Driving decarbonization How technologies can shape a greener future

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Global trends are changing our markets – structurally and profoundly

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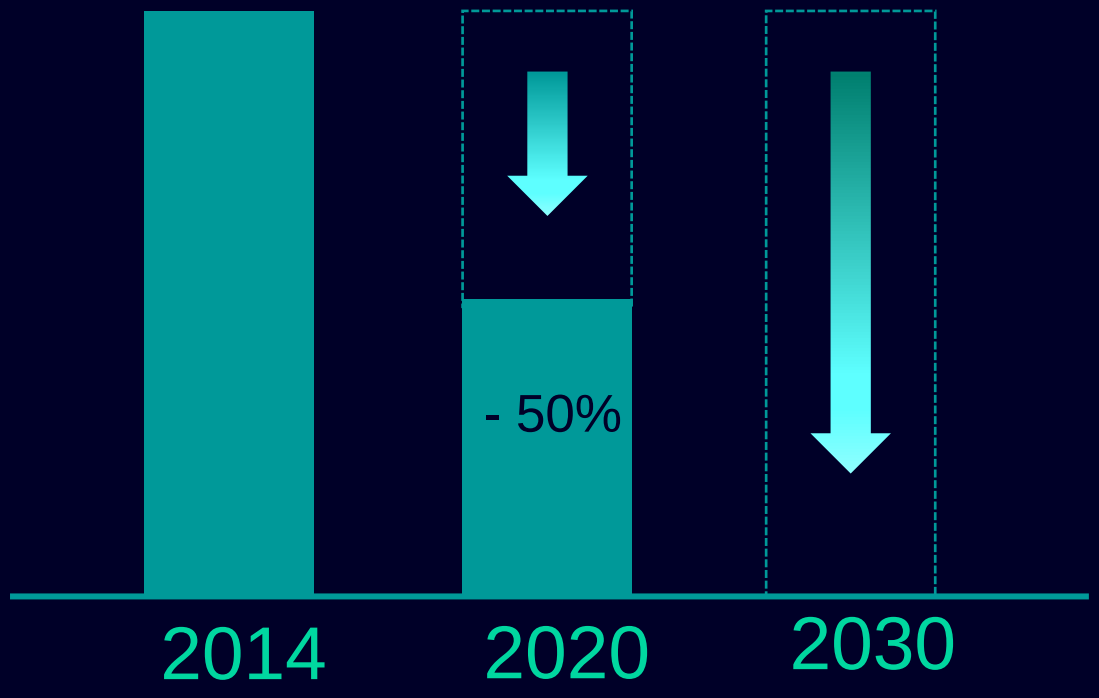
Siemens goes carbon neutral by 2030

CO_2



4 levers

- Drive Energy Efficiency
- Reduce Fleet Emissions
- Leverage Distributed Energy Systems
- Purchase Green Energy

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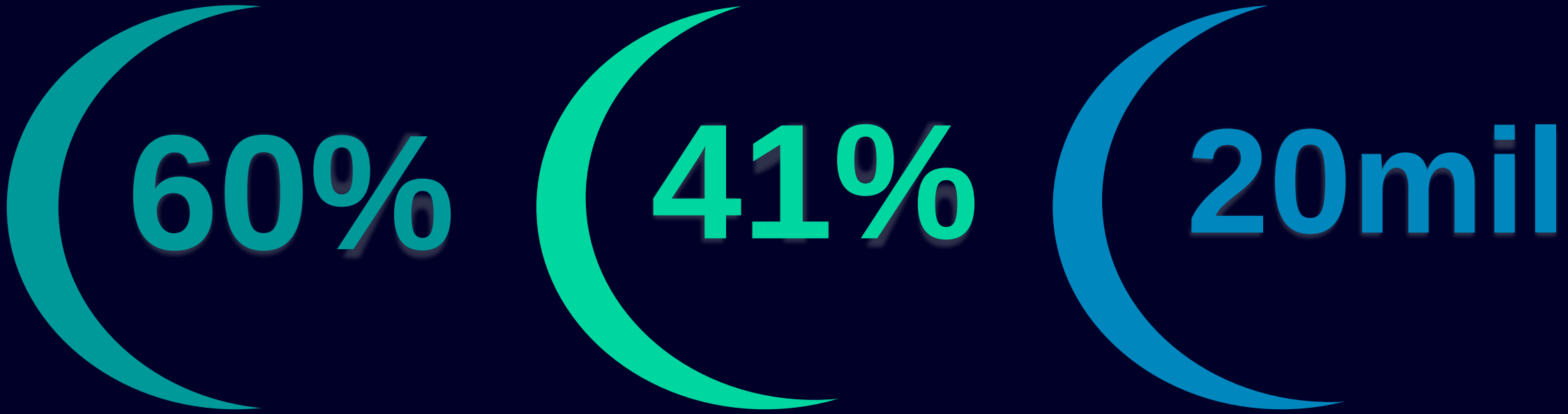

Of the electricity consumption of our sites globally is covered by renewables

Of CO2 emissions reduced since the launch of Siemens CO2 neutral program

Euros expected annual savings in operating costs starting 2020 due to investments in energy-efficiency projects

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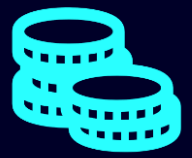
Siemens’ Environmental Portfolio – our decarbonization driver



38,4

billion €

Revenue from Environmental Portfolio in FY2019

637

Mt. CO_2

Saved by our customers in FY2019 as result of our Environmental Portfolio offerings = 80 % of Germany’s annual CO_2 emissions

44 %

Of Siemens’ total revenue in FY2019 coming from Environmental Portfolio

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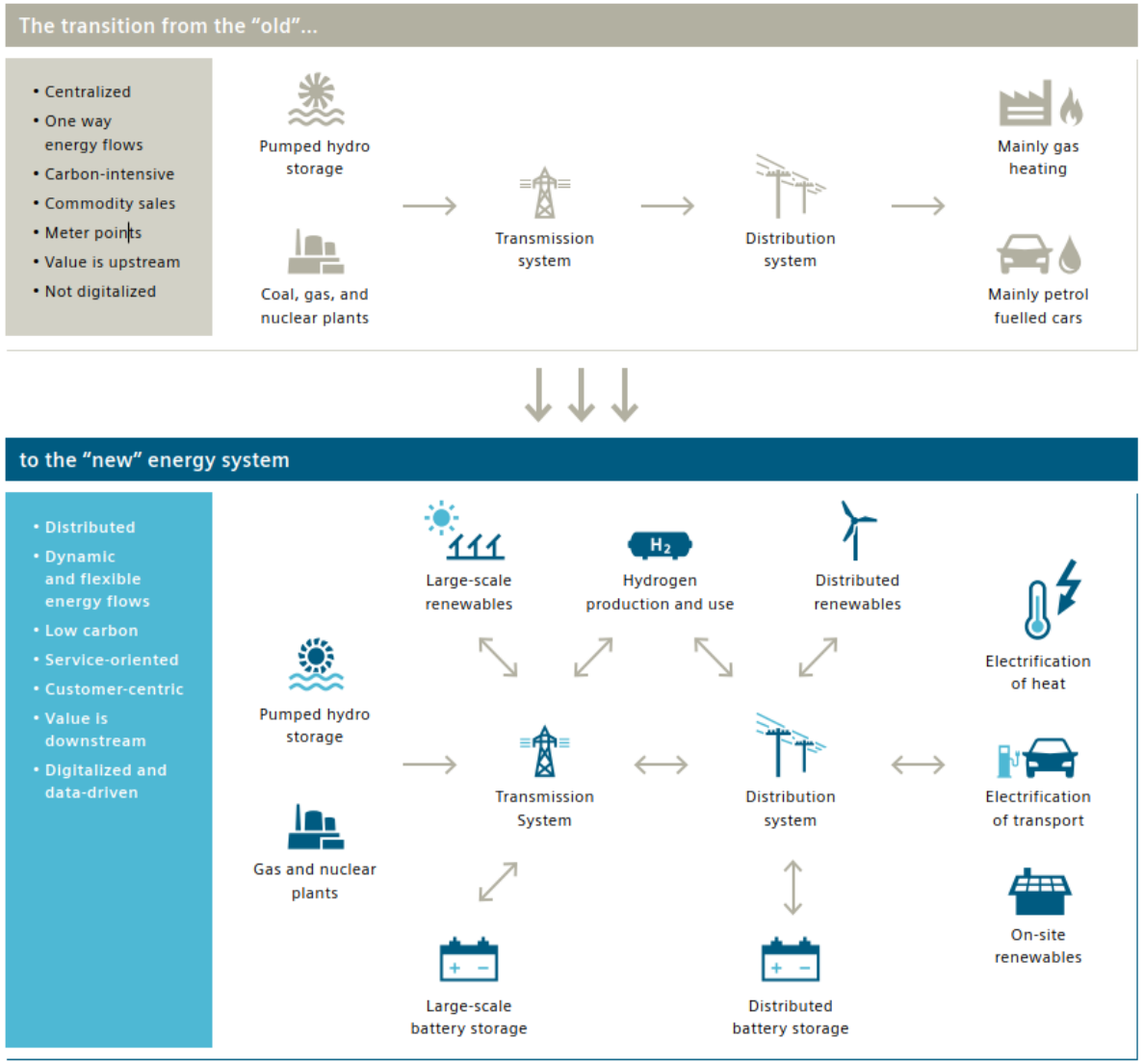
Decarbonization approach

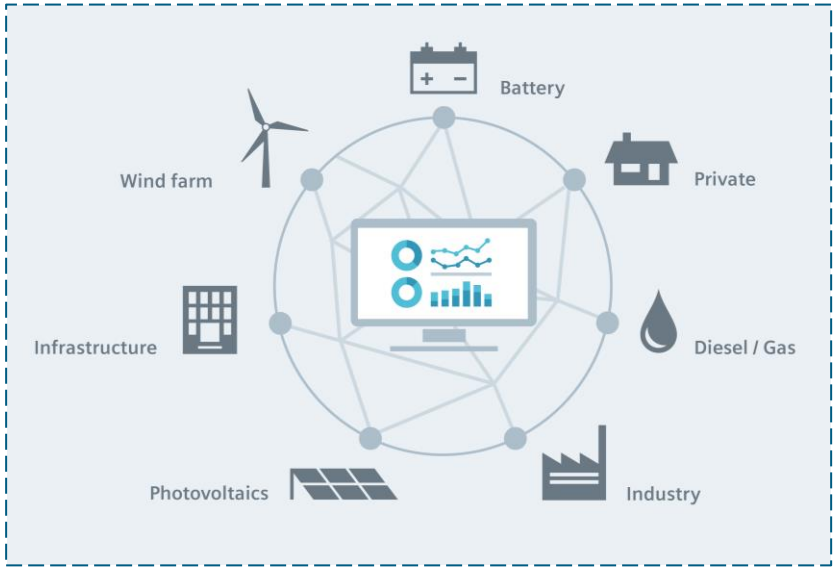
The need of decarbonization will transform the entire energy value chain within the next decades:

- On the supply side, the necessary rise of renewable will demand a highly flexible system in terms of grid integration, stability, demand-response, available storage solutions and Power-to-X technologies.
- On the demand side, efficient use of energy along the entire value chain such as in buildings, industrial processes and transportation is essential as it often comes along with a positive business case, enabling energy cost savings.

What technical developments are making decarbonization more feasible?



Digitalization enables microgrids



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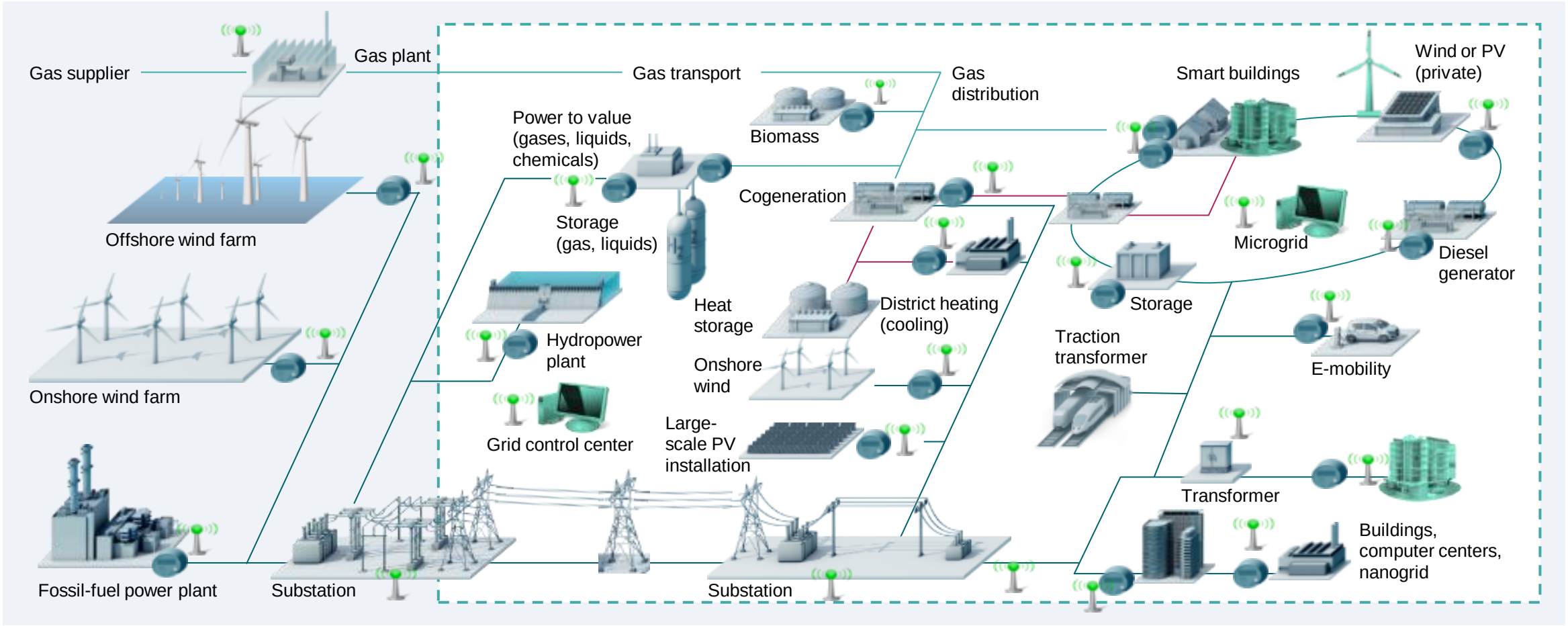
De-carbonizing the energy system – The global challenge
Siemens offers complete solutions for all applications



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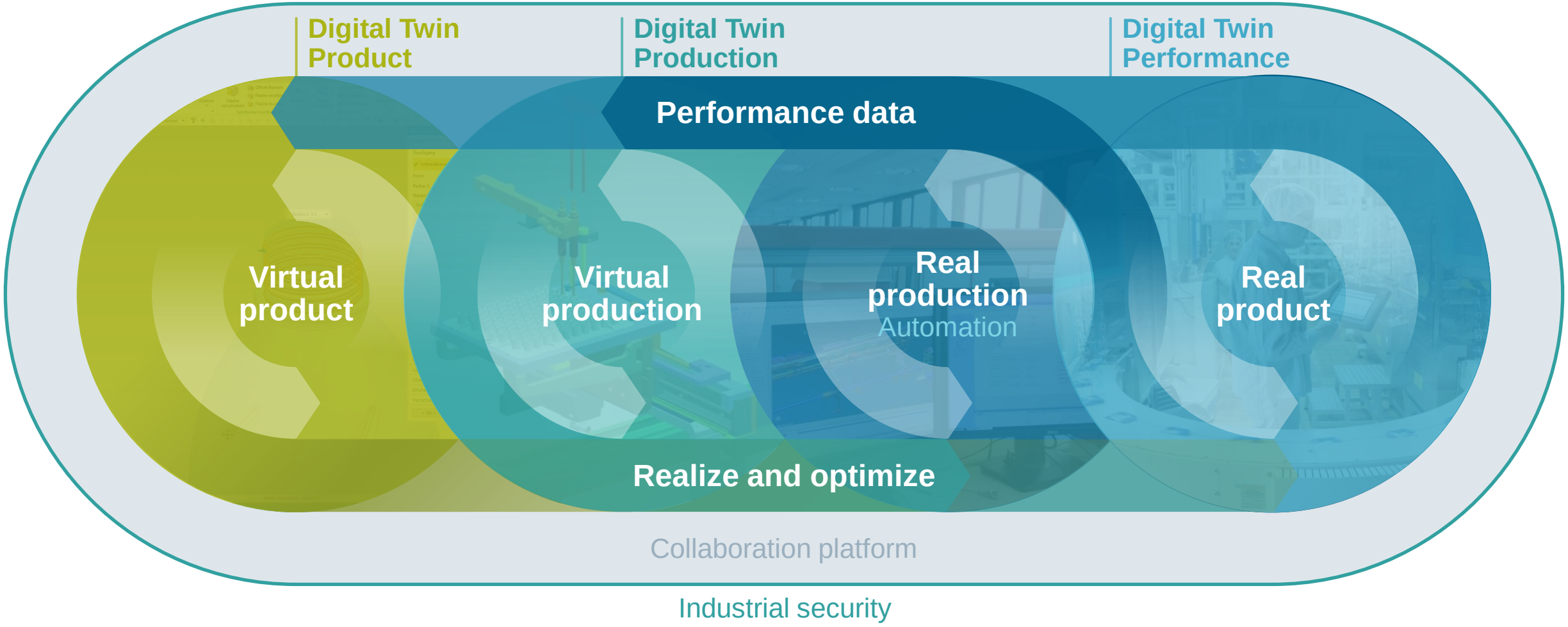
Our Digital Enterprise portfolio:
The basis for continuous optimization



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What are the typical actions that allow businesses to reach their decarbonization goals?

Internal Energy Goals

Support from an ESCO expert

Energy Strategy

1 Management

- *Create a dedicated team or person to deal with the energy strategy*
- *Increase responsibility for energy related decisions at the CXO level*
- *Challenge your supply chain to decarbonize*
- *Align energy KPIs with your business KPIs*
- *Support customers to decarbonize*

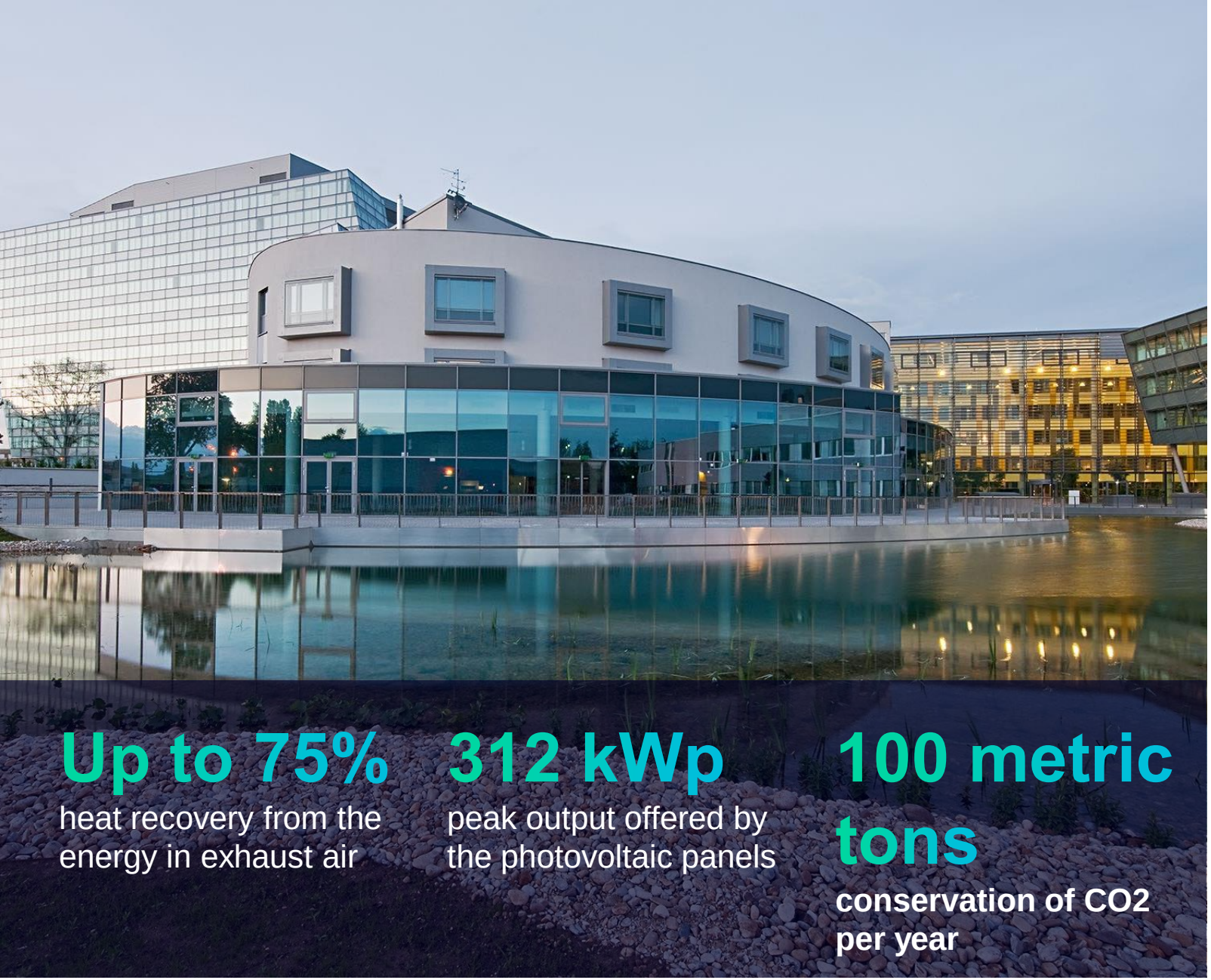
2 Energy Demand

- *Replace and renovate outdated equipment*
- *Use smart load control*
- *Electrify transport*
- *Review production process*

3 Energy Supply

- *Generate •green• electricity*
- *Shift to low-carbon heat*
- *Become a prosumer*
- *Purchase zero-carbon electricity*
- *Deploy energy storage*
- *Optimize supply with demand and energy tariffs*

Success stories



Siemens City, Vienna, Austria

Components in the Siemens Campus Microgrid

- Photovoltaic panels totaling 1,600 m² and 312 kWp
- Battery storage output: 500 kWh, capacity: 500 kW
- Siemens electromobility charging stations
- Siemens Desigo building management system
- Siemens microgrid controller
- Additional features: Pre5G Campus Network and circular economy project

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Evolution of power on the Galapagos

Siemens has developed a hybrid electricity generation system at Galapagos Islands using renewable fuels that could serve as a model for clean power in decades to come. It includes:

- 952-kW solar energy "farm" consisting of some 3,024 photovoltaic panels;
- 1625 kW biodiesel generation system made up of five 325-kW generation sets, and
- a battery storage element that can add 660 kW instantaneously when needed.

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Seawater desalination in Middle East

Seawater desalination is one of the biggest causes of CO_2 emissions in the Middle East.

Siemens realized the first large-scale solar-powered seawater desalination plant on the Persian Gulf. The client - Rawafid Industrial, relied on solutions from Siemens for the electrical equipment, automation with integrated drive technology, communication and instrumentation. Through the efficient use of solar power, the plant reduces CO_2 emissions significantly. In addition, the Siemens technology ensures system availability of about 98 percent.

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Thank you for your attention!

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