



**The European
Green Deal's impact
on energy and utilities**

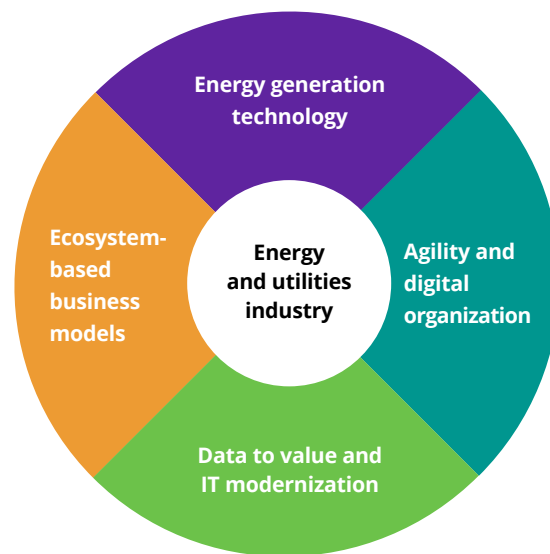
Technology innovation will play a major
role in meeting climate-neutral goals

Utilities follow trends and create new ones

The European Green Deal will bring a wealth of changes to the energy and utilities industry.

The Green Deal, a roadmap for the European Union's members to become climate-neutral by 2050, is a breakthrough policy: If successful, it will shift the industry foundations toward a cleaner future and demand more innovation. It will also create disruptive scenarios, opening the market for unexpected entrants and competitors and pushing legacy energy and utilities players to adopt new business models.

Sweeping legislation and regulation efforts backing the Green Deal at both the European and local country levels are driving four main pressure points for the industry (Figure 1).



New process technologies such as hydrogen generation, carbon capture systems and others are starting to receive investment and seeing wider industry adoption.

Constant deregulation and digitization are opening new ways to improve revenue, and, most importantly, create tighter integration between the energy industry and its customers (e.g., co-developing cleaner production processes).

Data is the future, and further focus on the value data brings is needed. A prerequisite to recognizing that is to modernize the underlying infrastructure.

Agility is transforming the industry, as an entirely new ecosystem of smaller and more nimble firms has emerged in the past few years.

Figure 1. New entrants are innovating a long-standing industry that is now a main enabler for the European Green Deal.

Clearly the energy and utility industry is becoming more dynamic, with boundaries opening up and innovation coming from all quarters, including new competition. While this poses threats for established suppliers, it also represents plenty of new opportunities.

The Green Deal captures the zeitgeist for new business and innovation to thrive

The European Green Deal goal of achieving a net-zero greenhouse gas emission economy by 2050 is perceived as a technological, economic and social transformation.

Through focused investments, the Green Deal has the potential to spark industry innovation in ways we have seldom seen before. New technologies such as hydrogen generation and energy storage systems — including power-to-gas and batteries — are tremendous technical advancements.

Large-scale adoption and industrialization of such clean technologies can change core industry dynamics, as more can be achieved with less money. View the example of solar panel costs dropping at high rates (**Figure 2**).

Utility-scale PV in selected European countries

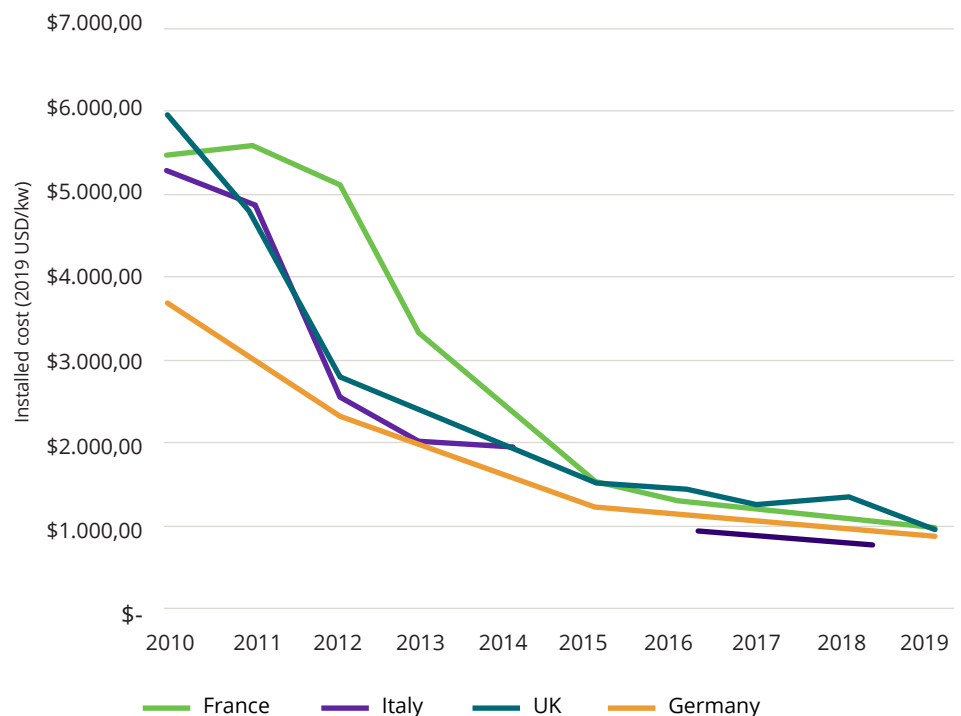


Figure 2. Technology industrialization is lowering installation costs and speeding up investment recovery. (Source — Irena, 2019)

The combination of constantly decreasing technology costs, an ambitious political climate, stimulus from the Green Deal and the economic resources to make it happen should result in an explosion of new technologies and business models.

Find value in the ecosystem — not the “ego-system”

Driving the next generation of electric vehicles

DXC developed part of the electric vehicle charging solution for Toyota’s Woven City, a living laboratory to explore the use of hydrogen fuel cells. DXC is developing the system to connect to and manage configuration of the loading station. The project also evaluates customer sensitivity toward different tariff options, such as incentive pricing during off-peak times or a penalty during peak hours.

Historically, regulations have sustained well-defined ownership of each part of the energy value chain, from generation to retail. But it is fair to say that as borders within and across industries blur, the landscape will become more complex as new parties become involved — some of them not originally from the energy industry. This calls for strategic decisions on whether to move forward as an ecosystem of partners — and sometimes competitors — or whether to go it on your own.

Given that many of the shiny new opportunities are complex, leveraging advances is likely to require an ecosystem approach, instead of an “ego-system.”

Let’s take the example of an increasingly important technology being developed to store clean energy: hydrogen. Its value chain is different from carbon’s, starting with the use of electrolysis to separate oxygen and hydrogen, a generation technique borrowed from the chemical industry. Recently, [Nouryon, Gasunie and other partners won an EU-backed project](#) for a 20MW hydrogen installation, and the results may dictate future expansion.

The use of hydrogen, which is very well suited for heavy industry, travel and logistics, will require a fundamental shift in thinking for major applications.

Whether energy is stored using gas (e.g., hydrogen or other), chemical battery or another technology, large amounts of assets will have to be deployed and financed. This will require new systems to manage and orchestrate those assets and provide better insight into resource availability to balance the grid and optimize clean energy that is already generated and stored.

It will be important, for example, to be able to identify green energy stored across the grid, as some prosumers and consumers will want to choose those sources, and some industries may be able to avoid carbon taxes by going green (**Figure 3**). DXC Technology has used blockchain technology to distinguish how energy is generated, where it is stored and how it is sold.

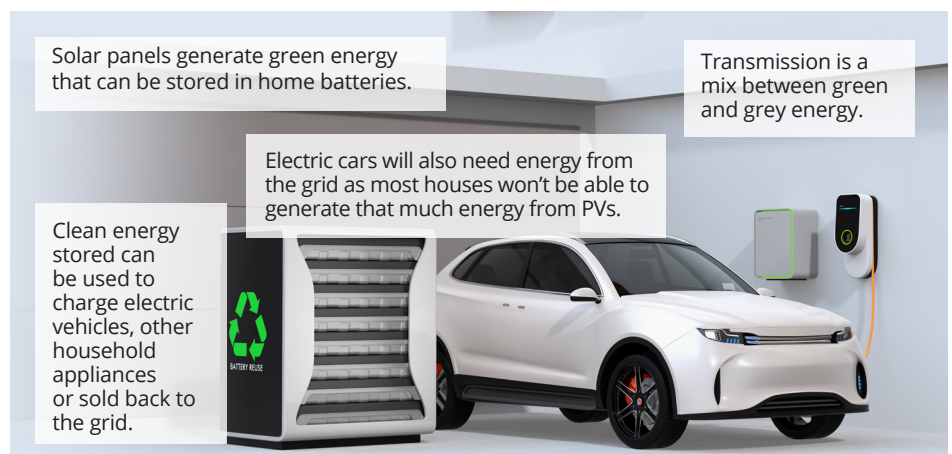


Figure 3. Because consumer technologies make it possible to sell energy back to the grid, new technologies are necessary to track where green energy is being generated and stored.

Exploring solar, battery management and microgrids

With our knowledge of solar panel energy forecasting, battery management and microgrid technologies, DXC is supporting an initial proof of value in Italy. The results are likely to dictate how such value could be rolled out on a large scale.

Given that new technologies are fundamentally shifting the energy market, it should come as no surprise that new entrants are eagerly looking for opportunities. Tesla, for example, already produces electric vehicles and photovoltaic (PV) solar, and also offers the Powerwall and [Megapack battery storage systems](#). It also has the license required to sell energy and has announced a virtual power plant with partner Octopus. Tesla will manage these assets to decrease household costs and sell energy back to the grid when either spot or advanced prices are high. As there are relatively low barriers to entering the market and the company has the energy storage know-how, its impact can be significant.

Based on similar thinking, the European Union is backing a new set of experimental propositions called Energy Communities (**Figure 4**).

The idea is to enable energy that is generated and stored in one house to be consumed in another house within the same microgrid substation, with any excess energy being sold back to the grid. This proposition is particularly interesting because it leverages locally generated green energy without requiring a large infrastructure investment.

An important by-product is that it enables other business propositions, such as peer-to-peer contracting.

Although these examples involve large companies, smaller organizations that are significantly faster, more agile and focused on new business models will play crucial roles in this ecosystem. The key point is that energy and utilities industry stalwarts need to evaluate when to compete and when to cooperate with new players.

The good news is these new entrants are dependent on the E&U industry in general, so there are symbiotic opportunities for all involved.

Microgrid with prosumption (solar generation)

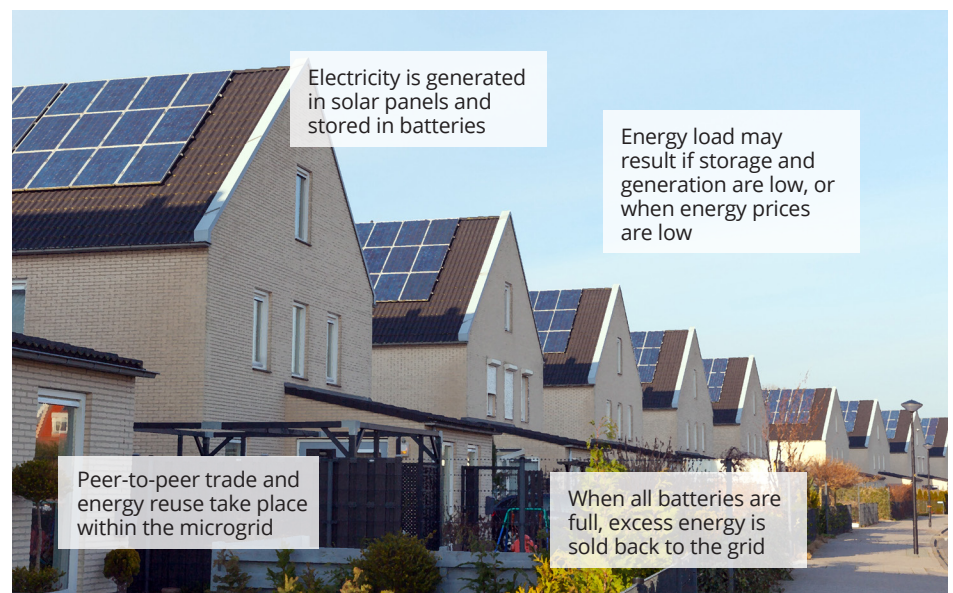


Figure 4. European Energy Community experiments will create sustainable microgrids.

Identify opportunities from edge to core

The time to act is now — start and learn fast, and fail fast when appropriate

DXC's 10-week proof of value

DXC can support you in creating ecosystems that generate value for customers and enable new revenue streams for all participants. Through DXC's down-to-earth design thinking approach, we can develop an ecosystem proof of value within 10 weeks.

The Green Deal requires swift and decisive action from governments, energy providers and energy consumers alike to achieve climate neutrality by 2050. To get there, significant budgets are being made available through national governments and the European Union, such as:

- France's 2 billion euro (7 billion euro over 10 years) plan to use clean hydrogen in industrial processes and transportation to cut the country's carbon dioxide output in 2030 by the equivalent of the annual emissions of Paris.
- Germany launched a similar plan last year, worth 9 billion euros over 10 years.
- The European Union is funding a 4-year project aimed at developing the world's first-ever power-to-X-to-power industrial demonstrator equipped with an advanced hydrogen turbine.

The question is: Where do you start?

Utilities need to increase investment in new technologies and solutions to accelerate the reduction of emissions. The top-ranked technologies, next to battery and storage technologies, to accelerate the sustainability journey are: automation, data analytics and artificial intelligence/machine learning (AI/ML).

Success will depend on the ability to:

- Test strategic hypotheses in an agile way
- Co-create and collaborate in ecosystems
- Use data to transform and drive better business outcomes
- Modernize the IT landscape to enable innovation and trackable results

What is needed is this: a clear energy transition roadmap, combined with the right governance structures and technology solutions, and close engagement from stakeholders.

The time to act is now.

Co-creation and ecosystem collaboration are critical

By now, it is increasingly evident that collaborating with external partners and adopting an entrepreneurial mindset are key to achieving an innovative edge.

The complexity of successful solutions will require cross-industry and ecosystem collaboration. More and more cross-sector initiatives are taking place, where companies that were once viewed as a potential threat to the very existence of utilities are now partnering on innovation (for example, on smart consumer engagement). To understand what is possible in the future of energy, it helps to study the ecosystem players that are flourishing across the value chain (nonexhaustive example in **Figure 5**). **Figure 6** shows the impact of the European Green Deal on energy and utilities.

Figure 5. Ecosystems flourishing across the energy and utilities value chain

Generation	Trading, transmission and distribution	Trading and retail
Oil and gas industry	Communication technologies	Energy communities
Universities and R&D	Carbon offsetting traders	Virtual power plants
Energy storage systems	Green energy traders	Storage systems
Renewables generation systems	Universities and R&D	Prosumers
System integrators and scale-ups	Engineering and technology	Startups on new business models (e.g., energy as a service)
Chemicals Industry	Grid balancing and flexibility firms	System integrators and analytics
Startups on clean energy (e.g., carbon capture systems)	System integrators and analytics	Government and civil associations
Engineering and technology	Government and civil associations	Automotive industry
Government and civil associations		Transportation and aviation
Data and advanced analytics		Heavy manufacturing
		PV solar systems
		Peer-to-peer energy companies

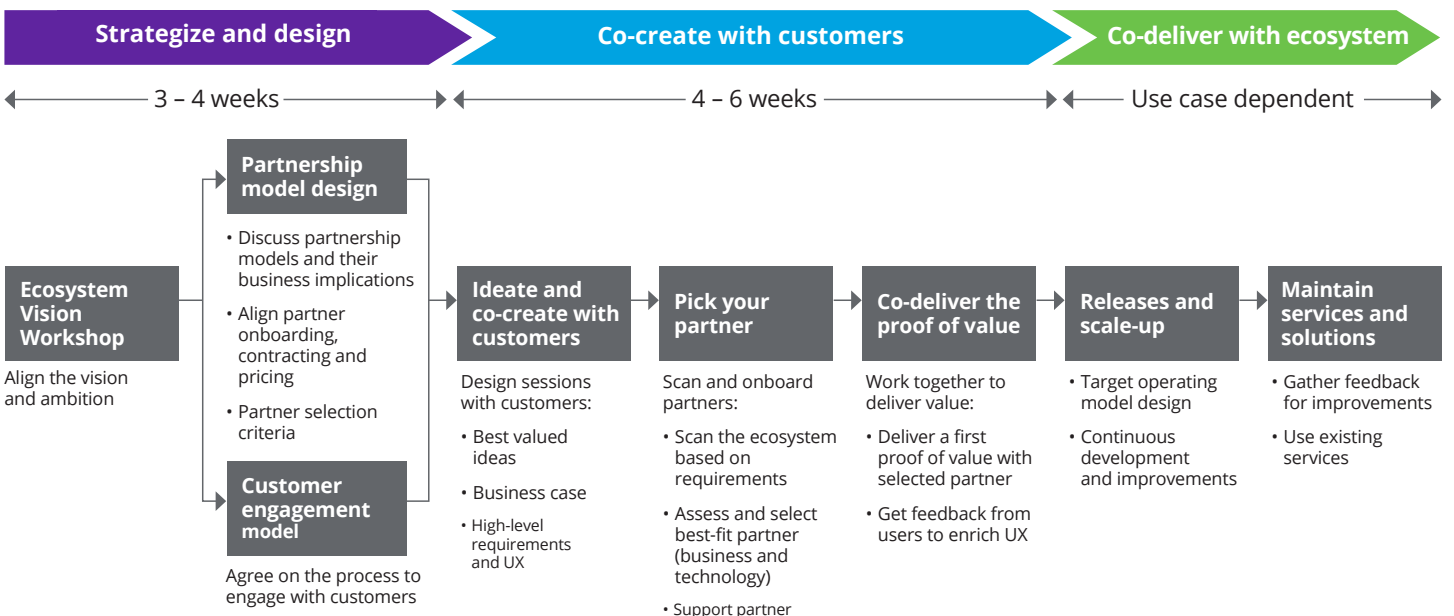


Figure 6. Preparing for the European Green Deal's impact

Become a data-driven enterprise: Get the data foundations of your house in order

Only a fraction of the data created is ever analyzed and used. Most businesses have a patchwork of digital systems that struggle to work together. Good ideas can get lost in execution.

As innovations in the energy industry will increasingly be driven by ecosystem collaboration, the ability to share data is becoming more important.

Utilities need to start by developing a data strategy that supports the business strategy, defining new or improved data sources and interactions that support business initiatives.



Align your business strategy

- Data and analytics need to be aligned to the business transformation strategy
- Prioritized use cases provide quantified business value and outcomes



Establish your core design

- Edge-to-core data, analytics and data science strategy
- Design thinking
- Architecture encompasses data repositories, data pipeline, internet of things (IoT), data catalog, AI/ML and technology components



Modernize

- Platform solutions and services, reference architecture, blueprints and accelerators
- Automated platform deployments, proven migration frameworks and DataOps
- Repeatability, productivity, agility and rapid delivery of data-driven transformations



Manage your data life cycle

- Data managed in line with data access, security, privacy, encryption and masking regulatory policies
- Data democratization enabled via self-service data access
- Information life cycle management, records management and data archiving



Deliver your business solution

- Data discovery, integration, cleansing, quality assurance and visualization
- Advanced analytics and AI, plus model development and management
- UI/UX for enhanced user experience and automation for enhanced business performance

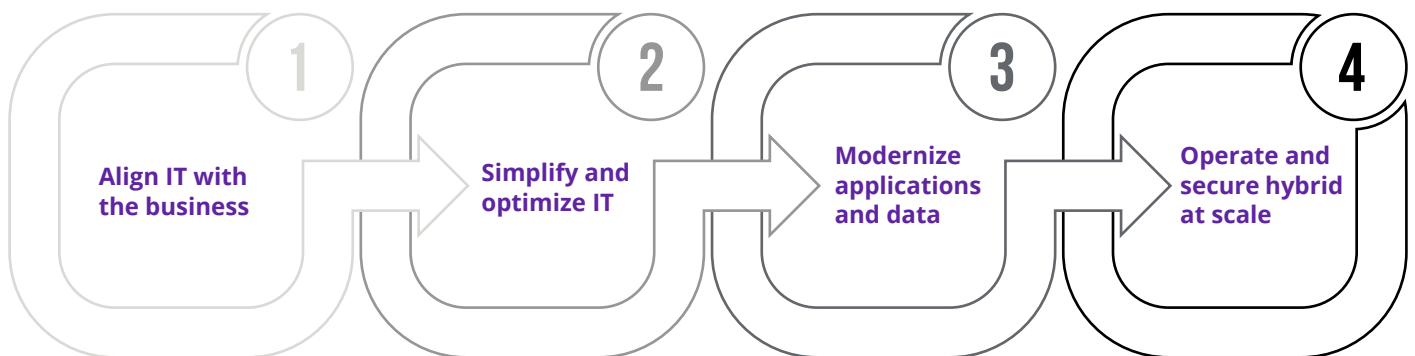


Figure 7. Key steps toward data and infrastructure modernization

DXC Technology and IT modernization

One of the world's leading IT services firms, DXC Technology is a recognized leader in complex, enterprise-scale transformation. We help customers reduce modernization costs and risks while increasing agility at every stage.

DXC's IT modernization solutions are underpinned by our enterprise technology stack, which includes an end-to-end suite of technology services, tools and capabilities, and our 200+ partner ecosystem.

IT modernization depends on four key success factors

To achieve the European Green Deal's objectives more rapidly, modernization is needed for organizations to reinvent themselves, help the business scale fast and shorten time to market. This means the introduction of new ways of working that harness the speed of the cloud and new cultures that value agility and innovation. Modern technology platforms help unlock data for deeper insights about customers and operations.

The path to modernization encompasses four success factors, as shown in **Figure 7**: aligning IT with the business, simplifying and optimizing the existing IT, modernizing applications and data, and operating securely at scale in a hybrid environment.

This will lead to a new operating model that ensures integrated operations, intelligent automation at scale and the ability to leverage analytics, AI and Lean processes for greater insights, speed and efficiency.

Successful execution requires a plan that covers people, processes and technology and a vision for adopting innovative Green Deal initiatives.

How DXC can help

DXC helps organizations capture, understand, process, connect and visualize their data to increase margins, optimize operations, and improve business resilience.

We bring our consulting capability when needed, to help connect technology capabilities and vision to business goals, ensuring alignment and stakeholder buy-in and awareness.

As a world leader in enterprise-scale data and analytics strategy services, DXC helps organizations transform and modernize their use of data to create contextual insights that drive measurable benefits at every point in the business process.

From data design to data sourcing and preparation to artificial intelligence and custom, business domain-specific data visualization solutions, we enable the end-to-end value chain: converting data to information, information to insights, and insights to outcomes.

Get the insights
that matter.

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