ONE POWER COMPANY

AN INDUSTRIAL POWER COMPANY

**ONE POWER COMPANY**

# UNITED STATES MARKET ANALYSIS

SEPTEMBER 2020

LEADING THE ON-SITE ENERGY REVOLUTION FOR C&I CUSTOMERS

20200908

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**One Energy Capital Corporation is an Ohio Corporation.**


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## EXECUTIVE SUMMARY

One Power's market analysis quantifies *Wind for Industry*'s market in the continental U.S. One Power, headquartered in Findlay, Ohio, is the largest installer of on-site wind energy in North America. Since 2009, One Power has installed 40.5 MW of *Wind for Industry* projects for world-class companies. *Wind for Industry* is One Power's flagship energy solution of installing utility-scale distributed wind projects for commercial and industrial (C&I) customers. This market analysis is made up of four components: the Total Addressable Market (TAM), the Serviceable Market (SM), Serviceable Market Growth, and *Wind for Industry's* Expansion Strategy.

The TAM identifies customer facilities that are technically viable based on the unique requirements of utility-scale wind turbine projects. One Power performed site-specific screenings for 822 facilities across four Energy Intensive Sectors and a representative General Industry Sampling. The total number of technically viable locations within the General Industry Sampling was used to extrapolate to all C&I facilities in the continental U.S., creating the General Industry Market Extrapolation. Using the results from the Energy Intensive Sectors and General Industry Market Extrapolation, along with estimated project sizing and cost, One Power estimated the total deployable capital of the TAM.

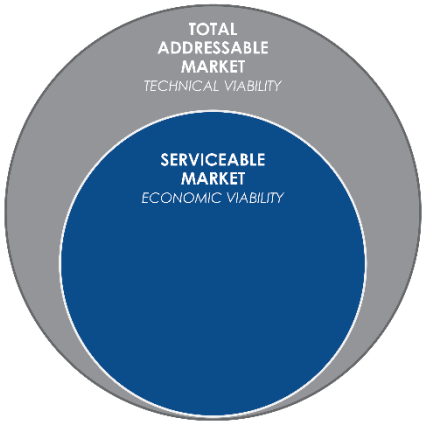
One Power's Serviceable Market (SM) is the segment of the TAM where *Wind for Industry* projects are economically viable. To determine economic viability, One Power compared the current grid rate to the estimated *Wind for Industry* PPA rate for each U.S. county. Using locations that are both technically and economically viable, One Power was able to calculate the total deployable capital of the Serviceable Market.

The Serviceable Market Growth analysis explores areas of business-model improvement including higher turbine efficiency, greater project cost efficiency, and higher grid rates. Scenarios are modeled to see how these improvements, as well as a phase-out of the Investment Tax Credit will impact the Serviceable Market.

The Expansion Strategy analysis creates a State Value Score to explore where One Power should focus its sales strategy. The states were ranked based on their customer concentration, economic viability, and manufacturing output. The highest ranked states closest to One Power's current project footprint will guide *Wind for Industry's* Expansion Strategy.

**TOTAL ADDRESSABLE MARKET**
All technically viable *Wind for Industry* projects in the continental U.S, expressed as deployable capital.

**SERVICEABLE MARKET**
The subset of the TAM where *Wind for Industry* projects are economically viable, expressed as deployable capital.




The key takeaways from the analysis include:

1. The *Wind for Industry* Serviceable Market in the continental U.S. is estimated at $66 billion in deployable capital based on a 0% Investment Tax Credit under current business model conditions (35,825 MW).
2. With a 30% Investment Tax Credit, the Serviceable Market nearly doubles to $120 billion (65,345 MW).
3. The Energy Intensive Sectors including Biodiesel, Cement Production, Ethanol Production, and Refining represent a $3.4 billion market for deployable capital without any Investment Tax Credit (1,865 MW).
4. As economies of scale and known technology improvements become fully effective, the *Wind for Industry* Serviceable Market will increase to $95 billion in deployable capital without any Investment Tax Credit (57,185 MW).
5. Approximately 20% of large C&I facilities will be able to have a technically viable and financially attractive *Wind for Industry* project as the industry reaches maturity.
6. The Investment Tax Credit is not critical to the success of the *Wind for Industry* market.
7. *Wind for Industry's* potential has a sizeable concentration in the Midwest states of Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio. These states are known for having a large manufacturing presence and good wind resource.

8. Texas and California markets each represent a substantial standalone opportunity.

As of January 2020, there are approximately 105,000 MW of wind energy in the U.S. The *Wind for Industry* market represents a substantial growth opportunity for wind energy expansion in the U.S. Due to several barriers to entry (the discussion of which is beyond the scope of this report), less than 200 MW of distributed on-site wind have been deployed to date in the continental U.S**.** As a result, nearly the entire $66 billion market is available to be captured by companies equipped to overcome these barriers.

## INTRODUCTION

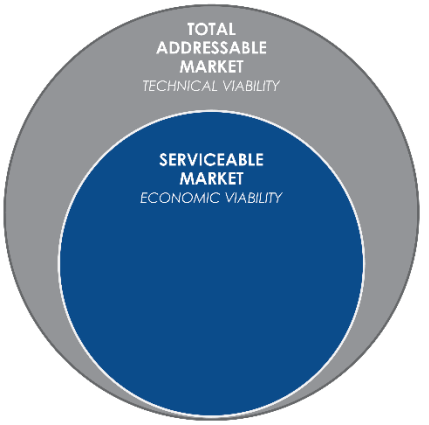
This market analysis was performed to quantify One Power's *Wind for Industry* market in the continental U.S. One Power, headquartered in Findlay, Ohio, is the largest installer of on-site wind energy in North America. Since 2009, One Power has installed 40.5 MW of *Wind for Industry* projects for world-class companies. *Wind for Industry* is One Power's flagship energy solution of installing utility-scale distributed wind projects for commercial and industrial (C&I) customers. This market analysis consists of the Total Addressable Market (TAM), the Serviceable Market (SM), Serviceable Market growth, and One Power's Expansion Strategy. The analysis of the TAM and SM is limited to the continental United States. The results of this report indicate there is a significant nationwide market for *Wind for Industry*, given One Power's current business model.

*Wind for Industry*'s market is made up of the nation's large energy users, which are typically C&I customers. The TAM identifies customer facilities that are technically viable based on the unique requirements of utility-scale wind turbine projects. One Power performed site-specific screenings to estimate the ratio of C&I facilities that are technically viable in the U.S. Using this viability ratio, estimated project sizing, and cost, One Power was able to estimate the total deployable capital of the TAM.

One Power's SM is the segment of the TAM where *Wind for Industry* projects are economically viable. The SM identifies the locations where One Power could offer the customer a lower PPA rate than the average industrial grid rate, making *Wind for Industry* a more attractive energy alternative. One Power believes cost is the single biggest driver of customer decisions; thus, price is the distinguishing factor for the SM. Using locations that are both technically and economically viable, One Power was able to calculate the total deployable capital of the SM.

**TOTAL ADDRESSABLE MARKET**
All technically viable *Wind for Industry* projects in the continental U.S, expressed as deployable capital.

**SERVICEABLE MARKET**
The subset of the TAM where *Wind for Industry* projects are economically viable, expressed as deployable capital.




After identifying the TAM and SM, the Serviceable Market Growth analysis explores how the SM could be impacted by the phase-out of the Investment Tax Credit (ITC), and how One Power will adapt and improve its business model. There are three areas of business-model improvement One Power expects to see: higher turbine efficiency, greater project cost efficiency, and higher grid rates. Based on these improvements, One Power modeled two scenarios to determine the potential to expand the SM.

To capture the market identified, the Expansion Strategy analysis explores where One Power should focus its sales strategy as it moves out of Ohio. One Power created the *Wind for Industry* State Value Score to rank states based on their customer concentration, economic viability, and manufacturing output. The highest ranked states closest to One Power's current project footprint will guide *Wind for Industry's* Expansion Strategy.

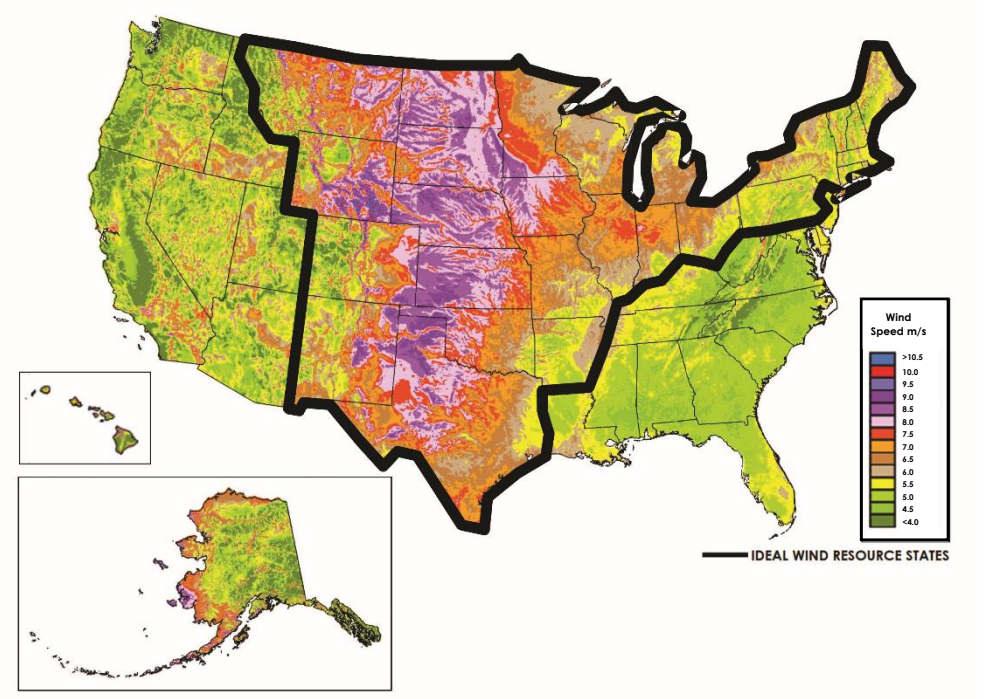
One Power has identified the current and future market potential of *Wind for Industry* by analyzing technical and economic viability data. The results of this market analysis demonstrate that a significant nationwide market exists for *Wind for Industry* projects. This document is a collection of several maps, graphs, and evaluations used to support this conclusion.

## REFERENCE MAPS

The following two pages include a series of Reference Maps. These maps provide a high-level view of several metrics used throughout the U.S. Market Analysis, including wind speed, manufacturing concentration, electricity rates, and the location of power generation facilities. Larger versions of these maps are also provided at the end of this document.

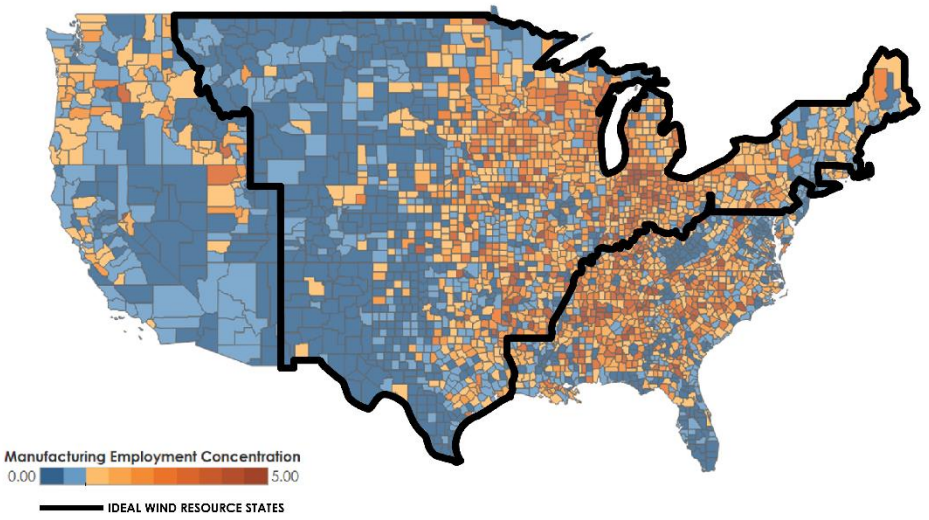
### *Map 1: U.S. Average Wind Speeds at 80 meters*

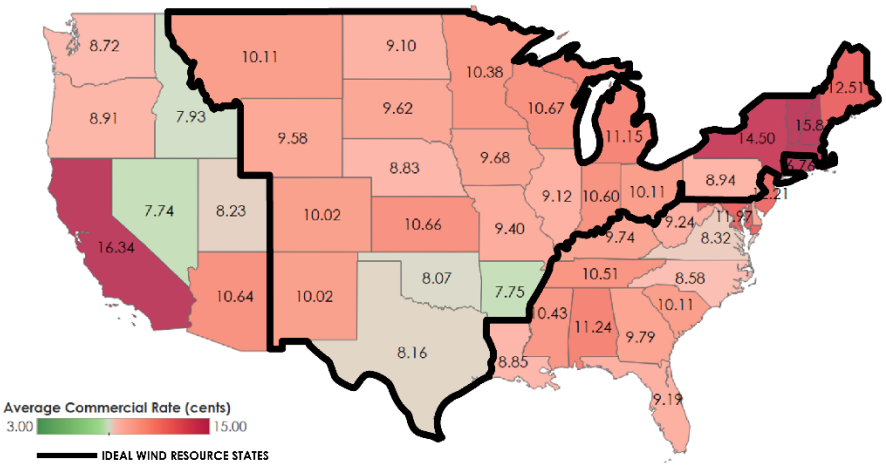
***The black outline is representative of states with generally enough wind for wind energy development.***



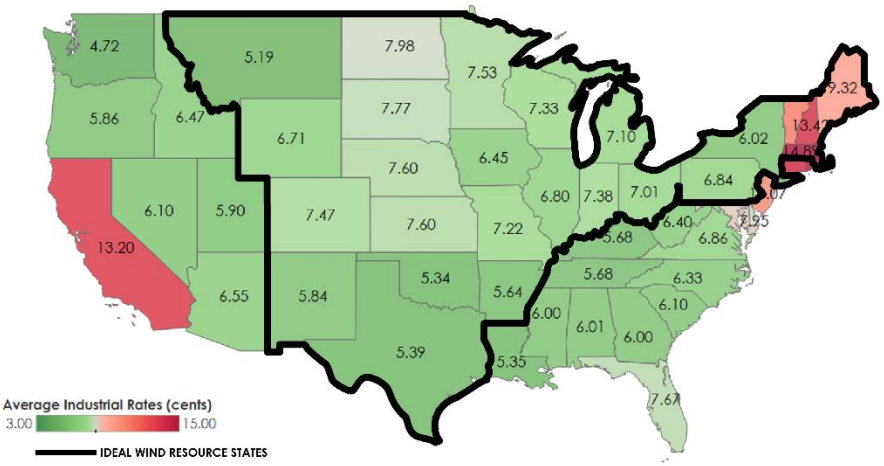

### *Map 2: Manufacturing Concentration by County, 2019*

There are **3,142** counties in the continental U.S.

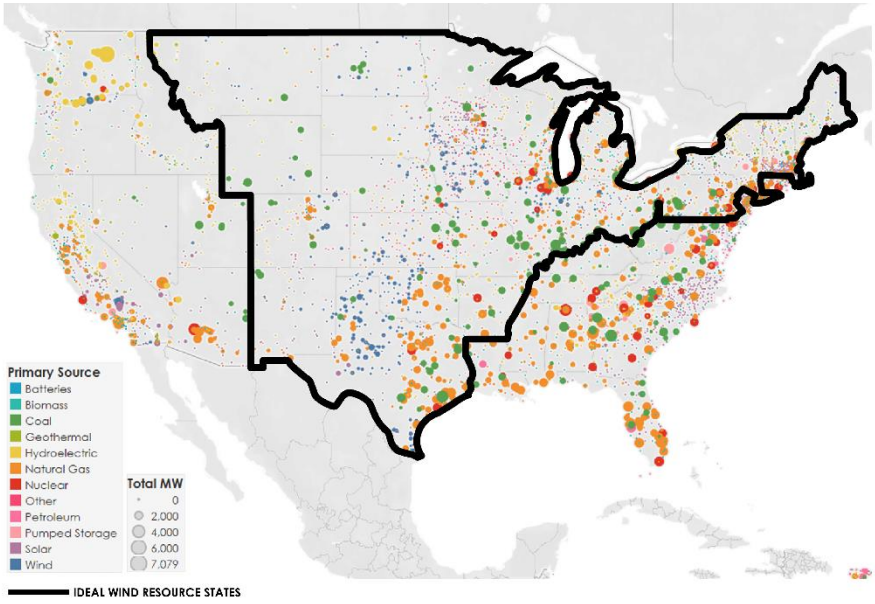





*Map 3:*
*Average Commercial Electricity Rates (cents/kWh), 2018*




*Map 4:*
*Average Industrial Electricity Rates (cents//kWh), 2018*




*Map 5:*
*U.S. Power Generation Facilities, 2020*

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# TOTAL ADDRESSABLE MARKET

All technically viable *Wind for Industry* projects in the continental U.S., expressed as deployable capital.

## Method

One Power investigated the *Wind for Industry* technical viability of potential customers across the U.S. One Power analyzed the TAM by breaking it down into two components: Energy Intensive Sectors, and General Industry Market Extrapolation. The Energy Intensive Sectors are specific industries where One Power has decided to strategically focus business efforts. The General Industry Market Extrapolation is meant to represent all other large C&I sectors. The combination of the Energy Intensive Sectors and General Industry Market Extrapolation comprises *Wind for Industry's* TAM.

The Energy Intensive Sectors include biodiesel, cement manufacturing, ethanol production, and petroleum refining. One Power performed site-specific screenings to determine the technical viability of facilities in these sectors. One Power chose these sectors in part because they tend to be in remote locations and therefore typically have a higher rate of technical viability. The screenings were based on publicly available sector location data. The Energy Intensive Sector analysis uses all known facilities and does not use a representative set.

For the General Industry Sampling, a representative population of facilities was used that included facilities belonging to seven companies from a range of industries. One Power has a location list for each of the facilities used, either from an existing relationship or from publicly available data. The General Industry Sampling covers a wide variety of industries and geographic areas and is a reasonable representation of all large C&I facilities. This analysis assumes that the General Industry Sampling results are representative of the entire C&I market (excluding the Energy Intensive Sectors) and can be applied to all other large C&I facilities in the U.S. The results are referred to as "General Industry Market Extrapolation" in this report.

The combined results of the Energy Intensive Sector analysis and the General Industry Market Extrapolation provides the total deployable megawatts and deployable capital of *Wind for Industry's* TAM. The companies whose facilities were used in the General Industry Sampling and the Energy Intensive Sectors screened are listed below:

| COMPANY | INDUSTRY |
|---|---|
| Ball Corporation | Metal Packaging |
| Ford Motor Company | Automotive Manufacturing |
| International Paper | Paper Processing |
| Procter & Gamble | Consumer Goods |
| Valfilm | Plastic Fabrication |
| Veoneer | Automotive Technology |
| Whirlpool | Home Appliance Manufacturing |

| SECTORS |
|---|
| Biodiesel |
| Cement |
| Ethanol |
| Refining |

For both the General Industry Sampling and the Energy Intensive Sectors, the deployable megawatts and deployable capital of the technically viable locations were estimated using an appropriate average project size and cost for each industry type. The average project size and cost were based on One Power's experience with development of actual projects within each sector.

### Screening Methodology

Below are the three main factors One Power considers when screening for technical viability for a *Wind for Industry* project:

1. Wind resource
2. Land availability
3. Proximity to airports

The wind resource is evaluated on a county by county basis, while land availability and proximity to airports are site specific evaluations.

### Wind Resource

Wind resource is evaluated using National Renewable Energy Lab (NREL) wind speed data, converted into a turbine Capacity Factor (CF)[a,b]. A minimum turbine CF of 20% is generally used when assessing viability. A single wind speed and CF is used for each county based on the average wind speed in the county.

### Land Availability

Land availability is determined visually by using satellite imagery. If the facility is surrounded by development with no land for turbine siting, it is considered nonviable. One Power has extensive experience with turbine siting and can reliably judge land availability based on prudent setbacks. One Power looked at each individual facility in the General Industry Sampling and each facility in the Energy Intensive Sectors to evaluate land availability. Typically, each wind turbine needs a minimum of an 800′ diameter circle around the turbine and a total setback of 1000′ from a residence. This standard may vary depending on the unique details of each facility.

### Proximity to Airports

Based on regulation and prudent practices, a wind turbine cannot be built in a location where it interferes with an airport's operations. The Federal Aviation Administration's (FAA's) online "Notice Criteria Tool" is used to determine if the proposed project will have any impact on air navigation. If a potential site exceeds an airport's critical area according to the "Notice Criteria Tool," the site is determined to be nonviable. There may be instances where a location is within the critical area but would be deemed "No Hazard" by the FAA, but because accurately identifying these exceptions would require filing with the FAA, One Power listed any site in the critical area as nonviable. All the facilities screened in the TAM analyses for General Industry Sampling and the Energy Intensive Sectors were entered into the Notice Criteria Tool.

### General Industry Market Extrapolation Methodology

To determine the total number of C&I facilities in the U.S. that are large enough for a *Wind for Industry* project, One Power used facility data from the U.S. Census Bureau[c], and filtered for manufacturing facilities that have greater than 100 employees[1]. In the U.S. there are 54,296 large C&I facilities with more than 100 employees. The facilities included in the General Industry Sampling were examined in detail, as described in the screening methodology. This report assumes that the results of that examination are representative of all large C&I facilities in the U.S. (excluding those in the Energy Intensive Sectors) and can be used to extrapolate the total number of technically viable facilities in the U.S.

Since the Energy Intensive Sector facilities are included in the number of large C&I facilities, the number of facilities used in the General Industry Market Extrapolation has been reduced to 53,743 to avoid counting any facilities twice. Throughout the rest of this report, One Power assumes there are 53,743 large general industry facilities in the continental U.S.[2] Applying the General Industry Sampling results to the number of large C&I facilities gives the total number of viable facilities that make up the General Industry Market Extrapolation.[3]

The deployable megawatts and deployable capital of the General Industry Market Extrapolation were calculated using an average project size of 5 MW. This presents a conservative estimate, as many facilities could utilize a larger project size. An installed cost of $1.85MM/MW was used to determine capital requirements. This cost is generally consistent with One Power's historical

---

[1] The census data is grouped by facilities with less than 5, 10, 20, 100, and 500 employees and facilities with over 500 employees. One Power's consideration of the number of employees is intended to capture only facilities that consume enough electricity to warrant the installation of a utility-scale wind project. Based on One Power's experience, this is the simplest way to distinguish "large" C&I facilities. This assumption does not capture energy intensive facilities with low employment.

[2] The analysis excluded facilities located in Alaska and Hawaii.

[3] The examined sample size for general industry facilities was 269 facilities which exceeds the square root of the 53,743 large general industry facilities and thus the sample size is considered large enough to be representative of the total population.

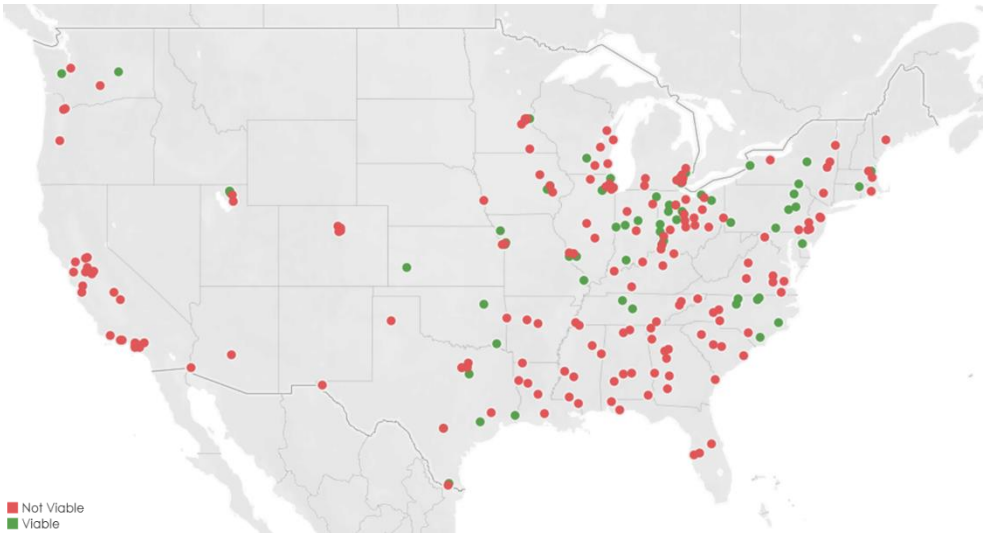
installed costs. While each location will have specific factors that increase or decrease the installed cost, One Power believes this cost is generally representative of *Wind for Industry* projects in the U.S.

One Power's operating projects are included in the number of viable facilities to account for sites that are already benefitting from *Wind for Industry*. These sites are not included in the deployable megawatts or capital.

## Results

### Market Potential: General Industry Sampling

One Power screened 269 facilities across the U.S. for the 7 companies in the General Industry Sampling. From this technical screening, One Power has identified a total of 76 technically viable *Wind for Industry* project locations for a total of 345 deployable megawatts. Applying this to the 53,743 large C&I facilities in the U.S., the General Industry Market Extrapolation predicts 15,183 viable facilities and 75,915 deployable megawatts.

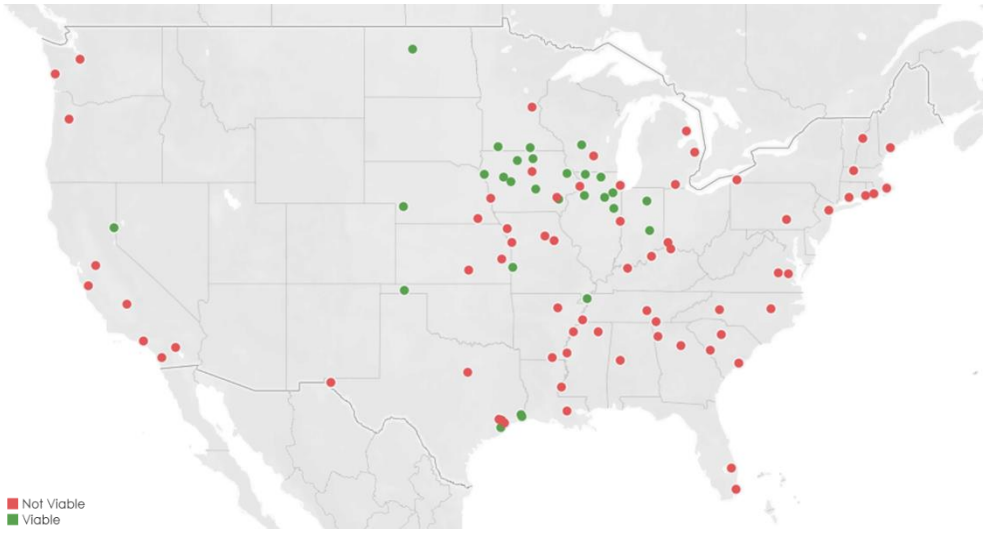



*Map 6: General Industry Sampling Locations*

| GENERAL INDUSTRY SAMPLING | |
|---|---|
| FACILITIES SCREENED: | 269 |
| VIABLE FACILITIES: | 76 |
| % OF FACILITIES VIABLE: | 28% |
| AVG. PROJECT SIZE (MW): | 5 |
| DEPLOYABLE MW: | 345 |
| DEPLOYABLE CAPITAL (MM): | $638 |
| **MARKET EXTRAPOLATION** | |
| DEPLOYABLE MW: | 75,915 |
| DEPLOYABLE CAPITAL (MM): | $140,443 |

### Market Potential: Biodiesel Sector

One Power screened 97 biodiesel facilities across the U.S. From this technical screening, One Power has identified a total of 28 viable *Wind for Industry* project locations for a total of 280 deployable megawatts based on an average project size of 10 MW per project.




*Map 7: Biodiesel Sector Locations*

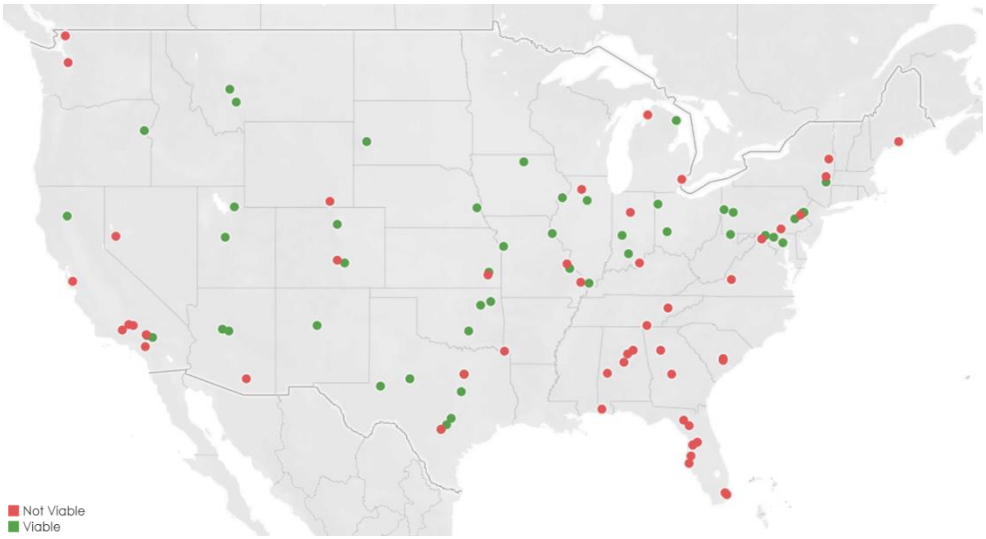
| | |
|---|---|
| FACILITIES SCREENED: | 97 |
| VIABLE FACILITIES: | 28 |
| % OF FACILITIES VIABLE: | 29% |
| AVG. PROJECT SIZE (MW): | 10 |
| DEPLOYABLE MW: | 280 |
| DEPLOYABLE CAPITAL (MM): | $518 |

**Market Potential: Cement Sector**

One Power screened 103 cement facilities across the U.S. From this technical screening, One Power has identified a total of 51 viable *Wind for Industry* project locations for a total of 250 deployable megawatts based on an average project size of 5 MW per project.

### *Map 8: Cement Sector Locations*

| | |
|---|---|
| FACILITIES SCREENED: | 103 |
| VIABLE FACILITIES: | 51 |
| % OF FACILITIES VIABLE: | 50% |
| AVG. PROJECT SIZE (MW): | 5 |
| DEPLOYABLE MW: | 250 |
| DEPLOYABLE CAPITAL (MM): | $463 |

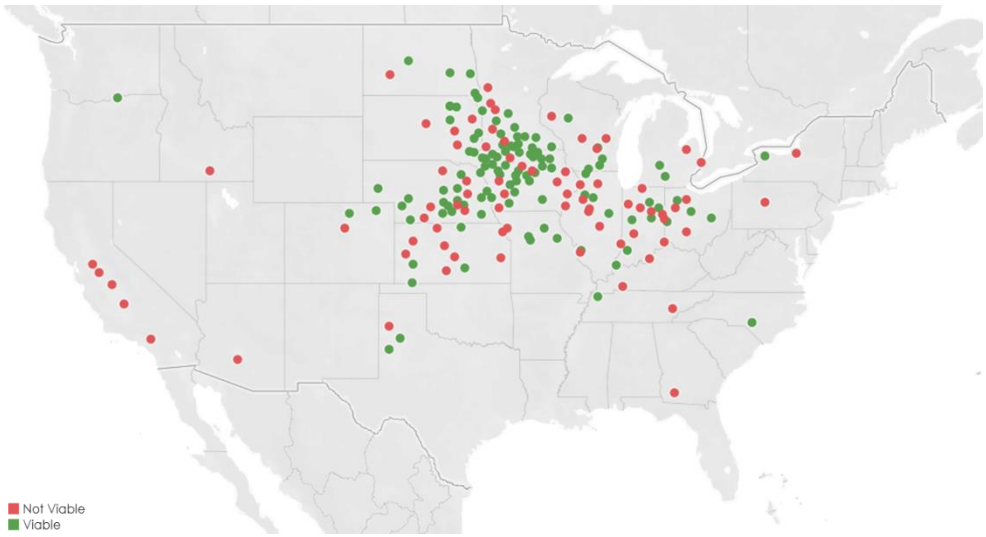



**Market Potential: Ethanol Sector**

One Power screened 200 ethanol facilities across the U.S. From this technical screening, One Power has identified a total of 114 viable *Wind for Industry* project locations for a total of 1,140 deployable megawatts based on an average project size of 10 MW per project.

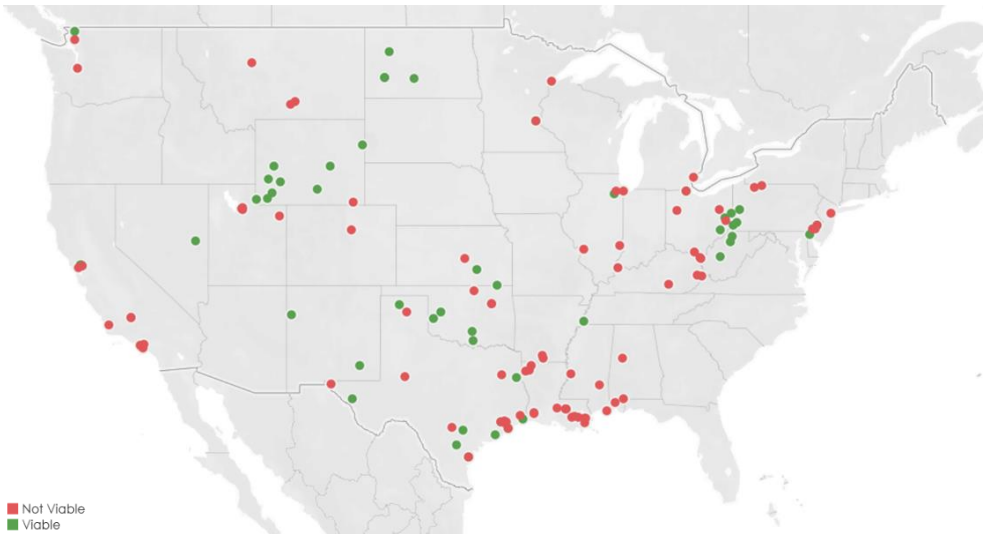
### *Map 9: Ethanol Sector Locations*

| | |
|---|---|
| FACILITIES SCREENED: | 200 |
| VIABLE FACILITIES: | 114 |
| % OF FACILITIES VIABLE: | 57% |
| AVG. PROJECT SIZE (MW): | 10 |
| DEPLOYABLE MW: | 1,140 |
| DEPLOYABLE CAPITAL (MM): | $2,109 |



**Market Potential: Refining Sector**

One Power screened 153 refining facilities across the U.S. From this technical screening, One Power has identified a total of 55 viable *Wind for Industry* project locations for a total of 1,100 deployable megawatts based on an average project size of 20 MW per project.

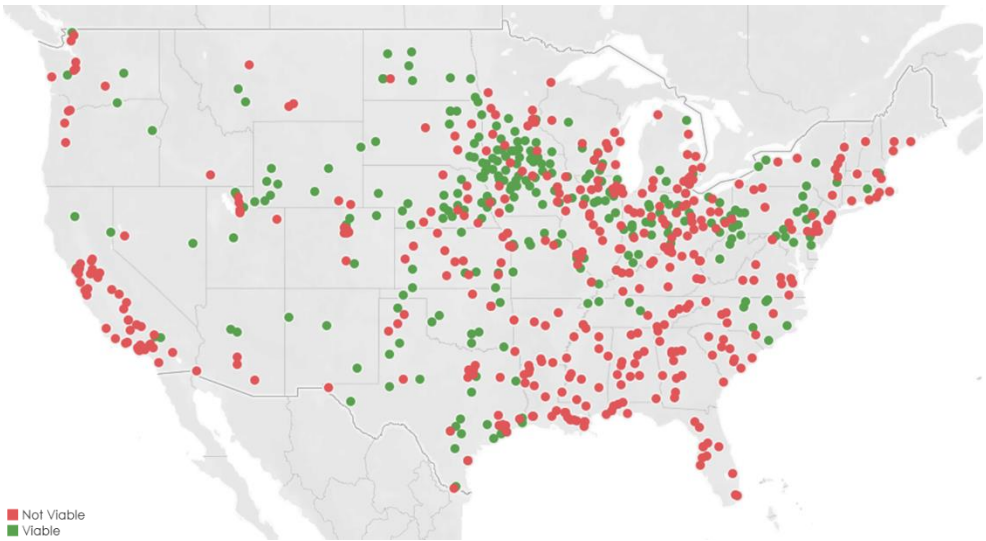



### *Map 10: Refining Sector Locations*

| | |
|---|---|
| FACILITIES SCREENED: | 153 |
| VIABLE FACILITIES: | 55 |
| % OF FACILITIES VIABLE: | 35.9% |
| AVG. PROJECT SIZE (MW): | 20 |
| DEPLOYABLE MW: | 1,100 |
| DEPLOYABLE CAPITAL (MM): | $2,035 |

**For Reference: All Screened Facilities**

For general geographic prioritizing, all site-specific screenings One Power completed are shown on one map. One Power screened 822 facilities across the U.S. from seven companies and four key sectors. This viability data is shown for reference and not used in later extrapolation. From this technical screening, One Power has identified a total of 324 viable *Wind for Industry* project locations for a total of 3,115 deployable megawatts based on an average project size of 5 MW per project.




### *Map 11: All Facility Locations*

| | |
|---|---|
| FACILITIES SCREENED: | 822 |
| VIABLE FACILITIES: | 324 |
| % OF FACILITIES VIABLE: | 39% |
| AVG. PROJECT SIZE (MW): | 5 |
| DEPLOYABLE MW: | 3,115 |
| DEPLOYABLE CAPITAL (MM): | $5,763 |

| TAM SUMMARY *General C&I* | COMPANY SAMPLING | MARKET EXTRAPOLATION |
|---|---|---|
| Number of Facilities Screened | 269 | 53,743 |
| % of Facilities Technically Viable | 28% | 28% |
| Average Project Size (MW) | 5 | 5 |
| Total Deployable MW | 345 | 75,915 |
| Deployable Capital (MM) | $638 | $140,443 |

| TAM SUMMARY *Energy Intensive Sectors* | BIODIESEL | CEMENT | ETHANOL | REFINERIES | TOTAL |
|---|---|---|---|---|---|
| Number of Facilities Screened | 97 | 103 | 200 | 153 | 553 |
| % of Facilities Technically Viable | 29% | 50% | 57% | 36% | 45% |
| Average Project Size (MW) | 10 | 5 | 10 | 20 | 11 |
| Total Deployable MW | 280 | 250 | 1,140 | 1,100 | 2,770 |
| Deployable Capital (MM) | $518 | $463 | $2,109 | $2,035 | $5,125 |

## Takeaway

One Power determined that 28% of the General Industry Sampling facilities are technically viable. When the General Industry Sampling factor is applied to the 53,743 large C&I facilities in the US, there are an estimated 15,183 total viable facilities.

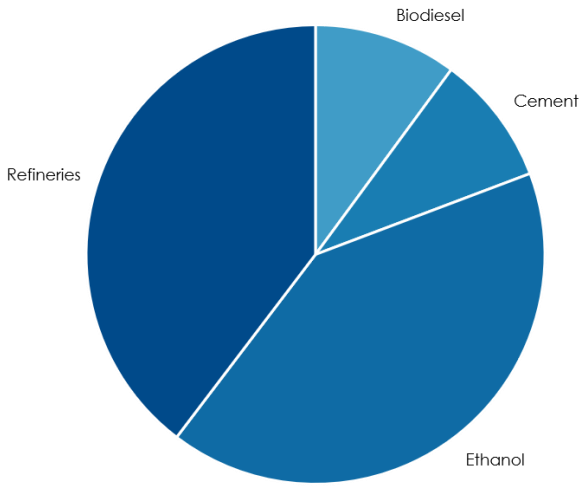
**This General Industry Market Extrapolation results in 75,915 MW and $140 billion of deployable capital of the TAM.**

The Energy Intensive Sector analysis contains 28 biodiesel locations, 51 cement locations, 114 ethanol locations, and 55 refining locations that are all technically viable for *Wind for Industry* projects. This results in 280 MW from biodiesel locations, 250 MW from cement locations, 1,140 MW from ethanol locations, and 1,100 MW from refining locations.

**The Energy Intensive Sectors make up 2,770 MW and $5,125 million of deployable capital of the TAM.**

Combining the General Industry Market Extrapolation and the Energy Intensive Sectors, the TAM has 78,685 MW and $146 billion dollars of deployable capital. This provides a substantial market for *Wind for Industry* projects.

*Energy Intensive Sector Deployable Capital Breakout*



## SERVICEABLE MARKET

The subset of the TAM where *Wind for Industry* projects are economically viable, expressed as deployable capital.

### Method

While wind projects help customers meet sustainability goals, One Power believes the main driver for any large energy user's decision to move forward with a *Wind for Industry* project is a financial incentive. With *Wind for Industry*, the financial incentive is a cost for energy that is less than the cost they are paying to the grid[4]. Based on One Power's experience with past sales, if the electricity rate offered to a *Wind for Industry* customer is lower than their current grid price, the customer is highly likely to move forward with the project. An energy project that offers certainty for 20 years, lowers Scope 2 emissions, provides green marketing material, and saves money immediately is an attractive project for any customer.

The rate competitiveness of *Wind for Industry* projects across the U.S. was determined by analyzing the available wind resource and current industrial grid rates[d]. For this study, the wind resource was evaluated for each county across the U.S. and translated into a capacity factor (CF). The CF was then utilized with *Wind for Industry*'s project cost model to determine an estimated 20-year PPA rate. The 20-year PPA rate was compared to the industrial grid rate in that area. If the One Power 20-year fixed PPA rate was lower than the average current grid rate, the county was identified as economically viable. For example, if the current grid rate in a county is $0.060/kWh, and One Power expects to be able to offer a $0.058/kWh rate based on the wind resource of the area, then that county is deemed economically viable.

Economic viability is analyzed at 30%, 24%, 18%, 12%, and 0% ITC rates, which reflect all ITC rate possibilities.

To determine the SM's deployable capital potential, One Power assessed the economic viability of the facilities screened in the TAM. Similar to the TAM, the project size and cost were applied to the technically and economically viable locations to obtain the total deployable megawatts and deployable capital. If a facility was not located in an economically viable county, it was not included in that sector's deployable capital potential.

The Energy Intensive Sector deployable capital for the SM was determined by calculating the number of technically viable facilities that were in economically viable counties. The deployable capital for each sector was adjusted based on percentage of facilities located in economically viable counties. The General Industry Market Extrapolation deployable capital potential for the SM was determined by applying the percentage of U.S. counties that are economically viable to the TAM results[5]. The total SM deployable capital was calculated by combining the deployable capital of the Energy Intensive Sector and the General Industry Market Extrapolation[6].

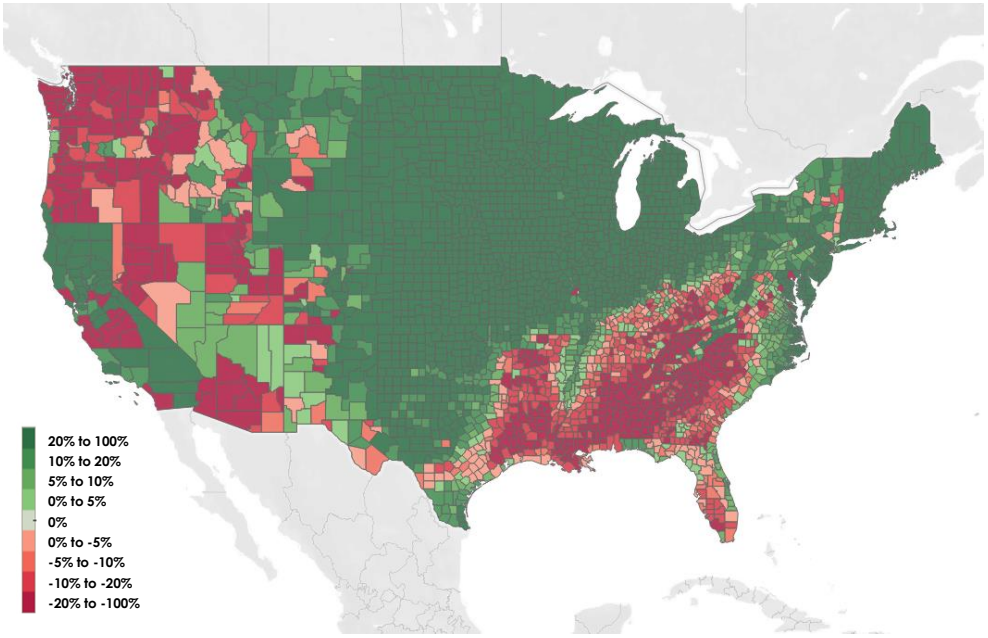
[4] One Power typically delivers projects through a Renewable Energy Agreement (REA) which sets a fixed energy price ($/kWh) for the customer for 20 years. Projects can also be delivered as a capital expenditure (CAPEX), where the customer pays for and owns the project, but this choice is uncommon.

[5] One Power's operating projects are included in the number of economically viable facilities to account for sites that are already benefitting from *Wind for Industry*. These sites are not included in the deployable megawatts or capital.

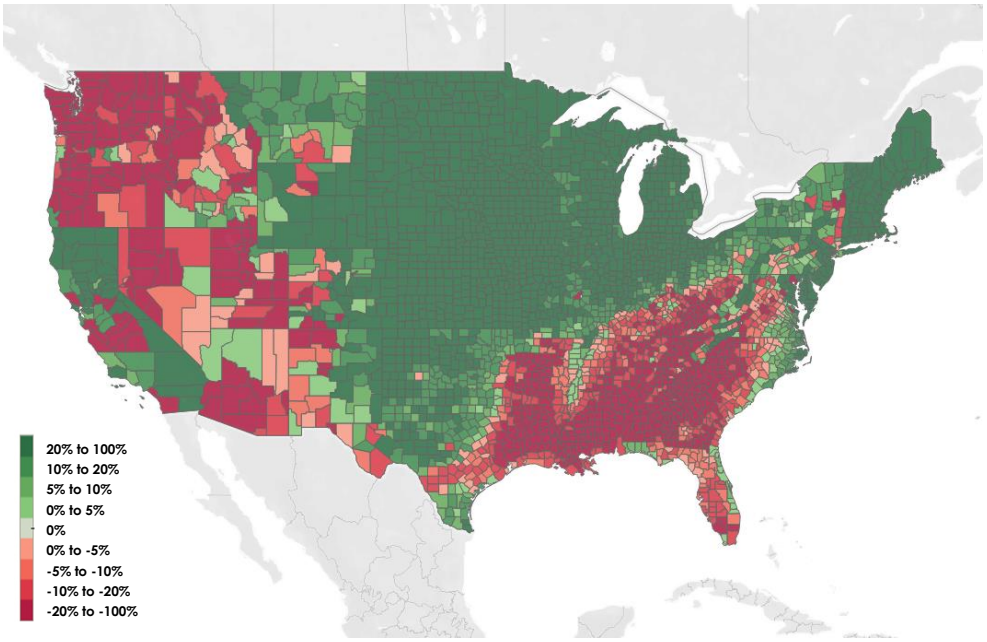
[6] This assumes even distribution of manufacturing across the U.S.

## Results

*Map 12: Economically Viable Counties at 30% ITC*



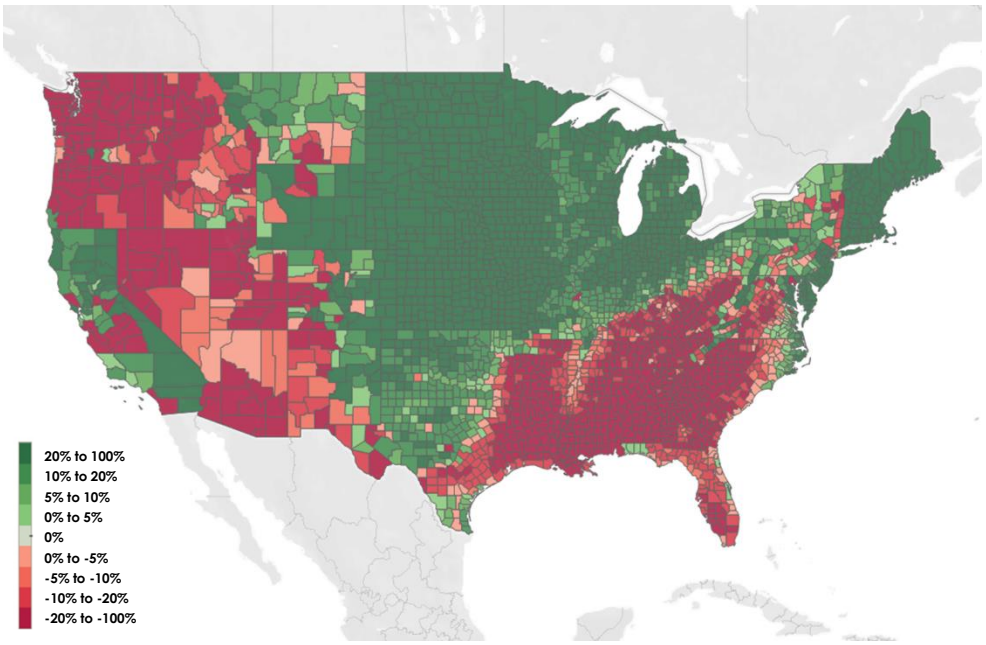

*Map 13: Economically Viable Counties at 24% ITC*



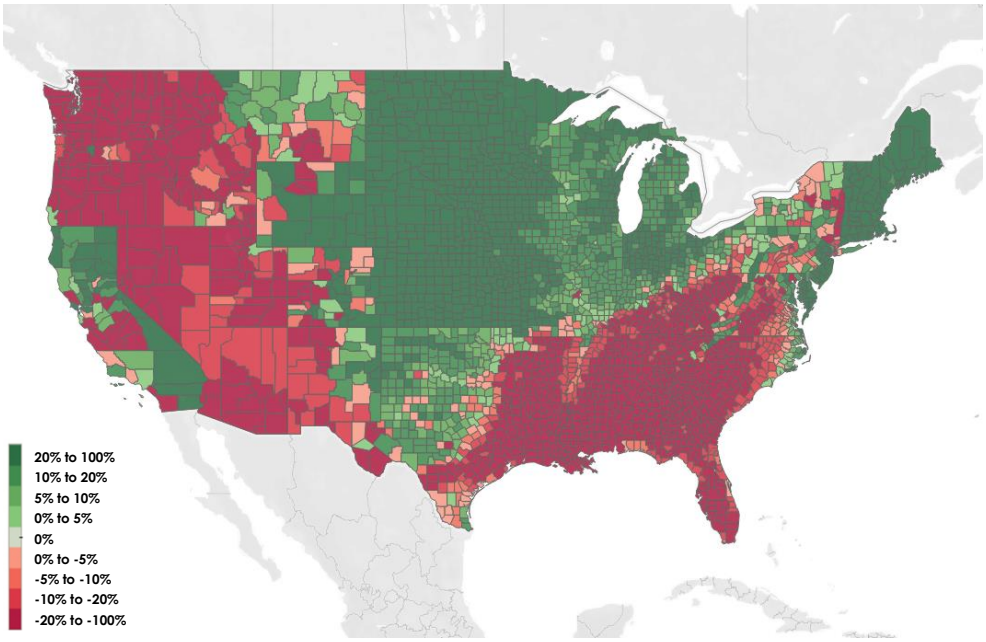

### *Understanding the Analysis*

*% difference from rate break-even*

| | |
|---|---|
| 20% to 100% | |
| 10% to 20% | *PPA rate < grid rate* |
| 5% to 10% | |
| 0% to 5% | |
| 0% | *PPA rate = grid rate* |
| 0% to -5% | |
| -5% to -10% | |
| -10% to -20% | *PPA rate > grid rate* |
| -20% to -100% | |

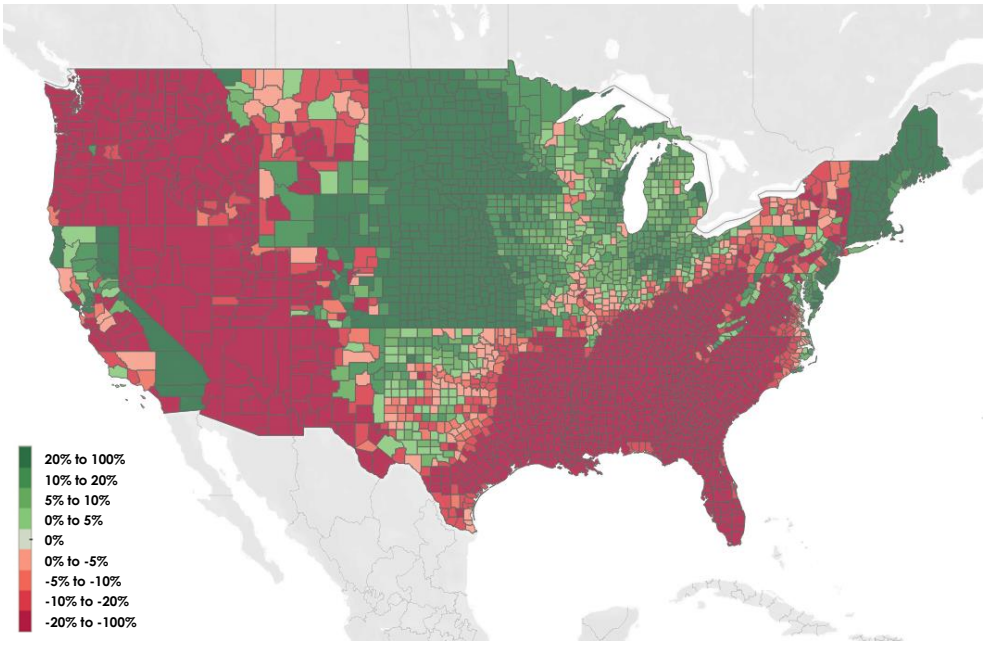



*Map 14: Economically Viable Counties at 18% ITC*




*Map 15: Economically Viable Counties at 12% ITC*

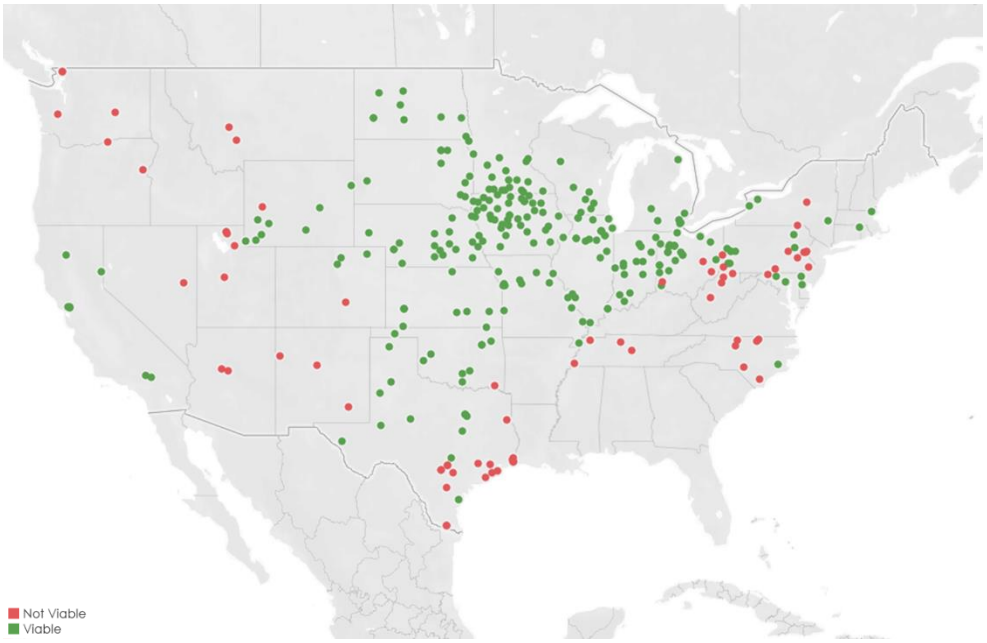
### *Map 16: Economically Viable Counties at 0% ITC*

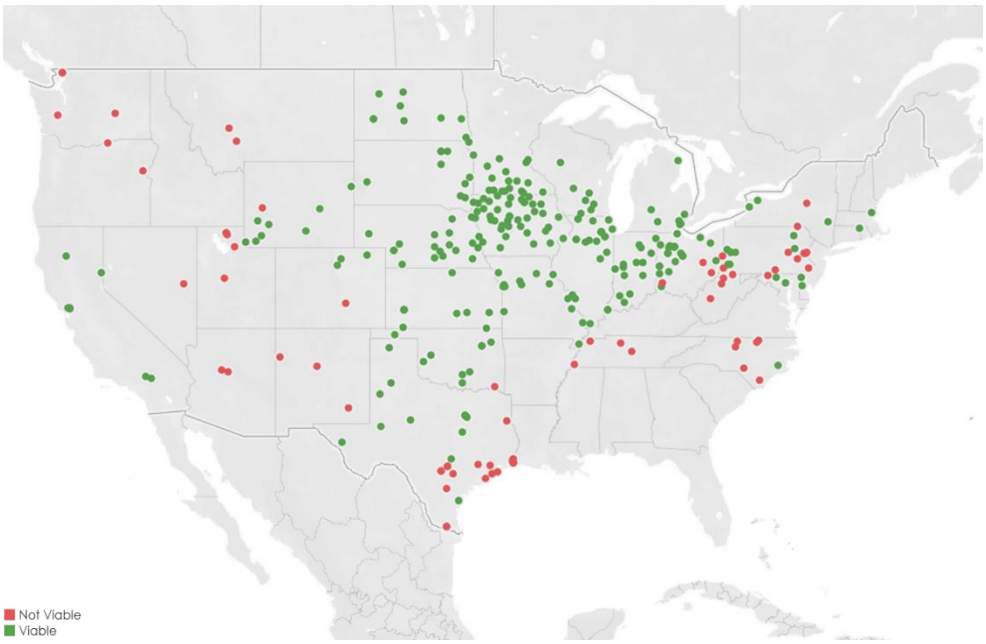



| SM RESULTS BY COUNTY | 30% ITC | | 24% ITC | | 18% ITC | | 12% ITC | | 0% ITC | |
|---|---|---|---|---|---|---|---|---|---|---|
| | COUNT | % | COUNT | % | COUNT | % | COUNT | % | COUNT | % |
| Total U.S. Counties | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - |
| Economically Viable Counties | 2,040 | 65% | 1,855 | 59% | 1,699 | 54% | 1,559 | 50% | 1,254 | 40% |

### *Map 17: Economically Viable Screened Facilities at 30%*

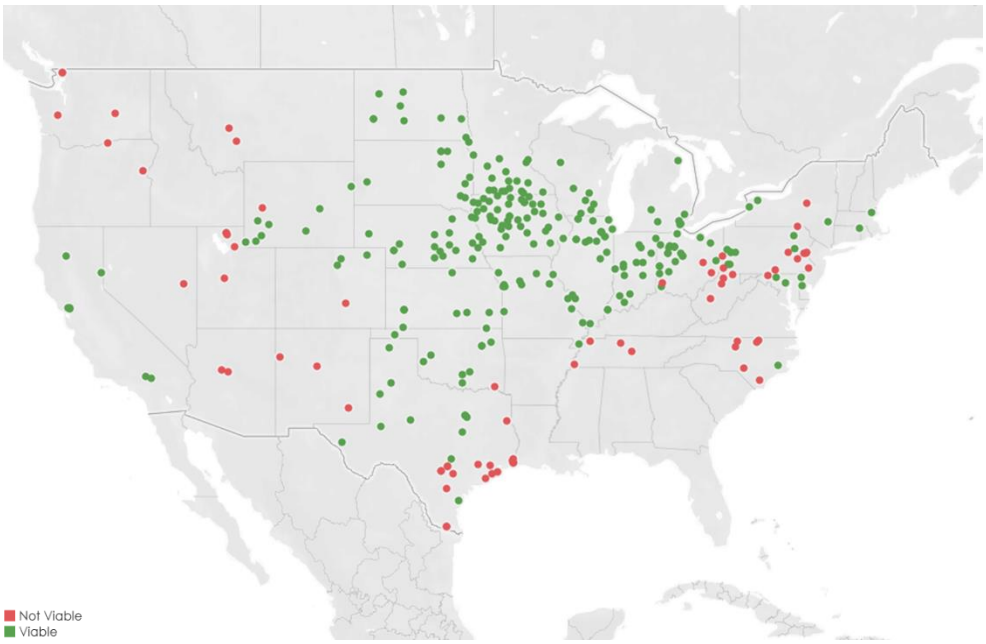
| | | |
|---|---|---|
| | VIABLE FACILITIES: | 286 |
| | NOT VIABLE FACILITIES: | 38 |






*Map 18: Economically Viable Screened Facilities at 24%*

| | |
|---|---|
| VIABLE FACILITIES: | 268 |
| NOT VIABLE FACILITIES: | 56 |

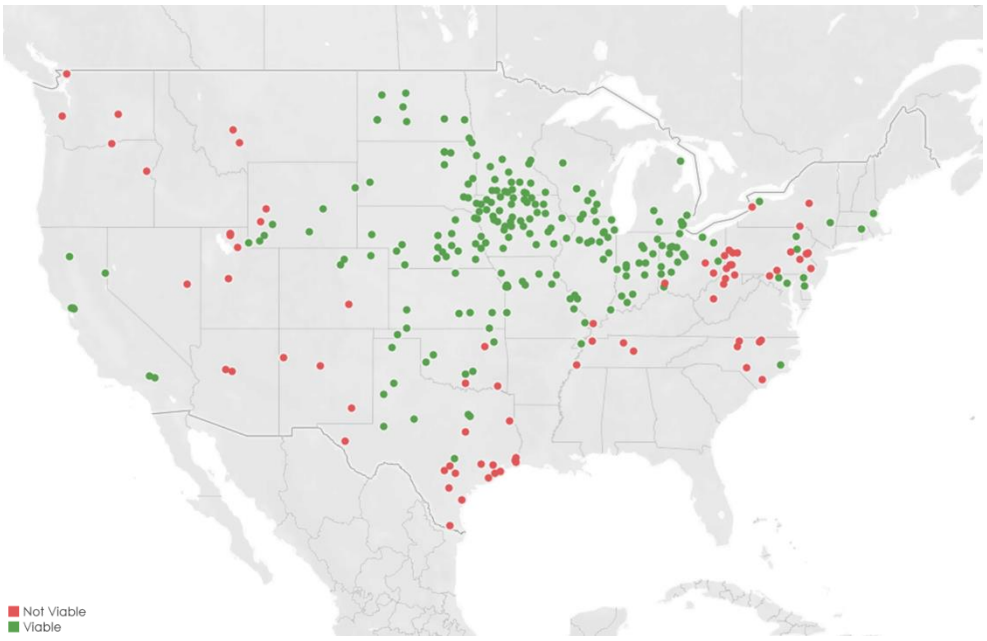



*Map 19: Economically Viable Screened Facilities at 18%*

| | |
|---|---|
| VIABLE FACILITIES: | 253 |
| NOT VIABLE FACILITIES: | 71 |

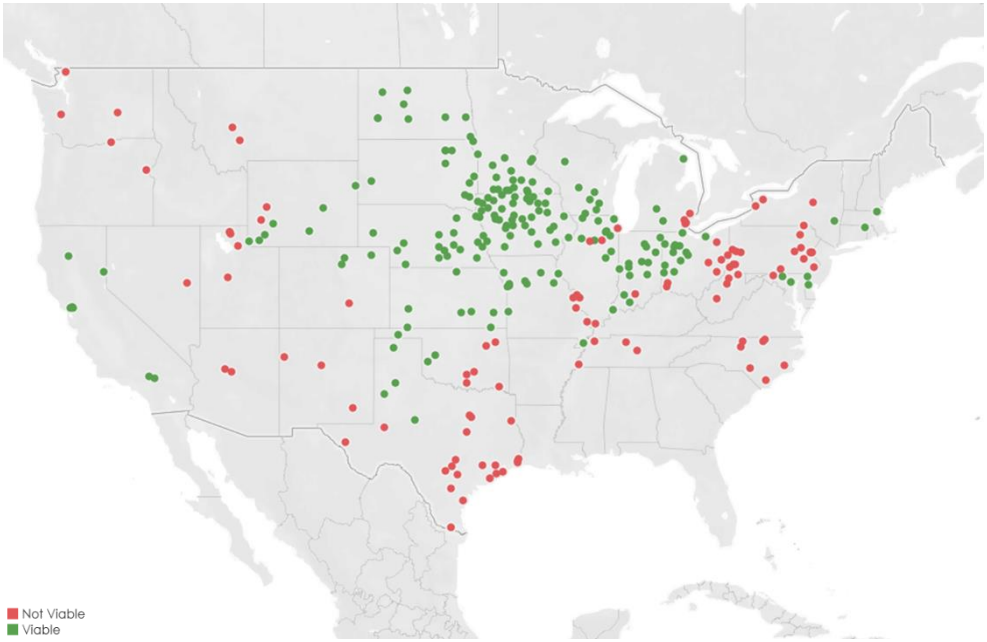
### *Map 20: Economically Viable Screened Facilities at 12%*

| | |
|---|---|
| VIABLE FACILITIES: | 238 |
| NOT VIABLE FACILITIES: | 86 |




### *Map 21: Economically Viable Screened Facilities at 0%*

| | |
|---|---|
| VIABLE FACILITIES: | 208 |
| NOT VIABLE FACILITIES: | 116 |



## Takeaway

One Power determined that, at 0% ITC, 1,254 of the 3,142 counties within the U.S. have grid rates that are higher than the PPA rate One Power is likely able to offer in that county. All results are shown at 0% ITC[7]. For additional ITC rate results, see Appendix D.

Of the facilities deemed technically viable in the General Industry Sampling, 45% were determined to be economically viable. Applying this factor to the General Industry Market Extrapolation results in 33,960 MWs and $62 billion of deployable capital.

Of the facilities deemed technically viable in the Energy Intensive Sector analysis, 70% were determined to be economically viable. This results in the Energy Intensive Sectors totaling 1,865 MW and $3 billion of deployable capital.

Combining the General Industry Market Extrapolation and the Energy Intensive Sectors results in a Serviceable Market of 35,825 MW and $66 billion in deployable capital.

Given current grid prices, there is a $66 billion market today for *Wind for Industry*.

| **SM GENERAL C&I** *0% ITC Rate* | **GENERAL INDUSTRY SAMPLING** | **MARKET EXTRAPOLATION** |
|---|---|---|
| Number of Facilities Screened | 269 | 53,743 |
| **TAM** | | |
| # of Viable TAM Facilities | 76 | 15,183 |
| Average Project Size (MW) | 5 | 5 |
| Total Deployable MW | 345 | 75,915 |
| Deployable Capital (MM) | $638 | $140,443 |
| **SM** | | |
| % of TAM Facilities Economically Viable | 45% | 45% |
| # of Viable SM Facilities | 34 | 6,792 |
| Total Deployable MW | 135 | 33,960 |
| Deployable Capital (MM) | $250 | $62,826 |

| **SM ENERGY INTENSIVE SECTORS** *0% ITC Rate* | **BIODIESEL** | **CEMENT** | **ETHANOL** | **REFINERIES** | **TOTAL** |
|---|---|---|---|---|---|
| Number of Facilities Screened | 97 | 103 | 200 | 153 | 553 |
| **TAM** | | | | | |
| # of Viable TAM Facilities | 28 | 51 | 114 | 55 | 134 |
| Average Project Size (MW) | 10 | 5 | 10 | 20 | 5 |
| Total Deployable MW | 280 | 250 | 1,140 | 1,100 | 2,775 |
| Deployable Capital (MM) | $518 | $463 | $2,109 | $2,035 | $5,134 |
| **SM** | | | | | |
| % of TAM Facilities Economically Viable | 86% | 39% | 94% | 42% | 70% |
| # of Viable SM Facilities | 24 | 20 | 107 | 23 | 174 |
| Total Deployable MW | 240 | 95 | 1,070 | 460 | 1,865 |
| Deployable Capital (MM) | $444 | $176 | $1,980 | $851 | $3,450 |

| **SM SUMMARY** *Deployable Capital* | **GENERAL INDUSTRY MARKET EXTRAPOLATION** | | **ENERGY INTENSIVE SECTORS** | | **TOTAL** | |
|---|---|---|---|---|---|---|
| **ITC RATE** | **MW** | **(MM)** | **MW** | **(MM)** | **MW** | **(MM)** |
| 30% | 62,925 | $116,411 | 2,420 | $4,477 | 65,345 | $120,888 |
| 24% | 57,935 | $107,180 | 2,295 | $4,246 | 60,230 | $111,426 |
| 18% | 52,940 | $97,939 | 2,150 | $3,978 | 55,090 | $101,917 |
| 12% | 49,940 | $92,389 | 1,985 | $3,672 | 51,925 | $96,061 |
| 0% | 33,960 | $62,826 | 1,865 | $3,450 | 35,825 | $66,276 |

[7] Throughout this document, 0% ITC was chosen to present the most conservative results and for the sake of brevity.

## SERVICEABLE MARKET GROWTH

One Power must consider a range of possible scenarios when determining the future potential of the serviceable market. With the phase-out of the ITC[8], One Power, along with the rest of the wind industry, will need to make improvements to maintain its current SM and create future market expansion. Future grid prices, turbine efficiency, and improved project costs could benefit *Wind for Industry*'s potential moving forward. The future growth scenarios explore the impact on the economic viability of *Wind for Industry* projects as the industry reaches maturity. The deployable megawatts and deployable capital for each scenario show how the SM can be expanded, even with a declining ITC.

One Power analyzed the General Industry Market Extrapolation, as well as the Energy Intensive Sectors to determine the Serviceable Market Growth. The analysis included 30%, 24%, 18%, 12%, and 0% ITC to illustrate the increase in market potential if the ITC is reinstated to a past percentage.

| ITC RATES | |
|---|---|
| 2016 | 30% |
| 2017 | 24% |
| 2018 | 18% |
| 2019 | 12% |
| 2020 | 18% |

### Scenario 1: Cost and Turbine Efficiency

Considering the ITC phase-out, how will decreased cost and increased turbine efficiencies impact the SM over the next 10 years?

**Method**

For Scenario 1, One Power assumes the project installation costs will decrease through increased efficiencies and the turbines' technology will improve, increasing the CF. Improved cost efficiencies could be possible through economies of scale, greater construction efficiency, and more competitive turbine supplier pricing. A higher CF is possible due to taller towers and longer blades, allowing turbines to capture more wind.

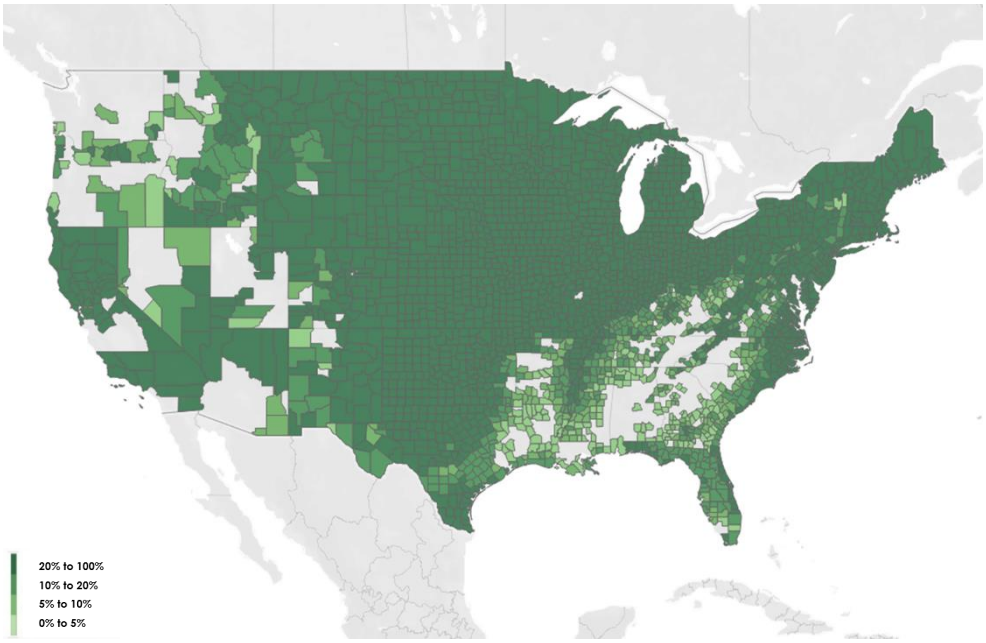
In this scenario, the CF calculated for the SM was increased by 10% for each county[9]. The installed project costs calculated for the SM were decreased by 10%. These new metrics were used to determine the Scenario 1 20-year PPA rate using five different ITC rates (30%, 24%, 18%, 12%, and 0%). As with the SM calculation, the new 20-year PPA rate was then compared to the grid rate in that area. If the Scenario 1 20-year fixed PPA rate was lower than the average current grid rate, the county was identified as economically viable[10].

[8] Wind energy projects qualify for either a Section 48 Investment Tax Credit (ITC) or a Section 45 Production Tax Credit (PTC). *Wind for Industry* projects typically elect the ITC. The ITC rate was originally set at 30% of the project cost and has been decreasing annually until fully phased out in 2021. Projects that begin construction in calendar year 2020 are eligible for a 12% ITC rate. The ITC rate eligibility is determined based on the year a project "begins construction." Projects have various ways to meet the "begin construction" test and typically must be placed in service within 4 years from when construction began. Because of the rules governing this credit, the practical phase-out lags the legal phase-out. The steps used previously for the phase-out were 30%, 24%, 18%, 12%, and 0%. Based on past deviations from the original legislation, future ITC phase-out rates may vary.

[9] A 30% CF is assumed in this scenario to now be 33%, a 10% increase in annual energy production. This increased the number of facilities that were considered technically viable from a wind resource standpoint.

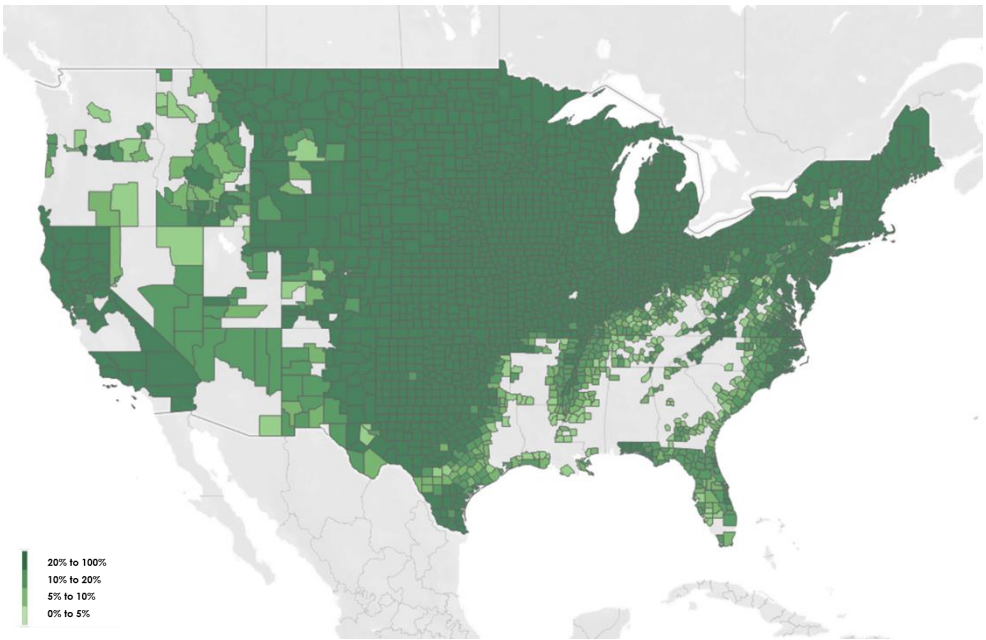
[10] The individual sector deployable capital total may be reduced due to the decrease in project cost. This does not capture the margin expansion or EBITDA of the projects. See Appendix E for revenue information.

**Results**




*Map 22: Scenario 1 Economically Viable Counties at 30% ITC*

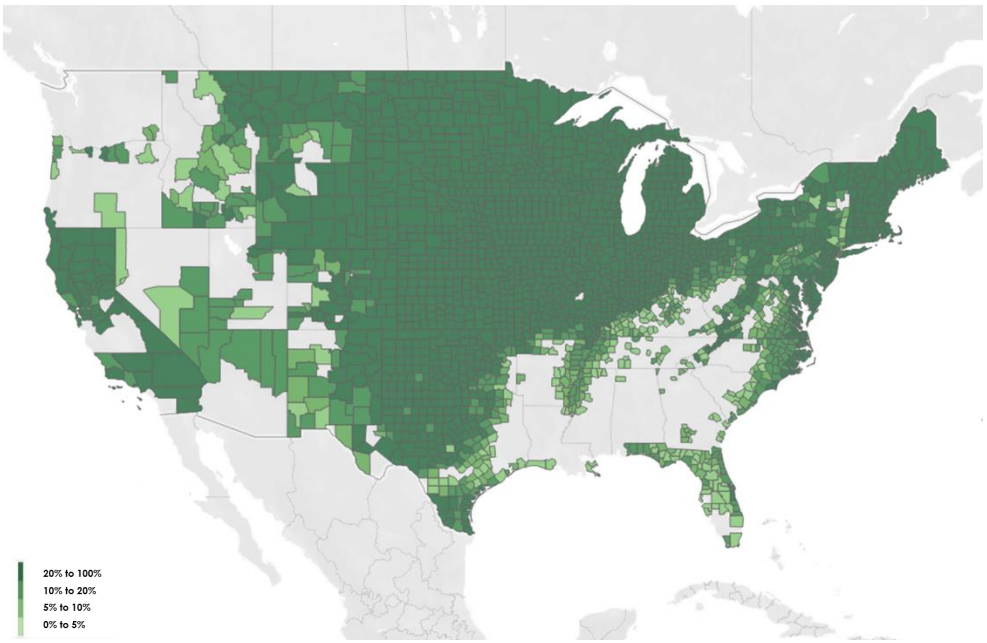
% OF COUNTIES VIABLE: 84%



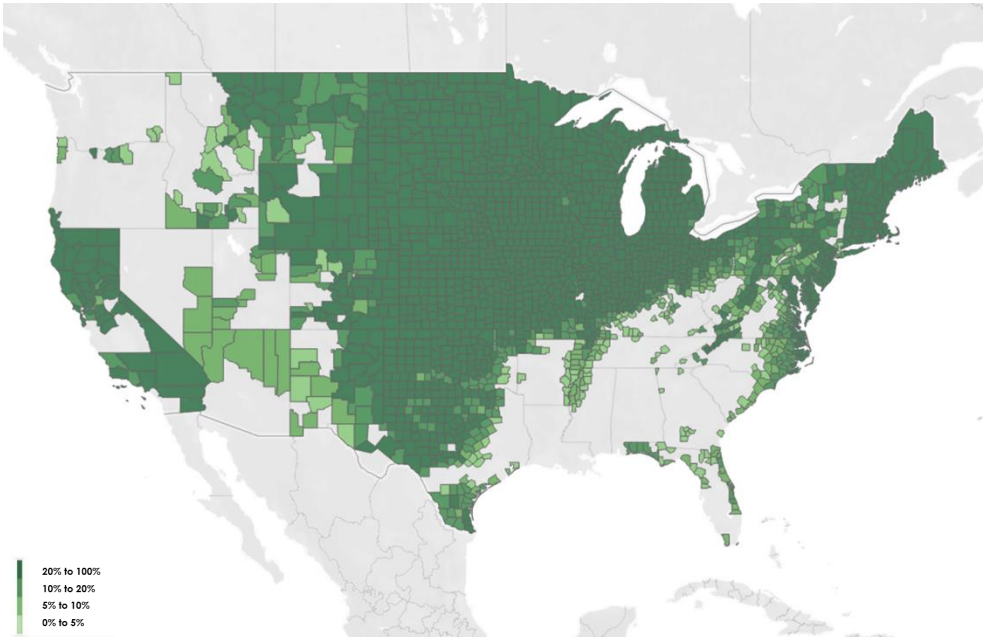

*Map 23: Scenario 1 Economically Viable Counties at 24% ITC*

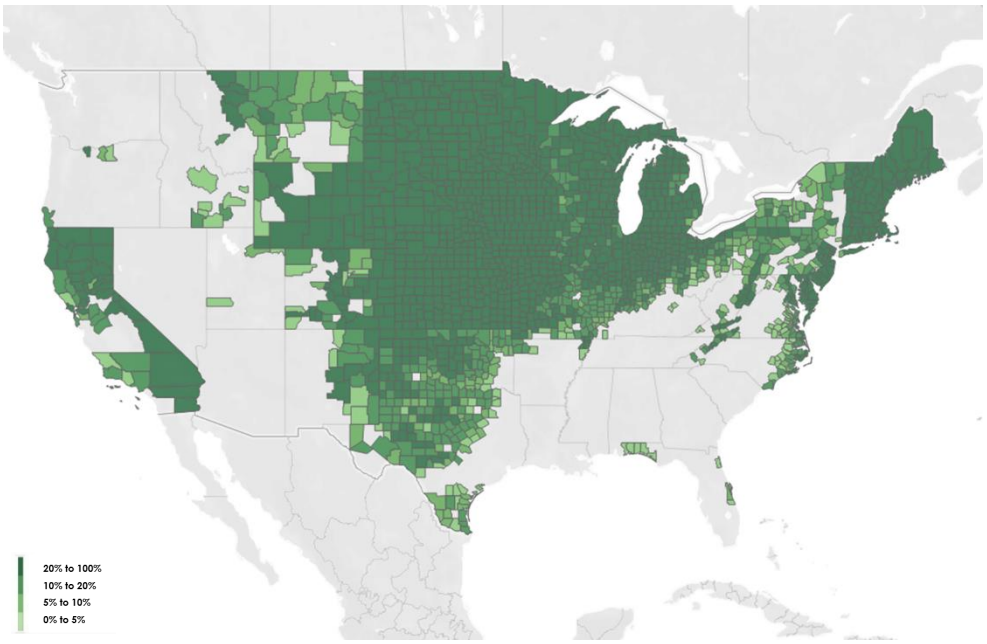
% OF COUNTIES VIABLE: 78%

### *Map 24: Scenario 1 Economically Viable Counties at 18% ITC*


### *Map 25: Scenario 1 Economically Viable Counties at 12% ITC*




*Map 26: Scenario 1 Economically Viable Counties at 0% ITC*


| FUTURE MARKET POTENTIAL: SCENARIO 1 | 30% ITC | | 24% ITC | | 18% ITC | | 12% ITC | | 0% ITC | |
|---|---|---|---|---|---|---|---|---|---|---|
| | COUNT | % | COUNT | % | COUNT | % | COUNT | % | COUNT | % |
| Total U.S. Counties | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - |
| Economically Viable Counties | 2,654 | 84% | 2,441 | 78% | 2,251 | 72% | 2,048 | 65% | 1,760 | 56% |

**Takeaway**

This analysis reveals that Scenario 1 expands the SM in the U.S. At a 0% ITC rate, One Power expects to be able to offer a PPA rate that is lower than the current grid rate in 1,760 counties (56% of all U.S. counties).

By decreasing projects costs by 10% and increasing project efficiencies by 10%, Scenario 1 increased the deployable capital potential of the General Industry Market Extrapolation from $62 billion to $91 billion. A matured industry has a positive impact on *Wind for Industry's* deployable capital.

| SCENARIO 1 *0% ITC Rate* | GENERAL INDUSTRY SAMPLING | MARKET EXTRAPOLATION |
|---|---|---|
| **SM** | | |
| % of TAM Facilities Economically Viable | 45% | 45% |
| Total Deployable MW | 135 | 33,960 |
| Deployable Capital (MM) | $250 | $62,826 |
| **SCENARIO 1** | | |
| % of Facilities Economically Viable | 72% | 72% |
| # of Viable Scenario 1 Facilities | 55 | 10,987 |
| Total Deployable MW | 240 | 54,935 |
| Deployable Capital (MM) | $400 | $91,467 |
| Increase in Deployable Capital (MM) | $150 | $28,641 |
| % Change in Deployable Capital | 60% | 46% |

| SCENARIO 1<br>*0% ITC Rate* | BIODIESEL | CEMENT | ETHANOL | REFINERIES | TOTAL |
|---|---|---|---|---|---|
| **SM** | | | | | |
| % of TAM Facilities Economically Viable | 86% | 39% | 94% | 42% | 70% |
| Total Deployable MW | 240 | 95 | 1,070 | 460 | 1,865 |
| Deployable Capital (MM) | $444 | $176 | $1,980 | $851 | $3,450 |
| **SCENARIO 1** | | | | | |
| % of Facilities Economically Viable | 86% | 64% | 97% | 61% | 80% |
| # of Viable Scenario 1 Facilities | 25 | 35 | 111 | 36 | 207 |
| Total Deployable MW | 250 | 170 | 1,110 | 720 | 2,250 |
| Deployable Capital (MM) | $416 | $283 | $1,848 | $1,199 | $3,746 |
| Increase in Deployable Capital (MM) | ($28) | $107 | ($131) | $348 | $296 |
| % Change in Deployable Capital | -6% | 61% | -7% | 41% | 9% |

| SCENARIO 1 SUMMARY<br>*Deployable Capital*<br>ITC RATE | GENERAL INDUSTRY MARKET EXTRAPOLATION | | ENERGY INTENSIVE SECTORS | | TOTAL | |
|---|---|---|---|---|---|---|
| | MW | (MM) | MW | (MM) | MW | (MM) |
| 30% | 66,925 | $111,430 | 2,715 | $4,520 | 69,640 | $115,951 |
| 24% | 66,925 | $111,430 | 2,665 | $4,437 | 69,590 | $115,867 |
| 18% | 64,925 | $108,100 | 2,620 | $4,362 | 67,545 | $112,462 |
| 12% | 62,925 | $104,770 | 2,470 | $4,113 | 65,395 | $108,883 |
| 0% | 54,935 | $91,467 | 2,250 | $3,746 | 57,185 | $95,213 |

## Scenario 2: Grid Rate Inflation

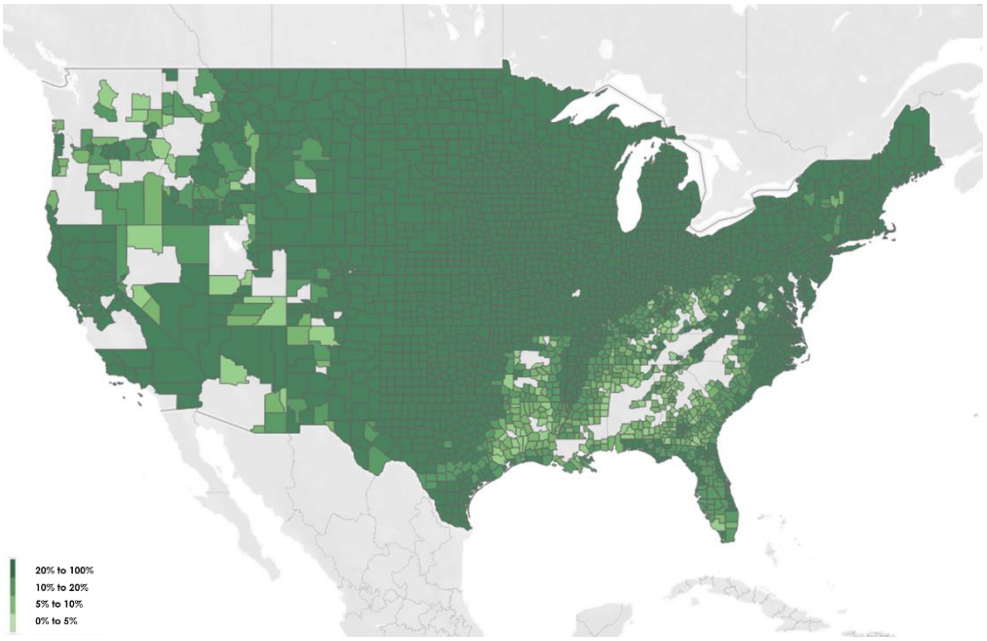
Considering the ITC phase-out, how will increased cost efficiencies, turbine efficiencies, and grid rates impact the SM over the next 10 years?

### Method

For Scenario 2, One Power included the same assumptions and calculations as in Scenario 1, with the additional assumption that the grid rate of each county increased by 5%. Historically, grid prices have trended up over a significant period[11]. One Power believes a 5% increase is a conservative metric to use for potential future grid rates.

The CF calculated for the SM was increased by 10% for each county. The installed project costs calculated for the SM were decreased by 10% and the grid rate was increased by 5%. These new metrics were used to determine the Scenario 2 20-year PPA rate using five different ITC rates (30%, 24%, 18%, 12%, and 0%). As with the SM calculation, the new 20-year PPA rate was then compared to the grid rate in that area. If the Scenario 2 20-year fixed PPA rate was lower than the average current grid rate, the county was identified as economically viable.

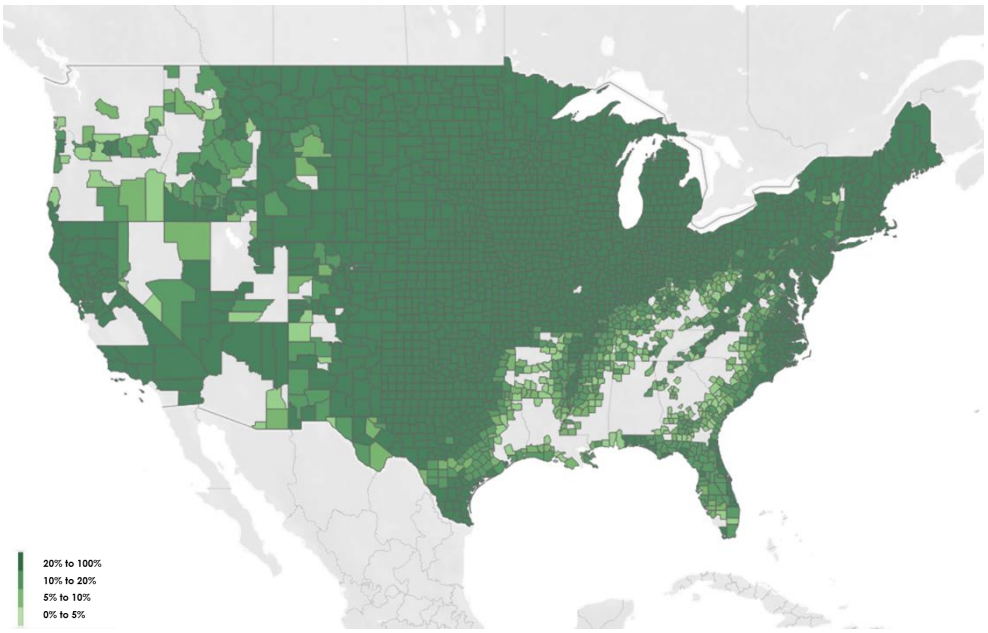
### Results



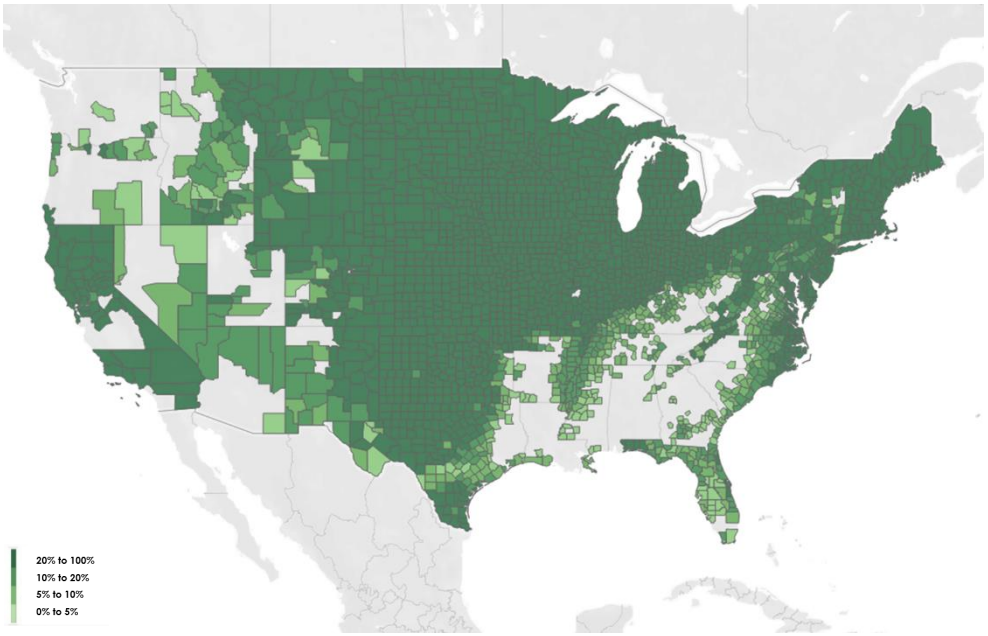

*Map 27: Scenario 2 Economically Viable Counties at 30% ITC*

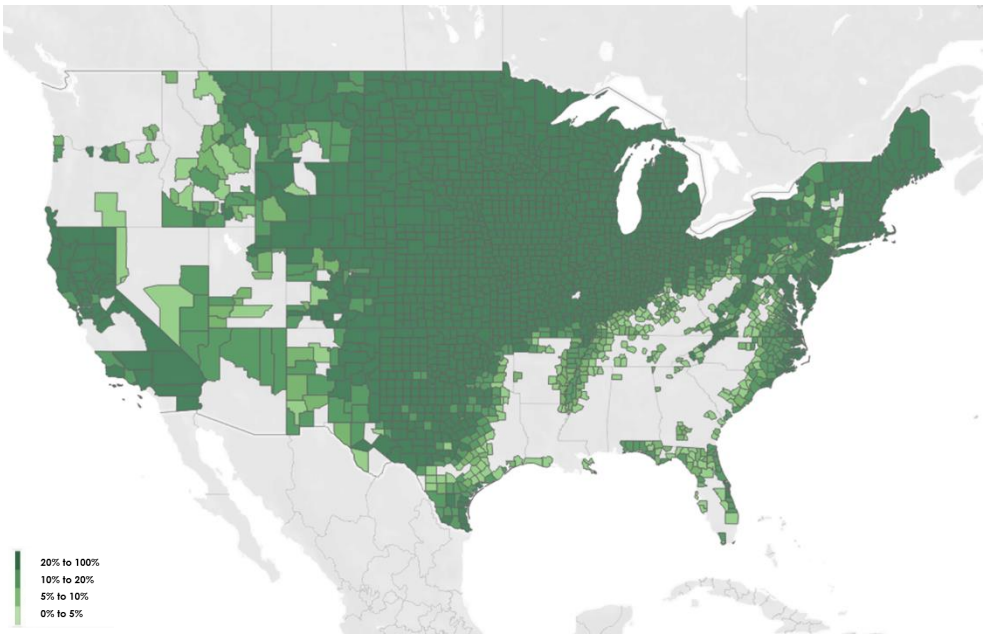

[11] According to the 2018 U.S. Energy Information Administration's annual report (EIA-861), the industrial user grid rate in the U.S. has increased 7.2% over the last 10 years, and 56% over the last 20 years.[e]

*Map 28: Scenario 2 Economically Viable Counties at 24% ITC*

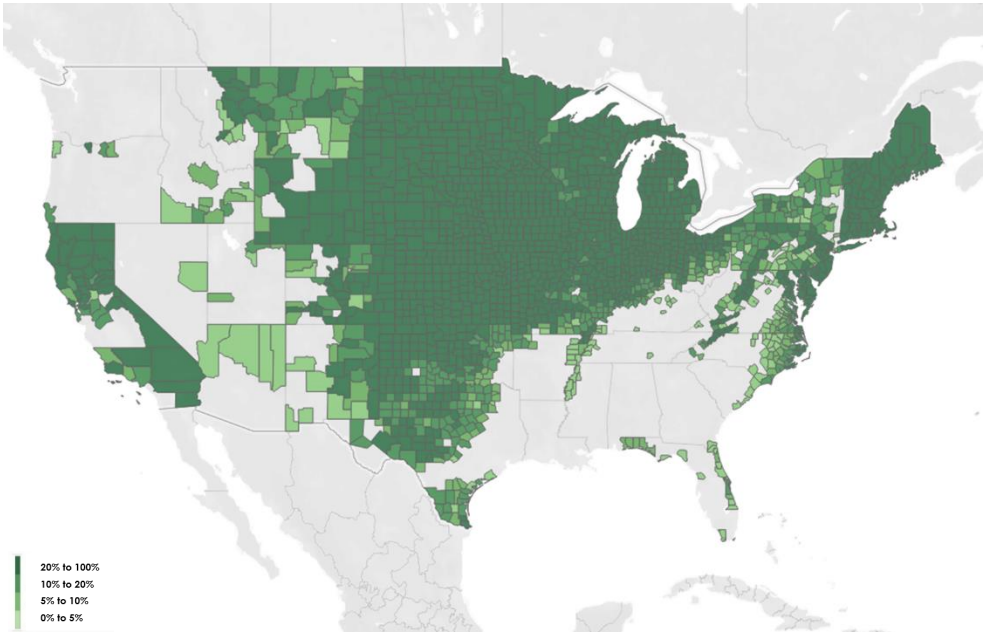

*Map 29: Scenario 2 Economically Viable Counties at 18% ITC*




*Map 30: Scenario 2 Economically Viable Counties at 12% ITC*

% OF COUNTIES VIABLE: 71%




*Map 31: Scenario 2 Economically Viable Counties at 0% ITC*

% OF COUNTIES VIABLE: 60%

| FUTURE MARKET POTENTIAL: SCENARIO 2 | 30% ITC | | 24% ITC | | 18% ITC | | 12% ITC | | 0% ITC | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Count | % | Count | % | Count | % | Count | % | Count | % |
| Total U.S. Counties | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - |
| Economically Viable Counties | 2,784 | 89% | 2,576 | 82% | 2,399 | 76% | 2,233 | 71% | 1,890 | 60% |

**Takeaway**

This analysis reveals that Scenario 2 expands the SM in the U.S. at a 0% ITC rate. One Power expects to be able to offer a PPA rate that is lower than the current grid rate in 1,890 counties (60% of all U.S. counties).

Scenario 2 increased the deployable capital potential of the General Industry Market Extrapolation from $62 billion to $101 billion. Increased grid rates have a positive impact on *Wind for Industry's* deployable capital.

| SCENARIO 2<br>*0% ITC Rate* | GENERAL INDUSTRY SAMPLING | MARKET EXTRAPOLATION |
|---|---|---|
| **SM** | | |
| % of TAM Facilities Economically Viable | 45% | 45% |
| Total Deployable MW | 135 | 33,960 |
| Deployable Capital (MM) | $250 | $62,826 |
| **SCENARIO 2** | | |
| % of Facilities Economically Viable | 80% | 80% |
| # of Viable Scenario 2 Facilities | 61 | 12,186 |
| Total Deployable MW | 270 | 60,930 |
| Deployable Capital (MM) | $450 | $101,448 |
| Increase in Deployable Capital (MM) | $200 | $38,622 |
| % Change in Deployable Capital | 80% | 61% |

| SCENARIO 2<br>0% ITC Rate | BIODIESEL | CEMENT | ETHANOL | REFINERIES | TOTAL |
|---|---|---|---|---|---|
| **SM** | | | | | |
| % of TAM Facilities Economically Viable | 86% | 39% | 94% | 42% | 70% |
| Total Deployable MW | 240 | 95 | 1,070 | 460 | 1865 |
| Deployable Capital (MM) | $444 | $176 | $1,980 | $851 | $3,450 |
| **SCENARIO 2** | | | | | |
| % of Facilities Economically Viable | 86% | 75% | 97% | 64% | 83% |
| # of Viable Scenario 2 Facilities | 25 | 41 | 111 | 38 | 215 |
| Total Deployable MW | 250 | 200 | 1,110 | 760 | 2,320 |
| Deployable Capital (MM) | $416 | $333 | $1,848 | $1,265 | $3,863 |
| Increase in Deployable Capital (MM) | ($28) | $157 | ($131) | $414 | $413 |
| % Change in Deployable Capital | -6% | 89% | -7% | 49% | 12% |

| SCENARIO 2 SUMMARY<br>*Deployable Capital*<br>ITC RATE | GENERAL INDUSTRY MARKET EXTRAPOLATION | | ENERGY INTENSIVE SECTORS | | TOTAL | |
|---|---|---|---|---|---|---|
| | MW | (MM) | MW | (MM) | MW | (MM) |
| 30% | 70,920 | $118,082 | 2,755 | $4,587 | 73,675 | $122,669 |
| 24% | 66,925 | $111,430 | 2,690 | $4,479 | 69,615 | $115,909 |
| 18% | 66,925 | $111,430 | 2,645 | $4,404 | 69,570 | $115,834 |
| 12% | 64,925 | $108,100 | 2,620 | $4,362 | 67,545 | $112,462 |
| 0% | 60,930 | $101,448 | 2,320 | $3,863 | 63,250 | $105,311 |

## Serviceable Market Growth Takeaway

The *Wind for Industry* Serviceable Market Growth analysis is defined by two scenarios. Scenario 1 projects a 10% increase in CF from expected improvements in turbine technology, and a 10% decrease in project costs as One Power becomes increasingly efficient in project installation. Scenario 2 uses the same assumptions as Scenario 1 and projects a 5% increase in grid rates, a conservative increase from historical grid-rate trends.

As these two scenarios illustrate, One Power expects the market for *Wind for Industry* to expand regardless of the future of the ITC rate.

## EXPANSION STRATEGY

One Power's expansion strategy ranks the states with the greatest potential for *Wind for Industry*.

### Method

The final step in the market analysis is to determine the logical progression of *Wind for Industry*'s expansion. One Power's expansion strategy will focus on the locations with the greatest potential for *Wind for Industry*. One Power is a vertically integrated company that develops, engineers, procures, constructs, and operates *Wind for Industry* projects. When determining an expansion strategy, One Power must consider the logistics and cost of self-performed construction and O&M. By layering a geographic analysis on the results of the technical and economic analysis of the TAM and Serviceable Market, One Power identified the states and regions most suitable for expansion.

Moving *Wind for Industry* into a new state requires considerable upfront work from a legal, regulatory, logistic, and permitting perspective. The decision to move into a new state and complete the required upfront work needs to consider the market potential of that state. If a state has significant market potential (many potential customers, attractive project pricing, high manufacturing output), then it is deemed a preferred state for expansion.

Each state's serviceability is explored by assigning it a *Wind for Industry* State Value Score. The county component of the *Wind for Industry* State Value Score is comprised of two equally weighted factors: potential customers and project pricing. The state component includes an additional factor: manufacturing output. These three are considered most vital to the success of One Power's expansion.

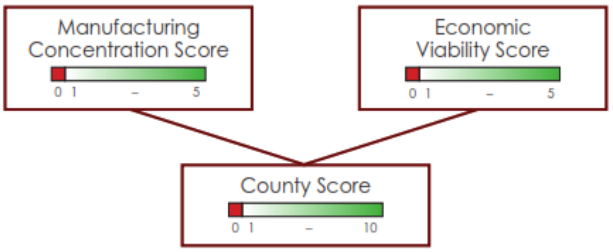
To calculate each state's *Wind for Industry* State Value Score, One Power first identified the counties within each state that had high concentrations of potential C&I customers. High concentration is defined as a county that has >75% of the nation's average manufacturing employment quotient or has a known facility in one of the TAM screened sectors[e]. This threshold is considered *high manufacturing concentration* for this analysis. Counties with high manufacturing concentration can be seen in Map 28 in orange (those with low concentration are colored in blue).

One Power then combined the counties with high manufacturing concentration with the economic viability results of the SM. Map 29 shows only counties that have high manufacturing concentration and were economically viable. To determine the County Score, the two components were assessed for each county. Both components were scaled to a value between 1 and 5 and then summed. Values that did not meet One Power's threshold for high manufacturing concentration and economic viability received a score of zero. A theoretically perfect county would receive a score of 10. The County Values were averaged for each state.

The final component of the State Value Score is the normalized manufacturing output[12,f]. States with higher manufacturing output make the upfront cost to move into that state more worthwhile. Each state's average score was weighted by the state's manufacturing output. The weighted scores were normalized to a maximum value of 100, comprising the final *Wind for Industry* State Value Score.

[12] The normalized manufacturing output was determined by dividing a state's manufacturing output in billions of dollars by the largest manufacturing output of an individual state. The state with the highest manufacturing output thus had a weight of one and all other states had a weight of less than one.[f]

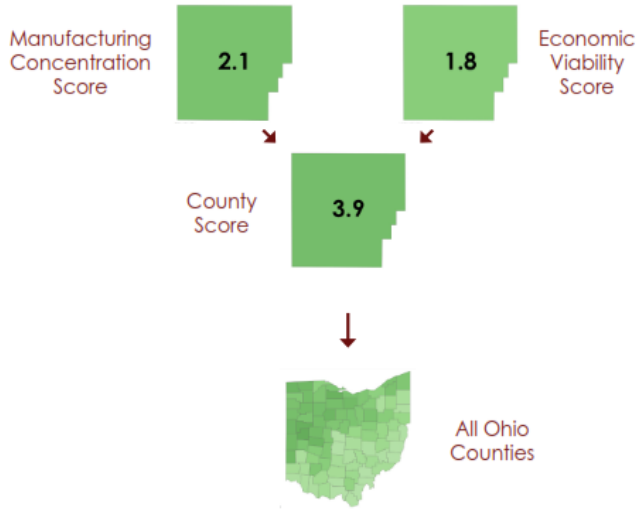
## COUNTY SCORE PROCESS




Repeat for all Counties in State

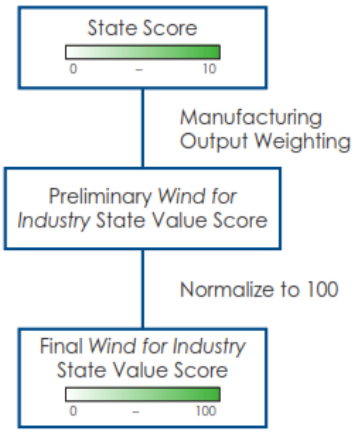
Average all Counties in State

## COUNTY SCORE EXAMPLE



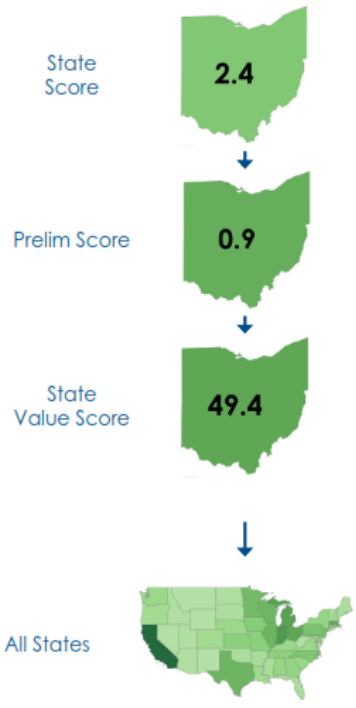

Average of all Counties in State = State Score

## STATE SCORE PROCESS

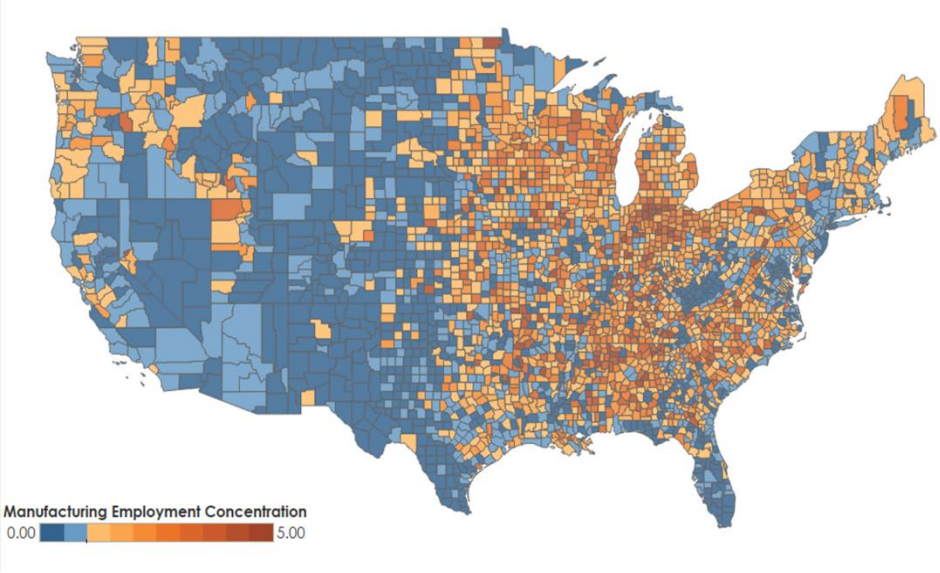



Repeat for all States

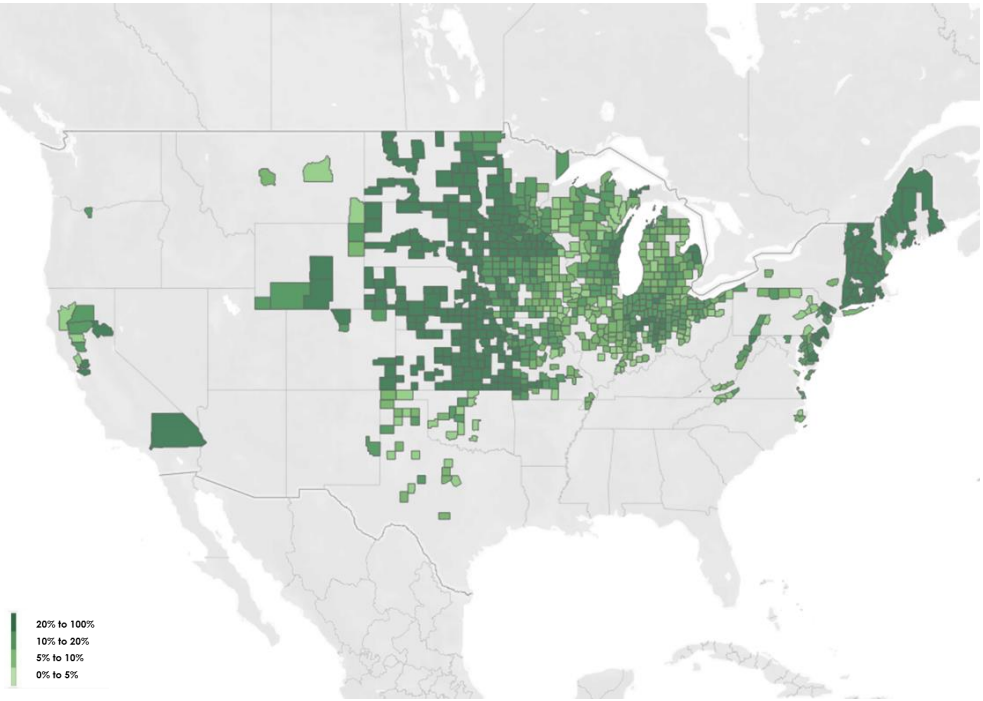
## STATE SCORE EXAMPLE



## Results




*Map 32: U.S. Manufacturing Concentration by County, 2019*




*Map 33: Economically Viable Counties Filtered for Manufacturing at 0%*

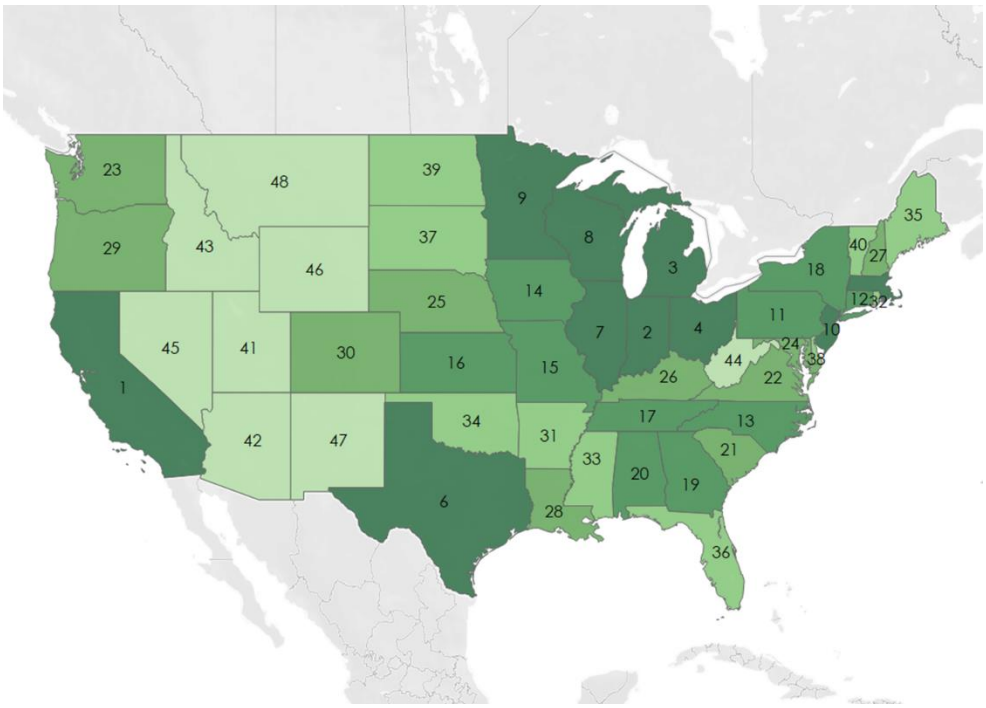
There are **860** economically viable counties with manufacturing in the continental U.S.

### *Understanding the Analysis*

*Percent by which PPA rate < grid rate*

- **20% to 100%**
- **10% to 20%**
- **5% to 10%**
- **0% to 5%**

| ONE POWER EXPANSION STRATEGY RESULTS | | | | |
|---|---|---|---|---|
| | STATE | STATE VALUE SCORE | CUMULATIVE SCORE | % OF TOTAL |
| 1 | California | 100.0 | 100.0 | 12% |
| 2 | Indiana | 60.4 | 160.4 | 20% |
| 3 | Michigan | 53.9 | 214.3 | 26% |
| 4 | Ohio | 49.4 | 263.7 | 33% |
| 5 | Massachusetts | 45.7 | 309.5 | 38% |
| 6 | Texas | 38.4 | 347.9 | 43% |
| 7 | Illinois | 38.2 | 386.1 | 48% |
| 8 | Wisconsin | 36.7 | 422.8 | 52% |
| 9 | Minnesota | 33.6 | 456.4 | 56% |
| 10 | New Jersey | 28.9 | 485.3 | 60% |
| 11 | Pennsylvania | 28.2 | 513.5 | 63% |
| 12 | Connecticut | 26.7 | 540.2 | 67% |
| 13 | North Carolina | 25.0 | 565.2 | 70% |
| 14 | Iowa | 20.7 | 585.9 | 72% |
| 15 | Missouri | 17.9 | 603.8 | 74% |
| 16 | Kansas | 17.9 | 621.7 | 77% |
| 17 | Tennessee | 16.7 | 638.4 | 79% |
| 18 | New York | 13.5 | 651.9 | 80% |
| 19 | Georgia | 13.3 | 665.1 | 82% |
| 20 | Alabama | 11.9 | 677.1 | 84% |
| 21 | South Carolina | 11.1 | 688.2 | 85% |
| 22 | Virginia | 10.1 | 698.3 | 86% |
| 23 | Washington | 9.7 | 708.0 | 87% |
| 24 | Maryland | 9.5 | 717.6 | 89% |
| 25 | Nebraska | 9.2 | 726.8 | 90% |
| 26 | Kentucky | 8.8 | 735.6 | 91% |
| 27 | New Hampshire | 8.3 | 743.9 | 92% |
| 28 | Louisiana | 7.6 | 751.5 | 93% |
| 29 | Oregon | 6.8 | 758.3 | 94% |
| 30 | Colorado | 6.7 | 765.0 | 94% |
| 31 | Arkansas | 5.1 | 770.2 | 95% |
| 32 | Rhode Island | 5.0 | 775.2 | 96% |
| 33 | Mississippi | 4.5 | 779.6 | 96% |
| 34 | Oklahoma | 4.1 | 783.8 | 97% |
| 35 | Maine | 3.8 | 787.6 | 97% |
| 36 | Florida | 3.6 | 791.2 | 98% |
| 37 | South Dakota | 3.3 | 794.5 | 98% |
| 38 | Delaware | 2.6 | 797.1 | 98% |
| 39 | North Dakota | 2.4 | 799.4 | 99% |
| 40 | Vermont | 2.3 | 801.7 | 99% |
| 41 | Utah | 2.0 | 803.7 | 99% |
| 42 | Arizona | 1.6 | 805.3 | 99% |
| 43 | Idaho | 1.5 | 806.8 | 100% |
| 44 | West Virginia | 1.3 | 808.1 | 100% |
| 45 | Nevada | 1.0 | 809.1 | 100% |
| 46 | Wyoming | 0.7 | 809.8 | 100% |
| 47 | New Mexico | 0.5 | 810.3 | 100% |
| 48 | Montana | 0.3 | 810.6 | 100% |




*Map 34: Wind for Industry State Value Score Rankings*

## Takeaway

As can be seen in Map 30, six of the top ten states (Indiana, Michigan, Ohio, Illinois, Wisconsin, and Minnesota) are located in the Midwest, making capturing this market One Power's ideal expansion strategy. While California has the highest State Value Score, approximately one third of the U.S.'s total score value can be obtained in the Midwest. This concentration of value is ideal from an expansion perspective. Focusing the expansion strategy in one region will make One Power's self-perform business model more feasible to execute; construction and O&M costs will be minimized by growing the business within one geographic area. Expanding *Wind for Industry* to the top ten scoring states would capture 60% of the total value in the U.S. The Midwest states indicated capture over 30% of the total value in the U.S., making them a viable strategy for initial expansion.

## KEY RESULTS AND CONCLUSIONS

One Power's market analysis quantified *Wind for Industry*'s potential in the continental U.S. One Power identified the Total Addressable Market (technically viable), the Serviceable Market (economically viable), Serviceable Market Growth, and *Wind for Industry's* Expansion Strategy. The key takeaways from this analysis include:

1. The *Wind for Industry* Serviceable Market in the continental U.S. is estimated at $66 billion in deployable capital based on a 0% Investment Tax Credit under current business model conditions (35,825 MW).
2. With a 30% Investment Tax Credit the Serviceable Market nearly doubles to $120 billion (65,345 MW).
3. The Energy Intensive Sectors including Biodiesel, Cement Production, Ethanol Production, and Refining represent a $3.4 billion market for deployable capital without any Investment Tax Credit (1,865 MW).
4. As economies of scale and known technology improvements become fully effective, the *Wind for Industry* Serviceable Market will increase to $95 billion in deployable capital without any Investment Tax Credit (57,185 MW).
5. Approximately 20% of large commercial and industrial facilities will be able to have a technically viable and financially attractive *Wind for Industry* project as the industry reaches maturity.
6. The Investment Tax Credit is not critical to the success of the *Wind for Industry* market.
7. *Wind for Industry's* potential has a sizeable concentration in the Midwest states of Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio. These states are known for having a large manufacturing presence and good wind resource.
8. Texas and California markets each represent a substantial standalone opportunity.

As of January 2020, there are approximately 105,000 MW of wind energy in the U.S. The *Wind for Industry* market represents a substantial growth opportunity for wind energy expansion in the U.S. Due to several barriers to entry (the discussion of which is beyond the scope of this report), less than 200 MW of distributed on-site wind have been deployed to date in the continental U.S**.** As a result, nearly the entire $66 billion market is available to be captured by companies equipped to overcome these barriers.

## REFERENCES

[a] National Renewable Energy Lab, Geospatial Data Science. Wind Integration National Dataset (WIND) Toolkit. https://www.nrel.gov/gis/wind.html. Accessed May 11, 2020.

[b] National Aeronautics and Space Administration EarthData. Modern-Era Retrospective analysis for Research and Applications version 2. https://disc.gsfc.nasa.gov/SSW/. Accessed May 11, 2020.

[c] U.S. Census Bureau. 2017 SUSB Annual Data by Establishment Industry. https://www.census.gov/data/tables/2017/econ/susb/2017-susb-annual.html. Accessed July 24, 2020.

[d] U.S. Energy Information Administration. Electricity: sales (consumption), revenue, prices & customers (EIA-861M). https://www.eia.gov/electricity/data.php#sales. Published October 18, 2019. Accessed February 7, 2020.

[e] Bureau of Labor Statistics. Quarterly census of employment and wages. United States Department of Labor. https://www.bls.gov/cew/datatoc.htm. Last Modified June 3, 2020. Accessed June 3, 2020.

[f] National Association of Manufacturers. 2019 United States Manufacturing Facts. https://www.nam.org/state-manufacturing-data/2019-united-states-manufacturing-facts/. Accessed July 28, 2020.

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# APPENDICES

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# APPENDIX A
# KEY TERMS

# APPENDIX A

## KEY TERMS

**Capacity factor (CF):** the ratio of the actual power output over a period of time to the theoretical maximum output if generation was at rated capacity continuously for the same time period.

**Energy Investment Tax Credit (ITC):** a federal financial incentive that is a one-for-one credit against a net tax liability.

**Grid rate:** electricity costs to a consumer purchasing power from the national electric grid. The 2018 average industrial rate per state was used as the grid rate throughout this analysis.

**Kilowatt hour (kWh):** 1,000 watts of electricity used for one hour.

**Low Carbon Fuel Standard (LCFS):** a standard implemented by California to incentivize cleaner fuel. The standard sets performance metrics on cleaner hydrocarbon fuels and assigns a monetary value to the carbon used to create the fuel.

**Megawatt (MW):** a unit of power equivalent to 1,000,000 watts.

**Power Purchase Agreement (PPA):** a contract between an energy provider and a customer who wishes to purchase energy at a predetermined rate for an extended period of time.

**Renewable Energy Agreement (REA):** One Power's version of PPA.

**Serviceable Market (SM):** The segment of the TAM where *Wind for Industry* projects are economically viable.

**Total Addressable Market (TAM):** the available revenue opportunity for a product or service. One Power's TAM is defined as the percentage of C&I facilities that could support a *Wind for Industry* project based on technical factors. The TAM is comprised of the General Industry Market Extrapolation and the Energy Intensive Sectors.

***Wind for Industry*:** a wind energy project designed to achieve a significant reduction of a C&I facility's electrical consumptions from the grid. These projects involve installing one or more utility-scale turbines and interconnecting them on the facility's side of their utility meter.

# APPENDIX B
# ADDITIONAL DATA INFORMATION

# APPENDIX B

## ADDITIONAL DATA INFORMATION

### Wind-Resource Data

Data from two sources was used in the analysis: 50-meter long-term wind speed data from NASA's Modern-Era Retrospective analysis for Research and Applications version 2 (MERRA2) and 80-meter average wind speed data from NREL's WIND Toolkit. 30 years of data from 81 MERRA2 nodes over nine states were utilized in the analysis. The WIND Toolkit data provided an average wind speed on a county level.

Each MERRA2 node was used to calculate an Annual Energy Production (AEP) value using the turbine power curve. A linear relationship was formed between the 30-year average wind speed and AEP. To calculate the capacity factor for each county, the linear relationship generated using MERRA2 was applied to the WIND Toolkit county average wind speed data.

The One Power Project Finance Model was used to establish a baseline PPA rate for project CFs ranging from 16% – 70% based on the assumptions of a 4.7 MW project and no wake loss. PPA rates in correlation to CFs were established for five different ITC levels (30%, 24%, 18%, 12%, and 0%). Each county was then assigned an expected PPA rate for each ITC rate based on the county's previously calculated CF.[a,b]

### Average Electricity-Rate Data

The 2018 average industrial grid rate data was downloaded from the U.S. Energy Information Administration (EIA). From the original data, the 2018/State/All Utilities/Industrial End Users information was extracted. The average industrial electricity rate in each state was then applied to each county in the state. Although the average commercial grid rate was also considered for analysis, the average industrial grid rate was utilized to remain conservative.[d]

### Manufacturing Concentration by County Data

The concentration of manufacturing by county was obtained from the U.S. Department of Labor's Bureau of Labor Statistics. The 1975 – 2019 Quarterly Census of Employment and Wages (QCEW) data at the county level was utilized. The data was provided on a per-county basis. For this analysis, the Employment Location Quotient Relative to the U.S. was used for the manufacturing industry. A quotient cutoff of 0.75 was used to generate the manufacturing-filtered maps; this criterion was selected because this is sufficiently representative of a high concentration of manufacturing employers in an area.[e]

# APPENDIX C

# PPA RATES

# APPENDIX C

## PPA RATES

The following PPA rates were determined using One Power's financial model and were used when calculating the current SM. The rates cited are constant un-escalated 20-year rates that match One Power's typical PPA-rate structure and yield an acceptable project internal rate of return (IRR). Given the rates are constant, these figures also represent average rates.

| | | ITC RATE | | | | |
|---|---|---|---|---|---|---|
| | | 30% | 24% | 18% | 12% | 0% |
| CAPACITY FACTOR | 16% | 0.1130 | 0.1199 | 0.1275 | 0.1350 | 0.1500 |
| | 17% | 0.1059 | 0.1130 | 0.1200 | 0.1270 | 0.1411 |
| | 18% | 0.0998 | 0.1064 | 0.1131 | 0.1197 | 0.1330 |
| | 19% | 0.0943 | 0.1006 | 0.1069 | 0.1132 | 0.1258 |
| | 20% | 0.0888 | 0.0952 | 0.1013 | 0.1073 | 0.1192 |
| | 21% | 0.0846 | 0.0903 | 0.0960 | 0.1017 | 0.1131 |
| | 22% | 0.0806 | 0.0860 | 0.0914 | 0.0969 | 0.1078 |
| | 23% | 0.0769 | 0.0821 | 0.0873 | 0.0925 | 0.1029 |
| | 24% | 0.0735 | 0.0785 | 0.0834 | 0.0884 | 0.0984 |
| | 25% | 0.0704 | 0.0751 | 0.0799 | 0.0847 | 0.0943 |
| | 26% | 0.0675 | 0.0721 | 0.0767 | 0.0813 | 0.0905 |
| | 27% | 0.0648 | 0.0692 | 0.0737 | 0.0781 | 0.0870 |
| | 28% | 0.0623 | 0.0666 | 0.0709 | 0.0751 | 0.0837 |
| | 29% | 0.0600 | 0.0641 | 0.0682 | 0.0724 | 0.0806 |
| | 30% | 0.0578 | 0.0618 | 0.0658 | 0.0698 | 0.0778 |
| | 31% | 0.0558 | 0.0597 | 0.0635 | 0.0674 | 0.0751 |
| | 32% | 0.0539 | 0.0577 | 0.0614 | 0.0651 | 0.0726 |
| | 33% | 0.0521 | 0.0558 | 0.0594 | 0.0630 | 0.0703 |
| | 34% | 0.0505 | 0.0540 | 0.0575 | 0.0610 | 0.0681 |
| | 35% | 0.0489 | 0.0523 | 0.0557 | 0.0591 | 0.0660 |
| | 36% | 0.0474 | 0.0507 | 0.0540 | 0.0574 | 0.0640 |
| | 37% | 0.0460 | 0.0492 | 0.0524 | 0.0557 | 0.0621 |
| | 38% | 0.0446 | 0.0478 | 0.0509 | 0.0541 | 0.0604 |
| | 39% | 0.0434 | 0.0464 | 0.0495 | 0.0526 | 0.0587 |
| | 40% | 0.0421 | 0.0451 | 0.0481 | 0.0511 | 0.0571 |
| | 41% | 0.0410 | 0.0439 | 0.0468 | 0.0498 | 0.0556 |
| | 42% | 0.0399 | 0.0428 | 0.0456 | 0.0485 | 0.0542 |
| | 43% | 0.0389 | 0.0416 | 0.0444 | 0.0472 | 0.0528 |
| | 44% | 0.0379 | 0.0406 | 0.0433 | 0.0460 | 0.0515 |
| | 45% | 0.0369 | 0.0396 | 0.0422 | 0.0449 | 0.0502 |
| | 46% | 0.0360 | 0.0386 | 0.0412 | 0.0438 | 0.0490 |
| | 47% | 0.0351 | 0.0377 | 0.0402 | 0.0428 | 0.0479 |
| | 48% | 0.0343 | 0.0368 | 0.0393 | 0.0418 | 0.0468 |
| | 49% | 0.0335 | 0.0359 | 0.0384 | 0.0408 | 0.0457 |
| | 50% | 0.0327 | 0.0351 | 0.0375 | 0.0399 | 0.0447 |
| | 51% | 0.0320 | 0.0343 | 0.0367 | 0.0390 | 0.0437 |
| | 52% | 0.0313 | 0.0336 | 0.0359 | 0.0382 | 0.0428 |
| | 53% | 0.0306 | 0.0329 | 0.0351 | 0.0374 | 0.0419 |
| | 54% | 0.0299 | 0.0322 | 0.0344 | 0.0366 | 0.0410 |
| | 55% | 0.0293 | 0.0315 | 0.0337 | 0.0358 | 0.0402 |
| | 56% | 0.0287 | 0.0308 | 0.0330 | 0.0351 | 0.0394 |
| | 57% | 0.0281 | 0.0302 | 0.0323 | 0.0344 | 0.0386 |
| | 58% | 0.0275 | 0.0296 | 0.0317 | 0.0337 | 0.0379 |
| | 59% | 0.0270 | 0.0290 | 0.0310 | 0.0331 | 0.0371 |
| | 60% | 0.0264 | 0.0284 | 0.0304 | 0.0324 | 0.0364 |
| | 61% | 0.0259 | 0.0279 | 0.0299 | 0.0318 | 0.0357 |
| | 62% | 0.0254 | 0.0274 | 0.0293 | 0.0312 | 0.0351 |
| | 63% | 0.0249 | 0.0269 | 0.0288 | 0.0307 | 0.0345 |
| | 64% | 0.0245 | 0.0264 | 0.0282 | 0.0301 | 0.0338 |
| | 65% | 0.0240 | 0.0259 | 0.0277 | 0.0296 | 0.0332 |

The following PPA rates were determined using One Power's standard financial model, assuming a 10% decrease in installed project costs. These rates were used when calculating the Future Market Potential in Scenarios 1 and 2.

| | | ITC RATE | | | | |
|---|---|---|---|---|---|---|
| | | 30% | 24% | 18% | 12% | 0% |
| CAPACITY FACTOR | 16% | 0.1042 | 0.1106 | 0.1174 | 0.1238 | 0.1378 |
| | 17% | 0.0975 | 0.1039 | 0.1102 | 0.1166 | 0.1292 |
| | 18% | 0.0919 | 0.0978 | 0.1038 | 0.1098 | 0.1218 |
| | 19% | 0.0868 | 0.0924 | 0.0981 | 0.1038 | 0.1151 |
| | 20% | 0.0822 | 0.0875 | 0.0929 | 0.0983 | 0.1090 |
| | 21% | 0.0779 | 0.0830 | 0.0881 | 0.0932 | 0.1035 |
| | 22% | 0.0741 | 0.0790 | 0.0839 | 0.0888 | 0.0986 |
| | 23% | 0.0707 | 0.0754 | 0.0801 | 0.0847 | 0.0941 |
| | 24% | 0.0676 | 0.0720 | 0.0765 | 0.0810 | 0.0900 |
| | 25% | 0.0647 | 0.0690 | 0.0733 | 0.0776 | 0.0862 |
| | 26% | 0.0620 | 0.0661 | 0.0703 | 0.0744 | 0.0827 |
| | 27% | 0.0595 | 0.0635 | 0.0675 | 0.0715 | 0.0795 |
| | 28% | 0.0572 | 0.0611 | 0.0649 | 0.0688 | 0.0765 |
| | 29% | 0.0551 | 0.0588 | 0.0625 | 0.0662 | 0.0737 |
| | 30% | 0.0531 | 0.0567 | 0.0603 | 0.0639 | 0.0710 |
| | 31% | 0.0512 | 0.0547 | 0.0582 | 0.0616 | 0.0686 |
| | 32% | 0.0495 | 0.0528 | 0.0562 | 0.0596 | 0.0663 |
| | 33% | 0.0478 | 0.0511 | 0.0544 | 0.0576 | 0.0641 |
| | 34% | 0.0463 | 0.0494 | 0.0526 | 0.0558 | 0.0621 |
| | 35% | 0.0448 | 0.0479 | 0.0510 | 0.0540 | 0.0602 |
| | 36% | 0.0434 | 0.0464 | 0.0494 | 0.0524 | 0.0584 |
| | 37% | 0.0421 | 0.0450 | 0.0479 | 0.0509 | 0.0567 |
| | 38% | 0.0409 | 0.0437 | 0.0466 | 0.0494 | 0.0551 |
| | 39% | 0.0397 | 0.0425 | 0.0452 | 0.0480 | 0.0535 |
| | 40% | 0.0386 | 0.0413 | 0.0440 | 0.0467 | 0.0521 |
| | 41% | 0.0375 | 0.0402 | 0.0428 | 0.0454 | 0.0507 |
| | 42% | 0.0365 | 0.0391 | 0.0417 | 0.0442 | 0.0494 |
| | 43% | 0.0356 | 0.0381 | 0.0406 | 0.0431 | 0.0481 |
| | 44% | 0.0346 | 0.0371 | 0.0395 | 0.0420 | 0.0469 |
| | 45% | 0.0338 | 0.0362 | 0.0385 | 0.0409 | 0.0457 |
| | 46% | 0.0329 | 0.0353 | 0.0376 | 0.0399 | 0.0446 |
| | 47% | 0.0321 | 0.0344 | 0.0367 | 0.0390 | 0.0436 |
| | 48% | 0.0313 | 0.0336 | 0.0358 | 0.0381 | 0.0426 |
| | 49% | 0.0306 | 0.0328 | 0.0350 | 0.0372 | 0.0416 |
| | 50% | 0.0299 | 0.0320 | 0.0342 | 0.0364 | 0.0407 |
| | 51% | 0.0292 | 0.0313 | 0.0334 | 0.0355 | 0.0398 |
| | 52% | 0.0285 | 0.0306 | 0.0327 | 0.0348 | 0.0389 |
| | 53% | 0.0279 | 0.0299 | 0.0320 | 0.0340 | 0.0381 |
| | 54% | 0.0273 | 0.0293 | 0.0313 | 0.0333 | 0.0373 |
| | 55% | 0.0267 | 0.0287 | 0.0306 | 0.0326 | 0.0365 |
| | 56% | 0.0261 | 0.0281 | 0.0300 | 0.0319 | 0.0358 |
| | 57% | 0.0256 | 0.0275 | 0.0294 | 0.0313 | 0.0351 |
| | 58% | 0.0251 | 0.0269 | 0.0288 | 0.0307 | 0.0344 |
| | 59% | 0.0246 | 0.0264 | 0.0282 | 0.0300 | 0.0337 |
| | 60% | 0.0241 | 0.0259 | 0.0277 | 0.0295 | 0.0331 |
| | 61% | 0.0236 | 0.0254 | 0.0271 | 0.0289 | 0.0324 |
| | 62% | 0.0231 | 0.0249 | 0.0266 | 0.0284 | 0.0318 |
| | 63% | 0.0227 | 0.0244 | 0.0261 | 0.0278 | 0.0312 |
| | 64% | 0.0223 | 0.0239 | 0.0256 | 0.0273 | 0.0307 |
| | 65% | 0.0218 | 0.0235 | 0.0252 | 0.0268 | 0.0301 |
| | 66% | 0.0214 | 0.0231 | 0.0247 | 0.0263 | 0.0296 |
| | 67% | 0.0210 | 0.0226 | 0.0243 | 0.0259 | 0.0291 |
| | 68% | 0.0207 | 0.0222 | 0.0238 | 0.0254 | 0.0286 |
| | 69% | 0.0203 | 0.0218 | 0.0234 | 0.0250 | 0.0281 |
| | 70% | 0.0199 | 0.0215 | 0.0230 | 0.0245 | 0.0276 |

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# APPENDIX D
# ADDITIONAL 5M ITC RESULTS

# APPENDIX D

## ADDITIONAL SM ITC RESULTS

| SM GENERAL C&I<br>*12% ITC Rate* | GENERAL INDUSTRY SAMPLING | MARKET EXTRAPOLATION |
|---|---|---|
| Number of Facilities Screened | 269 | 53,743 |
| **TAM** | | |
| # of Viable Facilities | 76 | 15,183 |
| Average Project Size (MW) | 5 | 5 |
| Total Deployable MW | 345 | 75,915 |
| Deployable Capital (MM) | $638 | $140,443 |
| **SM** | | |
| % of TAM Facilities Economically Viable | 66% | 66% |
| # of Viable SM Facilities | 50 | 9,988 |
| Total Deployable MW | 215 | 49,940 |
| Deployable Capital (MM) | $398 | $92,389 |

| SM ENERGY INTENSIVE SECTORS<br>*12% ITC Rate* | BIODIESEL | CEMENT | ETHANOL | REFINERIES | TOTAL |
|---|---|---|---|---|---|
| Number of Facilities Screened | 97 | 103 | 200 | 153 | 553 |
| **TAM** | | | | | |
| # of Viable TAM Facilities | 28 | 51 | 114 | 55 | 248 |
| Average Project Size (MW) | 10 | 5 | 10 | 20 | 5 |
| Total Deployable MW | 280 | 250 | 1,140 | 1,100 | 2,775 |
| Deployable Capital (MM) | $518 | $463 | $2,109 | $2,035 | $5,134 |
| **SM** | | | | | |
| % of TAM Facilities Economically Viable | 89% | 55% | 96% | 45% | 76% |
| # of Viable SM Facilities | 25 | 28 | 110 | 25 | 188 |
| Total Deployable MW | 250 | 135 | 1,100 | 500 | 1,985 |
| Deployable Capital (MM) | $444 | $250 | $2,035 | $925 | $3,654 |

| SM GENERAL C&I<br>*18% ITC Rate* | GENERAL INDUSTRY SAMPLING | MARKET EXTRAPOLATION |
|---|---|---|
| Number of Facilities Screened | 269 | 53,743 |
| **TAM** | | |
| # of Viable TAM Facilities | 76 | 15,183 |
| Average Project Size (MW) | 5 | 5 |
| Total Deployable MW | 345 | 75,915 |
| Deployable Capital (MM) | $638 | $140,443 |
| **SM** | | |
| % of TAM Facilities Economically Viable | 70% | 70% |
| # of Viable SM Facilities | 53 | 10,588 |
| Total Deployable MW | 230 | 52,940 |
| Deployable Capital (MM) | $426 | $97,939 |

| SM ENERGY INTENSIVE SECTORS<br>*18% ITC Rate* | BIODIESEL | CEMENT | ETHANOL | REFINERIES | TOTAL |
|---|---|---|---|---|---|
| Number of Facilities Screened | 97 | 103 | 200 | 153 | 553 |
| **TAM** | | | | | |
| # of Viable TAM Facilities | 28 | 51 | 114 | 55 | 248 |
| Average Project Size (MW) | 10 | 5 | 10 | 20 | 5 |
| Total Deployable MW | 280 | 250 | 1,140 | 1,100 | 2,775 |
| Deployable Capital (MM) | $518 | $463 | $2,109 | $2,035 | $5,134 |
| **SM** | | | | | |
| % of TAM Facilities Economically Viable | 89% | 65% | 96% | 58% | 81% |
| # of Viable SM Facilities | 25 | 33 | 110 | 32 | 200 |
| Total Deployable MW | 250 | 160 | 1,100 | 640 | 2,150 |
| Deployable Capital (MM) | $444 | $296 | $2,035 | $1,184 | $3,959 |

# APPENDIX E
# REVENUE

# APPENDIX E

## REVENUE

The balance of this report was based on deployable capital. This appendix provides an approximation of annual revenue instead of deployable capital.

One Power calculated the revenue of the SM at 0% ITC. The revenue was calculated at 30%, 35%, and 40% CF at $0.06/kWh to remain conservative in revenue estimates. One Power's operating projects were not included in the calculation of deployable megawatts, production, or revenue.

| SM TOTAL REVENUE 0% ITC RATE, **30% CF** | BIODIESEL | CEMENT | ETHANOL | REFINERIES | GENERAL INDUSTRY SAMPLING | MARKET EXTRAPOLATION |
|---|---|---|---|---|---|---|
| Total Viable Facilities | 24 | 20 | 107 | 23 | 34 | 6,792 |
| Average Project Size (MW) | 10 | 5 | 10 | 20 | 5 | 5 |
| Total Deployable MW | 240 | 95 | 1,070 | 460 | 135 | 33,960 |
| Production (kWh) | 630,720,000 | 249,660,000 | 2,811,960,000 | 1,208,880,000 | 354,780,000 | 89,246,880,000 |
| Revenue ($0.06/kWh) | $37,843,200 | $14,979,600 | $168,717,600 | $72,532,800 | $21,286,800 | $5,354,812,800 |

| SM TOTAL REVENUE 0% ITC RATE, **35% CF** | BIODIESEL | CEMENT | ETHANOL | REFINERIES | GENERAL INDUSTRY SAMPLING | MARKET EXTRAPOLATION |
|---|---|---|---|---|---|---|
| Total Viable Facilities | 24 | 20 | 107 | 23 | 34 | 6,792 |
| Average Project Size (MW) | 10 | 5 | 10 | 20 | 5 | 5 |
| Total Deployable MW | 240 | 95 | 1,070 | 460 | 135 | 33,960 |
| Production (kWh) | 630,720,000 | 249,660,000 | 2,811,960,000 | 1,208,880,000 | 354,780,000 | 89,246,880,000 |
| Revenue ($0.06/kWh) | $37,843,200 | $14,979,600 | $168,717,600 | $72,532,800 | $21,286,800 | $5,354,812,800 |

| SM TOTAL REVENUE 0% ITC RATE, **40% CF** | BIODIESEL | CEMENT | ETHANOL | REFINERIES | GENERAL INDUSTRY SAMPLING | MARKET EXTRAPOLATION |
|---|---|---|---|---|---|---|
| Total Viable Facilities | 24 | 20 | 107 | 23 | 34 | 6,792 |
| Average Project Size (MW) | 10 | 5 | 10 | 20 | 5 | 5 |
| Total Deployable MW | 240 | 95 | 1,070 | 460 | 135 | 33,960 |
| Production (kWh) | 840,960,000 | 332,880,000 | 3,749,280,000 | 1,611,840,000 | 473,040,000 | 118,995,840,000 |
| Revenue ($0.06/kWh) | $50,457,600 | $19,972,800 | $224,956,800 | $96,710,400 | $28,382,400 | $7,139,750,400 |

# APPENDIX F
# ADDITIONAL MARKET OPPORTUNITY

# APPENDIX F

## ADDITIONAL MARKET OPPORTUNITY

### LOW CARBON FUEL STANDARD (LCFS)

One Power identified a market opportunity within the C&I sectors that could improve the economic viability at many facilities across the US. This opportunity is the Low Carbon Fuel Standard imposed by the state of California on all transportation fuels being sold within the state. This section discusses the opportunity in further detail and explores the financial impact on the Serviceable Market.

**Method**

In recent years, there has been increased scrutiny on C&I facilities' carbon emissions and a push towards more sustainable business practices. While *Wind for Industry* projects benefit companies trying to meet sustainability goals, the customer's primary driver for on-site wind is (and will continue to be) the financial bottom line. One Power has identified a financial incentive market that puts monetary value on a customer's ability to lower their carbon emissions. This market makes *Wind for Industry* projects more financially attractive and expands the SM to new customers not previously considered.

California has implemented a Low Carbon Fuel Standard (LCFS) to incentivize cleaner fuel. The standard sets performance metrics on cleaner hydrocarbon fuels and assigns a monetary value to the carbon used to create the fuel. Transportation fuels with a lower carbon intensity (CI) score receive a higher dollar-per-gallon credit, which creates a quantifiable incentive for suppliers to reduce CI.

One Power has identified that *Wind for Industry* projects can significantly reduce the CI of transportation fuels by directly powering facilities behind the meter, or, according to LCFS language, "inside the fence." CI is calculated by assessing the emissions in the complete lifecycle of a fuel and is expressed in $CO_2$ equivalent per unit of energy ($gCO_2e/MJ$). If a fuel uses less carbon during any part of its lifecycle, including electricity consumed during processing, its CI goes down. Renewable energy must be utilized in a behind-the-meter application to directly offset energy consumption from the grid. This is exactly what One Power offers with *Wind for Industry*. One Power has identified numerous oil, biodiesel, and ethanol facilities that could utilize on-site wind energy to reduce their CI (for example, the sectors highlighted in the TAM).

CI reduction holds a quantifiable monetary value for qualifying facilities that would increase the financial attractiveness of a *Wind for Industry* project in a way that is unique to the transportation fuels industry. In some cases, the CI improvement value is higher than the actual cost of the energy. This results in *Wind for Industry* projects that are particularly financially attractive for both One Power and the customer.

In the analysis, One Power assumed the LCFS monetary value to the customer to be \$0.03/kWh, \$0.05/kWh, and \$0.07/kWh. These assumptions are based on values that One Power has obtained from an existing relationship with a major LCFS producer. The value varies with location, so these values were chosen to show a conservative range. The analysis does not include the assumptions from Scenarios 1 and 2. The LCFS value was added into the 20-year PPA rate using five different ITC rates (30%, 24%, 18%, 12%, and 0%). As with the SM calculation, the new 20-year PPA rate was then compared to the grid rate in that area. If the 20-year fixed PPA rate was lower than the average current grid rate, the county was identified as Economically Viable.

The economically viable counties were compared to the areas of high manufacturing concentration. The results below show the economically viable counties with high manufacturing concentration (green), and the economically viable counties without high manufacturing concentration (gray).

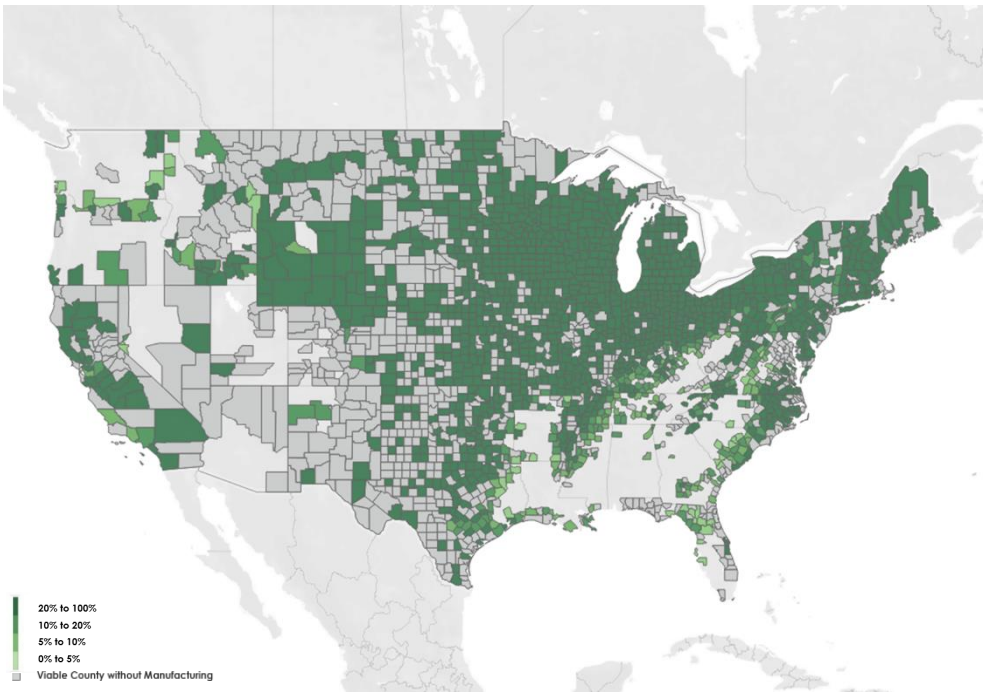
While the LCFS value currently only applies when selling into the California market, other states are exploring similar standards.

**Results**

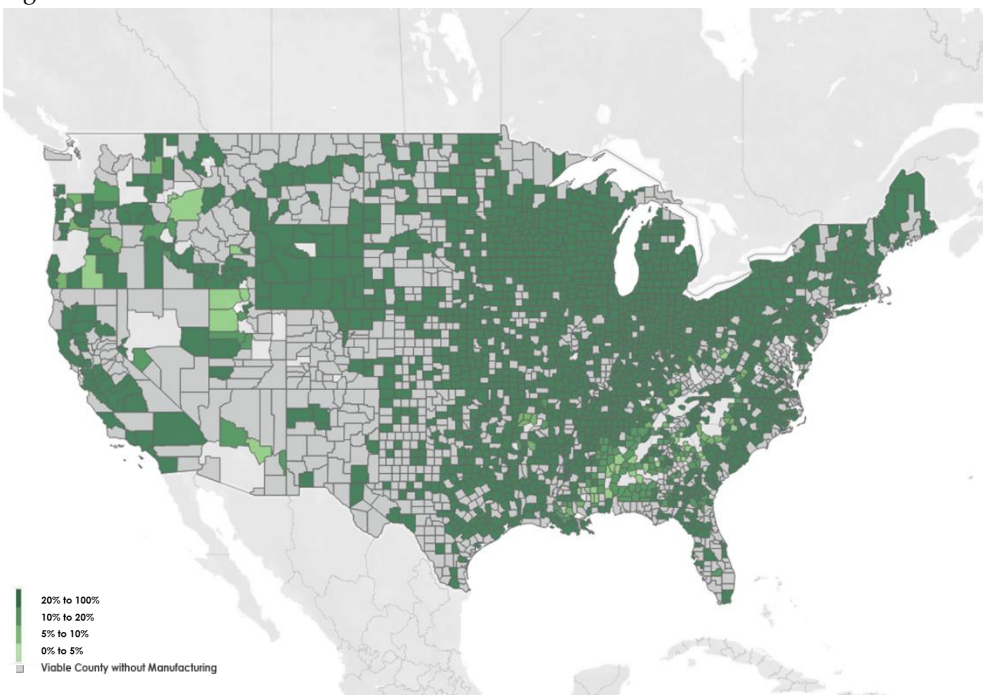
| LCFS MARKET POTENTIAL<br>*3 Cents* | 30% ITC | | 24% ITC | | 18% ITC | | 12% ITC | | 0% ITC | |
|---|---|---|---|---|---|---|---|---|---|---|
| | COUNT | % | COUNT | % | COUNT | % | COUNT | % | COUNT | % |
| Total U.S. Counties | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - |
| Economically Viable Counties | 3,022 | 96.2% | 2,973 | 94.6% | 2,883 | 91.8% | 2,796 | 89.0% | 2,410 | 76.7% |
| Economically Viable Counties with High Manufacturing Concentration | 2,020 | 64.3% | 1,982 | 63.1% | 1,914 | 60.9% | 1,852 | 58.9% | 1,594 | 50.7% |

| LCFS MARKET POTENTIAL *5 Cents* | 30% ITC | | 24% ITC | | 18% ITC | | 12% ITC | | 0% ITC | |
|---|---|---|---|---|---|---|---|---|---|---|
| | COUNT | % | COUNT | % | COUNT | % | COUNT | % | COUNT | % |
| Total U.S. Counties | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - |
| Economically Viable Counties | 3,092 | 98.4% | 3,076 | 97.9% | 3,061 | 97.4% | 3,036 | 96.6% | 2,954 | 94.0% |
| Economically Viable Counties with High Manufacturing Concentration | 2,072 | 65.9% | 2,059 | 65.5% | 2,049 | 65.2% | 2,030 | 64.6% | 1,970 | 62.7% |

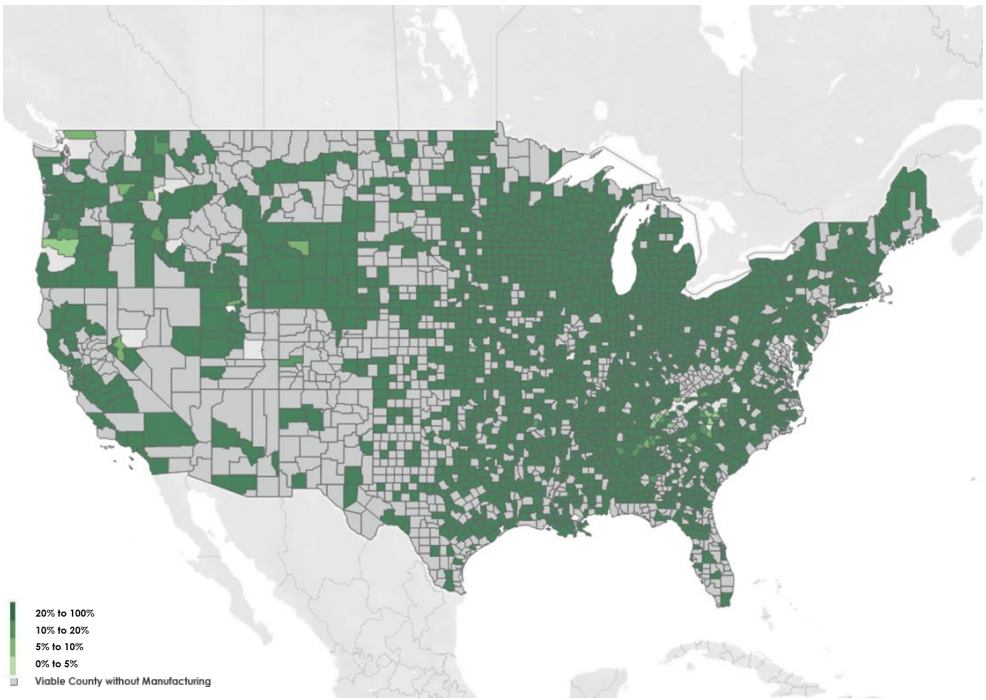
| LCFS MARKET POTENTIAL **7** *Cents* | 30% ITC | | 24% ITC | | 18% ITC | | 12% ITC | | 0% ITC | |
|---|---|---|---|---|---|---|---|---|---|---|
| | COUNT | % | COUNT | % | COUNT | % | COUNT | % | COUNT | % |
| Total U.S. Counties | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - | 3,142 | - |
| Economically Viable Counties | 3,100 | 98.7% | 3,099 | 98.6% | 3,092 | 98.4% | 3,086 | 98.2% | 3,086 | 98.2% |
| Economically Viable Counties with High Manufacturing Concentration | 2,080 | 66.2% | 2,080 | 66.2% | 2,072 | 65.9% | 2,067 | 65.8% | 2,053 | 65.3% |




***3 Cent LCFS Market at 0% ITC***




*5 Cent LCFS Market at 0% ITC*




*7 Cent LCFS Market at 0% ITC*

**Takeaway**

This analysis reveals that LCFS expands the SM in the U.S. at a 0% ITC rate. With a 3 cent LCFS incentive, One Power expects to be economically attractive to facilities in 2,410 counties (76.7%) and in 1,594 counties with customer potential (50.7%). With a 5 cent LCFS incentive, One Power expects to be economically attractive to facilities in 2,954 counties (94.0%) and in 1,970 counties with customer potential (62.7%). With a 7 cent LCFS incentive, One Power expects to be economically attractive to facilities in 3,086 counties (98.2%) and in 2,053 counties with customer potential (65.3%).

The LCFS allows One Power to reach more customers and to be more financially attractive to those customers. With an LCFS credit of 3 cents, the market increased the overlap of economically viable counties and high manufacturing concentration by 85.3%. The LCFS potential essentially opens the door for economically viable *Wind for Industry* projects at qualifying facilities across the U.S.

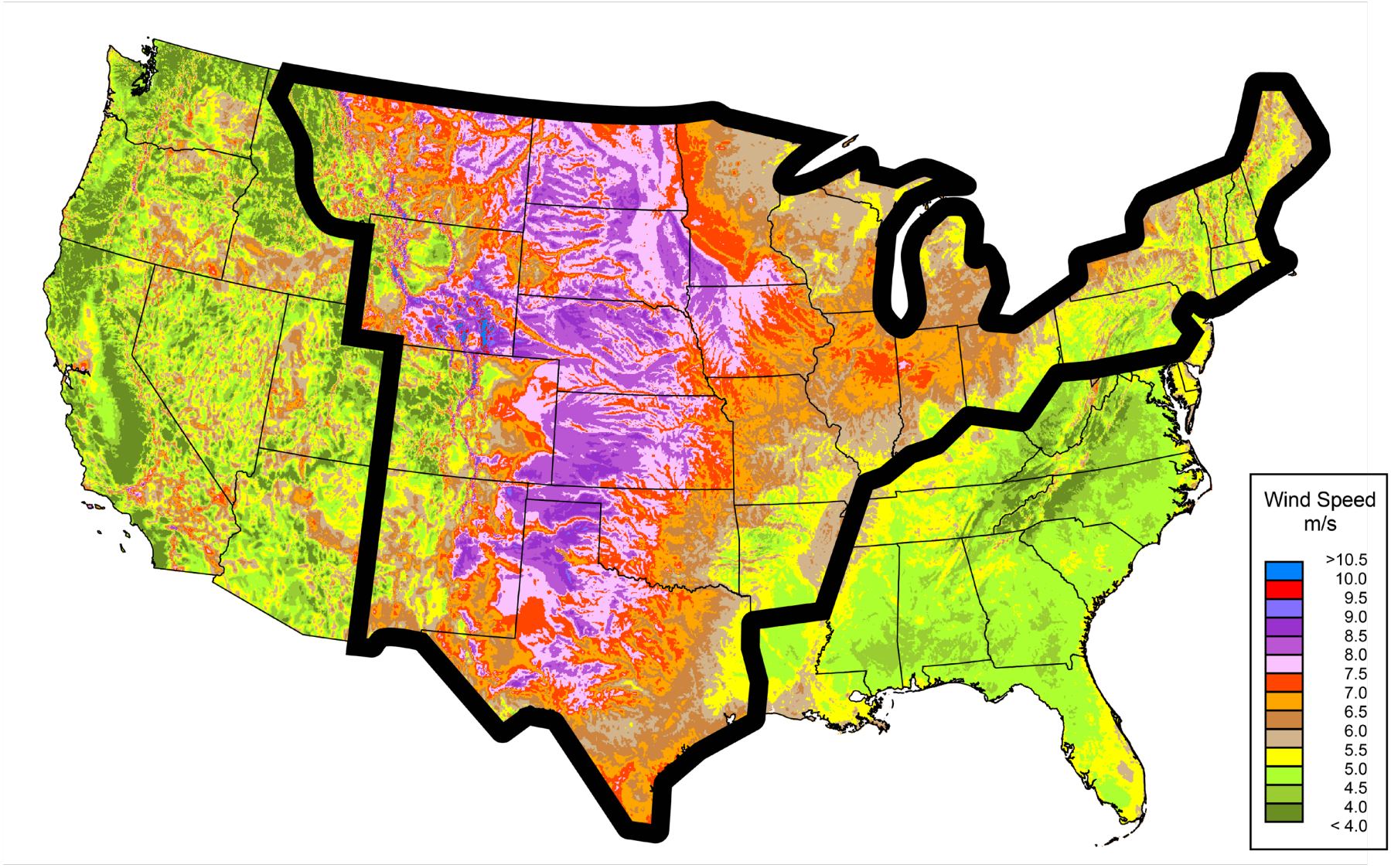
The LCFS has a positive impact on *Wind for Industry*'s deployable capital in the applicable sectors. Since LCFS potential only applies to transportation fuels at this time, the deployable capital potential only increased in those sectors.

| **LCFS MARKET POTENTIAL** *3 CENTS, 0% ITC* | **BIODIESEL** | **ETHANOL** | **REFINERIES** | **TOTAL** |
|---|---|---|---|---|
| **SM** | | | | |
| % of TAM Facilities Economically Viable | 86% | 94% | 42% | 74% |
| Total Deployable MW | 240 | 1,070 | 460 | 1,770 |
| Deployable Capital (MM) | $444 | $1,980 | $851 | $3,275 |
| **LCFS – 3 CENTS** | | | | |
| % of TAM Facilities Economically Viable | 100% | 100% | 89% | 96% |
| Total Deployable MW | 280 | 1,140 | 980 | 2,400 |
| Deployable Capital (MM) | $518 | $2,109 | $1,813 | $4,440 |

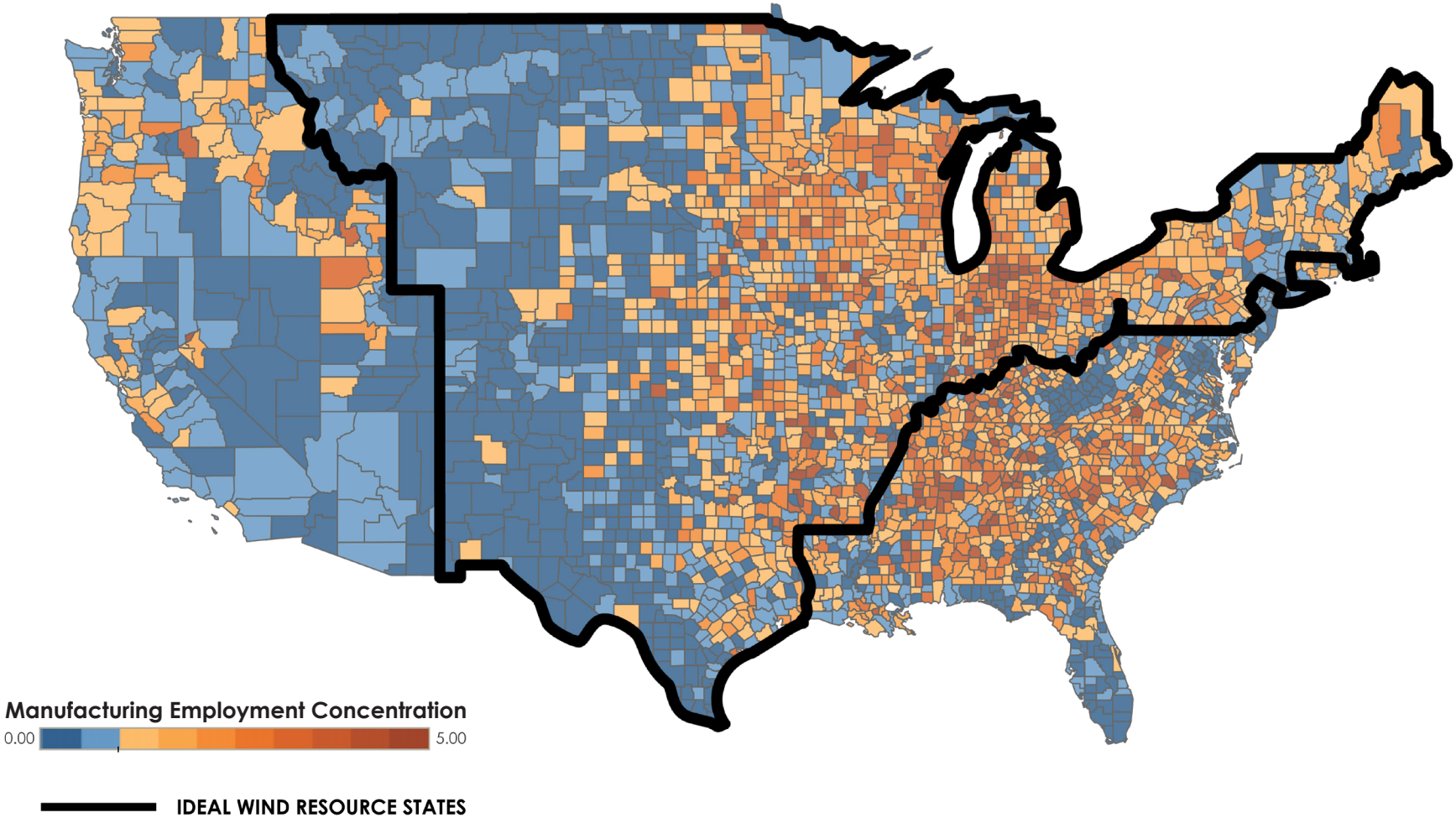
| **LCFS MARKET POTENTIAL** *5 CENTS, 0% ITC* | **BIODIESEL** | **ETHANOL** | **REFINERIES** | **TOTAL** |
|---|---|---|---|---|
| **SM** | | | | |
| % of TAM Facilities Economically Viable | 86% | 94% | 42% | 74% |
| Total Deployable MW | 240 | 1,070 | 460 | 1,770 |
| Deployable Capital (MM) | $444 | $1,980 | $851 | $3,275 |
| **LCFS – 5 CENTS** | | | | |
| % of TAM Facilities Economically Viable | 100% | 100% | 96% | 99% |
| Total Deployable MW | 280 | 1,140 | 1,060 | 2,480 |
| Deployable Capital (MM) | $518 | $2,109 | $1,961 | $4,588 |

| **LCFS MARKET POTENTIAL** *7 CENTS, 0% ITC* | **BIODIESEL** | **ETHANOL** | **REFINERIES** | **TOTAL** |
|---|---|---|---|---|
| **SM** | | | | |
| % of TAM Facilities Economically Viable | 86% | 94% | 42% | 74% |
| Total Deployable MW | 240 | 1,070 | 460 | 1,770 |
| Deployable Capital (MM) | $444 | $1,980 | $851 | $3,275 |
| **LCFS – 7 CENTS** | | | | |
| % of TAM Facilities Economically Viable | 100% | 100% | 100% | 100% |
| Total Deployable MW | 280 | 1,140 | 1,100 | 2,520 |
| Deployable Capital (MM) | $518 | $2,109 | $2,035 | $4,662 |

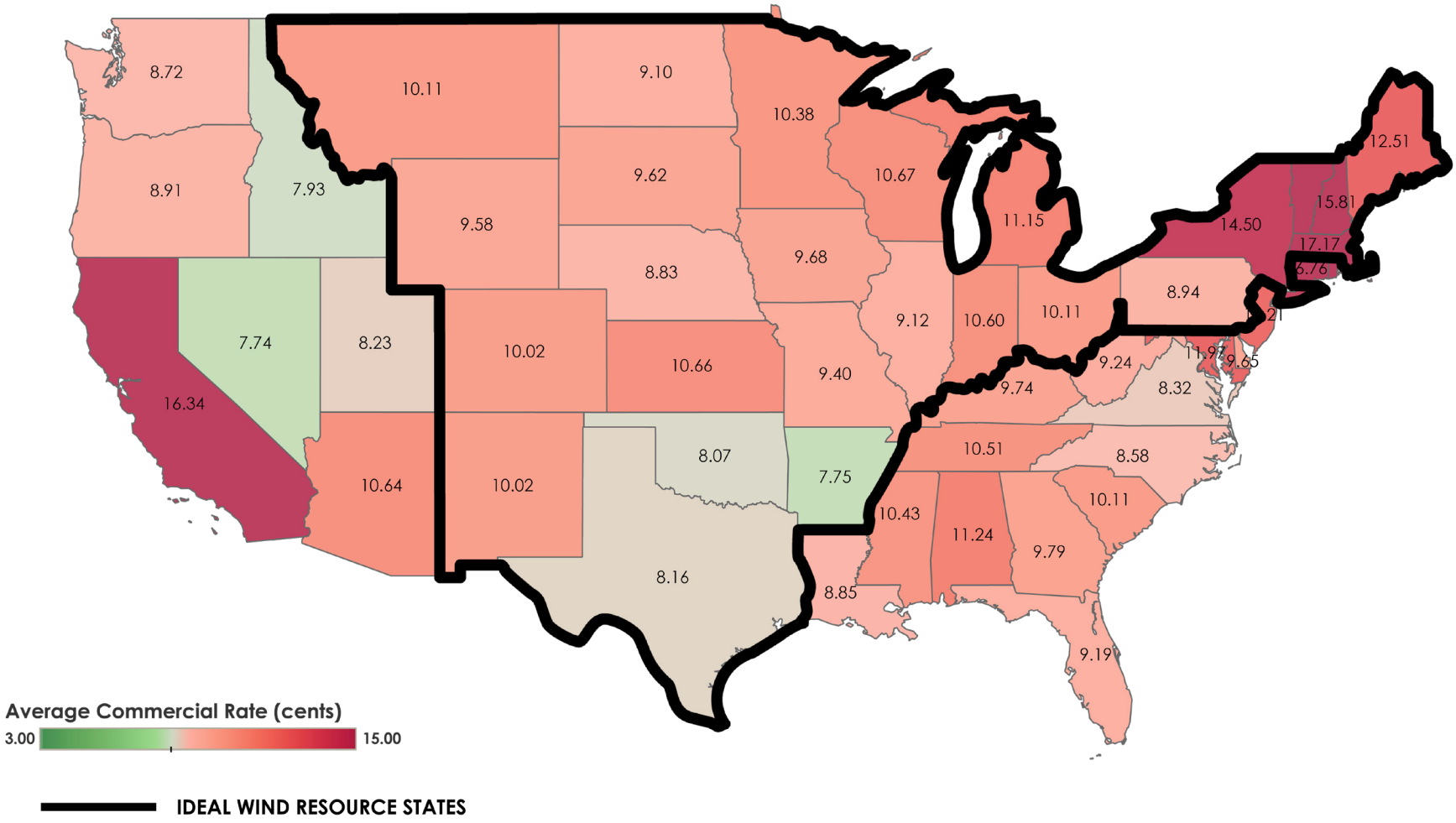
# APPENDIX G
# FULL-PAGE MAPS



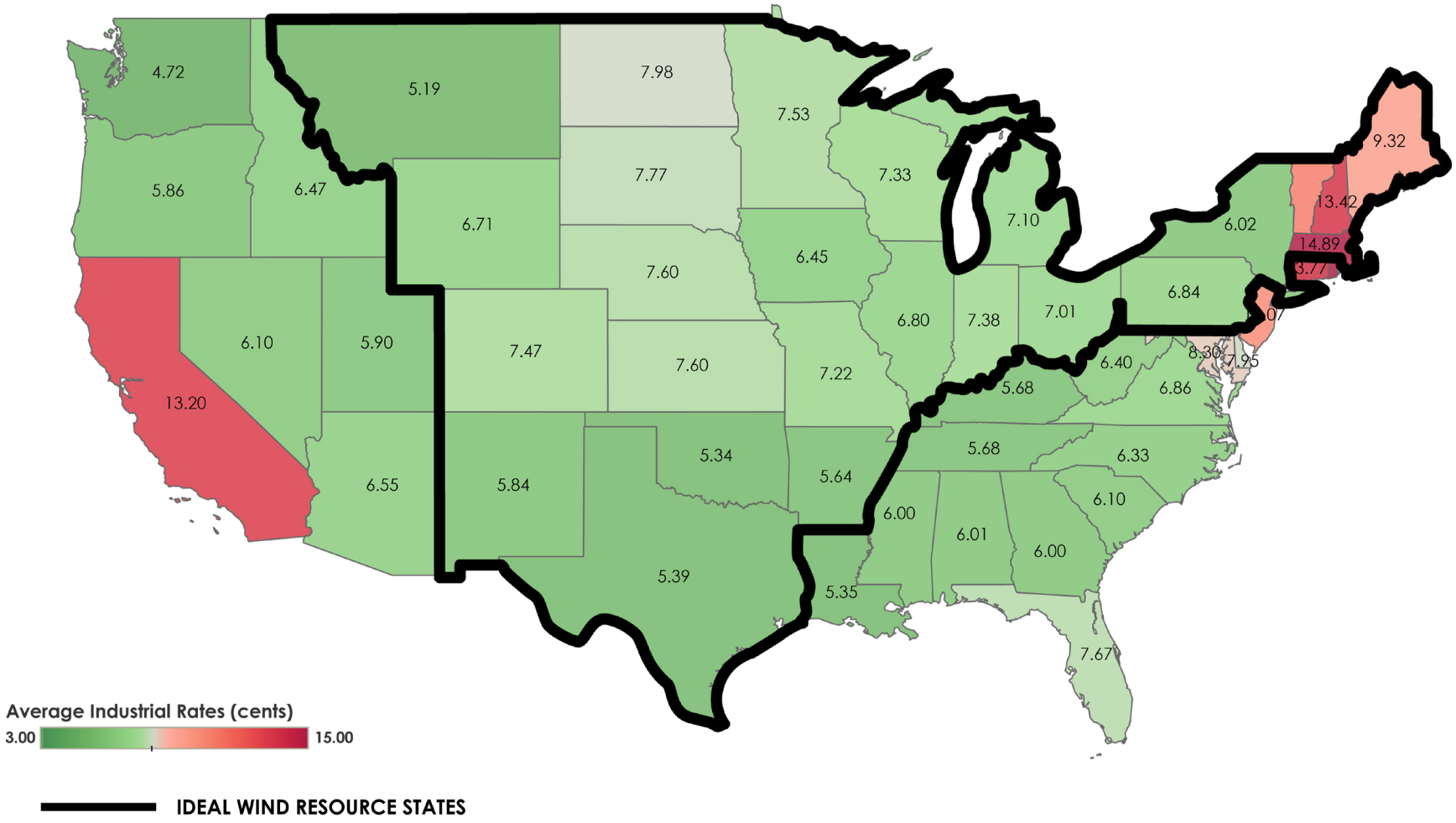

**MAP 1: U.S. AVERAGE WIND SPEEDS AT 80 METERS**



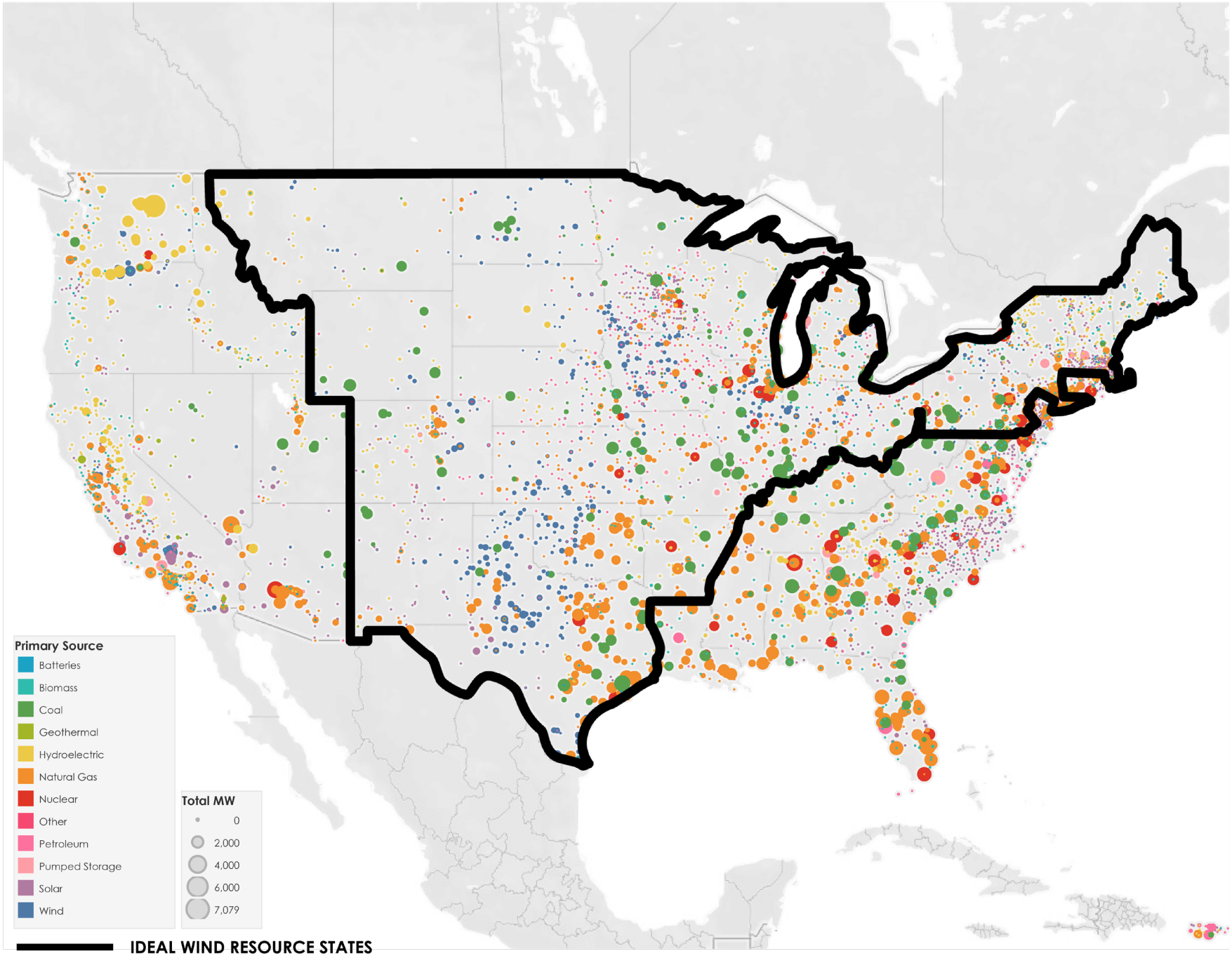

**MAP 2: MANUFACTURING CONCENTRATION BY COUNTY, 2019**



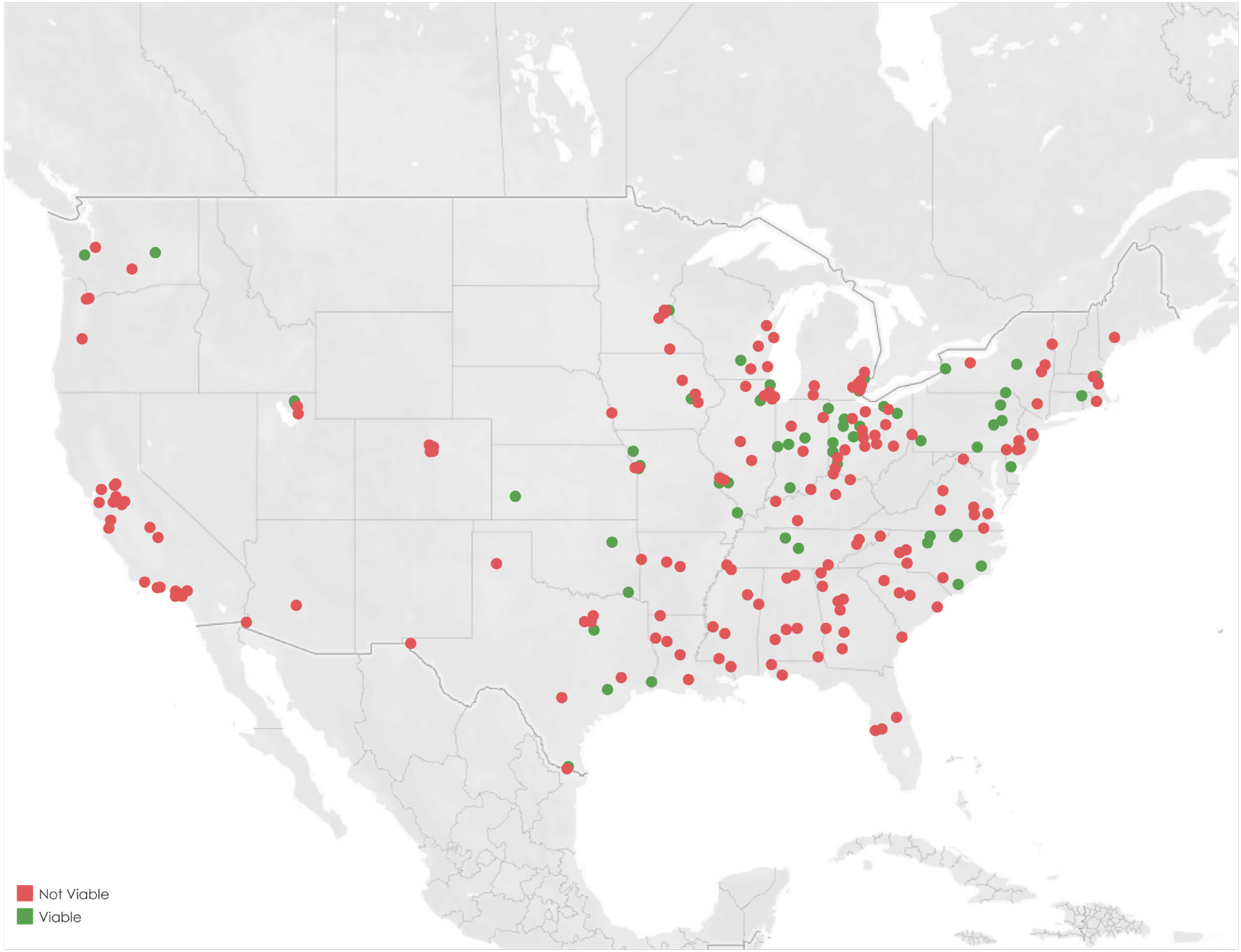

**MAP 3: AVERAGE COMMERCIAL ELECTRICITY RATES ($/kWh), 2018**



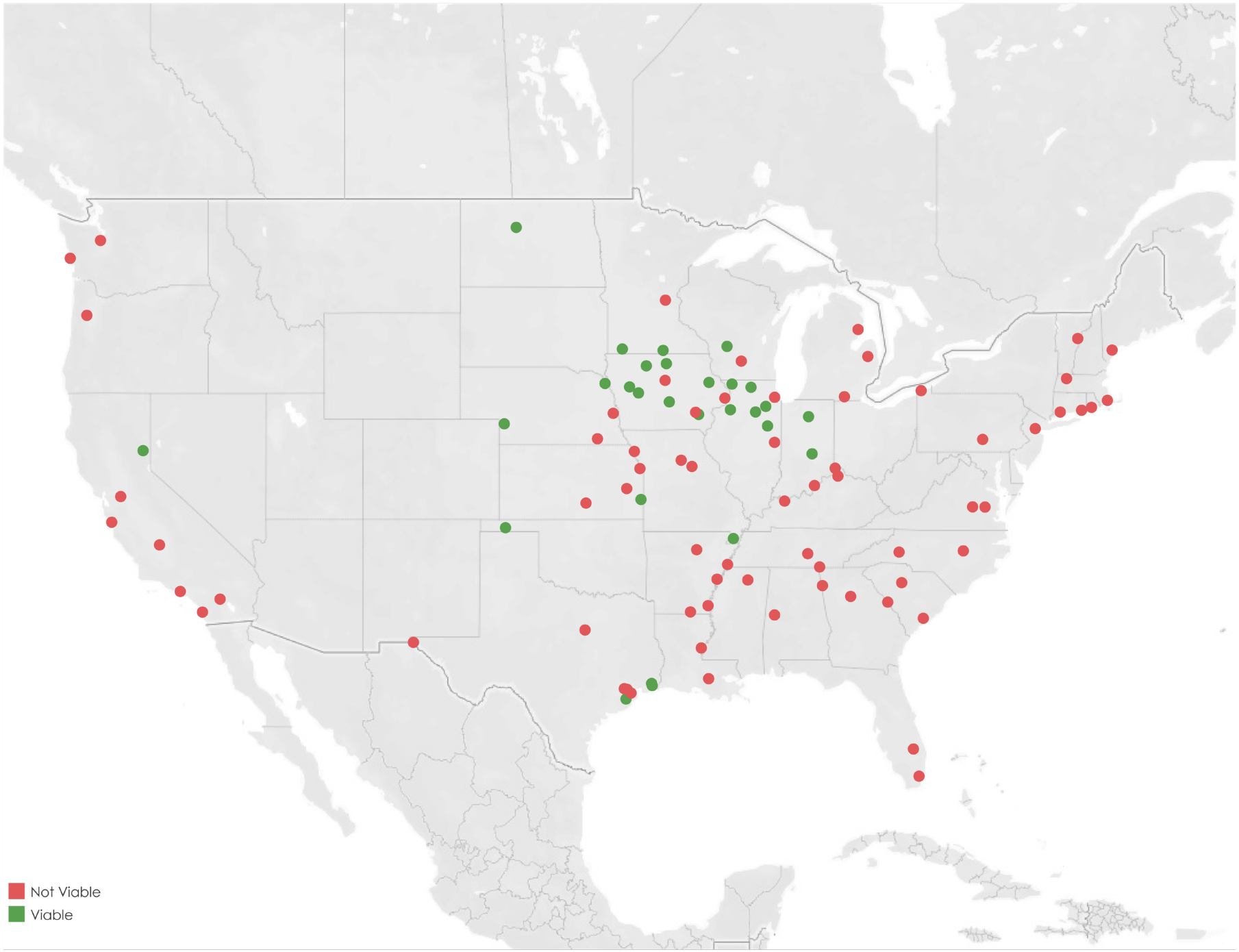

**MAP 4: AVERAGE INDUSTRIAL ELECTRICITY RATES ($/kWh), 2018**



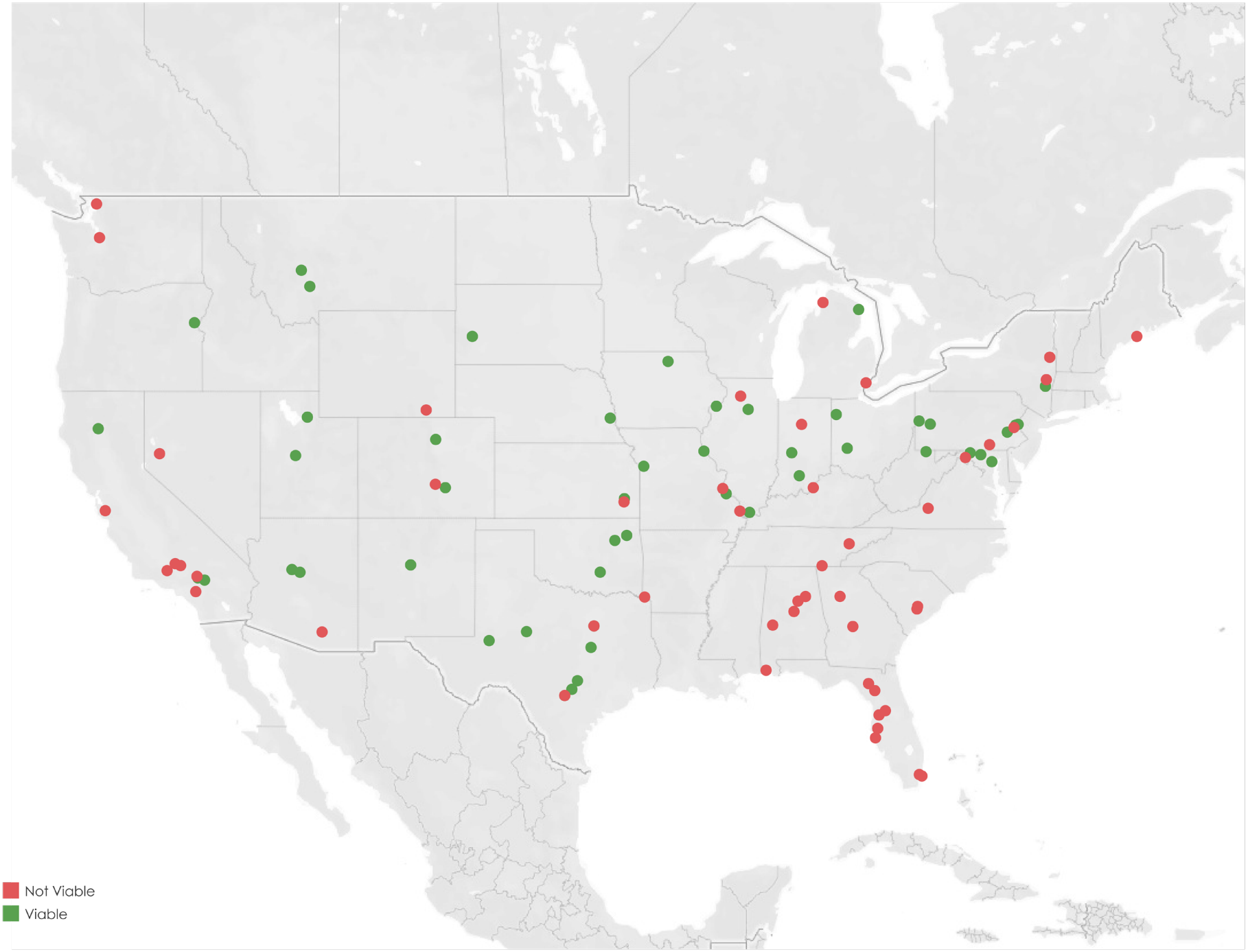

**MAP 5: U.S. POWER GENERATION FACILITIES, 2020**



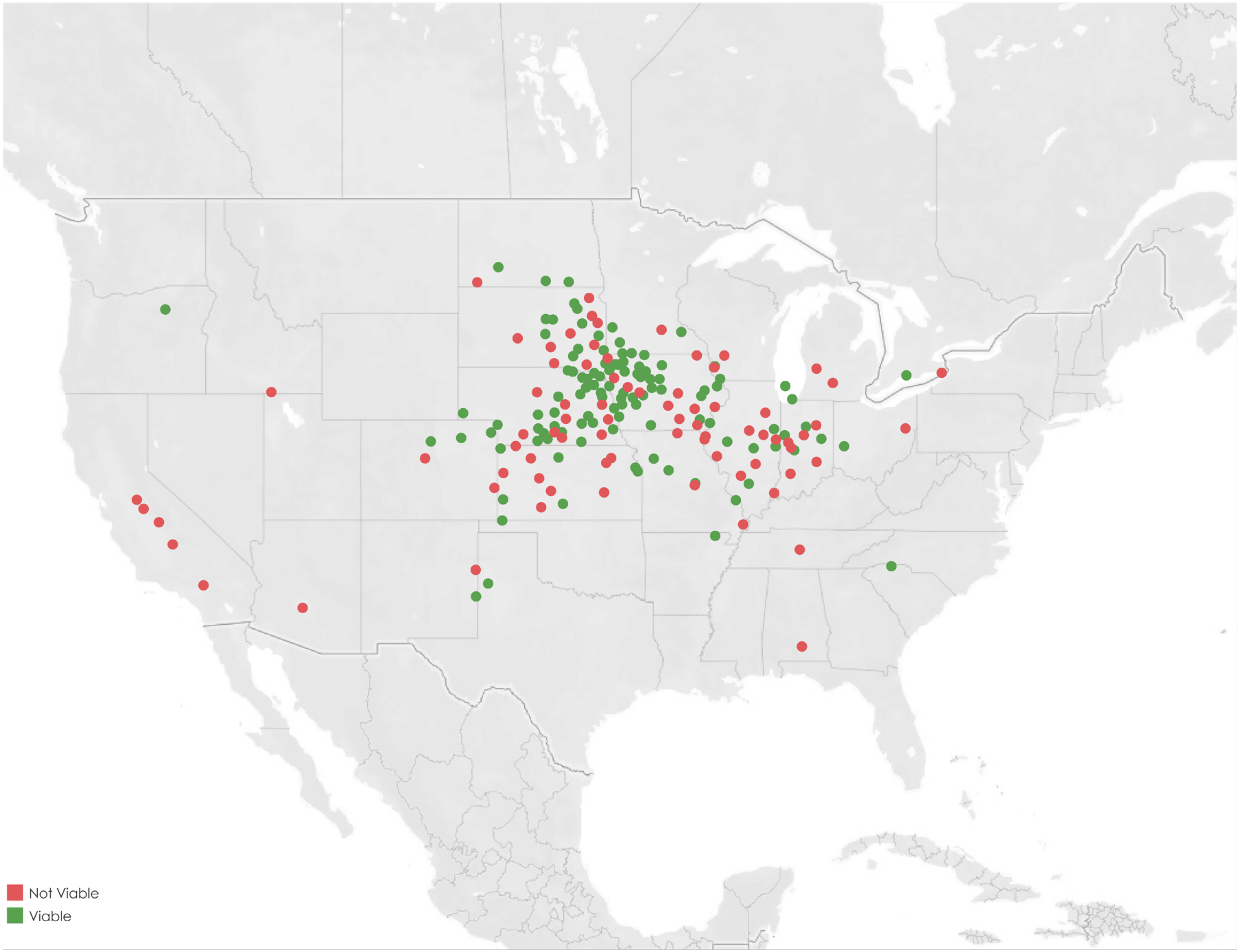

**MAP 6: GENERAL INDUSTRY SAMPLING LOCATIONS**



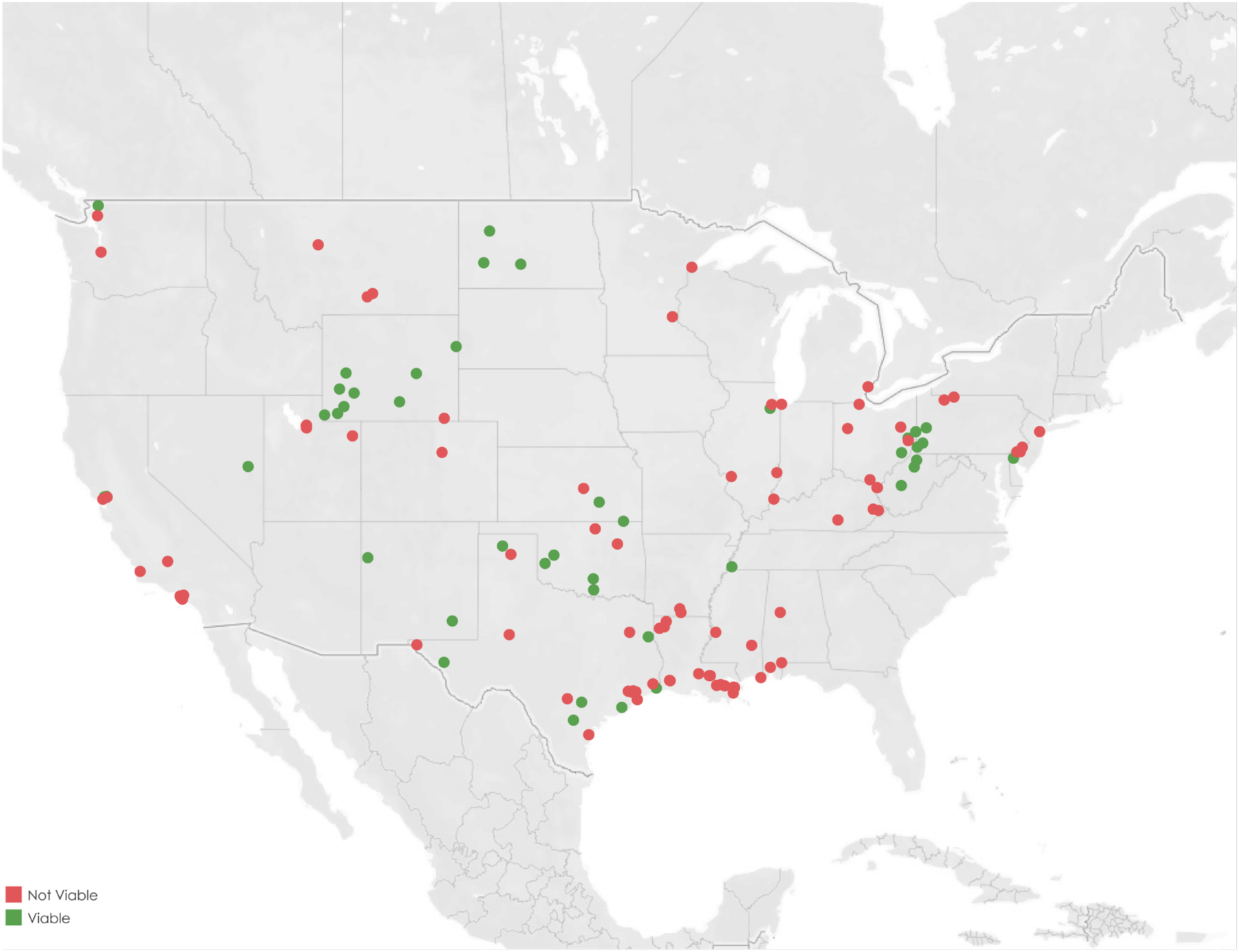

**MAP 7: BIODIESEL SECTOR LOCATIONS**



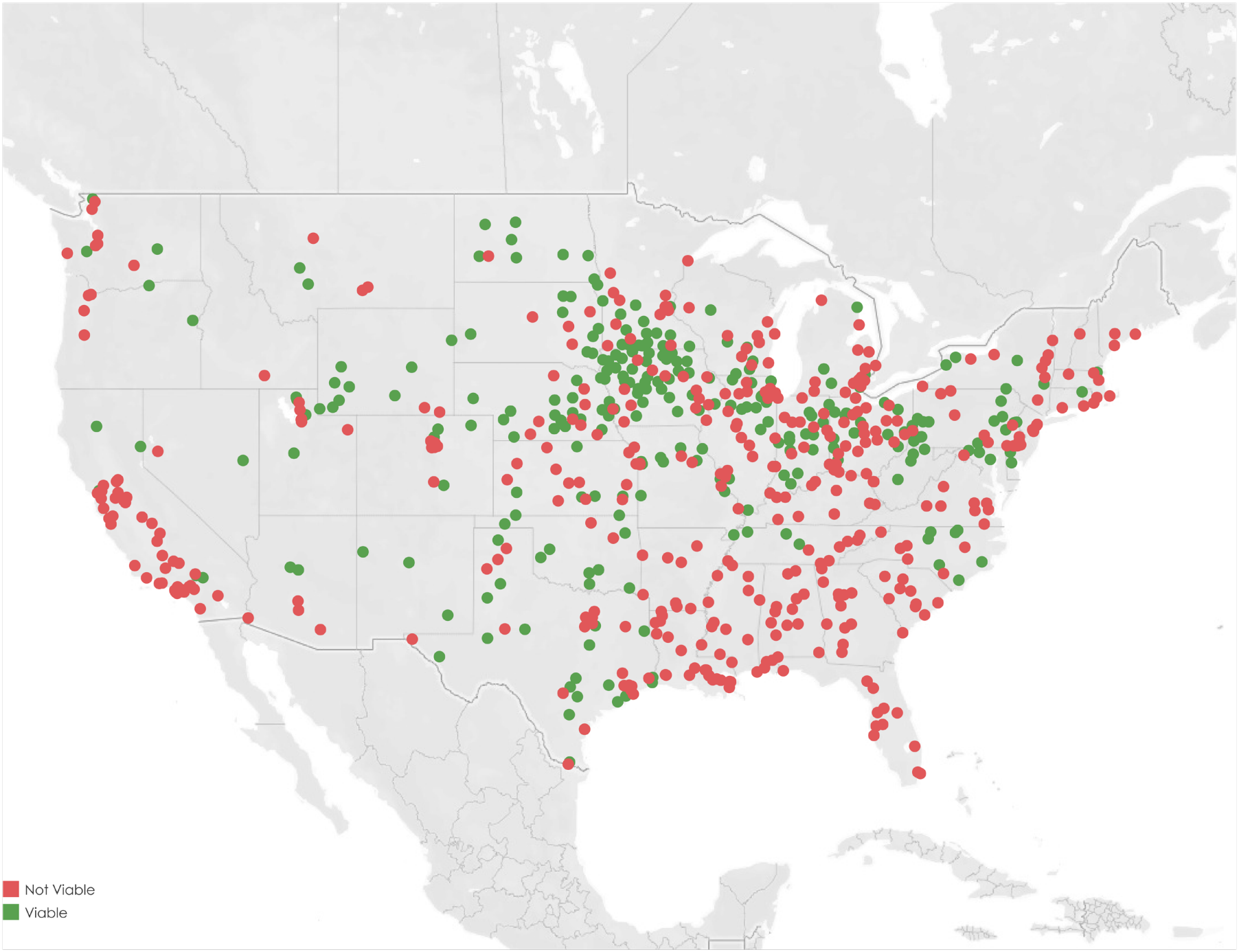

**MAP 8: CEMENT SECTOR LOCATIONS**



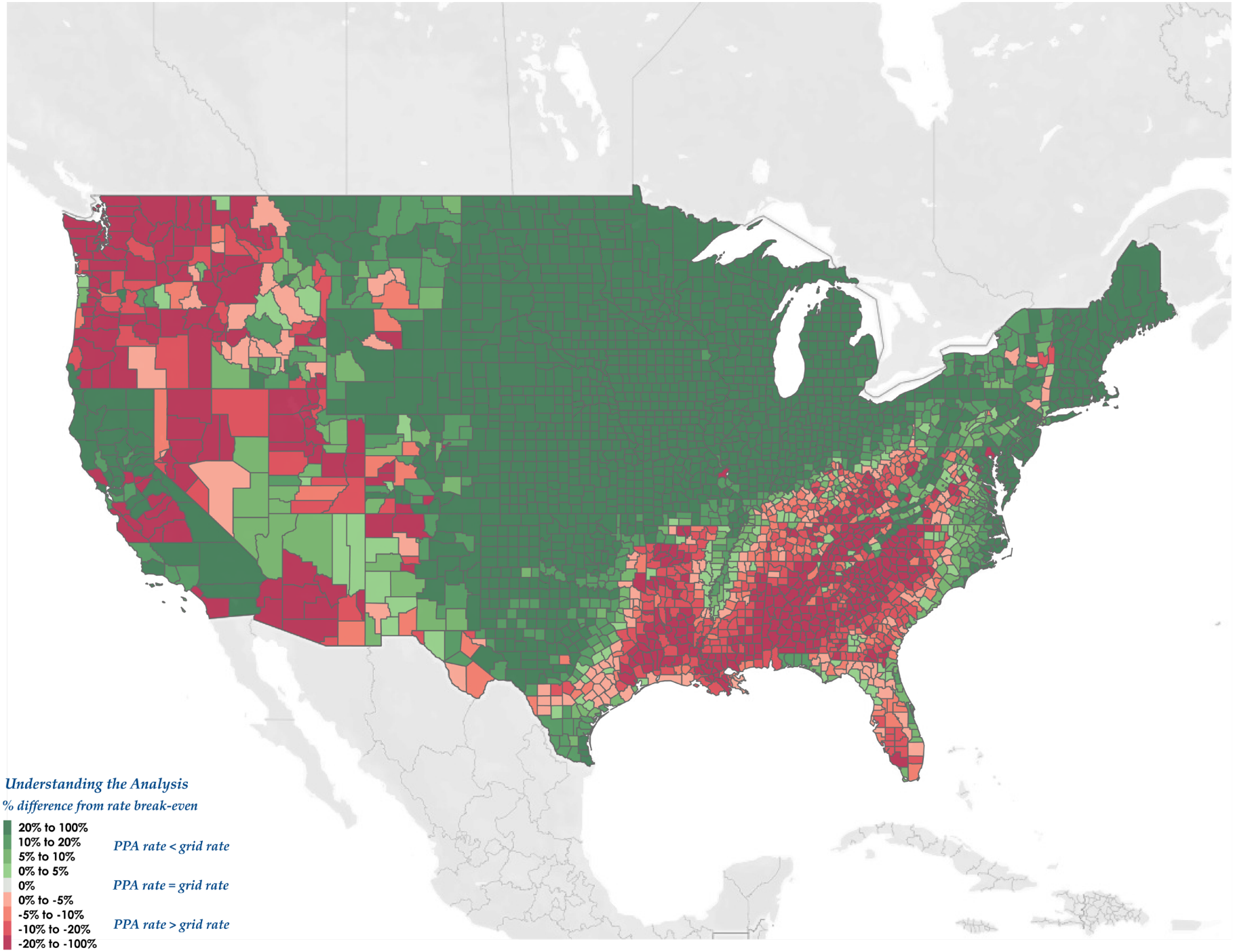

**MAP 9: ETHANOL SECTOR LOCATIONS**



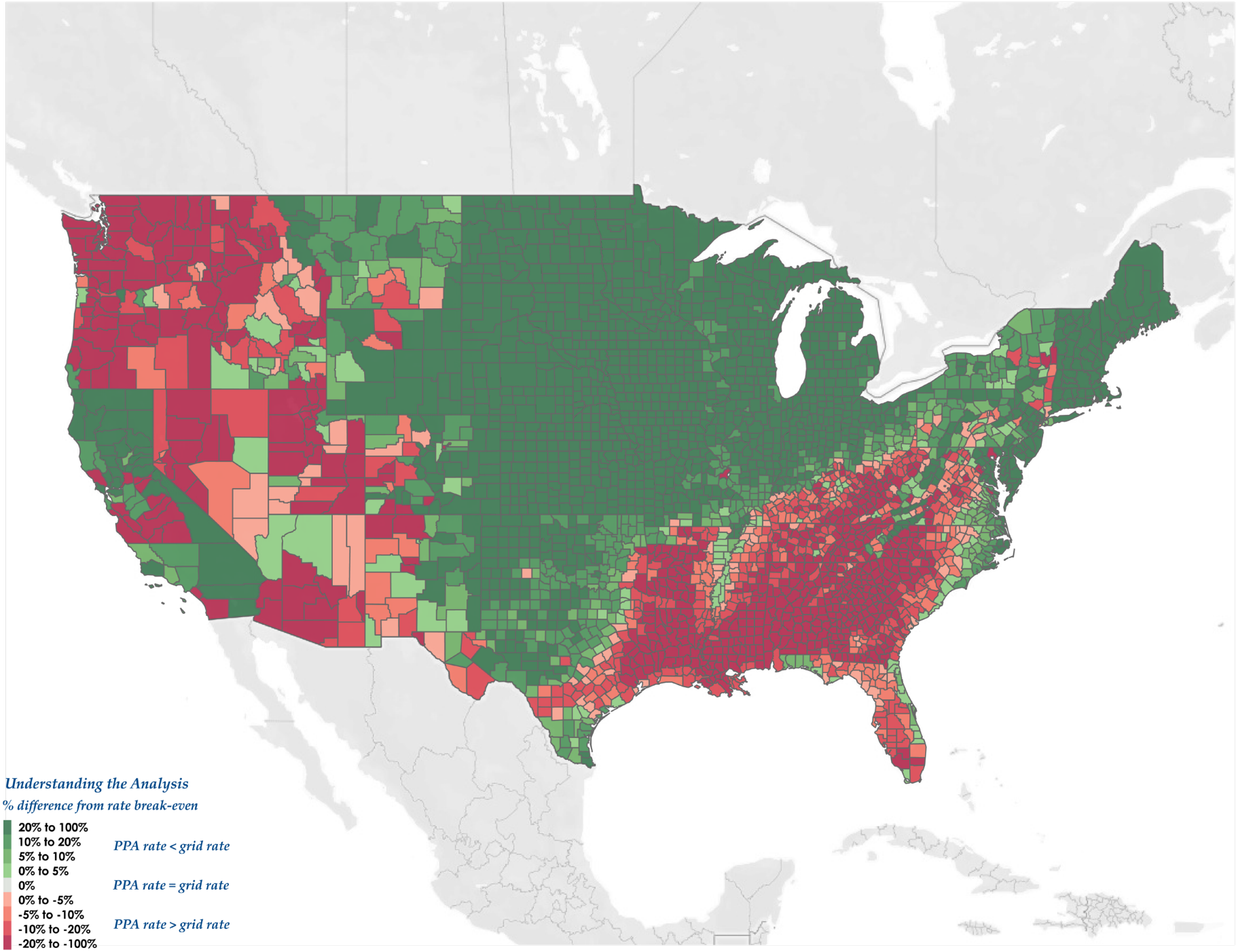

**MAP 10: REFINING SECTOR LOCATIONS**



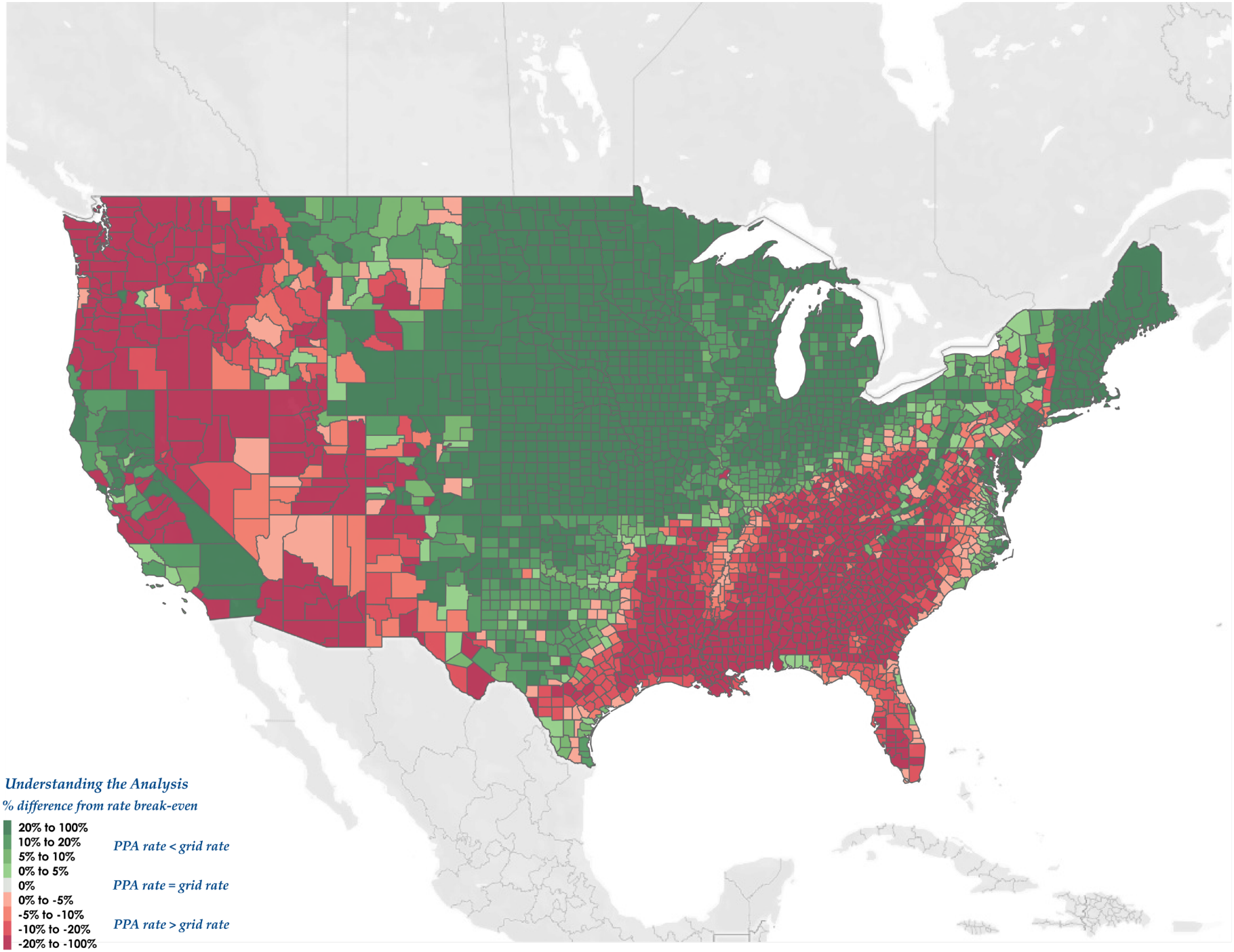

**MAP 11: ALL FACILITY LOCATIONS**



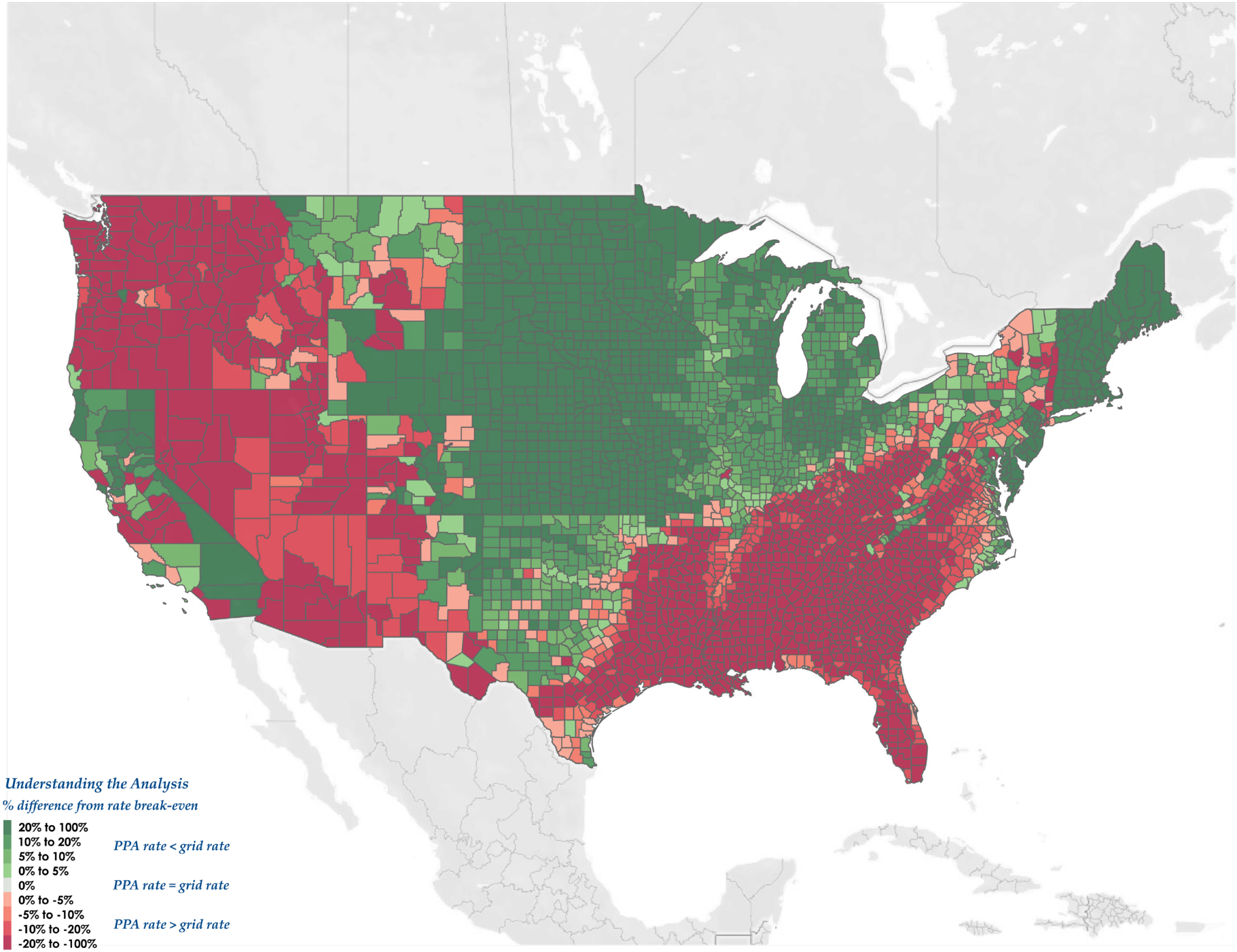

**MAP 12: ECONOMICALLY VIABLE COUNTIES AT 30% ITC**



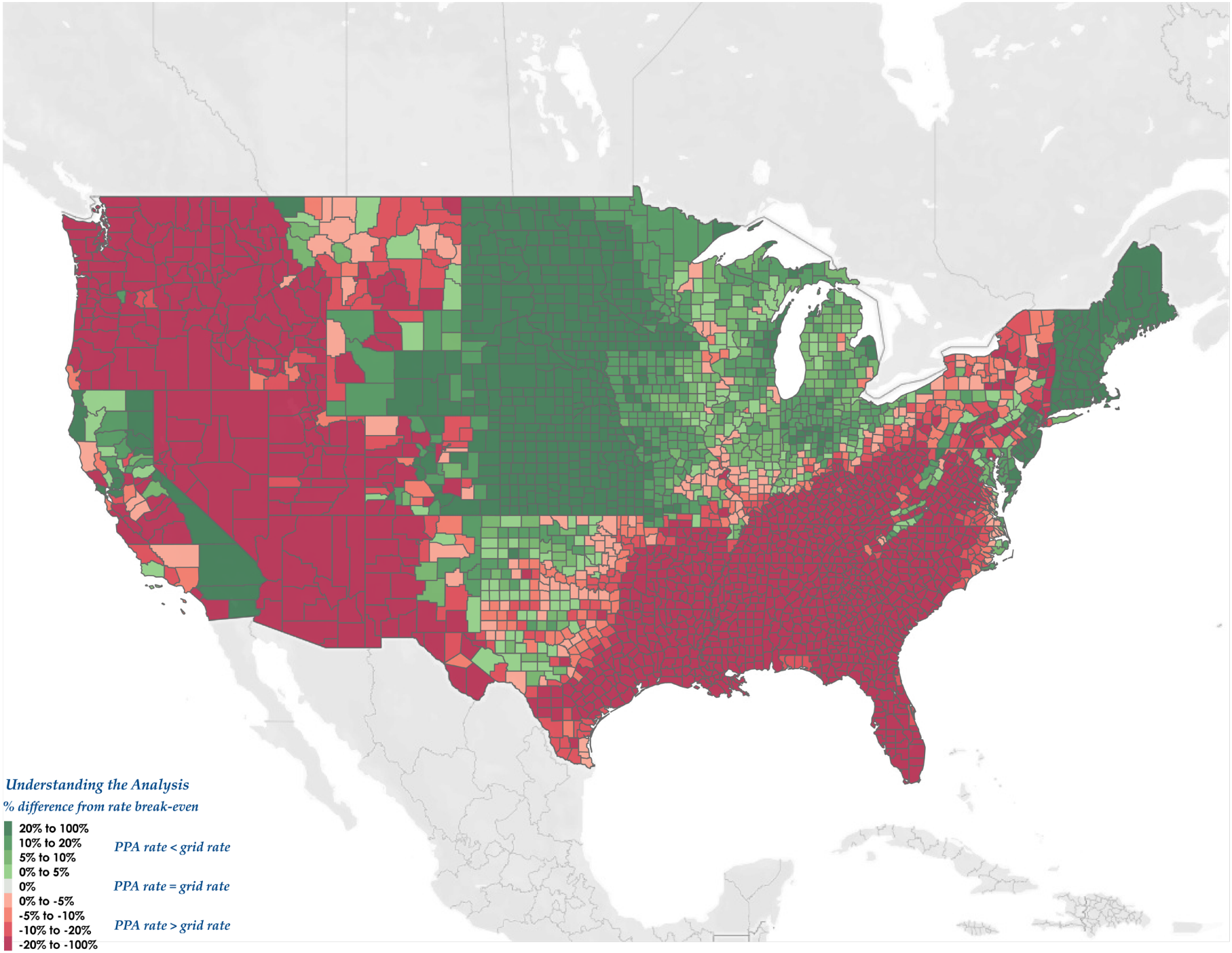

**MAP 13: ECONOMICALLY VIABLE COUNTIES AT 24% ITC**



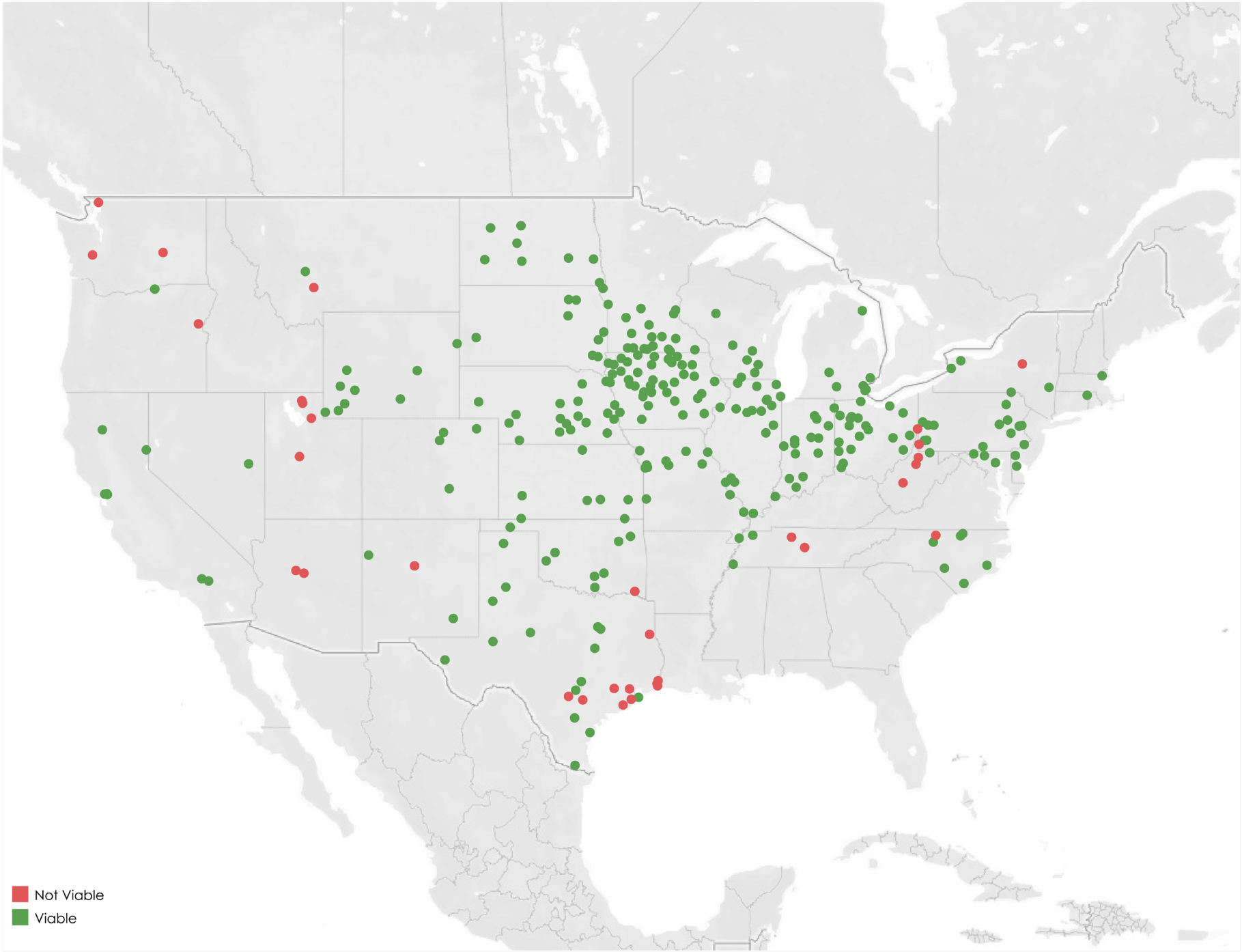

**MAP 14: ECONOMICALLY VIABLE COUNTIES AT 18% ITC**



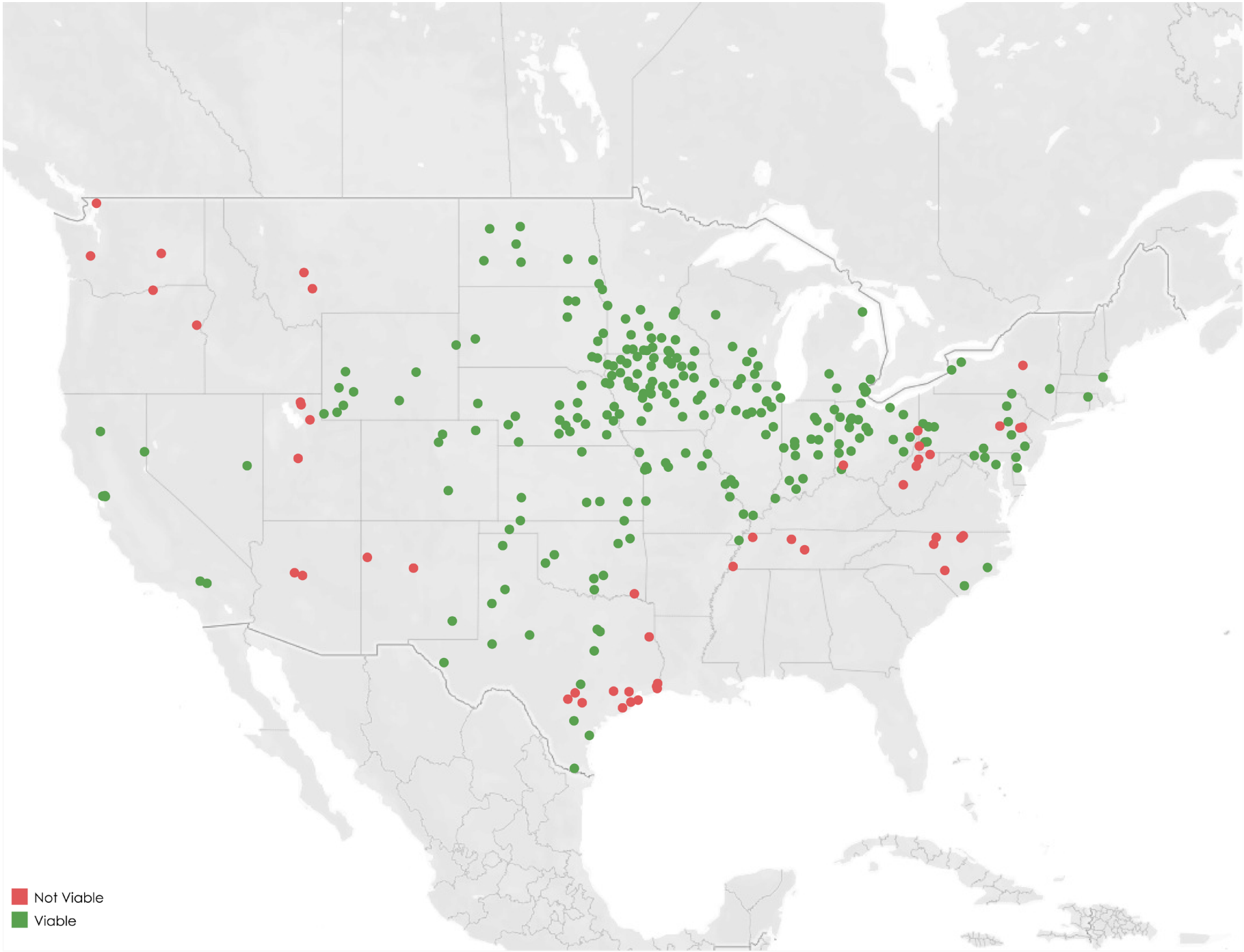

**MAP 15: ECONOMICALLY VIABLE COUNTIES AT 12% ITC**



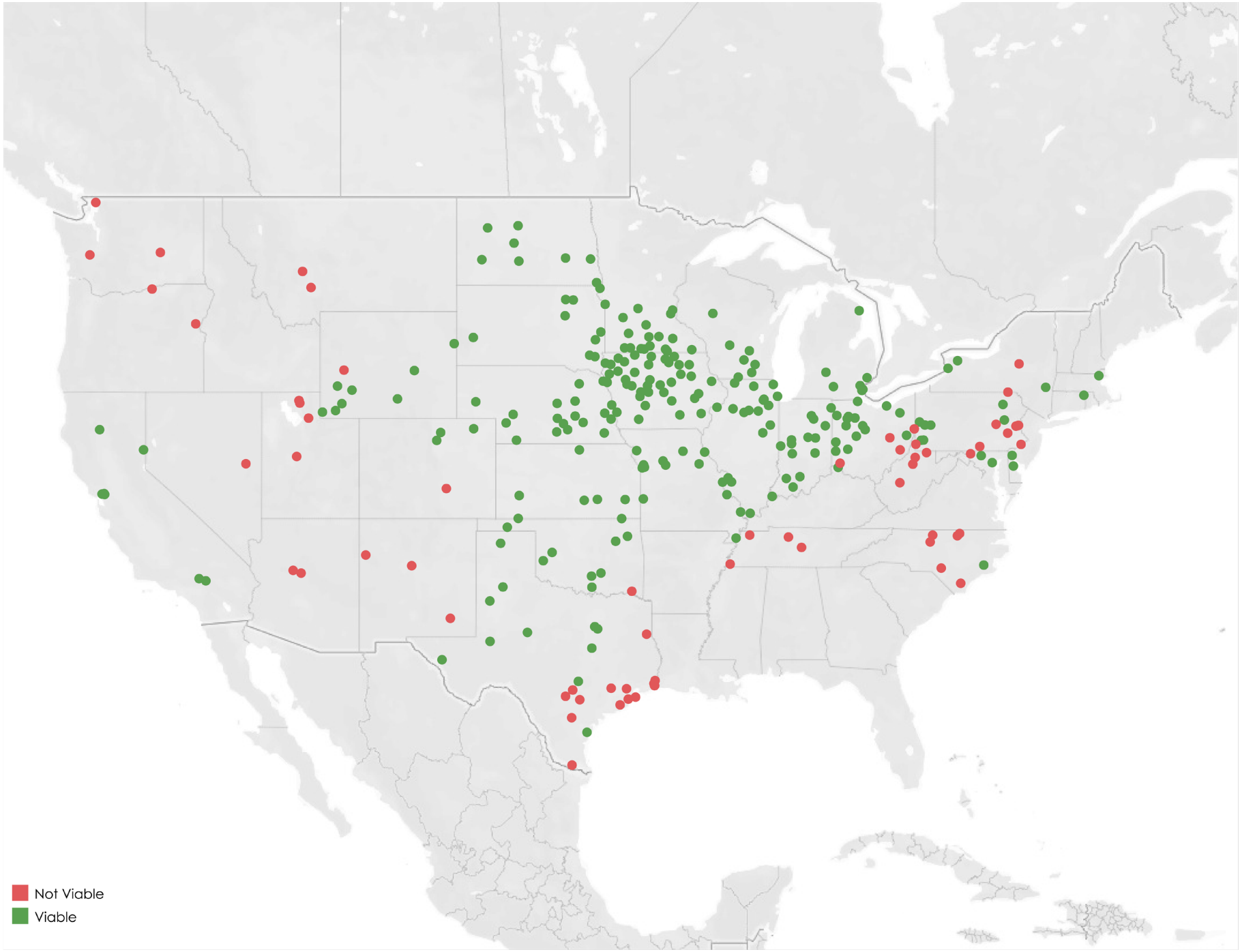

**MAP 16: ECONOMICALLY VIABLE COUNTIES AT 0% ITC**



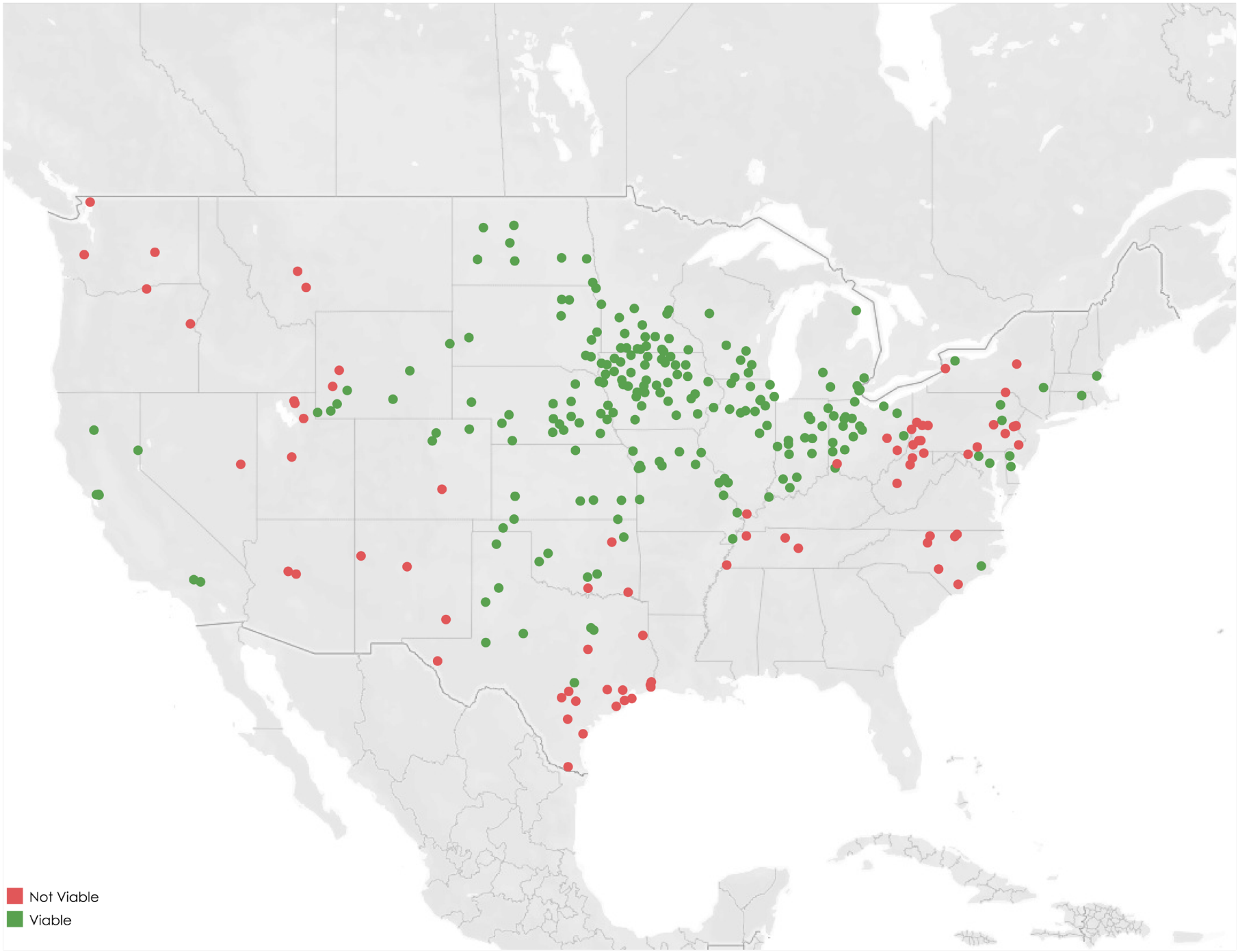

**MAP 17: ECONOMICALLY VIABLE SCREENED FACILITIES AT 30%**



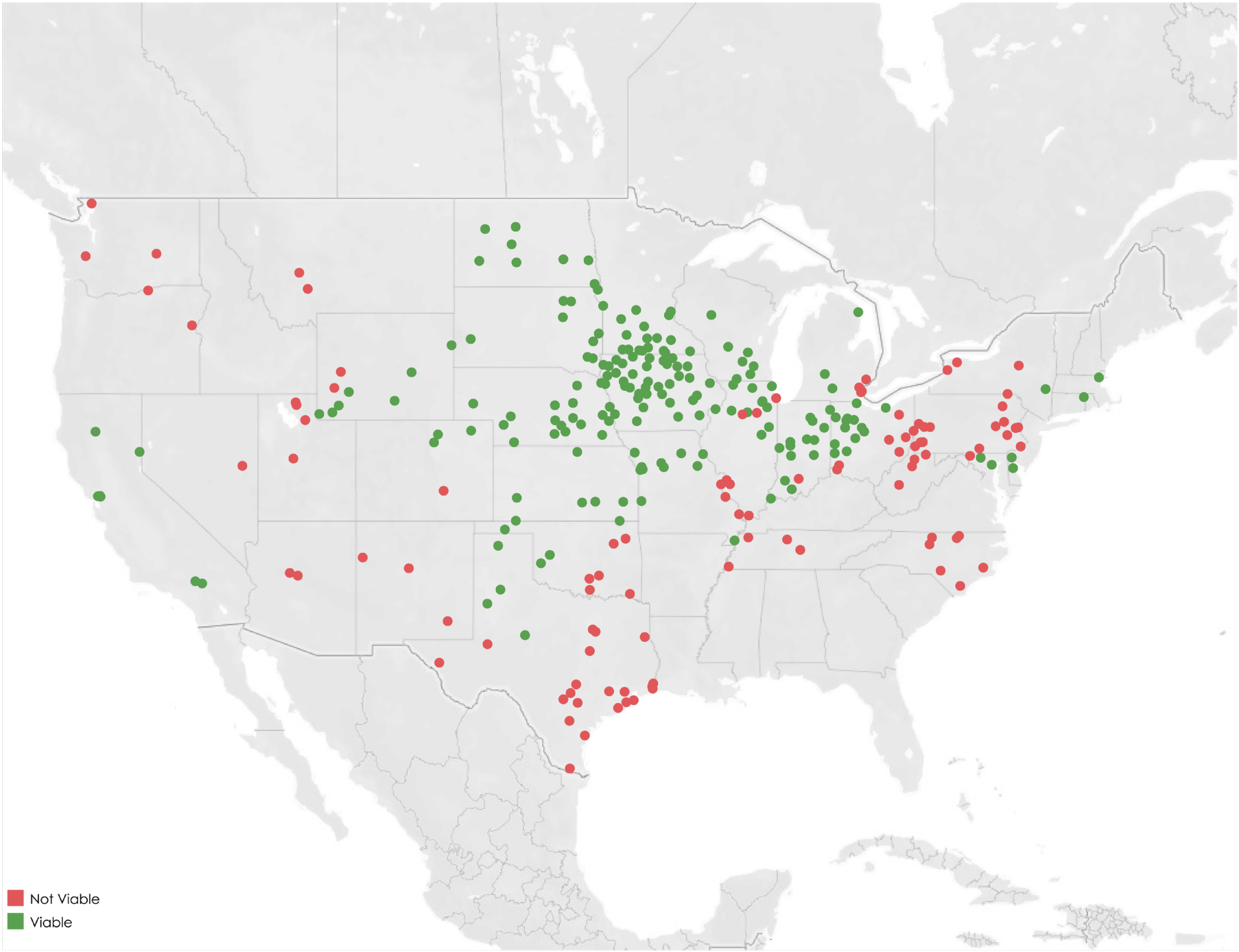

**MAP 18: ECONOMICALLY VIABLE SCREENED FACILITIES AT 24%**



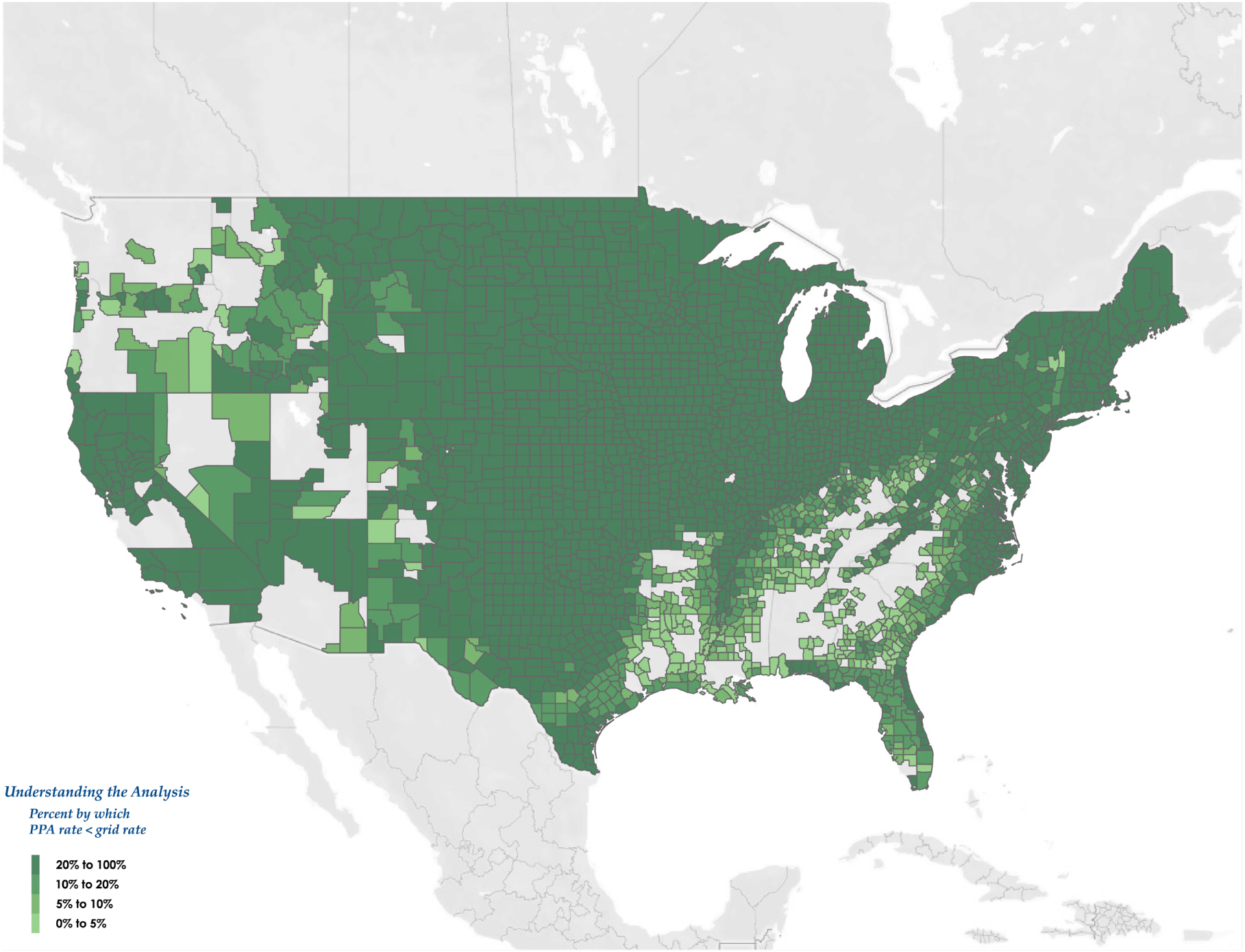

**MAP 19: ECONOMICALLY VIABLE SCREENED FACILITIES AT 18%**



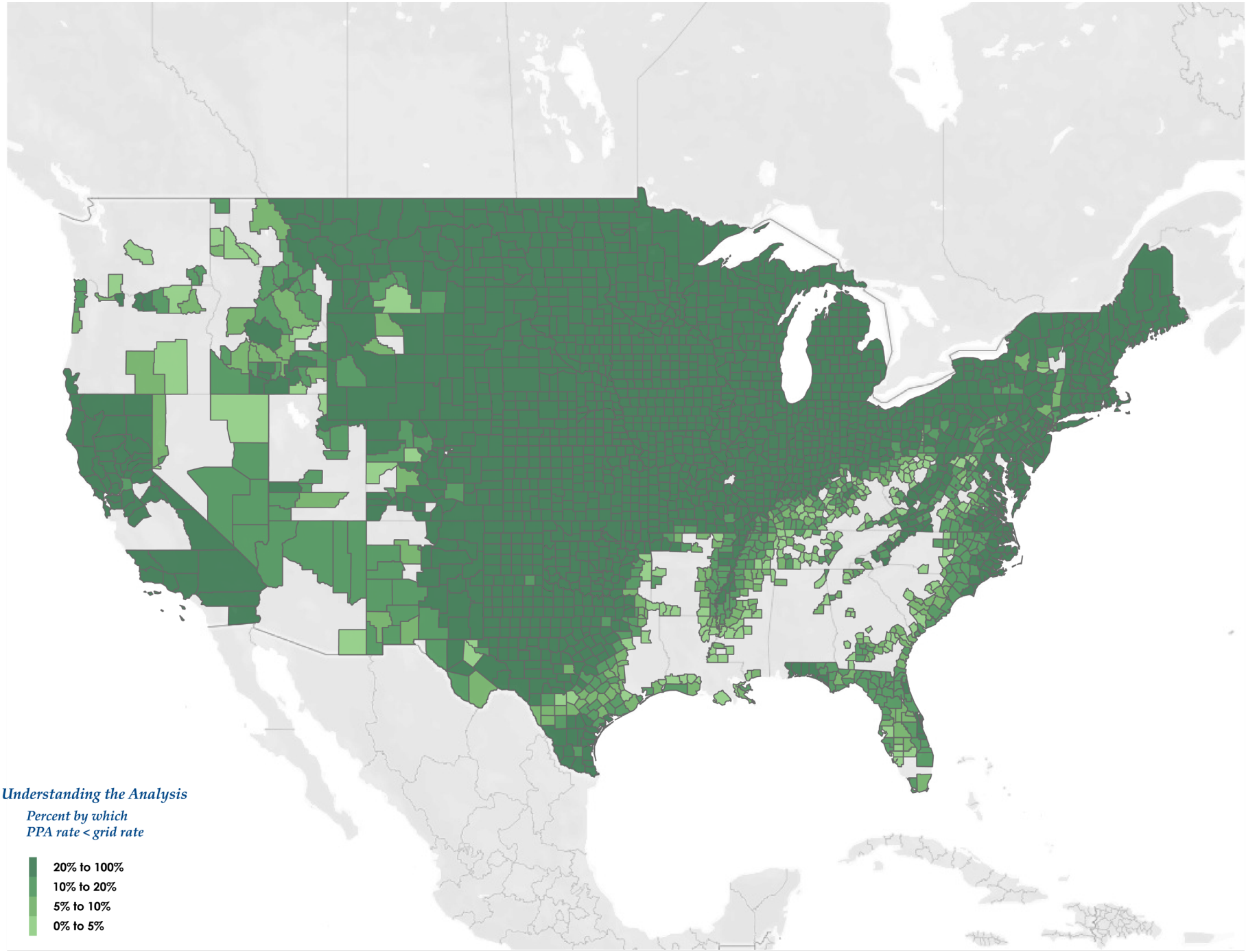

**MAP 20: ECONOMICALLY VIABLE SCREENED FACILITIES AT 12%**



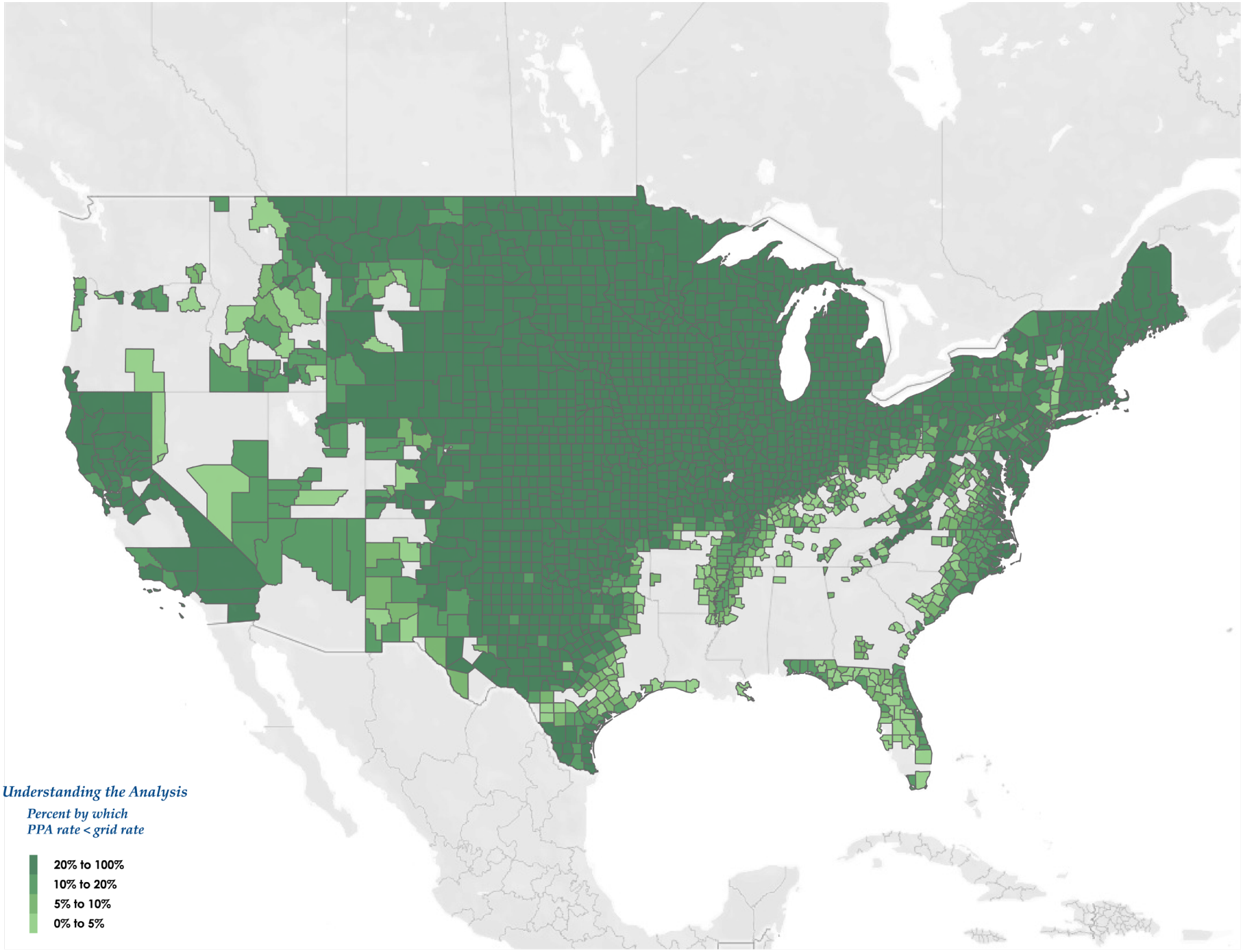

**MAP 21: ECONOMICALLY VIABLE SCREENED FACILITIES AT 0%**



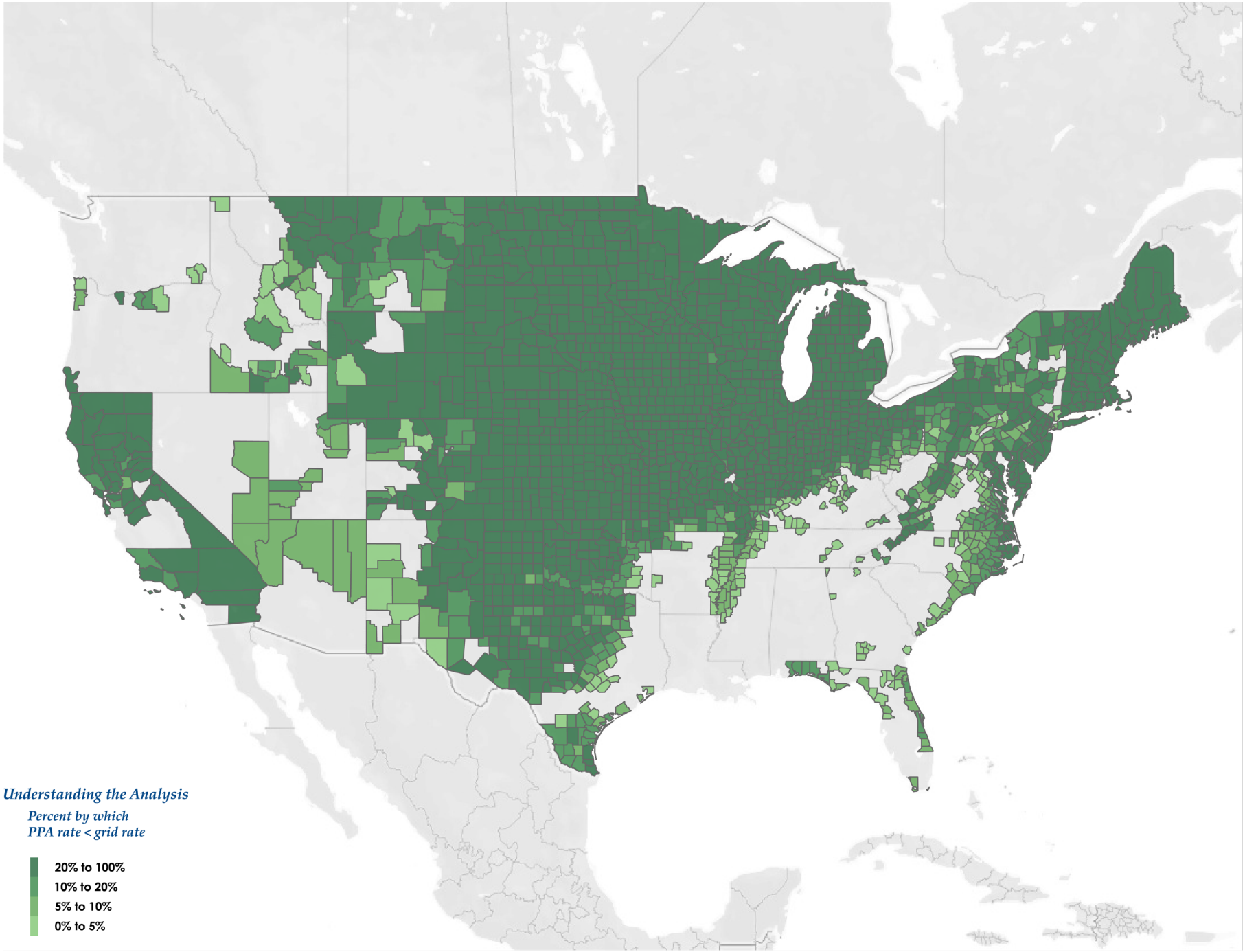

**MAP 22: SCENARIO 1 ECONOMICALLY VIABLE COUNTIES AT 30% ITC**



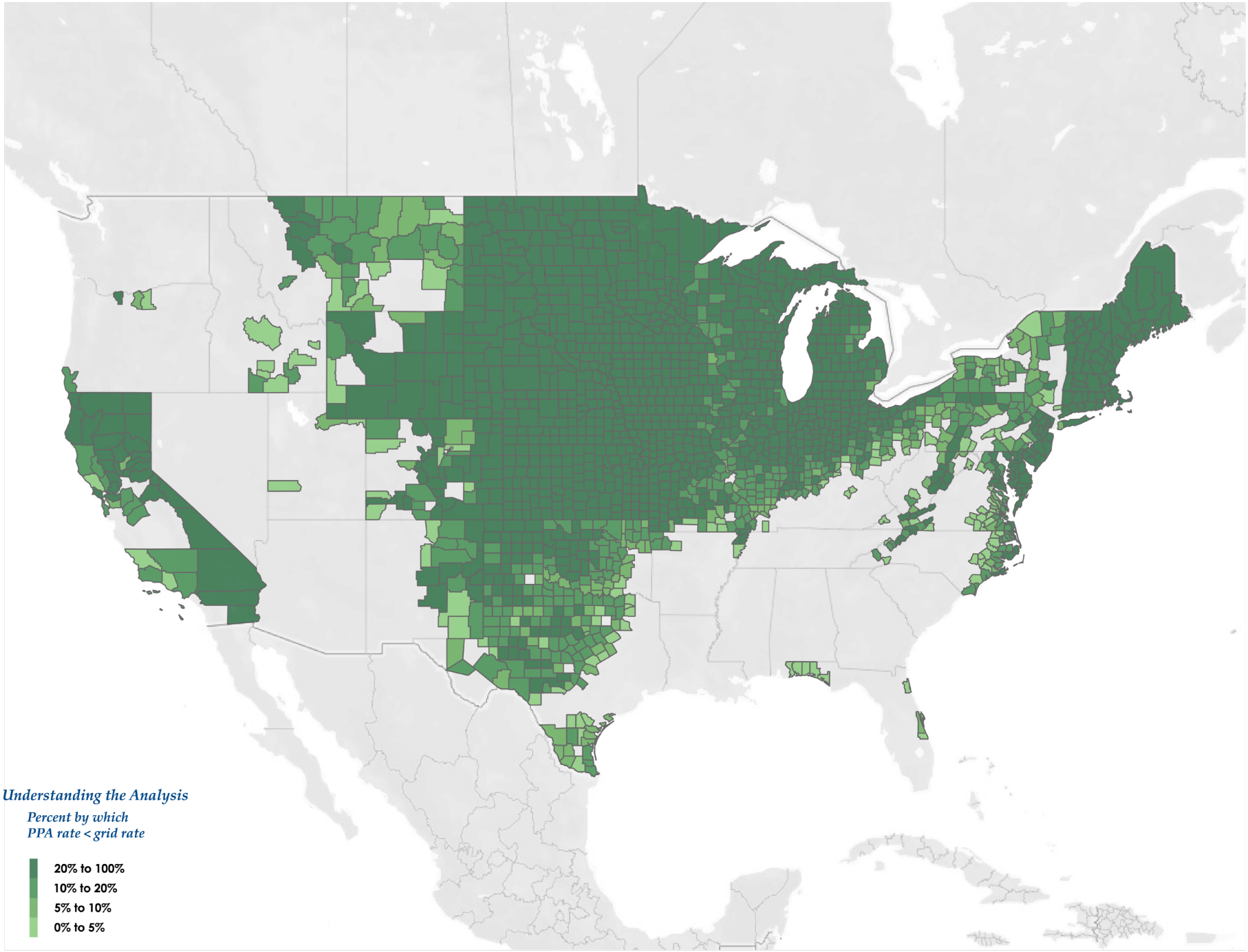

**MAP 23: SCENARIO 1 ECONOMICALLY VIABLE COUNTIES AT 24% ITC**



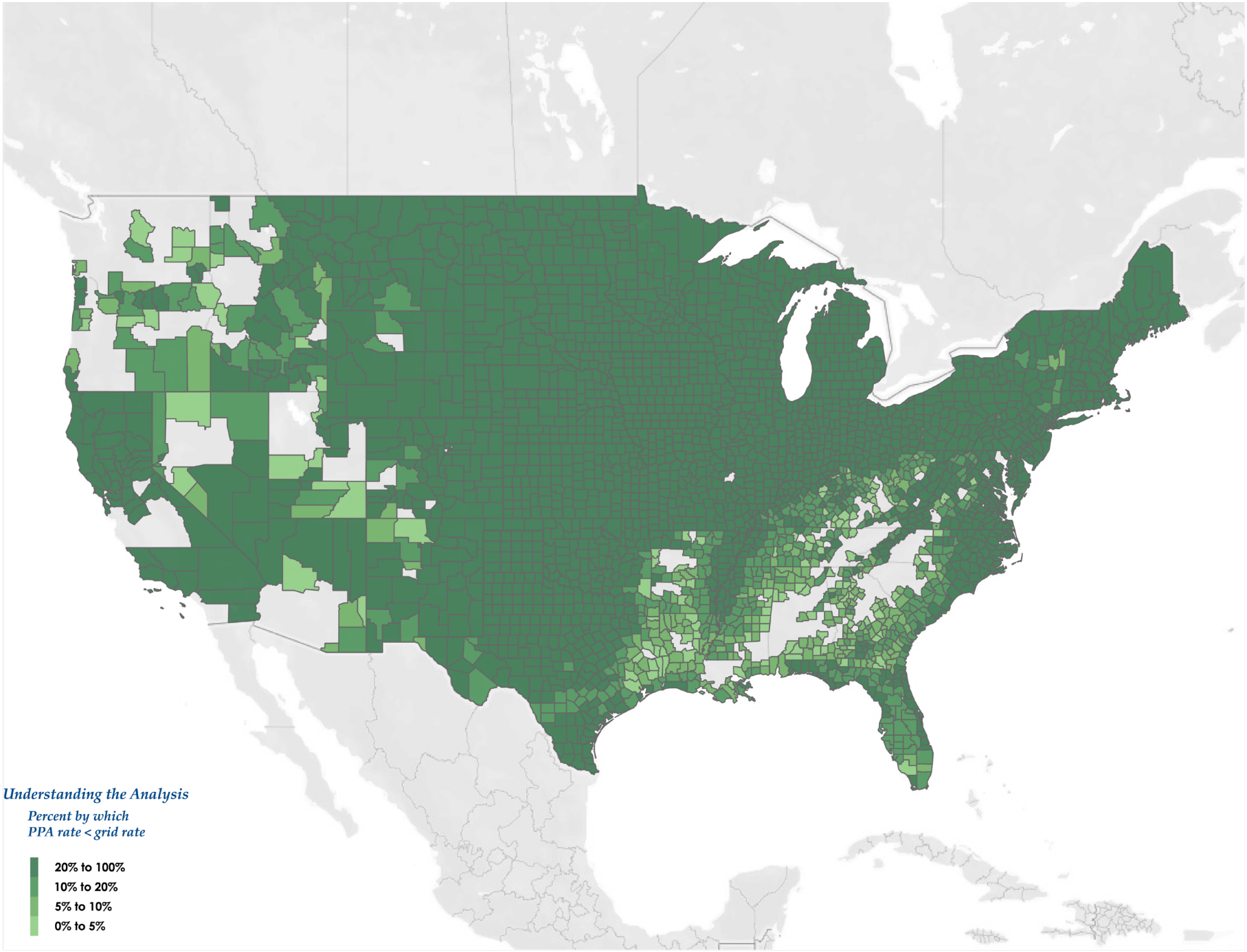

**MAP 24: SCENARIO 1 ECONOMICALLY VIABLE COUNTIES AT 18% ITC**



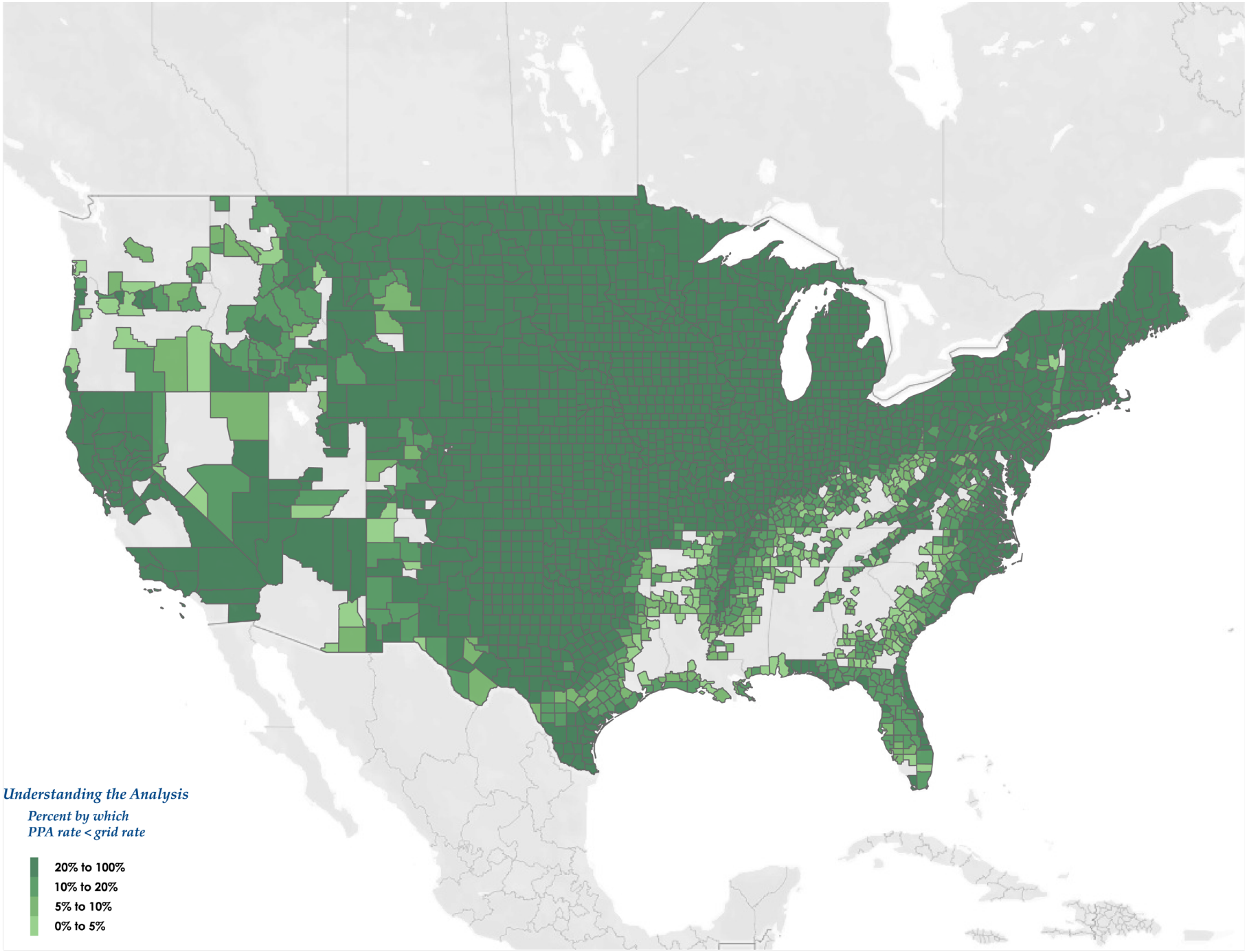

**MAP 25: SCENARIO 1 ECONOMICALLY VIABLE COUNTIES AT 12% ITC**



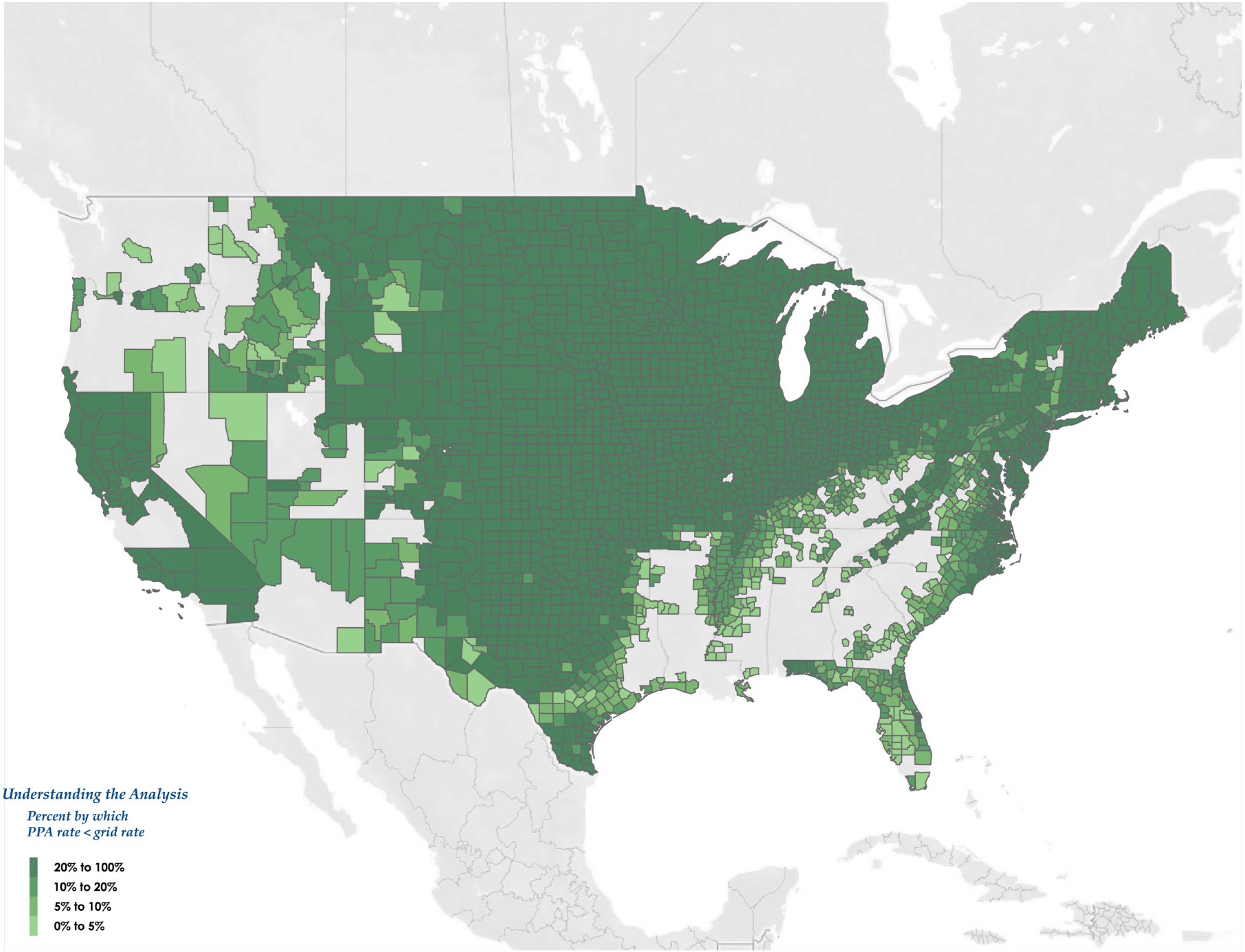

**MAP 26: SCENARIO 1 ECONOMICALLY VIABLE COUNTIES AT 0% ITC**



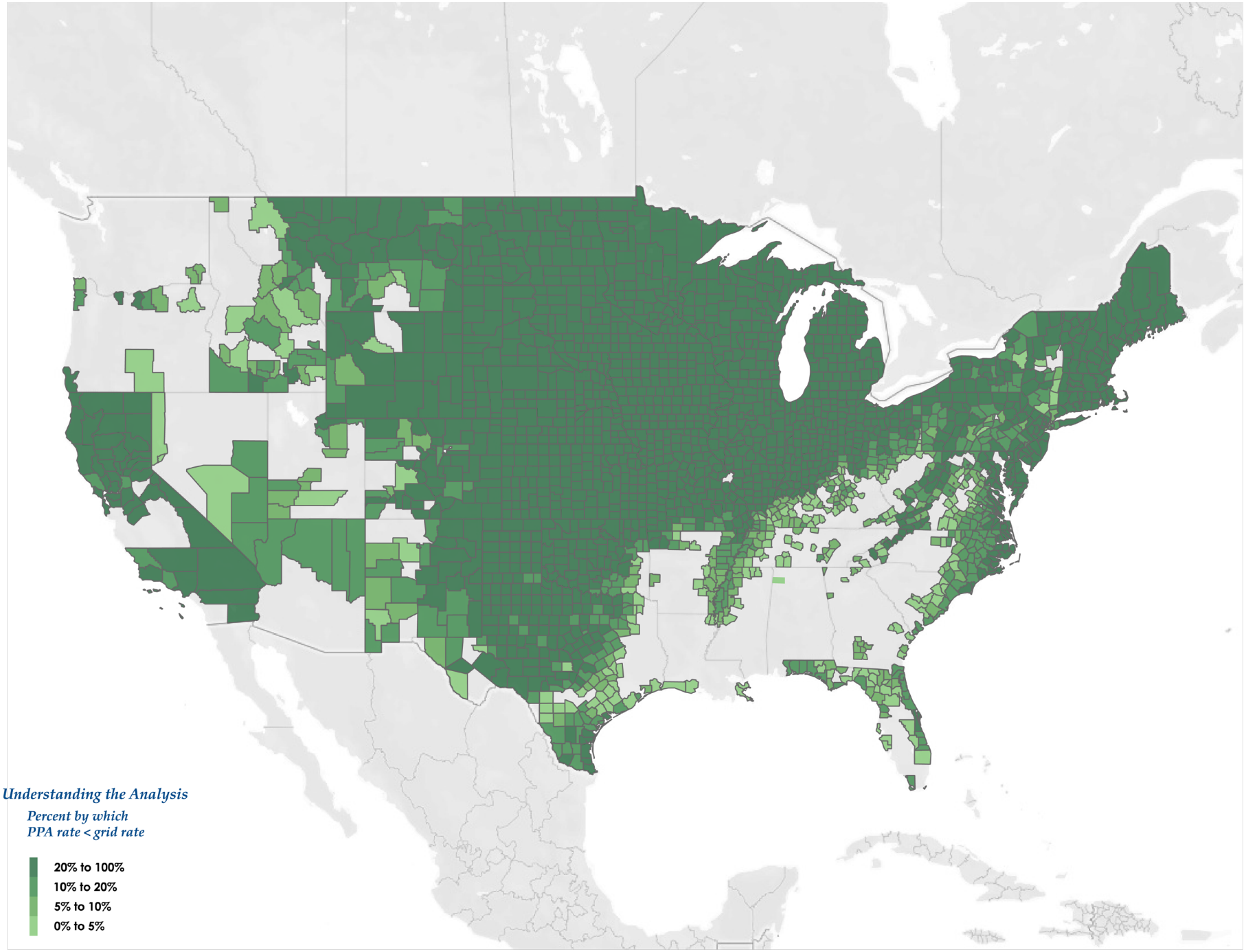

**MAP 27: SCENARIO 2 ECONOMICALLY VIABLE COUNTIES AT 30% ITC**



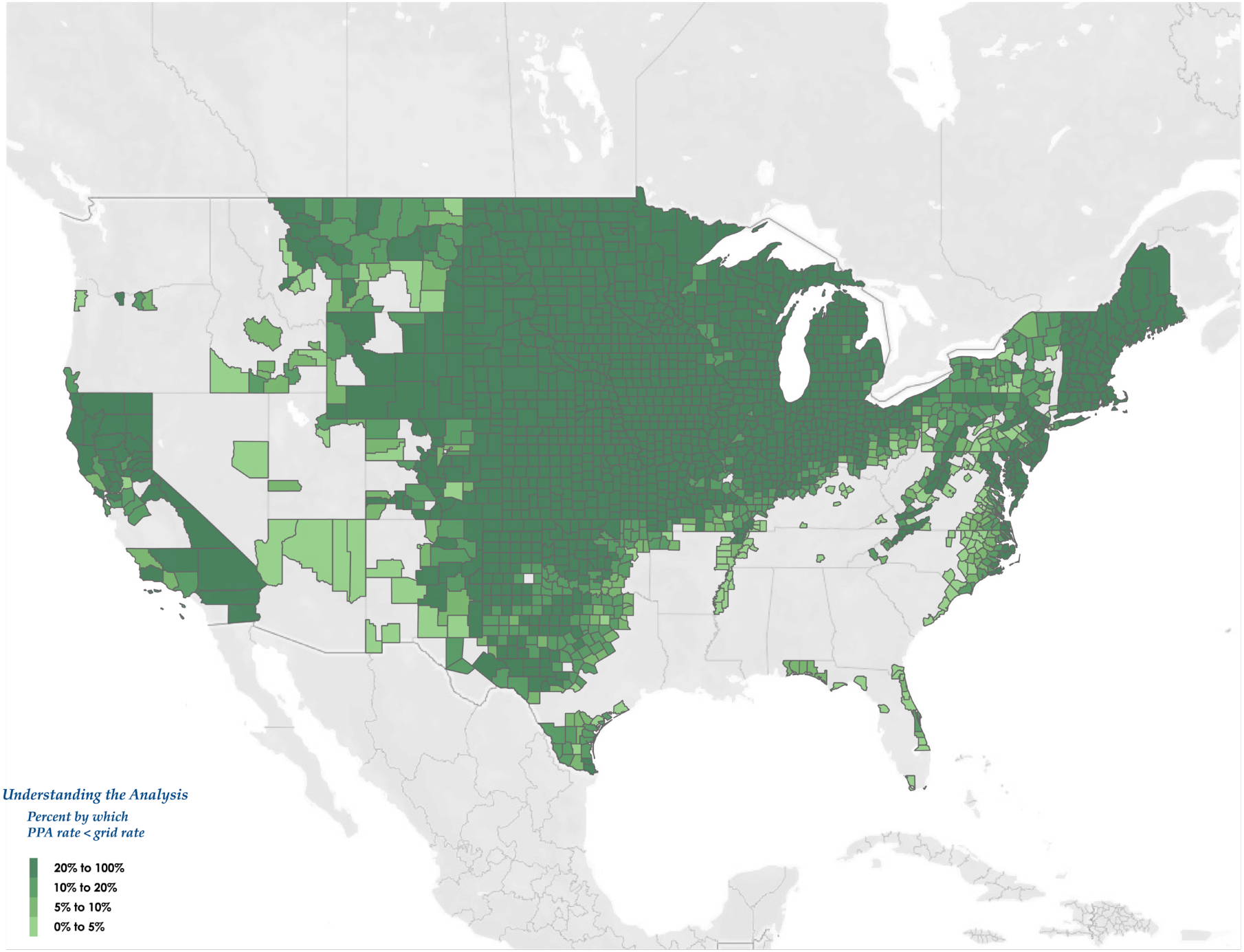

**MAP 28: SCENARIO 2 ECONOMICALLY VIABLE COUNTIES AT 24% ITC**



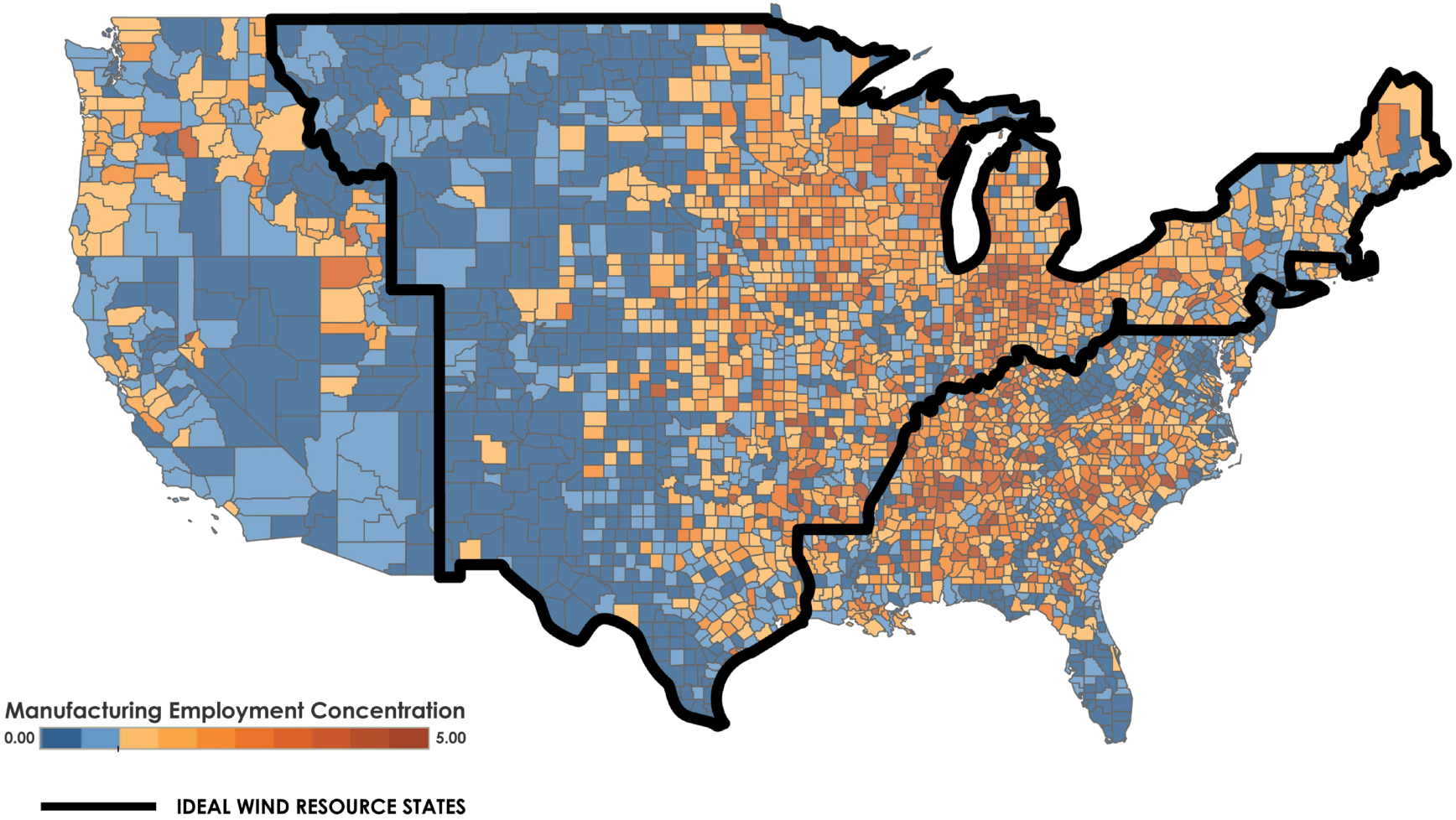

**MAP 29: SCENARIO 2 ECONOMICALLY VIABLE COUNTIES AT 18% ITC**



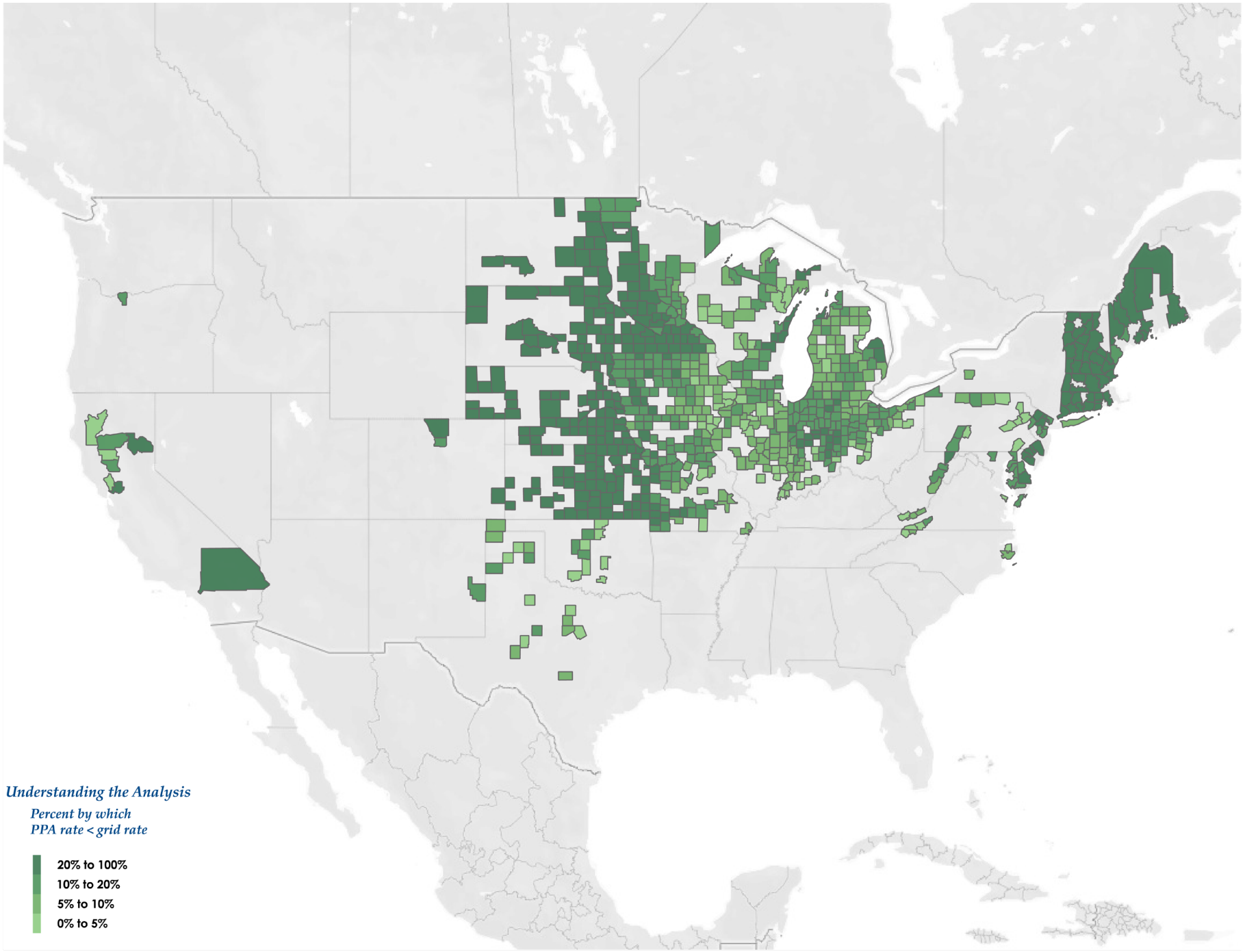

**MAP 30: SCENARIO 2 ECONOMICALLY VIABLE COUNTIES AT 12% ITC**



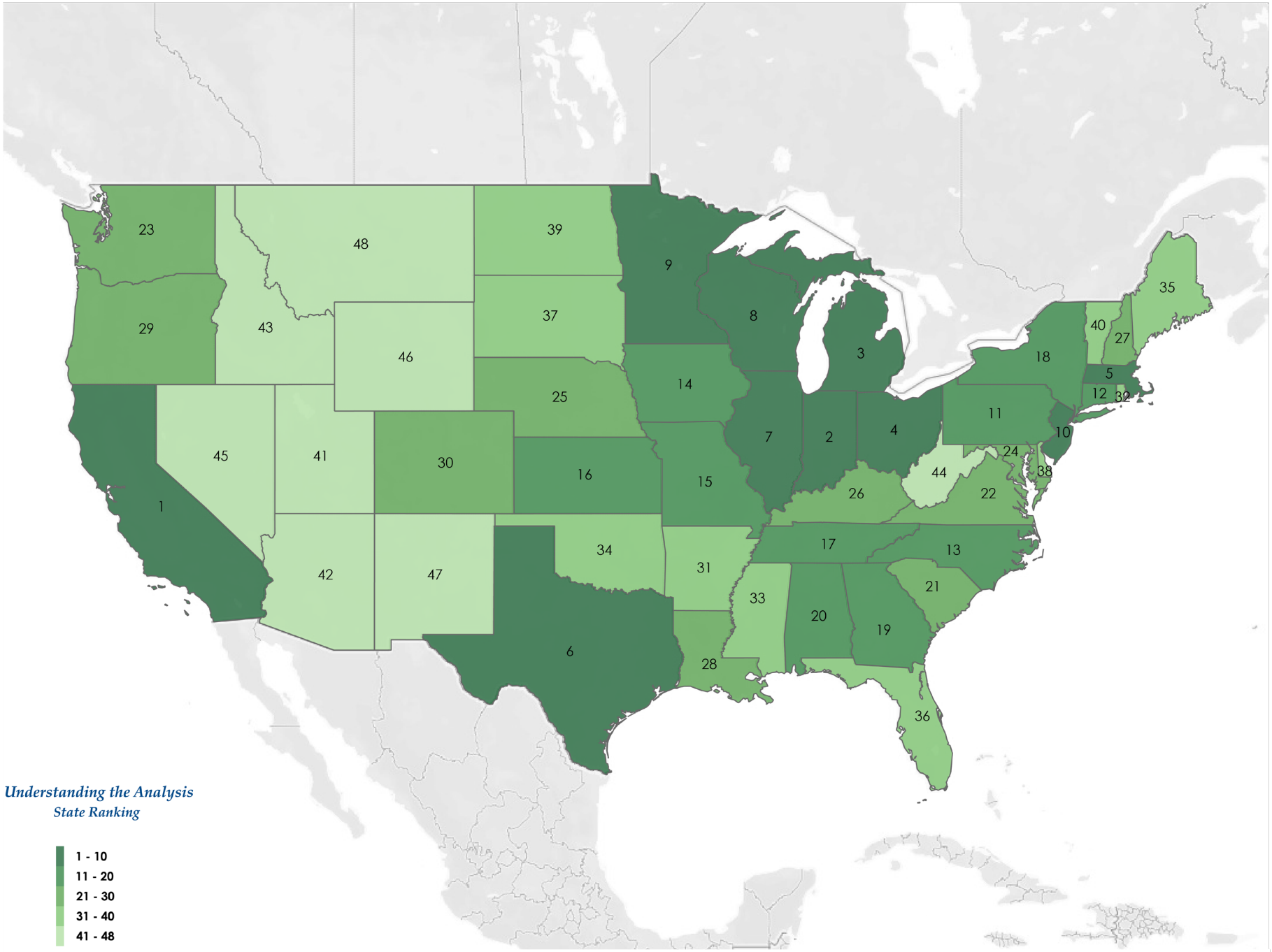

**MAP 31: SCENARIO 2 ECONOMICALLY VIABLE COUNTIES AT 0% ITC**




**MAP 32: MANUFACTURING CONCENTRATION BY COUNTY, 2019**




**MAP 33: ECONOMICALLY VIABLE COUNTIES FILTERED FOR MANUFACTURING AT 0%**




**MAP 34: Wind for Industry STATE VALUE SCORE RANKINGS**