

OPPORTUNITIES TO INCREASE CORPORATE ACCESS TO ADVANCED ENERGY: A NATIONAL BRIEF

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EXECUTIVE SUMMARY

For many companies, the ability to control energy costs and sources is a key factor when deciding where to locate or expand their operations. Advanced energy sources that use little or no fuel, such as wind, solar, hydropower, fuel cells, and energy storage create opportunities for corporations to capture savings and hedge against energy price volatility. The price of advanced energy sources has decreased dramatically during the past decade, and companies are increasingly seeking to purchase power from these resources in order to increase competitiveness and achieve corporate responsibility targets. A growing number of corporations have set formal goals for purchasing renewable energy, which they are integrating into their operations and decision making.

While companies across the country are purchasing advanced energy at an unprecedented rate, policy and regulation in many states constrains certain types of purchases. In some states, legislators, utilities, or utility regulators have enacted policies to expand corporate access to advanced energy. Such policies allow states to support corporate goals and attract or retain a strong corporate presence. At the same time, states that unlock corporate investment in advanced energy also stand to grow their advanced energy industry without expending state resources. Those states that choose to enact policies allowing corporate purchases of advanced energy will benefit most from the investment, tax revenue, jobs, and infrastructure upgrades that come with the resulting projects.

To understand the role that policies to expand corporate access to advanced energy could play across the country, this report first identifies policy options that states are using to enable corporate advanced energy purchases. The report then considers where these policies have the greatest potential to expand corporate access to advanced energy, assessing the regulatory and policy environment, potential market size for corporate purchases, and renewable energy potential of all 50 states. From this analysis, 11 states emerged among the top 5 for one or more of the policies profiled on the basis of its potential to increase corporate access to renewable energy: Alabama, California, Florida, Georgia, Indiana, Kentucky, Michigan, Minnesota, North Carolina, Ohio, and Texas. By the same metrics, an additional seven states emerged among the top 10 for one or more of these policies: Louisiana, Iowa, Missouri, South Carolina, Tennessee, Virginia, and Wisconsin.

The six policies considered in this report have been enacted in one or more states across the country, and were specifically selected as policies that allow companies to go beyond renewable energy certificate (REC) purchases. These policies can be broadly grouped into those that support purchases from offsite power plants (e.g., large-scale wind and solar facilities), and those that enable the installation of advanced energy on corporate property (e.g., rooftop solar, fuel cells, energy storage, and small-scale wind). The six policies are outlined below, along with a brief explanation of the criteria used to identify states in which each policy would particularly increase corporate access to advanced energy.

Policies to enable companies to purchase electricity from large offsite advanced energy projects. In states that allow customers to choose their electricity providers, companies already have several options to pursue offsite

Access to Advanced Energy: By the Numbers

3.1 GW

new renewable capacity under contract with a renewable purchaser in 2015

450 GW

renewable energy capacity needed to meet half the electricity needs of commercial and industrial customers

72%

of companies surveyed by PricewaterhouseCoopers in 2016 are actively pursuing advanced energy purchases.

purchases. In vertically integrated electricity markets, states are using three policy-enabled purchasing pathways to allow companies to access offsite generation:¹

- **Utility renewable energy tariffs:** Utility renewable energy tariff programs, sometimes referred to as “green tariffs,” allow customers to opt-in to a portfolio of competitively procured renewable energy supplied through their utility. In contrast to REC-based utility programs, which typically add a simple premium to customer tariffs, renewable energy tariffs are priced according to the price of renewable energy procured for program needs, such that participating customers could realize savings over time.
- **Utility-enabled back-to-back power purchase agreements (PPAs):** Sometimes grouped together with utility renewable energy tariffs, back-to-back (or “sleeved”) PPAs allow companies in traditionally regulated markets to contract for renewable energy, with the utility agreeing to act as an intermediary between a customer and a specific renewable energy project.
- **Direct access tariffs:** Direct access tariffs allow certain customers in traditionally regulated states, most frequently large energy users, to choose to purchase power from an energy supplier rather than the local distribution utility. Direct access tariffs do not necessarily have a renewable energy requirement, but this pathway does create the opportunity for renewable energy purchases.

While these policies enable different purchasing pathways, they all address the same regulatory barriers, and the criteria to identify states with high potential (and therefore the states identified) are the same for all three policies. States were only considered for these three policies if they do not currently allow electricity choice. Top states for expanding corporate access to offsite projects were distinguished by their strong commercial and industrial sector and strong resource potential.

Policies to enable companies to purchase advanced energy from distributed energy resources. Most states around the country currently have policies in place that support distributed advanced energy, but not all of them are structured to enable the participation of larger corporate users. Through discussions with corporate purchasers,² three policy designs were highlighted as improving access:

- **Raising system size limits:** Restrictive distributed energy system capacity limits prevent large consumers from using these projects to serve a significant portion of their demand.
- **Allowing third-party ownership:** In states allowing third-party ownership, corporations can partner with third parties to make project financing and operation of distributed resources much simpler.
- **Allowing virtual or aggregated metering:** Virtual or aggregated metering allow companies to apply the output from one or more distributed energy facility to multiple corporate meters (or buildings), serving companies whose needs are not met by a single onsite system at a single building.³

States were considered for one of these policies to enable distributed generation if they have an established means to compensate distributed energy resources, and if they currently lacked one or more of the three policy solutions. States highlighted as candidates for expanding corporate access to these projects were identified by their strong commercial and industrial sector load at facilities capable of hosting onsite resources, and by their strong solar potential, since distributed generation is currently dominated by solar PV.

¹ This report does not consider pathways that are not directly associated with potential state policies. This includes options which do not require any specific state policy in order to be utilized, such as synthetic PPAs, and options generally only available in restructured electricity markets, such as direct PPAs with competitive suppliers, since this report does not assume that states will adjust their overall utility regulatory frameworks.

² Policies enabling renewable energy purchases were initially identified through a series of conversations between Advanced Energy Economy and leading corporate purchasers and non-governmental organizations, which were then refined to select the issues discussed here. This set of policies is not intended as an exhaustive account of the ways in which states may take action to enable distributed energy projects, but to focus on a small number of specific policies that have been implemented to varying degrees in support of corporate access across the country.

³ Virtual net metering is often discussed as a key enabler of community/shared renewable energy models, which are often used to increase renewable energy access for residential or small commercial customers. For large corporate purchasers, this report contemplates virtual net metering primarily as a means of developing a renewable energy project that is used to offset the energy loads at multiple meters on a corporate campus or in-state corporate locations.

The analysis reviewed the potential to serve large corporate load with renewable energy purchasing mechanisms enabled by these various policies. The top states with policy opportunities for increased corporate renewable energy access—determined by an index that combined corporate energy consumption, in-state renewable energy resources, and the existence of supporting policies—are listed in Table 1.⁴ The Table also lists the total annual electricity consumption by large corporations and the equivalent renewable energy capacity that would be required to serve that demand.

Table 1 – States ranked among the top 5 states for one or more of the identified policies, based on potential to increase corporate access to advanced energy

State	Highly Ranked by Purchasing Pathway				Annual Large Corporate Consumption (GWh/yr)	Corresponding Renewable Energy Capacity (MW)
	Large Offsite Purchasing	Raise DG System Cap	Enable Third Party Ownership	Enable Virtual Metering		
Texas		X		X	106,945	40,876
California	X	X			78,504	28,909
Florida	X		X	X	49,414	19,078
Ohio				X	48,888	19,674
Indiana	X		X	X	39,876	15,842
Georgia				X	38,225	14,859
North Carolina			X		36,697	14,216
Michigan	X	X			30,608	12,317
Kentucky		X			29,845	11,830
Alabama		X	X		28,154	10,982
Minnesota	X		X		20,591	8,133

⁴ It is important to note that this index did not account for factors such political feasibility, economic costs and benefits, or other stakeholder concerns. The purpose of this list is not to identify all states where policy implementation would be beneficial, or to identify states where policies are likely to be enacted, but instead to identify states where successful implementation and market response could be expected to extend additional advanced energy access opportunities to serve the largest amount of corporate demand.

INTRODUCTION

In an increasingly competitive globalized economy, any opportunity to control energy costs is an obvious advantage for businesses. With multiple options to pursue either onsite installations or contract for offsite power, advanced energy offers just that. As prices for wind, solar, energy storage, and other technologies continue to fall, advanced energy provides not only greater control over energy budgets, but also a break from volatile electricity costs. Corporations across America have recognized this opportunity and acted accordingly, contracting for 3.1 gigawatts (GW) of renewable energy in 2015—double the amount procured by corporate purchasers the previous year.⁵

Recent corporate purchases are the product of a much larger commitment by companies to pursue renewable energy, driven by both economics and corporate commitments to make their business operations more environmentally sustainable. In 2014, 43% of Fortune 500 companies and 60% of Fortune 100 companies had set climate and/or clean energy targets, and in 2016, 72% of companies surveyed by PricewaterhouseCoopers were actively pursuing advanced energy purchases.⁶ Nationally, if even half of commercial and industrial electricity demand were met by renewable energy, this would drive development of nearly 450 gigawatts (GW) of renewable energy—more than four times the current capacity of wind and solar, and equivalent to the electricity required to power over 100 million houses.⁷

Despite impressive progress to date, the path to corporate renewable energy purchases is often less than clear. Market activity has been dominated by a small group of companies that have the determination and resources to navigate complicated regulatory waters. Opportunities also vary significantly across the country, and companies in some states are left with few options—if any—to pursue advanced energy. In these states, companies with firm advanced energy commitments are forced to explore other options, such as finding alternative locations for their operations or leaving their utility service provider.

As companies make their intention to purchase advanced energy increasingly clear, policymakers in some states have developed solutions that allow utilities to meet customers' changing needs. These policies enable states to retain and attract a strong corporate presence while also leveraging corporate investments to help grow the state's renewable energy industry.

To understand the role that policies to expand corporate access to advanced energy could play across the country, this report first identifies key policy options available to states. The report then considers where these policies have the greatest potential to expand corporate access to advanced energy, assessing the regulatory and policy environment, potential market size for corporate purchases, and renewable energy potential of all 50 states. From this analysis, 11 states emerged among the top 5 for one or more of the policies profiled on the basis of its potential to increase corporate access to renewable energy: Alabama, California, Florida, Georgia, Indiana, Kentucky, Michigan, Minnesota, North Carolina, Ohio, and Texas. By the same metrics, an additional seven states emerged among the top 10 for one or more of these policies: Louisiana, Iowa, Missouri, South Carolina, Tennessee, Virginia, and Wisconsin. A full explanation of the methodology used to identify these states is described below.

⁵ Bloomberg New Energy Finance, *2016 Sustainable Energy in America Factbook* (Feb. 2016), http://www.bcse.org/wp-content/uploads/BCSE-2016-Sustainable-Energy-in-America-Factbook_Executive-Summary.pdf.

⁶ David Gardiner & Associates, et al., *Power Forward 2.0: How American Companies Are Setting Clean Energy Targets and Capturing Greater Business Value* (2014), <http://www.pwc.com/us/en/corporate-sustainability-climate-change/publications/corporate-renewable-energy-procurement-survey-findings.html>.

⁷ Based on 2014 commercial and industrial electricity sales, assuming that this electricity is delivered from renewable energy facilities operating at a 30% capacity factor, see U.S. Energy Information Administration, EIA-861, 2014 Total Electric Industry Sales http://www.eia.gov/electricity/sales_revenue_price/pdf/table2.pdf; current installed capacity as of the end of 2015, see Federal Energy Regulatory Commission, Dec. 2015 Infrastructure Update, <http://www.ferc.gov/legal/staff-reports/2015/dec-infrastructure.pdf>; average house electricity use see U.S. Energy Information Administration, How much electricity does an American home use? (Oct. 2015), <https://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3>.

The six policies considered in this report have been enacted in one or more states across the country, and were specifically selected as policies that allow companies to go beyond renewable energy certificate (REC) purchases. These policies can be broadly grouped into those that support corporate purchases of electricity from offsite power plants (e.g., large-scale wind and solar facilities), and those that enable the installation of advanced energy on corporate property (e.g., rooftop solar, fuel cells, energy storage, and small-scale wind). The next section explains the methodology used to assess the potential to increase access to advanced energy through each policy across all 50 states. For each policy, the report identifies five states in which the policy holds significant potential to expand corporate access to advanced energy.

METHODOLOGY

The analysis first identified key policies to expand corporate access to advanced energy based on current practices in states, corporate buyer's stated preferences, and existing barriers to corporate purchases. Priority policies were initially identified through conversations with leading corporate purchasers and non-governmental organizations, which were then refined to select the issues discussed here.⁸ This set of policies was developed based on the assumption that state policy goals would target and prioritize enabling broad corporate access to renewable energy purchasing options—in practice, states may face competing or conflicting policy objectives that make these policies less attractive.

For each state, the analysis calculated the annual energy consumption of the large corporate sector (defined here as companies employing over 500 workers in a given state), and subdivided by industry.⁹ An index was then developed to rank the opportunity in each state for each policy intervention according to three factors, which are also summarized in Table 2 below:

1. Regulatory and policy status, indicating whether a given policy was meaningful given a state's regulatory regime;¹⁰
2. Market size, as measured by large corporate electricity consumption in that state; and
3. Available resources, measuring the available renewable energy resource potential in a state.¹¹

⁸ The resulting set of policies is not intended as an exhaustive account of the ways in which states may take action to enable in-state distributed energy projects, but to introduce the opportunity for a small number of specific policies that have been implemented to varying degrees across the country.

⁹ This analysis was conducted by combining several federally-maintained datasets. Estimates of average per-facility consumption by state were compiled from the Commercial Building Energy Consumption Survey and Manufacturing Energy Consumption Survey datasets available through the U.S. Energy Information Administration. See U.S. Energy Information Administration, *Manufacturing Energy Consumption Survey* (2010), <http://www.eia.gov/consumption/manufacturing/data/2010/> and *Commercial Buildings Energy Consumption Survey* (2010), <http://www.eia.gov/consumption/commercial/>. These estimates were multiplied by the number of facilities in each industry and state included in the U.S. Census Bureau's Statistics of U.S. Businesses (SUSB) database to calculate a preliminary estimate of electricity consumption by industry and state (as SUSB subsets data by total in-state employment, a separate estimate for the large corporate—i.e. more than 500 employees in a given state—sector was also calculated). See U.S. Census Bureau, *Statistics of U.S. Businesses*, <http://www.census.gov/programs-surveys/susb.html>. These preliminary estimates were then scaled so that the sum equaled actual commercial and industrial sectors retail sales, known through the EIA Form-861 Electric Power Sales database. See U.S. Energy Information Administration, *Form EIA-861, Table 5.4.A.*, https://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_5_4_a.

¹⁰ For example, policies to enable some form of PPA are only relevant where companies cannot pursue traditional PPAs (such as in many vertically integrated markets), and modifications to onsite metering policies are only meaningful interventions in states that have enacted some form of compensation for onsite generation. Additionally, states that had already enacted a particular policy were excluded. This analysis assumed that there would be no change in any state's overall regulatory framework (i.e. that no additional states would deregulate or re-regulate their utility sectors).

¹¹ As reported in: NREL (2012). U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis. Available at: <http://www.nrel.gov/docs/fy12osti/51946.pdf>.

For each of the enabling policies evaluated, these opportunity indices were used to identify the states where significant opportunities are present to enable increased access to renewable energy through policy.¹² This report describes the top-five ranked states for each enabling policy. It is important to note that the states profiled in this report are not the only states that could expand access to corporate renewable energy purchases by enacting one or more of the policies outlined in this report; nor do the policies identified for each state represent the only way for the 11 states profiled here to increase corporate access to advanced energy.

Table 2 – Criteria for identifying states with high potential to expand corporate access, broken down by policy

Purchasing Pathway	Policy	Criteria for identifying states with the largest potential to increase corporate access to advanced energy			Top 5 opportunity states based on criteria considered
		Regulatory and Policy Status	Corporate Electricity Demand	In-State Renewable Energy Potential	
Large Offsite Project ¹³	Utility Renewable Energy Tariff	Regulated utility market; No current electric choice / renewable energy purchasing option	High corporate electricity demand	Significant in-state renewable energy resources	CA, FL, IN, MI, MN
	Utility Back-to-Back PPA				
	Direct Access Tariff				
Distributed Energy Resources	Raise system capacity limits	Policies in place to compensate DERs; Low onsite system capacity limits	High corporate electricity demand at sites with adequate rooftop space ¹⁴	Significant in-state solar energy resources ¹⁵	TX, CA, MI, AL, KY
	Allow third-party ownership	Policies in place to compensate DERs; Third party ownership presently not allowed	High corporate electricity demand at sites with adequate rooftop space	Significant in-state solar energy resources	IN, FL, NC, AL, MN
	Allow virtual or aggregated metering	Policies in place to compensate DERs; Virtual or aggregated metering presently not allowed	High corporate electricity demand	Significant in-state renewable energy resources	TX, FL, OH, IN, GA

¹² It is important to note that this index did not account for factors such political feasibility, economic costs and benefits, or other stakeholder concerns. The purpose of this list is not to identify all states where policy implementation would be beneficial, or to identify states where policies are likely to be enacted, but instead to identify states where successful implementation and market response could be expected to extend additional advanced energy access opportunities to serve the largest amount of corporate demand.

¹³ While these policies enable different purchasing pathways, they all address the same regulatory barriers.

¹⁴ It was assumed that increasing system capacity limits and enabling third party ownership would primarily enable corporate rooftop solar installations. Rooftop solar potential was calculated by applying an industry-specific estimate of the share buildings with adequate solar roof-space to the projected annual energy consumption of that industry in each state.

¹⁵ It was assumed that increasing system capacity limits and enabling third party ownership would primarily enable corporate rooftop solar installations.

POLICY PATHWAYS

The interest in corporate access to advanced energy spans different industries, and companies seeking to purchase advanced energy have varying cost constraints and energy needs, and they operate within and across states with different regulatory structures. Their purchases may be motivated by a different set of goals, and evaluated against different metrics.

Unsurprisingly, there is no one-size-fits-all transaction or contract structure to meet these varying needs. The range of purchasing options starts with simple, low-commitment options like purchasing renewable energy certificates (RECs) or opting into a utility “green power purchasing program” to have RECs included with utility-delivered electricity. However, companies have increasingly expressed a strong desire for purchasing options that go beyond strictly REC-based purchases, since RECs do not generate savings or confer long-term price- or fuel-hedging benefits, nor do they necessarily support new or “additional” project development.¹⁶

The remaining options for companies can be divided into two primary categories: large offsite projects and distributed energy resources. For large offsite projects, in restructured states or states that allow electric choice, companies have the option to pursue PPAs, or to purchase electricity from a competitive renewable energy supplier. For distributed energy resources, in almost all states, companies also have an option to generate electricity and/or install energy storage onsite. However, there are barriers that prevent companies in many states from accessing advanced energy along one or both of these pathways. The next two sections explore each of these pathways in turn, with a focus on policies that facilitate these purchasing options.

POLICY PATHWAY 1: ALLOWING LARGE OFFSITE PURCHASES

Many companies want to invest more directly in advanced energy while also taking advantage of the potential financial benefits these projects offer, including cost savings over time and the ability to hedge against price uncertainty. Both utility-scale facilities (described here) and distribution-scale projects (described below) offer these benefits. Utility-scale projects are a particularly attractive option for companies with high electricity use and in states with good renewable potential and favorable economics for large projects.

The main barrier to accessing large offsite purchases is the electricity market structure in the state where a company or facility is located, and in particular whether utilities are vertically integrated or restructured, as explained below (see “Electricity Market Structure”).

¹⁶ World Resources Institute, *Corporate Renewable Energy Buyers’ Principles* (Dec. 2015), http://www.wri.org/sites/default/files/Corporate_Renewable_Energy_Buyers_Principles.pdf.

POLICY OPPORTUNITY: UTILITY RENEWABLE ENERGY TARIFFS

Utility Renewable Energy Tariffs are emerging as a new policy pathway that, when well designed and implemented, combine the simplicity of a green power purchasing program with the long-term price stability and potential cost savings of competitive project selection. In order to meet customer needs and support significant market demand, these tariffs must meet two basic criteria. First, successful Utility Renewable Energy Tariffs should rely on some degree of competitive procurement, rather than being served through utility-owned projects alone, in order to ensure that customers pay competitive market prices. The utility should procure these projects to match the level and duration of customer commitments. Second, rather than charging a set premium, these programs should be priced according to the long-term power purchase prices of the renewable energy contracts entered into by the utility. As such, participating customers could realize savings immediately or over time, as electricity prices increase relative to the contract price.

While a few states have adopted utility renewable energy tariffs or have such a program under consideration, in some cases these policies do not meet the criteria described above, and as such do not provide a meaningful opportunity for access to advanced energy.¹⁷ While an assessment of the efficacy of existing renewable energy tariffs is beyond the scope of this analysis, in some states amending existing tariffs to make them more competitive and ensure that benefits are passed through to participants likely also presents a policy opportunity.

POLICY OPPORTUNITY: BACK-TO-BACK UTILITY PPA

Companies are increasingly turning to specific utility-scale offsite projects to offset load at their facilities. However, companies in vertically integrated markets have not been able to access this opportunity; indeed, 91% of corporate deals in 2015-2016 have been signed in restructured markets.¹⁸

Back-to-Back Utility PPAs, offered through utilities, provide one policy option to overcome regulatory barriers that keep companies from entering into traditional PPAs. Back-to-back (or “sleeved”) PPAs are specialized tariffs whereby electric utilities agree to procure power from a specified advanced energy facility on behalf of a large commercial customer, and adjust the rate charged to the customer according to the cost of the contracted price negotiated by the customer and the advanced energy facility owner.

POLICY OPPORTUNITY: DIRECT ACCESS TARIFFS

Several traditionally regulated states do offer some degree of retail choice, often termed **Direct Access**, allowing certain customers, generally large energy users, to choose to purchase power from an energy supplier rather than the local distribution utility. While direct access tariffs are not specifically designed to allow access to advanced energy, companies interested in doing so could pursue PPAs and/or purchase electricity from a competitive renewable energy supplier.

States with Policy Intervention Potential for Large Offsite Purchases

Table 3 displays the five states that were ranked highest on the policy opportunity index (described above) for offsite purchases. These are states with regulated electricity markets, no currently available options for the three purchasing pathways described above, high in-state corporate energy consumption, and significant in-state renewable energy resources. By the same metrics, Alabama, Missouri, Iowa, Kentucky, and South Carolina ranked in the top 10.

For each state, Table 3 shows the calculated in-state annual energy consumption by large corporations, as well (to provide a sense of scale) as the amount of renewable energy capacity that would be developed if this energy need were entirely met by new renewable energy resources.¹⁹

¹⁷ World Resources Institute, *Emerging Green Tariffs in U.S. Regulated Electricity Markets* (Feb. 2016), http://buyersprinciples.org/wp-content/uploads/15_IB_GreenTarrif_CHARGE_v9-1.pdf.

¹⁸ Renewable Energy Buyers Alliance, *Perspectives on the Market* (May 2016), <http://rebuyers.org/wp-content/uploads/2016/05/2016-REBA-Summit-Fireside-Chat.pdf>.

Table 3 – Top 5 ranked states for policies to allow large offsite purchases, based on potential to increase corporate access to advanced energy

State	Annual Large Corporate Consumption (GWh/yr)	Corresponding Renewable Energy Capacity (MW)
California	78,504	28,909
Florida	49,414	19,078
Indiana	39,876	15,842
Michigan	30,608	12,317
Minnesota	20,591	8,133

POLICY PATHWAY 2: ENABLING DISTRIBUTED ENERGY RESOURCES

Many companies wish to procure power from local, distributed resources. This option is appealing for companies that have many locations spread across a state or across the country, and is particularly attractive in regions with strong distributed energy potential (generally solar). As distributed energy system costs continue to drop, customers are able to actually save money by investing in distributed energy systems.

Distributed generation projects are a good option for companies that have appropriate space at their facilities to host a project. For customer-facing businesses such as retail stores, onsite generation also allows a company to directly communicate its clean energy commitment to customers. Distributed generation systems can be either customer-owned or third-party-owned, with third-party ownership offering significant benefits in terms of lowering upfront system costs and reducing operating risk to the company over time. Distributed generation projects can also be used to meet load at multiple facilities through virtual or aggregated metering; by which a corporate power purchaser can use a single renewable energy project to meet energy needs at multiple facilities.

In order for either of these options to present an attractive purchasing pathway for large corporate customers, there must be a mechanism in place to credit customers for the generation from distributed energy resources.²⁰ Even in states with such a mechanism in place, there may still be barriers to deployment. Policies that mitigate these barriers could include: raising system size limitations, allowing third-party ownership, and allowing virtual or aggregated metering. Addressing these barriers in states where they exist will open opportunities for increased corporate access to distributed energy resources.

¹⁹ This calculation assumes that wind energy will amount to two-thirds of new capacity, and solar energy will amount to one-third. A wind capacity factor of 33.9% is assumed. See U.S. Energy Information Administration, *2014 wind energy production data*, http://www.eia.gov/electricity/monthly/epm_table_grapher.cfm?t=epmt_6_07_b. A solar capacity factor specific to each state is used. See National Renewable Energy Laboratory, *U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis* (July 2012), <http://www.nrel.gov/docs/fy12osti/51946.pdf>.

²⁰ While all of these states have some mechanism in place to compensate distributed energy resources, this report is focused on *access*, and therefore does not consider whether such policies are currently well-structured or effective at facilitating deployment.

POLICY OPPORTUNITY: RAISING DISTRIBUTED ENERGY SYSTEM LIMITS

Many states impose limits on the size of projects that can qualify for distributed generation programs. These limits restrict the usefulness of distributed energy resources in the corporate sector, since many large companies have electricity needs that would require a system well over 1 MW in size (as compared to a typical home, which could completely meet its needs with a 5-10 kW system). If a state has restrictive limits on system size, a company installing a system large enough to meet any significant portion of its energy needs would not be able to benefit from net metering or other crediting methods, reducing the system's value. Raising net system capacity limits would enable greater corporate access to distributed generation sector, though states may wish to balance this against competing or conflicting policy objectives.

Raising system limits presents a policy opportunity in states that have already implemented a mechanism for compensating distributed generation system owners, but where the limitations on the size of such systems may limit widespread corporate participation. This barrier could be addressed by eliminating capacity limits, raising capacity limits to a higher level (e.g., 5 MW), or tying capacity limits to electricity use. For example, a number of states—including Arizona, Colorado, Georgia, New Jersey, and Ohio—simply stipulate that a given facility cannot generate more electricity than could be consumed onsite over the course of a year. This creates additional market opportunities because it makes it much easier for large energy users to meet their needs.

Table 4 displays the five highest-ranking states on the policy opportunity index for increased distributed energy system limits. These are states with mechanisms in place to credit distributed energy projects for generated electricity, distributed generation system capacity limits that may restrict wide-scale corporate renewable energy purchases, high in-state corporate energy consumption at sites with the potential for onsite generation,²¹ and significant in-state solar energy resources.²² By the same metrics, Indiana, Tennessee, Wisconsin, Missouri, and Louisiana ranked in the top 10.

Table 4 – Top 5 ranked states for policies to raise system capacity limits, based on potential to increase corporate access to advanced energy

State	Annual Large Corporate Consumption (GWh/yr)	Corresponding Renewable Energy Capacity (MW)
Texas	106,945	40,876
California	78,504	28,909
Michigan	30,608	12,317
Alabama	28,154	10,982
Kentucky	29,845	11,830

POLICY OPPORTUNITY: THIRD-PARTY OWNERSHIP

Third-party ownership has been a useful tool in expanding distributed energy in both the residential and commercial markets. Third-party ownership creates the opportunity for large commercial facilities to procure power from distributed energy resources through rate-based PPAs rather than relying on the facility's own cash reserves and

²¹ To create estimates of corporate consumption at sites with good candidacy for onsite generation, the analysis weighted energy consumption by an industry-specific factor that estimated the percentage of sites in that industry which would be able to accommodate significant onsite renewable energy generation.

²² It was assumed that all onsite generation would be solar energy, given common feasibility and regulatory constraints for onsite wind.

debt capacity. Third-party ownership can be particularly effective in addressing financing barriers among corporate power purchasers, and has become an increasingly popular purchasing option in the commercial sector in recent years.²³

Table 5 displays the five highest-ranking states on the policy opportunity index for increased distributed energy system limits. These are states with mechanisms in place to credit distributed energy projects for generated electricity, no current mechanisms allowing third-party ownership of distributed energy resources, high in-state corporate energy consumption at sites with the potential for onsite generation,²⁴ and significant in-state solar energy resources.²⁵ By the same metrics, South Carolina, Kentucky, Tennessee, Wisconsin, and Missouri ranked in the top 10.

Table 5 – Top 5 ranked states for policies to allow third-party ownership, based on potential to increase corporate access to advanced energy

State	Annual Large Corporate Consumption (GWh/yr)	Corresponding Renewable Energy Capacity (MW)
Indiana	39,876	15,842
Florida	49,414	19,078
North Carolina	36,697	14,216
Alabama	28,154	10,982
Minnesota	20,591	8,133

POLICY OPPORTUNITY: ALLOW VIRTUAL OR AGGREGATED METERING

Some companies may benefit from developing a single distributed renewable energy project and using the electricity generated to serve the energy needs of multiple sites, which can be a more efficient and cost-effective means to utilize distributed energy resources. In many states, restrictive policies around distributed energy crediting prevent these flexible options, but there are straightforward solutions.

Virtual energy metering and **meter aggregation** are mechanisms that enable customers to generate energy at a single project and use it as a credit against energy consumption at one or more facilities (or meters) controlled by a single customer, allowing a corporation to efficiently serve energy needs across sites. Typically, such policies act as an expansion of net energy metering regulations

Table 6 displays the five highest-ranking states on the policy opportunity index for increased distributed energy system limits. These are states with mechanisms in place to credit distributed energy projects for generated electricity, no current mechanisms allowing virtual or aggregated metering, high in-state corporate energy consumption, and significant in-state renewable energy resource. By the same metrics, North Carolina, Michigan, Alabama, Virginia, and Missouri ranked in the top 10.

²³ Green Tech Media, *As More Corporations go Solar, How Are the Deals Structured?* (April 2016),

<http://www.greentechmedia.com/articles/read/corporations-go-solar-increasingly-through-third-party-financing>.

²⁴ To create estimates of corporate consumption at sites with good candidacy for onsite generation, the analysis weighted energy consumption by an industry-specific factor that estimated the percentage of sites in that industry which would be able to accommodate significant onsite renewable energy generation.

²⁵ It was assumed that all onsite generation would be solar energy, given common feasibility and regulatory constraints for onsite wind.

Table 6 – Top 5 ranked states for policies to allow virtual or aggregated metering, based on potential to increase corporate access to advanced energy

State	Annual Large Corporate Consumption (GWh/yr)	Corresponding Renewable Energy Capacity (MW)
Texas	106,945	40,876
Florida	49,414	19,078
Ohio	48,888	19,674
Indiana	39,876	15,842
Georgia	38,225	14,859

CONCLUSION

This report highlights the considerable potential for advanced energy growth and economic development in satisfying the growing desire of large corporations to directly purchase electricity to power their facilities from renewable energy generators rather than rely on the mix of resources provided by electric utilities. Corporations may choose to access advanced energy via large offsite projects, or from distributed renewable energy projects, but in some states, regulatory structures and policy frameworks prevent corporations from entering into some or all of these arrangements. These limitations constrain companies’ ability to obtain renewable power for their operations and limit the economic benefit to their host states that comes with improved corporate competitiveness and with renewable energy development more broadly. This report identifies six enabling policies that states are using to expand corporate access to advanced energy.

Three policy options would allow access to utility scale projects and benefit states that do not allow retail choice: **Utility Renewable Energy Tariffs**, which combine the simplicity of a green power purchasing program with the long-term price stability and potential cost savings of competitive project selection; **Back-to-Back Utility PPAs**, which give corporations the ability to contract for renewable energy even in traditionally regulated utility markets; and **Direct Access**, which allows corporations to purchase power from competitive suppliers, which may or may be sourced from renewable energy sources.

States that already provide effective means of crediting distributed energy can also enable corporate investment in distributed energy installations by **raising distributed generation system limits; permitting third-party ownership; and/or allowing virtual or aggregated metering.**

The report identifies states with the greatest potential to expand corporate access to advanced energy by assessing the regulatory and policy environment, potential market size for corporate purchases, and renewable energy potential of all 50 states. From this analysis, 11 states emerged among the top 5 for one or more of the policies profiled on the basis of its potential to increase corporate access to renewable energy: Alabama, California, Florida, Georgia, Indiana, Kentucky, Michigan, Minnesota, North Carolina, Ohio, and Texas. By the same metrics, an additional seven states emerged among the top 10 for one or more of these policies: Louisiana, Iowa, Missouri, South Carolina, Tennessee, Virginia, and Wisconsin.

