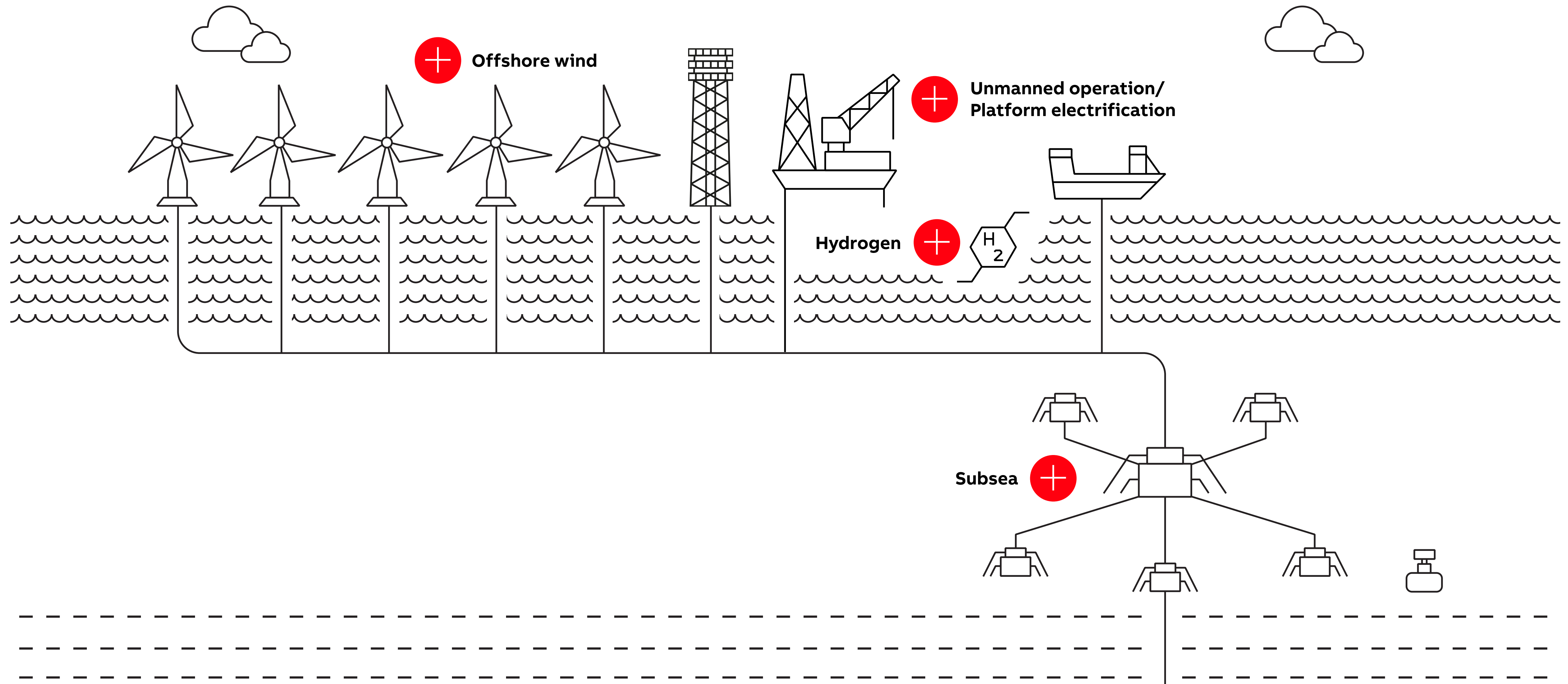


Enabling energy efficient and low carbons across the offshore market



Enabling energy efficient and low carbons across the offshore market







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Offshore wind

Click to find out more	Our offering	Benefits	Reference
<div><div>Automation</div></div>	<div><div>Automation</div><p>Keeping offshore wind turbines working at optimum performance requires efficient and reliable control. A comprehensive portfolio of industrial control and protection products, plus intelligent electronic devices and apparatus for the safe connection of power to the grid, help to safeguard and optimize performance under all operating conditions.</p><p>Our solutions include:</p><ul style="list-style-type: none">• SCADA (Supervisory Control & Data Acquisition) / DCS (Distributed Control System)• PLC (Programmable Logic Controller)• LV distribution and UPS (Uninterruptible Power Supplies)• Telecommunications• Cyber security</div>		
<div><div>Electrical</div></div>			
<div><div>Service</div></div>			
<div><div>Digital</div></div>			

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Enabling energy efficient and low carbons across the offshore market



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Offshore wind

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Our offering

Benefits

Reference

Automation


Electrical

Service

Digital

Electrical system design and integration

- Electrical system design and equipment integration for HVAC substations and grid connection, including all necessary early-phase feasibility studies, technical consulting and analysis
- Subsea distribution and conversion system
 - Subsea transformer
 - Subsea Variable Speed Drive
 - Subsea LV and MV Power Distribution



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Offshore wind

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Our offering

Benefits

Reference

Automation

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Electrical

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Service

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Digital

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Service

Understanding the maintenance and operational status of your turbine assets is the best way to keep them running at optimum efficiency. Our range of maintenance and condition-based monitoring services can help ensure your assets can continue to produce as much electricity as possible throughout their operational life.

Our services include:

- Software maintenance and cyber security
- Asset diagnostics through remote access
- Predictive Maintenance through system condition monitoring
- Advanced analytics and simulation, making use of available data to visualize system performance

Technical support

Training

Grid Code Compliance

Advanced Analytics

Spare parts

ABB Ability™ OPTIMAX

Diagnostics

Cyber Security

Condition Monitoring

Software management

ABB Care Agreement

Find out more >

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Offshore wind

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Click to find out more	Our offering	Benefits	Reference
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Automation



Digital

Our digital control and monitoring technologies give you full vision of all aspects of asset performance.

Our range of digital tools covers key areas of operation, including:

- Electrical power simulation
- Installation and commissioning
- Energy management
- Asset management
- Diagnostics and condition monitoring
- Condition-based maintenance
- Cybersecurity



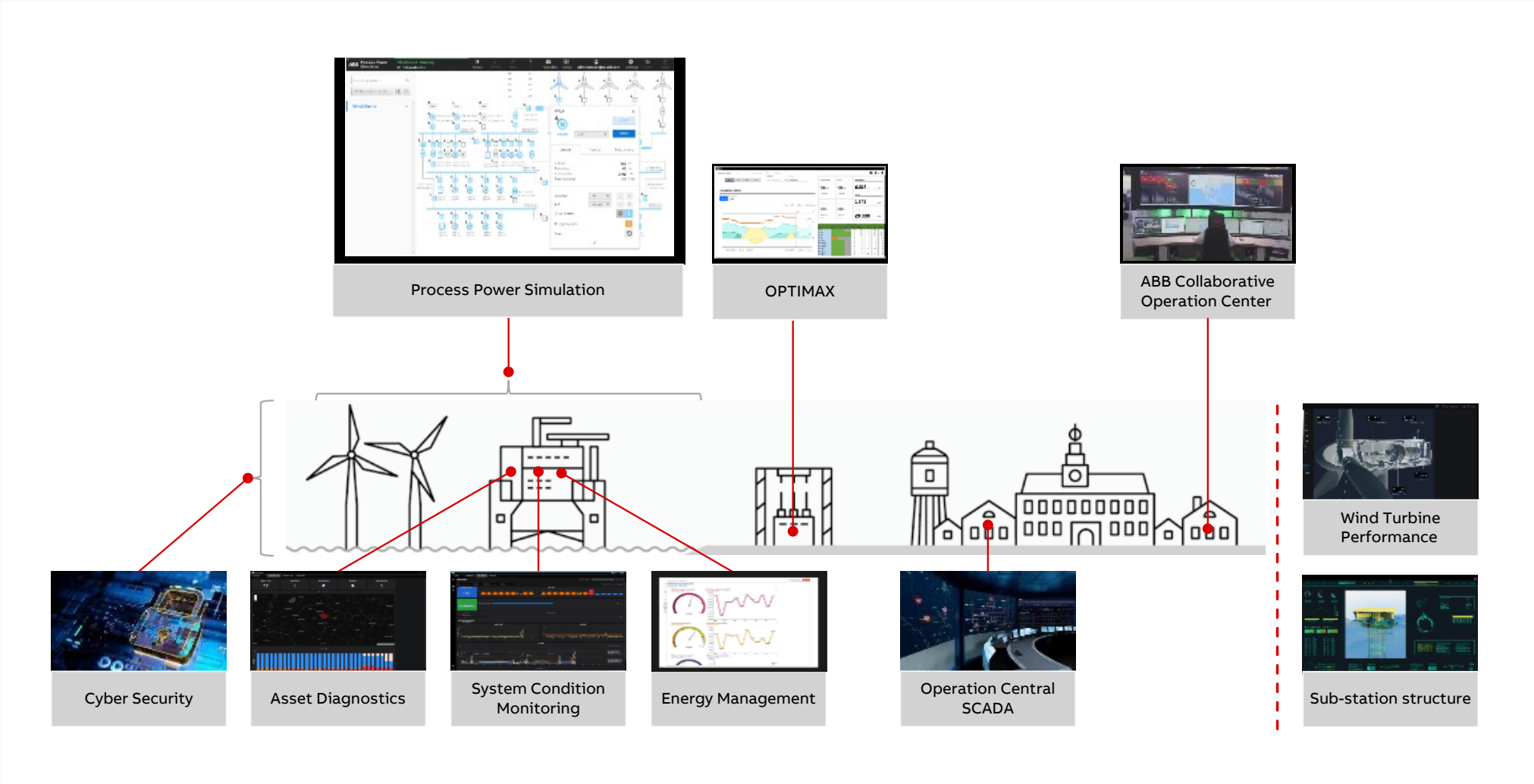
Electrical



Service



Digital



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Offshore wind

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Click to find out more >>>	Our offering	Benefits	Reference
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- Ensure safe, smart and efficient operations**
With our long experience in asset performance management we can help you increase your competitiveness and improve your return on investment with smart operations. We can help build a reliability culture, eliminate expensive turnarounds and drive cost reduction through operational improvements that bring together people, process and technology. Our remote operations (data support and analytics) and robotic technologies can dramatically reduce offshore manning levels thus increasing safety. Digitalizing operations and maintenance (O&M) ensures system availability by predicting potential failures.
- Optimize electrical systems to drive down transmission costs**
We can use our decades of experience in the oil and gas sector to help you deliver electricity to the market cost efficiently with high uptime, minimal downtime and low losses.
- Decarbonization of existing offshore assets**
Supplying emission-free wind energy to existing offshore platforms will reduce CO₂ footprint per unit of oil and gas produced. By analyzing and optimizing power system design and implementing effective control, we can help you to understand and handle this change in the best way to secure power quality and reduce risk.



Find out more > Request further details >



Close

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Our offering

Benefits

Reference



Germany is planning to generate 65 percent of electric power from renewable sources by 2030, including 20GW from offshore wind farms.



Application

- ABB Ability™ digital products and services for Dolwin 5 (Epsilon) offshore wind convertor platform



Outcome

- ABB is maximizing the safety, security and reliability of the energy transmission to the German national grid



Benefits

- Lowers environmental impact
- Enough energy to power 1 million homes
- Supporting Germany's energy transition



ABB solution

- ABB will enable the reliability, safety and security of the energy transmission from DolWin5 (Epsilon) by providing a comprehensive system for IT infrastructure, OT security, plant-wide condition monitoring, SCADA and remote access services to facilitate stable power transmission to the German national grid.



Dolwin 5 (Epsilon) offshore wind platform, Germany



Offshore - Connection, Kriegers Flak



Dogger bank offshore wind farm, UK

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Enabling energy efficient and low carbons across the offshore market



Offshore wind

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Click to find out more >>>	Our offering	Benefits	Reference
<div><div></div><div>Project information Customer: 50Hertz & Energinet DK Location: Baltic Sea Delivery: OPTIMAX® for VPPs</div></div>	<div><div>Offshore - Connection, Kriegers Flak</div><div><div><div></div><div>Customer need<ul style="list-style-type: none">2 countries interconnect their onshore transmission systemsVia 4 offshore wind farms platforms</div></div><div><div></div><div>Benefits Cutting-edge technology to manage and control the Combined Grid Solution:<ul style="list-style-type: none">Power flow (active, reactive)Incorporating the HVDC-Link</div></div><div><div></div><div>ABB solution<ul style="list-style-type: none">Real-time data processing and evaluating of P/V references to control power flowOptimal powerflow calculation based on grid modelPredictive and forecast functions</div></div></div></div>	<div><div></div><div>Dolwin 5 (Epsilon) offshore wind platform, Germany</div></div> <div><div></div><div>Offshore - Connection, Kriegers Flak</div></div> <div><div></div><div>Dogger bank offshore wind farm, UK</div></div>	

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Our offering

Benefits

Reference



1

Dogger Bank Wind Farm is an offshore wind farm being developed in three phases

- Dogger Bank A, B and C
- located in the North Sea between 130km and 190km from the North East coast of England

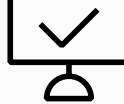
Collectively they will become the world's largest offshore wind farm.

Each phase will have an installed generation capacity of 1.2GW and represents a multi-billion pound investment. Combined, they will have an installed capacity of 3.6GW and will be capable of powering up to 6 million homes.



Application

- High-voltage direct current (HVDC) Light® converter systems to connect world's largest offshore wind farm to the UK transmission network



Outcome

- First ever UK use of HVDC technology with smaller environmental footprint for connecting offshore wind farms



Benefits

- Lowers environmental impact
- Enough energy to power 4.5million homes
- Increases current wind offshore capacity by 3.6 GW



ABB solution

Automation:

- Auxiliary Systems (ESD/HVA/C/IMAC/FIFI)
- Condition Monitoring for the whole substation
- IT Infrastructure including Operational Support Systems
- Overall OT-Security responsibility and delivery

Electrical:

- Electrical Low Voltage Switchboards (Main and Sub Distribution boards) for Auxiliary Power
- UPS

Telecommunication Systems:

- LAN network, CCTV, Radio system, Access control system, Telephone system, Entertainment system, PAGA, VSAT system, Wave Radar system, Weather Monitoring system, Video Conferencing system



Dolwin 5 (Epsilon) offshore wind platform, Germany



Offshore - Connection, Kriegers Flak



Dogger bank offshore wind farm, UK

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Enabling energy efficient and low carbons across the offshore market



Subsea

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Click to find out more	Our offering	Benefits	Reference
<div><div></div><div>Long step-out system</div></div>	<p>ABB's INSUBSEA® long step-out system includes drives for seabed compressors and pumps that can sit up to 150 km away from topside infrastructure. The system is based on ABB's standard frequency converters and specially designed transformers, adapted to meet the stringent requirements of topside or subsea installation.</p>		
<div><div></div><div>Subsea power distribution</div></div>	<p>The systems, which are customized, provide a low-cost solution to brownfield extensions and a cost-effective solution to greenfield developments. Long step-out systems apply to:</p> <ul style="list-style-type: none">• Re-use and upgrade of existing infrastructure• Tie-in of remote pockets of resources• Increased production capacity, recovery rates, and tail production• Shore-to-subsea developments• Subsea processing• Deepwater development		
<div><div></div><div>Direct Electrical Heating</div></div>			
<div><div></div><div>Subsea automation</div></div>			

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Enabling energy efficient and low carbons across the offshore market



Subsea

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Click to find out more	Our offering	Benefits	Reference
<div><div></div><div>Long step-out system</div><div>></div></div>	<div>Today the demand is for subsea electrical power supply system's able to transmit, distribute and control electrical power in the megawatt range. ABB is designing systems that can transmit electrical power to every location requiring energy via a single subsea power cable, as opposed to the present-day use of individual cables to carry power separately to subsea consumers.</div>		
<div><div></div><div>Subsea power distribution</div><div>></div></div>	<div>ABB's new subsea AC power distribution system will enable up to 100 MW from shore to be transmitted up to 600 km, to power equipment at depths of up to 3,000 m. The subsea power distribution such that all power system components including the transformer, switchgear and medium voltage drive, are located subsea. The power is then distributed to multiple applications such as pumps, compressors and boosters.</div>		
<div><div></div><div>Direct Electrical Heating</div><div>></div></div>			
<div><div></div><div>Subsea automation</div><div>></div></div>			

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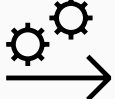




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Subsea

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Click to find out more	Our offering	Benefits	Reference
 Long step-out system	<p>Direct electrical heating (DEH) system prevents the formation of hydrate and wax in flowlines and pipelines, without the use of chemicals. ABB's INSUBSEA® DEH systems consist of a tailor made topside package installed in the platform's local equipment room (LER), or delivered as a complete module/ containerized solution. The package contains transformer, compensation unit, symmetration unit, control and protection products.</p>  <p>Photo credit: SINTEF</p>		
 Subsea power distribution			
 Direct Electrical Heating			
 Subsea automation			

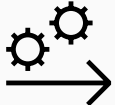




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Subsea

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Click to find out more	Our offering	Benefits	Reference
 Long step-out system	ABB supplies ultra-high-speed controllers for demanding subsea applications through to highly flexible human-machine interface (HMI) solutions for seamless integration to topside control systems.		
 Subsea power distribution	Its System 800xA distributed control system integrates subsea and topside equipment and allows engineers to run their entire operation from one screen. It also enables remote communication and monitoring and control operations for subsea factories. Engineers can manage entire operations from a modern onshore control room that may be some 600 km away.		
 Direct Electrical Heating			
 Subsea automation			

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Subsea

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Our offering

Benefits

Reference

- Minimizes capital and operating expenditures through lower project investment and maintenance
- Improves recovery rates
- Extends life of aging assets
- Significantly improves operational safety
- Opens new opportunities to explore longer, deeper and colder fields
- Enables production from remote and smaller fields
- Digital technology that integrates power and automation to provide reliable performance and predict problems before they happen










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Subsea

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Click to find out more >>>	Our offering	Benefits	Reference
<div><div></div><div>Project information<p>The Jansz-lo field is located around 200 kilometers offshore the north-western coast of Australia, at water depths of approximately 1,400 meters. The field is a part of the Chevron-operated Gorgon natural gas project, one of the world’s largest natural gas developments. The J-IC project, which moves gas from the deep seas to shore, marks only the third time that world-leading subsea compression technology is being deployed globally and the first time outside of Norway¹ where ABB is also responsible for providing the EPS.</p><p>The project will involve the construction and installation of a 27,000-tonne (Topside and Hull) normally unattended floating Field Control Station (FCS), approximately 6,500 tonnes of subsea compression infrastructure and a 135km submarine power cable linked to Barrow Island.</p></div></div>	<div><div>Jansz-lo compression, Australia</div><div><div><div>Application<ul style="list-style-type: none">Power to subsea compressor via Power from Shore and subsea long step out system</div><div><div>Outcome<ul style="list-style-type: none">This is the third time this groundbreaking technology is being deployed globally</div><div><div>Benefits<ul style="list-style-type: none">Significant reduction in power consumption and emissionsImproved recovery rateOptimal use of the existing resource</div><div><div>ABB solution<ul style="list-style-type: none">ABB will provide the majority of the electrical equipment, both topside and subsea for maintaining gas flow from the Jansz-lo field to three existing LNG trains and domestic gas plant on Barrow Island.This is the first time ABB is combining two core technologies - power from shore and Variable Speed Drive (VSD) long step-out subsea power for one project.The electrical system will be able to transmit 100 megavolt-amperes over a distance of approximately 140 kilometers and at depths of 1,400 meters.</div></div></div></div></div></div></div>	<div><div><div>Jansz-lo compression, Australia</div><div><div>Åsgard subsea compression system, Norway</div></div></div></div>	

Note: 1. The Åsgard and Gullfaks fields in Norway were the first to use subsea compression technology.

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Subsea

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Click to find out more >>>	Our offering	Benefits	Reference
<div><div></div><div>Project information</div><div>Åsgard is located on the Haltenbanken of Norway in water depths of 240-310m (787-1017ft). Gas and condensate from the Midgard and Mikkel reservoirs are transported through long distance flow lines to the Åsgar A platform.</div></div>	<div><div>Åsgard subsea compression system, Norway</div><div><div><div></div><div>Application</div><div>• Power to subsea compressor via subsea long step out system</div></div><div><div></div><div>Outcome</div><div>• New world record on world's first subsea gas compression system</div></div><div><div></div><div>Benefits</div><div>• Reliable power and control • Lower environmental impact • Significantly improved safety of the operation</div></div><div><div></div><div>ABB solution</div><div>• ABB was commissioned to provide power to the compression system, which it did by means of a cable that transmits 18 megavolt-amperes at 120 hertz over 43 kilometers. That sets a new world record for distance, voltage and frequency between a drive on a floating production facility and a seabed compressor and points the way to what will be possible in the increasingly challenging future of subsea electrical engineering. • ABB is responsible for system engineering including design, commissioning, qualification tests, measurement systems, simulations of topside drives, topside transformers and subsea transformers.</div></div></div></div>	<div><div><div></div><div>Jansz-lo compression, Australia</div></div><div><div></div><div>Åsgard subsea compression system, Norway</div></div></div>	

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Enabling energy efficient and low carbons across the offshore market



Platform electrification

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Click to find out more	Our offering	Benefits	Reference
 Pre-studies to front-end engineering and design	<p>The first stage in solving a customer’s problem is to sketch out the possible solutions and to make an initial estimate of their strengths and weaknesses, and what they would be likely to cost in terms of time and money. This serves as a preliminary assessment of the task, and provides a framework for more detailed investigations.</p>		
 System Integration	<p>The next step is to test the results of that first stage against the data we gather from the site and our analyses of the client’s performance requirements. Once the problem comes into focus, we are able to select the best solution and then proceed to the front-end engineering design, or FEED as it’s known, followed by a detailed engineering solution.</p>		
 Digital	<p>Once the feasibility work is completed, the FEED study sets out everything that must be accomplished in the execution phase. This is a complete to-do list, including technical requirements, applicable standards, project guidelines, analysis and drawings.</p>		
 Service	<p>ABB’s ability to adopt the best approach to a given problem rests on its unrivalled experience of what works in the oil and gas industry. Armed with this knowledge ABB offers a wide range of services in the fields of electrical, automation and optimization, digital and full range of telecoms and information systems.</p>		

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Enabling energy efficient and low carbons across the offshore market



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Platform electrification

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Our offering

Benefits

Reference

Pre-studies to front-end engineering and design

>

System Integration

>

Digital

>

Service

>

ABB's integrated automation and electrical approach lowers risk and price for projects.

- Control systems
- Electrical system includes Studies for Power from Shore, Offshore Wind and Subsea electrification
- Telecom systems
- Energy Management

Fixed Platform

FPSO

Control Room

Offshore wind farm

Subsea on seabed

Enabling energy efficient and low carbon operations across the offshore market

Electrification

Telecommunication

Automation

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Platform electrification

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Click to find out more	Our offering	Benefits	Reference
<div><div></div><div>Pre-studies to front-end engineering and design</div><div>></div></div>	<div>Solutions to increase efficiency, productivity, safety and sustainability.</div> <div><ul style="list-style-type: none">• Asset performance management• Simulations and digital twins• Industrial analytics• Manufacturing operations management• Energy management• Remote services</div>	<div></div>	
<div><div></div><div>System Integration</div><div>></div></div>			
<div><div></div><div>Digital</div><div>></div></div>			
<div><div></div><div>Service</div><div>></div></div>			

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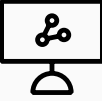



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Platform electrification

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<div><div></div><div>Pre-studies to front-end engineering and design</div><div>></div></div>	<p>ABB provides safe, secure and reliable operations by being an innovative partner with the best services and the best people with the strongest domain knowledge. ABB Care is how we get there, together.</p> <p>We offer a flexible Service contracting framework to:</p> <ul style="list-style-type: none">• Streamline your service engagement with us• Control your lifecycle costs• Protect your investment• Extend the life of your assets• Late life and decommissioning• Transform your operations with digital solutions <p>Four customizable levels help us deliver the Care you need:</p> <ul style="list-style-type: none">• Self Service• Priority• Collaboration• Complete Service	<div><div><div>Safe, secure and reliable operations</div><div><div>Support for Life</div><div><div><div>Protect</div><div>Spares</div><div>Security Patches</div><div>Software Updates</div><div>Benchmarks</div><div>Training</div></div><div><div>Extend</div><div>HMI Upgrades</div><div>Hardware Replacement</div><div>Evolution Planning</div><div>Assessments</div><div>Fingerprints</div></div><div><div>Transform</div><div>Remote Experts</div><div>Control Room Consolidation</div><div>Cyber Solutions</div><div>Enterprise Applications</div><div>Consulting</div></div></div><div>Automation: Process Control, Electrical Control, Excitation</div><div>Care Agreements / My Control System</div><div><div>People</div><div>Customer Focus</div><div>Technology</div></div></div></div></div>	
<div><div></div><div>System Integration</div><div>></div></div>			
<div><div></div><div>Digital</div><div>></div></div>			
<div><div></div><div>Service</div><div>></div></div>			

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Platform electrification

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Our offering

Benefits

Reference

- ABB is a market leader in wind, and subsea having been one of the few suppliers involved in the commercialization of wind power for 40+ years and 100+years experience in power generation
- ABB provides a complete ecosystem approach to managing your platform electrification project, through our integrated portfolio of electrical, automation and telecommunication solutions
- ABB have successfully delivered offshore power projects for over 2 decades (topsides and subsea)
- ABB provides a ‘one-stop’ shop which helps optimize the output, uptime and reliability of your platform, while minimizing the risk and cost of energy (LCOE).
- The vast experience ABB has built up helps us to generate electricity as cost effectively and lowest risk as possible through efficient project execution and high competence in electrical system design and integration
- Helps our customers decarbonize their assets and operations
- Helps customers to continue their license to operate
- Financial benefits for customers by utilizing power from other sources
- Less maintenance costs, less noise and less people are required offshore










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Platform electrification

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Click to find out more >>>	Our offering	Benefits	Reference
<div><div></div><div>Project information The Johan Sverdrup oil field is located in the North Sea 140km west of Stavanger, Norway. It is the 3rd largest oilfield on the Norwegian continental shelf and came online in 2019. ABB is supplying the oilfield with high-voltage direct current (HVDC) electricity from the onshore grid. Supplying power from shore to run the oil platforms, instead of using local generation, considerably lowers CO₂ emissions.</div></div>	<div><div>Johan Sverdrup power from shore, Norway</div><div><div><div>Application<ul style="list-style-type: none">Power from onshore grid to oilfield</div><div><div>Outcome<ul style="list-style-type: none">100MW at +/- 80kV is transmitted to the large oilfield in the North Sea</div><div><div>Benefits<ul style="list-style-type: none">Reliable power and controlReduced CO₂ emissionsReduced operating and maintenance costsImproved operational safety</div><div><div>ABB solution<ul style="list-style-type: none">ABB designed, engineered, supplied and commissioned the equipment for two ±80 kilovolt 100 MW HVDC converter stations, using Voltage-Sourced Converters (VSC) technology, by ABB called HVDC Light.The project included installation, supervision and site services. One station was situated on-shore at Haugsneset, near the Statoil Kårstø plant on the Norwegian west coast, the other on the platform situated 155 km west of the Norwegian coastline.</div></div></div></div></div></div></div>	<div><div><div><</div><div></div><div>Johan Sverdrup power from shore, Norway</div></div><div><div><div><</div><div></div><div>Oseberg Power from Shore, Norway</div></div></div></div>	

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Platform electrification

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<div><div></div><div><div>Project information</div><div><p>The Oseberg Field Centre includes three platforms, Oseberg A, B and D, connected to one another with bridges, in the southern part of the Oseberg field, and the Oseberg C platform, which lies 14 kilometres north of the field centre.</p><p>Gas export started from the Oseberg Field Centre on October 1, 2000. This represented the beginning of a new era for the Oseberg field and for Hydro as an offshore operator.</p></div></div></div>	<div><div>Oseberg Power from Shore, Norway</div><div><div><div></div><div>Application</div><div><ul style="list-style-type: none">Power from shore</div></div><div><div></div><div>Outcome</div><div><ul style="list-style-type: none">Phasing out gas turbines and installation of two new 10 MW pre-compressors for gas production</div></div><div><div></div><div>Benefits</div><div><ul style="list-style-type: none">Reduce CO₂ emissions by 320,000 tonnes per annumReduces operational expenditures, noise and maintenanceImproving regularity, health, environment, and safety (HES)</div></div><div><div></div><div>ABB solution</div><div><ul style="list-style-type: none">ABB has been appointed by Aibel to supply the complete power from shore system for electrification of the Oseberg field.The majority of ABB's deliveries is scheduled through 2023 with services like engineering, management and commissioning participation lasting until final commissioning, planned for 2026.The new electrical system is composed by onshore power transformer, gas insulated switchgears (GIS), shunt reactor, and offshore transformers, GIS, motors, variable speed drives (VSD), static frequency converters (SFC), low and medium voltage switchgears and a complete power distribution control system (PDCS). In addition, extensive modification is done to Oseberg A main switchgear for receiving power from shore.</div></div></div></div>	<div><div><div><</div><div></div><div>Johan Sverdrup power from shore, Norway</div></div><div><div><</div><div></div><div>Oseberg Power from Shore, Norway</div></div></div>	

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Hydrogen

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Power to the Electrolyzer

- 
Rectifier & transformer System
- 
Auxiliary Power
- 
Drives & motors
- 
Cooling Water Systems

Controlling and optimizing the process

- 
Controls, Safety and Protection
- 
Instrumentation & Measurement
- 
Telecom & Network

Power to consumers









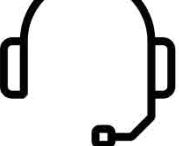

- 
MV Switchgear
- 
AC Filter
- 
Battery & Fuel cell solutions
- 
Power Mgmt Systems
- 
Step-Down transformer
- 
LV switchgear

ABB Ability™ 


Remote Operation and Digitalization


Service and Asset Management


Production and Energy Optimization

The successful operation of a hydrogen plant is about efficient energy and process management

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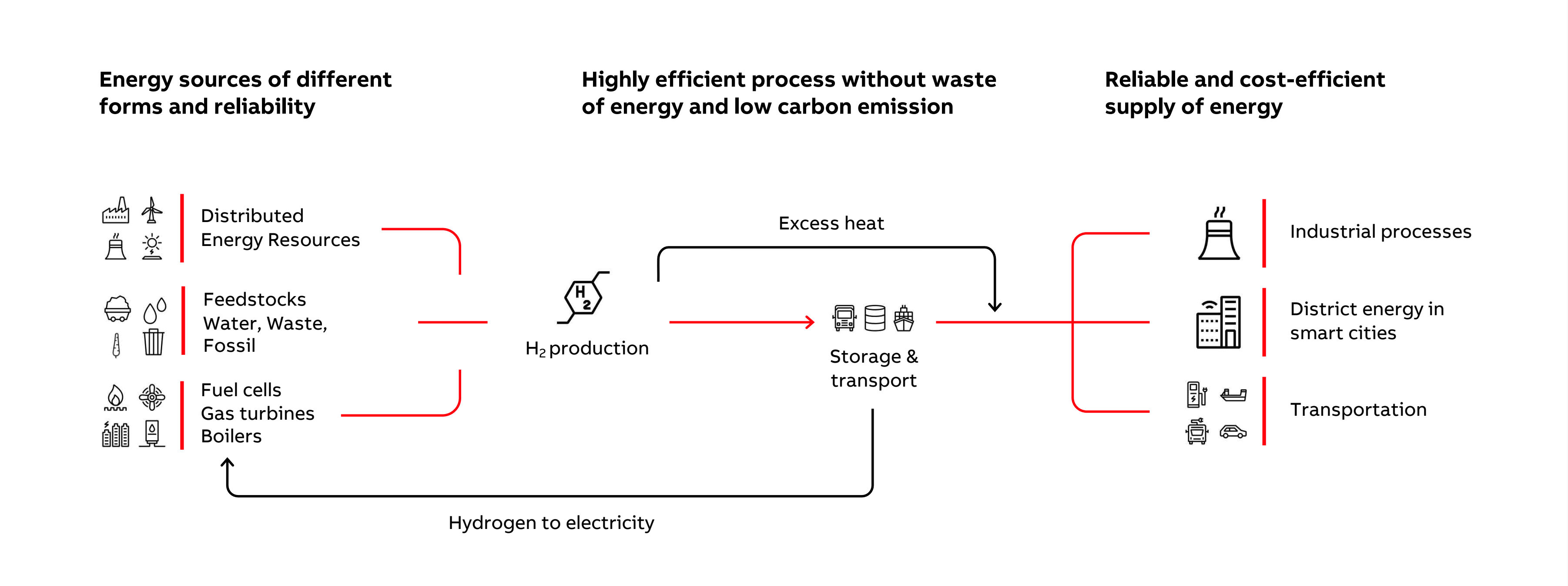
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Hydrogen

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Hydrogen

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CAPEX

- Power electrification - about 30% of total CAPEX
- Areas of optimization:
- Electrification
 - Energy quality
 - Automation and digitalization solutions
 - Project Commissioning

1. Technical solution
2. ABB Integrated Project



OPEX

- Operational optimization:
- Autonomous and controlled sites in a centralized control room
 - Predictive Maintenance and Advanced Services
 - Lifecycle management

1. Lifecycle management
2. ABB Services
3. ABB Ability™ Advanced services



Energy feedstock

- Energy efficiency: electricity = about 80% of the price of H2
- Renewable energy management; Anticipating weather forecasts and energy prices
 - Purchasing management - electricity sales on the EPEX Spot
 - Multi-site management

1. ABB Ability™ Optimax Energy Management System



Additional value

- Green certificate
- Original warranty

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Hydrogen

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<div><div></div><div>Project information ABB has signed an order with HydrogenPro, a hydrogen plant company, to provide electrical equipment for the world's largest single stack high-pressure alkaline electrolyser - a system that generates hydrogen by using electricity to split water into hydrogen and oxygen. Once deployed, at a specially built test facility in Herøya, Norway in 2022, the system will be capable of producing 1,100 normal cubic metres of green hydrogen per hour (Nm3/h).</div></div>	<div><div>HydrogenPro, Norway</div><div><div><div><div></div><div>Application<ul style="list-style-type: none">Integrated electrical package comprising transformers, rectifiers, DC Chokes and Busbars</div></div><div><div></div><div>Outcome<ul style="list-style-type: none">To develop a system that can produce 1,100 normal cubic metres of green hydrogen per hour (Nm3/h)</div></div><div><div></div><div>Benefits<ul style="list-style-type: none">Optimum operational performanceUnleash the full environmental and economic potential of hydrogen</div></div><div><div></div><div>ABB solution<ul style="list-style-type: none">ABB's scope will include an integrated electrical package comprising transformers, rectifiers, DC Chokes and Busbars. Hydrogen is very energy intensive to produce sustainably - everything in the production process, each little component adds a little bit of inefficiency, so this integrated portfolio approach will ensure that every single, possible improvement in efficiency is made</div></div></div></div></div>			<div><div><div><div></div><div>HydrogenPro, Norway</div></div><div><div></div><div>Lyfe's first green hydrogen clean energy production project, France</div></div></div></div>

Note: 1. The Åsgard and Gullfaks fields in Norway were the first to use subsea compression technology.

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<div><div></div><div>Project information</div><div>Lhyfe, the French producer and supplier of green hydrogen, has chosen ABB, the world leader in control systems and advanced technologies, to implement an automation solution at its first green hydrogen production site.</div></div>	<div><div>Lyfe's first green hydrogen clean energy production project, France</div><div><div><div><div></div><div>Application</div><div><ul style="list-style-type: none">• Freelance DCS• S500 and S500-XC IOs (~1000 HW IOs)• ABB Ability™ MOM (Dashboard, Trends & Events, Excel analyze)• Electrical cabinet through local System integrator (BOSSARD SA)</div></div><div><div></div><div>Outcome</div><div><ul style="list-style-type: none">• Integrated automation with common and centralized database</div></div><div><div></div><div>Benefits</div><div><ul style="list-style-type: none">• Improving industrial efficiency• Productivity and quality• Minimizing environmental impact</div></div><div><div></div><div>ABB solution</div><div><ul style="list-style-type: none">• ABB supports a wide range of industries in their digital transformation and will supply the first Lhyfe production site with its Freelance distributed control system and ABB Ability™ Manufacturing Operations Management (MOM) digital platform.• These solutions will control all the elements involved in the hydrogen production process at the Bouin site in the Vendée region, France and ABB's automation technology is being installed to deliver improved efficiency, safety and productivity across the operation.</div></div></div></div></div>			<div><div></div><div>HydrogenPro, Norway</div></div> <div><div></div><div>Lyfe's first green hydrogen clean energy production project, France</div></div>

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