



GE VERNOVA

# EMPOWERING THE ENERGY INDUSTRY TRANSFORMATION

Navigating Net Zero Through Diverse Sustainable Energy Solutions  
Christian Verhoeven, Chief Technology Officer  
ETH Energy Week, 4 December 2023



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World Energy Situation – Energy Trilemma

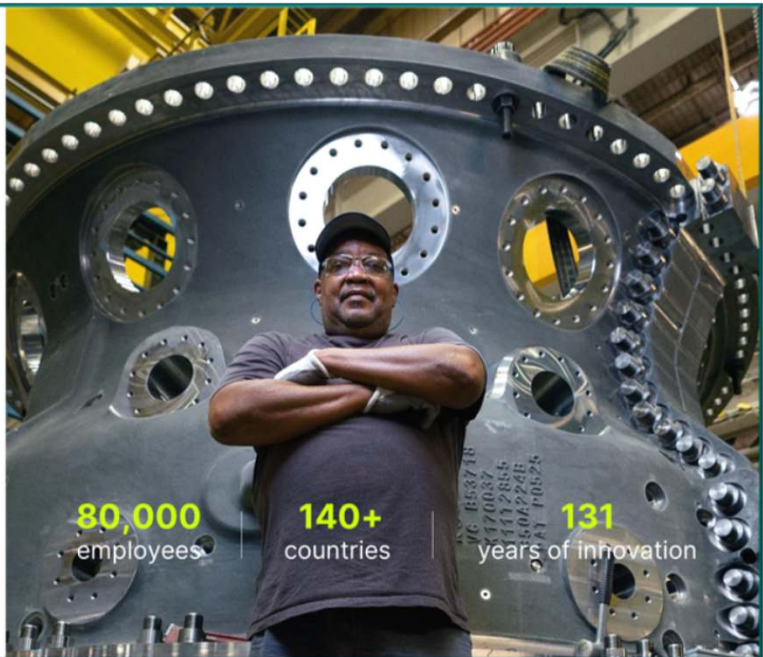
Decarbonization Solutions – Today & Future

# About GE Vernova



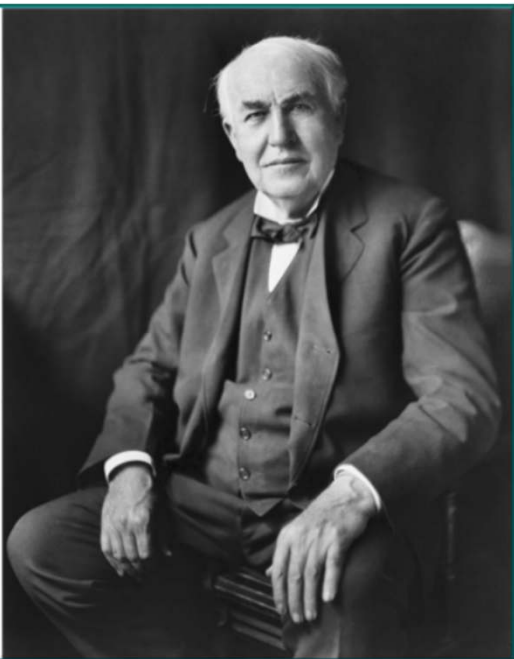
Our purpose:  
The Energy to  
Change the World

GE Vernova, the 131-year-old energy pioneer. Our unwavering commitment to powering the planet, now fully focused on the energy transition. No company has the unique combination to pioneer what's next – just as we have before. Together, with our customers and partners, we will chart the course to a better future.



“When you have exhausted all possibilities, remember this...  
**YOU HAVEN'T**”

Thomas A. Edison  
(1847–1931)



## Johann Heinrich “John” Kruesi 1. Chef Ingenieur bei GE



Ohne Johann Heinrich Kruesi gäbe es weder Plattenspieler, Glühbirne noch Isolierkabel. Aufgewachsen im Waisenhaus in Speicher, wanderte er 1870 nach Amerika aus und wurde 1877 die rechte Hand von Thomas Edison.

Der Werdegang von John Krüsi ist ein Musterbeispiel einer sogenannten Tellerwäscherkarriere, die ja oft mit dem «american dream» verbunden wird.

[https://wikispeicher.ch/w/Kr%C3%BCsi\\_John](https://wikispeicher.ch/w/Kr%C3%BCsi_John)



## Three future planned public companies



Driving innovation in precision health with 4M+ installations, 2B+ patient exams per year.



Accelerating the path to reliable, affordable, and sustainable energy, while helping provide 1/3 of the world's electricity.



Shaping the future of flight while powering 2/3 of commercial departures every day.



# GE Vernova is uniquely positioned

through its scale, breadth, and technological depth to play a key role in the energy transformation to address **climate change**.

ONSHORE WIND



OFFSHORE WIND



LM WIND POWER



HYDRO POWER



GAS POWER



STEAM POWER



GE HITACHI NUCLEAR POWER



POWER CONVERSION



SOLAR & STORAGE SOLUTIONS



GRID SOLUTIONS



DIGITAL



FINANCIAL SERVICES



## Strength + reach

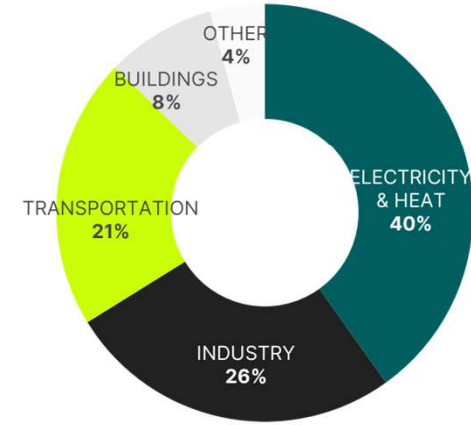
<p><b>~30%</b> World's electricity generated with the help of our technology</p>	<p><b>2,200GW</b> Global Installed Base</p>	<p><b>\$29B</b> 2022 revenue ~50% services</p>
<p><b>7K</b> Gas turbines installed... world's largest fleet</p>	<p><b>1st</b> Small Modular Reactor commercial contract signed in North America</p>	<p><b>\$4B</b> Financial Services - enabled orders</p>
<p><b>54K</b> Wind turbines installed in &gt;50 countries... #1 Onshore Wind in US<sup>a</sup></p>	<p><b>1st</b> Enhanced Electric Gas Turbine (EGT) Aero + Storage + Hybrid Control</p>	<p><b>~\$1B</b> Investment Advanced Research + Businesses ~3% of revenue</p>
<p><b>30%</b> Global utilities served by our software</p>	<p><b>220M</b> Haliade-X rotor size</p>	<p><b>\$107B</b> Backlog<sup>b</sup></p>

a) Source: American Clean Power Association  
b) GE Vernova refers to the sum of our Renewable Energy & Power segments, without giving effect to eliminations and Corporate adjustments. On a stand-alone basis, GE Vernova will include GE's portfolio of energy businesses and Digital

# World Energy Situation

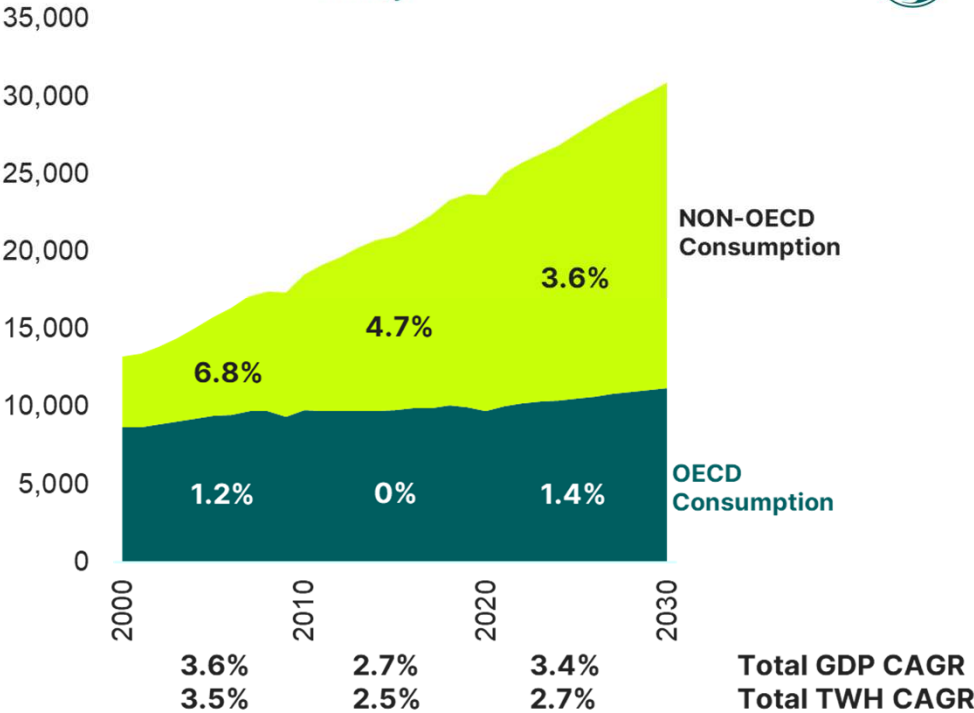


**Global CO<sub>2</sub> emissions** (36.6 gigatons)  
4 tiles using 14,16,17,18

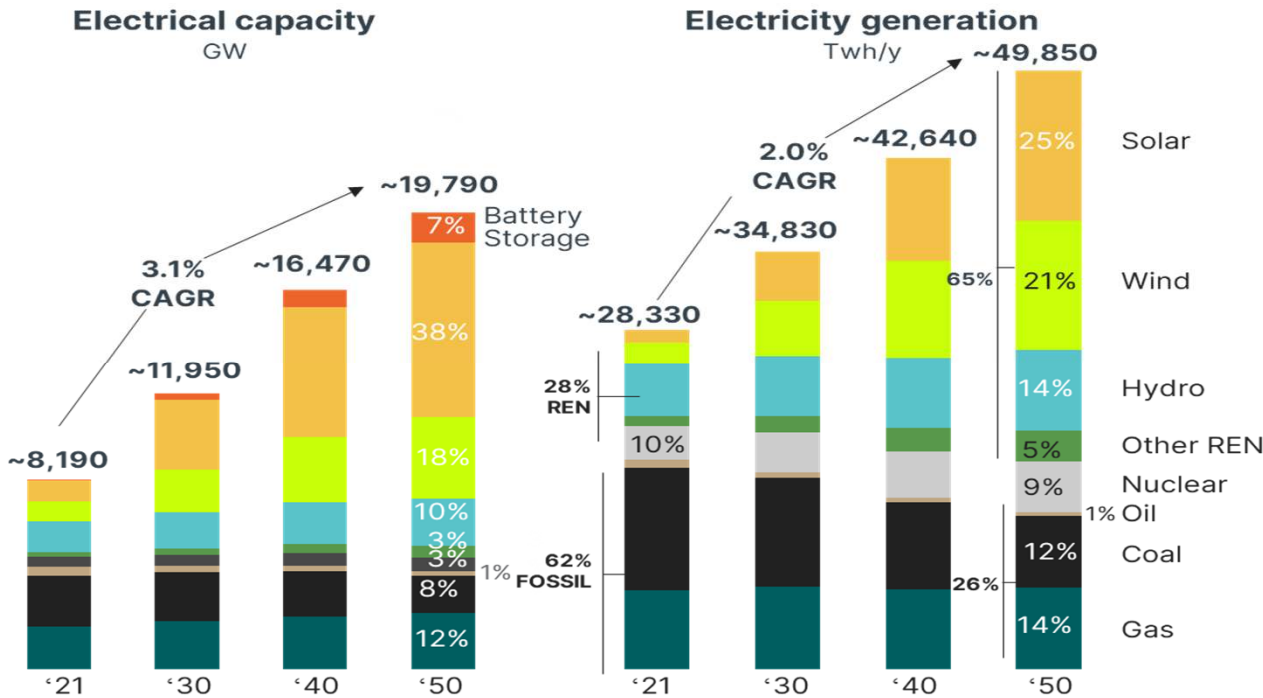


Source: IEA WEO 2022 and Gas Power at GE Vernova Marketing analysis using GE's Global Power Outlook 2022 and external data sets including IHS-Markit's Energy and Climate Scenarios

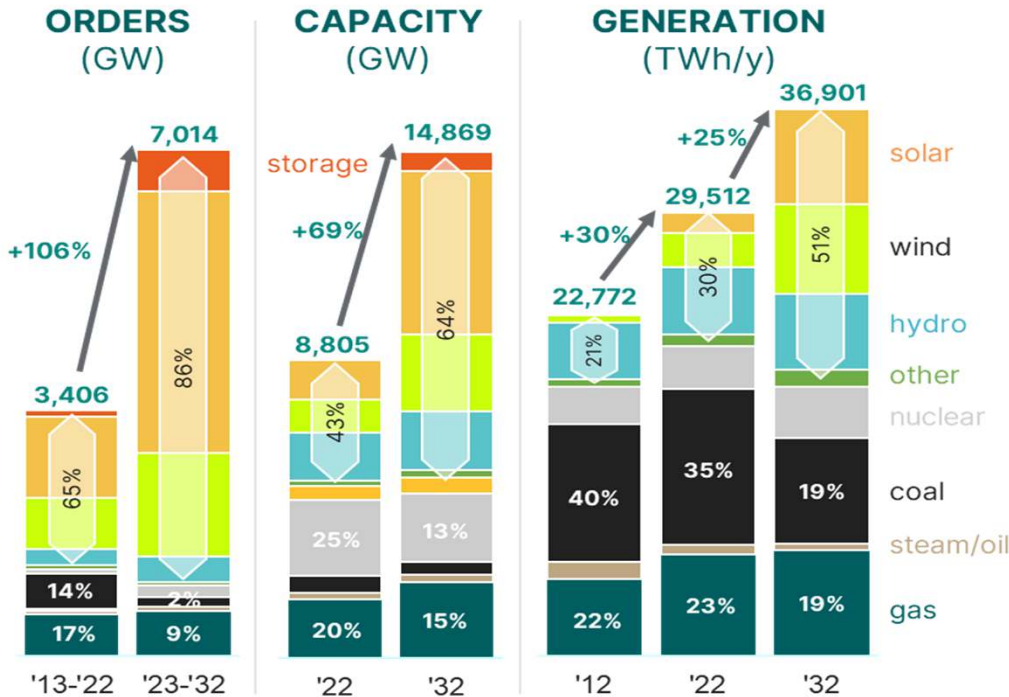
**Global electricity consumption**  
TWh/y



Source: Global Power Outlook 2021



Source: IEA WEO 2022 Stated Policies Scenario



Source: GE Vernova 2023 Global Power Outlook, Note: Battery storage charging/discharging is not shown separately as a source of generation

\*Decarbonization as used herein is intended to mean the reduction of carbon emissions on a kilogram per megawatt hour basis  
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Our true north:

# Electrifying the world while decarbonizing

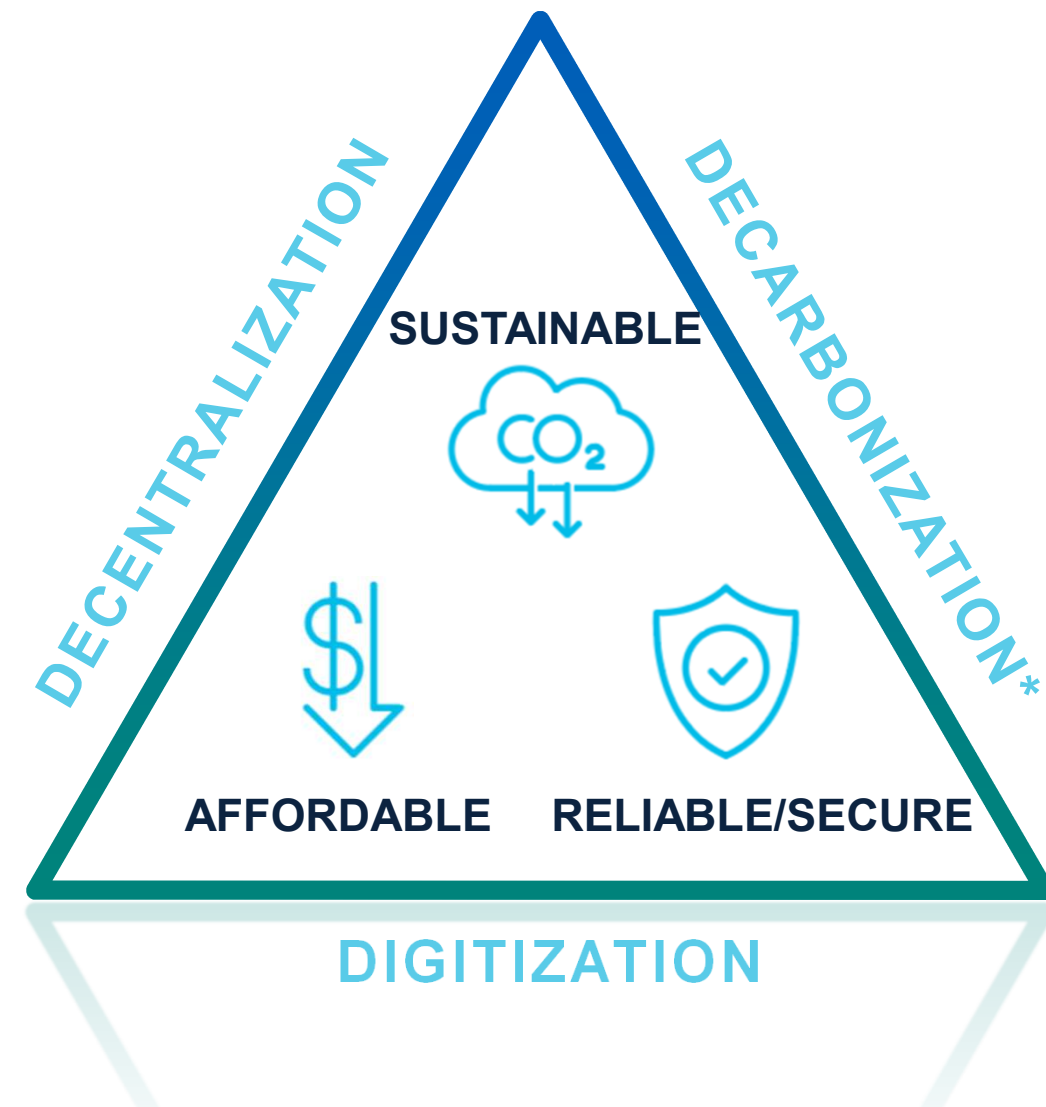
## The world needs more electricity

- >50% increase over the next 2 decades
- ~800 MM people lack access to reliable electricity
- Enables economic growth, health and prosperity
- Electrification of transportation, industry and heat to decarbonize non-power sectors

**30% of the world's electricity** today is generated with **GE's** installed base

... we must help **electrify the world**  
... while **decarbonizing it** with lower and zero-carbon-intensive technology  
... **that is sustainable, affordable, reliable/secure**

## *The Energy “Trilemma”*



# How GE Technologies & Products serve the Energy Transition

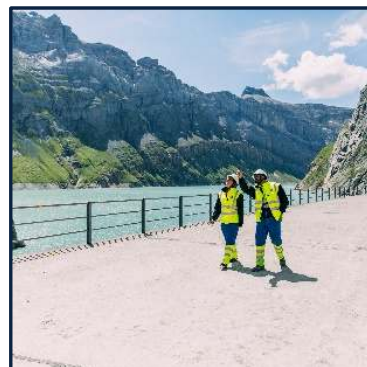
## Grow Renewable Energy as fast as the world can afford



Onshore Wind



Offshore Wind



Hydro

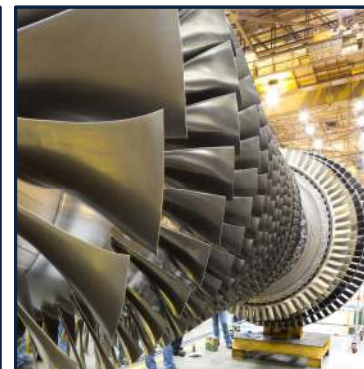


Hybrids

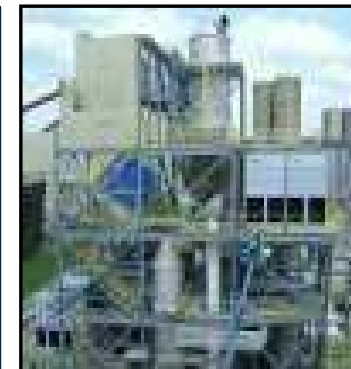
## Accelerate decarbonization with Gas... pathway for Gas to Zero CO<sub>2</sub>



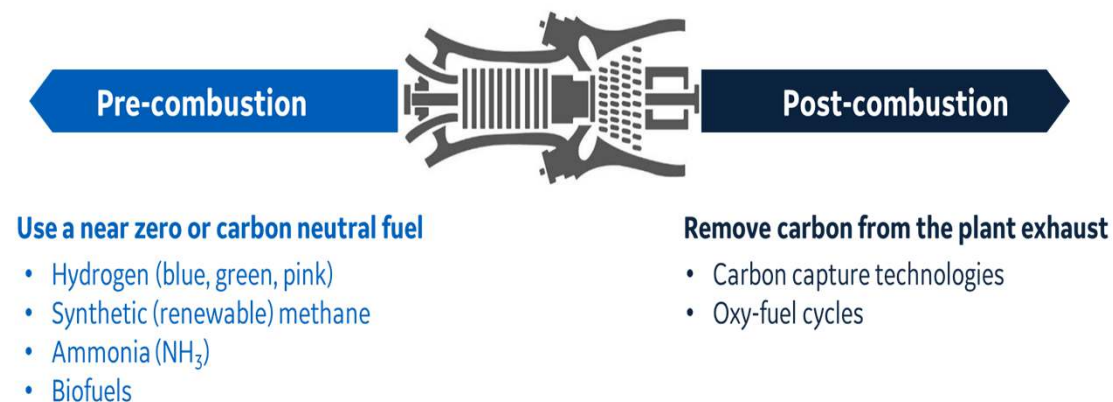
Hydrogen & CO<sub>2</sub>  
neutral fuels



Gas Turbines



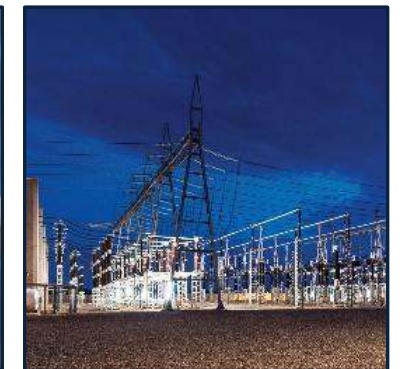
Carbon Capture



## Invest heavily in Grid ... for a diversified energy mix



Digital Services



Grid Solutions

## Reconsider CO<sub>2</sub> free thermal energy



Small Modular Reactor (SMR)

# Tacking Action on our Scope 1 & 2 Emissions

## Our Global Climate Actions

- Commitment to Environment, Social and Governance values (ESG)
- Lead transition to carbon-free future while continuing to help electrify the world
- Carbon neutral in our operations by 2030, net zero by 2050 inclusive of our sold products

## SUSTAINABILITY PRIORITIES



As of 2022, Scope 1 and 2 greenhouse gas emissions are down 28% compared to the 2019 baseline.

## Actions for our Switzerland operations

### Scope 1 Emissions

- Birr factory equipment almost completely electric
- Working on further reducing Birr factory heating energy via efficiency increase, heat pumps and connection to Birr/Lupfig district heating system
- Car sharing pool access for employees, GE Switzerland GreenPolicy CO2 limits in place for all management cars

### Scope 2 Emissions

- Birr factory & Baden offices on 100% Hydro Power
  - 296 tons (77%) CO2 reduction per year vs previous electricity mix
- Birr factory LED initiative (awarded by SFOE funding)
  - 3.94 GWh (87%) lower electricity consumption
- Regular Energy Kaizens to identify and drive further reduction opportunities





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