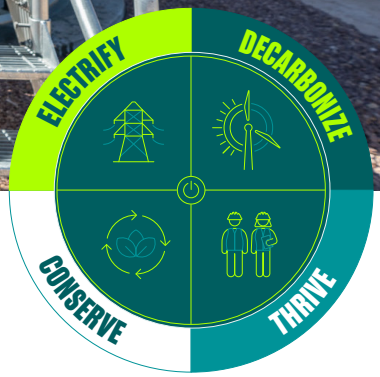
GE VERNOVA

PRODUCT STEWARDSHIP AND CIRCULARITY

Our commitment to innovate more while using less, safeguarding natural resources



GE VERNOVA'S COMMITMENT TO SUSTAINABILITY

As a global leader in the electric power industry, GE Vernova's purpose and mission to electrify and decarbonize the world has never been clearer or more urgent. Our planet and communities are feeling the increasing effects of a changing climate, geopolitical unrest, and the urgent global need to build a more sustainable electric power system. GE Vernova is well-positioned to play our role as our society responds to these generational imperatives and seeks to fundamentally change the arc of climate change.

Our Sustainability Framework encompasses four pillars – **Electrify, Decarbonize, Conserve,** and **Thrive** – each with leading goals that progress our objectives to electrify and decarbonize the planet, conserve natural resources, and support communities where everyone can thrive. These leading goals are core to our sustainability programs and the framework helps align our business performance with non-financial impacts.

The Conserve pillar captures our commitment to innovate more while using less, safeguarding natural resources. Our **Product Stewardship and Circularity Program** is foundational to achieving this commitment. We are incorporating environmental considerations into how our products are designed, engineered, deployed, serviced, reused, and recycled at the end of their useful life.

> "Product stewardship and circularity are central elements of our sustainability strategy and culture, and are embedded in our safety and quality management processes."

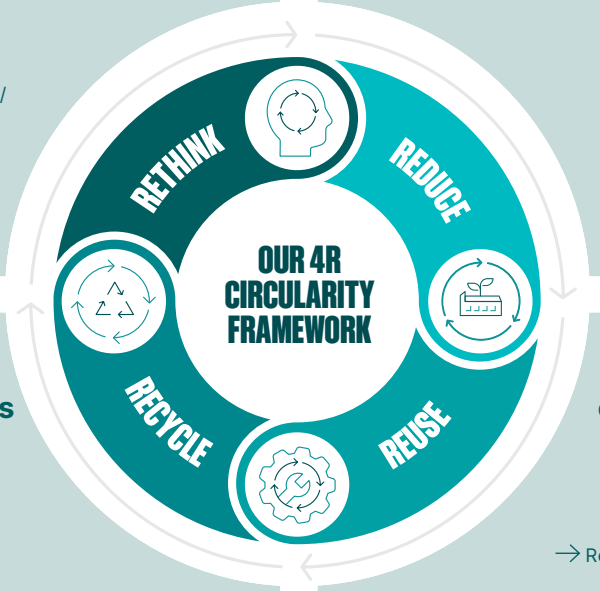
GOAL 2

90% of our top products covered by our 4R circularity framework by 2030

OUR 4R CIRCULARITY FRAMEWORK

We developed a product stewardship and circularity strategy, known as our **4R circularity framework**, to methodically identify and create value opportunities to **rethink, reduce, reuse,** and **recycle** materials used in our products.

Our goal is to have 90% of our top products (by sales) covered by the 4R circularity framework by 2030[1]. This goal enables us to focus on the product families with the biggest impact, aiming to separate our resource use and environmental impacts from our economic objectives. We are continuously improving our thinking around how we design, manufacture, service, and enable the circularity of our products, while establishing specific circularity requirements and criteria across our business operations.



RETHINK

Product engineering with sustainability in mind

Material & sourcing decisions in design

INITIATIVES

- → Circular & Eco-Design
- → Life Cycle Assessments (LCAs)/ Environmental Product Declarations (EPDs)
- → Sustainable and Safe Materials
- → Responsible Suppliers

Read more

REDUCE

Lean and efficient operations

Energy & waste reductions in manufacturing

INITIATIVES

- → Energy Efficiency
- → Waste & Water Reduction
- → Pollution Mitigation
- → Circular Manufacturing

Read more

RECYCLE

End-of-life (EoL) solutions and services

Recycling data, solutions, end-of-life partnerships

INITIATIVES

- → Recycling Solutions
- → Take-back Schemes
- → EoL Partnerships
- → EoL Materials Data & Docs

Read more

REUSE

Life extension and optimization services

Optimization & upgrade services for installed base

INITIATIVES

- → Repairs and Life Extension Services
- → Remanufacturing
- → Refurbishment
- → Optimization

Read more

[1] We define our "top products" for the purpose of this metric as the products with the highest annual sales.

HOW WE ARE DELIVERING OUR CIRCULARITY GOAL

Our product stewardship and circularity program, and the 4R circularity framework that sits behind it, aims to address scarcity of resources, as well as expectations for technology producers to take more responsibility for the impact their products have during their full life cycle. The program also enhances our ability to comply with regulatory disclosures, customer expectations for products with lower-carbon footprints, certified life cycle assessments (LCAs), and eco-design documentation[2].

[2] Eco-design is a systemic approach that considers environmental aspects in design and development with the aim to reduce adverse environmental impacts throughout the life cycle of a product.

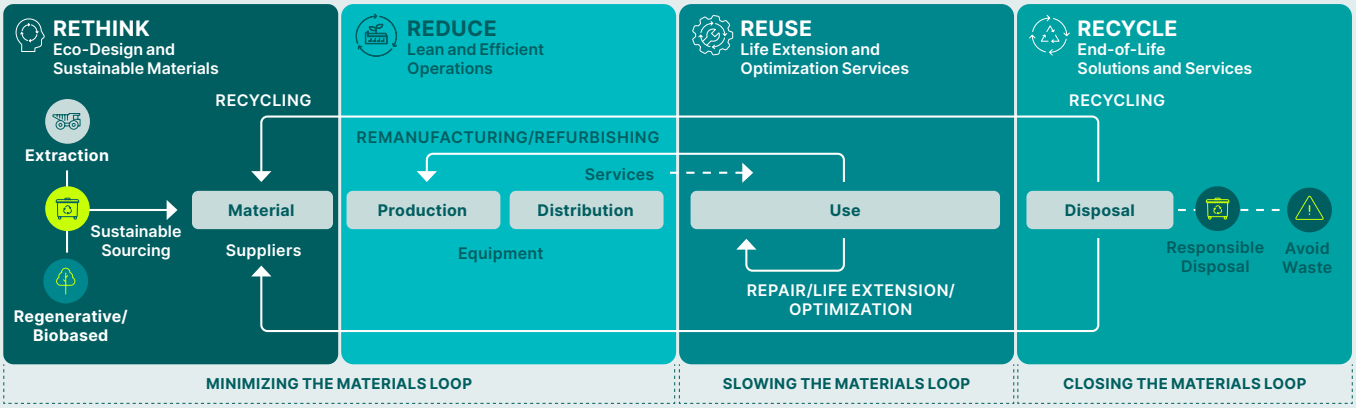
We deliver continuous improvement using Lean principles, which are key to identifying and eliminating waste, and are employing a sharp focus on product safety across our sites. We consistently review and strengthen our policies and practices to improve performance and reduce product-related risks for the environment and safety.

For each of the 4Rs, there are standard operating procedures (SOPs) to provide instructions on how to execute product stewardship initiatives; for example, we maintain an SOP on how to conduct LCAs across our business units. Each of the SOPs has specific training materials to educate our internal stakeholders.

MEASURING PROGRESS

We monitor the percentage of our top products covered by our 4R circularity framework for each top product. We do this by assessing and collecting circularity metrics related to the alignment of each top product against each of the 4R criteria. As part of the development of our Circularity Program, we're able to capture data for key performance indicators that will allow us to identify gaps, prioritize initiatives, and develop individual circularity roadmaps for top product lines towards achieving our 2030 goal.

CIRCULAR PRODUCT LIFE CYCLE AND HIGH LEVEL MATERIAL FLOWS



Develop and build best-in-class products with circularity in mind

Provide and orchestrate value-add circularity services and solutions to our customers

HOW OUR TOP PRODUCTS DELIVER OUR 4R CIRCULARITY FRAMEWORK

In our evaluation process, each of our leading products is assessed against 10 circularity criteria spanning four core areas. For a product to be deemed compliant, it must fulfil multiple criteria requirements within each of these areas simultaneously. For instance, to satisfy the criteria 1.2 Life Cycle Assessment (LCA) and Environmental Product Declaration (EPD), a product must have a documented LCA or possess third-party certifications. This approach applies similarly to other criteria, where products are required to demonstrate evidence of meeting the specified requirements.

Over time, our goal is to refine these criteria and requirements as we advance and as external conditions change such as regulations, internal goals or market expectations.

Our 4R circularity framework includes several maturity levels beyond these minimum requirements, encouraging continuous improvement and achievement of additional product criteria.

4R CIRCULARITY FRAMEWORK PRODUCT CRITERIA

RETHINK	• Design for Sustainability • LCA/EPD • Sustainable and Safe Materials • Supplier ESG Program
REDUCE	• Lean Manufacturing • Circular Packaging
REUSE	• Life Extension Services • Life Optimization Services
RECYCLE	• EoL Solutions and Collaborations • EoL Data and Transparency

KEY CIRCULARITY TERMS

A **Life Cycle Assessment (LCA)** is defined as the systematic analysis of the potential environmental impacts of products, services, or processes during the product life cycle.

An **Environmental Product Declaration (EPD)** is defined as a Type III declaration that quantifies environmental information on the life cycle of a product to enable comparisons between products fulfilling the same function.

RETHINK

Product engineering with sustainability in mind

RETHINK explains how we engineer and develop our products with circularity and resource efficiency in mind. This is an essential phase as decisions made during product development affect all other life cycle phases. This is also an area with significant innovation opportunities for product circularity, and for mitigating environmental impact. Activities within RETHINK may include eco-design in our new product introduction (NPI) and new technology introduction (NTI) processes, LCAs, and sourcing new sustainable materials.

France

GE VERNOVA TO DELIVER THE WORLD'S FIRST 245 KV SF_6-FREE GAS-INSULATED SUBSTATION FOR RTE

GE Vernova announced that its Grid Solutions business will manufacture, deliver, and commission the world's first 245 kilovolt (kV) SF_6-free gas-insulated substation (GIS) for RTE in France. Grid Solutions has deployed its advanced B105 SF_6-free GIS, a solution that will support RTE in replacing sulfur hexafluoride, SF_6 – a gas with a global warming potential 24,300 times greater than CO_2 – with its g^3 alternative.

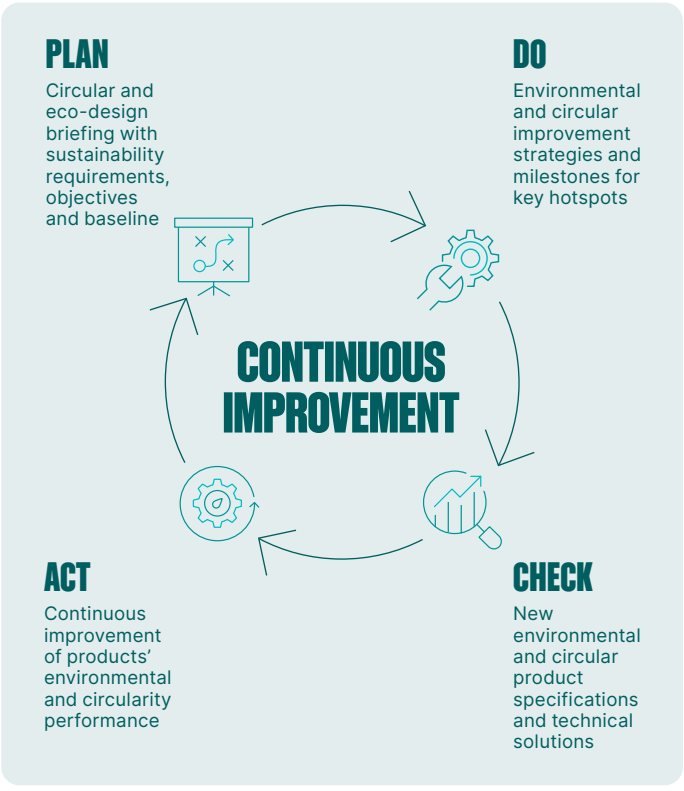
Find out more

ENGINEERING FOR ENVIRONMENT AND CIRCULARITY

We recognize both the need to reduce adverse impacts on the environment from products as well as the need to include environmental and circular consideration in design and development. This process, generally called "eco-design", is a systematic approach, which considers environmental aspects in design and development with the aim to reduce adverse environmental impacts throughout the life cycle of a product. Other similar terms that are used include "Design for environment" (DfE), environmentally conscious design (ECD), "Environmentally sustainable design" and "green design" (ISO 14006:2020)

At GE Vernova, we strive to adopt a holistic 360° view on design for sustainability combining both Design for Environment (DfE) and Design for Circularity (DfC). DfC aims to introduce circularity principles throughout the product life cycle during product development, including design for recyclability, durability, upgrading, maintenance, and/or disassembly.

New products and technologies must show evidence of being designed and developed considering the full lifecycle's environmental footprint and natural resources circularity. Our internal guidelines are aligned with ISO 14006 and IEC 62430, following a four step Plan-Do-Check-Act.



RETHINK
Continued

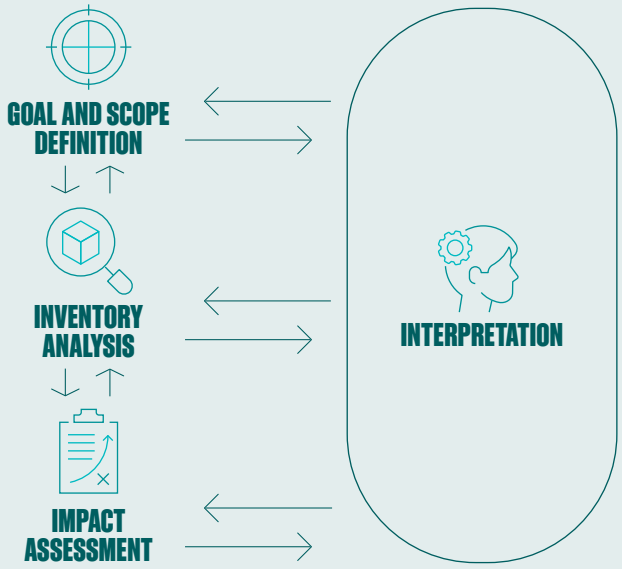
PRODUCT LIFE CYCLE ASSESSMENTS (LCAS)

An LCA is defined as the systematic analysis of the potential environmental impacts of products, services, or processes during the product life cycle. LCAs are an essential component of our Product Stewardship and Circularity strategy, as we must understand the net environmental value of our circularity initiatives to help ensure our program is adding value to the environment. All top products covered by our 4R Circularity framework need to have a product LCA or Environmental Product Declaration (EPD).

For the declaration and communication of product environmental footprint results we follow both type II and III ISO 14020 environmental labels guidelines. An EPD is defined by International Organization for Standardization (ISO) 14025 as a Type III declaration that "quantifies environmental information on the life cycle of a product to enable comparisons between products fulfilling the same function." The environmental impact categories of product environmental reports follow Product Category Rules (PCR) of the key program operators and cover a wide range of environmental and human health mid-point indicators such as climate change, ozone depletion, acidification, resource depletion, water use, land use, and human toxicity.

To consult our circularity policies and product life cycle assessments (LCAs) please contact our commercial teams.

LIFE CYCLE ASSESSMENT FRAMEWORK



ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework. Geneva, Switzerland: International Organization for Standardization.

SOURCING MORE SUSTAINABLE AND SAFER MATERIALS

More sustainable and safer materials are a key part of our strategy to engineer and develop more sustainable products while preventing and mitigating human rights concerns in our value chain. Sustainable practices are critical to combatting climate change and human rights concerns where considerations should be made not only in energy product but also in the sourcing and utilization of raw materials. Extraction of raw materials increases the risk of human rights violations and environmental destruction. Considerations should be made not only in energy production but also in the sourcing and utilization of raw materials.

As part of the First Movers Coalition initiative, we have increased efforts to source lower-carbon materials and announced a new commitment to purchase 10% of our steel with near-zero carbon emissions by 2030.

For circular materials, we aim to increase the recycled content in our products, with strategic initiatives for critical raw materials such as Copper, Aluminium or Rare Earth Elements (REEs). By increasing the recycled content in our products, we can minimize human rights and environmental concerns by reducing the need for new mining operations where worker exploitation and environmental degradation are significant issues.

Regarding smarter chemistry and non-hazardous materials, we aim to use safer materials to create safer products. This commitment requires diligent work to create an inventory of chemicals used in our products and adopt safer chemical alternatives or innovate through engineering to develop better approaches for manufacturing. As such, we monitor and assess our materials compliance with regulations such as the EU's REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) or RoHS (Restriction of Hazardous Substances in Electrical and Electronic Equipment), among others.

Top products covered by our 4R framework need to show evidence of sourcing sustainable and safe materials as part of their material composition.

North America

First Movers Coalition

LOWER-EMISSIONS STEEL

In 2023, we joined the First Movers Coalition with a commitment that at least 10% of all steel we purchase will produce near-zero emissions by 2030, measured by volume per year. As part of this commitment, and in alignment with our efforts to decarbonize our products, our Wind segment teamed up with steel manufacturer SSAB to supply SSAB Zero steel for our onshore wind towers in North America. Made from recycled steel, and produced with near fossil-free electricity and biogas, SSAB Zero enables us to significantly reduce Scope 3 carbon emissions related to our steel towers.

Find out more

REDUCE

Lean and efficient operations

REDUCE focuses on how we manufacture and assemble products in our own facilities, while reducing waste, water, and energy consumption, with a strong focus on efficiency within our operations. Applying Lean methodologies, our approach aims to reduce resource use and waste disposal, while decreasing costs and mitigating environmental impacts.

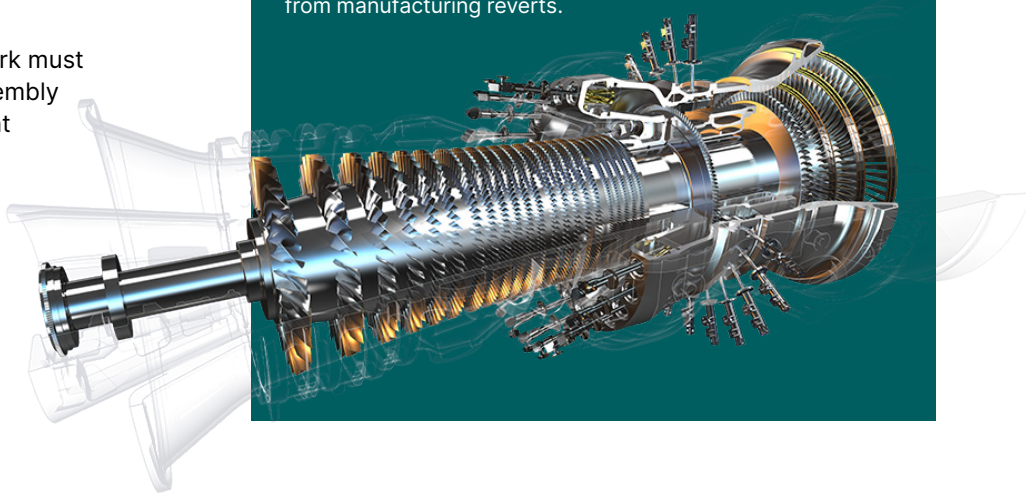
Resource-efficient operations contribute to our broader circularity approach and improve our product life cycle footprint. This includes reducing our energy and water consumption, and mitigating waste and pollution in our facilities. We aim to enhance our environmental management systems, aligned with ISO 14001, and aim to improve our resource efficiency through streamlined packaging of our products.

Top products covered by our 4R framework must demonstrate that manufacturing and assembly in our facilities adhere to lean and efficient practices, with commitments to reducing resources, waste, and pollution.

Global

REDUCING VIRGIN MATERIAL CONSUMPTION

GE Vernova's Power businesses work with suppliers and customers to reduce virgin material consumption by capturing value from manufacturing reverts. The scrap generated in manufacturing shops, external machining suppliers' shops, and customer sites is collected, cleaned, and processed for reuse. Through established partnerships with recyclers and waste managers who collect and recycle scrap materials, we can improve end of life solutions for waste materials. Circular reuse and recycling solutions allow GE Vernova to reduce the portion of virgin materials it uses by capturing value from manufacturing reverts.



U.S.

TURBO TOUR: GE VERNOVA'S COMBUSTION TEST FACILITY

Our Greenville, South Carolina combustion lab facility conducts early developmental testing with renewable fuels, such as hydrogen, to assess combustion performance, component durability, and levels of emissions within GE Vernova's emerging technologies. Dry low NOx (DLN) technology for hydrogen is currently a heavy focus of the combustion lab.

Find out more

"GE Vernova is testing DLN technology, which employs lean pre-mix combustion. The reason we use lean pre-mix combustion is if we pre-mix the fuel and air well, then we can have lower emissions than our diffusion flame combustors. Instead of maybe 200–300 parts per million of NOx, we're able to get some of our F-class combustion systems down to single digits."

Will York,
Technical Leader in Combustion Design

REUSE

Life extension and optimization services

REUSE occurs after we bring our products to the marketplace. We seek to assist our customers to extend the lifetime and efficiency of our products through our optimization and life-extension services. We aim to reuse and retain the value in the materials of our sold products use-phase for as long as possible, avoiding the extraction of new raw materials and negative impact, while producing the same output.

Circular services are an important aspect of our business model, given that a large portion of our backlog is for services that help extend the life of our sold products. Additionally, we offer optimization services aiming to maximize the efficiency of our installed fleet, and are expanding our refurbishment and remanufacturing capabilities in our businesses.

Top products covered by our 4R framework have services available for our customer to extend and optimize their products life cycle through maintenance, repairing, remanufacturing, refurbishment, and other solutions.

U.S.

REPOWER ORDER POSITIONS GE VERNOVA TO HELP MEET U.S. ENERGY DEMAND

GE Vernova received orders in 2024 to repower over 1 GW of U.S. wind turbines. The projects will use nacelles and drive trains manufactured at our Pensacola, Florida facility, where ~20% of the workforce are veterans, to support U.S. energy abundancy, affordability, and security. “As the U.S. works to meet the doubling of projected demand for more energy, repower projects like these help U.S. workers in U.S. factories take advantage of what we already have, where we already have it. Employees in our Pensacola facility and at the locations of partners across the supply chain are working to help us get the most out of our valuable energy assets already in the ground,” said Matt Lynch, General Manager of Repower at GE Vernova.

Find out more

RECYCLE

End-of-life (EoL) solutions and services

RECYCLE focuses on how we provide end of life (EoL) solutions and services to support our customers disassemble, dispose of, and recycle their equipment once they reach EoL. This links back to our engineering and development phase, where we target to develop our products while considering the circularity properties of our main components and raw materials. Advancing and scaling these EoL solutions is how we aim to enable closing the loop of our products' life cycles. This is particularly important to address some of the industry challenges in recycling wind turbine blades due to the composite materials used in their production, and in recovering safely scarce and critical minerals found in low-carbon technologies.

To help our customers and support recycling companies in capturing more value from secondary materials used in our products and components, we are improving data transparency and information available regarding our products' EoL. To that end, we are developing EoL documents and materials across our portfolios in alignment with legislative requirements.

Top products covered by our 4R framework have services and solutions available to support customers to disassemble, dispose of, and recycle their equipment once it reaches the end of its life, this might include take-back schemes, EoL guidelines, and recycling partnerships.

EU

ZEBRA PROJECT: WIND TURBINE BLADE RECYCLING

The ZEBRA project is a unique collaboration of industry leaders, including Arkema (resin supplier), Owens Corning (glass fiber supplier), GE Vernova's Wind Blade business, SUEZ (dismantling and waste processing), CANOE R&D center (recycling technology), and ENGIE (life cycle analysis). The ZEBRA project successfully recycled Elium® resin and Ultrablade® fabrics from wind turbine blades and manufacturing waste, reformulating them back into usable materials. This closed-loop process addresses the growing challenge of end-of-life blade management within the wind energy industry.

Find out more