

2020

绿色发展报告

Green Development Report 2020

Ford



Ford

长安福特
Changan Ford

I 关于本报告 About this Report

报告概述 Summary

本报告是长安福特汽车有限公司围绕产品全生命周期在采购、研发、制造、销售、回收利用等方面的绿色发展理念和实践情况。《2020 年绿色发展报告》的发布为利益相关方提供了关于公司绿色发展蓝图和进展的全面信息。我们针对一系列绿色发展议题开展了全面的实质性分析，并对结论进行了梳理和考量，在此基础上确定了报告的内容和主题。

This report mainly discloses the green philosophies and practices of Changan Ford Automobile Co., Ltd. for the whole life cycle of its products covering research and development, procurement, manufacturing, marketing, recycling and other related aspects. *Green Development Report 2020* provided stakeholders with comprehensive information on the company's green development blueprint and progress. We conducted a comprehensive and substantive analysis of a series of green development issues, combed and considered the conclusions, and determined the content and theme of the report.

时间范围 Time Frame

本报告内容以 2020 年为主，部分内容超过此范围。

This report focuses on the year of 2019 and some parts exceed this scope.

组织范围 Organisational Scope

本报告中制造方面信息主要以长安福特重庆一、二、三工厂为主。

The manufacturing information in this report is mainly based on CAF1, CAF2 and CAF3 in Chongqing.

指代说明 Anaphora

为了便于阅读，报告中“长安福特汽车有限公司”也以“长安福特”、“公司”或“我们”表示。

For the convenience of reading, the report "Changan Ford Automobile Co., Ltd." is also referred to as "CAF", "company" or "we".

编写依据 Compiling Principle

本报告参考中汽数据有限公司编写的《汽车企业绿色发展报告编制指南》，并结合长安福特的实际情况编写。

This report is prepared with reference to *the Automotive enterprise green development report compilation guide* by Automotive Data of China Co., Ltd. and based on the actual situation of CAF.

数据说明 Data Description

本报告披露的数据来自公司内部正式文件和统计数据。

All data disclosed herein are sourced from internal formal documents and statistic data of the Company.

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进无止境

01

企业简介

An Overview of CAF

- 02 企业概况
An Overview of CAF
- 05 战略规划
CAF Strategic

02

研发设计

Research & Development

- 10 研发战略
R&D Strategy
- 13 产品健康性能
Product Health Performance
- 18 产品节能技术
Product Energy Saving Technology
- 21 产品环境影响
Product Environmental Impact

03

生产制造

Manufacturing

- 24 制造战略
Manufacturing Strategy
- 25 管理体系
Management System
- 26 能源资源管理
Energy and Resources Management
- 28 环境排放治理
Environmental Emission Control

04

采购经销

Purchase and Distribution

- 34 绿色供应链
Green Supply chain
- 36 绿色运输
Green Transportation
- 38 绿色包装
Green Packaging
- 38 经销商管理
Dealer Management
- 绿色储存
Green Storage

05

回收利用

Waste Disposal and Recycling

- 40 动力蓄电池溯源
Power Battery Tracing
- 41 可回收利用率与可再利用率
Recyclability Rate and Recoverability Rate
- 41 拆解信息公开
Disclosure of Vehicle Dismantling Information
- 42 零部件再制造
Remanufactured Parts
- 43 标准披露项索引
Standard Disclosure Index



01 企业简介

An Overview of CAF

企业概况
An Overview of CAF

战略规划
CAF Strategic

长安福特成立于
2001年4月

I 企业概况 An Overview of CAF

长安福特汽车有限公司（以下简称“长安福特”），成立于2001年4月，是一家集整车、发动机、变速器制造于一体的大型综合性现代化汽车企业，并朝着“成为中国汽车行业的领跑者”的伟大愿景不断迈进。2020年实现营业收入492亿元。

长安福特目前生产和销售的主要车型有：福克斯、福睿斯、锐际、蒙迪欧、锐界、探险者、林肯冒险家、林肯飞行家、林肯航海家，加上未来将陆续投产的多款车型，长安福特产品谱系将涵盖所有主流市场，满足并引领用户需求。截至到2020年底，长安福特累计产量725万辆，累计销量723万辆，其中新能源车产销均为5000余辆。长安福特2020年产量为23万辆、销量为25万辆。

2020年实现营业收入
492亿元

长安福特以“创造卓越产品，成就品质生活”为使命，融合全球领先的技术和中国优秀的文化，创造智行、智擎、智联的汽车。我们努力向消费者提供世界一流的服务体系，建立起了遍布全国的福特品牌经销商网络，旨在为中国消费者提供世界一流的服务体验。

截至到2020年底
长安福特累计产量
725万辆

Changan Ford Automobile Co., LTD. (hereinafter referred to as "Changan Ford", abbreviated as CAF), founded in April 2001, is a large-scale comprehensive modern automobile enterprise integrating the manufacture of complete vehicles, engines and transmissions. It is striving for the great vision of "lead China's auto industry". In 2020, CAF achieved a revenue of 49.2 billion yuan.

CAF's current production and sales of the main models are: Focus, Escort, Escape, Mondeo, Edge, Explorer, Corsair, Aviator, Nautilus, coupled with the various models that will be put into production in the future, CAF product spectrum will cover all the mainstream market, meet and guide the user requirements. By the end of 2020, CAF has produced 7.25 million units and sold 7.23 million units, including more than 5,000 units of new energy vehicles (2003-2020). In 2020, CAF produced 230 thousands vehicles and sold 250 thousands units.

累计销量
723万辆

With the mission of "Create Excellent Products, Accomplish A Quality Life", CAF integrates world-leading technology and China's excellent culture to create intelligent mobility, intelligent engines, and intelligent connected vehicles. We strive to provide consumers with a world-class service system and have established a network of Ford brand dealers across the country, aiming to provide Chinese consumers with a world-class service experience.

— 业务布局 Business layout

2地6厂
2 places and 6 factories

4家整车厂
4 OEMs

1家变速器厂
1 transmission plant

1家发动机厂
1 engine plant

长安福特
Changan Ford

3家 长安福特整车厂

1家 变速器工厂

1家 发动机工厂

其中新能源车
产销均为
5000余辆

截至目前
经销商门店

500+
Dealer stores
up to now

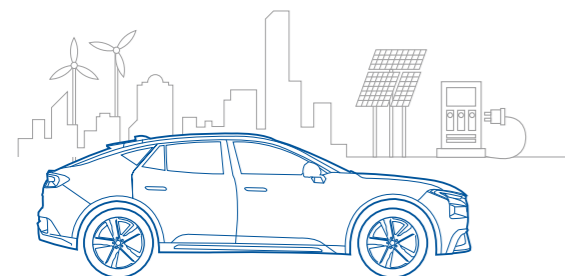
员工

10,000+
Employee



长安福特

— 发展里程碑 Milestone



— 产品图谱 Product Atlas

标志性车型 CAF Models

20 载奋斗之路



福克斯 FOCUS



福睿斯 ESCORT



翼虎 KUGA



蒙迪欧 MONDEO



锐界 EDGE



锐际 ESCAPE



金牛座 TAURUS



探险者 EXPLORER



林肯冒险家 CORSAIR



林肯航海家 NAUTILUS



林肯飞行家 AVIATOR



MUSTANG MACH-E

动力系统产品 Power System Products

发动机系列 Engine series

五星工厂制造 ★★★★★
Five-star factory manufacturing



变速器系列 Transmission series

五星工厂制造 ★★★★★
Five-star factory manufacturing



电池系列 Battery series

新能源产品
New energy products



电机系列 Motor series

新能源产品
New energy products



文化理念 CAF Culture

长福企业文化理念

融合双方母公司文化，基于自身发展特点和历史经验，通过不断总结与验证，形成了共同信念，建立了长安福特企业文化核心理念



创造卓越产品 成就品质生活
Create Excellent Products, Accomplish A Quality Life



成为中国汽车行业领跑者
Lead China's Auto Industry



以客户为中心 以奋斗者为本
诚信尊重 | 精简高效 | 创新变革
Customer Oriented, Role Model Employee as Core, Honest & Respectful, Simple & Efficient, Innovative & Adaptive

战略规划 CAF Strategic

随着“双碳”目标的提出，长安福特成立了碳中和团队，积极响应国家和地方政府的号召，开展碳减排研究工作。依据福特全球的碳减排目标，2035年前生产制造100%使用可再生电力，2050年前实现碳中和。

长安福特积极探索工厂层面碳减排机会、提高可再生电力的使用，目前已完成杭州工厂太阳能面板的安装，预计可提供工厂25%的电能使用量。未来长安福特将继续开展光伏合作项目，不断提高可再生电力的使用比例，力争早日实现碳中和目标。

With the proposal of the "Carbon peak and Carbon neutrality" goal, CAF established a carbon neutral team to actively respond to the call of the national and local governments to carry out carbon reduction research work. According to Ford's carbon reduction targets, production and manufacturing will use 100% renewable electricity by 2035, and carbon neutrality will be achieved by no more than 2050.

CAF is exploring opportunities for carbon emission reduction at the factory level and increasing the use of renewable electricity. Now CAF has completed the installation of solar panels in the Hangzhou factory, which is expected to provide 25% of the factory's electricity consumption. In the future, CAF will continue to conduct photovoltaic cooperation projects, continuously increase the proportion of renewable electricity usage, and strive to achieve the carbon neutral target as soon as possible.

研发战略 R&D Strategy

到2025年，福特在中国市场销售车型中的70%将提供电动车版本

未来福特在中国市场纯电动车占比将达到40%-50%

长安福特坚持将绿色环保理念贯穿从原料采购、工厂建设、工艺开发及产品设计每个环节。从源头出发进行生态设计，争取最大程度的资源利用和最小程度的资源消耗及环境影响，贯穿产品生命周期的全过程，从而达到环保、节能、减排的目的。长安福特秉承“爱无止境”社会责任理念，积极将世界变得更加美好。在产品之初即考虑产品的节能、健康、环保、安全，并开展深入研究。

福特汽车已宣布计划到2050年在其全球业务范围内实现碳中和愿景，并进一步加大了电气化投资力度。2025年底，福特将投入超过300亿美元用于纯电动车型和电池的研发和生产。2030年底，纯电动车型将占全球销量的40%-50%，林肯品牌全球实现纯电动化。

长安福特作为福特在中国市场的重要部分，将持续投放更多的新能源产品和电气化产品。其中，2021年已投产锐际 PHEV、冒险家 PHEV，并计划在下半年投产高端 SUV BEV 产品 Mache-E。同时，长安福特将加大传统燃油动力系统技术升级力度，在主要的1.5T/2.0T发动机上实施技术升级，提升节能水平。随着福特战略的整体推进，长安福特企业平均能耗水平将显著改善。

CAF adheres to the concept of green environmental protection throughout every link from raw material procurement, factory construction, process development and product design. CAF conducts ecological design from the source, strives for maximum resource utilization and minimum resource consumption and environmental impact, throughout the entire product life cycle, so as to achieve the goals of environmental protection, energy saving, and emission reduction. CAF adheres to the social responsibility concept of "Unending Love" and actively makes the world a better place. At the beginning of product design, the energy saving, health, environmental protection, and safety of the product are considered, and in-depth research is carried out.

Ford has announced it plans to achieve carbon neutrality by 2050 within its global business scope, and has increased its investment in electrification. At the end of 2025, Ford will invest more than 30 billion dollars in the research and development and production of electric vehicles and batteries. By the end of 2030, the share of electric models will account for 40%-50% of global sales, and the Lincoln brand will achieve all electrification worldwide.

As an important part of Ford in the Chinese market, Changan Ford will continue to launch more new energy and electric products. Escape PHEV and Corsair PHEV have been put into production in 2021, and the high-end SUV BEV product Mache-E is planned to be put into production in the second half of the year. In the future, a variety of high-end and economical BEV products and hybrid products will be launched. At the same time, efforts will be intensified to upgrade the traditional fuel power system technology, mainly 1.5T/2.0T engines to upgrade the energy saving level. With the overall advancement of Ford's China strategy, Changan Ford's average energy consumption level will significantly improve.



02 研发设计

Research & Development

研发战略
R&D Strategy

产品健康性能
Product Health Performance

产品节能技术
Product Energy Saving Technology

产品环境影响
Product Environmental Impact

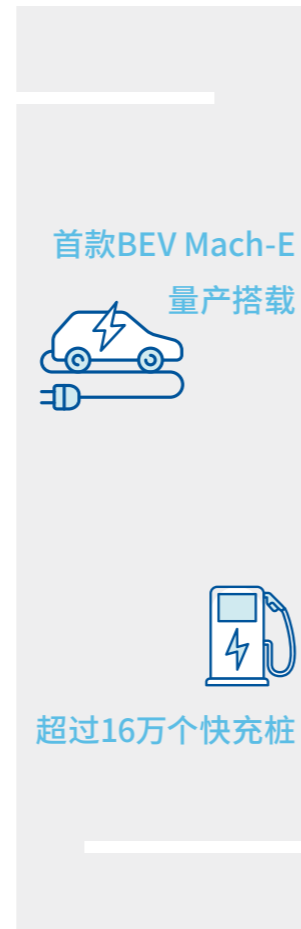
一 电动化产业布局 New Energy and Electrification

长安福特目前在重庆、杭州两地建有4个整车厂、1个发动机工厂和1个变速器工厂，其中3个整车厂和1个变速器工厂目前具备新能源整车及动力总成生产能力，生产纯电、插电式整车，以及相应的电池、电驱动、电机等产品。首款纯电动车Mach-E在重庆整车基地已量产下线。此外，根据纯电动车产品规划，正在加速对现有传统燃油车制造基地、产线进行转换、布局。

在动力电池、充电设施等关键领域，福特正逐步加大与本土领先供应商的战略合作，以支持福特中国市场快速发展。当前，在动力电池方面，福特已与比亚迪达成战略合作关系，并在首款BEV Mach-E量产搭载；在充电设施方面，福特已与蔚来汽车以及业内知名充电桩运营商展开合作，为福特电动车提供30万个以上的充电桩，其中有超过16万个以上的快充桩。

CAF currently has four vehicle plants, one engine plant and one transmission plant in Chongqing, Hangzhou, of which three vehicle plants and one transmission plant currently have new energy vehicle and powertrain production capacity, producing BEVs and PHEVs, as well as the corresponding battery, electric drive and motor products. The first battery electric vehicle Mach-E has been mass-produced and rolled off the assembly line in Chongqing. In addition, according to the battery electric vehicle product plan, the conversion and layout of the existing traditional fuel vehicle manufacturing base and production line are accelerating.

In key areas such as power batteries and charging facilities, Ford is gradually increasing strategic cooperation with leading local suppliers to support the rapid development of Ford's Chinese market. At present, in terms of power batteries, Ford has reached a strategic partnership with BYD, and it is installed in the first BEV Mach-E for mass production. In terms of charging facilities, Ford has cooperated with NIO and well-known charging pile operators to provide more than 300,000 charging piles for Ford electric vehicles, including more than 160,000 quick charging piles.



一 网联化产业布局 Connectivity

在驾驶座舱信息娱乐科技领域，长安福特与本土优秀企业建立了良好的合作关系，共同打造了车载信息娱乐系统，利用本土软件供应商丰富的生态应用和功能体验以满足中国客户的需求，提升福特IVI系统在中国市场的竞争力。目前，长安福特已实现新车100%搭载车联网。

In the field of cockpit infotainment technology, Changan Ford has established a good partnership with outstanding local enterprises to jointly create an in-car infotainment system, utilizing the rich ecological applications and functional experiences of local software suppliers to meet the needs of Chinese customers and enhance the competitiveness of Ford's IVI system in the Chinese market. Currently, Changan Ford has achieved 100% of new vehicles equipped with Telematics.

目前，长安福特
已实现新车
100%搭载车联网

■ 2020年底对部分已售车辆通过OTA升级实现了V2X车路协同功能。

At the end of 2020, V2X vehicle-road collaboration function was implemented in some sold vehicles through OTA upgrade.

■ 2021年初在探险者和锐界Plus新车型上实现V2X车路协同功能。

In early 2021, V2X Vehicle-Road Collaboration implemented in new Explorer and Edge Plus models.

■ 2023年计划引入包含V2V在内更丰富的V2X车路协同功能。

In 2023, we plan to introduce a wider range of V2X vehicle-road collaboration features, including V2V.

同时，2021年下半年在EVOS/Mach-E等全新车型上推出最新的车载信息娱乐系统；计划在2023年推出下一代车载信息娱乐系统，实现更加丰富的应用生态和便捷流畅的交互体验。

Meanwhile, the latest in-car infotainment system will be launched in the second half of 2021 on new models of EVOS/Mach-E; the next-generation in-car infotainment system is planned to be launched in 2023 to realize a richer application ecology and a convenient and smooth interaction experience.

一 智能化产业布局 Intelligent Technologies

驾驶辅助功能已成为用户在购车时重点关注的科技配置，依托福特领先的自动驾驶技术，长安福特已在量产车型上搭载了L2级驾驶辅助功能，并在21年下半年上市的Mach-E与EVOS车型上搭载更先进的L2+BlueCruise主动驾驶辅助。后续将持续开发和迭代更智能的驾驶辅助功能，不断满足中国市场客户的需求。

Driving assistance function has become a technological configuration that customers pay attention to when buying a car. Relying on Ford's leading autonomous driving technology, CAF has already equipped its production models with L2-level driver assistance features and will equip the more advanced L2+ BlueCruise active driver assistance on Mach-E and EVOS models to be launched in the second half of 2021. We will continue to develop and iterate on smarter driver assistance features to continuously meet the needs of customers in the Chinese market.

长安福特已在量产
车型上搭载了
L2级驾驶辅助功能

I 产品健康性能 Product Health Performance

— VOC管控 VOC Control

长安福特建立《车内空气质量开发管理程序》，对整车及零部件的车内空气质量指标的开发验证过程进行管理，以保证公司设计开发的整车及零部件符合国家标准及公司相关标准要求。

CAF has established the Interior Air Quality Development Management Procedure to manage the development and verification process of the interior air quality index of the whole vehicle and components to ensure that the whole vehicle and components designed and developed by the company meet the requirements of national standards and relevant company standards.

• 材料VOC管控 Material VOC control

低VOC、低气味材料的选取: 例如用水性胶水替换溶剂型胶水降低气味和苯类挥发，共聚POM替换均聚POM降低甲醛挥发，低气味低VOC座椅面料的使用。

Low VOC, low odor material selection: for example, we use water-based glue to replace solvent-based glue to reduce odor and benzene volatilization; copolymer POM to replace homopolymer POM to reduce formaldehyde volatilization; low odor and low VOC seat fabric use. According to the third-party inspection report, VOC content in the left front door interior panel assembly of a vehicle under development is all below the detection limit.

• 零部件VOC管控 Component VOC control

生产过程管控: 注塑工艺控制、除醛除味、通风放置等措施。

设计标准: 依据整车VOC要求，对车内每一个总成零部件设置严苛的管控限值，在DV/PV中进行签收。根据第三方检验报告，某在研车型的左前门内饰板总成的VOC含量均低于检出限值。

Production process control: injection molding process control, aldehyde and odor removal, ventilation and other measures.

Design standard: According to the vehicle VOC requirements, set strict control limits for each assembly component in the vehicle, and sign for it in DV/PV. According to the third-party inspection report, VOC content in the left front door interior panel assembly of a vehicle under development is all below the limit.

• 整车VOC管控 Vehicle VOC control

设计验证: 在每个装车阶段HB/TT/PP/MP按照GB/T 27630进行监控和签收。

量产监控: 对于已量产的车辆，每周抽样监控VOC并由金鼻子团队测试气味。

AAR新风管家: 拥有四重过滤结构的高效活性炭滤清器，能有效过滤96%的PM1.0与PM2.5、94%的PM0.3颗粒物，并能吸附包括正丁烷、甲苯和氮氧化物在内的有害物质，防止进入车内产生异味。

Design verification: HB/TT/PP/MP is monitored and signed according to GB/T 27630 at each loading stage.

Mass production monitoring: For vehicles that have been mass-produced, VOC samples are monitored weekly and the Golden Nose team will test the smell.

AAR New Air Steward has a high efficiency activated carbon filter with quadruplet filter structure, which can effectively filter 96% of PM1.0 and PM2.5, 94% of PM0.3 particles, and can absorb harmful substances including n-butane, toluene and nitrogen oxide, to prevent odor from entering the car.

样例

2020款
全新福克斯三厢车

中国汽车健康指数 (C-AHI)

评价中获得“5星”评级



满分5星

通过低挥发材料的选取、关键零件生产过程的控制，全新福克斯2020款三厢车在中国汽车健康指数 (C-AHI) 的评价中获得“5星”评级 (满分5星)，八项有害气体均远低于国家标准。

Through the selection of low volatile materials and the control of the production process of key parts, the all-new Focus 2020 three-box car is rated "5 stars" (out of 5 stars) in the Evaluation of China Automotive Health Index (C-AHI), and the eight hazardous gases are far below the national standard.

单位 Unit: g/m ³	苯 Benzene	甲苯 Methylbenzene	乙苯 Ethylbenzene	二甲苯 Xylene	苯乙烯 Styrene	甲醛 Formaldehyde	乙醛 Acetaldehyde	丙烯醛 Acrolein
检测值 Detection value	0.001	0.008	0.003	0.011	0.002	0.011	0.02	N.D.
限值 Limit	0.06	1	1	1	0.26	0.1	0.2	0.05



— 有害物质控制 Hazardous Substances Control

长安福特建立《汽车有害物质和可回收利用率管理程序》，对汽车材料有害物质信息和可回收利用率数据的收集和汇报。确保车用材料的选择和使用满足法规要求。

CAF has established the Management Procedure of Automobile Hazardous Substances and Recyclable utilization rate to collect and report the information of hazardous substances and recyclable utilization rate of automobile materials. Ensure vehicle material selection and usage meet regulatory requirements.

• 长安福特ELV方针 Changan Ford ELV Policy

(1) 深入实施中华人民共和国工业和信息化部2015年第38号公告《汽车有害物质和可回收利用率管理要求》和中国国家认证认可监督管理委员会CNCA-C11-01: 2020《强制性产品认证实施规则 汽车》，建立完善的汽车产品有害物质和可回收利用率管理体系。

(1) Implement the MIIT No. 38 of 2015 "Requirements for the Management of Hazardous Substances and Recoverability Rate of Vehicles" and the CNCA-C11-01:2020 "Implementation Rules for Compulsory Certification of Products Motor Vehicles" deeply. Establish a well-developed management system for hazardous substances and recyclability of automotive products.

(2) 积极开展生态汽车设计，遵循易拆解性和可回收利用性的设计原则，采用合理的结构和功能设计，选择无毒无害或低毒低害的绿色环保材料和易于拆解、利用的部件，应用资源利用效率高、环境污染小、易于回收利用的绿色制造技术。

(2) Actively carry out ecological design, follow the design principle of easy dismantling and recoverability, adopt reasonable structure and function design, select green environmental protection material of no toxicity and no hazard or low toxicity and low hazard and parts that can be easily dismantled and recovered, apply green manufacturing technologies featuring high resources utilization efficiency, small environmental pollution and easy recovery.

(3) 积极构建绿色供应链，控制有害物质使用、落实材料标识要求；指导各级零部件和材料供应商如实提供产品的材料和有害物质使用情况；对汽车有害物质和可回收利用率进行跟踪与分析；

(3) Actively establish green supply chain, and control the use of hazardous substances and carry out the material marking requirements. Guide all levels of automotive components/parts and material suppliers to provide usage information of material and hazardous substances of the products according to the facts, so as to facilitate follow-up and analysis of automotive hazardous substances and recoverability rate.

(4) 严格控制汽车产品有害物质满足国家标准GB/T 30512《汽车禁用物质要求》。

(4) Strictly control the harmful substances in vehicle products to meeting national standards GB/T 30512 "Requirement for prohibited substances on automobiles"

(5) 汽车产品可回收利用率计算方法符合GB/T 19515《道路车辆可再利用性和可回收利用率计算方法》的要求，力争可回收利用率要达到95%，其中可再利用率不低于85%。

(5) The calculation method of automobile product recyclability meets the requirements of GB/T 19515 "Road vehicles- Recyclability and Recoverability- Calculation method" , striving to achieve 95% Recoverability rate, of which the Recyclability rate will be no less than 85%.

建立完善的汽车产品
有害物质和可回收
利用率管理体系

选择应用
资源利用效率高
环境污染小
易于回收利用的
绿色制造技术

力争可回收利用率
要达到95%
其中可再利用率
不低于85%

所有零部件材料完全
不含有害物质比例
≥85%

有害物质提前达标
零部件比例
≥60%

(6) 按照GB/T 33460《报废汽车拆解指导手册编制规范》要求向回收拆解企业发布《汽车拆解指导手册》。

(6) According the requirement of GB/T 33460 "Specifications for compiling dismantling manual of end-of-life vehicles" provide "Dismantling manual of vehicles" to recycling and dismantling enterprises through appropriate approach.

得益于优秀的有害物质控制，新一代福睿斯车型的《有害物质高风险零部件清单》所有零部件材料完全不含有害物质比例≥85%，《有害物质豁免零部件清单》有害物质提前达标零部件比例≥60%。

Due to the excellent control of hazardous substances, the proportion of all parts and materials in Hazardous Substances High-risk Parts List for the new generation Escort models is no less than 85%, and the proportion of parts and materials in Hazardous Substances Exempted Parts List is no less than 60%.

— 车辆噪声控制 NVH Control



• 发动机变速器本体 Engine body

发动机增加平衡轴来降低发动机本体的振动，变速器优化齿形齿向来降低齿轮啸叫等，同时对高压油泵，高低压油轨，平衡轴等噪声源头增加NVH隔音罩来进一步降低本体噪音辐射，从源头到传递路径采取一系列有效的措施来提升动力系统本体NVH的表现。

CAF takes a series of effective measures on the source and transfer path to improve NVH performance of powertrain system. Such as tuned balance shaft to reduce the engine vibration, optimize gear profile to reduce gear whine, NVH sound package also implanted on noise-concerned parts such as high-pressure oil pumps, oil rails engine head etc.

• 整车动力系统 Vehicle power system:

为了提升怠速抖动水平，在设计前期综合考虑发动机的激励频率和系统（如冷却模块、转向系统等）固有频率，做到合理避频。

为了提升车内怠速和加速噪声水平，车型通常考虑采用ANC技术（车内声音主动降噪技术）

In order to improve the level of idling vibration, the excitation frequency of the engine and the natural frequency of the system (such as the cooling module, steering system, etc.) are comprehensively considered in the early stage of the design to avoid the frequency alignment.

In order to improve the idling speed and acceleration noise level in the car, the model usually considers the use of ANC technology (active noise reduction technology in the car)

• 整车 Vehicle NVH

- 轮胎合理选型，降低源头的激励；
Reasonable tyre selection, reduce the source of excitation;
- 悬架选型优化，降低力的传递；
Suspension selection optimization, reduce the transfer of force;
- 隔振系统优化隔振设计，提高隔振率；
Vibration isolation system optimization vibration isolation design, improve the vibration isolation rate;
- 车身接附点提高动刚度，降低力对车身的输入；
Body attachment points improve the dynamic stiffness, reduce the force input to the body;
- 优化车身结构，降低车身灵敏度。设定较高的声
Optimize body structure and reduce body sensitivity.
- 学包目标值，提升整车的吸隔声性能；
Set a higher acoustic package target value, improve the sound absorption performance of the vehicle;
- 整车合理避频，避免系统之间的耦合。
The vehicle avoids frequency reasonably to avoid coupling between systems.

路噪性能

Road noise performance

风噪性能

Wind noise performance

- 前挡采用夹层玻璃，侧窗采用夹层玻璃或者更厚的玻璃，门系统多层密封设计以及车身造型的流线型设计，通过DMU控制附件如后视镜，搭接配合关系，以达到降低车外噪声到车内的辐射，降低车身表面压力脉动对车身的输入。达到优化风噪性能的目的。

Laminated glass is used for the front baffle, laminated glass or thicker glass for the side window; Multi-layer sealing design of door system and streamlined design of body shape; DMU is used to control accessories such as rearview mirror and lap coordination relationship, so as to reduce the radiation from noise outside the car to the inside of the car, reduce the input of pressure pulsation on the body surface to the body, and achieve the purpose of optimizing wind noise performance.



得益于优秀的噪声控制，C490 21MY车型的怠速工况下车内噪声为 **25** dB
60 km/h工况下车内噪声为 **57** dB；车外噪声为 **70.1** dB。

Thanks to the excellent noise control, the interior noise of the C490 21MY model is 25dB under idling conditions, 57dB under 60km/h conditions, as well as the exterior noise is 70.1dB.

产品节能技术 Product Energy Saving Technology

— 车辆能耗 Vehicle Energy Consumption



缸内直喷

提升燃油效率和优化动力输出



可变轮轴正时

提升发动机扭矩和燃油经济性



涡轮增压

提升发动机功率及输出扭矩

凭借在涡轮增压发动机领域的持续创新，从2010年开始，福特EcoBoost发动机11年9次入选“沃德十佳发动机”，体现了福特在技术上的深厚积淀。

EcoBoost发动机是在传统自然吸气发动机的基础上，进一步添加了涡轮增压、燃油缸内直喷和双独立可变气门正时系统这三大关键技术优势，不仅保证了澎湃的动力输出，而且优化了燃油经济性高达20%，并降低15%的二氧化碳排放。

我们严格遵守国家“双积分”政策要求，2020年通过积分交易已实现当年度双积分合规要求。2020年平均燃料消耗量实际值7.18 升/百公里，较2019年有所上升。我们十分重视此情况及其相关带来的风险。未来，我们将优化产品结构，进一步提高节能低排放和零排放产品的占比。

With continuous innovation in turbocharged engines, Ford EcoBoost has been selected as one of the "Wards Top 10 Engines" for 9 times in 11 years since 2010, reflecting ford's deep technological accumulation.

The EcoBoost engine is a natural aspirated engine with turbocharging, in-cylinder direct injection and dual independent variable valve timing. The EcoBoost engine provides robust power output, optimizes fuel economy by up to 20%, and reduces CO₂ emissions by 15%.

We act in strict accordance with the dual credit policy of China, in 2020 we have achieved current year dual credit compliance requirements by credit trading. The actual average fuel consumption in 2020 was 7.18 L/ 100km, up from 2019. We are highly concerned on the situation and the related risks.

未来，我们将优化产品结构，进一步提高节能低排放和零排放产品的占比。

In the future, we will optimize the product mix and further increase the proportion of energy-saving, low-emission and zero-emission products.



一 汽车轻量化 Lightweight Technology

随着温室气体排放量显著增加，全球气候变暖形势越发严峻。国家也出台了各类严苛的汽车尾气排放法规，对燃油经济性、低碳排放和更高的安全性新的要求和挑战。这就要求车企采用更加先进的技术，制造出更高强度，更低重量的汽车。

以长安福特福睿斯为例，在同一IWC情况下，减重100KG，油耗降低0.06L；在跨IWC情况下，减重100KG，油耗降低0.2L。因此，汽车轻量化技术的研发与应用势在必行。

车身是整车的重要组成部分，通过科学的方式，将车身轻量化后，就可以有效减少燃油消耗。同时，降低了汽车重量，碰撞时整个需要被吸收转移的能量就会减少，车辆安全性会提升。因此白车身的减重至关重要。

近年来，长安福特加大了对白车身轻量化的研究，通过材料的合理使用、采用新工艺、结构优化设计等，不断开展白车身减重优化工作。以福特飞行家前端结构为例，通过铝合金铸造减重达36%。

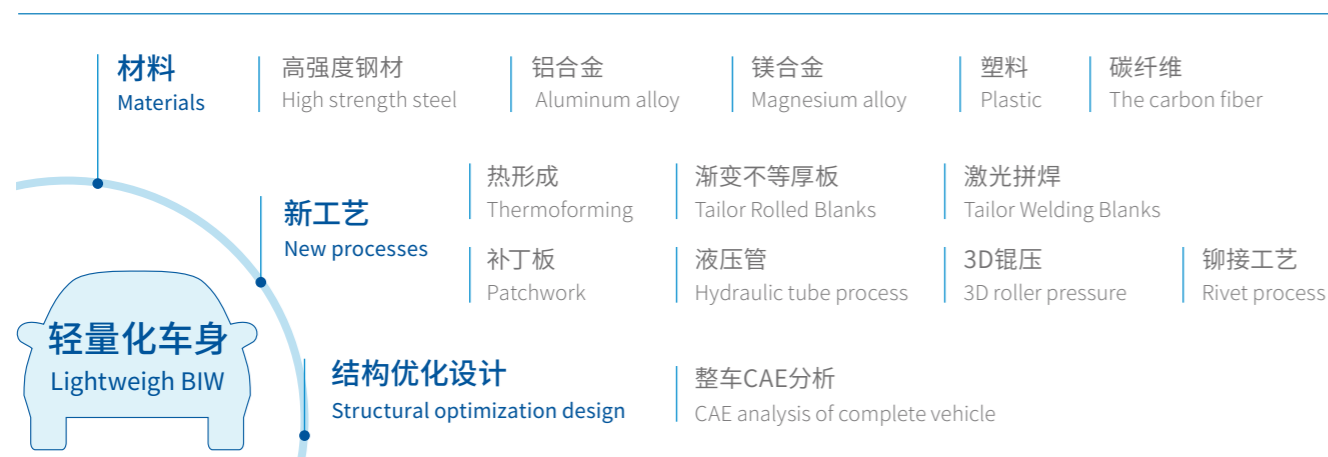
以福特飞行家
前端结构为例
通过铝合金铸造
减重达36%

With greenhouse gas emissions increasing dramatically, global warming is becoming more serious. The country has also introduced all kinds of stringent regulations on automobile exhaust emissions, new requirements and challenges for fuel economy, low carbon emissions and higher safety. This will require companies to use more advanced technology to make cars with higher strength and lower weight.

Take Escort as an example, under the same IWC condition, weight loss of 100KG, fuel consumption reduction of 0.06L; In the case of cross-IWC, weight loss of 100KG and fuel consumption reduction of 0.2L. Therefore, the research and application of automotive lightweight technology is imperative.

Body is an important part of the whole vehicle. After lightweight body in a scientific way, fuel consumption can be effectively reduced. At the same time, by reducing the weight of the car, the energy that needs to be absorbed and transferred during a collision will be reduced, and the safety of the vehicle will be improved. Therefore, the weight reduction of BIW is very important.

In recent years, CAF has increased the research of BIW lightweight, and continuously carried out BIW weight reduction optimization through the rational use of materials, the use of new technology, structural optimization design, etc. The front end structure of the Ford Aviator, for example, achieved a 36% weight reduction through aluminum casting.



下一步规划 Next planning

未来白车身的发展方向仍然是
多材料混合白车身

The use of materials for the BIW will continue to develop in the direction of high strength and light weight

同时，**特殊工艺**会更加普遍地
运用在白车身上

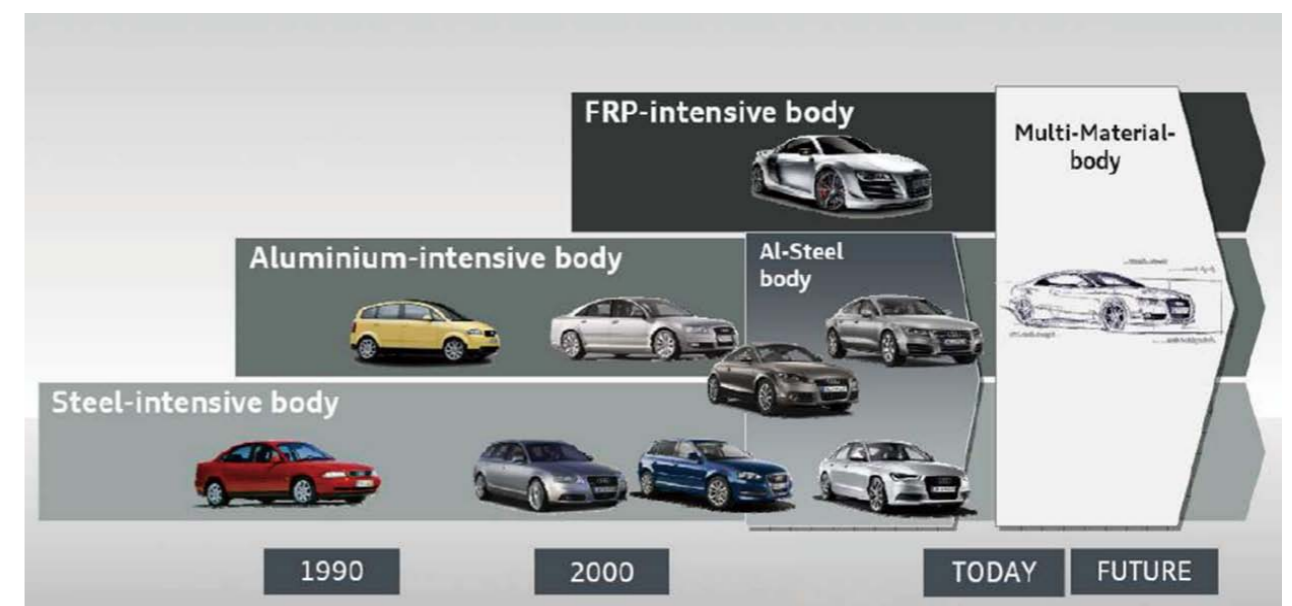
At the same time, special processes will be more commonly used on the BIW

白车身的材料运用会继续朝着
高强度、轻量化方向发展

CAF's future development direction of BIW is still a multi-material hybrid BIW

长安福特在新技术新材料运用方面
处于领先状态

CAF is in a leading position in the application of new technologies and new materials





产品环境影响 Product Environmental Impact

产品全生命周期碳排放 Product Life Cycle Carbon Emission

长安福特拥有专业团队负责产品碳排放管理，通过开展关键零部件和整车生命周期碳排放评价工作，根据分析结果，对产品生命周期碳排放进行管控。按照中汽数据的《中国汽车生命周期评价模型（CALCM-2021）》核算，福睿斯全生命周期碳排放为 217.8 gCO₂e/km，达到中国生态汽车认证中的满分要求。

CAF has a professional team responsible for the carbon emission management of products. Through the evaluation of carbon emission of key components and the vehicle life cycle, the carbon emission of products can be controlled according to the analysis results.

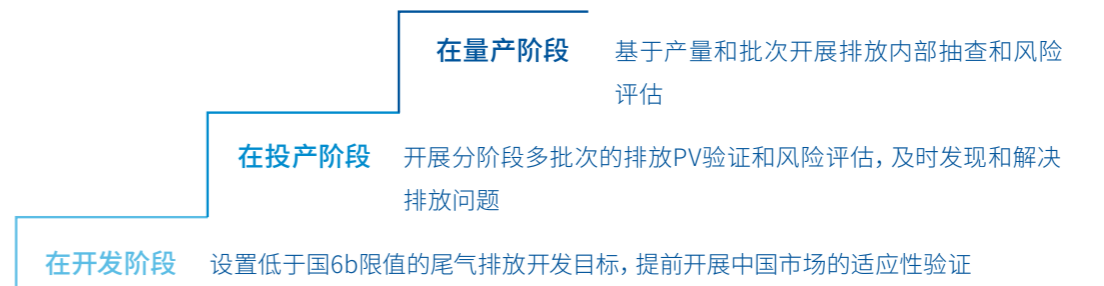
According to the Calculation of "China Automobile Life Cycle Assessment Model (CALCM-2021)" issued by Automobile Data of China Co., Ltd., the life cycle carbon emission of Escort is 217.8 gCO₂e/km.

影响指标 Impact indicator	单位 Unit	原材料获取 Rawmaterial acquisition	生产 Production	使用 Use	总值 Total
碳排放 Carbon emission	gCO ₂ e/km	34.4	3.7	179.7	217.8

尾气排放控制 Exhaust emission control

早在2016年，长安福特就积极开展排放控制技术升级研究工作。

As early as 2016, CAF has actively carried out research on emission control technology upgrading.



In the development stage, we set the exhaust emission development target lower than the national 6B limit, and carried out the adaptability verification of the Chinese market in advance.

In the start-up phase, we carried out PV verification and risk assessment of emissions in stages and batches to find and solve emissions problems in time.

During the mass production phase, we conduct internal spot checks and risk assessments of emissions based on volume and lot.

通过引入GPF、升级油箱、燃油管路、碳罐、车载油气回收技术（ORVR）等措施，不断改善车辆尾气排放，降低尾气排放对环境的影响。2019年7月长安福特全系车型跨过国6a阶段，直接满足国6b标准，提前满足更加严格的排放标准，减少尾气污染物的排放。

未来，长安福特将持续开展产品生态设计研究工作，并导入新能源及电气化车型，提升电气化水平、降低企业平均能耗水平。

We have introduced GPF, upgraded fuel tanks, fuel lines, carbon tanks, on-board oil and gas recovery technology (ORVR) and other measures to improve vehicle exhaust emissions and reduce the impact of exhaust emissions on the environment. In July 2019, all models of Changan Ford crossed the national 6a stage and directly met the National 6b standard, meeting the stricter emission standards in advance and reducing the emission of exhaust pollutants.

In the future, CAF will continue to carry out product ecological design research, and introduce new energy and electrified models to improve the electrification level and reduce the average energy consumption level of the enterprise.



03 生产制造 Manufacturing

制造战略
Manufacturing Strategy

管理体系
Management System

能源资源管理
Energy and Resources Management

环境排放治理
Environmental Emission Control

长安福特以建设
“绿色工厂”为目标

通过增加
污染物治理力度，
减少环境排放

I 制造战略 Manufacturing Strategy

长安福特一直坚持绿色发展理念，严格执行国家和地方的节能、环保、循环利用、清洁生产、低碳等领域相关的法律法规，致力于环保建设和生态环境保护，严格控制“三废”排放，以绿色制造为抓手，绿色发展为目标，推动企业不断朝着绿色工厂的目标发展；积极构建行业领先的高效、清洁、低碳、循环的绿色制造体系，系统推进节能环保、清洁生产和绿色制造系统工程。

为保持长安福特发展过程中的绿色化，确保绿色发展作为公司日常经营生产过程中的不变主题，长安福特以建设“绿色工厂”为目标，在原有的相关管理体系的基础上，形成了绿色工厂相关管理制度，并严格将相关制度落实到实际生产经营中。同时根据绿色发展相关制度，不定期通过不同形式开展绿色理念的宣传、绿色工厂建设、绿色制造等绿色化集成培训，向员工宣传创建绿色工厂的知识和环保基础的知识，积极营造绿色环保文化氛围，以此动员全公司的员工行动起来，共同参与到创建绿色工厂的工作中来。

下一步，长安福特将深入贯彻绿色制造体系理念，在制度执行、资源利用、产品生产、环境排放上均不断提供绿色化管理水平。以打造绿色制造示范企业为目标，提高能源利用率，加强企业碳排放管理，有效减少单位产品能耗和工业增加值能耗；通过增加污染物治理力度，减少环境排放。

CAF has always been adhering to the concept of green development, strictly implementing national and local laws and regulations on energy conservation, environmental protection, recycling, clean production, low carbon and other fields, committed to environmental protection construction and ecological environment protection, strictly controlling the discharge of "three wastes", with green manufacturing as the starting point and green development as the goal, promoting the enterprise to develop toward the goal of green factory. CAF actively builds an industry-leading efficient, clean, low-carbon and circular green manufacturing system, and systematically promotes energy conservation, environmental protection, clean production and green manufacturing system engineering.

In order to keep the green development in the development process of CAF and ensure green development as the constant theme in the daily operation and production process of the company, CAF takes the construction of "green factory" as the goal. Based on the original related management system, CAF has formed the relevant management system of green factory and strictly implemented the relevant system into the actual operation. At the same time, according to the relevant system of green development, CAF carries out the green integration training of green concept publicity, green factory construction and green manufacturing in different forms from time to time, to publicize the knowledge of building green factories and the basic knowledge of environmental protection to the employees, and actively create a green environmental protection culture atmosphere, so as to mobilize the employees of the whole company to take action in creating a green factory.

Next, CAF will thoroughly implement the concept of green manufacturing system, with the goal of building a demonstration enterprise of green manufacturing, continuously provide green management level in system implementation, resource utilization, product production and environmental emissions, improve energy efficiency, strengthen enterprise carbon emission management, and effectively reduce energy consumption per unit product and industrial added value energy consumption, while increasing pollution control efforts to reduce environmental emissions.

管理体系 Management System

— 安全职业健康管理体系 Occupational Health Management System

公司坚持以人为本，牢固树立安全发展理念，认真落实国家新《安全生产法》切实履行安全生产责任制以及各项安全规章制度，夯实基础管理，积极构建安全生产长效机制，保障公司全年的安全生产工作。公司于2014年取得国家安全生产标准化二级企业达标证书。

CAF adheres to the principle of people-oriented, firmly establishes the concept of safety development, earnestly implements the provisions of the new National "Safety Production Law" earnestly implements the safety production responsibility system and various safety rules and regulations, lays a solid foundation for management, actively builds a long-term safety production mechanism, and guarantees the company's year-round safety production work. CAF obtained the national Safety production Standardization Second-class enterprise standard certificate in 2014.

公司于2014年取得
国家安全生产标准化
二级企业达标证书

— 环境管理体系 Environmental Management System

公司严格遵守各项等法律法规，制订一系列公司内部规章制度，开展废气、温室气体排放、排污以及废弃物的管理工作，确保规范排放，切实履行保护环境的职责。公司通过并取得劳氏质量认证（上海）有限公司 ISO14001 认证和认证证书。

CAF strictly complies with various laws and regulations, formulates a series of internal rules and regulations of the company, carries out the management of waste gas, greenhouse gas emissions, sewage discharge and waste, to ensure standardized emissions and earnestly fulfill the responsibility of environmental protection. CAF has obtained the ISO14001 certificate issued by Lloyd's Quality Certification (Shanghai) Co., LTD.

通过并取得劳氏
质量认证（上海）
有限公司ISO14001
认证和认证证书

— 能源管理体系 Energy Management System

长安福特汽车有限公司根据福特全球统一的能源管理体系标准(EMOS)，建立了公司、工厂、车间级能源管理制度。每年定期对体系进行内部评审。

公司设立有专业的能源管理团队和专职的能源管理人员，各区域车间配置有兼职能源协调员，负责公司能源管理的具体工作。

According to ford's global unified Energy Management System Standard (EMOS), CAF has established energy management system at company, plant and workshop level, and conducts internal review on the system regularly every year.

CAF has set up a professional energy management team and full-time energy management personnel, each regional workshop is equipped with part-time energy coordinator, responsible for the specific work of the company's energy management.

公司设立有专业的
能源管理团队
和专职的
能源管理人员

2020年度全年
消耗能源
42901吨标煤

能源资源管理 Energy and Resources Management

— 能源管理 Energy Management

公司2016~2017年投资400多万元，在重庆二三工厂建立BMS，投资实现水、电、天然气和压缩空气等能源数据的实时采集分析和重点能耗设备的远程监控。公司能源计量器具分工厂、车间、重点设备三级配置，一、二、三级能源计量器具配备率及在线采集率均达100%。对工厂各区域和重点能耗设备的用能分析提供了强有力的基础保障，各类计量器具按国家和公司标准执行检定和校准。

公司主要能源消耗为电力、天然气、汽油，天然气主要用于涂装工艺和冬季空调供暖，汽油主要为产品车随车添加。公司每年都会投入专项资金用于节能技术项目的改造，并通过不断优化的管理措施推动节能工作开张，持续降低单车能源消耗

2020年度全年消耗能源42901吨标煤，其中重庆基地26091吨标煤。2020年重庆基地单车能耗0.170吨标煤/台，较2019年同比下降4.86%。

From 2016 to 2017, CAF invested more than 4 million yuan to establish BMS in Chongqing second and third Plant, and invested to realize real-time acquisition and analysis of energy data such as water, electricity, natural gas and compressed air and remote monitoring of key energy consumption equipment.

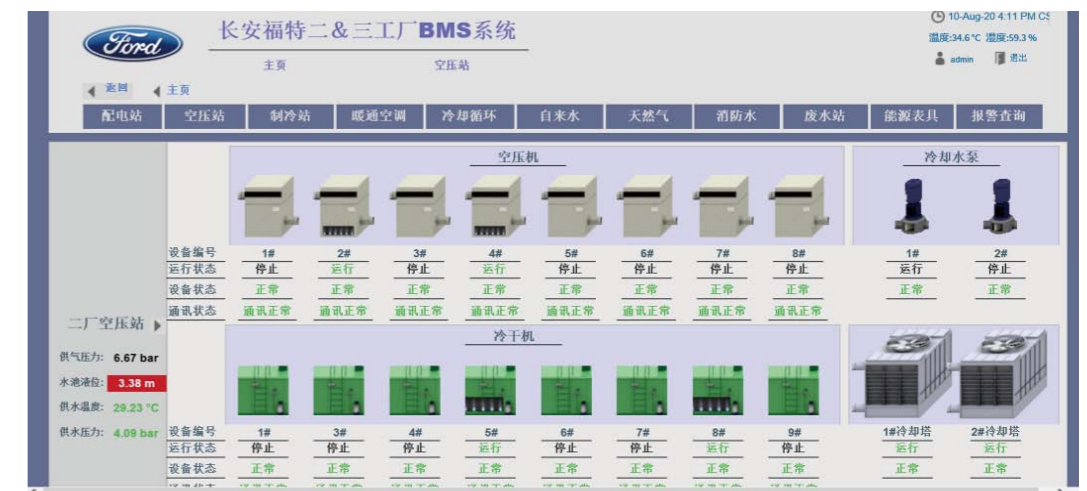
CAF energy metering instruments are divided into three levels: factory, workshop and key equipment. The equipment rate of the first and second and third level energy metering instruments reaches 100%. It provides a strong basis for the energy analysis of the plant's various regions and key energy consumption equipment. All kinds of measuring instruments are verified and calibrated according to the national and company standards.

The main energy consumption of CAF is electricity, natural gas and gasoline. Natural gas is mainly used for painting process and air conditioning heating in winter, and gasoline is mainly added to product vehicles. CAF invests special funds every year for the transformation of energy saving technology projects, and promote the start of energy saving work through continuous optimization of management measures, and continuously reduce the energy consumption of per vehicles.

In 2020, CAF consumed 42,901 tce, including 26,091 tce in Chongqing Base. In 2020, the energy consumption of chongqing Base per unit was 0.170 tce, 4.86% lower than that of 2019.

重庆基地
26091吨标煤

2020年
重庆基地单车能耗
0.170吨标煤/台
较2019年同比下降
4.86%



一 水资源管理 Water Resources Management

长安福特建立有安全与环境管理部，并配备专职的环境工程师负责公司的节水、环保管理工作。作为一个有社会责任感的企业公民，公司建有完善的环境管理制度，制定了节水管理、固废、大气、废水管理等环境控制程序，对关键环境指标设立年度目标，并制定相应的管理方案，每月跟踪回顾目标指标的执行情况，并不断进行持续改进。

长安福特不断寻找节水机会点，投入大量资金用于节水项目改造。如在废水新增一套中水回用系统，将废水站处理合格后的排放废水再次进行深度治理，治理合格后的中水用于涂装车间前处理工艺段重复使用，大大降低涂装车间的自来水消耗，全年可节约自来水4.3万吨。

使用节水新技术、新工艺方面：涂装车间电泳工段采用循环水清洗工艺，将第一个电泳槽的低浓度水通过溢流的方式进入第二个电泳槽，后续依次按此方式进入下一个电泳槽，通过循环往复利用的模式减少纯水的补水，最终仅排放高浓度电泳废水，通过工艺控制从源头上减少了废水的产生量。

CAF has established the Department of Safety and Environment Management, and equipped with full-time environmental engineers to take charge of the company's water-saving and environmental protection management. As a corporate citizen with a sense of social responsibility, we have established a sound environmental management system, formulated environmental control procedures such as water-saving management, solid waste, air and waste water management, set annual targets for key environmental indicators, and formulated corresponding management plans, tracked and reviewed the implementation of target indicators every month, and made continuous improvement.

Changan Ford constantly looks for water-saving opportunities and invests a lot of money in water-saving project transformation. For example, a new set of reclaimed water reuse system is added in the waste water, and the discharged waste water after qualified treatment in the waste water station is treated deeply again. The reclaimed water after qualified treatment is reused in the pre-treatment process section of the painting workshop, which greatly reduces the consumption of tap water in the painting workshop and saves 43,000 tons of tap water every year.

In the use of new water-saving technology, new process, coating workshop electrophoresis section using circulating water cleaning process, through process control from the source to reduce the amount of wastewater production. The low-concentration water from the first electrophoresis tank is poured into the second electrophoresis tank through overflow, and then into the next electrophoresis tank in this way. The water replenishment of pure water is reduced through recycling mode, and only high-concentration electrophoresis wastewater is discharged at last.

中水回用系统
降低涂装车间的
自来水消耗
全年可节约自来水
4.3万吨



环境排放治理 Environmental Emission Control

一 企业温室气体排放 GHG Emission

长安福特为加强企业温室气体排放控制、自觉履行国家要求的节能减排义务，响应“3060”双碳目标，进行了温室气体的核算并编制了温室气体排放核查报告。同时公司积极通过加强清洁能源、可再生能源的使用以及增加厂区绿化设备来降低企业生产过程中对环境的所造成的温室效应。

长安福特核算了2020年企业温室气体排放，核算边界为重庆老厂区CAF1和黄茅坪新厂区中CAF2，核算结果已上报重庆市生态环境局。2020年度碳排放量如下表所示。

In order to strengthen the control of greenhouse gas emission and consciously fulfill the obligation of energy conservation and emission reduction required by the state, CAF has prepared the verification report of greenhouse gas emission in response to the "3060" carbon peaking and carbon neutrality goals. At the same time, we actively strengthen the use of clean energy and renewable energy and increases plant greening to reduce the greenhouse effect caused by the production process of the enterprise to the environment.

CAF calculated its greenhouse gas emissions in 2020, and the accounting boundary is CAF1 and CAF2 in Chongqing. The accounting results have been reported to Chongqing Ecological Environment Bureau. Carbon emission in 2020 is shown in the table below.

2020 年长安福特汽车有限公司重庆一二工厂碳排放量汇总表

2020 Annual carbon emission summary of CAF1 and CAF2

排放边界 Discharge of the border	排放量 GHG emission(tCO ₂ e)
直接排放 Direct emissions	7504.28
间接排放 Indirect emissions	38299.69
特殊排放 Special emissions	/
总排放量 Total emission(tCO ₂ e)	45803.97

厂区用水全部来自市政自来水供水

2020年单位产量综合水耗为3.39m³/辆

较去年降低10%



All tap water supply comes from municipalities. In 2020 the comprehensive water consumption per vehicle is 3.39m³/ vehicle, which is 10% lower than last year.

一 废水排放 Wastewater Discharge

长安福特工厂设置废水处理系统，集中处理生产废水和生活污水。处理后的生产废水、生活污水经总排口排入市政管网最终进入嘉陵江。

CAF has set up wastewater treatment system, which centrally treats production wastewater and domestic sewage.



生产废水处理 Production wastewater treatment

磷化废水及电泳废水分别经预处理后进入生产废水综合处理系统处理后排放。废水总镍排放浓度满足《污水综合排放标准》(GB8978-1996)表1标准要求。含油废水直接排入依托的二工厂含油废水预处理系统，预处理后进入含油废水生化处理系统处理。

phosphating wastewater and electrophoresis wastewater are respectively pretreated and then discharged into the comprehensive wastewater treatment system. The total nickel concentration of wastewater meets the standard requirements in Table 1 of Integrated Wastewater Discharge Standard (GB 8978-1996). The oily wastewater is directly discharged into the oily wastewater pretreatment system of CAF2, and then into the oily wastewater biochemical treatment system for treatment.

长安福特重庆——工厂废水监测结果

CAF1 wastewater monitoring results(mg/L)

监测项目 Test Items	化学需氧 COD	氨氮 NH3-H	总磷 TP	阴离子表面活性剂 Anionic surfactant	五日化学需氧量 BOD ₅	悬浮物 SS	石油类 Petroleum
监测值 Test results	65	3.18	3.44	1.64	26.4	13.7	0.18
参考标准 Reference standards	500	45	8	20	300	400	20
达标情况 Standardreaching situation	达标 Reached	达标 Reached	达标 Reached	达标 Reached	达标 Reached	达标 Reached	达标 Reached



生活污水 Sewage

食堂废水经隔油池后和其他生活污水一起送入综合废水处理系统与生产废水一起处理。

canteen wastewater after separation tank and other sewage into comprehensive wastewater treatment system with production wastewater treatment.

长安福特重庆一、二、三工厂

2020年单车废水量为 **2.08m³/台**

同比减少 **9.6%**

废水回用率达到 **8.8%**

The waste water consumption per unit in 2020 was 2.08 m³/vehicle, which was 9.6% lower than last year, and the waste water reuse and recycle rate reached 8.8%.



一 废气排放 Exhaust Emission

长安福特各整车工厂废气处理措施基本一致。

The exhaust treatment measures of all vehicle factories of CAF are basically the same.

焊装车间焊接烟尘通过伞形罩捕集后经滤筒除尘器净化后排至车间内，不排入外环境。

The welding dust in the welding workshop is collected by the umbrella cover and purified by the filter cartridge dust collector before being discharged into the workshop.

涂装车间中的电泳室产生含有醇类物质的废气，电泳废气收集后采用沸石转轮处理设施和TNV热力焚烧炉处理后分别经排气筒排放。

The electrophoretic chamber in the painting workshop produces waste gas containing alcohols. The electrophoretic exhaust is collected by zeolite wheel treatment facility and TNV and then discharged by exhaust cylinder respectively.

电泳烘干炉产生有机废气，采用热废气氧化器(TAR)净化处理后，经排气筒排放。

The electrophoretic drying furnace produces organic waste gas, which is purified by TAR and discharged through the exhaust cylinder.

监测测试结果均符合《大气污染物综合排放标准》

单位面积挥发性有机物由原来35g/m²排放量降到7g/m²达到福特全球工厂最低水平

公司聘请有资质的第三方机构，根据排污许可管理要求对工厂废气排放情况以及特征污染物进行季度月度、季度和年度监测，监控污染物排放总量。监测测试结果均符合《大气污染物综合排放标准》等的各类要求，污染物总量满足排污许可管控要求。

为降低挥发性有机物的排放，2016年公司对喷涂工艺进行改造，同时2015年到2019年陆续完成各工厂的挥发性有机物深度治理工程。根据2020年物料平衡数据，公司挥发性有机物削减明显，单位面积挥发性有机物由原来35g/m²排放量降到7g/m²，达到福特全球工厂最低水平。

根据2020年环境监测报告，重庆一工厂、二工厂、三工厂各污染因子均达标排放，排放总量均低于排污许可证许可量。

We employs qualified third-party institutions to conduct quarterly monitoring of exhaust emissions and characteristic pollutants and monitor the total amount of pollutant emissions in accordance with the requirements of emission permit management. The monitoring and testing results all meet various requirements such as the Comprehensive Emission Standards for Air Pollutants, and the total amount of pollutants meet the emission permit control requirements.

In order to reduce the emission of VOC, CAF transformed the painting process in 2016. Meanwhile, we have completed the in-depth treatment of VOC for each factories from 2015 to 2019. According to the material balance data, the VOC reduced observably, which per area fell from 35g/m² to 7g/m², reached the lowest level in Ford global factories.

According to the 2020 environmental monitoring report, the pollution factors of CAF1, CAF2 and CAF3 all meet the emission standards, and the total emission is lower than the permitted amount of the Pollutants Discharge Permitting.

一 固废处理 Solid Waste Disposal

长安福特厂区建有一般工业固废暂存间和危废暂存间，危废暂存区地面已进行了防渗、防腐处理，一般工业固废暂存间符合国家标准的要求。

CAF has temporary storage room for general industrial solid waste and hazardous waste. The ground of the temporary storage area of hazardous waste has been treated with anti-seepage and anti-corrosion, general industrial solid waste temporary storage area meets the requirements of national standards.

各车间产生的可回收物分类收集
后外售给第三方公司回收利用。

The recyclables generated by each workshop is collected separately and sold to a third party company for recycling.

危险废物中含油废水及工业废水处理污泥、磷化废渣、漆渣、废油、废有机溶剂、废油漆桶、铅酸蓄电池等交由有资质的第三方公司安全处置。

Hazardous waste oily wastewater and industrial wastewater treatment sludge, phosphating waste residue, paint residue, waste oil, waste organic solvent, waste paint bucket, lead-acid battery, etc. are disposed of safely by a qualified third party company.

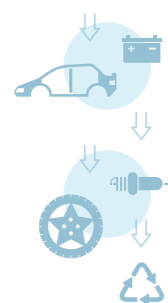
生活垃圾和一般工业固废委托给
第三方公司进行处置。

Household refuse and general industrial solid waste is entrusted to the third companies for disposal.

长安福特重庆一、二、三工厂固废产生情况

Solid waste generation of CAF1, CAF2 and CAF3

固废种类 Types	固废量 Solid Waste Volume
可回收固废 Recoverable Solid Waste(t)	25687.09
一般固废 General Solid Waste(t)	712.51
危险固废 Hazardous Solid Waste(t)	1357.01
固废产生总量 Total solid Waste(t)	27756.61



2020年单车固废产生量

较2019年下降 **7.5%** 且固废回收利用率达到 **97.4%**

The solid waste production per unit in 2020 dropped by 7.5% compared with 2019, and the solid waste recycling use rate was 97.4%.

一 厂界环境噪声 Plant Boundary Noise

长安福特工厂产生噪声的主要设备有主要噪声源有压力机、焊机、冷却塔、空压机、制冷机组、废气净化处理系统风机、水泵噪声等。长安福特针对各类声源的发声特征，分别采取减振、消声、隔声等降噪措施，降低噪声对环境的影响。根据2020年9月验收监测数据，重庆三工厂厂界昼间噪声值在51.0~61.0dB(A)，夜间噪声值在44.0~52.0dB(A)之间，满足《工业企业厂界环境噪声排放标准》(GB 12348-2008) 中的3、4类标准。

The main noise sources of CAF are presses, welders, cooling towers, air compressors, refrigeration units, exhaust gas purification and treatment system fans, water pumps, etc. According to the sound characteristics of various sound sources, CAF adopts noise reduction measures, such as vibration reduction, noise reduction and sound insulation, to reduce the impact of noise on the environment. According to the acceptance monitoring data in September 2020, the daytime noise value of the boundary of the CAF3 is between 51.0 dB(A) and 61.0dB(A), and the nighttime noise value is between 44.0 dB(A) and 52.0dB(A), meeting the category 3 and 4 standards in the Emission standard for industrial enterprises noise at boundary (GB 12348-2008).

噪声产生、治理情况一览表

List of noise generation and control

位置 Location	噪声源位置 Location of the noise source	治理措施 Measures
冲压车间 Stamping workshop	冲压机、冲孔机等 Punching machine, etc.	减震、隔声 Vibration and sound insulation
焊装车间 Welding workshop	焊机、铆接机等 Welding machine, riveting machine, etc.	隔声 Sound insulation
涂装车间 Painting	各类鼓风机、排风机、物料泵等 All kinds of blower, exhaust fan, material pump, etc.	消音器、隔声、减震 Muffler, sound insulation, shock absorption
总装车间 Assembly workshop	尾气检测排风机等 Exhaust detection exhaust fan, etc.	消音器、隔声、减震 Muffler, sound insulation, shock absorption



绿色供应链 Green Supply Chain

长安福特制定《生产采购通用条款和细则》对供应商及自身制定绿色环境生产目标

长安福特在针对供应商方面，通过建立供应商平台规范供应商的推荐，控制供应商选择风险，提高供应商选择效率，维持公平、公正、透明的供应商选择原则，维护稳定可靠的供应链，福特母公司制订了《环境要求-供应商指南》并要求长安福特依据环境要求相关标准进行供应链管理。同时，长安福特制定《生产采购通用条款和细则》，对供应商及自身制定绿色环境生产目标。

In terms of suppliers, CAF established a supplier platform to standardize supplier recommendation, control supplier selection risks, improve supplier selection efficiency, maintain a fair, just and transparent supplier selection principle, and maintain a stable and reliable supply chain. The parent company of Ford formulated the Environmental Requirements - Supplier Guide and required CAF to conduct supply chain management according to the relevant standards of environmental requirements. At the same time, CAF formulated the General Terms and Regulations of Production and Procurement to set green production goals for suppliers and itself.

管理策略 Supply Chain Strategy

长安福特将“环保方针”纳入公司未来发展战略

长安福特将“环保方针”纳入公司未来发展战略。从源头出发进行生态设计，实施绿色供应链管理，其目标是建立以绿色制造理论和供应链管理技术为基础，涉及供应商、生产厂、销售商和用户的供应链，从采购原材料开始到最终产品的回收再利用都使用绿色技术。

长安福特成立绿色供应链专项小组，并明确绿色供应链专项职责。实施绿色供应链管理、树立绿色采购理念、不断改进和完善采购标准、制度，将绿色采购贯穿原材料、产品和服务采购的全过程。

CAF has incorporated "environmental protection policy" into its future development strategy. We will start from the source of ecological design, the implementation of green supply chain management, its goal is to establish a green manufacturing theory and supply chain management technology as the basis, involving suppliers, manufacturers, sellers and users of the supply chain, from the procurement of raw materials to the recycling of the final product using green technology.

CAF set up a special team on green supply chain and clarified the special responsibilities of green supply chain. We will implement green supply chain management, establish the concept of green procurement, constantly improve and perfect procurement standards and systems, and make green procurement run through the whole process of raw materials, products and services procurement.



04 采购经销

Purchase and Distribution

绿色供应链
Green Supply Chain

绿色运输
Green Transportation

绿色储存
Green Storage

绿色包装
Green Packaging

经销商管理
Dealer Management

绿色供应链管理 Green Supplier Management

长安福特建立了完整的供应商管理体系，发布了一系列文件，建立健全的供应商认证、选择、审核、绩效管理和退出机制，每年对供应商是否具有继续供货资格进行定期核查评估。依据企业供应商评估体系，定期对供应商开展供应商准入认证机制和采购全过程管理。目前长安福特低风险供应商占比已达到85%以上。

截至2020年12月31日，长安福特通过第三方环境管理体系认证的供应商比例为84.03%，较去年大幅度提升。

长安福特的主要供应商通过发布社会责任报告的形式披露环境信息。

CAF has established a complete supplier management system, issued a series of documents, established a sound supplier certification, selection, review, performance management and withdrawal mechanism, and conducted regular verification and evaluation of suppliers' qualification for continued supply every year. According to the enterprise supplier evaluation system, we regularly carry out supplier access certification mechanism and procurement process management for suppliers. At present, CAF's low-risk suppliers account for more than 85% of all suppliers.

As of December 31, 2020, the proportion of Changan Ford's suppliers that have passed the third-party environmental management system certification was 84.03%, significantly increased from last year.

Major suppliers of CAF disclose environmental information in the form of distributed social responsibility reports.

目前长安福特低风险
供应商占比已达到
85%以上



供应链管理规划 Supply Chain Management Planning

未来三年,长安福特将持续优化供应链管理:

In the next three years, CAF will continue to optimize supply chain management:

- (1) 进一步完善我公司采购及绿色供应商标准、制度，从环保、节能减排等方面对供应商进行认证、选择、管理和绩效评估，同时充分发挥我公司的带动作用，推动上下游企业共同开展绿色供应链管理。

- (1) We will further improve our procurement and green supplier standards and systems, conduct certification, selection, management and performance evaluation of suppliers in terms of environmental protection, energy conservation and emission reduction, and give full play to our leading role to promote upstream and downstream enterprises to jointly carry out green supply chain management.

- (2) 持续探索绿色产品设计及机理研究，污染物排放量达到最低水平，同时产品生产过程和生命周期的全过程必须是绿色的，绿色贯穿整个工厂总线。

- (2) We will continue to explore green product design and mechanism research to achieve the lowest level of pollutant emissions, while the whole process of product production and life cycle must be green.

绿色运输 Green Transportation

入厂物流 Inbound Logistics

长安福特积极响应国家“绿色、控碳”制造号召，主动尝试通过运输模式优化、装载效率提升、运载工具升级等多维度入手，为CAF绿色运输持续优化提供有力实现途径。

Changan Ford actively responds to the national call for "green and carbon controlled" manufacturing, and actively tries to optimize transportation mode, improve loading efficiency, upgrade vehicles and other multidimensional aspects to provide a powerful way for the continuous optimization of CAF green transportation.

成效 Achievement

- ① 合理的供应链规划，对运输模式进行主动优化，2021年CAF实现水运占比较2020年占比提升7.73%，空运占比较2020年占比下降20.00%；

Through reasonable supply chain planning and active optimization of transportation mode, CAF will realize 7.73% increase in water transportation in 2021 compared with 2020, and 20.00% decrease in air transportation compared with 2020;2.

- ② 对入厂零件进行持续包装优化，及积极的拉动干预，2021年CAF实现装载率的进一步提升，较2020年提升4.59%；

Through continuous packaging optimization of incoming parts and positive pulling intervention, CAF will further improve the loading rate in 2021, 4.59% higher than that in 2020;

- ③ 所有涉及入厂运输车辆都在CAF全面有效管控之下，以确保所有运作车辆符合国家及属地相关法规条例的合规要求。2021年国五（及以上）排放标准车辆占比较2020年提升30.00%。

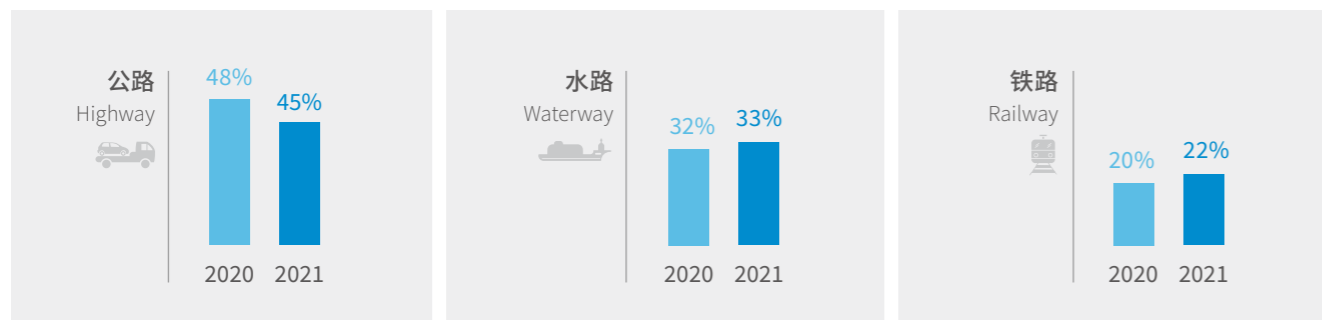
All transport vehicles involved in the factory are fully and effectively controlled by CAF to ensure that all operational vehicles meet the compliance requirements of the relevant national and territorial laws and regulations. The proportion of vehicles with national five (or above) emission standards in 2021 will increase by 30.00% compared with 2020.

一 出厂物流 Outbound Logistics

长安福特出厂物流坚持绿色运输优先，持续提升水铁路运输比例，近五年水铁路运输比例从2017年43%提升至2021年的55%，处于国内同行业领先地位（2021年1-6月同行业水铁路运输平均比例45%，数据来源中国物流与采购联合会），合计减少碳排放5600吨。

Changan Ford Outbound Logistics advocate green transportation first and continues to increase the proportion of waterway and railway transportation ratio. In the past five years, the proportion of waterway and railway transportation has increased from 43% in 2017 to 55% in 2021. The average proportion of waterway and railway transportation in the arer is 45% in first half of 2021 (Data source from the CFLP), which reduces carbon emissions by 5600 tons in total.

2021年
水铁路运输比例
提升至55%
合计减少碳排放
5600吨



此外，长安福特出厂物流通过智能化、数字化手段提升出厂物流效率和减少资源浪费。整车仓储和发运通过RFID技术、IWMS智能调度系统和智能配载等实现车辆无感收车、智能调度和智能装载，物流操作效率提升20%以上，有效降低了操作环节车辆等待时间和减少碳排放；通过数字化手段实现整车无纸化交付等，年节约纸张100万张以上。

实现整车无纸化交付
年节约纸张
100万张以上

Besides that, with general employ on logistics intelligence and digital tools, the outbound efficiency has been improved by taking less resources. Since the RFID, IWMS system is online, the intelligent dispatching and loading in vehicle compound increase the operation efficiency by more than 20%, that effectively reduce vehicle waiting time and carbon emission. And through digital means, it saves more than 1 million pieces of paper annually.



绿色储存 Green Storage

长安福特严格遵循绿色存储原则，按照环境污染小、货物损失少、运输成本低原则对存储进行规划和管理。

长安福特通过合理布局仓储、零件分级存储（危化品隔离存储）、进口零件巴氏消毒（疫情期间）、托盘零件高位货架存储、外协零件虚收虚发、周期性盘存等方式，降低仓储对环境的不利影响，保障存储货物的质量和数量，减少仓储面积及零件运输次数。

其中，重庆工厂2020~2021年外协零件通过虚收虚发模式节省仓储面积5000m²。

CAF strictly follow the principle of green storage, plan and manage the storage as principle of less environmental pollution, less goods loss and low transportation cost.

CAF reduce the adverse impact of storage on the environment, ensure the quality and quantity of stored parts, and reduce the warehouse area and transportation times by reasonably arranging storage, graded storage of parts (isolated storage of dangerous chemicals), pasteurization of imported parts (during the COVID Virus), high-bay storage for pallet parts, virtual receiving and shipping for bailment, periodic inventory, etc.

For example, Chongqing plants save 5000 square meters by virtual receiving and shipping for bailment in 2020 and 2021.

2020~2021年
重庆工厂外协零件
通过虚收虚发模式
节省仓储面积
5000m²

绿色包装 Green Packaging

长安福特严格规范零部件包装类型和使用要求。国产件原则上都是使用的可回收包装，工厂取货件供应商会用一次性包装、到厂后再包装。

长安福特目前使用的包装类型有塑料周转箱、围板箱、卡板箱、专用料架（铁制）等。外协零件优先使用纸箱包装，部分体积较大零件可选用周转包装。

CAF strictly standardized parts packaging types and use requirements. In principle, the domestic parts are all recyclable packaging, which will be used by the factory pick-up supplier and then packaged after arriving at the factory.

CAF currently used package is plastic turnover box, type coaming box, card board, box, special material (iron), etc. Carton packing is preferred for external parts, and revolving packing can be used for parts with large volume.



经销商管理 Dealer Management



长安福特采用绿色高效的视频直播/录播形式（如F120会议），与经销商分享商务政策、业绩表现、业务计划等方面内容，构建更灵活、更环保、更与时俱进的沟通模式。

CAF adopts green and effective live broadcast/video(e.g. F120) to share business policies, performance and business plans etc. with dealers, thus establishing a more flexible, environmentally-friendly, up-to-date communication mode.

05

回收利用

Waste Disposal and Recycling

动力蓄电池溯源
Power Battery Tracing

可回收利用率与可再利用率
Recyclability Rate and Recoverability Rate

拆解信息公开
Disclosure of Vehicle Dismantling Information

零部件再制造
Remanufactured Parts



动力蓄电池溯源 Power Battery Tracing

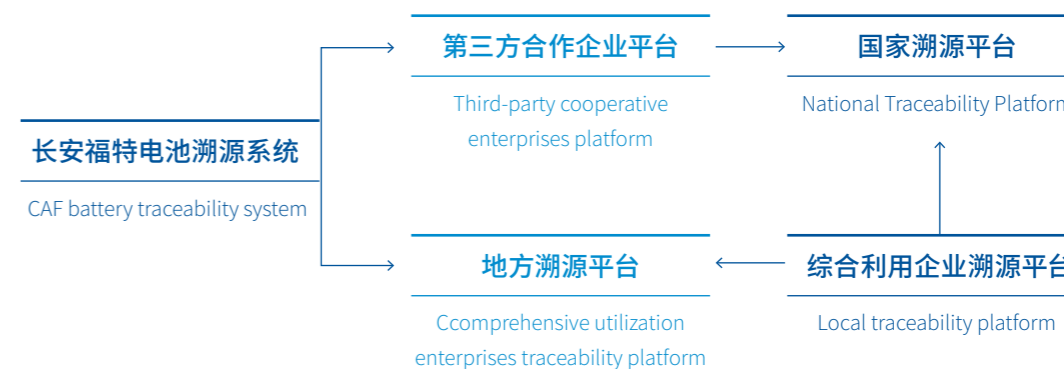
动力蓄电池溯源管理系统 Power Battery Traceability Management System

长安福特电池溯源系统：根据长安福特新能源汽车动力蓄电池溯源方案开发的用于汇总动力蓄电池的生产、销售、维修、回收、退役等溯源信息的数据库系统，并通过系统接口的方式将长安福特动力蓄电池溯源信息上传到国家和地方溯源平台。

系统已于2021年6月上线使用，目前部分功能还在调试优化。

CAF battery traceability system is based on CAF new energy vehicle power battery traceability scheme. It is a database system used to summarize the traceability information of power battery production, sales, maintenance, recycling and retirement, and upload the traceability information of CAF power battery to national and local traceability platforms through the system interface.

The system has been put into use in June 2021, and some functions are still being debugged and optimized.



溯源信息完成情况 Tracing Information

CD391 PHEV 动力蓄电池拆卸、拆解及有害物质使用信息表已完成公开并在国家溯源平台备案；2021 年新增 CX482 PHEV 和 CX483 PHEV 两款车型，均已完成动力蓄电池拆卸、拆解及有害物质使用信息表公开，并在国家溯源平台备案。

溯源信息上传完成率方面，以 CD391 PHEV 为例，CD391PHEV 生产溯源信息完成率、维修和退役溯源信息均为 100%。

CD391 PHEV power battery disassembly and hazardous substance use information sheet has been made public and put on record in the national traceability platform. In 2021, two new models, CX482 PHEV and CX483 PHEV, have completed the disassembly and disassembly of power battery and the disclosure of hazardous substance use information form, and have been put on record in the national traceability platform.

In terms of the completion rate of traceability information uploading, take CD391 PHEV as an example, the completion rate of production traceability information and maintenance and decommissioning traceability information are both 100%.

一 退役动力电池回收处置 Recycling and Disposal of Retired Power Batteries

2020年处置退役动力电池包和模组，已全部移交给合作的梯次利用企业。

2020回收的车辆退役动力电池量为80个，较2019年增加。

In 2020, retired power battery packs and modules have been disposed of, and all of them have been handed over cooperative cascade utilization enterprise.

In 2020, the recycled retired power batteries were 80 pcs, more than last year.

一 回收服务网点建设 Construction of Recycling Service Outlets

长安福特新能源汽车目前已销售城市231个，其中已建设的回收服务网点均已在工信部公示的新能源汽车动力蓄电池回收服务网点信息中。

CAF new energy vehicles have been sold in 231 cities, at present, recycling service outlets which have been built, have been listed in the information of new energy vehicle power battery recycling service outlets published by the MIIT.

可回收利用率与可再利用率

Recyclability Rate and Recoverability Rate

长安福特建立ELV方针，要求汽车产品可回收利用率计算方法符合GB/T 19515《道路车辆可再利用性和可回收利用性计算方法》的要求，力争可回收利用率要达到95%，其中可再利用率不低于85%。

根据数据统计，长安福特在产车型平均可再利用率94.5%，平均可回收利用率为97.5%，与去年基本持平。

CAF established ELV policy, requiring that the calculation method of automobile product recyclability meets the requirements of GB/T 19515 "Road vehicles- Recyclability and Recoverability- Calculation method", striving to achieve 95% Recoverability rate, of which the Recyclability rate will be no less than 85%.

According to statistics, the average recyclable rate of Changan Ford's in-production models is 94.5%, and the average recyclable rate is 97.5%, level with last year.

在产车型
平均可再利用率
为**94.5%**
平均可回收利用率为**97.5%**

拆解信息公开 Disclosure of Vehicle Dismantling Information

长安福特根据《报废汽车拆解指导手册编制规范》(GB/T 33460-2016)和《报废汽车机动车拆解环境保护技术规范》(HJ 348-2007)，开展报废实车拆解来指导编制报废车拆解手册。车型法规公告发布后半年内，长安福特在绿色拆解系统中发布汽车拆解手册。

According to the "Specifications for compiling dismantling manual of end-of-life vehicles" (GB/T 33460-2016) and "Environmental protection technical specifications for disassembly of end-of-life vehicles" (HJ 348-2007), CAF carries out scrapped vehicle dismantling to guide the compilation of scrapped vehicle dismantling manual. Within half a year after the announcement of model regulations was issued, CAF released the vehicle dismantling manual in the China Automotive Green Dismantling System.

零部件再制造 Remanufactured Parts

长安福特的再制造产品有变速器零件（如离合器、中央电脑等）及变速箱总成。

近一年间长安福特再制造变速器总成约1000个，变速器零件约5.79万个，因再制造零部件使用而减少钢铁的量：约164.6吨，铝的量约117.4吨。

CAF's remanufactured products include gearbox parts (such as clutch, central computer, etc.) and transmission assembly.

In the past year, CAF remanufactured about 1000 gearbox assemblies and 57,900 gearbox parts, and reduced the amount of steel and aluminum by 164.6 tons and 117.4 tons due to the use of remanufactured parts.

再制造变速器总成
约1000个

变速器零件
约5.79万个

因再制造零部件使用
而减少钢铁的量：
约164.6吨
铝的量约117.4吨

双离合器维修包
Dual clutch repair kit

再制造MPS6自动变速箱
Remanufactured MPS6 automatic transmission



再制造DPS6拨叉
Remanufactured DPS6 fork



再制造DPS6/TCM模块
Remanufactured DPS6/TCM modules

再制造DPS6离合器总成
Remanufactured DPS6 clutch assembly



标准披露项索引 Standard Disclosure Index

序号 No.	披露方向 Indicators	二级指标 Standard Disclosure	页码 Page
1	企业基本信息 Overview of Corporations	主要产品信息 Product information	2
2		企业运营范围 Business Scope	2
3		所有权性质及法律形式 Nature of Ownership and Legal Form	—
4		企业规模 Enterprise Size	2
5		员工信息 Employee Information	2
6	发展战略 Development Strategy	企业全产业链管理战略 Carbon Neutral	5/10/24
7		碳中和 Carbon Neutral	5
8	管理方针 Management Policy	职业健康安全管理体系 Occupational Health and Safety Management System	25
9		环境管理体系 Environmental Management System	25
10		能源管理体系 Energy Management System	25
11		绿色供应链管理 Green Supply Chain Management	34
12	新概念技术开发应用 New Concept Technology Development and Application	电动化 Electrification	11
13		网联化 Networking	12
14		智能化 Intelligent	12
15	优化生命周期设计 Optimize Life Cycle Design	产品生命周期碳排放 Product Life Cycle Carbon Emissions	21
16	降低材料环境影响 Reduce Material Environmental Impact	材料 VOC 管控 Control of Material VOC	13
17		材料有害物质管控 Control of Hazardous Materials	15
18		再生材料的使用 Environmental Management System	—
19		可降解材料的使用 Use of Degradable Materials	—
20		R-134a 的使用 Use of R-134a	—
21	减少材料用量 Reduce Material Usage	汽车轻量化 Lightweight	19
22	优化生产过程 Optimize the Production Process	能源消耗 Energy Consumption	26
23		单车能耗 Environmental Management Energy Consumption Per Vehicle	26
24		水资源消耗 Water Consumption	27
25		单车水耗 Water Consumption Per Vehicle	27
26		废水排放 Wastewater Disposal	29
27		企业温室气体排放 Greenhouse Gas Emissions	28
28		废气排放 Exhaust Emissions	30
29		固废排放 Solid Waste Discharge	31
30		厂界环境噪声 Plant Boundary Noise	32
31		绿色工厂 Green Plant	24
32		优化分销系统 Optimize the Distribution System	绿色包装 Green Packaging
33	绿色运输 Green Transportation		36
34	绿色仓储 Green Storage		38
35	经销商管理 Dealer Management		38
36	优化使用过程 Optimize the Use Process	产品能源消耗 Product Energy Consumption	18
37		车内 VOC Interior VOC	13
38		车辆噪声 Vehicle Noise	16
39		尾气排放 Emissions	21
40		绿色设计产品 Green Design Products	10
41		R-134a 泄露 R-134a Leaked	—
42	优化回收处理 Optimize Recycling	动力电池溯源 Traction Battery Traceability	40
43		拆解信息公开 Dismantling Information Disclosure	41
44		可再利用率和可回收利用率 Recyclability Rate and Recoverability Rate	41
45		回用件使用 Use of Recycled Parts	—
46		再制造零部件使用 Use of Remanufactured Parts	42

本索引根据《汽车企业绿色发展报告编制指南》编制

This index was prepared in accordance with the *Compilation Guide of Automotive Corporation Green Development Report*

* 可选披露项

* Optional disclosure