Building momentum towards planet resilience

Tata Motors has adopted a holistic approach towards Net Zero, and it involves our business and operational impact and strategy. We are embedding sustainability into our business by focusing on the three interconnected pillars of driving decarbonisation of our businesses and value chain, applying a systemic circular economy approach to reduce resource consumption and waste, along with preserving and restoring our natural environment.

Our sustainability goals are aligned with the global climate change mitigation targets, and we follow universally accepted guidelines and commitments like the Science Based Targets Initiative (SBTi) and RE100 to reach these goals. The way we operate is reflective of our pioneering objective of enabling a greater number of individuals to access and utilise clean mobility solutions. Considerable investments have been made in renewable energy sources, innovations in emissions reduction technologies, sustainable materials and circular processes.

UNITED NATIONS GLOBAL COMPACT

SIGNATORY TO THE UN GLOBAL COMPACT

CDP

B

CLIMATE CHANGE SCORE

Tata Motor Limited
Automobiles

S&P Global ESG Score 2022

64 /100

As of November 18th, 2022
Scores are industry specific.
Learn more at spglobal.com/esg/scores

S&P Global Sustainable1

Member of
Dow Jones Sustainability Indices
Powered by the S&P Global CSA

Our sustainability pillars for planet resilience

Driving Net Zero

Products driven
- → PV by 2040, CV by 2045

Operations driven
- → Sourcing 100% renewable electricity by 2030

Following science-based approach for emissions reduction

Pioneering circular economies

Operational circularity
- → Zero Waste to Landfill by 2030
- → Water Neutral by 2030 and Water Positive by 2040

Product circularity

Preserving nature and biodiversity

- → Aligning to Global Biodiversity Framework
- → Aligning to science to map and set targets across our value chain
- → Taking up flagship projects for Nature-based-Solutions

Driving decarbonisation with renewable power

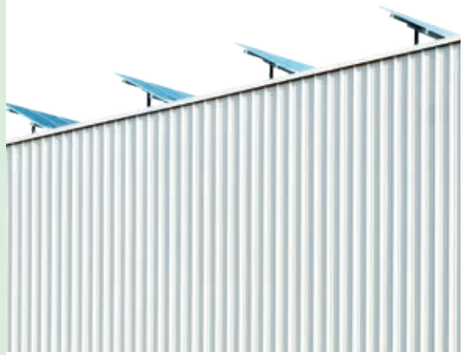
At Tata Motors, decarbonisation in operations will be primarily driven by transitioning to renewable energy sources. We are collaborating with power companies to drive our renewables initiatives forward.

Renewable energy strategy

On-site renewables
In-house generation through rooftop solar power

Off-site renewables
Investments in captive wind power

Renewable energy PPAs
Power purchase agreements with RE producers

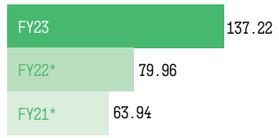


Highlights for FY 2022-23

Our Company continued to add on-site Renewable Energy (solar) generation capacity in FY 2022-23, bringing the total installed capacity of Solar PV installation to 5.8 MWp at Pune (Pimpri); 7.5 MWp at Jamshedpur; 7 MWp at Pantnagar; 0.435 MWp at Chinchwad; 4.07 MWp at Lucknow; 1 MWp at Dharwad; 15.5 MWp at Chikhali & 2 MWp at Sanand.

Renewable electricity

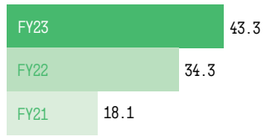
MILLION KWH



*restated

Total on-site renewable power installations

MWP



GHG emissions reduction

A roadmap has been prepared for reducing our Greenhouse Gas (GHG) emissions impact measured as Scope 1, 2 and 3 GHG emissions.

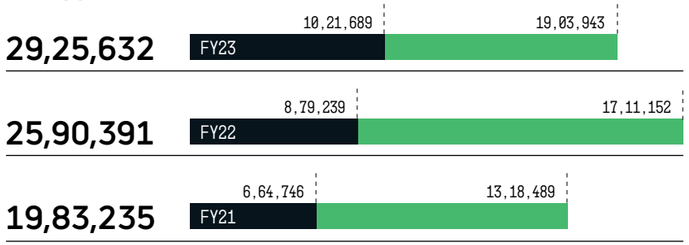
Emission reduction action plan

Scope 1 & 2	Scope 3
ACCELERATING TRANSITION TO RENEWABLE ENERGY REDUCING PER UNIT ENERGY CONSUMPTION IMPROVING ENERGY EFFICIENCY	REDUCING AND NEUTRALISING TAILPIPE EMISSIONS THROUGH OUR SHIFT TO LOW-EMISSION AND CLEAN MOBILITY

All our product plans across TML are aligned with our decarbonisation and Net Zero targets. Our product plans involve a whole spectrum of clean alternatives–across Battery Electric Vehicles, Hydrogen Fuel Cell Vehicles and Hydrogen ICE Vehicles.

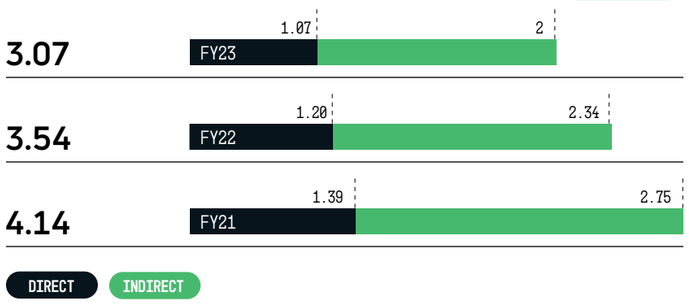
Energy consumption

GJ



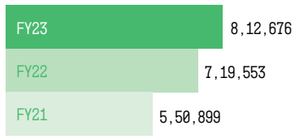
Specific energy consumption

GJ/VEHICLE



Operational energy consumption

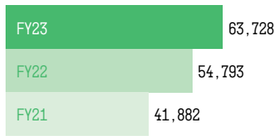
MWh



GHG emissions

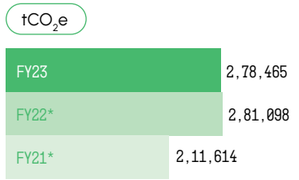
Scope 1 GHG emissions

tCO_2e



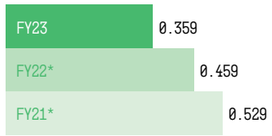
Scope 2 GHG emissions

tCO_2e



Specific GHG (Scope 1+2) emissions

tCO_2e/vehicle



*restated

FY23

25.9% OF TOTAL ELECTRICITY USED WAS SOURCED FROM RENEWABLES

Scope 3 emissions (tCO_2e)

PURCHASED GOODS & SERVICES[1]	3,26,061
FUEL & ENERGY RELATED ACTIVITIES	1,08,446
UPSTREAM TRANSPORTATION & DISTRIBUTION[6]	2,05,787
WASTE GENERATED IN OPERATIONS[3]	1,512
BUSINESS TRAVEL	2,354
EMPLOYEE COMMUTING[2]	14,004
UPSTREAM LEASED ASSETS[5]	1,886
USE OF SOLD PRODUCTS[7]	98,41,571
FRANCHISES[4]	14,130

[1] Purchased Goods & Services: Based on data received from 134 suppliers in FY23 for 11 months.
[2] Employee Commuting: Emissions from company provided buses used for employee commute.
[3] Waste generated in operations: Includes emissions from composting of biodegradable waste, incineration & landfill of hazardous waste.
[4] Franchises: Based on data received from 417 franchise outlet in FY23 for 11 months.
[5] Upstream leased assets: Emissions from Company offices (rented).
[6] Upstream transportation & distribution: Based on data received from 134 suppliers in FY23 for 11 months.
[7] Use of sold products: Emissions from Passenger cars.

ENVIRONMENT

Water management

Tata Motors

6.12 m^3/vehicle

WATER WITHDRAWAL INTENSITY

58,42,982 m^3

OPERATION WATER WITHDRAWAL

Tata Motors acknowledges the significance of water as a shared and scarce resource. We are committed to using water efficiently by maximising effluent recycling and re-use at all our manufacturing plants, and minimising leakage and wastage. We have created water bodies and ground water recharge structures within our manufacturing sites wherever feasible. Process water consumption is optimised by technological interventions and employee engagement through Kaizen events. These efforts reduce dependence on fresh water sources minimising the risk. We also take conscious efforts to replenish water through groundwater recharge structures in communities where we operate.

Going forward, our approach will be holistic and encompass all aspects of sourcing water and its optimal utilisation. We are working to augment natural water availability in the areas surrounding our Operations in order to achieve 'Water Positive' status.

Although none of our manufacturing plants are located in water-stressed regions, we are vigilant about how we manage our water resources. All our manufacturing units operate keeping in mind our long-term Aalingana goal of Net Water Neutrality, striving to achieve it by reducing water consumption and promoting water conservation. Our manufacturing facility in Lucknow was certified 'Water Positive' and the Pantnagar facility was certified 'Water Neutral' by CII-GBC in FY 2022-23.

Waste management

Tata Motors

1,69,844

OPERATIONAL WASTE GENERATED

9,376
HAZARDOUS

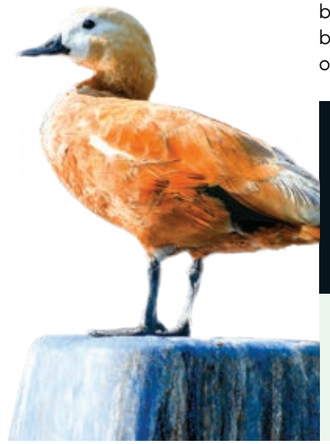
1,60,468
NON-HAZARDOUS

All our manufacturing facilities ensure that the management of wastes is done in full compliance of the legal requirements as specified by the operating permits, consents and authorisations. Waste is segregated as per material type and shape and sold to recyclers for conversion and utilisation. We ensure the sale of all flexible and rigid plastic packaging to authorised plastic waste processors for recycling and utilisation in the manufacture of new packaging material. Hazardous and Other Waste are similarly routed to authorised recyclers or re-processors for material recovery or to co-process for energy recovery through cement plants. E-wastes from our operations are limited to devices, their components and IT assets which are discarded after their useful life or due to obsolescence. These designated e-waste are disposed only to authorised recyclers.

Special efforts are taken to divert hazardous waste from landfill/incineration by deriving value from the same. Several plants divert hazardous waste for energy recovery through co-processing at cement plants. Where technically feasible, we are utilising the recovered material such as reclaimed thinner, secondary paint made from paint sludge or sand from our foundries in our own manufacturing operations or in our supply chain. Going forward, our efforts will be more focused, guided by our internal Circularity Framework to achieve status of 'Zero Waste to Landfill'.

Biodiversity

Tata Motors approach to preserving nature and biodiversity in our operational area and value chain includes conserving habitats around our operating sites, aligning to Science to map and set targets across our value chain and taking up flagship projects for Nature based Solutions beyond our value chain. In FY 2022-23, we commenced biodiversity baselining across our operational sites, which will cover all seasons. The baseline survey will enable the next phase of enhancing biodiversity at our sites through suitable habitat and species management.



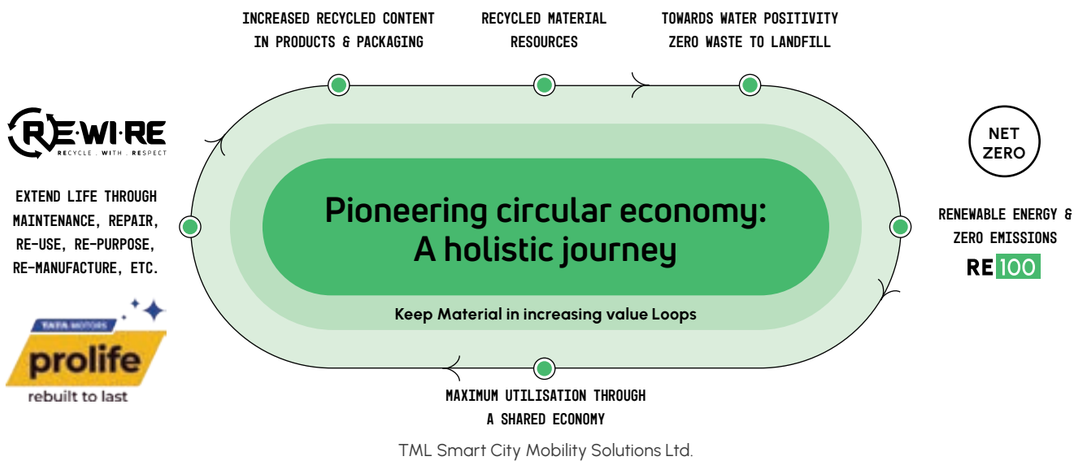
Wetlands developed at our Operations for optimal resource management and habitat creation

All our major operational sites have created artificial water bodies using the available storm water run-off. These water bodies and the surrounding areas have been developed as natural habitats which attract a large number of resident and migratory birds.

Pioneering circular economy

Natural resources are finite, and an enlightened approach to long-term manufacturing growth with consumer focus must integrate circularity and also work at prolonging product life. At Tata Motors, our consistent efforts are towards optimising the use of virgin material and moving determinedly towards a circular economy approach. Across the product lifecycle we have identified several processes that offer positive interventions in favour of greener product development, longer product use and safe and effective recycling.

To aid this transition, Tata Motors is developing a comprehensive Circularity Framework by using guidelines from principles originating from a model proposed by the World Economic Forum (WEF) and the World Business Council for Sustainable Development (WBCSD). Our transition will lead to product decarbonisation, material circularity, extending lifetime and improving utilisation.



TML Smart City Mobility Solutions Ltd.

Initiatives across circular economy pathways

We are working on higher use of secondary materials, extending useful life of parts and consumables and ensure a lower carbon footprint of materials.

We are also building enablers to close the loop in the form of vehicle scrappage facilities, expanding the scope of Prolife business, and introducing new business models through shared mobility.

Recycled material resources

Through life cycle impact assessment, we are identifying the various prospects to reduce vehicle-level environment impact. This helps us identify major hot spots and take effective measures to decrease the vehicle-level carbon footprint and enhance resource efficiency.

In support of our objective of eliminating hazardous materials and Persistent Organic Pollutants (PoP) from our value chain, we are working on omitting paints from polymeric parts.

Ambition into action

Internal experts across design and development, operations and manufacturing, sales, customer care and sourcing are working to establish practical principles and metrics. Furthermore we have pledged for long-term targets of Water Neutrality by 2030, and Zero Waste to Landfill by 2030 from our own operations, roadmaps and action plan for which are being charted.

We are utilising the following to fully leverage the potential of circularity

- NANO TECHNOLOGY
- NATURAL FIBRE COMPOSITES
- USE OF PRE-CONSUMER WASTE FROM TEXTILES
- RECOVERY OF PRECIOUS MATERIALS
- EXTENSION OF LIFE FOR THE DRAIN PERIOD OF OILS
- USE OF RECYCLED GLASS FOR WINDSHIELD AND SUNROOF ASSEMBLY

Renewable energy and zero emissions

We have taken a holistic approach towards our long-term ambition of net-zero emissions which recognises the role of circularity. Our decarbonisation journey is driven by our products where we focus on clean mobility solutions aspiring to achieve Net Zero by 2040 (PV business) and 2045 (CV business) as well as through our operations by focusing on maximising our renewable electricity share to 100% by 2030.

Maximum utilisation through a shared economy

With the launch of TML Smart City Mobility Solutions Limited (TSCMSL), Tata Motors intends to bring specific focus to its EV segment as a service offering across its CV portfolio. A diverse portfolio of commercial vehicles are being offered under a supply, operate and maintain model. So far the e-bus fleets has clocked 70 million cumulative miles. MoUs with Delhi Transport Corporation and Bengaluru Metropolitan Transport Corporation for the deployment of 1,500 and 921 buses, respectively, have been signed.

ENVIRONMENT

Extend life through maintenance, repair and re-use

TML offers a range of services by way of customer support for maintenance, repair and minimising downtime for our products. These services extend through the useful life of a product. There are over 1,600 service points as well as 24x7 on-site service support and mobile service vans. In order to actively develop the service support ecosystem, we provide extensive drivers' trainings and mechanics trainings.

To build a robust and dynamic service support infrastructure we are also ensuring proper inventory, usage analysis, replenishment and fulfilment of our spares. This supplements our efforts to build a collaborative ecosystem whereby the Mobility as a Service value proposition makes service and downtime easy for the customer. This is particularly in reference to our efforts towards daily preventive and corrective maintenance activities.

We also offer on-site dedicated container workshops that are equipped with the necessary tools, fast moving parts/lubes storage space, small office spaces so that repair and support operations can be carried out smoothly. Apart from this, we also provide many other value-added services under:

- Tata Kavach: For quick accident repair
- Tata Zippy: For quick vehicle repair
- Tata Alert: Roadside assistance programme with 24-hour problem resolution assurance for all CV models under warranty.

Lifetime parts planning, technician training to prolong life of vehicles

Our technicians are specially trained in carrying out scheduled services of vehicles in a way that prolongs the life of the vehicle and its components. Measures are taken for lifetime planning and stocking of phased out models so that working vehicles are not forced into obsolescence due to parts unavailability. Likewise, special tools and equipment are also maintained so that less common parts can still be easily handled. We provide repair kits for restoration, servicing of aggregates and major assemblies to avoid opting for expensive replacement of aggregates.

Tata Assured

Our 'Tata Assured' vertical, which is our in-house pre-owned vehicle programme, is operational across 150+ outlets. We help dealers buy, exchange and sell certified used cars, giving them the full benefit of our brand's trust assurance.

Tata OK

The Tata OK service offers similar services for trucks owners and buyers, with presence across 350+ exclusive Tata OK dealers across India. The range of services include buying, selling or exchange of commercial vehicles and ensuring complete reliability through 120 quality checks, engine warranty, document transfer and financing.

Prolife

The Tata PROLIFE programme gives a new lease of life to vehicle aggregates like engine, clutch plates and discs, and cabins. The remanufacturing makes the used aggregates as good as new, at a fraction of the cost, and also improves fuel mileage by 5-10% vis-à-vis the older parts. The environmental benefits are huge, as vehicle life gets prolonged. The PROLIFE aggregates are processed at our technologically advanced plants at Lucknow, Surat and Hyderabad.

PROLIFE SERVICES ARE AVAILABLE ACROSS THE COUNTRY THROUGH 1600+ WORKSHOPS AND OBVIATES THE NEED TO OPT FOR UNORGANISED SECTOR REPLACEMENTS.

25,807
CV ENGINES REMANUFACTURED

33,975
CLUTCH PLATE AND CLUTCH DISC REMANUFACTURED

Remanufacturing at Tata Motors

COMMERCIAL VEHICLE ENGINES FROM 2-6CYL. PRODUCT RANGE FROM BSII TO BSVI FUEL TYPES: DIESEL AND CNG

CLUTCH PLATE AND CLUTCH DISC RANGING 170 TO 380 DIA.

CABINS FOR 1516 TYPE AND SIGNA VEHICLE.

Re.Wi.Re: Responsibly managing the end-of-product life phase

Scrapping and recycling of vehicles in a responsible way at the end of the product lifecycle supports environmental goals. Tata Motors demonstrated its holistic commitment towards sustainable mobility with the launch of Re.Wi.Re –Recycle with Respect, our first state-of-the-art franchise-based Registered Vehicle Scrapping Facility (RVSF) in Jaipur, Rajasthan. Launched in February 2023, the plan is to open more such facilities across India. This move will lessen the pollution involved in the dismantling of ELVs and bring this activity within the organised sector. So far, scrap handling has been entirely run by the unorganised sector, often following primitive processes.

Re.Wi.Re.

LOWERING EMISSIONS | ENABLING MATERIAL CIRCULARITY | ACCELERATING CARBON NEUTRALITY

As a part of end-of-life product management, we work tirelessly to improve our products' circularity, by making vehicle designs with easy disassembly, and opting for sustainable materials.

JLR

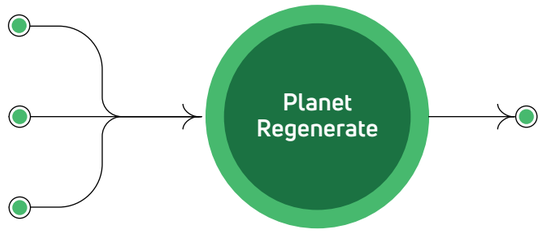
Planet Regenerate is driving JLR's transformation with the aim to become carbon net zero by 2039.

GHG emissions reduction

Decarbonising manufacturing & operations

Decarbonising the supply chain

Decarbonising the use phase of our vehicles



We published Science-Based Targets in March 2022 for ambitious CO2e reduction across Scope 1, 2 and 3 emissions by 2030

60%

REDUCTION PER VEHICLE KM, ACROSS THE USE OF OUR VEHICLES

46%

REDUCTION ACROSS JLR'S OWN OPERATIONS (SCOPE 1&2 EMISSIONS)

54%

REDUCTION PER VEHICLE, ACROSS OUR VALUE CHAIN (SCOPE 3 EMISSIONS)

During the development of our Science-Based Targets, we assessed that our total annual emissions across Scope 1, 2 and 3 were over 35MtCO_2e for FY 2019-20. This included emissions across our entire value chain, from raw material suppliers to client use through to end of life. This scale of CO_2e emissions is comparable with many countries' annually reported emissions and shows the scale of influence that our company can have in mitigating climate change. Tata Group's Project Aalingana has also established a number of group-wide targets in relation to carbon net zero, such as a 25% reduction in absolute carbon emissions by 2030 and carbon net zero across the group by 2045.

CARBON NET ZERO ACROSS TATA GROUP BY **2045**

Decarbonisation can drive immense impact

FY20

>35MtCO_2e

JLR'S TOTAL ANNUAL EMISSIONS ACROSS SCOPE 1, 2 AND 3

THIS SCALE OF CO_2E EMISSIONS IS COMPARABLE WITH MANY COUNTRIES' ANNUALLY REPORTED EMISSIONS

Our strategy to deliver

We have built a robust strategy to meet our targets, and it has been integrated into our Refocus 2.0 programme. Delivery against targets for Scope 1, 2 and 3 emissions has also been linked to the enterprise strategic bonus FY 2022-23 plan. We will drive energy consumption reduction across our sites and increase the use of on-site and off-site renewable electricity. This includes degasification; with the use of gas currently 74% of our market-based Scope 1 and 2 emissions.

Use of sold products: By 2030, in addition to 100% of Jaguar sales, we anticipate that around 60% of Range Rover, Defender and Discovery models sold will not have tailpipe emissions. We have established targets for future vehicle programmes, primarily focused on reducing the impact of key materials within our supply chain, such as steel, aluminium and battery cells.

Absolute Scope 1 & 2 emissions for FY23	152ktCO_2e
Scope 3 'Use of sold products'	24.6%
Use of sold products' emissions for FY23	255gCO_2e per vehicle km
Reduction on FY20 SBTi baseline	0.3%
Scope 3 'combined use of sold products and purchased goods and services'	64.0tCO_2e/vehicle
Reduction on FY20 SBTi baseline	0.5%

The last couple of years were impacted by the pandemic and the supply chain shortages that followed. This has resulted in a production and retail mix of vehicles that has driven with a marginal decrease compared to the SBTi baseline.

Introduction of the new Range Rover-and Range Rover Sport, which improved CO_2e by 14.7% (9.2tCO_2e/ vehicle) over previous models. This was due to the replacement of the AJ133 V8 engine with the new NC10 V8 engine and efficiency improvements with the new MLA platform.

In September 2022, we invited our global supplier network to commit to sustainability targets approved by the SBTi. All tier 1 suppliers were asked to set a decarbonisation pathway, report transparently and demonstrate progress towards their targets, disclosing their carbon reporting and collaborating with their own supply chain to deliver the same reductions. This requirement was shared with more than 5,000 companies.

ENVIRONMENT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Biodiversity

As part of our Planet Regenerate focus area, we are creating a nature and biodiversity strategy, using developing frameworks such as Taskforce for Nature-related Financial Disclosures (TNFD) and the Science-Based Targets Network (SBTN). In line with Tata Group's Project Aalingana strategy and approach, we are defining a nature and biodiversity strategy, and assessing our impact and dependences on nature.

We are in the early stages of standardising our approach to biodiversity management across our direct operations. However, our global facilities are already addressing biodiversity as part of ongoing site management, and this approach is looking to be replicated elsewhere.

In the UK, Gaydon and Fen End Proving Grounds continue to maintain and enhance habitats under their site ecology management plans. In June 2022, our Engine Manufacturing Centre in Wolverhampton invited the Staffordshire Wildlife Trust to visit the site and offer recommendations around specific management actions that will improve the diversity of wild pollinator species, and tree planting for a memorial garden.

Our vehicle manufacturing sites in Brazil and Slovakia have ongoing initiatives centred around habitat restoration and species monitoring.

In Brazil, this is in partnership with the State Environmental Institute (INEA) and researchers of the Middle Paraiba Wildlife Refuge (REVISMEP) to contribute to the goals within the Wildlife Refuge to protect plant and animal communities. In Slovakia, there is ongoing cooperation with the University of Constantine the Philosopher, to monitor the natural restoration of habitats as well as the inundation and revitalisation of wildlife communities (REVISMEP). The plan aims to protect natural environments for communities of flora and fauna species.

Circular economy

The circular economy is an essential part of our pathway to Net Zero, creating value in a resource-constrained world and maintaining resilience in our supply chain. We have clearly established Tata Group targets and a strategy in active development to meet these targets. We recognise that reducing resource consumption and waste and increasing recycled content in our materials will reduce the carbon intensity of key raw materials such as steel, aluminium and battery cell materials.

Our strategy is based around three key focus areas of:

01 **Circular resources**

02 **Circular products**

03 **Circular enablers**

Circular resources

We aim to maximise our resource efficiency, resilience and regenerative content, through increased recycled content in our vehicles, reducing waste and the proportion of our waste that goes to either landfill, or incineration.

We further support innovative projects that enable circular supply chains.

Two Innovate UK projects that enable circular supply chains

Recycling of EV Cells from Obsolete Vehicles at Scale (RECOVAS)

RECOVAS offers the potential for a new circular supply chain for electric vehicle batteries in the UK.

Securing Critical Rare Earth Magnets (SCREAM)

SCREAM is a project to produce recycled NdFeB magnets from scrap, to be used in clean technologies such as wind turbines generators in EVs.

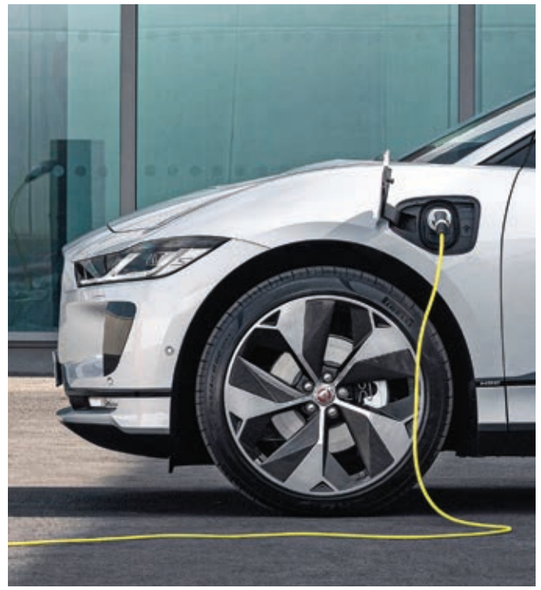
Circular products

We will increase the longevity of our components and products, through the implementation of circular economy principles in design and engineering, to increase repairability and recyclability. We will also target new business models from re-manufacturing and secondary products, such as engines, powertrains and 'second life' batteries.

Reusing vehicle batteries will create new circular economy business models for JLR in energy storage and beyond. Second-life battery supply for such applications could exceed 200 gigawatt-hours per year by 2030, creating a global value over $30 billion, and we are expanding such battery end of life circular economy initiatives.

JLR partnership with Pramac

In March 2022, we partnered with Pramac, to develop a portable, zero-emission energy storage unit powered by second-life electric vehicle batteries. Their Off Grid Battery Energy Storage System (ESS) feature lithium-ion cells from Jaguar I-PACE batteries, supplying zero-emission power where access to the main supply is limited or unavailable. It was showcased through the year by the Jaguar TCS Racing Formula E team, powering their on-grid utilities on race days.



Circular enablers

We will generate value through circular business models, such as our 'Transport as a Service' offering, Pivotal, while increasing engagement on circularity with our employees and value chain partners. To provide validation of our future progress as well as support the development of partnerships, education and communication of our activities, we have partnered with the Ellen MacArthur Foundation.

In the coming year, we plan to establish a baseline across our circular economy activities.

Progress through collaborations

We partnered with the Ellen Macarthur Foundation, an organisation dedicated to accelerating the transition to a circular economy based on three principles: Eliminate waste and pollution, circulate products and materials, and regenerate nature. Further, we have joined the World Economic Forum Circular Car Initiative, a network platform, to share insights, best practices and challenges in the area of circularity (always in line with anti-trust requirements). These tie-ups come from our belief that knowledge sharing and collaboration are critical to accelerate sustainability in our industry.