ECONOMIST IMPACT

The rEV Index: Methodology

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Contents

The rEV Index: Methodology

The rEV Index, produced by Economist Impact and supported by bp, assesses regions across the UK on their levels of readiness to transition to electric vehicles (EVs).[1] The index highlights what it means to be ready, from the perspectives of both vehicle users and vehicle producers. It measures readiness in terms of inputs—or the policies, investments and other considerations that drive users and producers towards EVs—and in terms of outputs—or the impacts of said policies and investments reflected in increased uptake and/or increased availability of EVs in the market.

The rEV Index scores regions in the UK against 23 unique quantitative and qualitative indicators organised across eight pillars of EV readiness. It aims to measure the extent to which different parts of the country are equipped with the policies, infrastructure and attitudes required to achieve a transition to EVs, and to highlight the areas where policymakers can focus their attention in order to take the next steps in the transition. The UK's overall findings are compared with those of leading EV markets globally—including China and European countries—to benchmark its performance and identify best practices that could be replicated.

The index identifies the hurdles that local geographies will need to overcome, as well as the opportunities for and pathways to a more rapid transition, helping to provide a platform for stakeholders to advocate for change.

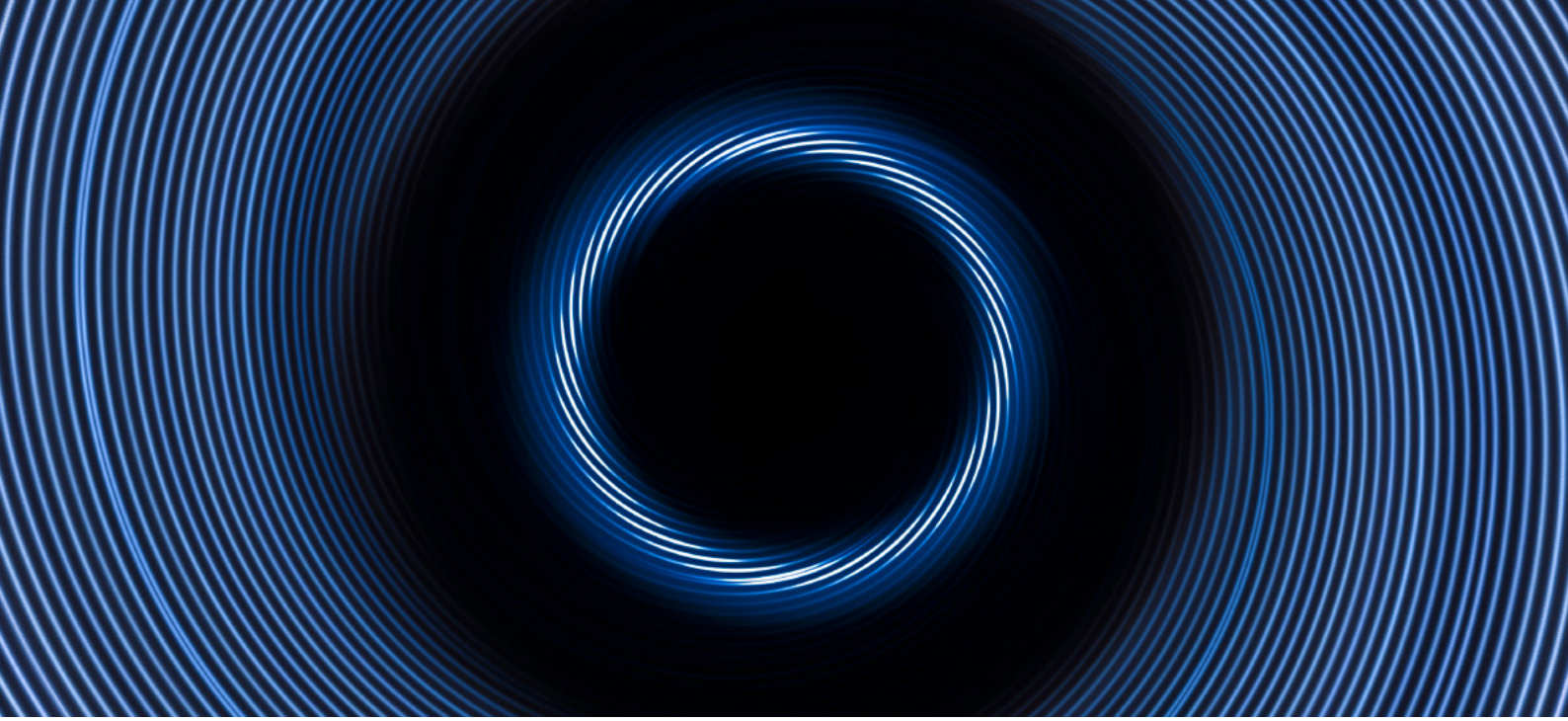
This document contains the methodology for the index. The full index data and results are available for download at the rEV Index.

Acknowledgements

This Economist Impact report has been commissioned by bp. The findings are based on an extensive literature review, insights from an expert panel, and a modelling exercise conducted between July and September 2021. Economist Impact bears sole responsibility for the content of this report. The findings and views expressed do not necessarily reflect the views of partners, sponsors or experts.

The research team drew on the expertise of highly respected industry leaders and academics to provide input on the methodology, data sources and modelling options for the index. A panel of experts convened on July 12th 2021 to discuss the research framework and project

[1] The index covers both battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs)



goals. We would like to extend our thanks to those experts who participated:

- **Liana Cipcigan:** Professor (Cardiff University's School of Engineering), Director (Electric Vehicle Centre of Excellence)
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- **Mike Hawes:** Chief Executive (Society of Motor Manufacturers and Traders)
- **Alison Pridmore:** Energy Analyst (International Energy Agency)
- **Reza Shaybani:** Co-Founder & CEO (The Electric Vehicle Network)
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Index pillars and scoring criteria

Pillars, indicators and weights used in the index were selected on the basis of analysis, a literature review, and consultation with industry experts and specialists from academia. The research team gathered data and conducted the research and analysis for all qualitative and quantitative indicators.

The index comprises 23 indicators organised across eight pillars as well as five background indicators. The eight pillars, summarised below, are spread across two sub-indices: rEV inputs and rEV outputs.

1. **rEV inputs:** The input sub-index includes six pillars which capture developments in the policy and infrastructural environment that enable readiness for EVs on both the demand and supply sides.
    1.1. **Affordability:** Numerous consumer surveys have identified two key barriers to

EV uptake: cost and lack of charge points. The affordability pillar captures the extent to which consumers can afford to switch from internal combustion engine (ICE) vehicles to EVs based on the cost of EVs and consumers' financial means.

1.2. **Purchase incentives:** Several local and national governments globally offer incentives to encourage the purchase of EVs. Often these address the high upfront costs, but they can also extend to non-financial incentives. This pillar captures the extent to which policies have been implemented to encourage EV uptake.

1.3. **Consumer sentiment:** This pillar captures shifts in consumer preferences towards EVs based on engagement efforts by policymakers reflected in consumers' propensity to buy EVs.

1.4. **Charging infrastructure:** Lack of sufficient charging stations is a common consumer concern in the uptake of EVs. It can give rise to a fear of running out of electric power before reaching a destination or chargepoint. This pillar assesses the maturity of the charging infrastructure to allow consumers to overcome this fear.

1.5. **Energy infrastructure:** As consumers transition towards EVs, demand for electricity will rise. This pillar captures the readiness of the energy sector to absorb additional energy demand.

1.6. **Regulations:** Readiness for EVs includes not only consumer readiness, but also readiness on the part of suppliers to invest in new technologies. This pillar assesses the regulatory environment and the extent to which it supports EV uptake.

2. **rEV outputs:** The output sub-index includes two pillars which capture the impact of policy and infrastructural developments, providing an indication of EV readiness.

2.1. **Uptake:** Developments in the policy and infrastructural environment to enable demand-side readiness for EVs are reflected in consumer purchase decisions. Hence, EV uptake provides an output measure of demand readiness.

2.2. **Availability:** Developments in the policy environment to enable supply-side readiness for EVs can be reflected in the availability of new EV models in the market.

Each pillar receives a score, calculated from a weighted average of the underlying indicator scores (see Appendix 3). Scores are then scaled from 0 to 100, where 100 represents the strongest environment for the adoption of EVs. The overall country/region score is a weighted average of the pillar scores.

Regions and countries

The rEV Index measures the readiness for EVs across regions in the UK which, in aggregate, cover the UK in its entirety. The analysis covers 41 regions based on the NUTS (Nomenclature of Territorial Units for Statistics) Level 2 territories. These are aggregated to 12 higher-level regions based on the NUTS Level 1 territories, and finally aggregated to an overall score for the UK. The list below provides the geographic breakdown for the analysis.

To compare the UK's progress, the overall findings are compared with those of leading EV markets in the world—including China and European countries—to benchmark its performance and identify best practices that could be replicated. The following eight countries have been included in the analysis: China, France, Germany, Italy, Netherlands, Norway, Spain and Sweden.

Data sources

The Economist Impact research team collected and analysed all of the quantitative and qualitative data used to develop the rEV Index. The data has been gathered from reputable

international, national and industry sources. The data collection process was conducted in August 2021. Any changes to source data after this time are not accounted for in this version of the index.

In developing the index, the team has relied heavily on publicly available sources. For some indicators where data is not readily available, the data has been created by the research team. All of the index data is available for download in the model workbook, which also provides detailed information on the methodology for estimation. This research approach has the benefit of creating a fully transparent and repeatable methodology.

The main sources of data used in the rEV Index include: UK's Office for National Statistics (ONS), UK's Department for Transport (DfT), UK's Department for Business, Energy and Industrial Strategy (BEIS), ChargeMap, World Bank, European Alternative Fuels Observatory (EAFO), International Energy Agency (IEA), European Automobile Manufacturers' Association (ACEA), and International Organisation of Motor Vehicle Manufacturers (OICA), among others. Qualitative data has been gathered through desk-based research, collating information from a range of sources including academic papers, industry reports, policy documents and news articles. For further detail on the data sources consulted, please refer to Appendix 1.

Data availability is a critical issue in this index and in this field of study more generally. The latest publicly available data is not always up to date or recent, which can impact the assessment of progress in such a fast-changing field. In addition, several international sources rely on data reported by countries. Country governments may adopt different methodologies to gather or analyse data, or lack the means to report on the most recent data, which causes variations in data quality and timeliness. One example is the use of survey data to assess consumer sentiment towards EVs—each survey asks for responses to slightly different questions over different time periods which can impact on the comparability of responses across surveys.

The rEV Index also focuses on regional-level readiness for EVs across the UK and therefore relies heavily on the availability of granular regional data which is not readily available for all indicators in the index framework. Appropriate disaggregation approaches have been used to assess data at the regional level where this is not directly available. In some cases, national-level or sub-regional-level data has been applied consistently to all regions across the UK in the absence of granular data. For example, this approach has been applied to estimating the cost of EV purchase across the country, although some regional variation in income levels and driving patterns has been accounted for.

Data modelling

Data collected for each indicator is transformed and then aggregated within and across pillars to enable a comparison across regions and countries. The process of transforming involves rebasing the raw indicator data to a common unit so that it can be aggregated. All the indicators in this model are transformed into a score on a 0 to 100 scale, where 100 indicates the highest level of readiness to transition to EVs.

All quantitative indicators within the index are transformed on the basis of a min/max normalisation, where the minimum and maximum raw data values across the regions and countries are used to bookend the indicator scores. The indicators for which a higher value indicates a more favourable environment for transitioning to EVs—such as the availability of EV chargers—have been transformed on the basis of:

$$\text{Index score} = [(x - \text{Min}(x)) / (\text{Max}(x) - \text{Min}(x))]*100$$

where Min(x) and Max(x) are, respectively, the lowest and highest data values in the regions/

countries for any given indicator. This in effect means that the country with the highest raw data value will score 100, while the lowest will score 0 for quantitative indicators in the index.

For the indicators for which a higher value indicates a less favourable environment for transitioning to EVs—such as the relative price of EV ownership—the normalisation function takes the form of:

Index score = [(x - Max(x)) / (Max(x) - Min(x))]*100

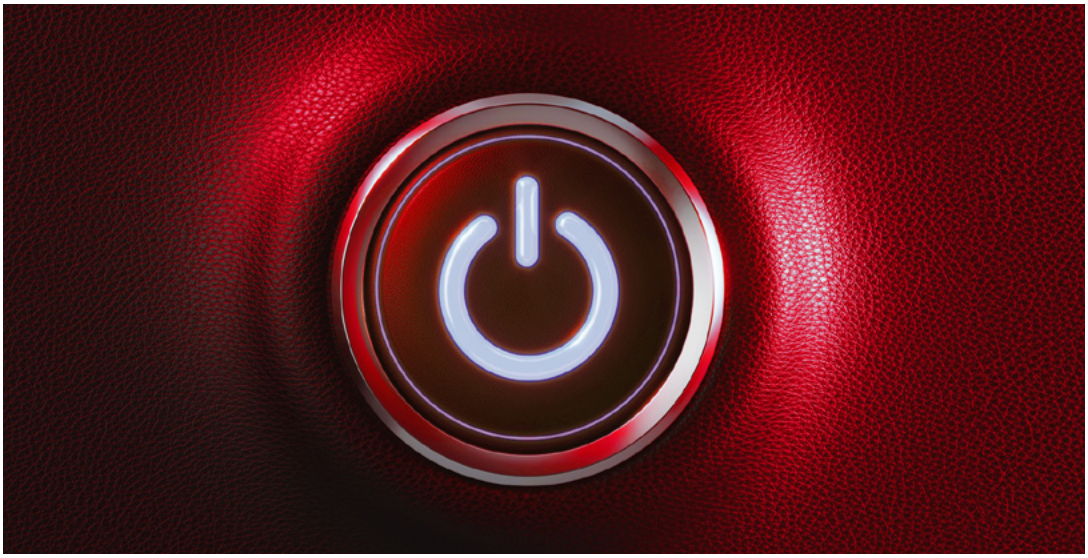
For qualitative indicators, the scoring approach used varies by indicator. A data score is calculated by the research team based on information collected through public sources. This data is then converted into an index score from 0 to 100 on a linear scale. For example, an indicator with data scores from 0 to 5 is rebased to obtain an index score out of 100 by multiplying the data score by 20.

Aggregation and weights

The transformed variables are aggregated into a final composite indicator using an ad hoc weighting scheme. In ad hoc weighting schemes, the research team chooses the contribution of each variable to the final composite indicator. While an attempt to base the weights is possible using a theoretical framework that assigns different priorities to different sub-dimensions, the final weight is—to some extent—always ad hoc.

Given the difficulties in assigning weights, many composite indices resort to an equal weighting scheme, allowing all variables to enter uniformly. The advantage of an equal weighting approach is transparency, while the clear disadvantage is the lack of an underlying theoretical justification for equal treatment of all variables and sub-dimensions. Other approaches that allow users to adjust weights or that present a number of weighting scenarios pose the risk of obfuscating the index outcome.

The weighting process for any index is a qualitative determination that may reflect the biases or suppositions of the researchers. One method for gauging the soundness of a weighting scheme is to think of the weights as implicit trade-offs among the sub-dimensions of an indicator. As such, a consultation with experts in the field was used to reflect on-the-ground priorities for regions to transition towards EVs. Based on their inputs, the final weights were assigned to the indicators. The weights are



supported by consumer surveys which indicate key concerns and priorities from consumers' perspectives. A recent survey conducted by energy regulator Ofgem in the UK, for example, identified the cost of EVs and anxiety around the availability of chargers as the topmost concerns for British consumers[2]—as a result, the index is weighted more heavily towards the affordability and purchase incentives pillars combined (25% weight), along with the charging infrastructure pillar (25% weight), compared with the other pillars.

The weight assigned to each pillar in the index is as follows:

Examining the weighting scheme by comparing the relative importance of different dimensions is an important tool for conducting robustness checks. Despite the care that has been taken in selecting the indicators, pillars and weights, this index is based on a qualitative ranking. We recognise that there are many different methods for weighting an index. As the demand for EVs continues to grow in the market and their usage by consumers changes, it will be necessary to revisit the weighting system applied to this index in order to determine whether the logic still holds.

INDEX PILLARS	WEIGHT
1. rEV inputs	**80%**
1.1 Affordability	15%
1.2 Purchase incentives	10%
1.3 Consumer sentiment	10%
1.4 Charging infrastructure	25%
1.5 Energy infrastructure	10%
1.6 Regulations	10%
2. rEV outputs	**20%**
2.1 Uptake	10%
2.2 Availability	10%

[2] Ofgem (2021), Press release. Available at: https://www.ofgem.gov.uk/publications/one-four-consumers-plan-buy-electric-car-next-five-years-according-ofgem-research

Appendix 1: Detailed indicator list

No.	INDICATOR	UNIT	DESCRIPTION	METHODOLOGY	SOURCE
OVERALL INDEX		**0-100**	**The overall index score is based on the scores of the rEV inputs and rEV outputs sub-indices**	**Score is the weighted average of the following sub-index scores:** **1. rEV inputs** **2. rEV outputs**	**Economist Impact calculation**
1	rEV inputs	0-100	The input sub-index includes six pillars which capture developments in the policy and infrastructural environment that enable readiness for EVs on both the demand and supply sides.	Score is the weighted average of the following pillar scores: 1.1 Affordability 1.2 Purchase incentives 1.3 Consumer sentiment 1.4 Charging infrastructure 1.5 Energy infrastructure 1.6. Regulations	Economist Impact calculation
1.1	Affordability	0-100	Numerous consumer surveys have identified two key barriers to EV uptake: cost and lack of charge points. The affordability pillar captures the extent to which consumers can afford to switch from ICE vehicles to EVs based on the cost of EVs and consumers' financial means.	Score is the weighted average of the following indicator scores: 1.1.1 Relative upfront cost 1.1.2 Relative cost of ownership 1.1.3 Purchasing power	Economist Impact calculation
1.1.1	Relative upfront cost	% (average EV cost relative to ICE)	Assesses the cost of purchase of an EV compared to the cost of purchase of an ICE vehicle. Although the total running cost can be lower, the upfront cost of purchasing an EV is typically higher than the cost of purchase for an ICE vehicle which can play a role in consumer purchase decisions. This indicator captures the difference in the price of an EV relative to the price of its ICE equivalent.	The upfront ICE cost has been estimated as the average of the most purchased ICE brands and models in each country. This is compared to the EV cost of purchase for comparable models.	Economist Impact analysis based on multiple sources

1.1.2	Relative cost of ownership	% (average EV ownership cost for three years relative to ICE)	The cost of owning and operating an EV over a three-year period compared to the cost of owning and operating an ICE vehicle over a three-year period. The cost of ownership includes the operating and maintenance costs of an EV. This indicator compares the cost of owning a new EV for a period of three years compared to the cost of owning a new ICE over the same period. This difference in cost can play a role in influencing purchase decisions.	The average ownership cost over three years has been estimated as an aggregation of the following costs incurred during ownership: insurance, depreciation, servicing/ maintenance, fuel costs and environmental taxes. The total cost for an EV is compared with the total cost of owning an ICE vehicle over the same period.	Economist Impact analysis based on multiple sources
1.1.3	Purchasing power	% (GDP per capita relative to EV cost)	Assesses the affordability of EVs by comparing the average GDP per person with the cost of buying an EV. In addition to the cost of purchasing an EV, the income and wealth levels of consumers also play a role in determining affordability. This indicator compares data on the average wealth levels of consumers in different localities (including earned income and other assets) relative to the cost of purchase.	The upfront EV cost has been estimated as the average cost of the electric equivalents of the most purchased ICE brands and models in each country.	Economist Impact analysis based on multiple sources: ONS; World Bank;
1.2	Purchase incentives	0-100	Several local and national governments globally offer incentives to encourage the purchase of EVs. Often these address the high upfront costs, but can also extend to non-financial incentives. This pillar captures the extent to which policies have been implemented to encourage EV uptake.	Score is the weighted average of the following indicator scores: 1.2.1 Purchase subsidies and tax benefits 1.2.2 Ownership tax benefits 1.2.3 Other purchase incentives	Economist Impact calculation
1.2.1	Purchase subsidies and tax benefits	Qualitative rating 0-4; 4=best	Assesses the availability and magnitude of financial incentives to reduce the cost of EV purchase. Includes direct subsidies or grants for purchase and/or reductions in purchase or registration taxes. Purchase subsidies and/or tax benefits are provided by some governments to reduce the net cost of EV purchase. This qualitative indicator compares policies across different localities.	Qualitative assessment; 0-4 (4=best) 0 = no purchase incentives 1 = some but minimal incentives 2 = grants up to €3,000; no tax benefits 3 = grants up to €6,000 and/or some tax benefits 4 = grants greater than €6,000 and/ or significant tax benefits	Economist Impact research

1.2.2	Ownership tax benefits	Qualitative rating 0-2; 2=best	Assesses the availability and magnitude of financial incentives to reduce the cost of operating EVs. Includes, for example, road taxes and ownership taxes. Screen reader support enabled. In addition to (or in place of) subsidies and tax benefits at the time of purchase, some governments and authorities offer benefits from ownership including reduced taxes for consumers and/or businesses.	Qualitative assessment; 0-2 (2 = best) 0 = no financial ownership benefits 1 = some but minimal financial incentives from ownership 2 = significant financial benefits from ownership	Economist Impact research
1.2.3	Other purchase incentives	Qualitative rating 0-2; 2=best	Assesses the availability and magnitude of other financial and non-financial incentives to encourage EV uptake. Includes, for example, reduced parking fees and dedicated parking spots. This indicator captures any other incentives offered by governments and authorities to incentivise EV purchase and ownership including financial incentives (e.g. reduced parking fees) and non-financial incentives (e.g. dedicated parking).	Qualitative assessment; 0-2 (2 = best) 0 = no other incentives 1 = some but minimal incentives 2 = significant incentives	Economist Impact research
1.3	Consumer sentiment	0-100	This pillar captures shifts in consumer preferences towards EVs based on engagement efforts by policymakers reflected in consumers' propensity to buy EVs	Score is the weighted average of the following indicator scores: 1.3.1 Public education 1.3.2 Propensity to buy	Economist Impact calculation
1.3.1	Public education	Qualitative rating 0-3; 3=best	Assesses the extent to which governments and authorities provide the public with information on the benefits of EV use and other useful guides to support EV uptake. EV purchase decisions can be influenced by communication and education on the part of policymakers to make citizens aware of the direction of travel and the reason for the push towards EVs. This qualitative indicator compares policies across different localities.	Qualitative assessment; 0-3 (3=best) 0 = no information provided by authorities 1 = basic information provided, without information on the benefits (simple lists/tables/press releases/ links to other sites) 2 = information provided to educate consumers on the benefits of EVs 3 = comprehensive/ interactive website to educate consumers and provide access to supplemental information	Economist Impact research
1.3.2	Propensity to buy	% (consumers who would consider buying an EV)	Assesses consumer intent to purchase an EV. The willingness of consumers to buy EVs is a leading indicator of EV demand growth and can be influenced by incentives, policies, education, etc. This indicator captures the propensity of consumers to buy EVs based on survey (or other similar) data.	Estimated percentage of population that intends to buy an EV based on existing survey data.	Economist Impact research based on multiple sources including: AlixPartners, Deloitte, EY

1.4	Charging infrastructure	0-100	Lack of sufficient charging stations is a common consumer concern in the uptake of EVs. It can give rise to a fear of running out of electric power before reaching a destination or chargepoint. This pillar assesses the maturity of the charging infrastructure to allow consumers to overcome this fear.	Score is the weighted average of the following indicator scores: 1.4.1 Public charging accessibility 1.4.2 Public charging availability 1.4.3 Fast-charging infrastructure 1.4.4 Chargepoint transparency 1.4.5 Charging incentives 1.4.6 Charging regulation	Economist Impact calculation
1.4.1	Public charging accessibility	Number of charging hubs per 100km of road network	Density of charging infrastructure measured as the number of charging hubs per 100km of road network. This indicator measures the accessibility of public chargers within a region or a country based on the number of charging hubs for every 100km of road network. A greater concentration of charging hubs allows EV drivers to recharge their vehicles as and when needed.	The number of charging hubs is estimated using data on the total number of charging points in a locality and the average number of charging points at charging hubs. The estimated number of hubs is compared to the total length of the road network of the locality to assess overall charging density.	Economist Impact analysis based on multiple data sources including: ChargeMap, DfT, EAFO and IEA
1.4.2	Public charging availability	Installed EV charging capacity per 1,000 vehicles (kW)	Total installed charging capacity for every 1,000 vehicles. This indicator measures the total charging capacity available within a region or a country relative to the needs of the population. As the number of EVs in use increases, the number of chargers available also needs to increase to ensure sufficient charging availability. However, not only does the number chargers need to increase, the overall capacity also needs to grow.	Estimated based on the total number of publicly accessible charging devices, the types of chargers and their charging speed, and the number of vehicles in operation in each locality	Economist Impact analysis based on multiple data sources including: ACEA, DfT, EAFO and IEA
1.4.3	Fast charging infrastructure	% (share of ultra-fast chargers (>100kW) relative to share of charging on highways/ public roads/service stations)	Assesses the share of ultra-fast public chargers available in each locality relative to the need for fast charging based on the charging behaviour of the population (e.g. the length of stay at the most commonly used charging locations) Ultra-fast charging (greater than 100kW) is typically required when EV users charge their cars in locations where they are not stationary for extended periods of time. This includes charging at service stations on highways or on public roads. Conversely, when EV users charge their cars in carparks or at workplaces where they may be parked for longer periods of time, slow charging is typically sufficient. This indicator therefore compares the availability of fast chargers to the charging behaviour of consumers based on preferences for charging at short-stay service stations.	Estimated as the ratio of: - Share of ultra-fast chargers (measured as the total number of ultra-fast chargers relative to the total number of public chargers) to: - Share of EV charging at locations that require fast charging (including highways, public roads and service stations)	Economist Impact analysis based on multiple data sources including: ChargeMap, DfT, EAFO, and IEA

1.4.4	Chargepoint transparency	Score out of 5; 5=best	Assesses the availability and transparency of information for the public on, for example, the location of charging points, the price of electricity at charging stations, the availability of chargers at charging stations, the average time to charge at charging stations, etc. Chargepoint availability and ease of access is an important concern for consumers in their decision to shift towards EVs. This indicator compares the transparency of information provided across different localities.	Score out of 5 based on the availability of information across the following indicators: - Location of charging stations - Number of charging bays at each station - Realtime information on bay availability - Price of electricity at station - Average time to charge at station	Economist Impact research
1.4.5	Charging incentives	Qualitative rating 0-4; 4=best	Assesses the extent to which governments incentivise the development and deployment of charging infrastructure, including commercial and private infrastructure. Subsidies and/or tax benefits are provided by some governments to incentivise individuals and commercial entities to install charging infrastructure in order to support increased uptake. This qualitative indicator compares policies across different localities.	Qualitative assessment; 0-4 (4=best) 0 = no incentives for private individuals or businesses 1 = minimal incentives for private individuals or businesses 2 = incentives for private individuals and/or businesses but not uniformly applied across the country 3 = substantial incentives for private individuals or businesses 4 = substantial incentives for private individuals and businesses	Economist Impact research
1.4.6	Charging regulation	Qualitative rating 0-2; 2=best	Assesses the extent to which governments regulate the development of charging infrastructure by setting requirements for commercial and residential buildings to allow for a minimum number of EVs to charge at any given point. Some governments have established regulations to support the development of charging infrastructure—for example, requirements for commercial and/or residential buildings to provide a certain number of charging bays. Over time, these regulations will force an increase in the number of charging points available for EVs.	Qualitative assessment; 0-2 (2=best) 0 = no regulations 1 = some infrastructural regulations 2 = significant regulations for infrastructure	Economist Impact research
1.5	Energy infrastructure	0-100	As consumers transition towards EVs, demand for electricity will rise. This pillar captures the readiness of the energy sector to absorb additional energy demand.	Score is the weighted average of the following indicator scores: 1.5.1 Grid headroom 1.5.2 Renewable energy generation	Economist Impact calculation

1.5.1	Grid headroom	% (grid headroom relative to total installed capacity)	Assesses spare grid capacity relative to installed capacity to meet growing demand for charging EVs. As EV demand grows, electricity demand will grow in parallel, necessitating developments in the energy infrastructure to support this growth.	Estimated based on peak electricity demand and installed capacity. Headroom is calculated as the difference between capacity and peak demand.	Economist Impact analysis based on multiple sources
1.5.2	Renewable energy generation	% (total electricity generation from renewables)	Assesses the share of total electricity that is generated using renewable energy sources. A transition to EVs can play a significant role in achieving climate targets, but can be even more effective if the electricity used to power EVs is generated through clean technology.	Estimated based on electricity generation using renewable energy compared to total electricity generation	Economist Impact analysis based on multiple sources including: BEIS, ONS and OurWorldInData
1.5.3	Strategic energy plans	Qualitative rating 0-4; 4=best	Assesses the current maturity of the energy infrastructure and the strategic plans in place to develop it, to shift towards clean energy, and to implement smart demand-management systems.	Qualitative assessment; 0-4 (4=best): 0 = no clear energy development plans 1 = basic plans to increase capacity 2 = plans to increase capacity and shift to renewables 3 = ambitious plans to develop the energy infrastructure (e.g. smart grids, storage projects, etc.) 4 = highly developed energy sector	Economist Impact research based on multiple sources including national grid plans and the World Economic Forum's Energy Transition Index
1.6	Regulations	0-100	Readiness for EVs requires not only consumer readiness, but also readiness on the part of suppliers to invest in new technologies. This pillar assesses the regulatory environment and the extent to which it supports EV uptake.	Score is the weighted average of the following indicator scores: 1.6.1 Environmental regulations 1.6.2 EV sales targets	Economist Impact calculation
1.6.1	Environmental regulations	Qualitative rating across two measures 0-10; 10=best	Assesses the ambition of climate change targets in each country and current levels of progress towards achieving them. This indicator assesses the existence and stringency of environmental regulations and targets including, for example, vehicle emission targets and net-zero targets. More ambitious targets necessitate a quicker supply-side shift towards EVs in order to meet the targets.	Qualitative assessment; 0-5 (scoring is across two measures: ambition of targets and current actions to date) 0 = no targets set or actions to date 1 = highly insufficient targets and actions to date 2 = insufficient targets and actions 3 = moderate targets and actions 4 = high ambition targets and actions 5 = very high ambition targets and actions	Economist Impact research based on multiple sources including: Climate Action Tracker (CAT) and Climate Change Performance Index (CCPI)
1.6.2	EV sales targets	Qualitative rating 0-3; 3=best	Assesses the existence and stringency of targets for EV sales as a share of total vehicle sales. More ambitious targets necessitate a quicker supply-side shift towards EVs in order to meet the targets.	Qualitative assessment; 0-3 (3=best) 0 = no targets 1 = low ambition targets 2 = medium ambition targets 3 = high ambition targets	Economist Impact research

1.6.1	Environmental regulations	Qualitative rating across two measures 0-10; 10=best	Assesses the ambition of climate change targets in each country and current levels of progress towards achieving them. This indicator assesses the existence and stringency of environmental regulations and targets including, for example, vehicle emission targets and net-zero targets. More ambitious targets necessitate a quicker supply-side shift towards EVs in order to meet the targets.	Qualitative assessment; 0-5 (scoring is across two measures: ambition of targets and current actions to date) 0 = no targets set or actions to date 1 = highly insufficient targets and actions to date 2 = insufficient targets and actions 3 = moderate targets and actions 4 = high ambition targets and actions 5 = very high ambition targets and actions	Economist Impact research based on multiple sources including: Climate Action Tracker (CAT) and Climate Change Performance Index (CCPI)
1.6.2	EV sales targets	Qualitative rating 0-3; 3=best	Assesses the existence and stringency of targets for EV sales as a share of total vehicle sales. More ambitious targets necessitate a quicker supply-side shift towards EVs in order to meet the targets.	Qualitative assessment; 0-3 (3=best) 0 = no targets 1 = low ambition targets 2 = medium ambition targets 3 = high ambition targets	Economist Impact research
2	**rEV outputs**	**0-100**	**The output sub-index includes two pillars which capture the impact of policy and infrastructural developments, providing an indication of EV readiness.**	**Score is the weighted average of the following pillar scores:** **2.1 Uptake** **2.2 Availability**	**Economist Impact calculation**
2.1	Uptake	0-100	Developments in the policy and infrastructural environment to enable demand-side readiness for EVs are reflected in consumer purchase decisions. Hence, EV uptake provides an output measure of demand readiness.	Score is the weighted average of the following indicator scores: 2.1.1 EV market share 2.1.2 BEV market share	Economist Impact calculation
2.1.1	EV market share	% (EVs relative to total passenger vehicle stock)	Share of EVs—BEVs and PHEVs (plug-in hybrid EVs)—in total passenger vehicle stock. This indicator measures the total number of EVs in operation relative to the total number vehicles on the road to provide a measure of changes in the overall share of EVs in vehicle stocks.	Estimated based on total EVs (BEVs and PHEVs) in use compared to the total number of passenger vehicles in use	ACEA; DfT; IEA; OICA
2.1.2	BEV market share	% (BEVs relative to total EV stock)	Share of BEVs in total EV stock This indicator measures the demand for BEVs relative to total demand for EVs to provide a measure of changes in demand for the most environmentally friendly electric alternatives.	Estimated based on the total stock of BEVs and the total stock of EVs (including BEVs and PHEVs)	ACEA; DfT; IEA; OICA
2.2	Availability	0-100	Developments in the policy environment to enable supply-side readiness for EVs can be reflected in the availability of new EV models in the market.	Score is the weighted average of the following indicator scores: 2.2.1 Tech and infra investment 2.2.2 EV model availability	Economist Impact calculation

2.2.1	Tech and infra investment	Qualitative rating 0-4; 4=best	Assesses the extent to which governments and the private sector are investing in developing EV technology and infrastructure. This measure captures domestic investment in infrastructure (e.g. charging stations and technologies) by governments and the private sector to support a transition to EVs.	Qualitative assessment; 0-4 (4=best) 0 = no specific earmarked investment 1 = some but minimal investment from public sector 2 = moderate investment from public sector 3 = high investment from public sector and private sector 4 = significant investment from both public and private sectors	Economist Impact research
2.2.2	EV model availability	Number of top 20 EV models available in market	Number of global top 20 EV models available. Developments in the policy environment to enable supply-side readiness for EVs can be reflected in the availability of new EV models in the market, captured through this indicator.	Score out of 20, calculated based on the number of top 20 EV models sold in each country.	Economist Impact research

Appendix 2: List of background indicators

There are five background indicators included in the dashboard tool, which give more context to the index. The background indicators are listed below.

NO.	INDICATOR	UNIT	DESCRIPTION	SOURCE
BG1	Population	Thousands	Measures the size of the population of the region/ country.	ONS, World Bank
BG2	Land area	Square kilometres	Measures the total land area within the region/ country.	ONS, World Bank
BG3	Population density	People per square kilometre	Measures the population density in the region/ country based on the total population and the land area.	ONS, World Bank
BG4	GDP per capita	US$	Measures average income per person in each region/ country.	ONS, World Bank
BG5	Number of EVs in use	Number of EVs	Measures the number of EVs in operation in the region/ country.	ACEA; DfT; IEA; OICA

Appendix 3: List of indicators and weights

The weights of each pillar within the index are as follows:

INDICATOR	WEIGHT WITHIN THE INDEX
1. rEV inputs	**80%**
1.1 Affordability	15%
1.2 Purchase incentives	10%
1.3 Consumer sentiment	10%
1.4 Charging infrastructure	25%
1.5 Energy infrastructure	10%
1.6 Regulations	10%
2. rEV outputs	**20%**
2.1 Uptake	10%
2.2 Availability	10%

The weight assigned to each indicator within the pillars is as follows:

INDICATOR	WEIGHT WITHIN THE INDEX	WEIGHT WITHIN THE PILLAR
OVERALL INDEX	**100%**	
1. rEV inputs	**80%**	
1.1 Affordability	**15%**	
1.1.1 Relative upfront cost	5%	33.3%
1.1.2 Relative cost of ownership	5%	33.3%
1.1.3 Purchasing power	5%	33.3%
1.2 Purchase incentives	**10%**	
1.2.1 Purchase subsidies and tax benefits	4%	40%
1.2.2 Ownership tax benefits	4%	40%
1.2.3 Other purchase incentives	2%	20%
1.3 Consumer sentiment	**10%**	
1.3.1 Public education	5%	50%
1.3.2 Propensity to buy	5%	50%
1.4 Charging infrastructure	**25%**	
1.4.1 Public charging accessibility	5%	20%
1.4.2 Public charging availability	5%	20%
1.4.3 Fast charging infrastructure	5%	10%
1.4.4 Chargepoint transparency	2%	8%
1.4.5 Charging incentives	4%	16%
1.4.6 Charging regulation	4%	16%
1.5 Energy infrastructure	**10%**	
1.5.1 Grid headroom	5%	50%

1.5.2 Renewable energy generation	2%	20%
1.5.3 Strategic energy plans	3%	30%
1.6 Regulations	**10%**	
1.6.1 Environmental regulations	5%	50%
1.6.2 EV sales targets	5%	50%
2. rEV outputs	**20%**	
2.1 Uptake	**10%**	
2.1.1 EV market share	5%	50%
2.1.2 BEV market share	5%	50%
2.2 Availability	**10%**	**10%**
2.2.1 Tech and infra investment	2.5%	25%
2.2.2 EV model availability	7.5%	75%

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