Red Tape: New Jersey's Energy Regulations Deter Residents From Installing Solar Photovoltaics

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INTRODUCTION

To seriously address the issues of climate change and increasingly extreme weather, our country needs to encourage renewable energy use on the residential level. All types of consumers, regardless of their place on the tax bracket, should have access to

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renewable energy sources. Individuals matter and our regulations regarding energy use need to reflect that mentality. New Jersey, California, and Germany have taken vastly different approaches to encourage and facilitate residential solar photovoltaic installation, a dominant form of renewable energy. This Note analyzes the energy regulations of New Jersey, California and Germany and determines that New Jersey's regulations of residential solar photovoltaic use deter individuals from using renewable energy.

On October 27, 2012, Governor Chris Christie declared a state of emergency in New Jersey[1] due to Hurricane Sandy, which was one of the deadliest and costliest tropical storms in U.S. history.[2] Sandy destroyed the summer home of Desma Dunne, along with many other homes on the Jersey Shore. Where her house once sat, now lays a vacant lot. Although it has been two years since Sandy, Dunne has had virtually no progress in the rebuilding process.[3] Dunne's reconstruction process has been stymied by her desire to use renewable energy sources.

A major part of her problem has been contracting. She asked why it was so difficult to use renewable energy for her new home. Seemingly, she *absolutely* could and should use as much renewable energy to power her home as possible. After an extensive search, Dunne finally found one contractor that was willing to *discuss* installing renewable sources like solar panels, wind power and geothermal technologies to power her soon-to-be retirement home. Ultimately, after extending her budget multiple times,

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[1] N.J. ADMIN. CODE § EX. ORD. No. 104 (2012).
[2] *Hurricane Sandy Fast Facts*, CNN WORLD (July 13, 2013, 2:37 PM),http://www.cnn.com/2013/07/13/world/americas/hurricane-sandy-fast-facts/.
[3] Interview with Desma Dunne, New Jersey Resident, in Staten Island, N.Y. (July 1, 2014).

the current blueprints have a few solar panels and solar power windows. The predominant problem Dunne is facing is the onerous state regulations slowing the installation process while simultaneously increasing cost.[4] Dunne represents the average middle-class American who is trying to combat climate change on the individual level. Finding out why it is seemingly impossible for good-intentioned citizens to give up their goal of trying to contribute to the fight against climate change is the muse for this Note.

First, this Note discusses New Jersey's solar energy regulations and incentives program and their impact on individuals. Second, it summarizes California's incentive program and specifically compares the California Solar Initiative to New Jersey's Clean Energy Program. Third, it summarizes Germany's solar energy regulations and compares them to New Jersey's Residential Development Solar Energy Systems Act. Finally, this Note concludes with recommendations that New Jersey should implement to model their system on California's incentive programs and Germany's environmental legislation.

I. NEW JERSEY ENERGY REGULATIONS DETER RESIDENTS FROM INSTALLING SOLAR ENERGY SYSTEMS

A. Residential Development Solar Energy Systems Act

Current New Jersey energy regulations ambitiously approach energy efficiency, conservation, and use of renewable sources. Yet, in effect, the regulations by the Residential Development Solar Energy Systems Act (Solar Act) contradict the stated purposes of the State Uniform Construction Code Act (Construction Act). The Herculean

[4] *Id.*

standards the state government set would ostensibly make using renewable energy sources on the residential level an attainable goal. However, because the regulations are ambiguous, cumbersome, and add daunting expenses, they negate the purpose of the Construction Act.[5] The goal is to make construction easier, specifically the use of renewable energy sources easier, but the Solar Act effectively deters residents from installing solar energy systems.[6]

For example, the State Uniform Construction Code Act (Construction Act) states that its purpose is to: "eliminate restrictive, obsolete, conflicting and unnecessary construction regulations that tend to unnecessarily increase construction costs or retard the use of new materials, products or methods of construction, or provide preferential treatment to types or classes of materials or products or methods of construction."[7] The plain language of the Construction Act evidences that the government's intent is to encourage efficient and innovative projects without superfluous costs and restrictions.[8] Yet, the Solar Act requires the consumer to meet standards that ultimately create regulatory boulders that burden installation.[9] The two laws clearly conflict with one another making it difficult for residents to install solar energy systems.

The Solar Act dictates minimum installation standards.[10] There are nine minimum requirements one must follow in order to install a solar energy system on the residential

[5] N.J. STAT. ANN. § 52:27D-120 (West 2009).
[6] *Id.*
[7] *Id.*
[8] *Id.*
[9] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).
[10] *Id.*

level. Some of the requirements seem understandable. Others cause the process of installing solar energy systems increasingly expensive and cumbersome. The stated purpose of the Construction Act is directly contradicted by some of the minimum requirements.

First, the system must be installed to both conform to the manufacturer's specifications and must comply with electrical and building code standards.[11] This requirement is logical because it does not impose unwarranted restrictions on the individual and complies with other established safety standards. Maintaining safety is important and including this provision is a reasonable regulation for the state to enforce. According to New Jersey Administrative Code, under the Uniform Construction Code, any utility connections must be in compliance with the regulation. The expressed intent of the regulation is to insure public safety and health.[12]

Second, the primary objective of the system must offset all or part of the consumer's own electricity demand.[13] This section of the Solar Act poses some issues. For example, the Solar Act purports no rationale as to why the predominant purpose of the solar energy system must be to offset the resident's own electricity demand. Consumers could be prevented from installing a solar energy system if their objective was not to provide energy for all or part of their electric load.[14] Meaning, if an individual's main purpose was not to offset their own electricity demand they would

[11] *Id.*
[12] N.J. ADMIN. CODE § 5:23-2 (2014).
[13] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).
[14] *Id.*

either have to evade regulatory requirements or be prevented from installing the solar system.[15] Without providing any reason for this requirement, the Solar Act implements an "obsolete"[16] construction restriction, which contradicts the Construction Act's stated purpose.

Third, all parts of the system must be new and unused and must not have been used in any other location or for any other purpose.[17] Because all parts of the system must be new, this provision is problematic from a consumer-cost perspective. Reusing refurbished systems would likely be an inexpensive alternative for consumers to implement. However, the Solar Act prohibits the use of any parts of the system that have been used before. The Solar Act provides no reason as to why using brand new parts is necessary. Reusing previously used parts that function and meet the other standards would likely allow residents who cannot afford brand new systems to install them. Part of the purpose of the Construction Act is to remove regulations that cause unnecessary expense to construction.[18] Yet, this minimum requirement does exactly that. It prevents individuals from using other inexpensive options.[19]

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[15] *See id.* ("That the solar energy system is intended primarily to offset part or all of the consumer's own electricity demand." One can reasonably infer that if their primary intent was to offset their neighbor's electricity demand they could, ostensibly, be prevented from doing so. For example, imagine that a mother buys her son a house on an adjacent lot to her own home. She then installs solar PV to partially power both homes. Because her solar energy system is intended to power part of both homes' electricity demand, she could be prevented from installing under this requirement.).
[16] N.J. STAT. ANN. § 52:27D-120 (West 2009).
[17] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).
[18] N.J. STAT. ANN. § 52:27D-120 (West 2009).
[19] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).

Fourth, the system must have a warranty that is at least ten years and is provided by the manufacturer. Also, the warranty is subject to The New Home Warranty and Builders' Registration Act. This could have a logical rationale. However, the additional requirement to subject the warranty to The New Home Warranty and Builders' Registration Act adds a myriad of other requirements and expense to the process of installing a system.[20] Again, the purpose of the Construction Act is contradicted by the added unnecessary regulations and increased cost.[21] The installation process here becomes even more cumbersome, further conflicting with the Construction Act's purpose.[22]

Fifth, the system must have meters to monitor and measure performance and quantity of electricity produced.[23] This fifth requirement is superfluous. Having a meter with the system is logical for the consumer to track the benefits of the system. However, *mandating* a meter is an additional cost that has no recognizable benefit in the consumer's point of view. The government should express why meters are beneficial and necessary to the electrical system if they are going to mandate them. Preventing a resident from installing a system because they do not want to pay for a meter seems to be, to the consumer, an unnecessary regulation and imposes an additional cost, thus contradicting the purpose of the Construction Act.

[20] *See* N.J. REV. STAT. ANN. § 46:2-3 (West 2014) (setting forth the rules and regulations of The New Home Warranty and Builders' Registration Act).
[21] N.J. STAT. ANN. § 52:27D-120 (West 2009).
[22] *Id.*
[23] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).

The remaining four requirements do not expressly contradict the purpose of the Construction Act. The sixth requirement states that the system must comply with energy codes for the dwelling unit where it is installed.[24] The seventh states the rating criteria for the system must assure reasonable performance and comply with the minimum requirements of the Act.[25] The eighth requirement states the system must be consistent with the net metering standards and safety and power quality interconnection standards set by the Board of Public Utilities. Finally, the ninth requirement states, "for the criteria by which the technical feasibility of the installation of a solar energy system is determined in section 4 of this act."[26] All of these requirements seem to have logical rationale that does not contradict the stated purpose of the Construction Act.[27]

The Solar Act's minimum installation standards contradict the purpose of the Construction Act, "to eliminate restrictive, obsolete, conflicting and unnecessary construction regulations…"[28] because some of the minimum requirements inflict arbitrary restrictions on the construction of residential solar energy systems. Although some of the minimum requirements listed are pertinent, various standards are superfluous. The second, third, fourth and fifth requirements create additional regulations and expenses for the prospective residential installer. The state should be trying to make the process of installing solar energy systems as simple as possible. Complex regulations

[24] *Id.*
[25] *Id.*
[26] *Id.*
[27] N.J. STAT. ANN. § 52:27D-120 (West 2009).
[28] *Id.*

discourage consumers from instituting environmentally conscious energy sources.[29] Though the Act's objective was to remove excess complexities and encourage consumers to install solar energy systems,[30] the Solar Act's installation standards deviate from the true intent of the Construction Act.

B. New Jersey's Clean Energy Program

Another important aspect of energy production is New Jersey's incentives program to provide consumers monetary assistance to install renewable energy systems. New Jersey has implemented a program encouraging renewable energy use, New Jersey's Clean Energy Program. The Clean Energy Program "is a statewide program that offers financial incentives, programs and services for New Jersey residents, business owners and local governments to help them save energy, money and the environment."[31] Notably, the Program increases incentives for people impacted by Hurricane Sandy.

The state's Clean Energy Program is an ambitious attempt to encourage renewable energy use on the residential level by offering financial incentives. Providing incentives for both energy efficiency and renewable energy use is a successful tool. Monetary incentives and grants help curb the daunting initial costs residents face when installing renewable energy systems. Incentives programs not only encourage consumers, but also help educate them about the renewable energy options available. Educating

[29] Ken Wells, *Solar Energy is Ready. The U.S. Isn't*, BLOOMBERG (Oct. 25, 2012 7:31 PM), http://www.bloomberg.com/news/2012-10-25/solar-energy-is-ready-the-u-s-isn-t.html.
[30] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).
[31] NEW JERSEY'S CLEAN ENERGY PROGRAM, http://www.njcleanenergy.com/ (last visited Oct. 25, 2015); *see also In Re New Jersey Clean Energy Program*, EO02120955, 2003 WL 23531267 (Mar. 4, 2003) (setting forth the authority for New Jersey's Clean Energy Program).

consumers about and providing incentives for renewable energy systems are important avenues states can take to encourage renewable energy use.[32]

However, the New Jersey Clean Energy Program has various provisions that actually dissuade residents from installing solar energy systems.[33] For example, typical rebates are not available for solar systems.[34] Solar energy consumers can receive Solar Renewable Energy Certificates (SREC) and the Clean Energy Program mandates owners of solar projects to register their projects with the SREC Registration Program (SRP). SREC are one credit for each 1,000 kilowatt-hours of electricity generated by the system. The SREC can then be sold. However, the revenue from this system does not help diminish the overwhelming initial costs of installation because one must actually generate the electricity before receiving the SREC.[35] Meaning, that if a consumer does not generate as much electricity, they will not receive as many credits and thus, less money in return. It seems counter-intuitive to have a program that promotes solar energy use but requires individuals to generate energy beyond their own needs to receive benefits. SREC consequently causes individuals to be less energy efficient.

The objective of monetary incentive programs is to help consumers offset costs of renewable projects. According to McKinsey and Company, a global management

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[32] MCKINSEY & COMPANY, ENERGY EFFICIENCY: A COMPELLING GLOBAL RESOURCE 12 (Tom Kiely ed., 2010).
[33] NEW JERSEY'S CLEAN ENERGY PROGRAM, http://www.njcleanenergy.com/ (last visited Oct. 25, 2015).
[34] *Id*.
[35] SREC REGISTRATION PROGRAM, http://www.njcleanenergy.com/renewable-energy/programs/solar-renewable-energy-certificates-srec/new-jersey-solar-renewable-energy (last visited Oct. 25, 2015).

consulting firm,[36] "[g]iven the large upfront investment needed to capture efficiency potential, various approaches could reduce financial hurdles that end-users face. Options include traditional and creative financing vehicles… monetary incentives and grants, including tax and cash incentives, and price signals, such as tiered pricing and externality pricing . . . ."[37] The New Jersey Clean Energy Program defeats the purpose of using incentives to "reduce financial hurdles that end-users face"[38] because it only allows residents to obtain SREC. New Jersey should offer monetary incentives upfront without having to first receive a credit and then sell the credits once the consumer generates a specific amount of energy. The current SREC process is too complicated and does not offer enough financial assistance.

Another issue with the Clean Energy Program is that the once available Renewable Energy Incentive Program (REIP) no longer extends to new solar systems. REIP states, "[b]y investing in renewable energy, you can help protect the environment, reduce our dependence on fossil fuels, and lessen our carbon footprint."[39] REIP also claims to make renewable energy technologies "affordable, practical, and just plain smart,"[40] yet does not include solar energy systems. Also, the wind programs are currently on hold, proving that other renewable energy systems are being deterred, like

[36] MCKINSEY & COMPANY, http://www.mckinsey.com/about_us (last visited Mar. 3, 2015).
[37] MCKINSEY & COMPANY, *supra* note 33, at 12.
[38] *Id.*
[39] RENEWABLE ENERGY INCENTIVE PROGRAM, http://www.njcleanenergy.com/renewable-energy/programs/renewable-energy-incentive-program (last visited Oct. 25, 2015).
[40] *Id.*

solar energy systems.[41] Residents who want to implement solar technologies in their homes have to bear the financial burden on their own. REIP seemingly provides no service to solar projects that can actually help offset carbon emissions in a considerable way, even though that is its intended purpose.

Additionally, the enhanced incentives for Hurricane Sandy victims do not extend to solar energy systems. On the residential level, Sandy Relief incentives are available for furnaces, boilers, heat pumps, gas water heaters, mini-split units, central air conditioners, clothes washers, refrigerators, and New Jersey Energy Star Homes. The rebates range from $50-$500.[42] Again the same issue arises: the disheartening expense related to installing solar energy systems receives no relief from New Jersey's incentives programs while the offered incentives are relatively insignificant.

The New Jersey Clean Energy Program encourages the use of renewable technologies and claims to help with the overwhelming financial burden of installing renewable technologies, but actually only provides help on a negligible scale. The average solar energy system costs between $15,000-$25,000.[43] Gas water heaters can

[41] *Id.*
[42] HURRICANE SANDY INFORMATION, http://www.njcleanenergy.com/sandy (last visited Oct. 24, 2014). *See also* In Re New Jersey Clean Energy Program, EO02120955, 2003 WL 23531267 (Mar. 4, 2003) (setting forth the authority for New Jersey's Clean Energy Program).
[43] SOLAR NEW JERSEY, COSTS OF SOLAR, FINANCING AND LEASE OPTIONS, http://www.solar-new-jersey.org/home-solar-power-facts/cost-of-solar-financing-lease-options/ (last visited Mar. 28, 2015); *See also* UNION OF CONCERNED SCIENTISTS, THE COST OF INSTALLING SOLAR PANELS: PLUNGING PRICES, AND WHAT THEY MEAN FOR YOU, http://blog.ucsusa.org/cost-of-installing-solar-panels-635 (last visited Mar. 28 2015).

cost up to about $1,000.[44] Central air-conditioners can cost up to about $2,000.[45] Refrigerators can cost up to about $2,000.[46] The rebates available for appliances are minimal compared to the actual cost. The lack of rebates for solar energy systems proves that the Clean Energy Program is not encouraging renewable energy use as much as it should to meet the Program's stated goal.

Ultimately, the New Jersey Clean Energy Program maintains that it provides incentives to residents that are implementing renewable energy technologies, but does not provide assistance for solar energy systems. New Jersey prides itself on being one of the fastest growing markets for solar photovoltaic in the United States.[47] For example, it is one of three states in the U.S. to have more than 1 GW of installed solar capacity and in 2013 it installed an additional 236 MWs.[48] Yet, when looking at its regulations and

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[44] HOME DEPOT, http://www.homedepot.com/b/Plumbing-Water-Heaters-Residential-Gas/N-5yc1vZc1tz, (last visited Mar. 28, 2015). *See also* HOME PERFORMANCE WITH ENERGY STAR, http://www.njcleanenergy.com/hp (last visited March 31, 2015) (explaining New Jersey's rebate offerings for using ENERGY STAR products.). *See also* STRENGTHEN ENERGY STAR STANDARDS, http://www.consumerreports.org/cro/magazine-archive/2010/october/home-garden/saving-energy/energy-star-appliances/index.htm (last visited Mar. 31, 2015) (discussing Energy Star prices and rebates).

[45] HOME DEPOT, http://www.homedepot.com/s/central+air+conditioning?NCNI-5 (last visited Mar. 28, 20155). *See also* HOME PERFORMANCE WITH ENERGY STAR, http://www.njcleanenergy.com/hp (last visited Mar. 31, 2015) (explaining New Jersey's rebate offerings for using ENERGY STAR products.). *See also* STRENGTHEN ENERGY STAR STANDARDS, http://www.consumerreports.org/cro/magazine-archive/2010/october/home-garden/saving-energy/energy-star-appliances/index.htm (last visited Mar. 31, 2015) (discussing Energy Star prices and rebates).

[46] LOWES, http://www.lowes.com/Appliances/Refrigerators/_/N-1z11pmd/pl (last visited Mar. 28, 2015). *See also* HOME PERFORMANCE WITH ENERGY STAR, http://www.njcleanenergy.com/hp (last visited Mar. 31, 2015) (explaining New Jersey's rebate offerings for using ENERGY STAR products.). *See also* STRENGTHEN ENERGY STAR STANDARDS, http://www.consumerreports.org/cro/magazine-archive/2010/october/home-garden/saving-energy/energy-star-appliances/index.htm (last visited Mar. 31, 2015) (discussing Energy Star prices and rebates.).

[47] RENEWABLE ENERGY INCENTIVE PROGRAM, *supra* note 26.

[48] SOLAR ENERGY INDUSTRIES ASSOCIATION, STATE SOLAR POLICY, http://www.seia.org/state-solar-policy/New-Jersey (last visited Mar. 28, 2015) ("New Jersey has been an early leader in solar, and is one of only three states in the US to have more than 1 GW of installed capacity. The market continues to be strong. The market is driven by net metering, a solar RPS and an accompanying SREC market.").

available incentive programs, services regarding solar energy systems on the residential level are comparatively feeble. Additionally, on a larger spectrum, it is interesting to see that a state with such cumbersome regulations for residential solar PV use is in the top three in the nation to have over 1 GW of installed solar.[49]

II. CALIFORNIA ENCOURAGES RESIDENTS TO INVEST IN INSTALLING SOLAR ENERGY SYSTEMS BY PROVIDING MONETARY INCENTIVES

A. California Solar Initiative

California has the leading solar market in the United States.[50] That is partially attributed to the amenable energy policies it implements. There are almost 2,000 solar companies in the state. In 2013, California was ranked first by the Solar Energy Industries Association because it installed 2,746 mega watts of solar electric capacity. Additionally, California invested $7.1 billion in solar energy systems in 2013 and the price of photovoltaic system prices fell by 6% in the state.[51] Also, in 2014, California enacted a bill that allows homeowners to install solar PV without reassessing their property taxes.[52] In effect, this bill makes it infinitely simpler (particularly compared to New Jersey's current regulations) to install solar energy systems on California homes because consumers can avoid another expensive, cumbersome regulatory process.[53]

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[49] *Id.*
[50] SOLAR ENERGY INDUSTRIES ASSOCIATION, STATE SOLAR POLICY, http://www.seia.org/state-solar-policy/california (last visited Oct. 25, 2015).
[51] *Id*.
[52] S.B. 871, Ch. 41, 2014 Sen. (Cal. 2014).
[53] *See* SOLAR ENERGY INDUSTRIES ASSOCIATION, STATE SOLAR POLICY, *supra* note 47 (discussing California's solar property tax exclusion).

One notable difference between New Jersey and California's outlook on solar energy systems is the incentive programs available. New Jersey instituted the New Jersey Clean Energy Program without offering the same rebates for solar energy systems as it did for other renewable energy sources and efficiency mechanisms.[54] Whereas California has implemented the California Solar Initiative, which is an incentive program entirely dedicated to solar energy systems.[55] By dedicating a system predominantly to solar energy use, California has provided a much better system for helping individuals gain access to solar energy. This is because the program provides direct monetary assistance to consumers. New Jersey, conversely, does not provide monetary rebates other than credits for sale.[56]

The California Solar Initiative (CSI) is a

> solar rebate program for California consumers that are customers of the investor-owned utilities… Together with the rebate program for New Solar Homes and rebate programs offered through the dozens of publicly owned utilities in the state — the CSI program is a key component of the Go Solar California campaign for California.[57]

The CSI has a significant budget of $2.167 billion for the years 2007 until 2016.[58] Also, its goal is to install 1,940 mega watts of new solar generation capacity.[59] The CSI

[54] RENEWABLE ENERGY INCENTIVE PROGRAM, *supra* note 29.
[55] GO SOLAR CALIFORNIA, ABOUT THE CALIFORNIA SOLAR INITIATIVE (CSI), http://www.gosolarcalifornia.ca.gov/about/csi.php (last visited Mar. 18, 2016).
[56] SREC REGISTRATION PROGRAM, http://www.njcleanenergy.com/renewable-energy/programs/solar-renewable-energy-certificates-srec/new-jersey-solar-renewable-energy (last visited Mar. 28, 2015).
[57] GO SOLAR CALIFORNIA, *supra* note 51.
[58] *Id.*
[59] *Id.*

program is an efficacious way for California to promote installing solar energy systems on the residential level.

The CSI program funds "solar on existing homes, existing or new commercial, agricultural, government and non-profit buildings . . . [it also] funds both solar photovoltaics (PV), as well as other solar thermal generating technologies."[60] In addition, the program funds solar thermal systems (solar hot water) for homes and businesses, called the CSI-Thermal program. The Single-Family Affordable Solar Homes (SASH) program provides rebates for low-income residents that own single-family homes and meet other eligibility criteria. The Multifamily Affordable Solar Housing (MASH) program provides rebates for multifamily affordable housing. Finally, the CSI Research, Development and Deployment (RD&D) program funds, "grants for research, development, demonstration and deployment of solar technologies."[61]

Interestingly, different incentives are offered based on "performance of their solar panels, including such factors as installation angle, tilt, and location rather than system capacity alone. This performance framework ensures that California is generating clean solar energy and rewarding systems that can provide maximum solar generation."[62] California has taken an innovative stance by offering better incentives for better systems. Focusing on the performance of the system likely incites consumers to install better systems in order to receive better incentives.

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[60] GO SOLAR CALIFORNIA, ABOUT THE CALIFORNIA SOLAR INITIATIVE (CSI), http://www.gosolarcalifornia.ca.gov/about/csi.php (last visited Mar. 18, 2016).
[61] *Id.*
[62] *Id.*

The CSI-Thermal Program offers a maximum of $2,719 in cash rebates for solar water heating systems installed in single-family homes.[63] Rebates up to $500,000 are available for multi-family homes and commercial properties.[64] The budget for the CSI-Thermal Program is $250 million from 2010 to 2017 and the goal is for 200,000 systems to be installed.[65] Dedicating $250 million and aiming to create 200,000 systems is an advantageous goal for a project lasting less than ten years. California is serious about its objective of promoting solar energy use.

The SASH Program "provides fully subsidized 1kW systems to very low-income households, and highly subsidized systems to other low-income households."[66] The goals of SASH are to use solar systems to lower electricity use without increasing the expense.[67] Also, SASH's goals include supplying full and partial incentives for low-income participants, allowing homeowners to harness solar power and energy efficiency[68] and finally, lowering the cost of solar energy systems and to develop environmental, economical and sustainable energy options.[69]

In order to be eligible for SASH, the customer must be in the designated service area, must occupy the residence that receives the system, and the residence's total income

[63] *Id.*
[64] GO SOLAR CALIFORNIA, CALIFORNIA SOLAR INITIATIVE, CSI – THERMAL, http://www.gosolarcalifornia.ca.gov/solarwater/index.php (last visited Mar. 16, 2016).
[65] GO SOLAR CALIFORNIA, ABOUT CALIFORNIA SOLAR INITIATIVE, http://www.gosolarcalifornia.ca.gov/about/csi.php (last visited Mar. 16, 2016).
[66] GO SOLAR CALIFORNIA, SINGLE FAMILY AFFORDABLE SOLAR HOUSING, http://www.gosolarcalifornia.ca.gov/affordable/sash.php (last visited Mar. 16, 2016).
[67] *Id.*
[68] *Id.*
[69] *Id.*

must be 80% of the Area Median Income.[70] A fully subsidized system must be given to a customer with very low-income and a highly subsidized system is given to an applicant subject to Federal Income Tax liability and eligibility for the California Alternative Rates for Energy (CARE) Program.[71] Offering low-income individuals the opportunity to install solar energy systems at an affordable cost is a pragmatic idea. California is not only cutting its carbon footprint, but also expanding access to lower energy costs for those who need the help the most.

The MASH Program grants rebates to building owners that install solar PV systems. The goals are to encourage solar energy system use in the affordable housing sector; improve energy use and quality by applying solar technology; lower energy costs; and increase the awareness and appreciation of the benefits of solar.[72] California has found another way to help low-income families alleviate burdensome energy costs while also meeting their goal of going solar. Using solar energy systems in the affordable housing sector is a sensible idea. There is a significant amount of property for use and the solar energy systems help curb the energy costs for people who need the money most. Also, because low-income individuals are able to save on energy costs, they have more resources to spend on other goods or services. All states should make solar energy systems available to all types of consumers, like California is doing.

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[70] *Id.*
[71] *Id.*
[72] MULTIFAMILY AFFORDABLE SOLAR HOUSING, http://proceedings.ases.org/wp-content/uploads/2014/02/SOLAR2013_0203_final-paper.pdf (last visited Mar. 17, 2016).

B. California Solar Research and Development

In addition to programs designed to encourage homeowners to install solar systems, California is investing significant funds into research and development The CSI Research, Development, Demonstration, and Deployment (RDD&D) program has a budget of $50 million through 2016 with a goal "to help build a sustainable and self-supporting industry for customer-sited solar in California."[73] The program focuses on lowering technology costs, improving system performance, educating the public to allow wide-scale use of solar, resolving issues specific to California, and integrating the power of the grid.[74] Research and development is an increasingly important aspect of instituting renewable technology. According to the McKinsey and Company, as part of an implementation strategy, "[f]oster[ing] innovation in the development and deployment of next-generation energy-efficiency technologies to ensure ongoing productivity gains . . . [and prioritizing] [o]ngoing funding and support of energy-efficiency research and development can help keep the United States on a trajectory to even greater productivity gains . . . ."[75] Creating the best technology possible will ultimately lead to more fiscally and technically efficient renewable energy sources.

[73] GO SOLAR CALIFORNIA, SOLAR ENERGY RESEARCH, http://www.gosolarcalifornia.ca.gov/professionals/research.php#csi (last visited Mar. 16, 2016).
[74] *Id.*
[75] MCKINSEY & COMPANY, ENERGY EFFICIENCY: A COMPELLING GLOBAL RESOURCE 3, 17 (Tom Kiely ed., 2010) *available at* http://www.mckinsey.com/~/media/mckinsey/dotcom/client_service/sustainability/pdfs/a_compelling_global_resource.ashx.

Ultimately, California offers a substantial amount of incentives for installing solar energy systems compared to New Jersey. CSI has allocated over $2 billion over the course of less than ten years to encourage and incite solar energy systems use throughout the state.[76] Not only are the rebates available to more affluent consumers, but California has also chosen to fully or partially subsidize solar energy systems for eligible lower-income households.[77] By choosing to offer incentives to all economic classes, California has shown that its dedication to solar energy use is beyond just capitalizing on a new industry. California has paid for all or part of solar energy systems for low-income people, which not only helps reduce green house gas emissions, but also lowers expenses for those low-income people. By investing in a renewable system for low-income individuals, California simultaneously alleviates climate change and economic hardship.

The approach California has taken is very different than New Jersey's. New Jersey offers fewer incentives for solar energy systems.[78] Because New Jersey does not offer direct monetary rebates, but rather offers SREC that can be sold, there is an additional step for New Jersey consumers than Californians.[79] In California one is able to

[76] GO SOLAR CALIFORNIA, ABOUT THE CALIFORNIA SOLAR INITIATIVE (CSI), http://www.gosolarcalifornia.ca.gov/about/csi.php (last visited Mar. 16, 2016).
[77] *Id.*
[78] *Compare* SREC REGISTRATION PROGRAM, http://www.njcleanenergy.com/renewable-energy/programs/solar-renewable-energy-certificates-srec/new-jersey-solar-renewable-energy (last visited Mar. 28, 2015) (explaining New Jersey's solar energy system incentive program) and GO SOLAR CALIFORNIA, ABOUT THE CALIFORNIA SOLAR INITIATIVE (CSI), http://www.gosolarcalifornia.ca.gov/about/csi.php (last visited Mar. 16, 2016) (explaining California's solar energy system incentive program).
[79] SREC REGISTRATION PROGRAM, http://www.njcleanenergy.com/renewable-energy/programs/solar-renewable-energy-certificates-srec/new-jersey-solar-renewable-energy (last visited Mar. 28, 2015).

receive the rebate by merely installing the system.[80] In New Jersey one must obtain credits before you can receive the benefits.[81] If New Jersey implemented some of the initiatives California has regarding incentives, it is likely that more people would be able to afford solar energy systems and the state would curb greenhouse gas emissions.

III. GERMAN ENERGY REGULATIONS FACILITATE INSTALLING SOLAR ENERGY SYSTEMS ON THE RESIDENTIAL LEVEL

A. Renewable Energy Sources Act

Germany has taken a proactive stance on curbing greenhouse gas emissions by promoting the use of renewable energy. For example, Germany's environmental legislation states that because global climate change poses serious issues, it is taking various measures to promote the use of renewable energy and protect the climate.[82] Specifically, the legislation states:

> The challenges posed by global climate change have led to an ambitious climate policy in Germany that in particular promotes the protection of the climate and measures for adaptation to the consequences of climate change. The implementation of various measures focuses inter alia on the reduction of greenhouse emissions and the promotion of renewable energies.[83]

One of the main objectives of Germany's policy is to expand renewable energy use in the electricity sector in Germany and internationally.[84] The nuclear disaster at

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[80] GO SOLAR CALIFORNIA, ABOUT THE CALIFORNIA SOLAR INITIATIVE (CSI), http://www.gosolarcalifornia.ca.gov/about/csi.php (last visited Mar. 16, 2016).
[81] SREC REGISTRATION PROGRAM, *supra* note 68.
[82] BUSINESS LAWS OF GERMANY § 16:79 Special Areas of Environmental Legislation — Climate Protection: Emissions Trading and Renewables (West 2014).
[83] *Id*.
[84] *Id*.

Fukushima in 2011 was one the catalysts behind Germany's decision to focus on renewable energy use, referred to as the new Energy Concept.[85] The predominant objectives of the new Energy Concept are a hasty shift towards renewable energy use and to phase out nuclear energy completely by 2022.[86] Germany is shifting to renewable energy sources to not only mitigate the damages of climate change but to also avoid the horrors of potential catastrophe caused by nuclear power sources. Germany has passed various pieces of legislation to meet those goals.

Most notably, the Electricity Feed-in Law was previously established in 1991 and then repealed in 2000 by the Renewable Energy Sources Act Erneuerbare-Energien-Gesetz (EEG).[87] Essentially, EEG replaced the Electricity Feed-in Law for a more vigorous response to climate change. In 2011, EEG was amended and has recently "led to a considerable increase in the contribution to electricity generation made by renewables . . . ."[88] The goal of EEG is to increase renewable energy sources in the electricity sector to at least thirty-five percent by 2020 and to continue increasing after that.[89] Germany has been able to shift away from nuclear power use and curb greenhouse gas emissions by increasing renewable energy sources in the electricity grid.

To meet its objectives, EEG "regulates priority connection to the grid systems for general electricity supply of installations generating electricity from renewable energy

[85] *Id*.
[86] *Id*.
[87] *Id*.
[88] *Id*.
[89] Erneuerbare Energien Gesetz – EEG [Renewable Energy Sources Act], as amended July 2014, at § 16:114 (Ger.) *translated in* Business Laws of Germany § 16:114 (West 2014).

sources and the priority purchase, transmission, distribution of and payment for such electricity by the grid system operators."[90] By generally encouraging and requiring the use of renewable energy sources, and specifically relying on solar energy systems on the residential level, Germany has become a world leader in renewable energy use.[91]

Germany's catchall legislation sets the tone for the country. EGG requires an increased amount of renewable energy use and the country meets that requirement by various other means.[92] Because Germany's installation process of solar energy systems is remarkably simple, consumers are able to easily install solar systems on their homes. New Jersey, however, maintains an exceedingly cumbersome process regarding solar energy system installation and does not have one all-encompassing piece of legislation comparable to the EGG.[93]

B. Germany's Streamlined Permitting Process Encourages Residents to Install Solar Energy Systems

Germany relies on the use of solar energy systems on the residential level to help meet the goals of the EEG. Germany facilitates installing solar energy systems by streamlining the permitting process.[94] The process to install solar systems on the residential level is much simpler in Germany compared to New Jersey's process. By avoiding a cumbersome installation process, Germany encourages residential solar

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[90] *Id*.
[91] Tom Jackson, *Follow Germany's Lead: Streamlined Permitting*, WORLD.COM (Aug. 09, 2012), http://www.renewableenergyworld.com/rea/blog/post/2012/08/follow-germanys-lead-streamlined-permitting.
[92] *Id*.
[93] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).
[94] Jackson, *supra* note 87.

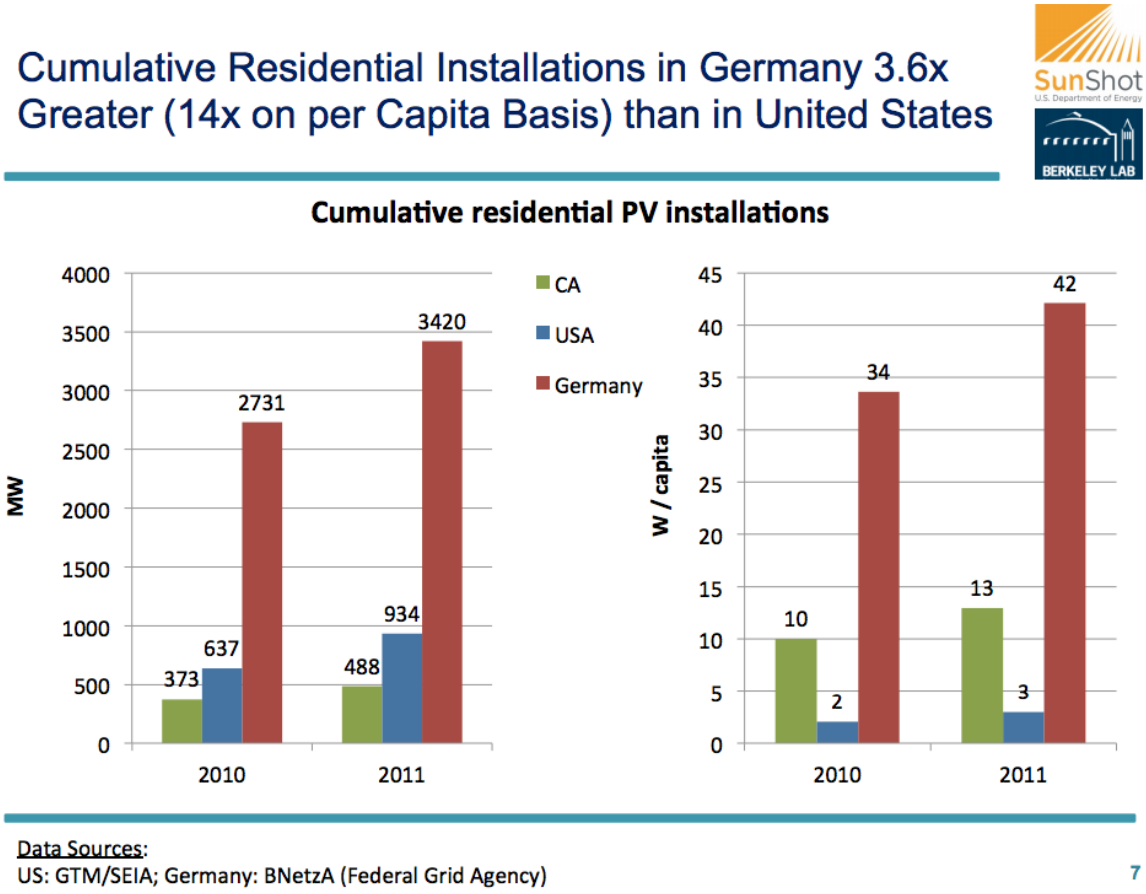
system use as opposed to New Jersey's regulations, which deter residents from installing solar systems.

Germany's simplified regulatory process has significantly impacted the country's ability to install solar energy systems on the residential level. Germany has streamlined its permitting process for installing solar energy systems to the point that an individual could have a solar system installed in less than a week.[95] Germany's standardized process enables consumers to save money and the time prior to installation is significantly reduced. In addition, standard residential solar systems no longer require a permit.[96] Ultimately, Germany requires a single online registration form before a resident can install solar panels.[97] By simplifying the process, Germany encourages and easily enables individuals to invest in solar energy systems.

Germany has been extremely successful through its methods of encouraging renewable energy use. The streamlined permitting process coupled with its feed-in tariff incentive program has caused Germany to be a leader in solar energy use. In 2012, "half of the country's electricity was generated from solar."[98] The simplified permitting process on the residential level for solar energy systems has significantly contributed to this success. For example, the cumulative residential installations are 3.6 times greater in

[95] *Id*.
[96] Jackson, *supra* note 87.
[97] Maury Blackman, *An Inconvenient Process: How Solar Permitting Reform Can Help in the Fight against Climate Change* HUFF POST GENERATION CHANGE (Nov. 10, 2014 2:45 PM), http://www.huffingtonpost.com/maury-blackman/residential-solar-permits_b_6133992.html.
[98] Jackson, *supra* note 87.

Germany than in the United States.[99] It is interesting to see the difference between the United States and Germany's residential solar installations. Also, adding California, the United States' leading country in solar energy use, evidences how much more successful Germany has been in residential solar PV installation. The following chart depicts residential solar PV installations in Germany, California and the United States.[100]



[99] Zachary Shahan, *Why German Solar is so Much Cheaper Than U.S. Solar — Updated Study*, CLEAN TECHNICA (Feb. 17, 2013), http://cleantechnica.com/2013/02/17/why-german-solar-is-so-much-cheaper-than-u-s-solar-updated-study/.

[100] *Id*.

Conversely, New Jersey's process is exceedingly demanding and deters individuals from installing solar energy systems.[101] New Jersey's Residential Development Solar Energy Systems Act has nine minimum requirements one must meet before installing a solar energy system.[102] The mandatory requirements slow the installation process and increase costs. Also, the superfluous minimum requirements have no stated purpose to explain the logic behind them.[103]

Germany has taken a more proactive stance in facilitating solar energy system use on the residential level compared to New Jersey. Both actors have similar stated purposes. New Jersey would like to mitigate climate change and minimize the release of greenhouse gases by encouraging renewable energy use.[104] Germany's motives are analogous to New Jersey's and emphasize the goal of moving away from nuclear power use entirely.[105] However, Germany has been much more successful with its efforts because it has implemented a regulatory system that coincides with the goals of the enacted legislation.[106] New Jersey claims to remove unnecessary and burdensome regulations regarding solar system installation through its Construction Act[107], but the current Solar Act[108] regulations continue to stymie individuals and obstruct their use of

[101] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).
[102] *Id*.
[103] *Id.*
[104] *Id.*
[105] Norbert Wimmer (ed.), BUSINESS LAWS OF GERMANY § 16:79, Special areas of environmental legislation — Climate protection: emissions trading and renewables (West 2012).
[106] Blackman, *supra* note 93.
[107] N.J. STAT. ANN. § 52:27D-120 (West 2009).
[108] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).

solar energy systems. Germany simplified the permitting process to the point that installing solar energy systems is efficient and economically feasible for many residents.

IV. RECOMMENDATIONS

New Jersey must change its current regulations to actually implement energy policies that encourage and facilitate its residents' use of solar energy systems. The incentive programs geared towards renewable energy use must be more amenable to solar PV, similar to California's system. The requirements for residents to install solar PV units must be simplified, like Germany. Ultimately, if New Jersey truly wants to mitigate climate change and avoid future extreme weather disasters like Hurricane Sandy, the state's policies need to change.

A. New Jersey Must Remodel its Incentives Programs

Incentive programs, like New Jersey's Clean Energy Program, are exceedingly important tools for the success of state programs. The daunting expense of solar energy systems and the long-term investment is difficult for most citizens to afford. New Jersey must provide more financial assistance to citizens to encourage the installation of solar energy systems.

California's incentive program is a commendable model for New Jersey to follow. Because California has allocated a significant amount of money solely to the installation of solar PV for residents, it is precisely the type of incentive program that will incite

substantial success for residential solar use.[109] New Jersey should organize its incentive program to be more like California's. New Jersey's current incentive program provides no assistance to citizens with the initial financial burdens of installing solar energy systems. New Jersey's Clean Energy Program merely allows citizens that generate electricity and then receive credits they can sell.[110] Without assistance from the government, prospective solar PV users are unable to install systems because of the cost.

New Jersey should amend the Clean Energy Program to dedicate a specific amount of funds to individuals installing solar energy systems, like the California Solar Initiative (CSI). CSI provides money at the outset for individuals installing solar energy systems.[111] Also, the CSI fully or partially subsidizes systems for low-income consumers.[112] The CSI dedicates a vast amount of resources to all types of consumers, which is a remarkable system to encourage and facilitate solar PV use on the residential level.[113] New Jersey should use this premise to change its incentive program and, rather than solely offering SREC, it should also allocate funding for the initial installation costs for consumers.

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[109] GO SOLAR CALIFORNIA, ABOUT CALIFORNIA SOLAR INITIATIVE, http://www.gosolarcalifornia.ca.gov/about/csi.php (last visited Mar. 16, 2016).
[110] NEW JERSEY'S CLEAN ENERGY PROGRAM, ABOUT NEW JERSEY'S CLEAN ENERGY PROGRAM, http://www.njcleanenergy.com/ (last visited Mar. 28, 2015).
[111] GO SOLAR CALIFORNIA, ABOUT CALIFORNIA SOLAR INITIATIVE, *supra* note 103.
[112] *Id.*
[113] *Id.*

B. New Jersey Must Simplify its Regulations Regarding the Installation of Solar PV

To encourage and facilitate more residents to install solar PV, New Jersey must simplify its regulations. Germany has seen tremendous success because of its streamlined process regarding resident's installation of solar PV. Germans can begin to install solar panels on their homes in less than a week. By avoiding purposeless bureaucratic regulations, German citizens save time and money.[114]

New Jersey should implement a process similar to Germany's. The state's current Construction Act purports its goal is to alleviate excessive costs and time-consuming regulations.[115] Yet, in New Jersey's Residential Development Solar Energy Systems Act many requirements contradict the Act's stated purpose.[116] The state must, at a minimum, rewrite these requirements to be less burdensome to citizens that are trying to install solar energy systems.

For example, the Act could amend the second requirement that mandates that a resident's primary objective of their solar energy system must be to offset all or part of their own electricity demand. The Act offers no reasoning as to why this requirement is necessary.[117] The Act should either state why this requirement is necessary or give less harsh consequences for not abiding by it. Completely disallowing an individual from installing a system because their primary objective is not to offset their own electricity

[114] Jackson, *supra* note 87.
[115] N.J. STAT. ANN. § 52:27D-120 (West 2009).
[116] N.J. STAT. ANN. § 52:27D-141.7 (West 2009).
[117] *Id.*

demand is excessive. The state could charge a fee rather than entirely preventing the installation.

The Act should also amend the third minimum requirement to allow individuals to use refurbished solar energy systems so long as they meet the other standards.[118] Reusing previously used systems would lessen the financial burden placed upon the citizen. By altering this requirement, the Act would be upholding its stated purpose to alleviate construction costs.

The Act must either explain why the solar energy system must have a warranty subject to The New Home Warranty and Builders' Registration Act per the fourth requirement. This requirement mandates residents to follow an entirely different act.[119] Not only is that time-consuming, it also adds other expenses. The Act should give its rationale or remove the caveat that it must follow the other legislation.

Finally, the fifth requirement that mandates every resident to install a meter must be changed.[120] Rather than mandating a metering system the Act should encourage it and perhaps impose a fee if a resident opts not to install a meter. The Act must justify its meter requirement. More information about the metering system would be helpful for individuals to understand why this additional cost exists. Another option would be to give a discount for those who do install meters. Ultimately, the Act should be more transparent

[118] *Id.*
[119] *Id.*
[120] *Id.*

with the purpose behind the minimum requirements to instill a complete understanding of each requirement's importance to individuals.

A more rigorous solution to New Jersey's burdensome regulations regarding the installation of solar energy systems would be to completely amend the Residential Development Solar Energy Systems Act to be entirely like Germany's. Germany has had an enormous amount of success with its system and New Jersey should follow suit.[121] Streamlining the permitting process to be as simple as one online registration form could revolutionize the installation of solar energy systems in New Jersey and potentially throughout the entire country. If New Jersey acts as the laboratory for a streamlined permit system and sees success like Germany has, other states are likely to follow.[122]

The process in New Jersey to install residential solar energy systems should be simplified like Germany's process. More people would be able to install solar PV if the process was simpler. The state could completely revitalize its current legislation or at least amend the more burdensome requirements. Facilitating consumer's efforts in using solar energy systems should be one of New Jersey's top priorities.

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[121] *See* Tom Jackson, *Follow Germany's Lead: Streamlined Permitting*, WORLD.COM (Aug. 09, 2012), http://www.renewableenergyworld.com/rea/blog/post/2012/08/follow-germanys-lead-streamlined-permitting (explaining why Germany has been so successful in installing residential solar PV and describing the permitting process in the United States) "Though the price of solar products is decreasing and solar adoption is steadily increasing in the United States, the costly, inefficient permitting processes are a burden to the buyer and impede progress of the solar industry at large." *Id.*

[122] *See* ELLIS KATZ & GEORGE ALAN TARR, FEDERALISM AND RIGHTS 17 (1996) (discussing Justice Louis Brandeis' metaphor of states to experimental laboratories for the country); *See New State Ice Co. v. Liebmann*, 285 U.S. 262, 311 (1932) (Brandeis, J., dissenting) "It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country."

The following chart compares New Jersey, California, and Germany regarding solar energy incentive programs and energy regulations, respectively.

	New Jersey	California	Germany
Incentive Programs for Residential Solar PV use.	The New Jersey Clean Energy Program only offers SREC to offset the high cost of installing solar PV. SREC are credits that the consumer can sell after using the energy system.[123] An incentive program that truly helps compensate the expense of solar energy systems should pay out before/during installation.	The California Solar Initiative provides upfront monetary incentives to all types of economic consumers.[124] Relieving the initial high cost of installing solar energy systems is important because the investment is overwhelming for the average consumer.	
Solar Energy Regulations.	New Jersey's Residential Development Solar Energy Systems Act purports to remove burdensome regulations and expenses to help encourage the use of solar energy systems on the residential level. However, in effect, the Act stymies the proposed purpose. The regulations are cumbersome and expensive.[125] New Jersey should incorporate a streamlined permitting system to uphold the Act's stated purpose.		Germany has a streamlined permitting system that allows residents to install solar PV within a week. The goal is to mitigate climate change and encourage the use of renewable energy.[126] Germany has successfully set up a system that encourages residents to install solar PV.

[123] NEW JERSEY'S CLEAN ENERGY PROGRAM, SREC REGISTRATION PROGRAM, http://www.njcleanenergy.com/renewable-energy/programs/solar-renewable-energy-certificates-srec/new-jersey-solar-renewable-energy (last visited Oct. 24, 2014).
[124] GO SOLAR CALIFORNIA, ABOUT THE CALIFORNIA SOLAR INITIATIVE, http://www.gosolarcalifornia.ca.gov/about/csi.php (last visited Mar. 16, 2016).
[125] N.J. STAT. ANN. § 52:27D-120 (West 2009).
[126] Jackson, *Follow Germany's Lead: Streamlined Permitting*, (Aug. 09, 2012). http://www.renewableenergyworld.com/rea/blog/post/2012/08/follow-germanys-lead-streamlined-permitting.

V. CONCLUSION

In conclusion, New Jersey energy regulations deter residents from installing solar PV. The process to install residential solar energy systems is onerous, time-consuming and expensive. The incentive programs that would typically assist consumers in offsetting the initial financial burden of installing solar energy systems are inadequate. In order for New Jersey to actually become a leader in solar energy use it must change its current legislation. New Jersey should model its incentive programs after the California Solar Initiative to provide meaningful assistance to all types of consumers. In addition, New Jersey needs to simplify the Residential Development Solar Energy Systems Act to be more efficient and affordable, similar to Germany's streamlined permitting process. Fundamentally, the fight against climate change needs to be as formidable as Hurricane Sandy was. If New Jersey wants to make a serious commitment to combating climate change it must change its regulations.