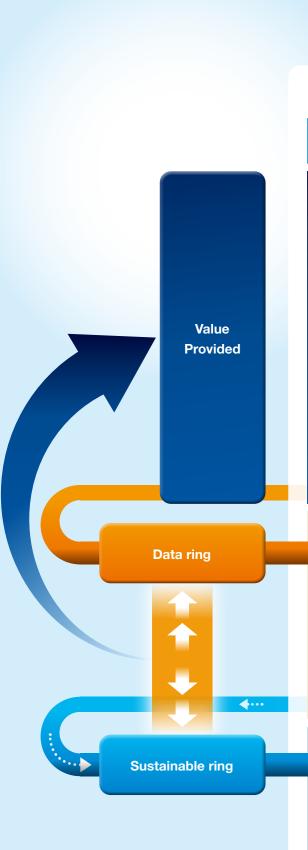
Value Created and Delivered by TOWANOWA





Planning and Design

- Higher Performance x Efficient Resource Usage
- O Lightweight Tires O Greater Fuel Efficiency O Longer Tire Life
- Targets for 2027 (vs. 2019 Levels)
- O 20% Reduction in Tire Weight O 30% Reduction in Rolling Resistance

⇒ Next-Gen EV Tires to Launch in 2027



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Material Development and Procurement

- Promoting Resource Circulation While Reducing CO₂ Emissions
- O Utilizing Sustainable Materials O Sustainable Natural Rubber Procurement
- Targets for Sustainable Materials Content O 2030: 40% O 2050: 100%





Realizing Tires Made from 100% Sustainable Materials

by bringing together this sustainable ring and this data ring, continuously creates new value.

Production and Logistics

- Realizing "Just-in-Time" Supply O Efficient Tire Freshness
- Management O Reining in Inventory Congestion O More Efficient Logistics
- Targets for 2030 (vs. 2021 Levels) O 10% Reduction in CO₂ Emissions During Transport O Domestic Modal Shift Rate: 30%







A unique approach, the TOWANOWA concept is best illustrated as a structure in which a "data ring" (here depicted in

orange) coordinates and leverages data obtained in each value chain process, while the "sustainable ring" (in blue) facilitates the circulation of goods and materials throughout the value chain processes, eliminates redundant resource consumption and helps realize a circular economy. TOWANOWA is thus our Concept for a circular economy business model, which,

Sales and Usage

- Optimal Tire Management Service
- O Tire Pressure Management
- O Detecting Signs of Wheel Detachment
- O Detecting Tire Wear Progression
- Optimal Tires for Customers
- O Fuel (ICE) / Energy (EV) Efficiency O Longer Tire Life
- O Greater Safety



Recovery and Recycling

- Retreading Light Truck Tires
- O Contributing to "Last One Mile" O Resource Conservation & Cost Reduction
- Putting ELT (End-of-Life-Tires) to Use O Usage as Recycled Tire Materials
- O Step Toward Realizing Circular Economy







Tire Lifetime Simulation

- ⇒ Tire Lifetime Performance Design
- Data Amassed with SENSING CORE ⇒ Tire Long-Life Design
- Model Base Development (MBD) and Design Al
- ⇒ Lightweight & Fuel-Efficient Tire Design
- ADVANCED 4D NANO DESIGN
- ⇒ High-Performance Material Design
- Tire Leap Al Analysis
- ⇒ Rubber Performance Decline Prediction
- WAVEBASE (Cloud platform)
- ⇒ Accelerating Material Development



- Tire Manufacturing Simulation ⇒ Improving Development Stage
- Quality/Precision
- Al and IoT platforms
- ⇒ Predictive Maintenance & **Energy Savings**
- Digital data infrastructure ⇒ Advanced Supply/ **Demand Predictions**



- SENSING CORE
- Tire Pressure Monitoring System
- Radio Frequency ID Tags (RFID) ⇒ Building a Business Model to Take Full Advantage of Data
- SENSING CORE
- Tire Pressure Monitoring System (TPMS)
- Radio Frequency ID Tags (RFID) ⇒ Understanding the Usage Status
 - of Tires & Managing Material Information





- **Evolution of SMART TYRE** CONCEPT
- ⇒ Resource Conservation, Longer Lasting Performance, Greater Overall Safety
- Promoting the Proliferation & Advancement of Sustainable Materials
- Modifying Natural Rubber for Better Performance & Productivity
- Improved Tire Quality & **Development Efficiency**
- Reduced of CO₂ emissions during tire production
- Reduced Tire Production/ Supply Loss
- Maintenance Service Solutions
- Robust Lineup of Tires to Meet **Diverse Needs**
- Tires Featuring Advanced Safety Technology
- ⇒ Tires Featuring ACTIVE TREAD Technology
- Recovering Quality Base Tires for Retreading
- ⇒ Reusing Same Base Tires Multiple
- Promoting the recovery of ELTs ⇒ Recycling for Use as Sustainable