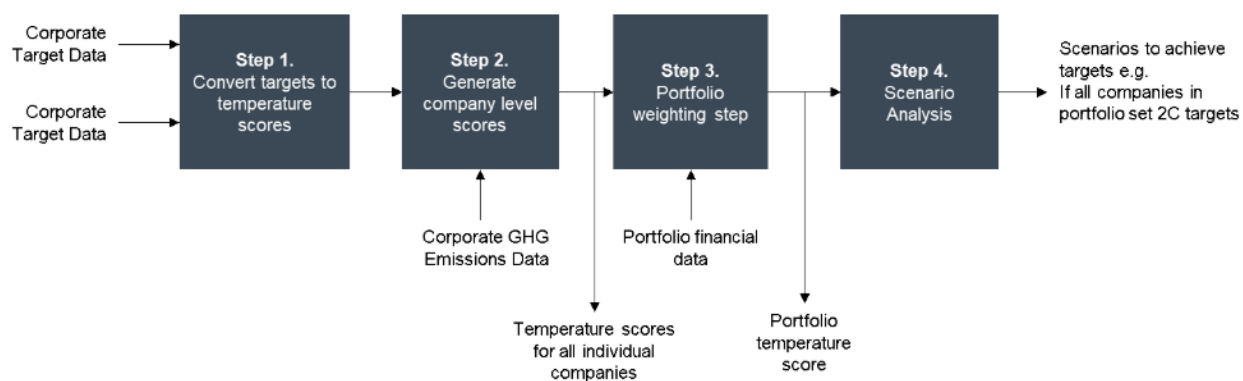
There is also a free data set available with corporate GHG targets data on the SBTi's [website](#). This includes data of all the companies that have set emissions reduction targets that have been approved by SBTi and is updated on a weekly basis. You can download an Excel-file with the data here: <https://sciencebasedtargets.org/companies-taking-action/>.

It is likely that your portfolio includes companies that are not in the list of companies with SBTi-approved targets, but that have publicly announced targets. Commercial data providers such as those listed above can provide target data for these companies.

Overview of how the tool works

The calculation methodology consists of four key steps, each requiring specific data points that are inputted at the beginning of the process. These data points are then used to convert the corporate GHG emission reduction targets into temperature scores at the company and the portfolio level.

Figure 4: Data Points for the Four-Step Process



Step 1: Converting publicly stated targets to temperature scores

The targets are first filtered and are - if valid - translated to a specific temperature score, based on the relevant regression model [Section 1.3 in the [methodology](#)]. The sector classification of the company is used to ensure that the target is correctly mapped to the appropriate regression model e.g. a target for power generation must be mapped to the power sector pathway and corresponding regression model. This process enables the translation of target ambition over a certain target time period into a temperature score. For example, a 30% reduction target in absolute GHG emissions over 10 years can be converted into a temperature score of 1.76°C. It should be noted that those companies without a valid target are assigned a default temperature score [Section 1.4 in the [methodology](#)], rather than being excluded from the analysis.

Step 2: Aggregate across targets (if applicable) to a company level temperature score

Reported corporate GHG emission data is employed to aggregate company level temperature scores.

Step 3: Aggregate individual company temperature scores to portfolio level scores

All the individual temperature scores per company in a portfolio are then combined with portfolio financial data to generate scores at the portfolio level.

Step 4: Run what-if analysis via the scenario generator

After the initial score calculations, a scenario generator can be used to determine how certain actions, e.g. engagement, can change the portfolio temperature score over time. When running these what-if scenarios, the temperature score is recalculated with the assumption that, based on various

engagements, some or all the companies in the portfolio decided to set (more ambitious) targets. The what-if analyses in Table 5 are included in the tool.

Table 5: What-If Analysis Options

Scenario 1	In this scenario all companies in the portfolio that did not yet set a valid target have been persuaded to set 2.0 Celsius (C) targets. This is simulated by changing all scores that used the default score to a score of 2.0C.
Scenario 2	In this scenario all companies that already set targets are persuaded to set “Well Below 2.0C (WB2C) targets. This is simulated by setting all scores of the companies that have valid targets to at most 1.75C.
Scenario 3	In these scenarios the top 10 contributors to the portfolio temperature score are persuaded to set 2.0C targets. Scenario 3a: All top 10 contributors set 2.0C targets. Scenario 3b: All top 10 contributors set WB2C, i.e. 1.75C targets.
Scenario 4	In this scenario the user can specify (by adding “TRUE” in the engagement_targets-column in the portfolio data file) which companies it wants to engage with to set 2.0C or WB2C targets. Scenario 4a: All companies that are marked as engagement targets set 2.0C targets Scenario 4b: All companies that are marked as engagement targets set WB2C targets.

How can I run the tool?

The SBTi Finance Tool has been built as an open-source, data-agnostic tool and works with input data from any data provider and in many different types of IT infrastructure.

As such, the tool can be used in several ways, depending on the specific preferences of the user. If you are unsure whether the tool will be useful for your application and workflow, or you would first like to run some examples to get a better idea of how the tool works and what types of outputs it generates, the ‘1_analysis_example’ notebook

(https://github.com/OFBDABV/SBTi/blob/master/examples/1_analysis_example.ipynb) offers a quick and no-code opportunity for such testing. The notebook combines text and code to provide a testing environment for your research, to give you an understanding for how the tool can help you analyze companies’ and portfolios’ temperature scores, to aid your engagement and investment decisions.

The notebook is loaded with example data, but you can also use your own data. For your first test, you can simply run the code cells one by one in the current sequence, to get an understanding of how it works. If you are not familiar with Notebooks, please refer to [this introduction](#).

Technical structure

Figure 5 provides an overview of the different parts of the full toolkit and their dependencies.

Figure 5: Overview of the Tool Kit

```
+-----+
|  UI    : Simple user interface on top of API  |
|  Install: via dockerhub                       |
|          docker.io/sbti/ui:latest            |
|-----+-----+
|  REST API: Dockerized FastAPI/NGINX          |
|  Source  : github.com/OFBDAVB/SBTi_api       |
|  Install: via source or dockerhub           |
|          docker.io/sbti/sbti/api:latest     |
|-----+-----+
|  |                                           |
|  |Core   : Python Module                    |
|  |Source : github.com/OFBDAVB/SBTi         |
|  |Install: via source or PyPi              |
|  |                                           |
|  +-----+-----+
+-----+-----+
```

As shown above, the Python code forms the core codebase of the tool. It is recommended to use the Python package if the user would like to integrate the tool in their own codebase. In turn, the second option is running the tool via the API if the user's preference is to include the tool as a Microservice in their existing IT infrastructure in the cloud or on premise. The development project also included the creation of a simple user interface (UI), which can be used for easier user interaction in combination with the API.

There are three main ways of installing and/or running the tool:

1. Users can integrate the **Python package** in their codebase. For more detailed and up-to-date information on how to run the tool via the Python package, please consult the 'Getting Started Using Python' section at <http://getting-started.sbti-tool.org/>.
2. The tool can be included as a Microservice (**containerized REST API**) in any IT infrastructure (in the cloud or on premise). For more detailed and up-to-date information on how to run the tool via the API, please consult the 'Getting Started Using REST API' section at <http://getting-started.sbti-tool.org/>. Optionally, the API can be run with a frontend (UI). This simple user interface makes testing by non-technical users easier. For more detailed and up-to-date information on how to use the UI as a frontend to the API, please consult the 'Getting Started Using REST API' section at <http://getting-started.sbti-tool.org/>.
3. During the development of this tool, we have worked with several data and service providers to the financial and ESG markets, some who have or are in the process of implementing the tool and methodology into their commercial solutions. These providers include Bloomberg, CDP, ISS,

MSCI, Ortec Finance, TruCost and Urgentem. Making use of their solutions can for some users be the easiest way to integrate the tool into existing infrastructure and workflow, to analyze portfolios' and companies' temperature scores.

Given the open source nature of the tool, the community is encouraged to make contributions (refer to 'Contributing' section at <http://getting-started.sbti-tool.org/>) to further develop and/or update the codebase. Contributions can range from submitting a bug report, to submitting a new feature request, all the way to further enhancing the tool's functionalities by contributing code.

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For more information on the tool, illustrative use cases, as well as how to install and run the tool, please consult <http://getting-started.sbti-tool.org/>.