A Multi-Level Perspective on the Geography of Solar Power Plant Diffusion

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Abstract

Solar energy technology is key to completing the global sustainability transition. In this research, I analyze the factors driving the diffusion of large-scale solar power plants. I make use of the Multi-Layer Perspective on sustainability transitions to distinguish between niche, regime and landscape factors, and add a geographical perspective to the analysis building on the notion of 'innovation in the periphery'. The multi-level analysis is applied both at the international level comparing diffusion across countries and at the country level comparing diffusion across U.S. states. From the results the key finding was the importance of a relevant capability base. If there is a capability base present, diffusion has a greater chance of succeeding, both in the country and in the state analysis. It was also found that OPEC members are significantly less active in solar power plants than other countries. I end with some policy reflections based on the empirical results.

Contents

1. Introduction

In the year 2019 the global energy demand increased by 0.9% with the expectation that for 2020 a new phase of growth would be entered (Deloitte, 2019; IEA, 2020a). This growth could be undesirable for the environment as energy consumption has a negative impact on the earth (Norton, 1991; MacRae, 1992), therefore increasing the need for renewable and sustainable energy more and more (Rosen, 1996; Dincer & Rosen, 1998). A shift in the general energy demand towards renewable energy would thus solve both the societal problem of the rising demand, as well as the scientific problem of climate change (Sims, 2004; Creutzig et al., 2017). However, currently the electricity generation market is still focused on the big three fossil fuels. Oil, coal, and natural gas each have a share of respectively 31.6%, 26.9% and 22.8% when it comes to the global share of total energy supply by source (IEA, 2020b). This comes down to a combined share of 81.3%, which leaves just 19.7% for other sources. This distribution is visualized in figure 1.

Though the outlook for the year 2020 was that most renewables were expected to experience a rise after the Covid-19 outbreak, solar PV, including both utility-scale and rooftop applications, was expected to remain stable (IEA, 2020c). This stagnation and lack of progression is disappointing seeing as it might imply that the technology falls short of the required level. Especially when the available market gain exceeds 97% as solar energy falls into the 2.0% of the 'other' category. Combined with the pressure on the fossil fuel sources and the rise of renewable competitors, the question comes to mind as to what is holding the diffusion of solar back.

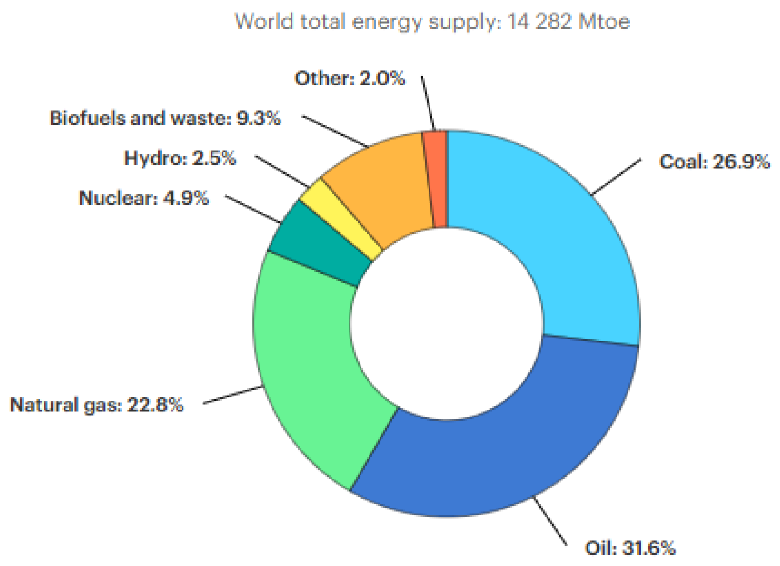

Figure 1. Global share of total energy supply by source in 2018 (IEA, 2020b).

The aim of the research, following this, is to understand what factors are supporting the development and diffusion of large-scale solar PV, namely utility-scale. These factors will be analyzed by focusing on geography of transition literature combined with innovation in the periphery facets. While this approach resembles the well-known multi-level perspective (MLP), the difference will be that this research will take on a more quantitative approach. Meelen et al., showed that the relationship between the innovation-regime influences spatial adoption (2019). They note, "an innovation that is largely symbiotic with the regime is more likely to emerge in a variety of places, and also where the regime is strong" (p. 140). Adding on to this, we take into account the global regime, allowing for a worldwide analysis using the MLP (Fuenfschilling & Binz, 2018). The added value of this, lies in the gap in research that lacks a combination of a MLP based analysis with a quantitative method of research. It will also serve as illuminating to see whether an analysis including the global regime is fitting to a quantitative methodology. From this, the research question that follows is as follows:

Which factors play a role in explaining the global diffusion process of utility-scale solar PV installations?

2. Theory

2.1 Technological transitions in a geographical perspective

The transition of technologies has been studied extensively since the start of the century by multiple researchers (Van den Ende & Kemp, 1999; Geels, 2002; Hekkert et al., 2007). From the work of Geels (2002) came the aim to address the question of how technological transitions (TT) come about. TT are defined as major, long-term technological changes in the way societal functions are fulfilled. TT do not only bring with them technological changes. They can also bring changes in user practices, regulation, industrial networks, and infrastructure (Geels, 2002).

Geels (2002) describes a multi-level perspective which combines both views of evolution and showcases TT, visualized in figure 2. A technology starts off in the niche at the bottom, and by evolving itself can create a path unto the socio-technical regimes where it brings change along with it, whilst reacting to landscape developments. The developments on the landscape level, e.g. the public opinion regarding a technology, can help the transition by pressurizing the regime. Once it has successfully disrupted the regime it is able to become part of it. Combining this with the current aim of the research adds important factors that need to be picked out and analyzed. These factors are not evenly distributed, and thus not the same, across the different installations. The MLP model emphasizes the interactions between the different levels. This implies that for this research that qualitative aspect of interactions needs to be translated into quantitative factors, i.e. niche, regime, and landscape factors.

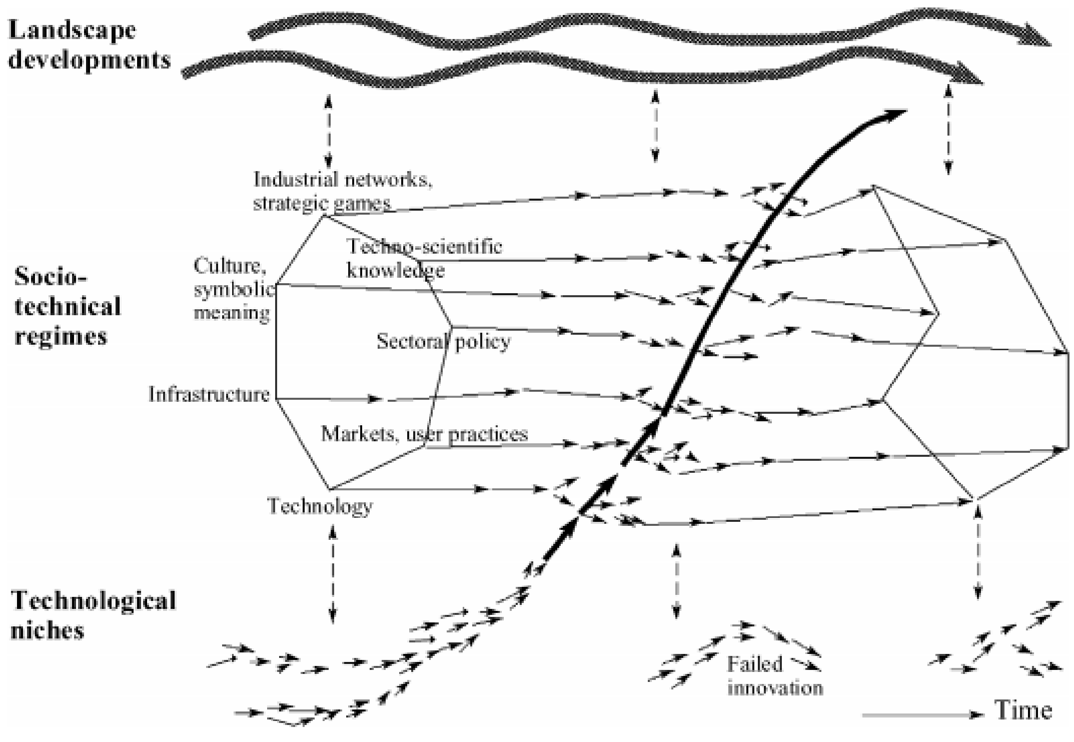

Figure 2. The Multi-Layer Perspective (Geels, 2002).

2.1.1 The domain of the niche

While the MLP by Geels (2002) emphasizes that change starts within niches, which implies that experimentation within the local setting is of importance, there has been a lack of acknowledgement of the location itself in early MLP research (Hodson & Marvin, 2009, 2010; Bulkeley et al., 2011; Lawhon & Murhpy, 2011; Truffer & Coenen, 2012). Therefore, this research aims to make the MLP model more connected to the geography.

The niche is where radical innovations are normally generated because of their protection, or insulation, from the general market selection (Schot, 1998). The reason for this is that the general innovation stands no chance against its competitors in the market. In a geographical sense the same can be argued. The niche would be the location where an innovation starts and sprouts before trying to become part of the global standard.

Analyzing these is harder than analyzing the regime technologies, the ones that are the standard. The reason for this analysis being harder is that emerging technologies tend to be more fluid, less rigid when it comes down to their build-up and context. Identifying potential key actors, emerging trajectories or potential dominant designs is much more speculative. Davies and Mullin (2010) refer to the interplay between a multitude of actors, consisting of firms, intermediaries, policy makers, as a critical method to understand the construction of new “configurations that work”. One of the methods of analyzing these emerging configurations are the seven Technological Innovation System (TIS) functions (Hekkert et al., 2007). These consist of the analysis of *entrepreneurial activities*, *knowledge development*, *knowledge diffusion*, *guidance of the search, market formation, resources mobilization* and *creation of legitimacy*.

One of the shortcomings of the current research on the geography of transitions is that most of the studies have zoomed in on the importance of place-specificity for the transition process (Hansen and Coenen, 2015). This however may have come with a bias towards emphasizing particularities found in single case studies of distinct places. As a result, the consensus is still *that* place-specificity matters while there is little generalizable knowledge and insight about *how* place-specificity matters for transitions. To answer the latter question, a quantitative analysis of transitions can be useful, as many places can be analyzed simultaneously and in a systematic manner (Meelen et al., 2019).

Theoretically, the concept of unrelated regional diversification is useful to understand why some places are leading in a transition compared to other places. Unrelated regional diversification is the occurrence when a region deviates from its own existing practices, processes and capability base and adopts a new industry. Boschma et al. (2017) aimed to answer how it takes place by setting up a framework that combines both Evolutionary Economic Geography with Transition literature. They set the sector of the technology and the capability base of the region up against each other and judged the relatedness towards the region’s capability base against the radicalness in the scheme of the regime, either niche or regime. From this it followed that an existing capability base does give opportunities for niche development.

One can expect new niches to occur in locations that master related technologies, as niche actors can build on knowledge, capabilities and institutions built up in the past regarding related technologies. Put differently, regions that create new niches by diversifying from existing technologies into new related technologies have more chance to succeed. As an example, regions that host a car industry and a battery industry are more likely to be successful in the niche of electric cars compared to regions that host only one or none of these two industries.

According to Sengers & Raven (2015), niches tend to occur in specific locations but may also be connected globally through loose networks of learning and investment. In their case-study they found that there were best practice examples, places where the niche was developed, and places of knowledge exchange where actors disseminated codified knowledge and spread it further, thus linking more and more places together and becoming a multi-scalar niche in the process, allowing for niche development in one place to help niche development in a different place.

2.1.2 The domain of the regime

The regime is the meso-level in the MLP framework. It consists of the current "rule-set" within institutions, actors, and organizations when it comes to a certain technology. The regime is thus basically directly connected to the general course of events and is seen as the main antagonist to the rise of the technological niche.

Following Truffer & Coenen (2012), geography does not only matter for where niches may occur, but it also matters for regime forces. The extent to which a regime can resist fundamental change depends on its institutional embeddedness in different spatial contexts. Regimes may show regionally differentiated transformation trajectories due to the influence of landscape forces and the difference in resources – a difference in spatial context - to accommodate the pressure of the forces. While a regime may be dominant at a global level, there may still be many regions where such dominance is absent, for example, in regions where two technologies co-exist side by side. For examples, in some cities or regions cars operate next to trams, metros, and local trains. Better understanding the place-specific configurations of resources on which regimes depend is deemed necessary to either assess regional policies or to transfer successful strategies from certain regions to other contexts.

The concept of the global regime has been further developed by Fuenfschilling & Binz (2018). They mention that while it is important to analyze the multi-scalar characteristics of niches, the spatial characteristic of the regime is also of importance. The researchers introduce the notion of isomorphism: "actors and practices have become increasingly similar all over the world, which is believed to be a consequence of the enactment of world polity scripts" (p. 737). Due to this, there might not be a local regime in cases, but more of a global socio-technical regime. The authors also mention that the power of the regime is influenced by different characteristics. This opens the possibility of the regime being strong at the core, but weaker at the periphery. For example, the regime regarding the generation of electricity would be strong in a country that already generates its own electricity but would probably not be as strong in a country that depends on other countries for its electricity. The former country would have multiple incentives, mainly economical, to keep the current situation as it is, whereas the latter country would have no direct ties to the regime and would thus be open to the possibility of a breakthrough from a technological niche.

2.1.3 The domain of the landscape

At the top level of the MLP model we find the landscape, the deep structural trends. These trends tend to put pressure on, or help support, niches or regimes and thus can lead to major changes. A country in which the general population supports a more sustainable lifestyle can result in a rise in the usage of renewable energy sources and providers. Thus making some room free within the regime for the niche to dive in to.

Multi-scalarity is a matter of concern in the regional studies community and has been largely ignored in the sustainability transitions literature. Multi-scalarity refers to the option of models and results being able to be scaled up or down while staying valid. Even though transition literature tends to ignore it, regime transformation must be conceptualized as potentially spanning over different scales and connecting distant places. Current models would have difficulty with the, realistic, chance of upcoming economies leapfrogging established economies on the matter of adopting a new socio-technical system. By being able to allow for the research of leapfrogging and catching-up the role of the landscape is acknowledged, and the multi-scalability is included. The principle of catching-up and leapfrogging in a sustainable transition perspective has been analyzed by Binz et al. (2012; 2017).

In the latter research, Binz et al. (2017) studied the catching-up patterns in China's wind, solar PV, and biomass power plant industries. In their research they found that traditional top-down catching-up policies played a decisive role in the development of China's wind industry but were of limited importance in the early solar PV industry, and resulted only in a limited period of rapid growth in the biomass industry. The progress achieved in the three industries was not related to top-down policy guidance alone, but also to private sector initiative, international interdependencies, and flexibility in adapting policy mixes. This suggested that the policy makers in NICs should thus aim to not generate general top-down policies, but rather tailor them to the specifics of the sector.

The process of top-down policy making, and leapfrogging can be linked to economic growth. Fast developing countries, such as China, that have a high leapfrogging potential tend to have a high economic growth (Liang & Jian-Zhou, 2006). This accompanies a higher energy demand in the same case of China (Zhang & Cheng, 2009). This increase in energy demand and economic growth may provide a positive influence into the option of other solutions for energy generation. When in demand for energy, whilst having a decent economic growth rate, constructing a utility scale solar power plant becomes a possibility.

Another potential landscape factor that may lead to an increase in diffusion of utility scale PV are international agreements. Agreements such as the Paris Agreement bind countries to targets that must be reached before the mid-century. Once a country has committed to the Agreement it will have to look at different sources that aid in reducing its emission rate. One of these could be looking into the adoption of utility scale solar PV.

2.2 Innovation in the periphery

While the global regime is strong at certain places, it may not be the only constraining factor for the niche to develop. Geographers tend to have another notion of periphery, countries or regions being on the side rather than the core. Think of rich countries, the G7, and the other countries. A poor, sparsely populated country would not have the same human and financial resources to create and develop a niche on its own when compared to a rich country. Hence, being peripheral in a general, economic sense may negatively impact the ability of a region or country to lead a sustainability transition.

Geography also matters in understanding the leeway of action for specific regional actors which will depend on their position relative to other regions or to higher level jurisdictions, the European Union for example. From such a political ecology perspective (Lawhon & Murphy, 2011), the focus should therefore be on the interplay between the different sources of power and the strategies of the different actors. In the MLP this is reflected by how the regime tries to stop the technological niche from breaking through. Regions with stronger power positions and more resources (e.g., core regions such a big cities or high-tech regions) will thus be generally better able to develop a niche than regions with little power (e.g., small cities or peripheral regions).

While innovation is often expected to take place in the core areas – places such as Silicon Valley that can make excellent use of knowledge spillovers – there are regions that can achieve a high level of innovation without being in such a position. These places, in direct opposition to the classic geographical definition of periphery, are interesting to include in the analysis as well. Fitjar & Rodríguez-Pose (2011) found that firms in the Southwest of Norway were able to compete on the National level whilst being within the periphery. By looking at both the role of the periphery with regards to the global regime, as well as the role of the periphery with regards to the world stage, a further distinction can be made and the role of the periphery can be identified better.

In a national context Eder (2019) found that one of the preconditions for an innovative periphery was the presence of both a university and an innovation policy. Furthermore, a periphery within a national context is often based upon a comparison with other regions in the country, but a periphery in an international context depends on the performance of a country relative to other countries.

2.3 Summary and hypotheses

Adding geography to the MLP, one can argue that niches tend to occur in specific locations although they may be connected globally through loose networks of learning and investment. One would associate the regime generally with a global level where the relative dominance of a regime differs across countries and regions. Landscape factors generally occur at the level of countries (such as economic growth) and international agreements (such as Climate Agreements). This multi-scalar view is also a direct improvement on the shortcomings that were analyzed by Hansen & Coenen (2015). They concluded that while multiple studies took a multi-scalar perspective, studies that looked explicitly at global sustainability transitions are less frequent. Like the first point, this resulted from the focus on primarily bottom-up approaches to transitions. By scoping back – to a more global view – we can directly look into the global sustainability transition and thus bring the geography of transitions in a different scope.

For the first hypothesis we need to refer to the article by Boschma et al. (2017). From this article the notion comes forth that an available capability base helps the niche. This leads to the formulation of the following hypothesis:

H1: *"Countries where solar PV is more related to the capability base will have a higher rate of diffusion"*

Fuenfschilling and Binz (2018) argued that the global regime can be weaker in certain countries. This in turn opens chances for the countries outside of the core to deviate from the regime. From this the following hypothesis follows:

H2: *"Countries that are outside of the core of the regime will have a higher rate of diffusion"*

The landscape level tends to focus on pressures from outside that might open up chances for niche development. One of those is the combination of a rise in energy demand and a rise of economic growth. Though a rise in economic tends to coincide with a rise of energy demand, only the former is used as an indicator of opportunity for niche development. This leads to the formulation of the following hypothesis:

H3: *"Countries with higher economic growth will have a higher rate of diffusion"*

A different landscape factor that was discussed was the presence of an international (climate) agreement. These agreements could make countries shift their focus into focusing on adopting renewable energy sources such as utility scale solar PV. From this the fourth hypothesis follows:

H4: *"Countries that have bound themselves to international Climate Agreements will have a higher rate of diffusion"*

The notion of innovation in the periphery, as just discussed, suggests that regions that are in the periphery, and normally thus unfit for development of niches. However, there may also be very specific conditions in peripheral regions that induce creative solutions or specific innovations. Hence, we cannot formulate a specific hypothesis regarding the question whether nice innovation is more or less likely in the periphery.

2.4 Conceptual model

Based upon the initial MLP framework a simple conceptual model can be formed that can be expanded upon. By incorporating the factors of the niche, regime and landscape and the geographical location the interplays of the different layers are visualized and made quantitative and geographical. Their presence or absence would allow for a greater diffusion process. This model can be expanded upon by incorporating the different research that have been mentioned in the previous sections of the theory. The base model is visualized below in figure 3.

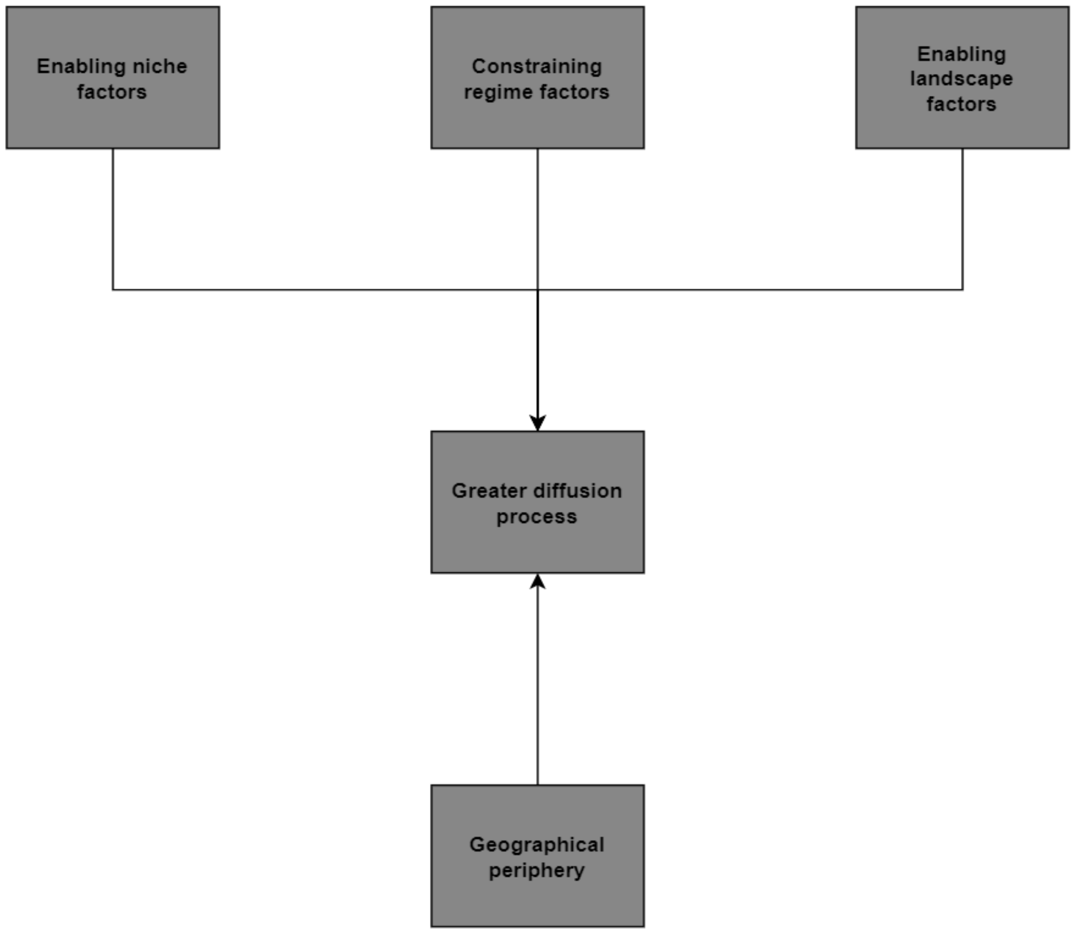

Figure 3. The initial conceptual model

2.4.1 Enabling niche factors

The third building block of the geography of transitions theory is the first of the enabling niche factors that can lead to a greater diffusion process. If the emerging socio-technical regime configuration construction works, it has a higher chance of rising successfully. These factors can be directly linked to the presence and strength of the seven functions of the TIS framework in the case of an analysis regarding the performance of a technology. However, since this research is not focusing on the performance but on factors related to the diffusion a different niche factor is used, the type of regional diversification followed within a region. While it is not clear whether a certain type of diversification performs better, it could be an interesting gap to dive into, to find out whether there is a significant difference in successfulness.

2.4.2 Constraining regime factors

The regime factors are more intertwined, while the first and second building block of the geography of transitions theory mentions that the current regime needs to be considered, and that the regime has a different trajectory based on its special context, it is followed by the parallel of the theory of innovation in the periphery. In the periphery of the regime there will be more room and less pressure, thus also satisfying building block two because of the chance – and thus an alternative trajectory - that this generates. This also can be linked directly to the fifth building block and the case of the global socio-technical regime. By incorporating the power of a regime mentioned by Fuenfschilling & Binz (2018) the pressure and strength can be used to analyze its effect. The higher its power is, the less it helps the diffusion rate.

2.4.3 Enabling landscape factors

The fourth building block of the geography of transition model mentioned that leapfrogging is currently undervalued in models. By capturing the dynamics behind the landscape factors of leapfrogging and catching-up specific attention is given to it. In the case of leapfrogging the taken trajectory can differ and has, like the type of diversification, a different impact. While the catching-up dynamics depend mostly on actively making up lost ground, they will most likely not be present in most cases. But in those in which they are present and custom-tailored to the sector, they could make an impact as shown by the case of China.

2.4.4 Geographical periphery

Last is the case of the geographical periphery. Prior research has shown that most transitions happen in areas that are at the core of development and innovation. But more recently works by Fitjar & Rodríguez-Pose (2011) and Eder (2019) have found that even outside in the periphery these developments and innovations can happen, even radical ones as the peripheral contexts are quite specific and may thus induce new type of solutions. That means that there is a case for geographical periphery being a constraining as well as an enabling factor.

This gives the following more complete framework, visualized in figure 4.

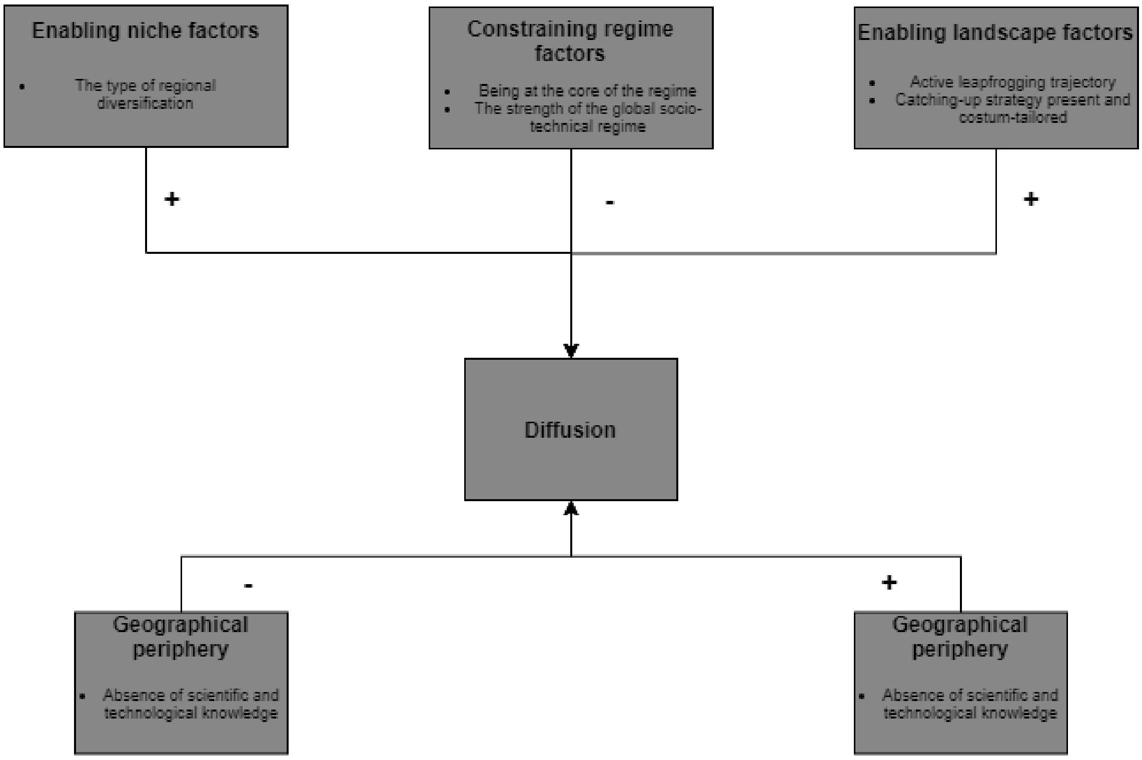

Figure 4. The conceptual model

3. Methodology

In this section, the case selection along with the data collection are introduced. Further, the different variables are presented in an operationalization table and lastly the used method for data analysis is described.

3.1 Research design

Since the aim of the research is to find the different factors that affect diffusion, the dependent variable should capture the cross-country development of solar parks. Therefore, the dependent variable is a count variable, representing the number of solar parks within a country. To explain solar park diffusion, we focus on four independent variables that each refer to the niche (one variable), regime (two variables), and landscape (two variables). These are the related capability base for the niche level, the share of fossil fuel usage in the energy demand and the membership of the Organization of the Petroleum Exporting Countries (OPEC) for the regime level, the economic growth and international agreement participation for the landscape level. Furthermore, we include a variable to denote periphery being the Gross Domestic Product (GDP) of the country.

For the control variables, it is of importance to note the importance of three factors, which are both related to the viability and feasibility of a PV project. The first concerns population density, which assumes that countries with low population density have more space to install large solar parks. The second factor is solar irradiance of the area. Both can give a country the edge over another country. Just as an example, it would make more sense for Saudi-Arabia to develop a solar power plant than it would for Denmark because of its space and irradiance. Therefore, the population density and the solar irradiance are included as control variables. The last control variable will be presence of neighbors that have adopted the usage of solar parks. Once a neighbor adopts the technology, the chances increase that the country will adopt it itself too. This is because it is possible to review the project from a distance but being close enough to copy and adopt it. The operationalization of these variables is given in table 1.

The aforementioned analysis aims to fulfil and answer the aim of the research. However, it should be noted that the analysis suffers from one limitation from the start. The database that is planned to be used for the analysis consists of a small number of observations in the context of this large analysis. While the next section will dive into this more in-depth, the solution will be elaborated upon here. To confirm the results of the country analysis, an analysis will be conducted on the individual state level of the United States. The reason being that there exist more observations within that dataset because of the addition of the data for the year of construction. Therefore, we can treat each combination of state and year as a separate observation, i.e. Arizona-2002 and Arizona-2003. By doing this after reviewing the results of the country analysis, the results, that might suffer from the small sample, can be confirmed. Another added benefit when doing this, is that the place-specificity and multi-scalarity can be tested immediately by comparing the results from the international country analysis with those from the regional United States state analysis. The state-level analysis will follow the same framework as the country-level analysis, aiming to analyze according to the same parameters on the fields of the niche, regime, landscape, and periphery aspect. Both the country and state databases have been included in Appendices 1 and 2.

3.2 Case and data selection

3.2.1 Country analysis

The cases selected for this quantitative analysis were those available within the Global Power Plant database that was made available by the World Resources Institute (Global Energy Observatory, 2018). The database consists of approximately 30,000 power plants from 164 countries and includes both thermal plants and renewables. The dataset has seen its latest update in June 2019 and aims to be continuously updated as data becomes available. From this dataset over 2,000 plants were using solar energy shared among 41 countries. The minimum installed capacity Within this dataset the countries with multiple solar power plants have been included as they have thus shown an increase in diffusion. While the advantage of this dataset is its open-source nature, it has a disadvantage as it lacks in its coverage with 239,237 MW capacity missing in the database. This is due to the restriction of the authors to allow only plants that generate over one megawatt. Most renewable stations tend to be newer, and often smaller which leads to their exclusion. In order to enhance the number of observations and analyze the situation fully the decision was made to add other countries too. The 41 countries that had solar parks and 87 countries without. These 87 countries have to meet one parameter, to have a population that is, at least, as high as the lowest populated country of those 41. Therefore, the entry barrier is set at Rwanda seeing as it has a solar park but the lowest population of those 41. A worldwide visualization of the solar parks can be seen in Appendix 3.

For the first independent variable, the related capability base, the countries that have been included are reviewed to analyze whether there is an active market of PV panel capability base. This is done by making use of the International Patent Classification and using the H02S10/00, H02S20/00, H02S30/00, H02S40/00, H02S50/00, H02S99/00, H01L31/00, H01L51/00 categories which refer to PV power plants and the associated systems. From patent studies executed by Shubbak (2019). This insight was also shared by Sampaio et al. (2018) and Son & Cho (2020). While all three papers found other codes too, the H02S and H01L codes were the common ground between them. Thus they were chosen. The source for this variable was the U.S. Patent Office (www.uspto.gov) due to its efficient and open search system and its industry wide standard for patent filing.

For the second independent variable, periphery of the regime, the energy overview of the country is reviewed to find whether they do import fossil fuel for their energy demand or rather generate their whole demand themselves. This is done for the year of their first project. This variable was sourced by the International Energy Agency (www.iae.org). The IEA gives a clear overview of the countries imports and usages.

For the fourth independent variable, economic growth, the gross domestic product increase will be included since the year of appearance of their first project up until the 2018. This variable was sourced by the Our World in Data database (www.ourworldindata.org).

The third independent variable, OPEC was sourced by using the member list in 2018 was taken. For this variable the source was the member list provided by the OPEC organization (https://www.opec.org).

For the fifth independent variable, international agreement participation, the presence or absence of a country with regards to the Paris agreement is noted. This presence needs to be confirmed by the agreement being ratified within the legislative bodies of the country, not just by signing the accord itself in Paris. This imposed an additional check with the intent to separate the nuances in the field. Data were taken from Wikipedia article of the list of parties to the Paris Agreement (https://en.wikipedia.org/wiki/List_of_parties_to_the_Paris_Agreement)

For the sixth independent variable, GDP the numbers from the World Bank (https://data.worldbank.org) were used, using the 2018 United States Dollar value. The numbers per country were reformed to per capita numbers to flatten the playing field and make it less erratic.

For the control variables Solar Irradiance and Population density the numbers will be taken of the year of the first project, as that was the starting situation for the decision to develop the installation. For the former the data of the Global Solar Atlas database (https://globalsolaratlas.info) was taken (Global Energy Observatory, 2018). For the population density the World Bank (https://data.worldbank.org) database was used. In the case of the neighbors, the number of neighbors of the country that possessed solar parks are noted. This variable came directly from the dataset itself and was thus sourced from the last known year in 2018.

3.2.2 State analysis

For the states analysis the same database was used as with the country analysis (Global Energy Observatory, 2018). The database consisted of only the longitude and latitude of a solar park and its year of commission. Thus the database was expanded by including the state it belonged in along with all the other states that year that did not have any solar park. This was done for the years 2002 up until 2018 for all U.S. states and the District of Columbia. This led to 868 data points that could be used as observations. A visualization of these data points can be seen in Appendices 4 and 5.

For the first independent variable, the related capability base, the same method will be applied to the states that is planned for the country analysis. So based on the research of Sampaio et al. (2018), Shubbak (2019) and Son & Cho (2020) the H02S and H01L patents are included.

For the second independent variable, periphery of the regime, the import overview of energy on the state level is not clearly available. Therefore, the states will be reviewed on their fossil fuel production. As all observations are on a year-to-year basis this will be reviewed for each year. In this case the U.S. Energy Information Administration was used as a source seeing as they monitor the state-wide developments.

For the third independent variable, economic growth, the gross domestic product increase is included for every year with regards to the year before. The U.S. Census Bureau (https://www.census.gov) provides the source for this variable.

For the fourth independent variable, international agreement participation, the presence or absence of a state with regards to the Paris agreement cannot be noted. Therefore, the presence of a Democrat president is noted as these tend to be more ecologically friendly, and thus favor renewable energy. In this case the variable label thus also changes to president. Each entry and the corresponding year was linked to the sitting president and their political orientation. For this variable, the Wikipedia article on the president of the United States was used (https://en.wikipedia.org/wiki/President_of_the_United_States).

For the fifth independent variable, GDP the numbers per capita per year are not found. Thus the general GDP value per state was taken for each and every year. In this case the U.S. Census bureau was the source for all the values.

For the control variables Solar Irradiance and Population density the numbers of each year are not available. Therefore, the last known value will be taken for these variables seeing as these three variables tend to stay stable over short periods of time. In their cases it is their 2020 value that was taken into the analysis. For the latter two the U.S. Census Bureau was the source, while for the former it was the Global Solar Agency. For the neighbor control variable, the number of neighbors of the state that possess solar parks are noted. This variable came directly from the dataset and was updated.

3.3 Operationalization table

In order to research and answer the hypotheses a number of variables were chosen differing from dependent ones, to independent, dummy and control variables. In order to measure the variables, they need to be operationalized with measurable indicators. These are shown in table 1 and 2 for the country and state analysis, respectively.

Table 1.

Operationalization table countries

Variable	Name	Label	Description	Unit	Source	Expected Effect
Dependent	Solar Parks	Solar Parks	Number of installed solar parks	Number	World Resources Institute Database	~
Independent (niche-level)	Capability base	Ln_Patents	How many patents regarding PV power plants does the country possess?	Number of patents (natural log)	U.S. Patent Office Database	Positive (Hypothesis 1)
Independent (regime-level)	Periphery of the regime	Fossil Fuel Share	How much fossil fuel does the country import for its energy demand?	Fossil fuel import percentage of total energy demand	International Energy Agency Data and Statistics	Positive (Hypothesis 2)
Independent (regime-level)	OPEC	OPEC	Is the country part of the OPEC coalition?	Present or absent	OPEC membership	Negative (Hypothesis 2)
Independent (landscape-level)	Economic growth	Economic growth	What was the increase in the gross domestic product per capita since the first project until 2017?	Increase in %	Our World in Data Database	Positive (Hypothesis 3)
Independent (landscape-level)	International agreement participation	Paris	Has the country signed the Paris Climate Agreements whilst having a plan of action that meets the agreements?	Present or absent	Legislative documents of governing bodies	Positive (Hypothesis 4)
Other	GDP	GDP	The gross domestic product of a country per capita	The 2018 value in U.S. Dollars	World Bank Database	Positive
Control	Solar Irradiance	Irradiance	Average solar irradiance experienced in the country	Number of kilowatt/km^2	Global Solar Atlas Database	Positive
Control	Population Density	Population Density	The average amount of people per square kilometer	Number of people/km^2	World Bank Database	Negative
Control	Spatial spillover	Neighbor	Neighboring with a solar park	Present or absent	World Resources Institute Database	Positive

Table 2.

Operationalization table states

Variable	Name	Label	Description	Unit	Source	Expected Effect
Dependent	Solar Parks	Solar Parks	Number of installed solar parks	Number	World Resources Institute Database	~
Independent (niche-level)	Capability base	Ln_Patents	How many patents regarding PV power plants does the country possess?	Number of patents (natural logarithm)	U.S. Patent Office Database	Positive (Hypothesis 1)
Independent (regime-level)	Periphery of the regime	Fossil Fuel Production	How much fossil fuel does the state produce for its energy demand?	Amount of British thermal unit produced	U.S. Energy Information Administration	Positive (Hypothesis 2)
Independent (landscape-level)	Economic growth	Economic growth	What was the increase in the gross domestic product per year?	Increase in %	U.S. Census Bureau	Positive (Hypothesis 3)
Independent (landscape-level)	President	President	Democrat president	Present or absent	White House Office	Positive (Hypothesis 4)
Other	GDP	GDP	The gross domestic product of a state	The 2018 value in U.S. Dollars	U.S. Census Bureau	Positive
Control 1	Solar Irradiance	Irradiance	Average solar irradiance experienced in the country	Number of kilowatt/km^2	Global Solar Atlas Database	Positive
Control 2	Population Density	Population Density	The average amount of people per square kilometer.	Number of people/km^2	U.S. Census Bureau	Negative
Control 3	Spatial spillover	Neighbor	Number of neighboring states with a solar park	Number of neighbors of the state	World Resources Institute Database	Positive

3.4 Data analysis

This study consists of one dependent variable that resembles a count value. Therefore, the appropriate analysis is a Poisson regression analysis, which will be performed using the statistical computing software R. Once the analysis starts overdispersion needs to be analyzed to find out whether to execute a regular Poisson analysis or a negative binomial analysis. The data analysis itself is divided into three steps: the descriptive statistics, the regression model, and the reviewing of model quality by analyzing the outliers.

In the first step the summary command was used to obtain descriptive statistics of the data set. Additionally, a correlation coefficient matrix was made using Pearson's r correlation method, in order to visualize the correlations between all the different variables. A correlation matrix can also show signs of multicollinearity and can be useful when comparing differences between different models. From these basic descriptive statistics, it is easier to grasp the results and later explain certain relations found.

In the second step the regression model in R has been obtained with the respective dependent variables, the independent variables, and the control variables. This step and the first step will be redone for the state analysis to confirm the regression results on the country level. Once that has been done the last step can be executed where country outliers have been marked and are analyzed to find out their impact.

3.5 Reliability and validity

While conducting this research, maximum quality by way of optimizing the validity and reliability was strived for. Reliability refers to the consistency of results which the research will produce when repeated. Validity refers to the accuracy or correctness of the findings. By showing the reader the origin of the research indicators and the methodology used the reliability was maximized. The validity flows out of the analysis and was maximized by interpreting the results scientifically and statistically. A limiting factor lay within finding a complete dataset for all the solar installations. However, the current dataset will be able to answer the research question based on the observations that are available.

4. Scope of the research

In the case of solar power plant energy two types of technologies came forward as the main players behind the energy generation. That of concentrating solar power (CSP) and photovoltaics (PV). Within the dataset both technologies were represented, with the majority of the solar plants making use of the photovoltaic technology. With this difference being present in the dataset that was used in the analysis, both technologies will be explained in short below to give the reader a base of understanding of both.

4.1 Types of solar power stations

4.1.1 Photovoltaic power stations

With most solar power plants in the world being photovoltaic power stations, the technology also holds the majority in the dataset. Photovoltaic power stations tend to have PV panels that are mounted to the ground and absorb the solar radiation. This radiation is then put through a solar inverter that converts the DC power output into AC output (El-Shimy, 2009). This output then gets put through a transformer that can connect the output to the utility grid (Islam et al., 2014). While there are little variations in the latter part of this, the part that absorbs solar radiation does come in three variations.

In the most neutral case, the panels are placed in a fixed array where they are oriented towards the Equator at a slight tilt (Alharthi et al., 2016). This fixed array position lets the panels provide an output that is not the highest achievable one, but the most efficient one for land use.

In the case of the second case the panels are set up to maximize their output based on the intensity of incoming solar radiation. To achieve this the arrays are designed with the use of two-axis trackers that are capable of tracking the sun during its daily orbit as well as during its year-wide elevation changes. Because these arrays are focused on maximizing the incoming radiation, they need to be spaced out of one another in order to reduce inter-shading. This in turn does lead to them using more land area but increases their output by an order of up to 36% (Rana, 2013)

The third array makes use of both the fixed array technology as well as the two-axis array technology in order to find the middle-ground between them. They function along a single axis. They function along a single axis that is capable of tracking the sun during its daily journey in the sky, but not adjusting for the seasons (Dolara et al., 2012). This makes them more efficient in land use than two-axis arrays, while being able to gather a higher output than fixed array.

4.1.2 Concentrated solar power stations

While they are in the minority, concentrated solar power stations tend to have a more consistent output than PV plants. This is due to the similarity CSP plants have with other thermal power stations such as coal, gas, or geothermal ones. Concentrated solar power uses mirrors or lenses, with tracking systems, to redirect and focus a large area of sunlight on a focal point or area. This concentrated radiation is then used as heat source in the same way that a conventional thermal power plants use heat as a source to generate rotational energy (Islam et al., 2018). Generating this heat can be done in four ways.

The first method is by using a parabolic through. In this case a linear parabolic reflector catches and concentrates light onto a receiver through positioned along the horizontal axis of the parabola. This through tends to contain a working fluid which is heated by the reflected radiation and can then be used as a heat source (El Gharbi et al., 2011).

The second method consists of a solar power tower. A set of dual-axis reflectors, using the same principle for the dual-axis as in the PV arrays, concentrate sunlight on a central receiver atop a tower. Within this receiver a heat-transfer fluid is heated up and used as a heat source for the power generation. While the tower technology is less advanced in its development compared to the throughs, it offers a higher efficiency and better energy storage capability (Islam et al., 2018).

The third method consists of the usage of Fresnel reflectors. Fresnel reflectors work in the same way as parabolic throughs except that they are linear reflectors instead of parabolic one. Due to their flatness, they possess more reflective surface in the same amount of space compared to parabolic reflectors, which allows them to capture more of the available sunlight, yet their thermal efficiency is lower than that of parabolic reflectors (El Gharbi et al., 2011; Ford, 2008).

The fourth method is a combination of the parabolic throughs and solar power towers. In the case of the dish Stirling method a parabolic reflector, standalone, concentrates light onto a receiver positioned at the reflector's focal point. This receiver has its own heat-transfer fluid that powers a Stirling engine at the focal point of the parabolic reflector (Yan et al., 2017).

5. Results

The results section is divided into three parts. The first part is dedicated to the country analysis, its descriptive statistics, correlation matrix and its regression results. The second part is dedicated to the states analysis, with the same topics as the country analysis. The third part is the reflection, which serves to summarize the results between both the analyses and compare them to the priorly stated hypotheses, while the last part deals with a concise deeper analysis into the major outliers.

5.1 Country analysis

The country analysis was started by making use of the variables mentioned in the methodology. In order to get a clear view of their state, without having to view the database, their respective descriptive statistics are included in table 3 below.

Table 3.

Descriptive statistics country analysis

	Mean	Standard deviation	Min value	Max value
Solar Parks	46.770	259.953	0	2281
Ln_Patents	5.626	3.445	0	5.969
Fossil fuel share	0.832	1.027	0.04	8.96
OPEC	0.0873	0.296	0	1
Economic growth	0.473	0.611	-0.49	2.59
Paris	0.571	0.498	0	1
GDP	13724	19588.15	293	80450
Irradiance	4.742	0.995	2.455	6.300
Population density	246.50	1035.477	3.0	7953.0
Neighbor	0.667	0.455	0	1

After the descriptive statistics, a correlation matrix was setup with all variables. By utilizing the correlation matrix, relations between variables can be expressed in correlation coefficients to show overlapping points in the dataset and find patterns and trends before attempting a regression analysis. Within this matrix the same variables were used as mentioned in the operationalization table. The matrix of the used dataset is visualized in table 4 below.

Table 4.

Correlation matrix countries

	Count	Ln_Patents	Fossil fuel share	OPEC	Economic growth	Paris	GDP	Irradiance	Population density	Neighbor
Count	1.00	0.38	-0.01	-0.06	-0.11	0.14	0.32	-0.22	-0.02	0.12
Ln_Patents	0.38	1.00	0.36	-0.10	-0.26	0.34	**0.76**	-0.59	0.18	0.24
Fossil fuel share	-0.01	0.36	1.00	-0.16	-0.19	0.16	0.44	-0.23	**0.79**	0.09
OPEC	-0.06	-0.10	-0.16	1.00	-0.16	-0.13	-0.06	-0.20	-0.06	-0.02

Economic growth	-0.11	-0.26	-0.19	-0.16	1.00	0.02	-0.33	0.16	0.04	0.07
Paris	0.14	0.34	0.16	-0.13	0.02	1.00	0.27	-0.16	0.11	0.03
GDP	0.32	**0.76**	0.44	-0.06	-0.33	0.27	1.00	-0.60	0.28	0.18
Irradiance	-0.22	-0.59	-0.23	0.20	0.16	-0.16	0.02	1.00	-0.09	-0.22
Population density	-0.02	0.18	**0.79**	-0.06	0.04	0.11	0.28	-0.09	1.00	0.09
Neighbor	0.12	0.24	0.09	-0.02	0.07	0.03	0.18	-0.22	0.09	1.00

From the correlation matrix two stark correlations are found. The first being between population density and fossil fuel share, with the second being between the natural logarithm of the amount of patents (Ln_Patents) and the GDP. Whenever there is a high correlation between two variables it suggests that the linear regression estimates will be unreliable. In this case, to protect the regression analysis, the choice was made to omit both population density and GDP from the analysis. The reason being both a combination of the amount of missing data points that were higher within those variables as well as the stronger link between the MLP model and the patents and fossil fuel share variables compared to the MLP model and the population density and GDP variables. This was not the only impact of the missing data points for certain observations. 21 observations did not have data points for each variable. This led to the creation of four different models based on maximizing the number of observations. These four models, named A, B, C and D are visualized in table 5 below. Before the analysis started an over dispersion test was ran, which found over dispersion within the dataset. Therefore, the analysis, over all the models, was done by using a negative binomial regression.

The first model, model A, prioritized the full list of observations. Within this model all 126 observations were preserved along with the four variables that all 126 of the observations had values for. This included the following variables: Paris, Ln_Patents, OPEC and Neighbor. This first model had only one significant and positive effect at the 99% level, that of the relevant capability base in patents. In this case a one-unit increase in the ln value of patents led to the addition of 2.29 solar power plants. This was in line with the expectation from the niche level of the MLP framework. If there is a relevant capability base, in this case the application of relevant patents, a positive soil exists for the niche to develop. Therefore, directly helping the creation of new power plants as seen by the 2.29 figure.

Another effect was observed with the OPEC variable. Since the database consisted of 126 observations, a 90% significance level was incorporated as the cut-off point rather than 95%. The reason being in the relatively small set of observations. The OPEC variable had a significant and negative effect where being part of the OPEC led to a decrease of $e^{2.13}$ = 8.41 in the number of power plants. This is also in line with the MLP framework. Being part of the OPEC means being part of the regime that builds and trusts upon fossil fuels for their needs. This regime has a lot of forces working against the creation of new plants which can be seen in the 8.41 figure.

With the four variables of model A, the three layers of the MLP framework were represented. The niche level by the patents, the regime level by the OPEC participation and the landscape level by the Paris agreement variable. The neighbor variable stood separately from the other variables but had no significant effect. While there was a perceived effect for the regime and niche level, there was none for the landscape level.

The second model, model B, included all the independent variables except for GDP. As explained before, those were excluded because of their correlation with other variables which might impact the regression. Within this model the niche level was again positive and significant at the 99% significance level with a one-unit increase in the ln number of patents leading to an increase of 2.14 of the amount of solar power plants. In this model the value of OPEC has become more significant, now even at the 99% level, with a country being part of the OPEC leading to a decrease of $e^{2.98}$ = 19.69 of the amount of solar power plants. Again a negative effect for being part of the regime. The negative significant value of being in the OPEC was followed by both the fossil fuel share and the economic growth. The former at the 99% significance level and the latter at the 90% significance level. In the case of fossil fuel share it meant that a one-unit increase led to a decrease of 0.53 in the amount of power plants. This meant that by being bound to the regime, by having a high share of fossil fuel imports in relation to the energy consumption, the chance of an increase in the solar power plant is lowered. This goes against the assumption that being dependent on the regime heightens the chance of going after independence, by constructing solar parks for example. A possible reason for this might lie in the used unit for the analysis. By looking at the relation between import and energy use, transshipment harbors might be overrepresented. These are harbors that import goods, only to ship them out to another destination later. In the dataset the five highest values, Singapore, Hong Kong, the Netherlands, Greece, and Belgium, all possess a busy harbor. In addition to that, the relatively small significance that sits at an alpha of ten percent, lowers the impact of this effect.

In the case of economic growth, a one-unit increase in the growth led to a 0.16 decrease in the amount of power plants. While this goes against the thought behind the landscape layer, in which economic growth allowed for the construction, development and support of new niches it helps to view the dive into the dataset to explain this trend. During the decade prior to 2018 the economic crisis took place in 2008. This crisis hit the big economies hard while leaving smaller economies with more room to grow. As an example, while the United Kingdom experienced a decrease of 20% over the decade in GDP per capita, Laos experienced a 240% increase in its GDP per capita. This while the UK had hundreds of solar plants compared to none in the case of Laos. The dataset also had multiple cases like that of Laos, where smaller economies experienced a growth while not investing in solar power plants. This probably skewed the number to the negative side. In this model all layers of the MLP framework were included.

Like with model A there was a positive role for the niche level, with an overall negative role for the regime level, due to the significance of OPEC of fossil fuel share. Both of these developments were in line with the expectations. In the case of the landscape developments however there was a negative, yet unexpected effect for economic growth. The inclusion of fossil fuel share and economic growth did lead to a loss of 20 observations, however. These were often countries that had a turbulent history behind them or less bureaucratically developed that led to missing data.

The third model, model C included all variables of the previous model B as well as the GDP variable to have a model with all independent variables. While this model was not supposed to be analyzed it has been included to show the effect of the inclusion of the GDP variable. Including the GDP variable led to the loss of the significance of the fossil fuel share variable, as well as a loss of strength for the OPEC variable. The GDP variable itself however added nothing with both the patents and economic growth variable keeping their effect and significance. By including the prerequisite of having a GDP value another observation was lost, leaving the analysis with 105 observations.

The fourth model, model D is the final model. It includes all the independent variables as well as the irradiance variable that has a controlling role. The only exceptions being population density and GDP because of their correlation with other variables. The addition of the control variable irradiance led to a loss in significance for economic growth and OPEC. This is thought to be so because of the similarities between the countries that experienced a good economic growth, mainly in Africa and Asia, and countries that receive a lot of solar irradiance, most of them being in those two continents too. The latter also tends to be true for OPEC countries. Most of them are countries in the Middle East where irradiance tends to be higher. The addition of solar irradiance is an interesting one as a control variable as its significant at the 99% level yet has a negative effect on the number of solar plants. Where irradiance was expected to have a positive effect seeing as more irradiance meant a higher potential for solar plants, it seems to not be the case. In this case it is interesting to dive into the dataset as well to find an explanation. From the dataset it shows that the top ten of countries, sorted by irradiance, have a combined total of four solar power plants, which lie in two different countries. When we look at the inverse situation, the ten lowest irradiance countries, we find a total of 1511 plants divided over four countries. This is a large divide that explains the negative value.

Table 5.

Regression summary country models

	A	B	C	D
Constant	1.05* (0.63)	2.76*** (0.75)	2.81*** (0.76)	6.79*** (1.84)
Ln_Patents	0.83*** (0.15)	0.76*** (0.15)	0.96*** (0.20)	0.56*** (0.16)
Fossil fuel share		-0.64* (0.34)	-0.55 (0.34)	-0.53* (0.32)
OPEC	-2.13* (0.15)	-2.98*** (1.15)	-2.74** (1.11)	-1.69 (1.11)
Economic growth		-1.86*** (0.56)	-1.76*** (0.60)	-1.28** (0.54)
Paris	-0.73 (0.63)	-0.49 (0.64)	-0.33 (0.65)	-0.57 (0.62)
GDP			-0.000024 (0.000023)	
Neighbor	0.67 (0.64)	0.13 (0.67)	-0.010 (0.67)	-0.28 (0.65)
Irradiance				-1.01*** (0.34)
No. observations	126	106	105	105

Standard errors are reported in parentheses.
*, **, *** indicates significance at the 90%, 95%, and 99% level, respectively.

5.2 State analysis

The state analysis hopes to support the results of the country analysis. Therefore, the same steps, as much as possible, are repeated in order to show the results. The first step is setting up the descriptive statistics for the variables of the state analysis. These are visualized below in table 6. One difference that is worth noting is that the max value of neighbor in the states analysis is not limited to present or absent in this case. Because the data points are sorted per year, a trend can be determined by noting the number of neighbors per year.

Table 6.

Descriptive statistics states analysis

	Mean	Standard deviation	Min value	Max value
Solar Parks	11.23	46.7166	0	496
Ln_Patents	0.9167	1.086145	0	5.1358
Fossil fuel production	1095.7	2337.638	0	19087.9
Economic growth	1.84	2.579531	-8.80	22.30
President	0.4706	0.4994223	0	1
GDP	312246	386758.5	24453	2708967
Irradiance	4.311	0.5609711	2.650	5.605
Population density	385.6	1365.177	1.2	9856.5
Neighbor	1.473	1.708596	0	8

Again the descriptive statistics were followed up by a correlation matrix all variables. The aim was, like before, to find linkages and relationships and act upon them before they would be able to interfere with the regression analysis. The matrix of the used dataset is visualized in table 4 below.

Table 7.

Correlation matrix states

	Count	Ln_Patents	Fossil fuel production	Economic growth	President	GDP	Irradiance	Population density	Neighbor
Count	1.00	**0.48**	-0.02	0.06	0.03	0.41	0.13	0.00	0.28
Lnpatents	**0.48**	1.00	0.06	0.02	0.17	**0.65**	0.06	-0.03	0.42
Fossil fuel production	-0.02	0.06	1.00	0.05	0.02	0.25	0.22	-0.10	0.06
Economic growth	0.06	0.02	0.05	1.00	-0.24	0.05	0.07	-0.01	-0.07
President	0.03	0.17	0.02	-0.24	1.00	0.02	0.00	0.00	0.29
GDP	0.41	**0.65**	0.25	0.05	0.02	1.00	0.22	-0.04	0.14

Irradiance	0.13	0.06	0.22	0.07	0.00	0.22	1.00	0.06	0.13
Population density	0.00	-0.03	-0.10	-0.01	0.00	-0.04	-0.06	1.00	-0.06
Neighbor	0.28	0.42	0.06	-0.07	0.29	0.14	0.13	-0.06	1.00

In this correlation matrix one strong correlation was found. As has happened with the country analysis, this correlation took place between the GDP and patent variables. In this case the correlation was weaker than before, being 0.65. This value is lower than the border value of 0.7 that is often used to exclude variables. Therefore, the GDP variable will be included in this research. Overall the other values are within the borders, with the only other high value being between the independent solar park count and the patents value with a 0.48. The states analysis will thus have all possible variables.

Within this dataset an over dispersion test was ran which, like in the prior analysis, found over dispersion. Therefore, this analysis has been conducted by making use of a negative binomial regression too. The negative binomial regression was divided into two models. Because the variables and observations were not a limiting factor, as opposed as to the country analysis, the two models were purely based on the variables. Model E made use of all the independent variables, whereas model F added the control variables on it. An overview of the results of the two models is visualized in table 8 below.

The first state model, model E, consists of the patents, fossil fuel production, economic growth, president, and GDP variables. Starting with the niche level and the patents variable there is an immediate significant and positive effect for the natural logarithm of patents. In this case a value of 0.88, which means that a one-unit increase in the ln value of patents led to a multiplication of 2.41 of the amount of power plants. As argued in the country analysis, this is in line with the MLP framework and concludes roughly the same as the country analysis.

The following variable is the regime level bound fossil fuel production. While the effect seems small, it is both negative and significant at the 99% level. For every British thermal unit of fossil fuel that is produced the number of solar parks decreases with a value of -0.000147. This result is in line with the expectations of the regime level seeing as a state that produces a lot of fossil fuel probably has an industry depending on it, thus tying it to the regime. To bring this number into perspective, from this value and the model it follows that the largest producer, the state of Texas, loses 2.5 solar parks each year due to its production.

The economic growth variable conflicted with the one of the country analysis. It was neither positive nor significant. This while economic growth was expected to have a positive effect on the adoption of solar parks due to the positive reinforcement from the landscape level.

The president variable proved that the periods in time where the nation saw a Democrat in power also saw an increase in the number of solar parks. The variable was both significant at the 99% level, and positive. This was according to the expectation that a landscape factor can open up room for innovation and transition in the MLP model. With a value of 0.991 each year under a Democrat president adds $e^{0.991}$ = 2.69 solar parks to the model, whereas a Republican president adds 0 to the model.

The last variable of this model is linked to the theory of peripheral innovation, GDP. The GDP is both positive as well as significant for the 99% level. Therefore, adding 0.887 solar parks per million GDP of a state.

The second model, model F, includes all the control variables alongside the previously mentioned independent variables. When compared to the previous model, the complete model seems to copy almost all the results. The niche variable in patents is slightly higher, but just as significant, having an effect of 2.48 increase in solar parks per one-unit increase in the natural logarithm of the patents. The fossil fuel production variable kept its significance at the 99% level, but became more negative. In model F a one unit increase in British thermal unit of fossil fuel produced led to a decrease of 0.000192 in the number of solar parks.

As with model E, economic growth failed to be significant, thus making its effect redundant.
In the case of the president variable, it kept almost the same. With a Democrat president having an increase of $e^{0.922}$ = 2.51 solar parks in each year that he was active.

The GDP function experienced a decrease in both effect and significance in model F over model E with it now being significant at the 95% level, but its effect being slimmed down to an increase of 0.764 solar parks per million GDP per state.

The addition of the neighbor control variable led to a positive and significant value. At the 95% level each increase in neighbor led to an increase of 0.169 in the number of solar parks. So once a state had seven neighbors who had all at least one solar park, it would lead to, roughly, an additional one for the state itself. This is in contrast with the variable in the country models where it had no significant effect.

The addition of population density could not be determined in the country model because of its removal due to correlation. In this model however, it appeared to not be significant, making its effect redundant.

The last control variable, irradiance, appeared to be both significant, at the 99% level, as well as positive. Each one-unit increase in kilowatt per square meter led to an increase of 1.01 in the amount of solar parks.

Table 8.

Regression summary state models

	E	F
Constant	-903.9*** (46.85)	-846.7*** (57.60)
Lnpatents	0.88*** (0.089)	0.91*** (0.089)
Fossil fuel production	-0.000147*** (0.000031)	-0.000192*** (0.000031)
Economic growth	-0.020 (0.032)	-0.045 (0.033)
President	0.911*** (0.166)	0.922*** (0.163)
GDP (USD in millions)	0.887*** (0.245)	0.764** (0.239)

Neighbor	0.169** (0.055)
Population density	-0.0000951 (0.000065)
Irradiance	1.01*** (0.139)

Standard errors are reported in parentheses.
*, **, *** indicates significance at the 90%, 95%, and 99% level, respectively.

5.3 Hypotheses tests

In the theory section, four hypotheses were formulated in light of the research question. Afterwards the regression analysis was performed where most variables were linked to a hypothesis. In order to reject or accept those hypotheses the regression analyses will be analyzed from the lens of the hypotheses.

The first hypothesis is: "Countries where solar PV is more related to the capability base will have a higher rate of diffusion". The related capability base is linked to the patents that are relevant to the adoption of solar power parks. In both the states and country analysis the patents variable was both significant and positive. Therefore, this hypothesis can be accepted.

The second hypothesis is: "Countries that are outside of the core of the regime will have a higher rate of diffusion". This hypothesis was tested by the fossil fuel share and OPEC variables in the country analysis and the fossil fuel production variable in the states analysis. The initial fossil fuel share result from the country analysis rejects this hypothesis, though from the states analysis we can accept the hypothesis given the expected negative effect of fossil fuel production. With the OPEC being negative and significant too in prior models but losing both in the final model, its role is not clear cut. Since the state analysis is included to control for the country analysis, has a higher number of observation and is more significant, this hypothesis is accepted.

The third hypothesis is: "Countries which have higher economic growth will have a higher rate of diffusion". This hypothesis can be rejected based on the country analysis and its failure to be tested sufficiently by the states analysis due to a lack of significance of the variable. The hypothesis has thus been rejected.

The fourth hypothesis is: "Countries that have bound themselves to international Climate Agreements will have a higher rate of diffusion". This hypothesis was only tested as such in the country analysis and was found to be not significant. Yet, the dummy variable at the level of states for Democratic U.S. presidency showed the expected positive effect on diffusion. Hence, while the hypothesis is to be rejected, some evidence of political impact is found for U.S. states.

5.4 Outlier analysis

The regression analysis showed the general patterns. It is however interesting in certain cases to look at the outliers, using the Cook's distance as a measure, and trying to understand how they found themselves in the position of an outlier.

In the case of the country dataset, the Czech Republic was a very positive outlier. With a total amount of 422 solar plants it placed itself as the number four worldwide. This is remarkable given that this country lacked the patent base of the other leading countries with only one patent in the relevant categories. The case of the Czech Republic is an interesting one looking at the more recent developments. Since 2011 no major solar plant has been constructed anymore, with the only rise of solar being in rooftop (Energiewende, 2019). Most plants from the database are thus a lot older than others in the database, being constructed in the first decade of the 21st century. The reason for this stagnation lies in the acts of the government with regards to solar park owners. In 2013 the state declared that solar panel prices had fallen significantly, and the laws did not allow integrating this fall into the purchasing prices for electricity from solar power plants. Thus, the state argued that the number of new solar PV plants and consequently the subsidies paid to them had increased sharply relative to the years prior. They aimed to get this loss back by imposing a solar tax of 28% on solar plants larger than 30kW (Tsagas, 2013). On top of this another 10% solar tax was set to be imposed in 2017 (Bellini, 2020). On top of this, in 2018 multiple PV installations have been disconnected due to alleged fraud which led to a decrease in PV capacity, relative to the year before.

A negative outlier at the country level is South Korea. Whilst having a substantial number of relevant patents, placed third out of all countries, South Korea lacked a large-scale solar power plant. This while other variables were comparable to the number one in the dataset, the United States. While the dataset ended in 2018, the current and following decades show promising potential for the country. Since their office period started in 2017, president Moon Jae-In has taken steps to phase out coal- and nuclear power for renewables (Saiyid, 2020). Since then the solar capacity of the country has almost doubled with the country having established a target of 30 GW by 2030 (Evans, 2021).

In the case of the state analysis New Jersey was an outlier in 2012. The reason for this most likely lies in the low number of patents that year combined with a rise of solar plants. Compared to the previous year its patents dropped by 50% while its plant count rose with almost 90%. Finding out the reason behind these numbers is harder than in the country analysis that spanned almost two decades. While New Jersey governor Murphy signed a Solar Act in 2012 it is not sure whether it has a direct effect on the number of plants in the same year (New Jersey, 2021).

This doubling of the number of solar plants was not only reserved for New Jersey. Another outlier, Vermont in 2014, experienced a 100% increase in its number of plants, while having 0 patents. In 2014 Vermont was also one of the four states that sourced all its new electrical capacity from solar energy (SEIA, 2015). This rise is most likely explained by the Energy Innovation Program of the Governor of Vermont, which lays out an agenda for a clean energy economy. While Vermont has not experienced a jump as big as the 2014 one ever since, it is slowly increasing its number of solar parks.

6. Conclusion

This research aimed to answer the following research question: 'Which factors play a role in explaining the global diffusion process of utility-scale solar PV installations?' Beyond this question, the research also aimed to solve the shortcomings of transition theory by adding a geographical perspective to it. The theory used was the MLP model, which emphasizes the interactions between the different levels, niche, regime, and landscape. The geographical perspective came in the form of additional variables as well as a state analysis accompanied with the country analysis.

In the case of the niche level, the shortcoming of existing studies has been the place-specificity. While it was understood that place matters, the main question remained *how* place matters. I argued on theoretical grounds that the existing capability base would matter to the niche level development. The research showed that – indeed – both at the country and at state level the capability base, measured by patents related to solar energy technology, mattered.

For the regime, the newest threads of theory mentioned isomorphism. Isomorphism would show itself in a global regime rather than a local regime. From the country analysis and to a lesser extent in the state analysis, it showed that a global regime does exist. In this research it is shown by the dependency on fossil fuel, where the membership to the OPEC lead to a lower diffusion.

The landscape level mentioned policies being able to let regions pull away or catch up. In this case the economic growth proved to be playing a negative role with countries, while a positive impact on the diffusion of solar plants was hypothesized. In the case of states, economic growth was not however significant.

In the case of periphery existing theory mentioned the periphery being able to surprise and compete with core regions. For this research the GDP was used as a measure of the periphery to see how it would perform. In the case of the country analysis its effect was not able to be measured due its correlation. In the state analysis the core regions outperformed those in the periphery with GDP having a positive and significant effect.

7. Discussion

This research made use of two different analyses to find factors that impact the global diffusion of solar power plants at the national level and the regional diffusion at the level of the United States. This was done according to the Multi-Level Perspective (Geels, 2002), in particular following the geography of transitions framework (Truffer & Coenen, 2012), with the addition of the notion of innovation in the periphery. The data was sourced from public databases with a mention of the timescale, the unit, and its usage. Based on this, it is fair to conclude that if the research were repeated, the results would be the same and the result would be valid.

The research showed mixed results when put in the perspective of the hypotheses. Two out of the four hypotheses were rejected, with two others being accepted due to the context of the analysis. To elaborate on the latter, it is of importance to highlight again that when the research was executed, it was expected that the small set of observations might prove results that would be hard to interpret and difficult to get to. Thanks to the multi-scalarity of the geography of transitions theory it was possible to add upon this smaller set of observations a bigger set of observations. Because due to that multi-scalarity, you can apply the theoretical framework on both a (inter)national as well as a regional level.

However, it is important to reflect on the theoretical framework. To what extent was the theoretical framework multi-scalar? While it fulfilled its task theoretically, the results and variables did differ slightly between the country and state analysis. One possible reason for the difference in outcomes holds that not all variables could be collected at both levels in the exact same ways. Nevertheless, this study may serve as a good starting point for further attempts, seeing as there were significant similarities with this model. Ideally these attempts would feature a complete dataset with the same variables between the scales.

The dataset itself spanned a decade of economic growth. While well-developed countries were having less opportunity for growth due to the crisis and the high level of economy they are already on, the bigger steps and jumps of economic growth were found within the smaller, less developed economies. Such an example was mentioned within the results section in the country of Laos. In the database the first well-developed country, Israel, is encountered on place thirty-one when sorted by economic growth. These countries might have had the opportunity thanks to their economic growth for the construction of the solar power plants but might not have been ready for it in terms of infrastructure or may not have contemplated the possibility at all politically.

While the notion of periphery was not linked to a hypothesis its variable, GDP, was included. While it had to be excluded in the country analysis due to the risk of multicollinearity, it was analyzed in the state analysis. It was found to have both a positive and significant effect, showing that being part of the core does help in the adoption process. However, the drawback of this conclusion might be that it is too simple. A question that arises is whether it is fitting to link the “core vs periphery” comparison to GDP. The periphery can revolve around more than just financial capital. Human capital or lack of it, in the form of knowledge or physical state, might also play a role in the periphery. It might thus be too early to write off the role of periphery completely.

This research has suffered from limitations. The biggest one being the small number of observations. While this limitation was bypassed by using the United States analysis as a robustness analysis, it showed that some variables were not one-to-one interchangeable in both analyses. That might have costed a few variables a stronger basis as a support. But in the end this limitation was partly mitigated by the role of the state analysis.

The second limitation that ties in with the first is the lack of available data in some instances. Multiple countries were not able to be analyzed due to missing data points on topics that are normally regarded as widely available. The major examples being economic growth and fossil fuel imports/exports. These limitations were not able to be mitigated and thus had to be coped with.

These limitations also directly provide one of the avenues for additional future research. As several climate targets get nearer and nearer, and the effects of climate change get closer the interest in solar power plants has a fair chance of rising. This will probably lead to better databases with more observations and more information, thus removing the aforementioned limitations. Combined with this is also a different lane for additional research in other fields of renewable energy plants. Wind farms are getting more attention and are also part of the change to more renewable energy generation, which may have the same or different deciding factors as this research.

Based on this research the main advice, in order to achieve climate targets, would be to create and invest in a relevant capability base. With both the state and country analysis a very significant and positive effect was seen for the patents. Therefore, investing in relevant education, start-ups, research, and development is key to unlocking the diffusion.

A different point of advice, based on the regime level, would be specifically aimed at the OPEC countries. Being part of the OPEC group hinders the adoption process. This while fossil fuel is a temporary stop measure in comparison to renewable sources with regards to energy generation. These countries need to diversify as fast as possible if you take the long term effects into consideration.

The last point of advice finds it roots more in the theory and hypotheses rather than the results. While the economic growth hypothesis thought that a positive growth would allow and fasten the adoption, it was not found to be significant. However, if the prior statement regarding the lack of political awareness or lack of infrastructure holds true, then for these countries the same advice holds true as the OPEC countries above. Investing the resources of the economic growth into renewable (solar) energy infrastructure provides an allocation of future resources in other areas. And while a niche level capability base is significant, it is not necessary. The Czech Republic proved to be one of the forerunners yet they lacked in their capability base.

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Appendix 1. Country database

Country	Solar Parks	Patents	Fossil_fuel_share	Opec	Economic growth	Paris	GDP	Irradiance	Pop_density	Neighbour
Afghanistan	0	0		0	0.45	0	519.885	5.11	57	1
Algeria	0	0	0.03	1	0.04	1	4111.294	5.575	18	1
Angola	0	0	0.39	1	0.31	1	4095.813	5.475	25	0
Argentina	2	2	0.26	0	1.02	1	14613.042	5.64	16	1
Australia	12	58	0.64	0	0.32	1	54027.967	5.07	3	0
Austria	0	30	1.15	0	0.01	1	47426.512	3.07	107	1
Azerbaijan	0	0	0.2	0	0.08	0	4147.09	4.12	120	1
Bangladesh	0	1	0.25	0	1.8	1	1563.914	4.64	1240	1
Belarus	0	0	1.9	0	0.22	1	5761.747	2.945	47	1
Belgium	0	64	2.12	0	0	0	44192.623	2.95	377	1
Benin	0	0	0.6	0	0.18	1	1136.593	5.205	102	0
Bolivia	0	0	0.23	0	1.44	1	3351.124	5.55	10	1
Brazil	4	6	0.31	0	0.35	1	9925.386	5.135	25	1
Bulgaria	0	4	1.09	0	0.42	1	8334.082	5.805	65	1
Burkina Faso	0	0		0	0.37	1	734.994	5.725	72	0
Burundi	0	0		0	0.7	0	292.998	5.005	435	1
Cambodia	0	0	0.46	0	1.19	0	1385.26	4.86	92	1
Cameroon	0	2	0.26	0	0.19	1	1425.108	5.145	53	0
Canada	138	162	0.41	0	0.01	1	45148.553	3.73	4	1
Central African Republic	0	0		0	0.12	1	450.9	5.66	7	0
Chad	0	0		0	-0.17	0	665.948	6.3	12	0
Chile	16	0	0.98	0	0.43	0	14999.37	5.025	25	1
China	124	1499	0.39	0	2.3	1	8879.439	4.285	148	1
Colombia	0	1	0.16	0	0.35	0	6376.707	4.635	45	1
Congo	0	0	0.11	1	-0.03	0	2191.22	4.71	15	1
Costa Rica	0	0	0.71	0	0.95	1	11814.627	4.65	98	0
Cuba	0	0	0.78	0	0.64	0	8541.211	5.29	109	0
Czech Republic	422	1	0.85	0	0.12	0	20636.2	3.07	138	1
D.R. Congo	0	0	0.04	0	0.63	0	467.074	5.125	37	1
Denmark	2	2	1.38	0	-0.01	1	57610.098	2.83	145	1
Dominican Republic	1	0	1.33	0	0.62	0	7609.339	5.355	220	0
Ecuador	0	0	0.53	1	0.74	0	6213.501	4.465	69	0
Egypt	0	3	0.39	0	0.47	0	2444.29	6.115	99	1
El Salvador	0	0	1.03	0	0.4	0	3910.257	5.675	310	1
Ethiopia	0	0	0.12	0	2.15	0	768.522	5.65	97	0
Finland	0	23	0.96	0	-0.04	1	46336.663		18	1
France	678	220	1.01	0	-0.06	1	38812.161	3.695	122	1
Germany	408	956	1.05	0	0.07	1	44552.819	3.045	237	1
Ghana	0	1	0.61	0	0.87	1	2025.932	5.075	131	0
Greece	24	4	2.47	0	-0.34	1	18930.291	4.49	83	1
Guatemala	2	0	0.52	0	0.76	0	4451.451	5.145	153	1
Guinea	0	0		0	0.3	1	855.574	5.43	51	0

Haiti	0	0	0.34	0	0.32	0	1294.24	5.275	404	1
Honduras	6	0	0.68	0	0.55	1	2453.728	5.245	86	1
Hong Kong	0	69	3.62	0	0.51	1	46165.857	3.915	7096	1
Hungary	0	1	1.22	0	0.05	1	14605.854	3.475	107	1
India	122	35	0.68	0	0.93	1	1981.651	4.705	455	1
Indonesia	0	0	0.35	0	1.06	1	3837.652	4.595	143	1
Iran	1	0	0.13	1	0.13	0	5520.31	4.95	50	1
Iraq	0	0	0.88	1	0.64	0	5205.288	5.385	89	1
Ireland	0	12	1.05	0	0.14	1	69822.347	2.56	71	1
Israel	16	62	1.75	0	0.63	1	40541.862	5.725	410	0
Italy	74	84	1.28	0	-0.14	1	32406.72	3.925	203	1
Ivory Coast	0	0	0.53	0	0.99	1	2111.027	5.09	79	0
Japan	131	4593	1.43	0	0.09	1	38386.511	3.605	347	0
Jordan	0	2	1.45	0	0.55	1	4234.403	5.95	112	1
Kazakhstan	1	0	0.19	0	0.37	0	9247.581	3.835	7	1
Kenya	0	0	0.35	0	0.9	0	1572.335	5.81	90	1
Kyrgyzstan	0	1	0.65	0	0.72	0	1242.77	3.965	33	1
Laos	0	0	0.38	0	2.41	1	2423.846	4.41	31	1
Lebanon	0	1	1.63	0	0.5	0	7801.179	5.175	669	0
Liberia	0	0		0	0.76	0	698.702	4.825	50	0
Libya	0	0	0.44	1	-0.49	0	5756.698	6.025	4	0
Madagaskar	0	0		0	0.17	0	515.293	5.275	45	0
Malawi	0	0		0	0.07	0	356.718	5.46	192	0
Malaysia	9	7	0.91	0	0.42	1	10259.182	4.625	96	1
Mali	0	0		0	0.39	1	830.018	5.995	16	1
Mauritania	2	0		0	0.17	0	1578.114	6.02	4	1
Mexico	3	1	0.83	0	-0.04	1	9287.85	5.45	65	1
Morocco	3	0	1.21	0	0.21	1	3036.325	5.445	81	1
Mozambique	0	0	0.47	0	-0.04	0	461.415	5.32	38	1
Myanmar	0	0	0.35	0	2.18	0	1291.542	4.2	82	1
Nepal	0	0	0.27	0	1.33	1	911.444	4.515	196	1
Netherlands	0	94	3.54	0	-0.06	0	48675.222	2.895	512	1
New Zealand	0	3	0.6	0	0.32	1	42849.426	3.265	18	1
Nicaragua	0	0	0.67	0	0.63	0	2159.158	5.23	54	1
Niger	0	0	0.09	0	0.33	1	517.975	6.195	18	0
Nigeria	0	0	0.15	1	0.05	0	1968.565	5.175	215	0
North Korea	0	0	0.2	0		1		3.83	212	1
Norway	0	8	0.53	0	-0.11	1	75496.754	2.455	15	0
Oman	0	0	0.09	0	-0.04	0	15130.521	6.22	16	1
Pakistan	2	0	0.35	0	0.61	1	1464.993	4.92	275	1
Papua New Guinea	0	0		0	0.92	1	2695.252	4.355	19	0
Paraguay	0	0	0.43	0	0.91	1	5680.581	5.065	18	1
Peru	4	0	0.48	0	0.86	1	6710.508	5.23	25	1
Philippines	26	2	1.06	0	0.79	0	3123.234	4.565	358	0
Poland	9	12	0.73	0	0.23	1	13864.682	2.97	124	1
Portugal	67	7	1.23	0	-0.06	1	21490.43	4.245	112	1
Romania	0	8	0.59	0	0.29	0	10807.795	3.45	85	0

Russia	18	11	0.06	0	0.18	0	10720.333	3.23	9	1
Rwanda	1	0		0	0.76	1	772.318	4.86	499	0
Saudi Arabia	2	29	0.13	1	0.26	1	20803.746	6.155	16	1
Senegal	0	0	1.23	0	0.11	1	1361.7	5.765	82	1
Serbia	0	2	0.76	0	0.08	0	6292.544	3.715	80	0
Sierra Leone	0	0		0	0.39	1	499.381	5.13	106	0
Singapore	0	62	8.96	0	0.54	1	60913.745	4.505	7953	1
Slovakia	0	0	1.37	0	0.09	1	17556.601	3.125	113	1
Somalia	0	0		0		1		6.06	24	0
South Africa	41	1	0.49	0	0.01	1	6132.48	5.375	48	0
South Korea	0	4312	1.78	0	0.31	1	31616.843	3.925	529	0
South Sudan	0	0	1.1	0		1		5.685	17	0
Spain	28	39	1.37	0	-0.13	0	28170.168	4.355	94	1
Sri Lanka	1	0	0.76	0	1.5	1	4077.044	5.035	350	1
Sudan	0	0	0.17	0	-0.01	0	1111.868	6.1	23	0
Sweden	0	45	1.09	0	0	1	53791.509	2.77	25	1
Switzerland	0	155	0.88	0	0.27	0	80449.995	3.24	215	1
Syria	0	0	1.22	0		0		5.36	92	1
Taiwan	0	743	1.7	0	0	1		3.975		1
Tajikistan	0	0	0.37	0	0.53	0	806.042	4.4	66	1
Tanzania	0	0	0.14	0	0.82	0	1004.841	5.635	64	1
Thailand	113	5	0.88	0	0.66	1	6592.915	4.81	136	0
Togo	0	0	0.31	0	0.39	0	626.092	5.195	145	0
Tunisia	0	0	0.98	0	-0.08	0	3481.229	5.185	74	0
Turkey	4	9	1.2	0	0.08	0	10591.474	4.195	107	1
Turkmenistan	0	0	0	0	1.53	1	6587.09	4.68	12	1
Uganda	0	0		0	0.85	1	747.197	5.33	213	1
Ukraine	0	2	0.66	0	-0.14	1	2640.676	3.38	77	0
United Arab Emirates	3	0	0.71	1	-0.03	1	40644.804	5.95	136	1
United Kingdom	1092	368	1.11	0	-0.2	1	40361.417	2.585	275	1
United States of America	2281	4073	0.47	0	0.25	1	60062.222	4.155	36	1
Uzbekistan	0	0	0.07	0	1.2	0	1826.567	4.5	75	0
Venezuela	0	0	0.37	1		0		5.02	33	1
Viet Nam	0	2	0.51	0	1.61	1	2365.622	4.34	308	1
Yemen	0	0	0.79	0	-0.06	0	960.529	6.17	54	1
Zambia	0	0	0.15	0	0.37	0	1534.867	5.865	23	0
Zimbabwe	0	0	0.15	0	2.59	0	1548.17	5.675	37	1

Appendix 2. States database

State	Year	Solar Parks	Patents	Fossil production	Economic growth	President	GDP	Irradiance	Pop density	Neighbour
Alabama	2002	0	0	900.4	2.6	0	161258	4.67	94.4	0
Alaska	2002	0	0	2641.7	4.6	0	42915.8	2.65	1.2	0
Arizona	2002	1	2	280.8	3.2	0	219370.4	5.605	56.3	0
Arkansas	2002	0	0	208.6	3.2	0	92989.3	4.55	56	0
California	2002	0	8	1890.8	2.4	0	1747199.5	5.32	239.1	1
Colorado	2002	0	0	1903.2	0.2	0	236869.2	4.86	48.5	0
Connecticut	2002	0	0	0	0	0	219956.8	3.98	738.1	0
Delaware	2002	0	2	0	-3.6	0	56897.3	4.22	460.8	0
Disctric of Columbia	2002	0	0	0	3.1	0	91221	4.18	9856.5	0
Florida	2002	0	0	26	4	0	684994.9	5.015	350.6	0
Georgia	2002	0	0	0	1.2	0	399790.5	4.695	168.4	0
Hawai	2002	0	0	0	3.2	0	57913.9	5.045	211.8	0
Idaho	2002	0	0	0	2.5	0	47334.4	4.16	19	0
Illnois	2002	0	1	823.5	0.7	0	646998.4	4.14	231.1	0
Indiana	2002	0	0	801.9	2.4	0	265089.5	4.08	181	0
Iowa	2002	0	0	0	2.8	0	124277	4.085	54.5	0
Kansas	2002	0	0	720.3	1.4	0	115707.1	4.665	34.9	0
Kentucky	2002	0	0	3208.9	2.6	0	155672.9	4.21	109.9	0
Louisiana	2002	0	0	2244.3	2	0	213120.2	4.8	104.9	0
Maine	2002	0	0	0	2.5	0	50636	3.625	43.1	0
Maryland	2002	0	1	125.7	3.8	0	270898.8	4.125	594.8	0
Massachusetts	2002	0	3	0	0.3	0	364926	3.895	839.4	0
Michigan	2002	0	0	327.7	2.7	0	435280.8	3.755	174.8	0
Minnesota	2002	0	2	0	2.3	0	252674.8	3.765	66	0
Mississippi	2002	0	0	281.5	1.2	0	88354	4.65	63.2	0
Missouri	2002	0	0	5.8	1.4	0	246885.3	4.325	87.1	0
Montana	2002	0	0	863.4	3	0	32514.1	3.91	6.8	0
Nebraska	2002	0	0	17.3	1.6	0	79684.7	4.385	23.8	0
Nevada	2002	0	0	3.2	3.3	0	110165	5.195	24.6	1
New Hampshire	2002	0	0	0	2.8	0	59057.6	3.665	147	0
New Jersey	2002	0	0	0	2.2	0	486924.3	4.085	1195.5	0
New Mexico	2002	0	0	2698.8	3.1	0	74241.5	5.545	17	1
New York	2002	0	1	38.7	-0.8	0	1098776.8	3.73	411.2	0
North Carolina	2002	0	1	0	1.4	0	365828.8	4.46	196	0
North Dakota	2002	0	0	649.7	5.3	0	26404.4	3.91	9.7	0
Ohio	2002	0	0	647.8	2.4	0	514107	3.935	282.3	0
Oklahoma	2002	0	0	2175.6	1.8	0	131054	4.79	54.7	0
Oregon	2002	0	1	0.9	2.2	0	139645.3	4.145	39.9	0
Pensylvania	2002	0	2	1912.3	0.9	0	549673.5	3.855	283.9	0
Rhode Island	2002	0	0	0	3.7	0	47584.9	4	1081.1	0

South Carolina	2002	0	0	0	2.4	0	154711.8	4.67	153.9	0
South Dakota	2002	0	0	8	10.6	0	32767.8	4.175	10.7	0
Tennessee	2002	0	0	85.4	3.3	0	240535.8	4.36	153.9	0
Texas	2002	0	1	8779.3	2	0	1042350.8	5.21	96.3	0
Utah	2002	0	0	961.8	1.9	0	95899.2	4.975	33.6	1
Vermont	2002	0	0	0	3.1	0	24452.8	3.63	67.9	0
Virginia	2002	0	0	873	0.9	0	362314	4.26	202.6	0
Washington	2002	0	1	91.3	1.6	0	310321.5	3.67	101.2	0
West Virginia	2002	0	0	4032.1	1.3	0	62797.6	3.985	77.1	0
Wisonsin	2002	0	0	0	2.1	0	241068.4	3.79	105	0
Wyoming	2002	0	0	8573.1	2.2	0	29917	4.475	5.8	0
Alabama	2003	0	0	910.3	2.5	0	165250.5	4.67	94.4	0
Alaska	2003	0	0	2642.1	-1.8	0	42132.7	2.65	1.2	0
Arizona	2003	1	0	263	6.4	0	233339.1	5.605	56.3	0
Arkansas	2003	0	0	217.4	4	0	96714.2	4.55	56	0
California	2003	0	18	1812.7	4.7	0	1829296.5	5.32	239.1	1
Colorado	2003	0	1	2004.1	0.8	0	238843.8	4.86	48.5	0
Connecticut	2003	0	1	0	1	0	222125.2	3.98	738.1	0
Delaware	2003	0	0	0	1.8	0	57916.4	4.22	460.8	0
Disctric of Columbia	2003	0	0	0	2.1	0	93137.5	4.18	9856.5	0
Florida	2003	0	3	23.4	4.4	0	714958.5	5.015	350.6	0
Georgia	2003	0	1	0	2.8	0	410866	4.695	168.4	0
Hawai	2003	0	0	0	5	0	60828.5	5.045	211.8	0
Idaho	2003	0	4	0	2.7	0	48624.8	4.16	19	0
Illnois	2003	0	0	789.2	1.5	0	656380.3	4.14	231.1	0
Indiana	2003	0	0	804.6	3.8	0	275172.6	4.08	181	0
Iowa	2003	0	0	0	4	0	129246.4	4.085	54.5	0
Kansas	2003	0	0	680	1.6	0	117541.4	4.665	34.9	0
Kentucky	2003	0	0	2918.5	2.4	0	159399.5	4.21	109.9	0
Louisiana	2003	0	0	2176	3.8	0	221295.9	4.8	104.9	0
Maine	2003	0	0	0	2.2	0	51733.5	3.625	43.1	0
Maryland	2003	0	1	124.6	2.6	0	277982.6	4.125	594.8	0
Massachusetts	2003	0	0	0	2.7	0	374692.5	3.895	839.4	0
Michigan	2003	0	0	286.5	1.7	0	442746.4	3.755	174.8	0
Minnesota	2003	0	2	0	4.3	0	263658.3	3.765	66	0
Mississippi	2003	0	0	306.9	4.2	0	92036.3	4.65	63.2	0
Missouri	2003	0	0	12	2.5	0	253103.3	4.325	87.1	0
Montana	2003	0	0	867.5	4.1	0	33860.3	3.91	6.8	0
Nebraska	2003	0	0	17.5	5.5	0	84099.1	4.385	23.8	0
Nevada	2003	0	0	2.9	4.5	0	115128.3	5.195	24.6	1
New Hampshire	2003	0	0	0	4.3	0	61610	3.665	147	0
New Jersey	2003	0	0	0	2.6	0	499353.6	4.085	1195.5	0
New Mexico	2003	0	0	2676.5	3.8	0	77088.4	5.545	17	1
New York	2003	0	1	37.9	0.3	0	1101603.6	3.73	411.2	0

North Carolina	2003	0	1	0	2.4	0	374588	4.46	196	0
North Dakota	2003	0	0	641.1	6	0	27996.7	3.91	9.7	0
Ohio	2003	0	1	669.3	1.6	0	522440.1	3.935	282.3	0
Oklahoma	2003	0	0	2137.6	1.4	0	132931.1	4.79	54.7	0
Oregon	2003	0	0	0.7	4.2	0	145500.1	4.145	39.9	0
Pensylvania	2003	0	1	1780.8	2.2	0	561781.4	3.855	283.9	0
Rhode Island	2003	0	0	0	3.7	0	49348.1	4	1081.1	0
South Carolina	2003	0	0	0	3.5	0	160100.1	4.67	153.9	0
South Dakota	2003	0	0	8.3	1.9	0	33381.1	4.175	10.7	0
Tennessee	2003	0	0	69.3	2.8	0	247175.6	4.36	153.9	0
Texas	2003	0	3	8820.8	0.6	0	1048182.1	5.21	96.3	0
Utah	2003	0	0	901.8	1.8	0	97639.9	4.975	33.6	1
Vermont	2003	0	2	0	3.4	0	25293.8	3.63	67.9	0
Virginia	2003	0	1	976.8	3.8	0	376191.2	4.26	202.6	0
Washington	2003	0	0	97.7	1.7	0	315728.1	3.67	101.2	0
West Virginia	2003	0	0	3745.6	0.2	0	62938.6	3.985	77.1	0
Wisonsin	2003	0	0	0	2.8	0	247796.9	3.79	105	0
Wyoming	2003	0	0	8573.1	2.4	0	30646.5	4.475	5.8	0
Alabama	2004	0	0	922.6	6.5	0	175916.8	4.67	94.4	0
Alaska	2004	0	0	2495.6	3.8	0	43752.3	2.65	1.2	0
Arizona	2004	1	2	278.8	4.2	0	243192.6	5.605	56.3	0
Arkansas	2004	0	0	229.2	4.6	0	101194.5	4.55	56	0
California	2004	0	34	1749.6	4	0	1902550.4	5.32	239.1	1
Colorado	2004	0	4	2169.1	1	0	241224.7	4.86	48.5	0
Connecticut	2004	0	2	0	6.6	0	236698.6	3.98	738.1	0
Delaware	2004	0	0	0	4.5	0	60545.8	4.22	460.8	0
Disctric of Columbia	2004	0	0	0	5.1	0	97904.5	4.18	9856.5	0
Florida	2004	0	1	21.2	6	0	757581.2	5.015	350.6	0
Georgia	2004	0	0	0	4.5	0	429301.7	4.695	168.4	0
Hawai	2004	0	1	0	6.7	0	64925.7	5.045	211.8	0
Idaho	2004	0	3	0	5.7	0	51388.8	4.16	19	0
Illnois	2004	0	2	786.7	2.9	0	675720.7	4.14	231.1	0
Indiana	2004	0	0	799.8	3.4	0	284609.6	4.08	181	0
Iowa	2004	0	0	0	8.3	0	139960.2	4.085	54.5	0
Kansas	2004	0	0	655	0.7	0	118320.6	4.665	34.9	0
Kentucky	2004	0	0	2961.2	2.5	0	163397.6	4.21	109.9	0
Louisiana	2004	0	0	2144.6	4.6	0	231479.8	4.8	104.9	0
Maine	2004	0	0	0	3.5	0	53529.4	3.625	43.1	0
Maryland	2004	0	0	129.1	5	0	291995.5	4.125	594.8	0
Massachusetts	2004	0	6	0	2.5	0	383895.8	3.895	839.4	0
Michigan	2004	0	2	306.3	0.4	0	444437.7	3.755	174.8	0
Minnesota	2004	0	2	0	4.2	0	274834.1	3.765	66	0
Mississippi	2004	0	0	235.4	1.9	0	93754.3	4.65	63.2	0
Missouri	2004	0	0	12.9	2.2	0	258558.8	4.325	87.1	0

Montana	2004	0	0	965.3	4.3	0	35323	3.91	6.8	0
Nebraska	2004	0	0	16	2.4	0	86116.1	4.385	23.8	0
Nevada	2004	0	0	2.7	11	0	127760.6	5.195	24.6	1
New Hampshire	2004	0	0	0	3.1	0	63497.8	3.665	147	0
New Jersey	2004	0	2	0	1.6	0	507222.7	4.085	1195.5	0
New Mexico	2004	0	1	2713.1	7.4	0	82784.5	5.545	17	1
New York	2004	0	3	48.2	2.5	0	1129017.5	3.73	411.2	0
North Carolina	2004	0	0	0	3.5	0	387840.1	4.46	196	0
North Dakota	2004	0	0	642.1	0.9	0	28255.5	3.91	9.7	0
Ohio	2004	0	0	696.4	2.3	0	534605.6	3.935	282.3	0
Oklahoma	2004	0	0	2251.5	3.1	0	137086	4.79	54.7	0
Oregon	2004	0	4	0.5	5.1	0	152854	4.145	39.9	0
Pensylvania	2004	0	1	1820.3	2.7	0	576989.8	3.855	283.9	0
Rhode Island	2004	0	0	0	4.5	0	51553.5	4	1081.1	0
South Carolina	2004	0	0	0	1.3	0	162209	4.67	153.9	0
South Dakota	2004	0	0	9	3	0	34383.5	4.175	10.7	0
Tennessee	2004	0	0	77.7	4.9	0	259206	4.36	153.9	0
Texas	2004	0	3	8614.7	5.3	0	1104047.5	5.21	96.3	0
Utah	2004	0	0	873.5	5.3	0	102827.2	4.975	33.6	1
Vermont	2004	0	1	0	5	0	26554.2	3.63	67.9	0
Virginia	2004	0	1	906	4.7	0	393832.9	4.26	202.6	0
Washington	2004	0	1	90	1.9	0	321877.9	3.67	101.2	0
West Virginia	2004	0	0	3957.6	1.3	0	63726.8	3.985	77.1	0
Wisonsin	2004	0	0	0	3.3	0	255891.9	3.79	105	0
Wyoming	2004	0	0	8982.6	3	0	31566.8	4.475	5.8	0
Alabama	2005	0	0	891.3	3.4	0	181871	4.67	94.4	0
Alaska	2005	0	0	2088.6	3	0	45064.7	2.65	1.2	0
Arizona	2005	1	1	263.9	8.2	0	263047.3	5.605	56.3	1
Arkansas	2005	0	1	229.5	3.5	0	104758.6	4.55	56	0
California	2005	1	24	1689.7	4.5	0	1988736.5	5.32	239.1	1
Colorado	2005	0	2	2211.5	4.2	0	251266.6	4.86	48.5	0
Connecticut	2005	0	0	0	2.4	0	242380.3	3.98	738.1	0
Delaware	2005	0	0	0	-1.2	0	59821.9	4.22	460.8	0
Disctric of Columbia	2005	0	0	0	2.1	0	100009.4	4.18	9856.5	0
Florida	2005	0	1	18.6	6.5	0	806805	5.015	350.6	0
Georgia	2005	0	1	0	3.8	0	445803.4	4.695	168.4	0
Hawai	2005	0	0	0	5.6	0	68553	5.045	211.8	0
Idaho	2005	0	7	0	7.8	0	55380.9	4.16	19	0
Illnois	2005	0	0	786.8	1.9	0	688522.6	4.14	231.1	0
Indiana	2005	0	0	782.2	0.4	0	285607.9	4.08	181	0
Iowa	2005	0	0	0	2.8	0	143905.3	4.085	54.5	0
Kansas	2005	0	0	631.1	3.4	0	122325.6	4.665	34.9	0
Kentucky	2005	0	0	3086.5	3.3	0	168840.3	4.21	109.9	0
Louisiana	2005	0	0	2012.4	6.2	0	245727.5	4.8	104.9	0

Maine	2005	0	0	0	0.1	0	53606.5	3.625	43.1	0
Maryland	2005	0	0	126.7	4.8	0	306126	4.125	594.8	0
Massachusetts	2005	0	5	0	2	0	391462.3	3.895	839.4	0
Michigan	2005	0	0	303.6	1.4	0	450635.9	3.755	174.8	0
Minnesota	2005	0	0	0	2.8	0	282487.5	3.765	66	0
Mississippi	2005	0	0	216.4	1.9	0	95499.9	4.65	63.2	0
Missouri	2005	0	0	13.5	1.8	0	263282.4	4.325	87.1	0
Montana	2005	0	0	1031	5	0	37078.1	3.91	6.8	0
Nebraska	2005	0	0	15.2	3.4	0	89082.3	4.385	23.8	0
Nevada	2005	0	0	2.6	8.6	0	138796.4	5.195	24.6	2
New Hampshire	2005	0	5	0	1.3	0	64350	3.665	147	0
New Jersey	2005	0	2	0	1.2	0	513115.9	4.085	1195.5	0
New Mexico	2005	0	0	2692.7	1.2	0	83793.8	5.545	17	1
New York	2005	0	5	57.8	3.4	0	1167640.1	3.73	411.2	0
North Carolina	2005	0	0	0	4.8	0	406293.9	4.46	196	0
North Dakota	2005	0	0	667.4	3.2	0	29166.5	3.91	9.7	0
Ohio	2005	0	0	726.4	1.8	0	544256.4	3.935	282.3	0
Oklahoma	2005	0	0	2219.5	4.2	0	142824.8	4.79	54.7	0
Oregon	2005	0	2	0.5	3.6	0	158368.7	4.145	39.9	1
Pensylvania	2005	0	1	1798.7	1.8	0	587274.2	3.855	283.9	0
Rhode Island	2005	0	0	0	1.4	0	52286	4	1081.1	0
South Carolina	2005	0	0	0	2.7	0	166563.8	4.67	153.9	0
South Dakota	2005	0	0	9.1	4.1	0	35781.6	4.175	10.7	0
Tennessee	2005	0	0	86.3	2.1	0	264652.9	4.36	153.9	0
Texas	2005	0	2	8846.6	2.6	0	1132550.4	5.21	96.3	0
Utah	2005	0	1	972.4	6.3	0	109278.2	4.975	33.6	1
Vermont	2005	0	1	0	1.3	0	26899.5	3.63	67.9	0
Virginia	2005	0	2	809	5.5	0	415610.6	4.26	202.6	0
Washington	2005	0	0	82.7	6.6	0	343111.9	3.67	101.2	0
West Virginia	2005	0	0	4108.4	2.9	0	65586	3.985	77.1	0
Wisonsin	2005	0	0	0	2.4	0	262068.2	3.79	105	0
Wyoming	2005	0	0	9132	5.1	0	33167.3	4.475	5.8	0
Alabama	2006	0	1	812.5	1.9	0	185337	4.67	94.4	0
Alaska	2006	0	0	2088.1	7.7	0	48538.5	2.65	1.2	0
Arizona	2006	1	2	180.3	5.4	0	277189	5.605	56.3	1
Arkansas	2006	0	0	313.7	2.2	0	107084.1	4.55	56	0
California	2006	2	30	1645.2	4.2	0	2072274.1	5.32	239.1	1
Colorado	2006	0	2	2243.3	1.9	0	256152.2	4.86	48.5	0
Connecticut	2006	0	0	0	3.8	0	251629.6	3.98	738.1	0
Delaware	2006	0	4	0	2.6	0	61365.4	4.22	460.8	0
Disctric of Columbia	2006	0	0	0	0.3	0	100315.9	4.18	9856.5	0
Florida	2006	0	1	17.2	3.4	0	834434.5	5.015	350.6	0
Georgia	2006	0	0	0	1.2	0	451010.5	4.695	168.4	0
Hawai	2006	0	0	0	2.7	0	70384.3	5.045	211.8	0

Idaho	2006	0	7	0	4	0	57598.9	4.16	19	0
Illnois	2006	0	1	801	2.6	0	706084.1	4.14	231.1	0
Indiana	2006	0	1	796.7	2.1	0	291705.2	4.08	181	0
Iowa	2006	0	0	0	1.5	0	146068.4	4.085	54.5	0
Kansas	2006	0	0	640.9	5.4	0	128914.9	4.665	34.9	0
Kentucky	2006	0	0	3115.6	2.8	0	173508	4.21	109.9	0
Louisiana	2006	0	0	2056.4	-1	0	243378.5	4.8	104.9	0
Maine	2006	0	0	0	1.3	0	54279	3.625	43.1	0
Maryland	2006	0	0	122.2	1.8	0	311609.6	4.125	594.8	0
Massachusetts	2006	0	8	0	1.7	0	398277.7	3.895	839.4	0
Michigan	2006	0	2	305.8	-1.6	0	443561.4	3.755	174.8	0
Minnesota	2006	0	3	0	0	0	282580.8	3.765	66	0
Mississippi	2006	0	0	224	2.6	0	97973.5	4.65	63.2	0
Missouri	2006	0	0	9	0.4	0	264421	4.325	87.1	0
Montana	2006	0	0	1082.4	3.8	0	38473.9	3.91	6.8	0
Nebraska	2006	0	0	14.6	2.8	0	91535.2	4.385	23.8	0
Nevada	2006	0	0	2.5	4.2	0	144601.7	5.195	24.6	2
New Hampshire	2006	0	0	0	2.5	0	65926.9	3.665	147	0
New Jersey	2006	0	6	0	2.1	0	523842.5	4.085	1195.5	0
New Mexico	2006	0	2	2610.5	2.5	0	85852.3	5.545	17	1
New York	2006	0	13	59	2.5	0	1196694.8	3.73	411.2	0
North Carolina	2006	0	0	0	6.3	0	431796.2	4.46	196	0
North Dakota	2006	0	0	698.5	4.1	0	30371.3	3.91	9.7	0
Ohio	2006	0	1	679.1	-0.5	0	541618.7	3.935	282.3	0
Oklahoma	2006	0	0	2296.2	6.8	0	152481.9	4.79	54.7	0
Oregon	2006	0	1	0.6	6	0	167910.6	4.145	39.9	1
Pensylvania	2006	0	3	1782.3	0.7	0	591252.7	3.855	283.9	0
Rhode Island	2006	0	0	0	2.3	0	53492.4	4	1081.1	0
South Carolina	2006	0	0	0	2.3	0	170333.5	4.67	153.9	0
South Dakota	2006	0	0	9.1	1.7	0	36393.5	4.175	10.7	0
Tennessee	2006	0	0	75.9	2.5	0	271344.5	4.36	153.9	0
Texas	2006	0	1	9119.2	6.8	0	1209018.2	5.21	96.3	0
Utah	2006	0	0	1069.4	8.5	0	118621.1	4.975	33.6	1
Vermont	2006	0	1	0	0.8	0	27126.3	3.63	67.9	0
Virginia	2006	0	1	875	1.9	0	423471.1	4.26	202.6	0
Washington	2006	0	3	40.3	4	0	356886.9	3.67	101.2	0
West Virginia	2006	0	0	4077.9	1.4	0	66488.9	3.985	77.1	0
Wisonsin	2006	0	0	0	1.8	0	266660.1	3.79	105	0
Wyoming	2006	0	0	10037.9	13.3	0	37582.2	4.475	5.8	0
Alabama	2007	0	0	818.6	0.6	0	186499.4	4.67	94.4	0
Alaska	2007	0	0	2038.9	5.4	0	51144	2.65	1.2	0
Arizona	2007	1	6	174.9	2.8	0	284811.7	5.605	56.3	2
Arkansas	2007	0	0	310.8	-0.8	0	106272.5	4.55	56	0
California	2007	6	45	1610.8	1.5	0	2103014.8	5.32	239.1	2

Colorado	2007	0	4	2303.9	3.3	0	264664.5	4.86	48.5	0
Connecticut	2007	0	5	0	3.7	0	260993.1	3.98	738.1	1
Delaware	2007	0	6	0	-0.2	0	61229.4	4.22	460.8	1
Disctric of Columbia	2007	0	0	0	2.7	0	103031.1	4.18	9856.5	0
Florida	2007	0	1	14.2	0.1	0	835637.2	5.015	350.6	0
Georgia	2007	0	0	0	0.4	0	452706.7	4.695	168.4	0
Hawai	2007	0	0	0	1.1	0	71179.7	5.045	211.8	0
Idaho	2007	0	9	0	1.9	0	58716.6	4.16	19	1
Illnois	2007	0	2	805.9	1	0	712910.5	4.14	231.1	0
Indiana	2007	0	0	796.7	2.6	0	299415.9	4.08	181	0
Iowa	2007	0	0	0	4.4	0	152466.2	4.085	54.5	0
Kansas	2007	0	0	635.8	5.2	0	135574.4	4.665	34.9	0
Kentucky	2007	0	0	2989	-1	0	171850.3	4.21	109.9	0
Louisiana	2007	0	0	2066.6	-3.6	0	234521.9	4.8	104.9	0
Maine	2007	0	0	0	-0.5	0	54017.1	3.625	43.1	0
Maryland	2007	0	1	53.8	0.1	0	311951.5	4.125	594.8	0
Massachusetts	2007	0	11	0	2.6	0	408524.9	3.895	839.4	0
Michigan	2007	0	2	307.8	-0.6	0	441120.4	3.755	174.8	0
Minnesota	2007	0	0	0	0.5	0	283857.8	3.765	66	0
Mississippi	2007	0	0	251.4	2.5	0	100386.4	4.65	63.2	0
Missouri	2007	0	0	5.9	0	0	264552.9	4.325	87.1	0
Montana	2007	0	0	1101.8	5	0	40401.9	3.91	6.8	0
Nebraska	2007	0	0	15.1	2.2	0	93581.2	4.385	23.8	0
Nevada	2007	1	0	2.4	-0.2	0	144315.1	5.195	24.6	3
New Hampshire	2007	0	2	0	-0.4	0	65674.6	3.665	147	0
New Jersey	2007	1	6	0	0.5	0	526661	4.085	1195.5	0
New Mexico	2007	0	1	2489.5	0.7	0	86474.5	5.545	17	1
New York	2007	0	16	58.4	0.6	0	1203502.8	3.73	411.2	1
North Carolina	2007	0	6	0	1.2	0	436767.3	4.46	196	0
North Dakota	2007	0	0	721.8	4.7	0	31790.4	3.91	9.7	0
Ohio	2007	0	1	677	0	0	541676.4	3.935	282.3	0
Oklahoma	2007	0	0	2377.9	1.9	0	155335.4	4.79	54.7	0
Oregon	2007	0	3	0.4	1.8	0	171016.6	4.145	39.9	2
Pensylvania	2007	0	5	1763.8	3.2	0	610285.2	3.855	283.9	1
Rhode Island	2007	0	0	0	-2.8	0	51994.2	4	1081.1	1
South Carolina	2007	0	0	0	2.6	0	174793.1	4.67	153.9	0
South Dakota	2007	0	0	10.7	5	0	38204.1	4.175	10.7	0
Tennessee	2007	0	1	73.4	-1	0	268668.2	4.36	153.9	0
Texas	2007	0	5	9674.7	5.4	0	1273882.1	5.21	96.3	0
Utah	2007	0	0	1069.7	5	0	124508.8	4.975	33.6	2
Vermont	2007	0	4	0	-1.2	0	26793.2	3.63	67.9	0
Virginia	2007	0	2	772.4	0.8	0	426911.6	4.26	202.6	0
Washington	2007	0	3	0	6	0	378291.5	3.67	101.2	0
West Virginia	2007	0	0	4129.6	0	0	66512.3	3.985	77.1	0

Wisonsin	2007	0	0	0	0.5	0	268050.3	3.79	105	0
Wyoming	2007	0	0	10392.8	7.3	0	40344.4	4.475	5.8	0
Alabama	2008	0	0	840.7	-0.7	0	185280.6	4.67	94.4	0
Alaska	2008	0	0	1920.9	-0.5	0	50891	2.65	1.2	0
Arizona	2008	1	1	174.8	-2.6	0	277357.6	5.605	56.3	2
Arkansas	2008	0	0	490.2	-0.3	0	105923.2	4.55	56	0
California	2008	14	40	1576.1	0.4	0	2110596.1	5.32	239.1	2
Colorado	2008	3	2	2382.2	1.2	0	267964.9	4.86	48.5	0
Connecticut	2008	0	5	0	-0.6	0	259385	3.98	738.1	1
Delaware	2008	0	1	0	-4.2	0	58637.7	4.22	460.8	2
Disctric of Columbia	2008	0	0	0	3.7	0	106805.5	4.18	9856.5	0
Florida	2008	0	1	13.8	-3.8	0	803607.1	5.015	350.6	0
Georgia	2008	0	0	0	-2.3	0	442300.5	4.695	168.4	0
Hawai	2008	0	2	0	0.7	0	71681.2	5.045	211.8	0
Idaho	2008	0	13	0	1.8	0	59744.9	4.16	19	1
Illnois	2008	0	2	814.1	-1.6	0	701791.9	4.14	231.1	0
Indiana	2008	0	0	818.6	-0.3	0	298560.6	4.08	181	0
Iowa	2008	0	0	0	-1.8	0	149735.5	4.085	54.5	0
Kansas	2008	0	0	662.4	2.4	0	138822.5	4.665	34.9	1
Kentucky	2008	0	1	3064.5	0.2	0	172242.2	4.21	109.9	0
Louisiana	2008	0	0	2037	0.4	0	235468.2	4.8	104.9	0
Maine	2008	0	0	0	-0.2	0	53925.8	3.625	43.1	0
Maryland	2008	0	1	65.6	1.2	0	315724	4.125	594.8	1
Massachusetts	2008	0	10	0	0.9	0	412191.8	3.895	839.4	0
Michigan	2008	0	1	198.7	-5.6	0	416626.5	3.755	174.8	0
Minnesota	2008	0	1	0	0.8	0	286093.3	3.765	66	0
Mississippi	2008	0	1	271.9	4.1	0	104471.7	4.65	63.2	0
Missouri	2008	0	0	6	2.7	0	271729.6	4.325	87.1	0
Montana	2008	0	0	1094.2	-0.7	0	40112.7	3.91	6.8	0
Nebraska	2008	0	0	17	0.5	0	94070.1	4.385	23.8	1
Nevada	2008	1	1	2.5	-4	0	138588.7	5.195	24.6	3
New Hampshire	2008	0	4	0	-1.1	0	64960.3	3.665	147	0
New Jersey	2008	1	3	0	1.2	0	532724.6	4.085	1195.5	1
New Mexico	2008	0	0	2433.7	-0.6	0	85937.9	5.545	17	2
New York	2008	0	15	53.6	-2.1	0	1177915.1	3.73	411.2	2
North Carolina	2008	0	3	0	2.3	0	446612.8	4.46	196	0
North Dakota	2008	0	0	817.8	7.9	0	34304.4	3.91	9.7	0
Ohio	2008	0	2	756.2	-1.6	0	533103.6	3.935	282.3	1
Oklahoma	2008	0	0	2520	3.9	0	161437	4.79	54.7	1
Oregon	2008	0	3	0.8	1.6	0	173802	4.145	39.9	2
Pensylvania	2008	1	3	1817	2.1	0	623068.2	3.855	283.9	1
Rhode Island	2008	0	0	0	-3	0	50412	4	1081.1	1
South Carolina	2008	0	0	0	-0.1	0	174565.8	4.67	153.9	0
South Dakota	2008	0	0	11.5	3.3	0	39454.1	4.175	10.7	0

Tennessee	2008	0	1	66	1.2	0	271927.5	4.36	153.9	0
Texas	2008	0	6	10581.4	0.1	0	1274662.1	5.21	96.3	0
Utah	2008	0	0	1155.6	-0.9	0	123382.1	4.975	33.6	2
Vermont	2008	0	2	0	2.4	0	27426.3	3.63	67.9	0
Virginia	2008	0	1	756.7	0	0	427071.4	4.26	202.6	0
Washington	2008	0	2	0	1.1	0	382323.5	3.67	101.2	0
West Virginia	2008	0	0	4159.8	1.9	0	67806.3	3.985	77.1	1
Wisonsin	2008	0	1	0	-1.3	0	264524.7	3.79	105	0
Wyoming	2008	0	0	10858.1	5.7	0	42640.4	4.475	5.8	1
Alabama	2009	0	0	726.6	-3.4	1	178893.4	4.67	94.4	1
Alaska	2009	0	0	1838.7	9.9	1	55910.6	2.65	1.2	0
Arizona	2009	1	1	161.7	-8.1	1	254906.9	5.605	56.3	2
Arkansas	2009	0	0	724.6	-3.2	1	102513.5	4.55	56	0
California	2009	25	55	1512.5	-4	1	2025633.2	5.32	239.1	2
Colorado	2009	6	2	2411.8	-2.1	1	262463.3	4.86	48.5	0
Connecticut	2009	0	1	0	-4.2	1	248612.1	3.98	738.1	1
Delaware	2009	0	2	0	3.8	1	60847.4	4.22	460.8	2
Disctric of Columbia	2009	0	0	0	-0.4	1	106376.4	4.18	9856.5	0
Florida	2009	1	3	4.3	-5.5	1	759432.2	5.015	350.6	0
Georgia	2009	0	1	0	-3.9	1	425155.8	4.695	168.4	2
Hawai	2009	1	0	0	-3.6	1	69122.5	5.045	211.8	0
Idaho	2009	0	7	0	-4.5	1	57073	4.16	19	1
Illnois	2009	0	3	837.6	-2.6	1	683432	4.14	231.1	0
Indiana	2009	0	1	815.7	-7	1	277763.6	4.08	181	0
Iowa	2009	0	5	0	-2.3	1	146223.6	4.085	54.5	0
Kansas	2009	0	0	632.9	-3.7	1	133743.4	4.665	34.9	1
Kentucky	2009	0	0	2752.9	-4	1	165300.6	4.21	109.9	0
Louisiana	2009	0	0	2181.8	1.5	1	238921.7	4.8	104.9	0
Maine	2009	0	0	0	-1.6	1	53075.6	3.625	43.1	0
Maryland	2009	0	3	53.4	-0.3	1	314737.4	4.125	594.8	1
Massachusetts	2009	0	9	0	-1	1	408071.6	3.895	839.4	0
Michigan	2009	0	2	196.4	-8.8	1	380048.2	3.755	174.8	0
Minnesota	2009	0	3	0	-3.5	1	276033.2	3.765	66	0
Mississippi	2009	0	0	286.9	-4.5	1	99784.7	4.65	63.2	0
Missouri	2009	0	0	10.2	-2.5	1	264872.5	4.325	87.1	0
Montana	2009	0	0	967.2	-1.8	1	39388.1	3.91	6.8	0
Nebraska	2009	0	0	15.9	0.3	1	94343.4	4.385	23.8	1
Nevada	2009	2	0	2.5	-8.3	1	127108.7	5.195	24.6	3
New Hampshire	2009	0	5	0	-0.8	1	64419.6	3.665	147	0
New Jersey	2009	9	3	0	-4.1	1	510832.5	4.085	1195.5	1
New Mexico	2009	0	2	2370.5	2	1	87636.8	5.545	17	2
New York	2009	0	10	47.7	3.7	1	1221256	3.73	411.2	2
North Carolina	2009	2	2	0	-4.3	1	427493.8	4.46	196	0
North Dakota	2009	0	0	935.1	2.9	1	35297.2	3.91	9.7	0

Ohio	2009	0	1	791.1	-5	1	506691.3	3.935	282.3	1
Oklahoma	2009	0	0	2532	-1.3	1	159371.6	4.79	54.7	1
Oregon	2009	0	8	0.8	-4.2	1	166581.6	4.145	39.9	2
Pensylvania	2009	1	3	1743.4	-2.9	1	605016.9	3.855	283.9	1
Rhode Island	2009	0	1	0	-0.4	1	50217.3	4	1081.1	1
South Carolina	2009	0	1	0	-4.4	1	166930.9	4.67	153.9	1
South Dakota	2009	0	0	11.8	1.1	1	39891.4	4.175	10.7	0
Tennessee	2009	0	0	57.4	-3.3	1	262836.7	4.36	153.9	1
Texas	2009	0	3	10343.7	-0.3	1	1270964.6	5.21	96.3	0
Utah	2009	0	1	1110.9	-1.9	1	120997.5	4.975	33.6	2
Vermont	2009	0	3	0	-1.6	1	26999.5	3.63	67.9	0
Virginia	2009	0	3	681.5	-0.2	1	426182.7	4.26	202.6	1
Washington	2009	0	2	0	-2.5	1	372813.1	3.67	101.2	0
West Virginia	2009	0	0	3689.1	-0.2	1	67646.4	3.985	77.1	1
Wisonsin	2009	0	0	0	-2.8	1	257125	3.79	105	0
Wyoming	2009	0	0	10295	-2.8	1	41428.9	4.475	5.8	1
Alabama	2010	2	0	790.7	2.3	1	183014.5	4.67	94.4	1
Alaska	2010	0	0	1722.5	-3	1	54219	2.65	1.2	0
Arizona	2010	1	5	168.3	1	1	257396.9	5.605	56.3	2
Arkansas	2010	0	1	972.1	2.6	1	105223.6	4.55	56	1
California	2010	39	68	1482.8	1.5	1	2056990.4	5.32	239.1	2
Colorado	2010	10	2	2473.9	1.1	1	265319.3	4.86	48.5	0
Connecticut	2010	0	5	0	-0.3	1	247876.8	3.98	738.1	2
Delaware	2010	0	4	0	-0.4	1	60577	4.22	460.8	2
Disctric of Columbia	2010	0	0	0	3.4	1	109940.9	4.18	9856.5	0
Florida	2010	3	4	22.9	1	1	766653.9	5.015	350.6	0
Georgia	2010	0	1	0	1.3	1	430702	4.695	168.4	2
Hawai	2010	1	0	0	2.8	1	71075	5.045	211.8	0
Idaho	2010	0	7	0	1.5	1	57952.9	4.16	19	1
Illnois	2010	1	9	822.2	1.5	1	694001.9	4.14	231.1	0
Indiana	2010	0	3	808.4	6.4	1	295526	4.08	181	2
Iowa	2010	0	1	0	2.7	1	150099.2	4.085	54.5	1
Kansas	2010	0	0	608.5	1.1	1	135182	4.665	34.9	1
Kentucky	2010	0	3	2716.3	4.2	1	172266.7	4.21	109.9	2
Louisiana	2010	0	1	2865.6	3.7	1	247856.5	4.8	104.9	1
Maine	2010	0	0	0	1.3	1	53790.1	3.625	43.1	0
Maryland	2010	0	2	58.8	3.9	1	327088.7	4.125	594.8	1
Massachusetts	2010	1	13	0	4.2	1	425028.7	3.895	839.4	0
Michigan	2010	0	3	177.7	5.5	1	400941.8	3.755	174.8	2
Minnesota	2010	0	3	0	3.5	1	285746.3	3.765	66	0
Mississippi	2010	0	0	283.7	0.3	1	100043.3	4.65	63.2	0
Missouri	2010	0	0	10.6	1.6	1	269057.9	4.325	87.1	1
Montana	2010	0	0	1034.5	3.1	1	40595.1	3.91	6.8	0
Nebraska	2010	0	0	15.7	3.7	1	97830.1	4.385	23.8	1

Nevada	2010	3	0	2.5	1.4	1	128878.9	5.195	24.6	3
New Hampshire	2010	0	4	0	3.2	1	66460.5	3.665	147	1
New Jersey	2010	20	5	0	1.1	1	516400.5	4.085	1195.5	1
New Mexico	2010	0	6	2214.8	-0.7	1	87053.8	5.545	17	3
New York	2010	0	26	38.8	3.8	1	1267972	3.73	411.2	3
North Carolina	2010	7	4	0	1.5	1	433916.7	4.46	196	0
North Dakota	2010	0	0	1138.1	7.6	1	37974.9	3.91	9.7	0
Ohio	2010	1	4	753.4	2.7	1	520300.6	3.935	282.3	1
Oklahoma	2010	0	0	2491.9	0.1	1	159534.9	4.79	54.7	2
Oregon	2010	0	9	1.4	1.5	1	169013.8	4.145	39.9	2
Pensylvania	2010	6	11	2105.5	2.8	1	622140	3.855	283.9	2
Rhode Island	2010	0	0	0	2.3	1	51364.7	4	1081.1	2
South Carolina	2010	0	0	0	1.9	1	170151.9	4.67	153.9	1
South Dakota	2010	0	0	11.2	1.2	1	40367.3	4.175	10.7	0
Tennessee	2010	0	0	52.5	1.4	1	266473.5	4.36	153.9	1
Texas	2010	1	10	10562.9	2.4	1	1301808.3	5.21	96.3	0
Utah	2010	0	2	1054.7	2	1	123476.3	4.975	33.6	2
Vermont	2010	0	3	0	4.1	1	28116.1	3.63	67.9	1
Virginia	2010	0	5	715.8	2.8	1	437964.5	4.26	202.6	1
Washington	2010	0	4	0	2.3	1	381512.8	3.67	101.2	0
West Virginia	2010	0	1	3801.1	1.2	1	68474	3.985	77.1	2
Wisonsin	2010	0	5	0	3.1	1	265116.5	3.79	105	1
Wyoming	2010	0	0	10483.8	-3.8	1	39842.9	4.475	5.8	1
Alabama	2011	2	0	742.7	1.4	1	185666.9	4.67	94.4	2
Alaska	2011	0	0	1627.2	0.9	1	54722.6	2.65	1.2	0
Arizona	2011	12	2	175.2	2.2	1	263144.1	5.605	56.3	3
Arkansas	2011	0	0	1128	2	1	107320.6	4.55	56	1
California	2011	64	73	1418.1	1.6	1	2090836.8	5.32	239.1	3
Colorado	2011	14	4	2638.5	1.2	1	268553.4	4.86	48.5	1
Connecticut	2011	0	3	0	-2.2	1	242323.3	3.98	738.1	2
Delaware	2011	4	6	0	3.2	1	62501.4	4.22	460.8	2
Disctric of Columbia	2011	0	0	0	1.8	1	111929.5	4.18	9856.5	1
Florida	2011	6	1	27.1	-0.4	1	763484.1	5.015	350.6	1
Georgia	2011	1	2	0	1.7	1	438060.2	4.695	168.4	2
Hawai	2011	2	0	0	1.6	1	72236.3	5.045	211.8	0
Idaho	2011	0	6	0	-0.2	1	57825.3	4.16	19	2
Illnois	2011	1	6	920.9	1.8	1	706705.2	4.14	231.1	1
Indiana	2011	1	1	861.7	0.4	1	296674.3	4.08	181	2
Iowa	2011	0	1	0	1.4	1	152153.2	4.085	54.5	1
Kansas	2011	0	0	596.5	2.7	1	138782	4.665	34.9	1
Kentucky	2011	0	0	2771.4	1.1	1	174202.7	4.21	109.9	3
Louisiana	2011	0	0	3687.4	-5.5	1	234299.7	4.8	104.9	1
Maine	2011	0	0	0	-1.3	1	53088.2	3.625	43.1	0
Maryland	2011	5	0	65.9	2.1	1	333963.8	4.125	594.8	2

Massachusetts	2011	4	16	0	2.4	1	435158	3.895	839.4	2
Michigan	2011	0	9	184.3	2.6	1	411427.2	3.755	174.8	3
Minnesota	2011	0	2	0	2.3	1	292275.1	3.765	66	0
Mississippi	2011	0	0	267.8	-1.3	1	98765.3	4.65	63.2	0
Missouri	2011	0	0	10.8	-1	1	266254.6	4.325	87.1	1
Montana	2011	0	0	964.5	2.3	1	41511.3	3.91	6.8	0
Nebraska	2011	0	0	16.8	5	1	102685.1	4.385	23.8	1
Nevada	2011	3	0	2.4	0.7	1	129748.1	5.195	24.6	4
New Hampshire	2011	0	6	0	0.6	1	66859.3	3.665	147	2
New Jersey	2011	54	11	0	-1.1	1	510773.3	4.085	1195.5	3
New Mexico	2011	12	1	2218.1	0.2	1	87225	5.545	17	3
New York	2011	4	13	34.1	0.2	1	1270516.7	3.73	411.2	4
North Carolina	2011	15	3	0	1	1	438423.4	4.46	196	1
North Dakota	2011	0	0	1382.2	11.1	1	42208.5	3.91	9.7	0
Ohio	2011	1	4	787.5	3.1	1	536583.2	3.935	282.3	2
Oklahoma	2011	0	0	2646.4	3.6	1	165209.7	4.79	54.7	3
Oregon	2011	2	5	1.4	2.9	1	173881.1	4.145	39.9	2
Pensylvania	2011	16	6	2905.9	1.4	1	630906.6	3.855	283.9	5
Rhode Island	2011	0	0	0	-0.2	1	51262.8	4	1081.1	2
South Carolina	2011	0	0	0	2.3	1	174119.1	4.67	153.9	2
South Dakota	2011	0	0	11.4	6.4	1	42947.2	4.175	10.7	0
Tennessee	2011	0	1	45.9	3.1	1	274626.7	4.36	153.9	3
Texas	2011	2	5	11690.9	3.2	1	1343700.8	5.21	96.3	1
Utah	2011	0	0	1103.1	3	1	127216.9	4.975	33.6	2
Vermont	2011	2	3	0	2.2	1	28732.9	3.63	67.9	2
Virginia	2011	0	1	718.1	1	1	442260.6	4.26	202.6	2
Washington	2011	0	3	0	1.7	1	388099	3.67	101.2	1
West Virginia	2011	0	0	3776.1	1.6	1	69577.2	3.985	77.1	3
Wisonsin	2011	0	2	0	2.1	1	270666.3	3.79	105	1
Wyoming	2011	0	0	10283.2	-1	1	39440.3	4.475	5.8	1
Alabama	2012	2	0	773.2	0.5	1	186553.9	4.67	94.4	3
Alaska	2012	0	0	1546.6	5.5	1	57717.5	2.65	1.2	0
Arizona	2012	19	2	161.8	1.9	1	268068.2	5.605	56.3	4
Arkansas	2012	0	1	1204	0.4	1	107718.8	4.55	56	2
California	2012	121	73	1422	2.5	1	2144089.6	5.32	239.1	3
Colorado	2012	16	8	2812.8	1.9	1	273593.9	4.86	48.5	2
Connecticut	2012	0	0	0	0.7	1	244114.4	3.98	738.1	2
Delaware	2012	4	4	0	-1	1	61866.7	4.22	460.8	2
Disctric of Columbia	2012	0	0	0	0.6	1	112610	4.18	9856.5	1
Florida	2012	10	2	13.2	0.7	1	768722.9	5.015	350.6	1
Georgia	2012	4	0	0	1.3	1	443566.1	4.695	168.4	3
Hawai	2012	2	0	0	2	1	73676.7	5.045	211.8	0
Idaho	2012	0	3	0	-0.1	1	57780.1	4.16	19	3
Illnois	2012	3	3	1152.8	2	1	720881.5	4.14	231.1	1

Indiana	2012	5	1	849.3	0.4	1	297816.1	4.08	181	2
Iowa	2012	0	1	0	3.7	1	157838.6	4.085	54.5	1
Kansas	2012	0	0	589.1	1.4	1	140764.1	4.665	34.9	1
Kentucky	2012	0	0	2330.4	1.2	1	176323.1	4.21	109.9	4
Louisiana	2012	0	0	3516.9	-0.3	1	233481.2	4.8	104.9	1
Maine	2012	0	1	0	-0.4	1	52866.6	3.625	43.1	0
Maryland	2012	10	4	54.1	0.2	1	334555.5	4.125	594.8	2
Massachusetts	2012	23	14	0	2.1	1	444478.2	3.895	839.4	2
Michigan	2012	0	8	178.3	1.8	1	418742.3	3.755	174.8	3
Minnesota	2012	0	0	0	1.4	1	296272.5	3.765	66	0
Mississippi	2012	0	0	235.8	0.9	1	99616.3	4.65	63.2	1
Missouri	2012	0	0	10.2	1	1	268861.9	4.325	87.1	2
Montana	2012	0	0	884.6	1.3	1	42041.6	3.91	6.8	0
Nebraska	2012	0	0	18.9	-0.1	1	102605.3	4.385	23.8	1
Nevada	2012	5	0	2.1	-1.5	1	127789.1	5.195	24.6	5
New Hampshire	2012	0	2	0	1.2	1	67635.7	3.665	147	2
New Jersey	2012	103	5	0	1.7	1	519569	4.085	1195.5	3
New Mexico	2012	18	4	2272.3	0.5	1	87644.8	5.545	17	3
New York	2012	6	16	29.3	4.2	1	1323400.8	3.73	411.2	4
North Carolina	2012	36	2	0	0.3	1	439539.7	4.46	196	2
North Dakota	2012	0	0	2003.8	22.3	1	51624.6	3.91	9.7	0
Ohio	2012	6	6	759.1	0.8	1	540882.4	3.935	282.3	2
Oklahoma	2012	0	0	2855.8	4.9	1	173238.8	4.79	54.7	3
Oregon	2012	5	6	0.8	0.3	1	174427.6	4.145	39.9	2
Pensylvania	2012	19	5	3784.7	1.5	1	640663.1	3.855	283.9	5
Rhode Island	2012	0	0	0	0.7	1	51607.4	4	1081.1	2
South Carolina	2012	0	0	0	0.7	1	175328.5	4.67	153.9	2
South Dakota	2012	0	0	25.6	1.4	1	43550.7	4.175	10.7	0
Tennessee	2012	3	2	36.8	3.2	1	283482	4.36	153.9	3
Texas	2012	7	7	13304.8	5	1	1410447.8	5.21	96.3	1
Utah	2012	1	1	1096.4	1.2	1	128764.2	4.975	33.6	2
Vermont	2012	3	2	0	0.6	1	28893.6	3.63	67.9	2
Virginia	2012	0	5	644.9	0.6	1	445120.7	4.26	202.6	3
Washington	2012	0	3	0	3.2	1	400623.3	3.67	101.2	1
West Virginia	2012	0	1	3676.6	-0.3	1	69335.6	3.985	77.1	3
Wisonsin	2012	0	1	0	1.4	1	274540.5	3.79	105	1
Wyoming	2012	0	0	9549.5	-2.5	1	38437.7	4.475	5.8	2
Alabama	2013	2	0	740.9	1.2	1	188814.2	4.67	94.4	3
Alaska	2013	0	0	1495.6	-5.1	1	54748.1	2.65	1.2	0
Arizona	2013	39	4	164.1	0.7	1	269967.4	5.605	56.3	4
Arkansas	2013	0	0	1204.2	2.4	1	110301.4	4.55	56	2
California	2013	175	83	1441.7	3.5	1	2219610.5	5.32	239.1	3
Colorado	2013	19	6	2712.6	3.3	1	282605.5	4.86	48.5	2
Connecticut	2013	1	2	0	-2.3	1	238621.4	3.98	738.1	3

Delaware	2013	6	11	0	-3.8	1	59496.1	4.22	460.8	2
Disctric of Columbia	2013	0	0	0	0.2	1	112811.4	4.18	9856.5	1
Florida	2013	10	5	12.9	2	1	784238.4	5.015	350.6	1
Georgia	2013	7	3	0	1.4	1	449796.1	4.695	168.4	3
Hawai	2013	4	0	0	0.8	1	74294.1	5.045	211.8	0
Idaho	2013	0	0	0	3.8	1	59966.8	4.16	19	3
Illnois	2013	3	8	1207.8	-0.1	1	719922.2	4.14	231.1	1
Indiana	2013	10	0	905.3	2.1	1	303966.8	4.08	181	2
Iowa	2013	0	0	0	0	1	157902.5	4.085	54.5	2
Kansas	2013	0	0	593.7	-0.3	1	140355.8	4.665	34.9	1
Kentucky	2013	0	0	2060.2	1.8	1	179499.1	4.21	109.9	4
Louisiana	2013	0	0	2921	-3.1	1	226345.4	4.8	104.9	1
Maine	2013	0	0	0	-0.8	1	52456.3	3.625	43.1	0
Maryland	2013	15	1	45.3	0	1	334431	4.125	594.8	2
Massachusetts	2013	52	20	0	0.4	1	446190.4	3.895	839.4	4
Michigan	2013	0	9	174.9	1.6	1	425327.3	3.755	174.8	4
Minnesota	2013	1	0	0	2.3	1	303222.5	3.765	66	0
Mississippi	2013	0	0	237.6	-0.2	1	99456.4	4.65	63.2	1
Missouri	2013	0	0	10.3	1	1	271475.9	4.325	87.1	2
Montana	2013	0	1	991	0.9	1	42429.7	3.91	6.8	0
Nebraska	2013	0	0	17.4	1.3	1	103974.8	4.385	23.8	1
Nevada	2013	8	0	1.9	0.4	1	128341.2	5.195	24.6	5
New Hampshire	2013	0	1	0	0.7	1	68124.5	3.665	147	2
New Jersey	2013	125	14	0	1.4	1	526889.9	4.085	1195.5	4
New Mexico	2013	25	7	2457	-1.2	1	86624.8	5.545	17	3
New York	2013	9	15	26.3	0.2	1	1325490	3.73	411.2	5
North Carolina	2013	69	4	0	1.3	1	445109.6	4.46	196	2
North Dakota	2013	0	0	2499.4	1.5	1	52385.5	3.91	9.7	1
Ohio	2013	8	5	834.1	1.8	1	550692.3	3.935	282.3	2
Oklahoma	2013	0	0	3024.9	2.1	1	176862.6	4.79	54.7	3
Oregon	2013	5	6	0.8	0.8	1	175811.6	4.145	39.9	2
Pensylvania	2013	23	12	4863	1.6	1	650802.3	3.855	283.9	5
Rhode Island	2013	1	0	0	0.1	1	51679	4	1081.1	3
South Carolina	2013	0	2	0	2	1	178757.4	4.67	153.9	2
South Dakota	2013	0	0	27.5	0.4	1	43737.7	4.175	10.7	1
Tennessee	2013	3	0	36.5	1.3	1	287259	4.36	153.9	3
Texas	2013	8	11	14770.6	4.3	1	1470464.6	5.21	96.3	1
Utah	2013	1	2	1105	2.6	1	132169.1	4.975	33.6	2
Vermont	2013	7	2	0	-1.8	1	28367.9	3.63	67.9	2
Virginia	2013	0	3	601.3	0.3	1	446625	4.26	202.6	3
Washington	2013	0	4	0	2.7	1	411468.9	3.67	101.2	1
West Virginia	2013	0	0	3749.4	1.1	1	70121.2	3.985	77.1	3
Wisonsin	2013	0	1	0	0.4	1	275648.7	3.79	105	2
Wyoming	2013	0	0	9179.4	0.2	1	38523.2	4.475	5.8	2

Alabama	2014	2	1	667	-0.7	1	187568	4.67	94.4	3
Alaska	2014	0	0	1455.4	-2.3	1	53480.6	2.65	1.2	0
Arizona	2014	45	6	173.7	1.5	1	274112.9	5.605	56.3	4
Arkansas	2014	0	0	1183.9	1.3	1	111729.9	4.55	56	3
California	2014	272	87	1459.1	4.4	1	2316331.2	5.32	239.1	3
Colorado	2014	20	7	2930.6	4.3	1	294812	4.86	48.5	2
Connecticut	2014	5	3	0	-0.4	1	237700.4	3.98	738.1	3
Delaware	2014	6	7	0	7.8	1	64123.6	4.22	460.8	2
Disctric of Columbia	2014	0	1	0	1.8	1	114814.8	4.18	9856.5	1
Florida	2014	10	3	13.8	2.8	1	806029.4	5.015	350.6	1
Georgia	2014	11	1	0	3.4	1	465137.8	4.695	168.4	4
Hawai	2014	6	0	0	0.3	1	74490.6	5.045	211.8	0
Idaho	2014	0	4	0	2.8	1	61663.2	4.16	19	3
Illnois	2014	3	7	1350.9	2.2	1	735876.3	4.14	231.1	3
Indiana	2014	20	2	907.6	3.2	1	313830.9	4.08	181	2
Iowa	2014	0	0	0	4.9	1	165641.4	4.085	54.5	4
Kansas	2014	0	0	606.3	2.7	1	144131.5	4.665	34.9	2
Kentucky	2014	0	0	1989.8	0.2	1	179888.5	4.21	109.9	5
Louisiana	2014	0	0	2506.4	2.8	1	232746.2	4.8	104.9	1
Maine	2014	0	0	0	1.9	1	53445.1	3.625	43.1	0
Maryland	2014	18	1	46.2	1.7	1	339991.3	4.125	594.8	2
Massachusetts	2014	120	20	0	1.7	1	453778.2	3.895	839.4	4
Michigan	2014	0	9	163.2	1.3	1	430935.6	3.755	174.8	5
Minnesota	2014	1	3	0	2.9	1	312084	3.765	66	1
Mississippi	2014	0	0	237.3	0	1	99501.2	4.65	63.2	1
Missouri	2014	2	2	9.3	0.5	1	272786.8	4.325	87.1	2
Montana	2014	0	0	1027.3	2	1	43285.1	3.91	6.8	0
Nebraska	2014	0	1	18.1	3.3	1	107394.4	4.385	23.8	2
Nevada	2014	10	0	1.8	0.8	1	129405.2	5.195	24.6	5
New Hampshire	2014	0	3	0	2	1	69506.5	3.665	147	2
New Jersey	2014	141	10	0	-0.5	1	524420.4	4.085	1195.5	4
New Mexico	2014	28	5	2523.4	3.2	1	89372.2	5.545	17	3
New York	2014	14	34	22.9	1.7	1	1347559.8	3.73	411.2	5
North Carolina	2014	131	6	0	2.3	1	455295.7	4.46	196	3
North Dakota	2014	0	0	3115.6	8	1	56554.6	3.91	9.7	1
Ohio	2014	10	6	1219.9	3.8	1	571424.7	3.935	282.3	2
Oklahoma	2014	0	0	3558.1	5.3	1	186307	4.79	54.7	4
Oregon	2014	7	2	1.2	3.4	1	181754.9	4.145	39.9	2
Pensylvania	2014	23	14	6127.4	2.4	1	666555.8	3.855	283.9	5
Rhode Island	2014	4	3	0	0.6	1	52005.5	4	1081.1	3
South Carolina	2014	1	2	0	2.7	1	183579.7	4.67	153.9	2
South Dakota	2014	0	0	26.4	1.6	1	44449.7	4.175	10.7	1
Tennessee	2014	4	3	29.6	1.5	1	291661.7	4.36	153.9	4
Texas	2014	11	6	16662.3	3.3	1	1518613.7	5.21	96.3	1

Utah	2014	1	1	1149.6	3.1	1	136325.2	4.975	33.6	2
Vermont	2014	17	0	0	0.5	1	28510.1	3.63	67.9	2
Virginia	2014	0	4	533.1	0	1	446790.6	4.26	202.6	3
Washington	2014	0	5	0	3.6	1	426481.6	3.67	101.2	1
West Virginia	2014	0	0	4164	-0.6	1	69720.7	3.985	77.1	3
Wisonsin	2014	1	2	0	2.3	1	282031.2	3.79	105	2
Wyoming	2014	0	1	9304.1	0.5	1	38711.1	4.475	5.8	2
Alabama	2015	2	1	569.3	1	1	189428.8	4.67	94.4	3
Alaska	2015	0	0	1406.1	1	1	54015.3	2.65	1.2	0
Arizona	2015	50	8	146.8	2.9	1	281935.6	5.605	56.3	4
Arkansas	2015	0	0	1068.9	1.1	1	112938.9	4.55	56	3
California	2015	353	129	1421.8	5.2	1	2437366.9	5.32	239.1	3
Colorado	2015	26	5	3074.1	4.8	1	308898.9	4.86	48.5	3
Connecticut	2015	7	4	0	3.2	1	245304.5	3.98	738.1	3
Delaware	2015	7	6	0	3.7	1	66527	4.22	460.8	2
Disctric of Columbia	2015	0	1	0	1.9	1	117011	4.18	9856.5	1
Florida	2015	13	9	13.8	4.5	1	842269.4	5.015	350.6	1
Georgia	2015	16	5	0	4.1	1	484378.4	4.695	168.4	4
Hawai	2015	7	0	0	3.6	1	77176.6	5.045	211.8	0
Idaho	2015	0	5	1.4	2.6	1	63235.7	4.16	19	3
Illnois	2015	3	13	1309.5	1.6	1	747666.8	4.14	231.1	4
Indiana	2015	34	2	796.6	-0.6	1	311850.4	4.08	181	3
Iowa	2015	0	0	0	3	1	170545.9	4.085	54.5	4
Kansas	2015	1	3	582.8	2.6	1	147929.8	4.665	34.9	2
Kentucky	2015	0	2	1610.5	1.4	1	182487.9	4.21	109.9	5
Louisiana	2015	0	0	2334.3	-1	1	230434	4.8	104.9	1
Maine	2015	0	0	0	0.8	1	53879.3	3.625	43.1	0
Maryland	2015	24	10	45.6	2.7	1	349146.8	4.125	594.8	2
Massachusetts	2015	139	28	0	4	1	471979.2	3.895	839.4	4
Michigan	2015	2	18	151.6	2.6	1	442287.6	3.755	174.8	5
Minnesota	2015	1	5	0	1.5	1	316863.3	3.765	66	1
Mississippi	2015	0	0	237.5	0.5	1	100013.6	4.65	63.2	1
Missouri	2015	6	1	4.1	1.3	1	276316.7	4.325	87.1	3
Montana	2015	0	0	965.4	4.1	1	45042.5	3.91	6.8	0
Nebraska	2015	0	1	17.1	3.1	1	110752.9	4.385	23.8	3
Nevada	2015	16	1	1.6	4.2	1	134892.2	5.195	24.6	5
New Hampshire	2015	0	4	0	2.8	1	71419.1	3.665	147	2
New Jersey	2015	152	55	0	2.1	1	535284.5	4.085	1195.5	4
New Mexico	2015	34	9	2639.8	2.6	1	91679.5	5.545	17	3
New York	2015	24	44	19.5	1.8	1	1372232.4	3.73	411.2	5
North Carolina	2015	229	11	0	3.1	1	469535.6	4.46	196	3
North Dakota	2015	0	0	3527.3	-2.6	1	55067.4	3.91	9.7	1
Ohio	2015	12	8	1742	1.5	1	579943.2	3.935	282.3	3
Oklahoma	2015	0	1	3846	3.7	1	193237.7	4.79	54.7	5

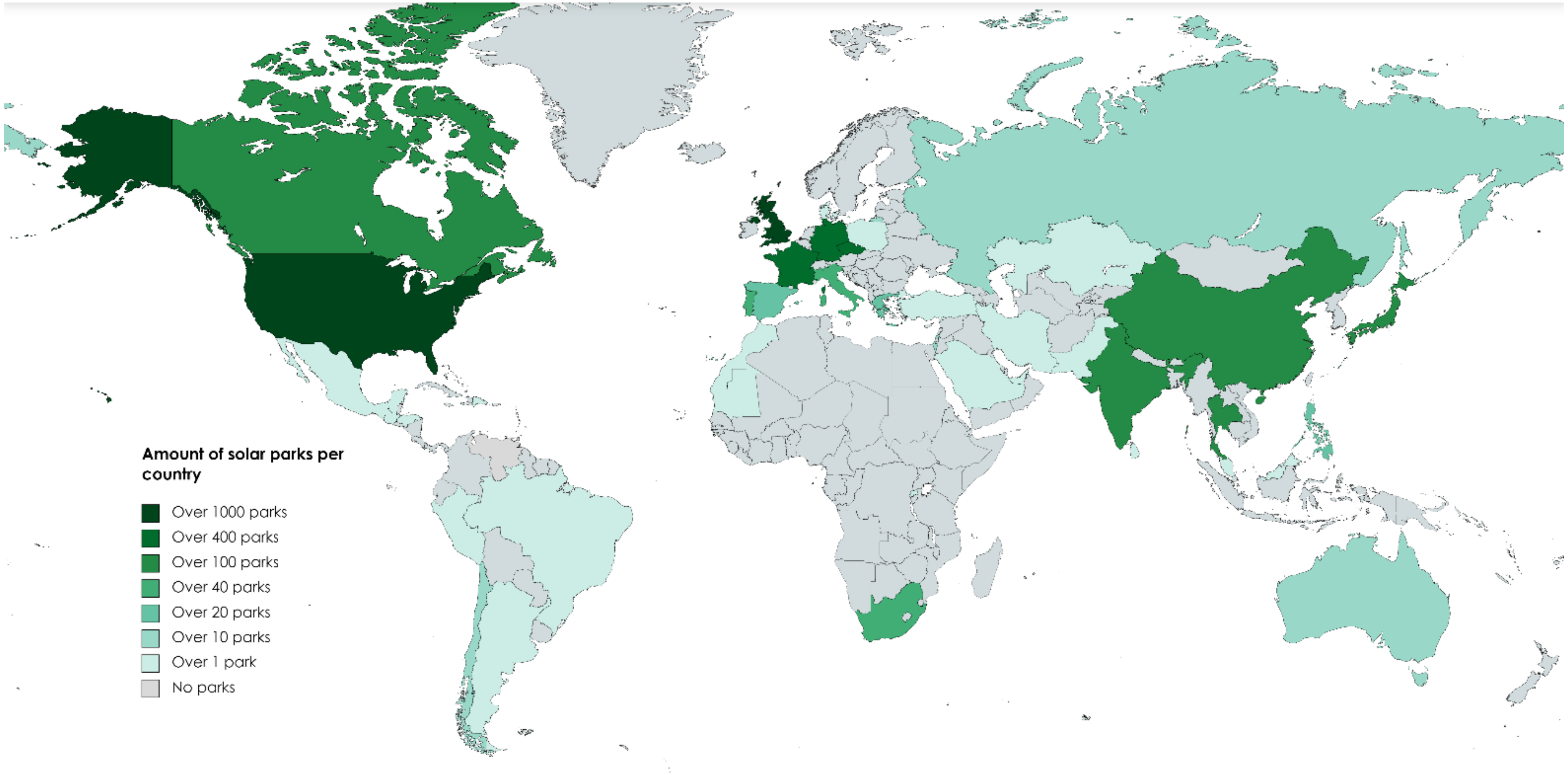
Oregon	2015	7	9	0.9	5.6	1	191864.2	4.145	39.9	2
Pensylvania	2015	23	51	6438.4	2.4	1	682527	3.855	283.9	5
Rhode Island	2015	6	1	0	1.8	1	52957.8	4	1081.1	3
South Carolina	2015	1	0	0	3.7	1	190294.1	4.67	153.9	2
South Dakota	2015	0	1	10.1	2.1	1	45371.8	4.175	10.7	1
Tennessee	2015	5	0	29.9	3.9	1	302970.2	4.36	153.9	4
Texas	2015	15	12	17059.2	5.1	1	1595969.5	5.21	96.3	1
Utah	2015	9	2	998.7	3.9	1	141602	4.975	33.6	2
Vermont	2015	18	1	0	1.3	1	28876.6	3.63	67.9	2
Virginia	2015	0	3	500.1	2	1	455830	4.26	202.6	3
Washington	2015	0	11	0	4.7	1	446628.3	3.67	101.2	1
West Virginia	2015	0	1	4075.9	0.9	1	70332.7	3.985	77.1	3
Wisonsin	2015	1	1	0	2.2	1	288260.1	3.79	105	3
Wyoming	2015	0	0	9030.9	3.1	1	39899	4.475	5.8	2
Alabama	2016	3	3	470.3	1.1	1	191523.4	4.67	94.4	3
Alaska	2016	0	0	1410.2	-1.3	1	53289	2.65	1.2	0
Arizona	2016	55	19	116.7	3.3	1	291259.6	5.605	56.3	4
Arkansas	2016	2	0	872.1	0.5	1	113490.4	4.55	56	4
California	2016	410	138	1298.8	3.4	1	2519133.6	5.32	239.1	3
Colorado	2016	35	5	2927.8	2.2	1	315793	4.86	48.5	4
Connecticut	2016	8	7	0	0.3	1	245966.1	3.98	738.1	3
Delaware	2016	7	14	0	-5.5	1	62889	4.22	460.8	2
Disctric of Columbia	2016	0	2	0	2.1	1	119420.2	4.18	9856.5	2
Florida	2016	19	14	12.2	3.4	1	870963.2	5.015	350.6	1
Georgia	2016	30	7	0	3.4	1	500909.3	4.695	168.4	4
Hawai	2016	9	0	0	2.5	1	79093.5	5.045	211.8	0
Idaho	2016	1	6	6.4	3.8	1	65643.2	4.16	19	3
Illnois	2016	3	17	1028.8	-0.2	1	746370	4.14	231.1	5
Indiana	2016	48	0	671.3	1.5	1	316545.6	4.08	181	3
Iowa	2016	1	1	0	-0.6	1	169488.8	4.085	54.5	6
Kansas	2016	1	0	499.3	3.1	1	152511.5	4.665	34.9	3
Kentucky	2016	0	1	1158.5	0.5	1	183454.9	4.21	109.9	6
Louisiana	2016	1	0	2258.8	-2.2	1	225361.8	4.8	104.9	2
Maine	2016	0	1	0	2.2	1	55088.1	3.625	43.1	0
Maryland	2016	44	7	37.9	3.1	1	359987.5	4.125	594.8	3
Massachusetts	2016	173	40	0	1.5	1	479184.9	3.895	839.4	4
Michigan	2016	6	24	140.7	2	1	451025.9	3.755	174.8	5
Minnesota	2016	7	7	0	1.6	1	321980	3.765	66	3
Mississippi	2016	0	0	199.3	0.4	1	100412.1	4.65	63.2	3
Missouri	2016	8	1	5.8	0	1	276210.9	4.325	87.1	6
Montana	2016	0	1	757.5	-1	1	44580.7	3.91	6.8	2
Nebraska	2016	1	4	13.7	0.8	1	111611.7	4.385	23.8	5
Nevada	2016	20	1	1.6	2.8	1	138638.9	5.195	24.6	6
New Hampshire	2016	0	4	0	2.2	1	73022.7	3.665	147	2

New Jersey	2016	175	56	0	1	1	540380.3	4.085	1195.5	4
New Mexico	2016	40	9	2506.8	0	1	91713.9	5.545	17	3
New York	2016	37	64	15.2	1.9	1	1397723.7	3.73	411.2	5
North Carolina	2016	376	7	0	1.7	1	477523.8	4.46	196	4
North Dakota	2016	0	0	3328.6	-7.1	1	51137.3	3.91	9.7	2
Ohio	2016	14	13	2079.9	0.9	1	585044.7	3.935	282.3	3
Oklahoma	2016	0	0	3760.6	-2.7	1	188063.3	4.79	54.7	6
Oregon	2016	17	9	0.8	4.8	1	201059.5	4.145	39.9	3
Pensylvania	2016	24	57	6730.2	1.3	1	691316.2	3.855	283.9	5
Rhode Island	2016	6	3	0	0.1	1	53030.2	4	1081.1	3
South Carolina	2016	1	3	0	3.2	1	196477.4	4.67	153.9	2
South Dakota	2016	1	3	8.6	0.8	1	45733.6	4.175	10.7	3
Tennessee	2016	5	4	22.3	1.7	1	308157.4	4.36	153.9	6
Texas	2016	20	23	15845.6	0.7	1	1606579.8	5.21	96.3	3
Utah	2016	23	1	887.1	4.2	1	147555.5	4.975	33.6	3
Vermont	2016	22	4	0	1.1	1	29206.3	3.63	67.9	2
Virginia	2016	3	2	462.3	1	1	460185	4.26	202.6	3
Washington	2016	0	19	0	3.9	1	463974	3.67	101.2	2
West Virginia	2016	0	0	3752.2	-1.5	1	69276.4	3.985	77.1	4
Wisonsin	2016	2	5	0	1.1	1	291320.5	3.79	105	4
Wyoming	2016	0	0	7463.7	-4.6	1	38079.7	4.475	5.8	5
Alabama	2017	5	0	517.5	1.1	0	193693	4.67	94.4	4
Alaska	2017	0	0	1430.6	-0.9	0	52825.9	2.65	1.2	0
Arizona	2017	65	19	134.2	3.7	0	302117.8	5.605	56.3	4
Arkansas	2017	3	0	739.6	1.3	0	114950.7	4.55	56	5
California	2017	481	169	1232.6	4.3	0	2628314.6	5.32	239.1	3
Colorado	2017	49	16	3109.4	4	0	328510.2	4.86	48.5	4
Connecticut	2017	17	5	0	0.9	0	248077.1	3.98	738.1	3
Delaware	2017	8	12	0	-1.7	0	61851.1	4.22	460.8	2
Disctric of Columbia	2017	0	0	0	0.7	0	120210.9	4.18	9856.5	2
Florida	2017	33	14	12	3.6	0	901903.5	5.015	350.6	1
Georgia	2017	39	4	0	3.7	0	519452.6	4.695	168.4	4
Hawai	2017	12	2	0	2.5	0	81039.5	5.045	211.8	0
Idaho	2017	8	2	4.7	4.2	0	68412.2	4.16	19	4
Illnois	2017	3	20	1129.5	0.8	0	752459.2	4.14	231.1	6
Indiana	2017	54	1	729.8	2	0	322969.3	4.08	181	4
Iowa	2017	3	0	0	-0.3	0	168976.5	4.085	54.5	6
Kansas	2017	4	2	462.2	1.3	0	154456.6	4.665	34.9	4
Kentucky	2017	2	0	1130.6	0.6	0	184600.8	4.21	109.9	6
Louisiana	2017	1	0	2565.3	1.5	0	228819.3	4.8	104.9	3
Maine	2017	2	0	0	1.6	0	55964.7	3.625	43.1	0
Maryland	2017	48	11	42.8	1.6	0	365857	4.125	594.8	3
Massachusetts	2017	232	35	0	2.4	0	490874.1	3.895	839.4	4
Michigan	2017	9	16	134.1	1.4	0	457341.5	3.755	174.8	5

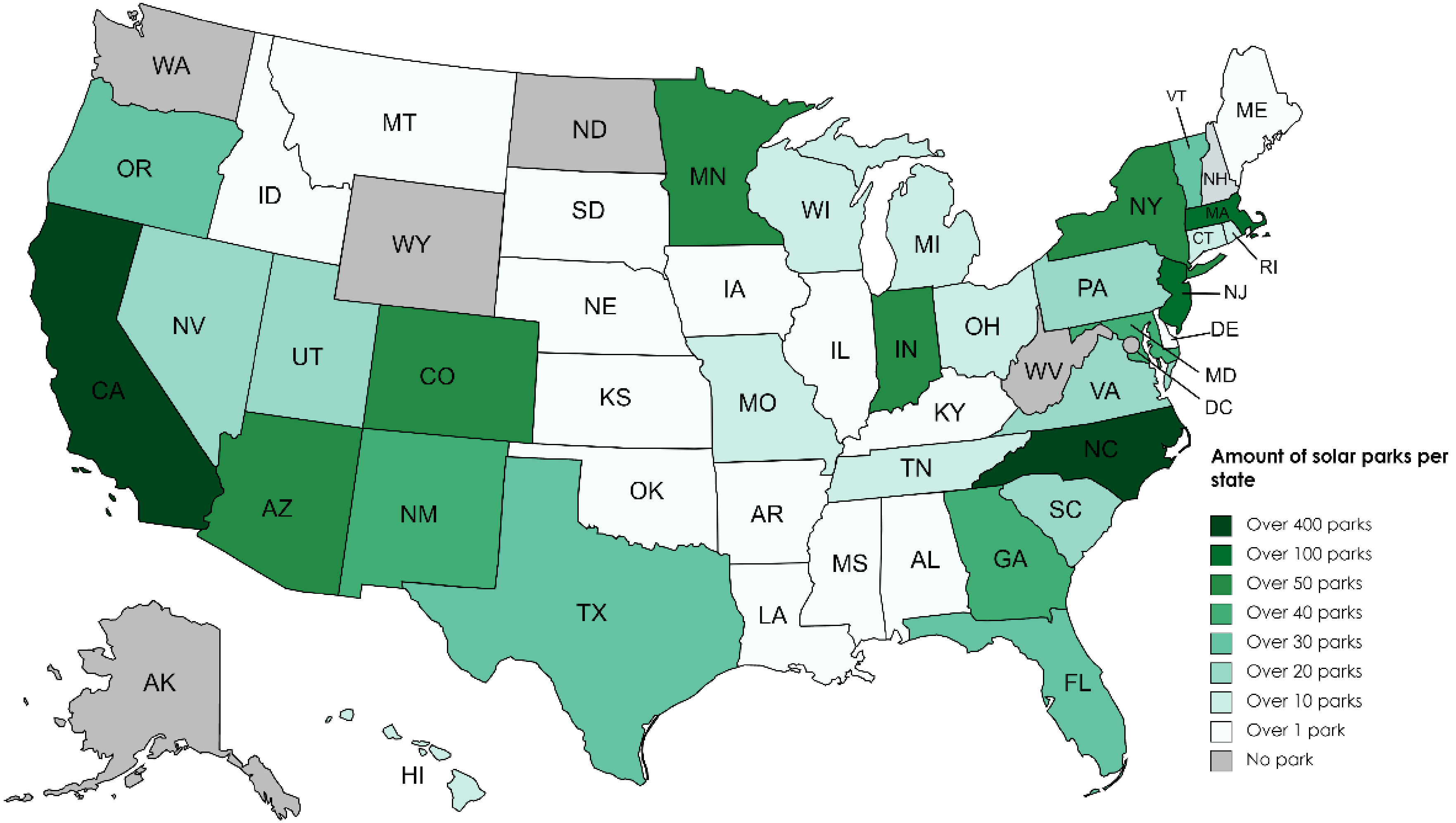
Minnesota	2017	69	16	0	1.8	0	327667.5	3.765	66	3
Mississippi	2017	4	0	173.5	0.7	0	101071.7	4.65	63.2	4
Missouri	2017	14	1	6	1.1	0	279264.3	4.325	87.1	8
Montana	2017	6	0	794.2	2	0	45480.6	3.91	6.8	2
Nebraska	2017	3	4	12.7	1.9	0	113754.2	4.385	23.8	5
Nevada	2017	26	0	1.6	3.6	0	143590.9	5.195	24.6	6
New Hampshire	2017	0	1	0	1.7	0	74253.6	3.665	147	3
New Jersey	2017	183	73	0	0.1	0	540656.6	4.085	1195.5	4
New Mexico	2017	43	6	2752.3	0.1	0	91772.3	5.545	17	4
New York	2017	53	61	12.9	1.9	0	1424905.5	3.73	411.2	5
North Carolina	2017	454	11	0	2.4	0	489026.6	4.46	196	4
North Dakota	2017	0	1	3487.2	0.3	0	51291.2	3.91	9.7	3
Ohio	2017	16	12	2357.5	1.3	0	592725.7	3.935	282.3	4
Oklahoma	2017	5	8	3887.2	0	0	188157.2	4.79	54.7	6
Oregon	2017	20	9	0.7	4.2	0	209581.3	4.145	39.9	3
Pensylvania	2017	24	65	7068	0.6	0	695560.8	3.855	283.9	5
Rhode Island	2017	6	4	0	-0.6	0	52727.7	4	1081.1	3
South Carolina	2017	10	4	0	3.1	0	202644.5	4.67	153.9	2
South Dakota	2017	1	0	8	0.6	0	46023.9	4.175	10.7	4
Tennessee	2017	9	0	16.3	2.2	0	314849.9	4.36	153.9	8
Texas	2017	30	16	16449.1	2.8	0	1651329.5	5.21	96.3	4
Utah	2017	29	3	861.8	4.4	0	153986	4.975	33.6	3
Vermont	2017	29	1	0	0.4	0	29312.4	3.63	67.9	2
Virginia	2017	14	2	465.2	1.7	0	468125.4	4.26	202.6	4
Washington	2017	0	15	0	5.5	0	489435	3.67	101.2	2
West Virginia	2017	0	0	4280.9	0.7	0	69743.2	3.985	77.1	5
Wisonsin	2017	13	7	0	1	0	294151.7	3.79	105	4
Wyoming	2017	0	0	7737.6	-0.6	0	37866.3	4.475	5.8	6
Alabama	2018	7	1	553.7	2.3	0	198053.7	4.67	94.4	4
Alaska	2018	0	0	1386.5	0.2	0	52928.7	2.65	1.2	0
Arizona	2018	66	31	140.9	3.9	0	314016.1	5.605	56.3	4
Arkansas	2018	4	1	629	1.5	0	116698.8	4.55	56	5
California	2018	496	137	1194.2	3.1	0	2708966.9	5.32	239.1	3
Colorado	2018	52	15	3507.7	4.4	0	342865.6	4.86	48.5	4
Connecticut	2018	17	10	0	0.4	0	249043.3	3.98	738.1	3
Delaware	2018	8	10	0	2.1	0	63162.6	4.22	460.8	2
Disctric of Columbia	2018	0	1	0	2	0	122661.9	4.18	9856.5	2
Florida	2018	34	17	11.6	3.8	0	936580.3	5.015	350.6	1
Georgia	2018	40	8	0	3.7	0	538730.8	4.695	168.4	4
Hawai	2018	12	0	0	1.4	0	82203.9	5.045	211.8	0
Idaho	2018	8	3	2.6	5.9	0	72455.4	4.16	19	4
Illnois	2018	4	23	1146.4	2.3	0	769631.2	4.14	231.1	6
Indiana	2018	56	3	796.5	2.8	0	332156.8	4.08	181	4
Iowa	2018	3	2	0	2.3	0	172844.7	4.085	54.5	6

Kansas	2018	4	0	435.6	2.4	0	158192.7	4.665	34.9	4
Kentucky	2018	5	1	1064.4	1.6	0	187507.4	4.21	109.9	6
Louisiana	2018	1	1	3219.5	2.7	0	235021.9	4.8	104.9	3
Maine	2018	2	1	0	2.4	0	57302.7	3.625	43.1	0
Maryland	2018	48	9	30.5	0.8	0	368810.4	4.125	594.8	3
Massachusetts	2018	239	35	0	3.4	0	507806	3.895	839.4	4
Michigan	2018	10	19	126.7	2.3	0	467828	3.755	174.8	5
Minnesota	2018	84	11	0	2.9	0	337215.9	3.765	66	3
Mississippi	2018	5	0	165.2	1	0	102061.7	4.65	63.2	4
Missouri	2018	14	3	6.2	1.9	0	284696.3	4.325	87.1	8
Montana	2018	6	0	854.6	2.5	0	46627.5	3.91	6.8	2
Nebraska	2018	4	1	12.2	1.2	0	115087.9	4.385	23.8	5
Nevada	2018	26	0	1.5	4.2	0	149663	5.195	24.6	6
New Hampshire	2018	0	1	0	2.6	0	76165.3	3.665	147	3
New Jersey	2018	185	77	0	1.5	0	549000.8	4.085	1195.5	4
New Mexico	2018	45	4	3347.1	2.3	0	93870.9	5.545	17	4
New York	2018	61	80	13.5	3	0	1467076.8	3.73	411.2	5
North Carolina	2018	477	9	0	2.6	0	501955	4.46	196	4
North Dakota	2018	0	0	4025.5	4.3	0	53472.8	3.91	9.7	3
Ohio	2018	17	16	3010.8	2.3	0	606141.5	3.935	282.3	4
Oklahoma	2018	5	4	4579.2	2.7	0	193204.7	4.79	54.7	6
Oregon	2018	34	8	0.5	4.6	0	219279.9	4.145	39.9	3
Pensylvania	2018	24	61	7891.5	1.9	0	708856.9	3.855	283.9	5
Rhode Island	2018	10	4	0	0.8	0	53135.5	4	1081.1	3
South Carolina	2018	21	0	0	3.1	0	209012.5	4.67	153.9	2
South Dakota	2018	1	1	7.8	2.7	0	47287	4.175	10.7	4
Tennessee	2018	10	1	11.1	2.7	0	323316.8	4.36	153.9	8
Texas	2018	39	23	19087.9	3.9	0	1715231	5.21	96.3	4
Utah	2018	29	3	844.1	5.6	0	162574.4	4.975	33.6	3
Vermont	2018	30	1	0	0.9	0	29565.4	3.63	67.9	2
Virginia	2018	21	4	436.2	2.3	0	478835	4.26	202.6	4
Washington	2018	0	8	0	7.2	0	524486.9	3.67	101.2	2
West Virginia	2018	0	0	4724.3	3	0	71858.7	3.985	77.1	5
Wisonsin	2018	13	5	0	3.3	0	303767.4	3.79	105	4
Wyoming	2018	0	0	7666.5	2.2	0	38696.3	4.475	5.8	6

Appendix 3. Solar park map of the world



Appendix 4. Solar park map of the United States



Appendix 5. Heatmap of solar parks in the United States