

enel x

NO CAPITAL NEEDED

Your Guide to No-Cost Energy Projects



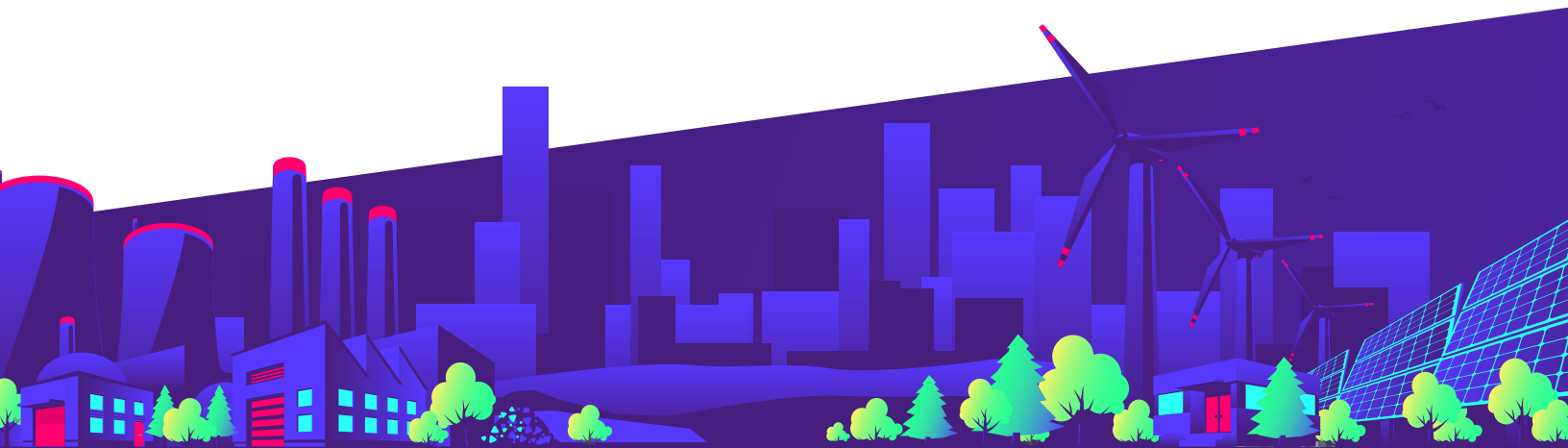
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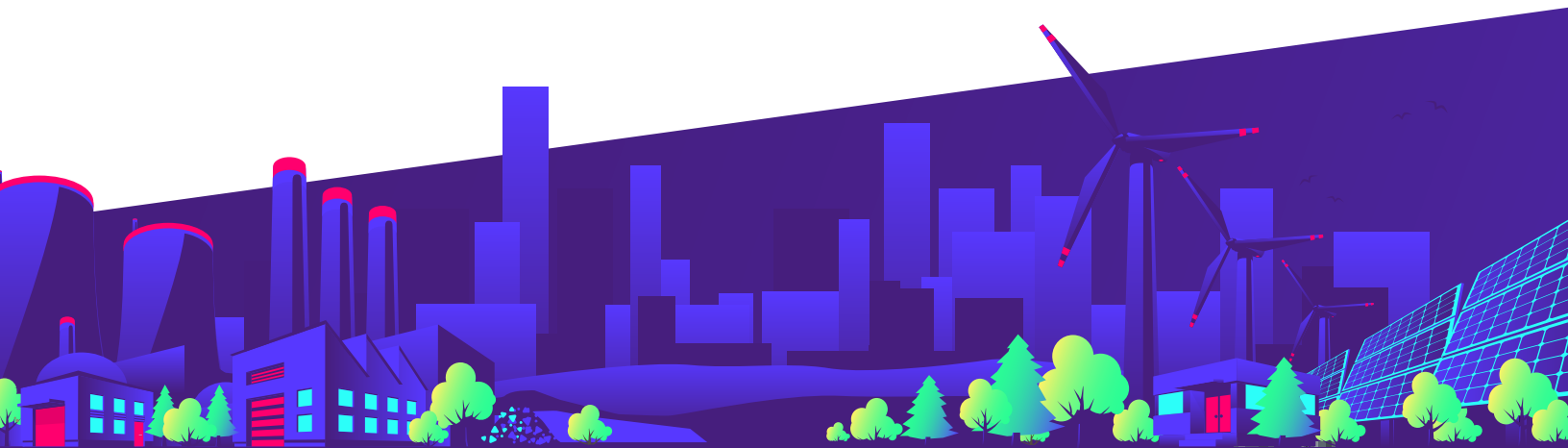
Less Risk. More Reward.

The transformation of the energy industry creates unprecedented opportunities for large energy consumers.

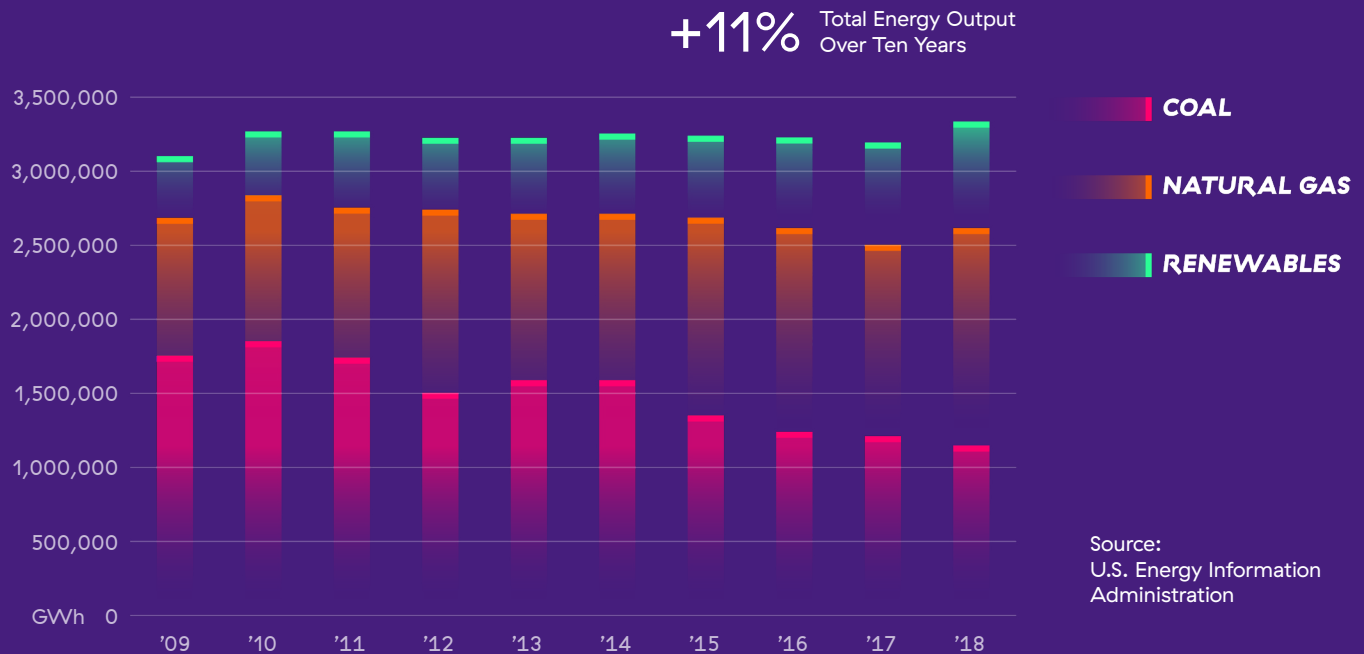
The transition from traditional power generation sources, such as coal and nuclear, to natural gas and renewable sources has led to increased price volatility and regulatory scrutiny on the energy markets. As the grid adapts to these new realities, utilities and electric grid operators are making changes to their rate structures and market rules, imposing new and increasingly complex charges on their customers' bills, and offering financial compensation for large energy consumers that help alleviate some of their most complex challenges.

For commercial and industrial (C&I) energy consumers, this creates incentive to invest in distributed energy resources (DERs) that can manage their facilities' exposure to the high costs of consuming energy from the grid.

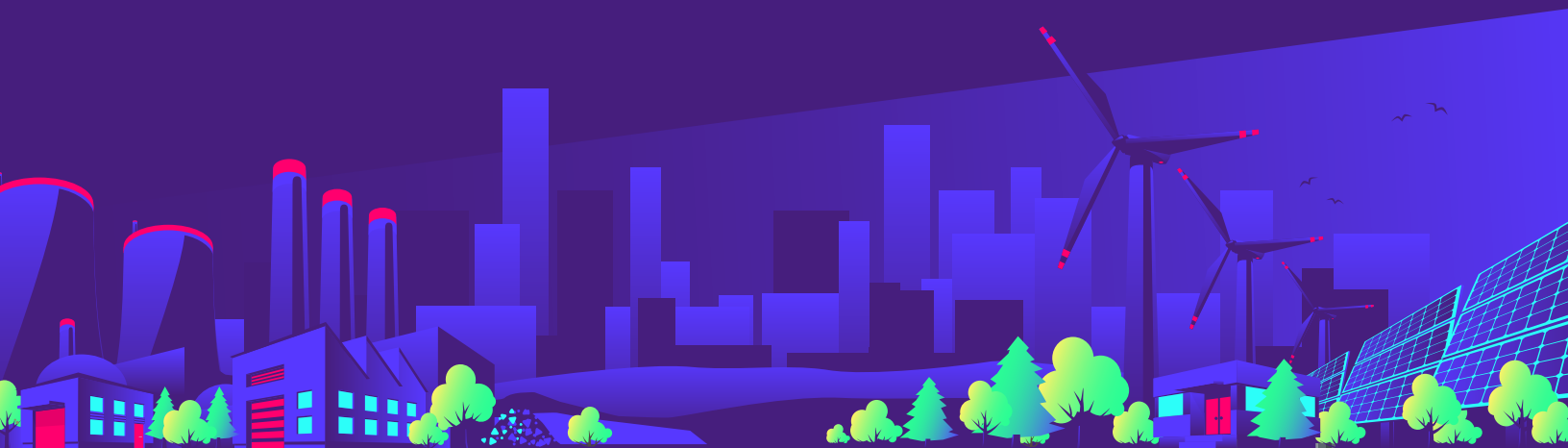
That incentive, in turn, also creates new opportunities for flexible financing options to help C&I energy consumers integrate and upgrade DERs to capture that value without taking on the risk of a capital investment.



U.S. Energy Production and Energy Sources Over the Past Decade



The continued evolution of the power generation mix has wide-reaching implications that make distributed energy resources more valuable for both the electric grid and the large energy consumers that rely on it.



The better you can adapt, the more you'll save.

The Opportunity

COST SAVINGS



Large energy consumers in some regions can save hundreds of thousands of dollars—even millions for some—annually by strategically adjusting their energy consumption from the grid during a few brief intervals.

INCENTIVES



To deliver energy during periods of high demand, energy providers are increasingly finding it easier and less expensive to pay large energy consumers to reduce consumption from the grid briefly than to construct expensive peak-power plants that only operate a few times per year.

The Solution

FLEXIBILITY



Whether to manage rising costs or to earn these incentive payments, today's large C&I energy consumers are seeing more value from their “flexibility,” or the ability to decrease consumption from the grid temporarily based on the financial implications.

DISTRIBUTED ENERGY RESOURCES (DERs)



The ability to create, store, and consume power on-site can maximize this flexibility—and the financial value that comes with it—by powering energy-intensive equipment on-site while minimizing exposure to the grid.

DER Value Streams: Understanding the Financial Value of Flexibility

Below is a brief overview of some of the common practices through which a facility's operational flexibility can reduce costs and generate revenue. While the value streams available depend on the facility's location, the return on an investment in DERs is typically based on some combination of these sources.

TIME-OF-USE MANAGEMENT



Access to low-cost electricity on-site can minimize exposure to daily peak pricing periods established by the electric utility.

DEMAND RESPONSE



Demand response programs compensate C&I energy consumers for the amount of electric load they can remove from the grid when called upon.

FACILITY DEMAND CHARGE MANAGEMENT



Reducing a facility's peak electricity usage levels can significantly reduce demand-related charges, which can account for a significant amount of the electricity bill.

SYSTEM PEAK CHARGE MANAGEMENT



Many utilities impose charges based on a facility's contribution to peak demand levels across the grid. Minimizing exposure to the grid during these brief periods can result in substantial savings.

ANCILLARY SERVICES



To keep supply and demand on the grid in equilibrium, grid operators offer incentives to those with the ability to deliver fast-acting relief in the form of energy demand reductions.

INCENTIVE PROGRAMS



Federal, state, and local incentive programs offer compensation to facilities that use DERs or help alleviate the challenges of supplying electricity during periods of high demand.

Common Distributed Energy Resources (DERs)



LITHIUM-ION BATTERIES

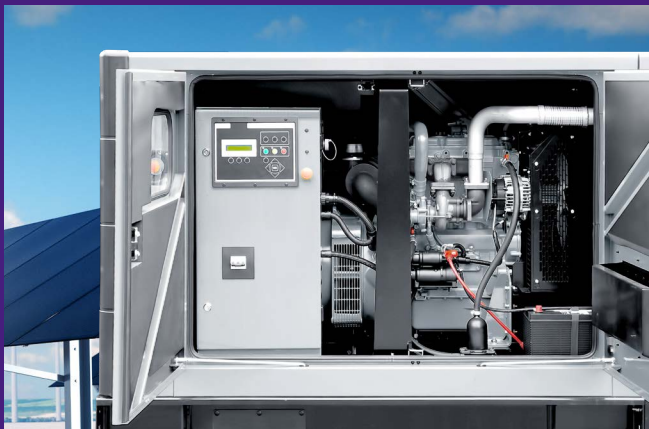


- > High energy density
- > Physical costs are declining

SOLAR PANELS



- > Clean energy production
- > Physical costs are declining
- > Added flexibility when combined with batteries



BACKUP GENERATORS



- > High-capacity backup power
- > Critical asset for reliability

The Challenge

Two common obstacles prevent large energy consumers from capitalizing on DERs.

CAPITAL



Finding the capital to invest in the hardware or equipment upgrades needed to maximize flexibility.

- > While hardware costs have declined in recent years, DERs still represent a significant investment.
- > With a focus on core business priorities, even those that face a lucrative business case for DERs may have difficulty gaining internal support for an investment.
- > Without a full understanding of the opportunities available to them, some C&I energy consumers may lack an accurate assessment of the potential return on these investments.

RESOURCES



Committing the internal resources to operate the assets and navigate the energy markets to deliver return on that investment.

- > DERs need to be sized to accommodate a facility's operational needs, while also aligning upfront investment costs to maximize ROI.
- > Delivering on that ROI requires navigating utility rates and tariffs, enrolling in demand response programs, and meeting the requirements of other state and federal incentive programs.
- > Capturing this value requires knowing how and when to use these assets to maximize financial performance.

Connecting the Dots

Financing projects based on the future value the assets will create.

With the expertise, technology, and energy market access to solve these challenges, energy solution providers are financing and managing distributed energy resources on behalf of large C&I energy consumers.

The incentive earnings and cost savings offer the promise of a long-term return on the investment, which creates the opportunity for flexible financing agreements that remove the barrier to investment while still delivering financial value to the energy consumer.

As a result, energy consumers can significantly offset their energy spend without making a major capital investment, and energy providers benefit from a more flexible and distributed electric grid.



Maximizing the Value of a Flexible Electric Grid

ENERGY PROVIDERS

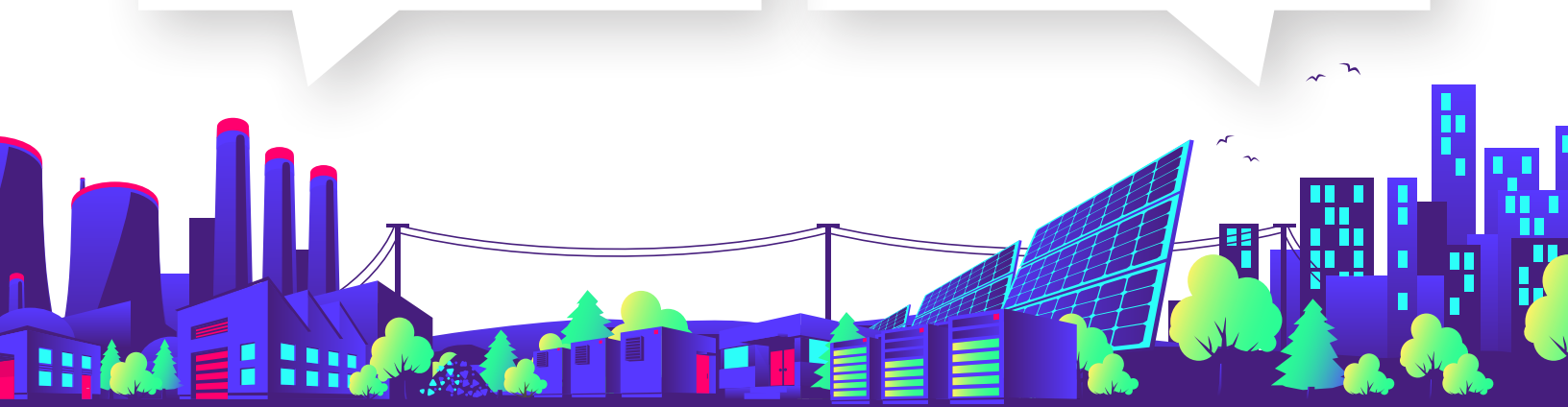


- > Offer **incentives** to encourage flexibility from energy consumers
- > Impose higher charges to manage costs of peak demand

ENERGY CONSUMERS



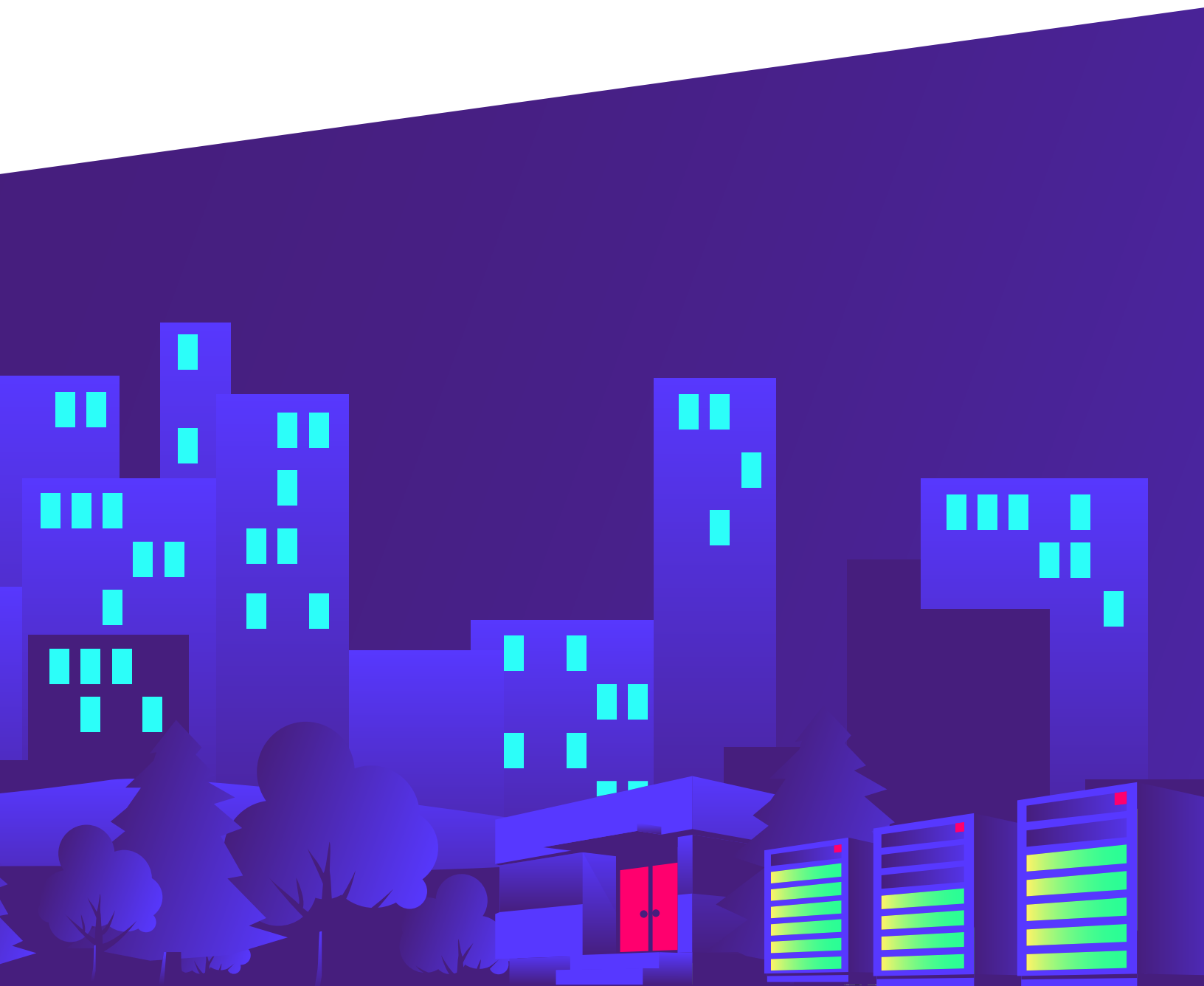
- > Lack capital to invest in DERs to maximize flexibility
- > Lack internal resources to install and operate DERs for **maximum ROI**



ENERGY SOLUTION PROVIDERS

- > Know how to maximize value for both energy consumers and energy providers
- > Finance and operate DERs on behalf of energy consumers to deliver flexibility and maximize financial performance

Energy Storage Project Financing: Understanding the Business Case



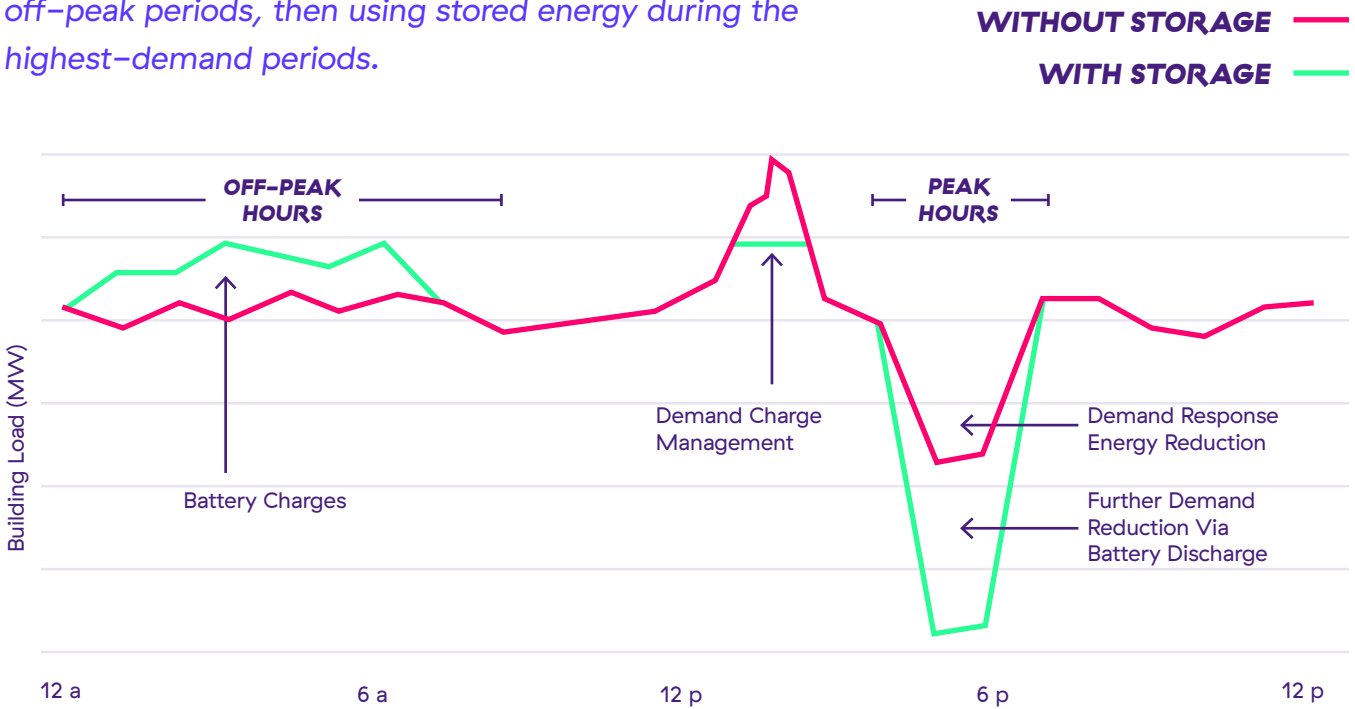
Energy Storage

Long considered the holy grail of energy management, the ability to store electricity enables C&I energy consumers to use the least expensive power at times when it is most valuable.

This can significantly reduce exposure to high electricity prices, utility rates, and demand-related charges.

The ability to transfer load onto a battery temporarily can also help earn payments through demand response programs and qualify for additional incentive programs without requiring the facility to shut down equipment.

Savings can be realized by charging batteries during off-peak periods, then using stored energy during the highest-demand periods.



The Challenge

Although the cost of lithium-ion batteries has declined markedly in recent years, energy storage can still represent a large capital expense. Even organizations with a lucrative business case for an energy storage system may not have the capital available to make the investment.

Upfront costs are only part of the challenge. Presented with the options of avoiding peak pricing, charging lithium-ion batteries, or participating in a demand response program, how does an end user appropriately manage the decision-making process to ensure they are maximizing the financial value available?

Batteries need to be:

- > Enrolled in energy market programs
- > Charged and discharged at the right times
- > Operated efficiently to maintain battery life



The Opportunity

With the technology and energy market access to capture the financial value of an energy storage system, an energy solution provider can create flexible financing agreements that best fit the energy consumer integrating the system.

Many energy consumers are embracing the benefit-sharing agreement, through which the energy solution provider covers all upfront hardware and installation costs, takes responsibility for operating the system, and passes a percentage of the overall value created—through incentive earnings and cost savings—onto the energy consumer.

As a result, the energy consumer sees significantly lower energy costs without taking on the risk of a capital investment or devoting internal resources to operate a new asset.

What is DER Optimization Software?

DER Optimization Software predicts the facility's future energy needs and automatically charges and discharges the battery system at the optimal times to maximize incentive earnings and minimize energy costs. As new incentive opportunities or cost drivers emerge, the energy solution provider can leverage the assets to manage the energy consumer's exposure.

Financing Options

DIRECT PURCHASE



Energy consumer buys the system and can choose to pay for ongoing O&M.

Benefits:

- > Energy consumer keeps 100% of financial value after incurring project costs

Units: \$

FIXED RATE



Energy consumer pays fixed monthly payment for energy storage savings, combined with a benefit-share structure for revenues via enrollment in demand response.

Benefits:

- > Energy consumer benefits from high energy storage performance
- > Incentives aligned on DR performance

Units: Fixed \$/mo. + \$/mo. (% split with Enel X) for DR

BENEFIT SHARE



Energy consumer agrees to share a pre-determined percentage of value created by energy storage system.

Benefits:

- > Energy consumer is protected from risk of energy storage underperformance
- > Incentives aligned on overall energy storage performance

Units: \$/mo. (% split with Enel X)

Inside a Sample Market: Ontario, Canada

Challenge

For Ontario businesses, the Global Adjustment charge can comprise as much as 70% of the electricity bill, and is measured based on a facility's consumption during the periods of highest demand on the electric grid.

Opportunity

Businesses that can reduce consumption during these periods by 1 MW can save more than \$500K in a given year.

Energy storage project financing in Ontario is based on those savings in addition to earnings through Ontario's demand response program.

WHAT MAKES FOR AN ATTRACTIVE MARKET?

- > High energy prices, demand charges
- > Lucrative demand response earnings
- > Access to incentive programs

Other examples:



Massachusetts



New York



California



Inside a Sample Project

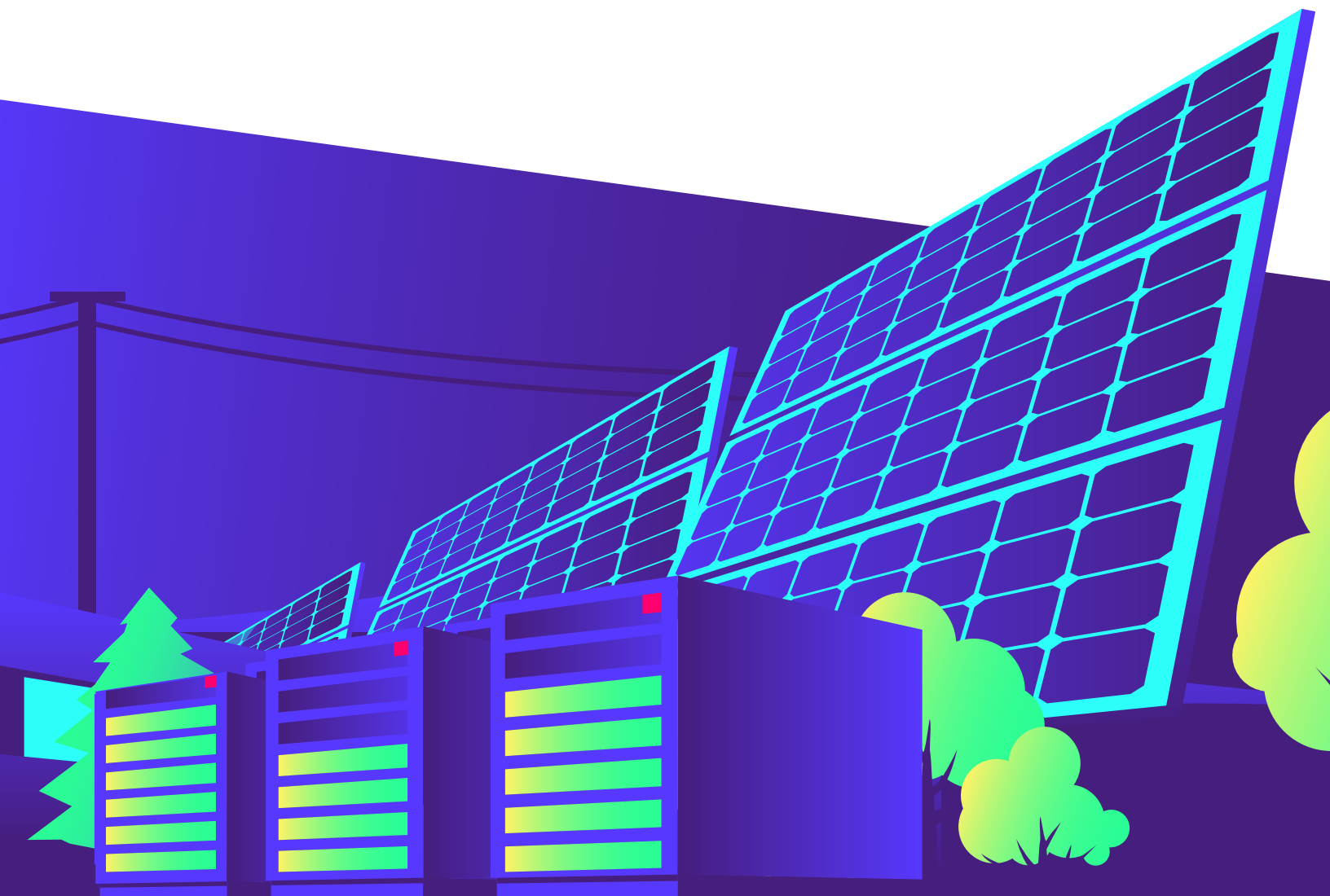
AMHIL NORTH AMERICA, ONTARIO, CANADA

Amhil North America, an Ontario-based food packaging company, integrated a 2.34 MW / 4.7 MWh lithium-ion battery system to minimize Global Adjustment charges and maximize earnings through Ontario's demand response program.

Through a benefit-share agreement, Enel X purchased and installed the system and implemented DER Optimization Software to control the battery's operations for maximum ROI.



Solar-Plus-Storage Project Financing: Understanding the Business Case



Solar-Plus-Storage

On its own, on-site solar power generation is limited to daytime hours when the sun is shining. While standalone solar can reduce exposure to peak pricing or demand charges that coincide with those hours, it provides little relief to cost drivers that occur outside of those windows.

Adding energy storage makes on-site solar power more flexible and enables energy consumers to put it to use when it would be most valuable.



The Challenge

CAPITAL



Costs for solar panels and lithium-ion batteries have fallen in recent years, but still represent significant capital expenditures for businesses to purchase on their own.

OPERATIONAL



Energy consumers also need to navigate the energy markets and incentive programs, as well as know how to operate the assets for maximum return.

SOLAR LESSENS
BURDEN DURING
ON-PEAK HOURS

STORAGE INCREASES
FLEXIBILITY FOR
ON-DEMAND POWER



The Opportunity

Since energy storage enables consumers to utilize their solar power more flexibly, energy solution providers can offer more flexible financing options.

Energy solution providers can cover the costs of the solar-plus-storage project through a power purchase agreement (PPA), which establishes a flat rate for the power provided by the system at a discount to utility rates.

Alternatively, they can finance the project through a hybrid PPA (hPPA), which establishes a lower rate solely for the solar power and a benefit-share agreement that delivers a percentage of the value of the energy storage system to the energy consumer.

In either case, the result is lower energy spend and access to incentive payments for operating a solar-plus-storage system without the risk of a capital investment.

Financing Options

DIRECT PURCHASE



Energy consumer buys the system and pays for ongoing O&M and enrollment in energy market programs.

Benefits:

- > Energy consumer keeps 100% of financial value after incurring project costs

Units: \$

ALL-IN POWER PURCHASE AGREEMENT (PPA)



Energy consumer pays a flat rate for power created and consumed via solar-plus-storage system.

Benefits:

- > Simple payment structure
- > Discount to utility rates

Units: \$/kWh (single rate)

HYBRID POWER PURCHASE AGREEMENT (hPPA)



Energy consumer pays a flat rate for solar power created and agrees to benefit-share for energy storage value.

Benefits:

- > Discount to utility rates for solar power
- > Incentives aligned on energy storage performance

Units: \$/kWh for Solar + \$/mo. (% split with Enel X) for Storage

Inside a Sample Market: Massachusetts

The Solar Massachusetts Renewable Target (SMART) program offered by the state's government and utilities offers a fixed rate for solar power projects, as well as added incentives for those that incorporate energy storage. With the promise of these incentive earnings, as well as the ability

to generate additional return through demand response payments and reduced electricity costs, energy solution providers can offer no-cost solar-plus-storage projects under a range of flexible financing options, including the PPA and hybrid PPA.

WHAT MAKES FOR AN ATTRACTIVE MARKET?

- > High energy prices, demand charges
- > Lucrative demand response earnings
- > Access to incentive programs

Other examples:



New York



California



Hawaii



Inside a Sample Project

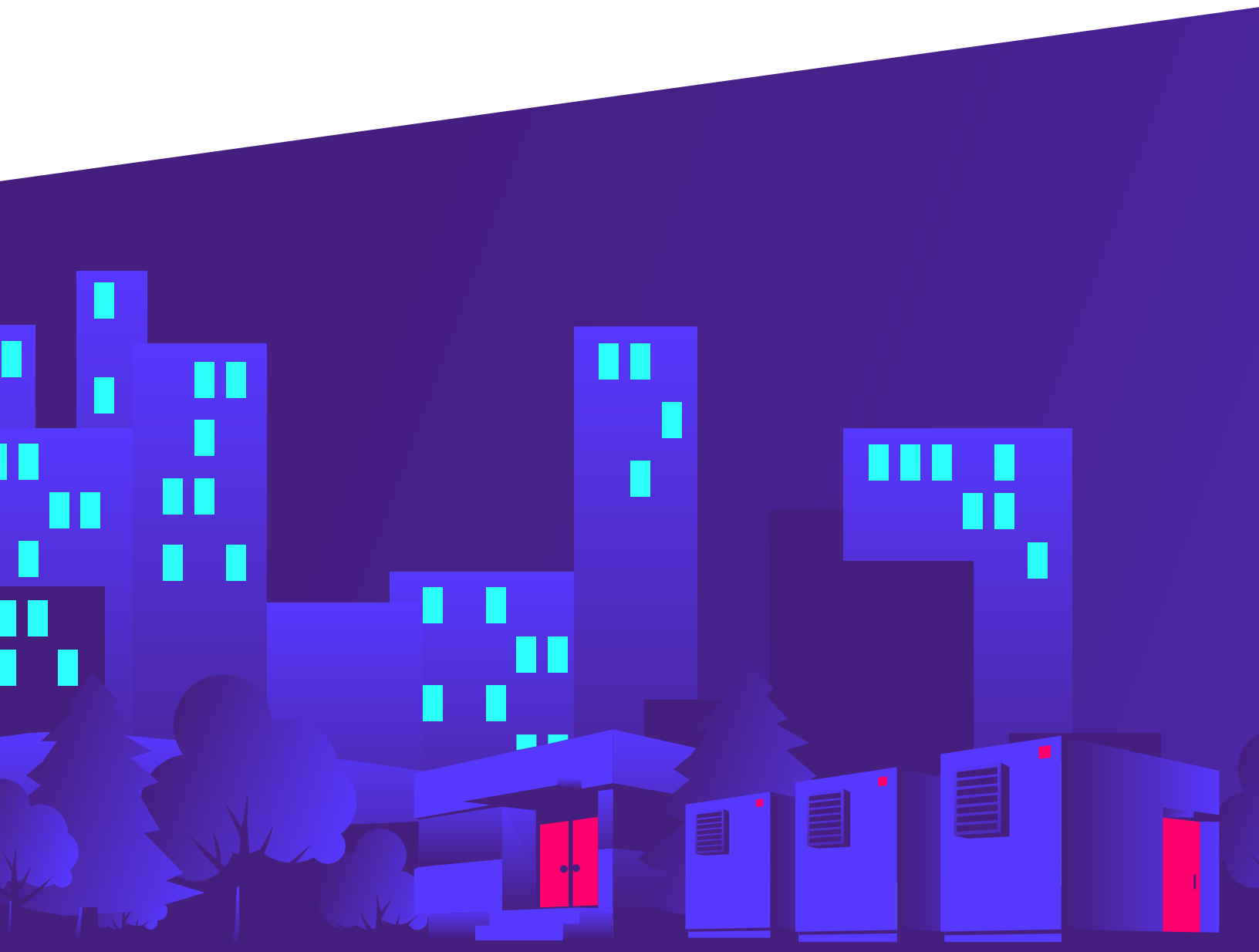
UNIVERSITY OF MASSACHUSETTS BOSTON, BOSTON, MA

The University of Massachusetts financed a project for its Boston campus consisting of solar panels installed on carports and rooftops offering 1MW of power and a lithium-ion battery system with 500kW/2MWh of capacity.

Using DER Optimization Software to manage energy costs and earn demand response payments, the project will offset the university's energy costs by 17%.



Backup Generator Upgrade Project Financing: Understanding the Business Case



Backup Generator Equipment Upgrades

Large C&I facilities with backup generators are a natural fit for demand response programs. For many of these organizations, backup generators are a necessary investment to ensure reliable power supply and maintain resilience in the event of grid outages or power quality issues.

Demand response offers an opportunity to generate a return on that investment, enabling participants to earn payments for agreeing to reduce consumption from the grid when called upon by transitioning their facility's electric load onto their backup generator.



The Challenge

REGULATORY



Backup generators need to meet regulatory standards to participate in demand response, which could require costly equipment upgrades to improve performance and lower emissions.

CAPACITY



Demand response compensates energy consumers for the amount of capacity they can remove from the grid. Limitations in the amount of electric load that a generator is capable of supporting can limit the organization's earnings potential.

OPERATIONAL



For some organizations, participating in demand response requires a seamless transition on and off its generator assets, with no disruption to power access in the process. This may require upgrades in control technology or transfer switch equipment.

CAPITAL



While these kinds of equipment upgrades can help provide access to—and even increase—demand response payments, many organizations struggle to find the capital to cover these costs. As a result, they often miss out on the opportunity.

The Opportunity

REVENUE



To help more organizations participate in demand response, energy solution providers will finance and implement the required generator equipment upgrades under a benefit-sharing agreement that covers the project costs and passes demand response payments onto the end customer.

RESILIENCE



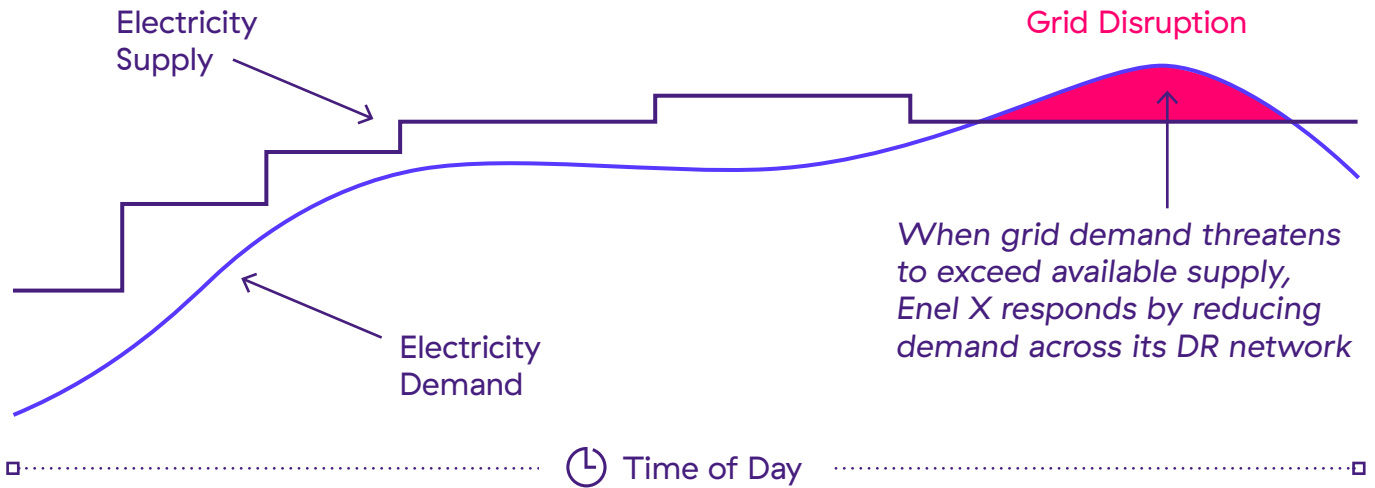
Demand response participants receive advance notification of grid disturbances, and are required to demonstrate that their generator can support facility load when needed. Additionally, many of the equipment upgrades that improve a generator's earnings potential also improve their reliability and performance in the event of grid outages.



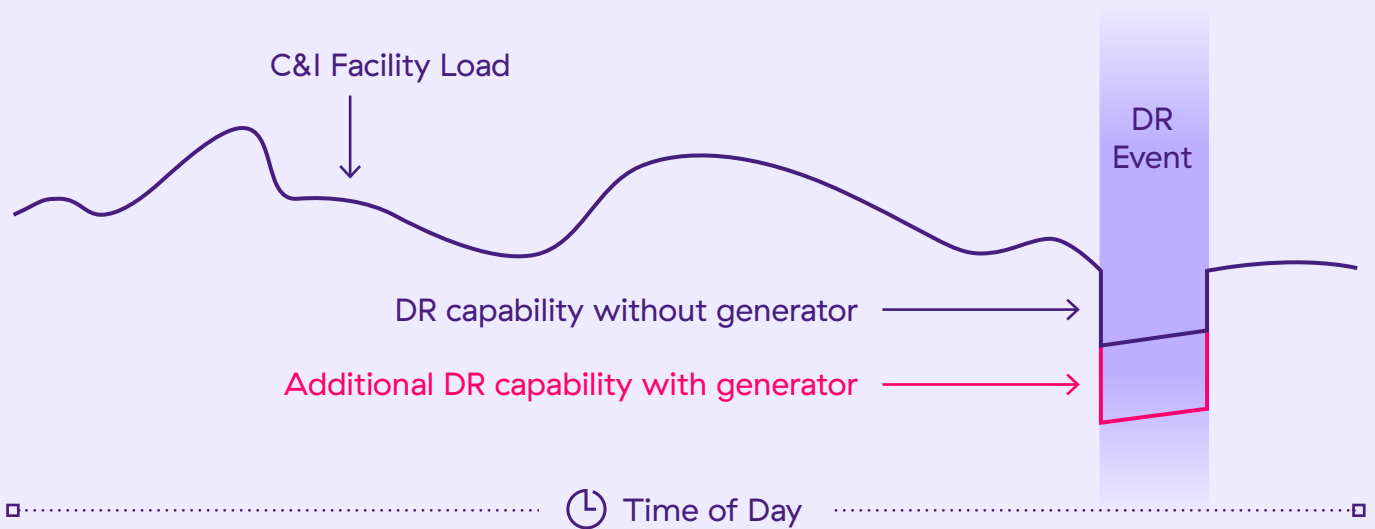
Managing Supply and Demand



DR PROGRAMS HELP MAINTAIN GRID STABILITY



GENERATORS INCREASE DR CAPACITY



Inside a Sample Market: New England

Large energy consumers in New England can use their generator assets to maximize payments through the demand response program offered by the regional electric grid operator, ISO New England, as well

as to reduce capacity charges, which are calculated based on a facility's demand levels during the times when the grid is at peak demand.

WHAT MAKES FOR AN ATTRACTIVE MARKET?

- > Lucrative demand response earnings
- > Potential access to multiple programs

Other examples:





Inside a Sample Project

PAWTUCKET WATER TREATMENT FACILITY, PAWTUCKET, RI

To ensure it can continue to process water for more than 100,000 customers, the Pawtucket Water Treatment Facility, located in Rhode Island, has installed a 1.8MW backup generator on site. After financing backup generator upgrades,

the Pawtucket Water Supply Board is positioned to earn more than \$116K in payments through ISO New England's demand response program—after the costs of the upgrade project—and receives notification of potential grid disturbances.



1.8MW

+



UPGRADE
FINANCING

=

\$116k

IN EARNINGS

Looking Ahead

Future-proofing facilities for tomorrow's energy challenges

The business case for these projects is a direct result of the evolution of the energy industry. The challenges facing energy providers have created the market conditions for these financing opportunities, which in turn enable energy consumers to help alleviate the grid's challenges.

Going forward, distributed energy resources will also provide large energy consumers the flexibility to adapt to unforeseen challenges on the grid.

Consider the potential impact as the grid adapts to the decline of coal and nuclear power, the rise of renewable power, and the charging needs for increasingly common electric vehicles. All of these developments have wide-reaching implications for the grid and the large energy consumers that rely on it. Those with adequate distributed energy resources will have the flexibility to adapt to these implications as they arise.

Let's explore your organization's options.

Enel X is here to help you navigate your options, providing flexible financing as well as the technology and expertise to solve your unique challenges and capitalize on your biggest opportunities.

To discuss options for your organization, speak with our experts today:

GET STARTED