

**ACT**

**SECTOR METHODOLOGY**

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# Assessing low- Carbon Transition

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## **Electricity**

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**VERSION 1.1 | MARCH 2019**

## ACKNOWLEDGMENTS

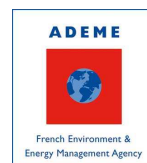
The authors wish to thank the stakeholders who contributed to the development of this methodology.

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## AUTHORS:



## FUNDERS:



The technical assistance for the current version of ACT was provided by:

**ECO2 Initiative,  
I Care & Consult  
and Carbone 4.**

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# 1. Introduction

The 2015 United Nations Climate Change Conference (COP21) in Paris solidified the global recognition to act on climate change with the political agreement to limit warming to well-below 2°C above pre-industrial levels. The ‘Assessing low-Carbon Transition’ (ACT) Initiative measures a company's alignment with a future low-carbon world. The goal is to drive action by companies and encourage businesses to move to a well-below 2°C compatible pathway in terms of their climate strategy, business model, investments, operations and GHG emissions management. The general approach of ACT is based on the Sectoral Decarbonization Approach (SDA) developed by the Science-Based Targets initiative (SBTi) in order to compare a company's alignment with a 2°C world, the application of which is described in the ACT Framework [1].

Currently, the generation of electricity is one of the major contributors to global greenhouse gas (GHG) emissions, representing about 25% of global total emissions [2]. The key to all decarbonization scenarios is the rapid deployment of low-carbon electricity generation technologies. A low-carbon world is impossible without a transformative change in the electric utilities (Electricity or EU) sector, which is why this sector has been included in the ACT project. In terms of assessment, the Electricity sector has a well-defined primary activity with accessible physical intensity data. This makes the sector suitable for analysis via the SDA and allows the ACT assessment to focus on quantitative indicators, accompanied by narrative and qualitative indicators to provide a deeper understanding of the impact. The methodology takes into account current scenarios that predict increased demand for electricity, improved efficiency and growth of renewables.

For electric utilities, a particular emphasis is placed on their electricity production capacity and their existing and planned power production technologies. The SDA was mainly developed for centralized electricity generation, which is the main electricity source. However, with the rise of distributed renewable generation technologies (e.g. solar PV, wind etc.), decentralized electricity generation has to be taken into account. The method considers such factors as: current production assets, locked-in emissions from these assets, production technology changes such as the deployment of renewables and/or carbon capture and storage CCS, and future investments and partnerships in low-carbon technologies. Such data feed simplified assessment models that aim to quantify the implications of, for example, technology choices for future emissions. Qualitative topics will also be considered relevant, including new business models, customer behaviour influence and policy engagement, past performance, and the overall stated strategy.

## 2. Principles

The selection of principles to be used for the methodology development and implementation is explained in the general ACT Framework. *Table 1* recaps the principles that were adhered to when developing the methodology.

TABLE 1: PRINCIPLES FOR IMPLEMENTATION

**RELEVANCE** - Select the most relevant information (core business and stakeholders) to assess low-carbon transition.

**VERIFIABILITY** - The data required for the assessment shall be verified or verifiable.

**CONSERVATIVENESS** - Whenever the use of assumptions is required, the assumption shall err on the side of achieving a 2° maximum global warming.

**CONSISTENCY** - Whenever time series data is used, it should be comparable over time.

**LONG-TERM ORIENTATION** - Enables the evaluation of the long-term performance of a company while simultaneously providing insights into short- and medium-term outcomes in alignment with the long-term.

## 3. Scope

### 3.1. SCOPE OF THE DOCUMENT

This document presents the ACT assessment methodology for the Electric Utilities (EU) sector. It includes the rationales, definitions, indicators and guidance for the sector-specific aspects of performance, narrative and trend scorings.

It was developed in compliance with the ACT Guidelines for the development of sector methodologies [\[3\]](#), which describe the governance and process of this development, as well as the required content for such documents.

It is intended to be used in conjunction with the ACT Framework, which describes the aspects of the methodology that are not sector-specific.

## 3.2. SCOPE OF THE ELECTRIC UTILITIES SECTOR

The EU sector corresponds to *Power generation* in the CDP Activity Classification System (CDP-ACS).

It is divided into 4 activity segments: generation, transmission, distribution, retail/marketing. Companies in the sector can operate within one or more of these segments.

The activities of gas distribution and retail, mining of fossil fuel resources and maintenance of other utility networks (telecoms, water, etc.) are outside the scope of the sector, although some companies in the sector also operate in these segments.

The sector's activities are classified under the code and description "3510 – Electric power generation, transmission and distribution" in the ISICS classification and under the code and description "35.1 – Electric power generation, transmission and distribution" in the NACE classification.

# 4. Boundaries

The main focus under the ACT project will be on the power generation segment, e.g. the production of electricity from primary energy sources. The focus of the analysis will be on the CO<sub>2</sub> emissions resulting from generation activities, also known as *generation emissions*, which are captured and reported in the companies' Scope 1 emissions.

Electricity generation is strongly influenced by regulation, market structure and network infrastructure, and these factors shall thus also be taken into account, while considering that generation companies have an important role in influencing and unlocking any constraints posed by these factors.

Downstream and upstream Scope 3 emissions should be taken into account whenever they become relevant to a company's low-carbon transition while avoided emissions and carbon offset are not taken into account by the ACT methodologies.

### →FOR EXAMPLE

- ♦ Electric utilities with a high share of variable renewable (e.g. solar, wind) assets should take action to reduce components (e.g. PV modules, inverters, wind turbines etc.) manufacturing emissions as they represent most of the electricity production life cycle impact. Examples of actions are setting up R&D programs, influencing suppliers to obtain lower impact components, etc.
- ♦ Electric utilities relying on biomass for their low-carbon transition should be taking action to ensure that this biomass contributes to GHG savings and complies with land-use change sustainability criteria (European Commission - Directive 2009/28/EC).

The other activities listed in section 3.2 *Scope of the Electric Utilities sector* above are not included in the quantitative analysis under ACT. Thus, they are excluded from the performance scoring.

#### **RATIONALE FOR BOUNDARY SETTING**

The focus is on generation emissions for two main reasons: (1) it is expected that these will generally represent more than 90% of the Scope 1+2 emissions of a company from the EU sector, and (2) they represent a homogeneous activity indicator that can accurately measure a company's low-carbon transition.

Companies might have secondary activities that could drive significant emissions of any of the GHG accounting scopes. Examples include gas exploration (significant Scope 1 emissions), transmission and distribution (significant Scope 2 emissions), or retail of gas (significant Scope 3: use of sold products emissions). These will be considered, but only to the extent that they reinforce or undermine the transition strategy of the company (e.g. by carbon lock-in). The transition strategy of the electricity generation is the main focus, but the final rating will be impacted if the company also has significant presence in other aspects of the fossil fuel value chain and does not show clear intention to divest from those sectors.

## **5. Construction of the data infrastructure**

### **5.1. DATA SOURCES**

In order to carry out a company level assessment, many data points need to be gathered which can be sourced from various locations. Principally, ACT relies on the voluntary provision of data by the participating companies. Alongside this, however, external data sources are consulted where this would streamline the process, ensure fairness, and provide additional value for verification and validation.

The ACT assessment uses the following data sources:



TABLE 2: ACT ASSESSMENT DATA SOURCES

DATA SOURCE	MAIN USE
Company data request	Primary data source for most indicators.
Contextual and financial information database sources (E.g. Online and press news, RepRisk)	Contextual and financial information on the company and events related to the company that could impact the ACT assessment
Asset activity database (e.g. GlobalData, EnerData)	Additional information used to fill the gaps of company reporting [7] [8]
EnerData statistics	Default modelling parameters [8]
IPCC (2006)	Fuel emission factors and related figures [9]
IPCC WG3 Assessment (2014)	Technology level data [10]
Company data request	Primary data source for most indicators

Where indicators refer to third-party data sources as the default option, reporting companies may provide their own data to replace it if they can provide a justification for doing so, and information about its verification status, any assumptions used and the calculation methodology.

## 5.2. COMPANY DATA REQUEST

In accordance with the approach presented in *1.Introduction*, the data request will be presented to companies in a comprehensive data collection format.

## 5.3. PERFORMANCE INDICATORS

Table 3 illustrates the performance indicators used by the EU sector assessment.

TABLE 3: PERFORMANCE INDICATORS OVERVIEW

	ELECTRIC UTILITIES			
		PAST	PRESENT	FUTURE
CORE BUSINESS PERFORMANCE	1. TARGETS	EU 1.3. Achievement of previous targets		EU 1.1. Alignment of Scope 1+2 emissions reduction targets
				EU 1.2. Time Horizon of targets
	2.MATERIAL INVESTMENT	EU 2.1. Trend in past emissions intensity		EU 2.2. Locked-in emissions
				EU 2.3. Trend in future emissions intensity
	3.INTANGIBLE INVESTMENT		AU 3.1 R&D for low-carbon transition	
	5.MANAGEMENT		EU 5.1. Oversight of climate change issues	EU 5.3. Low-carbon transition plan
			EU 5.2. Climate change oversight capability	
			EU 5.4. Climate change management incentives	EU 5.6. Climate change scenario testing
			EU 5.5. Fossil fuel power incentives	
	INFLUENCE	8.POLICY ENGAGEMENT		EU 8.1. Company policy on engagement with trade associations
EU 8.2. Trade associations supported do not have climate-negative activities or positions				
EU 8.3. Position on significant climate policies				
	9.BUSINESS MODEL	EU 9.1. Integration of a low-carbon economy in the current and future business model		

## TARGETS (WEIGHTING: 20%)

### • EU 1.1 ALIGNMENT OF SCOPE 1+2 EMISSIONS REDUCTION TARGETS (WEIGHTING: 12%)

DESCRIPTION & REQUIREMENTS	EU 1.1 ALIGNMENT OF SCOPE 1+2 EMISSIONS REDUCTION TARGETS										
<b>SHORT DESCRIPTION OF INDICATOR</b>	A measure of the alignment of the company's emissions reduction target with its decarbonization pathway. The indicator will identify the gap between the company's target and the decarbonization pathway as a percentage, which is expressed as the company's commitment gap.										
<b>DATA REQUIREMENTS</b>	<p>The questions comprising the information request that are relevant to this indicator are:</p> <ul style="list-style-type: none"> <li>♦ EU 0.B</li> <li>♦ EU 1.A</li> <li>♦ EU 2.A</li> <li>♦ EU 2.B</li> </ul> <p>External sources of data used for the analysis of this indicator are:</p> <ul style="list-style-type: none"> <li>♦ IEA ETP [4] – background scenario data</li> <li>♦ SDA [5] – specific benchmark pathway definition</li> <li>♦ EnerData [8] – default modelling parameters</li> </ul> <p>The benchmark indicators involved are:</p> <table> <tr> <th>TARGET TYPE</th><th>PARAMETER</th><th>INTENSITY METRIC</th><th>BENCHMARK</th></tr> <tr> <td>Generation emissions</td><td><math>CB_G</math></td><td>gCO2/kWh</td><td>IEA [4], SDA [5]</td></tr> </table>			TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK	Generation emissions	$CB_G$	gCO2/kWh	IEA [4], SDA [5]
TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK								
Generation emissions	$CB_G$	gCO2/kWh	IEA [4], SDA [5]								

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## HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's target ( $T_{S1(2)}$ ) and the company benchmark ( $CB_G$ ) 5 years after the reporting year.

The company target pathway ( $T_{S1(2)}$ ) is the decarbonization over time, defined by the company's emissions reduction target. To compute T, a straight line is drawn between the starting point of the analysis (i.e. reporting year) and the company's target endpoint.

The company benchmark ( $CB_G$ ) pathway is the 'company specific decarbonization pathway'. See *section 6.1* for details on the computation of this pathway.

The indicator compares  $T_{S1}$  to  $CB_G$ , by assessing the difference between these pathways 5 years after the reporting year. The pathways are expressed in grams of CO2e per unit of activity (intensity measure). The unit of activity for the electric utilities sector is kWh from electricity generation. Where necessary, targets shall be normalized to this activity unit. The result of the comparison is the commitment gap.

To assign a score to this indicator, the size of the commitment gap shall be compared to the maximum commitment gap, which is defined by the business-as-usual pathway ( $BAU_G$ ).  $BAU_G$  is defined as an unchanging (horizontal) intensity pathway, whereby the emissions intensity is not reduced at all from the reporting year.

## CALCULATION OF SCORE

The score is a percentage of the maximum commitment gap. It is calculated by dividing the company's commitment gap by the maximum commitment gap:

$$Commitment\ gap = \frac{T_{S1} - CB_G}{BAU_G - CB_G}$$

$$Score = 1 - Commitment\ gap$$

The score assigned to the indicator is equal to 1 minus the commitment gap and is expressed as a percentage (1 = 100%). Therefore, if  $T_{S1} - CB_G$  is equal to zero, the company's target is aligned with the sectoral benchmark and the maximum score is achieved.

**RATIONALE OF THE INDICATOR****RELEVANCE OF THE INDICATOR:**

Targets are included in the ACT EU assessment for the following reasons:

- Targets are an indicator of corporate commitment to reduce emissions, and are a meaningful metric of the company's internal planning towards the transition.
- As most emissions of the sector are within the sector boundaries of control, targets are a very powerful management tool to reduce these emissions. Most emissions from the EU sector can be captured in targets using existing target-setting frameworks.
- Targets are one of the few metrics that can predict a company's long-term plans beyond that which can be projected in the short-term, satisfying ACT's need for indicators that can provide information on the long-term future of a company.

**SCORING RATIONALE:**

Targets are quantitatively interpreted and directly compared to the low-carbon benchmark for the sector, using the  $CB_c$  benchmark. This is done because the vast majority of the emissions from the sector are from generation emissions, which makes the generation emissions benchmark the most relevant to the company.

Targets are compared to the benchmark directly, and the relative gap is calculated compared to the business-as-usual pathway. The gap method was chosen for its relative simplicity in interpretation and powerful message, which aligns with the UNEP's narrative of the global commitment gap of the UNFCCC Climate Agreements [6]. The simple percentage score also needs no further computation to become meaningful on its own, as well as be useable for aggregation in the performance score.

To ensure comparability of the scores and replicability of the measurement, targets are compared to the benchmark at a fixed point in time, similar for all companies. This is necessary, because the method interprets linear decarbonization pathways from the targets, while the decarbonization pathways are nonlinear. Therefore, the measurement gaps would vary over time if the time of measurement was not constant, and an undesired precedent would be set for reporting only targets with short-time horizons.

5 years after the reporting year was chosen as the reference for this measurement, as it is far enough in time to make a meaningful measurement of the company's future pathway, while close enough to be able to include the typical short to medium time scale of present-day company targets. 5 years after the reporting year was chosen as the reference for this measurement, as it is far enough in time to make a meaningful measurement of the company's future pathway, while close enough to be able to include the typical short to medium time scale of present-day company targets. It also aligns with the time horizon of the SEI metrics project that is being developed in parallel with ACT (more information at <http://seimetrics.org/>).

## • EU 1.2 TIME HORIZON OF TARGETS (WEIGHTING: 4%)

### DESCRIPTION & REQUIREMENTS

#### EU 1.2 TIME HORIZON OF TARGETS

#### SHORT DESCRIPTION OF INDICATOR

A measure of the time horizons of company targets. The ideal set of targets is forward looking enough to a long-time horizon that includes the majority of a company's asset lifetimes, but also includes short-term targets that incentivise action in the present. However, because some assets may have an expected lifetime that is too long, it is more meaningful to choose a fixed period for all energy utilities (i.e. 25 years from the reporting year) to calculate the horizon gap.

#### DATA REQUIREMENTS

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 0.B
- ◆ EU 1.A
- ◆ EU 2.A

External sources of data used for the analysis of this indicator are:

- ◆ EnerData [8] – asset level data (used to fill gaps of the GlobalData database)
- ◆ IPCC (2014) [10] – technology level data

The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Long-term point	$\{Q_{w.1st}, M_w, Q_{w.3rd}\}$	Years	Quantiles of statistic average lifetime of the company assets weighted by generation capacity

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## HOW THE ANALYSIS WILL BE DONE

The analysis has two dimensions:

A comparison of: (a) the longest time horizon of the company's targets, and (b) the quantiles and median of the company's capacity weighted asset lifetimes.

The company has interval targets that ensure both short and long-term targets are in place to incentivise short-term action and communicate long-term commitments.

### DIMENSION 1 - TARGET ENDPOINT:

The company's target endpoint ( $T_e$ ) is compared to the company's 1<sup>st</sup> quantile ( $Q_{w.1st}$ ), median ( $M_w$ ) and 3<sup>rd</sup> quantile ( $Q_{w.3rd}$ ) of ranked asset lifetimes, weighted by generation capacity and baselined on the reporting year. The company's target endpoint ( $T_e$ ) is equal to the longest time horizon among the company's targets, minus the reporting year:

$$T_e = \text{Longest target time horizon} - \text{reporting year}$$

The quartiles ( $Q_{w.1st}$ ,  $Q_{w.3rd}$ ) and median ( $M_w$ ) are calculated by ranking the company's generation assets by estimated lifetime, while also weighting this ranking with information on generation capacity. This means that at the median lifetime, 50% of the company's generation capacity will have been decommissioned. At the quartiles this is 25% and 75%, respectively.

Please see **Erreur ! Source du renvoi introuvable.** for a visual representation on how the weighted median and quartiles are derived. In the example shown on this figure, the weighted median lifetime horizon would amount to 20 years into the future, while the weighted 3<sup>rd</sup> quartile would amount to 36 years. Target endpoints would be benchmarked towards these horizons. While not visualized, the weighted 1<sup>st</sup> Quartile lifetime horizon would be 6 years.

The assessment will compare  $T_e$  to  $Q_{1st}$ ,  $M$  and  $Q_{3rd}$ . This assessment measures the horizon gap:

$$\text{Horizon gap} = \{Q_{w.1st}, M_w, Q_{w.3rd}\} - T_e$$

The company's target endpoint is compared according the following scoring table:

HORIZON GAP	SCORE
$T_e > Q_{w.3rd}$	50%
$T_e > M_w$	35%
$T_e > Q_{w.1st}$	20%
$T_e \leq Q_{w.1st}$	0%

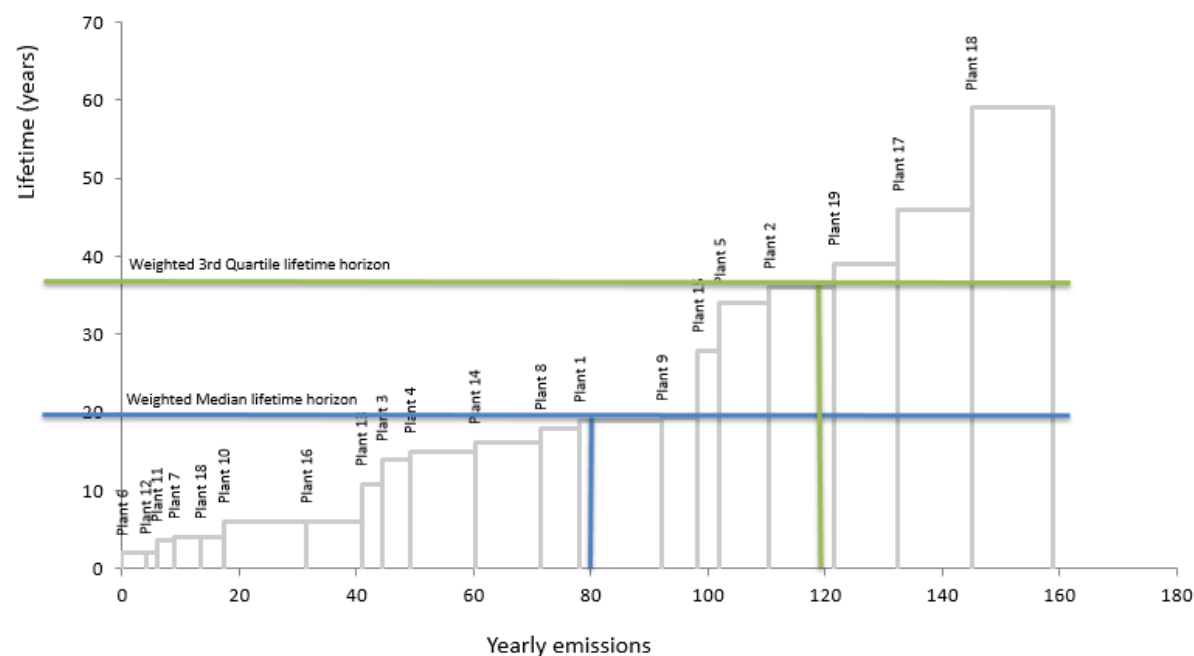


FIGURE 1: WEIGHTED LIFETIME EMISSIONS CURVE - DEFINITION AND DERIVATION OF WEIGHTED LIFETIME BENCHMARKS BY RANKING A SET OF ILLUSTRATIVE GENERATION ASSETS BY LIFETIME AND YEARLY CO<sub>2</sub> EMISSIONS



## DIMENSION 2 - INTERMEDIATE HORIZONS:

All company targets and their endpoints are calculated and plotted. The ideal scoring company does not have intervals between target endpoints larger than 5 years from the reporting year.

Measurements are done in five-year intervals between the reporting year and  $T_e$ .

The company's targets are compared according the following scoring table:

INTERMEDIATE TARGET GAPS	SCORE
No gaps of more than 5 years up until $T_e$	50%
No gaps of more than 5 years up until 60% of $T_e$	25%
No gaps of more than 5 years up until 40% of $T_e$	10%
There are gaps of more than 5 years after 40% of $T_e$	0%

## FOR ALL CALCULATIONS:

- ♦ if the company enters a 'year target was set' in the data request, then the calculations may be redone using this as the baseline instead of the reporting year. The company can attain up to 80% of the maximum score with this alternate calculation. The baseline that results in the higher score will be used for the final score.
- ♦ Targets that do not cover > 95% of generation emissions are not preferred in the calculations. If these types of targets only are available, then the score is adjusted downwards equal to the % coverage that is missing.

**AGGREGATE SCORE - DIMENSION 1: 50%, DIMENSION 2: 50%.**

## RATIONALE

### EU 1.2 TIME HORIZON OF TARGETS

#### RATIONALE OF THE INDICATOR

##### RELEVANCE OF THE INDICATOR:

The time horizon of targets is included in the ACT EU assessment for the following reasons:

- ◆ The target endpoint is an indicator of how forward looking the company's transition strategy is.
- ◆ The long expected time horizon of generation assets means that Electric Utilities 'commit' a large amount of carbon emissions into the future, which requires targets that have time horizons that are aligned with this reality.
- ◆ Aside from communicating long-term commitments, short-term action needs to be incentivised. This is why short-time intervals between targets are needed.

##### SCORING RATIONALE:

The score of this indicator is tied to how the target timeline compares to the lifetimes of the company's asset portfolio. The company has a 'horizon gap' if its targets do not include a significant part of its asset portfolio. It is however recognized that some assets may have lifetimes that exceed meaningful target endpoints.

## • EU 1.3 ACHIEVEMENT OF PREVIOUS TARGETS (WEIGHTING: 4%)

## DESCRIPTION & REQUIREMENTS

### EU 1.3 ACHIEVEMENT OF PREVIOUS TARGETS

#### SHORT DESCRIPTION OF INDICATOR

A measure of the company's historical target achievements and current progress towards active emissions reduction targets. The ambition of the target is qualitatively assessed and is not included in the performance indicators.

#### DATA REQUIREMENTS

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 0.B
- ◆ EU 1.A

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## HOW THE ANALYSIS WILL BE DONE

For the performance score, this will be assessed on two dimensions, whereby companies achieve the maximum score if

**DIMENSION 1:** The company achieved all previous emissions reduction targets with a target year in the past.

**DIMENSION 2:** The company is currently on track to meet an existing emissions reduction target, whereby the ratio between the remaining time period and the level missing to target achievement (Progress Ratio  $p$ ) is not lower than 0.5:

$$p = \frac{1 - \% \text{ time}}{1 - \% \text{ complete}} \geq 0.5$$

The highest score (100%) is attained if  $p$  is 1 or higher, and the lowest score (0%) is attained if  $p$  is 0.5 or lower. A percentage score is assigned for any value between 0.5 and 1.

**AGGREGATE SCORE - DIMENSION 1: 25%, DIMENSION 2: 75%.**

### FOR ALL CALCULATIONS:

- ◆ Companies whose past targets did not have target years but which only have target years in the future are not assessed on dimension 1 (score = 0), but only on dimension 2.
- ◆ Targets that do not cover >95% of generation emissions are not preferred in the calculation of dimension 2, but will not be penalized, as other indicators already penalize companies for not having a large coverage in the target.
- ◆ If the company has several active targets in different scopes that can be assessed according to the above criteria, then the score will be an average score based on the progress ratios of all targets assessed.

The performance score does not assess the ambition level and scope of previous targets, and therefore dimension 1 only has a low weight in the final performance score. This information is assessed in the analysis narrative, which will look at the following dimensions:

- ◆ Achievement level: To what degree has the company achieved its previously set emissions reduction targets?
- ◆ Progress level: To what degree is the company on track to meet its current emissions reduction targets?
- ◆ Ambition level: What level of ambition do the previously achieved emissions reduction targets represent?

**RATIONALE OF THE  
INDICATOR****RELEVANCE OF THE INDICATOR:**

- ◆ The ACT assessment only looks to the past to the extent that it can inform on the future. This indicator is future-relevant by providing information on the company's organizational ability to set and meet emissions reduction targets. Dimension 1 of this indicator adds credibility to any company claim to commit to a science-based reduction pathway.
- ◆ Indicators 1.1 and 1.2 look at targets in a vacuum. Dimension 2 of this indicator adds value to the analysis of a comparison to the company's performance with respect to its targets in the reporting year.

**SCORING RATIONALE:**

Quantitative interpretation of previous target achievement is not straightforward. The performance score thus makes no judgement of previous target ambition, and leaves it to the analysis narrative to make a meaningful judgement on the ambition level of past targets.

- ◆ Dimension 1 of the performance score will penalize companies who have not met previous targets in the past 10 years, as this means the company has lower credibility when setting ambitious science-based targets.
- ◆ Dimension 2 uses a simple ratio sourced from existing CDP data points (CC 3.1e) in order to compare targets. The threshold 0.5 was chosen as it allows companies some flexibility with respect to the implementation of the target, but it does have the ability to flag companies that are definitely not on track towards achievement. When  $p$  is lower than 0.5, the company needs to achieve more than twice the reduction per unit of time than the target originally envisioned.

## MATERIAL INVESTMENT (WEIGHTING: 35%)

### • EU 2.1 TREND IN PAST EMISSIONS INTENSITY (WEIGHTING: 7%)

#### DESCRIPTION & REQUIREMENTS

#### EU 2.1 TREND IN PAST EMISSIONS INTENSITY

#### SHORT DESCRIPTION OF INDICATOR

A measure of the alignment of the company's recent emissions intensity trend with that of its decarbonization pathway. The indicator will compare the gradient of this trend over a 5-year period to the reporting year (reporting year minus 5 years) with the decarbonization pathway trend over a 5-year period after the reporting year.

#### DATA REQUIREMENTS

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 0.B
- ◆ EU 1.A
- ◆ EU 2.A
- ◆ EU 2.B

External sources of data used for the analysis of this indicator are:

- ◆ IEA ETP [4] – background scenario data
- ◆ SDA [5] – specific benchmark pathway definition
- ◆ EnerData [8] – default modelling parameters
- ◆ IPCC (2006) [9] – fuel emission factors

The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Scope 1+2 emissions	$CB_G$	gCO <sub>2</sub> /kWh	IEA [4], SDA [5]

## HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's recent (reporting year minus 5 years) generation emissions intensity trend gradient ( $CR'_G$ ) and the company's decarbonization pathway trend gradient ( $CB'_G$ ) in the short-term (reporting year plus 5 years).

$CR'_G$  is the gradient of the linear trend-line of the company's recent generation emissions intensity (gCO<sub>2</sub>e/kWh) of gross electricity generation over time.

$CB'_G$  is the gradient of the linear trend-line of the company benchmark pathway. Refer to the ACT Framework [1] and the SDA methodology [5] for details on the computation of the company specific decarbonization pathway and its trendline.

The difference between  $CR'_G$  and  $CB'_G$  will be measured by their ratio ( $r_{S1}$ ). This is the 'Transition ratio', which is calculated by the following equation:

$$r_{S1} = \frac{CR'_G}{CB'_G}$$

If the transition ratio is a negative number, it means the company's recent emissions intensity has increased (positive  $CR'_G$ ) and a zero score is awarded by default. If the company's recent emissions intensity has decreased, the transition ratio will be a number between 0 and 1. A score is assigned as a percentage value equal to the value of  $r_{S1}$  (1 = 100%).

## RATIONALE

### RATIONALE OF THE INDICATOR

## EU 2.1 TREND IN PAST EMISSIONS INTENSITY

### RELEVANCE OF THE INDICATOR:

Trend in past emissions intensity is included in the ACT EU assessment for the following reasons:

- ◆ The trend shows the speed at which the company has been reducing its emissions intensity over the recent past. Comparing this to the decarbonization pathway gives an indication of the scale of the change that needs to be made within the company to bring it onto a low-carbon pathway.
- ◆ While ACT aims to be as future-oriented, it nevertheless does not want to solely rely on projections of the future, in a way that would make the analysis too vulnerable to the uncertainty of those projections. Therefore, this particular measure, along with projected emissions intensity and absolute emissions, forms part of a holistic view of company emissions performance in the past, present, and future.

### SCORING RATIONALE:

While 'gap' type scoring is preferred for any indicator where possible, this indicator only looks at past emissions, and would therefore require a different baseline in order to generate a gap analysis. Therefore, instead the two trends are compared. Another advantage of the trend analysis is that it does not require the use of a 'business as usual' pathway to anchor the data points and aid interpretation, as trends can be compared directly and a score can be directly correlated to the resulting ratio.

### NOTE ON CALCULATING CR's:

Where data on plant emissions intensity and generation is unavailable at the asset level (requested in EU 2A), a default factor is applied, which is the median of the range of values published in annex A.III.2 of IPCC [10].

## • EU 2.2 LOCKED-IN EMISSIONS (WEIGHTING: 14%)

DESCRIPTION & REQUIREMENTS	EU 2.2 LOCKED-IN EMISSIONS
<b>SHORT DESCRIPTION OF INDICATOR</b>	A measure of the company's cumulative generation emissions from the reporting up to 2050 from installed and planned power plants. The indicator will compare this to the emissions budget entailed by the company's generation intensity decarbonization pathway and projected generation trends in the sector at the country/regional level. The assets to be considered for the calculation of this indicator are the same as the ones used for the company's GHG emissions reporting.
<b>DATA REQUIREMENTS</b>	<p>The questions comprising the information request that are relevant to this indicator are:</p> <ul style="list-style-type: none"><li>♦ EU 0.B</li><li>♦ EU 1.A</li><li>♦ EU 2.A</li><li>♦ EU 2.B</li></ul>

External sources of data used for the analysis of this indicator are:

- ◆ IEA ETP [4] – background scenario data
- ◆ SDA [5] – specific benchmark pathway definition
- ◆ EnerData [8] – default modelling parameters
- ◆ IPCC (2006) [9] – fuel emission factors

The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Scope 1+2 emissions	$CB_G$	gCO2/kWh	IEA [4], SDA [5]

## HOW THE ANALYSIS WILL BE DONE

The analysis is based on the ratio between the company's installed and planned emissions for the 15 years after the reporting year [ $L_G(t)$ ], and the emissions budget entailed by the company's carbon budget [ $B_G(t)$ ] over the same period of time.

$L_G(t)$  is calculated as the total cumulative emissions implied by the lifetimes of currently active and confirmed planned assets that are going to be commissioned in the near future. If unknown, the commissioning year of projects is estimated from the project status (e.g. bidding process, construction, etc.) and data on typical project periods by plant type. An average historical capacity factor over a 5-year period to the reporting year is applied to power plant capacities to estimate future generation.

$L_G(t)$  is calculated as the company's locked-in carbon commitments, up until the chosen time period  $t$ , which is derived by taking the area under the company's future locked-in emissions curve. This curve in turn is derived from the company's intensity pathway  $CA_G$ , multiplied by generation activity  $A_G$ :

$$L_G(t) = \int_{\text{the reporting year}}^t A_G * CA_G$$

$B_G(t)$  is calculated as the company's carbon budget up until time  $t$ , which is derived by taking the area under the absolute emissions reduction curve. This curve in turn is derived from the company benchmark pathway ( $CB_G$ ) by multiplying it by generation activity  $A_G$ :



$$B_G(t) = \int_{\text{the reporting year}}^t A_G * CB_G$$

Depending on the data availability, the computation of these areas may not be as straightforward as the equations shown and will be done by approximation, but the principles will hold.

The locked-in ratio ( $r_{LB}$ ) is calculated as follows:

$$r_{LB}(t) = \frac{L_G(t)}{B_G(t)}$$

The default value for t is 15 years after the reporting year.

#### **CALCULATION OF THE SCORE:**

If  $r_{LB}$  is 1 or lower, then the company stays within its carbon budget, and will be assigned the maximum score (100%). If  $r_{LB}$  is 1.5 or higher, then the company strongly exceeds its carbon budget, and will be assigned the minimum score (0%). If  $r_{LB}$  is between 1 and 1.5, then the company will be assigned a score of 1.5-  $r_{LB}$  divided by 50%.

#### **RATIONALE**

#### **RATIONALE OF THE INDICATOR**

#### **EU 2.2 LOCKED-IN EMISSIONS**

#### **RELEVANCE OF THE INDICATOR:**

Locked-in emissions are included in the ACT EU assessment for the following reasons:

- ◆ Absolute GHG emissions over time are the most relevant measure of emissions performance for assessing a company's contribution to global warming. While the indicator EU 2.3 has a short-term measurement point on reporting year plus 5 years, the concept of Locked-in emissions allows a judgement to be made about the company's outlook in more distant time periods.

- ◆ Analysing a company's locked-in emissions alongside science-based budgets also introduces the means to scrutinise the potential cost of inaction, including the probability of stranded assets.
- ◆ Examining absolute emissions, along with recent and short-term emissions intensity trends, forms part of a holistic view of a company's emissions performance in the past, present, and future.

### **SCORING RATIONALE:**

The model [19] presents a snapshot of the present time, so the only data coming in is that which is provided by the asset dataset: currently active plants and plants that are 'in the pipeline' (which can be estimated to become active in the short-term).

When a plant reaches the end of its estimated lifetime, no replacement is assumed because those decisions have not been made yet. So the locked-in emissions calculated are the locked-in emissions of committed (existing and pipeline) plants only. Therefore the indicator describes the proportion their 2015-2050 budget that will be used up by committed activity.

Unlike the 'gap' and 'trend' comparisons done in all other quantitative indicators, this indicator compares two areas: that of the carbon budget until  $t$  and the locked-in emissions until  $t$ . It is expected that companies will exceed their budget when  $t$  is in the short-term future, but will not when it is in the long-term future. However, any short-term exceedance will have to be compensated for in later time periods. This is called carbon budget displacement, which makes the company's actual decarbonization pathway steeper than the original benchmark. There is a dimension of risk from inaction here.

When the company exceeds its full carbon budget up to 2050, it will not be able to displace enough carbon from later time periods to nearer ones, and will be faced with stranded assets when the current lifetime estimates are held up. This is a major problem, and this situation will certainly result in a zero score.

When companies are closer to their carbon budget than others, they will be less flexible in their future strategy as there is more pressure to add renewable capacity whenever a fossil fuel asset is decommissioned. There is also less room for refurbishment to extend the lifetimes of existing assets as this carries the risk of exceeding the carbon budget. Therefore, there is rationale for intermediate scoring levels that magnify this level of risk due of future flexibility in the future.

### **NOTE ON CALCULATING $L_6$ AND $B_6$ :**

Where data on plant emissions intensity and generation is unavailable at the asset level (requested in EU 2A), default factors are applied and are the median of the range of values published in annex A.III.2 of IPCC [10]. Data on typical project periods by plant type is also

obtained from this source. Where plant lifetime information is unavailable (requested in EU 2A), the median of known lifetimes in GlobalData [7] will be applied. The rationale for using these sources is that the medians are built on comprehensive samples of data.

## • EU 2.3 TREND IN FUTURE EMISSIONS INTENSITY (WEIGHTING: 14%)

### DESCRIPTION & REQUIREMENTS

#### EU 2.3 TREND IN FUTURE EMISSIONS INTENSITY

### SHORT DESCRIPTION OF INDICATOR

A measure of the alignment of the company's projected generation emissions intensity with its decarbonization pathway. The indicator will identify the gap in 5 years after the reporting year between the company's performance and the decarbonization pathway as a percentage, which is expressed as the company's 'action gap'.

### DATA REQUIREMENTS

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 0.B
- ◆ EU 1.A
- ◆ EU 2.A
- ◆ EU 2.B

External sources of data used for the analysis of this indicator are:

- ◆ IEA ETP [4] – background scenario data
- ◆ SDA [5] – specific benchmark pathway definition
- ◆ EnerData [8] – default modelling parameters
- ◆ IPCC (2006) [9] – fuel emission factors

The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Scope 1+2 emissions	$CB_G$	gCO2/kWh	IEA [4], SDA [5]

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## HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's action pathway ( $A_G$ ) and the company's benchmark ( $CB_G$ ) developing from the reporting year to 5 years after.

The company's action pathway ( $A_G$ ) is the generation weighted average plant emissions intensity over time, assuming the continuation of active power plants until anticipated decommissioning and the completion of known power plant projects. If unknown, the commissioning year of projects is estimated from the project status (e.g. bidding process, construction, etc.) and data on typical project periods by plant type.

The company's benchmark ( $CB_G$ ) pathway is the 'company specific decarbonization pathway'. See *section 6.1* for details on the computation of this pathway.

The analysis compares  $A_G$  to  $CB_G$ , by examining the difference between these pathways in 5 years after the reporting year. The pathways are expressed in grams of CO2 per unit of activity (intensity measure). The unit of activity for the electric utilities sector is kWh of electricity generation. The result of the comparison is the action gap.

### CALCULATION OF THE SCORE:

To assign a score to this indicator, the size of the action gap will be compared to the maximum action gap, which is defined by the business as usual pathway ( $BAU_G$ ).  $BAU_G$  is defined as an unchanging (horizontal) intensity pathway, whereby the emissions intensity is not reduced at all over a period after the reporting year.

$$\text{Future emissions action gap} = \frac{A_G - CB_G}{BAU_G - CB_G}$$

$$\text{Score} = 1 - \text{Future emissions action gap}$$

The score assigned to the indicator is equal to 1 minus the action gap and is expressed as a percentage (1 = 100%). Therefore, if  $A_G - CB_G$  is equal to zero, the company's target is aligned with the sectoral benchmark, and the maximum score is achieved.

**RATIONALE OF THE INDICATOR****RELEVANCE OF THE INDICATOR:**

The trend in future emissions intensity is included in the ACT assessment for the following reasons:

- ◆ The recent emissions intensity performance indicates the company's progression towards, or away from, the future emissions intensity necessary for the sector to decarbonize in line with a low-carbon scenario.
- ◆ This indicator is the most valuable in terms of the information it provides on the company's actual action towards decarbonization.
- ◆ This particular measure, along with recent emissions intensity and absolute emissions, forms part of a holistic view of company emissions performance in the past, present, and future.

**SCORING RATIONALE:**

The scoring rationale follows the same narrative as indicator EU 1.1: please refer to the rationale of this indicator to understand the choices made.

**NOTE ON CALCULATING  $A_G$ :**

Where data on plant emissions intensity and generation is unavailable at the asset level (requested in EU 2A), default factors are applied and are the median of the range of values published in annex A.III.2 of IPCC [10]. Data on typical project periods by plant type is also obtained from this source. Where plant lifetime information is unavailable (requested in EU 2A), the median of known lifetimes in GlobalData [7] will be applied. The rationale for using these sources is that the medians are built on comprehensive samples of data.

## INTANGIBLE INVESTMENT (WEIGHTING: 10%)

### • EU 3.1 R&D FOR LOW-CARBON TRANSITION (WEIGHTING: 10%)

#### DESCRIPTION & REQUIREMENTS

#### EU 3.1 R&D FOR LOW-CARBON TRANSITION

#### SHORT DESCRIPTION OF INDICATOR

A measure of the ratio of R&D investments in mitigation-relevant technologies. The indicator will identify the ratio between the company's R&D investment and the required investment as set by a scientific benchmark of R&D requirements.

#### DATA REQUIREMENTS

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 3.A

External sources of data used for the analysis of this indicator are:

- ◆ Ecofys-WWF Energy model [11] – benchmark data

The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
R&D Benchmark for EU industry	$B_{RD}$	M\$/M\$	Ecofys-WWF [11]

#### HOW THE ANALYSIS WILL BE DONE

The analysis is based on the ratio of the company's 'annual R&D expenditure on technologies that mitigate climate change' ( $CAPEX'MR\&D$ ) to the company's 'total annual capital expenditure' ( $CAPEX$ ). The highest scoring level will compare only 'R&D expenditure on non-mature technologies (see the indicator's rationale) that mitigate climate change' ( $CAPEX'MR\&D_{non-mature}$ ).

The ratios are defined as the 'mitigation R&D intensity' ratios ( $D$ ) or ( $D_{(non-mature)}$ ):

$$D = \frac{CAPEX' MR\&D}{CAPEX}$$

$$D_{(non-mature)} = \frac{CAPEX' MR\&D_{non-mature}}{CAPEX}$$

#### **DIMENSION 1 - INCLUSIVE R&D INVESTMENT RATIO:**

This intensity will be compared to a benchmark for mitigation R&D ( $B_{RD}$ ) intensity, and a score will be assigned depending on the company's proximity to the benchmark. This benchmark is defined by the Ecofys-WWF Energy Report [11]. The inclusive R&D investment ratio includes all investment in carbon mitigation technologies (mature and non-mature).

The score is a percentage of the maximum R&D investment ratio. It is calculated by dividing  $D$  by  $B_{RD}$ .

$$R\&D \text{ Investment ratio}_1 = \frac{D}{B_{RD}}$$

The score for dimension 1 is calculated by multiplying the investment ratio by 50% as long as the ratio is lower than 1. For values higher than 1, 50% will be assigned as a score.

#### **DIMENSION 2 - NON-MATURE R&D INVESTMENT RATIO:**

R&D investment is not as necessary for some technologies as it is for others. The non-mature technology investment ratio  $D_{non-mature}$  is compared to the benchmark for dimension 2:

$$R\&D \text{ Investment ratio}_2 = \frac{D_{non-mature}}{B_{RD}}$$

A company with an investment ratio of 1 for dimension 2 shall achieve 100% of the maximum score. If the ratio is lower than or equal to 1, the score for dimension 2 is the value of the calculated ratio.

The highest score between dimensions 1 and 2 is chosen as the company's final score.

## RATIONALE

## EU 3.1 R&D FOR LOW-CARBON TRANSITION

### RATIONALE OF THE INDICATOR

#### RELEVANCE OF THE INDICATOR:

The trend in future emissions intensity is included in the ACT assessment for the following reasons:

- ◆ To enable the transition, sectors such as the EU sector rely heavily on the development of low-carbon technologies to replace their currently high-emitting portfolio of generation assets. R&D is the principal proactive action to develop these technologies.
- ◆ R&D is also one of the principal tools to reduce the costs of a technology in order to increase its market penetration.
- ◆ Lastly, the R&D investment of a company into non-mature technologies allows for direct insight into the company's commitment to alternative technologies that may not currently be part of its main business model.

#### DEFINING 'MITIGATION R&D':

The 'mitigation R&D' is defined by the categorization employed by the OECD Statistics Database, which is used to identify patents in mitigation technologies [2]. The ACT assessment is not focused solely on patents, but will use the taxonomy presented. The relevant categories are 4: "climate change mitigation technologies related to energy generation, transmission or distribution", as well as 5: "capture, storage, sequestration or disposal of greenhouse gases" [2]. Only R&D in technologies with significant mitigation potential is included. R&D in optimizing the efficiency of fossil fuel technologies (coal, gas, oil) does not have this potential, and is therefore not a meaningful way of reducing the emissions of power generation [12]. Companies are asked to exclude their R&D in fossil fuel technologies in order to identify their mitigation R&D.

#### DEFINING 'NON-MATURE R&D':

A Technology Readiness Level (TRL) should be used to assess the maturity of a technology [13]. Higher scoring levels of this indicator exclude research in technologies that are already considered mature in terms of market penetration, in order to incentivise a focus on those technologies (i.e. wind power, solar power, but also nuclear fusion) that have a higher need for R&D investment, in order to break through technical barriers and reduce the levelized costs of deploying these technologies [14].

To formalize this distinction in the analysis, the company is asked for a detailed breakdown of R&D expenditure in Section 3 of the data request. As defining what type of R&D is 'non-mature' is theoretically difficult, the classification is inversed, and done based on the principle



of exclusion. This methodology excludes only those low-carbon technologies that are considered mature in terms of market position and levelized cost. For electric utilities, the only category of technologies that are excluded based on this principle are 'large hydropower' and mature 'nuclear fission' energy [14].

#### SCORING RATIONALE:

To align with the narrative of ratios that is also used in the indicators for Modules 1 and 2, the indicator is computed as the 'R&D investment ratio'. This investment ratio is only assigned 50% of the maximum score, as the analysis aims to incentivise R&D in non-mature technologies as opposed to mature technologies. Therefore, the achievable score for achieving a high R&D in non-mature technologies ( $D_{\text{non-mature}}$ ) is double that of the score when this criterion is not included (D).

## MANAGEMENT (WEIGHTING: 20%)

### • EU 5.1 OVERSIGHT OF CLIMATE CHANGE ISSUES (WEIGHTING: 1%)

DESCRIPTION & REQUIREMENTS	EU 5.1 OVERSIGHT OF CLIMATE CHANGE ISSUES
<b>SHORT DESCRIPTION OF INDICATOR</b>	The company discloses that responsibility for climate change within the company lies at the highest level of decision making within the company structure.
<b>DATA REQUIREMENTS</b>	<p>The questions comprising the information request that are relevant to this indicator are:</p> <ul style="list-style-type: none"> <li>◆ EU 5.A</li> <li>◆ EU 5.B</li> </ul> <p>External sources of data may also be used for the analysis of this indicator.</p>

## HOW THE ANALYSIS WILL BE DONE

The benchmark case is that climate change is managed within the highest decision-making structure within the company. The company situation is compared to the benchmark case, if it is similar then points are awarded.

The position at which climate change is managed within the company structure is determined from the company data submission and accompanying evidence.

### RATIONALE

#### EU 5.1 OVERSIGHT OF CLIMATE CHANGE ISSUES

### RATIONALE OF THE INDICATOR

Successful change within companies, such as the transition to a low-carbon economy, requires strategic oversight and buy-in from the highest levels of decision-making within the company. For the electric utilities sector, a change in strategy and potentially business model will be required and this cannot be achieved at lower levels within an organisation. Evidence of how climate change is addressed within the top decision-making structures is a proxy for how seriously the company takes climate change, and how well integrated it is at a strategic level. High-level ownership also increases the likelihood of effective action to address the low-carbon transition.

Changes in strategic direction are necessarily future-oriented, which fits with this principle of the ACT project.

Management oversight of climate change is considered good practice.

## • EU 5.2 CLIMATE CHANGE OVERSIGHT CAPABILITY (WEIGHTING: 1%)

### DESCRIPTION & REQUIREMENTS

#### EU 5.2 CLIMATE CHANGE OVERSIGHT CAPABILITY

### SHORT DESCRIPTION OF INDICATOR

Company board or executive management has expertise on the science and economics of climate change, including an understanding of policy, technology and consumption drivers that can disrupt current business

### DATA REQUIREMENTS

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 5.B

External sources of data may also be used for the analysis of this indicator.

## HOW THE ANALYSIS WILL BE DONE

The presence of expertise on topics relevant to climate change and the low-carbon transition at the level of the individual or committee with overall responsibility for it within the company is assessed. The presence of expertise is the condition that must be fulfilled for points to be awarded in the scoring.

The analyst determines if the company has expertise as evidenced through a named expert biography outlining capabilities. The analysis is binary: expertise is evident or not. A cross check is performed against 8.1 on the highest responsibility for climate change, the expertise should exist at the level identified or the relationship between the structures/experts identified should also be evident.

## RATIONALE

### EU 5.2 CLIMATE CHANGE OVERSIGHT CAPABILITY

## RATIONALE OF THE INDICATOR

Effective management of the low-carbon transition requires specific expertise related to climate change and its impacts, and their likely direct and indirect effects on the business. Presence of this capability within or closely related to the decision-making bodies that will implement low-carbon transition both indicates company commitment to that transition and increases the chances of success.

Even if companies are managing climate change at the Board level or equivalent, a lack of expertise could be a barrier to successful management of a low-carbon transition.

## • EU 5.3 LOW-CARBON TRANSITION PLAN (WEIGHTING: 8%)

## DESCRIPTION & REQUIREMENTS

### EU 5.3 LOW-CARBON TRANSITION PLAN

## SHORT DESCRIPTION OF INDICATOR

The company has a plan on how to transition the company to a business model compatible with a low-carbon economy.

## DATA REQUIREMENTS

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 5.C

## HOW THE ANALYSIS WILL BE DONE

The analyst evaluates the description and evidence of the low-carbon transition plan for the presence of best practice elements and consistency with the other reported management indicators. The company description and evidence is compared to the maturity matrix developed to guide the scoring and a greater number of points are allocated for elements indicating a higher level of maturity.

Among the best practice elements identified to date are:

- ◆ The plan includes financial projections
- ◆ The plan should include cost estimates or other assessment of financial viability as part of its preparation
- ◆ The description of the major changes to the business is comprehensive, consistent, aligned with other indicators
- ◆ Quantitative estimates of how the business will change in the future are included
- ◆ Costs associated with the plan (e.g. write-downs, site remediation, contract penalties, regulatory costs) are included
- ◆ Potential “shocks” or stressors (sudden adverse changes) have been taken into consideration
- ◆ Relevant region-specific considerations are included
- ◆ The plan’s measure of success is SMART - contains targets or commitments with timescales to implement them, is time-constrained or the actions anticipated are time-constrained
- ◆ The plan’s measure of success is quantitative
- ◆ The description of relevant testing/analysis that influenced the transition plan is included
- ◆ The plan is consistent with reporting against other ACT indicators
- ◆ Scope – should cover the entire business, and is specific to that business
- ◆ The plan should cover the short, medium and long terms. From now or the near future <5 years, until at least 2035 and preferably beyond (2050)
- ◆ The plan contains details of actions the company realistically expects to implement (and these actions are relevant and realistic)
- ◆ The plan has been approved at the strategic level within the organisation
- ◆ Discussions about the potential impacts of a low-carbon transition on the current business have been included
- ◆ The company has a publicly-acknowledged 2°C (or beyond) science-based target.

The maximum score (100%) is assigned if all of these elements are demonstrated.

**RATIONALE****EU 5.3 LOW-CARBON TRANSITION PLAN****RATIONALE OF THE INDICATOR**

The electric utilities sector will require substantial changes to its business to align with a low-carbon economy over the short, medium and long term, whether voluntarily following a strategy to do so or if forced to change by regulations and structural changes to the market. It is better for the success of its business and of its transition that these changes occur in a planned and controlled manner.

The IIGCC electric utilities investor expectations document [\[15\]](#) specifically states that companies in the sector should develop such a plan.

**• EU 5.4 CLIMATE CHANGE MANAGEMENT INCENTIVES (WEIGHTING: 1%)****DESCRIPTION & REQUIREMENTS****EU 5.4 CLIMATE CHANGE MANAGEMENT INCENTIVES****SHORT DESCRIPTION OF INDICATOR**

The Board's compensation committee has included metrics for the reduction of GHG emissions in the annual and/or long-term compensation plans of senior executives; the company provides monetary incentives for the management of climate change issues as defined by a series of relevant indicators.

**DATA REQUIREMENTS**

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 5.D
- ◆ EU 5.E

**HOW THE ANALYSIS WILL BE DONE**

The analyst verifies if the company has compensation incentives set for senior executive compensation and/or bonuses, that directly and routinely reward specific, measurable reductions of tons of carbon emitted by the company in the preceding year and/or the future attainment of emissions reduction targets, or other metrics related to the company's low-carbon transition plan.

**RATIONALE****EU 5.4 CLIMATE CHANGE MANAGEMENT INCENTIVES****RATIONALE OF THE INDICATOR**

Executive compensation should be aligned with overall business strategy and priorities. As well as commitments to action the company should ensure that incentives, especially at the executive level, are in place to reward progress towards a low-carbon transition. This will improve the likelihood of a successful low-carbon transition.

Monetary incentives at the executive level are an indication of commitment to successful implementation of a low-carbon transition strategy.

**• EU 5.5 FOSSIL FUEL POWER INCENTIVES (WEIGHTING: 1%)****DESCRIPTION & REQUIREMENTS****EU 5.5 FOSSIL FUEL POWER INCENTIVES****SHORT DESCRIPTION OF INDICATOR**

The company has eliminated any and/or all components in annual and/or long-term compensation plans that incentivise links between fossil-fuel power generation capacity growth and executive compensation

**DATA REQUIREMENTS**

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 5.F

**HOW THE ANALYSIS WILL BE DONE**

The analyst checks that incentives to grow fossil-fuel-based power generation capacity no longer exist, according to the data disclosed.

**RATIONALE****EU 5.5 FOSSIL FUEL POWER INCENTIVES****RATIONALE OF THE INDICATOR**

Executive and equivalent incentives and compensation should be aligned with the low-carbon transition plan in the short and long term, to increase the chances of success of the plan. Electric utilities growth targets could provide incentives to increase emissions if steps are not taken to guard against this possibility.

**• EU 5.6 CLIMATE CHANGE SCENARIO TESTING (WEIGHTING: 8%)****DESCRIPTION & REQUIREMENTS****EU 5.6 CLIMATE CHANGE SCENARIO TESTING****SHORT DESCRIPTION OF INDICATOR**

Testing or analysis relevant to determining the impact of the transition to a low-carbon economy on the current and projected business model and/or business strategy has been completed, with the results reported to the Board or C-suite (CEO, CFO, etc.), the business strategy revised where necessary, and the results publicly reported.

**DATA REQUIREMENTS**

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 5.G

**HOW THE ANALYSIS WILL BE DONE**

The analyst evaluates the description and evidence of the low-carbon economy scenario testing for the presence of best-practice elements and consistency with the other reported management indicators. The company description and evidence is compared to the maturity matrix developed to guide the scoring and a greater number of points is allocated for elements indicating a higher level of maturity.

Best-practice elements to be identified in the test/analysis include:

- ◆ full coverage of the company's boundaries;
- ◆ timescale from present to long-term (2035-2050);
- ◆ results are expressed in value-at-risk or other financial terms;
- ◆ multivariate: a range of different changes in conditions are considered together;
- ◆ changes in conditions are specific to a low-carbon climate scenario;
- ◆ climate change conditions are combined with other likely future changes in operating conditions over the timescale chosen.

Maximum points are awarded if all of these elements are demonstrated.

**RATIONALE OF THE  
INDICATOR**

Changes predicted to occur due to climate change could have a number of consequences for the EU sector, including the risk of “stranded assets”, increased costs, a dramatically changed operating environment and major disruptions to the business. There are a variety of ways of analysing the potential impacts of climate-related changes on the business, whether these are slow and gradual developments or one-off “shocks”. Investors are increasingly calling for techniques (see IIGCC investor expectations document for the sector [\[15\]](#)) such as use of an internal price on carbon, scenario analysis and stress testing to be implemented to enable companies to calculate the value-at-risk that such changes could pose to the business, and identify potential “stranded assets”. As this practice is emergent at this time there is currently no comprehensive survey or guidance on specific techniques or tools recommended for the sector. The ACT methodology thus provides a broad definition of types of testing and analysis that can be relevant to this information requirement, to identify both current and best practices and consider them in the assessment.

Scenario stress testing is an important management tool for preparing for the low-carbon transition. For businesses likely to be strongly affected by climate change impacts (both direct and indirect), and businesses with large fixed asset bases and long management horizons, such as the electric utilities sector, it has even greater importance.



## POLICY ENGAGEMENT (WEIGHTING: 5%)

### MODULE RATIONALE

The Electric Utilities industry is heavily regulated due to its structural importance to economies; however, regulation affecting the sector is usually developed in a consultative fashion due to the need for technical inputs. This allows significant opportunity for influence of these regulations, potentially in a way that is negative for the climate. Since the industry is currently a major source of emissions, effective, timely regulation is necessary to ensure that scientific limits are observed and that there is a “level playing field” for businesses in this sector to approach the transition to a low-carbon economy.

### • EU 8.1 COMPANY POLICY ON ENGAGEMENT WITH TRADE ASSOCIATIONS (WEIGHTING: 1%)

DESCRIPTION & REQUIREMENTS	EU 8.1 COMPANY POLICY ON ENGAGEMENT WITH TRADE ASSOCIATIONS
<b>SHORT DESCRIPTION OF INDICATOR</b>	The company has a constructive policy on what action to take when industry organisations in which it has membership are found to be opposing “climate-friendly” policies.
<b>DATA REQUIREMENTS</b>	<p>The questions comprising the information request that are relevant to this indicator are:</p> <ul style="list-style-type: none"><li>♦ EU 8.A</li><li>♦ EU 8.B</li><li>♦ EU 8.E</li></ul>
<b>HOW THE ANALYSIS WILL BE DONE</b>	<p>The analyst evaluates the description and evidence of the policy on trade associations and climate change for the presence of best-practice elements and consistency with the other reported management indicators. The company description and evidence is compared to the maturity matrix developed to guide the scoring and a greater number of points are allocated for elements indicating a higher level of maturity.</p> <p>Best practice elements to be identified in the test/analysis include:</p> <ul style="list-style-type: none"><li>♦ Having a publicly available policy in place</li><li>♦ The scope of the policy covers the entire company and its activities, and all group memberships and associations</li></ul>

- ◆ The policy sets out what action is to be taken in the case of inconsistencies
- ◆ The action carries the option to terminate membership of the association
- ◆ The action carries the option of publicly opposing or actively countering the association's position
- ◆ Responsibility for oversight of the policy lies at the top level of the organisation
- ◆ Presence of a process to monitor and review trade association positions

Maximum points are awarded if all of these elements are demonstrated.

## RATIONALE

## EU 8.1 COMPANY POLICY ON ENGAGEMENT WITH TRADE ASSOCIATIONS

### RATIONALE OF THE INDICATOR

See also the module rationale.

Trade associations are a key method by which companies can influence policy on climate indirectly. Thus, where trade associations take positions that are negative for the climate, companies need to take action to ensure that this negative influence is countered or minimised.

A policy to govern such interaction is a specific request of the 2015 UNPRI “Investor expectations on corporate climate lobbying” document [16].

## • EU 8.2 TRADE ASSOCIATIONS SUPPORTED DO NOT HAVE CLIMATE-NEGATIVE ACTIVITIES OR POSITIONS (WEIGHTING: 2%)

## DESCRIPTION & REQUIREMENTS

## EU 8.2 TRADE ASSOCIATIONS SUPPORTED DO NOT HAVE CLIMATE-NEGATIVE ACTIVITIES OR POSITIONS

### SHORT DESCRIPTION OF INDICATOR

The company is not on the Board or providing funding beyond membership of any trade associations that have climate-negative activities or positions. It should also be considered if the company is supporting trade associations with *climate-positive* activities and/or positions.

### DATA REQUIREMENTS

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 8.C
- ◆ EU 8.D
- ◆ ACT EU 8.E

External sources of data shall also be used for the analysis of this indicator (e.g. RepRisk database, press news).

---

**HOW THE ANALYSIS  
WILL BE DONE**

The list of trade associations declared in the CDP data and other external sources entries relating to the company is assessed against a list of associations that have climate-negative activities or positions. The results will be compared to any policy described in EU 8.1.

If the company is part of trade associations that have climate-positive activities and/or positions, this should be considered for the analysis.

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**RATIONALE****EU 8.2 TRADE ASSOCIATIONS SUPPORTED DO NOT HAVE CLIMATE-NEGATIVE ACTIVITIES OR POSITIONS**

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**RATIONALE OF THE  
INDICATOR**

See also the module rationale.

Trade associations are a key instrument by which companies can indirectly influence policy on climate. Thus, participating in trade associations that actively lobby against climate-positive legislation is a negative indicator and likely to obstruct the low-carbon transition.

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**• EU 8.3 POSITION ON SIGNIFICANT CLIMATE POLICIES (WEIGHTING: 2%)**

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**DESCRIPTION &  
REQUIREMENTS****EU 8.3 POSITION ON SIGNIFICANT CLIMATE POLICIES**

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**SHORT DESCRIPTION  
OF INDICATOR**

The company is not opposed to any significant climate relevant policies and/or supports climate friendly policies.

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**DATA REQUIREMENTS**

The questions comprising the information request that are relevant to this indicator are:

- ◆ EU 8.E
- ◆ EU 8.F

External sources of data shall also be used for the analysis of this indicator (e.g. RepRisk database, press news).

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**HOW THE ANALYSIS  
WILL BE DONE**

The analyst evaluates the description and evidence on the company's position on relevant climate policies for the presence of best practice elements, negative indicators and consistency with the other reported management indicators. The company description and evidence are compared to the maturity matrix developed to guide the scoring and a greater number of points will be allocated for elements indicating a higher level of maturity.

Maturity matrix contents include (in order of decreasing maturity):

- a.** The company publicly supports relevant significant climate policies
- b.** No reports of any opposition to climate policy
- c.** Reported indirect opposition to climate policy (e.g. a via trade association)
- d.** Reported direct opposition to climate policy (third-party claims are found)
- e.** The company publicises direct opposition to climate policy (e.g. direct statement issued or given by a company representative in a speech or interview)

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**RATIONALE****EU 8.3 POSITION ON SIGNIFICANT CLIMATE POLICIES**

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**RATIONALE OF THE  
INDICATOR**

See also the module rationale.

Policy and regulation that acts to promote transition to a low-carbon economy is key to the success of the transition. Companies should not oppose effective and well-designed regulation in these areas, but should support it.

## BUSINESS MODEL (WEIGHTING: 10%)

### • EU 9.1 INTEGRATION OF THE LOW-CARBON ECONOMY IN CURRENT AND FUTURE BUSINESS MODELS (WEIGHTING: 10%)

DESCRIPTION & REQUIREMENTS	EU 9.1 INTEGRATION OF THE LOW-CARBON ECONOMY IN CURRENT AND FUTURE BUSINESS MODELS
<b>SHORT DESCRIPTION OF INDICATOR</b>	<p>The company is actively developing business models for a low-carbon future by demonstrating its application of low-carbon business model pathways. The 5 future business model pathways as identified in the “Low carbon, high stakes” report [17] are:</p> <ul style="list-style-type: none"> <li>♦ energy as a service provider;</li> <li>♦ local low-carbon energy access provider;</li> <li>♦ large scale low-carbon electricity generator;</li> <li>♦ flexibility optimizer;</li> <li>♦ carbon capture and use operator.</li> </ul>
<b>DATA REQUIREMENTS</b>	<p>The questions comprising the information request that are relevant to this indicator are:</p> <ul style="list-style-type: none"> <li>♦ EU 9.A</li> </ul>
<b>HOW THE ANALYSIS WILL BE DONE</b>	<p>The analysis is based on the company’s degree of activity in one of the 5 future business model areas used to benchmark. The analyst evaluates the implementation of the future business model pathways through a maturity matrix and the highest level achieved determines the current level of the company.</p> <p>The maturity matrix breaks down the 5 future business model pathways in progressive steps:</p> <ul style="list-style-type: none"> <li>♦ <b>Energy as a service-provider:</b> <ul style="list-style-type: none"> <li>a. encourage the development of smart meters and smart grids;</li> <li>b. develop an understanding of customer’s needs and use behavior;</li> <li>c. help customers reduce their energy use through monitoring.</li> </ul> </li> <li>♦ <b>Local low-carbon energy access provider:</b></li> </ul>

- a. adoption of micro-grids;
- b. development of a skilled decentralized workforce;
- c. adoption of a shared-value approach.

♦ **Large scale low-carbon electricity generator:**

- a. transparency of emissions for consumers;
- b. development of technology expertise;
- c. development of low-carbon electricity portfolio;
- d. carbon pricing.

♦ **Flexibility optimizer:**

- a. monitoring and forecast capabilities;
- b. ability to fluctuate generation output;
- c. development of storage capabilities or partnerships with storage providers.

♦ **Carbon capture and use operator:**

- a. development of carbon storage capacity;
- b. carbon pricing;
- c. CO2 as a product (as a resource for other processes).

In order for companies to align with a low-carbon future and meet the future electricity needs, it is expected that they pursue at least one of these future business model pathways and integrate them in their strategic plans. The analyst evaluates the description and evidence of the company's degree of activity in one of the 5 future business model areas for the presence of best practice elements and consistency with the other reported management indicators. The company description and evidence are compared to the maturity matrix developed to guide the scoring and a greater number of points are allocated for elements indicating a higher level of maturity.

The minimum requirement for points to be awarded is that some level of exploration of one or more of these relevant business areas has started. This could include participation in collaborations, pilot projects, or research funding.

Best-practice elements to be identified in the test/analysis include:

- ♦ the company has developed a mature business model that integrates one or many of the above elements;
- ♦ the business activity is profitable;
- ♦ the business activity is of a substantial size;

- ◆ the company is planning to expand the business activity;
- ◆ expansion will occur on a defined timescale.

Maximum points are awarded if all of these elements are demonstrated.

## RATIONALE

## EU 9.1 INTEGRATION OF THE LOW-CARBON ECONOMY IN CURRENT AND FUTURE BUSINESS MODELS

### RATIONALE OF THE INDICATOR

In addition to growing low-carbon energy generation, a company may transition its business model to other areas to remain profitable in a low-carbon economy. The company's future business model should enable it to grow while decoupling from growth in emissions, in order to meet the constraints of the low-carbon transition while continuing to generate value. The business model shifts identified do not conflict with the changes that are implied by decarbonizing the company's electricity generation systems.

This indicator aims to identify both the relevant current business activities the company is participating in, and those still at a nascent stage. It is recognised that the EU sector can suffer from structural barriers to rapid innovation and change, compared to other sectors, and that the transition to a low-carbon economy, with the associated change in business models, will take place over a number of years. The analysis will thus seek to identify and reward projects at an early stage as well as more mature business activities, although more mature (i.e. substantially sized, profitable, and/or expanding) business activities will be better rewarded.

The "Low Carbon, High Stakes" report [\[17\]](#) from Accenture Strategy offers a comprehensive review of the challenges facing the electricity generation sector connected to the low-carbon transition. It groups together a number of opportunities for the sector which the ACT assessment adopts as a taxonomy for reporting the development of business activities connected to them.

# 6. Assessment

## 6.1. SECTOR BENCHMARK

The default sectoral benchmark is taken from the sectoral decarbonization approach (SDA [5]) to science-based targets. For the electric utilities sector the SDA only takes into account the CO<sub>2</sub> emissions due to power generation and excludes other business segments (e.g. transmissions, distribution, retail etc.) emissions, which if relevant should be considered in the analysis narrative. This approach is, by default, conveyed with the use of scenario data published with the IEA ETP series [4]. Specifically, the 2°C scenario (2DS) of the ETP model is drawn from and used as a default benchmark.

A preliminary analysis comparing the IEA ETP 2DS model's scenario to other scenarios in the power generation sector (*Figure 2*) shows that IEA ETP falls within a reasonably narrow envelope. Moreover, the generation mix underlying its computation occupies a middle ground with the range of scenario portfolios (*Figure 3*).

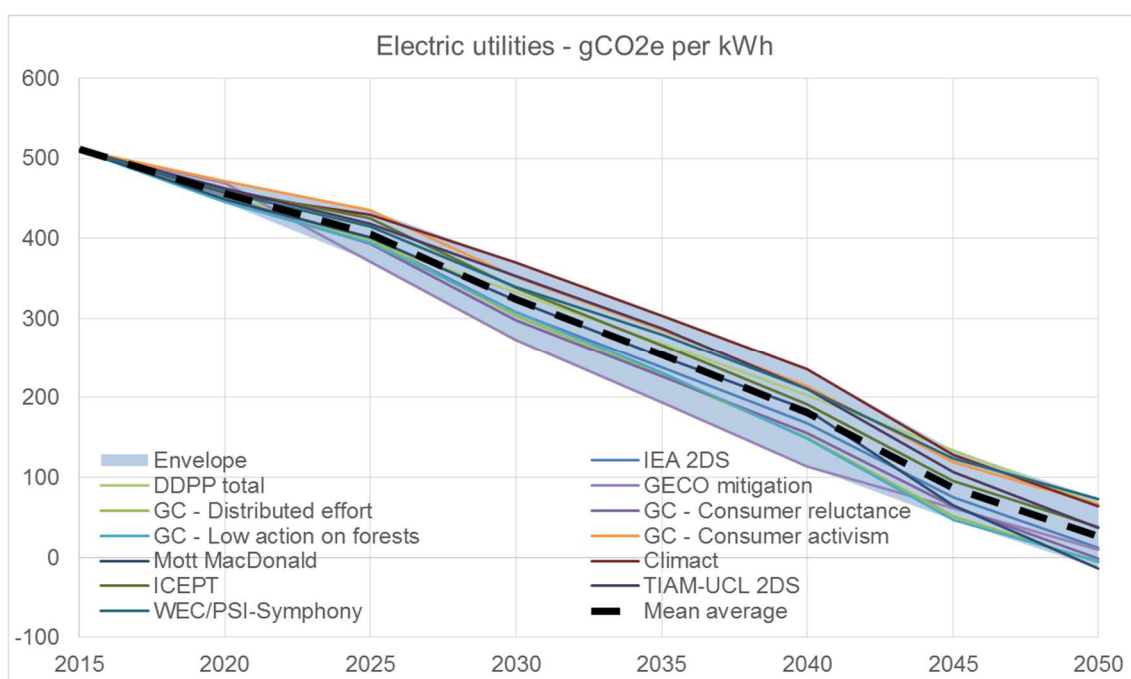


FIGURE 2: ELECTRIC UTILITIES SCENARIO ENVELOPE (SOURCE: CDP)



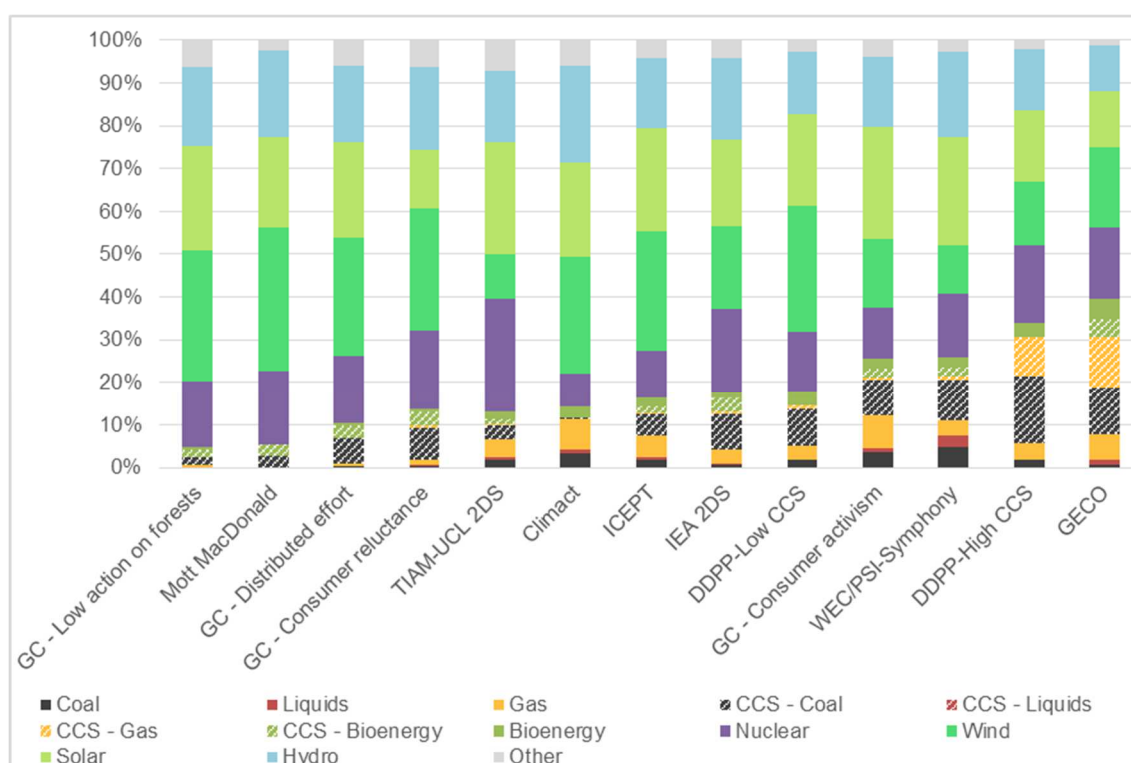


FIGURE 3: 2050 POWER GENERATION MIX PER SCENARIO, INCREASING FOSSIL FUEL DEPENDENCY FROM LEFT TO RIGHT  
(SOURCE : CDP BASED ON GLOBAL CALCULATOR [18] DATA)

The company generation emissions benchmark (CB<sub>G</sub>) is the company allocated decarbonization pathway. The company is allocated this pathway from the sector decarbonization pathway, of which there are different pathways for different countries and regions. The extent to which a company is tied to a scenario in any one country is proportional to its power generation capacity in that country, Thus the CB<sub>G</sub> is geographically weighted.

The allocation mechanism, as defined by the SDA, is the convergence mechanism. This allocation takes the company's emissions intensity in the initial year and converges it to the sector's emissions intensity in 2050. Thus, companies starting from a lower intensity will have a shallower decarbonization pathway than companies starting from a higher intensity. In this way, past action or inaction to reduce intensity is incorporated.

## 6.2. QUANTITATIVE BENCHMARKS USED FOR THE INDICATORS

The following table lists the benchmarks used for the quantitative indicators and their sources:

TABLE 4: BENCHMARKS FOR THE QUANTITATIVE INDICATORS

BENCHMARK	PARAMETER	SOURCE	INDICATOR RELEVANCE
Company benchmark for Generation emissions	CBG	IEA [4], SDA [5]	EU 1.1, EU 2.1, EU 2.2, EU 2.3
Quantiles of statistic average lifetime of the company assets weighted by generation capacity	$Q_{w,1st}$ , $M_w$ , $Q_{w,3rd}$	ACT	EU 1.2
R&D benchmark for EU industry	B <sub>RD</sub>	Ecofys-WWF [11]	EU 3.1

## 6.3. WEIGHTINGS

The selection of weights for both the modules and the individual indicators was guided by the principles of value of information, impact of variation, future orientation and data quality sensitivity. See the ACT Framework [1] for more information.

TABLE 5: PERFORMANCE INDICATOR WEIGHTINGS

AU	MODULE	INDICATOR	MODULE WEIGHT	INDICATOR WEIGHT
1.1	TARGETS	Alignment of emission reduction targets	20%	12%
1.2		Time horizons of targets		4%
1.3		Historic target ambition and company performance		4%
2.1	MATERIAL INVESTMENT	Trend in past emissions intensity	35%	7%
2.2		Locked-in emissions		14%
2.3		Trend in future emission intensity		14%
3.1	INTANGIBLE INVESTMENT	R&D in Climate Change mitigation technologies related to energy generation, transmission or distribution	10%	10%
4.1	MANAGEMENT	Oversight of climate change issues	20%	1%
4.2		Climate change oversight capability		1%
4.3		Low carbon transition plan		8%
4.4		Climate change management incentives		1%
4.5		Fossil fuel power incentives		1%
4.6		Climate change scenario testing		8%
5.1	POLICY ENGAGEMENT	Company policy on engagement with trade associations	5%	1%
5.2		Trade associations supported do not have climate-negative activities or positions		2%
5.3		Position on significant climate policies		2%
6.1	BUSINESS MODEL	Integration of the low-carbon economy in current and future business model	10%	10%
OVERALL			100%	100%

The quantitatively scored modules (Targets, Material investment, Intangible investment) carry 65% of the final weight, and the qualitatively scored modules (Management, Policy engagement, Business model) carry 35%. The indicators within the modules also carry their own weighting.

## • RATIONALE FOR WEIGHTINGS

### Targets 20%

The targets module has a heavy weight of 20%. Most of it is placed on the *alignment of Scope 1+2 emissions reduction targets*, with a strong weight of 12%. This indicator contains most of the information about the company's future commitments with respect to GHG emissions reductions. Not having an ambitious target means it is very unlikely that the company is committed to a transition, and therefore this indicator has a high impact on the likelihood of a successful transition. Targets are also future oriented, as a valuable proxy for assessing the company's long-term emissions pathway.

The *time horizon of targets* and *achievement of previous targets* have a medium weight of 4%. The time horizon of targets is a proxy of how forward-looking the company is, which is very long-term oriented. Finally, the *achievement of previous targets* indicator measures the company's past credentials on target setting and

achievement, which provides more contextual information on the company's ability to meet ambitious future targets.

## **Material Investment**

**35%**

This is the primary module that assesses the development of the company's generation assets, and how these existing assets impact the likelihood of a low-carbon transition. Over the short-term, the company's current generation portfolio and confirmed planned assets are used to generate an estimate of the company's *trend in future emissions intensity*. As this is a direct measurement of the decarbonization pathway, with a high impact of variation, and which looks to the future, it receives a very strong weighting of 14%.

The *locked-in emissions* indicator uses the same information, but tries to measure the amount of carbon emissions that the company has already committed from its individual carbon budget. This means it is also very future oriented, and also receives a strong weight of 14%. Finally, the *trend in past emissions intensity* is an indication of the 'adjustment' that the company has to make to place itself on a low-carbon pathway. It principally adds information about what kind of changes the company needs to undergo in order to become low-carbon aligned, and therefore receives a medium weight of 7%.

## **Intangible investment**

**10%**

Intangible investment is focused entirely on R&D. As it is not a necessary condition for companies to engage in R&D (as they can also be technology adopters), the impact of variation here is hard to quantify. However, it is a necessary condition for the system as a whole to advance the technology for a low-carbon future, and large R&D programs in climate-mitigating technologies are indicative of a strong financial commitment by the company. As it relies on a taxonomy of R&D that may not readily exist within the company reporting, it is quite sensitive to the quality of information reported. These considerations, along with the future-relevance of the indicator, means it receives a medium-to-high weight of 10%.

## **Management**

**20%**

Management is a multi-faceted module that makes up 20% of the score, because it incorporates many different smaller indicators that together paint a picture of the company's management and strategic approach to the low-carbon transition. Going by the principle of future orientation, the majority of this weight is placed on the *low-carbon transition plan* and *climate change scenario testing*, each of which is weighted 8%. These two indicators provide more information on how this company will specifically deal with the transition, given its unique constraints and opportunities, and therefore provide valuable insights into the company's planning and narrative towards the final goal.

The other four indicators have a low weight of 1%, as they are contextual indicators whose outcome can strengthen or undermine the company's ability to carry out the transition plan and meet ambitious science-based targets.

## **Policy engagement**

**5%**

In line with the rationale for the management indicators of low weight, the policy engagement indicators are also contextual aspects which tell a narrative about the company's stance on climate change and how the

company expresses it in their engagement with policy makers and trade associations. The total weight for this module is therefore medium at 5%. The *trade associations supported do not have climate-negative actions or positions* indicator and the company's *position on significant climate policies* make up the bulk of this, with 2% each. Finally, 1% is allocated to the *company policy on engagement with trade associations*, as this is a very specific question that does not hold a lot of value on its own.

## **Business model**

**10%**

The *integration of a low-carbon economy in current and future business model* is a composite indicator that captures many elements and aspects that cannot otherwise be captured in any of the other modules. It includes those aspects that are relevant to the transition but are not directly a part of the primary generation activities. It is future oriented by asking the companies on its narrative on certain future directions that the sector can/has to take to enable the transition.

# 7. Rating

The ACT rating shall comprise:

- A performance score
- A narrative score
- A trend score

These pieces of information shall be represented within the ACT rating as follows:

- Performance score** as a number from 1 (lowest) to 20 (highest)
- Narrative score** as a letter from E (lowest) to A (highest)
- Trend score** as either “+” for improving, “-” for worsening, or “=” for stable.

In some situations, trend scoring may reveal itself to be unfeasible depending on data availability. In this case, it should be replaced with a “?”.

The highest rating is thus represented as “20A=”, the lowest as “1E=” and the midpoint as “10C=”.

TABLE 6: LOWEST, HIGHEST AND MIDPOINT FOR EACH ACT SCORE TYPE

LOW SCORES	MID SCORES	HIGH SCORES
1,E,-	10,C,=	20,A,+

See the ACT Framework [1] for general information and methodology on the ACT rating.

## 7.1. PERFORMANCE SCORING

A detailed description of the performance indicators and of their weightings for the EU sector is presented in *5.3 Performance indicators*.

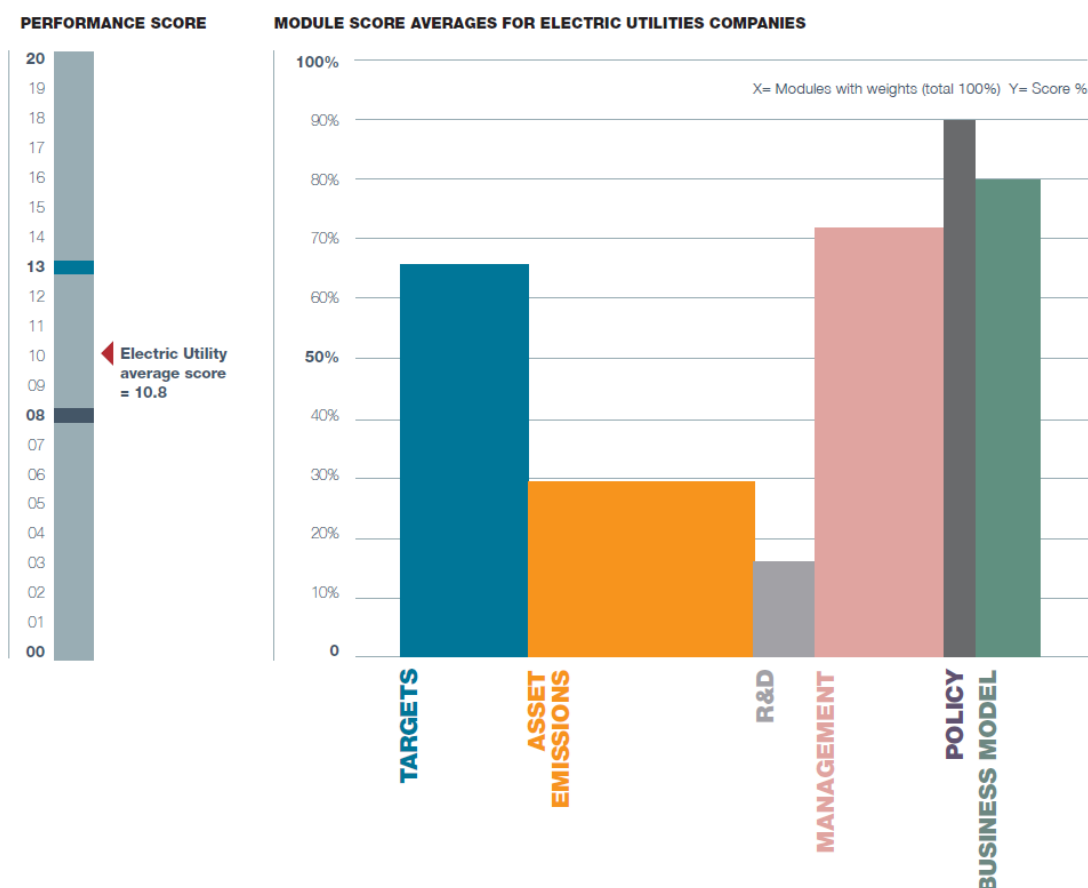


FIGURE 4: EXAMPLE OF A DISPLAY OF THE PERFORMANCE SCORE BROKEN DOWN BY MODULE (THE WIDTH OF THE BARS IS PROPORTIONAL TO THE MODULE'S WEIGHTING)

Performance scoring shall be performed in compliance with the ACT Framework. No additional sector-specific issue impacting the narrative scoring for this sector has been identified to date.

## 7.2. NARRATIVE SCORING

Narrative scoring shall be performed in compliance with the ACT Framework. No sector-specific issues impacting the narrative scoring for this sector have been identified to date.

## 7.3. TREND SCORING

Trend scoring shall be performed in compliance with the ACT Framework.

To apply the trend scoring methodology presented in the ACT Framework, the analyst should identify the trends from the existing data infrastructure based on the data points and/or indicators that can indicate the future direction of change within the company.

The table below includes an overview of which indicators/data points could possibly have valuable information about future directions for the EU sector.

TABLE 7 : RELEVANT PERFORMANCE INDICATORS FOR TREND IDENTIFICATION FOR THE EU SECTOR

MODULE	INDICATOR
<b>Targets</b>	EU 1.1 Alignment of Scope 1+2 emissions reduction targets
	EU 1.3 Time horizon of targets
<b>Material investments</b>	EU 2.2 Locked-in emissions
	EU 2.3 Trend in future emissions intensity
<b>Intangible investments</b>	EU 3.1 R&D for low-carbon transition
<b>Management</b>	EU 5.3 Low-carbon transition plan
	EU 5.6 Climate change scenario testing
<b>Business model</b>	EU 9.1 Integration of the low-carbon economy in current and future business model



# 8. Aligned state

The table below presents the response of a low-carbon aligned company of the sector to the 5 questions of ACT:

- What is the company planning to do? [Commitment]
- How is the company planning to get there? [Transition Plan]
- What is the company doing at present? [Present]
- What has the company done in the recent past? [Legacy]
- How do all of these plans and actions fit together? [Consistency]



FIGURE 5: ALIGNED STATE FOR COMPANIES IN THE ELECTRICITY SECTOR

# 9. Sources

- [1] “ACT Framework - Version 1.1”, ACT Initiative, 2019
- [2] “Environmental Mitigation Technologies Search Strategy, Modules 4 and 5”, OECD, 2015
- [3] “ACT Guidelines for the development of sector methodologies - Version 1.0”, ACT Initiative, 2018
- [4] “Energy Technology Perspectives 2017”, IEA, 2017
- [5] “Sectoral Decarbonization Approach (SDA): A method for setting corporate emissions reduction targets in line with climate science.”, Science Based Targets Initiative, 2015
- [6] “The Emissions Gap Report 2015”, UNEP, 2015
- [7] GlobalData asset database. Available at: [Accessed: 15-Feb-2019] <https://www.globaldata.com>
- [8] EnerData asset database and statistics. Available at: [Accessed: 15-Feb-2019] <https://www.enerdata.fr>
- [9] “IPCC Guidelines for National Greenhouse Gas Inventories”, Chapter 2, IPCC, 2006
- [10] “Climate Change”, IPCC, 2014
- [11] “The Energy Report: 100% renewable energy by 2050”, Ecofys & WWF, 2010
- [12] “R&D Investment in the Priority Technologies of the European Strategic Energy Technology Plan”, Commission, E.-E. & others, Comm. Staff Work. Doc. SEC 2009 1296, 2009
- [13] “Technology readiness levels. White Paper”, Mankins, J. C. April, 6. 1995
- [14] “World Energy Perspective; Cost of Energy Technologies”, World Energy Council, (WEC and BNEF), 2013
- [15] “Investor Expectations of Electric Utility Companies: Looking down the line at carbon asset risk”, IIGCC, 2016
- [16] “Investor expectations on corporate climate lobbying”, UNPRI, 2015
- [17] “Do you have the power to transform?”, Van Beek, M., Holst, A. & Keeble, J. Low Carbon, High Stakes. (Accenture Strategy), 2015
- [18] The Global Calculator, 2014. Available at: [Accessed: 31-Mar-2016] <http://tool.globalcalculator.org/>
- [19] “Commitment accounting of CO2 emissions”, S. Davis & R. Socolow, Environ. Res. Lett. 9 084018, 2014

# 10. Glossary

## **2 DEGREES (2°C)**

A political agreement was reached at COP21 on limiting global warming to 2°C above the pre-industrial level ([COP21: Why 2°C?](#)). A 2°C scenario (or 2°C pathway) is a scenario (or pathway) compatible with limiting global warming to 2°C above the pre-industrial level.

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## **ACT**

The Assessing low-Carbon Transition (ACT) initiative was jointly developed by ADEME and CDP. ACT assesses how ready an organization is to transition to a low-carbon world using a future-oriented, sector-specific methodology ([ACT website](#)).

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## **ACTION GAP**

In relation to emissions performance and reduction, the action gap is the difference between what a given company has done in the past plus what it is doing now, and what has to be done. For example, companies with large action gaps have done relatively little in the past, and their current actions point to continuation of past practices.

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## **ADEME**

Agence de l'Environnement et de la Maîtrise de l'Energie; The French Environment and Energy Management Agency ([ADEME webpage](#)).

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## **ALIGNMENT**

The ACT project seeks to gather information that will be consolidated into a rating that is intended to provide a general metric of the 2-degree alignment of a given company. The wider goal is to provide companies specific feedback on their general alignment with 2-degrees in the short and long term.

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## **ANALYST**

Person in charge of the ACT assessment.

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## **ASSESS**

Under the ACT project, to evaluate and determine the low-carbon alignment of a given company. The ACT assessment and rating will be based on consideration of a range of indicators. Indicators may be reported directly from companies. Indicators may also be calculated, modelled or otherwise derived from different data sources supplied by the company. The ACT project will measure 3 gaps (Commitment, Horizon and Action gaps – defined in this glossary) in the GHG emissions performance of companies. This model closely follows the assessment framework presented above. It starts with the future, with the goals companies want to achieve, followed by their plans, current actions and past actions.

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## **ASSET**

An item of property owned by a company, regarded as having value and available to meet debts, commitments, or legacies. Tangible assets include 1) fixed assets, such as machinery and buildings, and 2) current assets, such as inventory. Intangible assets are nonphysical such as patents, trademarks, copyrights, goodwill and brand value.

<b>BARRIER</b>	A circumstance or obstacle preventing progress (e.g. lacking information on supplier emissions and hotspots can be a barrier to companies managing and reducing their upstream Scope 3 emissions).
<b>BASE YEAR</b>	According to the GHG Protocol and ISO14064-1, a base year is “a historic datum (a specific year or an average over multiple years) against which a company’s emissions are tracked over time”. Setting a base year is an essential GHG accounting step that a company must take to be able to observe trends in its emissions information ( <a href="#">GHG Protocol Corporate Standard</a> ).
<b>BENCHMARK</b>	A standard, pathway or point of reference against which things may be compared. In the case of pathways for sector methodologies, a sector benchmark is a low-carbon pathway for the sector average value of the emissions intensity indicator(s) driving the sector performance. A company’s benchmark is a pathway for the company value of the same indicator(s) that starts at the company performance for the reporting year and converges towards the sector benchmark in 2050, based on a principle of convergence or contraction of emissions intensity.
<b>BOARD</b>	Also the “Board of Directors” or “Executive Board”; the group of persons appointed with joint responsibility for directing and overseeing the affairs of a company.
<b>BUSINESS-AS-USUAL</b>	No proactive action taken for change. In the context of the ACT methodology, the business-as-usual pathway is constant from the initial year onwards.
<b>BUSINESS MODEL</b>	A plan for the successful operation of a business, identifying sources of revenue, the intended customer base, products, and details of financing. Under ACT, evidence of the business model shall be taken from a range of specific financial metrics relevant to the sector and a conclusion made on its alignment with low-carbon transition and consistency with the other performance indicators reported.
<b>CAPACITY (POWER)</b>	In relation to power generation, nameplate capacity is the power output number, usually expressed in megawatts (MW), and registered with authorities for classifying the power output of a power station.
<b>CAPITAL EXPENDITURE</b>	Money spent by a business or organization on acquiring or maintaining fixed assets, such as land, buildings, and equipment.
<b>CARBON CAPTURE AND STORAGE (CCS)</b>	The process of trapping carbon dioxide produced by burning fossil fuels or other chemical or biological process and storing it in such a way that it is unable to affect the atmosphere.
<b>CDP</b>	Formerly the "Carbon Disclosure Project", CDP is an international, not-for-profit organization providing the only global system for companies and cities to measure, disclose, manage and share vital environmental information. CDP works with market forces, including 827 institutional investors with assets of over

US\$100 trillion, to motivate companies to disclose their impacts on the environment and natural resources and take action to reduce them. More than 5,500 companies worldwide disclosed environmental information through CDP in 2015. CDP now holds the largest collection globally of primary climate change, water and forest risk commodities information and puts these insights at the heart of strategic business, investment and policy decisions ([CDP website](#)).

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**CLIMATE CHANGE**

A change in climate, attributed directly or indirectly to human activity, that alters the composition of the global atmosphere and that is, in addition to natural climate variability, observed over comparable time periods (UNFCCC).

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**COMPANY**

A commercial business.

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**COMPANY PATHWAY**

A company's past emissions intensity performance pathway up until the present.

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**COMPANY TARGET PATHWAY**

The emissions intensity performance pathway that the company has committed to follow from the initial year on until a future year, for which it has set a performance target.

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**COMMITMENT GAP**

In relation to emissions performance, the difference between what a company needs to do and what it says it will do.

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**CONSERVATIVENESS**

A principle of the ACT project; whenever the use of assumptions is required, the assumption shall err on the side of achieving 2-degrees maximum.

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**CONSISTENCY**

A principle of the ACT project; whenever time series data is used, it should be comparable over time. In addition to internal consistency of the indicators reported by the company, data reported against indicators shall be consistent with other information about the company and its business model and strategy found elsewhere. The analyst shall consider specific, pre-determined pairs of data points and check that these give a consistent measure of performance when measured together.

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**COP21**

The 2015 United Nations Climate Change Conference, held in Paris, France from 30 November to 12 December 2015 ([COP21 webpage](#)).

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**DATA**

Facts and statistics collected together for reference and analysis (e.g. the data points requested from companies for assessment under the ACT project indicators).

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**DECARBONIZATION**

A complete or near-complete reduction of greenhouse gas emissions over time (e.g. decarbonization in the electric utilities sector by an increased share of low-carbon power generation sources, as well as emissions mitigating technologies like Carbon Capture and Storage (CCS)).

**DECARBONIZATION  
PATHWAY**

Benchmark pathway (See 'Benchmark')

**EMISSIONS**

The GHG Protocol defines direct GHG emissions as emissions from sources that are owned or controlled by the reporting entity, and indirect GHG emissions as emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity ([GHG Protocol](#)).

**ENERGY**

Power derived from the utilization of physical or chemical resources, especially to provide light and heat or to work machines.

**EU**

Abbreviation of the 'Electric Utilities' sector.

**FOSSIL FUEL**

A natural fuel such as coal, oil or gas, formed in the geological past from the remains of living organisms.

**FUTURE**

A period of time following the current moment; time regarded as still to come.

**POWER GENERATION**

The process of generating electric power from other sources of primary energy.

**PRIMARY ENERGY**

Primary energy is an energy form found in nature that has not been subjected to any conversion or transformation process. It is energy contained in raw fuels, and other forms of energy received as input to a system. Primary energy can be non-renewable or renewable.

**GREENHOUSE GAS  
(GHG)**

Greenhouse gas (e.g. carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and three groups of fluorinated gases (sulfur hexafluoride (SF<sub>6</sub>), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs)) which are the major anthropogenic GHGs and are regulated under the Kyoto Protocol. Nitrogen trifluoride (NF<sub>3</sub>) is now considered a potent contributor to climate change and is therefore mandated to be included in national inventories under the United Nations Framework Convention on Climate Change (UNFCCC).

**GUIDANCE**

Documentation defining standards or expectations that are part of a rule or requirement (e.g. [CDP reporting guidance for companies](#)).

**HORIZON GAP**

In relation to emissions performance, the difference between the average lifetime of a company's production assets (particularly carbon intensive) and the time-horizon of its commitments. Companies with large asset-lives and small time horizons do not look far enough into the future to properly consider a transition plan.

**INCENTIVE**

A thing, for example money, that motivates or encourages someone to do something (e.g. a monetary incentive for company board members to set emissions reduction targets).

<b>INDICATOR</b>	<p>An indicator is a quantitative or qualitative piece of information that, in the context of the ACT project, can provide insight on a company's current and future ability to reduce its carbon intensity. In the ACT project, 3 fundamental types of indicators can be considered:</p> <ul style="list-style-type: none"> <li>◆ Key performance indicators (KPIs);</li> <li>◆ Key narrative indicators (KNIs); and</li> <li>◆ Key asset indicators (KAIs).</li> </ul>
<b>INTENSITY (EMISSIONS)</b>	The average emissions rate of a given pollutant from a given source relative to the intensity of a specific activity; for example grams of carbon dioxide released per MWh of energy produced by a power plant.
<b>LIFETIME</b>	The duration of a thing's existence or usefulness (e.g. a physical asset such as a power plant).
<b>LONG-TERM</b>	Occurring over or relating to a long period of time; under ACT this is taken to mean until the year 2050. The ACT project seeks to enable the evaluation of the long-term performance of a given company while simultaneously providing insights into short- and medium-term outcomes in alignment with the long-term.
<b>LOW-CARBON SCENARIO (OR PATHWAY)</b>	A low-carbon scenario (or pathway) is a 2°C scenario, a well-below 2°C scenario or a scenario with higher decarbonization ambition.
<b>LOW-CARBON TRANSITION</b>	The low-carbon transition is the transition of the economy according to a low-carbon scenario.
<b>LOW-CARBON SOLUTION</b>	A low-carbon solution (e.g. energy, technology, process, product, service, etc.) is a solution whose development will contribute to the low-carbon transition.
<b>MATURITY MATRIX</b>	A maturity matrix is essentially a “checklist”, the purpose of which is to evaluate how well advanced a particular process, program or technology is according to specific definitions.
<b>MITIGATION (EMISSIONS)</b>	The action of reducing the severity of something (e.g. climate change mitigation through absolute GHG emissions reductions)
<b>MODEL</b>	A program designed to simulate what might or what did happen in a situation (e.g. climate models are systems of differential equations based on the basic laws of physics, fluid motion, and chemistry that are applied through a 3-dimensional grid simulation of the planet Earth).
<b>PATHWAY (EMISSIONS)</b>	A way of achieving a specified result; a course of action (e.g. an emissions reduction pathway).

<b>PERFORMANCE</b>	Measurement of outcomes and results.
<b>PLAN</b>	A detailed proposal for doing or achieving something.
<b>POINT</b>	A mark or unit of scoring awarded for success or performance.
<b>POWER</b>	Energy that is produced by mechanical, electrical, or other means and used to operate a device (e.g. electrical energy supplied to an area, building, etc.).
<b>PROGRESS RATIO</b>	An indicator of target progress, calculated by normalizing the target time percentage completeness by the target emissions or renewable energy percentage completeness.
<b>RELEVANT / RELEVANCE</b>	In relation to information, the most relevant information (core business and stakeholders) to assess low-carbon transition.
<b>RENEWABLE ENERGY</b>	Energy from a source that is not depleted when used, such as wind or solar power.
<b>REPORTING YEAR</b>	Year under consideration.
<b>RESEARCH AND DEVELOPMENT (R&amp;D)</b>	A general term for activities in connection with innovation; in industry; for example, this could be considered work directed towards the innovation, introduction, and improvement of products and processes.
<b>SCIENCE-BASED TARGET</b>	To meet the challenges that climate change presents, the world's leading climate scientists and governments agree that it is essential to limit the increase in the global average temperature at below 2°C. Companies making this commitment will be working toward this goal by agreeing to set an emissions reduction target that is aligned with climate science and meets the requirements of the <a href="#">Science-Based Targets Initiative</a> .
<b>SCENARIO</b>	The <a href="#">Fifth Assessment Report</a> (AR5) of the Intergovernmental Panel on Climate Change (IPCC) presents the results of an extensive climate modelling effort to make predictions of changes in the global climate based on a range of development/emissions scenarios. Regulation on climate change-related issues may present opportunities for your organization if it is better suited than its competitors to meet those regulations, or more able to help others to do so. Possible scenarios would include a company whose products already meet anticipated standards designed to curb emissions, those whose products will enable its customers to meet mandatory requirements or those companies that provide services assisting others in meeting regulatory requirements.
<b>SCENARIO ANALYSIS</b>	A process of analysing possible future events by considering alternative possible outcomes.



**SECTORAL  
DECARBONIZATION  
APPROACH (SDA)**

To help businesses set targets compatible with 2-degree climate change scenarios, the [Sectoral Decarbonization Approach](#) (SDA) was developed. The SDA takes a sector-level approach and employs scientific insight to determine the least-cost pathways of mitigation, and converges all companies in a sector towards a shared emissions target in 2050.

**SHORT-TERM**

Occurring in or relating to a relatively short period of time in the future.

**STRESS TEST**

A test designed to assess how well a system functions when subjected to greater than normal amounts of stress or pressure (e.g. a financial stress test to see if an oil & gas company can withstand a low oil price).

**SCOPE 1 EMISSIONS**

All direct GHG emissions ([GHG Protocol Corporate Standard](#)).

**SCOPE 2 EMISSIONS**

Indirect GHG emissions from consumption of purchased electricity, heat or steam ([GHG Protocol Corporate Standard](#)).

**SCOPE 3 EMISSIONS**

Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc. ([GHG Protocol Corporate Standard](#)).

**SECTOR**

A classification of companies with similar business activities, e.g. automotive manufacturers, power producers, retailers, etc.

**STRATEGY**

A plan of action designed to achieve a long-term or overall aim. In business, this is the means by which a company sets out to achieve its desired objectives; long-term business planning.

**SUPPLIER**

A person or entity that is the source for goods or services (e.g. a company that provides engine components to an automotive manufacturing company).

**TARGET**

A quantifiable goal (e.g. to reduce GHG emissions).

- ◆ The following are examples of absolute targets:
  - metric tonnes CO<sub>2</sub>e or % reduction from base year
  - metric tonnes CO<sub>2</sub>e or % reduction in product use phase relative to base year
  - metric tonnes CO<sub>2</sub>e or % reduction in supply chain relative to base year
- ◆ The following are examples of intensity targets:
  - metric tonnes CO<sub>2</sub>e or % reduction per passenger. Kilometre (also per km; per nautical mile) relative to base year

- metric tonnes CO2e or % reduction per square foot relative to base
- metric tonnes CO2e or % reduction per MWh

<b>TRADE ASSOCIATION</b>	Trade associations (sometimes also referred to as industry associations) are an association of people or companies in a particular business or trade, organized to promote their common interests. Their relevance in this context is that they present an “industry voice” to governments to influence their policy development. The majority of organizations are members of multiple trade associations, many of which take a position on climate change and actively engage with policymakers on the development of policy and legislation on behalf of their members. It is acknowledged that in many cases companies are passive members of trade associations and therefore do not actively take part in their work on climate change ( <a href="#">CDP climate change guidance</a> ).
<b>TRANSPORT</b>	To take or carry (people or goods) from one place to another by means of a vehicle, aircraft, or ship.
<b>TREND</b>	A general direction in which something (e.g. GHG emissions) is developing or changing.
<b>TECHNOLOGY</b>	The application of scientific knowledge for practical purposes, especially in industry (e.g. low-carbon power generation technologies such as wind and solar power, in the electric power generation sector).
<b>TRANSITION</b>	The process or a period of changing from one state or condition to another (e.g. from an economic system and society largely dependent on fossil fuel-based energy, to one that depends only on low-carbon energy).
<b>VERIFIABLE / VERIFIABILITY</b>	To prove the truth of, as by evidence or testimony; confirm; substantiate. Under the ACT project, the data required for the assessment shall be verified or verifiable.
<b>WEIGHTING</b>	The allowance or adjustment made in order to take account of special circumstances or compensate for a distorting factor.