Global
DIGITAL
Transformation Benefits Report

Life Is On | Schneider Electric

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Contents

Introduction

The world is heading toward a digitized future. Already, an entire generation has grown up immersed in the digital world. Digital transformation — or the widespread adoption of digital technologies to disrupt business models, create efficiencies, and enhance customer experience — is reinventing core aspects of human existence, from homes to industry, buildings to cloud, and beyond. The digital transformation of energy management and automation lies at the core of this journey, enabling the emergence of a new landscape of energy, a paradigm shift for the industry, and a revolutionized experience.

Unquestionably, there is an urgent need to transform the way the world uses its resources, among which energy is central. Despite the threat of global climate change, the world is growing more resource hungry by the year. Digital transformation is key to resolving this paradox. If we focus on energy, cumulative energy savings in buildings alone as a result of digitization could save 65 petawatt hours by 2040 — equivalent to the total final energy consumed by non-Organization for Economic Coordination and Development countries (including China and India) in 2015.[1] By expanding digital transformation across buildings, data centers, industry, and infrastructure, we can together create a more efficient, reliable, safe, and sustainable world.

[1] International Energy Agency, "Digitalization and Energy," November 2017, https://www.iea.org/digital/

The business case for digital transformation

It is clear that, broadly speaking, a return on investment exists for digital transformation. A World Economic Forum and Accenture analysis using data from 16,000 companies found that there is an overall positive return on investment, although most of the gains are clustered among industry leaders.[2] These early adopters saw a 70 percent productivity increase, compared to just 30 percent for industry followers.[3] It is no wonder, then, that 85 percent of industrial equipment executives feel that to maintain a competitive edge, they have to innovate faster.[4]

Many executives, including Schneider Electric CEO Jean-Pascal Tricoire, understand digital transformation as a matter of "disrupt or be disrupted."[5] Consider that emergent digital business models are a "principal reason" why half the Fortune 500 companies from 2000 have disappeared from this prestigious ranking.[6] These findings bring the business case for digital transformation into crystal-clear urgency.

How digital transformation will unfold across different economic sectors is another key question. Four key sectors warrant further discussion as they are all central to global commerce and ripe for deep transformation: buildings, data centers, industry, and infrastructure.

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[2] World Economic Forum, in collaboration with Accenture, "Maximizing the Return on Digital Investments," May 2018, http://reports.weforum.org/digital-transformation/files/2018/05/201805-DTI-Maximizing-the-Return-on-Digital-Investments.pdf

[3] Note: These percentages vary by industry segment. World Economic Forum, in collaboration with Accenture, "Maximizing the Return on Digital Investments," May 2018, http://reports.weforum.org/digital-transformation/files/2018/05/201805-DTI-Maximizing-the-Return-on-Digital-Investments.pdf

[4] Accenture, "Manufacturing the Future," March 2018, https://www.accenture.com/t20180327T080042Z__w__/ie-en/_acnmedia/PDF-74/Accenture-Pov-Manufacturing-Digital-Final.pdf

[5] Jean-Pascal Tricoire, "Disrupt or Be Disrupted: Innovation for the Sake of Customers," April 2018, https://blog.schneider-electric.com/energy-management-energy-efficiency/2018/04/05/disrupt-or-be-disrupted-innovation-for-the-sake-of-customers/

[6] World Economic Forum, "Digital Disruption Has Only Just Begun," January 2016, https://www.weforum.org/agenda/2016/01/digital-disruption-has-only-just-begun/

Buildings

In buildings, the business value of digital transformation lies in lower energy use, greater occupant comfort, and simplified operation. In terms of energy, buildings account for 36 percent of all global final energy use and 39 percent of carbon emissions.[7] And yet, the technology exists now for buildings to generate more energy than they use. For example, the Edge, Deloitte's office building in the Netherlands, generates 102 percent of its own power through a combination of energy management, automation, and IoT connectivity. It is this same IoT connectivity that enables app-based environmental control over lighting and temperature, thereby driving occupant comfort. In fact, since the building's opening, not one occupant comfort complaint has been filed.[8] Finally, the building's open, interoperable management system streamlines operation and maintenance issues into a single dashboard, with real-time alarm notifications and pinpointed issue diagnosis.

Data Centers

The power requirements of IT physical infrastructure, from cooling to back-up power systems, are increasingly eating into budgets — cooling alone can account for 40 percent of the data center's total costs.[9] At the same time, a widely cited forecast predicts that by 2025, the information and communications technology industry's electricity consumption will balloon to 20.9 percent of the entire global total, and thus account for 5.5 percent of global greenhouse gas emissions.[10]

In contrast to these concerning projections, successful cases of digitally transformed data centers are emerging around the world. This new breed of data center, whether a cloud / colocation provider or an edge site, can deploy 20 percent faster with modular infrastructure.[11] In terms of operation, stories such as China Unicom's paint a hopeful picture of what is now possible. In two of their hyperscale cloud data centers, totaling over 600,000 square meters, they have achieved 99.999 percent uptime while cutting operational costs by over 30 percent. This ability to do more computing with less cost was made possible through an integration of supervisory software, cloud analytics, and on-site expert support.

[7] UN Environment and International Energy Agency, "Towards a Zero-emission, Efficient, and Resilient Buildings and Construction Sector. Global Status Report 2017," https://www.worldgbc.org/sites/default/files/UNEP%20188_GABC_en%20%28web%29.pdf

[8] Schneider Electric, "The World's Most Sustainable Office," https://www.schneider-electric.com/en/work/campaign/life-is-on/case-study/the-edge.jsp

[9] Z. Song, X. Zhang, and C. Eriksson, "Data Center Energy and Cost Saving Evaluation," Energy Procedia, August 2015, https://www.sciencedirect.com/science/article/pii/S1876610215009467

[10] Nicola Jones, "How to stop data centers from gobbling up the world's electricity," Nature, September 2018, https://www.nature.com/articles/d41586-018-06610-y

[11] "Internal data, 2018."

Industry

The same promise of doing more with less applies to the industrial sector. The industrial internet of things (IIoT) connects inventory to smart sensors across the supply chain, making it easier than ever to bring goods to market faster, with lower production costs — the holy grail for industrial companies. On top of that, digitally driven plants, with their seamless record keeping and real-time monitoring, ease regulatory compliance and better mitigate environmental impacts. Despite this potential, an Accenture report found that only 7 percent of surveyed C-suite decision-makers reported a comprehensive IIoT strategy.[12]

Companies that do enact a comprehensive strategy are seeing results. In the case of New Belgium Brewery, a US-based craft brewery, intelligent sensors were integrated with a new automation system to help the plant vastly increase their output with existing machines. New Belgium increased overall equipment effectiveness from 45 to 65 percent in two years and decreased equipment downtime by over 50 percent. Their story shows that digital transformation can create significant productivity gains by digitizing complex legacy machines and processes.

Infrastructure

Infrastructure, whether publicly or privately owned, will be put to the test in the coming decades. Expanding populations, especially in new economies, will continue to stress the systems that move people, products, and energy around the world. In addition, the urgency of global climate change will require infrastructure to meet this growing capacity while concurrently reducing emissions. This energy paradox must be resolved — and it will, through digital transformation.

The electric power industry has onboarded digital transformation. The smart grid, perhaps the most intricate "machine" ever made, is home to billions of components (e.g., electric meters, transformers, capacitors, phasor measurement units, and power lines) that are now being brought under the control of a centralized digital architecture.[13] When the grid becomes fully connected, it will become far more responsive to ever-changing environmental and load conditions, making it more reliable, while also generating troves of data that can be used to optimize efficiency, enable two-way energy flow, and accelerate the shift toward renewable energy transition. With these advances, the grid will be better suited to respond to the dual trends of population growth and decarbonization.

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[12] "Winning with the Industrial Internet of Things," 2015,
https://www.accenture.com/t00010101T000000Z__w__/it-it/_acnmedia/PDF-5/Accenture-Industrial-Internet-of-Things-Positioning-Paper-Report-2015.pdf

[13] Thomas M. Siebel, "Why Digital Transformation is Now on the CEO's Shoulders," McKinsey Quarterly, December 2017,
https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/why-digital-transformation-is-now-on-the-ceos-shoulders#

Where we are now

Taken together, these four sectors of the economy — buildings, data centers, industry, and infrastructure — are all undergoing transformations that will fundamentally change the way people will live, work, and play.

Despite this potential, many countries and industries are operating well below their digital potential. For example, the US, in achieving just 18 percent of its potential, is well ahead of most of Europe.[14] The reason for this lag is largely a matter of complexity. A survey of chief information officers identified "complex legacy technology" as the primary barrier to digital transformation.[15] Another survey of business and IT professionals echoes this sentiment, with a majority reporting "increasing complexity of their technology ecosystem" and low confidence in resolving digital performance problems.[16]

A blueprint for successful digital transformation

These surveys and reports indicate that many businesses and organizations need a trusted authority to manage this complexity to unlock the full potential of digital transformation. Schneider Electric™ has travelled the road of digital transformation for decades. Twenty years ago, a proto version of the Schneider Electric flagship EcoStruxure™ solution was known as Transparent Factory, an Ethernet-based architecture that connected factory shop floors to the internet. This early investment in digital transformation paid off; digitization now accounts for about 50 percent of Schneider Electric revenue, and the company is still transforming.

EcoStruxure is the engine that drives the digital transformation of energy management and automation. It is an IoT-enabled digital platform consisting of connected products; edge control solutions; and apps, analytics software, and services. The platform affords visibility and control across the enterprise via real-time monitoring, mobile insights, digital twin capabilities, and proactive risk mitigation. Today, EcoStruxure covers 500,000 sites globally, connecting some 45,000 developers and system integrators, 3,000 utilities, and 650,000 service providers and partners as a community.

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[14] McKinsey Global Institute, "Digital Europe: Realizing the continent's potential," June 2016, https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-europe-realizing-the-continents-potential

[15] Logicalis, "Logicalis Global CIO Survey 2017 – 2018," 2018, http://www.us.logicalis.com/globalassets/united-states/downloads/cio-reports/2017-cio-survey-report.pdf

[16] Dynatrace, "The Global Digital Performance & Transformation Audit," 2018, https://assets.dynatrace.com/en/docs/report/digital-performance-transformation-audit.pdf

Measuring the power of digital transformation

After helping thousands of customers navigate successful digital transformation, Schneider Electric is ready to present a comprehensive report on the state of digital transformation among a global sample of customers. The Global Digital Transformation Benefits Report puts forth concrete evidence of the power of digitization across the spectrum of global commerce. This evidence takes the form of 330 data points developed from a sample repository of 230 customer projects Schneider Electric completed in the last five years across 41 countries. In addition, the report features stories from 34 customers, providing overviews of the goals they started with, the challenges they faced, the solutions they chose, and the results they saw.

At the core of this report are 12 key business benefits of digital transformation. These benefits are divided into three categories, each essential to effective marketplace competition: capital expenditure (CapEx), operational expenditure (OpEx), as well as sustainability, speed, and performance. The 12 benefits (See Table 1) center around two overarching statistics: Our customers' average (mean) performance on these benefits, as well as the "up-to" or best-case scenarios. The goal for this report is to provide readers with a useful and realistic benchmark on digital transformation's potential.

BENEFIT	UP TO	AVERAGE
CapEx		
Engineering costs and time optimization	80%	35%
Commissioning costs and time optimization	60%	29%
Investment costs optimization	50%	23%
OpEx		
Energy consumption savings	85%	24%
Energy costs savings	80%	28%
Productivity	50%	24%
Equipment availability and uptime	50%	22%
Maintenance costs optimization	75%	28%
Sustainability, Speed, and Performance		
CO_2 footprint optimization	50%	20%
Time to market optimization	20%	11%
Decrease in occupant comfort-related incidents	33%	24%
Return on investment	0.75 year	5.3 years

Table 1: The 12 benefits at a glance

EcoStruxure — the engine for digital transformation

Every one of the customer projects in the dataset involved the use of the EcoStruxure platform — our IoT-enabled architecture consisting of connected products; edge control; and apps, analytics, and services.

	Building	Data Center	Industry	Infrastructure
EcoStruxure™ Architecture				

End-to-end Cybersecurity · Cloud and / or on Premise

Apps, Analytics, and Services

Edge Control

Connected Products

EcoStruxure Power	EcoStruxure Building	EcoStruxure IT	EcoStruxure Machine	EcoStruxure Plant	EcoStruxure Grid
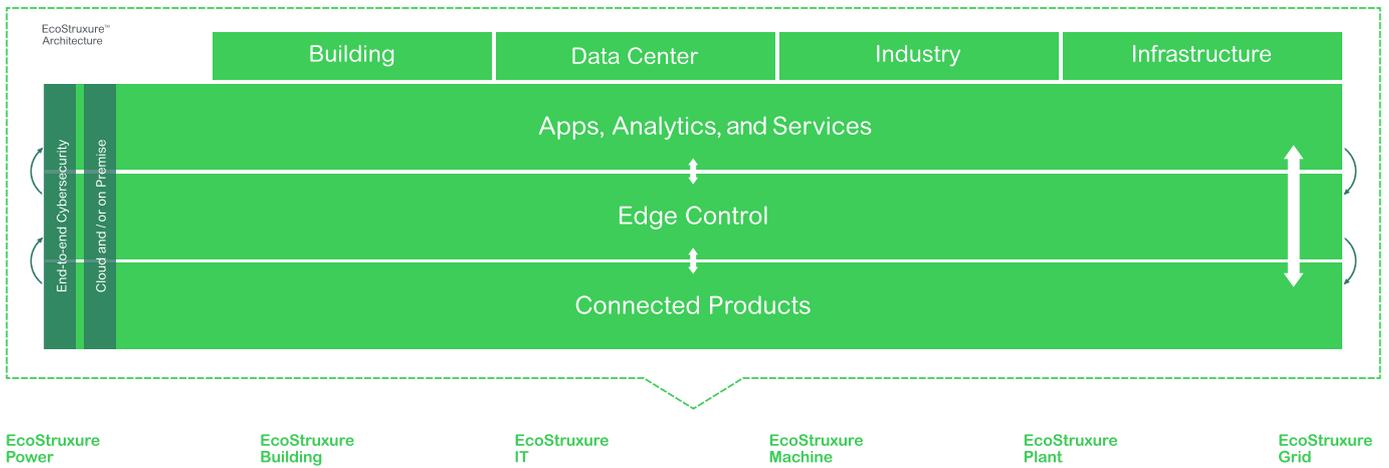
Methodology

Two hundred and thirty major projects completed by Schneider Electric and our alliance of partners were reviewed in order to identify stories of digital transformation. These projects, completed over the last five years, were then analyzed for key takeaways related to CapEx, OpEx, and other core benefits. This analysis generated 330 unique quantifiable data points, which were then categorized into one of the 12 benefit types. The average result for each benefit and its best-case scenario were also established to give a sense of the full range of achievable results. See Table 1 on page 7 for a summary of these analyses.

01 | CapEx

Creating upfront value

For some businesses, digital transformation seems like an expensive upfront prospect. Not only would they need to buy new equipment, they would need to find a way to integrate it with their complex legacy systems. Our customers' projects demonstrate the opposite. In many cases, newer interoperable solutions integrate faster and easier than outdated alternatives. In addition, the equipment longevity gains achieved by advances in intelligent maintenance and monitoring allow companies to future-proof their investments, i.e., deferring future CapEx. By embracing digitization, businesses can finally end fragmentation among stakeholders in the planning, design, installation, and commissioning stages, thereby creating upfront value.

CapEx Benefit #1:

Engineering costs and time optimization

The engineering phase plays an outsized role in total cost of ownership (TCO). Around 30 percent of construction costs result from rework.[17] Fortunately, solutions exist today to better manage such costs. In complex projects where numerous subcontractors often work in silos, digitizing the engineering phase enables centralized integration among projects and systems, thereby streamlining the work. As a result, digital transformation can drive significant savings in engineering costs and time optimization. Our analysis indeed indicates that our customers on average saved 35 percent in this area, and one customer saved 80 percent.

BENEFIT	UP TO	AVERAGE
Engineering costs and time optimization	80%	35%

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[17] Mohammad Miri and Mahsa Khaksefidi, December 2015, "Cost Management in Construction Projects: Rework and Its Effects," Mediterranean Journal of Social Sciences, http://www.mcser.org/journal/index.php/mjss/article/viewFile/8491/8151

Manufacturing faster time to profit at a siloxane plant

Dow Corning, US

"After working extensively with the team at Schneider Electric, we developed a strong action plan … When the time finally came, we had one week to perform the upgrade, and everything was going as it should."

— Chris Wolfschlag,
Project Manager,
Dow Corning Engineering Solutions

At Dow Corning's Carrollton, Kentucky siloxane plant, operational uptime is a must. When the plant's distributed control system reached the mature stage of its life cycle, the plant's managers decided that, even though it wasn't broke, they would "fix" the system by upgrading it to a modernized, digital EcoStruxure Plant platform. That way, the plant, one of the largest silicone materials production facilities in the world, would avoid any unexpected downtime due to aging equipment failures.

Dow Corning's managers were initially concerned the digital overhaul would require a rip-and-replace approach, which would cause costly production slowdowns. However, in working with Schneider Electric engineers, they were able to design a phased approach that allowed engineering and installation work to occur with minimal interruption. The existing infrastructure — nose cones and field wiring — could remain in service while new cabinets and more powerful controllers were installed.

Dow Corning's migration toward full digitization unlocked significant CapEx avoidance. With an open, interoperable EcoStruxure solution and an agile, phased approach, the team was able to complete the job 50 percent faster and thereby save 50 percent of CapEx. In addition, because of the rapid completion, Dow Corning was able to generate two extra days of production, ensuring a faster time to profit.

50%
CAPEX SAVINGS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
Modernization services

EDGE CONTROL:
EcoStruxure Plant including EcoStruxure Foxboro DCS

CONNECTED PRODUCTS:

Reduced costs by keeping existing infrastructure

Used a phased approach to prevent costly slowdowns

Sped time to profit with two extra days of production

Avoiding wasted engineering costs in a wastewater plant

Wide Bay Water Corporation, Australia

"Everything we do at Wide Bay Water Corporation, we do with excellence. Our Schneider Electric solution helped Nikenbah wastewater treatment plant achieve this and more."

— Tim Mahony, Manager,
Electrical Engineering Services,
Wide Bay Water Corporation

Alongside the pristine waters of Fraser Bay in Queensland, Australia, the Wide Bay Water Corporation runs the state-of-the-art Nikenbah wastewater treatment plant. Population growth and aging infrastructure were putting pressure on the corporation to expand and modernize its systems. They also sought to achieve water recovery rates of 90 percent by improving filtration and process automation systems.

In the past, Wide Bay Water had used multiple vendors and solutions within their plants, which slowed down installation, commissioning, and maintenance. Based on this experience, Wide Bay Water wanted to work with a single provider who could offer fully integrated, high-availability systems. The EcoStruxure Plant platform fit the bill — in addition to ease of installation, it afforded deep visibility into energy use and performance issues.

Wide Bay Water's new digitized water treatment plant was built under budget by AU$2 million. These savings were made possible by speeding engineering integration times by 20 percent, and shortening commissioning times by 25 percent. In addition, the EcoStruxure Plant solutions freed up additional finances by ensuring fewer labor hours, faster fault detection, and 12.5 percent energy savings.

20% FASTER INTEGRATION TIMES

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:
EcoStruxure Geo SCADA Expert
EcoStruxure Hybrid DCS

CONNECTED PRODUCTS:

Cut project costs — $2 million under budget

Saved $50,000 per year on labor hours

Generated 12.5% energy savings

CapEx Benefit #2:

Commissioning costs and time optimization

Commissioning isn't a one-time process. New systems and assets are continually being added to the mix, and integration of the old and the new needs to be seamless. Open, interoperable, and IoT-connected devices can expedite the commissioning process by "playing well" with other systems. In addition, decreased commissioning times can speed the overall progress of digital transformation by ensuring faster startup. The customer projects featured here — a Mexican natural gas facility and a Dutch drinking water company — illustrate the opportunities for speeding the commissioning process. One customer cut commissioning costs by 60 percent, while the average savings are 29 percent.

BENEFIT	UP TO	AVERAGE
Commissioning costs and time optimization	60%	29%

Fueling faster site startups at a Mexican natural gas plant

Pemex (Petróleos Mexicanos), Mexico

The oil and gas industry, with its expansive supply chains and automation-friendly value chains, is ripe for digital transformation in the CapEx phase. Pemex (Petróleos Mexicanos), Mexico's state-owned petroleum company, decided to harness the power of digitization with an ambitious project to update its natural gas measurement sites.

SCADA International, a Schneider Electric partner in the System Integrator Alliance, came aboard to help Pemex transition away from older flow computers and replace them with SCADAPacks, which are intelligent remote terminal units. The new SCADAPacks provide Pemex with the ability to validate the volume of gas flowing through their pipes in real time, affording them greater visibility into their system's performance.

The new SCADAPacks seamlessly integrate with existing systems, enabling a rapid installation period that takes 60 percent less time. Before the new digital solution was implemented, site startups lasted several days. Now they take four hours. This dramatic reduction translates into 50 percent savings on labor hours.

50%
LABOR HOUR SAVINGS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:

SCADAPack 350

CONNECTED PRODUCTS:

RealFLO™ 6.84 with Pemex modbus

Streamlined configuration and historical reporting

Ensured seamless equipment replacement

Improved operational efficiency via smart maintenance

A Dutch water utility unites five automation systems into one platform

Vitens, Netherlands

"[With the Schneider Electric solution] we will have a high-performance automation platform with high reliability and maintainability."

— Doeke Schippers,
Manager,
Vitens

Vitens, the leading drinking water supplier in the Netherlands, was bogged down by five regions operating under different automation systems. The company installed the EcoStruxure Plant architecture to unify these five systems under a single platform. This digital integration standardized the system's operations, shortened deployment times, and reduced engineering costs.

The newly installed automation platform includes software, servers, and sensors that install quickly and integrate with legacy systems. With EcoStruxure Plant, Vitens now has a universal method for collecting, analyzing, and reporting on the entire water management system. In addition, the Unity Application Generator solution sped up software creation by minimizing the number of staff needed to build and maintain applications.

The digital transformation of Vitens' automation architecture freed up savings in the project's commissioning phase. Because fewer staff were needed to install and commission the new equipment, deployment times shrank by 65 percent, while engineering costs dropped by 25 percent.

25%
ENGINEERING COST REDUCTION

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:
EcoStruxure Hybrid DCS
Citect SCADA

CONNECTED PRODUCTS:
M340 PAC controllers
Quantum controllers
ConneXium switches

Standardized reporting, benchmarking, and design

Added flexibility over resources

Cut engineering costs by 25%

CapEx Benefit #3:

Investment costs optimization

One overlooked benefit of digitization is that it can prolong the life of existing equipment and thereby create investment cost savings. Digitization extends equipment longevity by ensuring assets are optimally maintained throughout the life cycle. Digitizing also enables cloud analytic tools to make timely recommendations based on reams of historical and real-time data. Results from Schneider Electric customers indicate that these savings can be substantial — up to 50 percent reductions in investment costs, with an average savings of 23 percent.

BENEFIT	UP TO	AVERAGE
Investment costs optimization	50%	23%

DartPoints, an edge data center and colocation provider, reduced total cost of ownership for its customers by as much as 45% over three years. Discover more HERE.

Outlasting the competition in a competitive cloud market

F12.net, Canada

"The Toronto data center marks the next step in our journey to advance the technology posture of [small and medium businesses] across Canada, by offering fully managed geo-redundant data centers from Edmonton to Toronto."

— Calvin Engen,
Director of IT,
F12.net

In a tight cloud and colocation market, F12.net needed a step up — a step up to geo-redundancy. Their decision to build a new data center in the greater Toronto area was made easier with the knowledge that their new IT infrastructure would integrate and scale quickly, last significantly longer, and take up less space than older models.

F12.net used the EcoStruxure IT On-Premise solution to enable power usage effectiveness monitoring. This way, the company could ensure the delivery of clean, reliable power to its IT infrastructure and thus ensure exceptional customer service. They also installed EcoStruxure-ready lithium-ion UPSs, which deployed quickly. Together, these upgrades extended equipment life cycles and deferred future CapEx.

F12.net's digitally integrated infrastructure is built to outlast the competition. It extends UPS longevity by up to three times the expected life of lead-acid (VRLA) alternatives. The total cost of ownership is thus reduced by 30 – 50 percent. In addition, these UPSs take up less space, weigh less, and feature a modular design, so the facility can increase capacity as needed, without needing to build out more space.

TOTAL COST OF OWNERSHIP REDUCED BY
30 – 50%

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:
EcoStruxure IT On-Premise

CONNECTED PRODUCTS:
Galaxy™ VM UPS

Introduced scalability for continued business growth

Enabled faster recharge times

Extended battery life three times longer than VRLA

Building the hospital of the future — without silos

Penn Medicine, US

"We're building a hospital that will allow us to deliver the very best care the 21st century can offer patients — but we're also 'future-proofing' it to ensure that we can quickly and seamlessly adapt what we do to help our patients in the coming decades."

— J. Larry Jameson, MD, PhD,
Dean of the Perelman School of Medicine,
University of Pennsylvania

Penn Medicine in Philadelphia, Pennsylvania, the first hospital and medical school in the United States, is now a world-renowned medical center. To build on their success, Penn Med is constructing the hospital of the future: a digitally driven facility agile enough to adapt to the next 100 years of medicine.

Together with Schneider, the team uses a project delivery contracting method built on lean principles — one integrated project plan, using EcoStruxure for Healthcare to break down design and contracting silos. Components of this platform were proven in an integration lab built for the project, enabling the team to uncover potential issues before they multiplied in the field. The team also used the platform to enhance patient satisfaction through intelligent building controls, power monitoring, patient entertainment, nurse call, lighting, and shade control. EcoStruxure also provides a central platform for data collection, which will provide analytics to maintain design and energy efficiency of this LEED-certified building when it opens.

With a digitally driven platform, the project team generated CapEx savings on the initial investment. By sharing data across core systems in the hospital infrastructure, and eliminating substantial duplication of equipment and cabling, the team believes they saved about 5 percent across the total low voltage system's budget.

5% CAPEX SAVINGS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
EcoStruxure Building Advisor
EcoStruxure Asset Advisor

EDGE CONTROL:
EcoStruxure Power Monitoring Expert
EcoStruxure Building Operation

CONNECTED PRODUCTS:
Switchgear
Square D™ by Schneider Electric QED2 switchboards
PowerLogic™
I-Line™ Busway

Eliminated unnecessary material procurement

Improved patient experience with smart controls

Achieved LEED certification for a future-ready hospital

02 | OpEx

Driving continual savings

OpEx composes a vast majority of the total cost of ownership of buildings, data centers, and other facilities. Digitization, by harnessing IoT connectivity, unleashes step change improvements in efficiency, reliability, safety, and sustainability. Open and interoperable software tools pull back the curtain on a facility's energy use, asset performance, and environmental conditions. Moreover, this newfound visibility is captured by cloud analytics, which enable intelligent decision-making that was previously done through institutional knowledge alone. Instead of operating by guesswork and reactive maintenance, facilities operate with insights driven by real-time monitoring, software analytics, and expert advice. The results of this report demonstrate the power of digitized energy management and automation to unlock savings during the OpEx phase.

OpEx Benefit #4:

Energy consumption savings

The key to unlocking business value from digital transformation is to consume less energy without sacrificing productivity or comfort. These two goals, often thought to be contradictory, have come into alignment through the digital transformation of energy management and automation. New software management tools bring sweeping visibility and control over enterprise-wide energy consumption. Before, facility managers were in the dark as to whether lights were getting left on. Now, they can automate lighting, HVAC, and other systems to ensure energy is used only when needed. With a central dashboard, businesses can now easily locate and execute performance enhancements. The results here attest to these capabilities — Schneider Electric customers have reduced energy consumption by as much as 85 percent.

Bolloré Logistics cut energy consumption by 10% in warehouses across 105 countries. **WATCH HOW.**

BENEFIT	UP TO	AVERAGE
Energy consumption savings	85%	24%

Cutting energy waste at a wastewater plant

City of Lakeland, US

The city of Lakeland, Florida had an underperforming wastewater plant that was holding the city back from economic and population growth. The city decided to upgrade its main wastewater facility to accommodate this future growth and achieve energy consumption savings.

Using components of the EcoStruxure Plant platform, the city implemented a series of process enhancements. These included installing a combined heat and power system, a gas collection and conditioning system, and other upgrades that afforded increased control over energy consumption.

The impacts of the wastewater plant's digital transformation extend throughout the city. The upgraded systems reduced energy consumption by 41 percent, freeing up US$14 million over the project's life cycle to return to the city's budget. In addition, the wastewater plant's improved performance will attract businesses that produce high-strength wastes, such as juicing plants and microbreweries. The project thus achieved energy savings while boosting performance — a win-win outcome for the entire city.

$14 million
ENERGY CONSUMPTION SAVINGS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:

EcoStruxure Foxboro DCS
Avantis™ software [Aveva software]
SimSci™ Esscor [Aveva software]

CONNECTED PRODUCTS:

Enhanced wastewater treatment system efficiency

Saved $14 million over project life cycle

Created new economic development opportunities

High-flying energy savings at a remote Air Force base

Edwards Air Force Base, US

"Schneider Electric's PowerLogic system plays a big role in day to day, even moment by moment — score-keeping and analysis that we use to strategize our energy reduction efforts."

— Ron Ryan,
SCADA Systems Manager,
Edwards Air Force Base,

Deep in the Mojave Desert, Edwards Air Force Base spans 470 square miles of rugged wilderness. Frequently buffeted by hurricane-strength winds and baked by extreme temperatures, the base, with its 19 runways, faced a daunting task in ensuring reliable power distribution. Adding to the need for a digital transformation was a new federal mandate to cut energy consumption.

As a result, the base installed EcoStruxure Power Monitoring Expert, a tool that offered moment-by-moment monitoring of energy use and performance. The platform allows the base to strategize effective approaches to saving energy and analyzing power quality. One of these approaches is a demand-reduction program that allows the base to draw electricity from the grid at opportune times of the day.

The large scope of the base's power distribution needs is matched by the high degree of success resulting from this digital transformation. The base cut energy consumption by 18.1 percent in the first year, and in some weeks generated $20,000 worth of utility credits. Moreover, the base avoided $1 million worth of power outages thanks to enhanced monitoring and issue resolution capabilities.

18.1%
ENERGY CONSUMPTION SAVINGS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:
EcoStruxure Power Monitoring Expert

CONNECTED PRODUCTS:
PowerLogic™ power meters

Upgraded power quality in extreme conditions

Minimized maintenance and repair hours

Reduced power outages, saving $1 million

OpEx Benefit #5:

Energy costs savings

The cost of energy touches every part of the economy. Higher gas prices raise wheat prices. Higher electricity costs hike up the price of cloud computing — and so on. Equipment that is insensitive to energy efficiency adds to the problem. Businesses around the world now face the challenge of addressing increasing energy costs through the use of renewables, demand response, and other digitally driven approaches. The future of energy is decarbonized, decentralized, and digitized. The data from customer projects analyzed in this report provide a clear sense of how businesses area shifting toward a green energy future. Customers saw on average 28 percent energy costs savings, while one customer achieved 80 percent savings.

BENEFIT	UP TO	AVERAGE
Energy costs savings	80%	28%

Carrefour Egypt, a leading retailer, found a way to compete in a crowded market — by cutting energy costs by 7%. **WATCH HOW.**

Enel, the largest electricity distributor in Italy, saved 4% on annual energy costs by shifting toward green energy. **WATCH HOW.**

Striking LEED Gold in the desert

Hilton Garden Inn Dubai Mall of the Emirates, UAE

"Schneider's vision is to create innovative technology, and our vision is to create exceptional guest experiences. This is exactly where the two come together. Schneider's vision enables us to create exceptional guest experiences."

— Oliver Kesseler,
General Manager,
Hilton Garden Inn Dubai Mall of the Emirates

Just down the road from the Burj Khalifa, the world's tallest building, the Hilton Garden Inn Dubai Mall of the Emirates boasts its own superlative: it is one of the most sustainable hotels in the world. Hilton, in planning their new Dubai location, had to ensure that it could compete in a crowded market. By ensuring the hotel was optimized for energy savings and occupant comfort, Hilton was able to gain a competitive advantage — all while achieving LEED Gold certification.

The hotel used the EcoStruxure Building platform to unite the building, guest room, and property management systems under a single integrated architecture. This integration allowed Hilton to drive synergistic energy cost savings — e.g., automatically turning lights off or adjusting temperature when sensors detected unoccupied guest rooms. The combination of energy management and automation unlocked deep savings potential.

The hotel now achieves between 25 – 44 percent energy savings while simultaneously improving guest experience. Guests have greater environmental control while in their rooms, while the hotel can reclaim control automatically once the rooms are unoccupied. In addition, the hotel harnesses the sun-drenched weather to provide solar energy for their water heating system. The result is a hotel that makes its own mark in a city crowded with famous buildings.

25 – 44%
ENERGY SAVINGS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:
EcoStruxure Building Operation
EcoStruxure Guest Room Expert

CONNECTED PRODUCTS:
Automation server
Room controllers

Achieved LEED Gold certification

Prioritized energy and operational efficiency

Drove guest comfort, convenience, and control

Creating the right conditions for all kinds of entertainment

PNC Arena, US

"Schneider Electric has been … very responsive. We're very happy with the system … it's going to be a long partnership for years to come."

— Dave Olsen,
Executive Vice President and General Manager,
PNC Arena

The PNC Arena in Raleigh, North Carolina is home to a professional hockey team and dozens of annual performances. With basketball games in the afternoon and ice hockey in the evening, the arena needed to adapt to constantly changing conditions without driving up energy costs.

Using EcoStruxure Resource Advisor, PNC Arena was able to master its environment. All components of the HVAC system were automated to ensure precise temperature and lighting control. In addition to enhanced precision and real-time monitoring, EcoStruxure tools also freed up energy costs by optimizing how and when HVAC systems deployed.

The PNC Arena's digital transformation unlocked major improvements in agility and energy efficiency. The result was a fully automated 77,000-square-foot environment that could adapt easily to ice, pyrotechnics, and other unique environmental conditions. The arena achieved a $300,000 reduction in utility bills over six years, mostly due to the upgraded and digitized building management system. The energy costs savings allow PNC to continually invest in something else — a great fan experience.

$300,000
UTILITY BILL REDUCTION

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
EcoStruxure Resource Advisor

EDGE CONTROL:

CONNECTED PRODUCTS:

Created a fully controlled and automated environment

Ensured optimal environmental conditions

Cut utility bills by $300,000 over 6 years

OpEx Benefit #6:

Productivity

Digital transformation poses the potential for business to do more with less — more yield with less energy, fewer materials, and fewer labor hours. A World Economic Forum and Accenture analysis of over 16,000 companies supports this idea. It found that digital transformation led to productivity gains and returns on investment in all 14 major industries that were studied.[18] Early adopters of digital technology more than doubled productivity between 2006 and 2016, whereas industry followers saw declining productivity. It's not only early adopters seeing benefits; those who invest in a combination of digital technologies (e.g., connected devices, robotics, AI, etc.) reported tripling productivity compared to companies that only invest in a single approach.

Increased productivity, in the form of yield, results from energy management and automation efficiencies across the value chain, from IoT-enabled tracking to automated production lines. Customer stories, ranging from a steel factory in China to a wastewater facility in the Arizona desert, demonstrate the potential of digital transformation to improve yields by as much as 50 percent.

Roy Hill Mining, a leading iron ore producer, boosted supply chain efficiency by 20 percent. Find out how they streamlined pit-to-port efficiency HERE.

BENEFIT	UP TO	AVERAGE
Productivity	50%	24%

[18] World Economic Forum, in collaboration with Accenture, "Maximizing the Return on Digital Investments," May 2018, http://reports.weforum.org/digital-transformation/files/2018/05/201805-DTI-Maximizing-the-Return-on-Digital-Investments.pdf

OPEX: DRIVING CONTINUAL SAVINGS

A Chinese steel giant gets a digital upgrade

Baosteel, China

"With Schneider Electric's expertise in energy management and automation, the 1580 hot rolling workshop will see significant improvement in engineering control, efficient and smart operation, safety, and reliability."

— Wenqing Yuan,
Hot Rolling Mill Plant Director,
Baosteel

Baosteel operates the largest steel-producing enterprise in China. As part of the ambitious initiative to ensure global competitiveness, the company sought to digitally upgrade the facility. With an IoT-enabled, heavily automated hot rolling workshop, Baosteel could address rising labor costs, tighter standards, and energy efficiency issues.

Using EcoStruxure Plant as the central architecture, Baosteel transformed its energy management and automation processes. The hot rolling shop, where steel is processed at temperatures exceeding 1700 °F, presented significant complexity due to the extreme environmental conditions. With a digital-first platform, Baosteel was able to automate 98 percent of its crane operations, enhancing safety and labor efficiency. The company also used real-time monitoring of important equipment to ensure systems throughout the plant operated at peak performance.

With these improvements, Baosteel was able to boost productivity yield by 30 percent. In addition, they increased the steel slab transfer rate up from 30 percent to 70 – 80 percent, which eliminated material losses.

30%
BOOST IN PRODUCTIVITY

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
Expert engineering services

EDGE CONTROL:
Modicon™ M580 PAC
SCADA
Fluxx by Synthetis (Partner software solution)

CONNECTED PRODUCTS:
Altivar™ process drives
Magelis™ human machine interface
Circuit breakers, inverters, and switches

Minimized mechanical wear via efficient asset maintenance

Boosted steel slab transfer rate from 30% to ~75%

Achieved automated operations in its hot rolling workshop

Life is On | Schneider Electric   27

Reclaiming 60 million gallons of water per day in the Arizona desert

Tres Rios Reclamation Facility, US

"The Wonderware SCADA has enabled our Tres Rios facility to double capacity, while operating using the same number of staff, which is about a 50 percent increase in operational efficiency with a 10 percent reduction in energy consumption."

— Rod Graupmann,
SCADA Manager,
Pima County Tres Rios Reclamation Facility

In arid Pima County, Arizona, water is precious. The county, an academic and commercial hub home to one million people, has made a point of reclaiming as much water as possible — 60 million gallons of water per day. To accommodate a growing population and address aging infrastructure, the Tres Rios Reclamation Facility needed to digitally transform its automation system to enhance filtration, energy efficiency, and productivity.

The facility integrated a new Wonderware™ software platform with existing SCADA systems to better monitor and optimize its water treatment. Wonderware software not only gathered more data, it provided crucial context to that data, allowing plant managers to understand exactly what was needed to improve operations. The software solution fostered the creation of a single "plant model" that represented the entire county's wastewater system in a coherent manner, allowing for rapid diagnostic and operational improvements.

As a result of this digital transformation, the Tres Rios Reclamation Facility doubled its output while cutting energy consumption by 10 percent — a textbook example of doing more with less. The upgrades also qualified the plant for a $352,000 rebate check from the utility, further driving cost savings.

2x OUTPUT

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

Wonderware System Platform
Wonderware InTouch
Wonderware Historian
Wonderware Historian Client
Wonderware IntelaTrac

EDGE CONTROL:

CONNECTED PRODUCTS:

Advanced productivity with identical staff levels

Captured institutional knowledge to train future workforce

Earned a $362,000 rebate check from the local utility

OpEx Benefit #7:

Equipment availability and uptime

Productivity is about more than just increased yield. Workers get bogged down by IT outages, machines sit idle due to bottlenecks in the process, and businesses lose money. Therefore, uptime and availability are key OpEx metrics, especially in the digital age, where a minute of downtime can cost thousands of dollars and irreparable reputation hits.

Businesses that can't locate problems easily certainly cannot fix them quickly. A central digital platform provides this comprehensive visibility across the installation to protect against equipment failures, deliver real-time notifications of anomalies, and provide many other layers of protection. The result of this newfound visibility is that mission-critical systems remain available far longer than before.

BENEFIT	UP TO	AVERAGE
Equipment availability and uptime	50%	22%

At Nemours Children's Hospital, power is life-saving. Find out how they boosted uptime of critical infrastructure by 15% HERE.

In Ho Chi Minh City, DTS' colocation center ensures 99.99% uptime despite growing data demands and the need for high security. WATCH HERE.

Brewing up productivity gains for a craft beer company

New Belgium Brewing Company, US

"With Wonderware MES Performance Software coupled with New Belgium's continuous improvement strategy, we have extended our packaging area capacity to about 1.3 million barrels each year. At this point, our approach to higher volumes is 'bring it on.'"

— Joe Herrick,
Packaging Systems Manager,
New Belgium Brewing Company

In the mountains of Colorado, New Belgium Brewing Company was perched atop the craft beer industry. Its brewery and bottling facility was the eighth-largest brewery in the US, but to stay that way, it needed to give the people what they wanted — more great-tasting beer. They were rapidly reaching full capacity in their brewing and bottling plants, and to free up more capacity they needed to address some process-based inefficiencies.

The company expanded their Wonderware software platform to find more hours of the day for brewing and bottling. With this expansion, New Belgium gained critical insights into their production efficiency. These insights enabled real-time information on unscheduled downtime, predictive capabilities that enhanced performance, and better supply chain visibility.

The digital transformation of their automation system increased overall equipment effectiveness from 45 to 65 percent in two years. The upgrade also decreased equipment downtime by over 50 percent, alongside scheduled run time efficiency increases of 25 – 30 percent. Through these improvements, New Belgium was able to achieve record production and successfully meet growing customer demand — all by increasing the efficiency of their existing system.

50%
DECREASE IN EQUIPMENT DOWNTIME

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

Wonderware Manufacturing Execution System (MES) Performance Software [by Aveva]

EDGE CONTROL:

CONNECTED PRODUCTS:

Achieved record production weeks with new software

Extended packaging area capacity to meet growing demand

Increased scheduled run time efficiency by 25 – 30%

Chasing 100% uptime in a hyperscale data center

China Unicom Cloud Data, China

"With the Critical Facility Operation services provided by Schneider Electric, the two cloud computing bases in Hohhot and Langfang have finally achieved zero interruption to user's key workloads."

— Kang Nan,
General Manager of the Operations and Services Department,
China Unicom Cloud Data

Telecommunications company China Unicom had an ambitious plan: to build 12 super-scale cloud data centers and 335 regional data centers throughout China. The company needed a strategic partner with strong experience in hyperscale data center operations to achieve this goal.

The company chose to outsource the on-site critical power operation services for their Hohhot and Langfang sites to Schneider Electric — from utility entrance to rack power distribution units, with emergency generators and direct-current power supply systems. China Unicom felt they could trust Schneider to help achieve 99.999% availability at the hyperscale level through efficient operation, maintenance management, and continuous optimization.

By combining and complementing the knowledge bases and expertise of both companies, the two sites readily met the Rating 3 requirements of ANSI/TIA-942 standard and reached Rating 4 for its electric power system. Both sites achieved a goal of zero interruptions to key user workloads. In addition, a staff of Schneider Electric experts are always on site, providing 24/7 operation and maintenance services. China Unicom has been able to improve reliability and efficiency, offering 99.999% uptime while realizing a 30% savings in operational costs.

99.999%
UPTIME

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
Critical Facility Operation services

EDGE CONTROL:

CONNECTED PRODUCTS:

Instituted 24/7 predictive maintenance and risk control

Reduced energy consumption significantly

Achieved zero interruptions to key user workloads

Self-healing grid ensures uptime for 350,000 households

Tata Power, India

"We've taken an innovative step in implementing a decentralized control approach to handle power interruption — a self-healing grid by Schneider Electric."

— Tata Power

Mumbai, India is home to about 18 million people, making it India's largest city. It is only fitting then that Tata Power, India's largest power generation company, serves the city. Mumbai is a sprawling, highly distributed area with growing power demands, making it difficult for Tata Power to pinpoint power losses and rapidly restore power to 350,000 households.

To ensure greater reliability and substantially reduce power restoration times, Tata Power worked with Schneider to implement India's first self-healing grid. The grid heals itself through automated fault isolation and restoration, requiring no manual intervention. The solution, built with EcoStruxure ADMS, connects smart ring main units, circuit breakers, packaged systems, and digital substations. Together, these components offer comprehensive visibility and decentralized control over a vast, complex grid.

The digitally upgraded system now detects and resolves faults far faster than the previous system. Instead of taking hours, these outages are resolved in a matter of seconds, boosting customer satisfaction and minimizing revenue loss.

24/7 POWER SUPPLY

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
EcoStruxure ADMS

EDGE CONTROL:
EcoStruxure self-healing grid connecting to existing SCADA and DMS

CONNECTED PRODUCTS:
Smart digital substations
Smart RMUs
Smart packaged systems
Smart breakers

Reduced average power restoration time from hours to seconds

Established India's first self-healing grid

Upgraded power quality and reliability to over 350,000 homes

OpEx Benefit #8:

Maintenance costs optimization

The longest stage of a facility or asset's life cycle is the operation and maintenance stage. As a result, some of the largest cost reduction opportunities are found in maintenance. Digitally transforming the operation and maintenance stages produces cost savings by prolonging equipment life, ensuring uptime, and optimizing performance. In the past, maintenance was often done in a reactive or prescriptive manner, which led to maintenance that was either premature or came too late. Now, it's all about predictive maintenance. IoT-connected sensors can send data in real time to the cloud, thereby enabling preventive maintenance work that is timely, accurate, and far more efficient. Our customer projects reflect the value of digitally driven maintenance regimes, averaging 28 percent reductions in maintenance costs.

BENEFIT	UP TO	AVERAGE
Maintenance costs optimization	75%	28%

# Putting maintenance issues under a microscope

Boston Scientific, US

"Boston Scientific wants to do what's right for the environment by minimizing our energy footprint as much as possible. When the utility invoices start to drop, I know we're doing the right thing."

— **Greg Lamson**,
Senior Facilities Engineer,
Boston Scientific

Boston Scientific, a global medical device developer and manufacturer, built a new corporate headquarters with the strategic goal of reducing energy waste. Their facility, home to office space, laboratories, a daycare center, and other unique environments, presented a variety of operational needs. The company sought to optimize performance across these spaces and thereby realize operational savings.

The maintenance work was one area that needed a digital upgrade. By seamlessly integrating EcoStruxure Building Advisor with the existing building management system (BMS), Boston Scientific was able to put its various building systems under the microscope of detailed cloud analytics. The software tool turned reams of BMS data into actionable information, leading to improvements in fault detection, occupant comfort, and equipment uptime.

Boston Scientific's ongoing digital transformation resulted in a 40 percent reduction in avoidable costs related to faults, including a 51 percent reduction in energy-related faults. In addition, the company achieved a 49 percent reduction in faults causing improper zone conditions. These reductions were driven by digital tools that pinpointed issues, trends, and energy-saving opportunities.
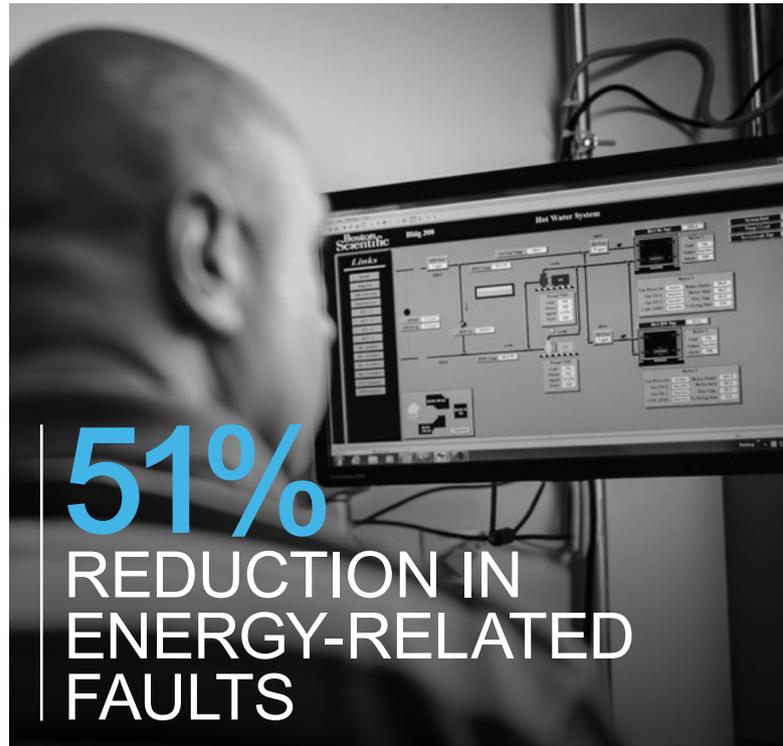
51%
REDUCTION IN ENERGY-RELATED FAULTS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
EcoStruxure Building Advisor

EDGE CONTROL:

CONNECTED PRODUCTS:

Cut down faults from improper zone conditions by 49%

Shrank energy-related faults by 51%

Saved 160,184 kWh of electricity in first year alone

Historic hotel gets a digital makeover

Fort Garry Hotel, Canada

"I have worked with a number of building control companies over the years and without a doubt … the Schneider Electric system [is] far and ahead of the other companies I've used … We now have a modern hotel in a historic building — an old system with new brains."

— Richard Bel,
Owner & Operator,
Fort Garry Hotel

Fort Garry Hotel, a landmark building in the heart of Winnipeg, Manitoba, was facing pressure from rising energy costs, increased regulation, and the need to improve operational efficiency. As a heritage, century-old building, the hotel was energy-intensive and not insulated to modern standards. The building's layout and infrastructure also added complexity, with a whole range of functioning but aging equipment, including 14 air-handling units — some dating back several decades. Without a centralized view or control of the various mechanical systems in the building, the hotel relied on three siloed systems. Adjustments to temperature, airflow, and steam could only be made manually, as a reaction to complaints.

The solution to the hotel's situation was a digital overhaul of its BMS. With EcoStruxure Building and SE8000 Room Controllers, the hotel was able to provide guests complete control over room temperatures, and then automatically adjust temperatures when rooms were unoccupied.

Fort Garry Hotel's digital upgrade enhanced occupant comfort while saving energy and maintenance costs. Guest complaints decreased, while maintenance staff hours plunged by 25 percent, freeing up a substantial amount of OpEx to put toward other improvements.

25% REDUCTION IN MAINTENANCE HOURS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:

CONNECTED PRODUCTS:
SE7000 Room Controllers and SE8000 Room Controllers
Field devices
Automation server
MPM gateways
Altivar variable speed drives
MNB controller
SED-DOR wireless door switch

Drove reductions in energy use and maintenance needs

Centralized a disperse system into a single dashboard

Enhanced guest comfort and minimized complaints

Adapting to changing times

There is more to the story of digital transformation than CapEx and OpEx. Corporate responsibility initiatives, the rise of connectivity, and other trends are pushing businesses to expand focus beyond the world of finance. Around the world, in all manner of segments, businesses are pursuing efforts to increase sustainability, comfort, safety, and speed. These pursuits involve harnessing the full power of digitization — IoT connectivity, cloud analytics, and real-time monitoring. Integrated software platforms extend human intelligence beyond what was previously possible, allowing users to spot energy waste, detect safety issues, and resolve downtime threats from across the world.

Benefit #9:

CO_2 footprint optimization

The world urgently needs to decouple emissions from economic growth, and digital transformation plays a key role in this decoupling. Between 2016 and 2025, it can help the electricity, logistics, and automotive industries alone avoid 26 billion metric tons of CO_2 emissions — the equivalent of Europe's emissions over the same time period.[19] Digital energy management and automation, in affording unprecedented monitoring and management capabilities, allows businesses to finally move toward closing the resources loop. Net zero waste, net zero energy, and net zero carbon are no longer theoretical goals — as customer projects featured in this section indicate, sustainable businesses are increasingly seen as smart business.

Digital technology also vastly improves monitoring and reporting on sustainability measures across the value chain. IoT-connected devices and monitoring software make it possible to track materials and equipment performance to more accurately and easily report on and optimize sustainability initiatives. Already, progress is being made on this front: 79 percent of energy and sustainability professionals reported they were collecting data for this purpose.[20] The customer projects discussed here demonstrate the full degree of carbon emission reductions possible through fully digitized energy management and automation systems. Businesses have been able to cut up to 50 percent of their carbon footprint, while on average they see 20 percent reductions.

Lidl Finland, an international grocery chain, runs the largest distribution center in Finland. Find out how they achieved 40% CO_2 reductions HERE.

BENEFIT	UP TO	AVERAGE
CO_2 footprint optimization	50%	20%

[19] World Economic Forum, in collaboration with Accenture, "Digital Transformation of Industries: Societal Implications," January 2016, http://reports.weforum.org/digital-transformation/wp-content/blogs.dir/94/mp/files/pages/files/dti-societal-implications-white-paper.pdf

[20] Schneider Electric, in collaboration with GreenBiz Research, "Research Report: The State of Corporate Energy & Sustainability Programs," January 2018, https://www.greenbiz.com/report/state-corporate-energy-sustainability-programs-2018

SUSTAINABILITY, SPEED, AND PERFORMANCE

Making the data-driven business case for carbon reductions

The Blackstone Group, US

"I've got to go right to the data and right to the money. Resource Advisor is how I do that. It is a critical platform because it tracks money associated with energy spend that Schneider Electric is continuously renegotiating on behalf of our companies."

— Don Anderson,
Chief Sustainability Officer,
Blackstone

Blackstone is one of the world's largest private equity firms, managing more than US$365 billion in assets. To stay ahead in a competitive market, the company looks for every opportunity to save and is quick to move and capitalize on smart investments. The company, using a data-driven approach, determined that ambitious sustainability efforts within its own company as well as the companies it owns and supports would save millions of dollars.

Above all, Blackstone needed data and reporting capabilities to strengthen the business case for carbon reductions. Blackstone implemented an aggressive energy management and sustainability strategy. The strategy centered around EcoStruxure Resource Advisor, a cloud-based platform that captures and normalizes energy and utility data at all levels of the company's portfolio, from individual sites to regional cross sections. The technology is paired with an expert consultant who is dedicated for each site. These experts help interpret the data, and pinpoint and act on opportunities for efficiency improvements.

Overall, the project has saved tens of millions of dollars. Active energy management programs and collaboration are in place at over 20 portfolio companies and counting, resulting in 15 percent reductions in CO_2. In addition, enhanced reporting ensures the program continues and deepens, as the argument for carbon reductions becomes increasingly clear.
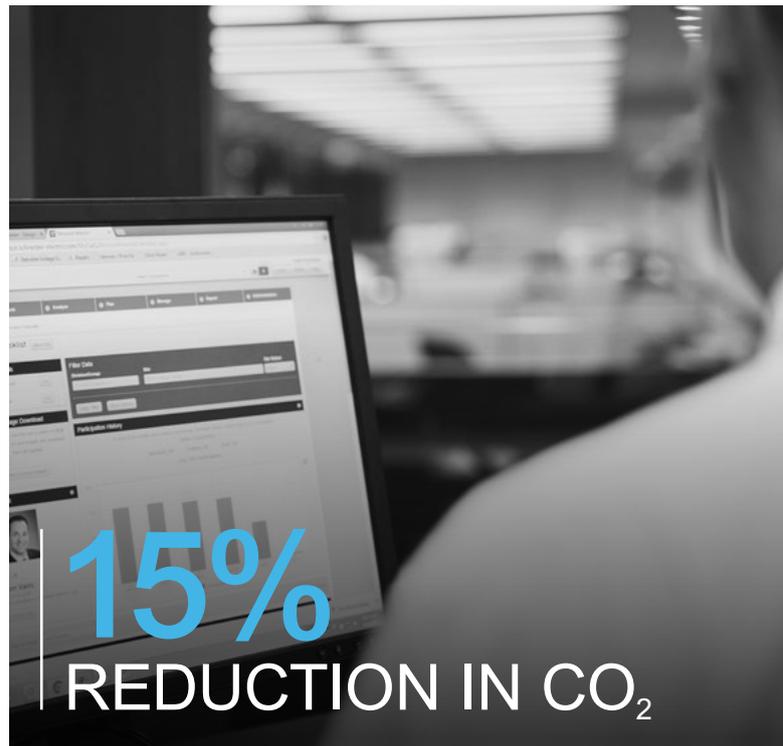
15% REDUCTION IN CO_2

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
EcoStruxure Resource Advisor

EDGE CONTROL:

CONNECTED PRODUCTS:

Used in over 20 portfolio companies and counting

Generated tens of millions in energy savings

Enhanced reporting that strengthens the program's future

Teaching students the value of sustainability

Delran Township School District, US

"I'm proud to report that the Delran Township school district has achieved a 50 percent reduction in greenhouse gas emissions and is the only school district in the state to receive the governor's environmental excellence award for clean air. Thanks to our energy saving improvement program with Schneider Electric, we've become a regional leader in sustainable schools."

— Dr. Brian Brotschul,
Superintendent,
Delran Township School District

The Delran Township school district was facing rising costs in its four schools. The school district wanted to pursue carbon reductions as a way to cut costs, and also use the technology upgrades as a way to teach students about sustainability.

To achieve these goals, the school district installed EcoStruxure connected products, including a two-megawatt photovoltaic system, and made digital upgrades to its lighting and HVAC systems. An additional layer of services helped the district analyze how energy was purchased and used, offering insights into savings opportunities that resulted in a 32 percent reduction in energy costs.

The digital transformation of the school district's energy management system led to deep carbon reductions of 50 percent. The school now sources 80 percent of its power from the photovoltaic system, and uses the solar array in its STEM curriculum. In addition, the project will pay for itself through energy savings, which will amount to $5.6 million over 15 years.

50%
REDUCTION IN CO_2

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:

CONNECTED PRODUCTS:
Lighting and HVAC upgrades
Solar panels

Received state award for environmental excellence

Paid for cost of project through energy savings

Upgraded to energy-efficient classroom lighting

Benefit #10:

Time to market optimization

The story of digital transformation is in part a story of speed — speed of information, speed of production, speed to market. As technology inevitably speeds up the way we live and work, the hunt is on for ways to design faster, produce faster, and sell faster. Digital transformation speeds time to market through a constellation of improvements that support process efficiency and the supply chain. Customer projects featured here indicate that 20 percent improvements in time to market are possible through advances in digitization.

BENEFIT	UP TO	AVERAGE
Time to market optimization	20%	11%

Pumping up the innovation for an OEM

Romeo Engineering, US

"We were able to reduce the cost of components and move the same amount of money into the drive and control portion of the solution, which doesn't need to be replaced often."

— Ed Martell,
Vice President of Systems,
Romeo Engineering

When Romeo Engineering in Fort Worth, Texas heard that a leading oil services company was taking bids for a pump system, Vice President of Systems Ed Martell had an idea for making sure his company won the job. The client needed a pump to use for downhole tooling / logging while drill testing. This job normally calls for a variable displacement piston pump, which is large and costly, with a long lead time. Martell had a more innovative, automated solution in mind, one that would not only be smaller, less expensive, and available within a shorter timeframe, but which would be more energy efficient and just as effective.

Working with Schneider Electric engineers, he developed a system built around an Altivar 71 drive, Modicon M340 programmable logic controller (PLC), and pressure transducers. The PLC sends data to a Magelis XBT GT human machine interface (HMI) that allows operators to manage any number of pressure and temperature variables, and change pump pressure by changing the RPM of the motor. Martell said that his fixed displacement vane pumps have run as low as 12 percent of power at the maximum pressure of 3,500 lbs. / in.^{2} — an 88 percent savings for a 150 hp motor.

In addition, using standardized components in the fixed displacement pumps cuts Romeo Engineering's lead time on builds down from 10 – 16 weeks to just 2 – 3 weeks — an impressive time savings. Their customers further benefit from the fact that the replacement costs for a fixed displacement pump are approximately 10 times less than that of a variable displacement piston pump, delivering them a substantial OpEx benefit.

LEAD TIME ON BUILDS DOWN TO
2 – 3 weeks

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:
Modicon M340

CONNECTED PRODUCTS:
Altivar 71 drive
Magelis XBT GT

Lessened lead times by about 75%

Lowered equipment replacement costs by as much as 10x

Generated significant energy savings

Assuring a proper level of success for a chemical company

Raylo Chemical, Canada

"When you add in the increase in quality, the improved pH readings by one sensor can be worth hundreds of thousands of dollars per year."

— Rob Pastushak,
Senior Technical Supervisor of Pharmaceutical Manufacturing,
Raylo Chemical

Raylo Chemical of Edmonton, Alberta, Canada is a custom manufacturer of a wide range of products used in applications from cancer treatments to antivirals. Their processes must be tightly controlled in order to meet compliance regulations and ensure quality and consistently high yields. One critical component in realizing their quality goals is the maintenance of correct pH ranges. When Raylo's existing sensors proved unreliable, costly, and time consuming — largely due to the failure of O-rings —they needed a more dependable solution.

Raylo found their answer in the Foxboro™ 871PH Series rebuildable pH probe from Schneider Electric. Not only did the unit's patented technologies match their needs, Raylo was also able to tap into Schneider engineers' technical expertise and production capabilities to modify the sensors to include O-rings made from the durable Kalrez® perfluoroelastomer. Other companies they considered only offered off-the-shelf pH sensors.

With the Foxboro 781PH sensors in place, Raylo recognized time savings on several fronts. The unit's accuracy reduced the number of grab samples needed for testing, letting the company complete more batches in the same period of time. The time to adjust pH levels was reduced from 18 – 24 hours to just three. The faster, real-time readings from the sensor helped reduce manufacturing cycles by up to 20 percent, increasing capacity and competitiveness.

REDUCE MANUFACTURING CYCLES BY up to 20%

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:

CONNECTED PRODUCTS:
Foxboro 781PH Series

Improved pH measurement accuracy to ±0.03 pH units

Ensured regulatory standards compliance and certification

Sped pH adjustments from 18 – 24 hours to just 3 hours

Decrease in occupant comfort-related incidents

With digital transformation, buildings have become much more than just walls, windows, and square footage. Connected devices and centralized building management systems have turned them into responsive environments capable of adapting to individual heating and lighting preferences. Above all, the digital transformation of buildings has improved occupant comfort, from easier-to-find parking spaces to custom-lit work spaces. However, with greater capability comes greater expectations — especially from top talent and companies. The goal is now to upgrade buildings with app-based environmental control and intelligent ease of access to meet these new expectations and thereby attract desirable tenants.

From a medical research center in Australia to a Schneider Electric manufacturing plant in the US, new IoT-connected building management systems are improving air quality, HVAC conditions, and lighting customization. In fact, our data show that these projects resulted in 24 percent improvements in comfort, on average.

BENEFIT	UP TO	AVERAGE
Decrease in occupant comfort-related incidents	33%	24%

Creating the right atmosphere for innovation

South Australian Health and Medical Research Institute (SAHMRI), Australia

"We need environments that encourage creativity … to ensure researchers are at their best, most creative and productive."

— Steve Wesselingh,
Executive Director,
SAHMRI

The South Australian Health and Medical Research Institute (SAHMRI) set out to build a new research facility that would foster creativity, productivity, and innovation, while achieving operational, environmental, and regulatory compliance goals. SAHMRI's design team was committed to developing a building plan that would inspire and attract top talent.

To align its forward-thinking goals with its building's capabilities, SAHMRI put in place an EcoStruxure solution that ensures predictable temperatures, better air quality, and therefore, greater occupant comfort. The solution integrates 50,000 points throughout the building, bringing into a single digital platform power management, process automation, building management, IT management, and security.

The fully digitized solution succeeded in creating a comfortable place to work. Indoor air quality is kept to stringent standards, with minimum airflow rate exceeding 50 percent. The building's LEED Gold certification is another source of appeal, with 40 percent water savings and upwards of 30 percent energy savings driving occupant satisfaction.

50%
MINIMUM AIRFLOW RATE

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:

EDGE CONTROL:
EcoStruxure Power Monitoring Expert
EcoStruxure Building Operation

CONNECTED PRODUCTS:
Altivar VSD
Pelco™ by Schneider Electric cameras
Integrated lighting control
Foxboro 781PH Series LV/MV switchgear

Ensured minimum airflow rate of at least 50%

Connected 50,000 integrated points

Drove 30% energy savings and earned LEED Gold

Leading by example: A story from our own facility

Seneca Plant, US

"EcoStruxure Building Advisor diagnosed HVAC issues we didn't even know we had ... and paid for itself in the first year based on saving energy and wear and tear on equipment."

— **Joshua Coale,**
Facilities Technician,
Schneider Electric

Schneider Electric uses its own products and solutions throughout its enterprise. The Seneca Plant, the birthplace of some Schneider motor control centers, is also home to hot summers, cold winters, and high ceilings. Seneca was recently upgraded to a new digital building management platform to ensure optimal occupant comfort for workers — and to save some energy along the way.

To achieve these goals, Schneider installed EcoStruxure Building Advisor platform as a way to pinpoint HVAC and lighting performance issues. In the past, the facility required monthly checkups. Now, the platform creates reports every five minutes, recommending upgrades to maximize comfort and energy savings. These recommendations are ranked across criteria such as severity, financial opportunities, and comfort impact.

The digital transformation of energy management allowed Schneider to do more with less. The solution achieves $9,000 in energy savings per year, with an 83 percent reduction in avoidable energy costs related to HVAC. Although these savings are part of a strategic effort to go carbon neutral by 2030, an immediate focus is on workers. The new digital solution reduced comfort-related issues by 33 percent, and reduced maintenance incidents by 29 percent.

REDUCED COMFORT-RELATED ISSUES BY
33%

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
EcoStruxure Building Advisor

EDGE CONTROL:

CONNECTED PRODUCTS:

Saved $9,000 per year via heating and cooling systems

Eased root cause reports for better troubleshooting

Prolonged heating and cooling equipment lifespans

Benefit #12:

Return on investment

Many businesses opt not to make digital upgrades because they believe the return on investment isn't there, or it will take too long to realize. The experiences of Schneider Electric customers tell a different story; when it comes to digital transformation in energy management and automation, the average return on investment or payback period is just 5.3 years, while some projects produced returns on investment of under a year.

BENEFIT	UP TO	AVERAGE
Return on investment	0.75 year	5.3 years

SICAE, a French utility company, digitized their operations and achieved a 4-year payback on the project. WATCH HERE.

Monitoring the heartbeat of a medical center — and securing a 20x ROI

University of Rochester Medical Center, US

"What was once 'dumb' equipment can now tell us its condition and whether or not it is approaching failure and needs service. This is incredibly valuable to us."

— Mark Schwartz,
Director of Medical Center Facilities,
University of Rochester

At the University of Rochester Medical Center, both life-saving research and patients' lives depend on clean, reliable power. Outages can cost millions of dollars and can put people at risk. In addition, the medical center's credibility and reliability directly impacts its bottom line. To protect the building from unexpected downtime, the medical center needed a digital upgrade of its power supply system.

To execute this upgrade, the medical center installed the EcoStruxure platform. The digital solution sends notification of potential equipment issues before failure, providing the facilities team with enough time to respond. Vast troves of data are analyzed in the cloud for insights into performance improvements and downtime threats.

This solution is the first step toward a completely digital campus — a digital transformation that will touch the lives of students, hospital staff, and patients. The project brings much-needed peace of mind to the facilities team. Because the system provides early notice of any downtime threats, the center was able to save $1 million — 20 times the cost of the initial project.

$1 million
SAVINGS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
EcoStruxure Asset Advisor

EDGE CONTROL:
EcoStruxure Power Monitoring Expert
EcoStruxure Power SCADA Operation
EcoStruxure Building Operation

CONNECTED PRODUCTS:
MasterPact™ MTZ circuit breakers

Enabled predictive, condition-based maintenance

Saved nearly $1 million through early issue detection

Provides peace of mind via continuous monitoring

Compressing the timeframe of return on investment

Ingersoll Rand, Italy

"The solutions we have developed on the US corporation's platform have enabled our customers to avoid the release of 15,000 tons of CO_2 into the atmosphere. Such quantity … is the equivalent of €1.6 million saved."

— **Fiorenzo De Vecchi**,
Italian Controls Manager,
Ingersoll Rand

Ingersoll Rand is a leader in the production of centrifugal compressors. For years now, they have maintained a team focused on the reduction of power consumption. And for good reason: in Italy, the energy to supply industrial compressors has accounted for as much as 12 terrawatt hours. That's 11 percent of the total energy consumption for production processes on a national scale. Operating compressors also has a significant impact on costs and environment. Ingersoll Rand's team always looks for ways to improve their customers' energy efficiency.

While the company had developed software to monitor their proprietary equipment, customers were also asking for a way to control compressors from other vendors as well. This meant the creation of a standard market platform. One customer suggested considering the Wonderware (now AVEVA) software and InTouch HMI they were currently using. Ingersoll Rand saw the benefits of the solution, including the ability to check the status and operation of machines in real time, perform remote diagnostics and adjustments, and enable predictive maintenance.

The benefits to Ingersoll Rand and its customers have been as substantial as they are practical. The company notes that the solution has helped avoid the release of 15,000 tons of CO_2 into the atmosphere. One customer reported a return on investment of just nine months, and energy cost savings of approximately €8,000 per month, year over year. Combined with full visibility into their compressor room, the solution has changed the way their engineers work every day.

€8,000/mo.
ENERGY COST SAVINGS

EcoStruxure Architecture

APPS, ANALYTICS, AND SERVICES:
AVEVA software

EDGE CONTROL:

CONNECTED PRODUCTS:
AVEVA InTouch HMI (formerly Wonderware)

Gained
real-time visibility
of installed
equipment

Avoided
15,000 tons of
CO_2 emissions

Saved
~€8,000 / month
on energy bills

Conclusion

The Global Digital Transformation Benefits Report presents compelling evidence for the operational, financial, environmental, and strategic value of digital transformation. Using data and stories from 230 customer projects, it builds the case that digitization unlocks savings across CapEx, OpEx, and other key business goals.

The continual opportunities of digital transformation

A larger story emerges from this report about the power of digital transformation in energy management and automation: when businesses digitize both energy management and automation, the two work in concert to drive even greater value.

For instance, the story of Hilton Garden Inn Dubai Mall of Emirates (see page 24) used automation to shut off lights and adjust temperatures when guest rooms were unoccupied. In this way, the hotel was able to manage its energy use and achieve energy cost savings of 25 – 44 percent. It is now one of the most sustainable hotels in the world.

Another story from the infrastructure sector demonstrates the power of coupling energy management and automation. Puget Sound Energy, a utility company in Washington state, digitally enhanced their data centers' automated intake processes and integrations, which reduced their total server rack needs by 33 percent. This reduction created a virtuous cycle in which more efficient IT management lessened energy needs and CapEx while still maintaining Tier 1 and 2 availability.

The reach of digital transformation extends into every economic segment. It has revolutionized hotels, medical facilities, wastewater treatment plants, mines, factories, banks, schools, and much more. The goal for most businesses and organizations now is to move beyond considerations of digital transformation's potential and into action. This report presents concrete evidence that justifies this shift.

When done right, digital transformation never ends. Businesses and innovators will continue to find novel ways to digitize and disrupt the value chain. As these transformations unfold, Schneider Electric will be prepared to evolve along with them. Likewise, the Global Digital Transformation Benefits Report will continue to analyze and quantify the emergent potentiality of the digital transformation journey.

APPENDIX:

Customers included in this report

- Dow Corning
- Wide Bay Water Corporation
- Pemex
- Vitens
- DartPoints
- F12.net
- Penn Medicine
- Bolloré Logistics
- City of Lakeland
- Edwards Air Force Base
- Carrefour
- Enel

- Hilton Garden Inn Dubai Mall of the Emirates
- PNC Arena
- Roy Hill Mining
- Baosteel
- Tres Rios Reclamation Facility
- Nemours Children's Hospital
- DTS Vietnam
- New Belgium Brewing Company
- China Unicom Cloud Data
- Tata Power
- Boston Scientific

- Fort Garry Hotel
- Lidl Finland
- The Blackstone Group
- Delran Township School District
- Romeo Engineering
- Raylo Chemical
- South Australian Health and Medical Research Institute
- Schneider Electric Seneca Plant
- SICAE
- University of Rochester Medical Center
- Ingersoll Rand

About the report

This report presents an analysis of 330 customer data points from projects implemented over a five-year period. An analysis of these data across three ROI categories and a total of 12 key business benefits form the foundation of this report.

About Schneider Electric

Schneider Electric is leading the digital transformation of energy management and automation. We partner with customers across segments and around the world to innovate, improve performance, and bring bold ideas to life. We drive value for our customers through unprecedented connectivity, sustainability, efficiency, reliability, and safety, and help companies become more efficient in how they buy and consume energy.

About EcoStruxure

Schneider Electric brings together energy management, automation, and software in one interoperable IoT architecture: EcoStruxure. We also partner with clients to help them buy energy more strategically, reduce energy use, and operate more sustainably through our EcoStruxure Energy & Sustainability Services.

Discover more stories on successful digital transformation.

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