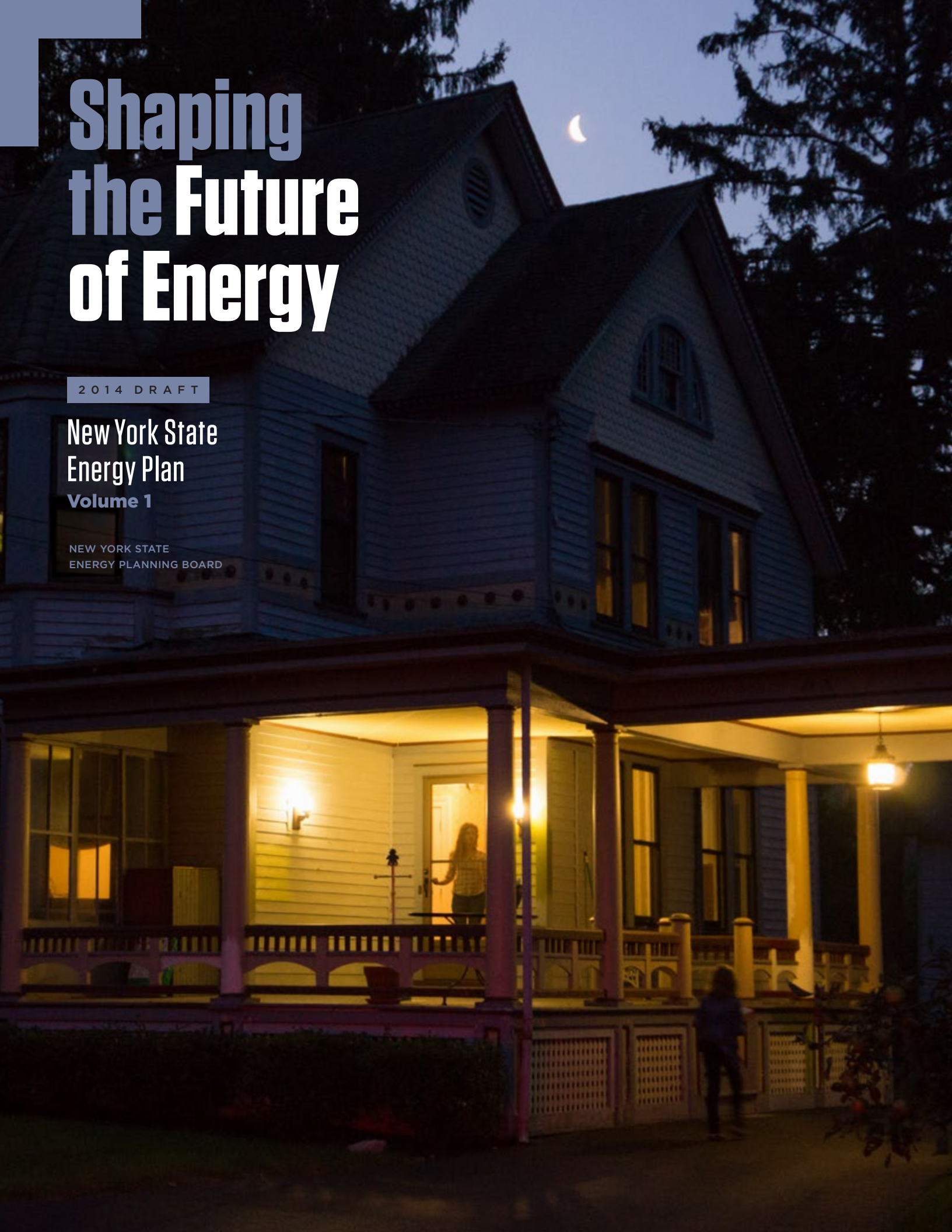
Shaping the Future of Energy

2014 DRAFT

New York State Energy Plan

Volume 1

NEW YORK STATE
ENERGY PLANNING BOARD



If we did all the things we are capable of, we would literally astound ourselves.

Thomas Edison

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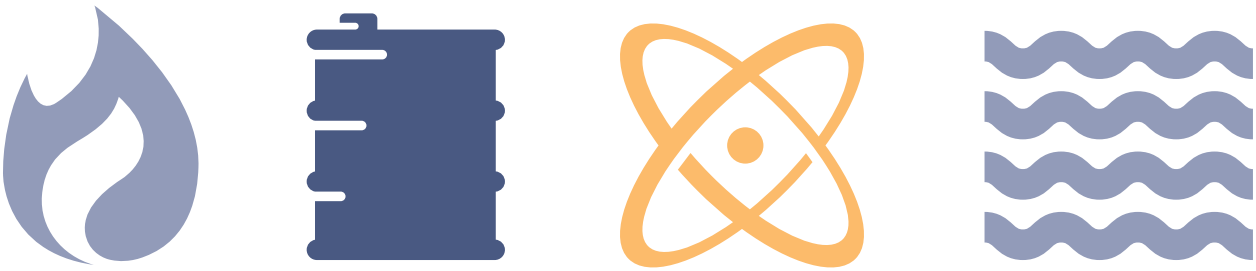
Introduction

The Draft 2014 New York State Energy Plan sets forth a vision for New York's energy future that connects a vibrant private sector market with communities and individual customers to create a dynamic, affordable clean energy economy. We have already made great strides toward this goal. Renewable power sources—hydro, solar, wind, and other carbon-free solutions—continue to grow as a share of the total energy produced in the State. Long Island is home to one of the country's fastest-growing residential solar photovoltaic (PV) markets. More New Yorkers are driving electric vehicles than ever before and are supported by an ever-expanding number of public charging stations.



And yet, we can and must do more. Recent storms have forced us to rethink the way we approach energy. This Draft Plan acknowledges the obstacles that we face and capitalizes on the emerging technologies and resources now available to us to overcome these barriers. It outlines new strategies to achieve our objectives of providing clean, reliable, and affordable power; creating jobs; and producing the other economic and environmental benefits that flow from a clean energy economy. It creates a framework to enable sustainable growth, balancing the need to harness proven technologies with the flexibility to adapt to future insights and innovation.

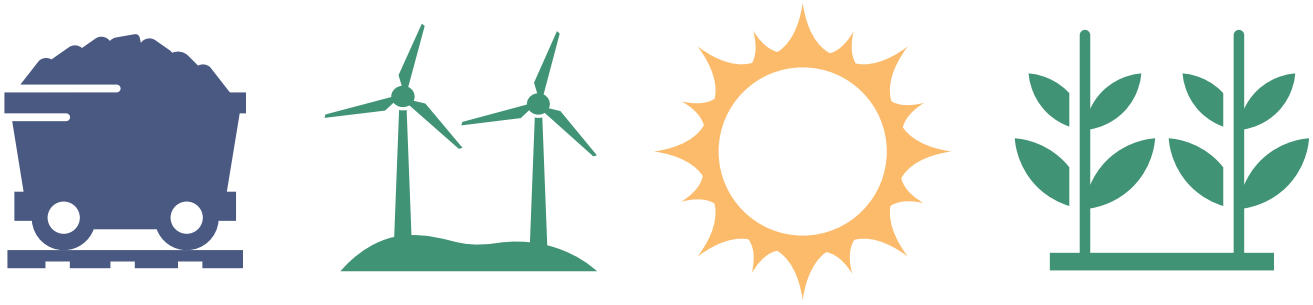
The boldness of our solutions should match the magnitude of our challenges.

Imagine having power in your home during a blackout because your entire community has backup generation. Imagine your home appliances monitoring energy prices and shifting into sleep mode during peak hours to save you money. Imagine purchasing solar power generation for your rooftop with no money down and selling electricity to your neighbors while on vacation. We envision an energy future designed to provide you with more choices.

We are all in this together: New York challenges require New York solutions. We invite you to participate in this process by providing feedback online, and in person at our public forums. As this Draft Plan is about you, the consumer, we'd very much like to hear your thoughts.

Get Involved

Learn more at
energyplan.ny.gov



Energize

The World Today

New York State has made significant progress toward a more cost-effective and clean energy system in recent years. With both restructuring and revenue decoupling, the State has one of the most progressive electric utility regulatory and policy regimes in the country. New York is the largest hydroelectric power producer east of the Rocky Mountains and has made notable progress in reducing the emissions of air pollutants that are harmful to public health.

I will play my part in New York's clean energy economy.

New York will establish a $1 billion Green Bank to encourage investment and innovation in clean energy projects, also creating new career and job opportunities in New York State.

In the middle of difficulty lies opportunity.

Albert Einstein

Governor Cuomo's initiatives—including NY-Sun, the Regional Greenhouse Gas Initiative (RGGI), Cleaner Greener Communities, the New York Energy Highway, Charge NY, Build Smart NY, the Renewable Portfolio Standard, the Energy Efficiency Portfolio Standard, ReCharge NY, and others—have established the foundation for the deployment of clean energy and transportation options. While there has been progress in many facets of New York's energy industry, challenges and opportunities remain, including the need to replace aging infrastructure; to improve our regulatory model to match technological advances; to ensure that quality, reliability, and resiliency of the energy system meet the demands of an increasingly connected society to manage energy costs; and to protect our environment and health. If one thing is clear, it is that we must be proactive and forward-thinking in our planning and policies.

Weather events and inadequately protected equipment that threaten the reliability of electricity and fuel supply must be addressed. Power outages across the country are lasting longer and are resulting in greater economic losses each year.[1] The growth of the digital economy means that even momentary blackouts can have significant impacts. Further, our dependence on fossil fuels continues to expose us to sporadic global disruptions in oil and gas production and distribution.

Ignoring these challenges could mean that already high energy prices will increase. Over the last decade, regulated electric utilities in New York have invested over $17 billion in delivery assets. Unless we change our approach to provide greater emphasis on energy efficiency and clean, localized power sources, it is estimated that over the next 10 years more than $30 billion will need to be invested in New York's electric system to replace aging infrastructure and central generation resources just to meet currently projected energy demand.[2] Although such investment is an essential component of the State's energy planning, the need for it could be reduced through innovative and less costly alternatives. This is critical, since major capital investments would result in significant impacts on electric rates, figures that do not even take into account costs associated with unpredictable and extreme weather patterns and cyber-attacks.

Environmental and health issues must also be addressed. Almost one-third of New Yorkers still rely on oil for home heating, which subjects them to higher costs and their communities to poorer air quality.

New directions are possible. There is the potential for many customers to realize additional value from the clean and efficient energy system New York is pursuing. The present regulatory system was designed with the assumption that customer energy usage is inelastic and that the most efficient system is one that is almost entirely dependent upon large, central station power plants. Today, that is no longer the case. While central power plants and the transmission network are and will remain the vital backbone of our electric system, technology has significantly advanced and prices of distributed solutions are rapidly declining, enabling greater control and ownership opportunities for customers and communities. Given these developments, New York has the ability to operate the energy system more efficiently and at a lower cost.

Current energy business models, regulatory structures, markets, and financing options must improve to further New York's progress. This evolution will take into account advances in energy technology, market changes, and will allow communities and individual customers to have a higher level of engagement and choice. This Draft Plan aims to empower customers and enable the private sector to provide the services and energy options that customers value.

Environmental Justice communities, characterized by low-income and minority residents, have historically been overburdened by a high density of air pollution sources, particularly those associated with transportation and energy. New York has taken a leadership role nationwide in incorporating Environmental Justice concerns into the energy siting and permitting review process and increasing community involvement in the development of transportation projects.

While gains have been made, more can be done for these communities, which also bear the burdens of higher rates of asthma, diabetes, cardiovascular disease, and childhood lead poisoning. Although the State alone cannot alleviate all environmental and economic challenges faced by these communities, it can promote efforts to address the negative environmental impacts that energy facilities and transportation sources have on these areas. Clean energy jobs, urban renewal, sustainable development, and affordable energy and transportation options are just a few of the many goals of this Draft Plan that will benefit Environmental Justice communities.


Jump ahead.
XBOX ONE
BILL O'
1500
LUTIONS THAT
S.H.I.E.L.D.
Live on ESPN
CALIFORNIA
STAGE
EMPANADAS
PASTRIES-COFFEE

Imagine

New York's Vision

Energy is the engine for any modern economy, providing the means for industry, commerce, technology, and communities to thrive. We rely on energy for comfortable buildings and homes in all seasons, efficient and clean manufacturing and industrial processes, light for work and recreation; and power for our phones, computers, ATMs, and other communication and business devices that keep us productive and in touch.

We're innovating energy in ways few imagined.

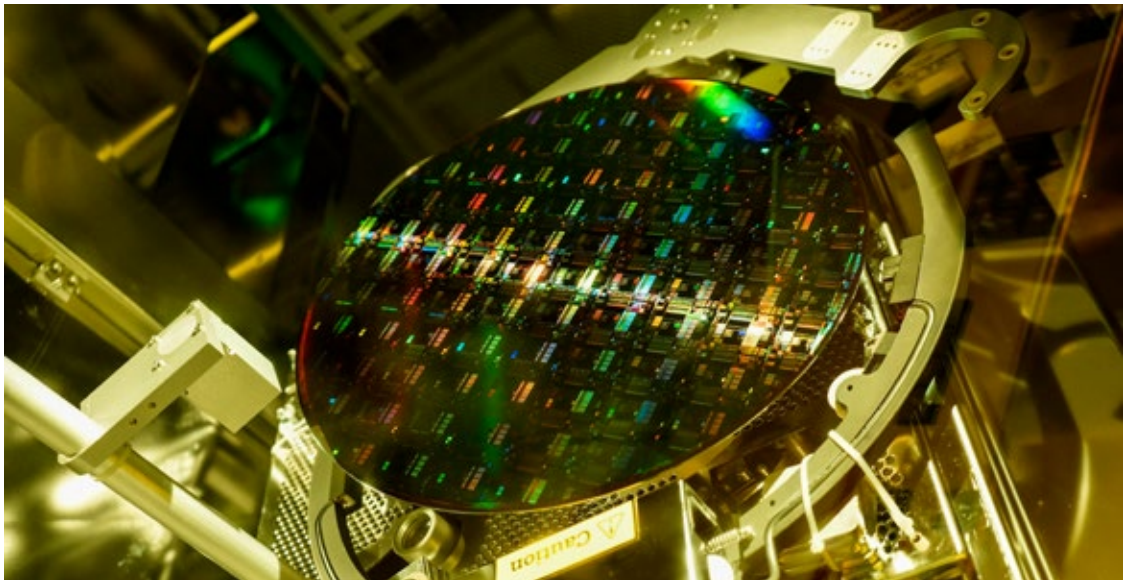
The clean energy incubator program at the College of Nanoscale Science and Engineering (CNSE) at SUNY Albany helps companies develop and commercialize clean energy technologies.

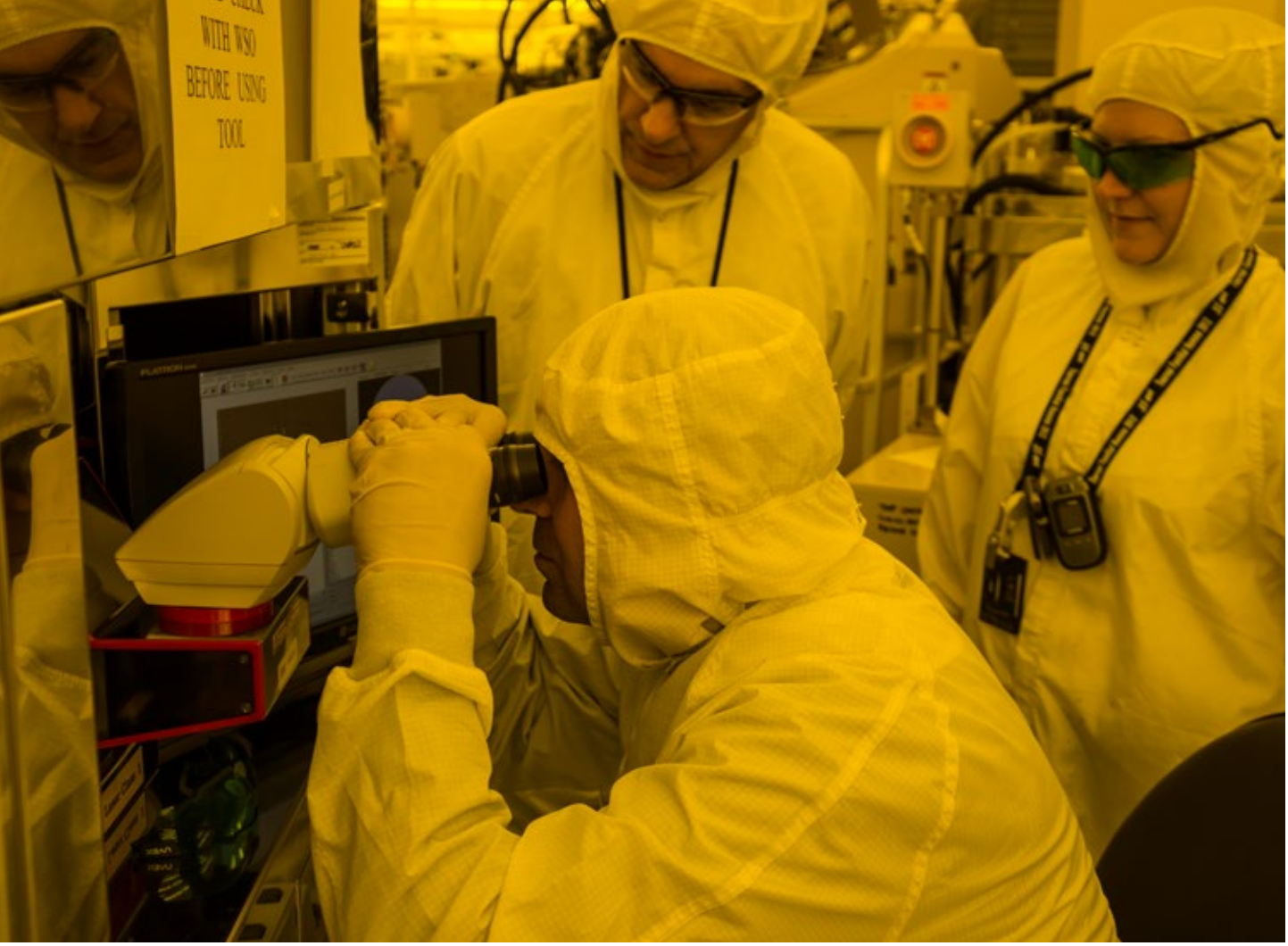
Energy powers personal and public transportation and many other components necessary for economic growth and prosperity. Although New York is one of the most efficient states on the basis of energy use per person, like the rest of the country we continue to face rising costs, intensifying impacts of extreme weather, and growing environmental and health concerns associated with our dependence on fossil fuel power generation. Addressing climate change is a global challenge, but New York can seize the local opportunity to lead and realize the benefits from our transition to a cleaner, more productive economy.

New York envisions a flexible and clean energy system that empowers residential customers, business, and communities to receive the reliability and affordability they value. To achieve this, we will focus on the following five areas:

1. Improving energy affordability
2. Unleashing the power of private sector energy financing
3. Providing a more resilient and flexible power grid
4. Giving customers more control over their energy use
5. Aligning energy innovation with market demand

Reformed regulations, new roles for utilities, and new strategies based on markets and customer priorities will result in an energy system that is innovative, sustainable, and reliable.





This Draft Plan envisions a New York State Energy Future that looks like this:

Residential Customers and Businesses

Residential, commercial, and industrial customers understand how much energy they consume and have the tools to easily and efficiently manage their consumption and bills. Customers have the ability to choose from a variety of products offered by different suppliers, as well as to elect when and how much power they will consume from the grid or distributed resources. Energy-intensive and quality-sensitive customers such as manufacturers, university and commercial campuses, hospitals, and data centers can choose to bolster the reliability and resiliency of their energy supply in order to provide business continuity and meet their varying needs.

Communities

Communities across the State develop and implement coordinated energy plans that deliver the electricity, heating, water, communications, land-use, and transportation systems that each community values. Communities build out strategically located power sources for increased resiliency. Whole-building approaches to energy efficiency are adopted to achieve substantial energy savings in existing buildings and net-zero energy consumption in new buildings. Communities offer diverse transportation options and revitalized town centers, and are incentivized to use local renewable resources and to implement clean energy options.

Markets and Market Participants

Customers can become active participants in the retail energy markets and receive economic value from managing their usage, allowing utility systems to operate at higher efficiency and lower cost. Retail and wholesale energy markets are aligned, providing transparency and efficiency that allow the full value of customer investments to be realized. The value of clean energy to the power grid is better reflected in energy prices. Regulatory models and market rules allow new businesses to be created and bolster competition among energy suppliers, resulting in lower costs to customers. Various financing tools, such as those that will be offered by the New York Green Bank, work at the wholesale level to catalyze private capital investment. State government works to remove market obstacles to innovation and commercialization, providing a bridge to an independent, self-sustaining clean energy market. Increased investment in clean energy technologies reduces their cost and expands the energy options for all New Yorkers.

> **Energy and persistence conquer all things.**
>
> **Benjamin Franklin**

Infrastructure

Reliable, resilient energy and transportation systems accommodate emerging technologies, and withstand and recover quickly from extreme weather events and cyber-attacks. The transportation sector has transitioned to greater fuel economy and lower carbon fuels, such as electricity, natural gas, hydrogen, and biofuels. Electric and natural gas delivery infrastructure is the secure backbone of the energy system, allowing consumers to easily connect to efficient, affordable, reliable, and increasingly clean energy sources. Real-time data availability and

communication throughout the energy sector reduce transaction costs, drive operating efficiency, and increase physical and cyber security. Load management through expanded use of customer energy efficiency, load shifting, distributed generation, and energy storage results in a more efficient and less capital-intensive grid. New York‘s renewable resources are fully and economically deployed to serve both upstate and downstate markets.

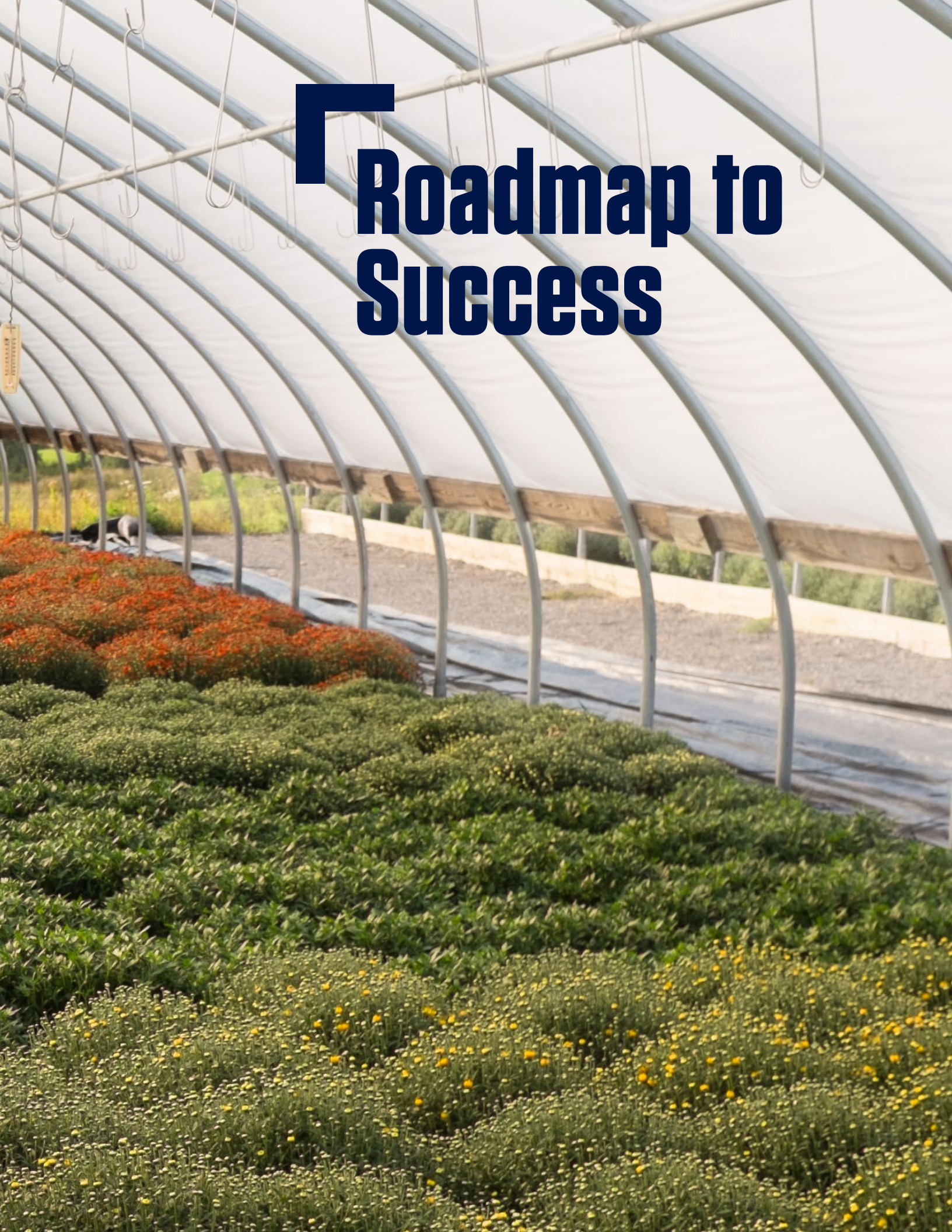
Environment and Public Health

The environment and public health are protected by the implementation of clean energy options and the increased adoption of energy efficiency across customer groups and sectors. The State meets health-based air and water quality standards, maintains its leadership in reducing greenhouse gas emissions, and improves its energy infrastructure resiliency. Environmental Justice communities partner with the State through public processes surrounding energy and transportation projects, making those communities less vulnerable to the impacts of disproportionate power plant siting and high energy prices.

Economic Opportunity

New York’s economy is supported by a workforce trained in the technologies and skills needed for a vibrant and growing clean energy economy. The State makes strategic use of limited government resources to spur private sector investment. Public and private capital is efficiently deployed to achieve scale in the development of energy technologies and services. New investment by private companies is attracted into the State. New York is a major export center for energy innovation and expertise developed by businesses and seeded by academic institutions in the State. Businesses and communities use the development of clean energy systems and infrastructure to drive revitalization and sustainable job growth. New York retains more energy dollars in the State while maintaining critical ties to neighboring energy markets. Market opportunities enhance consumers’ choices and the value they derive from the energy system.

Create



Roadmap to Success

Creativity and innovation in regulation, policy, and financial tools will enable New York's economy to continue to grow, supported by affordable, reliable, and clean energy. The Draft New York State Energy Plan sets forth a vision for the energy system in the context of the rapidly evolving uses of energy and the challenges facing energy sources and delivery systems.

I keep looking for new ways to be efficient.

NYSERDA's Agriculture Energy Efficiency Program (AEEP) helps eligible orchards, dairies, greenhouses, vegetable growers, vineyards, grain dryers, and poultry/egg producers identify and implement electric and natural gas energy efficiency.

Understanding the many changing drivers that will shape the future, such as the price of fuels, technology development, and impacts of extreme weather the Draft Plan takes a flexible and proactive approach. These strategies are intended to provide guidance to State agencies and authorities in development of their policies and programs.

To provide a framework for measuring New York's progress toward a clean and affordable energy system that helps to drive economic growth, four key metrics will be tracked:

- **Improved Energy Affordability**
  As a result of the actions in this Draft Plan, New York residential customer electric bills will be kept at or below the national average as a percentage of median household income.

- **Cleaner Environment**
  Working through innovative public-private partnerships, investments in clean energy strategies will help New York to reduce the intensity of its carbon emissions from the energy

sector by 50 percent by 2030 (measured in CO_2 emissions per Gross State Product from 2010 baseline), putting New York on a pathway to achieve an 80 percent reduction in total emissions by 2050.

- **Robust Economic Activity**
  In order to support our aggressive environmental goals, New York will increase the total investment in the clean energy economy by advancing policies and programs that attract new private capital, catalyze new business opportunities, and enable new markets for the energy services that customers value.
- **Increased System Efficiency**
  The state-wide utilization of existing electric infrastructure averages just under 60 percent. Strategies focused on system efficiency will increase the utilization factor, enabling New York to yield more benefit from the assets currently installed.

Responsible agencies and authorities include: New York Department of Environmental Conservation (DEC), New York Division of Homeland Security and Emergency Services (DHSES), New York Department of Health (DOH), New York Department of State (DOS), New York Department of Transportation (DOT), New York Department of Public Service (DPS), New York State Empire State Development (ESD), Long Island Power Authority (LIPA), New York Power Authority (NYPA), New York State Energy Research and Development Authority (NYSERDA), New York State Thruway Authority (NYSTA), New York State Office of General Services (OGS), and New York State Education Department (SED).

The following areas of focus and initiatives will be pursued and implemented through the cooperation of agencies and authorities, New York's colleges and universities, and private sector stakeholders across the State.

Improving Energy Affordability

Today's electric systems are designed with assurances to provide reliable service during peak periods, such as the few days of extremely hot temperatures per year. However, the current design and strategy result in low utilization factors and high energy costs. A new strategy of investing in cost-effective smart grid solutions and focusing on active demand management will enable improved utilization of new and existing assets, reduced energy costs, and continued reliability.

New York will transform its energy efficiency programs to stimulate the self-sustaining market adoption of energy efficient technologies and systems, with a focus on customers. Initiatives will facilitate the creation of demand for energy efficiency projects, mobilization of capital, supply and services sector readiness and capacity, increased consumer awareness, improved ease and simplicity of participating in programs, better availability of reliable and meaningful data, improvement of building codes, and investments in State facilities.

Initiative
01

Realign energy efficiency policies to work with and through markets in order to accelerate the pace of energy efficiency deployment while fostering continued economic growth in New York State.

a. DPS, NYSERDA, and other agencies to create a portfolio of energy efficiency programs with a State commitment through 2020 that achieves high customer value for public investment, reduces customer confusion, streamlines application and delivery processes, promotes broad and deep uptake of efficiency measures across all fuels, and strategically addresses market barriers and gaps to maximize

deployment. The State's approach to energy efficiency will operate in accordance with the following guiding principles:

- Develop and provide rate and economic incentives to encourage utility investments in energy efficiency that will reduce the amount of capital required to maintain the grid and will improve overall system efficiency.
- Focus State resources on energy efficiency projects that may be economic but face addressable barriers to increasing market penetration, with the goal of animating markets. The role of ratepayer funds will be to accelerate these investments through the combination of grants and financial products.
- Facilitate greater access and support for energy efficiency opportunities in low-income and underserved communities to provide those who are most vulnerable to increasing energy prices and least able to invest in clean energy with access and means to reduce their energy costs.

Initiative

02

Enable and facilitate new energy business models for utilities, energy service companies, and customers to be compensated for activities that contribute to grid efficiency. Maximize the cost effective utilization of all behind-the-meter resources that can reduce the need for new infrastructure through expanded demand management, energy efficiency, clean distributed generation, and storage.

a. DPS to consider the potential for distribution utilities to coordinate and/or aggregate customer-based demand control options, and receive a rate of return on utility capital invested in customer side efficiency improvements and distributed generation.
b. DPS to pursue actions that will ensure alignment among federally regulated wholesale markets, State policy and regulatory objectives, and retail markets.
c. DPS and appropriate energy agencies to determine the total system and life cycle value of resource diversity, including the support of load control, renewables, and storage.
d. DPS to review demand-side management programs and recommend changes to increase the dispatch of reliable and clean demand-side resources as a primary tool to reduce system peaks and optimize load curves.
e. NYPA to implement strategies to increase the portion of electricity demand of public entities participating in demand-side management programs that is subject to such programs.
f. DPS to implement strategies to spur energy service companies to develop programs that will increase the participation of large customers in load control and dynamic pricing activities.
g. DEC to establish regulatory standards to foster increased use of cleaner distributed resources while maintaining air quality and supporting reliability needs.

Initiative 03

Establish and implement building codes and standards that will help support energy efficiency and clean energy.

a. NYSERDA and DOS to provide training and support to local communities to help with code enforcement.
b. DOS to adopt incrementally more progressive codes for all buildings that move toward net-zero energy consumption and encourage healthy indoor environments, as well as on-site renewable generation.
c. NYSERDA and NYPA to assist eligible entities in their programs to implement enhanced codes and policies that promote high energy performance in their buildings.

Unleashing the Power of Private Sector Energy Financing

Even with new utility business models and a more competitive market around the customer, one key issue we must simultaneously focus on is how to attract the substantial quantity of private capital needed to transition to a clean energy future. Currently, various New York State entities collect and spend approximately $1.4 billion per year on renewables and energy efficiency, with approximately 80 percent of this funding—or $1.15 billion—coming in the form of one-time subsidies. The problem in attracting capital is not the ability to generate adequate returns, as many clean energy technologies are already economically viable, but, instead, the difficulty is in obtaining financing.

To attract greater private sector financing and achieve more leverage from ratepayer funds, market-specific policies will be developed to provide the long-term certainty and stability needed to facilitate greater investment in New York's clean energy economy. The New York Green Bank will be established to accelerate the deployment of private capital in renewable and energy efficiency projects by providing risk mitigation and aggregating transactions. In order to reduce long-term dependence on subsidies and optimize the use of public funds, government support will focus on market transformation and cost reduction to spur demand.

Initiative
04

Establish a $1 billion New York Green Bank to unlock and mobilize private sector capital for greater investment in New York's clean energy economy. The Green Bank will work to eliminate current market barriers and fill financing gaps by partnering with private sector intermediaries through the use of various forms of financial support such as credit enhancement, warehousing, and securitization, making a much larger supply of private capital available to finance clean energy projects.

a. The Green Bank will operate in accordance with the following guiding principles:

- Provide a bridge to a sustainable and efficient private sector clean energy financing market.
- Address market barriers and inefficiencies that are impeding the growth of clean energy financing, and partner with private sector entities to fill financing market gaps.
- Partner alongside, rather than compete with, financial institutions and other private sector entities, leveraging both private sector capital and these entities' institutional capabilities.
- Focus on projects that are economically viable but not currently financeable.
- Work with existing financial intermediaries that are making progress in the market, but whose progress is limited by lack of available financing.
- Facilitate the development of clean energy capital markets (with a particular focus on bond markets).
- Enhance market confidence in clean energy investing by compiling and publishing loan payment and project performance data on all Green Bank-financed clean energy transactions.
- Maintain the administrative flexibility needed to adapt to movements in the markets, and to focus on a constantly evolving frontier where the Bank's credit enhancement can unlock new sectors of the clean energy finance market.

Initiative
05

Coordinate renewable energy policies to strategically harness the many resources that the State can provide to solar, wind (offshore and land-based), bioenergy, geothermal, hydrokinetic, storage, and other power supply options. Implemented strategies should take into account the opportunities provided by the diverse renewable resources available in different regions of the State.

a. DPS, NYSERDA, and other agencies to create a portfolio of renewable energy programs with a State commitment through 2025 to help achieve scale and drive down the cost of implementation. The State's approach to renewable energy will operate in accordance with the following guiding principles:

- Provide greater incentive-level predictability and increased project revenue certainty through the State's various renewable energy programs and policies.
- Dedicate State resources to reducing the costs associated with development, such as permitting, licensing, stand-by charges, regulatory compliance, and customer acquisition expenses.
- Conduct predevelopment work to accelerate and aggregate economic opportunities for emerging technologies and nascent markets.
- Coordinate with other states to increase the scale of clean energy projects.
- Develop renewable resources that support community-based energy needs.
- Establish incentives that reward installation of new renewable power sources where they can increase system efficiency, improve portfolio diversity, and contribute to the State's environmental goals.

This Initiative to upgrade and modernize New York's electric grid to increase capacity, improve flexibility, and move power from where it is generated to where it is used produced 13 actions that are moving forward on or ahead of an aggressive schedule. This includes the initial development of an Energy Management Control Center. In addition, the Public Service Commission is conducting proceedings related to alternating current transmission upgrades and the development of an Indian Point Contingency Plan.

This Statewide economic development initiative focuses on retaining and creating jobs through allocations of low-cost power, long-term contracts that provide financial certainty, and support for growth industries. More than 700 megawatts of low-cost power have been allocated to about 600 businesses and not-for-profits Statewide.

Cleaner Greener Communities

This program to empower New York's ten regions to create more sustainable communities by funding smart growth practices has completed its first phase of creating regional sustainability plans, and is now selecting smart development projects for integrated, sustainable solutions.

Powerful Id

New York has already made significant progress towards many of its energy goals. These initiatives, policies, and programs have collectively set New York on a path towards a more efficient energy system.

Charge NY

This program supports the acceleration of the electric vehicles (EVs) market by installing more than 3,000 public and workplace charging stations over five years, making EVs easier to use and more economically viable in New York.

Regional Greenhouse Gas Initiative

New York plays a leading role in this cooperative effort among Northeast and Mid-Atlantic states, which has capped and cost-effectively reduced greenhouse gas emissions from the power sector.

BuildSmartNY

This initiative to reduce energy consumption in State buildings by 20 percent by 2020 has issued a benchmarking energy-use study of more than 2 million square feet of State-owned buildings; and initiated development of energy master plans for Albany, Buffalo, Rochester, Syracuse, and Yonkers.

The NY-Sun Initiative

This public-private partnership to drive growth in the solar industry by making solar technology more affordable for all New Yorkers has taken steps to reduce balance-of-system solar costs and expand incentive programs to support solar deployment.

eas at Work

ReBuild NY

Central to New York's Statewide efforts to increase resiliency in the face of extreme weather events such as Superstorm Sandy, this program focuses on the critical role of a reliable electric power supply with specific actions to build redundancies into the fuel delivery system, harden the resilience of utilities, and strengthen PSC's regulatory and enforcement oversight.

Energy Efficiency Portfolio Standard

A policy created to reduce the amount of energy used each year in New York by 15 percent by 2015—one of the most ambitious energy efficiency goals in the United States.

Renewable Portfolio Standard

A policy created to increase the amount of electric energy that is derived from renewable sources, such as solar and wind, to 30 percent by 2015.

Providing a More Resilient and Flexible Power Grid

In October 2012 Superstorm Sandy exposed the vulnerabilities of our energy system. Overcoming these challenges will take a bottom-up, customer-directed approach that reflects community input and neighborhood-specific needs. The outcome of this process will be a system that offers greater value to customers in the form of reliability, power quality, and the protection of critical facilities.

Community-driven planning and design will also increase the security of valued services and buildings, improve business continuity, and enable on-site power, storage, efficiency, and energy management.

Initiative

06

Update and modernize electricity and gas delivery systems to replace aging infrastructure and ensure service quality and reliability with a more integrated and distributed energy network.

a. DPS to work with utilities to foster smart grid development and reap its attendant benefits, such as interoperability, coordinated distributed operations, and real time data management.
b. DPS and NYSERDA to develop specific incentives for grid-based and behind-the-meter storage technologies.
c. DPS to consider allowing electric utilities to own and operate small scale distributed resources. In addition, DPS to address current

obstacles to microgrid development to meet customer needs, State requirements, and system planning objectives by revisiting stand-by electric rates, interconnection guidance, maximum plant size, and other issues.

d. NYPA to evaluate supporting microgrids in strategic locations with its customers, especially in community rebuilding zones.
e. NYPA and LIPA to support public-private partnerships that further transmission system investments.

Initiative 07

Support community-based energy planning and facilitate public-private partnerships to develop smart, integrated energy networks to spur regional economic development.

a. DPS to refine policies pertaining to microgrids, and NYSERDA and NYPA to develop programs, and authority if needed, to encourage new financing and ownership models to facilitate community grid projects.
b. NYSERDA to develop community aggregation models to address soft costs and achieve scale in energy efficiency and renewable solutions.
c. NYSERDA to provide assistance to communities and regions to integrate and cross-reference their land use, smart growth, and transportation capital projects, with the ultimate goal of achieving consistent outcomes.
d. The State to consider legislation allowing wastewater treatment plants to net-meter electricity produced from biogas to encourage full use of the available waste stream.
e. DOS to support the development of smart growth plans that incorporate the principles contained in the New York State Smart Growth Public Infrastructure Policy Act of 2010. When feasible, the State to provide investment incentives for projects that conform to regional sustainability plans through prioritization in State funding opportunities, as well as tax credits supporting transit-oriented development and local designated priority growth centers.
f. DPS, NYSERDA, and ESD to develop specific programs that enhance New York's reputation as a commercial center with the ability to offer clean, reliable, cost-effective, and high quality energy services to energy-intensive technology-based businesses.

Initiative 08

Accelerate securing of critical infrastructure to ensure the safety, security, and reliability of an increasingly complex and interconnected energy system, including transportation, liquid fuels, electricity, and natural gas infrastructure.

a. NYSERDA to strengthen liquid fuels distribution systems and explore opportunities to relocate key fuel-related infrastructure to higher elevations by working with appropriate local, State, and federal authorities, and private fuel supply companies.
b. DPS and DHSES to coordinate with the State's Cyber Security Advisory Board and top information technology officials from the regulated utilities to address issues affecting critical energy systems in the State. Such issues to include cross-industry sharing of data and best practices, identifying existing and evolving vulnerabilities in the energy system, deploying of state-of-the-art cyber-defense technologies, and ensuring appropriate regulatory oversight.
c. DHSES, DOS, and DEC to disseminate updated flood maps for the major waterways within the State in order to give utilities and emergency preparedness groups a common platform from which to design mitigation and response plans.

Initiative

09

Reduce reliance on petroleum products for heating buildings by supporting the use of clean alternatives to heating oil and expanding access to natural gas in the near term while pursuing strategies to reduce natural gas leakage.

a. DPS to encourage and support oil-to-gas conversions by collaborating with other State agencies and regulated gas utilities to accelerate investments in natural gas distribution.
b. DPS to reduce emissions from natural gas infrastructure by requiring gas utilities to identify and repair leaks of significant magnitude.
c. DEC to evaluate regulations to limit methane emissions from natural gas compressor stations on intrastate pipelines.
d. NYSERDA to support economic and efficient clean heat options as alternatives to fossil fuel consumption, including solar thermal, geothermal, and the use of sustainably harvested biomass and advanced heating systems.
e. DEC, DOH, and NYSERDA to support research to enable the quantification of public health benefits to be incorporated into energy planning and policies.

Giving Customers More Control Over Their Energy Use

This vision starts with the customer as a primary decision maker. Through this new model, customers will have more control over what they want, reflecting a trend that has occurred in other industries such as telecommunications. Some customers will want more resiliency; others will want to get paid more for services that they provide to the grid. Some customers will be willing to pay more for increased reliability and backup generation; others may want financing services such as the ability to pay back the cost of a new efficient refrigerator or heating, ventilation and air conditioning system through bill savings. Some of these customers will want to pay up front for their new solutions; others will want pay as they go, using "energy as a service" financing. To fully realize the benefits of a more competitive market, consumers will need access to transparent data that will enable them to make more informed decisions and markets to work more efficiently and effectively.

Initiative 10

Give customers more choice and control of their energy usage to determine what services they value by cultivating a more competitive market around home energy solutions.

a. DPS to make the regulatory changes needed to enable a competitive marketplace for business and home energy solutions centered on customer needs and values.

Initiative 11

Provide improved information and access to energy-related data to support customers' ability to make educated decisions about clean and efficient energy investments, including labeling mechanisms for commercial and residential buildings.

a. DPS to develop programs that result in utility bill design improvements; DPS will also act to increase availability of retail price information to facilitate customer comparison of utility and competitive provider services.
b. NYSERDA and DOS to work with government entities to facilitate disclosure of building energy performance to potential renters and purchasers, benchmarking of energy usage by owners of commercial buildings over a certain minimum size and capture energy efficiency considerations in home and commercial property valuations.
c. NYSERDA and DEC to evaluate implementing a labeling mechanism for industrial, commercial, and residential buildings based on the buildings' energy usage and possibly, their greenhouse gas emissions, allowing customers to easily compare choices.
d. DPS to evaluate methods to provide aggregated consumption data to service providers to encourage demand response and energy efficiency penetration.

Initiative 12

Increase transportation alternatives and vehicle diversity to harness the benefits of decreased dependence on oil and a cleaner, more connected, and more flexible transportation sector.

a. OGS working with DOT through the NY Clean Fleets Initiative to encourage New York State agencies and authorities to incorporate efficient and alternative fuel vehicles into their fleets by pooling agency funds together to increase purchasing power.
b. NYSERDA and NYPA to stimulate market demand for electric vehicles through consumer education, collaboration between private and public sectors, continued support for charging infrastructure, and innovative demonstrations.
c. DPS to evaluate utility rate designs that encourage electric vehicle charging at times that are optimal and economic for customers and the grid.

d. DOS to establish consistent building codes and standards for installing electric vehicle charging infrastructure.
e. DOT, NYSTA, and OGS to reduce the cost and increase the convenience of alternative fuel vehicles by providing incentives such as high occupancy vehicle lane access, and reduced tolls at bridges and tunnels, and on the New York Thruway.
f. DOT, NYSERDA, and DEC to explore and evaluate innovative financial strategies that will capture the value from increased local economic activity as a result of reduced consumer spending on petroleum fuels.
g. Department of Agriculture and Markets, NYSERDA, and DEC to support in-state, sustainable fuel production including agriculture and organic waste feedstocks, especially as a substitute for petroleum fuels.
h. NYSERDA to assess and develop potential deployment strategies and infrastructure requirements for the commercialization of hydrogen fuel cell vehicles.
i. DOT to support infrastructure improvements that encourage increased use of bicycles and pedestrian, transit, and intercity passenger rail modes.

Initiative
13

Bring innovative information technology to transportation system users to support more efficient and safe travel.

a. DOT to refine and improve 511NY, a free comprehensive traveler information system and mobile app that provides users with information related to a variety of transportation choices and conditions, including mass transit and rideshare options, and incident information.
b. DOT to expand the availability and use of real-time data on travel and weather conditions to help travelers avoid traffic congestion and maximize use of mass transit options.

Aligning Energy Innovation with Market Demand

In order to fully realize the economic development benefits of the clean energy economy, the State must first identify the areas in which it can and should play a role in technology adoption and commercialization. New York will develop a continuum of market support for clean energy innovation in the State, aligning, where possible, State University of New York campuses, research and development centers, supply chains and customer demand, market participants, and workforce capabilities.

Initiative
14

Encourage clean technology innovation and commercialization to maximize the economic impacts of a vibrant private sector in New York.

a. NYSERDA to spur private investment in clean energy research and development by strategically mitigating risks through the support of proof-of-concept centers that partner the private sector with academic institutions. In addition, NYSERDA to leverage the research capabilities of New York's institutions of higher education to fulfill industry's research needs. NYSERDA to also create licensing policies that recognize the sustained importance of startup companies.
b. NYSERDA to increase its emphasis on cleantech and cleanweb startups by supporting business incubators, mentorship programs for entrepreneurs, and innovative events such as hackathons and prize competitions.
c. ESD to provide work and office space for clean energy companies to develop new technologies in tax free zones through START-UP NY.
d. NYSERDA to accelerate the use of new, clean energy technologies through high profile demonstration projects, broad communication of project performance, and support for their transition to mainstream markets.
e. NYSERDA to foster economic development opportunities for clean energy companies in New York by identifying regional strengths, existing clean energy clusters, basic supply chains, market positions, and growth potential.
f. NYSERDA and NYPA to identify areas where the State can play a bigger role as a purchaser of goods and services and in partnering with private sector companies to co-install locally developed clean technologies.

g. NYSERDA to assist New York's clean energy companies in identifying State, national, and foreign customer demand and coordinate with ESD to expand international trade activities and leverage ESD's local and foreign office initiatives with World Trade Center Trade Center and United States Department of Commerce programs.

Initiative 15

Foster a clean energy workforce targeting participants across all aspects of the energy sector.

a. NYSERDA and SED to consult the clean energy industry members and the State's Regional Economic Development Councils to define regional workforce needs that can help shape curricula (including short courses and worker retraining), particularly at the State University of New York, City University of New York, community colleges, and technical institutes.
b. SED to expand Science, Technology, Engineering and Math (STEM) training at all levels of primary and secondary education to increase the number of students pursuing clean energy careers.

Success Stories

Since its inception just over three years ago, NYSERDA's public/private partnerships program with six clean energy business incubators across the State has helped to support more than 100 cleantech startup companies and the creation of 323 jobs. Current and former tenant companies have launched more than 90 new cleantech products and have attracted nearly $100 million in private investment. The NYSERDA-funded incubators provide startups with the resources and environments they need to access private capital from the outset. Partnerships such as this help to foster the production of ground breaking technologies in the clean energy industry, while creating good paying jobs for New Yorkers.

In an effort to increase renewable energy generation and further their participation in Build Smart NY, the New York State Office of Parks, Recreation and Historic Preservation (Parks) sent twenty of their electricians to Alfred State College for solar installation training. Through this program, all twenty trainees were provisionally certified as solar installers and have since been implementing solar projects at Parks sites throughout the State. Using in-house labor and taking advantage of available State rebates has allowed Parks to realize reduced payback periods. In addition to two already completed projects, Parks will start a 25-kilo-Watt (kW) pole-mounted solar project at Allan Treman State Park in mid-November, a 50kW roof-mounted installation at Fort Niagara State Park in late November, a 10kW installation at Grafton Lake State Park in March of 2014 and a 15kW system at Robert Moses State Park, also in March of 2014.

Inspired by community solar projects around the country, a small group of Brooklyn neighbors brought together residents in the Windsor Terrace, Kensington, and Flatbush neighborhoods to make installing solar on their homes easier and more affordable for everyone. In early 2013 Solarize Brooklyn was born, and two community groups, Sustainable Kensington Windsor Terrace and Sustainable Flatbush, joined with a local nonprofit, Solar One, a NYSERDA outreach partner, to provide solar education sessions to area residents and organize an open, competitive process to select two solar installers. The winning proposals from EmPower Solar and Quixotic Systems agreed to provide discounts to participants and take part in green jobs training programs. At the end of the program, 23 homeowners had signed contracts for solar installations at competitive prices, representing a substantial increase in solar in those neighborhoods.

Achieve

Measuring Progress

New York will measure the effectiveness of the State Energy Plan across all focus areas including electricity, heat, and transportation, using common and well-understood metrics such as reduction in greenhouse gas emissions, improvements in energy affordability, and increases in energy productivity.

My children will have more choices.

New York is creating a portfolio of resources to support solar, wind (offshore and land-based), bioenergy, geothermal, hydrokinetic, storage, and other power supply options.

Let the future tell the truth, and evaluate each one according to his work and accomplishments.

Nikola Tesla

New York will track the following metrics to assess the effectiveness of its strategies in achieving its vision of empowered customers and a clean, reliable, and affordable energy system:

Improving Energy Affordability

- Keep New York residential customer electric bills as a percentage of household income at or below the national average (% of median household income)
- Reduce the percentage of household income devoted to energy bills for low-income New Yorkers (% of low to moderate household income)
- Improve competitiveness of industrial customer electric rates—maintain below national average
- Decrease number of customers relying on oil or propane for heat
- Increase energy efficiency resource deployment (MW, MWh, DTH, $/resource)
- Decrease electric system peak demand (MW)
- Improve utilization of existing electric infrastructure—increase load factor (average load compared to peak load) (MW capacity and the total GWh energy requirement [i.e. “sendout”])

Unleashing the Power of Private Sector Energy Financing

- Increase renewable energy deployment (MW, MWh, $/resource)
- Increase cost effective distributed energy deployment (MW, MWh, $/resource)
- Increase leverage ratio of private capital to public investment ($ private investment/$ public investment)
- Increase New York energy dollars retained in the State
- Decrease energy use per unit of gross state product (MWh/GSP)
- Increase clean energy business activity, such as number of new start-ups

- Increase net job impacts of energy initiatives and clean energy program portfolios

Providing a More Resilient and Flexible Grid

- Improve the electric system's ability to withstand extreme weather events
- Increase the number of customers and communities supported through distributed resources that can be isolated from the electric grid during emergency events
- Decrease outage recovery duration following major events
- Increase power quality for system sensitive customers
- Increase load control penetration by customer sector (MW, MWh in a year)
- Reduce the duration and frequency of outages during storm events

Reducing Environmental Impacts Associated with Our Energy System

- Decrease greenhouse gas emissions in New York
- Reduce the carbon intensity of our energy system (MWh/CO_2)
- Reduce reliance on petroleum in all sectors (Btu consumed)
- Reduce health and economic impacts associated with air pollution from fossil fuel use in the energy sector
- Increase number of alternative fueled vehicles registered in New York to 1 million vehicles by 2025
- Increase number of alternative fueling and charging stations
- Increase fuel diversity of electricity and transportation systems
- Increase the average fuel economy of passenger motor vehicles registered in New York

New York envisions a energy system that en and customers to rec and affordability they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Conclusion

By placing the needs and desires of customers at the center of energy innovation, New York will become a national and global leader in creating an industry transformation that is truly customer focused. We will be positioned to leverage private capital, to create robust and transparent markets for clean energy resources, and to drive efficiency from the point of consumption through all means of supply. We will develop new jobs and a workforce trained in the skills that the marketplace demands.

This Draft Plan recognizes that the transition to our stated vision will take time; it requires both near-term action and long-term commitment. The existing energy infrastructure—including the backbone of transmission, large centralized power plants, and electric and fuel distribution systems—will continue to play a vital role in providing the reliability we expect and deserve. Today's system also requires significant upgrades, offering opportunities to make investments in energy infrastructure that will enable the innovative and distributed energy systems of the future.

From Edison and Franklin to Einstein, Tesla and Carson, many before us have demonstrated the enormous importance and potential benefits of thinking critically about improving our energy system and the environment. Harnessing innovation and addressing our current challenges requires a flexible approach and an understanding that success takes time. As the policies in this plan are implemented and change is effected, New York will remain steadfastly committed to the customer, focused on enhancing energy value while efficiently deploying the public and private capital necessary for an affordable, clean, and reliable system.

> **"I am always more interested in what I am about to do than in what I have already done."**
>
> **Rachel Carson**

NOTES

1 Ventyx, PA Consulting Group; http://bigstory.ap.org/article/us-power-grid-costs-rise-service-slips

2 Estimates based on electricity sector modeling performed using the Integrated Planning Model (IPM), developed by ICF International. IPM is a linear programming model, which incorporates the New York electricity system, the systems managed by the New England Independent System Operator (ISO-NE), and Pennsylvania, Jersey, Maryland (PJM), as well as the systems extending throughout the rest of the United States and Canada. The objective function is to solve for the optimal system dispatch of electricity by fuel type (including imports and exports), new capacity, retirements, and repowering, given the specified demand, system characteristics, reserve margins, and environmental constraints. The modeling analysis was coordinated by New York State Energy Research and Development Authority (NYSERDA) staff, working closely with the New York Independent System Operator (NYISO).

PHOTO CAPTIONS

Front Cover
Exterior of a home in Singerland, NY at twilight.
Photographer: David Alan Harvey
(Magnum Photos)

Inside Front Cover
Women viewing a tablet at the High Line in New York City at night.
Photographer: Peter van Agtmael
(Magnum Photos)

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Photographer: David Alan Harvey
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Photographer: Peter van Agtmael
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Exterior of the SUNY NanoTech Center, Albany, NY.
Photographer: David Alan Harvey
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SUNY NanoTech Center, Albany, NY.
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(Magnum Photos)

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Photographer: Peter van Agtmael
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Teens relaxing in High Line.
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Shaping the Future of Energy

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