

Automation



MAY 18, 2022

ABB Capital Markets Day

Process Automation

Helsinki, Finland

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These statements are based on current expectations, estimates and projections about the factors that may affect our future performance, including global economic conditions, and the economic conditions of the regions and industries that are major markets for ABB Ltd. These expectations, estimates and projections are generally identifiable by statements containing words such as “expects,” “believes,” “estimates,” “targets,” “plans,” “outlook,” “on track,” “framework”, “ambition” or similar expressions.

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- Costs associated with compliance activities
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- Changes in governmental regulations and currency exchange rates
- General market conditions, and
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Automation

1 for process automation

INTEGRATED SYSTEMS

4 DIGITAL



3 AUTOMATION



1 SENSING



2 ANCHOR PRODUCTS



ELECTRICAL & MOTION



Agenda

What this session is about

- 1 How the **market** environment for process automation is evolving
- 2 How we address our **customers'** automation needs, **today** and **tomorrow**
- 3 How we create **more value** for our automation customers and ABB



Bernhard Eschermann
CTO, Head of Process Control Platform

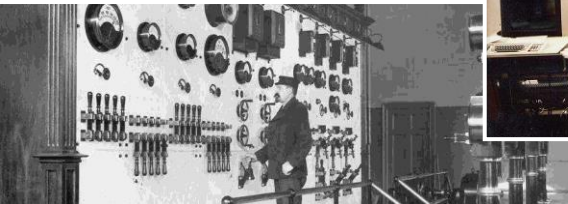


Brandon Spencer
Division President,
Energy Industries



Process automation over time

Isolated operations



Connected operations



Collaborative operations



Autonomous operations



1890

1980

Today

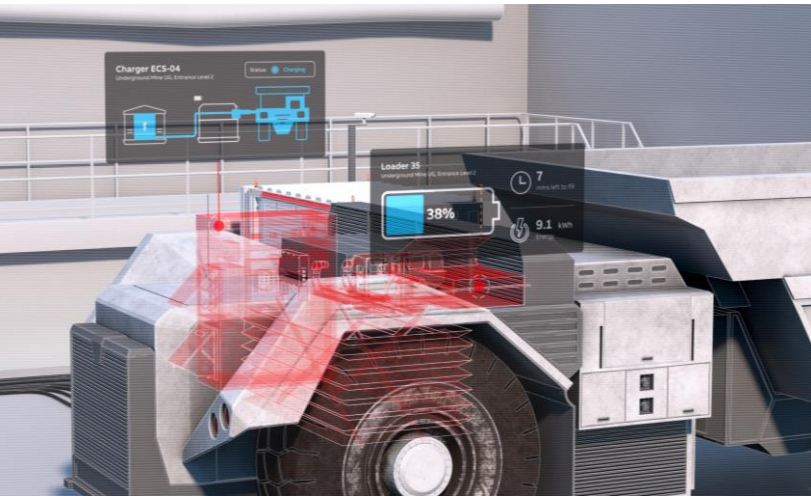
Tomorrow



— Evolving markets

Automation will become more important

**Changes in automation
end markets**



**Technology & digital
evolution/revolution**



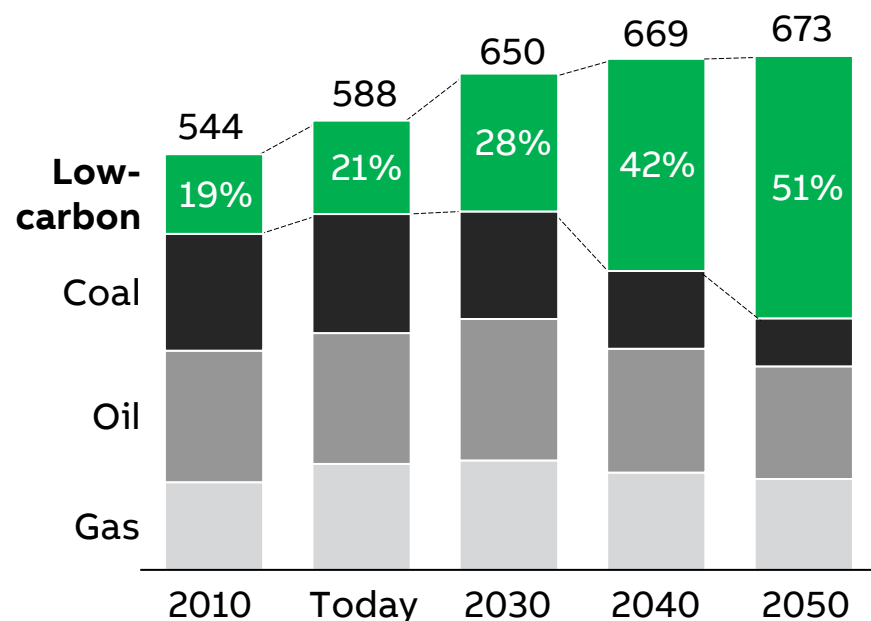
**Workforce
changes**



Traditional automation strongholds

Evolving with the energy transition

The challenge: shift ~30% of energy to low-carbon sources until 2050, meeting increasing demand



Global energy supply, Exajoules

IEA Announced Pledges Scenario (middle-of-road scenario, 2.1° warming¹)

Increased need for automation, digitalization and electrification to...



Minimize emissions from extraction and processing of fossil sources



Decarbonize hard-to-abate process industries



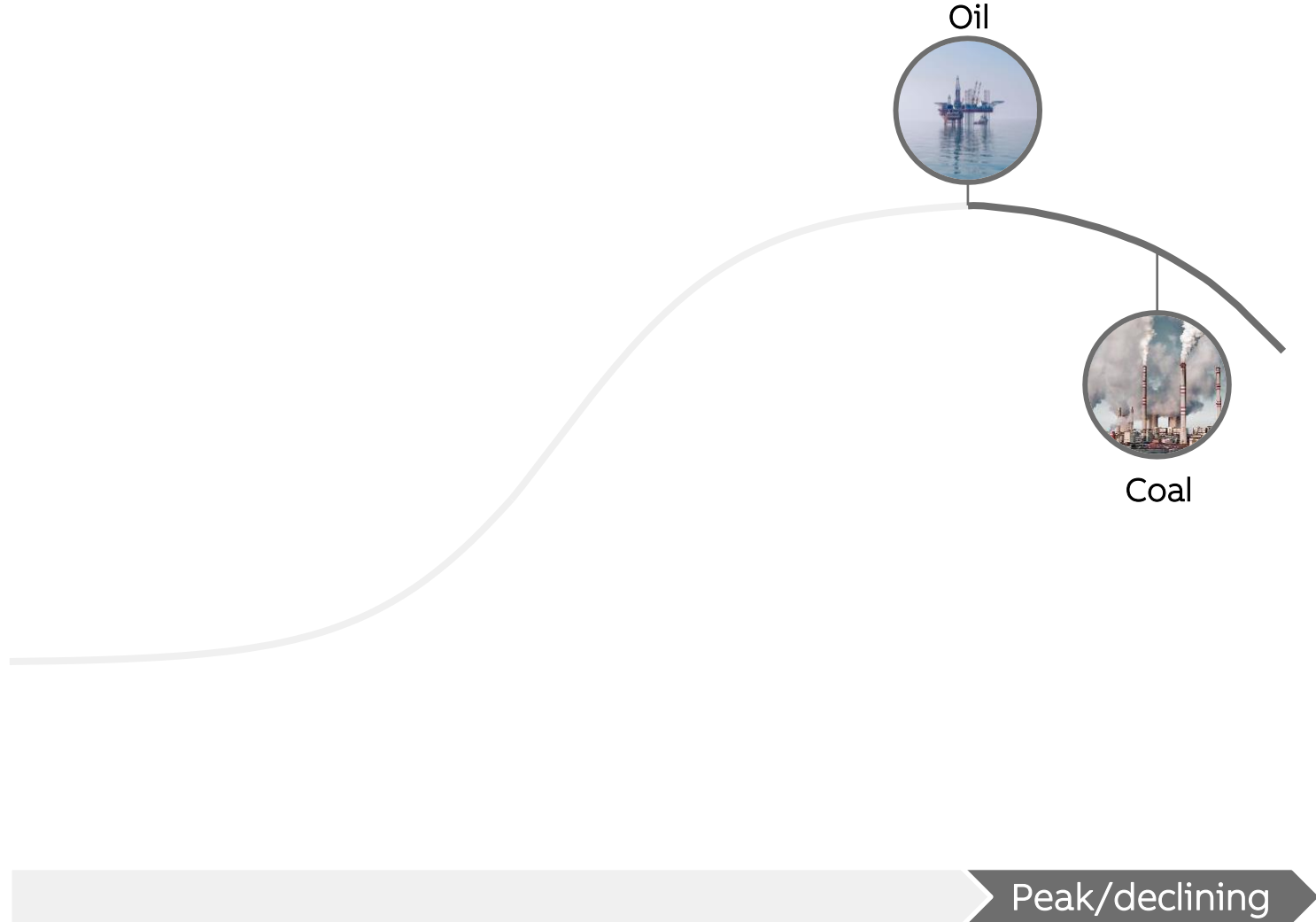
Enable cost-efficient scaling of low-carbon technologies



Allow for facilities that can adapt

Automation customer industries

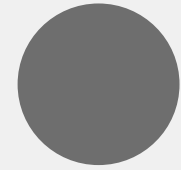
Continued demand growth as landscape shifts gradually



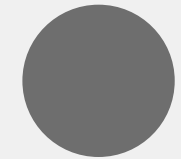
Decades-long installed base lifetime

Demand for process automation and our ABB DCS business

Today

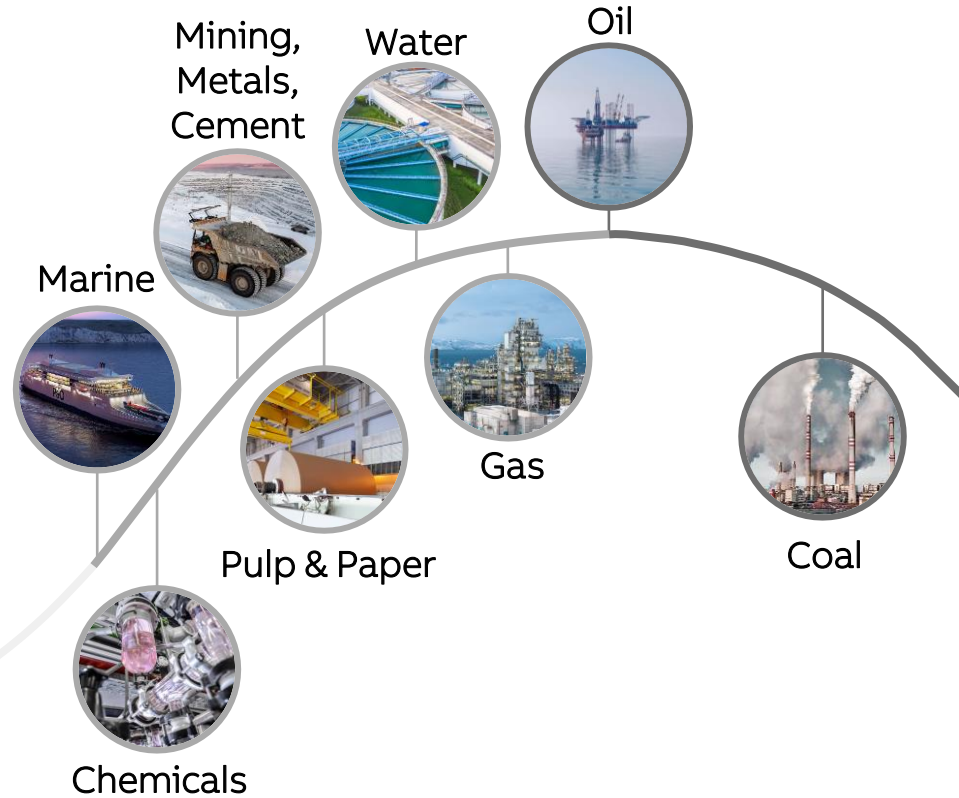


2030



Automation customer industries

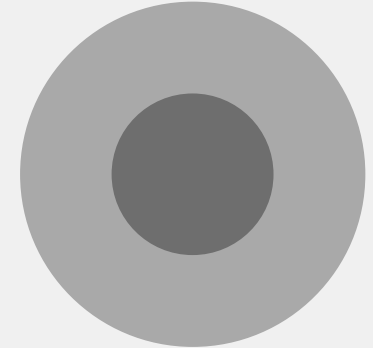
Continued demand growth as landscape shifts gradually



Decades-long installed base lifetime

Demand for process automation and our ABB DCS business

Today

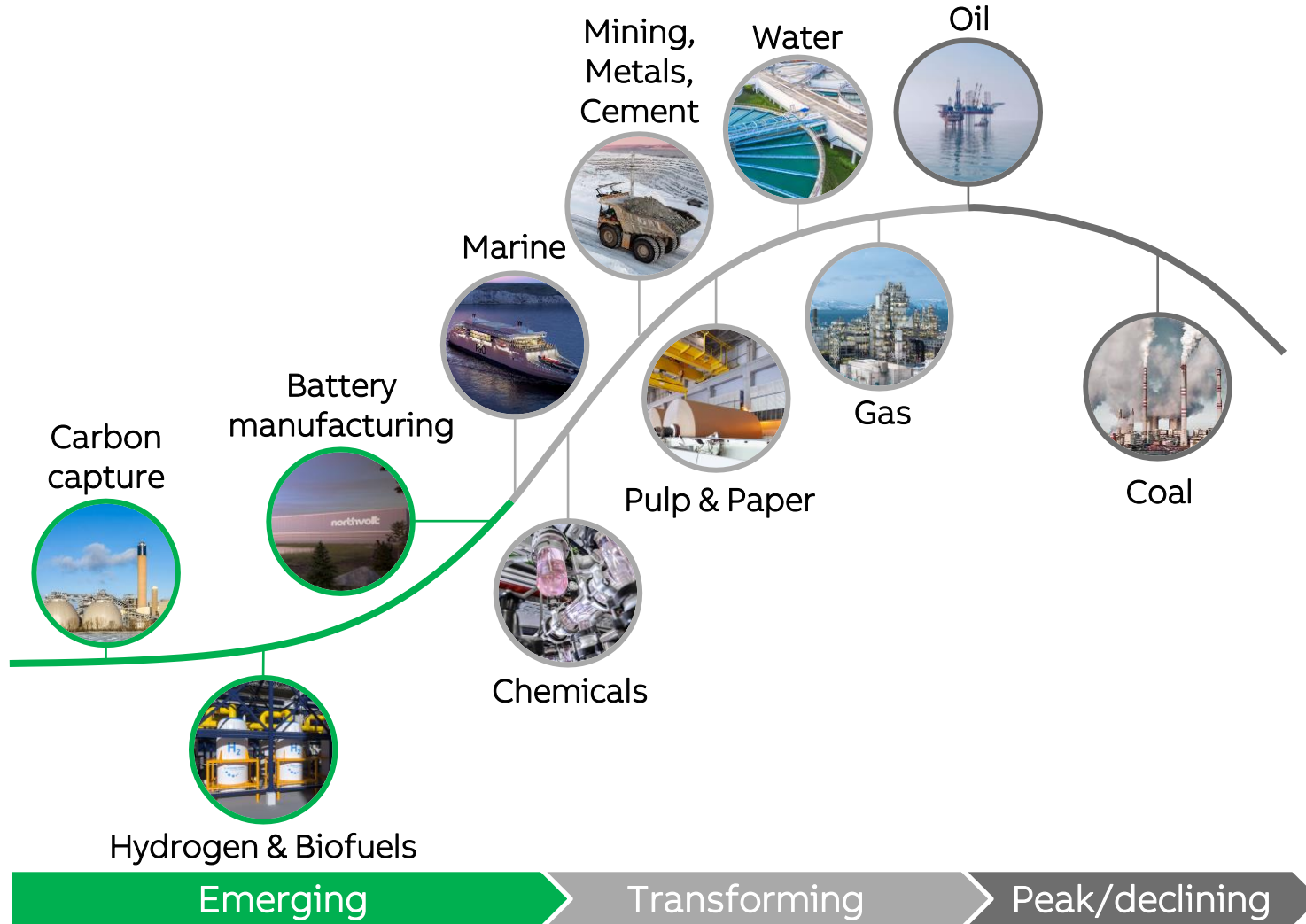


2030



Automation customer industries

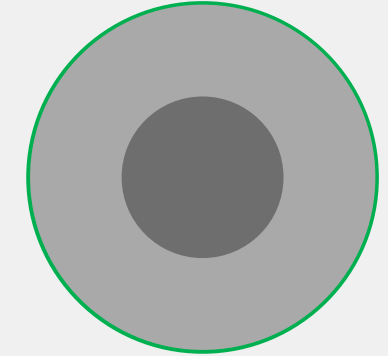
Continued demand growth as landscape shifts gradually



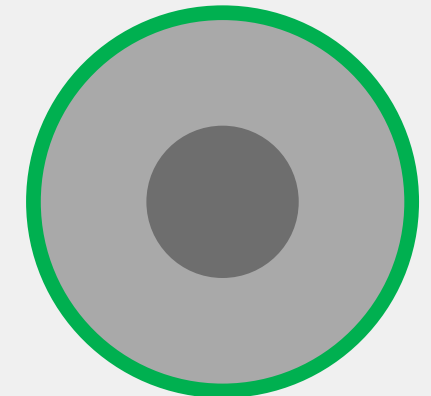
Decades-long installed base lifetime

Demand for process automation and our ABB DCS business

Today



2030



Complexity of industrial processes will continue to grow

Increasing need for automation

Current processes become more complex

Example: unmanned oil and gas platforms



New complex facilities and value chains

Example: hydrogen, biofuels, carbon capture



Automation & electrification convergence

Example: sustainable transport, process electrification

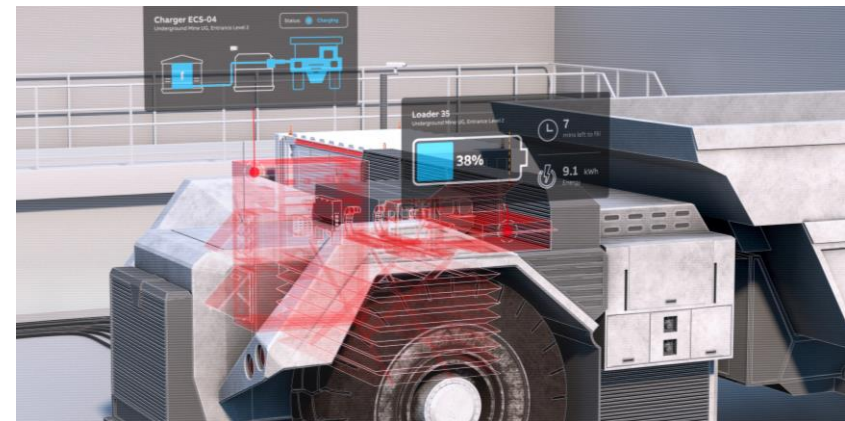
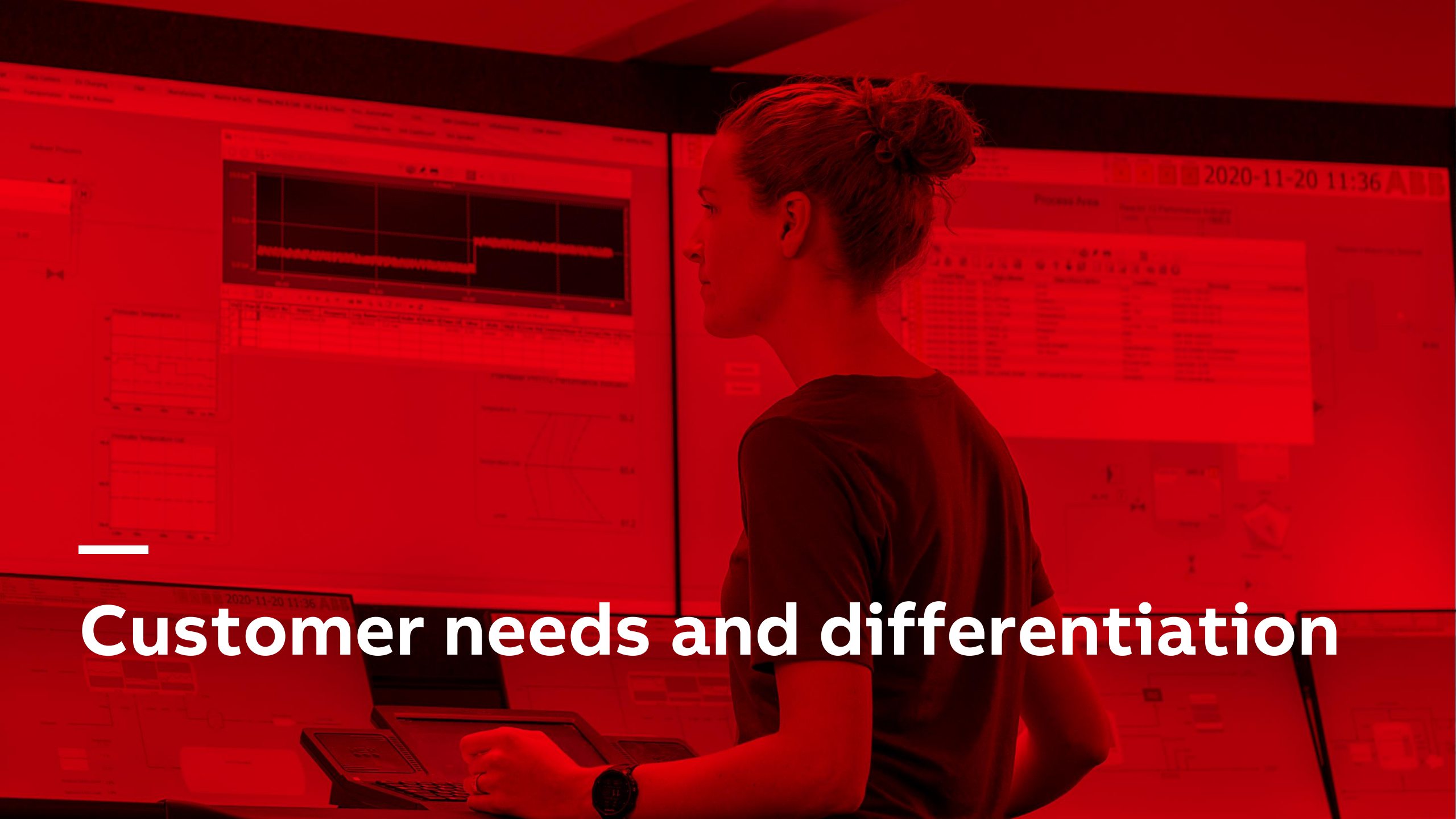


ABB uniquely positioned – leader for highly complex automation and integrating automation with power management



Customer needs and differentiation

Process customers' needs – today

Distributed Control Systems (DCS) evolved as perfect solution to those needs

What if a 24/7 continuous process is disrupted?



Economic loss



Clean-up of material residues in process



Environmental and people safety risk



Damage to equipment

Customer needs

Reliability: 24/7 uptime

Process steps tightly integrated

Safety

Productivity and asset utilization

Continuous improvement

Solution: DCS



ABB is delivering the #1 DCS solution

Continuously growing DCS installed base, driver of service business in the future

Scale of our installed base

#1

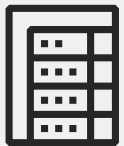
22 years

Consecutive years of DCS leadership¹



~100,000

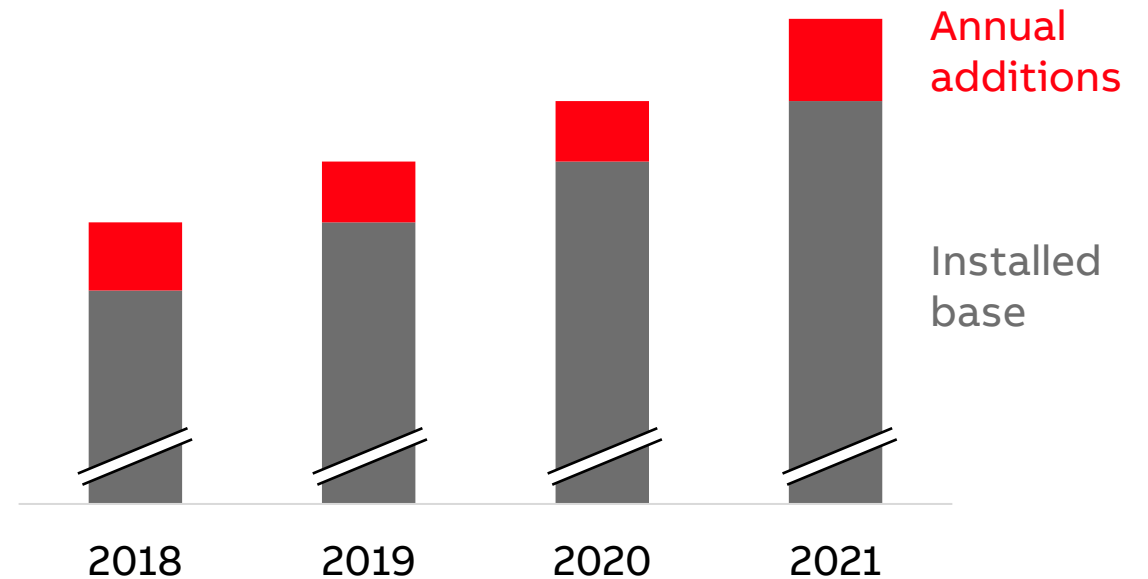
Workstations connected



~100,000,000

Input/output points connected

Number of input/output points connected



Grew installed base also in a down-cycle



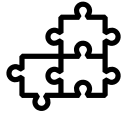

Process customers' needs – tomorrow

Current needs

- ✓ Reliability: 24/7 uptime
- ✓ Process steps tightly integrated
- ✓ Safety
- ✓ Productivity and asset utilization
- ✓ Continuous improvement

+

Future requirements

-  Fast modernization cycles with reliable schedule at low cost
-  Easy and comprehensive **access** to production **data**, IT systems and ability to **optimize process**
-  Scalable, modular automation solutions
-  Open systems allowing to connect best in class components

Solution: future process automation



How we address the evolving needs

Changes in automation end markets

Strengths we build on



Electrical integration and power management



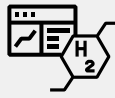
Excellence in traditional DCS characteristics



Evolution without obsolescence



What we add



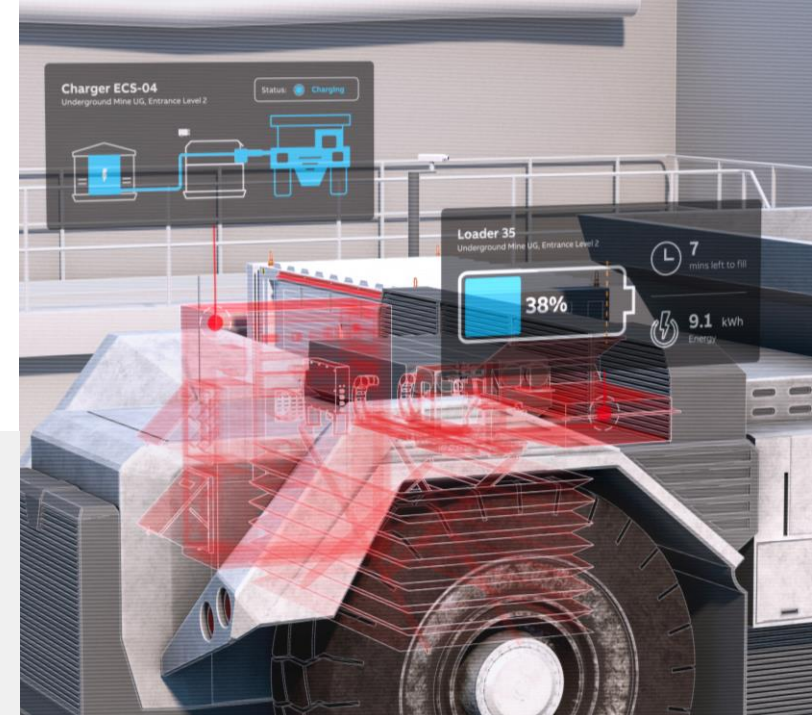
Specific application libraries for evolving industries



Modular, adaptable systems



Fundamental refresh of technology base



How we address the evolving needs

Technology & digital evolution, workforce changes

Strengths we build on



Frontrunner in “Industrial IT”



Open standards approach



Cloud/remote engineering, ABB Adaptive Execution



Remote operation and expert support



What we add



Digitalization path and solution offering for installed base



Hardware agnostic deployment, openness to, e.g., cloud, 5G



Augmented operator offering, towards autonomous systems

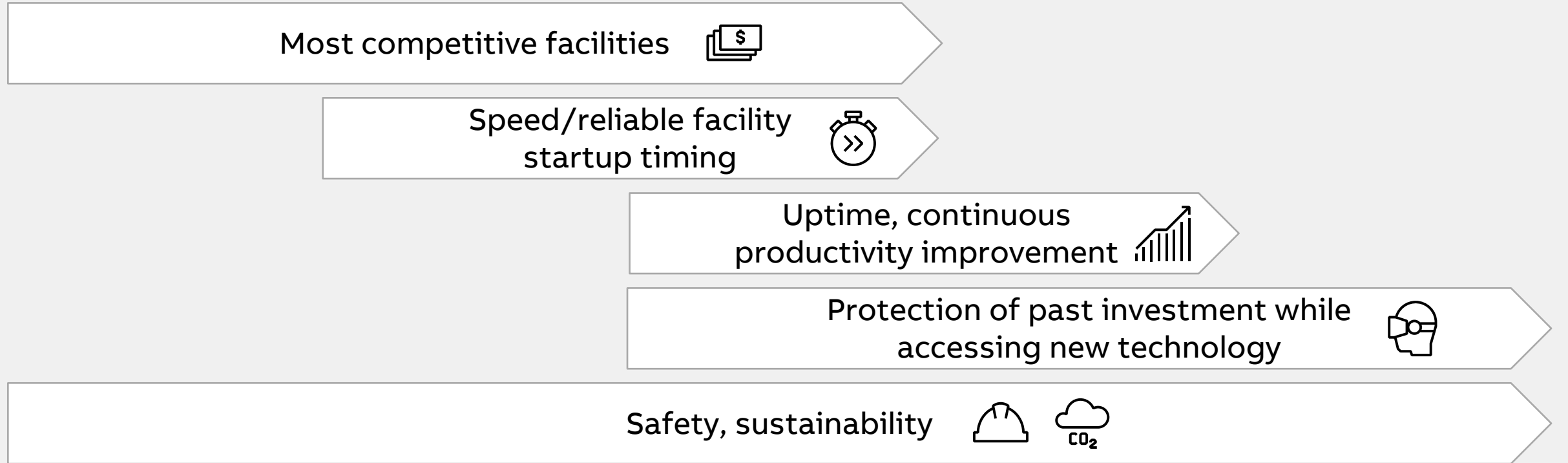




—
How we create value

Process plant lifecycle

Customer needs



Process plant lifecycle

Creating customer value – recent examples



Ritz-Carlton Evrima

Enable seamless operation of pioneering vessel series
Integrate all systems on board



Equinor Aasta Hansteen

40 days and 2,700 person-hours saved during commissioning
“One-button start-up”:
3,600 operator clicks removed



Saudi Aramco/Dow Chemicals Sadara

Controlling world's largest petrochemical complex built in a single phase
“State-based control” successfully completing rigorous creditors reliability tests



INEOS Styrolution Pasadena

Enhanced capabilities for world largest single train styrene monomer plant
Delivered DCS & electrical during 3-week turnaround, protecting customer IP



Crude-to-biofuels refinery conversion

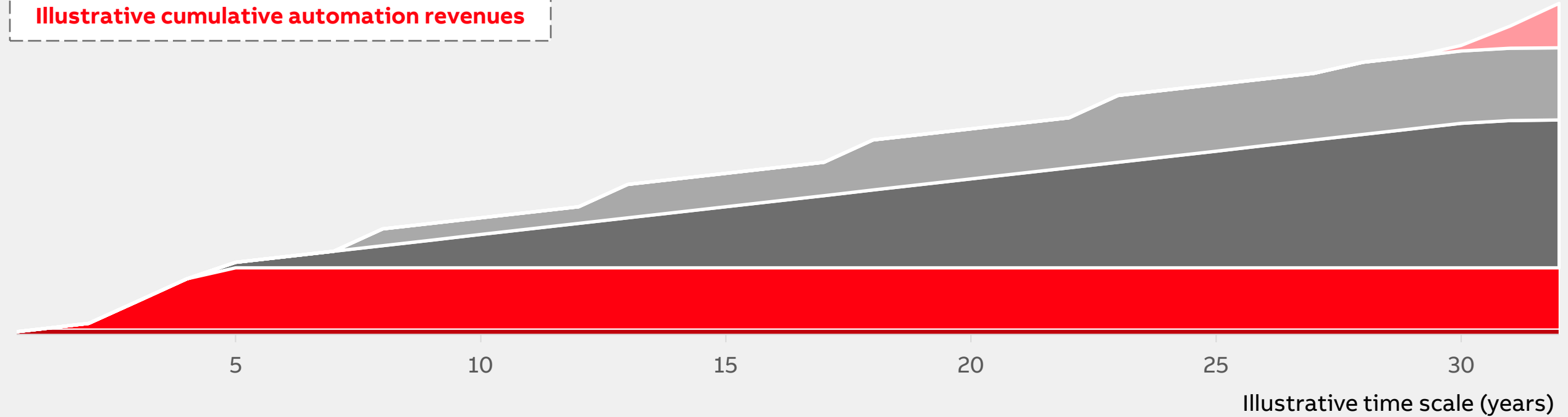
Converted aged plant to produce renewable diesel using cooking oil & animal fat as feedstock

Process plant lifecycle – ABB view

Generating recurring and predictable returns over decades of plant lifespan



Illustrative cumulative automation revenues



Performance improvement journey

Automation

Completed



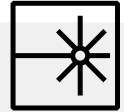
- Automation reorganization – consolidation of DCS “backend”
- Project selectivity
- Margin transparency for “frontend”

Implementing



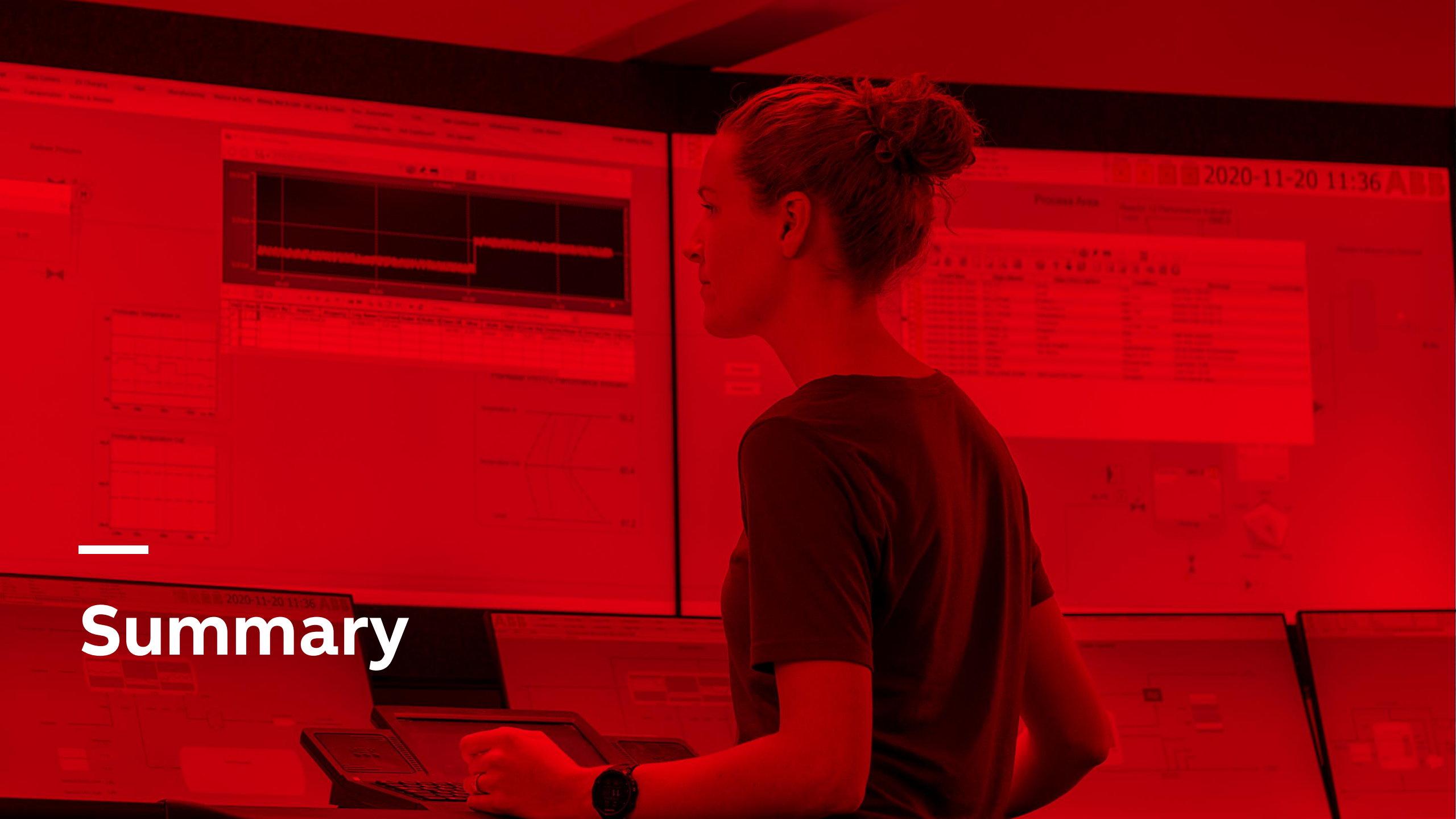
- ABB Adaptive Execution™ for projects
- ABB Way
- Fundamental refresh of technology base
- Invest in line with market evolution
- Grow extended automation and cyber-security solutions

Ramping up



- Further productization of digital offering
- Channel growth strategy
- Pricing

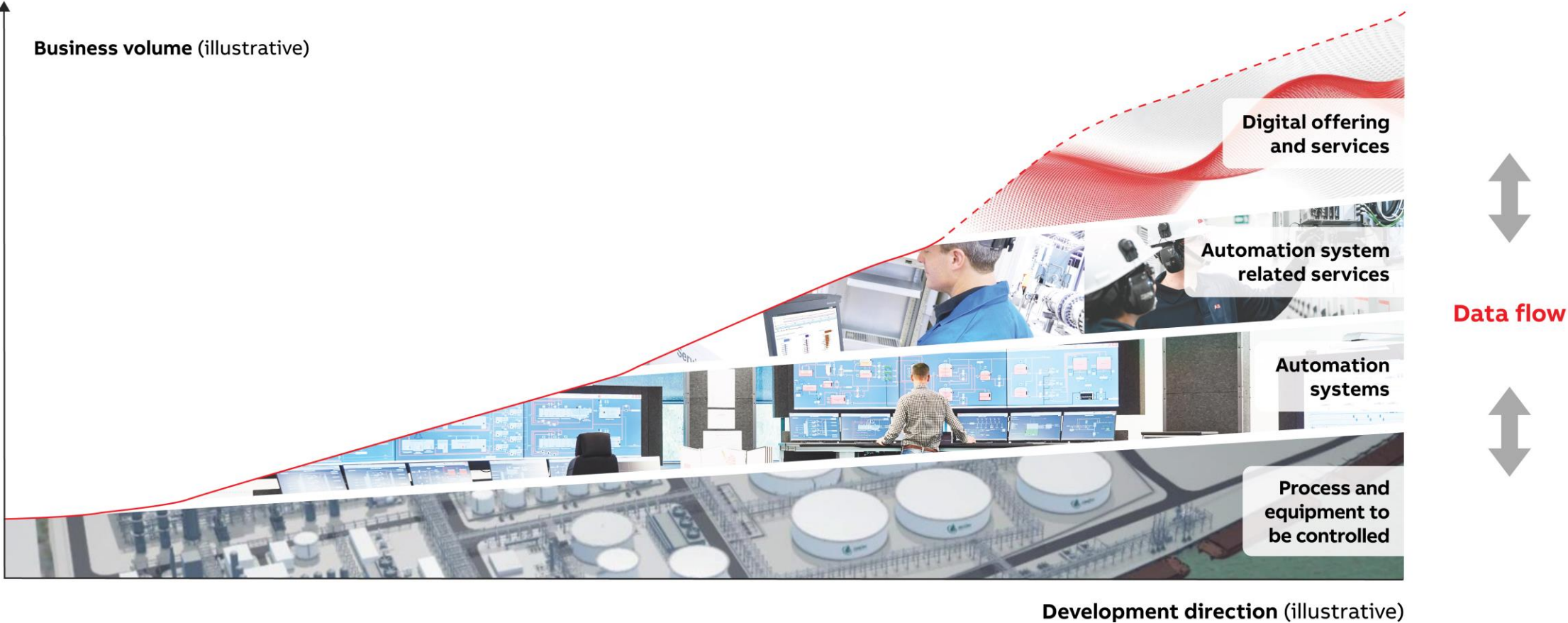




Summary

Connecting the world of operations with the IT/digital world

In a safe and cyber secure way



Automation an indispensable enabler for industry digitalization

Continue to lead in Automation

Strong platform for growth in digital

1 Process automation markets are evolving

Automation will evolve with them

2 ABB well positioned to capture growth

Leading market position and technology

3 Further improving performance

Improving profitability while investing for growth



ABB