

Accelerating ABB's Mission to Zero

Graham Abrahams, senior vice president for the Electrification Products Division of ABB South Africa, talks about what is required to achieve net zero emissions by 2050.



The step towards ABB's Mission to Zero is to deploy digital solutions for smart green buildings and energy management, such as monitoring, control and optimisation.

“Achieving net zero emissions by 2050 will require a complete transformation of the energy landscape. The world wants an energy revolution. It wants a quick transition to a smarter, brighter, more sustainable future. ABB understands the urgency of this need. However, we also know that the transition cannot happen overnight,” begins ABB's Graham Abrahams.

He says that real progress will take a balanced approach with a journey mindset: Strategic investments scaled over time to reduce carbon emissions, waste and cost. The transition needs partners who enable the pathway with ROI, today and in the future. Partners who offer real solutions and are willing to invest in needed innovation for a low carbon future.

As a partner in a low carbon future, ABB can bring balance to this equation by enabling safe, smart and sustainable investment in low carbon technologies. “By combining the full power of our integrated automation, electrification and digitalisation solutions, we will help meet our commitments and maximise the value of our operational investments, while reducing carbon emissions, waste and cost throughout the energy transition journey,” says the company's senior vice president for ABB's Electrification Products Division.

“Not only ABB, but also our customers, want to contribute to a low carbon society. But, this requires a willingness to relinquish our collective dependency on the forms of

energy that result in the slow poisoning of the planet,” he adds.

He identifies five key steps to achieving carbon neutrality.

- The first is to deploy digital solutions for smart green buildings and energy management, such as monitoring, control and optimisation, which is the core of the Mission to Zero offering.
- Next is to increase energy efficiency by utilising building management systems and installing new, highly efficient motors and drives, for example.
- Maximising electrification is also important. For example, switching to heat pumps and having an EV charging infrastructure.
- The installation of renewable energy solutions, from photovoltaic technology and wind turbines, through to battery energy storage systems and thermal energy storage.
- Finally, procuring renewable energy from the grid and offsetting any remaining emissions.

In summary, Smartification, Digitalisation and Electrification of everything, coupled with energy efficiency and renewable electricity, is proving to be the solution for most carbon emissions. Nevertheless, some hurdles still exist.

From a technology standpoint, excessive consumption of electricity by inefficient equipment – for example, legacy HVAC systems, drives, pumps, etc – or simply due to poor asset or occupancy management,

result in vast energy wastage. This presents a huge potential for smart building energy management systems, coupled with highly efficient variable speed drives, purposely built and configured for the application.

Moreover, 100% electrification of heat in buildings with improper insulation can be inefficient. This creates a need for carbon-free high-temperature heating from bio-oil, biogas or hydrogen. From a business model standpoint, few building owners can afford deep energy efficiency retrofits.

“This is creating a need for OPEX-based financing models such as leasing or X-as-a-service. From a go-to-market standpoint, building owners expect ‘one-stop shop’ solutions. This creates a need for integrated end-to-end solutions and a necessity for solutions such as ABB's Mission to Zero to be adopted,” suggests Abrahams.

Products and solutions

As per ABB's Technology Blueprint, a typical smart building will use interconnected technologies to improve comfort and performance across energy management, water use, air conditioning, access, automation, lighting, remote monitoring, and communication networks.

Thanks to solution areas within the ABB Ability Building Ecosystem, building operators and facility managers can have digital control of all these elements, and smart buildings will capture their inherent opportunities to become more environmentally friendly – by substantially contributing to

carbon reduction targets through efficiency gains in heating and cooling equipment and in the building itself.

ABB digital solutions enable constant surveillance and optimum control of energy production, consumption and storage. Largely autonomous, this learning system calculates the optimum energy flow based on predictive data and compensates for deviations in real time. In a Mission to Zero site, these technologies are combined for a holistic approach that can easily be scaled according to the requirements of the building.

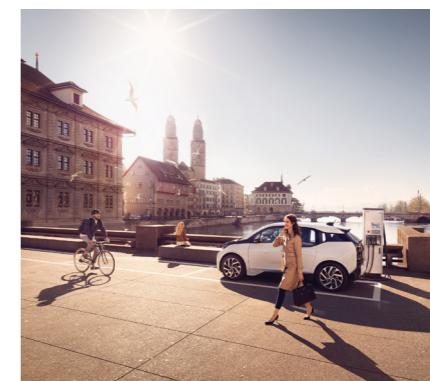
The digitalisation of buildings through connected technologies and building automation also has a key role to play in helping to manage grid resiliency and reliability, and to reduce energy costs while increasing energy efficiency.

Moreover, it is an important step towards the energy transition, as it enables the building to provide value-adding services towards the modern energy grid and thus supports the shift from ‘consumer’ to ‘prosumer’ – facilitating concepts such as virtual power plants and maximising the value of Distributed Energy Resources on a broader scale – such as photovoltaic and battery storage.

Within that context, the programme also strongly leverages on the ABB Ability™ Energy and Asset Manager for monitoring, optimisation and maintenance prediction using big data and artificial intelligence.

The typical solution scope for a Mission to Zero project includes:

- Distributed energy resources: Such as on-site photovoltaic technology, EV-chargers, energy storage, motors and drives, power supplies and protection, as well as digital solutions for energy management, including monitoring, control and multipurpose optimisation.
- Building automation and HVAC controls: Such as digital integration platforms, building automation and con-



Left: ABB's Mission to Zero strategy highlights electric vehicle charging infrastructure (EVCI) for fast (DC) and slow (AC) charging applications. Right: ABB advocates and offers the installation of renewable energy solutions, from photovoltaic technology and wind turbines, through to battery energy storage systems and thermal energy storage.



trol, HVAC control and optimisation, space management, wellness and productivity, lighting and shading control, and presence detection.

Although borne from the Electrification Business Area, Mission to Zero spans the entire organisation and many product and solution sets, combined with third party technology via the partnership ecosystem.

These include:

- Building control and automation through ABB Ability™ Building Ecosystem, including HVAC, lighting, and shading control and automation via i-bus® KNX and ABB Cylon® BACnet® solutions.
- Metering, monitoring and optimisation of electrical power and energy flows through ABB Ability™ Energy and Asset Manager platforms.
- Power distribution with ABB System pro E power or MNS® 3.0 low-voltage switchgear, including Emax 2 air circuit breakers or NEO Gear low-voltage switchgear solutions.
- Electric vehicle charging infrastructure (EVCI) for fast (DC) and slow (AC) charging applications.
- Highly efficient and smart electrical motors and variable speed drives.

- Battery energy storage systems (BESS) for maximising PV self-consumption and peak-shaving.
- Photovoltaic systems for local green energy generation, which are provided by partners.

“With our 2030 sustainability strategy, we are actively enabling a low-carbon society as well as working with our customers and suppliers to implement sustainable practices across our value chain and the lifecycle of our products and solutions. We are equally committed to driving social progress, along with our suppliers and in our communities,” says Abrahams.

“A key part of our 2030 sustainability strategy is to support our customers and suppliers to reduce their emissions and achieve carbon neutrality in our own operations. Our greenhouse gas emissions reduction targets have been validated by the Science Based Targets initiative as being in line with the 1.5 °C scenario of the Paris Agreement. “But to ensure that we are focused on achieving our goals, our sustainability targets are integrated into our decision-making processes, plus we have accountabilities and incentive plans in place to drive action,” he concludes.

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Industrial facilities are a key part of ABB's Mission to Zero.