



# Sustainability at Siemens Energy

Summary of the Sustainability Report 2021



# How to fight climate change now?

Interview: Oliver Sachgau Photography: Götz Schleser

Climate change is a major threat to humanity. As Siemens Energy Chief Executive Officer and Chief Sustainability Officer Christian Bruch notes, the time has come to radically change and decarbonize our energy system.



In conversation at the Futurium, Berlin's "House of Futures", Bruch lays out a path forward for Siemens Energy and the world at large.

Christian Bruch, the world is far from where it needs to be to meet the Paris Climate Agreement goals. We are nearing a tipping point. Why is there still so much hesitancy to do what's needed to meet these goals?



The Futurium in Berlin is a meeting point for presenting and exchanging information about science, research, and innovation – the ideal location for a conversation with Christian Bruch about the future of sustainability in the energy sector.

I would not call it hesitancy. The transformation we need to go through is complex and massive. We can see that the elements we are driving today are not sufficient. The IPCC [Intergovernmental Panel on Climate Change] report has shown us that we have to move fast, and we have to move differently. We need to bring all stakeholders together to shift gears. The time to act is now.

The effects of climate change are distributed unevenly, affecting some areas of the world much more than others, especially developing countries and the global south. How do you address the disparity between where climate change is hitting people the hardest and where we have the most resources to tackle it?

We do need different solutions in different parts of the world. At the same time, as the Paris Agreement clearly states, the developed world has an obligation to support the developing world in tackling the challenges of energy supply while addressing sustainability. We, as the developed world, have not lived up to this commitment. We need to recognize that in the developing world in particular, the increase in energy demand will be massive. If the developing world fails to deal with this challenge, we will not be able to mitigate climate change, which will ultimately also be to the disadvantage of the developed world.

Your current portfolio consists of conventional and decarbonized technologies. At the same time, you want to be the partner of choice for the energy transition. What will this mean for your portfolio?

There's no single silver bullet for the energy transition, whether it's solar or wind or hydrogen. We will need a variety of technologies – and for a transitional time, we will need conventional technologies. This is why I believe it's a strength to have what we call decarbonized portfolio elements and conventional technologies like gas turbines, because our customers have the same problem. Having said that, our portfolio is absolutely going to change going forward. That's not even a question. We focus our R&D investments of €1 billion every year on technologies that are relevant in a decarbonized energy world.

You've spoken in the past about the importance of bridging technologies. Why would switching to gas help us decarbonize? Aren't you just taking half-measures?

First of all, if you can produce power from a renewable energy source, that's a better way to do it. Nobody is questioning that. But if you have a situation today where 70% of the CO<sub>2</sub> emissions in power production are

caused by coal-fired power production, the most urgent task becomes how to stop and replace that. If gas helps us build a bridge by cutting the CO<sub>2</sub> emissions by two-thirds compared to coal, then this is the right measure for reducing CO<sub>2</sub> emissions in the short and medium term. Will it still be the right technology and approach ten or more years down the road? Probably not, but for me, it's important that we stop talking about long-term targets and start tackling some things immediately.

Siemens Energy has the goal of being powered by 100% renewable energy by 2023 as one lever of becoming climate neutral by 2030. How are you doing with these goals?

We're well on track here, and there's no doubt that we will achieve that target of being climate neutral in our own operations by 2030. Reaching this goal will obviously require reducing emissions, but we will also need to compensate emissions from 2030 onwards.

Is it more important to talk about how we as individuals use electricity, or about the way companies generate it?

That is a very important point because we underestimate the relevance of the individual. If we don't change the way we consume energy, we won't solve the problem. It will require all three elements – how we generate electricity, how we distribute and store it, and how we consume it – and we all have a role as individuals to tackle that. We will have to change, all of us.

Oliver Sachgau is a Berlin-based German-Canadian writer and journalist focusing on financial topics. His work has appeared in Bloomberg, the Washington Post, Fortune, and the Independent.

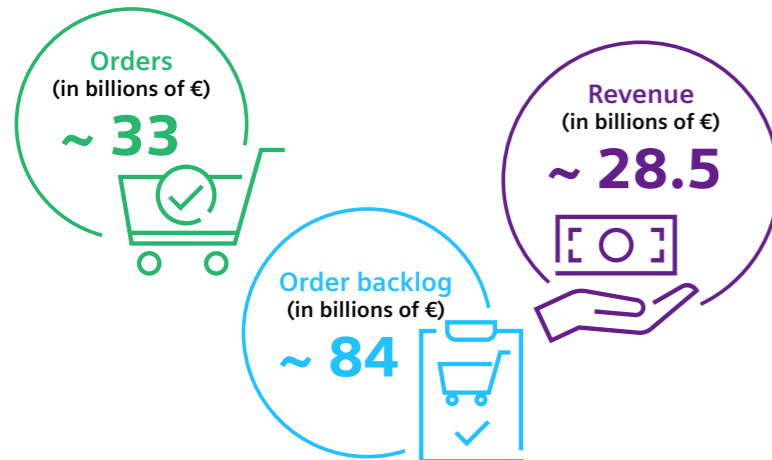
# Company overview

At Siemens Energy, our mission is to empower our customers to meet the growing demand for energy while transitioning to a more sustainable world. With our innovative technologies and extensive energy experience we are committed to decarbonizing global energy systems and driving the energy transition.

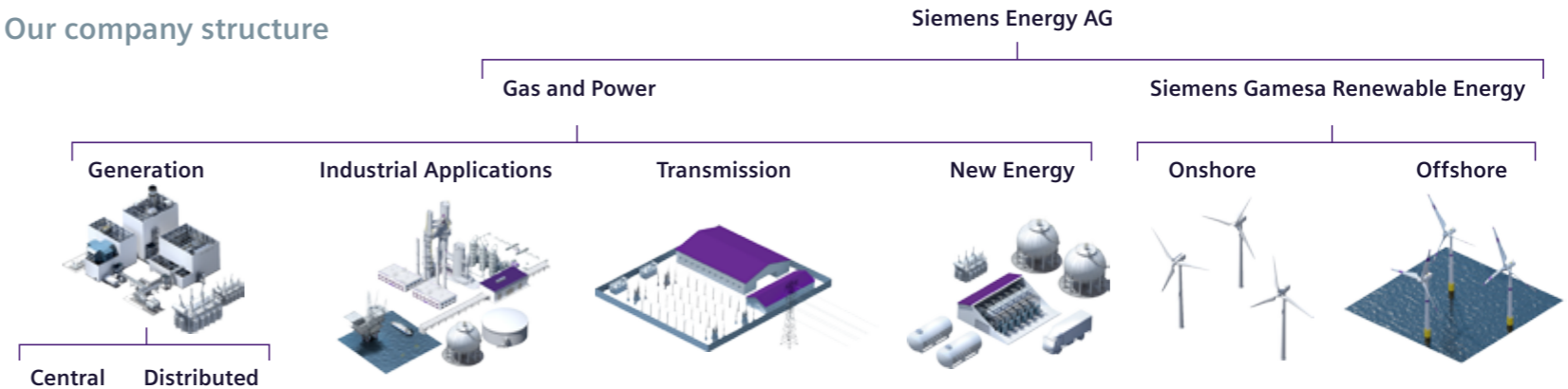
Our broad portfolio of products, solutions and services covers almost the entire energy value chain, from conventional to renewable energy technologies. These include gas and wind turbines, hybrid power plants operated with hydrogen, high voltage grid access solutions and high voltage transformers.

Behind Siemens Energy is a global team of more than 91,000 dedicated employees working across 90 countries. Our company is structured around two segments, Gas and Power (GP) and Siemens Gamesa Renewable Energy (SGRE), under which we operate the following Divisions:

## Key financial indicators



## Our company structure



## Gas and Power

- **Generation:** We provide products, solutions and services for conventional power generation with high efficiencies. We reduce carbon emissions from existing assets and develop technologies that will be critical in the future for the decarbonization of power generation applications.
- **Industrial Applications:** We support industrial customers in their conventional business and activities towards energy transition, by providing safe, reliable and highly efficient rotating, electrical, automation and digital products, solutions and services.
- **Transmission:** We partner with our customers to build and operate efficient grid infrastructures. We offer reliable products, solutions, and state-of-the-art services improved with digital functions to meet the growing demand for sustainable electrification.

- **New Energy Business:** We shape the green hydrogen economy. We are developing the technologies and applications urgently needed for decarbonization on an industrial scale and coupling economic sectors with renewable sources of power

## Siemens Gamesa Renewable Energy

**Wind energy:** Through our majority stake in SGRE, we are one of the leading providers of wind power solutions across 90 countries. SGRE operates with a flexible business model and manages its business in two segments:

- Wind Turbines (comprising Onshore and Offshore), which covers the design, development, manufacturing and installation of wind turbines, and
- Service.

# Strategic focus

At Siemens Energy, we believe innovative technologies are the key to combating climate change. As one of the world's leading energy technology companies, we are uniquely positioned to drive the energy transition. Our extensive experience in the energy market makes us the partner of choice for our customers on their journey to a more sustainable future.

To maintain our focus, we have established our company strategy along the three pillars of low- or zero-emission power generation, transport of energy and storage as well as reducing our greenhouse gas footprint and energy consumption in industrial processes.

## Our strategic pillars

We focus on building our company based on three strategic pillars:



Low- or zero-emission power generation



Transport of energy and storage



Reducing our greenhouse gas footprint and energy consumption in industrial processes

## Our Sustainability Program

We energize society



Our Sustainability Program is integrated into our company strategy. The program is structured around topics that help us to contribute to the most relevant Sustainable Development Goals (SDGs) and be a sustainability leader in the industry.

The SDGs and their related targets are fostering a new understanding of how economic development can be reconciled with social and environmental challenges. To ensure our efforts have the biggest impact, we focus our activities on SDG 5, 7, 8, 9 and 13.

At the core of our Sustainability Program is the goal to decarbonize energy systems along the entire value chain. With our commitment to responsible operations, we are also leveraging Siemens Energy's societal impact.

Our first major **ESG ratings** results show that we are on track to lead the energy transformation. You can find more information on our ambition and program in the **Sustainability Report 2021**.

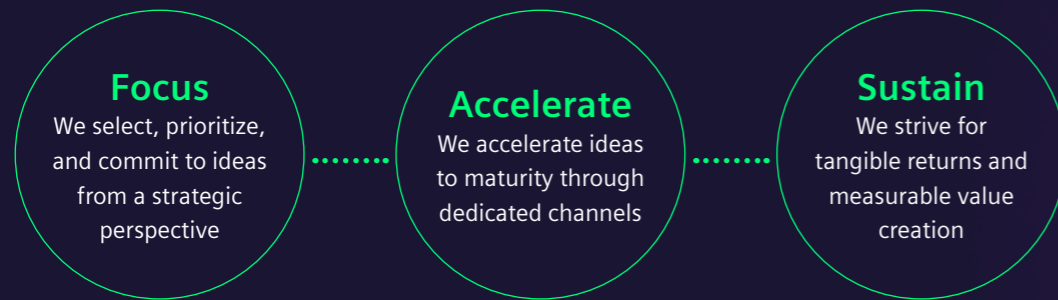
## Sustainability performance highlights

# Customers and innovation

Innovation is key to creating the future. We value co-creation and partner with our customers to decarbonize energy systems.

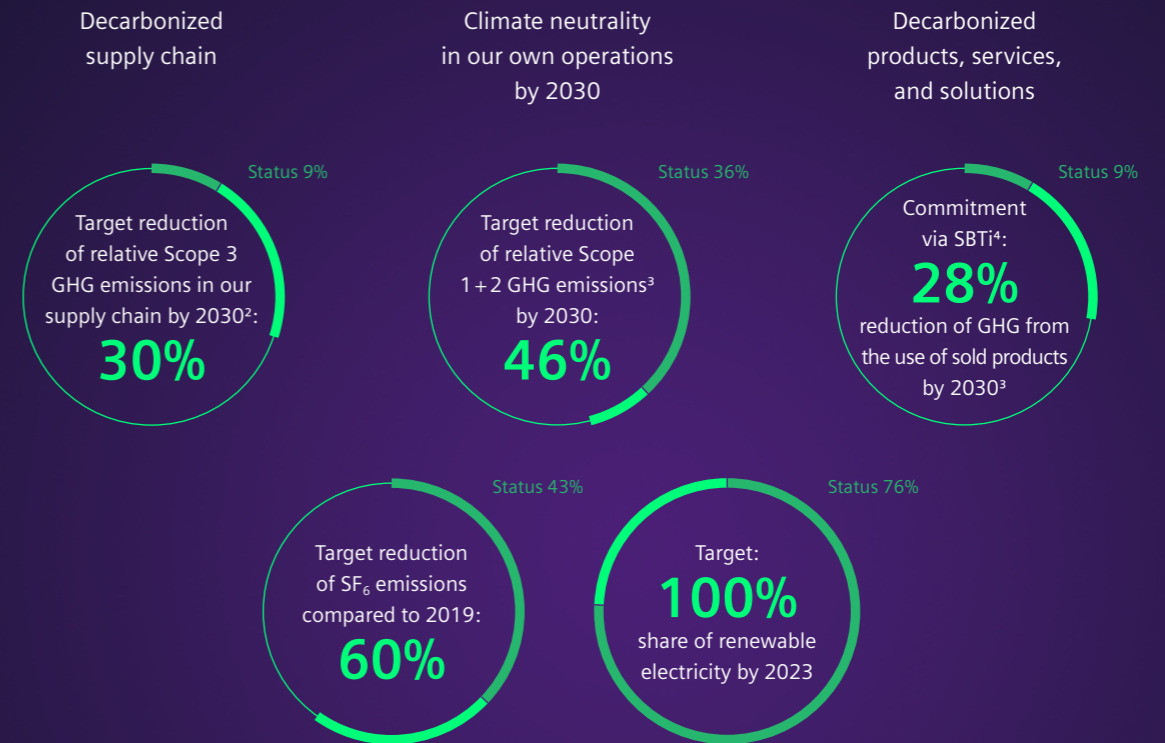


Innovation is the core of our business. Our simple, fast, and unified approach to research and development (R&D) has three elements:



# Decarbonization

Our strategy to decarbonize global energy systems is central to our efforts to be the partner and driver of the energy transition. We accelerate decarbonization along the value chain:



SGRE: net zero by 2040

<sup>1</sup> Index measuring willingness of customers to recommend a company's products or services to others.

<sup>2</sup> kg CO<sub>2</sub>e/€ PVO spent, base year 2018; reporting segment GP. <sup>3</sup> from a 2019 base; reporting segment GP.  
<sup>4</sup> SBTi = Science Based Targets initiative.

➔ See SE Sustainability Report 2021

## Selected examples for innovation and decarbonization



Our high-voltage switchgear operates climate-neutrally in Burladingen

### SF<sub>6</sub>-free substation of the future

The substation of the future, operated by Netze BW, applies Siemens Energy SF<sub>6</sub>-gas-free and F-gas-free Blue gas-insulated high-voltage switchgear (GIS) and will go into operation in southern Germany at the end of 2022. It uses vacuum switching technology and Clean Air as the insulating medium, instead of SF<sub>6</sub> and other F-gases, so is therefore climate-neutral in operation. This Blue switchgear is also more cost-effective in its operation and throughout its whole lifecycle, with less maintenance, less reporting costs according to F-gas regulations, and with no impact on health and safety (due to avoidance of F-gases). In Burladingen, Germany, the substation saves 100% of F-gas-related CO<sub>2</sub> emissions. Siemens Energy currently has 50 Blue GIS-bays (substations formed by several bays with connection to energy consumers and power stations) for 145 kV in operation globally, with a further 300 on order in Europe and the US.

### Going full circle with DecomBlades

Launched in 2021, "DecomBlades" is a three-year project that is testing the commercial viability of recycling wind turbine blades using sustainable solutions. The consortium behind the project, of which SGRE is a part, has now been awarded funding from the Innovation Fund Denmark. The project focuses on three specific processes: the shredding of wind turbine blades so that the material can be reused in different products and processes; the use of shredded blade material in cement production; and, finally, a method to separate the composite material under high temperatures, also known as pyrolysis. For more information see [↗](#).

### Electrifying Norway's ferries

The Norwegian transport company Bast. Fosen is a subsidiary of Torghatten ASA. The company operates ferry traffic between Horten and Moss and aims to increase its environmental commitment for Norway's busiest ferry route. Siemens Energy Marine has been commissioned to build a new battery-operated ferry and to retrofit two more ferries. With charging options on the quayside in Moss and Horten, more than 6 million liters of diesel will be saved every year, leading to a 75% reduction in annual CO<sub>2</sub> emissions. For more information see [↗](#).

Leaving diesel behind: electric ferries for Norway's busiest route



Haru Oni: the first large-scale plant to produce e-fuel from green hydrogen

### E-fuel from wind and water

Harnessing the strong winds of the Magallanes in southernmost Chile, the Haru Oni project is the world's first integrated and commercial large-scale plant to produce climate-neutral e-fuel. The plant converts wind energy, water, and CO<sub>2</sub> captured from the air to produce green hydrogen. This is then further refined to produce e-Methanol, a liquid energy carrier that emits about 90% less CO<sub>2</sub> than its fossil counterpart. Siemens Energy will work alongside several international companies led by Highly Innovative Fuels on the project, which intends to produce over 550 million liters of e-Gasoline by 2026. To explore the full story see [↗](#).

### H2 Orange: teaming up for hydrogen research

Siemens Energy, Duke Energy, and Clemson University have teamed up to study the use of hydrogen for energy storage and as a low- or no-carbon fuel source to produce energy at Duke Energy's combined heat and power plant located at Clemson University in South Carolina.

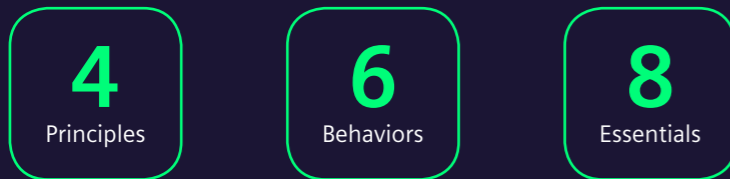
The pilot project, called H2 Orange, was launched in March 2021, and includes studies on hydrogen production, storage, and co-firing with natural gas.

The studies will evaluate multiple forms of hydrogen production, including green hydrogen, which is created from water and has no byproducts. Hydrogen also has the potential to store larger quantities of energy more efficiently and for longer durations than current lithium-ion battery technology. Read the article here [↗](#).

## Sustainability performance highlights

### Zero Harm Framework

We promote a strong Zero Harm culture that aims to prevent injuries to people and adverse effects to health and the environment.



### Occupational health & safety

Providing a safe and healthy working environment for all employees, partners, contractors, and suppliers is our utmost priority.



<sup>1</sup> Number of recordable injuries (TRI) x 200,000/work hours performed.

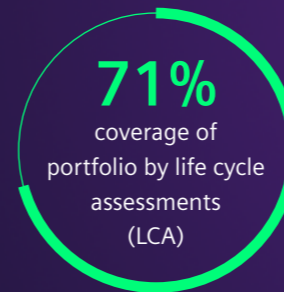
### Conservation of resources

We aim to minimize our impact on the environment. Our environmental management systems are founded on the principles and elements of the international ISO 14001 and 50001 standards or energy audits.



### Product stewardship

Our approach to product stewardship includes all environmental aspects with a strong focus on climate change adaptation and resource efficiency.



<sup>2</sup> Excluding construction and other waste.

➔ See SE Sustainability Report 2021



## Selected examples of responsible operations

### Measuring footprints with the EcoTransparency app

The energy transition and the focus on providing sustainable energy solutions will be a key issue over the coming years. One of the biggest challenges for all players in the energy sector will be to accurately project, analyze, and improve environmental footprints. This is not only essential for reducing environmental impact but also in providing transparent data for sustainable finance reporting.

Our EcoTransparency app, which was launched in September 2021, was developed for just this purpose. The app enables the Siemens Energy Sales, Product Management as well as R&D departments to calculate product- and project-specific greenhouse gas footprints under varying scenarios. Adjustable parameters can include load scenarios, material selection, or transport, among others. With these calculations we aim to add another layer of transparency to our established life cycle assessments (LCA). The app is based on existing LCA models and provides customers and stakeholders with additional information regarding specific footprints and thus enables them to meet reduction targets for all environmental impact categories.

The application will be further developed in cooperation with various industrial partners and research institutes. It shall enable the evaluation of the circular economy aspects of the German energy transition, such as the comparison of impacts during recycling versus end-of-life and be the foundation for meeting future requirements for calculating environmental footprints.

### Working toward zero waste

At Siemens Energy, we are working toward zero waste to landfill through the reduction of our material use and using circular economy approaches.

In the UK, two Siemens Energy projects collaborated to reuse and recycle stone for their construction sites. Around 8,768 metric tons of stone, enough to fill almost three Olympic-sized swimming pools, previously used to build a temporary access road and site accommodation for the Triton Knoll onshore substation works, was moved to the neighbouring National Grid Viking Link interconnector project. The initiative saved more than 58 metric tons of CO<sub>2</sub> in total, the equivalent of the CO<sub>2</sub> generated by heating 20 homes for one year.

In Brazil, the environmental team has been working to reduce material waste through environmental education, innovation, and use of renewable waste disposal technologies. These include industrial biodigesters such as those installed at the Jundiaí and Santa Bárbara D'Oeste's cafeterias in August 2021. The biodigesters turn organic waste into sewage, reducing around 5 tons of waste a month. Through all our efforts, we ensured that 86% of the waste generated at our Brazilian sites in 2021 were sent to recycling facilities; by the end of 2022, we want to achieve the landfill-free target.

In the US, the Siemens Energy facility in Rural Hall met its goal that no solid or hazardous waste should be directly disposed of in landfill. Today some 80-90% of the facility's waste by weight is recycled and repurposed into another product. At the Orlando campus of Siemens Energy, the external building management company CBRE and the internal GREEN Employee Resource Group have collaborated on acquiring a vendor to compost the cafeteria's food preparation scraps. The organic waste is collected once a week and composted off-site. [Read the full story here ↗](#).



The stone used at the onshore Triton Knoll substation will be transported to the adjacent National Grid Viking Link interconnector project

### Celebrating Safety and Health at Work

On April 28, 2021, Siemens Energy joined the global community to celebrate World Day for Safety and Health at Work. The day was initiated by the International Labour Organization in 2003 to promote the prevention of occupational accidents around the world. Here at Siemens Energy, this is an opportunity to talk about the importance of safety issues and of creating a culture that reduces work-related injuries, diseases, and deaths. To mark the day, local Siemens Energy News Yammer groups and offices shared their special celebrations using the hashtag #SafetyAndHealth. The Berlin team, for example, designed a 15-minute "Body & Soul" session to energize co-workers on their break.

## Sustainability performance highlights

# Sustainable supply chain management

We apply stringent environmental and social standards to contribute to a sustainable supply chain.



# Working at Siemens Energy

Our People Agenda promotes a thriving environment, game-changing leaders, and a vibrant workforce.

## Share of females

All employees

**19.3%**

in top leadership positions<sup>1</sup>

**21%**

Our target top leadership positions by 2025

**25%**

by 2030

**30%**

## Training hours

**8.6**

Total average training hours per employee

# Human rights

We are committed to ensuring respect for human rights along the value chain within our sphere of influence.



We conduct human rights due diligence for our customer projects

# Compliance & integrity

Our company-wide zero-tolerance approach aims to ensure a strong culture of business ethics and compliance.



Our Business Conduct Guidelines are binding for all executives and employees worldwide



# Societal engagement

Our global engagement addresses needs in the countries in which we operate.

€ **4.71** million  
total donations

<sup>1</sup> At reporting segment GP.

➔ See SE Sustainability Report 2021

## Selected examples of responsible operations



Honoring those that share Siemens Energy's spirit of innovation

### The Siemens Energy Passion for Energy Award

In May 2021, we introduced our new GP award program, the Passion for Energy Award, to celebrate our best and brightest employees who exemplify the Siemens Energy values, behaviors, and spirit of innovation. The Passion for Energy Award program honors projects and initiatives that drive the success of our company and ensures that everyone's contributions at Siemens Energy are seen, valued, and celebrated. Employees from around the world participated and, 651 projects or initiatives were submitted.

### Repowering a city in need

In August 2021 record rainstorms lashed Zhengzhou, one of the largest cities in central China, claiming lives and forcing people to relocate. Upon learning about the catastrophe, GP factories were quick to lend their support to the local power company. Within 36 hours, Siemens Transformer (Wuhan) Co., Ltd. had mobilized a fast-response team and delivered a 110kV mobile substation to help the city restore power.



In Zhengzhou: the green mobile substation equipped with a Sensformer™ filled with natural ester oil ready for operation

### A compliance roadmap for Iraq

In June 2021, employees of the Siemens Energy Middle East Legal and Compliance department provided officials from the Ministry of Electricity in Iraq with training in anti-corruption. The training covered the historical development of anti-corruption, global anti-corruption measures, cases, and practical exercises. The training was well received by the participants and the objective is for them to further train other officials.



Honoring those that share Siemens Energy's spirit of innovation

### Girls with Energy Hackathon

In August 2021, GP hosted the inaugural Girls with Energy Hackathon in Mexico. Seventy girls aged between 12–18 years were invited, most of whom were daughters of Siemens Energy employees, stakeholders, or customers. The goal was to develop a product or service related to energy in science, technology, engineering and mathematics (STEM) using learning games such as Kahoot and Skribbl. In the lead-up to the event, we held workshops on energy and climate, design thinking, Canvas, and presenting an elevator pitch. Female GP employees acted as mentors and judges.

In the UK, GP has partnered with Stemettes, an award-winning social enterprise working across the UK and Ireland to inspire and support young women and nonbinary people to study STEM subjects. On International Women's Day in February 2021, we hosted a panel session to inform attendees about career options in STEM areas. A second event was held in March with attendees working collaboratively to develop an app to solve a sustainability problem. The events were supported by 21 volunteers from GP. [Read the full article here ↗](#).

# Our sustainability performance

## Decarbonizing our business

Performance indicator	Unit	2021	2020
<b>Greenhouse gas emissions</b>			
<b>Scope 1+2 emissions</b>			
absolute	1,000 metric tons CO <sub>2</sub> e	273	292
thereof SF <sub>6</sub>	1,000 metric tons CO <sub>2</sub> e	41	66
thereof fleet	1,000 metric tons CO <sub>2</sub> e	29	29
<b>Scope 3 downstream emissions<sup>1</sup></b>			
absolute	1,000 metric tons CO <sub>2</sub> e	1,369,163	927,476
intensity	metric tons CO <sub>2</sub> e/ € order intake	0.041	0.027
<b>Scope 3 upstream emissions<sup>2</sup></b>			
absolute	1,000 metric tons CO <sub>2</sub> e	4,761	4,722
intensity	kg CO <sub>2</sub> e/€ PVO spent	0.473	0.476
<b>Energy</b>			
Energy consumption	million gigajoule	6.33	5.80
Share of green electricity	%	76	78

<sup>1</sup> Includes category "use of sold products" only.

<sup>2</sup> Includes categories "purchased goods and services" and "transportation and distribution" only. Without SGRE.

<sup>3</sup> Without SGRE.

## Responsible operations

Performance indicator	Unit	2021	2020
<b>Research &amp; development</b>			
Research & development expenses	million €	1,155	985
<b>Sustainable supply chain management</b>			
External sustainability audits at suppliers	no.	157	60
<b>Waste</b>			
Waste recycling and recovery rate	%	82	78
<b>Water</b>			
Water consumption	million cubic meters	4.10	3.23
<b>Product stewardship</b>			
Portfolio coverage by Life Cycle Assessments (LCAs)	%	71	–
<b>Employees</b>			
Share of women in overall workforce	%	19.3	19.1
Share of women in top leadership positions <sup>3</sup>	%	21	21
Training hours per employee	no.	8.6	–
<b>Occupational health and safety</b>			
Total Recordable Incident Rate (TRIR) of employees	no.	0.49	–
<b>Societal engagement</b>			
Donations	million €	4.71	5.44



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For the full sustainability report see:

➤ [www.siemens-energy.com/sustainability-report-2021](https://www.siemens-energy.com/sustainability-report-2021)

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