Smart Factory solutions

How to implement a successful digital transformation

Smart Factory: Lexington, US

Life Is On | Schneider Electric

Agenda

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Welcome to the Smart Factory

The world of industry is changing at an unprecedented pace, and **the digital transformation is in full swing**. To get ahead, we must change the way we produce goods and deliver services.

At Schneider Electric, we understand the importance of smart solutions for manufacturing… because we use them ourselves.
With EcoStruxure™, we're implementing the IIoT throughout our global supply chain.

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Smart Factory showcases

Our sites:

1. Hyderabad, India
2. Le Vaudreuil, France
3. Wuhan, China
4. Beijing, China
5. Lexington, KY, USA
6. Cavite, Philippines
7. Monterrey, Mexico
8. Batam, Indonesia
9. Bangalore, India
10. Cikarang, Indonesia

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Addressing cybersecurity challenges on multiple levels

Cybersecurity solutions for operational lifecycle:
Consulting, integration, and managed security services

Technology partnerships:
Situational awareness, compliance, change management, big data security

System deployment:
Greater security for delivery of project and services during product or system deployment

**Cybersecurity by design:
More secure products, solutions, and software**

End-to-End Cybersecurity

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Achieve a more sustainable production process

The **Smart Factory program** boosts **sustainability** through:

- Operational and energy efficiencies with EcoStruxure

- End-to-end efficiency of manufacturing operations through:

  - Energy efficiency

  - Process efficiency

  - Asset performance management

As a result, the program contributes to our and our customers' overall sustainability ethos, including hitting sustainability targets.

21%
energy savings achieved at some sites

377 tons
of CO_2 reduced

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Discover the benefits of Smart Factories

This presentation shows how Schneider Electric has digitally transformed its manufacturing operations **at its Smart Factory facilities** and how you can do the same, through:

Getting started with digitization

Empowering the workforce

Connecting factory machines

Increasing productivity

Boosting energy efficiency

Strengthening traceability
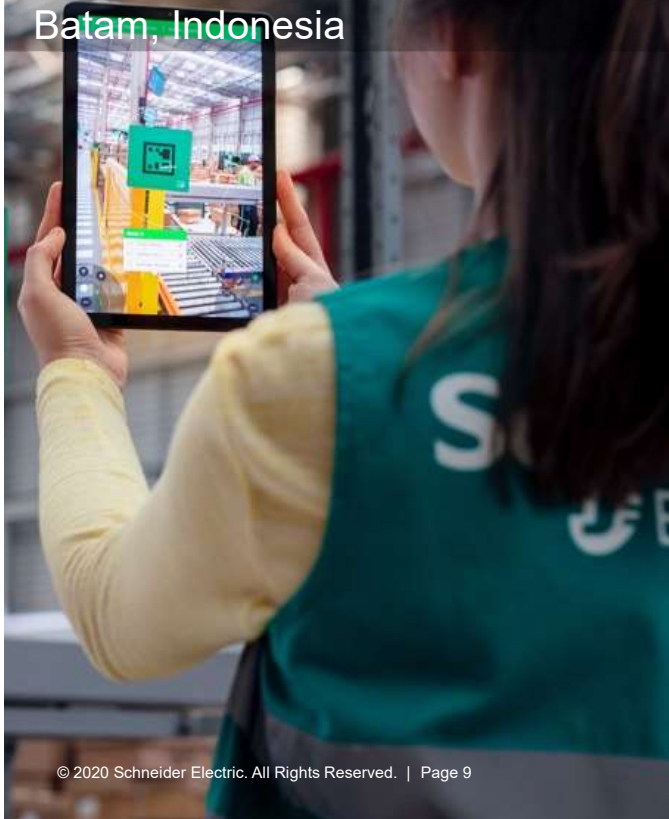
Optimizing asset management

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How to get started with digitization

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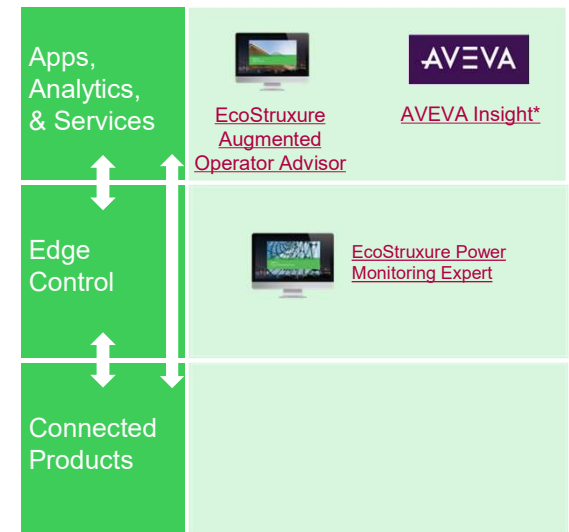# Taking the first steps in your digital transformation

Batam, Indonesia

Steps taken

- Upgraded factory equipment with connected products and IoT boxes

- Achieved real-time monitoring and faster action with digital documentation

- Alert system provided the right information to the maintenance team

Benefits

- **-17%** maintenance time

- **-44%** downtime

- **-40%** scrap cost

- **+20%** product return rate

- **-67%** response time (AA)

- **-5%** energy costs (PME)

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Augmented Operator Advisor	AVEVA Insight*
Edge Control	EcoStruxure Power Monitoring Expert	
Connected Products		

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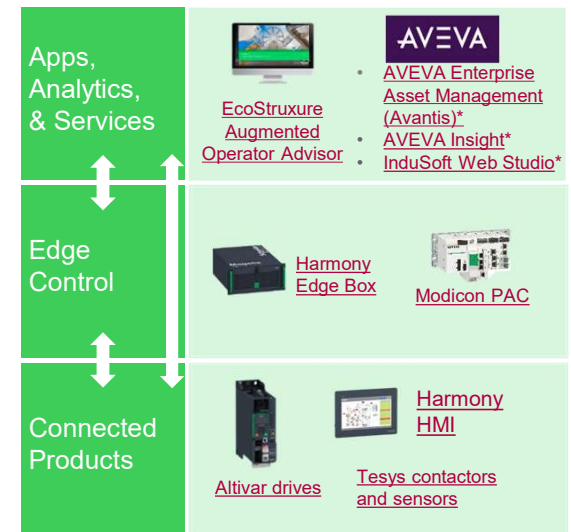# Digitizing your greenfield site

Monterrey, Mexico

⚙ Steps taken

- Aligned factory set-up to the three levels of EcoStruxure integration: with Connected Products, Edge Control, and Apps, Analytics and Services solutions from EcoStruxure Power

- Installed energy meters and used EcoStruxure Power Monitoring Expert to reduce energy usage

☆ Benefits

- **-30%** downtime

- **+20%** efficiency

- **-20%** mean time to repair

- **710,000** KWh saved in one year – equivalent to **277** tons of **CO_2**

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Augmented Operator Advisor	AVEVA • AVEVA Enterprise Asset Management (Avantis)* • AVEVA Insight* • InduSoft Web Studio*
Edge Control	Harmony Edge Box	Modicon PAC
Connected Products	Altivar drives	Harmony HMI Tesys contactors and sensors

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Digitizing your brownfield site

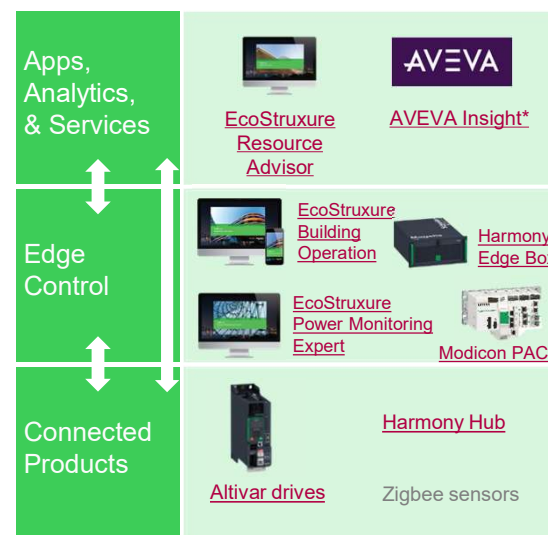## Le Vaudreuil, France

⚙ Steps taken

- Connected key aspects of factory operation
- Installed management system
- Implemented cybersecurity training

☆ Benefits

- **+7%** operational efficiency
- **+10%** energy savings
- **-30%** cost of critical equipment maintenance

Eco truxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Resource Advisor	AVEVA Insight*
Edge Control	EcoStruxure Building Operation / EcoStruxure Power Monitoring Expert	Harmony Edge Box / Modicon PAC
Connected Products	Altivar drives	Harmony Hub / Zigbee sensors

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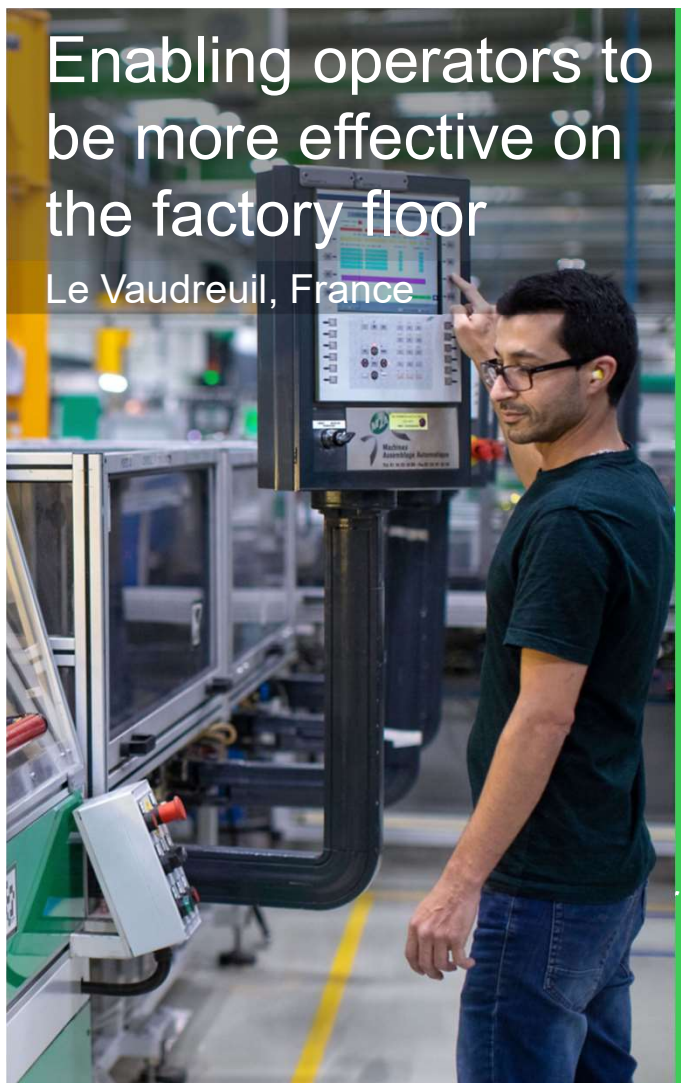
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How to empower your workforce

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Enabling operators to be more effective on the factory floor
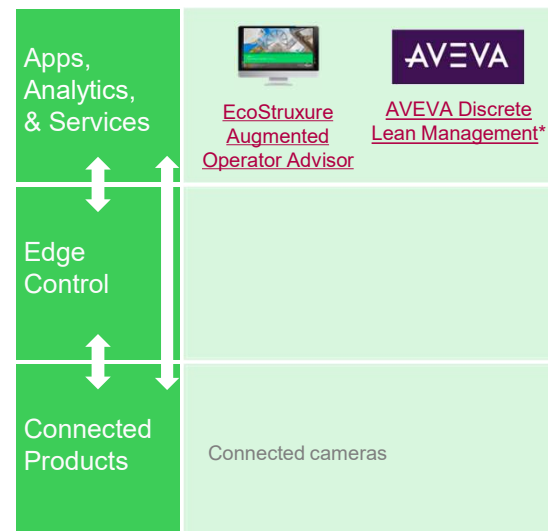
Le Vaudreuil, France

⚙ Steps taken

- Implemented a rigorous change management program along with connected technologies

☆ Benefits

- **50x** implementation of ideas coming from the shop floor

- **-20%** diagnosis time

- **-30%** maintenance costs

- Increased worker engagement

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Augmented Operator Advisor	AVEVA Discrete Lean Management*
Edge Control		
Connected Products	Connected cameras	

Additional technologies:
- 3D printing
- 3D vision control operator help with Gooroo solution (POC)
- Virtual reality training

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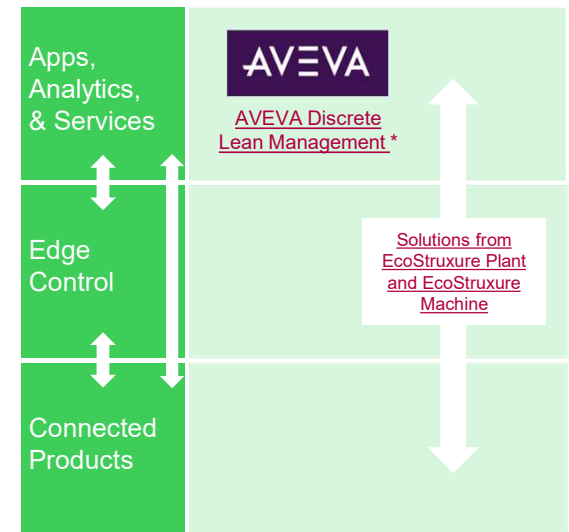# Enabling operators to be more effective on the factory floor

Wuhan, China

⚙ Steps taken

- Enhanced transparency, visibility, and reactivity with lean digitization system
- Reinforced control process and traceability
- Implemented SIM cycle to simplify on-site management
- Introduced new technologies to the factory, including AI, automation by cobots and Automated Guided Vehicles (AGVs)
- Moved to paperless operations

☆ Benefits

- **+12%** labor productivity
- **-15%** quality issues
- **-5-10%** lead time
- **+4%** increase in overall equipment efficiency (OEE)
- **-21%** energy use
- **-10%** maintenance costs
- Paperless operations

EcoStruxure™ for Industry

Apps, Analytics, & Services	AVEVA AVEVA Discrete Lean Management *	
Edge Control		Solutions from EcoStruxure Plant and EcoStruxure Machine
Connected Products		

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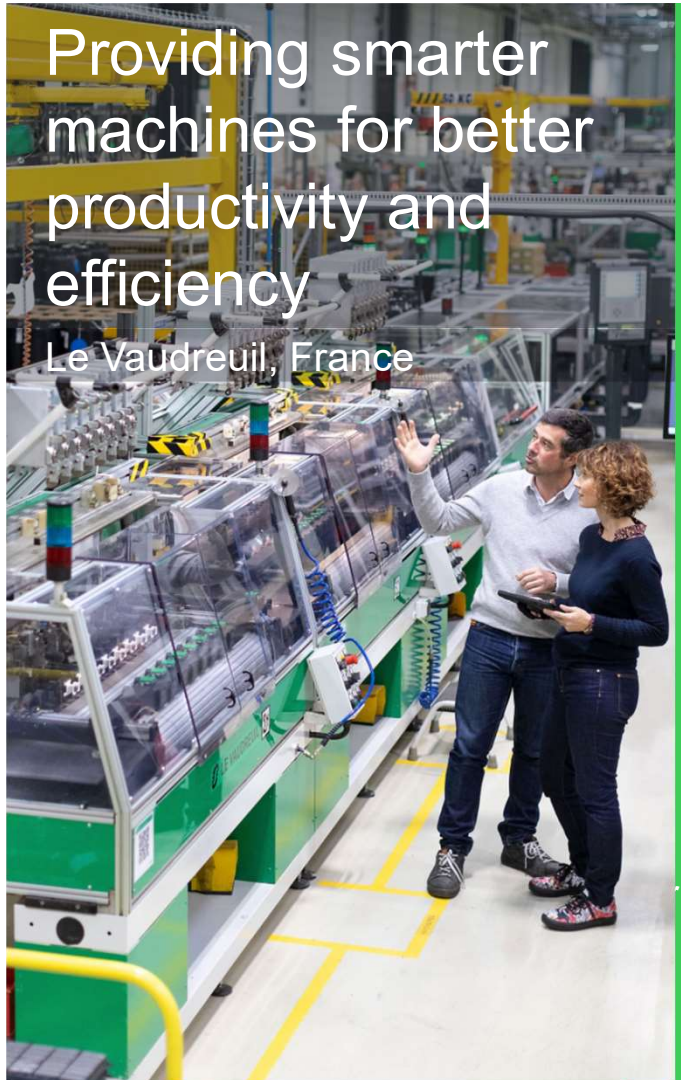
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How to connect your machines

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Providing smarter machines for better productivity and efficiency
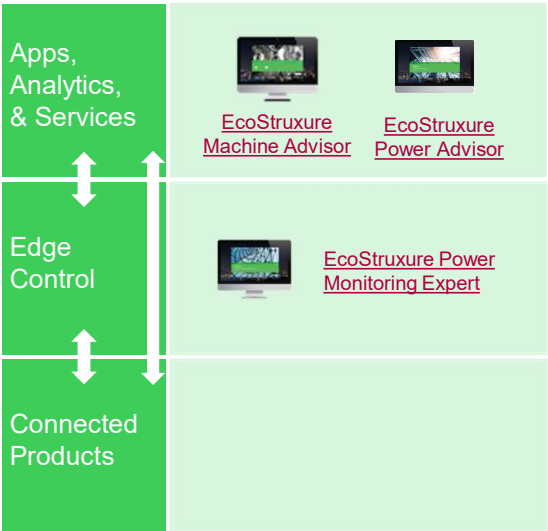
Le Vaudreuil, France

⚙ Steps taken

- Improved implementation process to facilitate the deployment of new technologies

☆ Benefits

- Delivery time of raw materials to production lines reduced from **90** minutes to **18** minutes

- Fewer workplace injuries

- More robust production

Eco truxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Machine Advisor	EcoStruxure Power Advisor
Edge Control	EcoStruxure Power Monitoring Expert	
Connected Products		

Additional technologies:
- Collaborative Robot (Cobot)
- Automated Guided Vehicle (AGV)

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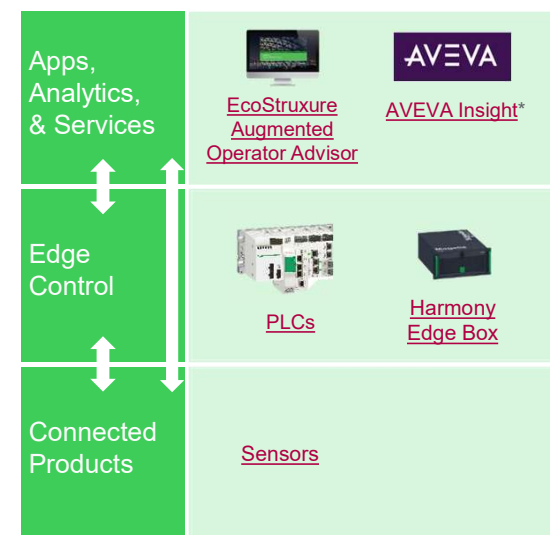# Providing smarter machines for better productivity and efficiency

Hyderabad, India

⚙ Steps taken

- Connected machines for real-time monitoring of critical machines and quality of output
- Enabled monitoring helps decrease machine downtime and reduce costs

☆ Benefits

- **-10%** machine downtime
- **-8%** cost of repair and spare parts
- **-40%** mean time to repair (MTTR)

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Augmented Operator Advisor	AVEVA Insight*
Edge Control	PLCs	Harmony Edge Box
Connected Products	Sensors	

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Providing smarter machines for better productivity and efficiency
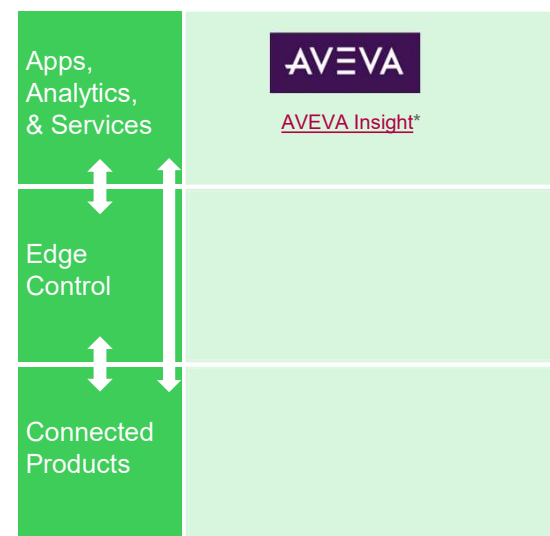
Lexington, KY, USA

Steps taken

- Connected key aspects of the operation

- Implemented management platform

Benefits

- Instant access to data

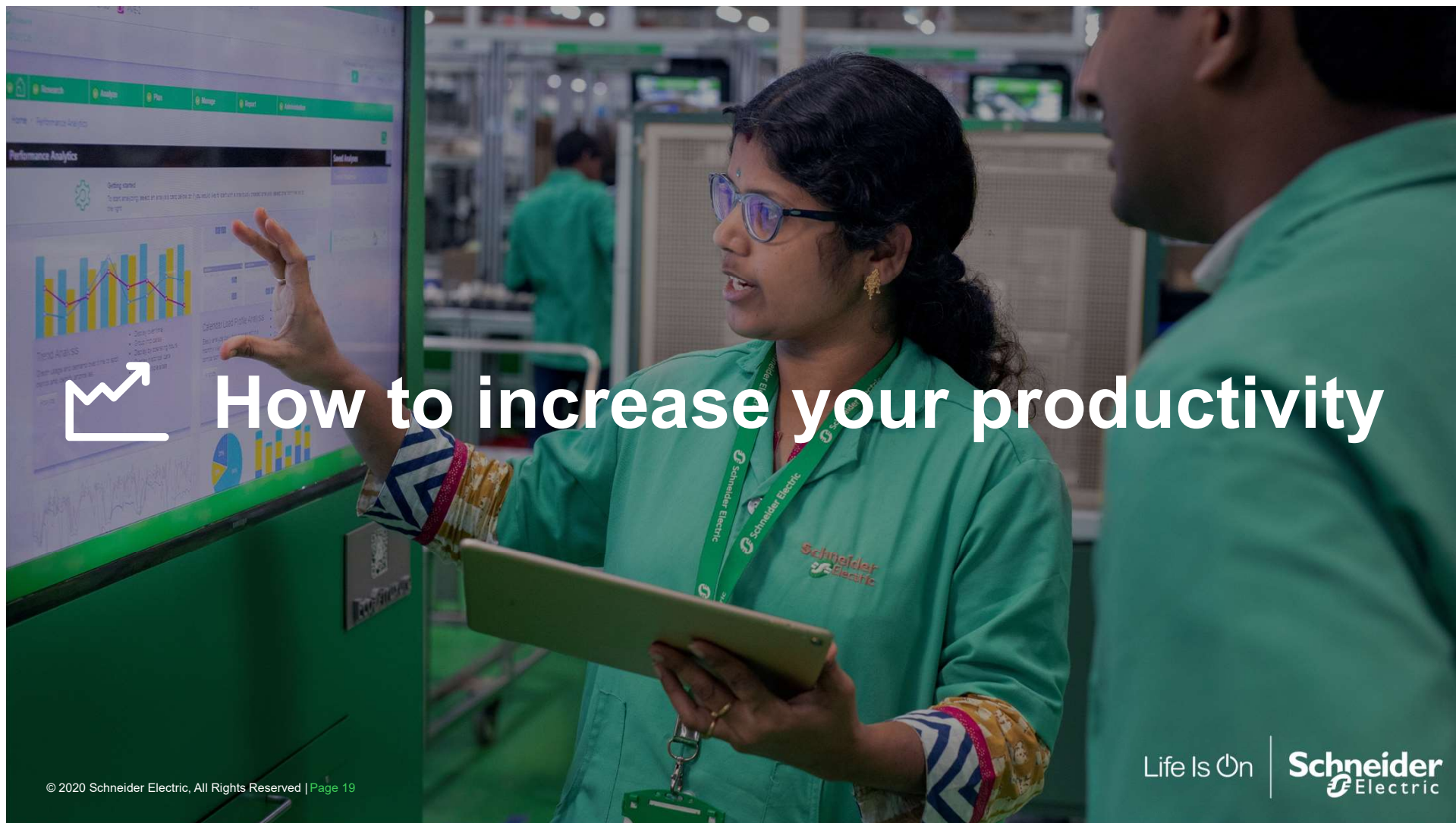- Ability to visualize data and share

- **-6%** unplanned downtime

Eco truxure™ for Industry

Apps, Analytics, & Services	**AVEVA** AVEVA Insight*
Edge Control	
Connected Products	

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How to increase your productivity

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Ensuring greater control for higher throughput and faster processing
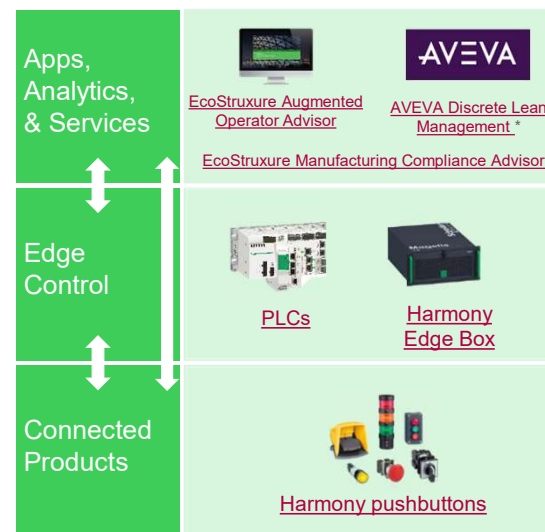
Hyderabad, India

Steps taken

- Smart solutions implemented to increase productivity by:
  - Improving shop floor efficiency
  - Reducing machine downtime
  - Decreasing warehouse operating costs
  - Improving conformance testing to regulatory standards

Benefits

- **+2%** industrial efficiency
- **-40%** mean time to repair (MTTR)
- **+8%** cost optimization

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Augmented Operator Advisor · AVEVA Discrete Lean Management *
	EcoStruxure Manufacturing Compliance Advisor
Edge Control	PLCs · Harmony Edge Box
Connected Products	Harmony pushbuttons

Additional technologies:
Automated Guided Vehicle

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Increased productivity
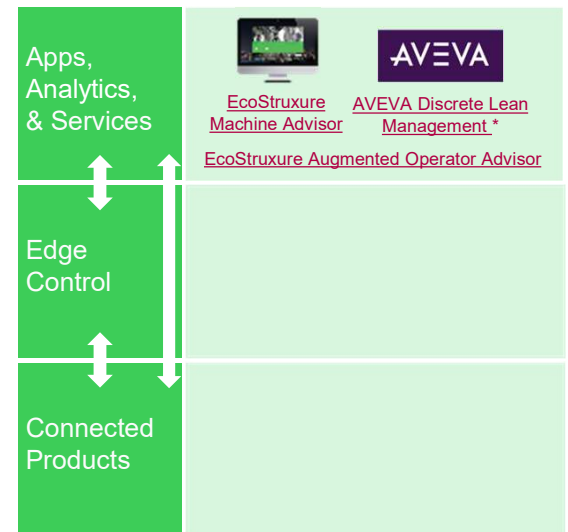
Beijing, China

⚙ Steps taken

- Live monitoring and control of line performance

- Alarm system

☆ Benefits

- **+8.7%** direct labor productivity

- **+20%** overall equipment effectiveness (OEE)

- **-50%** customer claims

Eco truxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Machine Advisor	AVEVA Discrete Lean Management *
	EcoStruxure Augmented Operator Advisor	
Edge Control		
Connected Products		

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How to boost your energy efficiency

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Enabling visibility, control, and optimization of power consumption & costs
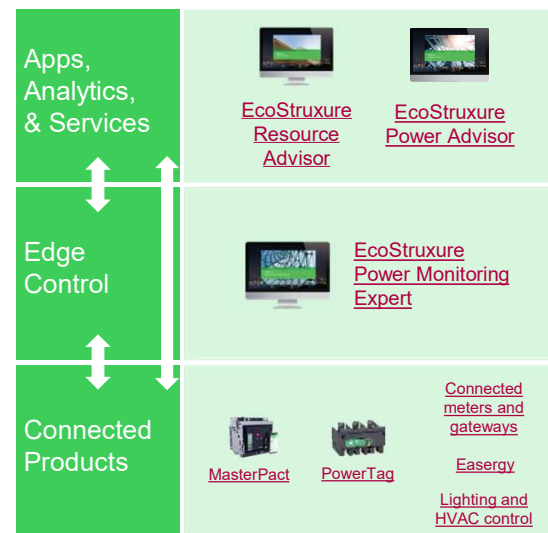
Cavite, Philippines

⚙️ Steps taken

- Improved visibility and control of energy costs and usage

- Optimization of power consumption and costs

☆ Benefits

- **-14%** energy use

- **+$900K** in annual cost savings

- **4.11 GWh** annual energy savings

- **100%** energy spend covered by EcoStruxure Resource Advisor

- Energy and sustainability insights

- Real-time power monitoring

- Greater energy efficiency and power reliability

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Resource Advisor	EcoStruxure Power Advisor
Edge Control	EcoStruxure Power Monitoring Expert	
Connected Products	MasterPact PowerTag	Connected meters and gateways Easergy Lighting and HVAC control

Life Is On | **Schneider** Electric

Enabling visibility, control, and optimization of power consumption & costs
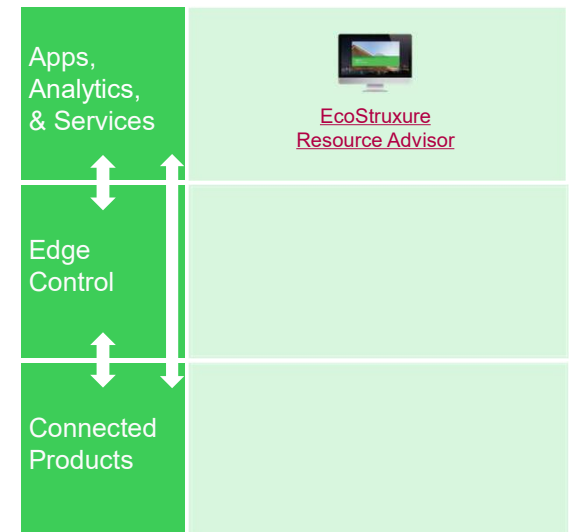
Lexington, KY, USA

⚙ Steps taken

- Implemented new management platform

☆ Benefits

- **3.4%** year-on-year savings on plant-level energy spend

- Ability to benchmark and compare facility data

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Resource Advisor
Edge Control	
Connected Products	

Life Is On | Schneider Electric

Enabling visibility, control, and optimization of power consumption & costs
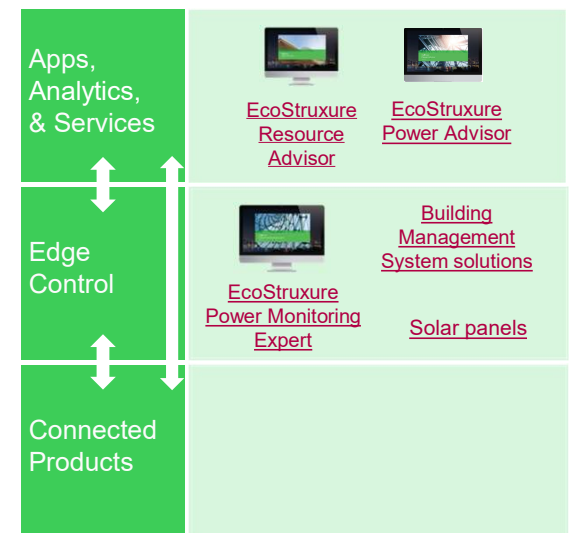
Beijing, China

⚙️ Steps taken

- Implemented live monitoring and control of energy consumption

- Alarm and escalation system

☆ Benefits

- **+6.2%** manufacturing volume

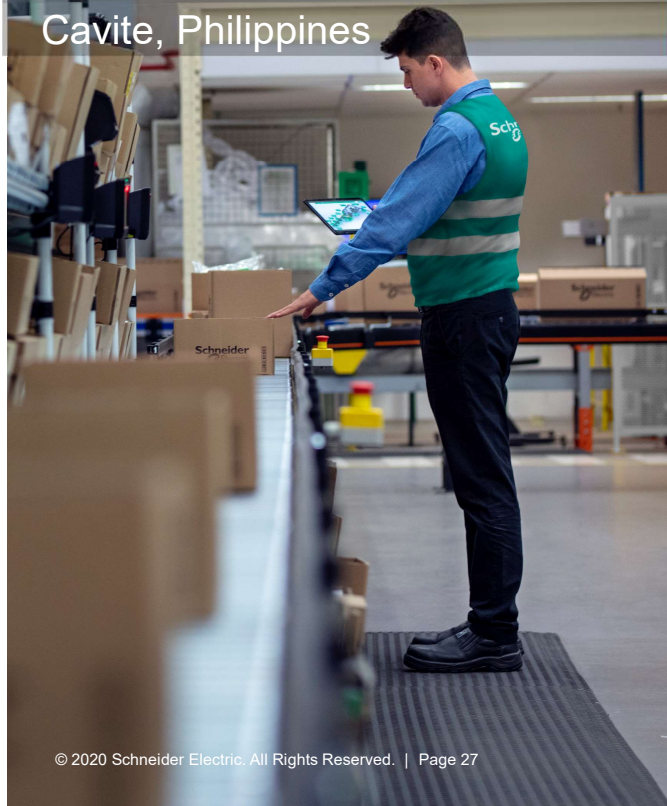- **-15.6%** energy consumption

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Resource Advisor	EcoStruxure Power Advisor
Edge Control	EcoStruxure Power Monitoring Expert	Building Management System solutions Solar panels
Connected Products		

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How to realize traceable operations

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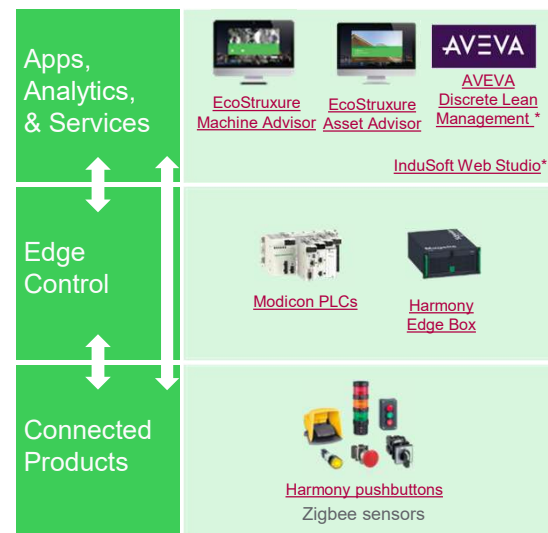# Driving better, faster decisions through increased visibility

Cavite, Philippines

⚙ Steps taken

- Delivered lean digitization through transparency, visibility, and reactivity

- Reinforced control process through system platform implementation

☆ Benefits

- ROI in less than **1.5** years

- Simplified shop-floor management across Cavite manufacturing sites

Eco☲truxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Machine Advisor	EcoStruxure Asset Advisor	AVEVA Discrete Lean Management *
			InduSoft Web Studio*
Edge Control	Modicon PLCs	Harmony Edge Box	
Connected Products	Harmony pushbuttons	Zigbee sensors	

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Driving better, faster decisions through increased visibility
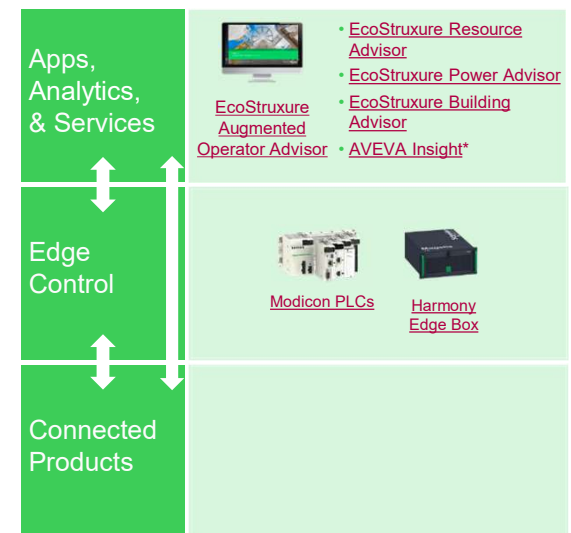
Hyderabad, India

⚙ Steps taken

- Brought in smart technology and connected machines for more visibility

☆ Benefits

- Improved quality
- Real-time data monitoring

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Augmented Operator Advisor	• EcoStruxure Resource Advisor • EcoStruxure Power Advisor • EcoStruxure Building Advisor • AVEVA Insight*
Edge Control		Modicon PLCs Harmony Edge Box
Connected Products		

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How to optimize your asset use

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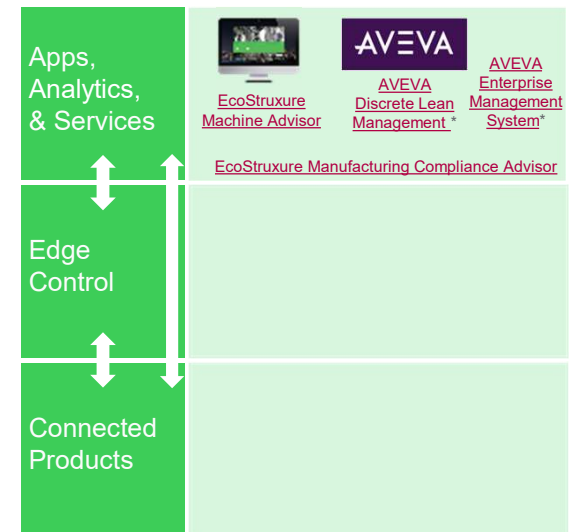# Optimizing asset use to improve profitability

Batam, Indonesia

⚙ Steps taken

- Preventive maintenance proactively planned and managed
- Set up machine performance monitoring
- Connected products installed
- Lean digitization system apps installed on all production lines for faster and more reactive issue resolution

☆ Benefits

- **-18%** mean time to repair (MTTR)
- **+49%** mean time between failures
- **+12%** efficiency

Eco☰truxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Machine Advisor	AVEVA Discrete Lean Management *	AVEVA Enterprise Management System*
	EcoStruxure Manufacturing Compliance Advisor		
Edge Control			
Connected Products			

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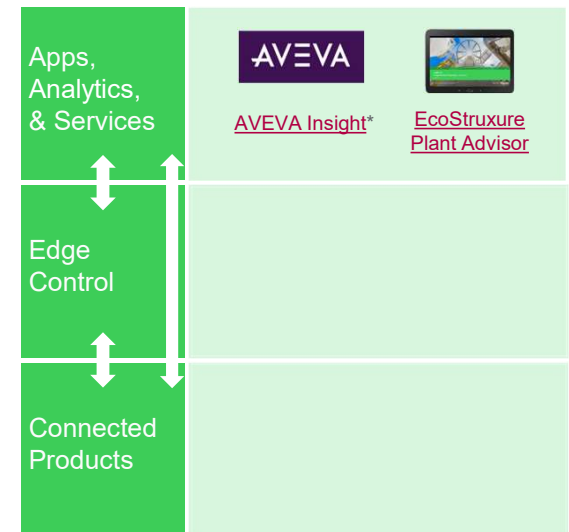# Effectively managing data

Across the Smart Factory network

⚙ Steps taken

- Agile methods to deploy applications and solutions based on data (using a data model to use data efficiently)
- Advanced analytics delivered to factories to help accelerate their decision making
- Benchmarking across sites to find opportunities for improvement

☆ Benefits

- **Increased site productivity:** This not only includes labor productivity but also "white collar" savings that can be achieved through efficient access to reliable data that saves time on data collection so more time can be spent on value-added actions

EcoStruxure™ for Industry

Apps, Analytics, & Services	AVEVA AVEVA Insight*	EcoStruxure Plant Advisor
Edge Control		
Connected Products		

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Cybersecurity

All locations have robust cybersecurity practices in place

Steps taken

Risks addressed:
- Business disruption – distribution and production centers
- Damage to customer assets – compromised software and firmware

Mitigation:
- Identify – people & assets
- Protect – awareness and do's & don'ts, shop floor and production lines, including assets
- Detect and respond – vulnerabilities and cyber incidents
- Recover – business continuity plan, disaster recovery plan

Our differentiation

- Vendor-agnostic solution capabilities
- Understand and apply IT cybersecurity solutions within OT context and perspective
- Flexible security solutions to ensure maximum value and efficiency
- Customized controls based on customer requirements
- Deep understanding of OT priorities and concerns

Key enablers

- Cybersecurity site leader
- OT visibility and monitoring
- Connected Services Hub
- Security Operations Center
- Physical security
- Firewalls

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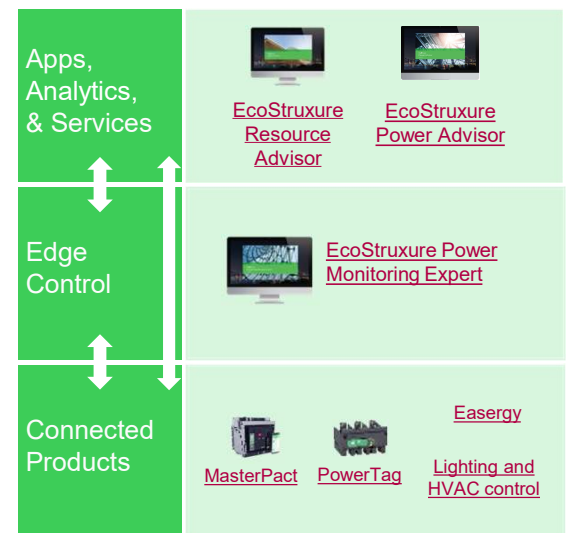
Sustainability

Across the supply chain

⚙ Steps taken

- See where energy is used and wasted in Smart Factories and Smart Distribution Centers
- Circular design and lifecycle processes
- Decarbonization of processes

☆ Benefits

- **+12%** revenue from circular business models
- **Two million** assets under management (AUM)
- **43,000+** tons primary resources avoided
- **178** sites labeled 'Towards Zero Waste to Landfill'
- **80%** renewable electricity

EcoStruxure™ for Industry

Apps, Analytics, & Services	EcoStruxure Resource Advisor	EcoStruxure Power Advisor
Edge Control	EcoStruxure Power Monitoring Expert	
Connected Products	MasterPact PowerTag	Easergy Lighting and HVAC control

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Accelerate your own digital journey

Take advantage of our advanced **solutions that are creating the factories of the future**, simplifying digital transformation and boosting businesses and operations.

Our Smart Factories feature solutions from EcoStruxure Plant, Machine, Building, Power, and Grid, with cybersecurity built in at each step.

Discover our future-ready EcoStruxure solutions and advance your factory's digitization journey, today!

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