SOLARCITY CORP
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Solar Bonds are debt securities issued by SolarCity. As with any investment, purchasing Solar Bonds involves risk. You must make your own decision about whether and how much to invest in Solar Bonds. SolarCity cannot make any investment recommendations or otherwise provide any investment advice. Solar Bonds are not FDIC-insured. Your earnings and principal are not guaranteed.

SolarCity has filed a registration statement (including a prospectus) with the Securities and Exchange Commission (SEC) for offerings to which this information relates. Before you invest, you should read the prospectus in that registration statement and other documents SolarCity has filed with the SEC for more complete information about SolarCity and the offerings. You may obtain these documents for free by visiting EDGAR on the SEC web site at http://www.sec.gov/Archives/edgar/data/1408356/000119312514371976/0001193125-14-371976-index.htm . Alternatively, you may obtain the prospectus relating to the Solar Bonds, and the pricing supplement relating to a particular series of Solar Bonds, on the Solar Bonds platform.

RSF Purchases $9 Million in Solar Bonds from SolarCity

RSF Purchases $9 Million in Solar Bonds from SolarCity
(http://www.solarcity.com/newsroom/press/rsf-purchases-9-million-solar-bonds-solarcity)

Transaction sparks relationship between social enterprise and clean energy leaders

Jul 23, 2015

SAN FRANCISCO RSF Social Finance (RSF) is pleased to announce that it has purchased $9 million in solar bonds from clean energy leader SolarCity, which launched its public bond offering to individual consumers in October.

The investment in SolarCity solar bonds is a strong strategic match with RSF s mission of transforming the way the world works with money. RSF is a San Francisco-based organization that lends money to path-breaking social enterprises, provides impact investing vehicles accessible to a wide range of investors, manages grant funds, and works to build a finance infrastructure that will allow social enterprises to thrive.

RSF is proud to directly support SolarCity s work in renewable energy, said Don Shaffer, president and CEO of RSF. This contributes to our goal of employing all our assets to create social and environmental benefits. It also is in line with our effort to democratize impact investing. Like RSF s Social Investment Fund, SolarCity s solar bonds are available to individual investors with a minimum $1,000 investment. We re happy to add capital to a fund that offers this opportunity.

We re extremely pleased to have RSF Social Finance join the growing number of investors including both institutions and individuals who are getting paid by the sun with SolarCity s solar bonds, said Tim Newell, SolarCity s vice president of financial products. RSF s investment in solar bonds is the latest example of their leadership as an institution in defining the future of impact investing. We re proud to help RSF and their investors achieve their mission.

RSF favors investments with broad impact. Solar panels, in contrast with conventional natural gas, nuclear and coal power plants, require no water to produce electricity, create no air pollution, and emit no greenhouse gases. The solar industry is also a prodigious job creator in 2014 it created jobs nearly 20 times faster than the overall U.S. economy. SolarCity, the largest solar employer in the U.S., has added more than 6,000 jobs in the past year.

RSF purchased the majority of the bonds with its liquidity fund, a largely cash reserve that holds donor advised funds awaiting grant-making. Impact investors have limited options for investing these types of funds, so solar bonds are welcome option. RSF s solar bond purchase will yield a weighted annual return of 2.61% and help diversify its investment portfolio.

The solar bonds provide an opportunity for RSF and like-minded individuals and organizations to earn an attractive financial return while helping SolarCity expand its use of the sun s clean energy to reduce our society s dependence on fossil fuels for power generation, said Joe Avenatti, RSF s senior director of investments. We look forward to exploring additional ways for our two organizations to work together.

About RSF Social Finance

RSF Social Finance (RSF) is a San Francisco-based financial services organization dedicated to transforming the way the world works with money. Since 1984, the organization has made over $275 million in loans and $130 million in grants to non-profit and for-profit social enterprises working in the areas of Food & Agriculture, Education & the Arts, and Ecological Stewardship. RSF has provided seed and growth capital to leaders such as B Lab, Revolution

Foods and PACT Apparel. Loan capital comes primarily from more than 1,500 investors who have placed $1,000 or more in the organization s Social Investment Fund. Investors earn a competitive return on their money comparable to a certificate of deposit while their funds are deployed to leading social enterprises. To learn more go to www.rsfsocialfinance.org.

About SolarCity

SolarCity® (NASDAQ: SCTY) provides clean energy. The company has disrupted the century-old energy industry by providing renewable electricity directly to homeowners, businesses and government organizations for less than they spend on utility bills. SolarCity gives customers control of their energy costs to protect them from rising rates. The company makes solar energy easy by taking care of everything from design and permitting to monitoring and maintenance. Visit the company online at www.solarcity.com and follow the company on Facebook & Twitter.

SolarCity s GivePower Foundation Provides Light to 500 Schools in the Developing World, Doubles 2015 Scope with $500,000 Grant from Bank of America Charitable Foundation
(http://www.solarcity.com/newsroom/press/solarcity%E2%80%99s-givepower-foundation-provides-light-500-schools-develop

SolarCity s GivePower Foundation Provides Light to 500 Schools in the Developing World, Doubles 2015 Scope with $500,000 Grant from Bank of America Charitable Foundation

SolarCity s previously self-funded foundation now accepting public donations, expects to light an additional 1,000 schools by the end of 2015

SolarCity GivePower Foundation

Aug 12, 2015

San Mateo, Calif. GivePower Foundation a charitable non-profit organization that addresses energy poverty by providing solar-powered lighting to schools in the developing world is expanding. Through a $500,000 donation from the Bank of America Charitable Foundation, GivePower Foundation now plans to provide light to an additional 1,000 schools, totaling more than 1,500 schools by the end of 2015. In 2014, GivePower Foundation donated solar powered lighting to 511 schools in Africa and Central America, exceeding its first year goal to provide light to a school in a developing country for each megawatt of solar power it installs in the United States. The GivePower Foundation, established with funding that came entirely from SolarCity in 2014, will begin to accept public donations in 2015.

GivePower Foundation donates solar panels, batteries and lighting to schools to extend classroom hours in the early morning and evening, and create a night time gathering place in communities that often lack basic access to electricity. The solar panels can also power cell phones and other small electronic devices throughout the day. This donation is part of Bank of America s commitment to environmental philanthropy focused on carbon emission reductions, access to clean water and research and innovation. The $500,000 grant will support hundreds of school lighting projects as well as solar training, research and development in off-grid communities.

We are extremely grateful for Bank of America Charitable Foundation s generous donation to GivePower, said Hayes Barnard, SolarCity s Chief Revenue Officer and GivePower Foundation President. With this commitment, we are able to expand our program, bringing light to even more schools and communities in need.

This year s GivePower Foundation projects will bring light to remote villages in Mali, Nicaragua, Kenya, Haiti, Uganda, Nigeria, Malawi, Nepal, and Ghana. As a 501(c)(3) public charity, the foundation is now accepting donations to help it bring light to even more schools and communities in need. Approximately 291 million children around the world attend primary schools without electricity, and 1.3 billion people around the world live without electricity.*

Education is vital to empowering communities and forming tomorrow s leaders, and we are excited to play a role in ensuring these schools have lighting for the first time, said Anne Finucane, vice chairman and global chief strategy and marketing officer at Bank of America. Our new partnership with GivePower Foundation is bringing clean energy to the developing world and is part of our broader strategy to help finance the transition to lower-carbon economies.

For every megawatt of solar power SolarCity installs, the foundation makes a donation of light to one school in need. GivePower, and all those who support it, also helps provide resources to train local residents to install and maintain systems, and to gain and share knowledge with surrounding communities. Access to power allows schools to increase the number and type of classes they offer, attract and retain teachers, and access vast educational resources on the Internet.

To learn more about the GivePower Foundation, or to get involved, please visit www.givepowerfoundation.org.

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About Bank of America

Bank of America s commitment to corporate social responsibility (CSR) is a strategic part of doing business globally. Our CSR efforts guide how we operate in a socially, economically, financially and environmentally responsible way around the world, to deliver for shareholders, customers, clients and employees. Our goal is to help create economically vibrant regions and communities through lending, investing and giving. By partnering with our stakeholders, we create value that empowers individuals and communities to thrive and contributes to the long-term success of our business. We have several core areas of focus for our CSR, including responsible business practices; environmental sustainability; strengthening local communities with a focus on housing, hunger and jobs; investing in global leadership development; and engaging through arts and culture. As part of these efforts, employee volunteers across the company contribute their time, passion and expertise to address issues in communities where they live and work. Learn more at www.bankofamerica.com/about and follow us on Twitter at @BofA_Community.

* According to the United Nations Development Programme

This release contains forward-looking statements including, but not limited to, statements regarding future installations. Forward-looking statements should not be read as a guarantee of future performance or results, and will not necessarily be accurate indications of the times at, or by, which such performance or results will be achieved, if at all. Forward-looking statements are subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in or suggested by the forward looking statements. You should read the section entitled Risk Factors in SolarCity s quarterly report on Form 10-Q, which has been filed with the Securities and Exchange Commission and identifies certain of these and additional risks and uncertainties. We do not undertake any obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future developments or otherwise.

SolarCity Introduces Affordable New Energy Storage Services Across the U.S.
(http://www.solarcity.com/newsroom/press/solarcity-introduces-affordable-new-energy-storage-services-across-us)

SolarCity Introduces Affordable New Energy Storage Services Across the U.S.

SolarCity incorporates new Tesla battery to create turnkey residential solar battery backup system system cost reductions are over 60% lower than previous product; cost breakthrough also results in greater savings for business and government customers

SolarCity Tesla energy storage

Apr 30, 2015

SAN MATEO, Calif. In an important step toward the distributed electricity grid of the future, SolarCity (NASDAQ: SCTY) will make more affordable battery storage available to residential, business and government customers across the U.S., and remote communities around the world. SolarCity Co-founder and Chief Technology Officer Peter Rive provided additional detail about the rollout tonight in a post on the company s blog.

For businesses and government organizations, SolarCity will incorporate the new Tesla battery into its DemandLogic energy storage system to significantly increase the utility cost savings customers can realize from using stored solar electricity. DemandLogic, which is being adopted by several of the largest retail, biotech and Internet companies in the U.S., allows businesses to reduce energy costs by using stored electricity to reduce peak demand, and can also provide backup power during grid outages. DemandLogic s management software automates the discharge of stored energy to optimize savings on utility demand charges for customers.

For remote communities around the world, SolarCity will incorporate the new Tesla battery into its GridLogic microgrid service. GridLogic combines distributed energy resources solar energy systems, batteries and controllable load to enable a cleaner, more resilient and more affordable way of providing power. SolarCity s microgrid service will ensure that any community anywhere in the world vulnerable to power outages and high energy costs including remote or island communities, hospitals and military bases can have dependable, clean power off-grid, when the grid is down. GridLogic can operate either in conjunction with or independently of the utility grid.

For residential solar customers, SolarCity will provide a turnkey battery backup service that includes permitting, installation and ongoing monitoring. Equipment includes Tesla s home battery, the Tesla Powerwall, which consists of an advanced hybrid solar/battery, inverter and monitoring and control systems. The fully-installed system stores electricity generated from the solar power system, using that power to automatically provide backup power during utility grid outages. SolarCity s battery backup service replaces noisy, dirty fossil fuel generators with zero-emission storage technology. Roughly the size of a suitcase, the sleek, enclosed pack can be easily mounted on indoor or outdoor walls. When a power outage occurs, the control system immediately begins feeding power to the home from the solar system and the battery to continue operating the most commonly needed, eligible circuits selected by the customer, including the refrigerator, lighting, computer, alarm system and electrical outlets. When the battery is depleted, it can be recharged by solar power even if the outage continues for multiple days.

Incorporating Tesla s new battery technology, SolarCity is now able to configure a solar system (along with other energy management technologies) as a stand-alone, off-grid power supply. SolarCity plans to first offer these off-grid systems to eligible Hawaii customers that might otherwise be prevented from using solar power.

The combination of solar power generation and battery storage will make the utility grid safer and less susceptible to service interruptions, and will also lower the cost to expand and maintain the grid. SolarCity s energy storage rollout supports efforts already underway in multiple states to integrate aggregated storage capacity with existing grid

resources. A distributed network of solar power systems and energy storage devices can also make renewable energy available on demand to utilities and their customers. In the future, distributed solar and storage resources are likely to become marketable assets, and homeowners and businesses may be able to collect revenues by providing self-generated, clean energy to others.

SolarCity will begin taking orders for the new energy storage systems on May 1st and expects to begin installing customers in October. SolarCity will initially make its battery backup options available only to new solar customers in the company s current service area, and will accommodate customers on a first-come, first-served basis. The company plans to make the battery backup system available to its existing solar customers later this year. Off-grid solutions offered in Hawaii are expected to become available in the first half of 2016. Potential customers can call 888-765-2489 or visit www.solarcity.com/batterybackup to inquire about pricing or reserve a system.

Contractor licenses: www.solarcity.com/company/contractor-licenses

This release contains forward-looking statements including, but not limited to, statements regarding future product rollouts, including availability, eligibility, timing and cost savings, and future technology developments. Forward-looking statements should not be read as a guarantee of future performance or results, and will not necessarily be accurate indications of the times at, or by, which such performance or results will be achieved, if at all. Forward-looking statements are subject to risks and uncertainties that could cause actual performance or results to differ materially from those expressed in or suggested by the forward looking statements. You should read the section entitled Risk Factors in SolarCity s annual report on Form 10-K, which has been filed with the Securities and Exchange Commission and identifies certain of these and additional risks and uncertainties. We do not undertake any obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future developments or otherwise.

About SolarCity

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The Solar Boom

MSNBC s All in with Chris Hayes (http://www.msnbc.com/all-in/watch/the-solar-boom-482385987705)

Jul 10, 2015

For decades, solar power was so expensive, few could afford it. That s now changing.

Transcript: http://www.nbcnews.com/id/57615852/ns/msnbc-all_in_with_chris_hayes/

HAYES: For decades, solar power was so expensive and unwieldy if you could afford it, and that is changing in a mind bendingly rapid pace. Over the past several years, the cost of solar energy has dramatically decreased, I mean dramatically, making it more accessible to more people.

Earlier this week it got another shot in the arm from the Obama administration after it announced a new initiative to make solar energy more affordable to low and middle income Americans. White House hopeful Senator Bernie Sanders then introduced legislation, similar goal.

Solar energy is having a moment right now. And the future we have long been promised is now finally upon us.

ELON MUSK, CHAIRMAN, SOLARCITY: We have this handy fusion reactor in the sky called the sun. You don`t have to do anything, it just works. It shows up every day and produces ridiculous amounts of power.

HAYES: Solar energy is booming. And it`s a boom a very long time in the making.

JIMMY CARTER, 39th PRESIDENT OF THE UNITED STATES: Its energy will not run out. It will not pollute the air. It will not poison our waters.

HAYES: In the midst of the 1970s energy crisis, the technology and the will existed to make solar a viable alternative to fossil fuels.

TOM BROKAW, JOURNALIST; If there is not enough heat or air conditioning, you don`t blame the Middle East or the president, you blame the sun.

HAYES: In the era of eight tracks and disco, solar energy was the future.

UNIDENTIFIED FEMALE: The solar heating business is expanding so rapidly that the federal government has set up a solar information center.

HAYES: By 1979, the country appeared to be on the verge of a solar revolution. And the Carter administration set a goal: 20 percent of the country`s needs would be drawn from renewable sources by the end of the century. The president even had solar panels installed on the roof of the White House.

UNIDENTIFIED FEMALE: These solar panels at the White House cost almost $30,000 and they heat only the water in the buildings West Wing, but they are meant to symbolize the Carter administration`s commitment to solar energy.

HAYES: But despite having a champion in the White House, it was solar`s steep price tag that proved to be its biggest obstacle.

UNIDENTIFIED MALE: For most builders and homeowners, the saving in fuel bills is not worth the cost of the installation.

HAYES: And then came Ronald Reagan.

RONALD REAGAN, 40TH PRESIDENT OF THE UNITED STATES: In years to come, solar energy may provide much of the answer, but for the next two or three decades, we must do such things as master the chemistry of coal.

HAYES: The Reagan administration slashed funding for solar research and development. Tax breaks were eliminated, and the White House solar panels came down.

UNIDENITIFIED FEMALE: On a practical level, the Reagan administration`s support for solar energy has ground to a halt.

HAYES: The would-be solar revolution went from boom to bust.

UNIDENTIFIED MALE: There was no failure in the solar technologies. When the subsidies were cut, there was no way solar could compete.

HAYES: But today solar is making a comeback, big time. Solar power capacity in the U.S. has jumped 20-fold since 2008. The fastest growing source of electricity in America is the sun.

The California-based company SolarCity, which is country`s largest installer of residential solar systems, has seen its customer base doubled over just the past the four quarters. And it`s not just because technology has improved or because more people have decided to go green, it`s a matter of simple economics.

UNIDENTIFIED MALE: The biggest trend is solar has become affordable.

HAYES: SolarCity`s CEO Lyndon Rive is confident the company can enlist a million customers by 2018.

LYNDON RIVE, CEO, SOLARCITY: The demand has always been there, it`s just the industry has to build out the infrastructure to deliver that demand.

HAYES: That kind of rapid growth is thanks mainly to cost. Solar is now cheap. China has helped drive down solar manufacturing costs by investing a lot of money in solar power production.

But solar is also booming because companies like SolarCity have figured out a way to give Americans what they crave: zero money down.

UNIDENIFIED MALE: We switched to SolarCity. No upfront costs, lowered our monthly bill, now we have the infinite power of the sun working for us 24/7.

HAYES: Instead of spending thousands up front, many customers are essentially leasing them.

UNIDENTIFIED MALE: I think once we turn on the meter we`ll definitely see the savings, get this installed today and then see the benefits tomorrow.

HAYES: Over the past few years, solar home installations have gotten faster and cheaper, something not lost on the utility companies.

The big utilities make more money selling you your power are watching more and more customers across the country install solar panels and move towards their own personal energy independence.

The solar boom we were promised is finally happening. The question now is whether utility companies will let it.

Infographic: Solar energy has a big environmental impact
(http://blog.solarcity.com/infographic-solar-energy-has-a-big-environmental-impact)

By SolarCity September 02, 2015

You know installing solar on your home is good for the environment
(http://www.solarcity.com/residential/benefits-of-solar-energy), but have you ever wondered just how big your individual impact is? Here s proof that one person can make a difference:

Power to Give (http://blog.solarcity.com/the-givepower-foundation)

Power to Give

By SolarCity August 12, 2015

The story of the GivePower Foundation starts in 2010, in the aftermath of the massive Deepwater Horizon Oil Spill in the Gulf of Mexico. In an area still recovering from the devastation of Hurricane Katrina several years earlier, the spill severely hampered the local seafood industry and put a lot of people out of work. Elon, Pete and Lyndon wanted to try to do something to help, and at the same time demonstrate the potential of energy without oil in an area that had seen very little renewable development.

With funding from Elon s Musk Foundation, SolarCity donated a solar panel and battery backup installation to a hurricane response center in a town in southern Alabama Coden whose lifeblood had been commercial fishing prior to the spill. The donation was meant to ensure that local residents would have a safe, well-lit and air-conditioned place to gather should another disaster strike, with the added bonus of lowering the response center s ongoing electricity costs.

The project began what would become the first of a series of disaster relief efforts. SolarCity and Elon s Musk Foundation teamed on a similar project in Japan in 2011 in the wake of the Fukushima nuclear disaster, and in 2012, SolarCity worked with partners to provide portable solar power stations for victims of Hurricane Sandy in the Northeast.

SolarCity went public in late 2012 and grew into a better position to make a broader impact. In the fall of 2013, Hayes Barnard joined SolarCity as chief revenue officer when his own company Paramount Energy Solutions was acquired. A few years earlier, Hayes had been exposed to the challenges that schoolchildren in impoverished areas of the globe faced through buildOn, a nonprofit that builds schools in the developing world.

Hayes spearheaded an effort to create a charitable foundation within SolarCity to address energy poverty for schoolchildren around the world, and recruited David Reichbaum to lead the organization. At the end of 2013 SolarCity officially launched the GivePower Foundation to provide light to schools in the developing world that lack basic access to electricity.

In 2014, GivePower exceeded its goal of lighting 400 schools, helping a total of 511 schools in Africa and Central America expand their potential. Power can instantly make a difference to the 1.3 billion people living off the grid.

These schools are often the central meeting place in the communities, says Reichbaum, GivePower s Global Program Manager. Whether it s a health clinic or adult literacy classes in the evening, or a spot for the community to gather, by bringing electricity these schools are now empowered to lift the community from some of the worst poverty imaginable.

GivePower targets areas of the world most in need such as sub-Saharan Africa and parts of Central America and Asia, home to nearly 97% of the world s people currently living without access to power. Schools with power can attract superior teachers, increase the number and type of classes, and help students connect with the world.

The simple to use, solar-in-a-box kits GivePower provides include batteries, panels, and lights; they allow many schools to have interior lighting for the first time. Working with partners such as Intel, buildOn, World Vision and GRID Alternatives, last year the GivePower program sent teams to four countries to build schools from the ground up and install solar systems.

SolarCity employees were able to join on three of these trips, and see firsthand the changes connectivity can mean for a community. In Mali, where only 1/4 of the population has access to electricity, recipient schools can now attract more teachers to the rural area. In Nicaragua, where more than 1.5 million people don t have power, the remote 250 person-strong community of El Islote no longer lives in the dark. And in Kenya, the school in the village of Kirindon can now power the laptops donated by Intel.

The solar kits are designed to last at least a decade, and much longer for the larger build projects. The SolarCity teams also train locals to troubleshoot equipment, and provide long-term support to ensure schools remain powered.

GivePower continues its goal of providing light to one school for every megawatt of solar power installed in the U.S. This year, thanks to a $500,000 donation from the Bank of America Charitable Foundation, the organization s goal has doubled to over 1,000 additional schools.

GivePower has also achieved 501(c)(3) public charity status; now everyone can give the gift of light regardless whether they ve gone solar with SolarCity or not. Corporations and individuals can help bring light and opportunity to communities in need with GivePower through donations.

Reichbaum says with more backing, GivePower has its sights set on expanding to light up medical clinics and libraries, as well as expanding people s expectations of solar energy.

The goal is to demonstrate to the world that solar is not only for developed countries, it s something the rest of the world has adopted to skip over the traditional energy infrastructure. We d like to inspire people to consider solar as the new norm.

A Solar Revolution (http://blog.solarcity.com/a-solar-revolution)

A Solar Revolution

By SolarCity July 04, 2015

100,000 Solar Ambassadors are helping us change the way we power our country.

We began the SolarCity power revolution nine years ago today.

An idea imagined during a cross-desert drive started to become a reality, as SolarCity was founded on July 4, 2006.

Those nine years have brought some accomplishments that we re very proud of.

From just two employees in California, we ve grown exponentially. We recently hired our 12,000th employee, and entered our 18th state. Our grassroots independent Solar Ambassador program, which empowers people to help us promote our mission, recently topped 100,000 members. This has helped us maintain our position as the number one provider of rooftop solar in the United States.

Putting our growth in context

All this has happened in the context of something much bigger a solar revolution. Americans now recognize there s a better way to power our country than expensive, dirty, fossil fuels.

According to our 2015 homeowners survey, 87 percent of respondents said renewable energy is an important part of the country s future. Solar was the most favored source.

Americans aren t just talking about it. GTM Research announced that in the first quarter of 2015, 51 percent of new, electric-generating capacity in the United States came from solar. There s now enough installed solar capacity 21.3 gigawatts to power 4.3 million American homes.

Fostering the solar revolution

Our mission is to accelerate the mass adoption of clean energy. That means more than just installing solar panels on rooftops, it s why you see us continuing to foster the solar revolution.

In recent months:

We ve announced a community solar program. It gives renters, schools, and municipalities a chance to buy renewable energy without installing solar panels on their property.

We announced a turnkey battery backup service featuring our sister company Tesla s revolutionary Powerwall storage device. The service is designed to provide more reliable power to solar customers during grid outages.

We introduced MyPower, a first-of-its-kind financing option. It helps solar customers who want to own their system enjoy both a low upfront cost and prompt utility savings.

We ve continued construction of a one-million-square-foot solar panel factory in Buffalo, NY. When it opens next year, it ll be the largest solar factory in North America.

Become a Solar Ambassador

As we celebrate SolarCity s ninth birthday and our country s 239th we offer a sincere thank you to our customers, Solar Ambassadors, employees and supporters. None of this neither our growth as a company, nor the growth of the solar revolution would be happening without you.

We invite you to join us. You can become a Solar Ambassador whether or not you re a SolarCity customer. You ll enjoy some great advantages including a $250 reward for referring friends to SolarCity.

In fact, this is the perfect time to join us. Now through Labor Day (September 7), every one of your referrals that goes through site survey get you an entry into our Win Solar for Life sweepstakes. So sign up today.

Stay Current: Our Top Solar Links (http://blog.solarcity.com/stay-current-our-top-solar-links-11)

Stay Current: Our Top Solar Links

By SolarCity July 02, 2015

We re all about saving you energy, so we ve rounded up the latest in solar so you don t have to.

The way humans get electricity is about to change forever, Bloomberg Business writes, citing six shifts the top three being solar that will transform markets over the next 25 years.

The New Yorker takes a deep dive into solar energy and its strong future growth prospects in Power to the People: Why the rise of green energy makes utility companies nervous , including some comments SolarCity CEO Lyndon Rive made while standing on an Arizona roof.

The latest buzz in the information technology industry regards the Internet of things, but realizing that vision will require extremely low-power sensors that can run for months without battery changes or extract energy from the environment to recharge. MIT researchers are helping to bridge that gap with their work on a new ultralow-power circuit that improves the efficiency of energy harvesting to more than 80 percent.

Images from NASA s Earth Observatory show that China s first large-scale solar power station has grown threefold since construction began in 2009.

In Senegal, the government and the nonprofit sector plan to build thousands of eco villages using solar power, according to the International Business Times.

The Copenhagen International School will be open to the public and will house one of the largest building-integrated solar power plants in Denmark, according to PSFK Labs.

VOX details the five biggest challenges that solar and wind pose to the grid and the solutions to such challenges.

Finally, Forbes looks at the ongoing dispute between utility companies and solar energy supporters in Florida over who can sell power to consumers.

The New Yorker on SolarCity and the rooftop solar revolution
(http://blog.solarcity.com/the-new-yorker-on-solarcity-and-the-rooftop-solar-revolution)

The New Yorker on SolarCity and the rooftop solar revolution

By SolarCity June 25, 2015

In this week s The New Yorker magazine, writer Bill McKibben covers the rise of rooftop solar in the United States, and utility opposition to that rise. We were excited to be profiled, alongside others who are rethinking the way we power our homes, schools, and businesses, including Green Mountain Power in Vermont and New York State s Reforming the Energy Vision (REV) program.

McKibben visited a five-person SolarCity crew in Surprise, Arizona and stood on a rooftop with CEO Lyndon Rive chatting about SolarCity s rapid growth:

Solar City has grown by a hundred per cent each year for the past seven years, in part by lowering the soft costs of installation. A job that once took three days can now be done in one, and Rive showed me a training video of a California crew that could do two houses in a day and still have time to surf. By next year, solar will be the fastest-growing new source of energy in the country, approaching half of new capacity. That s still only a fraction of the total capacity, Rive said, but if you just maintain that, just plot out the line with the retirement of old plants, it s inevitable that it will be over fifty per cent of the total generating capacity eventually. And that s assuming nothing changes.

Solar, combined with other technological improvements, can save consumers a lot of money and the upheaval McKibben describes is both necessary and possible in a world threatened by climate change:

Dave and Karen Correll live across town from the Borkowskis, in a well-kept Colonial Cape that was another of the original batch of E-home renovations. First, contractors re-insulated the basement and the attic. Then came the air-source heat pump, which the Corrells lease from Green Mountain Power for forty-seven dollars a month. Their oil bill fell sixty-seven per cent during the course of Vermont s long, cold winter of 2015. I can t wait to see what comes out next, Karen told me. Our furnace is about at the end of its life, and I can t wait to replace it.

Neither the Corrells nor the Borkowskis changed their homes out of concern for global warming. (If it s not on the Disney Channel, I don t hear about it, Sara Borkowski said.) But that s the point: a bold reworking of energy systems, long necessary and expensive, is now necessary and much more affordable. That could make for a very different world.

You can read the whole article here: http://www.newyorker.com/magazine/2015/06/29/power-to-the-people

Text from http://www.newyorker.com/magazine/2015/06/29/power-to-the-people:

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Power to the People (http://www.newyorker.com/magazine/2015/06/29/power-to-the-people)

Why the rise of green energy makes utility companies nervous.

BY BILL MCKIBBEN

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Mark and Sara Borkowski live with their two young daughters in a century-old, fifteen-hundred-square-foot house in Rutland, Vermont. Mark drives a school bus, and Sara works as a special-ed teacher; the cost of heating and cooling their house through the year consumes a large fraction of their combined income. Last summer, however, persuaded by Green Mountain Power, the main electric utility in Vermont, the Borkowskis decided to give their home an energy makeover. In the course of several days, coördinated teams of contractors stuffed the house with new insulation, put in a heat pump for the hot water, and installed two air-source heat pumps to warm the home. They also switched all the light bulbs to L.E.D.s and put a small solar array on the slate roof of the garage.

The Borkowskis paid for the improvements, but the utility financed the charges through their electric bill, which fell the very first month. Before the makeover, from October of 2013 to January of 2014, the Borkowskis used thirty-four hundred and eleven kilowatt-hours of electricity and three hundred and twenty-five gallons of fuel oil. From October of 2014 to January of 2015, they used twenty-eight hundred and fifty-six kilowatt-hours of electricity and no oil at all. President Obama has announced that by 2025 he wants the United States to reduce its total carbon footprint by up to twenty-eight per cent of 2005 levels. The Borkowskis reduced the footprint of their house by eighty-eight per cent in a matter of days, and at no net cost.

I ve travelled the world writing about and organizing against climate change, but, standing in the Borkowskis kitchen and looking at their electric bill, I felt a fairly rare emotion: hope. The numbers reveal a sudden new truth that innovative, energy-saving and energy-producing technology is now cheap enough for everyday use. The Borkowskis house is not an Aspen earth shelter made of adobe and old tires, built by a former software executive who converted to planetary consciousness at Burning Man. It s an utterly plain house, with Frozen bedspreads and One Direction posters, inhabited by a working-class family of four, two rabbits, and a parakeet named Oliver. It sits in a less than picturesque neighborhood, in a town made famous in recent years for its heroin problem. Its significance lies in its ordinariness. The federal Energy Secretary, Ernest Moniz, has visited, along with the entire Vermont congressional delegation. If you can make a house like this affordably green, you should be able to do it anywhere.

Most of the technology isn t particularly exotic these days, you can buy a solar panel or an air-source heat pump at Lowe s. But few people do, because the up-front costs are high and the options can be intimidating. If the makeover was coördinated by someone you trust, however, and financed through your electric bill, the change would be much more palatable. The energy revolution, instead of happening piecemeal, over decades, could take place fast enough to actually help an overheating planet. But all of this would require the utilities the interface between people and power to play a crucial role, or, at least, to get out of the way.

An electric utility is an odd beast, neither public nor exactly private. Utilities are often owned by investors, but they re almost always government-regulated, and they are charged with delivering power reliably and at an affordable price. Utilities are monopolies: since it would make no sense to have six sets of power poles and lines, utilities are granted

exclusive rights to a territory. When you buy or rent a house, you automatically become the customer of the local utility, assuming that you want electricity and you don t plan to generate all of it yourself. To keep the nation s utilities honest, they are typically regulated at the state level by a public-service commission that sets rates, evaluates performance, and enforces mandates, such as a requirement that a certain amount of power come from renewable sources.

Whereas most enterprises are about risk, utilities are about safety: safe power supply, safe dividends. No surprises. As a result, the industry has not attracted the single greatest minds, David Roberts, who has covered energy for various outlets for a decade and is now a reporter for Vox, told me. If you re in a business where the customer is the public-utility commission, and after that your profits are locked in by law, it s the sleepiest business sector there is, if you could even call it a business sector. They build power plants, sit back, and the money comes in. The entire realm is protected, he added, by a huge force field of boringness.

But what has been a virtue, by and large, is now almost certainly a vice. Scientists insist that in order to forestall global warming we need to quickly change the way we power our lives. That s perhaps most easily done by giant companies with big budgets for new technology; Google, Apple, and IKEA have all announced major plans to switch to renewable energy. For average Americans, however, the biggest source of carbon emissions is their home, so the utilities help is crucial in making the transition. And, even without climate change, utilities face a combination of threat and opportunity from disruptive new technologies.

Consider the Borkowskis new air-source heat pumps, which use the latent heat in the air (down to about zero degrees) to heat their home and provide hot water. These devices have made it practical for electricity to be used for tasks traditionally performed by oil and gas. Smart thermostats, such as the Nest, allow you to make your home far more energy-efficient and can even, when connected to the smart meters that are now appearing on many houses, permit the utility to turn your demand down for a few seconds in response to fluctuations in the supply of sun and wind. Electric vehicles provide a major new use for electricity and, perhaps soon, the opportunity for huge numbers of idle car batteries to serve as a storage system for reserve power. (Solar and wind power can be a challenge to incorporate into the grid, because they re intermittent cloudy days happen, the wind fails. Affordable batteries are essential to making renewable energy widely available.)

Americans spend eight per cent of their disposable income on all forms of energy, David Crane told me. Crane is the C.E.O. of NRG, the country s biggest independent power provider; the company operates more than a hundred energy-generation facilities, selling electricity to utilities that, in turn, sell it to customers. Nobody wants that eight-per-cent figure to rise, Crane said, because when energy prices go up the country tends to trip into recession. But plenty of companies, including Crane s, would like to see a larger slice of that eight per cent. I m interested in electric cars, for instance, not just because of the effect on air quality but because I want to take market share away from oil, Crane said. It s a brutal fight for market share.

Power utilities now face uncertainty of a kind that traditional phone companies faced when cellular technology emerged. A few utilities welcome the challenge; others are resisting it; and the rest are waiting for someone to tell them what to do.

The headquarters of Green Mountain Power are situated in a converted service garage on the outskirts of Burlington. On most days, Mary Powell, the company s C.E.O., can be found at one of the standing desks on the floor next to the customer-service reps. Powell, who is fifty-four, is one of the rare utility executives with an entrepreneurial background. Fresh out of college, she fell into a job at the Reserve Fund, the world s first money-market fund, and became the associate director of operations. Eventually, she quit and moved with her fiancé to Vermont, where she worked in state government, then in banking, and then quit again, to have a daughter and work on growing the canine-apparel business that she had launched a few years earlier. I was always terrified about my dogs during hunting season, she told me. There was nothing to protect them. So I started making reflective protective outerwear. (You can buy it still blaze-orange bandanna, vest, and collar for $66.85.) In 1998, Powell joined Green Mountain Power as the vice-president of human resources. The company was fighting off bankruptcy, after state regulators turned down its request for a large rate increase. Soon, as chief operating officer, Powell helped restructure Green Mountain Power, and, in 2008, she became its C.E.O.

Utilities, unlike, say, canine-apparel companies, gain their customers automatically, based on where a resident lives, and typically take little interest in them. (You know what a customer is to a utility? Crane asked me. A meter.) Powell, by contrast, describes herself as customer-obsessed. Green Mountain Power regularly surveys its customers, and the main thing Powell has learned, she said, is that Vermonters wanted us to be as environmentally

strong as possible, but they wanted us to do it without us telling them it was going to cost more money. So that became our vision: low carbon, low cost. Powell became fixated on new technologies, everything from electric-vehicle charging stations to utility-scale storage batteries. If we move in this direction very rapidly, we can, hopefully, keep rates flat forever, she said, and, in fact, G.M.P. cut its electric rates by two per cent last year. She started searching for partners; at least three contractors worked on the Borkowskis house, and that collaboration was one of the real innovations. Not approaching customers in a siloed way, with a dozen companies each pitching a piece. It s How can we come to you with a package?

How all this will translate into revenue isn t entirely clear, not to Green Mountain or to anyone else in the business. But the cash flow available to the utilities gives them plenty of low-cost capital to work with. They can make money by leasing heat pumps and solar panels to customers. The insulators and other contractors will contribute something, because working with Green Mountain reduces the cost of acquiring new customers. And there s money to be saved. Currently, utilities plan their operations around the busiest day of the year, making sure they have the capacity to meet peak demand on the hottest August afternoon. But as Green Mountain Power modernizes one home after another so far it s enabled a few dozen fully remodelled E-homes and more than a hundred partial makeovers the utility gains the potential ability to briefly turn down water heaters and air-conditioners during high-usage periods. This demand management allows the utility to avoid peak charges from the regional power grid and can save it hundreds of dollars per customer each year.

You wouldn t notice, because we re turning down the water heater for just a few seconds, Powell said. But getting permission to do that, or even getting customers to believe that you can save them money with a makeover, requires a different kind of relationship. Can we really build a deep emotional and intellectual relationship with our customers?

There are no guarantees, Powell said. But so far she has met every revenue goal set by Green Mountain Power s corporate parent, the Canadian company Gaz Métro. A challenge in the utility culture is precisely that it s built on guarantees. Innovation happens when there are no guarantees.

Arguably, the era s most disruptive technology is the solar panel. Its price has dropped ninety-nine per cent in the past four decades, and roughly seventy-five per cent in the past six years; it now produces power nearly as cheaply as coal or gas, a condition that energy experts refer to as grid parity. And because it s a technology, rather than a fuel, the price should continue to fall, as it has for cell phones. Solar power is being adopted most rapidly in places where there is no grid it s cheaper and quicker to stick panels on the roofs of huts in villages than to build a centralized power station and run poles and wires. In Bangladesh, crews install sixty thousand solar arrays a month. Even in the U.S., where almost everyone has been connected to the grid for decades, solar prices have fallen to the point where, with the help of a federal tax credit, an enterprising company can make money installing solar panels.

One morning in March, I stood on the roof of a suburban ranch in Surprise, a suburb of Phoenix, with Lyndon Rive, the co-founder and C.E.O. of Solar City, the biggest and the fastest-growing installer of rooftop solar in the country. Around us, a five-man crew was laying out a grid of solar panels, following a plan designed by an employee in California who had looked up the roof on Google Earth and measured it. The crew had assembled at the house at seven that morning, and by 5 P.M. the new solar array would be ready to be turned on. The homeowner, like the Borkowskis, was paying nothing up front, and within the first month would see her total electric bill decline. Glancing around the neighborhood, I counted fourteen solar arrays on a hundred or so houses. It s like e-mail in 1991, Rive said. When I look out at this street, there s no reason every one of these houses can t have solar in ten years.

Rive is the cousin of the Tesla pioneer Elon Musk, who is the chairman of Solar City s board of directors. Currently, Rive said, the company finishes a solar array somewhere in its eighteen-state service area every three minutes. That sounds impressive, but it s only two hundred thousand homes so far, out of forty million. My goal is to get it to one home every three seconds. Or maybe we could go faster than that one every second, he said, snapping his fingers. He pulled an iPhone out of his pocket, called up the calculator app, and punched in some numbers. At that rate, we could

do every house in . . . seventy-six years. No, that s too long I forgot a division. In a year and a half.

That pace would change the projections for climate change, but it would also require a major government initiative, akin to the one that revitalized industry at the start of the Second World War. Even without it, Solar City has grown

by a hundred per cent each year for the past seven years, in part by lowering the soft costs of installation. A job that once took three days can now be done in one, and Rive showed me a training video of a California crew that could do two houses in a day and still have time to surf. By next year, solar will be the fastest-growing new source of energy in the country, approaching half of new capacity. That s still only a fraction of the total capacity, Rive said, but if you just maintain that, just plot out the line with the retirement of old plants, it s inevitable that it will be over fifty per cent of the total generating capacity eventually. And that s assuming nothing changes. In fact, he noted, each month brings some new improvement in panels or batteries.

But many utilities see residential solar power as an existential threat. In 2013, an industry trade group called the Edison Electric Institute warned that utilities face what company executives were quick to call a death spiral. As customers began to generate more of their own electricity from the solar panels on their roofs, utility revenues would begin to decline, and the remaining customers would have to pay more for the poles and wires that keep the grid alive. That would increase the incentive for the remaining customers to leave.

Since the death-spiral session, utilities around the country have sought to slow the growth of solar: by supporting laws and regulations that would reduce targets for renewable energy; by ending net metering laws that force utilities to pay solar customers retail prices for the surplus energy they put back on the grid; by imposing connection fees to make up for lost revenues. Much of the campaigning has been spurred by the right-wing American Legislative Exchange Council and funded by various groups linked to the Koch brothers and their fossil-fuel fortune. In 2008, when Solar City first expanded into Arizona, the state had just announced a target for renewable energy, and the utilities were offering generous rebates to customers who installed solar panels. At first, few homeowners took advantage of the offer the up-front cost, which ran to twenty thousand dollars or more, was too high. It took the efforts of Solar City, and other competitors using the same no-cost leasing plan, to ignite the market.

The utilities were always convinced that they could throttle down solar just by tuning down the rebate they were offering, Rive said. What caught them off guard was when costs came down to the point where we didn t need their rebate for solar to make sense. Suddenly, they couldn t control the outcome anymore. And suddenly you didn t see any more solar billboards, and suddenly they started taking a hostile approach.

Arizona s biggest utility, Arizona Public Service, insists that it is pro-solar and notes that it has built its own utility-owned solar arrays in the desert. But it views customers who install rooftop panels as, in essence, cheaters: they get the benefits of the grid uninterrupted power, even on cloudy days but, because they provide so much of their own electricity, they aren t paying their fair share of the total price. In 2013, A.P.S. asked state regulators for permission to charge anyone who wanted to put up a solar panel a fee. Whether or not you re producing enough electricity to power your house, you re still connected to the grid, Jeff Guldner, the company s senior vice-president for public policy, said. These costs get recovered from somebody, and that somebody is customers who don t have solar.

The argument makes a certain intuitive sense, even if utilities like Green Mountain Power, and a fair amount of academic research, suggest that solar customers save utilities as much money as they cost them, by shaving peak demand and by moving power generation closer to clients, which reduces the electricity lost on power lines. The Arizona Corporation Commission agreed with A.P.S. and allowed the utility to charge an average of about five dollars a month, a tenth of the fifty-dollar fee it had requested. Solar City decided not to appeal the ruling. The savings the company was offering many customers still exceeded the new charge, and business continued to grow.

But A.P.S. went on the offensive. In the fall of 2014, as members of the Arizona Corporation Commission, which regulates many of the state s utilities, began running for election, the company contributed to the campaigns of sympathetic candidates, although it declined to say whom it has supported. (The utility has said only that it periodically contributes to candidates, causes and organizations that support economic growth, sound energy policy, and other issues important to our company and our customers.) A.P.S. is even widely suspected of helping to fund the campaign of a candidate for Arizona Secretary of State, because his father was a key vote on the Corporation

Commission.

I listened to stories like this for the better part of an afternoon, sitting in a Scottsdale law office with Court Rich and Jason Rose, two self-described strongly conservative political operatives who had gone to work for a coalition of

companies, including Solar City, to help elect solar advocates to the Corporation Commission s board of directors. They were mercenary, but they also seemed genuinely outraged. A.P.S. is a quasi-governmental agency, and they re using ratepayer money to influence elections? Rich said. All of a sudden, we started seeing anti-solar commercials all over the TV. I mean, the ads were comparing solar customers to people stealing from children. (A.P.S. says that its political contributions were paid for by employee contributions, not by ratepayer revenue.)

The solar advocates didn t prevail in the election. In politics, there s a direct correlation between spend and win, Rose said. And our side was outspent considerably. But the utilities argument for self-preservation may have reached its limit. Rich and Rose ran a campaign that leaned heavily on standard conservative tropes of self-reliance and freedom.

Solar should be our issue, Rose said. Obamacare is bad because it diminishes health-care choice. Public education is bad because it diminishes school choice. You d think it would apply as well to energy. They helped form a group called Tell Utilities Solar Won t Be Killed, or TUSK from the Republican-elephant thing, Rose said. We have a lot of Tusk and Trunk dinners in the G.O.P. For its chair, they recruited Barry Goldwater, Jr., the son of the original Arizona Republican idol.

Indeed, an odd coalition of environmentalists and conservatives has sprung up around the country to defend solar power. In Georgia, a Tea Party activist named Debbie Dooley and the Sierra Club fought successfully to allow the leasing of rooftop solar panels in the state. Their joint project, the Green Tea Coalition, has spread to Florida, which has some of the nation s most restrictive solar laws. They are working to collect seven hundred thousand signatures by next February, enough to put a measure on the ballot that would amend the state s constitution to allow residents with solar panels to sell electricity back to the grid, as is done in many other states.

But in December Arizona s second-largest utility, the Salt River Project, imposed charges of some fifty dollars a month on the average new solar installation. S.R.P. also insists that it is pro-solar, but the new charges effectively make it economically difficult for homeowners in the company s service district in the sunniest state in the country, and in a city that roots for the Phoenix Suns to install solar panels. Rooftop installations, booming six months ago, have all but halted, and Solar City is transferring large numbers of workers to other districts, as well as suing the utility to have the new charges overturned. Citing the lawsuit, S.R.P. refused requests for an interview, issuing a statement that says, in part, S.R.P. is confident that its new price plan will be determined to be appropriate and is confident that it will prevail in all such challenges to it.

Most utilities are neither as innovative as Vermont s nor as scared as Arizona s; most are simply waiting for guidance.

There are no thirty-year-old C.E.O.s of electric utilities, no Zuckerbergs, David Crane, the NRG chief, told me. You have to pay your dues, come up through the ranks. You become C.E.O. when you have five years, max, left. Some of them are just not worrying about ten, fifteen years in the future. A member of the executive committee at a major mid-Atlantic utility said, We don t want to be Kodak, because we can see digital imaging on the horizon. But the regulators are damned slow in figuring out which way we should move. There are eleven hundred utilities in this country, and they re regulated at the state level, so change is going to be very dispersed.

On one of the first hot days of May, I joined Richard Kauffman, the chairman of energy and finance for New York State, and the state s energy czar, as he and several aides piled into a stuffy L train at Fourteenth Street. In 2013, a few months after Hurricane Sandy left many New Yorkers powerless for days, Governor Andrew Cuomo accused utilities of being the equivalent of vinyl records in the age of the iPod and appointed Kauffman to prod them into action. Kauffman soon announced a program of incentives that would eventually be called REV Reforming the Energy Vision. Around the country, other regulators are watching to see how the initiative fares.

Forty-five minutes after boarding the subway, we got off at East 105th Street, in the heart of warehouse Brooklyn, on the edge of Canarsie. We walked half a mile to look at a particular warehouse belonging to a fish wholesaler. Con Ed,

faced with growing electrical demand in the borough, had planned to build a billion-dollar substation on the site. But, in the first real test of the REV plan, the utility will instead supply some of the additional power by encouraging customers to install solar panels and cutting-edge storage batteries. It will also pay customers to limit their usage during peak hours, thereby reducing over-all demand. The effort will cost Con Ed many millions of dollars less than building a new substation, which would seem to make the decision an obvious one.

But, in the odd world of regulated utilities, a company like Con Ed traditionally makes money by building more stuff: put in a billion-dollar substation and you can rate base it, making customers pay the cost, plus a ten-per-cent markup, for decades. That arrangement worked well when society needed utilities to build the electrical system, to serve everyone, and when the cheapest technical solution involved big plants pushing electrons in one direction, Kauffman said. But today the system is not just energy-inefficient; it s capital-inefficient. At any given moment, New York s utilities are using only about fifty-five per cent of their system capacity. No other industry uses capital like that anymore, Kauffman said. The regulations are perverse: new software that can reduce electrical demand must be expensed in the current year, while a new wooden pole can generate that ten-per-cent markup for the utility in the course of its fifty-year life span. A pole makes money hence, poles.

In the next decade, if New York s power industry stumbles along on its current course it will spend about thirty billion dollars on more substations, and on other similarly outdated technology. Electricity costs will continue to rise, and New York s are already among the highest in the country. That would lead more people to defect from the grid, Kauffman said. Maybe it s not the death spiral, but it becomes a zombie industry. And, as rates go up, employers would say it s too costly to do business in New York and they d leave.

Through REV, Kauffman is trying to change the rules so that the utilities can both shift direction and make money. Persuading Con Ed to forgo the substation meant figuring out how to pay them performance incentives to instead install the cheaper solar power and storage batteries. In the months to come, New Yorkers should begin to see other examples. Maybe some appliance company will say to a consumer, We ll give you all new appliances for free, and you ll have the same electric bill less five per cent, Kauffman said. Your fridge would come with a chip that allowed it to be cycled off for a moment when demand was peaking, and, as the middleman in the transaction, the utility could take a cut. The same thing with home entertainment each new generation of flat-screen TVs uses a lot less power.

Kauffman has all sorts of plans, from a green bank to attract private-sector capital to finance extensive energy-saving retrofits to new rules that would pressure utilities to play nicely with outside partners like Solar City. It s kind of a Hannah Arendt thing, he said. There s not a lot of intentional evil in utilities. But we ve created a golden cage for them, protected them from enormous trends. We were on the subway again, and as it clattered back toward Manhattan Kauffman had to shout to be heard: Our aim is to create a policy environment that is not standing against the forces of history but is in line with them.

Technological change will fundamentally transform the power industry. The question is whether that transformation can happen fast enough to matter, either for the survival of the utilities or, more important, for the preservation of the climate. In the past, energy transformations wood to coal, coal to oil have taken fifty years or more to unfold as infrastructure was slowly replaced. New York has a home-energy-audit program, whereby a team will come to your home, determine how much insulation it needs, and identify other ways of boosting your energy efficiency, much the way that Green Mountain Power assessed the Borkowskis house. But at current rates of penetration it will take us centuries to do the whole state, Kauffman said.

This time, though, technological change may be coming so rapidly that a quick adaptation is possible. The week that I was in Canarsie with Kauffman, Mary Powell flew to California to attend Elon Musk s announcement of his new home battery, the Powerwall. Green Mountain Power was the only utility in the country that was ready to sell the new battery on the first day that it became available. And Powell was excited by its low price: three thousand dollars, far below what analysts had predicted, and low enough that her company could immediately begin installing it for customers, especially those who wanted backup electricity in case a snowstorm disabled the grid.

A week after the battery launch, Musk described demand for the batteries as just nutty and off the hook. His company had already sold all the batteries it could make through the middle of next year and was discussing expanding its giant new factory, in Nevada, even before construction was completed. The day after Tesla s launch, Solar City announced that, beginning in 2016, it will routinely package Musk s new batteries with its panels in some markets. If utilities won t

relent and embrace innovation, homes and businesses will soon be able to circumvent them altogether. The threat is real enough that it might actually soften the attitude of even recalcitrant utility executives.

Meanwhile, Green Mountain Power is almost ready to flip the switch at its biggest solar farm, built on top of Rutland s old dump. In July, when the site flickers on, the city will be the most solarized in northern New England. But the less obvious changes count even more. Dave and Karen Correll live across town from the Borkowskis, in a well-kept Colonial Cape that was another of the original batch of E-home renovations. First, contractors re-insulated the basement and the attic. Then came the air-source heat pump, which the Corrells lease from Green Mountain Power for forty-seven dollars a month. Their oil bill fell sixty-seven per cent during the course of Vermont s long, cold winter of 2015. I can t wait to see what comes out next, Karen told me. Our furnace is about at the end of its life, and I can t wait to replace it.

Neither the Corrells nor the Borkowskis changed their homes out of concern for global warming. (If it s not on the Disney Channel, I don t hear about it, Sara Borkowski said.) But that s the point: a bold reworking of energy systems, long necessary and expensive, is now necessary and much more affordable. That could make for a very different world.