IoT for Sustainability

Achieve business and sustainability goals
with digital solutions and collaboration

Explore

Life Is On | Schneider Electric

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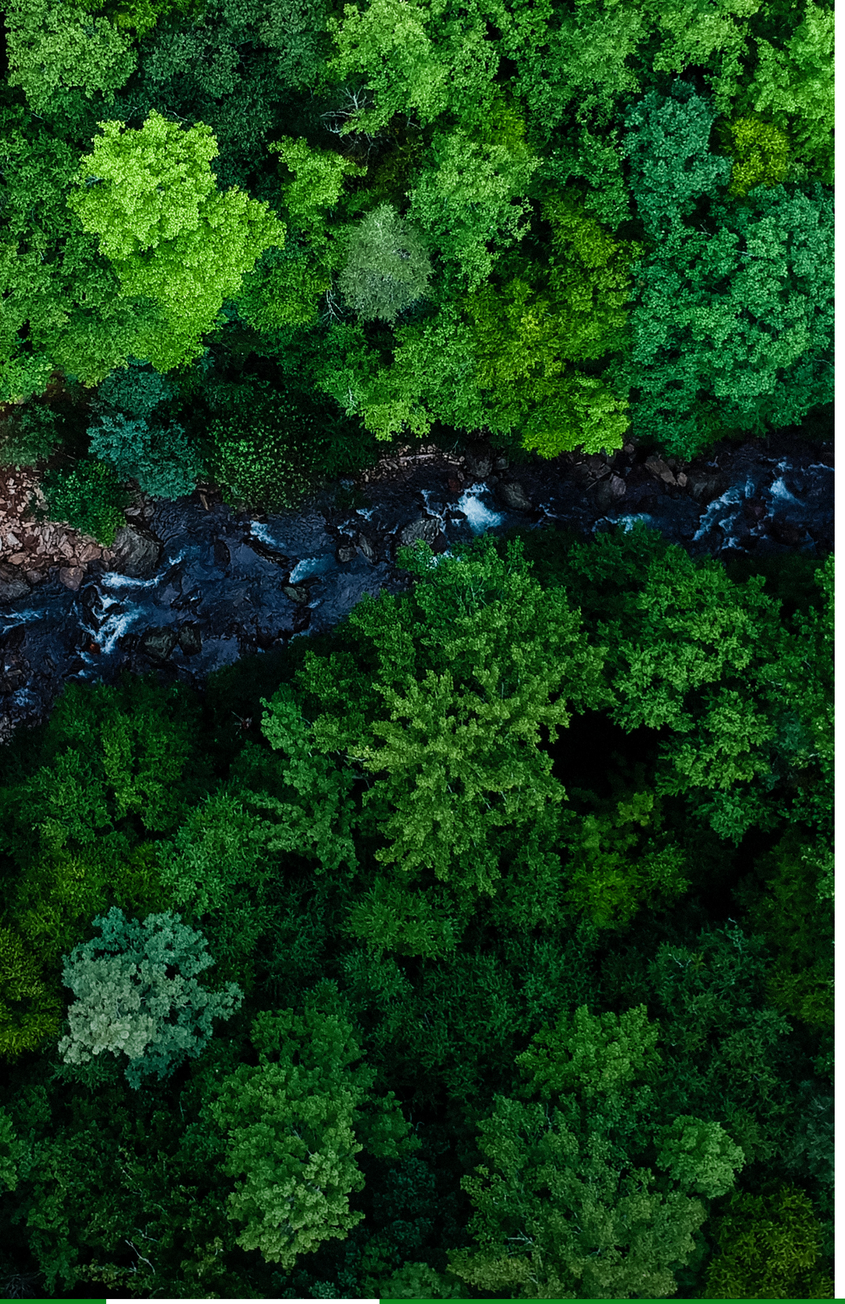


Business-driven climate wins

Seizing opportunities for sustainable recovery and growth

In June 2020, the World Economic Forum launched its “Great Reset Initiative”[1] in response to the COVID-19 pandemic’s deep impact on every facet of society. This initiative fosters unprecedented global opportunities to achieve a transformative green economy, with the environment emerging as “one of the big winners.”[1] All told, global lockdowns resulted in reduced emissions: 7% in 2020 compared to 2019 levels.

The reality for businesses worldwide, though, is this: despite COVID-19, climate priorities made well before the pandemic have not changed, and no company should become complacent from the momentary reduction in emissions, a drop in the ocean when trying to turn the tides on climate change.[2]

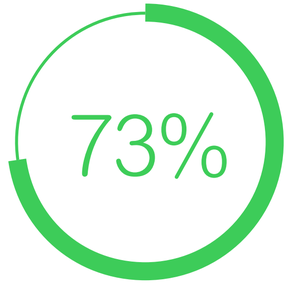
“Like the pandemic, climate change is a global crisis affecting all of us, in every country, business, and community. It is no longer a corporate social responsibility issue. Addressing the climate threat is a business imperative.”

— Olivier Blum
Schneider Electric Chief Sustainability Officer

Why sustainable business is good business

Simply put, sustainability commitments are not just better for the planet; they are better for business, too. In its research on sustainability imperatives, Accenture found that, “between 2013-2019, companies with consistently high environmental, social, and governance (ESG) performance enjoyed 4.7x higher operating margins and lower volatility than low ESG performers over the same period.”[3] Similarly, BCG has reported that among Consumer & Packaged Goods companies, for example, those considered ESG leaders have an 11% valuation premium over competitors.[4]

What’s more, sustainability commitments are becoming an essential part of a brand’s value for employees, customers, and shareholders. By the numbers, 73% of Generation Z retail consumers in the U.S. are willing to pay more for sustainable products, following in the footsteps of the 68% of millennials who feel the same way.[5] Future leaders are committed, too: a recent Yale survey of top business school students, for instance, revealed that 78% were “more inclined to apply for a job with a company with excellent environmental performance.”[6]



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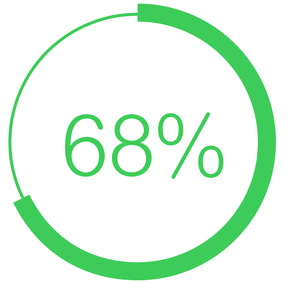


following in the footsteps of the 68% of millennials who feel the same way.

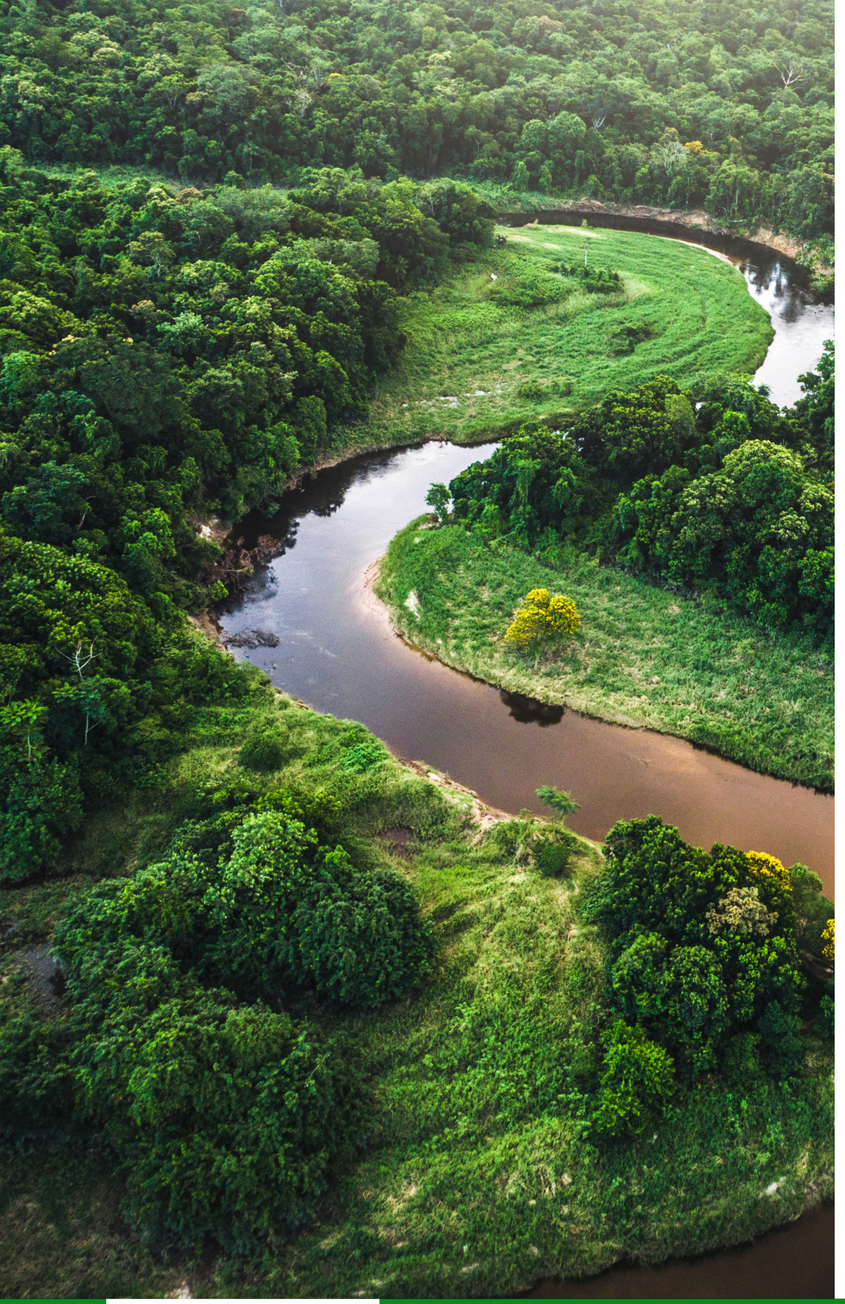
Investors view

> **“Businesses that integrate digital and sustainable transformation into their operations and value chains are 2.5 more likely to be successful in the future.”[7]**
>
> — World Economic Forum

Investors also have a sharp, expectant eye on sustainable companies, as indicated by their investment preferences. In his letter to CEOs, Chairman and CEO Larry Fink of BlackRock, the world’s leading financial asset manager with more than $7 trillion under management, writes,

“As the [energy] transition accelerates, companies with a well-articulated long-term strategy, and a clear plan to address the transition to net zero, will distinguish themselves with their stakeholders – with customers, policymakers, employees and shareholders – by inspiring confidence that they can navigate this global transformation.”[8]

Who can accelerate the energy transition? It is no secret that industrial plants, data centers, buildings, transportation, and energy-intensive industries bear the most weight and the opportunity to bring about climate change. Now is the time for these sectors, and others, to take concrete measures to steer the course toward a healthier future.



Making what is possible, possible

Across energy-intensive industries such as oil & gas, manufacturing, and buildings, we have the collective ability to seize the opportunity to rebuild and grow in much more efficient and sustainable ways. Business prosperity can happen in lockstep with sustainability outcomes.

The burning question is how do we achieve measurable sustainability outcomes?

Take it from the leader of the world's most sustainable corporation, as ranked by Corporate Knights' 2021 Index, Schneider Electric.

"If you are a company and can run your process and manufacture products with a carbon footprint that is half or one third of your competitor, then you will win. It is a question of good economic sense."

— Jean-Pascal Tricoire
Schneider Electric Chairman & CEO

Advancing sustainable business ambitions

This paper will help you discover three ways to advance sustainable business ambitions harnessing the potential of digitalization on the path to a net-zero economy:

1. Tap into the benefits of IoT to unleash opportunities for both process and energy efficiency, especially as digital transformation efforts accelerate to accommodate the needs of the new normal.
2. Leverage the value of data as a deep well of insights to optimize energy consumption and lower carbon emissions.
3. Collaborate across industries and expertise to gain the speed needed to seize the opportunity to reset — and revitalize — connected infrastructure, energy efficiency opportunities, sustainability commitments, renewable energy usage, and digital innovation for a better, cleaner, and greener tomorrow.

Tap into the benefits of IoT to unleash opportunities for both process and energy efficiency, especially as digital transformation efforts accelerate to accommodate the needs of the new normal.

The Internet of Earth

The Internet of Earth

IoT for the sake of the planet

> **"Digitalization can improve energy efficiency through technologies that gather and analyze data to effect real-world changes to energy use."[9]**
>
> — International Energy Agency

There is no question that the pandemic has been an intense accelerator of digital transformation. In addition to ensuring digital customer experiences to fuel the new normal, companies have been forced to digitize infrastructures to bring about greater efficiency, agility, and resiliency.

As companies push ahead with a focus on recovery and then growth, now is the time to unleash the efficiency potential of connected infrastructures to reduce costs via more sustainable processes and operations. Why? Because at its core, IoT is about monitoring, measuring and remotely controlling (when necessary) previously unconnected 'things', enabling people to connect and act based on data.

Digitalization is the road ahead, and the Internet of Things (IoT) is the vehicle that will drive us forward, fast.

Knowing that deployment and scalability are widespread challenges for IoT rollout, Schneider Electric developed EcoStruxure™ as an IoT-enabled, plug-and-play, open, interoperable architecture and platform. By leveraging the power of digitization, EcoStruxure applications improve energy and resource use in homes, buildings, data centers, infrastructure, and industries.

Use case:

A Finnish first: net-zero efficiency at Lidl

Lidl, one of Europe's largest grocery store chains, needed a new distribution center to support its growing operations in Finland. Its vision was for a facility that could stand as a practical symbol for its sustainability commitments. Schneider Electric's EcoStruxure™ Building Operation teaches the building management system to predict events and optimize energy use. This digital system works in tandem with EcoStruxure™ Microgrid Advisor so that energy is produced, consumed, or stored exactly where it needs to be, saving 70% in energy costs.

The facility runs so efficiently that, during certain times of year, it goes beyond net-zero by distributing excess energy to 500 homes nearby, reducing the community's draw on the local power plant – and setting a new benchmark in efficiency.

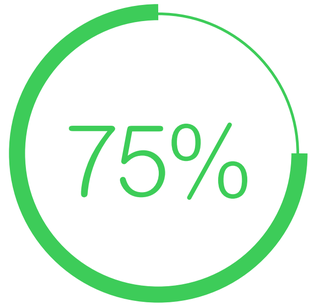
Watch the video.

IoT as a lever for Sustainable Development Goals

Across manufacturing plants, critical infrastructure such as hospitals, electrical grids, city infrastructure, heavy process industrial environments, and more, the IoT can advance the gains in energy efficiency enabled by connected devices. In fact, World Economic Forum analysis shows that “84% of IoT deployments are currently addressing, or have the potential to address, the Sustainable Development Goals (SDGs) as defined by the United Nations”[10] — without compromising the commercial drivers of the IoT integration.

The underlying premise is that when you can see and measure efficiency holistically, and in real time, you can run leaner and cleaner operations. It is not a coincidence, therefore, that “75% of these [SDGs] concentrate on the five goals that correspond to some of the most profitable industry applications.”[10] These are #12. Responsible production and consumption, #11. Sustainable cities and communities, #9. Industry, innovation and infrastructure, #7. Affordable and clean energy and #3. Good health and well being.

Most organizations intuitively turn to digitalization to carry forward their sustainability commitments, as the two go hand in hand. Imagine the sustainability impact of IoT projects when sustainability goals inform the project upfront — with the driver of business growth.



of IoT projects focus on 5 SDGs:

Green Growth:

2021 - 2025

SCHNEIDER SUSTAINABILITY IMPACT

Lessons learned from the world's most sustainable company

Schneider Electric was an early adopter of ESG commitments when it introduced its first sustainability barometer in 2005. Fifteen years later, Schneider has proven that ESG commitments cannot just be a one-off. Accordingly, the company has reinforced its commitment every three years to contribute to make the world greener and more inclusive.

Learn how Schneider has taken action on the goals. Read the "Schneider Sustainability Report"

6 long-term commitments	11+1 targets for 2021-2025	
CLIMATE	1	Grow our green revenues to 80%
	2	Deliver 800 million tons of saved and avoided CO_2 emissions to our customers
	3	Reduce CO_2 emissions from top 1000 suppliers' operations by 50%
RESOURCES	4	Increase green material content in our products to 50%
	5	100% of our primary and secondary packaging is free from single-use plastic and uses recycled cardboard
TRUST	6	100% of our strategic suppliers provide decent work to their employees
	7	Measure the level of confidence of our employees to report behaviours against our Principles of Trust
EQUAL	8	Increase gender diversity, from hiring to front-line management and leadership teams (50/40/30)
	9	Provide access to green electricity to 50 million people
GENERATIONS	10	Create opportunities for the next generation – 2X number of opportunities for interns, apprentices, and fresh graduates
	11	Train 1 milion underprivileged people in energy management
LOCAL	+1	100% of Country and Zone Presufents define 3 local commitments that impact their communities in line with our sustainability transformations

Advancing system-level efficiency

As the International Energy Agency explains, “Digital technologies expand our view of energy efficiency: from end-use efficiency to system efficiency.”[9] We must look to system efficiency as a driver of the long-term sustainability outcomes needed to stave off climate disaster.

Four axes of integration can advance this push toward system-level efficiency through digitization:

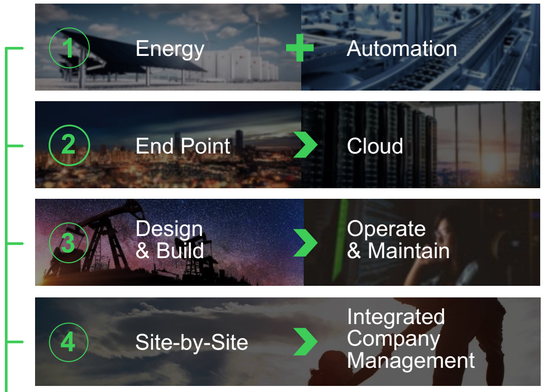
1. The integration of energy management and automation for cost reduction while curbing carbon emissions and resource consumption.

2. The vertical integration of end-point to cloud, connecting every point in an installation from the shop floor upwards, so data (including energy and resource efficiency metrics) is accessible and transparent in real-time.

3. Lifecycle integration, from design and building, to operation and maintenance, in order to eliminate all discontinuities and inefficiencies in the transition from CapEx to OpEx.

4. The evolution into an Integrated Company Management for a big-picture view of energy and resource consumption (that is, shifting from the traditional way of managing a company site-by-site to a holistic view) for the optimization of every company on a global scale.

Applied to some of the greatest business problems before us — how to run more sustainable operations — digitization offers great promise. But its true power to improve energy and resource efficiency lies is the analytics made possible by the massive amount of data derived from widespread IoT rollout.



4x

Efficiency

The power of data analytics

The power of data analytics

AI-based energy insights for better outcomes

> **"The IoT is about mass connectivity and mass transparency. In the process, it also generates a huge amount of data that is becoming a source of competitive advantage."[10]**
>
> — World Economic Forum

Data can strengthen a company's competitive position while advancing sustainability efforts — at the same time. When it comes to achieving measurable sustainability outcomes,

"AI (…) is poised to revolutionize the way we produce, transmit, and consume energy,"[11] says Harvard researcher Franklin Wolfe.

Although it has been said of late that "every company is a data company",[12] the reality is that AI expertise often extends beyond a company's core competencies. Even the most innovative tech startups often need to bring in AI experts to help them make the most of data by building business-relevant data analytics that can yield business outcomes and accelerate decision-making. Additionally, domain expertise is just as important for training and perfecting AI models.

Accelerating with Schneider Electric Exchange

For large energy consumers such as manufacturers, for example, being able to predict energy consumption is imperative for many things, from accurately forecasting demand to negotiating pricing and budget proactively. Data analytics can inform these predictions, streamline maintenance schedules and pave the way for renewables integration, wherein the wind flow and solar inputs can be inconsistent and, hence, intrinsically less predictable.

It is in this spirit of use case-driven collaboration involving AI and domain expertise that Schneider Electric launched Schneider Electric Exchange in 2019 as an open ecosystem for IoT energy management and automation solutions. The goal of Exchange is to facilitate collaboration in order to solve real-world sustainability and efficiency challenges faster by bringing together communities of experts who can tackle specific use cases and scale their impact across additional scenarios.

Technical resources & toolbox

Best-in-class management of API, data science, data sets and SDKs

Public & private communities

Collaborators co-innovating digital solutions, all content indexed and searchable

Digital marketplace

Full publisher lifecycle management capability and a global payment integrating lead generation

Use case:

Better matching energy forecasting to actual demand

Participating in Schneider Electric Exchange, the Swiss company Predictive Layer, for example, helps companies eliminate the uncertainty of energy demand forecasting. In commercial building applications, Predictive Layer's Crystal for Energy Management AI engines integrate power signal and weather data into its forecasting models to anticipate normal behavior and detect changes in pattern and usage. Should an actual anomaly occur, Predictive Layer's analytics service will alert and advise the facility manager to take certain actions to maintain optimized energy consumption, comfort, and security in the facilities.

By engaging in Exchange, Predictive Layer connects and offers its AI Forecasting platform to a broad ecosystem on the worldwide market. Predictive Layer also publishes its own external data sets in Exchange for companies who want to start with basic analytics before implementing full AI.

predictive layer
Shape Your Future

Predictive Layer's analytics services can yield:

- Up to 25% savings on energy bills
- A workplace optimized by 10-20%
- Up to 12% savings on operating expenses

AI-based energy insights

The value of AI models goes well beyond their impressive prediction capabilities. “One lesser-known benefit of joining IoT devices with each other and acquiring a wealth of data is the opportunity to improve energy efficiency. The technology can create reporting capabilities on everything from grid performance to where an organization is wasting energy. In turn, such reports can help determine potential savings, without requiring human intervention,”[13] notes Darren Cooper, President of Renteknik Group in Burlington, Ontario, Canada.

Gathering real-time energy insights is also essential for making efficiency gains that support sustainability initiatives. Such real-time information is even more critical since COVID-19 which has drastically disrupted the continuity of historical data sets, as many companies pivoted to remote workforces and changed production schedules based on supply chain constraints.

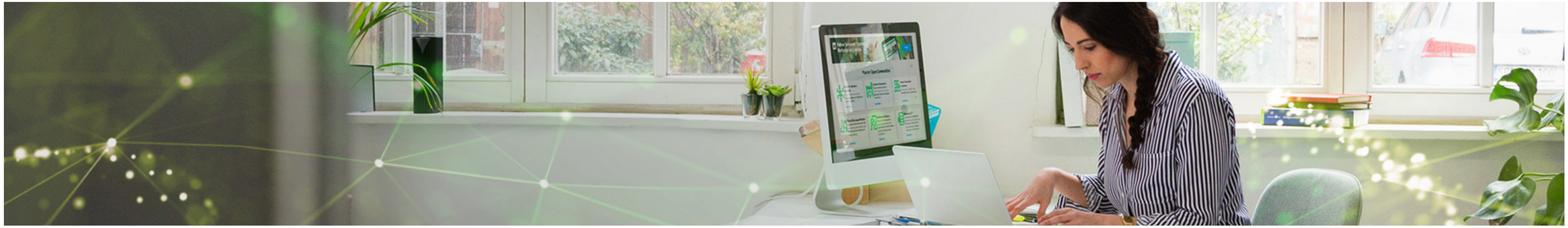
From raw data to data insights

Not too long ago, efficiency-focused analytics was a bold idea. As we have seen through multiple use cases within the Schneider Electric Exchange ecosystem, companies can turn the mountains of data already at their disposal to valuable business insights. No longer are these insights simply nice to have; indeed, they are a “must-have” with competitive value. Collaboration with AI experts is the way to bring forward this untapped value.

On Exchange: Leading data insights for LEED certification

ArcSkoru is an energy management technology platform that helps create better buildings and places for people and the environment. Arc allows buildings, cities, and communities to manage and benchmark progress, and improve sustainability.

Arc calculates an overall sustainability score based on operational building performance data for five categories, including: energy, water, waste, transportation, and human experience. By aggregating data from a variety of sources, such as water and energy meters, utility bills, and user surveys, Arc provides users with analytics across each performance category, as well as an overall performance score. Projects can use Arc scores to track and manage performance or achieve LEED certification.



On Exchange: Optimizing energy insights from the real estate industry

myrspoven

Myrspoven AI makes the operation of real estate self-driving. Myrspoven is a unique software service for BMS optimization, based on the combination of cutting-edge AI technology and engineering insights from the real estate industry. The service is connected to over 300 buildings and delivers results such as ~20% electrical cost-saving, ~5-20% thermal cost-saving, significant improvement in indoor climate, improved district heating return temperature, and identifying bottleneck components.

The software is self-learning and works as an add-on service to the existing Building Management Systems (BMS). It includes external data such as energy tariffs and weather forecasts together with any open-source data which can improve the AI-models predictions. The software works fully autonomously and includes a fallback solution with an ON and OFF switch to easily take the building to its pre-operational control. Myrspoven's vision is to globally contribute to the real estate industry's reduction of the carbon footprint of non-renewable kilowatt-hours by 1%.

Collaborating to scale efforts

Collaborating to scale efforts

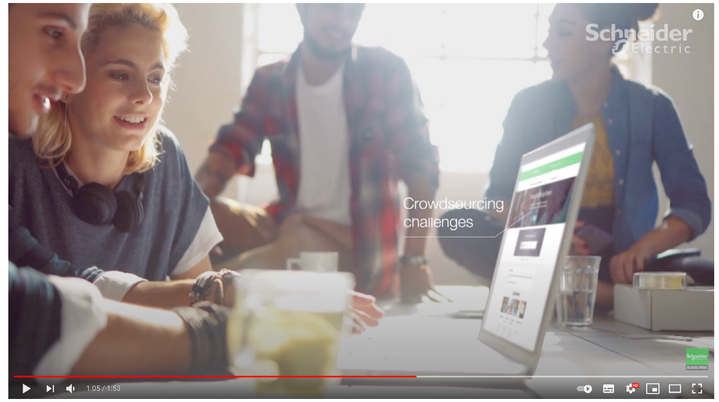
A faster journey to green growth

> **“Digital collaboration will help companies take greater and faster action for efficiency, sustainability, and business innovation.”**
>
> — Sophie Borgne, SVP Digital Plant, Schneider Electric

Well before COVID-19 changed the world as we know it, industry analyst leaders were calling on collaboration as the only way to ensure a successful, fast, and business-relevant digital transformation. The pandemic has accelerated this imperative.

While companies are reeling from such a sudden shift in ways of doing business, digital ecosystems that foster collaboration are essential for enabling companies of all sizes to become active stakeholders in tempering climate change. Yet prioritizing projects that can reduce energy use, even in inherently energy-intensive industries, can be a path toward long-term efforts to continue reducing carbon emissions.

In this context, Schneider Electric Exchange is a place to find experts, resources, and offers that will take you through the cycle of connecting devices, monitoring them, gathering data, getting actionable insights — ultimately to succeed in meeting your sustainable business goals immediately and for the long term. Exchange orchestrates collaboration, enabling companies to work with trusted experts, technology partners, and peers to take projects to the next level.



Watch the video

Use case:

How two companies joined forces to tackle an energy challenge

When an oil & gas company faced the daunting challenge of optimizing the consumption of additives and energy for transporting crude oil, which generally represents a significant cost for the customer, it turned to Schneider Electric Exchange.

SWCOL is an automation systems integrator in Colombia and certified as Schneider Electric Alliance Partner. They connected with Pepite based in Belgium, which is a certified Technology Partner of Schneider Electric, through Schneider Electric Exchange. Pepite specialized in data analysis for industrial process optimization using innovative techniques such as Artificial Intelligence, Machine Learning and Data Analytics, with an additional focus on integrating operating and technical staff knowledge into data analysis.

The challenge

SWCOL wanted to optimize the consumption of additives for the transportation of crude oil.

The solution

Thanks to Schneider Electric Exchange, SWCOL connected with Pepite to address their need for specialties & skills in data analytics to optimize crude oil transportation costs in Colombia´s main oil pipelines. They also extended their collaboration to address additional customer challenges around optimization of chemical products & energy consumption.

The benefits

- Exchange was used to easily connect SWCOL and Pepite around their respective specialties and business opportunities.
- The scalability provided by Exchange will help promote this solution to other oil & gas companies in Colombia and USA.

Use case:

Unlocking the value of data without CapEx investment

ENERGIENCY
ENERGY INTELLIGENCE FOR MANUFACTURING

Many manufacturers, including those in energy-intensive industries such as mining, are sitting on virtual goldmines of data. With no CapEx investment needed, manufacturers, including heavy process ones, can leverage this data to make leaps in their ability to curb energy waste.

Specialists in energy efficiency AI analytics, Energiency enables companies to transform this raw data from factory sensors into new sources of energy savings via algorithms that interpret that data and turn them into concrete action plans for operators in industry shop floors.

The data is Energiency's "raw material" to create energy intelligence for manufacturers. Factories are teeming with valuable data, but, until the onset of artificial intelligence, it was underexploited and analysis was relegated to spreadsheets. Energiency is using AI to unlock the value for factory operators, allowing them to visualize energy waste thanks to AI. The algorithms can tell based on time, machine information, raw material, or product, where the energy waste occurred, in turn enable better, more competitive operations.

Because AI often is not a native expertise, manufacturers can look to Schneider Electric Exchange for partners and tools to fill this gap.

The collaborative solution:

The joint Energiency – Ecostruxure solution leverages the data embedded within Schneider Electric environment (Power Monitoring Expert, process & production) with other relevant data (energy and fluids, process and production, maintenance, weather) to achieve up to 5% energy reduction with the help of AI techniques for energy efficiency.

Answer the call to action

Answer the call to action

Resetting sustainability commitments

If you take away one lesson from this paper, let it be this:

Digitization and IoT are key components in the fight against climate change, empowering companies to advance measurable decarbonization and efficiency ambitions while driving business value and innovation.

You can achieve this by:

1. Prioritizing digitization as an inherent aspect of business-driven efficiency projects;
2. Turning the volumes of data from IoT-connected devices into valuable energy insights; and
3. Collaborating across industries and expertise to make faster, more far-reaching leaps toward sustainability outcomes.

Turn to Schneider Electric Exchange to find ways create a better, cleaner, and greener tomorrow — within the context of your business strategy for recovery and growth.

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