



# MNS® Low Voltage Switchgear

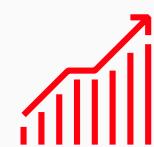
## Exceeding the standards

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# Benefits with MNS switchgear

## Power with Purpose



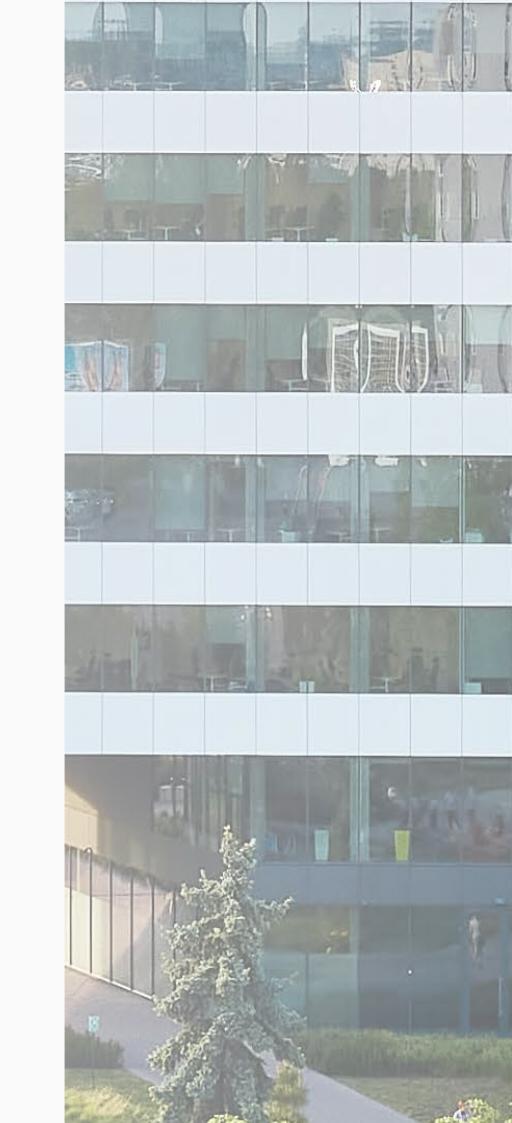
### Performance oriented

ABB's MNS switchgear solutions set the benchmark for safety, reliability, and adaptability, maintaining continuous power and keeping operations running even in the harshest environments. ABB's verification testing and arc protection technologies provide superior safety for people and processes. Its modular design makes it easy to scale and adapt to a site's changing power requirements.



### Sustainability embedded

Integrate ABB Ability™ for real-time power management and continuous condition monitoring into operations with ABB MNS switchgear. MNS enables users to optimize operations and lower energy and maintenance costs. ABB's independently verified Environmental Product Declarations and green manufacturing processes provide transparency and sustainability.



### Peace of mind

Rely on the world's largest installed base of power distribution switchgear and motor control centers engineered by a global network of the industry's most skilled experts. Our teams are committed to delivering a superior customer experience with world-class quality from our state-of-the-art production facilities.

# Exceeding the standards with MNS

## 5 essentials of switchgear solutions

Since ABB first introduced the modular low voltage switchgear platform MNS over 50 years ago, MNS has always been at the forefront of innovation in the marketplace.

**Safety, reliability and flexibility** all come from the rigorous testing and certification program initiated with our MNS platform introduction. Technical innovation has been a driver from the beginning and continues to this day.

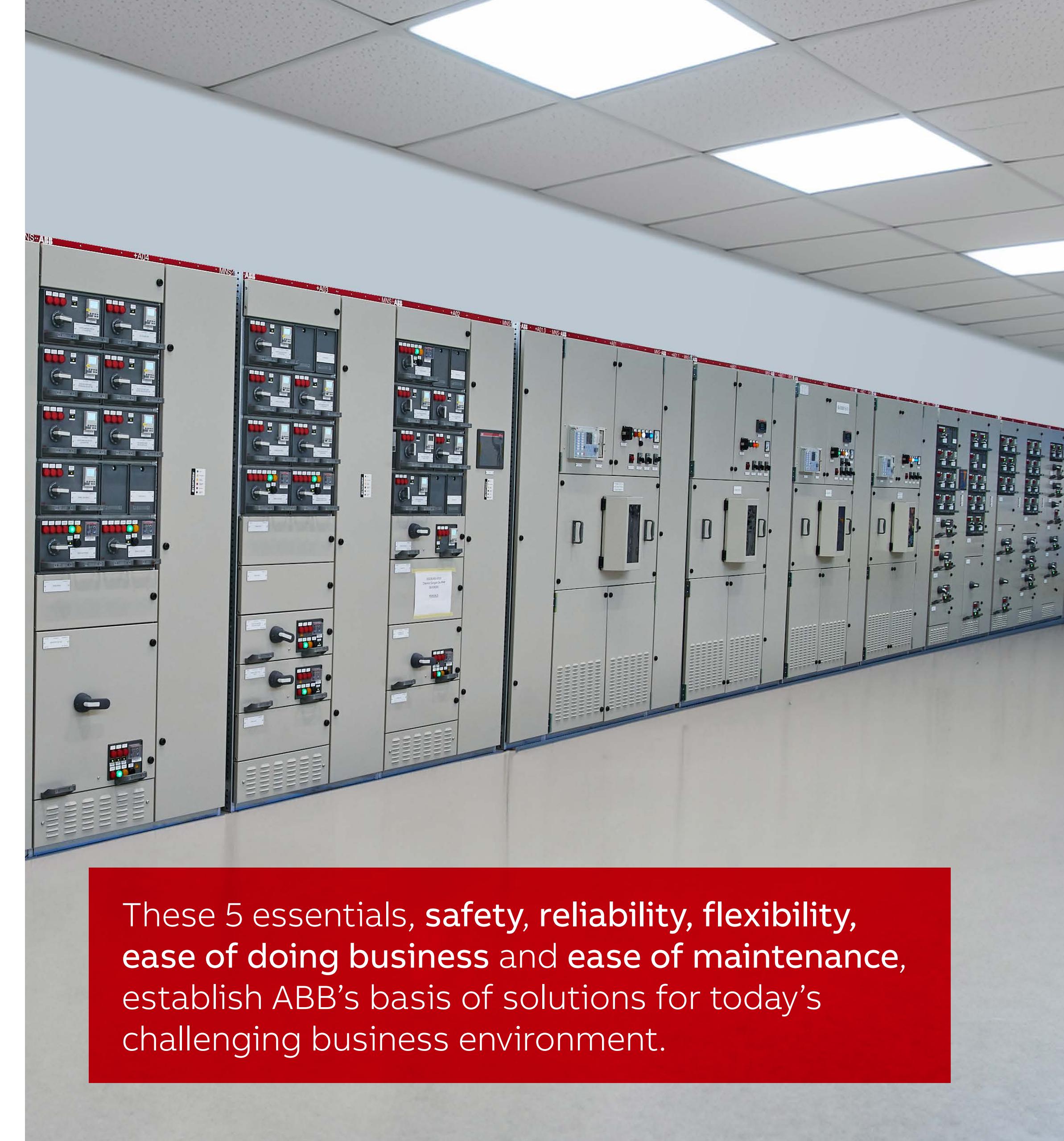
ABB also focuses on the following additional factors valued by customers:

### **Ease of doing business**

 With a network of global experts, our customer tailored solutions are the best fit to their needs. Using standardized manufacturing processes across global locations, we ensure high-quality, consistent products, fast response to demand, and quick delivery times.

### **Ease of maintenance**

Customers benefit from a tailor-made service strategy to meet their demands. This coupled with a standardized design and condition monitoring solution ABB Ability CMES, operators can reduce their OPEX costs by 30%.



These 5 essentials, **safety, reliability, flexibility, ease of doing business** and **ease of maintenance**, establish ABB's basis of solutions for today's challenging business environment.



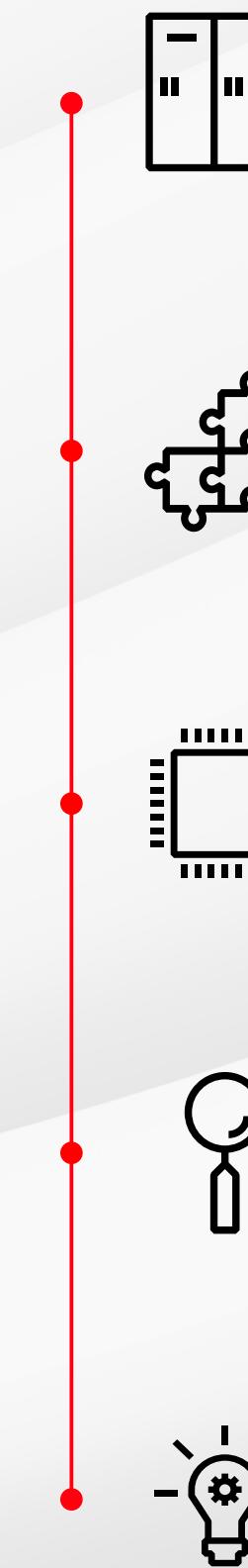
## Safety

Our strategy exceeding the safety standards originated with our first arc fault containment tests in 1979 with characteristics of 500 V, 50 kA and 690 V, 35 kA. Since then ABB has invested over \$60 million in testing and verification of MNS to increase the safety levels reaching now the ratings of 415 V, 100 kA and 690 V, 80 kA arcing class C criteria 1 to 7. With this commitment it can be clearly seen that MNS offers the highest standard of safety available in the market today.

### Notable aspects are:

- The MNS arc ignition protected zone comprises the vertical distribution bars and the power contact to the short-circuit protection device.
- To ensure the arc is limited to the defined area, gas-tight seals are used between the main busbar system and equipment (incoming and outgoing) compartments.
- Embedded vertical distribution bars guarantee superior phase segregation, creepage distance and increased safety.
- Thermal sensors can be added to monitor temperatures at critical connections.

### History of MNS



1972

First fixed raster-based weld-free frame with MNS

1983

First modular fully withdrawable arc proof system MNS

1990

First digital LV System with MNS and INSUM

2005

First fully self-supervising LV system MNS with condition monitoring

2022

50 years of experience and continuous development



## Reliability

Since the introduction of MNS in the early 1970s the lifecycle comprises three discrete product generations. The constructional aspects of the MNS platform have remained the same throughout the product evolution. This enables extensions and retrofit of the entire installed base. Over 1,7 million MNS sections have been delivered so far, and over 80 percent of these remain in operation. This demonstrates the reliability and quality offered by MNS.

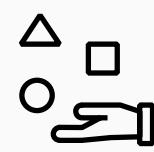
Maintenance-free busbars and mechanical

structures help to reduce operational costs. The main power contact is that of a turnable construction, de-coupling cable stress and eliminating hot spots.

ABB's design guideline defines that the temperature inside the assembly shall not exceed 55°C.

### Internal view of MNS





## Flexibility

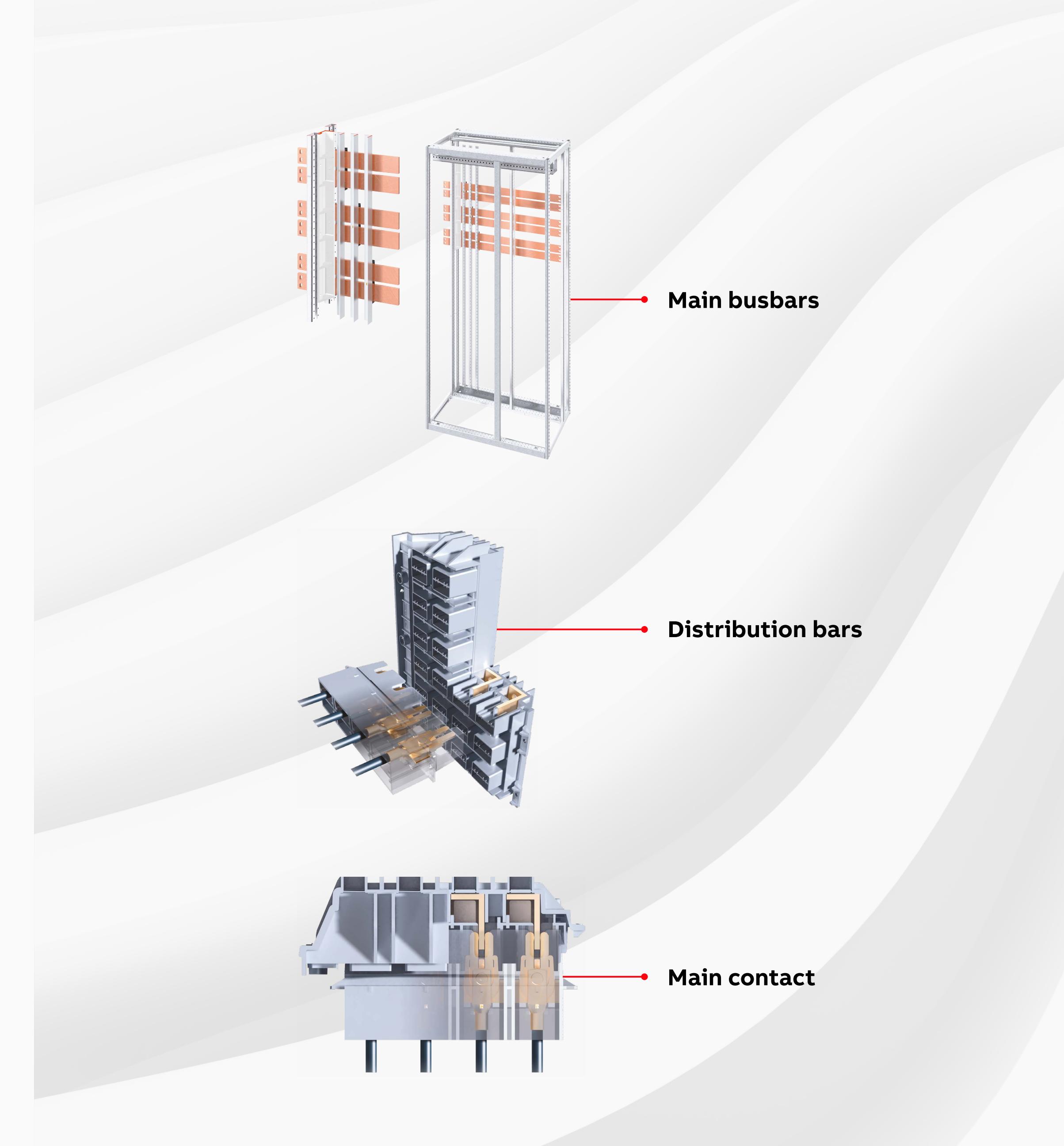
The MNS modular design forms the basis of the system flexibility. This aspect also provides the ability to combine solutions from the entire ABB low voltage product range. These products are integrated in close coordination with the associated product development teams which provides increased performance for MNS and ensures the full requirements of the IEC 61439 are met.

Fixed, plug-in, and withdrawable motor starters, energy distribution, variable speed drives, soft starter, and power factor correction can be configured in the same vertical section.

- MNS provides solutions for both front and rear access designs for switchroom optimization.
- Special service conditions for MNS are possible and subjected to agreement with the user.

Safety, reliability, and flexibility are values proven in our continuous verification programs, these are conducted with our globally recognized partners:

- CESI (IPH-Berlin) testing authority providing ASTA certification
- DEKRA testing authority.



# Cooperation with Third Party Certification Bodies

A low voltage switchgear assembly involves a complex supply chain from design to customer application. ABB ensures that its switchgear assemblies are designed and verified according to the latest IEC standards, guaranteeing safe operation, reliability, and prevention of energy supply loss. Clients can trust that the switchgear meets both their needs and IEC requirements.

The IEC 61439 series (International standards for low voltage switchgear and controlgear assemblies) sets design verification rules for safe performance and serves as a basis for third-party certification and testing.

ABB collaborates with third-party certification bodies like DEKRA and ASTA, under the IECEE system (IEC system of Conformity Assessment Schemes for Electrotechnical Equipment and Components), to ensure independent and recognized verification of the MNS design. A Quality Test Certificate from these certification bodies confirms that the product has undergone the full sequence of tests required by the IEC 61439 standards, proving its compliance.

Additionally, certification bodies offer the option to obtain a Test Report, which allows testing specific requirements, such as short circuit withstand during development or temperature rise for increased ambient temperatures.

Content of this page supplied by courtesy of DEKRA



Content of this page supplied by courtesy of IPH / ASTA



# Exceeding the standards with MNS

ABB's knowledge and experience gained in design, testing and supplying switchgear over the last century is unrivalled.

This coupled with the '5 essentials of switchgear solutions' and our global business model provides a differentiating factor for many decisions in today's challenging business environment.

## Quality management with ABB

The two interrelated processes hereunder illustrate ABB's quality policy covering the complete value chain from global development to local delivery.

ABB's quality process is embedded in the culture of the entire organisation. Each of the manufacturing units world-wide operates in accordance with the ISO 9001 Quality Management System. ABB's

policies include but are not limited to, delivering on-time, with continuous quality to ensure customer satisfaction.

The certified quality and reliability ensured by choosing MNS provide the customer with the best-in-class asset to achieve higher productivity and increased safety for both plant and personnel, which in turn lowers the lifecycle costs.

## Original manufacturer and assembly manufacturer

ABB has a unique position with respect to its global presence and the IEC standards definition where ABB is both the 'Original manufacturer' and the 'Assembly manufacturer'.

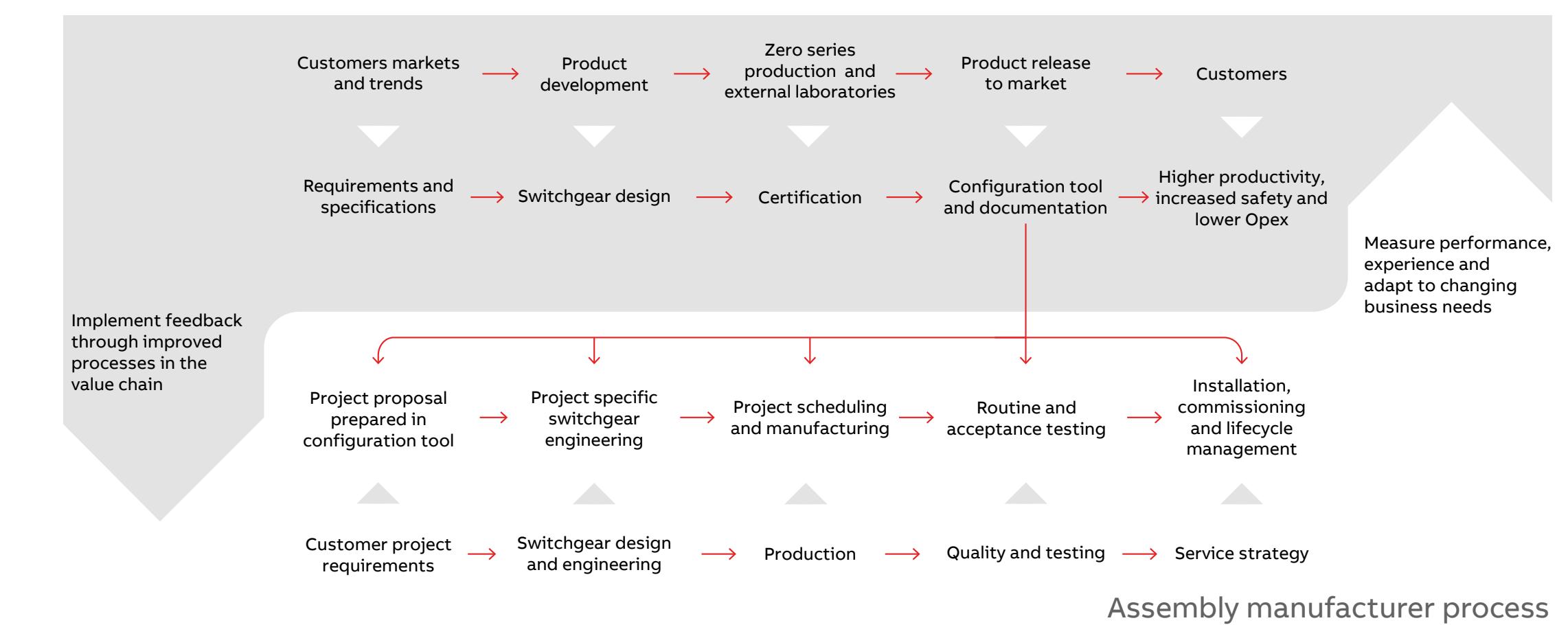
## Benefits of integrated supply chain model

The original manufacturer is responsible for the design and verification of the entire product platform, led by R&D and Product Management to ensure compliance with market needs and IEC standards.

Once finalized, the design documentation is shared with all manufacturing sites for consistent execution. The assembly

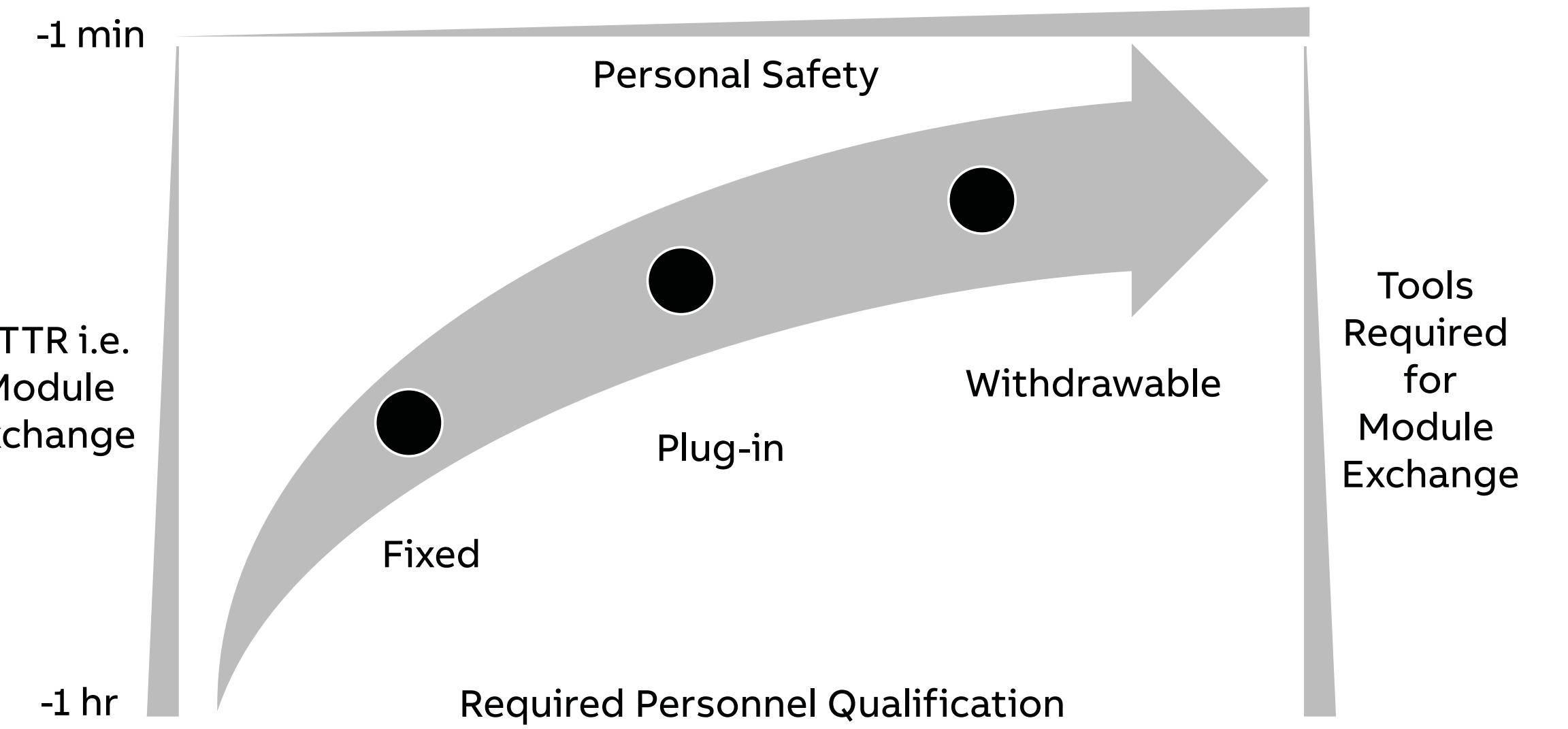
manufacturer's responsibility begins with project-specific engineering, covering assembly and routine testing. ABB's operations ensure precise project execution according to the product design, delivering unmatched quality and superior customer experience.

### Original manufacturer process



# Scale your solution with MNS

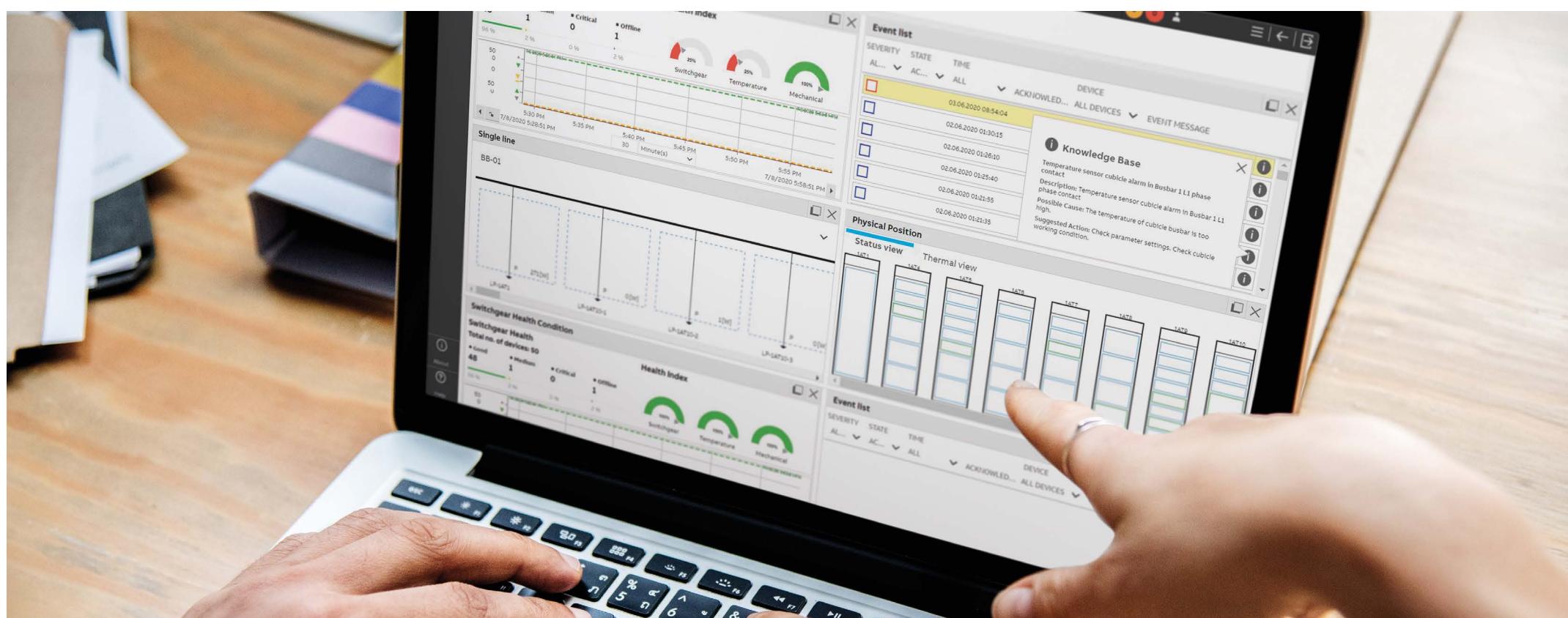
The MNS platform provides complete scalability across the entire portfolio with options for front or rear access designs. This coupled with the portfolio applications that fulfill requirements in all industry segments from final distribution to high-end process control and secure power systems, ensures MNS is the definitive solution for all applications.



# Higher asset availability with MNS Digital

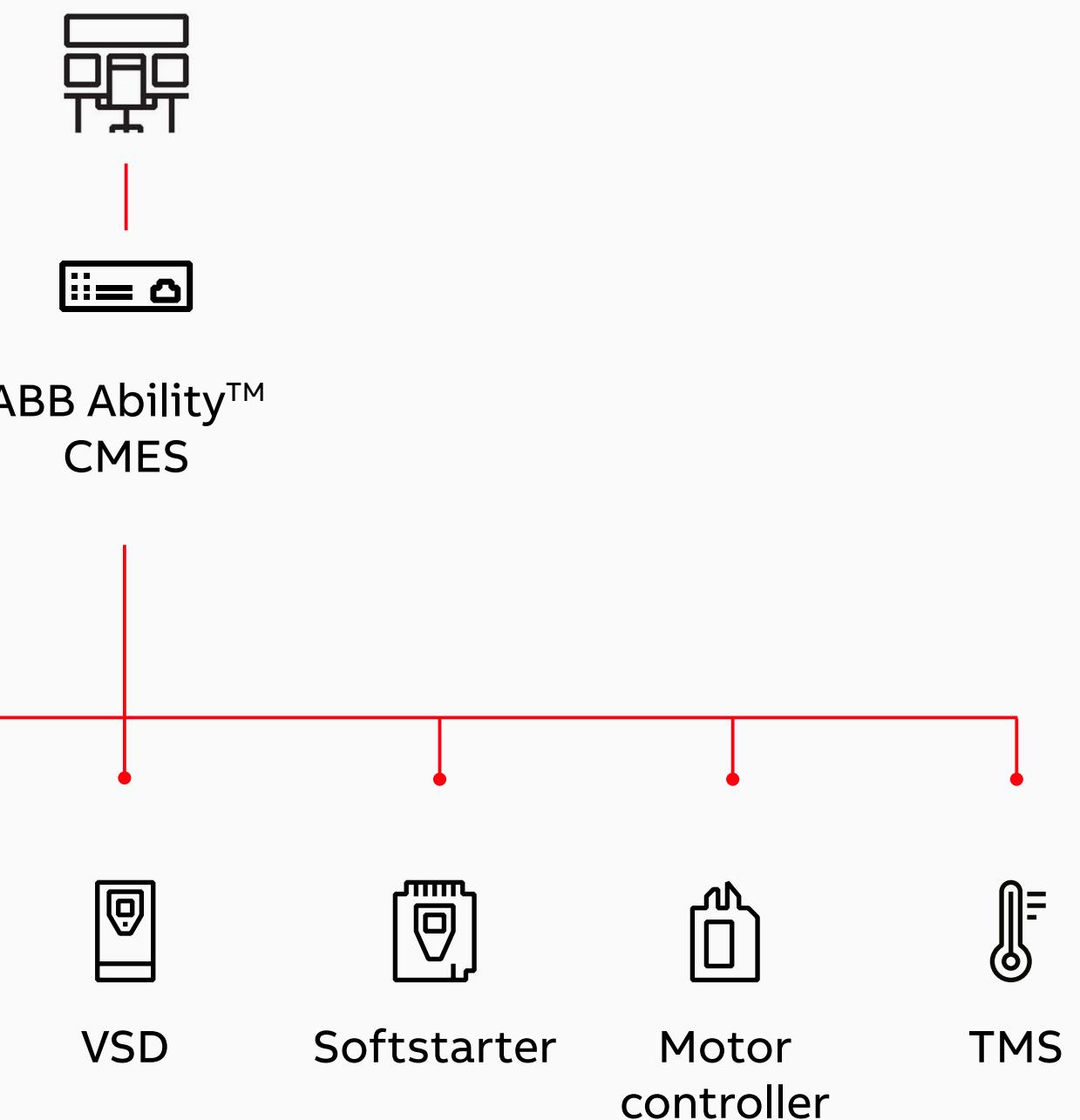
**MNS Digital** utilizes latest smart devices and technologies available in the proven MNS system platform and enables complete visibility for all the connected assets providing real-time information.

With the utilization of the on-site **ABB Ability™ Condition Monitoring for electrical systems (CMES)**, data is collected and analyzed to ensure continuous operation but also



maintenance is scheduled only when and where it is required (predictive maintenance). This reduces unwanted shutdowns and increases asset availability.

In addition, MNS Digital provide energy management data. Combining this data with the high availability and reliability offered by MNS enables optimization of operational procedures resulting in OPEX cost savings of up to 30%.



ACB: Air circuit breakers Emax2 with Ekip Touch / HiTouch

MCCB: Molded case circuit breakers Tmax XT

Motor controller: UMC100.3 / M10x - M

TMS: Temperature Monitoring System

VSD: Variable Speed Drives

# Setting new standard in sustainability

## Enabling a more sustainable and resource-efficient future

As a technology leader in electrification and automation, ABB is at the core of accelerating the energy transition. Every day, we empower customers across the globe to optimize, electrify, and decarbonize their operations.

Our Sustainability Agenda is fully in line with this mission. Guided by recognized best-practice standards and guidance, and embedded across our business, it aims to enable a low-carbon society, preserve resources and promote social progress for a net-zero future. Our actions are underpinned by our culture of integrity and transparency, extending across our value chain.

### Enabling low-carbon society

To enable a low-carbon society, we are taking action across our value chain. With our technologies, we empower customers to avoid emissions and ramp up renewables. To cut our own greenhouse gas emissions, we follow targets that are aligned with the Net-Zero Standard of the Science Based Targets initiative (SBTi). To go further, we work with our suppliers and partners.



### Preserving resource

To preserve the earth's resources for future generations, we are moving to circular business models that eliminate waste and keep products and materials in use. Our Circularity Approach covers all stages of the product life cycle, from design and sourcing, through production and use, all the way to responsible end-of-life services.

To support our customers in meeting their circularity commitments, we have in place retrofit, take-back, and recycling solutions and services that extend or give a second life to our products. Some examples include the recycling of large motors and the retrofitting of windmills, ships, and robots. With this support, we ensure some of the world's most complex and critical infrastructure lasts longer and operates in the most efficient way.

We are assessing our Circularity Approach against the latest regulatory developments and key sustainability standards that address circularity and product performance.



### Promoting social progress

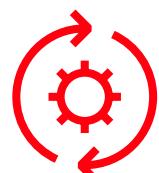
We believe in an inclusive energy transition to a net-zero future, with lifted-up communities, workers, and societies. We respect and promote human rights and dignity, and strive to create safe, fair, and inclusive working environments where our people can thrive. Community engagement is at the center of our Sustainability Agenda.

## ABB EcoSolutions

Leading the way to a circular economy

Our ABB EcoSolutions™ product portfolio helps customers and partners make more sustainable decisions. Each product's circularity value and environmental impact are fully transparent. We are continuously partnering across the value chain to innovate and expand our EcoSolutions portfolio.

ABB EcoSolutions products meet our circularity criteria in each stage of the product life cycle, as defined in ABB's circularity framework, and have Type III Environmental Product Declarations (EPDs). Product circularity values and EPDs are easily accessible through a QR code. Our EPDs meet high requirements for transparency and accuracy, and they are externally verified by a third party (compliant with ISO 14025 Type III).



### ABB's circularity criteria include:

- designed to last and made with more sustainable materials
- made with processes designed to avoid waste and increase sustainable packaging materials
- designed to increase resource and process efficiency while in use, be upgradable and optimize equipment lifetime
- supported by take-back services for refurbishment, reuse, or recycling of products and components, and accompanied by instructions for responsible end-of-life treatment.

### About sustainability and ABB MNS

ABB is enabling a more sustainable and resource-efficient future. Environmental product declarations for our switchgear solutions provide independent third-party verification of ABB's use of renewable energy and waste reduction in our operations.

With ABB MNS, you gain a long-lasting solution that gives you the ability to monitor energy usage in real-time, providing you with valuable insights to make informed sustainable choices.

It can connect to ABB Ability™, which will use the data you collect about your energy usage and turn it into insights. You can then use these insights to make better decisions to optimize your operations, schedule predictive maintenance, and improve sustainability while reducing your carbon footprint.

A global multi-year sustainability program has been rolled out in our facilities to enable a low-carbon society.

### The main pillars of our program are:

- Waste Management: optimize waste sorting, waste reduction, and waste reuse
- Paperless Factory: use e-drawings to minimize printing, optimize the usage of recycled paper
- Energy Initiatives: purchase green energy, move to 100% EVs, on-site green energy generation with solar power supply.

### Read more in our White paper:

ABB's third-party verified Environmental Product Declarations

#### Additional information

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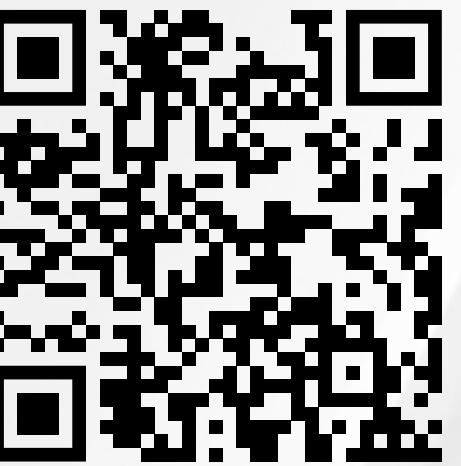


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