ACT

SECTOR METHODOLOGY

Assessing low-Carbon Transition

Auto

VERSION 1.2 – NOVEMBER 2020

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Contents

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].

The transport sector represents about one quarter of all emissions from fossil fuels [2], and poses great challenges in terms of climate mitigation. Automobile transportation has become the dominant mode of personal transportation, and its consequent importance to decarbonization scenarios is why the automotive manufacturing (Auto or AU) sector was included in ACT from the beginning. In terms of assessment, despite complex multi-tiered industrial supply chains, there is a defined main activity with corresponding emissions data. This makes the Auto sector suitable for analysis via the SDA and allows the ACT assessment to focus on quantitative indicators. However, other qualitative indicators are also considered due to the complexity of the sector, its economic importance and its current and changing business models, and the significance of these aspects when considering the alignment of the auto industry with a low-carbon future.

For the automotive manufacturing industry, a Well-to-Wheel (WTW) approach is used when assessing indirect emissions (Scope 3) released during the use of sold vehicles. The WTW emissions reflect not only the direct use emissions from fuel combustion (TTW: Tank-to-Wheel) but also upstream emissions related to fuel production and distribution (WTT: Well-to-Tank), including electricity generation for electric vehicles [3]. When data on WTW emissions are not available, a TTW approach shall be used taking into consideration WTT regional conversion factors.

As most of the emissions in the value chain of the manufacturing sector are created during use, from the combustion of fossil fuel in ICE engines of vehicles, particular emphasis is placed on fleet greenhouse gas (GHG) emissions. The method considers such factors as: fuel efficiency of internal combustion engine (ICE) cars, technology changes towards advanced low-carbon vehicles, as well as other technological pathways for reducing on-road emissions compared to those from test conditions. This information will feed simplified assessment models that aim to quantify the implications of, for example, a particular technology choice and the rate of efficiency improvements in the fleet. In addition to business model considerations, other qualitative indicators included are the company's stance on climate change regulations and engagement with the supply chain.

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 Auto (AU) 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 [4], 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 AUTO MANUFACTURING SECTOR

The AU sector includes *Automobile manufacturing* from the CDP Activity Classification System (CDP-ACS).

The activities of the AU sector include the design of light duty vehicles (cars) and heavy duty vehicles and their final assembly. They do not include the manufacturing of vehicle parts.

Note: "final assembly" means final products (goods and services).

They are classified under the code and description "2910 – Manufacture of motor vehicles" in the ISICS classification and under the code and description "29.10 – Manufacture of motor vehicles" in the NACE classification.

4. Boundaries

Fleet emissions of the current range of cars sold will be the main indicator for assessment. The total lifetime of cars sold is taken into account, as that is what governs the emissions produced. This means that having a carbon-intensive range in the present has a strong effect on the cumulative impact that these cars will have over their lifetime.

Since 'fleet emissions' is a homogeneous activity indicator for the entire sector, the Sectoral Decarbonization Approach (SDA) can be utilised to determine benchmarks for this part of the assessment. The SDA expects that all car companies with a wide consumer portfolio will converge to a fleet-emissions benchmark for the sector.

Although scenarios predict that modal transportation shifts will be vital to the decarbonization of the transport sector, these changes lie outside the boundary of company activities chosen for the ACT assessment. However, auto manufacturers' business models may react to these modal shifts, for example by beginning to manufacture vehicles for mass transportation, and this will be considered relevant for the analysis. Business models may also diversify to include activities that aim to reduce barriers to uptake of advanced low-carbon vehicles, for example developing charging infrastructure for electric vehicles, and this will be included in the analysis indicators.

RATIONALE AND GUIDANCE

Decarbonization of the transport sector is one of the major transitions in any low-carbon scenario. The majority of global passenger travel is by passenger cars or buses. These emit higher average CO_2 per passenger-kilometre than competing ground-transport technologies, such as railway travel. With car-ownership and travel expected to increase, the future technology pathway of the auto manufacturing sector becomes paramount for enabling a low-carbon transition.

Most of the emissions in the value chain of the AU sector happen during use phase due to the combustion of fossil fuel in ICE vehicles. The main focus of the ACT project will therefore be on how auto manufacturers intend to reduce their fleet emissions between now and 2050. The IEA ETP 2DS 2017 scenario [5] requires that the efficiency (energy consumed per passenger kilometre) of the world's fossil fuel car fleet improve by about 2.4% annually through to 2050 (3.1% in the B2DS [5]). To gain more substantial fleet emissions reductions, many climate models also increase the share of advanced vehicles (hybrid, plug-in hybrid, full electric, hydrogen); for example, the IEA ETP 2DS 2017 foresees a 56% penetration by 2050 (79% in the B2DS scenario).

Besides the reduction of fleet emissions through technological means, the transition of the transport sector will also imply a rethinking of the way cars are used in society. Car companies are challenged to present their

views on the intensification of car-usage, and how they see their role evolving in scenarios that imply a different use-case of cars, such as a move away from private ownership to car-sharing. The optimization of car use as a result of these shifts is something auto manufacturers will have to engage in. For example, if these trends mean that car sales move away from private to cooperative, there are good business opportunities in focusing specifically on this sales avenue.

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 company and events related to the company that could impact the ACT assessment
OICA database	Recent sales data on EU, US and China markets [19]
ICCT Roadmap Model v1.0	WTW Emission factors and regionalized load factors[1] [8]
Additional database for sales data (e.g. WardsAuto database)	Additional information used to fill the gaps of company reporting [9]

[1] When necessary, the ICCT data are corrected in order for consistency with the IEA ETP background scenario data to be achieved on the underlying hypothesis of regional average kilometers per year.

Where indicators use third-party data sources as the default option, reporting companies may provide their own data 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. For auto manufacturing companies, the Well-to-Wheel approach (WTW) shall be preferred when assessing indirect emissions (scope 3) released during the use of sold vehicles. In the absence of available data, the Tank-to-Wheel (TTW) approach will be applied.

5.3. PERFORMANCE INDICATORS

Table 3 illustrates the performance indicators used by the AU sector analysis.

TABLE 3: PERFORMANCE INDICATORS OVERVIEW

		AUTO MANUFACTURING			
			PAST	PRESENT	FUTURE
CORE BUSINESS PERFORMANCE		1. TARGETS	AU 1.4 Achievement of previous targets		AU 1.1 Alignment of Scope 1+2 emissions reduction targets
					AU 1.2 Alignment of fleet emissions reduction targets
					AU 1.3 Time horizon of targets
	INVESTMENT	2.MATERIAL INVESTMENT	AU 2.1 Trend in past emissions intensity		
		3.INTANGIBLE INVESTMENT		AU 3.1 R&D for low-carbon transition	
		4.SOLD PRODUCTS PERFORMANCE	AU 4.1 Fleet emissions pathway		AU 4.2 Fleet emissions lock-in
			AU 4.3 Low-carbon vehicle share		
			AU 4.4 Conventional ICE vehicle efficiency performance		
		5.MANAGEMENT		AU 5.1 Oversight of climate change issues	AU 5.3 Low-carbon transition plan
				AU 5.2 Climate change oversight capability	AU 5.5 Climate change scenario testing
				AU 5.4 Climate change management incentives	
INFLUENCE		6.SUPPLIERS		AU 6.1 Supplier engagement	
		7.CLIENTS	AU 7.1 Efforts to promote sales of advanced vehicles		
		8.POLICY ENGAGEMENT		AU 8.1 Company policy on engagement with trade associations	
				AU 8.2 Trade associations supported do not have climate-negative activities or positions	
				AU 8.3 Position on significant climate policies	
		9.BUSINESS MODEL	AU 9.1 Business activities that reduce structural barriers to market penetration of advanced vehicles		
			AU 9.2 Business activities that contribute to low-carbon optimization of personal mobility		
			AU 9.3 Business activities around the design and manufacture of vehicles to facilitate the modal transport shift		

TARGETS (WEIGHTING: 15%)

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

DESCRIPTION & REQUIREMENTS	AU 1.1 ALIGNMENT OF SCOPE 1+2 EMISSIONS REDUCTION TARGETS
SHORT DESCRIPTION OF INDICATOR	A measure of the alignment of the company's Scope 1+2 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.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 0.B ♦ AU 0.J ♦ AU 1.A External sources of data used for the analysis of this indicator are: ♦ OICA [19] – background scenario data ♦ IEA ETP [5] – background scenario data ♦ SDA [6] – specific benchmark pathway definition The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Scope 1+2 emissions	CB_{S12}	gCO2/vehicle sold	IEA [5], OICA [19]

HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's target (T_{S12}) and the company benchmark (CB_{S12}) 5 years from the reporting year.

The company's target pathway (T_{S12}) 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 and the company's target endpoint.

The company benchmark (CB_{S12}) pathway is the 'company specific Scope 1+2 decarbonization pathway'. See *section 6. Assessment* for details on the computation of this pathway.

The analysis compares T_{S12} to CB_{S12}, by assessing the difference between these pathways 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 auto manufacturers' Scope 1+2 emissions is value added in a unit of currency. Where necessary, targets are normalized to this activity unit to enable the comparison. The result of the comparison is the commitment gap.

To assign a score to this indicator, the size of the commitment gap is compared to the maximum commitment gap, which is defined by the business-as-usual pathway (BAU_{S12}). $BAU_{S12}$is defined as an unchanging (horizontal) intensity pathway, whereby the emissions intensity is constant after 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 (taking all values 5 years after the reporting year):

$$Commitment\ gap\ [Scope\ 1+2] = \frac{T_{S12} - CB_{S12}}{BAU_{S12} - CB_{S12}}$$

$$Score = 1 - Commitment\ gap$$

The score assigned to the indicator is equal to 1 minus the commitment gap and is expressed as a percentage (1 = 100%). Therefore, if $T_{S12} - CB_{S12}$ is equal to zero, and hence the company's target is aligned with the sectoral benchmark, the maximum score is achieved.

RATIONALE OF THE INDICATOR

RELEVANCE OF THE INDICATOR:

Scope 1+2 Targets are included in the ACT AU 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.
- 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 benchmarks for the sector, using the SDA benchmark, which is further explained in section *6.1. Sector Benchmark*.

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 [7]. 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 to 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. 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/).

- **AU 1.2 ALIGNMENT OF FLEET EMISSIONS REDUCTION TARGETS (WEIGHTING: 9%).**

DESCRIPTION & REQUIREMENTS	AU 1.2 ALIGNMENT OF FLEET EMISSIONS REDUCTION TARGETS.

SHORT DESCRIPTION OF INDICATOR

This indicator assesses the company's WTW fleet emissions reduction target, which also incorporates emissions outside of the company's boundary of control.

The indicator identifies the gap between the company's target and the decarbonization pathway as a percentage, which is expressed as the company's commitment gap.

DATA REQUIREMENTS

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

- AU 0.B
- AU 0.I
- AU 1.A
- AU 4.A

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

- IEA ETP [5] – background scenario data
- SDA [6] – specific benchmark pathway definition
- SBTi [3] – specific benchmark pathway conversion into passenger.km

The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Fleet emissions	CB_{FL}	gCO2/p.km	IEA [5], SDA [6], SBTi [3]

HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's target (T_{S3}) and the company benchmark (CB_{FL}) 5 years after the reporting year.

The company's target pathway (T_{S3}) is the decarbonization over time, defined by the company's emissions reduction target. To compute T, a linear line is drawn between the starting point of the analysis and the company's target endpoint.

The company benchmark (CB_{FL}) pathway is the company's WTW fleet emissions decarbonization pathway. See *section 6. Assessment* for details on the computation of this pathway.

The analysis compares $T_{S3}$to CB_{FL}, by assessing the difference between these pathways 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 auto manufacturers Scope 3 emissions from the use of sold products (i.e. WTW fleet emissions) is passenger kilometres. Where necessary, targets are normalized to this activity unit to enable the comparison, using fixed assumptions on passenger occupancy rates from the ICCT [8]. The occupancy rate may be geographically weighted depending on data availability, to improve the accuracy of the measurement. The result of the comparison is the commitment gap.

To assign a score to this indicator, the size of the commitment gap is compared to the maximum commitment gap, which is defined by the business as usual pathway (BAU_{FL}). BAU is defined as an unchanging (horizontal) intensity pathway, whereby the emissions intensity is constant after 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:

$$Commitment\ gap\ [Scope\ 3] = \frac{T_{S3} - CB_{FL}}{BAU_{FL} - CB_{FL}}$$

$$Score = 1 - Commitment\ gap$$

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_{S3}-$CB_{FL}$is equal to zero, and hence the company's target is aligned with the sectoral benchmark, the maximum score is achieved.

The quantitative measurement above is focused on the fleet emissions for the newly manufactured vehicles. Scope 3 targets may also include the upstream value chain. The maximum attainable score is 25% if the company does not have a Scope 3 target that includes the use of sold products (i.e. downstream fleet emissions).

RATIONALE	AU 1.2 ALIGNMENT OF FLEET EMISSIONS REDUCTION TARGETS.
RATIONALE OF THE INDICATOR	**RELEVANCE OF THE INDICATOR:** Scope 3 targets are included in the ACT AU 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. ♦ 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. ♦ WTW fleet emissions include the majority of emissions in the value chain of conventional ICE vehicles, which presently make up the bulk of light passenger vehicles, and therefore the largest individual share of total value chain emissions for most car companies. **SCORING RATIONALE:** Targets are quantitatively interpreted and directly compared to the low-carbon benchmarks for the sector, using the SDA benchmark (see *section 6.1. Sector Benchmark*). The scoring of this indicator follows the same general methodology of scoring indicator AU 1.1. Therefore, refer to the rationale of indicator AU 1.1 for more details on the choices made for this scoring methodology.

• AU 1.3 TIME HORIZON OF TARGETS (WEIGHTING: 2%)

DESCRIPTION & REQUIREMENTS	AU 1.3 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 include a long-term horizon that includes the majority of a company's asset lifetimes, but also includes short and mid-term targets that incentivise action in the present.

DATA REQUIREMENTS

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

- AU 0.B
- AU 1.A
- AU 4.A

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

ICCT [8] – default modelling parameters (car lifetime statistics)

The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Global average lifetime of cars in kilometers	*Ha*	Years	ICCT Roadmap [8]
Regionally weighted lifetime of cars in kilometers	H_{ga}	Years	ICCT Roadmap [8]

HOW THE ANALYSIS WILL BE DONE

The analysis has two dimensions:

1. A comparison of (a) the longest time horizon of the company's targets, and (b) the sector average vehicle lifetimes.
2. 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.

AGREGATE SCORE: DIMENSION 1: 50%, DIMENSION 2: 50%

DIMENSION 1 - TARGET ENDPOINT: The company's target endpoint (T_e) is compared to the general sector average lifetime (H_a) or to the company's geographically weighted average lifetime (H_{ga}) of cars sold. The company's target endpoint (T_e) is equal to the longest time horizon among the company's targets, minus the reporting year:

$$T_e = Longest\ target\ time\ horizon - reporting\ year$$

H_a is the average world lifetime of cars. H_{ga}uses data on geography-specific lifetimes, compared with the company's sales portfolio in these geographies, to create a company-specific average lifetime. $H_{ga}$is more accurate than H_a; however, data availability concerns exist on the viability of calculating H_{ga}.

The analysis compares the company's target endpoint (T_e) to H_{ga}or H_a. This analysis measures the horizon gap:

$$Horizon\ gap = T_e - H_{ga}$$

The company's target endpoint is compared to H_{ga}. A maximum score of 50% is attained if $T_e$equals or exceeds H_{ga}, in which cases the horizon gap is zero. A zero score is awarded if the horizon gap is > 2/3 of H_{ga}, and an intermediate percentage score is awarded for any target that is between these two points, proportional to the size of the horizon gap.

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 H_{ga}. This time horizon is chosen, because H_{ga}represents the final time horizon that the company's long-term target should reach.

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

INTERMEDIATE TARGET GAP LENGTH	SCORE
0 < GAP ≤ 5 years	50%
5 years < GAP ≤ 10 years	25%
10 years < GAP ≤ 15 years	10%
GAP > 15 years	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. The company can attain up to 80% of the maximum score in this calculation. The baseline that results in the higher score is used for the final score.
- Targets that do not cover > 95% of Scope 1+2 or > 95% of 'use of sold products' 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.

RATIONALE	AU 1.3 TIME HORIZON OF TARGETS

RATIONALE OF THE INDICATOR

RELEVANCE OF THE INDICATOR:

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

- The target endpoint is an indicator of how forward looking the company's transition strategy is.
- The expected long lifetime of cars sold means that auto manufacturers 'commit' a large amount of carbon emissions into the future through the cars sold today, 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 expected average lifetime of cars sold by the company. The company has a 'horizon gap' if their targets do not go up to this lifetime.

Three options were considered for calculating the benchmark of this indicator:

1. Using average lifetimes of the company's cars sold today, possibly weighted by the geography of the sales.
2. Using median & quartile lifetimes of the company's cars sold today.
3. Applying a minimum carbon budget coverage on the 'committed emissions' that are implied by cars sold today.

Option 1 was chosen: The average lifetime of the company's cars sold today. The possibility of weighting by geography of sales is explored, as there are relatively accurate estimates available from the ICCT Roadmap model [8].

Option 2 was considered, but no interpretative advantage is offered by this approach for the auto manufacturers assessment.

Option 3 provides the most theoretically favourable measurement method. This method would calculate the implied 'carbon commitment' from cars sold today. However, this would have required additional data on the lifetime in terms of vehicle kilometres, and not just lifetime in terms of years. This is available as an assumption similar to the vehicle lifetime and used by indicator ACT AU 4.2, but would have been subject to uncertainty if it could not be geographically weighted. This option was ultimately not chosen at this time due to unavailability of data.

• AU 1.4 ACHIEVEMENT OF PREVIOUS TARGETS (WEIGHTING: 2%)

DESCRIPTION & REQUIREMENTS	AU 1.4 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: ♦ AU 0.B ♦ AU 0.J ♦ AU 1.A
HOW THE ANALYSIS WILL BE DONE	For the performance score, this is assessed on two dimensions, whereby companies achieve the maximum score if: **DIMENSION 1:** The company has 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 remaining to target achievement (Progress Ratio p) is not lower than 0.5:

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

The highest score is attained if p is 1 or higher. 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 who do not have targets with target years in the past but only with target years in the future are not assessed on dimension 1, but only on dimension 2.
- Targets that do not cover >95% of (i) 'Scope 1+2 emissions' or (ii) 'Scope 3 use of sold product emissions' are not preferred in the calculation of dimension 2, but are not penalized, as other indicators already penalize for not having a large coverage in the target.
- If the company has multiple targets in different scopes that can be assessed according to the above criteria, then the score is an average score based on the progress ratios of all targets assessed.

The performance score does not assess the ambition level of previous targets, and therefore dimension 1 has only a low weight in the final performance score. This information is also qualitatively assessed in the analysis narrative, which will take another 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 currently active 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 historical target ambition and company performance is included in the ACT AU assessment for the following reasons:

- The ACT assessment looks to the past only to the extent that it can inform on the future. This indicator is future-relevant by providing information on the organizational capability to set and meet emissions reduction targets. Dimension 1 of this indicator adds credibility to any company claim to commitment to a science-based reduction pathway.
- Indicators 1.1, 1.2 and 1.3 look at targets in a vacuum. Dimension 2 of this indicator adds value to the analysis of a comparison with the company's performance with respect to their 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: 2%)

- **AU 2.1 TREND IN PAST EMISSIONS INTENSITY (WEIGHTING: 2%)**

DESCRIPTION & REQUIREMENTS	AU 2.1 TREND IN PAST EMISSIONS INTENSITY
SHORT DESCRIPTION OF INDICATOR	This metric assesses the company's reduction in emissions intensity of scope 1+2 emissions over a 5-year period to the reporting year (reporting year minus 5 years).
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 0.B ♦ AU 2.A External sources of data used for the analysis of this indicator are: ♦ OICA [19] – background scenario data ♦ IEA ETP [5] – background scenario data ♦ SDA [6] – specific benchmark pathway definition The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Scope 1+2 emissions	CB_{S12}	gCO2/vehicle sold	IEA [5], OICA [19]

HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's recent (reporting year minus 5 years) emissions intensity trend gradient (CR'_{S12}) and the company's decarbonization pathway trend gradient (CB'_{S12}) in the short-term (reporting year plus 5 years).

CR'_{S12} is the gradient of the linear trendline of the company's recent Scope 1+2 emissions intensity (CR_{S12}).

CB'_{S12} is the gradient of the linear trendline of the company benchmark pathway for emissions intensity (CB_{S12}). See *section 6.2. Quantitative benchmarks used for the indicators* for details on the computation of the company specific decarbonization pathway.

The difference between CR'_{S12} and CB'_{S12} will be measured by their ratio (r_{S12}). This is the 'Scope 1+2 Transition ratio' which is calculated by the following equation, with the symbol 'used to denote gradients:

$$r_{S12} = \frac{CR'_{S12}}{CB'_{S12}}$$

If the transition ratio is a negative number, it means the company's recent emissions intensity has increased (positive CR'_{S12}) and a zero score is awarded by default. If the company's recent emissions intensity has decreased, the transition ratio will be a positive number. The value of the ratio is capped at 1, which represents the maximum score. A score is assigned as a percentage value equal to the value of r_{S12} (1 = 100%).

RATIONALE **AU 2.1 TREND IN PAST EMISSIONS INTENSITY**

RATIONALE OF THE INDICATOR

RELEVANCE OF THE INDICATOR:

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

- While the focus is on fleet emissions, a not insignificant part of emissions comes from the production phase of cars, and therefore a holistic assessment does need to take it into account.
- 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, ACT does not want to solely rely on projections in a way that would make the analysis too vulnerable to uncertainty. Therefore, this particular indicator, 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. Thus, instead of a gap analysis, a trend analysis is conducted. An 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.

INTANGIBLE INVESTMENT (WEIGHTING: 12%)

• AU 3.1 R&D FOR LOW-CARBON TRANSITION (WEIGHTING: 12%)

DESCRIPTION & REQUIREMENTS	AU 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 identifies 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: ♦ AU 3.A External sources of data used for the analysis of this indicator are: ♦ Ecofys-WWF [11] – benchmark data

The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
R&D Benchmark for AU 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 compares 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 is compared to a benchmark for mitigation R&D (B_{RD}) intensity, and a score is 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 gap. It is calculated by dividing D by B_{RD}.

$$R\&D\ Investment\ ratio_1 = \frac{D}{B_{RD}}$$

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% is 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:

$$R\&D\ Investment\ ratio_2 = \frac{D_{(non-mature)}}{B_{RD}}$$

A company with an investment ratio of 1 for dimension 2 shall achieve 100% of the maximum score. If the ratio is lower 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	AU 3.1 R&D FOR LOW-CARBON TRANSITION
RATIONALE OF THE INDICATOR	**RELEVANCE OF THE INDICATOR:** Trend in past emissions intensity is included in the ACT AU assessment for the following reasons: ♦ To enable the transition, sectors such as the Auto manufacturers sector rely heavily on the development of low-carbon technologies to replace their currently high-emitting drivetrains. 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 in the company's commitment to alternative technologies that may not currently be part of its main business model.

DEFININD ‘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 [12]. The ACT assessment is not focused solely on patents, but will use the taxonomy presented. The main relevant category is 6: “climate change mitigation technologies related to transport.” [13].

DEFINING ‘NON-MATURE R&D’:

It is recognized that ICE drivetrain efficiency has made great strides of improvement over the past few decades, but that it does not have the mitigation potential similar to alternative drivetrains [14]. The IEA scenarios have identified such alternative drivetrains such as electric vehicles (BEV), plug-in hybrid vehicles (PHEV) and hydrogen electric vehicles (HEV) as key technologies for a successful transition [2]. Because of their untapped potential and high current production costs [15], these technologies are defined as ‘non-mature’ in the ACT assessment.

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. Technologies that have a low mitigation potential compared to competing technologies are excluded, as they are considered ‘mature’. For auto manufacturers, the only category of technology that is excluded by this principle is ‘R&D in ICE Drivetrains’ [15].

SCORING RATIONALE:

To align with the narrative of gaps that is also used in the indicators for Modules 1 and 2, the indicator is computed as the ‘R&D investment gap’. This investment gap is only assigned 50% of the maximum score, as the analysis wishes to incentivise R&D into low-carbon drivetrains as opposed to conventional ICE drivetrains. Therefore, the achievable score for achieving a high R&D in non-mature technologies ($D_{(non-mature)}$) is double that of the score when this criterion is not included (D).

SOLD PRODUCT PERFORMANCE (WEIGHTING: 35%)

• AU 4.1 FLEET EMISSIONS PATHWAY (WEIGHTING: 8%)

DESCRIPTION & REQUIREMENTS	AU 4.1 FLEET EMISSIONS PATHWAY
SHORT DESCRIPTION OF INDICATOR	A measure of the alignment of the company's sold WTW fleet emissions intensity with its decarbonization pathway. The indicator will identify the gap in the reporting year between the company's new product performance and that required by 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: ♦ AU 0.B ♦ AU 0.I ♦ AU 4.A External sources of data used for the analysis of this indicator are: ♦ IEA ETP [5] – background scenario data ♦ SDA [6] – specific benchmark pathway definition ♦ SBTi [3] – specific benchmark pathway conversion into passenger.km ♦ ICCT [8] – default modelling parameters The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Fleet emissions	CB_{FL}	gCO2/p.km	IEA [5], SDA [6], SBTi [3]

HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's action over the 5 years previous to the reporting year (A_{FL}) and the company benchmark ($CB_{FL.-5years}$) that was applicable 5 years before the reporting year.

The company action pathway (A_{FL}) is benchmarked on WTW emissions from car use. This is expressed as the emissions intensity (gCO2e/p.km) of PLDVs over the previous 5 years. Sales are converted from the number of PLDVs sold to p.km using country-level average passenger density and travel distance factors.

The company benchmark ($CB_{FL.-5years}$) pathway is the 'company specific decarbonization pathway' that was applicable 5 years before the reporting year. See *section 6. Assessment* for details on the computation of this pathway.

The analysis compares $A_{FL}$to $CB_{FL.-5years}$ by examining the difference between these pathways in the reporting year. 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 is compared to the maximum action gap, which is defined by the business-as-usual pathway based on the company performance 5 years before the reporting year ($BAU_{FL.-5years}$). $BAU_{FL.-5years}$ is defined as an unchanging (horizontal) intensity pathway, whereby the emissions intensity is constant after this initial year.

$$Fleet\ emissions\ action\ gap = \frac{A_{FL} - CB_{FL.-5years}}{BAU_{FL.-5years} - CB_{FL.-5years}}$$

$$Score = 1 - Future\ emissions\ action\ gap$$

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_{FL}-$CB_{FL.-5years}$ is equal to zero, and the company's target is thus aligned with the sectoral benchmark, the maximum score is achieved.

RATIONALE OF THE INDICATOR

RELEVANCE OF THE INDICATOR:

The (WTW) fleet emissions pathway is included in the ACT assessment for the following reasons:

- 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.
- In the Auto sector, emissions from the use of sold products (i.e. WTW fleet emissions) far outweigh Scope 1+2 emissions.

SCORING RATIONALE:

This indicator is where the principal 'action gap' between the company's actions and the benchmark is assessed. Ideally, this would be done on a future date, whereby the company's sales projections would dictate the company's pathway. However, because of the volatility of the auto market and the confidentiality/uncertainty of such data, this is not a very robust approach. While it may be possible to do with improvements on data availability, we are aiming to use more available past data. Therefore, the benchmark that companies are assessed on for this particular indicator also starts 5 years prior to the reporting year, and not in the reporting year itself as with the Targets indicator.

To ensure comparability of the scores and replicability of the measurement, WTW fleet emissions are compared to the benchmark at a fixed point in time, similar to all companies. This is necessary because the method interprets linear trendlines from company data, while the decarbonization pathways from the benchmark are nonlinear. Therefore, the measurement gaps would vary over time if the time of measurement was not constant.

• AU 4.2 FLEET EMISSIONS LOCK-IN (WEIGHTING: 7%)

DESCRIPTION & REQUIREMENTS	AU 4.2 FLEET EMISSIONS LOCK-IN
SHORT DESCRIPTION OF INDICATOR	A measure of the company's cumulative sold WTW fleet emissions deriving from PLDV sales over the short-term based on market projections. The indicator will compare this to the emissions budget from the same period entailed by the company's WTW fleet emissions intensity decarbonization pathway and scenario projected sector sales trends at the country/regional level.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 0.B ♦ AU 4.A External sources of data used for the analysis of this indicator are: ♦ IEA ETP [5] – background scenario data ♦ SDA [6] – specific benchmark pathway definition ♦ SBTi [3] – specific benchmark pathway conversion into passenger.km ♦ ICCT [8] – default modelling parameters ♦ OICA [19] – car sales statistics The benchmark indicators involved are:
HOW THE ANALYSIS WILL BE DONE	The analysis is based on the difference between the company's locked-in emissions of PLDVs sold over the short-term ($L_{FL.5years}$) with the emissions budget entailed by the company's carbon budget ($B_{FL.5years}$).

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Fleet emissions	B_{FL}	gCO2/p.km	IEA [5], SDA [6], SBTi [3]

$L_{FL.5years}$ is calculated as the total cumulative emissions implied by sales in the near future up until 5 years after the reporting year, calculated as the cumulative product of the sales volume multiplied by the fleet emissions intensity. The fleet emissions intensity pathway and sales pathway over the 5-year period should be deduced from the emissions respective trends on the reported year. The sales trends may be drawn by assuming the continuation of country-level trends in PLDV sales, adjusted for changes in past and projected trends in country GDP per capita. It is then assumed that the company's share of sector sales in each market remains fixed, and therefore follows this trend.

$B_{FL.5years}$ is calculated as the company's carbon budget over the 5 years after the reporting year, by drawing the total carbon budget up until 2050 (calculated using CB_{FL}) and cutting off at 5 years from the reporting year to draw the intermediate budget. The total carbon budget of the company is calculated based on the company's benchmark. Any exceedance of this intermediate budget will have to be compensated for at a later date, which is penalized for in the score. The 'Lock in ratio' (r_{LB}) is calculated as follows:

$$r_{LB} = \frac{L_{FL.5years}}{B_{FL.5years}}$$

CALCULATION OF THE SCORE:

If r_{LB} is 1 or lower, then the company stays within its carbon budget, and is assigned the maximum score (100%). If r_{LB} is 1.5 or higher, then the company strongly exceeds its carbon budget, and is 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	AU 4.2 FLEET EMISSIONS LOCK-IN
RATIONALE OF THE INDICATOR	**RELEVANCE OF THE INDICATOR:**

Fleet emissions lock-in is included in the ACT assessment for the following reasons:

- Absolute greenhouse gas emissions over time is the most relevant measure of emissions performance for assessing a company's contribution to global warming. Analysing a company's locked-in emissions alongside science-based budgets also introduces the means to scrutinise the potential cost of inaction over the short-medium term.
- Examining absolute emissions, along with recent and short-term emissions intensity trends, forms part of a holistic view of company emissions performance in the past, present, and future.

SCORING RATIONALE:

By estimating sales 5 years after the reporting year, this indicator attempts to explore the divergence between the forecasted trajectory and the trajectory required by the science based targets. Applying this forecast provides a useful indication of how the company's emissions intensity relates to absolute emissions. To set it apart from AU 4.1; fleet emissions pathway, this is a more forward-looking analysis.

• AU 4.3 LOW-CARBON VEHICLE SHARE (WEIGHTING: 15%)

DESCRIPTION & REQUIREMENTS	AU 4.3 LOW-CARBON VEHICLE SHARE
SHORT DESCRIPTION OF INDICATOR	A measure of the company's growth in sales of low-carbon vehicles as compared with the annual growth rate required in the sector under a 2°C scenario.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 0.B ♦ AU 4.A External sources of data used for the analysis of this indicator are: ♦ IEA [5] – background scenario data The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
Low-carbon vehicle share	CB_{LCV}	% sales	IEA [5]

HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's low-carbon vehicle sales (CS_{LCV}) across the 2 years that precede the reporting year (e.g. 2015-2017 if reporting year is 2017) and the low-carbon vehicle sales required by the IEA ETP 2DS (or B2DS) scenario across the same period to reach the global target set 10 years after the reporting year.

The company's sales 2 years before the reporting year (e.g. in 2015 if reporting year is 2017) will be compared to the global average, and the company-specific benchmark that was applicable to the company 5 years before the reporting year ($CB_{LCV.-5years}$) is computed using a partial convergence method similar to SDA. Please see *section 6. Assessment* for more details on the computation of this benchmark.

Two calculations are performed to calculate the difference, namely a gap analysis and a trend comparison. The assigned score is the arithmetic average of the scores obtained with each of the two calculations:

1. TREND COMPARISON:

The trend comparison follows the methodology of AU 2.1, 'Trend in past emissions intensity'. The ratio of the gradients of the company sales to the benchmark is computed across the 2 years that precede the reporting year. The resulting number is the 'LCV Growth ratio' (r_{LCV}). The symbol ' is used to denote gradients:

$$r_{LCV} = \frac{CS'_{LCV}}{CB'_{LCV}}$$

SCORE:

In the trend comparison, if r_{LCV} is 1 or greater, the company's growth rate is equal to or greater than the benchmark and receives the maximum score of 100%. If r_{LCV} is lower than 1, the company growth rate is lower than the benchmark and a score is assigned as a percentage value equal to the value of r_{LCV} .

2. GAP COMPARISON:

The gap comparison follows the methodology of AU 4.1, 'Fleet emissions pathway'. The difference between the company sales and what the company sales should have been according to the benchmark is computed for the reporting year. For this, the business as usual sales pathway ($BAU_{LCV.-5years}$) is computed, which assumes no growth in LCV's from 5 years before the reporting year onwards. The resulting

number is the ‘LCV sales gap’. The anchor point in time from which the pathways (benchmark, company sales, business as usual) can vary is yet to be determined, as it is dependent on data availability and data quality.

$$LCV\ sales\ gap = \frac{CS_{LCV} - CB_{LCV.-5years}}{BAU_{LCV.-5years} - CB_{LCV.-5years}}$$

SCORE:

In the gap comparison, if the difference between the two terms is zero or negative, then there is no LCV sales gap and the company receives the maximum score. If there is a positive LCV sales gap, a score is assigned equal to the relative size of this gap.

RATIONALE	AU 4.3 LOW-CARBON VEHICLE SHARE
RATIONALE OF THE INDICATOR	**RELEVANCE OF THE INDICATOR:**

Low-carbon vehicle share is included in the ACT AU assessment for the following reasons:

- Emissions intensity pathways in the sector cannot be met without a change in drivetrain technology, and sales are the direct ‘output measure’ that indicates how this change is incorporated in the business model.
- The IEA 2DS scenario, and 2-degree scenarios of other models, all include a significant share of annual sales in 2050 coming from low-carbon vehicles. A company’s commitment to new technologies is therefore a strong indication of its commitment to a 2 degrees future.

Refer to the Glossary for a definition of ‘*low-carbon vehicle*’.

SCORING RATIONALE:

Because of the novelty of the indicator and uncertainty of the data availability, the scoring methodology was built as a mix between gap and trend analysis. Gap analysis has interpretative advantages and is aligned with most of the other indicators. However, as LCVs are a relatively new concept and therefore picking a fixed time interval after which a gap can be identified may be challenging, trend analysis is also relevant.

Data may not be available on LCV sales for all companies in a particular year, or if it is available it may be of low quality or such low maturity that it is not meaningful to start benchmarking from that point. Due to this, the benchmark point may have to move forward in time to such a degree that gap analysis is no longer meaningful and trend analysis becomes preferable.

• AU 4.4 CONVENTIONAL ICE VEHICLE EFFICIENCY PERFORMANCE (WEIGHTING: 5%)

DESCRIPTION & REQUIREMENTS	AU 4.4 CONVENTIONAL ICE VEHICLE EFFICIENCY PERFORMANCE
SHORT DESCRIPTION OF INDICATOR	A measurement of the recent (5 years to the reporting year) trend in WTW fleet emissions intensity of sold PLDVs that use conventional ICE (including conventional hybrids) drivetrains is measured and assessed.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 0.B ♦ AU 0.I ♦ AU 4.A External sources of data used for the analysis of this indicator are: ♦ IEA [5] – background scenario data ♦ SBTi [3] – conversion of scenario data into passenger.km The benchmark indicators involved are:

TARGET TYPE	PARAMETER	INTENSITY METRIC	BENCHMARK
ICE vehicle emissions intensity	CB_{ICE}	gCO2/p.km	IEA [5], SBTi [3]

HOW THE ANALYSIS WILL BE DONE

The analysis is based on the difference between the company's recent fleet emissions intensity trend (CE_{ICE}) and the company ICE emissions intensity benchmark (CB_{ICE}).

This is a trend comparison that follows the methodology of AU 2.1, 'Trend in past emissions intensity'. The ratio of the gradients of the company sales to the benchmark is computed, for the 5 years prior to the reporting year. The resulting number is the 'ICE vehicle efficiency ratio' (r_{ICE}). The symbol ' is used to denote gradients:

$$r_{ICE} = \frac{CE'_{ICE}}{CB'_{ICE}}$$

SCORE:

In the trend comparison, if r_{ICE} is 1 or greater, the company's growth rate is equal to or greater than the benchmark and receives the maximum score of 100%. If r_{ICE} is lower than 1, the company growth rate is lower than the benchmark and a score is assigned as a percentage value equal to the value of r_{ICE}.

RATIONALE **AU 4.4 CONVENTIONAL ICE VEHICLE EFFICIENCY PERFORMANCE**

RATIONALE OF THE INDICATOR

RELEVANCE OF THE INDICATOR:

Conventional ICE vehicle emissions intensity is included in the ACT AU assessment for the following reasons:

- Improving conventional vehicles alone will not be enough for the transport sector to achieve its low-carbon transition. However, the rate of improvement in the fuel economy of conventional ICE PLDVs is indicative of a company's recognition for tackling emissions today and in the short-term.
- Design actions not relating to the drivetrain, e.g. light-weighting, are also important in the long-term and efforts in those dimensions can be visible through measurement of this indicator, whereas in indicator EU 4.1 those impacts would be overshadowed by changes in drivetrain technology.

SCORING RATIONALE:

While 'gap' type scoring is preferred for any indicator where possible, the availability of data on vehicle emissions and the accepted practice of showing trends in vehicle emissions across similar reports [5], has made the trend analysis attractive for scoring this indicator. 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.

MANAGEMENT (WEIGHTING: 11%)

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

DESCRIPTION & REQUIREMENTS	AU 5.1 OVERSIGHT OF CLIMATE CHANGE ISSUES
SHORT DESCRIPTION OF INDICATOR	The company discloses that responsibility for climate change within the company lies at the highest level of decision-making within the company structure.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 5.A ♦ AU 5.B External sources of data may also be used for the analysis of this indicator.
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	AU 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 AU 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 as a good practice.

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

DESCRIPTION & REQUIREMENTS	AU 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: ♦ AU 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	AU 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 level, a lack of expertise could be a barrier to successful management of low-carbon transition.

• AU 5.3 LOW-CARBON TRANSITION PLAN (WEIGHTING: 4%)

DESCRIPTION & REQUIREMENTS	AU 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: ♦ AU 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 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.

Among the best practice elements identified to date are:

- The plan includes financial projections
- The plan should include cost estimates or other assessments 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
- The scope should cover 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 is 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 (SBT)

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

RATIONALE	AU 5.3 LOW-CARBON TRANSITION PLAN
RATIONALE OF THE INDICATOR	The AU 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.

• AU 5.4 CLIMATE CHANGE MANAGEMENT INCENTIVES (WEIGHTING: 1%)

DESCRIPTION & REQUIREMENTS	AU 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: ♦ AU 5.D ♦ AU 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	AU 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.

• AU 5.5 CLIMATE CHANGE SCENARIO TESTING (WEIGHTING: 4%)

DESCRIPTION & REQUIREMENTS	AU 5.5 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: ♦ AU 5.F
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 are 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: ♦ entire coverage of the company's boundaries ♦ timescale from present to long-term (2035-2050) ♦ translation of results into value-at-risk or other financial terms ♦ multivariate: a range of different changes in conditions are considered together ♦ changes in conditions that 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	AU 5.5 CLIMATE CHANGE SCENARIO TESTING
RATIONALE OF THE INDICATOR	Changes predicted to occur due to climate change could have a number of consequences for the AU sector, including 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 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. 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 analysis. 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), it has even greater importance.

SUPPLIER ENGAGEMENT (WEIGHTING: 6%)

- **AU 6.1 SUPPLIER ENGAGEMENT (WEIGHTING: 6%)**

DESCRIPTION & REQUIREMENTS	AU 6.1 SUPPLIER ENGAGEMENT
SHORT DESCRIPTION OF INDICATOR	This indicator assesses the level of engagement that the company has with its suppliers, based on an assessment of ‘demonstration’ that shows whether or not the company engages with suppliers in various ways.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 6.A ♦ AU 6.B

♦ AU 6.C

HOW THE ANALYSIS WILL BE DONE

The analysis assigns a maturity score based on the company's demonstration of engagement with its suppliers, expressed in a maturity matrix. Successive levels into this matrix represent a more advanced level of engagement that works towards a collaborative effort of decarbonizing the manufacturing chain, and assumes that the actions in the previous level are also part of the company's engagement.

STARTING POINT →	→	→	**ALIGNED**
No engagement with suppliers with respect to emissions reduction	The company requires suppliers to sign a code of conduct or similar agreement. The company assesses risks in the supply chain by suppliers and has self-reported information by suppliers audited..	The company builds capacity and educates suppliers on the importance of emissions reduction. The company has an active track record of driving emissions reduction in the supply chain. The company collaborates with suppliers in R&D in improving the efficiency of existing vehicles.	The company collaborates with its key technology suppliers to define a joint transition plan. The company collaborates with suppliers in R&D in developing low-carbon drivetrains.	The company has a proven track record in emissions reduction in its sold products due to collaboration with suppliers in R&D.

A company that is placed in the 'aligned' category receives the maximum score. Companies that are at lower levels receive a partial score, with 0% assigned for having no engagement at all.

This maturity matrix is indicative but does not show all possible options that can result in a particular score. Companies' responses are examined by the analyst and then placed on the level in the matrix where the analyst deems it most appropriate.

RATIONALE **AU 6.1 SUPPLIER ENGAGEMENT**

RATIONALE OF THE INDICATOR

RELEVANCE OF THE INDICATOR:

Supplier engagement is included in the ACT AU assessment for the following reasons:

- As the auto manufacturing value chain is highly specialized, technologically complex and integrated, car companies rely heavily on innovations within their supply chain.
- Decarbonization of the supply chain is also key to achieving ambitious decarbonization goals in both the manufacturing and use-case of the cars.

SCORING THE INDICATOR:

Because of data availability and complexity, a direct measure of the outcome of such engagement is not very feasible at this time. It is often challenging to quantify the emissions reduction potential and outcome of collaborative activities with the supply chain. Therefore, the approach of a maturity matrix allows the analyst to consider multiple dimensions of supplier engagement and assess them together towards a single score for Supplier Engagement.

CLIENT ENGAGEMENT (WEIGHTING: 4%)

• AU 7.1 EFFORTS TO PROMOTE SALES OF ADVANCED VEHICLES (WEIGHTING: 4%)

DESCRIPTION & REQUIREMENTS	AU 7.1 EFFORTS TO PROMOTE SALES OF ADVANCED VEHICLES
SHORT DESCRIPTION OF INDICATOR	This indicator measures whether the company has put in active efforts to promote the sales of more efficient vehicles as opposed to less efficient ones, in order to influence their customers and direct a culture change away from high-emitting vehicles.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 7.A ♦ AU 7.B

HOW THE ANALYSIS WILL BE DONE

The performance analysis for this indicator looks at these dimensions (< high score vs medium/low score >):

DIMENSION 1: Model type of the promotion (< low-carbon vehicles vs efficient ICE only >). (x/2)

1 point is awarded for promoting efficient ICE vehicles. 2 points for promoting low-carbon vehicles.

DIMENSION 2: Geographic coverage (< multinational effort vs localized in one region >). (x/4)

4 points are awarded if company has efforts in 4 or more regions, with decreasing points for decreasing multinational coverage.

DIMENSION 3: Active status (< Still active/succeeded vs ended >) (x/2)

If the reported efforts are no longer active, 0 points. Otherwise, 2 points.

DIMENSION 4: Success KPI (< High ambition of sales growth vs. low ambition of sales growth. >) (x/4)

If the sales efforts are reduced after a certain (regulation imposed) limit is reached, then the company will receive 0 points.

RATIONALE | **AU 7.1 EFFORTS TO PROMOTE SALES OF ADVANCED VEHICLES**

RATIONALE OF THE INDICATOR

RELEVANCE OF THE INDICATOR:

Efforts to promote more efficient vehicles are included in the ACT AU assessment for the following reasons:

- It has been identified that some efficient ICE and low-carbon vehicles on the market do not go beyond regulatory limits (compliance cars) and therefore do not imply any meaningful transition within the company. This indicator exists to identify this situation.
- Companies who wish to change their primary drivetrain technology to low-carbon alternatives need to be able to market them, and convince their clients of the merits of the new vehicles.

SCORING THE INDICATOR:

Scoring this indicator is done in a similar fashion to the CDP scoring system, as it scores a set of narrative data points that do not have a quantitative interpretation. 4 dimensions were identified, and of these dimensions, the most weight was given to the geographic coverage and success KPI. This is because these two provide the most information on the scale of the promotion efforts, and are therefore best able to identify compliance cars.

POLICY ENGAGEMENT (WEIGHTING: 6%)

MODULE RATIONALE

Vehicle specifications, such as fuel efficiency, are often regulated, highlighting the importance of air pollution management to economies. However, regulation affecting the sector is usually developed in a consultative fashion due to the need for technical inputs. This allows significant room for influencing these regulations, potentially in a way that is negative for the climate. Since the industry is currently a major source of GHG emissions, timely regulation is necessary to ensure that scientific limits are considered and that there is a "level playing field" for businesses in this sector to approach transition to a low-carbon economy.

• AU 8.1 COMPANY POLICY ON ENGAGEMENT WITH TRADE ASSOCIATIONS (WEIGHTING: 2%)

DESCRIPTION & REQUIREMENTS	AU 8.1 COMPANY POLICY ON ENGAGEMENT WITH TRADE ASSOCIATIONS
SHORT DESCRIPTION OF INDICATOR	The company has a policy on what action to take when industry organisations to which it belongs are found to be opposing "climate-friendly" policies.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 8.A ♦ AU 8.B ♦ AU 8.E
HOW THE ANALYSIS WILL BE DONE	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 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. Best practice elements to be identified in the test/analysis include: ♦ Having a publicly available policy in place

- The scope of the policy covers the entire company and its activities, and all group memberships and associations
- The policy sets out what action is to be taken in the case of inconsistencies
- Action includes the option to terminate membership of the association
- Action includes 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
- There is a process to monitor and review trade association positions

Maximum points are awarded if all these elements are demonstrated.

RATIONALE	AU 8.1 COMPANY POLICY ON ENGAGEMENT WITH TRADE ASSOCIATIONS
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, when 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].

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

DESCRIPTION & REQUIREMENTS	AU 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: ♦ AU 8.C

- AU 8.D
- AU 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 source entries relating to the company is assessed against a list of associations that have climate-negative activities or positions. The results are compared to any policy described in AU 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.

RATIONALE	AU 8.2 TRADE ASSOCIATIONS SUPPORTED DO NOT HAVE CLIMATE-NEGATIVE ACTIVITIES OR POSITIONS
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.

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

DESCRIPTION & REQUIREMENTS	AU 8.3 POSITION ON SIGNIFICANT CLIMATE POLICIES
SHORT DESCRIPTION OF INDICATOR	The company is not opposed to any significant climate relevant policy and/or supports climate friendly policies.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 8.E ♦ AU 8.F

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 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 are allocated for elements indicating a higher level of maturity.

Maturity matrix contents may include (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. via a 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 issues or given by a company representative in a speech or interview)

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

RATIONALE OF THE INDICATOR

See also the module rationale.

Policy and regulation that act to promote transition to a low-carbon economy are 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: 9%)

MODULE RATIONALE

In addition to developing low-carbon vehicles, 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 decouple financial results from GHG emissions, in order to meet the constraints of a 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 design, production and sales of vehicles.

This indicator aims to identify both relevant current business activities and those still at a burgeoning stage. It is recognised that 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 the latter (i.e. substantially sized, profitable, and/or expanding) business activities will be better rewarded.

A variety of sources have been consulted to develop a comprehensive review of the challenges facing the auto manufacturing sector in relation to the low-carbon transition. A number of opportunities for the sector have been identified which the ACT initiative has formatted under a taxonomy for reporting the development of business activities connected to them. The main reference source for these indicators is "New Business Models for Alternative Fuel and Alternative Powertrain Vehicles", Wells & Niewenhuis, IFP, 2012 [17].

Climate scenarios can identify shifts in modes of transport as a component of change in the transportation system that will foster the transition to a low-carbon economy. Companies committed to adapting their business to these predicted changes will be better positioned to take advantage of associated opportunities and successfully transition to a low-carbon economy.

- **AU 9.1 BUSINESS ACTIVITIES THAT REDUCE STRUCTURAL BARRIERS TO MARKET PENETRATION OF ADVANCED VEHICLES (WEIGHTING: 3%)**

DESCRIPTION & REQUIREMENTS	AU 9.1 BUSINESS ACTIVITIES THAT REDUCE STRUCTURAL BARRIERS TO MARKET PENETRATION OF ADVANCED VEHICLES
SHORT DESCRIPTION OF INDICATOR	The company is actively developing business models for a low-carbon future, and participating in business activities that reduce structural barriers to market penetration of advanced vehicles
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 9.A
HOW THE ANALYSIS WILL BE DONE	The analysis is based on the company's degree of activity in one of the future business model areas used to benchmark. Relevant business activity areas for this indicator are: ♦ Financing for consumers ♦ Vehicle leasing models ♦ Battery leasing models ♦ Public-private leasing models ♦ Insurance/guarantees/take-back schemes (taking the financial risk of new technologies away from the consumer) ♦ Financing for the supply chain to retool & restructure ♦ Infrastructure development ♦ Financing electric charging stations ♦ Developing charging station technology ♦ Renewable energy infrastructure development ♦ Developing hydrogen infrastructure ♦ Developing hydrogen production, transport and storage technology ♦ Financing for low-carbon vehicle infrastructure development ♦ Technological enabling of Low-carbon vehicle infrastructure development ♦ Collaboration in Low-carbon vehicle infrastructure development

In order for companies to align with a low-carbon future and meet the future mobility needs, it is expected that they pursue at least one of these future business model pathways and integrate them into their strategic plans. The analyst evaluates the description and evidence of the company's degree of activity in one of the 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	AU 9.1 BUSINESS ACTIVITIES THAT REDUCE STRUCTURAL BARRIERS TO MARKET PENETRATION OF ADVANCED VEHICLES
RATIONALE OF THE INDICATOR	See the module rationale.

• AU 9.2 BUSINESS ACTIVITIES THAT CONTRIBUTE TO LOW-CARBON OPTIMIZATION OF PERSONAL MOBILITY (WEIGHTING: 3%)

DESCRIPTION & REQUIREMENTS	AU 9.2 BUSINESS ACTIVITIES THAT CONTRIBUTE TO LOW-CARBON OPTIMIZATION OF PERSONAL MOBILITY
SHORT DESCRIPTION OF INDICATOR	The company is actively developing business models for a low-carbon future, in participating in business activities associated with modal shifts and other activities such as car sharing.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 9.A
HOW THE ANALYSIS WILL BE DONE	The analyst evaluates the company's degree of activity in one of the future business model areas used to benchmark. Relevant business activity areas for this indicator are: ♦ Modal transport shift - other ♦ Car sharing schemes ♦ Carpooling or car-ride services ♦ Vehicle-as-a-service offerings In order for companies to align with a low-carbon future and meet the future mobility 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 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	AU 9.2 BUSINESS ACTIVITIES THAT CONTRIBUTE TO LOW-CARBON OPTIMIZATION OF PERSONAL MOBILITY
RATIONALE OF THE INDICATOR	See the module rationale.

• AU 9.3 BUSINESS ACTIVITIES AROUND THE DESIGN AND MANUFACTURE OF VEHICLES TO FACILITATE THE MODAL TRANSPORT SHIFT (WEIGHTING: 3%)

DESCRIPTION & REQUIREMENTS	AU 9.3 BUSINESS ACTIVITIES AROUND THE DESIGN AND MANUFACTURE OF VEHICLES TO FACILITATE THE MODAL TRANSPORT SHIFT
SHORT DESCRIPTION OF INDICATOR	The company is actively developing business models for a low-carbon future and participating in business activities to build vehicle types required by modal shifts in mobility.
DATA REQUIREMENTS	The questions comprising the information request that are relevant to this indicator are: ♦ AU 9.A
HOW THE ANALYSIS WILL BE DONE	The analyst evaluates the company's degree of activity in one of the future business model areas used for benchmarking. Relevant business activity areas for this indicator are: ♦ Manufacturing mass low-carbon alternative vehicles to PLDVs (bus/train/other mass transport)

- Manufacturing personal low-carbon alternative vehicles

In order for companies to align with a low-carbon future and meet future mobility needs, it is expected that they pursue at least one of these future business model pathways and integrate them into their strategic plans. The analyst evaluates the description and evidence of the company's degree of activity in one of the 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	AU 9.3 BUSINESS ACTIVITIES AROUND THE DESIGN AND MANUFACTURE OF VEHICLES TO FACILITATE THE MODAL TRANSPORT SHIFT
RATIONALE OF THE INDICATOR	See the module rationale.

6. Assessment

6.1. SECTOR BENCHMARK

The default sector benchmark is based on the sectoral decarbonization approach (SDA [6]) of the Science-Based Targets Initiative, which uses WTW emissions as metrics. This approach is, by default, conveyed with the use of scenario data from IEA ETP series. Specifically, the 2DS scenario of the ETP model [5] that deals with the passenger light duty vehicle (PLDV) sector is drawn from and used as the default.

Figure 1 illustrates the transition of the global light duty vehicles (LDV, which includes PLDV and LCDV or light commercial duty vehicles) stock by power-train technology under the IEA ETP 2DS scenario, in which global average PLDV 'well-to-wheel' emissions intensity (emissions per passengers.kilometres) decreases by about 73% between 2015 and 2050 (i.e. 159.7 to 42.9 gCO2/p.km) [18].

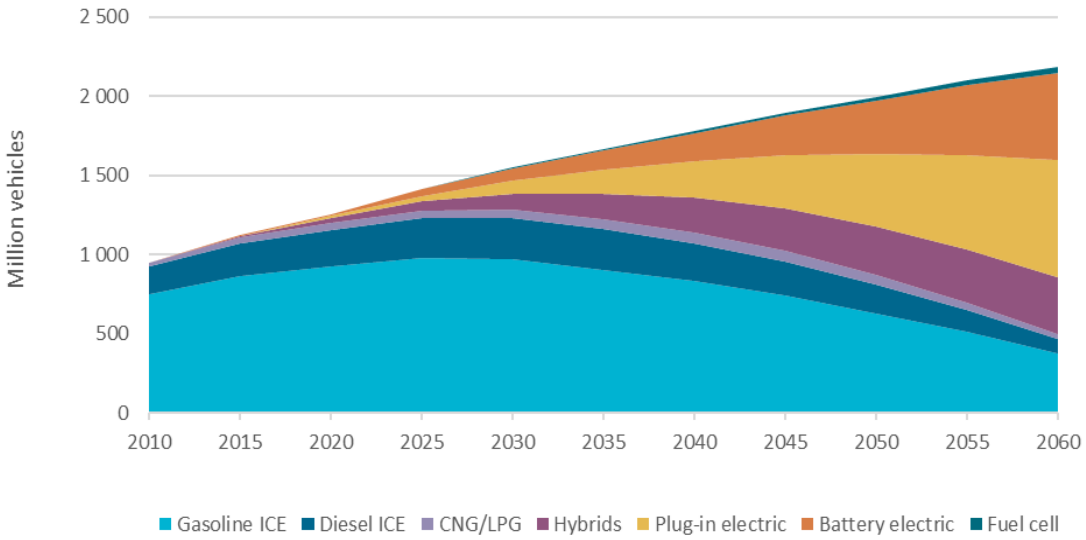


FIGURE 1: ILLUSTRATIVE AUTOMOTIVE TECHNOLOGY MIX [5]

The company benchmark (CB) 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 sales in that country, Thus the CB is geographically weighted. This weighting applies to modelling for sales growth, passenger density and annual travel distances, but it does not apply to vehicle performance (fuel economy and emissions intensity). This is because the sector has a high trade intensity, making this company-influenced factor less dependent on location.

The allocation mechanism, as defined by the SDA, is the convergence mechanism. This allocation takes the company's WTW 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 Scope 1+2 emissions	CB_{S12}	IEA [5], OICA [19]	AU 1.1, AU 1.4, AU 2.1
Company Benchmark for FLeet emissions	CB_{FL}	IEA [5]], SDA [6], SBTi [3]	AU 1.2, AU 1.4, AU 4.1, AU 4.2
Global Average lifetime of cars in kilometers	H_a	ICCT Roadmap [8]	AU 1.3
Geographically weighted Average lifetime of cars in kilometers	H_{ga}	ICCT Roadmap [8]	AU 1.3
R&D Benchmark for AU industry	B_{RD}	Ecofys-WWF [11]	AU 3.1
Company Benchmark for Low-Carbon Vehicle sales	CB_{LCV}	IEA [5]	AU 4.3
Company Benchmark for ICE vehicle emissions intensity	CB_{ICE}	IEA [5], SBTi [3]	AU 4.4

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] document for more information.

TABLE 5: PERFORMANCE INDICATOR WEIGHTINGS

AU	MODULE	INDICATOR	MODULE WEIGHT	INDICATOR WEIGHT
1.1	TARGETS	Alignment of Scope 1+2 emission reduction targets	15%	2%
1.2		Alignment of Scope 3 inclusive emission reduction targets		9%
1.3		Time horizons of targets		2%
1.4		Historic target ambition and company performance		2%
2.1	MATERIAL INVESTMENT	Trend in past emission intensity	2%	2%
3.1	INTANGIBLE INVESTMENT	R&D in Climate Change mitigation technologies related to Low-carbon transportation	12%	12%
4.1	SOLD PRODUCT PERFORMANCE	Fleet emissions pathway	35%	8%
4.2		Fleet emissions lock-in		7%
4.3		Low carbon vehicle share		15%
4.4		Conventional ICE vehicle efficiency performance		5%
5.1	MANAGEMENT	Oversight of climate change issues	11%	1%
5.2		Climate change oversight capability		1%
5.3		Low-carbon transition plan		4%
5.4		Climate change management incentives		1%
5.5		Climate change scenario testing		4%
6.1	SUPPLIER ENGAGEMENT	Supplier Engagement	6%	6%
7.1	CLIENTS ENGAGEMENT	Efforts to promote sales of more efficient vehicles	4%	4%
8.1	POLICY ENGAGEMENT	Company policy on engagement with trade associations	6%	2%
8.2		Trade associations supported do not have climate-negative activities or positions		2%
8.3		Position on significant climate policies		2%
9.1	BUSINESS MODEL	Business activities that reduce structural barriers to market penetration of advanced vehicles	9%	3%
9.2		Business activities that contribute to low-carbon optimization of personal mobility		3%
9.3		Business activities around design and manufacture of vehicles to facilitate modal transport shift		3%
OVERALL			100%	100%

The quantitatively scored modules (Targets, Material investment, Intangible investment, Sold product performance) carry 64% of the final weight, and the qualitatively scored modules (Management, Policy engagement, Business model) carry 36%. The indicators within the modules also carry their own weighting.

- **RATIONALE FOR WEIGHTINGS**

Targets 15%

The targets module has a relatively large weight of 15%. Most of this is placed on *alignment of fleet emissions reduction targets*, with 9%. This is because this target is relevant for the majority of the company's emissions, which are embedded in the WTW fleet emissions. *Alignment of Scope 1+2 emissions targets* has a relatively lower impact on the company's total emissions pathway, and therefore is only given a low weight of 2%.

The *time horizon of targets & achievement of previous targets* also have a low weight of 2%. The time horizon of targets is a proxy of how forward-looking the company is, which is very long-term oriented. Finally, the previous achievement 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 2%

This module has a low weight of only 2%, as it only has an indicator on the emissions performance of the company's in Scope 1 and 2. This is not a very informative indicator about the company's technological direction. Low-carbon production facilities may have a higher carbon intensity than conventional production lines, but the benefit of producing low-carbon vehicles would still far outweigh such disadvantages. It is also not a future oriented indicator.

Intangible Investment 12%

Intangible investment is focused entirely on R&D. The automotive sector is very R&D intensive, with auto companies generally spending the most R&D per unit of capital expenditure of all sectors. It is a necessary condition for the system as a whole to achieve progress in 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. The analysis would like to focus on those R&D processes that contribute to climate change mitigating technologies, described in R&D for low-carbon transition. This is very future oriented, and thus has a relatively large weight of 12%.

Sold product performance 35%

The focus of the ACT project is on the WTW fleet emissions, and this module captures all indicators that relate to this concept. More specifically, the indicators *Fleet emissions pathway* and *Fleet emissions lock-in* are two ways of capturing the way the company's fleet emissions are developing in the short-term future. As these two indicators represent direct measurement of the decarbonization pathway, with a high impact of variation, that look into the future, they receive a very strong combined weighting of 15%, with 8% allocated to the fleet emissions pathway and 7% to the fleet emissions lock-in.

The future outlook of the automotive sector is based wholly on the adoption of low-carbon vehicles to replace conventional ICE vehicles. Therefore, the present *low-carbon vehicle share* of the company is a direct measurement of the company's progress towards this goal. There are also strong benchmarks available for this indicator for the short-term that reflect back on the 2050 targets. It receives a high weight of 15%.

Finally, the ICE vehicle efficiency indicator is given a medium weight of 5%, to recognize that it is also relatively significant for companies to continue to develop their ICE technology to reduce emissions.

Management 11%

Management is a multi-faceted module that makes up 11% 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*, which are weighted 4% each. 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 three 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.

Supplier engagement 6%

In order to develop the technology required for the low-carbon transition, it is imperative that carmakers involve their supply chains. Nonetheless, it is not an indicator that is easy to measure, and relies heavily on data quality to make a proper analysis. Therefore, considering these aspects, this indicator is given a weight of 6%.

Client engagement 4%

The client engagement indicator is focused on the company's efforts to promote low-carbon vehicles to their customers. This is an important aspect, in order to identify companies that make real efforts to make low-carbon vehicles a significant part of their sales. Nonetheless, this indicator alone is a narrow aspect of the transition and therefore total weight is low at 4%.

Policy engagement 6%

In line with the rationale for the low weighted management indicators, the policy engagement indicators are also contextual aspects that tell a narrative about the company's stance on climate change and how the company expresses that in their engagement with policymakers and trade associations. The total weight for this module is therefore medium at 6%, equally allocated to the three indicators,*trade associations supported do not have climate-negative activities or positions, company's position on significant climate policies*, and *company policy on engagement with trade associations*, that are of similar importance and relevance.

Business model 9%

The Business activities that reduce barriers to market penetration of low-carbon vehicles indicator includes those aspects that are relevant to low-carbon vehicle adoption but are not directly a part of the primary auto manufacturing activities, such as charging infrastructure. It is future oriented by asking the companies in its narrative about certain future directions that the sector can/has to take to enable the transition.

The other indicators ask car companies how they are engaging with the projected modal shift under a low-carbon scenario, which is important as this can have major impacts on the company's future business model. *Low-carbon optimisation of personal mobility* covers new mobility models such as car-sharing, and *Business activities around the design and manufacture of vehicles to facilitate the modal transport shift* covers alternative vehicles to facilitate modal transport shift.

Together these 3 indicators make up a medium weight of 9%, which breaks down as 3% for each, as all of them capture many unique elements and aspects that cannot otherwise be captured in any of the other modules.

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:

a. **Performance score** as a number from 1 (lowest) to 20 (highest)
b. **Narrative score** as a letter from E (lowest) to A (highest)
c. **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 AU sector is presented in *5.3. Performance indicators.*

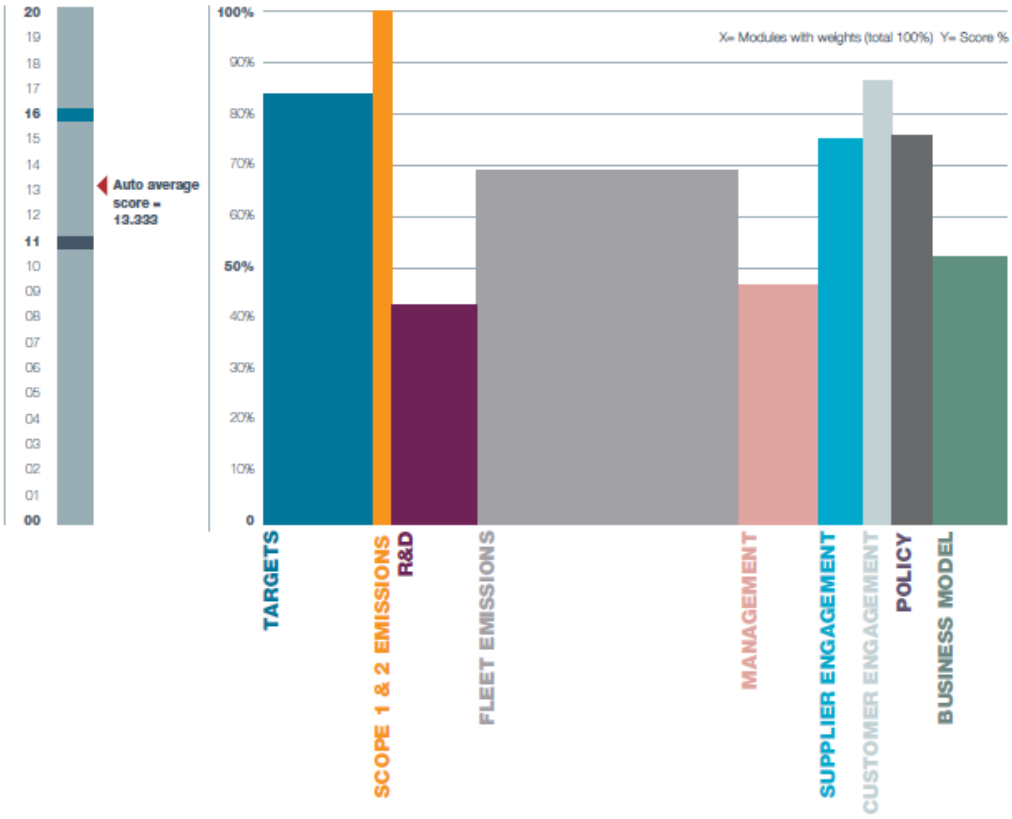


FIGURE 2: EXAMPLE OF A DISPLAY OF THE PERFORMANCE SCORE BROKEN DOWN BY MODULE (THE WIDTH OF THE BARS IS PROPORTIONAL TO THE MODULE'S WEIGHTING)

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

7.2. NARRATIVE SCORING

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

The information reported in Module 7 shall be considered with peculiar attention for the analysis narrative and narrative scoring for the AU sector: with this information, the analyst can take a holistic view on the company's sales efforts to redouble the identification of compliance cars and reward companies who have done real efforts to promote efficient and low-carbon vehicles.

No other sector-specific issue impacting the narrative scoring for this sector has 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 AU sector.

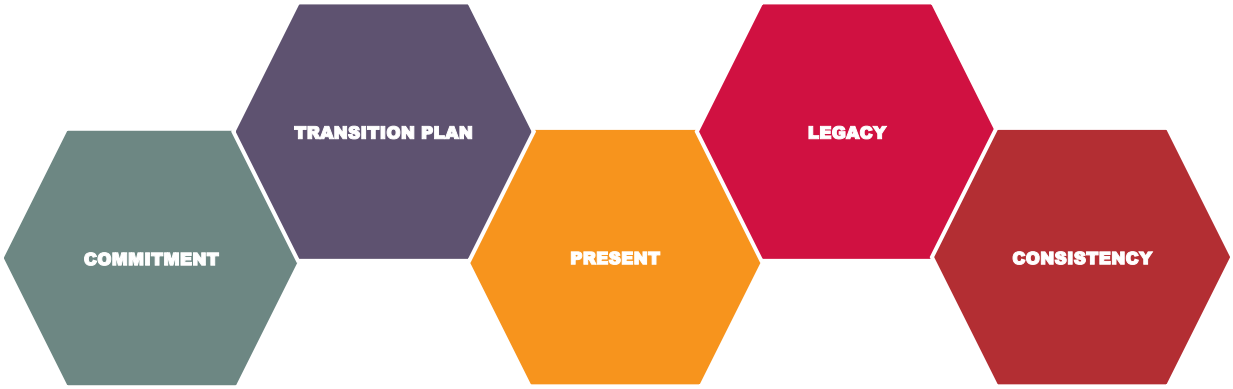
TABLE 7: RELEVANT PERFORMANCE INDICATORS FOR TRENDS IDENTIFICATION FOR THE AU SECTOR

MODULE	INDICATOR
Targets	AU 1.1 Alignment of Scope 1+2 emissions reduction targets
	AU 1.2 Alignment of fleet emissions reduction targets
	AU 1.4 Time horizon of targets
Intangible investments	AU 3.1 R&D for low-carbon transition
Sold product performance	AU 4.2 Fleet emissions lock-in
Management	AU 5.3 Low-carbon transition plan
	AU 5.5 Climate change scenario testing
Business model	AU 9.1 Business activities that reduce structural barriers to market penetration of advanced vehicles
	AU 9.2 Business activities that contribute to low-carbon optimization of personal mobility
	AU 9.3 Business activities around the design and manufacture of vehicles to facilitate the modal transport shift

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]
- →



1	2	3	4	5
The company has science-based targets for operational and fleet emissions, which have a time horizon that covers at least 80% of the full lifetime emissions of the vehicle fleet.	The company's strategic planning details the sales targets for low-carbon vehicles up to the point where they become the dominant technology sold.	Current investment strategy in new production capacity and R&D place clear focus on low-carbon drivetrain technologies and related research.	A trend is evident of lowering emissions intensity of the vehicle fleet over the last 5 years, that is in alignment with the emissions reductions required in the short term through deliberate development decisions.	The company's targets, transition plan, present actions and past legacy show a consistent willingness to achieve the goals of low-carbon transition. The company does not lobby against vehicle emissions regulations and in fact supports more stringent standards and improved emissions measurement.

FIGURE 3: ALIGNED STATE FOR COMPANIES IN THE AUTO SECTOR

9. Sources

[1] “ACT Framework - Version 1.1”, ACT Initiative, *2019*

[2] "Energy Technology Perspectives: Mobilising Innovation to Accelerate Climate Action", IEA, *2015*

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[4] “ACT Guidelines for the development of sector methodologies - Version 1.0”, ACT Initiative, *2018*

[5] "Energy Technology Perspectives 2017", IEA, *2017*

[6] “Sectoral Decarbonization Approach (SDA): A method for setting corporate emissions reduction targets in line with climate science”, Science Based Targets Initiative, *2015*

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[16] “Investor expectations on corporate climate lobbying”, UNPRI, *2015*

[17] “New Business Models for Alternative Fuel and Alternative Powertrain Vehicles”, Wells & Niewenhuis, IFP, *2012*

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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.
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).
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.
ACTIVITY DATA	Activity data are defined as data on the magnitude of human activity resulting in emissions or removals taking place during a given period of time (UNFCCC definitions).
ADEME	Agence de l'Environnement et de la Maîtrise de l'Energie; The French Environment and Energy Management Agency (ADEME webpage).
ADVANCED VEHICLE	Advanced vehicles include: ♦ Plug-in hybrid vehicles (PHEV) ♦ Battery electric vehicles (BEV) ♦ Fuel cell electric vehicles (FCEV) ♦ Conventional hybrids ♦ Other high-efficiency ICE vehicles Conventional hybrids and other high-efficiency ICE vehicles are advanced vehicles but they are not low-carbon vehicles.
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.
ANALYST	Person in charge of the ACT assessment.

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.
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.
AU	Abbreviation of the 'Automotive' sector
BARRIER	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).
BASE YEAR	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 (GHG Protocol Corporate Standard).
BENCHMARK	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.
BOARD	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.
BUSINESS-AS-USUAL	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. In general, the initial year – which is the first year of the pathway/series – is the reporting year (targets indicators) or the reporting year minus 5 years (performance indicators).

BUSINESS MODEL	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.
CAPACITY (POWER)	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.
CAPITAL EXPENDITURE	Money spent by a business or organization on acquiring or maintaining fixed assets, such as land, buildings, and equipment.
CARBON CAPTURE AND STORAGE (CCS)	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.
CDP	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).
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).
COMPANY	A commercial business.
COMPANY PATHWAY	A company’s past emissions intensity performance pathway up until the present.
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.
COMMITMENT GAP	In relation to emissions performance, the difference between what a company needs to do and what it says it will do.
CONFIDENTIAL INFORMATION	Any non-public information pertaining to a company's business.

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.
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.
COP21	The 2015 United Nations Climate Change Conference, held in Paris, France from 30 November to 12 December 2015 (COP21 webpage).
CONVENTIONAL (TECHNOLOGY)	In relation to automobiles and emissions, conventional internal combustion engines (ICE) are those that generate motive power by burning fossil fuels, as opposed to advanced (low-carbon) vehicle engines such as battery electric vehicles or hydrogen fuel cells.
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).
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.
FLEET	A group of vehicles (e.g. all the automobiles manufactured by an automotive manufacturing company and currently in use by private individuals).

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_2), methane (CH_4), nitrous oxide (N_2O) and three groups of fluorinated gases (sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs)) which are the major anthropogenic GHGs and are regulated under the Kyoto Protocol. Nitrogen trifluoride (NF_3) 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).
INDICATOR	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: ♦ Key performance indicators (KPIs); ♦ Key narrative indicators (KNIs); and ♦ Key asset indicators (KAIs).

INTENSITY (EMISSIONS)	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.
INTERVENTION	Methods available to companies to influence and manage emissions in their value chain, both upstream and downstream, which are out of their direct control (e.g. a retail company may use consumer education as an intervention to influence consumer product choices in a way that reduces emissions from the use of sold products).
LIFETIME	The duration of a thing's existence or usefulness (e.g. a physical asset such as a power plant).
LONG-TERM	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.
LOW-CARBON SCENARIO (OR PATHWAY)	A low-carbon scenario (or pathway) is a 2°C scenario, a well-below 2°C scenario or a scenario with higher decarbonization ambition.
LOW-CARBON TRANSITION	The low-carbon transition is the transition of the economy according to a low-carbon scenario.
LOW-CARBON SOLUTION	A low-carbon solution (e.g. energy, technology, process, product, service, etc.) is a solution whose development will contribute to the low-carbon transition.
LOW-CARBON VEHICLE	Vehicles described as low-carbon (LCV) are defined as vehicles that have a drivetrain that have the potential to operate on non-fossil energy sources for at least > 50% of their common use phase. This includes: ♦ Plug-in hybrid vehicles (PHEV) ♦ Battery electric vehicles (BEV) ♦ Fuel cell electric vehicles (FCEV) Conventional hybrids are excluded from the definition of low-carbon vehicles. Because conventional hybrids do not eschew fossil fuels (aside from the minor addition of biofuels into the fuel mix), they are not qualified for the definition of an LCV.
MANUFACTURE	Making objects on a large scale using machinery.
MATURITY MATRIX	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.

MATURITY PROGRESSION	An analysis tool used in the ACT project that allows both the maturity and development over time to be considered with regards to how effective or advanced a particular intervention is.
MITIGATION (EMISSIONS)	The action of reducing the severity of something (e.g. climate change mitigation through absolute GHG emissions reductions)
MODEL	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).
PATHWAY (EMISSIONS)	A way of achieving a specified result; a course of action (e.g. an emissions reduction pathway).
PERFORMANCE	Measurement of outcomes and results.
PLAN	A detailed proposal for doing or achieving something.
POINT	A mark or unit of scoring awarded for success or performance.
POWER	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.).
PROGRESS RATIO	An indicator of target progress, calculated by normalizing the target time percentage completeness by the target emissions or renewable energy percentage completeness.
RT	Abbreviation of the 'Retail' sector
RELEVANT / RELEVANCE	In relation to information, the most relevant information (core business and stakeholders) to assess low-carbon transition.
RENEWABLE ENERGY	Energy from a source that is not depleted when used, such as wind or solar power.
REPORTING YEAR	Year under consideration.
RESEARCH AND DEVELOPMENT (R&D)	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.
SCIENCE-BASED TARGET	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 Science-Based Targets Initiative.
SCENARIO	The Fifth Assessment Report (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.
SCENARIO ANALYSIS	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).
TANK-TO-WHEEL EMISSIONS (TTW)	Tank-to-wheel emissions refer to the emissions occurring during the combustion of fuel by vehicles.
TARGET	A quantifiable goal (e.g. to reduce GHG emissions). ♦ The following are examples of absolute targets: → metric tonnes CO2e or % reduction from base year → metric tonnes CO2e or % reduction in product use phase relative to base year → metric tonnes CO2e or % reduction in supply chain relative to base year ♦ The following are examples of intensity targets: → metric tonnes CO2e 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
TRADE ASSOCIATION	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 (CDP climate change guidance).
TRANSPORT	To take or carry (people or goods) from one place to another by means of a vehicle, aircraft, or ship.
TREND	A general direction in which something (e.g. GHG emissions) is developing or changing.
TECHNOLOGY	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).

TRANSITION	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).
VERIFIABLE / VERIFIABILITY	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.
WEIGHTING	The allowance or adjustment made in order to take account of special circumstances or compensate for a distorting factor.
WELL-TO-TANK EMISSIONS (WTT)	Well-to-Tank emissions are based on attributional life-cycle analysis studies of fossil-derived fuels (e.g. gasoline, diesel, compressed and liquefied natural gas), biofuels and electricity (based on time- and scenario-specific estimated average grid carbon intensity). Energy use and emissions resulting from pipeline transport are accounted for under “Energy industry own use” in the IEA modelling.
WELL-TO-WHEEL EMISSIONS (WTW)	Tank-to-Wheel (TTW) and Well-to-Tank (WTT) make up WTW emissions.