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USING THE PAST TO PREDICT THE FUTURE

**TECH LESSONS OF 2020** 

### Creating resilient returns



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#### The evolution of GRESB

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energy consumption

The agility of a rental business is found in many data points. Dialing in to what that means in today's business environment is part of navigating risk and finding points of profitability in all climates.

Using the past to

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GRESB members include Blackrock. CalPERS, Franklin Templeton Investments, JP Morgan Asset Management, Morgan Stanley and State Street Global Advisors, and its importance is only growing.

#### 8 Tech lessons of 2020

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Adding solar panels to your property is just one of many ways to reduce electricity expense for common areas and residents. Todav's solar offers quite a few business models.



## Tech, which makes us stronger

When I think of resiliency, I think of the Giant Sequoia trees in California. Not the California Redwoods, which grow on the coast of the State.

The Giant Sequoias only exist in a narrow 260-mile stretch of the state. It is the only place in the world that these prehistoric trees grow.

A Giant Sequoia's bark is fire-resistant and pest-impervious. These ancient giants live up to 3,000 years, growing throughout their entire life. For Sequoias to reproduce it takes a forest fire to open their pinecones. Now that's true resilience. Growth no matter the adversity. And to make the relentless Sequoia's story even greater, adversity is actually a catalyst for birth and change.

As we move into 2021, let's consider our resiliency as an industry. Do we wither in the face of adversity, or continue to grow and redefine success?

This issue of JOUM is an exploration of ideas and new technologies that help our businesses grow, even thrive, no matter the climate. It may, once again, be time to look to technology for greater yield. Consider tech advancements and look differently on how we run our communities.

We have been compelled to look at our common areas differently, how and when we power our communities, and how we utilize technology for predictive maintenance, choosing systems that allow our teams to communicate and understand our assets in ways not seen before.

The fire of 2020 has ignited us. We thrive in adversity and are changing our practices



for the better. Not only will we not crumble in this fire, we will continue to grow.

Marv Nitschke Publisher, Journal

### Business continuity in a new era

We've yet to realize the pandemic's full impact on our nation's economy and psyche. Apartment owners and operators are already taking a second look at their business continuity plans in light of the new landscape of risk.

Who could have imagined how our lives would change in an instant? Today, entire industries struggle while others prosper. A significant number of workers-without notice-shifted to WFH (work from home), changing their apartments from non-work residences to around-the-clock home and office. WFH also gave residents newfound freedom.

After years of the lowest relocation rates in history, a great migration away from urban cores began in 2020 and continues today.

For apartment operations, the impact from the pandemic has meant rising operating costs and property traffic from food and package delivery, greater wear and tear on plant infrastructure and some slowing, even



disruption, in rent payments. Many owners are also dealing with eviction moratoriums.

There's much to be said for the agility of apartment businesses that quickly assessed and deployed processes to keep staff and residents healthy and safe-kept the doors open and operations humming.

Some states categorized apartment operators as essential. Others did not and management offices closed operations for periods of time. Through all of it, one thing rose to the top in importance and value: communications and automation.

The single most important strategy for 2021 will be building further resiliency into our operations. Rapid deployment, nimble processes and high-level agility are absolutely essential for today's apartment business.

We've learned that businesses must be prepared to operate with less emphasis on sitespecific, human-based workers. Maintaining operational continuity and centralizing tasks allows staff to move through daily functions from anywhere.

Such agility also allows a team to think on their feet in unprecedented times, even excel with creative solutions that can give an operation the competitive edge.

Getting operations back to normal quickly is critical to continuity. Identifying those areas where automation can accelerate maintenance scheduling and workflows, manage and reduce energy consumption, and facilitate customer service in all conditions are just a few necessary steps to adaptation.

> Operational agility comes from the synergy between humans and automation. It's core to every product and service we offer.

Joni Sappington Journal Guest Editor





As acronyms go, GRESB and ESG may not be immediately recognizable. However, if you are seeking investment funds, particularly funds from European sources, they are acronyms you probably should know.

#### The genesis of GRESB

GRESB originally stood for Global Real Estate Sustainability Benchmark. The standard grew from a meeting of EU pension fund managers who gathered in 2009 with the intention of perpetuating sustainability. Specifically, they sought to devise a way to evaluate the Environmental, Social and Governance (ESG) performance of properties in which they were investing.

According to Dan Winters, GRESB head of the Americas, these fund managers "threw some money in a hat and recruited academics to come up with what I am going to call an ESG DDQ, due diligence questionnaire." The fund managers sent the resulting questionnaire to those with whom they held a fiscal position. After processing over 200 responses, the group deemed it a success in meeting its sustainability goals and repeated the process the following year. Ten years later, "GRESB has become the global benchmark for ESG," said Winters.

In late 2020, GRESB began transitioning to a nonprofit foundation that owns and manages the GRESB standards and brand.

GRESB standards are used by real estate owners, asset managers and developers to assess their properties' ESG performance in comparison to other properties. GRESB investor members use the standards to determine if their property meets GRESB criteria for investment.

Member U.S. companies include Blackrock, CalPERS, Franklin Templeton Investments, JP Morgan Asset Management, Morgan Stanley and State Street Global Advisors.

#### Meeting the standard

The **environmental** assessment of the program considers "how the company performs as a steward of nature." Specifically, how do a company's policies intersect with climate change, energy emissions, waste management and resource depletion?

The social aspect considers how a company "manages its relationships with employees, suppliers, customers and the community." It weighs a company's policies with respect to health and wellbeing, building safety, employee relations, diversity and the company's impact on the communities in which it operates.

Governance assesses how a company is governed. How is executive pay determined? What are shareholder rights? What are its board's diversity and structure audits?

#### The GRESB process

GRESB assessments are performed annually from April 1 through July 1. Participants can review their preliminary findings beginning Sept. 1, prior to results being released to investors Oct. 1.

Organizations seeking a GRESB rating are assessed on a curve. Results are sorted by quintiles with the top quintile being given an A rating, the next quintile being given a B rating, and so on. "Listed property companies participate in the benchmark," Winters said. "They are compared with the industry."

In 2020, more than 1,200 property companies, REITs, funds and developers were assessed under the GRESB real estate category alone. Up 20 percent from the year prior, with the increase representing \$4.8 trillion in assets under management in 64 countries. Another 544 firms were reviewed under the infrastructure category. Results of GRESB assessments are only disclosed to GRESB investor members.

Within the real estate category, GRESB has separate evaluation standards for operators of existing buildings and for developers of new buildings. GRESB performs an assessment of the firm's management practices across both types.

In GRESB-speak, all firms are evaluated using the management component. Management procedures and practices are called "aspects." Aspects under Management include leadership, policies, reporting, risk management and stakeholder engagement. Management is universal and applicable to any type of business.

Real estate firms operating existing properties (called Standing Investments) are subject to a Performance evaluation in addition to a Management review. Performance Aspects include risk assessment, targets, tenants and community, energy, greenhouse gases, water, waste, data monitoring and review, and building certifications.

Those developing new properties are evaluated under the Development component in addition to the Management. Aspects assessed under this component include ESG requirements, materials, building certifications, energy, water, waste and stakeholder engagement.

Firms that develop new properties and operate existing properties may obtain GRESB benchmark reports for their Standing Investments and for their Development by completing all three components.

GRESB also has an optional Resilience Module. It is intended to "increase access to information about strategies used by property and infrastructure companies to assess and manage risks from social and environmental shocks and stressors, including the impact of climate change."

#### **GRESB's future view**

There's a saying that you can't manage what you don't measure. This explains the emphasis on data reporting, data quality and transparency in GRESB's early years.

Recently, however, the focus of GRESB has shifted and will continue to do so. Accruing historical data offers the ability to analyze performance metrics. So starting in 2020, GRESB assessments are now done on an asset level, rather than a portfolio level. Individual asset assessments are aggregated and, along with the management assessments, a determination on the overall performance of the firm is created.

GRESB seeks to standardize its performance indicator metrics. This will improve the quality of data used for comparisons and allow greater accuracy of those comparisons.

The GRESB assessment process is constantly evaluated to determine which metrics are most valuable. Standards will be continued to be added, dropped or modified as the process evolves to remain most useful to investors who rely on its direction.

When U.S. states and cities began to mandate the use of ENERGY STAR Portfolio Manager to report on their properties' energy consumption, they found that the data required to do this was unavailable.

Utility companies were prodded to provide the whole-building data necessary to complete the reporting. Similarly, apartment managers may find that some of the information required to complete a GRESB assessment is not readily available. Data on waste is just one example.

"One of the great beauties of GRESB is the idea of prodding the industry forward," said Winters. "It's not just prodding fund managers and REITs forward, it's prodding their service providers, as well. So, by asking this question, it makes somebody at a firm start to push and get this data."

While estimates may be acceptable in the place of hard data that is unavailable today, Winters said, "It just takes time. It will take a couple more years, but we will continue to raise the bar. That's the goal."

#### How to get started with GRESB

The organization offers free online training for those considering participating and obtaining GRESB benchmark reports. Consulting firms are available to assist firms seeking a GRESB assessment. In addition, first-year participants may opt not to reveal their assessment results to other GRESB investor members.





John Elfreth Watkins wrote an article in 1900 for *The Ladies' Home Journal* entitled, "What may happen in the next hundred years." The son of a civil engineer and train enthusiast, Watkins, Jr. likely inherited his appreciation of networks and their import into the future. Formed by family and imagination, Watkins presciently predicted the invention of HVAC, teleconferencing, Wi-Fi, high-speed trains and aerial warfare.

Long before Watkins, Nostradamus or Oracles, humans were both fascinated and vexed by the future. Throughout the ages, prophets, seers, sci-fi writers and behavioral scientists have offered incredible, sometimes unrecognizable, depictions of the future.

Much has changed and in early modernity forecasting, once symbolized by the evening weatherman and a punch line, has garnered a semblance of credibility.

Enter the Networked Age. The rapidly growing connectivity of millions of usersespecially their knowledge, behavioral patterns and resources-from around the world, opened the floodgates of data that never before existed, much less were imagined.

In the historical blink of an eye, big data matured into organized data, then into structured data where it could be analyzed and engineered into real-time market reporting, and finally into useful indexes that now inform nearly all commerce, government and the daily lives of citizens.

The successful application of big data is most notable in the monumental rise of big tech and tech-enabled companies in today's economy. Technology has enabled their rapid growth across nearly all sectors, outperforming less tech-driven competitors at faster rates.

#### Predictions fueled by data science

Like most industries, apartment management, has also benefited from the efficiencies and knowledge afforded by automation, data analytics and trending. We're familiar with AIbased revenue management and its boost to revenue via rent setting as just one example. Facilities management is also leading the way in changing how we do business and the ability to reach profitability through automation.

Data analytics has likewise impacted the business of prognostication. While science fiction writers still provide far-reaching future views—with the best tethered to research—most are more entertainment than useful or actionable information.

Today, broad predictions are drawn from a mix of media stories, scientific research, surveys, computer simulations, and coalescing data from field experts, according to Timothy Mack of the World Future Society.

Like other industries, demand for predictive analysis has grown with tech-driven successes and sophistication. As such, many market and behavioral predictions are underwritten by companies and governments seeking to gain competitive advantage and hedge risk.

Today's most accomplished futurists have become more behavioral scientist-engineer than science fiction author, and they are far more dependent on big data networks to devise forecasts. One example of today's proven futurist is also an engineer, inventor, investment manager and promoter—all of the facets needed to move the needle of progress in today's world.

#### Elon Musk, futurist and inventor

South African-born Elon Musk emigrated to the U.S. for economic opportunity. With degrees in physics and economics from the University of Pennsylvania, Musk left Stanford's graduate program after only a couple of days because he felt the internet provided greater opportunities to change society. Musk founded or led mega successes Zip2 (purchased by Compaq for \$307M), PayPal (bought by eBay for \$1.5B), Tesla (sells a million-plus electric cars annually—predicts 20 million annually by 2027), SpaceX (Musk is also chief designer of the company's high-efficiency rockets—Falcon, Dragon and Grasshopper), Starlink and Hyperloop (highspeed rail).

Musk is unique in that he is directly involved in creating the inventions he predicts. Musk's **predictions for 2021**:

Self-driving cars-EV robotaxis will again change the world's transportation model. Robotaxi ownership ROI will compete with that of investment property, said Musk.

Batteries are 40 percent of the cost of EV autos, according to China-based Guotai Junan Securities, with cobalt the highest-cost material in batteries. Musk said he will have a full cobalt replacement in 2 to 3 years. Telsa's NCA formula already reduces the cobalt in its batteries to an amalgam using less than 5 percent cobalt.

Worldwide satellite internet–Using highefficiency, low-cost SpaceX/Starlink rockets, Musk has sent internet-link satellites into space at a rate of 60/month with 1,000-plus now orbiting earth. The FCC has approved Musk to launch 12,000 total satellites (compared to a total of 3,300 in operation today).

Satellite internet would mark the end of government-controlled internet access. Spacebased bank accounts, business accounts, services and citizenship would change the infrastructure, regulations and ownership under which the world currently operates.

In December of last year, the FCC awarded SpaceX Starlink an \$885M grant to bring internet to rural America.

Solar reaches cost parity with fossil fuels —The growth of solar power and energy storage will surpass the growth of electric cars. Musk believes that over half of the world's countries will reach solar grid parity, i.e., solar power costs fall below that of fossil fuel energy, this year.

Tesla Energy has already built power plants around the world, created from a grid of privately-owned Tesla Powerwall batteries that store energy from solar panels on the enclosing structure.

Massachusetts, Connecticut and Rhode Island Tesla Powerwall customers connect to the company's virtual power grid, which is connected to the national grid via the Tesla Energy app. The app connects energy from batteries across these states for a larger supply of sustainable, uninterrupted energy, as well as delivering ROI to Powerwall owners.

Carbon capture-Carbon capture processes

#### Future smart homes



**\$463.9 BILLION** smart city market value by 2027

## 12 DEVICES

now

per household with broadband internet



## **3** PURCHASING TRENDS

High-speed internet, residential security products and services, and smart home gadgets have risen significantly since lockdowns

#### PANDEMIC ACCELERATES Smart solutions

The pandemic has meant people spending more time indoors and at home. WFH (working from home). Security is also more important now that resident deliveries have increased (food and packages).

## BEHAVIORAL

Residents are discovering smart home features that have been there all along, dialing in more holistic experiences

#### COMPLETION 2026

Panasonic is developing a 382-acre smart transit-oriented development in Denver, Colo., dubbed CityNow. Stage I includes free Wi-Fi, LED street lights, pollution sensors, solar-powered microgrid with lithium-ion battery storage and security cams. The town is a public-private partnership.

exist in many forms. However, innovation is still needed to find a process that is economically viable. Musk believes we're close. Over 240 lobbyists, the American Petroleum Institute, American Gas Association and hundreds more have rallied vocally and financially for scientists and entrepreneurs to find the solution. Adding to a long line of government and private funds, Musk is attracting the best and brightest with a promise of \$100 million to the developer of the best carbon capture technology. Musk's worldview is centered on disruptive improvement—magic, as he likes to say.

The innovative standards are not so much based on the technology itself, as they are on the technology's economies of scale with the intention of mass deployment.

#### Stretch the imagination

Most predictions hold a seed of present-day reality. As tech innovations shorten the time to market for nearly everything, here are a few of the longer-range, harder-to-fathom notions of our future.

All products become services by 2040. The apartment model may be ahead of the game in a world where nothing is owned, according to Danish Parliament member Ida Auken. By 2030 needs are leased on demand.

**Recast your parking garage.** Driverless cars will be everywhere—and free if you don't mind hearing ads during the drive. In 2040, autonomous vehicles (AVs) will be cheaper and safer than owning a car, predicts Benjamin Clark, professor of planning and public policy at University of Oregon.

Home sick. Hospitals will be obsolete as telemedicine becomes the standard in care. Melanie Walker, medical advisor to the World Bank, also predicts that injected nano-robots will fight disease, medical professionals and automated systems will analyze spit from a distance, and medical professionals will 3D print human organs within 20 years. I think, therefore I am. By 2050, neuro tech means humans communicate via thought. Ian Pearson, British futurist, said that computer chips placed in the brain will allow people to interface with advanced quantum computers located in the cloud to communicate, even to download skills.

#### A stretch of the imagination

All futurists weave their own context and knowledge into predictions for the future. In that way, there's a bit of futurist in all business owners and entrepreneurs. The year ahead is an excellent opportunity to futurize toward a better way of doing business.

Automation, analytics and trending are here to stay and readily available to all businesses seeking to gain insights into the future—immediate and distant.

Its impact on revenue for multifamily housing operations will continue to be strong. It's not hard to imagine greater profitability.

## THE RISE OF TECHNOLOGY



WORK FROM HOME • 5G AND INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT) ONLINE SHOPPING AND ROBOT DELIVERIES • DIGITAL AND CONTACTLESS PAYMENTS DISTANCE LEARNING • TELEHEALTH • ONLINE ENTERTAINMENT SUPPLY CHAIN 4.0 • 3D PRINTING • ROBOTICS AND DRONES

### Tech lessons of 2020

The pandemic changed the world of apartment operations seemingly overnight. People who had never heard the phrase "social distancing" quickly became dedicated practitioners. To say that the mass change in social behavior had a ripple effect on apartment operations would be a huge understatement. It was more like a tidal wave.

The pandemic exposed inherent weaknesses in the product and service delivery of rental operations across the nation. Fortunately, technologies that support apartment operations in a socially-distanced, even contactless environment have been in development—even deployment—for some time.

Abruptly threading the whole of an apartment operation solely though the needle of technology and automation was a grand experiment in business resilience and continuity. After all, apartment operations rely heavily on face-to-face human engagement. Or do they?

New world, new values

Let's start with the basics. Operational continuity in any business, especially multifamily housing, begins with a strong Wi-Fi network. Internet *becomes the business* when it becomes the primary platform of operation. A reliable internet service provider (ISP), with redundant providers for continuity, is core to building resiliency. Ruggedization means that a product or service is designed to withstand extreme conditions. While apartment management is not a battlefield, the pandemic showed just how mission-critical connectivity is to an entire operation. Connectivity impacts communications, operations and security and should be considered carefully for all possible conditions and events.

Ruggedizing apartment operations at the core of its structure hedges many risks and provides a layer of protection to all stake-holders in time of crisis—from prospect to resident to manager. It's also a win for property owners when a rental business runs with little to no financial disruption, even through a global crisis.

Through the pandemic, smart and auto-

mated apartments and operations had field advantage and learned the value of agility in real time.

Properties automated by smart management, maintenance and facilities processes were generally equipped to work through mandatory closures and lockdowns, while providing continuity of service to prospects and residents.

Such reliability in the marketplace especially in uncertain times, is not soon forgotten and naturally becomes part of the community's public brand.

In the world of the theoretical, the pandemic proved an unintended case study on the value of technology and automation in building resilience into multifamily housing businesses.

Operations with a greater percentage of automated facilities and processes clearly experienced less disruption in service and revenue and were afforded more opportunities to work through the shutdown.

Here are just a few of the ways smart property operations overcame various levels of lockdown orders and provided value to their customers.

#### An apartment for all seasons

Smart apartments have grown in popularity, but as more residents began to work from home (WFH) through the pandemic—some now permanently—reliable, high-speed internet suddenly became a mission-critical component of their apartments.

From a precipitous rise in internet loads via teleconference calls, file movement, greater digital television use, even a rise in telemedicine services, those communities with high-speed internet accommodated the new normal with scale and ease.

Smart thermostats, Wi-Fi connected lighting, motion detectors, smart door locks and video intercoms—already gaining popularity—got another boost through the pandemic. Sales spiked in smart home devices by over 51 percent year-over-year as consumers added them, according to Xiaomi, a global smart device producer. Of those surveyed, 63 percent purchased smart home devices, 82 percent adapted a room for WFH, and 79 percent reconfigured at least one room.

"Smart living has always been about reimagining and optimizing physical space to solve problems and adapt to new realities through the use of technology. We've seen this adoption accelerate in 2020," said Daniel Desjarlais, Xiaomi. "Connected homes, automated systems and new technology are helping people create ecosystems within their homes to solve new challenges presented by increased time at home, whether it's adapting or creating new uses for old spaces, such as office space or classrooms, or just creating a more streamlined home that is easier to manage and control."

Home security tech, in response to external conditions ranging from social unrest to an increase in package and food deliveries, also saw an increase in product and service sales year-over-year.

Required in-unit maintenance increased as a result of more residents spending nearly all their time in their apartments. Automated maintenance scheduling and arrival notifications simplified maintenance calls, making repairs safely possible.

With advanced planning, residents could be in another room while the maintenance was completed. Similar scheduling apps have worked when restricting occupancy in exercise facilities and other community amenities, organizing between-use cleaning and sanitation, and scheduling resident use.

Touchless rental payments and other digital transactions are yesterday's news with today's pandemic appeal. The payoff period of such systems will further compress as social protocols—remnants of the pandemic—continue to linger and fuel greater market adoption.

In 2012, 70 percent of residents paid their rent by check, RealPage reports. By 2019,

76 percent of residents paid their rent electronically. Accepting rent payments by credit card without added fees was a huge boost to property cash flow.

#### Setting facilities operations to "away"

Smart facilities management has only begun to permeate apartment operation models to the extent it has in the hotel, office and other real estate sectors. The smart building market is expected to reach \$25.7 billion in annual sales by 2025, according to Market Research Future.

Owners who invested in smart building management prior to the pandemic experienced accelerated ROI by way of uninterrupted monitoring and remote management of their real investments.

The ability to remotely analyze and address energy, utilities, irrigation, security and maintenance became a game-changer for apartment managers in the lockdown. Billions of dollars in assets were controlled with equal or better attention and care than before the lockdowns.

#### Virtual tours. Great move.

In 2019, 9.3 percent of Americans moved the lowest rates in recorded history, according to the Brookings Institute. Just one year and a pandemic later, over 15.9 percent of Americans moved between the months of February and July 2020 alone, according to MyMove, an information platform.

The freedom afforded by WFH policies, a collapse of certain jobs sectors and residents fleeing urban cores frozen by stringent lock-downs are some of the reasons for the sudden spike in relocations. Experts expect the trend to continue. More than half of all workers would consider moving to a different city if their company extended the WFH policy, according to a Robert Half study. Fifty percent of companies are open to the idea of a permanent WFH arrangement.

High move rates typically equate to good times in the apartment business. Lay that against lockdowns and it could have easily meant opportunity lost.

Enter virtual tours.

Virtual tours, from video to user-guidedanimation to virtual reality, have become indispensable tools under pandemic restrictions. Companies like Matterport create digital experiences of apartment floorplans that are then posted online.

For prospects who must see to believe, properties have also instituted physical selfguided tours where an electronic key is left for the prospect, in order to view the unit on their own. Prospects are typically also tracked via their key for optimal security.

Such self-guided tours require an infrastructure of smart locks, security cameras and key tracking. In its ultimate form, a selfguided tour is scheduled online. The prospect's identity is verified and he is issued access credentials shortly before the appointed tour time. Digital directions are sent to the prospect on how to reach the property and then the unit within the property. The prospect's location within the property is tracked using GPS, facial recognition at video intercoms and motion detectors. Lights are turned on in the unit and the thermostat is set to a comfortable temperature for the tour. A recorded description of the apartment's features that the prospect can listen to while viewing the apartment is sent to the prospect's smartphone.

Self-guided tours are essentially contactless. The convenience of being able to schedule tours after regular hours, and the reduced demands on the leasing staff, could make self-guided tours a competitive necessity in the future. RealPage reports that 86 percent of prospects say they would use selfguided tours if available. However, only 36 percent of properties currently offer selfguided tours.

#### Gateway to resiliency

The growing list of hardware and software it now takes to automate and manage an apartment property in today's world is found in the property portal.

The portal is equally important and core to the business as the ISP. Possibly more so, it could be argued. This is literally the property's operational engine and includes everything from resident lifecycle to facilities automation to management processes and more.

Resident lifecycle is a property's engagement with a resident from beginning to end (marketing, traffic tracking, available units, tour scheduling, resident pre-screening, application processing, retention, movein/move-out handling and scheduling).

Given that 38 percent of prospects visit only one or two properties before signing their lease, this window of opportunity becomes all important in maintaining occupancy levels in all market conditions. It's critical that all-information, in its best form, be present to the prospect.

Humans are innately social. A millennium will not be changed in a single moment.

Humans are also inventive. Technology and automation pave the path to operational resiliency.



### Future-proofing energy consumption

The U.S. energy infrastructure is large and plodding. Assets span coal mines, gas wells, oil refineries, hydro turbines, nuclear plants, generating stations, pipelines, power lines and technology—to name a few. Trillions of dollars over scores of generations have built a system that delivers a continuous stream of energy to the thirdmost populous country in the world—home to over 330 million people. And now we're a net exporter.

Like the hard assets on apartment properties—equipment, appliances, even buildings—the nation's energy-producing assets have calculated useful lives, too—many over a half-century. Slow asset turnover equates to the rate at which core systems can change.

The history of America's energy production is plodding—but heretofore reliable and now officially resilient.

The nation has achieved energy independence, according to the Energy Information Administration (EIA). We're now a net exporter of energy, building the economy and creating the operational resilience that we've dreamed of for decades.

How was this accomplished? American ingenuity. Total U.S. energy production supplied by fossil fuels over the last 50 years fell from 92 to 80 percent according to EIA. This includes petroleum, natural gas and coal. Eight percent is drawn from nuclear electric power. Renewables (geothermal, solar, hydroelectric, wind, biomass waste, biofuels, wood) generate the remaining 11 percent of the nation's total energy output.

While both energy production and innovation have remained in high gear, consumption has dropped through better technology and conservation. This nexus has culminated in a downward trend in U.S. energy consumption per capita over the last decade—even as the population grows.

#### Price, tech inform free markets

Innovation and price will always guide free energy markets and set the focus for invention. Historically, government regulations and subsidies through tax credits, loan discounts, rebate programs and other artificial stimuli have moved the needle on things like nuclear and clean energy, but only marginally. Such programs are designed to change the payoff model for nascent technologies in order to nudge market adoption and elevate interest in innovation.

Until the payoff model catches up to business profitability, economics will always

guide free market adoption. Still, as administrations change, so do their priorities and their interest in creating change.

The agility of a rental business is found in many data points. Dialing in to what that means in today's business environment is part of navigating risk and finding points of profitability in all climates.

Remaining informed and current on subsidies and credits around energy-efficient products and services will be ever more imperative to navigating today's operations and business environment.

#### American innovation: A history

U.S. energy production is plodding, but American ingenuity, bolstered by free markets, remains quick and nimble.

Until the 1970s, energy was cheap, abundant and run by the private sector. When cartels replaced free markets, the Feds stepped in to control runaway energy prices. This led to the formation of the Department of Energy (DOE) in 1977.

Through the years, DOE's focus has expanded to include clean energy technologies, betting that such innovation will become the "cornerstone of prosperity."

Still, price and technology have yet to meet at the point of market viability. Clean energy remains on the drawing board of feasibility and so is still highly subsidized. With government intervention, hybrid models do work as technology improves.

#### Flipping the business model

John S. Hoffman worked for EPA in the 1990s. A researcher, inventor and environmentalist, Hoffman was one of the first at EPA to study climate change and its potential.

Hoffman surmised that the fastest way to control the negative environmental impact of fossil fuel-based energy was to reduce consumption. Hoffman calculated that this could be accomplished by eliminating wasted energy consumption through awareness and better performing appliances and equipment.

ENERGY STAR was born. Fast-forward and by 2018, over 800,000 ENERGY STAR products spanning electronics, appliances, equipment and lighting were sold annually, according to EPA. The brand has since expanded beyond residential into commercial and industrial operations, saving an estimated \$35 billion in energy in 2018.

Still the second-largest energy consumer in the world, the U.S. reduced electricity consumption again in 2019, according to Statista. Such decline is even a greater feat as the nation's population continues to grow.



#### Next pivot in U.S. energy

Reducing energy consumption continues to garner traction around the world because of its economic and environmental gains.

In 2012, EPA's ENERGY STAR Portfolio Manager moved the model to America's buildings—including residential apartments. Working from the same voluntarybased program as ENERGY STAR, property owners could register their buildings online in order to benchmark performance against other similar buildings nearby.

Portfolio Manager enables property operators to record, track and benchmark building performance anonymously, effectively calculating property improvements for profitability, as well as positioning a property for available green lending and other subsidies.

Recently, local governments—such as New York City—have made programs like Portfolio Manager mandatory.

Beginning October 2020, NYC buildings 25,000 sq. ft. and larger must have a building energy assessment and post the resulting grade in public view. Buildings are graded A to F according to their ENERGY STAR Score.

Nearly half of NYC's 40,000 buildings posted grades of D or lower (Fs are only given to non-filing buildings). Grading occurs once annually.

In 2024 the city will fine buildings in what could run into the hundreds of thousands for failure or for low energy performance.

The mandate is part of NYC's plan to reduce emissions by 80 percent by 2050. Studies found that buildings put out nearly 70 percent of NYC's carbon emissions related to energy consumption.

The NYC ruling is meant to compel property owners toward energy efficiency through public pressure and regulation. This moves away from the ENERGY STAR model that relies on free market and internal fiscal analysis to determine when to pull the lever on upgrades. Historically, regulating behavior has only slowed economies and advancement, such as housing construction.

Plus, upgrading appliances and equipment only get a property owner so far. Residents control up to 80 percent of energy use, according to the U.S. Department of Energy. What this means is that engaging residents "in energy efficiency is crucial to unlocking the full energy-saving potential of a building."

#### Payoff analysis

Technology changes everything, and the speed of technological advancement is increasing. Seemingly overnight, LED light bulbs shifted the lighting market. Smart thermostats changed one of the largest costs of building operations and on-demand water heaters are heading in a similar direction with water heating.

We cannot know what advancements are possible without first measuring consumption, and then analyzing it against our properties' performance.

The technology and innovation around property data has also advanced since the first days of Portfolio Manager, along with the usefulness of the data.

Understanding where a property is among its competitors is a baseline to market performance. In the coming years, it will also be pivotal to simple operational and performance resiliency.

## The future is here for EV charging stations



As the world gets greener and apartment residents desire to leave a smaller carbon footprint, providing electric vehicle charging stations at communities is gaining traction. Multifamily energy and sustainability roundtables inevitably are turning to accommodating renters who own or plan to buy battery-operated cars and trucks.

And it's not just all talk. The dash to install charging stations at apartments is moving east from its origins in California and Washington to Texas, Missouri, Massachusetts and Georgia. The movement is being fueled by an increasing number of energy-conscious drivers and by legislation ultimately aimed at shrinking or eliminating future use of gasoline-combustion engines.

While EVs may be a fraction of all vehicles when rubber hits the road, they are leaving a noticeable impression. More than 1.4 million plug-in electric cars have been sold since the U.S. market took off in 2010. Research shows that, at current growth rates, there could be more than 30 million on the road by 2030.

Analysts at Morgan Stanley projected in December that the electric vehicle market will grow 50 percent or more in 2021, according to MarketWatch. That could edge higher with recent bans of new sales of gasoline-powered cars by 2035. California and Massachusetts have enacted legislation requiring all new vehicles sales to be electric by that time. New Jersey intends to follow.

To handle future growth, the U.S. Department of Energy (DOE) has invested in building a nationwide charging infrastructure so energy-minded motorists have more options. Charging stations are becoming common along highways, in shopping malls, neighborhoods and other locations and at home.

The trend is prompting apartment operators to invest in technology to accommodate residents now and in the future. At a multifamily energy conference last year, sustainability professionals said the industry needs to start focusing on the demographic sooner rather than later.

Most recently, a Fairfield Residential Affordable property in Fremont, Calif., opened with five dedicated charging spots, and more are planned at a nearby market rate property in early summer. Elsewhere, Tacara Steiner Ranch Apartments, a new luxury community in Northwest Austin managed by TLC Properties, installed 13 dedicated charging stations in addition to a public charging station near its community center. Other communities are doing the same.

#### A good marketing opportunity

Gail Corder, ancillary services manager at Fairfield Residential, says charging stations present a good marketing opportunity for multifamily properties to increase and retain residents. Home is where the charge is.

Home charging reduces "range anxiety," a driver's constant need to look for plug-ins that are in much shorter supply than gas stations. Installing chargers at apartments can appeal to drivers who otherwise might choose to live in a single-family home or who are less likely to downsize to an apartment without charger access.

A 2017 Federal Highway Administration survey showed that homeowners are three times more likely to own an electric vehicle. Also, more than 80 percent of EV drivers charge their cars at home, says Chargepoint, which specializes in multifamily charging stations.

Installing them at apartments is making more and more sense, Corder says.

"Electric car drivers have a different mind-

set," she said. "They don't go until they have a quarter of a tank left. They are always topping off. They don't know when they're going to get their next charge. You need to change the way you think about these drivers."

#### **Planning EV charger installs**

There is much to consider when installing stations at apartments, Corder says. For one, state and local laws are ever-changing and must be reviewed, and a development's electrical capacity should meet specifications of chargers on the market today. Retrofitting older properties may require a couple more steps, such as additional breakers to bring capacity up to par.

Types of charging stations—dedicated and multi-use—and how they are used should be considered. The last thing an apartment community wants to do is turn an amenity into angst among residents over charging their cars.

In Fremont, Fairfield Residential chose to install dedicated stations at its properties, as opposed to multi-use chargers that can aggravate residents when "charger hogs" don't move their cars once charged. Dedicated stations afford drivers convenience and exclusivity by using a key or code for a flat fee.

Also, whether to hook up chargers to dedicated meters is a consideration. Doing so allows the property to charge the resident for electricity usage rather than absorb the energy cost. But, installing dozens of meters gets costly and crowds electrical closets.

The alternative is to run stations off a single meter and charge a flat fee.

Fairfield Residential installed five dedicated chargers at its Affordable property, Geo Apartments, and 41 stalls are going in at Embark, a Class A development. Chargers will operate off the property's main meter and residents will pay a flat fee.

"We do have a flat fee and understand we might lose a little bit (on electricity), but we're not seeing it as a major revenue source," Corder says. "We're trying to break even and give residents what they want."

Upcoming Fairfield Residential projects will be built with the ability to provide convenient charging access to residents today and tomorrow. It's better to invest in the infrastructure now than to have to retrofit in the future, Corder says. EV vehicles appear to be here to stay.

"Who knows what's going to happen in the future. We're already ready on those deals so that if they need to have charging stations hooked up quickly, we have space to put them in."

# EV by the numbers

1.5% of all auto sales were EVs (2019 Q1)

**Economic traction has** been a struggle for the EV industry. EVs are not yet profitable for automakers and cost twice that of similar compact cars without the electric drive train. That hasn't stopped General Motors from committing to exclusively produce EVs by 2035.

## 20/1

TODAY'S U.S. EV/CHARGER

THE IDEAL IS

**50/1 ESTIMATES** 

BLOOMBERGNEF

RATIO

500,000 **EV CHARGERS** FEDS WILL DELIVER

BY 2030

90,000 EV CHARGERS IN U.S. TODAY ACROSS 28,000 STATIONS

#### HOW ARE EV STATIONS POWERED?



**Check government and private subsidies** for commercial properties installing EV charging stations. Some utilities also offer rate discounts related to these installations.



% 50



Vehicle emissions v. miles traveled

1970 1975 1980 1985 1990 1995 2000 2005 2010 2015 2020 2025 2030

**EV** ownership demographic





## Stars aligning for solar in multifamily housing

Reducing expenses through solar and other renewable energy sources is growing among affordable and conventional multifamily housing operators.

Solar energy and other renewables now make up nearly 20 percent of net domestic electrical generation in the U.S., according to Renewable Energy World. Favorable policies, programs, green contracts and incentives are affording apartment operators greater opportunities to save on electricity and improve their carbon footprint.

In recent years, leading multifamily housing owners have embraced solar technologies and policies to help minimize—or eliminate—electric bills for both common areas and individual apartment units. One available tool growing in popularity is community solar, a solar energy purchasing program which can be ideal for renters.

"The major trend we are seeing is the evolution of community solar, enabling renters to participate directly in the benefits of solar electricity," says Darien Crimmin, vice president of energy and sustainability for WinnCompanies. "Solar continues to prove that it can save money and reduce electric bills for businesses, communities and even individual renters."

Community solar programs are designed to bring the benefits of renewable energy to residents and communities that may not have the available space or appetite to install solar on their property. Subscribers buy an allocation of the solar output from an off-site shared solar facility managed by a utility or third party, and in return receive a credit on their electricity bill for their piece of the production.

Depending on state-specific regulations and how the program is funded, community solar promises relief to apartment residents on their energy bills.

#### Saving with solar

WinnCompanies, the nation's fifth-largest multifamily property manager and a provider of affordable and privatized military housing, has been a pacesetter in integrating solar energy into its utility mix.

Since 2007, it has developed over 3 megawatts of solar on rooftops and delivered 10 megawatts of off-site solar to its multifamily affordable communities—all to the tune of \$250,000 in savings a year. Leveraging solar has helped stabilize property utility expenses while reducing dependence on fossil fuels and achieving clean-energy policies.

Two years ago, Atlantic Terrace, an affordable housing property in Washington, D.C., owned and operated by WinnCompanies, debuted as one of the first and largest community solar projects in the District to harness the sun's energy specifically for apartment residents. The District's Department of Energy and Environment awarded Winn \$1.3 million to install 651 kilowatts (DC) of photovoltaic panels atop the roofs of the community's six buildings.

Meters record energy generated by panels, which is fed into the District's utility grid, while qualifying residents subscribe to receive \$40-\$50 in monthly savings on their utility bills. The District's program, known as Solar for All, is one of many community solar programs across the country designed to prioritize benefits for low- and moderate-income residents. On the other side of the country, Bostonbased WinnCompanies is helping clients in California lower residents' electric bills through similar solar installations.

"California has committed \$1 billion over the next decade to encourage solar that benefits low- and moderate-income residents, creating by far the most comprehensive and aggressive program in the country," Crimmin says, referring to the state's Solar on Multifamily Affordable Housing (SOMAH) program.

In addition to resident benefits, WinnCompanies has partnered with leading solar and energy storage service providers in the U.S. to offer clients direct financial incentives for installing solar.

#### Including residents in the equation

The future is bright for solar technology as policies and funding begin to galvanize sustainability and clean energy priorities for multifamily housing's future.

Renewable power purchase agreements enable a property and potentially its residents to reap the benefits of solar with minimal investment.

The cost for photovoltaic cells, structures that convert light energy into electricity, have become drastically reduced. Panels are smaller and more efficient, and the typical payback period for a complete solar energy system is 3-6 years, according to the Solar Energy Industries Association, depending on available federal and state incentives.

It all adds up to the potential for greater savings for residents, as well as operators.

"We're seeing an evolution in policy encouraging renters to be able to participate meaningfully within community solar projects and specifically encouraging or requiring lowand moderate-income individuals to participate," Crimmin said. "Across the country, we are including residents into the equation when evaluating the potential for solar."

## Solar by the numbers

#### **\$3/WATT** 2019 PANEL COST OF SOLAR,

2019 PANEL COST OF SOLAR, DOWN FROM 1956 WHEN SOLAR WAS \$300 PER WATT INCLUDING INSTALLATION

. . . . . . . . . .

### 2021

THE FEDERAL SOLAR INVESTMENT TAX CREDIT WAS EXTENDED TO THIS YEAR

#### \$22.9 BILLION

PROJECTED SOLAR MARKET REVENUE BY 2025

SUBSIDIES SUPPORT WIND AND SOLAR AS THESE INDUSTRIES ARE NOT ECONOMICALLY VIABLE YET HAVE GOVERNMENT AND PUBLIC SUPPORT.



#### Electricity cost breakdown

Taxes and fees help fund renewable energy subsidies but increase the cost of unsubsidized power.

#### **Utility production costs**



## **\$70 BILLION**

FEDERAL SUBSIDIES FOR RENEWABLE ENERGY 2010-2019 NOT COUNTING STATE, LOCAL AND UTILITY DISCOUNTS

#### EPA SUCCESSES: Clean Air Act has made huge

gains—mostly by moving from coal to natural gas—Here are 3:



#### **U.S. air and quality of life have improved dramatically,** even while GDP has grown. Mortality rates, illness and more have declined since CAA was instituted in 1990.

CONTINUITY RISK:

#### Renewable energy relies heavily on global supply chain

The supply chain required to build solar panels and related infrastructure relies heavily on China. Growing different aspects of the supply chain in the U.S. would diversify the supply chain at a cost. On constrained rare earth elements, there are no options; China has cornered the market even beyond its borders. Ramping up U.S. production on other materials would cost more and take more time than importing, according to analysts.

CHINA'S WORLD MARKET SHARE

**80%** OF RARE EARTH ELEMENTS 40% OF POLYSILICON (SOLAR CELLS)





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