

# POLICY PLAYBOOK

## CLEAN ENERGY



### TABLE OF CONTENTS

---

Policy Options.....	3	–	16
Communications & Messaging.....	17	–	24
Additional Resources.....	25	–	26

### INTRODUCTION

A majority of Americans across party lines support action to address climate change and promote clean energy. Unfortunately, the Trump administration has taken a page from the establishment playbook and set up its federal agencies to do the bidding of polluters by taking us back to the reckless and dangerous policies that put the dirty energy industry’s profits ahead of the health and safety of Americans. It’s clear that under Trump, the federal government is now led by those who are intent on slowing the transition to a clean energy economy, and this failed leadership is bad for business, bad for public health, and bad for the economy.

But the shift to a clean energy economy is already underway, driven by market forces, bolstered by consumer demand, and supported by major American companies that are already investing in clean energy. The World Energy Council reports that globally, renewable energy now accounts for a record 30% of total installed power generation capacity, as we shift rapidly toward cleaner, safer sources of energy like wind and solar. And within the United States, it is at the state level that progress and innovation will continue to advance. This Policy Playbook looks at a selection of state policies (even absent the EPA’s Clean Power Plan) that legislators can use to continue the march toward a clean energy future, including renewable portfolio standards, shared renewables, alternative financing tools, and grid modernization.



## POLICY OPTIONS

### Renewable Portfolio Standard (RPS)

A renewable portfolio standard (RPS) is a statutory requirement for utility companies to sell a certain percentage of their electricity from clean energy sources (such as wind or solar). Most states already have an RPS on the books that they can build upon. Some of the strongest RPSs in the country include California, Hawaii, and Vermont. Hawaii leads the pack with a 100% RPS by 2045, but Vermont also has an aggressive RPS with a 55% requirement by 2017 and 75% by 2032.

#### Hawaii House Bill 623

([http://www.capitol.hawaii.gov/session2015/bills/HB623\\_CD1\\_.HTM](http://www.capitol.hawaii.gov/session2015/bills/HB623_CD1_.HTM))

*(a) Each electric utility company that sells electricity for consumption in the State shall establish a renewable portfolio standard of:*

- (1) Ten per cent of its net electricity sales by December 31, 2010;*
- (2) Fifteen per cent of its net electricity sales by December 31, 2015;*
- (3) Thirty per cent of its net electricity sales by December 31, 2020;*
- (4) Forty per cent of its net electricity sales by December 31, 2030;*
- (5) Seventy per cent of its net electricity sales by December 31, 2040; and*
- (6) One hundred per cent of its net electricity sales by December 31, 2045.*

#### Vermont House Bill 40/Act 56

(<http://legislature.vermont.gov/assets/Documents/2016/Docs/ACTS/ACT056/ACT056%20As%20Enacted.pdf>)

*(B) Required amounts. The amounts of total renewable energy required by this subsection shall be 55 percent of each retail electricity provider's annual retail electric sales during the year beginning on January 1, 2017, increasing by an additional four percent each third January 1 thereafter, until reaching 75 percent on and after January 1, 2032.*

#### 2015 California Senate Bill 350

([http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb\\_0301-0350/sb\\_350\\_bill\\_20150911\\_enrolled.pdf](http://www.leginfo.ca.gov/pub/15-16/bill/sen/sb_0301-0350/sb_350_bill_20150911_enrolled.pdf))

*(a) In order to attain a target of generating 20 percent of total retail sales of electricity in California from eligible renewable energy resources by December 31, 2013, 33 percent by December 31, 2020, and 50 percent by December 31, 2030, it is the intent of the Legislature that the commission and the Energy Commission implement the California Renewables Portfolio Standard Program described in this article.*

### Distributed Generation Carve-Out

An RPS is an important first step, but we also recommend adding a distributed generation carve-out to



incentivize the development of an energy system that doesn't completely rely on utility-scale generation. While having a relatively small RPS requirement (only 6% in 2016 and rising by 1 percentage point until reaching 15% in 2025), Arizona has one of the strongest distributed generation carve-outs, which started at 5% in 2007 but quickly rose to 30% by 2012. This equates to 4.5% total electricity sales from renewable distributed generation by 2025 (15% RPS x 30% DG carve-out).

Arizona Administrative Code Title 14. Public Service Corporations

([http://apps.azsos.gov/public\\_services/Title\\_14/14-02.pdf](http://apps.azsos.gov/public_services/Title_14/14-02.pdf))

*R14-2-1805. Distributed Renewable Energy Requirement*

*B. An Affected Utility's Distributed Renewable Energy Requirement shall be calculated each calendar year by applying the following applicable annual percentage to the Affected Utility's Annual Renewable Energy Requirement:*

*2007: 5%, 2008: 10%, 2009: 15%, 2010: 20%, 2011: 25%, After 2011: 30%*

By 2032, Vermont will require 7.5% of its total annual electricity sales to come from distributed generation (75% RPS x 10% DG carve-out).

Vermont Statutes Title 30: Public Service, Chapter 089: Renewable Energy Programs

(<http://legislature.vermont.gov/statutes/section/30/089/08005>)

*§ 8005. RES categories*

*(C) Required amounts. The required amounts of distributed renewable generation shall be one percent of each retail electricity provider's annual retail electric sales during the year beginning January 1, 2017, increasing by an additional three-fifths of a percent each subsequent January 1 until reaching 10 percent on and after January 1, 2032.*

### Renewable Energy Technology Carve-Out

States like New Mexico have specific renewable energy technology carve-outs for electricity generation from wind and solar. For example, under New Mexico's 30% requirement for wind and 20% for solar, by 2020, 6% of total electricity sold must be from wind and 4% from solar.

New Mexico Administrative Code: Title 17 Public Utilities and Utility Services, Chapter 9 Electric Services, Part 572 Renewable Energy for Electric Utilities

(<http://164.64.110.239/nmac/parts/title17/17.009.0572.htm>)

17.9.572.7 DEFINITIONS: Unless otherwise specified, as used in this rule:

G. fully diversified renewable energy portfolio means one in which no less than 30% of the renewable portfolio standard requirement is met using wind energy, no less than 20% is met using solar energy, no less than 5% is met using one or more of the other renewable energy technologies, as defined by this section; in a fully diversified renewable energy portfolio . . .



### Alternative Compliance Payments

When a utility has neither generated enough renewable energy nor purchased sufficient credits from another renewable energy generator to satisfy the RPS requirements, they can often make an alternative compliance payment to the state in an amount either fixed by the regulating agency or determined by a market mechanism. There are of course a number of uses for these funds. One principle based on equity described in greater detail in our [Toolkit on Carbon Pricing and Equity](#) is that this “stream of revenue should, to the maximum extent possible, be directed towards providing restorative justice to communities that have historically borne disproportionate economic and health impacts from the operation of fossil fuel power plants.”

For example, in Massachusetts, the alternative compliance payments made by utilities are used to partly fund the Department of Energy Resources’ Division of Green Communities, which is designed to help local governments “reduce energy consumption and costs, reduce pollution, facilitate the development of renewable and alternative energy resources, and create local jobs related to the building of renewable and alternative energy facilities and the installation of energy-efficient equipment” (MA General Laws Chapter 25A Section 10). Former Massachusetts Governor Deval Patrick also tapped the alternative compliance payments to fund investments in micro-grids and nano-grids.

And while it’s not RPS-generated revenue, California’s example of using cap-and-trade auction revenue may be instructive, as it focuses heavily on frontline communities and improving the environment and the economy:

#### California Health and Safety Code Section 39712

*39712. (b) Moneys shall be used to facilitate the achievement of reductions of greenhouse gas emissions in this state consistent with Division 25.5 (commencing with Section 38500) and, where applicable and to the extent feasible:*

- (1) Maximize economic, environmental, and public health benefits to the state.*
- (2) Foster job creation by promoting in-state greenhouse gas emissions reduction projects carried out by California workers and businesses.*
- (3) Complement efforts to improve air quality.*
- (4) Direct investment toward the most disadvantaged communities and households in the state.*
- (5) Provide opportunities for businesses, public agencies, Native American tribes in the state, nonprofits, and other community institutions to participate in and benefit from statewide efforts to reduce greenhouse gas emissions.*
- (6) Lessen the impacts and effects of climate change on the state’s communities, economy, and environment.*



## Shared Renewables

### Community Solar

In order to support the adoption of clean, renewable energy use among renters and low-income families, it is important that state legislators advance shared renewable programs, such as community solar. Colorado has a community solar garden law that provides an exemplary model for other states.

Colorado Revised Statutes Title 40. Utilities § 40-2-127. Community energy funds—community solar gardens

(<http://codes.findlaw.com/co/title-40-utilities/co-rev-st-sect-40-2-127.html>)

(2) *Definitions. As used in this section, unless the context otherwise requires: (1)(A)*

*“Community solar garden” means a solar electric generation facility with a nameplate rating of two megawatts or less that is located in or near a community served by a qualifying retail utility where the beneficial use of the electricity generated by the facility belongs to the subscribers to the community solar garden. There shall be at least ten subscribers. The owner of the community solar garden may be the qualifying retail utility or any other for-profit or non-profit entity or organization, including a subscriber organization organized under this section, that contracts to sell the output from the community solar garden to the qualifying retail utility. A community solar garden shall be deemed to be “located on the site of customer facilities”.*

(4) *Community solar gardens not subject to regulation. Neither the owners of nor the subscribers to a community solar garden shall be considered public utilities subject to regulation by the commission solely as a result of their interest in the community solar garden. Prices paid for subscriptions in community solar gardens shall not be subject to regulation by the commission.*

### Low-Income Solar

Within the same statutory section, Colorado’s law also prioritizes the inclusion of low-income utility customers within the community solar project.

Colorado Revised Statutes Title 40. Utilities § 40-2-127. (Subsection 5e)

(5) *Purchases of the output from community solar gardens.*

*(e) Each qualifying retail utility shall set forth in its plan for acquisition of renewable resources a proposal for including low-income customers as subscribers to a community solar garden. The utility may give preference to community solar gardens that have low-income subscribers.*

### Virtual Net Metering

One funding mechanism that can support shared renewables is virtual net metering. While traditional net metering compensates an owner for renewable energy generated on their property, virtual net metering allows for reimbursements based on shared renewables, such as community solar. Colorado provides an example of how to implement this policy within their community solar gardens law.



Colorado Revised Statutes Title 40. Utilities § 40-2-127. (Subsection 5e)

(5) *Purchases of the output from community solar gardens.*

*(b)(I) The output from a community solar garden shall be sold only to the qualifying retail utility serving the geographic area where the community solar garden is located. Once a community solar garden is part of a qualifying retail utility’s plan for acquisition of renewable resources, as approved by the commission, the qualifying retail utility shall purchase all of the electricity and renewable energy credits generated by the community solar garden. The amount of electricity and renewable energy credits generated by each community solar garden shall be determined by a production meter installed by the qualifying retail utility or third-party system owner and paid for by the owner of the community solar garden.*

*(II) The purchase of the output of a community solar garden by a qualifying retail utility shall take the form of a net metering credit against the qualifying retail utility’s electric bill to each community solar garden subscriber at the premises set forth in the subscriber’s subscription. The net metering credit shall be calculated by multiplying the subscriber’s share of the electricity production from the community solar garden by the qualifying retail utility’s total aggregate retail rate as charged to the subscriber, minus a reasonable charge as determined by the commission to cover the utility’s costs of delivering to the subscriber’s premises the electricity generated by the community solar garden, integrating the solar generation with the utility’s system, and administering the community solar garden’s contracts and net metering credits. The commission shall ensure that this charge does not reflect costs that are already recovered by the utility from the subscriber through other charges. If, and to the extent that, a subscriber’s net metering credit exceeds the subscriber’s electric bill in any billing period, the net metering credit shall be carried forward and applied against future bills.*

## Alternative Financing Tools

Traditional financing for residential or community clean energy projects is often lacking and does very little to address the needs of disadvantaged communities.

### On-Bill Recovery/Pay As You Save (PAYS)

One alternative financing mechanism that can be used to support either energy efficiency or renewable energy upgrades is “on-bill recovery” — where a loan is repaid from the on-bill utility savings. So for example, if a homeowner gets a loan to pay for solar panels, which cut his or her electricity bill in half, some percentage of that savings could be paid every month to the loan provider (this way the homeowner’s utility bill would be lower, but not cut in half since he or she would still need to repay the loan). One of the benefits of this financing tool is that there is little to no upfront cost to consumers, and they can still save money on their utility bill even as they pay back their loan. Here are some examples from New York and Connecticut:



New York Article 8, Title 9-A § 1896. Green jobs-green New York revolving loan fund

<https://www.nysenate.gov/legislation/laws/PBA/1896>

(1) (c) *In administering such program, the authority is authorized and directed to:*

- (iii) establish an on-bill recovery mechanism for repayment of loans for the performance of qualified energy efficiency services for eligible projects provided that such on-bill recovery mechanism shall provide for the utilization of any on-bill recovery programs established*
- (iv) establish standards for customer participation in such on-bill recovery mechanism, including standards for reliable utility bill payment, current good standing on any mortgage obligations, and such additional standards as the authority deems necessary; provided that in order to provide broad access to on-bill recovery, the authority shall, to the fullest extent practicable, consider alternative measures of creditworthiness that are prudent in order to include participation by customers who are less likely to have access to traditional sources of financing;*

Connecticut Statute Sec. 16a-40m. Residential clean energy on-bill repayment program

[https://www.cga.ct.gov/current/pub/chap\\_298.htm#sec\\_16a-40m](https://www.cga.ct.gov/current/pub/chap_298.htm#sec_16a-40m)

*(b) On or before April 1, 2014, the Energy Conservation Management Board and the Connecticut Green Bank, in consultation with the electric distribution companies and gas companies, shall establish a comprehensive residential clean energy on-bill repayment program financed by third-party private capital managed by the Connecticut Green Bank. Such program shall have the following features:*

- (1) To establish a process for qualifying clean energy improvements;*
- (2) To prioritize clean energy improvements for cost-effectiveness;*
- (3) To reduce peak electricity demand;*
- (4) To assist customers of electric distribution companies or gas companies in accessing incentives, other cost savings and financing for clean energy improvements, including natural gas furnaces or boilers that meet or exceed federal Energy Star standards and propane and oil furnaces and boilers that are not less than eighty-four per cent efficient;*
- (5) To identify knowledgeable contractors for installation of clean energy improvements and to ensure successful installation of such improvements;*
- (6) To finance clean energy improvements to the extent the tenor of such financing repayment does not exceed the average expected life of such improvements;*
- (7) To provide that the repayment amount plus the anticipated periodic customer bill after installation of the clean energy improvements does not exceed the anticipated periodic bill for electric or gas service without installation of such improvements, including no energy savings improvements;*
- (8) To authorize the disconnection for nonpayment by the customer of any financing repayment amount, except during the pendency of any complaint, investigation, hearing or appeal challenging the on-bill repayment loan, terms, accuracy or related matters, with any on-bill repayment amount treated as part of the customer's utility account subject to the protections*



*provided in sections 16-262c, 16-262d, 16-262g to 16-262i, inclusive, and 16-262x;*

*(9) To establish program guidelines to address the ramifications of on-bill repayment and the risks associated with disconnection of service of low-income and hardship customers;*

*(10) To provide the assignment of repayment obligations to subsequent owners of the dwelling unit upon the development by the Energy Conservation Management Board and the Connecticut Green Bank of timely written notice guidelines to subsequent owners, except on-bill repayment amounts may not be directly charged to a tenant of a dwelling unit by a utility company*

### Property Assessed Clean Energy (PACE)

Property Assessed Clean Energy or PACE is similar to on-bill recovery, but instead of being paid off on a utility bill, the loan is paid through a municipal assessment tied to the property. (See statutory language from Connecticut and California for examples.) States, like California, have also taken steps to improve the financial safety of these programs, and additional consumer protection bills are in the works<sup>1</sup>.

Connecticut Statute Chapter 97, Section 7-121n. Sustainable energy program

[https://www.cga.ct.gov/current/pub/chap\\_097.htm#sec\\_7-121n](https://www.cga.ct.gov/current/pub/chap_097.htm#sec_7-121n)

*(a) As used in this section:*

- (1) “Energy improvements” means any renovation or retrofitting of qualifying real property to reduce energy consumption or installation of a renewable energy system to service qualifying real property, provided such renovation, retrofit or installation is permanently fixed to such qualifying real property;*
- (2) “Qualifying real property” means a single-family or multifamily residential dwelling or a nonresidential building, regardless of ownership, that a municipality has determined can benefit from energy improvements;*
- (3) “Property owner” means an owner of qualifying real property who desires to install energy improvements and provides free and willing consent to the contractual assessment; and*
- (4) “Sustainable energy program” means a municipal program that authorizes a municipality to enter into contractual assessments on qualifying real property with property owners to finance the purchase and installation of energy improvements to qualifying real property within its municipal boundaries.*

*(b) Any municipality, that determines it is in the public interest, may establish a sustainable energy program to facilitate the increase of energy efficiency and renewable energy. A municipality shall make such a determination after issuing public notice and providing an opportunity for public comment regarding the establishment of a sustainable energy program.*

<sup>1</sup> NOTE: Some consumer protection advocates have voiced concerns about certain bad actors within the residential PACE industry, and as such, recent legislation has been introduced in states such as California (2017 SB 242) and Connecticut (2017 SB 973) to address some of these concerns.



California Streets and Highways Code Chapter 29 - Creation of Contractual Assessment Program  
 ([https://leginfo.legislature.ca.gov/faces/codes\\_displayText.xhtml?lawCode=SHC&division=7.&title=&part=3.&chapter=29.&article=2.](https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=SHC&division=7.&title=&part=3.&chapter=29.&article=2.))

*5898.21. . . upon the written consent of an authorized public agency official, the proposed arrangements for financing the program pertaining to the installation of distributed generation renewable energy sources or energy or water efficiency improvements that are permanently fixed to real property may authorize the property owner to purchase directly the related equipment and materials for the installation of distributed generation renewable energy sources or energy or water efficiency improvements and to contract directly for the installation of distributed generation renewable energy sources or energy or water efficiency improvements that are permanently fixed to the property owner's residential, commercial, industrial, agricultural, or other real property.*

*5898.28. (a) A public agency may issue bonds pursuant to this chapter, the principal and interest for which would be repaid by voluntary contractual assessments. . . Bond proceeds may be used to establish a reserve fund for debt service or paying the costs of foreclosure on properties participating in the program, to fund capitalized interest for a period up to two years from the date of issuance of the bonds, to fund the administrative fee required for participation in the PACE Reserve Program established pursuant to Chapter 4 (commencing with Section 26050) of Division 16 of the Public Resources Code, and to pay for expenses incidental to the issuance and sale of the bonds. . .*

### Green Bank

While on-bill recovery and PACE are tools to lower barriers for repayment by individuals, policies such as green banks (often revolving loan funds) incentivize investment by public and private actors. The Connecticut Green Bank (formerly the Clean Energy Finance and Investment Authority) was the first state attempt at a “green bank.”

Sec. 16-245n. Connecticut Green Bank. Charge assessed against electric customers. Clean Energy Fund

([https://www.cga.ct.gov/current/pub/chap\\_283.htm#sec\\_16-245n](https://www.cga.ct.gov/current/pub/chap_283.htm#sec_16-245n))

*(c) There is hereby created a Clean Energy Fund which shall be within the Connecticut Green Bank. The fund may receive any amount required by law to be deposited into the fund and may receive any federal funds as may become available to the state for clean energy investments. Upon authorization of the Connecticut Green Bank established pursuant to subsection (d) of this section, any amount in said fund may be used for expenditures that promote investment in clean energy in accordance with a comprehensive plan developed by it to foster the growth, development and commercialization of clean energy sources, related enterprises and stimulate demand for clean energy and deployment of clean energy sources that serve end use customers in this state and for the further purpose of supporting operational demonstration projects for*



*advanced technologies that reduce energy use from traditional sources. Such expenditures may include, but not be limited to, providing low-cost financing and credit enhancement mechanisms for clean energy projects and technologies, grants, direct or equity investments, contracts or other actions which support research, development, manufacture, commercialization, deployment and installation of clean energy technologies, and actions which expand the expertise of individuals, businesses and lending institutions with regard to clean energy technologies.*

*(d) (1) (A) There is established the Connecticut Green Bank, which shall be within Connecticut Innovations, Incorporated, for administrative purposes only. The Connecticut Green Bank is hereby established and created as a body politic and corporate, constituting a public instrumentality and political subdivision of the state of Connecticut established and created for the performance of an essential public and governmental function. The Connecticut Green Bank shall not be construed to be a department, institution or agency of the state.*

*(B) The Connecticut Green Bank shall (i) develop separate programs to finance and otherwise support clean energy investment in residential, municipal, small business and larger commercial projects and such others as the Connecticut Green Bank may determine; (ii) support financing or other expenditures that promote investment in clean energy sources in accordance with a comprehensive plan developed by it to foster the growth, development and commercialization of clean energy sources and related enterprises; and (iii) stimulate demand for clean energy and the deployment of clean energy sources within the state that serve end-use customers in the state.*

## Energy Bonds

Another public financing mechanism is a low-cost bonding mechanism such as qualified energy conservation bonds and clean renewable energy bonds. The proceeds from these types of public financing tools can be used on a number of capital projects related to clean energy and energy efficiency. Hawaii passed a law to use green infrastructure bonds to provide special funds for green infrastructure loans, which can be used to install clean energy technology.

2013 Hawaii Senate Bill 1087/Act 211

[http://www.capitol.hawaii.gov/session2013/bills/SB1087\\_CD1\\_.pdf](http://www.capitol.hawaii.gov/session2013/bills/SB1087_CD1_.pdf)

§196-A Definitions. As used in this part:

*“Green infrastructure equipment” means infrastructure improvements, equipment, and personal property to be installed to deploy clean energy technology, demand response technology, and energy use reduction and demand side management infrastructure.*

*“Loan program” and “green infrastructure loans” means the program established by this part and loans made to finance the purchase or installation of green infrastructure equipment for clean energy technology, demand response technology, and energy use reduction and demand side management infrastructure, programs, and services as authorized by the public utilities commission*



*using the proceeds of bonds or other proceeds.*

*§196-E Hawaii green infrastructure special fund. (b) Moneys in the Hawaii green infrastructure special fund may be used, subject to the approval of the public utilities commission, for the purposes of:*  
*(1) Making green infrastructure loans; . . .*

*§196-G Hawaii green infrastructure bond fund. (a) There is established the Hawaii green infrastructure bond fund as a special fund into which all proceeds of the green infrastructure fee established pursuant to section 269-F and any other proceeds of green infrastructure property shall be paid. The Hawaii green infrastructure bond fund may also receive other moneys as the department may determine and as provided in a financing order, including, without limitation, green infrastructure charges.*

*(b) Moneys in the Hawaii green infrastructure bond fund shall be impressed with the lien created by, and shall be used solely for purposes set forth in, section 269-D. Upon payment or defeasance of all bonds and financing costs, moneys in the fund, at the direction of the department, may be transferred into the Hawaii green infrastructure special fund established pursuant to section 196-E or other purpose as the department shall specify.*

### Competitive Grants

States can also set up competitive grant programs that are designed to specifically support low-income/disadvantaged communities. One such example is the California Transformative Climate Communities Program:

2016 California Assembly Bill 2722/Chapter 371

[https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201520160AB2722](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160AB2722)

*PART 4. Transformative Climate Communities Program*

*75240. The Transformative Climate Communities Program is hereby created, to be administered by the Strategic Growth Council. The program shall fund the development and implementation of neighborhood-level transformative climate community plans that include multiple, coordinated greenhouse gas emissions reduction projects that provide local economic, environmental, and health benefits to disadvantaged communities, as described in Section 39711 of the Health and Safety Code. By making such comprehensive public investments, it is the intent of the Legislature that private resources can be more effectively catalyzed to support innovative community and climate transformation in disadvantaged communities.*

*75241. (b)(2) In awarding grants, the council may give priority to plans and projects that cover areas that have a high proportion of census tracts identified as disadvantaged communities and that focus on communities that are most disadvantaged.*

*(c) In order to be eligible for funding under the program, a plan, and a project that implements a plan, shall demonstrate that it will achieve a reduction in emissions of greenhouse gases.*



*(d) The California Environmental Protection Agency shall provide assistance in performing outreach to disadvantaged communities and assessing the environmental justice benefits of project awards.*

*(e) Projects shall maximize climate, public health, environmental, workforce, and economic benefits.*

## Grid Modernization

In order to best support the development of distributed clean energy resources, states are examining ways to upgrade their electrical grids, develop new energy storage systems, and implement advanced metering technologies.

## Distribution Resources Plans

California has enacted policies that require public utilities to submit distribution resources plans to the Public Utilities Commission (PUC). These plans are meant to be the outcome of a stakeholder process that examines the costs and benefits of distributed energy resources.

2013 California Assembly Bill 327/Chapter 611

[https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill\\_id=201320140AB327](https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201320140AB327)

*SEC. 8. Section 769 is added to the Public Utilities Code, to read:*

*(a) For purposes of this section, “distributed resources” means distributed renewable generation resources, energy efficiency, energy storage, electric vehicles, and demand response technologies.*

*(b) Not later than July 1, 2015, each electrical corporation shall submit to the commission a distribution resources plan proposal to identify optimal locations for the deployment of distributed resources. Each proposal shall do all of the following:*

- (1) Evaluate locational benefits and costs of distributed resources located on the distribution system. This evaluation shall be based on reductions or increases in local generation capacity needs, avoided or increased investments in distribution infrastructure, safety benefits, reliability benefits, and any other savings the distributed resources provides to the electric grid or costs to ratepayers of the electrical corporation.*
- (2) Propose or identify standard tariffs, contracts, or other mechanisms for the deployment of cost-effective distributed resources that satisfy distribution planning objectives.*
- (3) Propose cost-effective methods of effectively coordinating existing commission-approved programs, incentives, and tariffs to maximize the locational benefits and minimize the incremental costs of distributed resources.*
- (4) Identify any additional utility spending necessary to integrate cost-effective distributed resources into distribution planning consistent with the goal of yielding net benefits to ratepayers.*
- (5) Identify barriers to the deployment of distributed resources, including, but not limited to,*



*safety standards related to technology or operation of the distribution circuit in a manner that ensures reliable service.*

### Micro-Grids

The next generation of distributed generation will include micro-grids and nano-grids. The [U.S. Department of Energy defines](#) a “micro-grid” as “a group of interconnected loads and distributed energy resources (DER) with clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid [and can] connect and disconnect from the grid to enable it to operate in both grid-connected or island mode.” This definition has also been adopted by Connecticut, one of the early innovators around micro-grids. One important element to this definition is the ability for a micro-grid to operate in “island mode.” In this way, micro-grids can strengthen the entire electricity system’s resilience. Nano-grids are generally defined as micro-grids that serve a single building or single load. Some definitions limit the size of the electricity generation, but this is not always the case. Nano-grids are currently being developed through distributed energy resources such as residential solar panels coupled with energy storage and smart grid technology.

Connecticut Statute Sec. 16-243y. Microgrid grant and loan pilot program to support distributed energy generation for critical facilities.

[https://www.cga.ct.gov/current/pub/chap\\_283.htm#sec\\_16-243y](https://www.cga.ct.gov/current/pub/chap_283.htm#sec_16-243y)

*(5) “Microgrid” means a group of interconnected loads and distributed energy resources within clearly defined electrical boundaries that acts as a single controllable entity with respect to the grid and that connects and disconnects from such grid to enable it to operate in both grid-connected or island mode.*

*(b) The Department of Energy and Environmental Protection shall establish a microgrid grant and loan pilot program to support local distributed energy generation for critical facilities. The department shall develop and issue a request for proposals from municipalities, electric distribution companies, participating municipal electric utilities, energy improvement districts and private entities seeking to develop microgrid distributed energy generation, or to repurpose existing distributed energy generation for use with microgrids, to support critical facilities.*

In response to the devastation caused by Hurricane Sandy, New York has put forward planning and platforms to improve system resilience through microgrids:

STATE OF NEW YORK PUBLIC SERVICE COMMISSION

CASE 14-M-0101 – Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision

<http://www3.dps.ny.gov/W/AskPSC.nsf/All/71BF9B959E12F08A85257FC5005E0679?OpenDocument>

*The functional center of New York’s Reforming the Energy Vision (REV) framework is the distributed system platform provider or DSP. The following DSP definition was developed by the Platform Technology Working Group:*



*The DSP is an intelligent network platform that will provide safe, reliable and efficient electric services by integrating diverse resources to meet customers' and society's evolving needs. The DSP fosters broad market activity that monetizes system and social values, by enabling active customer and third party engagement that is aligned with the wholesale market and bulk power system. Taking into account broader REV objectives such as empowering customers and animating markets, our specific policy toward microgrids will be centered on five attributes:*

- 1. ability to optimize system efficiency within the microgrid and advance REV objectives such as integration of clean distributed generation and addressing grid constraints;*
- 2. interconnection with the larger utility system, assuming a DSP market that allows mutual benefits and services to be monetized;*
- 3. resilience and the ability to island in the event of system outage, particularly where critical customer facilities are involved;*
- 4. the obligation to provide reliable power at just and reasonable rates within the microgrid; and*
- 5. consumer protections for residential customers as required by the Home Energy Fair Practices Act.*

### Virtual Power Plants

Micro-grids and nano-grids function the best when integrated as part of a “virtual power plant” – which [can be defined](#) as “a system that relies upon software and a smart grid to remotely and automatically dispatch and optimize distributed energy resources via an aggregation and optimization platform linking retail to wholesale markets.”

States like Hawaii are moving forward in developing virtual power plants. Their Public Utilities Commission (PUC) has written:

*The Commission also recognizes a growing role for non-utility energy service providers that can intermediate the relationship between the utility and customer by aggregating distributed, customer-side energy resources into controllable resources with technical characteristics that are similar to conventional generation resources, described sometimes as “virtual power plants”. Virtual power plants combine DER (distributed energy resources) to provide seamless, controllable, responsive energy and ancillary services to the grid, much as the utility's existing power plants do today. Hawaii's utilities should take action now to enable incorporation of virtual power plants and integrated energy districts into power system design and operation. (<http://puc.hawaii.gov/wp-content/uploads/2014/04/Commissions-Inclinations.pdf>)*

### Vehicle-to-Grid Systems

Another upcoming innovation to the electric grid is around vehicle-to-grid systems. The U.S. Department of Energy estimated that as of September 2015, more than 360,000 electric vehicles (EVs) had been



deployed in America. And the adoption of EVs provides both a challenge and an opportunity to electric utilities. Delaware has developed a policy to reimburse EV owners for allowing utilities to treat their cars as distributed energy storage by integrating their vehicles to the grid.

Delaware Code Title 26. Public Utilities. Chapter 10. Electric Utility Restructuring

[\(http://delcode.delaware.gov/title26/c010/\)](http://delcode.delaware.gov/title26/c010/)

*§ 1001 Definitions.*

*(17) “Grid-integrated electric vehicle” means a battery-run motor vehicle that has the ability for 2-way power flow between the vehicle and the electric grid and the communications hardware and software that allow for the external control of battery charging and discharging by an electric distribution company, electric supplier, PJM Interconnection, or an aggregator.*

*§ 1014 Public purpose programs and consumer education.*

*(g) A retail electric customer having on its premises 1 or more grid-integrated electric vehicles shall be credited in kilowatt-hours (kWh) for energy discharged to the grid from the vehicle’s battery at the same kWh rate that customer pays to charge the battery from the grid, as defined in paragraph (e)(1) of this section. Excess kWh credits shall be handled in the same manner as net metering as described in paragraph (e)(1) of this section.*



## Communications & Messaging

### Background:

When talking about climate change, here are a few important things to keep in mind:

- First, define the problem.
- When outlining the solution, focus on outcomes rather than process.
- Emphasize the present and make climate change impacts and solutions locally relevant.
- Frame policy solutions in terms of what can be gained (not in terms of what is lost).

### Topline Message:

In order to minimize costs, protect vulnerable communities, safeguard public health, and create jobs, states should maximize clean energy investment now. We have a responsibility to our children and grandchildren to address climate change by investing in sustainable energy sources and moving away from dirty fossil fuels that pollute our air and water.

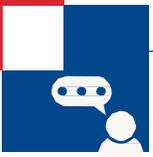
### Talking Points:

#### New Federal Government

- A majority of Americans across party lines support action to address climate change and promote clean energy. Despite the Trump administration's recent attacks on the environment, the reality is that public opinion strongly favors clean, renewable energy over dirty fossil fuels.
- Even Exxon Mobil has declared that it supports aggressive climate action through the Paris climate agreement and has recommended that the agreement remain intact.
- Trump won the election, but he didn't secure the popular vote. He has no mandate to wage a war on public health and the environment by rolling back the Clean Air Act or protections against power plant pollution and any other public health threat.
- Trump's fossil fuel-driven approach to energy will harm public health and the important natural places that are our heritage as Americans. His dangerous policies eliminate vital protections against pollution of the air we breathe and the water we drink and will increase carbon pollution that scientists say is responsible for climate change.
- These policies are a sell-out to the same old corporate interests, Washington lobbyists, and millionaires and billionaires who know how to game the system. A few powerful and well-connected people are angling to make a lot of money, but the rest of us will pay the price.
- Whatever short-term shifts there may be from the new administration, states and power companies know that climate change is real, that the rest of the world is continuing to take action to solve this global crisis, and that our federal government will eventually come back to reality.

#### Economy

- According to the Solar Energy Industries Association, recently approved federal tax credits for renewable energy will attract more than \$40 billion in solar industry investments over the next four



years and more than double the number of jobs in the industry to 420,000. The U.S. Department of Energy estimates that today's 73,000 jobs in the wind industry could grow to 380,000 jobs by 2030.

- The renewable energy industry accounted for approximately 14 percent of America's job growth last year and employs hundreds of thousands of Americans.
- According to the Department of Energy's 2017 [U.S. Energy and Employment Report](#), the solar industry supports nearly 374,000 jobs – more workers than coal, oil, and natural gas combined. The wind industry, meanwhile, [employs more than 100,000 Americans](#).
- If Trump continues to ignore the clean energy economy, he will be ignoring hundreds of thousands of American workers who are helping to build a cleaner, brighter, and more prosperous future.
- On the campaign trail, Trump touted his business experience and promised to focus on American jobs. If he's serious about putting Americans to work, he should invest in building a clean energy economy, not waste taxpayer dollars on propping up dirty energy sources that contribute to climate change and make people sick.

### Public Health

- Clean energy isn't just important for the 2.5 million Americans employed in the industry. It's also important for the other 330 million of us—and our health. That's because clean energy reduces the usage of dirty power sources like coal. Coal-fired power plants are the single largest source of carbon pollution, which fuels climate change and harms public health.
- Dirty air exacerbated by climate change disproportionately affects low-income communities, as well as children, seniors, and those who work or play outdoors (Integrated Science Assessment for Particulate Matter- Final Report, EPA 2009). According to the International Energy Agency, exposure to air pollution is linked to the premature deaths of 6.5 million people every year. That makes it the fourth largest threat to human health after high blood pressure, dietary risks, and smoking.
- Carbon pollution exacerbates climate change and contributes to more frequent and more violent extreme weather, which costs communities, the federal government, and our economy billions every year and threatens public health.
- A 2007 study by researchers at Stanford University found a direct link between increases in carbon dioxide emissions and increases in human mortality, with each increase of 1 degree Celsius in the earth's temperature caused by industrial carbon pollution resulting in air pollution that would lead annually to about a thousand additional deaths in the U.S.
- Particle pollution, which can linger in the air for hours – sometimes days – can increase the risk of heart attacks, strokes, and emergency room visits. Currently, close to 45 million Americans live in 58 counties that experience far too many days of unhealthy spikes in particle pollution. ([American Lung Association, 2016 State of the Air Report](#))
- According to the American Lung Association 2012 State of the Air report, "In addition, the body's defenses that help adults fight off infections are still developing in young bodies. Children have more respiratory infections than adults, which also seems to increase their susceptibility to air pollution." ([American Lung Association, State of the Air Report, 2014](#))



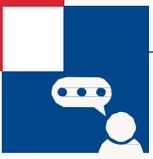
- “Researchers for Johns Hopkins, Harvard and Yale universities reviewed a nationwide health database of 12.5 million older Americans on Medicare and found that increases in outdoor temperatures raise the risk for the elderly of being rushed to the hospital with respiratory disorders. ‘All else being equal for the same time in summer, a day that’s 10 degrees hotter will tend to have 4.3 percent more hospitalizations,’ said G. Brooke Anderson, the study’s lead author and a postdoctoral biostatistics researcher at Hopkins’ Bloomberg School of Public Health. The findings appeared in the March issue of the American Journal of Respiratory and Critical Care Medicine.” ([Baltimore Sun, 5/10/13](#))

### Rapid Renewable Growth

- The shift to a clean energy economy is already underway – driven by market forces, bolstered by consumer demand, and supported by major American companies that are already investing in clean energy. Slowing the transition to clean energy is bad for business, bad for public health, and bad for the economy.
- Just three years ago, the U.S. was on the cusp of installing its 10th gigawatt of solar power. Now, we’re about to see 10 gigawatts of photovoltaics alone come online within just a matter of months.
- This growth is no surprise, as renewable energy like wind and solar is expected to attract two-thirds of all power plant investment from 2016 to 2040.
- Smart states are moving forward with their own customized plans to meet long-term carbon pollution reduction targets and take advantage of the benefits of a clean energy economy. Creating more jobs while reducing pollution is a win-win proposition.
- Climate deniers in Congress are trying to force states to rely on 19th century dirty energy technology to power a 21st century economy. But doing so only denies states the ability to invest in the booming clean energy sector.

### On Going 100% Renewable

- Numerous experts agree that the biggest hurdle to going 100% renewable is not technical or financial but political. Technologies to get us to 100% renewable energy exist and are getting cheaper and more sophisticated all the time. Building the political will in the face of entrenched interests is the largest challenge, and this is up to we the people.
- Action today is critical because decisions about what energy system we have in the future are happening now. Regulations, policies, and energy infrastructure choices impact investments and how we get our energy for decades to come. If we want to see decentralized 100% renewable energy in 20 or 30 years, we need to make sure the right decisions get made in the next few years.
- 100% renewable energy is not a question of if, but of when, how, and who will lead and profit. Non-renewable energy sources, by definition, will only deplete. In the meantime, continued dependence on them is causing multiple crises. If we want energy, transitioning to 100% renewable sources is inevitable. The real issues are when we do it, how we get there, and who is going to move quickly and reap the greatest benefits.
- Support for 100% renewable energy transcends partisan, cultural, and socio-economic lines. The



frontrunner leaders of the growing 100% renewable energy movement are a remarkable mix of conservative and progressive, urban and rural, wealthy and developing. Their circumstances and priorities may differ, but what they have in common is recognition that renewable energy adds value to them and their communities.

- 100% renewable energy targets in the business sector have gone from pipe dream to mainstream. According to the EPA, more than 1,000 businesses in the United States alone have adopted 100% renewable electricity goals. It's not just the typical "green" brands that are recognizing that renewable energy is good for their bottom line; household names like Staples, Ikea, BMW, and Apple have jumped on board. The Business for Environment (B4E), which is among the biggest international business conferences to focus on sustainability issues, also officially advocates for 100% renewable energy.

### Energy Storage

- Energy storage may act as inventory of electric energy on the grid, adding a buffer to what is otherwise a just-in-time delivery system.
- Energy storage may make the overall grid more flexible, allowing for the accommodation of more variable generation such as renewables and reducing the strain on conventional generators.
- Energy storage may increase the reliability and resiliency of the grid by providing temporary local sources of electricity, augmenting the transmission and distribution network.
- Energy storage may also reduce the potential for future rate increases by allowing deferral of grid upgrades and increasing asset utilization on the grid.
- In the United States, about 2.1% of generated electricity is stored; in Europe, about 4.5% of generated electricity is stored; and in Japan, about 8.8% of generated electricity is stored.

### Opposition Messaging & Responses:

Argument: Climate change isn't real, and if it is, then it isn't caused by humans.

*"The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive."* –President Donald Trump, 11/6/2012

(<https://twitter.com/realdonaldtrump/status/265895292191248385?lang=en>)

*"I think that measuring with precision human activity on the climate is something very challenging to do. And there's tremendous disagreement about the degree of impact. That - so, no, I would not agree that it's a primary contributor to the global warming that we see."* –Administrator Scott Pruitt, Environmental Protection Agency, 03/9/2017

(<http://www.npr.org/2017/03/09/519499975/epa-head-scott-pruitt-doubts-basic-consensus-on-climate-change>)

Response: 97% of scientists now agree that carbon pollution is a major cause of climate change, and



Americans can already see that climate change is creating more extreme and costly weather events, including superstorms, droughts, and wildfires that threaten communities and businesses. Politicians who support pro-fossil fuel policies are denying the science of climate change and are just looking to protect their own self-interest by doing the bidding of the oil companies and other polluters who fund their campaigns.

Argument: Dealing with climate change would be too costly or difficult.

*“Serious carbon dioxide abatement demands huge changes in basic infrastructure, lifestyles, and institutions in order to curb energy consumption or replace fossil fuels with alternative energy sources. Imposing such onerous transformations upon society is not something most governments have the power to accomplish, much less the political will.” –Lee Lane, the Hudson Institute, 2014*

(<http://www.thenewatlantis.com/publications/toward-a-conservative-policy-on-climate-change>)

*“Are we flush at the moment, with plenty of fiscal and economic room to make bad policy bets? No, I do not think we are.” –Ross Douthat, columnist for The New York Times, 6/24/2014*

([https://douthat.blogs.nytimes.com/2014/06/24/reform-conservatism-and-climate-change/?\\_r=0](https://douthat.blogs.nytimes.com/2014/06/24/reform-conservatism-and-climate-change/?_r=0))

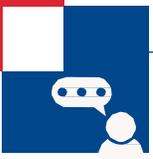
Response: Unchecked, climate change could have wide-ranging impacts on Americans, including: amplified health threats caused by extreme weather; increased ozone pollution that would cause diminished lung function; increased hospitalizations for cardiovascular, kidney, and respiratory disorders; greater smoke exposure from increased wildfires; increased deaths from flooding; and an increase in disease spread by insects. Clean air and water are critical to the health of all Americans. We have a responsibility to our children and grandchildren to address climate change by investing in sustainable energy sources and moving away from finite energy sources that pollute our air and water. The longer we put it off, the more expensive and painful it will be for our economy and our families to solve this problem.

Argument: The cost of renewable energy can't compete with fossil fuel.

*“Despite [substantial political and policy] support, wind and solar power have exhibited poor outcomes in terms of market competitiveness with power generation using such conventional fuels as coal and natural gas . . . the projected cost of renewable power in 2016, including the cost of backup capacity, is at least five times higher than that for conventional electricity.” –Benjamin Zycher, American Enterprise Institute, 1/17/2012*

(<http://www.aei.org/publication/wind-and-solar-power-part-i-uncooperative-reality/>)

*“I think that given the fact that solar is really expensive, even when it's made in China, it just goes to show that even if this stuff is made for free, with slave labor, economically, it still doesn't make sense. Nobody can really afford to do this.” –Steve Milloy, Founder of JunkScience.com, 2011*



<https://mediamatters.org/embed/clips/2011/09/02/19816/fnc-ywwnc-20110901-yourworldmilloy>

Response: New wind power and/or solar power plants are typically cheaper than new coal, natural gas, or nuclear power plants—even without any governmental support for solar or wind. The world recently passed a turning point and is adding more capacity for clean energy each year than for coal and natural gas combined. In 2015, renewables surpassed coal to become the largest source of global electricity capacity and are expected to cover more than 60% of global power capacity growth over the next five years. Peak fossil fuel use for electricity may be reached within the next decade.

Conservative estimates of the life cycle cost of coal and the waste stream generated indicate that coal costs the U.S. public up to \$500 billion annually in external costs. When adding in these externalities, the price of electricity from coal is actually up to three times higher than the market price, making wind, solar, and other forms of non-fossil fuel power generation even more economically competitive.

### Polling:

#### Climate Change

[Gallup Poll](#)-Sixty-four percent of U.S. adults say they are worried a “great deal” or “fair amount” about global warming, up from 55% at this time last year and the highest reading since 2008.

- 65% of Americans now say increases in the Earth’s temperature over the last century are primarily attributable to human activities rather than natural causes. This represents a striking 10-percent-age-point increase in the past year and is four points above the previous high of 61% in 2007.

#### [Yale and George Mason Universities](#)

- Two-thirds of registered voters (66%) say the U.S. should reduce its greenhouse gas emissions, regardless of what other countries do.
- A majority of registered voters say corporations and industries should do more to address global warming (72% of all registered voters; 87% of Democrats, 66% of Independents, and 53% of Republicans).
- Nearly eight out of ten registered voters (78%) support taxing global warming pollution, regulating it, or using both approaches, while only one in ten opposes these approaches.

#### Clean Energy

##### [Pew Research Center](#)

- Eighty-nine percent of Americans favor more solar panel farms, while just 9% oppose. A similarly large share supports more wind turbine farms (83% favor, 14% oppose).
- By comparison, the public is more divided over expanding the production of nuclear and fossil fuel energy sources. Specifically, 45% favor more offshore oil and gas drilling, while 52% oppose. Similar shares support and oppose expanding hydraulic fracturing or “fracking” for oil and gas (42% favor and 53% oppose). Forty-one percent favor more coal mining, while a 57% majority opposes it.
- Across the political spectrum, large majorities support expansion of solar panel and wind turbine



farms. Eighty-three percent of conservative Republicans favor more solar panel farms; so, too, do virtually all liberal Democrats (97%). Similarly, there is widespread agreement across party and ideological groups in favor of expanding wind energy.

- Among all who have installed or given serious thought to installing solar panels, large majorities say their reasons include cost savings on utilities (92%) or helping the environment (87%).

### Gallup Poll

- 59% of those surveyed indicated that “protection of the environment should be given priority, even at the risk of limiting the amount of energy supplies—such as oil, gas and coal—which the United States produces.” (34% wanted to prioritize development of energy supplies.)
- 71% responded that in order to solve the nation’s energy problems, the U.S. should “emphasize the development of alternative energy such as wind and solar power.” (23% wanted to emphasize production of more oil, gas, and coal supplies.)

### Sample Social Media Content:

Here are some sample tweets you can adapt for your own use. This language can also be easily modified for posting on Facebook:

The oil and gas industry is putting [STATE] kids at risk. We must protect #CleanAir4Kids.

Cutting methane will also reduce pollution that causes [X] childhood asthma attacks in [STATE] #CleanAir4Kids.

A majority of Americans across party lines support action to address #climatechange and promote #cleanenergy.

States should maximize #cleanenergy investment to minimize costs, protect vulnerable communities, safeguard public health & create jobs.

#Trump won the election, but he didn’t secure the popular vote. He has no mandate to wage a war on #publichealth and the #environment.

#Solar industry supports nearly 374k jobs and #wind industry supports over 100k - more than coal, oil & natural gas combined. #cleanenergy

Dirty air exacerbated by #climatechange disproportionately affects low-income communities, children & seniors. #cleanenergy

Carbon #pollution contributes to more frequent & violent extreme weather, costing our economy billions



each year. #climatechange

Smart states are moving fwd w/ plans to meet long-term carbon pollution reduction targets and reap the benefits of a #cleanenergy economy.

If we want to see 100% renewable energy in 20-30 years, we need to make sure the right decisions get made now. #cleanenergy



## ADDITIONAL RESOURCES

### Exemplary & Model Legislation

[Arizona Administrative Code Title 14](#)

[2015 Hawaii House Bill 623](#)

[2013 Hawaii Senate Bill 1087/Act 211](#)

[2015 Vermont House Bill 40/Act 56](#)

[2016 California Assembly Bill 2722/Chapter 371](#)

[2015 California Senate Bill 350](#)

[2013 California Assembly Bill 327/Chapter 611](#)

[Connecticut Statute Sec. 16a-40m](#)

[Connecticut Statute Sec. 16-243y](#)

[Connecticut Green Bank/Sec.16-245n](#)

[Colorado Statutes Title 40. Utilities § 40-2-127](#)

[Delaware Code Title 26. Chapter 10](#)

[2016 Nebraska Legislative Bill 1012](#)

[Vermont Statutes Title 30: Public Service/Chapter 089](#)

[New Mexico Administrative Code Title 17/Chapter 9/Part 572](#)

[New York Article 8, Title 9-A § 1896](#)

### Policy Briefs & Reports

[Advancing Grid Modernization and Smart Grid Policy](#), Advanced Energy Economy, December 2013

[State of the Air 2016](#), American Lung Association

[Expect the Unexpected: The Disruptive Power of Low-carbon Technology](#), Carbon Tracker Initiative, February 2017

[Blocking the Sun: Utilities and Fossil Fuel Interests That Are Undermining Solar Power](#), Environment America, December 2016

[State Leadership Driving The Shift to Clean Energy](#), Georgetown Climate, November 2016

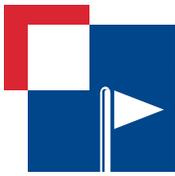
[Shared Renewable Energy for Low- to Moderate-Income Consumers](#), IREC, March 2016

[Just Energy Policies: Reducing Pollution and Creating Jobs](#), NAACP, January 2014

[State Renewable Portfolio Standards and Goals](#) National Conference of State Legislatures, December 2016

[Cleaning Up Our Act on Energy and Reaping the Benefits](#), NRDC, November 2016

[American Wind Farms: Breaking Down the Benefits from Planning to Production](#), NRDC, September 2012



[Comprehensive Clean Energy and Climate Legislation Will Bring More Jobs, a Stronger Economy, and Less Pollution](#), NRDC, April 2010

[Clean Energy Momentum: Ranking State Progress](#), Union of Concerned Scientists, April 2017

[Financing Clean Energy](#), Union of Concerned Scientists, July 2015

[Solar Power on the Rise](#), Union of Concerned Scientists, August 2014

[Cleaner Air and Better Health: The Benefits of Ohio’s Renewable and Efficiency Standards](#), ELPC, LCV, NRDC, September 2015

[Sec. 15. 2016 Plug-In Hybrid and Electric Vehicle Registration Fees](#), Vermont Agency of Transportation, December 2016

[The Energy Report: 100% Renewable Energy by 2050](#), World Wildlife Fund, January 2011

[Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide](#), National Academies of Sciences, Engineering, and Medicine, 2017

[Lazard’s Levelized Cost of Energy Analysis – Version 10.0](#), Lazard, December 2016

#### Messaging & Communications Materials

[Renewable Energy Social Media Toolkit](#), The Climate Reality Project

[Bipartisan Support for PACE](#), PACENation

[Yale Climate Opinion Maps – United States](#), Yale Program on Climate Change Communication, April 2015

[Simple Messages Increase Understanding of the Climate Change Consensus](#), Yale Program on Climate Change Communication, April 2015

[How to Communicate the Scientific Consensus on Climate Change](#), Yale Program on Climate Change Communication, July 2014

#### Graphics

[50 State 100% Infographics](#), The Solutions Project

[50 State Interactive Map to Go!](#), The Solutions Project

[50 State Energy Mix, Transition to 100% Clean, Renewable Energy by 2050](#), The Solutions Project

[Ramping Up Renewables: Energy You Can Count On](#), Union of Concerned Scientists