Methodology

The Sustainable Development Report of the United States measures progress towards the internationally agreed Sustainable Development Goals. Using publicly available, recent data from reputable sources, this index presents an aggregate snapshot of development progress in US states. Progress is benchmarked on current achievement, and therefore measures distance to go towards achieving the SDGs relative to progress achieved by other US States. The methodology below builds on the methodology built by SDSN and Bertelsmann Stiftung for the SDG Index and Dashboards Report.[20] This section includes: 1) information on indicator and data selection, 2) rescaling and normalizing the data and 3) aggregating composite index and adding colors.

Indicator selection criteria

To determine quality, technically-sound, indicators for selection we used the following criteria:

1. **SDG and US state relevance:** Data is matched to the SDG targets, then matched to suggested indicators as closely as possible. From this list, indicators are selected that are most relevant to state contexts, for example: the index excludes international cooperation indicators. Finally, when possible, indicators should be relevant to a policy context and/or support communities and leaders in policy-making decisions. Alignment of each indicator to the SDG target or indicator is noted on the sources pages.

2. **Statistical quality:** Data must be from a reputable source that produces data in a replicable and reliable way. Preference is given to datasets that are updated routinely, so progress can be tracked to 2030, and to datasets that have disaggregated data available, to track progress for all groups.

3. **Timeliness:** Data must be published recently, with preference given to data covering years 2015 or later.

   In 10 instances, data from earlier years was used because it was the most reliable source to cover an essential issue (see the source annex for more information on specific data sources and years covered).

4. **Coverage:** Datasets must provide data for at least 80% of states.

   While all variables have more than 80% coverage, there are five variables that have missing values: Water stress index (two missing states – Hawaii and Alaska), Incarceration rate and Jail admission rate (six missing states each – Delaware, Alaska, Vermont, Rhode Island, Hawaii, Connecticut), Students with debt (one missing – North Dakota) and Non-carbon ecological footprint (one missing – Hawaii).

5. **Comparability:** Data was chosen that has a reasonable or scientifically determined threshold.

   There are several indicators that the UN has recommended for monitoring purposes, that aren't well suited for comparison in an index because there is no consensus on 'best' level of achievement, and indeed 'best' levels may vary by location. This is the case, for example, with passenger and freight volumes (Indicator 9.1.2) or percent of employment in the manufacturing sector (Indicator 9.2.2) from Goal 9, neither of which have an optimal level of achievement at the state level.

6. **Repeated indicators:** Data should not repeat across Goals.

   Within the SDGs official indicators, there are indicators that are repeated across multiple Goals. This promotes the idea that the SDGs are interconnected and interdisciplinary. However, in order to prevent double counting of indicators within the index calculations, indicators were not repeated across Goals. In cases where an indicator could reasonably fit within multiple SDGs, it was placed within the Goal with the target that was determined to most closely/directly match the language/intent of the indicator.

7. **Outcome indicators:** Whenever possible, data should measure outcomes.

   In cases where outcome data was unavailable, process or output indicators were used to track policies or actions that have research-supported impact on outcomes. For example, state recycling legislation (disposal bans and mandatory recycling laws) was used as an indicator for recycling, as % of waste recycled is not consistently available at the state level.

Goals 14 and 17 are not included in this index due to issues of data availability and to lack of state-level comparability. We hope to include these Goals in future versions of this report. See Box 1 in the results section (Page 14) for more detailed information on measuring these SDGs.

Rescaling and normalizing the data

To rescale and normalize the data, the index followed the methodology developed by SDSN and Bertelsmann Stiftung, which is detailed below. Indicators were rescaled so they could be compared with one another. The choice of upper and lower bounds with which to rescale the data is a sensitive one and can introduce unintended effects into datasets if extreme values and outliers are not taken into account. (Note: in this section the term "upper bound" is used to refer to the target value, even if the indicator data is descending and the most progress is represented by a smaller number.) Lower bounds are particularly sensitive to outliers as they can impact the rankings of the data.[21] Detailed information about each indicator, it's bounds, and the rationale for those bounds can be found in Annex 3. To account for these considerations, this index used the following methodology for determining upper and lower bounds:

The upper bound for each indicator was determined using a five-step decision tree developed by SDSN and Bertelsmann Stiftung:[22]

1. **Use the absolute quantitative thresholds outlined in the SDGs and targets:** e.g. zero poverty, universal school completion, universal access to water and sanitation, full gender equality. Some SDG targets also propose relative changes (e.g. halve poverty).

2. **Where no explicit SDG target is available, set upper bound to universal access or zero deprivation for the following types of indicators:**

   a. Measures of poverty (e.g. working poor), consistent with the SDG ambition to "end poverty in all its forms everywhere" (Goal 1).

   b. Public service coverage (e.g. preschool access).

   c. Access to basic infrastructure (e.g. broadband access, road conditions, etc.).

   d. Leave No One Behind (e.g. workplace discrimination), consistent with the SDG ambition to eliminate disparate treatment for all vulnerable groups including those identified by race, indigenous status, religion, gender, sexual orientation, disability, poverty, location, and age.

3. **Where science-based targets exist that must be achieved by 2030 or later, use these to set 100% upper bound:** target value of 1.7 tons of CO_2/capita by 2050 as outlined in the Deep Decarbonization Pathways report for the United States (e.g. Goal 13: Energy-related CO_2 emissions).

4. **Where even the best performing states lag significantly behind the international community, and the indicator matches one used in international contexts, use the average of the top 5 OECD performers or the top 5 Global Index performers.**

5. **For all other indicators use the average of the top 5 performers.**

The lower bound for each indicator was determined using a two-step decision tree:

1. Use science-based thresholds for lowest acceptable or safe performance.

2. Use the 2.5 percentile score of the available data to account for outliers.

For both the upper and lower bounds:

Each indicator distribution was censored, so that all values exceeding the target value scored 100, and values below the lower bound scored 0. In cases where the bounds were scientifically determined, the normalized score can be interpreted as percent of progress made towards achieving the SDGs, with 100% meaning achieving that indicator. In many cases, however, a score of zero is simply the lower benchmark of current progress of US states. In cases where the average of the top 5 is used to determine the score of '100', a '100' indicates only that this threshold level of achievement can be reasonably expected in the US context.

Calculating the index and assigning colors

Goal scores were created by taking the arithmetic average of the normalized indicator scores. Overall score was calculated by averaging the score for the 15 included SDGs.

Color scales were developed by creating interior thresholds that benchmark progress towards achieving the SDGs. The colors reflect the following scale:

red—major challenges remain; orange—significant challenges remain; yellow—challenges remain; green—making progress towards SDGs; grey—information unavailable. Green should not be interpreted as meeting the SDG indicator, but rather as an indication that the state is within range of achievement by 2030. As this index provides primarily a benchmark of current achievement, states could be slowing progress or moving away from achievement, and that would not be captured here. Similarly, states could be within range of achievement but not moving quickly enough to actually achieve the Goal by 2030.

Interior thresholds were developed, when available, by expert or scientifically determined levels. When this wasn't possible, interior thresholds were determined using summary statistics, such as using the mean (yellow/orange threshold) and the standard deviation (to set the yellow/green and orange/red thresholds) and then adjusted for clustering within the data. When there was just a three-point scale, 3 colors were used: red, yellow and green. The colors for Goal-level achievement were determined by mapping the indicator colors to a four-point scale (0-3), and then averaging the value across all indicators for a specific Goal. If any state had more than 1/3 of its indicators red for any Goal, that Goal was automatically determined to be red, to highlight the level of action necessary to achieve these Goals by 2030.