



FEBRUARY 2023

COMPANY OVERVIEW



WHO WE ARE



Garrett mission

Garrett is a cutting-edge technology provider that enables vehicles to become cleaner, more efficient and connected.

We lead the development of innovative and differentiated solutions which empower the transportation industry to redefine and further advance motion.



Pioneering technology solutions provider



Turbo Technology

- Reduce fuel usage
- Reduce exhaust emissions
- Enhance engine performance



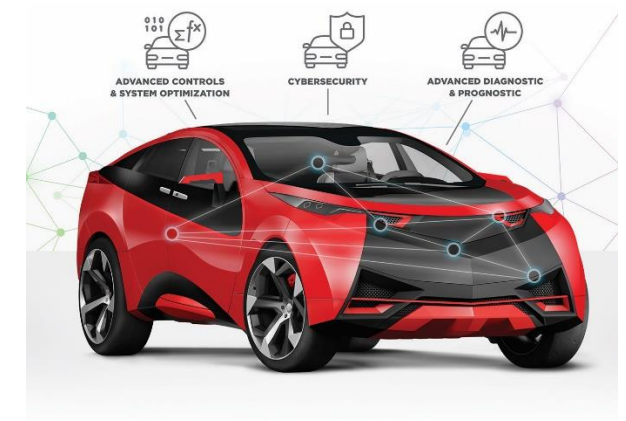
Electric & Hybrid

- Optimize fuel economy
- Step toward a zero emissions future
- More responsive driving



Connected Vehicles

- Protect vehicles against cyber attacks
- Diagnose and predict anomalies
- Avoid breakdown and liabilities



Garrett at a glance

\$3.6B

Revenue in 2022

~9,300

Employees

~1,250

Engineers

40+

Vehicle manufacturers served globally

5

R&D centers

11

“Close-to-customer”
engineering centers

5

Software development
centers

13

State-of-the-art
manufacturing facilities

1,600+

Patents issued or pending

100+

New applications annually

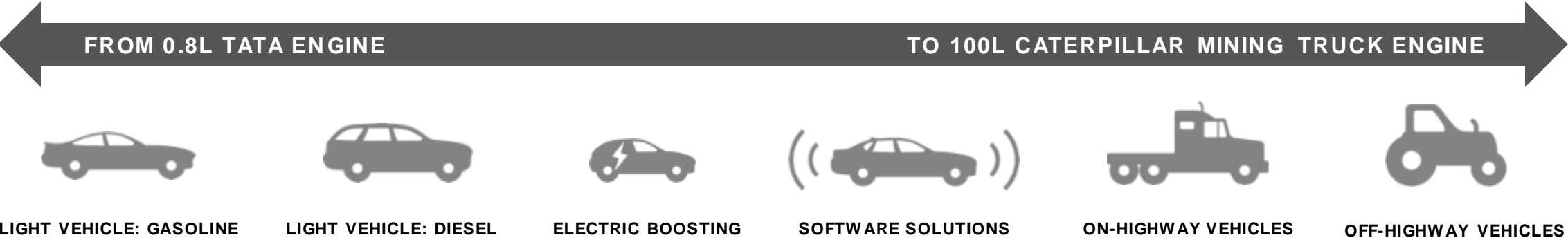
50,000+

Turbos / day

120M+

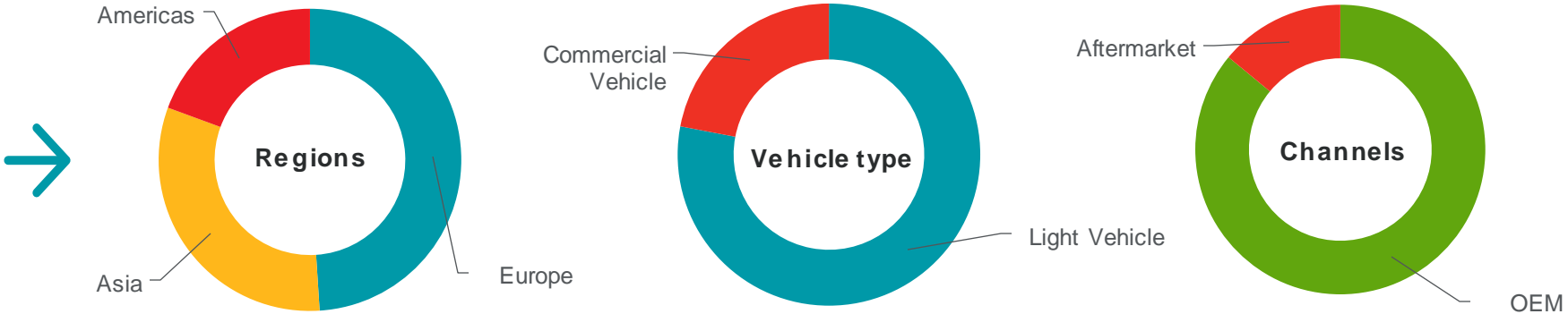
Garrett turbos in use globally

Broad product portfolio, serving all markets



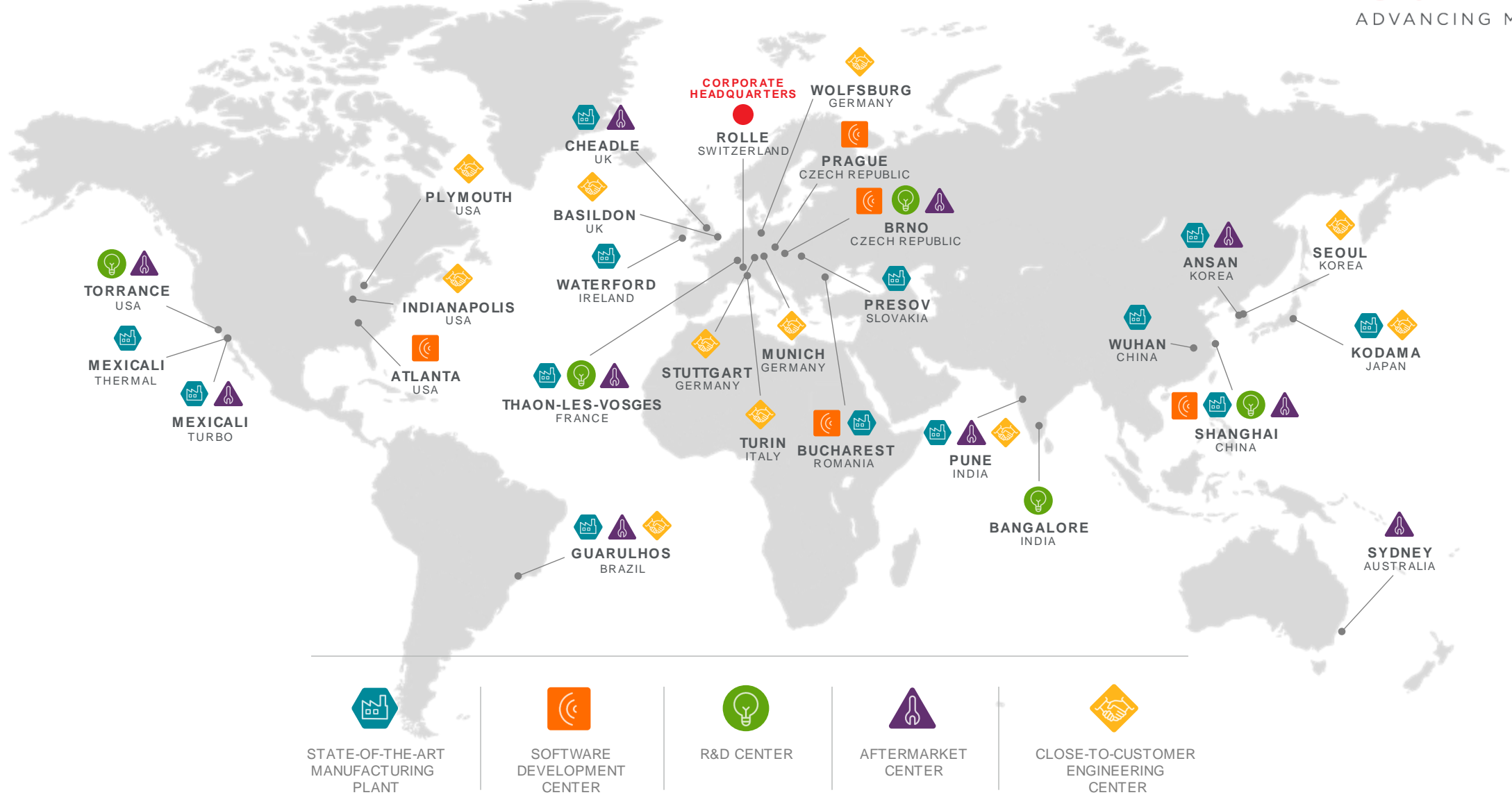
Revenue in 2022

\$3.6B



All vehicles, all segments, all regions

Global footprint, local player



Sales, R&D and Engineering close-to-customers | Global manufacturing presence

Differentiated integrated supply chain strategy



Differentiated internal manufacturing technologies

- Home-grown “industry firsts” (including high-speed electron-beam, laser welding and more)
- Proprietary super high-speed balancing
- 100+ manufacturing patents and trade secrets

Standardized manufacturing processes

- Global engine programs sourced from multiple plants
- Maximized flexibility and assets utilization
- Resilience to industrial risks

13

State-of-the-art manufacturing facilities

50,000+

Turbos / day

100+

New applications annually

Driving best-in-class productivity and performance

Long-term customer relationships with 40+ manufacturers



SINGLE SUPPLIER PER ENGINE
20+ YEARS CYCLE

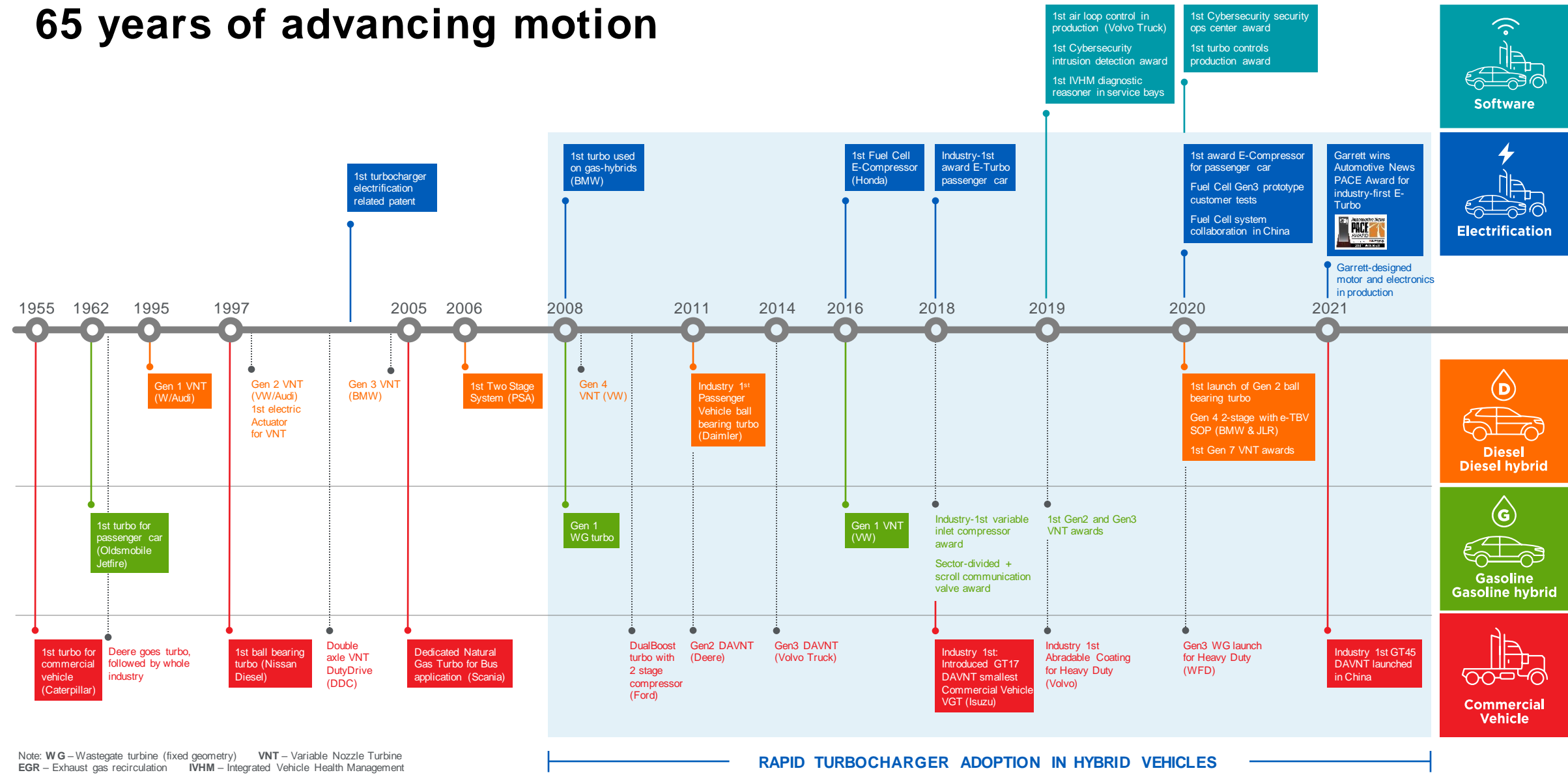
| | | | | | | | | |
|--|--|--|---|--|---|--|---|--|
|  |  Volkswagen |  Mercedes-Benz |  RENAULT |  |  CITROËN |  |  HYUNDAI |  Weifang Diesel |
| 63 YEARS | 40 YEARS | 40 YEARS | 38 YEARS | 35 YEARS | 33 YEARS | 32 YEARS | 30 YEARS | 25 YEARS |

Early engagement leads to long-term global business relationships




TECHNOLOGY DIFFERENTIATION



65 years of advancing motion



Garrett's differentiated technology offering

| | TURBOCHARGERS | ELECTRIC & HYBRID | CONNECTED VEHICLES SOFTWARE |
|----------------------|---|---|--|
| |  |  |  |
| INNOVATIVE SOLUTIONS | <ul style="list-style-type: none"> • Variable Geometry Turbine • Wastegate • Two Stage | <ul style="list-style-type: none"> • Award-winning E-Turbo technology • Two Stage Electric Compressor for Hydrogen Fuel Cell • 48V Electric Compressor | <ul style="list-style-type: none"> • Advanced Controls & System Optimization • Cybersecurity • Advanced Diagnostic & Prognostic |
| BENEFITS | <ul style="list-style-type: none"> • Fuel economy • Compliance with emissions standards • Reliability and asset uptime | <ul style="list-style-type: none"> • Improved CO2 for hybrid powertrains • Enhanced driving pleasure • Full portfolio of E-Boosting solutions | <ul style="list-style-type: none"> • Safety & security • Reliability / assured functionality • Vehicle uptime |

Turbocharging – technology at the cutting edge

Journal bearing clearance

0.0004 inches of oil film

7 times thinner than human hair

Average compressor flow

20 cubic meters per minute

the capacity of a utility van

Wheels tip speed

1,300 miles per hour

**supersonic, more than 1.7 times
the speed of sound**

Being shaken

at 25g vibration level

fighter jets can withstand ~14g

From 50,000 RPM to 200,000 RPM

in less than 2 seconds

**3 seconds for F-16 engine to
spool up to maximum thrust**

Rotor group rotating speed

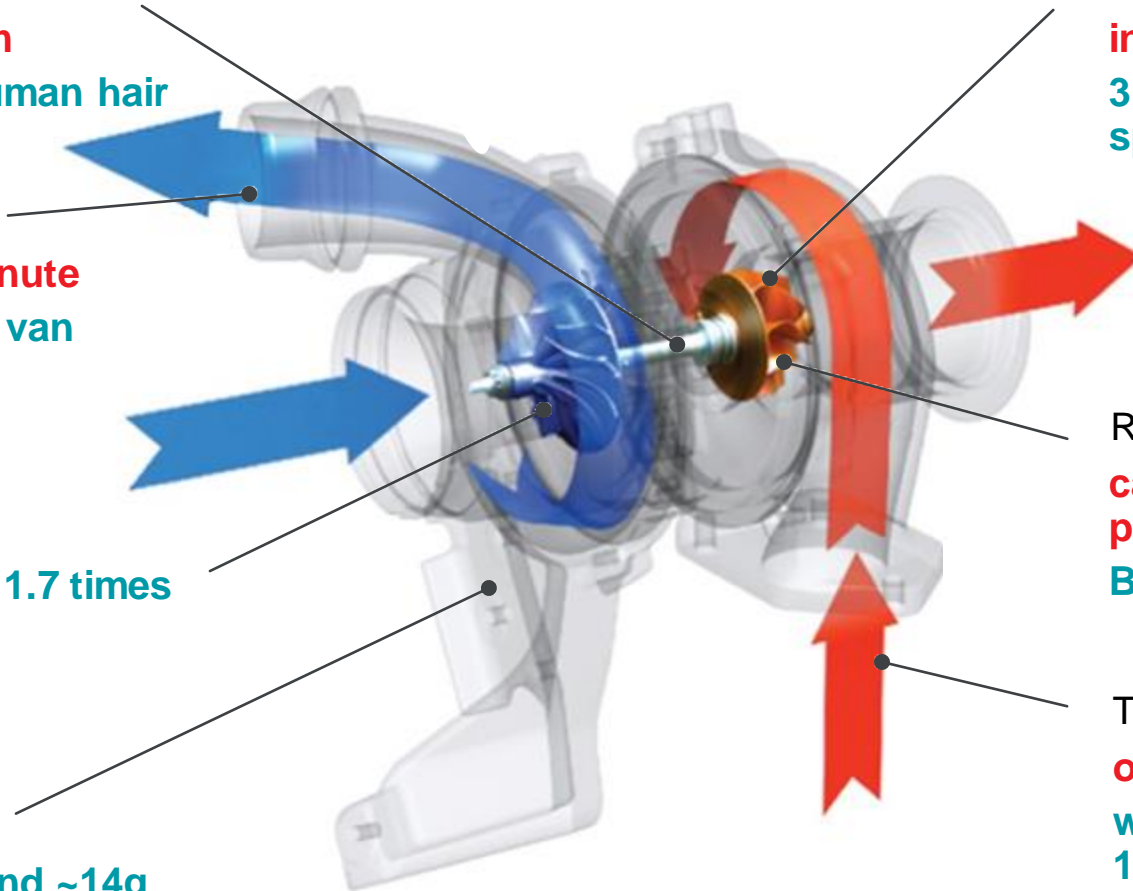
**can reach 350,000 revolutions
per minute**

B787 engines reach only 14,000 RPM

Turbine inlet temperature

over 1,900 degrees Fahrenheit








**window glass melts at
1,800 degrees Fahrenheit**



Jet engine technology under the hood of your car

Garrett light & commercial vehicle turbo technologies

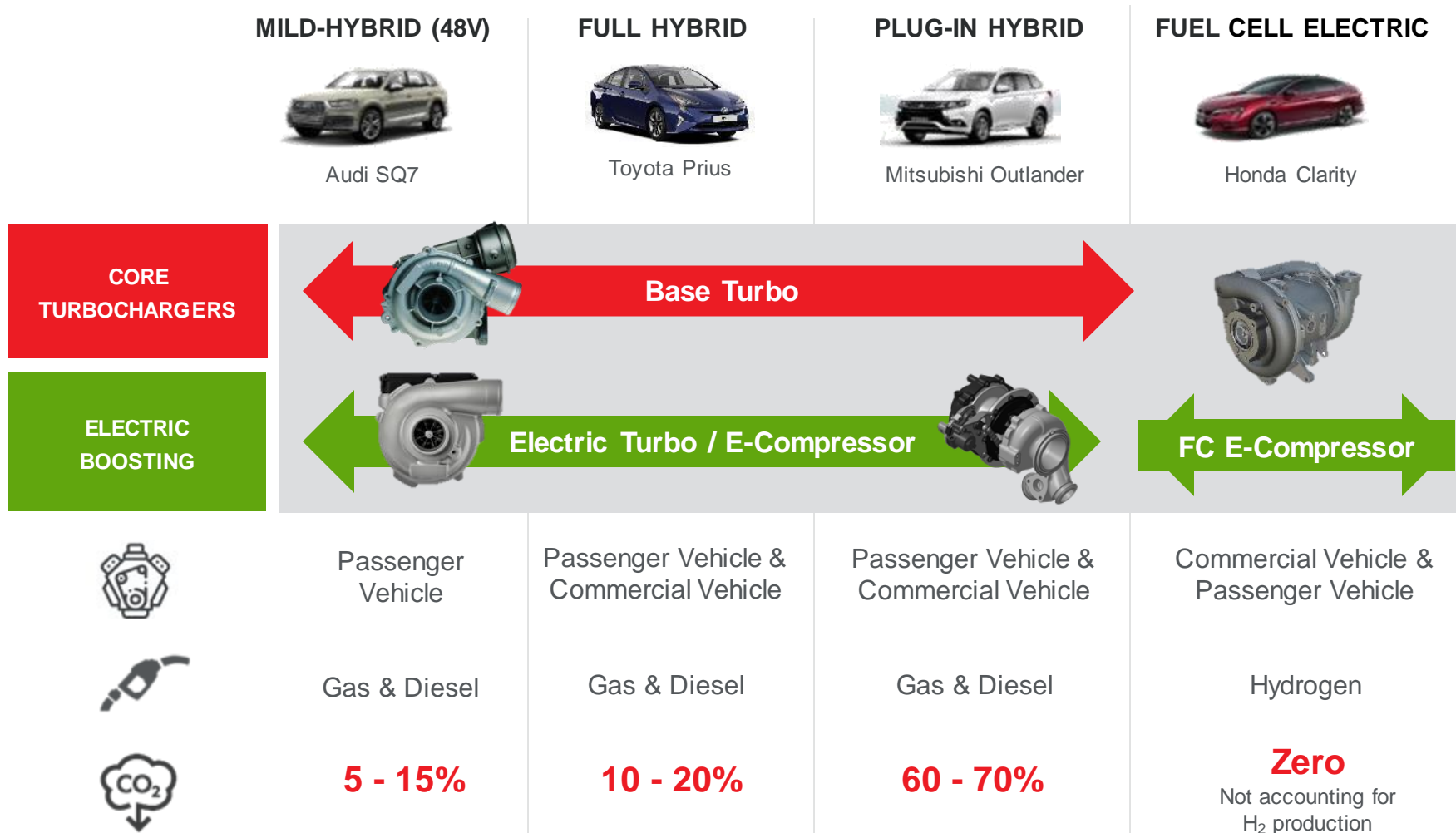
Turbos

| FREE-FLOAT | WASTEGATE | VARIABLE NOZZLE TURBINE (VNT™) | |
|--|--|--|--|
|  |  |  | |
| DOUBLE AXLE VNT | TWO STAGE | TURBO-COMPOUNDING | ELECTRIC BOOSTING |
|  |  |  |  |

Benefits

- Broadest portfolio with dedicated engineering support
- Fuel efficiency through state-of-the-art aerodynamics, bearing systems and control
- Higher performance, better fuel economy and emissions control enabled by innovative variable nozzle turbine designs
- Optimized for transient behavior to improve drivability and enhance driving pleasure




Turbocharging electrified powertrains



- 76% hybrid powertrains and 100% hydrogen fuel cell powertrains turbocharged by 2025
- Full CO₂ potential unlocked with electric boosting
- Hydrogen fuel cell electric vehicles require high performance E-Compressor

Toward zero emissions with hybrids and hydrogen fuel cell powertrains

Garrett electric boosting offering

| | ELECTRIC COMPRESSOR Mild Hybrid Full Hybrid Plug-in Hybrid | ELECTRIC TURBO Mild Hybrid Full Hybrid Plug-in Hybrid | TWO STAGE ELECTRIC COMPRESSOR FOR FUEL CELLS Fuel Cell Electric |
|---------------------------|--|--|--|
| |  |  |  |
| CUSTOMER BENEFITS | <ul style="list-style-type: none"> • Full speed within 0.25s • 2-3% better fuel economy • 20% NOx reduction (Diesel) • Enables Lambda 1 (Gasoline) | <ul style="list-style-type: none"> • 4x faster than a conventional turbo • 2-4% better fuel economy (regen) • 20% NOx reduction (Diesel) • Enables Lambda 1 (Gasoline) | <ul style="list-style-type: none"> • Enables 40% downsizing of fuel cell stack • Reduces volume, weight and cost • Optimal power consumption due to architecture & high-efficiency design |
| GARRETT EXPERIENCE | <ul style="list-style-type: none"> • Specific aerodynamics • High-speed electric machines • System integration | <ul style="list-style-type: none"> • System packaging • High-speed electric machines • Boost and energy management | <ul style="list-style-type: none"> • Innovative high-efficiency aerodynamics • High-speed electric machines • Air bearing |
| ARCHITECTURE | <ul style="list-style-type: none"> • Aerodynamics and motor matched for optimal speed • Sealed for life bearings | <ul style="list-style-type: none"> • Integrated turbo & high-speed motor/generator • Stand alone or Integrated Power Electronics | <ul style="list-style-type: none"> • Two Stage series compressors • 100% oil-free foil bearing technology to avoid pollution of fuel cell stack with oil and provide the lowest noise & vibration possible |

Garrett connected vehicle software

MULTIPLYING COMPLEXITY

Internal Combustion Engine

Aftertreatment + E-boosting + . . .



Electrified Powertrain

Hybridization + battery SOC/SOH, etc.



Autonomy

Sensors + actuations + . . .



Connected

Threat surfaces + updates + . . .

UNSOLVED CHALLENGES

Optimize complex systems

Validate for real-world

Ensure in-use compliance

Detect health degradation

Diagnose accurately

Differentiate fault vs. hack

GARRETT SOLUTIONS AND DIFFERENTIATORS

Advanced Controls and System Optimization

We solve complex automotive challenges, advancing controls technology

- Fuel, energy and emissions optimization
- Reduced development time
- Best-in-class algorithms and performance
- *Industrial process controls heritage*
- *+30 patents*
- *In production*



Advanced Diagnostic and Prognostic

We make complex diagnostic simple, advancing vehicle health management technology

- Improved diagnostic accuracy
- Reduction of warranty costs
- Improved fleet uptime
- *Aircraft health management heritage*
- *25+ patents*
- *In production*



Cybersecurity

We make connected cars cyber resilient and compliant, advancing vehicle security

- Best-in-class detection rate and false positive
- Best-in-class on-board footprint
- Holistic off board forensic capabilities
- *Industrial security management heritage*
- *50+ proprietary algorithms*
- *SOP 2021*



New challenges require new technologies for control, health and security management

AFTERMARKET

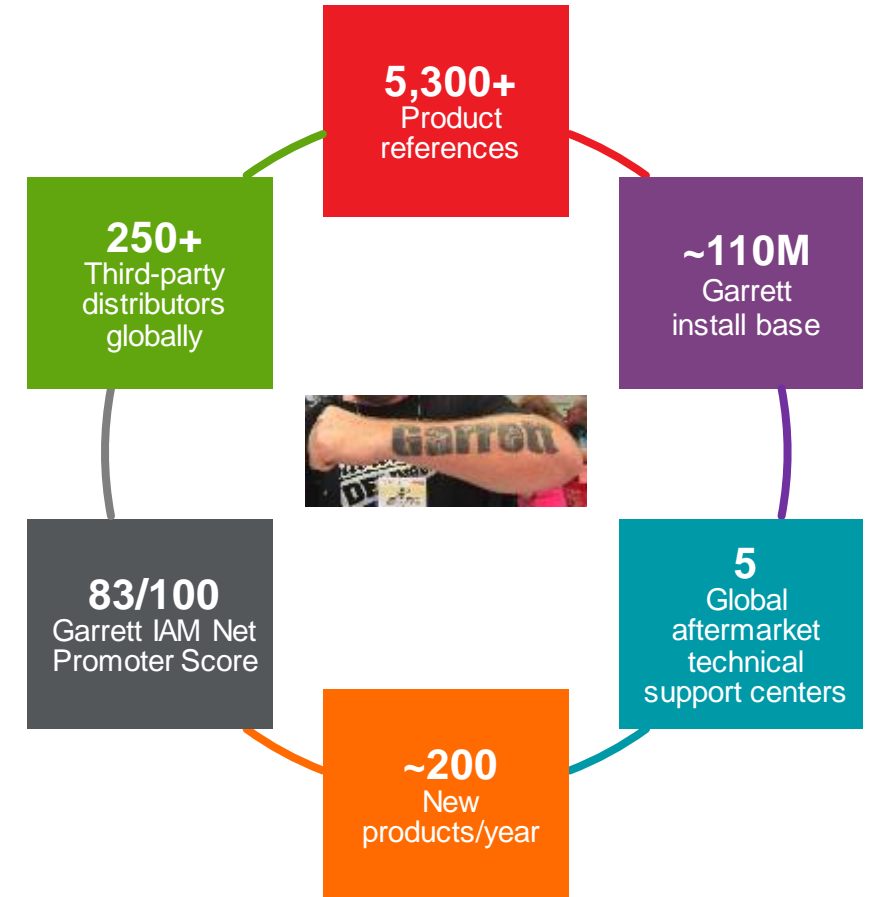


Strong aftermarket platform with brand equity

Broad aftermarket product portfolio

| | | |
|---|---|---|
| ORIGINAL EQUIPMENT / INDEPENDENT AFTERMARKET |  | <ul style="list-style-type: none">• Original supply ensuring emission compliance• Distributors network |
| REMANUFACTURE |  | <ul style="list-style-type: none">• Remanufacturing of OE design• Economic alternative with no trade-off on quality/durability |
| RED BOOST |  | <ul style="list-style-type: none">• Economic turbo for high growth regions, with good reliability• Original production line, portfolio expansion |
| PERFORMANCE & MOTORSPORTS |  | <ul style="list-style-type: none">• Higher power, with reliability• 50+ years of racing support |

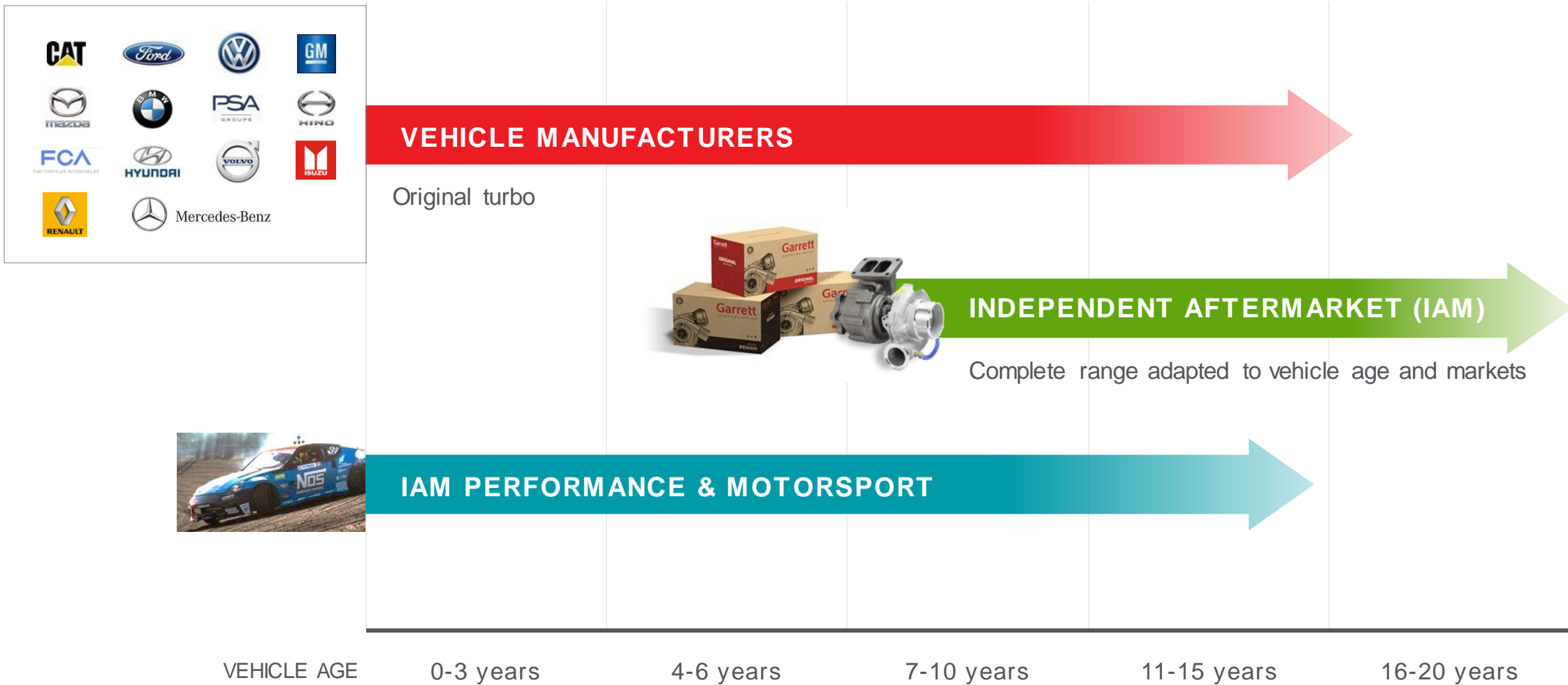
#1 in global brand awareness



Note: IAM – Independent aftermarket

Broad aftermarket portfolio serving a large install base globally

Garrett aftermarket channels



Garrett motorsport technology

Redefining the limits

CUSTOMISED TECHNICAL COMPETENCIES

- **Fuel Cell Compressors:** One and two stage mixed flow compressor stages with oil-less bearing technology to eliminate contamination of FC stack and lowest NVH.
- **Electric Turbos:** Efficiency-optimized turbos combined with high-speed electric machines for max transient (performance) and energy recuperation (fuel efficiency).
- **High-Temperature VNT™ turbos:** Robust 1050°C VNT turbine for both Diesel and Gasoline engines.

Also available:

High-temperature, thin-wall (HK30) turbine housing castings

High-temperature (MarM-247) turbine wheel materials

High efficiency dual row ball bearing cartridges

Lightweight Titanium and Magnesium components

Championship wins

29

FIA World Rally Car
100% since 2002



21

24 Hours of Le Mans
100% since 2000

14

Indianapolis 500



11

CART / Champ Car
67% win rate

10

American Le Mans Series



8

IMSA GTP / GTO

7

FIA World Touring Car
100% since turbo engine rule



7

Global Rallycross
100% since series introduced



6

Super Formula
Turbo engines starting 2014

6

Super GT
Turbo engines starting 2014



6

FIA World Rallycross
Inaugural season 2014

SUSTAINABILITY



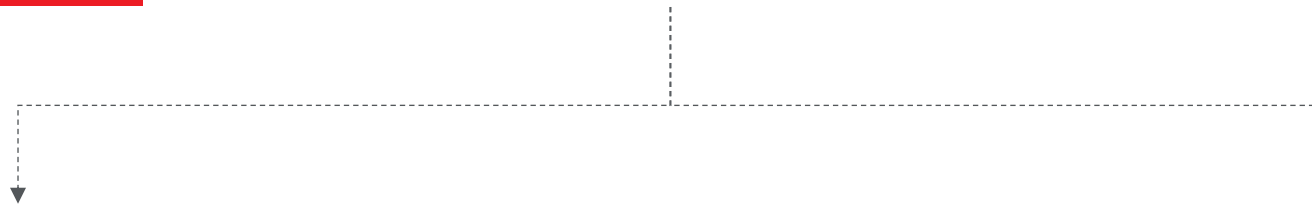
Our sustainability framework starts from our mission

We Care⁴



CLEANER, MORE EFFICIENT VEHICLES

We help make vehicles cleaner, more efficient and connected through cutting-edge technologies



CULTURE OF INNOVATION

We invest in a culture of continuous innovation to deliver on our mission



OPERATING RESPONSIBLY

We operate responsibly to ensure the long-term impact of our mission

We enable cleaner, more efficient vehicles



Developing cutting-edge
technologies for more
sustainable mobility



EMISSION-REDUCING TECHNOLOGIES



of Garrett revenue



of Garrett R&D investment

CUTTING-EDGE TECHNOLOGY

From internal combustion engine turbocharging and hybridization, to hydrogen fuel cell, electrification solutions and connected vehicle software –

Garrett's in-house experts help to **drive the future of sustainable mobility** for both passenger and commercial vehicles

We nurture a culture of innovation



We are empowering growth reached **66,000+ hours of employee training** in 2021

We are nurturing talent with **350+ students** in Garrett internships and STEM education programs in 2021

Diversity makes us better. **Garrett employees come from 60+ countries** and we are on track towards our 25% gender diversity ambition to 2025

Garrett has been **recognized as best employer** in the US and Slovakia in 2021



We are operating responsibly

We are **on track** to reduce environment impact and meet our **2024 targets** :

- ▶ carbon emissions
- ▶ energy
- ▶ water
- ▶ waste

100% of our manufacturing sites are environment and energy management certified (ISO 14001 and ISO 50001)

We implemented **52 new safety projects** in 2021 alone

Our **sustainability performance** is recognized externally, rating strong in our sector.





www.garrettmotion.com



[in](#)

[f](#)



| [garrettmotion](#)