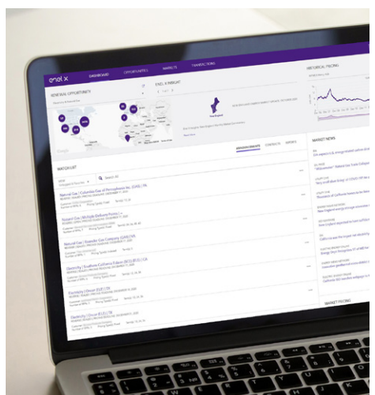
enel x

Most Innovative Projects of 2020



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Introduction

While 2020 will be remembered as a year of pandemic, accelerating climate change, and record heatwaves, wildfires, and hurricanes, it also marked a major, positive shift in the way energy is consumed.

Fossil fuel companies continued to lose market share as deployments of renewable energy projects accelerated. Even in oil- and gas-rich Texas, solar, wind, and energy storage projects dominated the queue to connect with the grid.

At Enel X, we are seeing and feeling these changes as we help leading commercial, industrial, institutional, and utility clients meet their energy challenges—and get in front of them. In this, our annual Top Projects review, we salute the forward thinkers and doers in energy, showcasing:

- Highly coordinated demand response programs that protected the grid and local communities in hours of need;
- Innovative solar-plus-storage initiatives that are replacing grid instability with energy resiliency, while also reducing GHG emissions; and
- Ingenious fleet and infrastructure electrification efforts that are making carbon-free travel possible.

Following are some of the most innovative energy stories of the year within our vibrant, growing customer base. We hope you like what you see, draw some inspiration from the efforts of your peers, and ask how we can help make 2021 the year you meet your organization's energy and sustainability goals.

A Post-Maria Microgrid Story: Bringing Energy Resilience to Puerto Rico

Ever since Hurricane Maria devastated Puerto Rico in 2017, causing $90 billion in damage and leaving much of the island without power, building a greener, more resilient grid has been one of this U.S. territory's top political, economic, and environmental goals.

Enel X and Eaton, a global power management solution and services provider with four manufacturing facilities on the island, are stepping up to meet the challenge, starting with a solar-plus-storage microgrid at Eaton's Arecibo manufacturing facility.

The microgrid—financed, owned, and managed by Enel X—incorporates a turnkey energy storage and solar photovoltaic system that will interconnect to the site's electrical infrastructure, supplementing its existing 8 MW of backup generation. The resulting asset, which includes Enel X Distributed Energy Resources Optimization Software (DER.OS) and Eaton's microgrid controllers, will be one of the largest microgrids on the island, providing 13 MW of available load.

Solar-plus-storage microgrid comprised of **5 MW solar array + 1.1 MW battery storage**

GHG emissions reduction of **4,000+ MT annually**

Solution includes Enel X DER Optimization Software and Eaton microgrid controllers

Microgrid delivers energy resilience, reduces GHG emissions and dependence on local grid

The microgrid will provide an "always on" electric resource for the manufacturer's strategic island site during periods of local grid instability or black outs, while at the same time reducing a projected 4,000 MT of GHG emissions annually and providing renewable energy for over half of the site's annual consumption.

With the microgrid, Eaton will be positioned to provide excess power back to the grid, deepening the company's partnership with PREPA, the island's electric utility, and local communities. In the future, Eaton and Enel X will seek opportunities to expand their clean microgrid solution across the island, helping Puerto Rico rebuild its electric grid on the bedrock of renewable energy.

Commenting in a *Greentech Media* article, Wood MacKenzie analyst Isaac Maze-Rothstein called the Puerto Rico microgrid project a "postcard from the future for islands and other centralized grid systems transitioning toward more distributed resources."

World's First 100% Electric Pan-American Charging Corridor Created for *Long Way Up*

How would you like to go on a road trip from Argentina to California driving an electric vehicle?

As seen in *Long Way Up*, the 2020 AppleTV+ documentary series that follows Ewan McGregor and Charley Boorman as they take that very ride on electric motorcycles, there is a need for electric vehicle charging infrastructure everywhere people drive. Enel X supported this bold initiative by installing 240 JuiceBox EV charging ports in 11 countries along the Pan American route that McGregor and Boorman drove from Ushuaia, Argentina to Los Angeles.

Photo by Claudio von Planta/Long Way Up

Today, Enel X JuiceBox smart EV charging stations are available approximately every 100 miles along the Pan American route that crosses through remote countryside, small villages, and major cities alike. Most of this charging network is now available through the Enel X JuicePass app for EV drivers in these locations and for adventure-seekers looking to follow the *Long Way Up* route on their own road trip.

With the rapid adoption of EVs, there is a corresponding need to ensure that sufficient infrastructure is put in place to support increasing demand for EV charging. In addition to residential charging stations, public charging stations are a critical piece of the puzzle, providing drivers with an easy connection to a network of EV chargers for longer drives. While much attention has been focused on establishing EV charging networks across the United States, electric mobility is a global market, and charging infrastructure at home, work and in public is critical to supporting widespread adoption of EVs.

Enel X contributed to the creation of the first **100% electric** Pan-American highway

Groundbreaking effort featured in the *Long Way Up* Apple TV+ docuseries

Charging corridor anchored by **240+ JuiceBox** smart EV charging stations

Enel X-supported EV electrification network spans **11 countries**

Public charging stations are key to driving EV adoption

Beating the Heat: How Salt River Project Is Using Demand Response to Meet Growing Energy Demand and Sustainability Goals

Community-based, non-profit utility serving **over 1 million electricity customers**

Number 1 **fastest-growing** county in America, Number 2 **hottest city** in America

Demand response part of 20 **sustainability goals** for 2035

25+ MW of demand response delivered in 2020 over 8 events

Salt River Project (SRP), a major provider of electricity in the greater Phoenix metropolitan area, is on the frontlines of two considerable trends impacting power demand—one demographic, one climatic.

First, the population of Phoenix is booming, leading the country in population growth. Second, the city continues to experience severe heat in summer. Meeting these challenges is top of mind at the utility and a key driver of SRP's 2035 Sustainability Goals, an ambitious roadmap for delivering a sustainable future for its customers and communities.

Demand response, the load-shaving programs that pay electricity customers to curtail energy use during times of peak demand (in Phoenix, this typically occurs on very hot summer afternoons when cooling needs are highest), figures prominently in SRP's master sustainability and resource plan. From 2009–2015, SRP teamed with Enel X (then EnerNOC) on a successful program engaging commercial and industrial (C&I) energy users. The utility looked to recreate that synergy for the summer 2020 SRP Business Demand Response Program, May 15 to Oct. 15.

Working closely with SRP's Strategic Energy Managers, Enel X enlisted more than 200 C&I sites—constituting 25 MW of available capacity—in just four short months. As Phoenix's hottest summer on record ensued—with average August temperatures topping 99 degrees Fahrenheit—the demand response program answered the call, exceeding expectations. C&I customers reliably met their curtailment commitments, delivering more capacity than the 25 MW contracted.

"We have gotten off to a fast, very successful start with Enel X on our Business Demand Response Program. This year placed unusual strain on our grid, with wildfires in California and Arizona creating resource constraints, COVID-19 making 'business as usual' anything but, and more consecutive days of extreme high heat, so it was critical that the promised capacity in our demand response program be available for dispatch when called upon. With Enel X, and the outstanding participation from our business customers, the program delivered as planned."

—Dan Dreiling, Director of Customer Programs at SRP

Uber Commits to 100% Zero-Emission Rides by 2040

Uber commits to **100% zero-emission** rides by 2040

U.S. drivers on Uber platform receive **discounts on JuiceBox home chargers**

Free access to JuiceEco makes ridesharing more sustainable

Smart charging infrastructure helps meet **sustainability, cost, employee-retention goals**

Enel X **fleet-electrification services** help future-proof fleets

To support sustainability goals and reduce total cost of ownership, public and private fleet operators are considering the compelling value-prop of going electric. This year, Enel X has continued to team with utilities and Fortune 500 companies to make fleet-electrification goals a reality. Our latest partner, Uber, has committed to making rides on its platform 100% zero-emission by 2040.

With the partnership, U.S. drivers on the Uber platform receive special discounts on JuiceBox home chargers and free access to JuiceEco, making ridesharing more sustainable. JuiceEco offers electric vehicle drivers a new way to match their electricity consumption with 100% renewable energy. Available exclusively through Enel X, JuiceEco provides Green-e® certified Renewable Energy Certificates (RECs) to drive any EV anywhere in the U.S. with carbon-free electricity.

In addition to sustainability benefits, fleets are turning to EVs and smart-charging infrastructure to meet cost goals while helping recruit and retain employees. Our corporate fleet customers, spanning leaders in biotech, telecom, and mobility, rely on turnkey Enel X fleet-electrification services to future-proof their fleets and prepare for increasing EV adoption.

"I'm Lovin' It": McDonald's Deploys 200 Smart EV Charging Stations in Italy

McDonald's deploying **200 Enel X EV charging stations** across Italy

Project will remove **1,800 tons of CO_2 annually**

Demand for **sustainable transportation** is on the rise in Italy

EV registration up **127%**, plugin hybrid registration up **210%** in 2020

Initiative underscores McDonald's **commitment to sustainability**

Consider adding this to your bucket list: Refuel with a Big Mac while charging up your electric vehicle at an Enel X charging station in Italy.

As part of a new partnership with Enel X, McDonald's will deploy 200 smart EV charging stations throughout restaurant locations in Italy. The project will remove 1,800 tons of carbon dioxide from the atmosphere on an annual basis—an amount equal to the CO_2 absorbed by more than 100,000 trees in a year.

Demand for sustainable transportation is on the rise across Italy, with a 127% increase in electric vehicle registrations and a 210% increase in plugin hybrid registrations this year. This partnership will help meet a critical need for increasing electric vehicle charging infrastructure throughout the country, and supports McDonald's commitment to sustainability.

Energy Procurement for U.S. Federal Government: Enel X's Exchange Platform Uses Enhanced Data Security for FedRAMP Certification

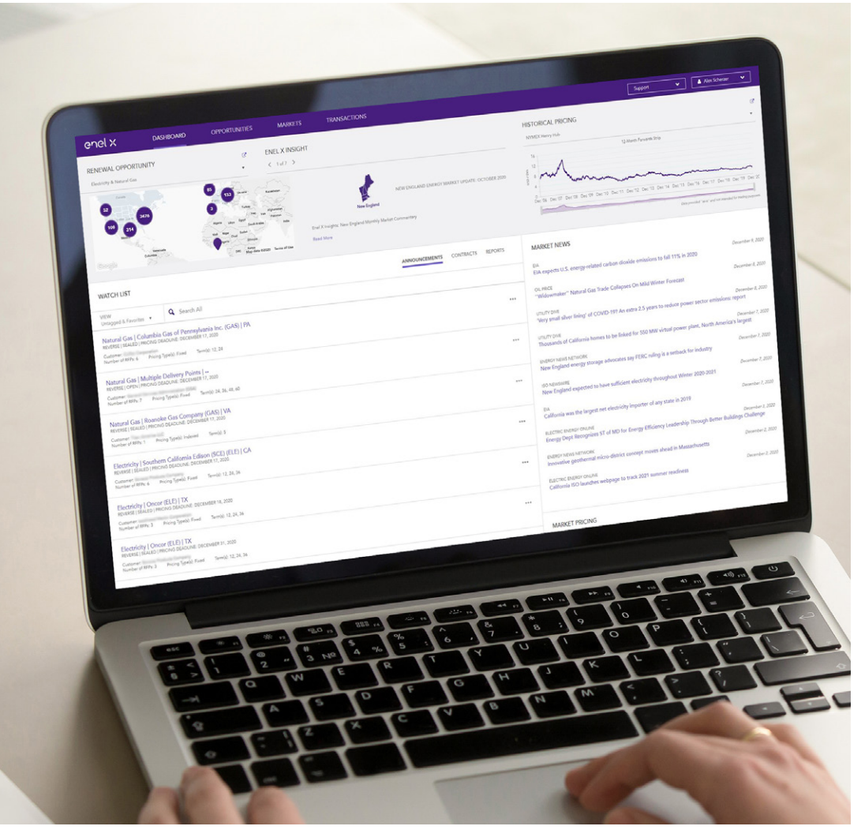
First and only energy procurement auction platform to attain FedRAMP certification

Over $1 million invested in the Enel X Exchange to meet enhanced security standards

Enel X Exchange tested across **126 security requirements**

Advances Enel X's leadership among Federal agency energy buyers

Enel X C&I, institutional, and utility **customers benefit** from same platform security upgrades



Continuous improvement is essential to building and maintaining leadership in any market, and that is especially true when working with Federal agencies.

With more and more business being conducted in the cloud, the Federal Government has escalated its efforts to ensure its data is safeguarded and that the SaaS solutions it approves for agency use meet strict security protocols and are regularly monitored.

Enter the Federal Risk and Authorization Management Program, a.k.a. FedRAMP.

Developed in concert with the National Institute of Standards, the General Services Administration, the Department of Defense, and the Department of Homeland Security, FedRAMP provides a standardized approach to security assessment, authorization, and continuous monitoring for cloud product and services.

And, as of October 1, 2020, the Enel X Exchange, the industry's leading online platform for energy supply management and procurement, is the first and only energy auction platform to become FedRAMP-certified.

Earning this certification wasn't easy. Enel X made over $1 million in security upgrades to meet program requirements across 126 testable controls in areas such as Application Security, Security Monitoring, Audit Log Management, and Continuous Monitoring. The result is an even stronger, more secure Enel X Exchange that continues to be the gold standard in government energy procurement. For the GSA alone, Enel X has:

- Purchased natural gas in 37 states; electricity in 10 states; and both commodities across 70+ utilities;
- Purchased 21 million Dth of natural gas annually, representing $98 million in contract value; and
- Purchased 1.6 billion kWh of electricity annually, representing $104 million in contract value.

FedRAMP certification, and all the enhancements that went into attaining it, isn't just good for Enel X government clients; it also means the Enel X Exchange got that much better for large commercial, industrial, institutional, and utility energy buyers.

Critical Relief in California: Enel X's Distributed Energy Resources Step Up to the Challenge of Rolling Blackouts

Worst **wildfire season** and record-breaking **heatwave** combine to strain CA energy resources

Rare **"Stage 3" electric emergencies** and first-in-20-years r**olling blackouts** called

Enel X energy storage, demand response, and smart-EV charging contribute to statewide reduction of **1,300 MW**

250 Enel customer sites contribute **100 MW** of daily demand response capacity

Demand response, the programs that pay businesses, institutions, and residential customers to reduce energy use when pressure on the grid is most severe, is establishing itself as a highly reliable, aggregate "resource for good" around the world and across North America.

In 2020, California faced an onslaught of wildfires—the worst fire season in its history—and a record heatwave, leading to back-to-back days of rare "Stage 3" electric emergencies and the state's first rolling blackouts since 2001. But it could have been worse.

Enel X demand response, energy storage, and smart EV-charging customers across California pitched in as part of a statewide cleantech and residential conservation effort to reduce strain on the grid, with CAISO, the state's grid operator, and the California Public Utility Commission, lauding those contribution as "the only way we have gotten through these (demand) peaks."

Combined, C&I and residential demand response programs around the state delivered 1,300 MW of critically needed capacity to the grid. Enel X resources—about 100 MW of demand response and stationary energy storage + ~70 MW of virtual battery capacity from smart EV charging—were dispatched 20 times through the record heatwave that began August 14th. They provided the grid a flexible capacity of 150 to 200 MW per day, the equivalent of powering 115,000 homes.

"This heat wave resulted in more than 250 Enel-managed sites being dispatched across multiple regions in the state, and our team had all hands on deck to help ensure a smooth process for our customers," said Joel Obillo, Head of Demand Response at Enel X. "These organizations were asked to reduce their demand multiple days in a row, a very rare occurrence, but one which could have had an impact on their operations. Our customers stepped up and were ready to help their local communities while contributing to the stability of California's grid. These efforts helped minimize disruption and shortened the duration of these blackouts."

Over the course of that one historic week, nearly all California demand response programs were called, including five different demand response programs across Southern California Edison and Pacific Gas & Electric. All told, Enel X resources were dispatched on average 20 hours across all programs.

With extreme weather expected to continue increasing across North America, the need to deploy demand response and other capacity resources at scale will only grow. Enel X and its customers, as they demonstrated in California, are ready to pitch in when needed.

Demand response praised by California energy leaders as key to meeting peak demand

SMUD Reduces EV Infrastructure Installation Costs by 50%

SMUD has **fully electrified** its vehicle fleet

The utility has added **70 JuiceBox Pro** smart charging stations to facilitate EV charging

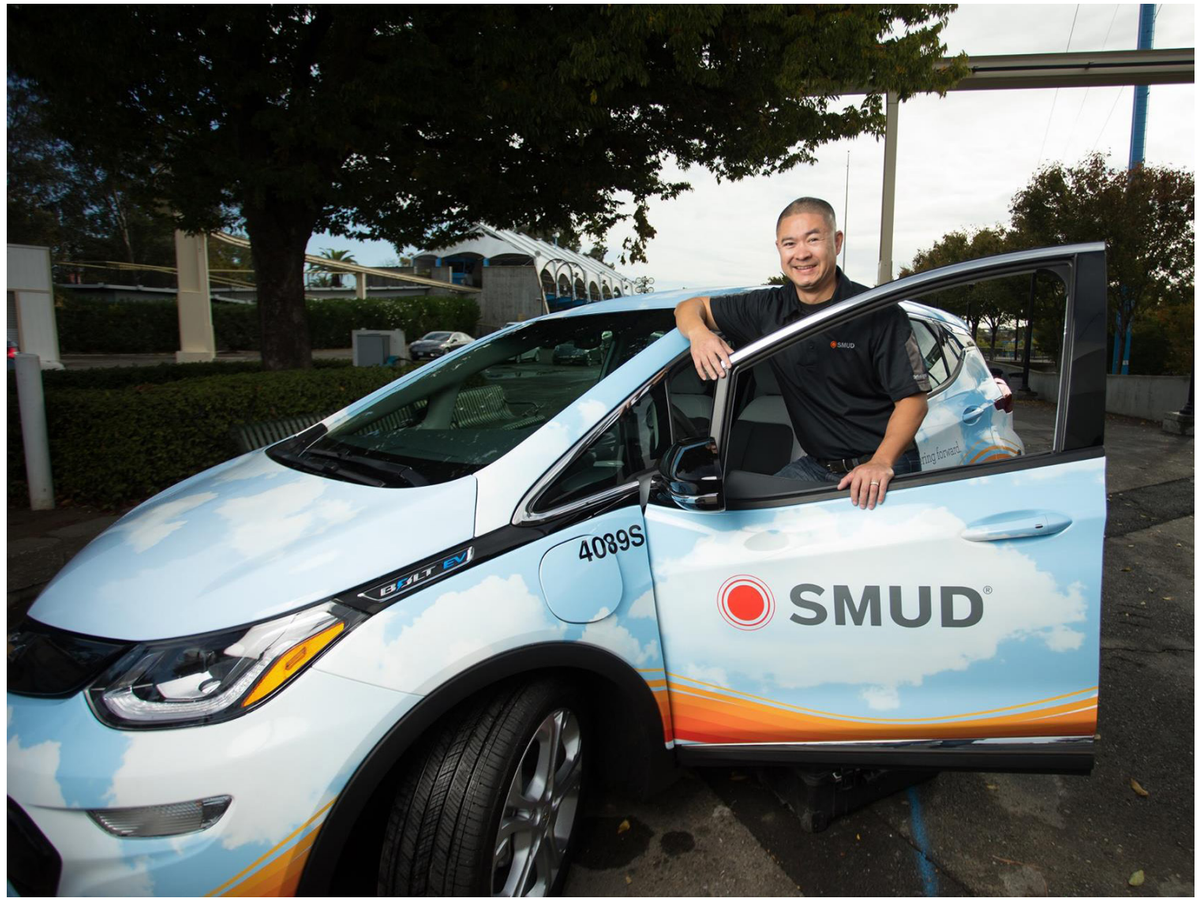
Smart chargers have more than **tripled SMUD's installed capacity**

JuiceBox Pro smart charging stations **reduced installation costs by 50%**

Initiative supports EV growth in SMUD service area of **~300 vehicles per month**

In late 2019, the Sacramento Municipal Utility District (SMUD), the nation's sixth-largest community-owned, not-for-profit electric service, realized a major milestone: full electrification of its fleet—adding 16 all-electric Chevrolet Bolts while selling off its remaining gas-powered vehicles. SMUD's commitment to sustainability and mobility helps improve the Sacramento region's air quality and incr-eases access to its residents. The utility supports equal opportunities in Sacramento for increased mobility, clean air, and access to employment, healthcare, and education.

Now, as more utilities like SMUD increase adoption of renewable energy and electric



vehicles, they are leveraging smart charging infrastructure to provide customers with a convenient charging experience and to help integrate renewable energy into the grid as a flexible resource.

As part of its fleet electrification initiative, SMUD upgraded non-networked charging stations and added 70 JuiceBox Pro smart charging stations to its facilities to support employee and SMUD fleet vehicle charging. This upgrade underscores the value of smart charging, allowing SMUD to more than triple its installed capacity. Two JuiceBox Pro units are capable of charging on a single 50-amp circuit. This helped reduce installation costs by around 50 percent compared to using non-networked stations that don't offer load balancing.

SMUD's electric vehicles and JuiceBox charging stations are integral to the organization's aggressive roadmap to lower greenhouse gas emissions. In mid-2020, there were more than 13,000 EVs in the SMUD service area, a number that is growing at a rate of about 300 EVs every month.

UMass Boston Solar-Plus-Storage Deployment Wins National Award, Commonwealth "Lead by Example" Grant

1 MW solar PV system **+0.5 MW/2 MWh** lithium-ion battery storage system

11 smart electric **vehicle charging stations** for public use

$2.7M in projected financial value for UMass Boston

Awarded Commonwealth of Massachusetts **Lead by Example grant**

Winner of ***E+E Leader* Top Project of The Year** award

Massachusetts' largest energy consumers face a big challenge: exposure to high, time-based electricity costs. Energy storage provides a compelling solution by enabling users to store—then consume—electricity on-site at times when relying on the grid would be much more expensive.

For the University of Massachusetts Boston, reducing these costs not only required a low-cost solution, but one which would align with the campus' plan to improve environmental sustainability.

UMass Boston integrated a 1 MW rooftop solar PV system with a 500 kW/2 MWh lithium-ion battery storage system to not only self-generate clean energy on-campus, but also to store and consume excess power on-demand, reducing exposure to the grid when some of its most expensive charges are calculated. Equipped with Enel X's DER Optimization Software, the solar-plus-storage system also enables the campus to earn payments through regional demand response programs and qualify for incentive earnings through the Solar Massachusetts Renewable Target (SMART) program.

In addition, the project includes 11 Enel X JuiceBox smart electric vehicle (EV) charging stations, which are designed to prevent EV charging during times when high demand on the grid will increase overall energy spend. As an added bonus, the university, through its partnership with Enel X, financed the entire project based on the future value the assets would create, enabling it to capitalize on its energy opportunities without incurring large upfront hardware and installation costs.

To date, the solar-plus-storage project is on pace to generate $2.7M in value, and is earning accolades at both the state and national level. In December 2019, the Commonwealth of Massachusetts awarded UMass Boston a coveted "Lead by Example" grant, which was followed by an *E+E Leader* Top Project of the Year 2020 award.

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