

POINTE COUPEE

PARISH GOVERNMENT

P.O. Box 290
160 East Main Street
New Roads, Louisiana 70760
PHONE: 225-638-9556 FAX: 225-638-5555

MAJOR THIBAUT
Parish President

June 28, 2021

The following comments are based in my experience as the parish president for Pointe Coupee Parish and the last two years of meetings, negotiations, and dealings with multiple industrial solar companies. During this time, many of the comments, concerns, and questions our parish dealt with represented in HCR 40 by Speaker Schexnayder, SR 182 by Senator Mizell, and Act 301 by Senator Allain.

Pointe Coupee Parish has long been one of the leading producers of agriculture in our state. We have a broad range of crops that are produced within our parish including sugarcane, soybeans, rice, crawfish, timber and cattle. The fertile soils in our parish provide for many families, businesses and revenue for our local governmental entities. Our residents as well as our elected leaders have had many of the same questions that the legislature and other parishes have had with the emergence of industrial scale solar in our state and nation. Rather than waiting and potentially losing out on hundreds of millions of investment dollars into our rural parish by the industrial scale solar industry, our parish government sought to address many of those issues and concerns at the local level. We accomplished this by developing an ordinance/solar permit that addressed several key areas. Those areas included drainage, traffic, buffer zones, secured access/lighting, decommissioning, and maintenance.

With that said, I think it is appropriate that state regulations and guidelines do need to be developed for Louisiana for this emerging alternative energy source. Act 301 is a great starting place. As we learn more, these rules and guidelines can be changed and adapted over time. Just as our state accomplished with the oil and gas industry over a 100-year timeframe.

In Pointe Coupee we want to preserve our rural feel and agricultural heritage. The solar ordinance we developed allows our local government the ability to place a moratorium on the permit thus limiting the amount of solar related development we would like in our parish. Currently we have a permitted a 300-megawatt project that encompasses approximately 2000 acres of mostly non-productive land that is scheduled for construction later this year. For Pointe Coupee this project and others represents a great opportunity for our parish. This one project is will provide over a \$300,000,000 investment into our rural parish that lacks industrial development.

While it provides for few permanent jobs, it does provide for approximately 400 construction jobs for 15-18 months. It will also provide ad valorem taxes at an industrial rate on the land as well as on approximately \$200,000,000 of equipment and infrastructure. The local sales tax generated from the equipment purchased on this project generates over \$7,000,000 just

Administration
225-638-9556

Finance
225-638-9556

Public Works
225-638-5552

Parks & Recreation
225-638-3870

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in itself. Besides diversifying our local school system, sheriff's office, and parish government revenue stream it also provides our parish with a new industry that does not tax or strain our resources. In other words, our law enforcement will not be burdened, or sewer, water and gas systems will not be overrun, no extra classroom spaces are required, drainage is actually improved in the area and the fire district does not take on an increased risk. I do believe it is the states obligation to set solar industry standards and regulations for our great state, I do believe that local governments and land owners with in our parishes are quite capable of determining how many projects are appropriate within their respective borders.

HCR 40 focuses mostly on ITEP. I do believe studying what other states offer as exemptions is appropriate to see if the current 80/20 exemption over 10 years is competitive perhaps it can be lowered and we still remain competitive with other states. This study should not be done at the expense of projects already in the pipeline. When that evaluation is complete necessary changes can be made at the legislature to make a change to ITEP exemption percentages for solar. We must not forget that in the ITEP process the local governmental entities do have a say so and can deny the request if the exemption is too rich, or the parish can alternatively enter into a PILOT if they want to customize their exemption.

In summary, I believe industrial solar development within reason is a great opportunity for our state. I believe minimum standards and regulations regarding solar leases, decommissioning standards, and buffer zones should be established. At the end of the day these regulations and promulgated rules should not hinder local government's ability to make their own choices. The citizens of our state, the landowners themselves, and our local elected officials know what is acceptable and right for their respective communities and local economy.

Thank you for your consideration of this matter. I am happy to speak to you further if you have any questions or concerns. I am,

Sincerely yours,

A handwritten signature in blue ink, appearing to read "Major Thibaut", with a stylized, flowing script.

Major Thibaut

AN ORDINANCE

To enact Chapter 26, of the Pointe Coupee Code of Ordinances, pertaining to Solar Farms; and to otherwise provide with respect thereto.

BE IT ORDAINED by the Pointe Coupee Parish Council in regular session convened that Chapter 25 of the Pointe Coupee Code of Ordinances is hereby enacted to read as follows:

CHAPTER 26. SOLAR FARM REGULATION

ARTICLE I. Administration

Sec. 26-1. - Purpose.

The purpose of this article is to promote the health, safety and general welfare by regulating solar farms within the Parish of Pointe Coupee.

Sec. 26-2. - Definitions.

For the purposes of this Chapter the following terms shall mean:

- (a) Solar energy: Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.
- (b) Solar energy system: A device or structural design feature intended to provide for collection, storage, and distribution of solar energy for heating or cooling, electricity generation, or water heating.
- (c) Solar farm: The use of land where a series of solar collectors and related equipment and accessories are placed in an area on a parcel of land for the purpose of generating photovoltaic power which has a generation capacity of at least fifteen fifty (45 50) kilowatts (kW) direct current (dc) or more when operating at maximum efficiency. Solar farm shall not be interpreted to mean one or more solar collectors intended to provide electrical power generation for a single residential dwelling or commercial property.

Sec. 26-3. - Permits and Fees.

- (a) Prior to placing, establishing, expanding, or substantively altering the operation of a solar farm, a permit must be obtained by the developer from the Parish of Pointe Coupee. Permits shall be issued only after the plan therefor has been approved as provided for in this Chapter.
- (b) The Parish shall develop and promulgate a Solar Farm Permit Application to be submitted along with the plans for the proposed solar farm. Each Application will include a site plan showing all property to be included in the project, all access roads, drainage study, environmental study, and a traffic plan. The applicant shall conduct at least one community meeting to provide adjacent landowners and the public an opportunity to ask questions and discuss the project. The community meeting shall be conducted prior to permit approval. Notice of the public meeting shall be published at least twice in the official journal and the meeting shall be held at a location in the parish which is suitable for public meetings.
- (c) The applicant shall include with the permit application the plan for the solar farm that meets the requirements provided for in this Chapter.
- (d) The permit application shall be submitted to the Parish Building Official, and upon submission of a permit application the applicant shall pay a fee to the Parish in the sum of \$500.00 1000.00 for a solar farm consisting of 500 acres or less. For a solar farm consisting of more than 500 acres, the fee shall be \$1000.00 plus an additional \$1.00 for each acre in excess of 500 acres. The applicable permit fee shall be determined by consideration of the entire project, inclusive of buffer zones and access roads.

(e) The application and plan shall be reviewed by the Parish Building Official. If approved by the Building Official, the application, plan and any comments by the Building Official shall be forwarded to the Parish Engineer for review. If approved by the Parish Engineer, the application, plan and any comments thereon shall be forwarded to the Parish President for review and consideration. If approved by the Parish President, the Parish Engineer and the Building Official, the permit shall be issued. The Parish President, or a designee, shall present the application and plan to the Parish Council to approve or deny the permit.

(f) If the application is denied at any step of the review process, the official issuing such denial shall provide a written statement as to the reasons for the denial to the applicant and the applicant shall be afforded thirty days to submit additional information or an amended plan to remediate the defects that were the basis for the denial. If the application is finally denied, the applicant shall have the option to appeal the denial to the Council, and the Council may, by majority vote, direct the Parish President to grant the permit.

(g) A permit issued under this Chapter may, with the approval of the Parish, be transferred or assigned, with the assignee being obligated to all requirements of the permit and this Chapter; however, written notice of such transfer or assignment shall be made to the Parish and the identity of the new permittee shall be noted in the Parish records.

(h) The issuance of a permit under this Chapter shall serve as the agreement and acknowledgment by the permittee, and its successors and assigns, as well as the property owners, that Pointe Coupee Parish Government shall have standing to enforce any and all provisions and obligations of the permit.

(i) A permit shall expire one year from the date of issuance, unless construction has commenced on the solar farm. After the expiration of a permit, the applicant may reapply.

ARTICLE II. REQUIREMENTS FOR SOLAR FARMS

Sec. 26-4. - Single or Multiple Tracts.

(a) A Solar Farm may be operated on a single contiguous tract or multiple non-contiguous tracts, either with ownership by applicant, under one or more leases in which applicant is lessee, or any combination thereof.

(b) Any permit issued for a solar farm which relies upon one or more lease agreements shall become null and void upon the termination of any such lease agreement, unless the lease agreement is terminated upon the permittee/lessee taking ownership of the property previously subject to the lease.

Sec. 26-4.5. - Traffic Plan.

(a) The plan for a proposed solar farm shall include a traffic plan for the movement of vehicles that will use parish roads during the construction, maintenance and decommissioning of the solar farm.

(b) The plan shall provide for the remediation of any damages occasioned to parish roads during the construction or erection, maintenance and decommissioning of the solar farm.

Sec. 26-5.6. - Drainage Plan.

(a) The plan for a proposed solar farm shall include a drainage plan.

(b) The drainage plan shall include an hydrologic and hydraulic (H&H) analysis to establish that the solar farm will not have any adverse impact on the parish drainage system or adjacent property owners; alternatively the drainage plan shall establish a plan for remediating any adverse impact on the parish drainage system or adjacent property owners that may result from the construction of and the operation of the solar farm. The plan shall also include an ongoing schedule of water sampling and testing of water runoff from the site of the solar farm.

Sec. 26-6 7. - Buffer Zones.

(a) The plan for a proposed solar farm shall include the provision of a buffer zone around the perimeter of the solar farm.

(b) The buffer zone shall include a setback of not less than 300 feet from the center of any adjacent public roadway.

(c) The buffer zone shall include a setback of at least 150 feet from any residence and 50 feet from any adjacent property line used for residential purposes at the time of the application.

(d) Each buffer zone shall include a stand of trees or shrubbery, between the operational area of the solar farm and the adjacent roadway or property owner, to screen the solar farm from view, the sufficiency of which is subject to review and approval as part of the plan.

(e) The buffer zone shall be maintained in such a manner so as to not present a nuisance as provide for otherwise in the Code of Ordinances. Maintenance thereof shall be subject to the enforcement provisions in regard to nuisances.

Sec. 26-7 8. Secured access and Lighting.

(a) The plan for a proposed solar farm shall include a plan for secured limited access to the solar farm.

(b) The plan for a proposed solar farm shall include the minimum lighting necessary for the safe operation of the solar farm and shall be designed to limit, to the extent practicable, the impact of artificial lighting of adjacent roadways or properties.

Sec. 26-8 9. Decommissioning Plan.

(a) The plan for a proposed solar farm shall include a decommissioning plan for the remediation of the area of the solar farm upon the cessation of operations of the solar farm.

(b) Cessation of operations for a period in excess of 180 consecutive days or a lack of operations for more than 180 days, in the aggregate, in any calendar year, shall trigger the decommissioning plan and termination of the permit.

(c) The decommissioning plan shall provide for the removal of the solar panels, ancillary structures, and other infrastructure utilized in the operation of the solar farm.

(d) The decommissioning plan shall provide for the remediation of any environmental hazards remaining on the property of the former solar farm, as determined by the EPA, DEQ or the Pointe Coupee Government.

(e) Any lease forming a portion of the application for the original permit shall include reference to the decommissioning plan and the funding thereof as a necessary term therein.

Sec. 26-9 10. Maintenance Plan.

(a) The plan shall include a schedule of maintenance of the solar farm and buffer zone including but not limited to grass cutting, shrubbery and tree maintenance, and general upkeep of the premises.

(b) Adherence to the plan is subject to periodic or random inspections by the Parish, and the Parish may require the adherence to the plan in regard to maintenance.

(c) In the event an inspection notes a failure to adhere to the plan, the Parish may levy a fine of up to \$100 if the applicant fails to remedy the failure within one day of such notice. Each day thereafter shall be an additional violation and shall be subject to an additional \$200 fine for each violation until the failure is remedied. After five consecutive days of violation, the per day fine shall increase to \$500. A repeat violation within the same month as a prior violation is remedied shall be subject to a fine of \$500. Such fine shall apply to each day of the repeat violation shall

provide written notice to the permittee of the deficiency, which notice shall be deemed provided upon delivery by mail or electronic means. The permittee shall have five days from the date of delivery of the notice to remediate the deficiency. If the permittee fails to remediate the deficiency, the permittee shall be fined \$500.00. The permittee shall be fined \$500.00 for each day, or part thereof, for each subsequent day that the deficiency is not remediated, with each day considered a separate violation.

(d) The Parish may also enforce the plan through the existing parish ordinances in regard to nuisances.

All ordinances or parts thereof in conflict herewith are hereby repealed.

This ordinance shall take effect upon its adoption.

Should any provision of this ordinance, or the application thereof, be held invalid, such invalidity shall not affect the validity of the remaining portions of this ordinance.

A public hearing was held on March 9, 2021, after due advertisement, and the ordinance was duly adopted by the following roll call vote:


YEAS: Messrs. Gaspard, LaCoste, Soulier, Watkins, Jarreau, Bazile, Bergeron and Boudreaux.
NAYS: None.
ABSTAIN: None.
ABSENT: None.

On a vote of 8-0-0-0, the ordinance was declared adopted this 9th day of March, 2021.

APPROVED:


Dustin Boudreaux - Chairman

ATTEST:


Gerrie P. Martin - Council Clerk

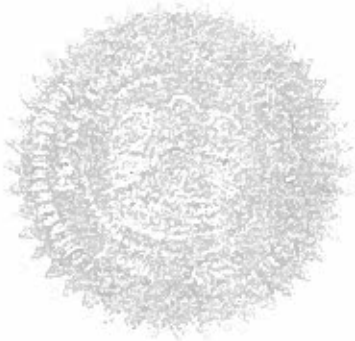
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STATE OF LOUISIANA

PARISH OF POINTE COUPEE

I, GERRIE P. MARTIN, Council Clerk of the Parish Council of the Parish of Pointe Coupee, Louisiana, certify that the above and foregoing constitutes a true and correct copy of an ordinance of the Pointe Coupee Parish Council adopted at its regular meeting on March 9, 2021.

IN WITNESS WHEREOF, I have subscribed my official signature and impressed the official seal of the Pointe Coupee Parish Council, Louisiana, this 9th day of March, 2021.



Gerrie P. Martin
Gerrie P. Martin – Council Clerk

* * * * *

This ordinance was submitted to the Parish President on the 12th day of March, 2021 at 9:10 a.m.

APPROVED:

Major Thibaut
Major Thibaut - Parish President

RETURN RECEIPT

This ordinance was returned to the Council Clerk on the 12th day of March, 2021 at 10:00 a.m.

**Louisiana Farm Bureau Federation Testimony
Presented To
The Louisiana Department of Natural Resources and the Louisiana Department of
Agriculture and Forestry
Regarding Senate Resolution 182 of the 2021 Regular Session – Concerns Regarding
the Development of Solar Energy
June 29, 2021**

The Louisiana Farm Bureau Federation submits the following testimony to the Louisiana Department of Natural Resources and the Louisiana Department of Agriculture and Forestry regarding solar energy's impact to Louisiana agriculture. The Louisiana Farm Bureau Federation is not opposed to solar energy and recognizes that it offers new opportunities for some landowners. However, solar energy development on agricultural acres under current laws, rules and regulations stands to alter the long term value of the property and also creates challenges after decommissioning of the solar site for the land to return to crop production of some commodities. Therefore, Louisiana Farm Bureau testimony highlights Farm Bureau's current policy on solar energy and our concerns about how solar energy development may impact our Louisiana's agricultural industry and farmers.

Farm Bureau Policy on Solar Energy on Agricultural Acres

Farm Bureau members vote every year on policy positions impacting agriculture.

Below is Farm Bureau policy on solar energy.

11. Solar Energy

11.1 - We Support:

- 11.1.2 – Establishment of state standards for commercial solar energy conversion systems that protect private property rights and allow for reasonable development of projects;
- 11.1.3 – Ensuring adequate funds are in place for decommissioning
- 11.1.4 – Allowing landowners the option of terminating a solar lease agreement if solar panels fail to produce energy for a period longer than 12 consecutive months; and
- 11.1.5 – Efforts to locate solar energy projects on marginal or underused lands.

Solar Plants – Loss of Agricultural Acres for Tenant Farmers

In Louisiana, the majority of Louisiana's agricultural production is produced by "tenant farmers" who lease or rent land from a landowner. Tenant farmers either pay the landowner a share of the crop they produce as "share rent" or they pay a flat rate as "cash rent" to the landowner for the use of the land to plant crops or pasture animals.

According to the LSU Ag Center - Dept. of Agricultural Economics and Agribusiness - Asst. Professor - Dr. Naveen Adusumilli in an article titled, "Farm Size, Tenure, and Age Distribution of Farmers in Louisiana", Dr. Adusumilli reported that tenant farmers farm 3 times more acres than farm owners.

The Louisiana Dept. of Agriculture and Forestry and the Louisiana Dept. of Natural Resources should understand that one of the biggest jeopardies of solar energy development in Louisiana is the jeopardy it poses to the majority of Louisiana farmers who are tenant farmers. Louisiana tenant farmers fear they could lose substantial portions of their farm acres, or all of their farm acres, if their landowner(s) leases large portions of the agricultural acres they are currently farming to a solar company. Therefore, there are concerns in the farming community that if substantial portions of the land they farm are leased to a solar company, they could lose their livelihood.

Impact to Agricultural if Solar Plants are Concentrated in a Region

According to a comment from Stephen Wright, Executive Director of the Gulf States Renewable Industry Association, solar development in Louisiana would consume less than 1% of available farmland in Louisiana. To put that in perspective, according to the National Agriculture Statistics Service (NASS), Louisiana has approximately 8 million acres in agriculture.

Therefore, projections of solar energy consuming around 1% of Louisiana's agricultural acres translate to about 80,000 of Louisiana's agricultural acres that could be lost to solar development.

A huge concern for Louisiana agriculture is if solar plants are concentrated in a given region. For example, if a sugar mill processes sugarcane from 45,000 acres of sugarcane grown in their region and solar plants convert 15,000 acres of their sugarcane acres to solar plants, it could leave the sugar mill without sufficient sugarcane to continue operation and force the sugar mill to close.

This could leave the remaining sugarcane acres processed by the sugar mill without one to process their sugarcane. If this was multiplied with solar plants concentrating in the industrial corridor around the Mississippi River and multiple sugar mills lost thousands of acres of sugarcane to solar plants, it could hurt the Louisiana sugarcane industry and cripple the agricultural infrastructure that supports many small Louisiana agricultural communities. Therefore, concentration of solar energy development in a specific production region could have dire consequences for agriculture and farm communities in that region.

Conversion of Agricultural Acres to Solar – Permanent Loss of USDA Program Crop Base

Many not familiar with agriculture fail to realize that when agricultural acres are converted to a non-agricultural use that the USDA Program Crop Base attached to the agricultural acres are permanently lost. This means that after the solar plant is decommissioned that the acreage would no longer be eligible to receive USDA Farm Program support to plant program crops such as rice, soybeans, corn, cotton or grain sorghum. It would be difficult for solar plant acreage after being decommissioned to return to agronomic crop production of crops such as soybeans, corn, rice, cotton and grain sorghum without USDA farm program support.

Conversion of Agricultural Acres to Solar on Prior Converted (PC) crop acres results in Permanent Loss of Prior Converted crop acre status

A significant portion of Louisiana's crop acres are classified as Prior Converted (PC) crop acres and are permitted to remain in crop production under provisions associated with the Clean Water Act. When Prior Converted (PC) crop acres are converted to a non-agricultural use such as a solar plant, the acres converted to a solar plant will permanently lose their Prior Converted (PC) crop acre status. Therefore, the solar plant acres after decommissioning will not be able to return to agricultural production as Prior Converted (PC) crop acres. There are Farmed Wetland options but realistically, there would be few economically viable agricultural uses for Prior Converted (PC) farm acres after the land after decommissioning from solar energy production.

Conversion to Solar Plant – Loss of Agricultural Use Value Rate of Taxation

Agricultural acres in Louisiana are taxed based on agricultural use value based on the revenue of the crops produced. When agricultural acres are leased by solar plants, the tax rate on the property will change and will be a higher property tax rate.

However, when the solar plant is decommissioned and the landowner's acres are no longer leased by the solar plant, many are concerned that the higher property tax rate would still apply to the land leaving the landowners to pay the higher solar plant property tax rate without the solar plant lease revenue.

Conversion of Agricultural Acres to Solar Plants – Local businesses loss of sales

Farmers purchase many inputs to operate such as fuel, fertilizer, chemicals, tires, chains, farm equipment, farm implements etc... and employ many full and part time employees. The dollars spent by farmers in a community are many times the farm community's primary source of revenue. We are very concerned that the economic contributions and taxes paid by agricultural businesses and buy products to and from farmers and the overall economic activity supported by farms in a community are not taken into consideration.

By contrast, after the solar plants are constructed, they produce almost no employment and will not purchase the agricultural inputs that have kept local farm communities in business for generations. Large scale solar development on agricultural acres in a specific region would be detrimental to businesses in small farming communities that rely on business with farmers to survive.

Compensation for Value of Crops on Agricultural Acres when Converted to Solar Plants

Since landowners will be negotiating solar leases without input from their farmer(s), there are concerns regarding tenant farmer's receiving proper compensation for their crops in the field once solar plant construction begins.

For example, crops such as sugarcane have a multi-year value as the sugarcane crop in the field may be in year one of a three year production cycle. The goal is to compensate the farmer for the full value of the crop in the field for its entire production cycle.

Tenant farmers are also concerned about receiving compensation for the improvements they have made on leased property such as drainage and irrigation improvements that cannot be transferred or moved. Many fear that they will not be properly compensated for their land improvements they have made on leased agricultural acres when the land they farmed is leased to a solar plant.

There have been concerning reports recently that compensation is being offered to tenant farmers based on planted acres with the acreage in field ditches and headlands being subtracted to reduce the compensation that is being paid to the tenant farmer.

Funding for Rehabilitating Acres after Decommissioning of Solar Plants

One of the biggest concerns in agriculture is making sure that solar plant leases require a bond that will pay for the full cost of removal of all of the solar equipment once the solar plant is decommissioned and pay for complete rehabilitation of the property. Since the ownership of the solar plant may change several times before it is decommissioned, rules and regulations should require that solar plants must post a bond to pay for the full cost of clean-up and rehabilitation of the property after decommissioning in Louisiana.

Loss of Wildlife Habitat when Agricultural Acres are converted to Solar Plants

Agricultural crop acres provide habitat for many forms of wildlife. Solar plants with solar panels and little vegetation do not provide the similar habitat for wildlife. We are concerned that solar plants will reduce habitat for wildlife.

Lack of State Regulation on Solar Energy

Louisiana's Mineral Code affords many protections for landowners and provide regulations that guide those involved in mineral exploration.

Louisiana's Mineral Code does not apply to the development of solar energy leaving landowners with few legal rights should a dispute develop between the landowner and the solar company. There is also little governance and legal guidance for those involved in solar energy development in Louisiana.

Several provisions in Louisiana's Mineral Codes such as those dealing with servitudes, dissolution, possession, extinction, royalties, contracts etc... should be studied and if applicable, expanded to apply to solar energy.

There should also be consideration regarding the regulatory authority of the Public Service Commission's ability to regulate solar energy after seeing the impact on the pricing of electricity during the 2021 freeze in Texas.

Severe Storm Damage – Impacts and Cleanup

With Louisiana's proximity to the Gulf of Mexico and the occurrence of severe weather, tropical storms and hurricanes there are concerns regarding damage to solar plants. The damage could not only impact the facility's energy generation but could also spread debris from damaged solar panels onto other property. Who would be responsible for the cleanup and associated costs for the damages on the site and other landowners?

Closing

The Louisiana Farm Bureau Federation appreciates the opportunity to comment to the Louisiana Department of Natural Resources and the Louisiana Department of Agriculture and Forestry on the potential impacts of solar energy development to Louisiana agriculture. We hope you will consider our comments in developing regulatory framework for solar energy in Louisiana.

Thank You.

Robin Narez

From: Andy Kowalczyk <andy@senergysolutions.org>
Sent: Tuesday, June 29, 2021 1:29 PM
To: Mollie Montelaro; Robin Narez
Subject: Comments regarding Act 301 and SR182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Honorable Senator Beth Mizell
Honorable Senator R.L. Allian II

Secretary Harris and DNR staff,

My name is Andy Kowalczyk, and I am a sole proprietor and independent consultant with Sustainable Energy Economy Solutions. My primary scope of work is related to issues on the MISO bulk electricity market, but I have a past in working on regulatory issues related to distribution service for utilities, and facilitating growth of renewable energy in Louisiana, Arkansas, Mississippi and Texas.

I am a resident of Louisiana, and I've worked for many years as an advocate with the environmental group 350 New Orleans. I strive to find solutions that promote equity and environmental justice for communities throughout the state, and that extends to landowners. I speak as an advocate for renewable energy, both in my consulting practice, but also in terms of the value it can have in promoting the public good. I am not getting paid as a consultant to deliver this testimony, but I'm offering these comments as a concerned citizen that wants the best for the future of the state and landowners.

The amount of solar projects currently waiting to be interconnected to the grid in Louisiana, is a little over 6.7GW's of capacity according to one of Louisiana's two grid operators, MISO (SPP being in the Northwest of the State). According to a report by the National Renewable Energy Laboratory in Boulder, CO, the amount of land required to interconnect these resources equates to roughly 60,000 acres. This number may sound large to some folks, but it's worth considering that availability of this land is highly distributed and dependent on existing and future grid infrastructure in the state. To interconnect to MISO is a costly and lengthy process both in terms of upfront costs, as well as additional costs identified later in the process. It takes an average of two years from the time that a developer enters a project into the MISO 'queue' before the cost to interconnect is identified, and subsequently, if a developer enters into an 'interconnection agreement', the costs must be paid to interconnect to the grid. In recent years the cost to interconnect projects in MISO have been prohibitively high, and created a hurdle for new projects for some developers. I bring this to your attention, because there are existing, physical and financial constraints on land use currently that prohibit development in the state. It's important to understand that the interconnection process requires fees of up to \$750k upfront, depending on the size of a project.

Louisiana has over 7 million acres of agricultural land in the state, with only half of it being in production according to the USDA. If all 6.7GW's of capacity in MISO's queue were to get connected in Louisiana, that still is only about 2% of the unproductive land in Louisiana. The nature of the transmission grid all but guarantees that this land use would be distributed across the state, and not delegated by land density, even in the case that every one of these projects get built (unlikely, considering over 2016-2020 3GW's of projects withdrew from the queue)

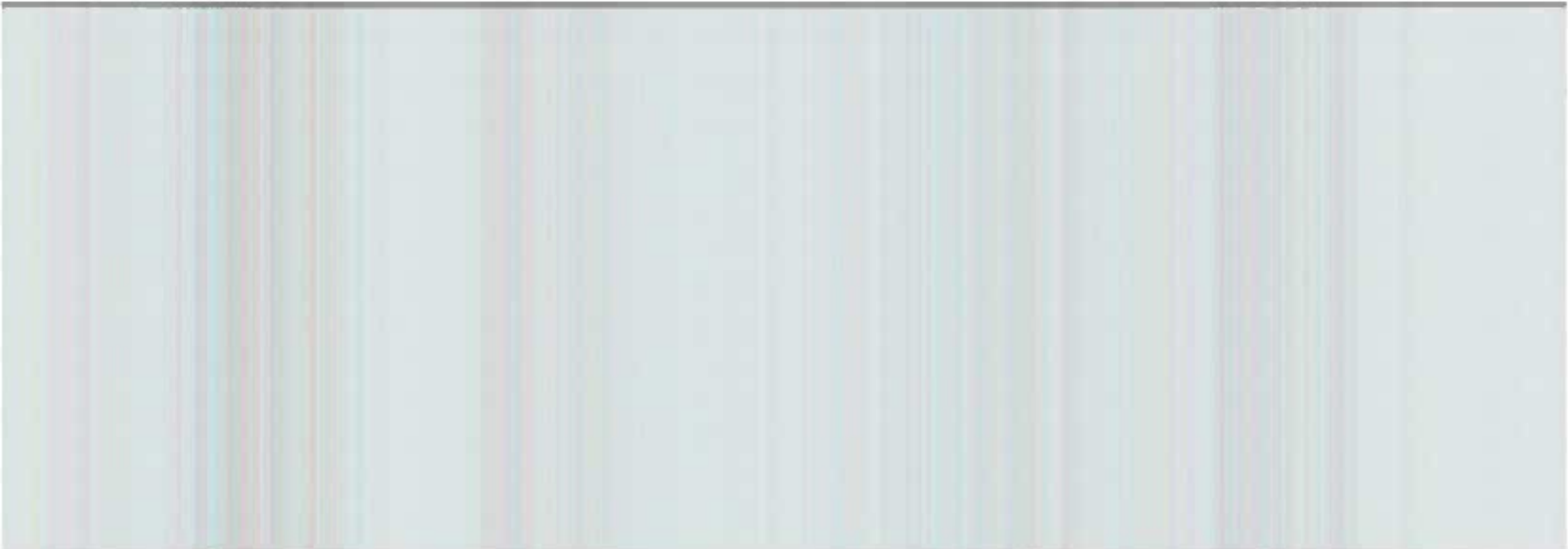
Robin Narez

From: Ashley Stephens <ashleys@lfbf.org>
Sent: Tuesday, June 29, 2021 11:16 AM
To: Mollie Montelaro; Robin Narez
Cc: Kyle McCann
Subject: Solar Comments - Benson Langlinais
Attachments: Solar Comments B. Langlinais.pdf

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Good morning! Pleased see the attached comments from one of our Farm Bureau leaders, Benson Langlinais, regarding his thoughts on solar energy with regards to agriculture. Thank you!

Ashley M. Stephens
Executive Liaison
Louisiana Farm Bureau Federation
225-922-6201



Dear Sirs:

I think expansion of solar energy is good but believe the efforts should be focused on existing and future roof tops. This would prevent the competition of solar energy with the production of Food and Fiber. Good productive Farm Lands are very important not only too Louisiana's economy but the nation's economy as well. Agriculture is very important to the Louisiana economy and Food and Fiber production should not be in direct competition with energy. The use of existing roof tops makes more sense because each roof top is directly tied to the existing grids and doesn't compete with Agriculture Solar energy is only available to produce energy when the sun shines. It has no value when it's dark so half of the day it has no value for Energy production. Here in Louisiana we grow crops not only when the sun shines but we grow crops as long as the temperatures are into the seventies during night time. Let's not make decision based only on energy along Food and Fiber are the most important resources to Louisiana and the nation and this is a valuable resource in our national Security.

Respectfully Submitted,

Benson J Langlinalais
4701 Railroad Rd
New Iberia LA 70560-9256
(337) 685-4817
ben-langlinalais@delcambre.net

Robin Narez

From: Mollie Montelaro
Sent: Tuesday, June 29, 2021 7:54 AM
To: Robin Narez
Subject: Fwd: Support of solar installations in the state

Print and add.

Mollie Montelaro
Confidential Assistant to the Secretary
Louisiana Department of Natural Resources
Office: 225.342.4681
Cell: 251.423.7330

Begin forwarded message:

From: Brenda OConnell <grammy.oconnell@gmail.com>
Date: June 29, 2021 at 7:42:20 AM CDT
To: Mollie Montelaro <Mollie.Montelaro@la.gov>
Subject: Support of solar installations in the state

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

I was very encouraged to learn that there were efforts being made in Louisiana to invest in solar energy and to begin to do our part to stem the tide of global climate change by looking to renewable energy sources. I strongly support the efforts being made to begin to move away from dependance on fossil fuels. I believe that many of the concerns listed in the proposed legislation could be ameliorated.

Brenda O'Connell

CONFIDENTIALITY NOTICE

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Robin Narez

From: Mollie Montelaro
Sent: Tuesday, June 29, 2021 7:55 AM
To: Robin Narez
Subject: Fwd: comments on senate resolution 182

Please print and add.

Mollie Montelaro
Confidential Assistant to the Secretary
Louisiana Department of Natural Resources
Office: 225.342.4681
Cell: 251.423.7330

Begin forwarded message:

From: Mollie Montelaro <Mollie.Montelaro@la.gov>
Date: June 29, 2021 at 7:54:33 AM CDT
To: Leslie Breaux <breauxfamily3@gmail.com>
Subject: **Re: comments on senate resolution 182**

Thank you, this will be added to the record.

Mollie Montelaro
Confidential Assistant to the Secretary
Louisiana Department of Natural Resources
Office: 225.342.4681
Cell: 251.423.7330

On Jun 29, 2021, at 7:51 AM, Leslie Breaux <breauxfamily3@gmail.com> wrote:

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Writing in support on the advancement of utility scale solar energy in Louisiana.

Solar energy is a important step toward a cleaner environment. As a landowner in Louisiana, I welcome the site of solar developments on unused or underutilized land. I would love to see Louisiana recognized as a progressive state with regard to

Robin Narez

From: Renee Boudreaux <lr**boudreaux@gmail.com**>
Sent: Monday, June 28, 2021 4:54 PM
To: Mollie Montelaro
Subject: Solar Farms

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Sent from my iPad. This email is sent to you that we support Solar Farms. We are supporters of oil & gas but also for solar which is in our future. We have seen Solar Farms in other states & they are well hidden from anything around them. It is the landowner’s choice to have solar on their land. We would be ok to have a Solar Farm on our property.

Robin Narez

From: Bruce Rainey <brainey04@gmail.com>
Sent: Monday, June 28, 2021 6:46 PM
To: Robin Narez
Subject: Solar farm

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

I am writing to express my concerns about the massive solar farms coming to the state. I live in Tangipahoa Parish where 3000 acres are being proposed within a 15 mile radius of my home. I have many concerns that our parish is addressing, but we need state regulation. Please consider limiting the number of acres allowed in an area so that parishes do not become a solar hot spot. Our state is beautiful and many other states who have undertaken this renewable energy train are regretting it. (Ohio and Oregon) Sincerely, Betty Rainey

Robin Narez

From: Mollie Montelaro
Sent: Tuesday, June 29, 2021 6:26 AM
To: Robin Narez
Subject: Fwd: Solar farms

Please print and add.

Mollie Montelaro
Confidential Assistant to the Secretary
Louisiana Department of Natural Resources
Office: 225.342.4681
Cell: 251.423.7330

Begin forwarded message:

From: CHARLES J JR BOURG <bourg_c@bellsouth.net>
Date: June 28, 2021 at 7:25:07 PM CDT
To: Mollie Montelaro <Mollie.Montelaro@la.gov>
Subject: Solar farms
Reply-To: CHARLES J JR BOURG <bourg_c@bellsouth.net>

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Good Afternoon, i would like to voice my approval FOR solar farms in Louisiana. We need to embrace renewable energy and move forward with projects like solar farms to have alternative energy sources aling with Oil and Gas.
I firmly believe that land owners have the right to do what they wish with their property such as turning it into a solar farm.

Thank you,
Shari Bourg

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Robin Narez

From: Terry Morgan <tmorgan@wpgov.org>
Sent: Monday, June 28, 2021 5:14 PM
To: Mollie Montelaro
Cc: Beth Mizell; Donna Graham
Subject: Solar Energy Public Meeting (6/29/2021, 2:00 p.m.)

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Mollie,

Would this Public Meeting be accessible on ZOOM or any other video portal?

Thank you for your assistance,

Terry S. Morgan
Assistant to Richard N. Thomas, Jr.
Washington Parish President
909 Pearl Street
Franklinton, LA 70438
Washington Parish Notary Public
Direct Line 985.335.1302
Office: 985.839.7825



From: Steven LeBlanc <leblancsm467@gmail.com>
Sent: Monday, June 28, 2021 4:58 PM
To: Mollie Montelaro
Subject: RE: Comment on Senate Resolution No. 182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Mollie,

Will the meeting be live streamed and/or video recorded for public viewing? Please send the link if so.

Steve

From: Mollie Montelaro [mailto:Mollie.Montelaro@LA.GOV]
Sent: Monday, June 28, 2021 12:50 PM
To: Steven LeBlanc <leblancsm467@gmail.com>
Subject: Re: Comment on Senate Resolution No. 182

Thank you. This will be added to the record.

Mollie Montelaro
Confidential Assistant to the Secretary
Louisiana Department of Natural Resources
Office: 225.342.4681
Cell: 251.423.7330

On Jun 28, 2021, at 11:59 AM, Steven LeBlanc <leblancsm467@gmail.com> wrote:

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

As a private landowner in the State of Louisiana, I fully support solar farm development. Solar farms will produce environmentally friendly clean energy for our electric grid for years with little to no impact to our farm communities. Also, solar farms will take up less than one percent of available farmland in the state if allowed to reasonably develop.

The state should promote positive growth of clean energy and should not over regulate solar farms to the detriment of our future.

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Robin Narez

From: Jessica Hendricks <jessica@all4energy.org>
Sent: Monday, June 28, 2021 4:38 PM
To: Mollie Montelaro; Robin Narez
Subject: Comments on Act 301 and SR182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Good afternoon,

My name is Jessica Hendricks and I'm the State Policy Director with the Alliance for Affordable Energy. The Alliance for Affordable Energy safeguards Louisiana's future by protecting consumers' right to an affordable, equitable, and environmentally responsible energy system. The Alliance is the only dedicated consumer advocate in Louisiana for utility customers. We fight for consumers through education, clean energy, and energy efficiency.

Unfortunately the misinformation around land use conflicts has served to derail Louisiana's progress towards clean and affordable energy. We do not see a conflict between agricultural farms and solar farms, rather both industries have an opportunity to compliment each other. There are best practices already implemented in other states that address vegetative barriers, land maintenance and decommissioning bonds, and solar developments have historically co-existed with farmland, often on the same property. We also know that solar's peak production hours, between 12noon - 3pm, often coincide with farmers' peak energy demand.

Louisiana is currently at the crossroads of a dynamic energy transition and has an opportunity to capitalize on our solar potential. Solar power generates clean energy, creates jobs, attracts new industry, and helps keep electric bills low for Louisianans, some of which are still struggling through the COVID recession. With no associated fuel costs, solar power can help keep electric bills low for Louisianans. In a state with a very high energy burden whereas the most under-resourced Louisianans pay upwards of 20% of their monthly income on energy bills, lower electric bills need to be a top priority.

Louisiana has long since been an energy state, and as the energy industry is changing, we must change as well in order to continue to be an energy leader of the South.



Jessica Hendricks

State Policy Director
Alliance for Affordable Energy

504.208.9761
225.366.9328
www.all4energy.org • Jessica@all4energy.org

A future where energy works for everyone.

Robin Narez

From: Mollie Montelaro
Sent: Monday, June 28, 2021 12:51 PM
To: Robin Narez
Subject: Fwd: Comment on Senate Resolution No. 182

Please print and add to the public comments folder.

Thanks!

Mollie Montelaro
Confidential Assistant to the Secretary
Louisiana Department of Natural Resources
Office: 225.342.4681
Cell: 251.423.7330

Begin forwarded message:

From: Steven LeBlanc <leblancsm467@gmail.com>
Date: June 28, 2021 at 11:59:53 AM CDT
To: Mollie Montelaro <Mollie.Montelaro@la.gov>
Subject: Comment on Senate Resolution No. 182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

As a private landowner in the State of Louisiana, I fully support solar farm development. Solar farms will produce environmentally friendly clean energy for our electric grid for years with little to no impact to our farm communities. Also, solar farms will take up less than one percent of available farmland in the state if allowed to reasonably develop.

The state should promote positive growth of clean energy and should not over regulate solar farms to the detriment of our future.

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Ms.Narez

6/24/2021

This letter is to voice my concern for the proposed Solar plants under planning and design here in Louisiana. This is a huge mistake in my opinion to allow these to be developed here in Louisiana.

First, I am a conservation minded citizen who has advocated for many years across our State on various issues that impact our environment. The wetlands my primary focus. Media reports are stating that there are plans to build these "solar farms" in various parishes. 3 that I am aware of to date. I am opposed to this for the following reasons.

While my knowledge is limited I feel strongly that the clear cutting of land for the panels will cause harm to the environment for several reasons. First the potential loss of habitat that contains native species both plant and animal. We know that Louisiana is home to many species that fall under the threatened and endangered category. Next, the farms will be built and once completed, who will regulation of these farms fall to and who will be responsible for the removal of hazardous runoff and waste should these farms become abandoned? What mitigation will occur and how will the citizens of Louisiana be guaranteed that these farms will not become the Next Super Fund sites that Louisiana was once home to? The potential to harm the existing residents in the areas are clear. The toxic fluids used to build these farms will have potential impacts both on the ground water and down stream. Downstream cumulative effects from the runoff and added other runoff could cause serious problems for the watershed and ecosystems.

Having spent a lifetime advocating for our Wetlands and protection of our Environment I am concerned about these Solar farms being built here and am opposed to their construction. Our State has been harmed enough by companies that come here, destroy the land and leave.

Respectfully,
Polly Glover
38384 Welsh Dr
Prairieville, La. 70769

Mollie Montelaro

From: Salvador Lopinto <sal.lopinto@icloud.com>
Sent: Friday, June 25, 2021 12:56 PM
To: Mollie Montelaro; Robin Narez
Subject: Comments on Act 301 and SR182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Hello,
I am a Louisiana resident. I support the state moving towards more renewable energy resources. Solar resources emit no air pollution, no water pollution, and can be a drought-proof cash crop for farmers and landowners. I would like to encourage the Louisiana Department of Natural Resources to work with the Louisiana Center for Planning Excellence to recommend model ordinances regarding solar siting that can voluntarily be adopted by local municipalities and parish governments.

Thank you for your service,
Sal

Sal Lopinto
Lafayette, LA

Mollie Montelaro

From: Tom Ripp <trippolon@gmail.com>
Sent: Friday, June 25, 2021 1:13 PM
To: Mollie Montelaro; Robin Narez
Subject: solar legislation

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe

Hello Friends,

I am a Louisiana resident. I support the state moving towards more renewable energy resources. Solar resources emit no air pollution, no water pollution, and can be a drought-proof cash crop for farmers and landowners. I would like to encourage the Louisiana Department of Natural Resources to work with the Louisiana Center for Planning Excellence to recommend model ordinances regarding solar siting that can voluntarily be adopted by local municipalities and parish governments.

Background:

During Louisiana's legislative session, there were three bills introduced that represented varying risks to the utility-scale solar energy industry. [HCR40](#) would have stripped the ITEP tax credits for some solar facilities but after a strong effort the bill was amended to essentially eliminate the threat.

[SB185](#) introduced by Sen. Allain (representing Iberia, Lafourche, St. Mary, Terrebonne parishes) became Act 301, which added a new requirement to the Dept. of Natural Resources (DNR) to host a public meeting and develop solar leasing regulations after the Secretary identifies funding to implement the rules. Sen. Allain has not been supportive of solar, calling solar panels eyesores. For that bill, there will be a DNR meeting in the morning on 6/29.

Also, [SR182](#) introduced by Sen. Mizell requested that Dept. of Natural Resources plus the Department of Agriculture and Forestry host a joint public meeting amongst multiple stakeholder groups "for the purpose of receiving public testimony on issues and concerns related to the development and production of solar energy in the state and to provide guidance addressing those issues and concerns". Sen. Mizell was quoted in The Advocate saying "I thought we were an oil and gas state" and clearly not supportive of renewable resources. For that bill, there will be a DNR meeting in the afternoon on 6/29

As you can tell, the future of what I consider simple sensible power for us all is in jeopardy. The environmental consequences and expense of our heretofore oil and gas reliance is rapidly making that source, irrelevant. Surely we convert the our work force and infrastructure to accommodate a sensible energy future. Thanks for reading.

Tom Rippolon

Mollie Montelaro

From: Camille Stagg <camillelstag@gmail.com>
Sent: Friday, June 25, 2021 2:33 PM
To: Robin Narez; Mollie Montelaro
Subject: Comments on Act 301 and SR182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe

Hello,

I am a voting Louisiana resident. I support the state moving towards more renewable energy resources. Solar resources emit no air pollution, no water pollution, and can be a drought-proof cash crop for farmers and landowners. Furthermore it provides a new opportunity for stable economic growth in the state, which for too long has been booming and busting at the whim of oil prices.

I would like to encourage the Louisiana Department of Natural Resources to work with the Louisiana Center for Planning Excellence to recommend model ordinances regarding solar siting that can voluntarily be adopted by local municipalities and parish governments.

It's time to move forward. We can't rely on practices that were once profitable in the past but in the last several decades have continually failed to support our economy and community.

Sincerely,
Dr. Camille Stagg

Mollie Montelaro

From: roger peak <repeakjr@yahoo.com>
Sent: Saturday, June 26, 2021 8:15 AM
To: Mollie Montelaro
Subject: Re: Act 301, SR 182

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Thanks you

RP

Roger Peak

phone 337 349 1622

On Friday, June 25, 2021, 04:18:33 PM CDT, Mollie Montelaro <mollie.montelaro@la.gov> wrote:

Thank you. We will add this to the record.

Mollie Montelaro
Confidential Assistant to the Secretary
Louisiana Department of Natural Resources
Office: 225.342.4681
Cell: 251.423.7330

On Jun 25, 2021, at 3:30 PM, roger peak <repeakjr@yahoo.com> wrote:

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe

I am a Louisiana resident. I support the state moving towards more renewable energy resources. Solar resources emit no air pollution, no water pollution, and can be a drought-proof cash crop for farmers and landowners. I would like to encourage the Louisiana Department of Natural Resources to work with the Louisiana Center for Planning Excellence to recommend model ordinances regarding solar siting that can voluntarily be adopted by local municipalities and parish governments.

Solar farms will not significantly reduce available farmland. Renewable energy will benefit our state economically.

Thank you for you consideration.

RP

Roger Peak
Lafayette, La

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Mollie Montelaro

From: Robin Narez
Sent: Friday, June 25, 2021 8:38 PM
To: Mollie Montelaro
Subject: Fw:

From: carr70422 <carr70422@peoplepc.com>
Sent: Friday, June 25, 2021 3:23:30 PM
To: Robin Narez
Subject:

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

No solar farm in Amite

Sent via the Samsung Galaxy S@ 5 mini, an AT&T 4G LTE smartphone

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Mollie Montelaro

From: Joseph Katz <josephkatz50@yahoo.com>
Sent: Saturday, June 26, 2021 9:21 AM
To: Mollie Montelaro; Robin Narez
Subject: Comments on Act 301 and SR182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe

Hello,

I am a Louisiana resident. I support the state moving towards more renewable energy resources. Solar resources emit no air pollution, no water pollution, and can be a drought-proof cash crop for farmers and landowners. I would like to encourage the Louisiana Department of Natural Resources to work with the Louisiana Center for Planning Excellence to recommend model ordinances regarding solar siting that can voluntarily be adopted by local municipalities and parish governments.

Joseph Katz
Resident of Lafayette, La.

Mollie Montelaro

From: lmcprog <lmcprog@gmail.com>
Sent: Saturday, June 26, 2021 9:26 AM
To: Mollie Montelaro; Robin Narez
Subject: Request for Positive Action to Promote Solar Expansion in LA

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Greetings,

I am writing you both because I am concerned about a trend I've observed against the promotion of solar energy in Louisiana.

I live in Lafayette and am very worried about the hurricanes and heating we've observed over the last years, not to mention the changes in climate dynamics worldwide. Louisiana has a great knowledge base in energy development and management through its oil & gas industry, and it is perfectly situated to take the lead in renewable energy.

Solar energy collection can be located close to centralized power hubs and may not require additional transmission lines through unfavorable terrain (like offshore wind). Rooftop collection for individual homes requires no additional space and, over the long term, provides relief to families. Farmers and landowners can build solar panel arrays as a "cash crop" that doesn't rely on water resources. Building these arrays creates jobs and is good for local communities.

I understand that some view solar arrays as "eye sores." I would suggest that beauty is in the eye of the beholder, and there are those who find oil rigs unattractive, despite the clear benefit to the Louisiana economy.

I am unable to attend the public meetings for ACT 301 and SR 182 personally. But I wish to register my request that the Louisiana Department of Natural Resources and Louisiana Center for Planning Excellence work together to recommend model ordinances regarding solar siting that can voluntarily be adopted by local municipalities and parish governments.

Thank you for your attention.

Laura McColm
Lafayette, LA

Mollie Montelaro

From: M Watts <mwatts06@hotmail.com>
Sent: Sunday, June 27, 2021 11:14 AM
To: Mollie Montelaro; Robin Narez
Subject: Fwd: Chuck DeVore: Texans and Californians learn that wind and solar are neither reliable nor affordable | Fox News

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Begin forwarded message:

From: M Watts <mwatts06@hotmail.com>
Date: June 26, 2021 at 10:10:33 AM CDT
To: district10@tangipahoa.org, district9@tangipahoa.org
Subject: Fwd: Chuck DeVore: Texans and Californians learn that wind and solar are neither reliable nor affordable | Fox News

Sent from my iPhone

Begin forwarded message:

From: M Watts <mwatts06@hotmail.com>
Date: June 25, 2021 at 9:48:24 PM CDT
To: M Watts <mwatts06@hotmail.com>
Subject: Chuck DeVore: Texans and Californians learn that wind and solar are neither reliable nor affordable | Fox News

For many Texans last week something was different during the first heatwave of the year. | Fox News

<https://www.foxnews.com/opinion/chuck-devore-texans-and-californians-learn-that-wind-and-solar-are-neither-reliable-nor-affordable>

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Chuck DeVore: Texans and Californians learn that wind and solar are neither reliable nor affordable

By Chuck DeVore

Published June 25, 2021

[Fox News](#)



[Video](#)

PROGRAMMING ALERT: Watch author Chuck DeVore discuss this topic and more on "Tucker Carlson Tonight" on Friday, June 25 at 8 p.m. EDT.

It got hot in [Texas](#) last week. It tends to do that in June.

But for many [Texans](#), something was different during the first heatwave of the year. They woke up sweating because their thermostats had been turned up by their power companies.

What these Texas [electrical consumers](#) did, but in many cases didn't recall or understand, is sign up for a program that offers rebates or lower electrical rates in exchange for the electric provider having the right to control a so-called "smart thermostat" that can be adjusted over the internet to save electricity when the grid is under strain.

This process is part of an array of tools used by power companies and grid operators called "demand response." [Electric grids](#) must generate power the instant it is used. This is becoming increasingly difficult as unreliable renewable energy—wind and solar—are making up larger amounts of the power grid.

CALIFORNIA GOV. NEWSOM DECLARES STATE OF EMERGENCY AMID EXTREME HEAT

Demand response asks consumers, not generators, to manage variability in electric supply and demand. Reducing demand during peak times reduces the need for peaker plants—generators that only run for a few hours a year—and produces a net societal benefit in terms of lower costs for electricity and, for environmentalists concerned about greenhouse gases, lower carbon dioxide emissions.

Demand response can work in a competitive market when scarcity during peak times causes higher prices for electricity, allowing consumers—particularly large industrial operations—to save money by reducing consumption.

Back to the Texas heatwave. As often happens when Texas gets hot, the wind doesn't blow much. Texas has thousands of wind turbines. If the wind blows just right and when it is needed, those wind turbines could generate about 30% Texas's requirements. During peak demand in the middle of the heatwave, Texas's massive wind turbine fleet produced about 10% of their capacity, or about 2% of the grid's needs. At one point during the heatwave, wind produced less than 1% of its installed capacity.

Texans got a rude awakening as to how vulnerable their electric grid has become due to overreliance on wind and solar during the 100-year event winter storm in February. With many power plants offline due to weather issues, gas supply shortages, or maintenance to prepare for the hot summer, Texas' grid was slammed, and people suffered. Many died in the cold. Even so, gas, coal, and nuclear—known as thermal plants—produced 91% of the power Texans needed during the duration of the deep freeze—wind and solar, an anemic 9 percent.

LEFT AIMS TO DEFEAT ANOTHER PIPELINE, BUT NATIVE AMERICAN BUSINESS LEADERS DEFEND CONSTRUCTION

How did Texas get to this point? When the state largely deregulated its electric market 20 years ago, federal tax credits for wind power—known as the Production Tax Credit—were due to expire. Congress instead revived the program and then extended it. This allows wind producers, with a comparable program for solar, to make money even if they pay the grid to take their power.

More from Opinion

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- [Tammy Bruce: Britney Spears deserves to prevail in fight for her freedom. Here's why her saga matters](#)
- [RNC Chairwoman McDaniel: Biden's border crisis -- Harris caves, finally shows up for work](#)

In Texas, about one-third of the wind power transactions are negative. This negative pricing causes havoc in the markets and discourages investment into new reliable thermal power plants while accelerating the decommissioning of old power plants.

In the last few years, even while electric demand has grown, Texas has added a net of 21,000 megawatts of subsidized and unreliable wind and solar while seeing a net loss of 4,000 megawatts of reliable gas and coal.

[CLICK HERE TO GET THE OPINION NEWSLETTER](#)

Texas's elected officials took the first steps to fix their renewable reliability problem during their just-concluded legislative session, though it may be a couple of years before any results are seen.

California has arrived at roughly the same place as Texas but by a different route, using regulatory mandates and laws to force more renewables onto the grid. The main difference is that in the Golden State, solar power dominates rather than wind as in Texas.

California is also seeing more demand response being pushed onto consumers. The problem in California is that voluntary demand response programs will be seen by powerful, environmentally minded regulators and politicians as an insufficient sacrifice. This will inevitably lead to mandatory use of smart thermostats and, eventually, mandatory smart meters that charge variable rates for electricity—cheap at low demand times and sky-high during hot afternoons when solar power starts to ramp down with the sun.

[CLICK HERE TO GET THE FOX NEWS APP](#)

Rather than force working Americans to pay for the environmental dreams of the coastal elites, producers of unreliable renewable power should be required to guarantee reliability and price that into their costs.

Electric grid reliability and affordability matters. Wind and solar are not capable of being both reliable and affordable—as consumers in California and Texas are starting to learn the hard way.

[CLICK HERE TO READ MORE FROM CHUCK DeVORE](#)

Chuck DeVore is a vice president with the Texas Public Policy Foundation and served in the California State Assembly from 2004 to 2010.

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<https://www.foxnews.com/opinion/chuck-devore-texans-and-californians-learn-that-wind-and-solar-are-neither-reliable-nor-affordable>

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Mollie Montelaro

From: M Watts <mwatts06@hotmail.com>
Sent: Sunday, June 27, 2021 11:12 AM
To: Mollie Montelaro; Robin Narez
Subject: Fwd: Solar Panel Project Tangi
Attachments: Solar Panel Project Tangi .pdf

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Sent from my iPhone

Begin forwarded message:

From: Kayla Watts <kayla.watts14@outlook.com>
Date: June 25, 2021 at 3:03:09 PM CDT
To: district1@tangipahoa.org, district10@tangipahoa.org, district9@tangipahoa.org, mizellb@legis.la.gov
Cc: rmiller@tangipahoa.org
Subject: Solar Panel Project Tangi

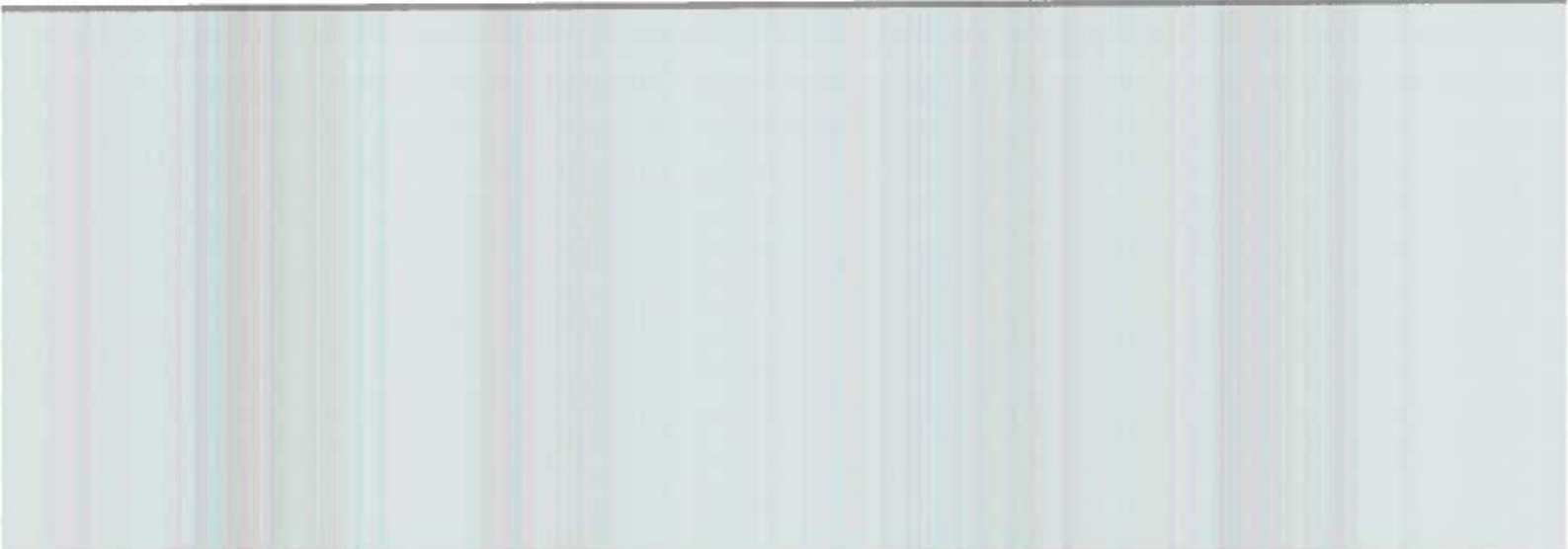
Good Afternoon All,

Please see the attached letter in regards to the potential Solar Panel Projects located in our parish. If you could please take a moment review our concerns, I would greatly appreciate it.

Thank you for your time and have a wonderful weekend.

Sincerely,

Mary Watts
Homeowner of Tangipahoa Parish



June 25, 2021

Hon. Trent Forrest
19334 Highway 38A
Kentwood, LA 70444

RE: Solar Panels

Dear Mr. Forrest,

Good afternoon. My name is Mary Watts, and I am one of the homeowners that will have a direct impact when the solar panels are installed on highway 445. We purchased our property in 2017 and built a home in 2018 on the property. It is a very beautiful countryside, and we love our home. It was supposed to be our last home. Now with solar panels being installed right across the street, we are not sure. We have very strong concerns. A culvert ruins under 445 onto our property. There will be direct drainage coming from the solar farm onto our property. One of our main concerns is our water well for our home. It is very close to the direct drainage. What happens when toxins or other substances start showing up in our water? This natural drainage can be traced all the way to the Tchefuncte River. We also have livestock that drink from this drainage. We sale our livestock to Amite livestock in Amite. What happens when our livestock start testing positive for toxins? We desperately need to put in that if a homeowner's well is within so many feet from direct drainage the panels will not be put in the area of the runoff on the solar farm. Our view will be destroyed, right now we have a beautiful view of green pastures with tall pine trees. That will no longer exist. Our appraised market value of our home will depreciate. We will never get the current market value of our home after the solar farm is put in. This will affect our family in so many different ways. There definitely needs to be an Environmental and Economic impact study done.

There is a resolution that could possibly help for all parties involved. I worked for The LTL – Schock Group. It is a company that specializes in land acquisition, relocation services, easement acquisition, noise mitigation, disaster relief, program management, property management, and community outreach. The project I worked on was for the Baton Rouge Metropolitan Airport. A noise impact study was completed and any homeowner within the designated amount radius of the airport was offered appraisal market value for their home and also offered relocation assistance. There website is LTL-Schockgroup.com. If you could please take a moment and visit their site, I think it would be a positive move in the right direction for the residence of Tangipahoa parish. This company would be hired by the corporation coming in with the solar panels. This would give the homeowner the option to stay or relocate. Given the choice it would be a good neighbor gesture from the corporation and avoided potential future legal litigation for all parties involved. It would also show the residences of Tangipahoa parish that the council is looking out for their best interest and understands the concerns of the hardworking homeowners that love their property are being affected deeply by the solar panel project. It truly shows caring and compassion from the council that they realize the importance of this matter. It also gives a good

response from the homeowners. (Ei) Yes, we were affected by the solar panel project, but our council made sure we were taken care of and by doing that the corporation, council, and homeowners worked together and were able to move forward. I cannot stress to you the importance to bring this company in and make the corporation responsible for disrupting our beautiful country life. Taking this initiative would show the surrounding parishes that Tangipahoa parish takes care of their homeowners and would make Tangipahoa parish a leader in setting the guidelines for future incoming projects. Once again, please take time to research this company and make it a part of the guidelines that this corporation will have to follow. Do we really want to move? NO we love our home and we love where we are located, but do we want to spend the rest of our life looking at solar panels right out of our front and back doors? Wondering about the water we are drinking, cooking and bathing in? NO. I ask just for a moment to put yourself in our shoes think how you would feel if this was pushed in your backyard? We hope and pray that the council will do what is in the best interest of the affected homeowners and give them the opportunity to have a choice to stay or relocate. Thank you for your time and God bless you.

Sincerely,

Mary Watts
Homeowner/Resident of Tangipahoa Parish
e-mail: mwatts06@hotmail.com
Phone:225-573-8481

Mollie Montelaro

From: Jeffrey LeBlanc <jeff.leblanc1@yahoo.com>
Sent: Sunday, June 27, 2021 8:06 PM
To: Mollie Montelaro; Robin Narez
Subject: Comments on Act 301 and SR182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Hello,

I am a Louisiana resident. I support the state moving towards more renewable energy resources. Solar resources emit no air pollution, no water pollution, and can be a drought-proof cash crop for farmers and landowners. I would like to encourage the Louisiana Department of Natural Resources to work with the Louisiana Center for Planning Excellence to recommend model ordinances regarding solar siting that can voluntarily be adopted by local municipalities and parish governments.

Thank you,

Jeff LeBlanc, Ph. D., P.E.

ASME Material & Energy Recovery Division - Chair

Ph: 337-258-9653

60353 Hwy. 445

Amite, La. 70422

Ladies and Gentlemen of the Tangipahoa Parish Council, our Parish has been in an active debate over Solar Energy. We have some large-land owners who are signing leases with out-of-state solar companies. At the same time, some of the neighboring land owners are not willing to sign leases. I am writhing this letter to voice my concerns about this unique situation.

In general most people, if not all, respond only to two things: one is fear and the other is education. In our current situation fear is taking the lead role. When I say this, it is by both sides, "Proponents and Opponents." The Proponents may be looking at securing their future financially, while the Opponents have a list of reasons that include, but are not limited to, environmental hazards, health concerns and aesthetics of the community. As one can see, fear is rampant and causing a lot of tension in our area. At this point we need to turn to education and our leaders for guidance.

Education and research take time. Through education the council can make fair decisions and provide guidance. In the past, some parish councilman voted in favor of pursuing solar energy without any education. These councilmen voted routinely against any type of moratoriums. Thankfully we did have some councilman/councilwomen who did want to be educated by voting for the moratoriums. This provided time for research and education. It is time for Tangipahoa Parish to come together over this crucial situation.

The debate is no longer about "what a person can do with their land" because they have already done so. By signing leases, they no longer control their land, the out of state company now controls their land. What we need to do is to come together, those who signed leases and those who did not, and provide ordinances and regulations on these out of state companies. My recommendation is to vote on an extension to the moratorium until the State of Louisiana provides their regulations. The state is currently drafting guidelines and regulations on Solar Energy.

This is a life changing decision which our councilmen/councilwomen will make. Remember it is no longer about large landowners against small landowners. It is about our parish, community and neighbors against out-of-state companies that do not have a permanent plan, blueprint or size for their financial endeavor. I am asking for your support in extending the moratorium, honor the regulations from the planning committee or wait for guidelines from the state.

Thank You,

Greg Vosbein

Mollie Montelaro

From: Robin Narez
Sent: Monday, June 28, 2021 6:45 AM
To: Mollie Montelaro
Subject: FW: Solar Energy

From: billy fortier <billyfortier@yahoo.com>
Sent: Sunday, June 27, 2021 11:35 PM
To: Robin Narez <Robin.Narez@LA.GOV>
Subject: Solar Energy

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Hello, Robin Narez. I am a resident of Lafayette Parish in Louisiana, and I am hoping for our state to move forward with supporting our residents in the increasing use of solar power. Solar power is a clean power. Solar power can be a weather and pest-proof cash crop for farmers and landholders. I am asking for your help in encouraging the La. Dept. of Natural Resources to work with the La. Ctr. for Planning Excellence to recommend model ordinances regarding solar siting that can be adopted by local municipalities and parish governments.

Thank you,
Billy Fortier
Broussard, La.

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Mollie Montelaro

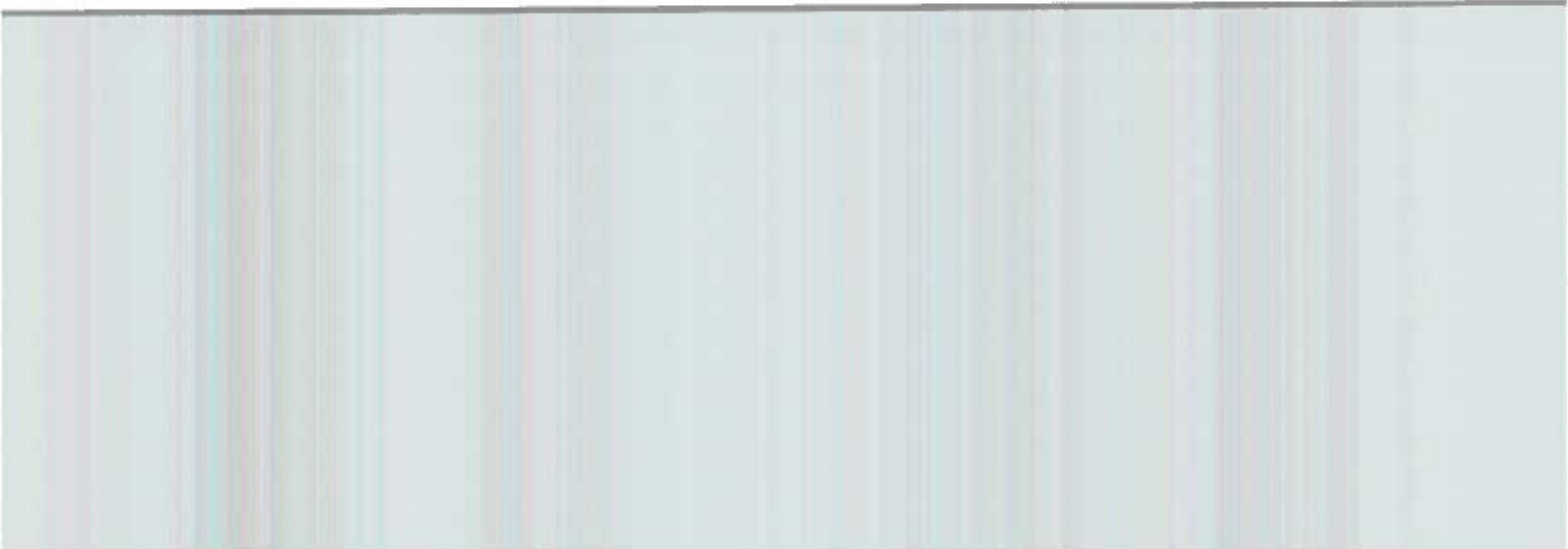
From: Simon Mahan <simon@southernwind.org>
Sent: Monday, June 28, 2021 8:00 AM
To: Mollie Montelaro
Subject: Written testimony on SR182 re: solar
Attachments: F-SREA testimony LA DNR 6.28.21 .pdf; Tunica County, MS - Wind and Solar Zoning Amendment, 4834-5627-2097, 11 (1).docx; 2018-07-30 _final_model_solar_ordinance.pdf; Template-Solar-Energy-Development-Ordinance-for-North-Carolina.pdf; in-solar-ordinance-2020-december.pdf

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Good morning,
Please see the attached written comment by the Southern Renewable Energy Association for tomorrow's meeting.

-Simon

Simon Mahan | Executive Director
Southern Renewable Energy Association
simon@southernwind.org | (c) 337.303.3723
www.southernrenewable.org





Southern Renewable Energy Association

11610 Pleasant Ridge Rd Ste 103 #176, Little Rock, AR 72223

June 29, 2021

Re: Public Meeting re: SR182, solar energy

Dear Ms. Montelaro,

Please accept the following written testimony regarding Senate Resolution 182 regarding solar energy power projects.

Sincerely,



Simon Mahan
Executive Director
Southern Renewable Energy Association

Testimony of Simon Mahan
Executive Director

Southern Renewable Energy Association

Louisiana Department of Natural Resources and Department of Agriculture and Forestry

Joint Meeting on Senate Resolution 182 regarding Solar Energy

Good afternoon,

My name is Simon Mahan. I am the Executive Director of the Southern Renewable Energy Association. The Southern Renewable Energy Association is a nonprofit organization that supports the development of utility-scale renewable energy projects throughout the south, including in Louisiana. Our members have invested millions of dollars in Louisiana and are excited for the opportunity to bring jobs, economic development and private funds to landowners across the state.

Renewable energy demand is growing. Renewable energy prices have plummeted over the past few years. Renewable energy prices have declined by 70-90% just since 2009.¹ In many parts of the country, renewable energy is now cost competitive against traditional energy resources. Utilities like Southwestern Electric Power Company (Louisiana/Arkansas)², MidAmerican

¹ Lazard (October 2020). Lazard's Levelized Cost of Energy Analysis - Version 14.0.
[<https://www.lazard.com/media/451419/lazards-levelized-cost-of-energy-version-140.pdf>]

² Clean Technica (July 27, 2017). USA's Largest & World's Second-Largest Onshore Wind Farm (2 Gigawatt Farm) To Be Built In Oklahoma. [<https://cleantechnica.com/2017/07/27/invenenergy-ge-team-2-gw-worlds-second-largest-us-largest-onshore-wind-farm/>]

(Iowa)³, and Georgia Power⁴ have announced *multi-gigawatt renewable energy power purchase agreements*. North Carolina has over 7,100 megawatts of solar power installed,⁵ enough to power nearly 860,000 homes. Corporations like Wal-Mart, Amazon, Facebook, Google, FedEx, Ford, GM, Toyota, Volkswagen, and other non-utility buyers are finding innovative mechanisms to buy renewable energy resources and cut carbon emissions. Entergy and the Southwestern Electric Power Company have announced net zero carbon emission commitments. To those ends, SWEPCO has released a 3,000 megawatt (MW) request for proposals for wind energy⁶ resources, plus a 300 MW solar RFP.⁷ Entergy Louisiana has also recently released a 500 MW solar RFP.⁸ Lafayette Utilities System has announced a 300 MW solar RFP which if fulfilled would make it the highest solar purchaser by utility size in the south.⁹ And the new 1803 Cooperative utility has announced over 340 MW's of solar power purchases agreements.¹⁰ These voluntary announcements are due to the low costs of renewable energy¹¹ and Louisiana is poised to significantly diversify its energy portfolio.

³ Greentech Media (August 31, 2016). New \$3.6B Project in Iowa Could Be One of Many 'Mega' Wind Orders [https://www.greentechmedia.com/articles/read/iowas-new-3.6b-wind-project-could-be-one-of-many-mega-wind-orders]

⁴ Georgia Public Service Commission (July 16, 2019). Commission adds 2,210 MW of renewable energy in Georgia Power 2019 Integrated Resources Plan.

[https://psc.ga.gov/site/assets/files/4279/media_advisory_for_7-16-19_gpc_irp_for_web.pdf]

⁵ Solar Energy Industries Association (2021). North Carolina Solar. [https://www.seia.org/state-solar-policy/north-carolina-solar]

⁶ https://qa.swepco.com/business/b2b/energy-rfps/2021Wind

⁷ https://qa.swepco.com/business/b2b/energy-rfps/2021Solar

⁸ https://spofossil.entergy.com/ENTRFP/SEND/2021ELLSolarRFP/Documents/Main%20Body.pdf

⁹ https://www.lus.org/irp-capital-projects/

¹⁰ https://lpscpubvalence.lpsc.louisiana.gov/portal/PSC/ViewFile?fileId=Nk5wxQgNTqE%3D

¹¹ American Wind Energy Association (June 11, 2020). Wind Powers American Business Report [https://www.awea.org/resources/publications-and-reports/corporate-purchasers-market-reports/wind-powers-american-business]

Each megawatt of new renewable energy resources could power some 200-400 homes every year for the next 20-30 years. There are currently over 6,000 MW's proposed solar energy, hybrid and battery energy projects in the Midcontinent Independent System Operator (MISO) footprint of Louisiana¹² with an additional 600 MW's in the Southwest Power Pool (SPP) portion of the state.¹³ While not all of these renewable energy projects will be built, the renewable energy industry could still invest billions of dollars in Louisiana over the next decade.

Currently, Governor John Bel Edwards' Louisiana Climate Initiatives Task Force is evaluating multiple policy proposals to promote renewable energy development around the state. One of the recommendations provided to the Task Force by the Center for Planning Excellence is to develop model ordinances for municipal and parish governments regarding renewable energy siting and decommissioning rules. SREA supports CPEX's efforts to develop a model ordinance for renewable energy development so that local governments can choose general best practices based on local needs.

Many communities across the country have developed model ordinances for renewable energy development siting. For example, Tunica County, Mississippi is currently undergoing a process by its Planning and Zoning Commission to approve reasonable siting rules regarding wind farms and solar farms. Indiana University's Environmental Resilience Institute has also developed model solar ordinance for local governments that adequately balances the rights of

¹² <https://giqueue.misoenergy.org/PublicGiQueueMap/index.html>

¹³ <https://opsportal.spp.org/Studies/GIActive>

private property owners and the general public.¹⁴ In North Carolina, the North Carolina Clean Energy Technology Center through North Carolina State University conducted a robust stakeholder process involving multiple state and federal agencies, as well as numerous associations, organizations and groups to develop model ordinance for solar siting.¹⁵ Similarly, Georgia Institute of Technology helped develop Georgia's Model Solar Ordinance.¹⁶

Allowing city and parish governments to adopt their own siting guidelines ensures that local concerns and considerations are adequately represented in local zoning rules. By crafting model ordinances, local governments can best adapt rules and guidelines to their specific needs. A one-sized-fits-all siting mandate from the State of Louisiana will strip local governments of their siting and zoning rights, and Home Rule Charter authorities.

Renewable energy resources pair well with agricultural communities. Wind energy and solar energy resources do not emit any harmful air or water pollution. Landowners can usually still farm around wind turbines. The United States Department of Energy's 2015 Wind Vision report studied wind farm interactions with farm land and found that typically a couple of acres are temporarily disturbed per megawatt installed, but that "...about 99% of land around a wind plant can be used for other activities, such as farming, ranching, and recreational

¹⁴ Indiana University (December 2020). Model Solar Ordinance for Indiana Local Governments. [<https://eri.iu.edu/documents/in-solar-ordinance-2020-december.pdf>]

¹⁵ North Carolina Clean Energy Technology Center (2016). Template Solar Energy Development Ordinance for North Carolina [<https://nccleantech.ncsu.edu/wp-content/uploads/2018/06/NC-Template-Solar-Ordinance.pdf>]

¹⁶ Georgia Tech (July 2018). The Georgia Model Solar Zoning Ordinance. [https://energy.gatech.edu/sites/default/files/documents/2018-07-30_final_model_solar_ordinance.pdf]

activities.”¹⁷ That means much of the already occurring land usage can continue with limited interruption.

Solar farms give agricultural land an opportunity to replenish after generations of tilling, fertilizing and harvesting, while paying landowners enough so they do not have to sell their farm. Renewable energy projects help farmers diversify their crops to protect against fluctuating crop prices and natural disasters. Renewable development companies work closely with their landowner partners to maximize already existing local infrastructure like farm roads and pathways and drainage to minimize disruptions and impacts to the land.

Renewable energy resources are drought-proof cash crops for local farmers, and they provide steady tax income for local and state governments. While solar farms and wind farms can contribute significantly to local tax revenue, the renewable energy projects require little to no additional governmental services – meaning the vast majority of local tax revenue can be spent however the municipalities and counties choose.

The key to good siting principles is to protect private property owner rights while balancing the needs of the general public. Setting onerous or arbitrary restrictions on renewable energy development in Louisiana will strip private property owners of their rights to develop their own land as they see fit while also harming the general public by slowing down the transition to renewable energy resources. The renewable energy industries want to be treated fairly and

¹⁷ United States Department of Energy (2015). Wind Vision: A New Era for Wind Power in the United States. [https://www.energy.gov/sites/default/files/2015/03/f20/wv_full_report.pdf]

not be disadvantaged when compared to other energy industries. The Louisiana Department of Natural Resources and Department of Agriculture and Forestry should not apply more stringent mandates, rules, fines, fees, taxes or regulations to the new renewable energy industries that the agencies have not also adopted or proposed for the existing agricultural, energy or mining industries. If DNR and DAF restrict private landowner rights, those agencies should be required to compensate the landowners who have lost the financial opportunity to use their private property as they wish. SREA encourages the Louisiana DNR, DAF and the Legislature to provide funding to support CPEX's efforts to develop model ordinance for renewable energy siting.

Thank you for your consideration.

Sincerely,

Simon Mahan

**TUNICA COUNTY, MISSISSIPPI ZONING ORDINANCE
RENEWABLE ENERGY TEXT AMENDMENT**

WHEREAS, the purpose of this amendment is to provide standards for the placement, design, construction, operation, monitoring, modification and removal of wind energy conversion systems and solar energy systems that address public health, safety, and welfare of residents of Tunica County and minimize impacts on surrounding land uses; and

WHEREAS, the Board of Supervisors of Tunica County, Mississippi recognizes that wind and solar energy are potentially abundant, renewable and nonpolluting energy resources of the County and that conversion of wind and solar energy to electricity could reduce dependence on nonrenewable energy resources and decrease air and water pollution that result from the use of conventional energy sources; and

WHEREAS, pursuant to Section 1060 *et seq.* of the Tunica County Zoning Ordinance (the "Zoning Ordinance"), the Board of Supervisors has the authority enact text amendments to amend the Zoning Ordinances.

NOW, THEREFORE, be it resolved by the Board of Supervisors of Tunica County, Mississippi as follows:

**Section 1
Findings**

The Board of Supervisors of Tunica County, Mississippi finds and declares that:

- A. Wind and solar energy are abundant, renewable and nonpolluting energy resources of the County, and conversion to electricity will reduce our dependence on nonrenewable energy sources, which, in turn, will decrease air and water pollution resulting from the use of conventional energy sources.
- B. The generation of electricity from properly sited wind turbines and solar panels can be cost effective, and, in many cases, existing power distribution systems can be used to transmit electricity from wind energy conversion systems and/or solar energy systems to utilities.
- C. Regulations on the siting and installation of wind turbines and solar panels are necessary to protect the health and safety of neighboring property owners and the general public.
- D. Responsible development of renewable energy resources is a national policy priority.
- E. Responsibly sited wind and solar power construction can result in significant cost savings and/or additional revenue to the County over the life of the projects as well as significant economic benefits and benefits to the future health and well-being of our citizens.
- F. Wind and solar power were not contemplated at the time that the Tunica County Zoning Ordinance was enacted in 2003, and updating the Zoning Ordinance to address orderly development of wind and solar power facilities is prudent and consistent with the purposes of the County's Comprehensive Plan.

Section 2

Definitions

Article II, Section 220. The following definitions shall be added to the Zoning Ordinance:

Industrial Solar Energy System(s) (“Industrial SES”): Any SES with a name plate capacity of more than one (1) MW in total generating capacity.

Industrial Wind Energy Conversion System(s) (“WECS”): A system which includes all equipment, machinery and structures utilized in connection with the conversion of wind to a usable form of electricity on-site to be transferred to a transmission system for distribution to offsite customers or for sale to a distribution company. This includes, but is not limited to, permanent met towers, transmission lines needed to connect to a local utility’s electric transmission and/or distribution system, storage, electrical collection and supply cables and equipment, substations, transformers, service and access roads, and one or more wind turbines.

Non-Industrial Wind Energy Conversion System(s) (“Non-Industrial WECS”): An electrical generating facility comprised of one or more wind turbines and accessory facilities, including, but not limited to, power lines, transformers, storage, collection and supply equipment, substations and meteorological towers, which operate by converting the kinetic energy of wind into electrical energy with a nameplate up to 100kW in total generating capacity. The energy maybe used on-site or distributed into the electrical grid.

Occupied structure: residence, school, hospital, church, or public library that is occupied or in use when the site plan is submitted for review.

Participating landowner: Landowners who are party to any agreement with any WECS or SES operator.

Solar Energy System(s) (“SES”): A system (including solar collector surface, ancillary solar equipment and auxiliary infrastructure) either affixed to a permanent primary or accessory building or functioning as a freestanding structure, that collects, stores and distributes solar energy for uses including but not limited to heating or cooling, generating electricity, or heating water.

Wind monitoring or meteorological tower: A temporary tower equipped with devices to measure wind speeds and direction, including any related monitoring equipment, and used to determine how much wind power a site can be expected to generate.

Wind turbine: A device that converts kinetic wind energy into rotational mechanical energy that drives an electrical generator to create electrical energy, in compliance with applicable local, state and federal regulations.

Section 3 WECS Rules and Regulations

[Insert as a new section]

No WECS shall be constructed, modified or operated in the County, except in accordance with this provision of the Zoning Ordinance. All WECS developments must be consistent with all applicable state and federal laws and regulations and shall obtain all necessary state and federal permits.

The following regulations shall apply to Industrial WECS:

1. Clearance. Rotor blades must maintain at least seventy five (75) feet of clearance between their lowest point and the ground.
2. Warnings.
 - a. For all WECS, a sign or signs shall be posted on the transformer and substation warning of high voltage.
 - b. Signs with emergency contact information shall also be posted on the turbine or at another suitable point.
3. Height. WECS sited and operated pursuant to this section shall be exempt from seeking a height variance under the Zoning Ordinance.
4. Noise. WECS shall not exceed fifty (50) dBA, as measured at the closest occupied structure. The level, however, may be exceeded during short-term events such as utility outages or wind storms. This requirement may be waived pursuant to individual agreement between adjacent property owners and the WECS operator.
5. Interference. All WECS shall minimize or mitigate interference with electromagnetic communications, such as radio, telephone, microwaves, or television system caused by any WECS.
6. Lighting. Lighting, including lighting intensity and frequency, shall adhere to but not exceed requirements established by the Federal Aviation Administration permits and regulations. Minimum security lighting required for operations and maintenance shall be allowed provided that no such lighting shall be erected, operated or maintained in such a manner as to create a nuisance to surrounding properties or that create a public safety hazard due to glare. Security lighting shall be designed to minimize impacts on surrounding landowners, including the use of light hoods, low glare fixtures and directing lights at the ground. Documentation of coordination with the FAA shall be provided as part of site plan review and such documentation shall satisfy this condition.
7. Shadow Flicker. WECS shall be sited in a manner than minimizes shadowing or flicker impacts. Shadow flicker at any occupied structure on a nonparticipating landowner's property caused by a WECS shall not exceed forty (40) hours per year. This requirement may be modified through execution of a good neighbor agreement between nonparticipating landowner and the WECS operator.
8. Other Signage. All signs shall comply with the requirements of the applicable zoning district for displaying any advertisement or sign.
9. Decommissioning. The WECS owner and operator shall, at its expense, complete decommissioning of the wind energy facility, or individual wind turbines, within

twelve (12) months after the end of the useful life of the facility or individual wind turbines. The WECS or individual wind turbines will be presumed to be at the end of its useful life if no electricity is generated for a continuous period of twelve (12) months. Decommissioning shall include removal of wind turbines, buildings, above ground and below ground electrical collection cables (not to include below ground electrical collection cables buried at a depth of more than four feet), electrical components, roads, foundations to a depth of thirty-six (36) inches, and any other associated facilities. A performance bond shall be provided to Tunica County no earlier than fifteen (15) years following issuance of the building permit to ensure financial resources will be available for decommissioning.

Section 4

Solar Energy Systems Rules and Regulations

[Insert as a new section]

No SES shall be constructed, modified or operated in the County, except pursuant to this provision of the Zoning Ordinance. All SES developments must be consistent with all applicable state and federal laws and regulations and shall obtain all necessary state and federal permits.

In addition to all other applicable regulations under the Zoning Ordinance, the following regulations apply to Industrial SES:

1. Setbacks. All solar panels must be located at least thirty (30) feet from all property lines, unless adjacent properties are participating landowners.
2. Fencing. An SES located in a residential or agricultural zoning district shall have a fence surrounding the project area.
3. Glare. Documentation of coordination with the Federal Aviation Administration shall be provided with site plan review if required by applicable law.
4. Warnings. A SES shall display signs stating the risks that may result from contact with a SES, identifying the owner of the SES and providing emergency contact information. All signs shall comply with the requirements of the applicable zoning district for displaying any advertisement or sign.
5. Lighting. Exterior lighting within the SES shall be the minimum necessary for security and should be designed to minimize impacts to landowners, including the use of light hoods, low glare fixtures and directing lights at the ground.
6. Decommissioning. All SES shall be removed within twelve (12) months from the date of discontinued operations. Decommissioning shall consist of physical removal of all SES structures, equipment, security barriers and transmission above ground and below ground electrical collection cables (not to include below ground electrical collection cables buried at a depth of more than four feet) or other electrical project lines from within the site to the point of interconnection and restore the property to ground level.

Section 5
Other Amendments

1. Chart 1, Article IV. The following uses are to be added as “Other Uses” in Chart 1.

Other Uses	A-1	A-5	R-R	R-1	R-2	R-3	M-H	O	C-1	C-2	RA	CA	I-L	I-H	PR
Wind Energy Conversion System	X	X													
Solar Energy Systems	X	X													

The Georgia Model Solar Zoning Ordinance

Version 1.0 – July 2018

Representatives from Emory Law School, Georgia Institute of Technology, and University of Georgia developed this Model Ordinance in response to the rapid development of solar energy in Georgia. It is based on current best practices from across the nation and tailored to meet Georgia's unique needs.

BEFORE USING THE MODEL ORDINANCE, IT IS IMPORTANT TO REMEMBER:

- **It is a model document that should be voluntarily adapted and adopted.** That means:
 - It is not law, and therefore it is not enforceable unless adopted by a county or city;
 - It will not be a perfect fit for every county and city, and therefore it should not be adopted wholesale without considering existing local ordinances and land use plans; and
 - Bracketed text signals placeholder language or a range of acceptable alternatives that must be selected before being adopted.
- **It should be read in conjunction with the Georgia Model Solar Zoning Ordinance Guide.** The Guide provides:
 - The necessary background information to understand how and why choices were made in developing the Model Ordinance; and
 - Reasonable alternatives to help counties and cities adapt the Model Ordinance to fit their community's needs.
- **Solar energy systems can and should be treated no differently than similar land uses.** While the Model Ordinance provides a wide-range of provisions, a county or city should first look to the requirements in its existing zoning code before adopting a provision from the Model Ordinance. Often, existing provisions will be sufficient.
- **The Model Ordinance is provided for informational purposes only.** Although every reasonable effort has been made to provide current and accurate information, Emory Law School, Georgia Institute of Technology, and University of Georgia make no guarantees of any kind.

AN ORDINANCE AMENDING THE [COUNTY/CITY] ZONING CODE TO PROVIDE COMPREHENSIVE GUIDELINES FOR THE SAFE AND ORDERLY DEVELOPMENT OF SOLAR ENERGY IN [COUNTY/CITY].

WHEREAS it is in the best interest of [County/City] to facilitate the siting, construction, installation, and decommissioning of solar energy systems (SESS) in [County/City] in a manner that encourages local economic development and protects the health, safety, and welfare of the citizens of [County/City], and at the same time mitigates any adverse impacts to wildlife, agricultural lands, forests, and other natural landscapes; and

WHEREAS the intent of [County/City] is to increase energy security and diversify the energy portfolio, to promote the use of Georgia-based energy resources, to decrease the cost of energy, to bolster local economic development and employment prospects, to increase consumers' choices in energy consumption, to encourage the use of a renewable energy resource, to support [Georgia's/County's/City's] sustainability agenda, and to reduce air and water pollution; and

WHEREAS the intent of [County/City] is not to compromise or contradict the health, safety, or environmental requirements contained in other federal, state, and local laws, nor is it to create heightened standards for the siting, construction, installation, and decommissioning of SESS that would discriminate against SESS relative to other similar commercial, industrial, or utility projects within [County/City];

BE IT ORDAINED by the [zoning authority] of [County/City] as follows:

Definitions to be added to “Definitions” article of County/City’s zoning code:

- ***Solar Energy System (SES)*** means a device or structural design feature that provides for the collection of solar energy for electricity generation, consumption, or transmission, or for thermal applications.

For purposes of the [County/City] zoning code, SES refers only to (1) photovoltaic SESs that convert solar energy directly into electricity through a semiconductor device or (2) solar thermal systems that use collectors to convert the sun’s rays into useful forms of energy for water heating, space heating, or space cooling.

SES as used in the [County/City] zoning code excludes concentrated solar power, which uses mirrors to focus the energy from the sun to produce electricity.

- ***Integrated Solar Energy System*** means an SES where solar materials are incorporated into building materials, such that the two are reasonably indistinguishable, or where solar materials are used in place of traditional building components, such that the SES is structurally an integral part of a house, building, or other structure. An Integrated SES may be incorporated into, among other things, a building facade, skylight, shingles, canopy, light, or parking meter.
- ***Rooftop Solar Energy System*** means an SES that is structurally mounted to the roof of a house, building, or other structure and does not qualify as an Integrated SES.
- ***Ground Mounted Solar Energy System*** means an SES that is structurally mounted to the ground and does not qualify as an Integrated SES. For purposes of the [County/City] zoning code, any solar canopy that does not qualify as an Integrated SES shall be considered a Ground Mounted SES, regardless of where it is mounted.

The ***Footprint*** of a Ground Mounted SES is calculated by drawing a perimeter around the outermost SES panels and any equipment necessary for the functioning of the SES, such as transformers and inverters. The Footprint does not include any visual buffer or perimeter fencing. Transmission lines (or portions thereof) required to connect the SES to a utility or consumer outside the SES perimeter shall not be included in calculating the Footprint.

Ground Mounted SESs shall be delineated by size as follows:

- ***Small Scale Ground Mounted Solar Energy System (Small Scale SES)*** means a Ground Mounted SES with a Footprint of less than [1 – 5*] acres.
- ***Intermediate Scale Ground Mounted Solar Energy System (Intermediate Scale SES)*** means a Ground Mounted SES with a Footprint of between [1 – 5*] and [15 – 50*] acres.
- ***Large Scale Ground Mounted Solar Energy System (Large Scale SES)*** means a Ground Mounted SES with a Footprint of more than [15 – 50*] acres.

* There is no single best practice for designating sizes of Ground Mounted SESs. Rather, the appropriate size designations will vary by jurisdiction. This Model Ordinance therefore only provides reasonable ranges. Counties and cities should select a specific number within this range—jurisdictions with larger average lot sizes may consider selecting numbers on the larger end of the range, while jurisdictions with smaller average lot sizes may consider selecting numbers on the smaller end. For further information on how to select the appropriate designations, and for additional alternatives, please see the Georgia Model Solar Zoning Ordinance Guide.

[Uses to be added to “Permitted Uses by District” tables of County/City’s zoning code:]

Accessory Use	Residential	Commercial	Industrial	Agricultural
<i>Integrated SES</i>	A	A	A	A
<i>Rooftop SES</i>	A	A	A	A
<i>Ground Mounted SES</i>				
<i>Small Scale SES</i>	A	A	A	A
<i>Intermediate Scale SES</i>	SUP	A	A	SUP
<i>Large Scale SES</i>	SUP	SUP	SUP	SUP
Primary Use	Residential	Commercial	Industrial	Agricultural
<i>Integrated SES</i>	-	-	-	-
<i>Rooftop SES</i>	-	-	-	-
<i>Ground Mounted SES</i>				
<i>Small Scale SES</i>	A	A	A	A
<i>Intermediate Scale SES</i>	SUP	A	A	SUP
<i>Large Scale SES</i>	SUP	SUP	SUP	SUP
A: Allowed Use. The SES is allowed in this district.				
SUP: Special Use Permit Required. If the applicant first obtains a Special Use Permit in accordance with the [County/City] zoning code, the SES is allowed in this district.				

[To be added to “Uses” articles of County/City’s zoning code:]

RESIDENTIAL DISTRICT <ul style="list-style-type: none">• The following primary uses are allowed:<ul style="list-style-type: none">– <i>Small Scale SES</i>• The following accessory uses are allowed:<ul style="list-style-type: none">– <i>Integrated SES</i>– <i>Rooftop SES</i>– <i>Small Scale SES</i>• The following primary or accessory special uses are allowed, after receiving a Special Use Permit:<ul style="list-style-type: none">– <i>Intermediate Scale SES</i>– <i>Large Scale SES</i>	AGRICULTURAL DISTRICT <ul style="list-style-type: none">• The following primary uses are allowed:<ul style="list-style-type: none">– <i>Small Scale SES</i>• The following accessory uses are allowed:<ul style="list-style-type: none">– <i>Integrated SES</i>– <i>Rooftop SES</i>– <i>Small Scale SES</i>• The following primary or accessory special uses are allowed, after receiving a Special Use Permit:<ul style="list-style-type: none">– <i>Intermediate Scale SES</i>– <i>Large Scale SES</i>
INDUSTRIAL DISTRICT <ul style="list-style-type: none">• The following primary uses are allowed:<ul style="list-style-type: none">– <i>Small Scale SES</i>– <i>Intermediate Scale SES</i>• The following accessory uses are allowed:<ul style="list-style-type: none">– <i>Integrated SES</i>– <i>Rooftop SES</i>– <i>Small Scale SES</i>– <i>Intermediate Scale SES</i>• The following primary or accessory special uses are allowed, after receiving a Special Use Permit:<ul style="list-style-type: none">– <i>Large Scale SES</i>	COMMERCIAL DISTRICT <ul style="list-style-type: none">• The following primary uses are allowed:<ul style="list-style-type: none">– <i>Small Scale SES</i>– <i>Intermediate Scale SES</i>• The following accessory uses are allowed:<ul style="list-style-type: none">– <i>Integrated SES</i>– <i>Rooftop SES</i>– <i>Small Scale SES</i>– <i>Intermediate Scale SES</i>• The following primary or accessory special uses are allowed, after receiving a Special Use Permit:<ul style="list-style-type: none">– <i>Large Scale SES</i>

[A new article “Solar Energy Systems” to be added to County/City’s zoning code:]

Section 1. – Applicability

- (a) This article applies to the siting, construction, installation, and decommissioning of any new SES to be constructed or installed after [the effective date of this ordinance] within the jurisdiction of [County/City].
- (b) Any SES that, prior to [the effective date of this ordinance]:
 - 1. is in operation;
 - 2. is being lawfully sited, constructed, or installed; or
 - 3. has caused the incurrence of substantial liabilities relating to siting, construction, or installation;shall be exempt from complying with this [ordinance], unless the surface area of an Integrated SES or Rooftop SES or the Footprint of a Ground Mounted SES is increased by more than [5 – 25*]% after [the effective date of this ordinance].
- (c) Unless otherwise expressly stated herein, an SES shall comply with all applicable federal, state, and local laws, including the requirements of the [County/City] zoning code and applicable building, fire, electric, and plumbing codes. If a provision in this [ordinance] directly conflicts with a requirement of the [County/City] zoning code, this [ordinance] shall control.

Section 2. – Requirements for Integrated Solar Energy Systems

- (a) **Solar Access.** Consistent with O.C.G.A. § 44-9-20 *et seq.*, a property owner may obtain a solar easement from another property owner for the purpose of ensuring the Integrated SES adequate exposure to sunlight.
- (b) **Tree Removal.** The removal of trees or natural vegetation for an Integrated SES shall be avoided to the extent reasonably practicable and shall comply with the requirements of the [County/City] zoning code.

Section 3. – Requirements for Rooftop Solar Energy Systems

- (a) **Solar Access.** Consistent with O.C.G.A. § 44-9-20 *et seq.*, a property owner may obtain a solar easement from another property owner for the purpose of ensuring the Rooftop SES adequate exposure to sunlight.

* There is no single best practice for this percentage. Rather, the appropriate designation will vary by jurisdiction. This Model Ordinance therefore only provides a reasonable range. Counties and cities should select a specific number within this range—a smaller number will subject more existing SESs to the requirements of this Model Ordinance (after they expand), while a larger number will subject less. For further information on how to select the appropriate designation, and for additional alternatives, please see the Georgia Model Solar Zoning Ordinance Guide.

- (b) **Tree Removal.** The removal of trees or natural vegetation for a Rooftop SES shall be avoided to the extent reasonably practicable and shall comply with the requirements of the [County/City] zoning code.
- (c) **Height.** A Rooftop SES shall be given an equivalent exemption, if any, to the applicable zoning district's height restrictions for roof-mounted mechanical devices or equipment, except a Rooftop SES mounted on a sloped roof shall not vertically exceed the highest point of the roof to which it is attached.

Section 4. – General Requirements for All Ground Mounted Solar Energy Systems

The following requirements apply to all Ground Mounted SESs, in addition to the specific requirements in this [ordinance] that apply to Intermediate and Large Scale SESs respectively.

- (a) **Solar Access.** Consistent with O.C.G.A. § 44-9-20 *et seq.*, a property owner may obtain a solar easement from another property owner for the purpose of ensuring a Ground Mounted SES adequate exposure to sunlight.
- (b) **Impervious Surface.** Ground mounted structures and components of the Ground Mounted SES, including transformers and foundations, shall be considered impervious. However, for purposes of compliance with the [County/City] zoning code's impervious surface coverage requirements, the panels of a Ground Mounted SES shall be considered pervious if they maintain sheet flow and allow for water to infiltrate under and around them through a pervious surface and into the subsoil.
- (c) **Lighting.** To reduce light pollution, lighting of a Ground Mounted SES shall:
 - 1. be limited to the minimum reasonably necessary for its safe operation;
 - 2. be directed downward where reasonably feasible;
 - 3. incorporate full cut-off fixtures; and
 - 4. reasonably utilize motion sensors.
- (d) **Tree Removal.** The removal of trees or natural vegetation for a Ground Mounted SES shall be avoided to the extent reasonably practicable and shall comply with the requirements of the [County/City] zoning code.
- (e) **Decommissioning.** Unless otherwise approved by the [zoning authority], decommissioning shall begin no later than 12 months after a Ground Mounted SES has ceased to generate electricity or thermal energy:
 - 1. for a Ground Mounted SES allowed without a permit, within 6 months of the beginning of decommissioning, the SES and all structures associated with it shall be removed, all materials shall be recycled or otherwise reused to the extent reasonably practicable, and the property shall be returned to its condition prior to the installation of the SES or to some other condition reasonably appropriate for the designated land use; and
 - 2. for a Ground Mounted SES allowed with a permit, the SES shall be decommissioned in accordance with the most recent decommissioning plan approved by the [zoning authority], and as further described in the Special Use Permit provision of this [ordinance].

Section 4A. – Specific Requirements for Intermediate Scale Solar Energy Systems

The following requirements apply to Intermediate Scale SESs, in addition to the general requirements in this [ordinance] that apply to all Ground Mounted SESs.

(a) Setbacks. An Intermediate Scale SES shall comply with the following setback requirements:

1. the Intermediate Scale SES shall be located no closer than the lesser of (a) 15 feet from any property line, or (b) the required setback for the applicable zoning district, if any;
2. the Intermediate Scale SES shall be located no closer than the lesser of (a) 20 feet from any public right-of-way, or (b) the required setback for the applicable zoning district, if any; and
3. the Intermediate Scale SES shall be located no closer than 50 feet from any residential dwelling unit on an adjacent lot.

(b) Visual Buffers. An Intermediate Scale SES in a residential or agricultural district shall have, to the extent reasonably practicable, a visual buffer of natural vegetation, plantings, earth berms, and/or fencing that provides a reasonable visual and lighting screen to reduce the view of the SES from residential dwelling units on adjacent lots (including those lots located across a public right-of-way). The existing natural tree growth and natural land forms along the SES perimeter may create a sufficient buffer and shall be preserved when reasonably practicable. Any visual buffer must be established and maintained in accordance with the most recent visual buffer plan approved by the [zoning authority], and as further described in the Special Use Permit provision of this [ordinance].

(c) Signage. An Intermediate Scale SES:

1. shall display signs (a) stating the risks that may result from contact with an Intermediate Scale SES, (b) identifying the owner or operator of the Intermediate Scale SES, and (c) providing a 24-hour emergency contact phone number;
2. shall comply with the requirements of the applicable zoning district for displaying any advertisement; and
3. may have signs that contain educational information about the Intermediate Scale SES.

Section 4B. – Specific Requirements for Large Scale Solar Energy Systems

The following requirements apply to Large Scale SESs, in addition to the general requirements in this [ordinance] that apply to all Ground Mounted SESs.

(a) Setbacks. A Large Scale SES shall comply with the following setback requirements:

1. the Large Scale SES shall be located no closer than the lesser of (a) 15 feet from any property line, or (b) the required setback for the applicable zoning district, if any;
2. the Large Scale SES shall be located no closer than the lesser of (a) 20 feet from any public right-of-way, or (b) the required setback for the applicable zoning district, if any; and
3. the Large Scale SES shall be located no closer than 100 feet from any residential dwelling unit on an adjacent lot.

(b) Visual Buffers. A Large Scale SES shall have, to the extent reasonably practicable, a visual buffer of natural vegetation, plantings, earth berms, and/or fencing that provides a reasonable visual and lighting screen to reduce the view of the SES from residential dwelling units on

adjacent lots (including those lots located across a public right-of-way). The existing natural tree growth and natural land forms along the SES perimeter may create a sufficient buffer and shall be preserved when reasonably practicable. Any visual buffer must be established and maintained in accordance with the most recent visual buffer plan approved by the [zoning authority], and as further described in the Special Use Permit provision of this [ordinance].

(c) Signage. A Large Scale SES:

1. shall display signs (a) stating the risks that may result from contact with a Large Scale SES, (b) identifying the owner or operator of the Large Scale SES, and (c) providing a 24-hour emergency contact phone number;
2. shall comply with the requirements of the applicable zoning district for displaying any advertisement; and
3. may have signs that contain educational information about the Large Scale SES.

Section 5A. – Special Use Permit Application

In addition to the general requirements for a Special Use Permit application set forth in the [County/City] zoning code, the following shall be contained in any Special Use Permit application for an SES:

(a) Basic Information. The applicant shall submit a document that lists the following:

1. the address of the property on which the SES will be located;
2. the applicant's name, address, telephone number, and email address;
3. the property owner's name, address, telephone number, and email address;
4. if known, the SES operator's name, address, telephone number, and email address;
5. if known, the installation company's name, address, telephone number, email address, and license number; and
6. evidence of the applicant's control of the property, such as a deed, lease, or option agreement with the landowner.

(b) Planning. The applicant shall submit the following, based on the most current and accurate information reasonably available:

1. a site plan of the property that depicts the locations of all existing and proposed structures (including solar arrays, inverters, transformers, electrical substations, and buildings), property lines, rights-of-way, roads, required setbacks, and visual buffers;
2. a topographic map that depicts vegetative cover, watersheds, or wetlands on the property;
3. a visual buffer plan that demonstrates that any visual buffer (a) minimizes impacts of the SES on adjacent residential dwelling units, as required by this [ordinance], (b) preserves natural tree growth and natural land forms along the SES perimeter, as required by this [ordinance], and (c) adheres to any additional visual buffer requirements of the [County/City] zoning code that may further minimize impacts of the SES on the community character;
4. a list that identifies (a) federal or state endangered, threatened, or candidate species that may be present on the property or within 1,000 feet of the property, and (b) critical habitat on the property or within 1,000 feet of the property;

5. if the SES is located in an agricultural district, a map that identifies prime farmland and farmland of statewide importance on the property; and
 6. a decommissioning plan that contains the following:
 - a. the name, address, telephone number, and e-mail address of the person(s) or entity(ies) responsible for implementing the decommissioning plan;
 - b. a statement of conditions that require the decommissioning plan to be implemented;
 - c. as part of decommissioning, a removal plan that identifies all structures, components, and non-utility owned equipment that shall be removed;
 - d. as part of decommissioning, a plan for recycling or otherwise reusing all materials to the extent reasonably practicable;
 - e. as part of decommissioning, a restoration plan to return the property to its condition prior to the installation of the SES or to some other condition reasonably appropriate for the designated land use after the SES is removed; and
 - f. a timeline to complete decommissioning.
- (c) **Certifications.** The applicant shall submit an affidavit that provides, to the best of the applicant's knowledge:
1. construction and operation of the SES will comply with all applicable federal and state laws;
 2. construction and operation of the SES will comply with all local laws, including the requirements of the [County/City] zoning code, unless waived by the [zoning authority]; and
 3. commercial general liability insurance will be maintained throughout the siting, construction, installation, operation, and decommissioning of the SES.

Section 5B. – Special Use Permit Review

- (a) Upon receiving a Special Use Permit application for an SES, the [zoning authority] shall conduct permitting proceedings in accordance with the requirements of the [County/City] zoning code.
- (b) A Special Use Permit application may be denied if the [zoning authority] determines the SES does not comply with the requirements of the [County/City] zoning code.
- (c) The applicant's appeal rights are consistent with those rights expressed in the [County/City] zoning code.

Template Solar Energy Development Ordinance for North Carolina

Executive Summary

North Carolina is rapidly becoming a leader in solar energy development not only in the southeast, but also in the US. Before the template, there was statewide discussion about how to regulate and permit solar energy systems, and no clear guide to creating one that does not overly burden industry or irresponsibly manage land use. Most local governments in NC, both at the municipal and county levels, provide some regulation on land use within their jurisdiction, yet most have yet to institute regulation for solar development. This template ordinance provides consensus input on a best practice model for how solar development can be regulated.

Template Solar Ordinance Meets a Growing Need

The rapid growth in solar development in NC makes this a very opportune time for development of the template ordinance, particularly because there is significant experience across the state with solar projects of all sizes, yet the industry is still at the early stages of its ongoing growth.

Template Approach Affords Flexibility

It is important to understand that the solar ordinance is a template rather than an enforceable rule or one-size-fits-all law. It is designed to be adapted and then adopted by jurisdictions across the state and to serve as the basis for local development ordinances in their respective communities. In this way the template solar ordinance provides valuable guidance while still allowing flexibility that local governments may want to help them best address local interests.

Broad Stakeholder Working Group Enhances Template's Value

The North Carolina Solar Center (NCSC) and the North Carolina Sustainable Energy Association (NCSEA) managed the development of the template ordinance and the organization of the drafting working group. The working group consisted of representatives of the solar industry, local NC planners, State Farm Bureau, NC Department of Agriculture, NC Department of Environment and Natural Resources (DENR), NC Association of County Commissioners, NC League of Municipalities, military, University of North Carolina School of Government, NC Conservation Network, Duke Energy Progress, North Carolina State University Forestry, Federal Aviation Administration (FAA), and many others. The initial draft was developed by NCSC and NCSEA in May 2013 based on a study of current NC solar ordinances and available state model ordinances. Throughout the summer and fall the working group, often in the form of smaller topic-specific focus groups, worked to improve and update the existing drafts. Additionally NCSC and NCSEA hosted five public forums across the state on the development of the template ordinance. At these forums NCSC and NCSEA convened a group of experts to inform interested stakeholders in the area about solar development and its regulation. The final three forums walked through the draft template and received valuable public feedback to assist with its development.

Template Ordinance Overview and Important Features

The ordinance covers photovoltaic as well as solar hot water projects, and classifies projects into one of three levels.

- **Level 1 System:**
 - Roof-mounted, building integrated, mounted over a parking lot, or ground-mounted and no more than half the footprint of the primary structure on the lot
 - A permitted use provided it meets applicable height, setback, aviation notification, and related district standards
- **Level 2 System:**
 - Ground-mounted system with a footprint of no more than ½ an acre in residential districts, no more than 10 acres in commercial/business districts or of any size in industrial districts
 - Subject to additional solar development standards (administrative approval)
- **Level 3 System:**
 - Systems that do not meet the requirements of Level 1 or 2 systems. Most solar farms are Level 3 systems.
 - Subject to the same solar development standards as Level 2
 - Require a public permit hearing (conditional/special use permit)

The template ordinance addresses some of the most common considerations that arise in the permitting of solar energy facilities. Some of the important topics covered in the ordinance include:

- Parcel Line Setbacks
- Height Limitations
- Aviation Notification (requires airport or FAA notification if project is within 5 nautical miles of an airport)
- Visibility (requirements regarding visual buffering, public signage, and lighting)
- Decommissioning (requires a decommissioning plan for the project)

There are other topics and resources that may be important to communities and other solar facility stakeholders but which were not deemed appropriate to include in the body of the template ordinance itself. Examples of those topics include wildlife habitat mapping and land lease considerations. These and other topics are nevertheless included in the form of appendices to the template ordinance document.

Implementation and Support

The template is designed to be used by jurisdictions across the state as a starting point for developing or updating their specific solar energy development regulations. However, there are natural limitations on the amount of information that can be included in the ordinance, even within multiple appendices. In order to facilitate local governments' access to the template ordinance and its contributors, the ordinance includes contact information for 30 individuals involved in the development of the template and who possess knowledge concerning various aspects of the ordinance. These organizations and individuals have agreed to share their contact information and serve as resources for fielding questions about the ordinance.

The Template Solar Energy Development Ordinance for North Carolina is available here:

[DSIRE website](#)

[NCSC website](#)

[NCSEA website](#)

Historical Document and information related to the template ordinance are available here:

[NCSC website](#)

[NCSEA website](#)

Introduction

Over the last few years, the state of North Carolina has experienced a massive increase in solar energy development. This can be attributed to many factors, including dramatic reduction in the price of solar modules, a state investment tax credit, the state's renewable energy portfolio standard (REPS), and the long-term standard offer contracts offered by utilities for projects below five megawatts (MW) in capacity. According to SNL Financial's latest industry data, the state has an installed capacity of 245 MW as of June 3, 2013.¹ This positions North Carolina as fifth nationally in cumulative installed capacity.² Thus, the North Carolina Sustainable Energy Association (NCSEA) and the North Carolina Solar Center organized this collaborative effort to construct a template ordinance. This ordinance facilitates the adoption of local regulation backed by industry, government, and citizen input.

Constructing solar energy projects requires numerous considerations and entails a thorough process of siting, permitting, and construction. These projects represent valuable assets in the community – creating local construction jobs, workforce training, economic development, increased property tax base, and ongoing educational opportunities. The permitting process generates discussion in communities with respect to the size and location of projects. Larger systems are often sited on farmland, forestland, or other open spaces, which can impact multiple residents. Responsible development of solar resources in North Carolina requires careful and consistent regulation in order to preserve important existing resources while facilitating the growth of this valuable new industry.

North Carolina's land use planning and regulation is handled by local governments. Cities, towns, and counties may delineate zoning districts within their jurisdiction and regulate various types of development within those local zoning districts. As of 2012, 87% of the state's 550 cities and 79% of the state's 100 counties have adopted zoning ordinances.³ Of these, only 24 cities and 18 counties have incorporated solar development ordinances into their codes; each on a case-by-case basis. This inconsistent approach to solar development regulation has created a patchwork of disparate and often undefined approaches, potentially creating unnecessary barriers to investment and development.

This discontinuity of policy prompted NCSEA and the NC Solar Center to lead in the drafting of a template solar ordinance that will not only provide guidance on effective language for responsible regulation of solar development, but also educate the public about this technology and its application. The wider public input process included five forums located throughout the state and a six-week period of open comments on nine key development issue areas using the Institute for Emerging Issues "IEI Commons" online tool. The drafting process included four months of working group meetings and several rounds of revisions. The drafting Working Group consisted of key stakeholders from planning, local government, agriculture, forestry, economic development, environment, wildlife, utilities, solar industry, and other specialties. Consensus on each aspect of this template ordinance was the goal throughout the drafting process.

The template ordinance set forth in this document attempts to organize and harmonize the language for regulating solar at the county and city level while incorporating some best practices. It divides solar energy systems into three different levels. Level 1 addresses all rooftop, parking lot, small ground mount associated with a building, and building-integrated solar systems. Level 2 applies to all mid-sized ground mounted systems and requires the systems meet development standards set by the ordinance before approval. The applicant must submit the required documents to the Zoning Administrator who reviews them and may then

¹ www.snl.com/InteractiveX/Article.aspx?cdid=A-17930699-11303

² Solar Energy Industries Association and GTM Research. (2011 & 2012). U.S. Solar Market Insight Report 2011 & 2012 in Review

³ David Owens and Dayne Battem, "2012 Zoning Survey Report: Zoning Adoption, Administration, and Provisions for Design Standards and Alternative Energy Facilities," *Planning and Zoning Law Bulletin: UNC School of Government* no. 20 (July 2012), 1

approve the application as meeting the development standards. Level 3 systems are generally larger scale ground-mounted solar systems, often referred to as solar farms. Level 3 systems must obtain a special/conditional use permit and conform to the development standards in this solar development ordinance. The ordinance suggests development limitations based upon trends in North Carolina in order to maximize legitimacy and relevancy of the requirements.

This template is not law, rather a carefully crafted guideline for cities and counties to consider when adopting ordinances specific to solar energy development in their jurisdiction. The authors of this template emphasize that the standards must be tailored to fit the existing local land development ordinances and suggest that ordinances treat solar similarly to other uses with similar attributes and land/community impacts. The zoning districts included in this template ordinance are generic districts which will need to be replaced with the existing zoning districts of the jurisdiction. The template ordinance may also be applied in non-zoned jurisdictions upon the modification and approval of the authorizing agency. Furthermore, the adoption of an ordinance will not supersede any existing federal, state, or local rules pertaining to the development of the project. There are many important aspects of solar development that are out of the jurisdiction of the city or county yet should be considered by the property owner, such as doing a title search to find out if there are any use restrictions of the parcel, such as would exist with an enhanced farm district or some easements. Additional guidance for landowners outside of the scope of this ordinance is provided in Appendix A. There are several other appendices that provide related information but that are not part of the template ordinance regulations, such as the appendix on Sustainable Development (Appendix B) with information for planners and policy makers on additional options related to solar to consider in other development ordinances.

Stakeholders Available for Contact

The following selected members of the template ordinance working group have agreed to make themselves available for questions regarding the ordinance or issues related to solar development.

NC Clean Energy Technology Center (NCCETC) (formerly the NC Solar Center) Tommy Cleveland (919) 515-9432 Tommy_Cleveland@ncsu.edu	NC Sustainable Energy Association (NCSEA) Maggie Clark (336) 402-6246 Maggie@energync.org
Duke Energy Bruce Barkley (919) 546-2814 Bruce.Barkley@duke-energy.com	Duke University Nicholas Institute Larry Shirley (919) 613-8745 Larry.Shirley@duke.edu
Federal Aviation Administration (FAA) Dana Perkins at Atlanta ADO in Working Group Aaron Braswell at Memphis ADO is current contact (901) 322-8192 Aaron.Braswell@faa.gov	Mathis Consulting Ben Edwards (828) 351-9631 ben@mathiscounseling.com
NC Association of County Commissioners Casandra Skinner 919-715-7665 Casandra.Skinner@ncacc.org	NC Conservation Network Nadia Luhr (919) 857-4699 ext.107 nadia@ncconservationnetwork.org
NC Department of Agriculture – Ag. Development & Farmland Preservation Dewitt Hardee (919) 707-3069 Dewitt.Hardee@ncagr.gov	NC Department of Agriculture – Agribusiness Development Ron Fish (919) 707-3119 Ron.Fish@ncagr.gov
NC Depart. of Commerce – Div. of Community Assistance - Community Planning, Central Region Oliver Bass (919) 571-4900 obass@nccommerce.com	NC DENR – Division of Energy, Mineral, & Land Resources - State Energy Program Bob Leker (919) 733-1907 bleker@nccommerce.com
NC DENR – Division of Water Quality (DWQ) Bill Diuguid (919) 807-6369 Bill.Diuguid@ncdenr.gov	NC DENR – Military Affairs and Strategic Planning Chris Russo (919) 707-3128 Chris.Russo@ncdenr.gov
NC Department of Revenue (Tax) Michael Brown (919) 814-1142 Michael.Brown@dornrc.com	NC Farm Bureau Paul Sherman (919) 719-7292 Paul.Sherman@ncfb.org
NC League of Municipalities Kim Hibbard (919) 715-3936 khibbard@nclm.org	NC State University Forestry Department Mark Megalos (919) 513-1202 mamegalo@ncsu.edu

NC Wildlife Resources Commission Kacy Cook (910) 638-4887 Kacy.Cook@ncwildlife.org	Planner – Catawba County Susan Ballbach (828) 465-8381 sballbach@catawbacountync.gov
Planner – Cleveland County Chris Martin 704-484-4975 Chris.Martin@clevelandcounty.com	Planner – Granville County Dervin Spell (919) 603-1333 Dervin.Spell@granvillecounty.org
Planner – Guilford County Les Eger (336) 641-3635 leger@co.guilford.nc.us	Planner – Warren County Ken Krulik (252) 257-7027 ext.30 kkrulik@co.warren.nc.us
Solar Industry - Carolina Solar Energy Richard Harkrader (919) 682-6822 rharkrader@carolinasolarenergy.com	Solar Industry - Parker Poe Adams & Bernstein, LLP Katherine Ross (919) 835-4671 katherineross@parkerpoe.com
Solar Industry - PCG Solar/Green Guys Mike Whitson (704) 497-0367 mike@pcgsolar.com	Solar Industry - O₂Energies, Inc. Logan Stephens (336) 708-5161 logan@o2energies.com
Solar Industry - Spilman Thomas & Battle, PLLC Nathan Atkinson (363) 725-4496 natkinson@spilmanlaw.com	Solar Industry - Southern Energy Management Bob Kingery (919) 836-0330 ext 101 bkingery@southern-energy.com
Solar Industry - Strata Solar Lance Williams (919) 960-6015 ext 306 lwilliams@stratasolar.com	Solar Industry - QF Solutions Donna Robichaud (513) 659-1178 drobichaud@qf-solutions-llc.com
UNC School of Government Adam Lovelady (919) 962-6712 adamlovelady@sog.unc.edu	NCSEA/Duke University Graduate Student Michael Fucci (302) 584-4152 fucci@energync.org

Local government planning support resources:

- **NC Department of Commerce – Division of Community Assistance – Office of Community Planning:** To request services please contact the office nearest you. Contact information is available at www.nccommerce.com/cd/community-planning/regional-office-services
- **Solar Outreach Partnership (SolarOPs) – a US Department of Energy funded project:** Designed to help accelerate solar energy adoption on the local level by providing best practices, resources, and technical assistance to local governments. www.solaroutreach.org

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Template Solar Energy Development Ordinance

1. Purpose

The purpose of this ordinance is to facilitate the construction, installation, and operation of Solar Energy Systems (SESs) in the County/City of _____ in a manner that promotes economic development and ensures the protection of health, safety, and welfare while also avoiding adverse impacts to important areas such as agricultural lands, endangered species habitats, conservation lands, and other sensitive lands⁴. It is the intent of this ordinance to encourage the development of SESs that reduce reliance on foreign and out-of-state energy resources, bolster local economic development and job creation, support the diversification of the state's energy portfolio, strengthen energy and grid security, reduce greenhouse gas emissions, reduce local air and water pollution, and aid North Carolina in meeting its Renewable Portfolio Standard. This ordinance is not intended to abridge safety, health or environmental requirements contained in other applicable codes, standards, or ordinances. The provisions of this ordinance shall not be deemed to nullify any provisions of local, state or federal law.

2. Definitions

Solar Energy System (SES) - the components and subsystems required to convert solar energy into electric or thermal energy suitable for use. The area of the system includes all the land inside the perimeter of the system, which extends to any fencing. The term applies, but is not limited to, solar photovoltaic (PV) systems, solar thermal systems, and solar hot water systems. A system fits into one of three system types: Level 1 SES, Level 2 SES, and Level 3 SES.

Level 1 Solar Energy System - Level 1 SESs include the following:

- i. Roof-mounted on any code-compliant structure.
- ii. Ground-mounted on an area of up to 50% of the footprint of the primary structure on the parcel but no more than 1 acre.
- iii. Covering permanent parking lot and other hardscape areas.
- iv. Building integrated solar (i.e., shingle, hanging solar, canopy, etc.).

Level 2 Solar Energy System - Level 2 SESs are ground-mounted systems not included in Level 1 that meet the area restriction listed below:

- v. Agricultural/Residential: SES \leq 1/2 acres
- vi. Residential Low Density: SES \leq 1/2 acre
- vii. Residential Medium Density: SES \leq 1/2 acre
- viii. Residential High Density: SES \leq 1/2 acre
- ix. General Commercial/Business: SES \leq 10 acres
- x. Light Industrial: SES of any size
- xi. Heavy Industrial: SES of any size
- xii. Office-Institutional: SES \leq 10 acres

Level 3 Solar Energy System – Level 3 SESs are systems that do not satisfy the parameters for a Level 1 or Level 2 Solar Energy System.

⁴ See Appendix C for information on the NC resources

3. Applicability

- a. This ordinance applies to the construction of any new SES within the jurisdiction of the County/City.
- b. An SES established prior to the effective date of this ordinance shall remain exempt:
 - i. Exception: Modifications to an existing SES that increases the SES area by more than 5% of the original footprint or changes the solar panel type (e.g. photovoltaic to solar thermal) shall be subjected to this ordinance.
- c. Maintenance and repair are not subject to this ordinance.
- d. This ordinance does not supersede regulations from local, state, or federal agencies. Some important examples of such regulations include, but are not limited to:
 - i. **Building/Electrical Permits Required**
Nothing in this ordinance modifies already established building standards required to construct a SES.
 - ii. **Onsite Wastewater System Avoidance**
Nothing in this ordinance modifies already established Department of Health and Human Services requirements. A SES shall not be constructed over onsite waste water systems (e.g. septic systems) unless approved by the Department of Health and Human Services.
 - iii. **Stormwater Permit Required⁵**
Nothing in this ordinance modifies the requirements or exempts any SES of complying with the various stormwater jurisdictions⁶ and regulations established by the Department of Environment and Natural Resources. North Carolina statute requires the acquisition of stormwater permits for construction projects that impact stormwater runoff.
 - iv. **Historic Districts**
Nothing in this ordinance modifies already established State Historic Preservation Office requirements. May require additional permitting (certificates of appropriateness) to install solar in Historic Districts⁷

4. Permits Required

The type of permit required for an SES is displayed in Table 1: Permit Requirements.

⁵ See Appendix D: Water Infiltration and Soil Conservation for information on their relationship with ground-mounted solar energy systems

⁶ <http://portal.ncdenr.org/web/wq/ws/su/sw-permitting-map>

⁷ www.hpo.ncdcr.gov (see also: www.nrel.gov/docs/fy11osti/51297.pdf)

Table 1: Permit Requirements

Types of Permits Required: P= Permitted Use; D= Development Standards ⁸ ; SUP= Special Use Permit or Conditional Use Permit (see Appendix E)								
Zoning District	Agricultural/ Residential	Residential Low Density	Residential Med. Density	Residential High Density	Commercial/ Business	Light Industrial	Heavy Industrial	Office/ Institutional
Solar Energy Facilities								
Roof-mounted, parking lot cover, or building integrated (Level 1)	P	P	P	P	P	P	P	P
Ground-mounted:								
up to 50% of the footprint of the primary structure (Level 1)	P	P	P	P	P	P	P	P
≤1/2 acre (Level 2)	D	D	D	D	D	D	D	D
≤10 acres (Level 2 or 3)	SUP	SUP	SUP	SUP	D	D	D	D
>10 acres (Level 2 or 3)	SUP	SUP	SUP	SUP	SUP	D	D	SUP

5. Parcel Line Setbacks

The following table provides the Parcel Line setback to ground mounted SES equipment, excluding any security fencing, poles, and wires necessary to connect to facilities of the electric utility.

Table 2: Parcel Line Setbacks

Zoning District	Level 1	Level 2	Level 3		
			Front	Side	Rear
Agricultural/Residential	Per Zoning District**,**	Per Zoning District*, **	30’*	15’*	25’*
Residential, low density			50’*	50’*	50’*
Residential Medium Density			Per Zoning District*		
Residential High Density					
Commercial/Business			30’*	15’*	25’*
Light Industrial			30’*	15’*	25’*
Heavy Industrial			30’*	15’*	25’*
Office/Institutional			30’*	15’*	25’*
* 100’ setback for SES equipment, excluding any security fencing, to any residential dwelling unit. If the SES is on a working farm where the primary residential structure of the farm is on an adjacent lot then this 100’ setback will not apply to this primary residential structure.					
** Ground-mounted SES must comply with district front yard limitations and setbacks, or otherwise not impair sight distance for safe access to or from the property or other properties in the vicinity					
*** Level 1 SESs are not subject to screening requirements typically applied to accessory utility systems (HVAC, dumpsters, etc.).					

⁸ Referred to as “Limited Use” in some jurisdictions

6. Height Limitations

The height of systems will be measured from the highest natural grade below each solar panel.

Table 3: Height Limitations*

Zoning Districts	Level 1 ⁹	Level 2	Level 3
Agricultural/Residential	Roof-mounted: Per zoning district Ground-mounted: 20'	20'	20'
Residential, low density		20'	20'
Residential Medium Density		20'	20'
Residential High Density		20'	20'
Commercial/Business		20'	20'
Light Industrial		20'	20'
Heavy Industrial		20'	20'
Office/Institutional		20'	20'
* This excludes utility poles and any antennas constructed for the project.			

7. Aviation Notification (see Appendix F for additional information)

- The requirements below apply only to Level 1, 2, & 3 systems over half (½) an acre in size:
- a. A map analysis showing a radius of five (5) nautical miles from the center of the SES with any airport operations within this area highlighted shall be submitted with permit application.
 - b. For consideration of potential impacts to low altitude military flight paths, notification of intent to construct the SES shall be sent to the NC Commanders Council¹⁰ at least 30 days before the CUP/SUP hearing for Level 3 SESs and at least 45 days before starting construction for applicable Level 1 & Level 2 SESs. Notification shall include location of SES (i.e. map, coordinates, address, or parcel ID), technology (i.e. roof-mounted PV, ground-mounted fixed PV, tracked PV, solar thermal, etc.), and the area of system (e.g. 5 acres). Proof of delivery of notification and date of delivery shall be submitted with permit application.
 - c. The latest version of the Solar Glare Hazard Analysis Tool (SGHAT)¹¹ shall be used per its user’s manual to evaluate the solar glare aviation hazard. The full report for each flight path and observation point, as well as the contact information for the zoning administrator, shall be sent to the authority indicated below at least 30 days before the CUP/SUP hearing for Level 3 SESs and at least 45 days before starting construction for Level 1 & Level 2 SESs. Proof of delivery of notification and date of delivery shall be submitted with permit application.
 - i. Airport operations at airport in the National Plan of Integrated Airport Systems (NPIAS)¹² within 5 nautical miles of the center of SES: provide required information to the Federal Aviation Administration’s (FAA) Airport District Office (ADO) with oversight of North Carolina¹³

⁹ An alternative for roof mounted systems would be to exempt roof mounted systems from building height restrictions.
¹⁰ Mail: Commanding General; Attn: Community Plans and Liaison (NC Commanders Council); Marine Corps Installations East (MCIEAST); PSC Box 20005; Camp Lejeune, NC 28542
Email: Subject: NC Commanders' Council Notification of Solar Development Project in "Town or County Name"
Address: Gray CIV Alexander K [alexander.gray@mcw.usmc.mil]
¹¹ <http://sandia.gov/glare>
¹² http://www.faa.gov/airports/planning_capacity/npias/reports/
¹³ as of October 2013 this is the Memphis ADO

- ii. Airport operations at airport *not* in the NPIAS, including military airports, within 5 nautical miles of the center of SES: provide required information to the NC Commanders Council for military airports and to the management of the airport for non-military airports
- Any applicable SES design changes (e.g. module tilt, module reflectivity, etc.) after initial submittal shall be rerun in the SGHAT tool and the new full report shall be sent without undue delay to the contact specified in 7.b.i and 7.b.ii above for accurate records of the as-built system.

8. Level 1 Solar Energy System Requirements

Level 1 SESs are a permitted use provided they meet the applicable height, setback, aviation notification, and related district standards.

9. Levels 2 & 3 Solar Energy System Requirements

These requirements are in addition to height, setback, aviation notification, and applicable district standards.

a. Site Plan

- i. A site plan¹⁴ shall be submitted to the Zoning Administrator demonstrating compliance with:
 - 1. Setback and height limitations established in Tables 2 and 3,
 - 2. Applicable zoning district requirements such as lot coverage,
 - 3. Applicable solar requirements per this ordinance.

b. Visibility

- i. SESs shall be constructed with buffering as required by the applicable zoning district or development standards (see Appendix J for solar visual buffering example standards).
- ii. Public signage (i.e. advertising, educational, etc.) as permitted by local signage ordinance, including appropriate or required security and safety signage.
- iii. If lighting is provided at site, lighting shall be shielded and downcast such that the light does not spill onto the adjacent parcel or the night sky. Motion sensor control is preferred.

c. Decommissioning (see Appendix G for a sample decommissioning plan and Appendix H for example abandonment clause and information on decommissioning)

- i. A decommissioning plan signed by the party responsible for decommissioning and the landowner (if different) addressing the following shall be submitted with permit application.
 - 1. Defined conditions upon which decommissioning will be initiated (i.e. end of land lease, no power production for 12 months, etc.)
 - 2. Removal of all non-utility owned equipment, conduit, structures, fencing, roads, and foundations
 - 3. Restoration of property to condition prior to development of the SES.
 - 4. Timeframe for completion of decommissioning activities, not to exceed one year.
 - 5. Description and copy of any lease or any other agreement with landowner regarding decommissioning.
 - 6. Name and address of person or party responsible for decommissioning..
 - 7. Plans and schedule for updating this decommissioning plan.
- ii. Before final electrical inspection, provide evidence that the decommissioning plan was recorded with the Register of Deeds.

¹⁴ Applicants may choose to provide a sketch plan to the Planning Administrator ahead of a site plan, as sketch plans do not require much investment and are an opportunity for the Planning Administrator to point out design changes ahead of more expensive site planning.

APPENDIX A: Landowner Guidance

There are many aspects of solar energy system development that impact the land, the landowner, the community, and the solar owner that are not regulated by the local government, or other regulatory bodies. Below is a list of issues developed in early 2013 in consultation with staff at the State Energy Office, the NC Solar Center, and the NC Attorney General's office to help identify *some* issues landowners should investigate when considering a lease offered for land used for a solar farm. Please be advised that the list is not meant to be a comprehensive list of all issues. It is recommended that landowners complete item #1 - get a land-lease lawyer.

1. It is highly recommended that you retain a lawyer with land lease experience to help you evaluate a lease. You can reach the NC Bar Association at 1-800-662-7660 and they can give you a list of lawyers in your area.
2. An option or feasibility period may be proposed by a developer while they are investigating whether a parcel of land is appropriate for a project – before they offer a long term lease. This is a due diligence period a developer will use to examine if the right conditions exist for a solar farm and possibly to secure agreements for the sale of power from the project.
3. Make sure conservation easement conditions or agricultural designation for tax purposes are consistent with the new lease. Taking land out of agricultural designation may result in additional taxes owed. The contract should state who is responsible for increased taxes due to the Solar Energy System development.
4. Evaluate any potential conflicts that the solar lease may have w/ any existing mortgage terms.
5. Evaluate any potential conflicts that the solar lease may have w/ any existing land use agreements, such as easements or an enhanced farm district.(A title search may be used to identify potential conflicts)
6. Make sure there is compensation for timber removal (if appropriate).
7. Make sure all conditions of a lease or options in advance of a lease are received in writing.
8. Have detailed decommissioning (removal) and restoration terms for the solar equipment at the end of lease so the land can be used for other purposes.
9. The developer should be responsible for managing storm water on the site. The installation of the arrays will impact storm water on the site and may require changes to storm water management or increase maintenance of storm water system (i.e. erosion control and keeping drainage ditches/pipes free flowing).
10. Make sure the lease identifies all work to be done and exact locations for equipment, also make sure there is proper notification of landowner in advance of any work to be done.
11. Take time to review lease documents before signing them.
12. It may be useful to check w/ neighbors to assess compensation rates being offered for land leases in your area.

Another resource that individuals as well as local governments may wish to consult is a document that the Solar Foundation prepared with funding from the U.S. Department of Energy as part of the US Department of Energy SunShot Program. It discusses a number of background requirements for solar farms as well as major elements of lease documents. You can find the document at the following link

http://thesolarfoundation.org/sites/thesolarfoundation.org/files/TSF_Leasing%20Fact%20Sheet.pdf

APPENDIX B: Sustainable Energy Options and Resources

This appendix is provided to supply planners and policy makers with inspiration and information about concepts and policies that in one way or another relate to solar energy, but do not appear within the scope of a solar development ordinance. None of the policies in this appendix are included in the template solar ordinance.

Project Permit – Solar Permitting map, database, and ratings, by Vote Solar

A project of the Vote Solar Initiative, Project Permit is an interactive website that scores municipal solar permitting practices nationwide. It is designed to help permitting staff, solar advocates, and municipal leaders understand how their city or town compares to permitting best practices. Project Permit includes tools and resources to help more municipalities achieve permitting best practices. Project Permit is funded by Solar 3.0, a DOE Sunshot Initiative grant recipient.

<http://projectpermit.org/>

Model Inspection Checklist for Rooftop PV Systems, from Interstate Renewable Energy Council (IREC), September 2013

For municipalities, an inspection checklist can serve a variety of important functions. First, it can serve as a supplementary educational tool for new or experienced inspectors to ensure they are aware of the host of code requirements that must be verified on-site during the inspection. It can also increase the consistency of inspections, by both a single inspector, as well as different inspectors working for the jurisdiction. Consistent inspections ensure high-quality, safe installations and also reduce conflict with installers, who may complain when they perceive that inspectors provide different results. The municipality can also use an inspection checklist as a tool for highlighting particular issues that seem to be repeatedly problematic for installers. For example, a checklist could contain a section for “common mistakes” which could highlight particular issues for both installers and inspectors to verify. The Model Inspection Checklist for Rooftop PV Systems was developed after reviewing existing checklists that have been created by leading jurisdictions across the United States. IREC incorporated the best components of each of these checklists and then worked with Don Hughes, Senior Electrical Inspector with Santa Clara County, California, to identify the relevant code requirements and add the citations. Finally, this document was peer-reviewed by qualified inspectors and building code officials from across the country, and by UL representatives.

www.irecusa.org/wp-content/uploads/2013/09/Model-Inspection-Checklist.pdf

Expedited Permit Process, from Solar American Board for Codes and Standards (Solar ABCs)

This report presents an Expedited Permit Process for PV Systems. The permit process in this report was created to meet the needs of the growing, small-scale photovoltaic (PV) market in the U.S. and is applicable nationwide. It takes advantage of the many common characteristics inherent in most of the small-scale PV systems installed today to streamline both the application and award of permits. The term “expedited permit process” refers to an organized permitting process by which a majority of small PV systems can be permitted (structural & electric) quickly and easily. It is not intended to apply to all types of PV systems. The primary need and use for this process is for systems of less than 15kW maximum power output. The expedited permit process is intended to simplify the structural and electrical review of a small PV system project and minimize the need for detailed engineering studies and unnecessary delays.

www.solarabcs.org/about/publications/reports/expedited-permit/

Solar Powering Your Community: A Guide for Local Governments, from U.S. Department of Energy

The U.S. Department of Energy developed this comprehensive resource to assist local governments and stakeholders in building sustainable local solar markets. This second edition of the guide was updated to include new market developments and innovations for advancing local solar markets that have emerged since the first edition was released in 2009. This updated edition also contains the most recent lessons and successes from the original 25 Solar America Cities and other communities promoting solar energy. The guide introduces a range of policy and program options that have been successfully field tested in cities and counties around the country.

This guide can help stimulate ideas or provide a framework for a comprehensive solar plan for a community. DOE recognizes that there is no one path to solar market development. This guide therefore introduces a range of policy and program options that can help a community build a local solar infrastructure. Communities can tailor their approach to fit their particular needs and market barriers.

www4.eere.energy.gov/solar/sunshot/resource_center/resources/solar_powering_your_community_guide_local_governments

NC Solar Access Law:

North Carolina has a Solar Access Law, which among other things, states that Cities and counties in North Carolina generally may not adopt ordinances prohibiting the installation of "a solar collector that gathers solar radiation as a substitute for traditional energy for water heating, active space heating and cooling, passive heating, or generating electricity for residential property. For more information visit:

www.dsircusa.org/incentives/incentive.cfm?Incentive_Code=NC08R

Renewable Energy Ready Homes

Local governments can encourage construction of more capacity for rooftop solar installations on industrial, commercial and residential rooftops. The American Planning Association recommends that for this purpose local governments require the installation of solar 'stub-ins' on rooftops of appropriate new construction and building renovation. Stub-ins and their installation are very affordable and can significantly reduce the cost of installing a solar system in the future.

Energy Star has Renewable Energy Ready Homes specifications:

www.energystar.gov/index.cfm?c=rerh.rerh_index

Design for Solar Access

New developments can be designed to maximize solar access for each property, greatly increasing the ability of the buildings in the development to make use of solar energy.

Some resources:

- Site Design strategies for Solar Access in model Sustainable Community Development Code: www.law.du.edu/documents/rmlui/sustainable-development/SolarAccess.pdf and www.law.du.edu/images/uploads/rmlui/rmlui-sustainable-siteDesignStrategiesSolarAccess.pdf
- Solar Ready Development: <http://www.solarsimplified.org/zoning/solar-zoning-toolbox/solar-ready-zoning>
- APA Planning and Zoning for Solar Energy information packet: www.planning.org/pas/infopackets/open/pdf/30part1.pdf

Wildlife Friendly Power Lines

The U.S. Fish & Wildlife Service provides guidelines on how to minimize the impacts of distribution and transmission lines to wildlife at www.fws.gov/birds/documents/powerlines.pdf.

APPENDIX C: NC Resource Mapping and Information

The **Biodiversity and Wildlife Habitat Assessment map** can be obtained from the **N.C. Conservation Planning Tool** at www.conservationtool.nc.gov and displays the location of high priority habitats and natural resources. Also included in the N.C. Conservation Planning tool are maps of Open Space and Conservation Lands, Agricultural Lands, and Forestry Lands.

- The NC Wildlife Resources Commission recommends that Solar Energy System developers address how they will minimize impacts as much as is practical to forests and sensitive lands mapped in the Biodiversity and Wildlife Habitat Assessment.

Maps of Managed Areas (lands managed at least partially for wildlife habitat) and Smoke Awareness Areas (areas adjacent to lands managed with prescribed burning) are available from the **Green Growth Toolbox** website at www.ncwildlife.org/greengrowth (see below).

- The NC Wildlife Resources Commission recommends that Solar Energy System developers address how they will minimize impacts as much as is practical to forests and sensitive lands mapped in Managed Areas and impacts to the ability to conduct prescribed burning on adjacent lands. The NC Wildlife Resources Commission also recommends that sites should not be located immediately adjacent to Managed Areas.

NC OneMap (www.nconemap.org) is a public service providing comprehensive discovery and access to North Carolina's geospatial data resources. NC OneMap, the State's Clearinghouse for geospatial information, relies on data sharing and partnerships. Information available is extensive and includes wetlands, soil types, streams, and airports.

NC DENR Watershed Plan Map: <http://portal.ncdenr.org/web/wq/ps/bpu/watershed-plan-map>

NC Green Growth Toolbox: Wildlife & Natural Resource Stewardship in Planning, from North Carolina Wildlife Resources Commission

The NC Green Growth Toolbox is a guide to provide North Carolina's counties, towns, and cities with tools for growth that conserves wildlife and natural resources. The Toolbox includes a Green Growth Handbook, Wildlife Action Plan, Conservation Data, Habitat Conservation Recommendations, Training Workshops, and more.

www.ncwildlife.org/Conserving/Programs/GreenGrowthToolbox.aspx

APPENDIX D: Water Infiltration and Soil Conservation at SES

The prevailing interpretation of ground-mounted solar energy systems is that the solar arrays do *not* count towards the impervious allowance. In other words, the solar arrays are pervious. The State definition of built-upon area states built-upon area does not include a wooden slatted deck or pervious or partially pervious paving material to the extent that the paving material absorbs water or allows water to infiltrate through the paving material.¹⁵ Therefore, if the solar panels can be constructed in such a manner as to promote the effective infiltration of rainfall then they could be considered pervious, similar to a slatted deck or pervious pavement. Other structures such as transformers, buildings, entrance roads, etc. would still be considered impervious. The following criteria could be used at a minimum in establishing a solar panel as pervious cover:

1. Panels must be positioned to allow water to run off their surfaces.
2. Soil with adequate vegetative cover must be maintained under and around the panels.
3. The area around the panels must be adequate to ensure proper vegetative growth under and between the panels.

It is suggested that the solar farm designer/developer design the ground cover as pervious to the maximum extent practicable, so that the stormwater infiltrates or is cleaned by sheetflow across the solar farm before exiting the property or reaching the waters of the State.

Information on soil conservation:

- North Carolina Division of Water Quality Best Management Practices (BMP) Design Manual (<http://portal.ncdenr.org/web/lr/bmp-manual>) details how to design various stormwater BMPs effectively.
- North Carolina Association of Soil & Water Conservation Districts (<http://ncaswcd.org/>)
- A sample (soil) conservation plan: http://www.dec.ny.gov/docs/water_pdf/appendixfl.pdf

¹⁵ State's model Phase II post-construction ordinance, Section 6: Definitions, Built-upon area (BUA)
<http://portal.ncdenr.org/web/lr/ms4-resources>

APPENDIX E: Conditional Use Permits and Special Use Permits

Special Use Permits (aka Conditional Use Permits) require a quasi-judicial hearing where the application must be found to meet several general standards and any special conditions required by the board. In general, decisions of a quasi-judicial body require findings of facts to reach conclusions of law that justify the decision. Decisions of a quasi-judicial body are often legally enforceable under the laws of a jurisdiction; they can be challenged in a court of law which is the final decisive authority

Most NC jurisdiction use the following four general standards: 1) Does not materially endanger the public health or safety; 2) Meets all required conditions and specifications; 3) Would not substantially injure the value of adjoining property or be a public necessity, and 4) Will be in harmony with the area in which it is located and be in general conformity with the comprehensive plan. More information on SUP/CUP in NC is available from the UNC School of Government: http://www.sog.unc.edu/sites/www.sog.unc.edu/files/SS_22_v4b.pdf

APPENDIX F: Airports

Experience and research has shown that there is a possibility for today's solar energy systems to cause a glare hazard for pilots and/or air traffic controllers. The Department of Energy's Sandia National Laboratories recently developed a 3-D modeling based online hazard assessment tool to determine if a solar project is likely to create a Solar Glare Aviation Hazard. The tool is free and recommended by the Federal Aviation Association (FAA). <https://share.sandia.gov/phlux>. Contact the FAA's local Airport District Office (ADO) for help with the tool or to get input data for tool variables that must come from the airport.

A new FAA interim policy¹⁶ (published 10-23-2013) for on-airport solar development requires the use of this glare assessment tool and defines the below criteria to assess acceptable risk of glare.

The proposed solar energy system meets the following standards:

1. No potential for glint or glare in the existing or planned Airport Traffic Control Tower (ATCT) cab, and
2. No potential for glare or "low potential for after-image" (shown in green in [reports]) along the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP)¹⁷. The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.

The following are recommended steps required to complete the aviation notification requirement in the template solar ordinance for NC for SESs near an airport.

1) OFF AIRPORT solar project-

- a) Determine if the site is so close to an airport that it falls under FAA authority to require a filing with the Federal Aviation Administration (FAA) in accordance with CFR Title 14 Part 77.9 & follow instructions. If a filing is required steps b-f are not required, otherwise continue with the step below. (<https://oeaaa.faa.gov/oeaaa/external/gisTools/gisAction.jsp?action=showNoNoticeRequiredToolForm>)
- b) Use internet/software mapping tool (such Google Earth or Google Map) to identify airports within 5 nautical miles of the center of the proposed solar project site.
- c) If search results indicate no airport within 5 nautical miles of the project site, append research results to the permit application.
- d) If search results indicate airport(s) within 5 nautical miles of the project site, go to http://www.faa.gov/airports/planning_capacity/npia/ to determine if it is in the National Plan of Integrated Airport Systems (NPIAS), i.e. an FAA "obligated" airport. If you are unable to determine if the airport is in the NPIAS or require assistance, contact the FAA's local ADO.
 - i) Notification of airports in the NPIAS should be sent to the local ADO.
 - ii) Notification of military airports should be sent to the NC Commander's Council via mail or email
 - iii) Notification of all other airports should be sent to the management of the airport¹⁸
- e) Run the latest version of the SGAHT according to the user manual. Unless otherwise directed in the user's manual, use the tool to assess for glare hazards at¹⁹:
 - i) the Airport Traffic Control Tower (ATCT) cab, and

¹⁶ www.gpo.gov/fdsys/pkg/FR-2013-10-23/pdf/2013-24729.pdf

¹⁷ FAA airport GIS maps and eALPs at <https://airports-gis.faa.gov/public/>

¹⁸ NC airports in NC contact information at www.faa.gov:

www.faa.gov/airports/airport_safety/airportdata_5010/menu/contacts.cfm?Region=ASO&District=&State=NC&County=&City=&Use=&Certification=

¹⁹ Sources of NC airport data: Unofficial Airport information available under *Maps and Diagram* at

<http://flightaware.com/resources/airport/browse/NC> and official GIS maps at <https://airports-gis.faa.gov/public/>

- ii) the final approach path for any existing landing threshold or future landing thresholds (including any planned interim phases of the landing thresholds) as shown on the current FAA-approved Airport Layout Plan (ALP). The final approach path is defined as two (2) miles from fifty (50) feet above the landing threshold using a standard three (3) degree glidepath.
- f) Review and send the results summary as well as the results of the glare analysis tool for each flight path and the ATCT.

On-airport solar projects at FAA obligated airports must follow FAA requirements. The following are recommended steps to facilitate meeting the FAA requirements.

2) ON AIRPORT Solar Projects

- a) Contact the ADO to discuss big picture concept (type of system, siting, size, environmental requirements, FAA Form 7460, etc.). This way FAA can give the proponent a general “roadmap” for the way forward (General FAA areas of concern, introduce the SGHAT Tool, if an on-airport project: give a feel for which areas ON AIRPORT can be considered for siting (per FAA safety & design standards); lease requirements on obligated airports, etc. Also, the ADO can facilitate contact between the solar proponent, the sponsor (& NCDOA if project location is on or near a State Block airport. In this case the ADO will be available to support NCDOA as requested.
- b) If after preliminary discussion, the solar proponent is still interested, collaborate with the FAA (or NCDOA) until conceptual agreement by all parties with the FAA’s lease requirements.
- c) Develop National Environmental Policy Act (NEPA) documentation to support siting alternatives & run the SGHAT Tool for all site alternatives carried forward for analysis.
- d) Submit 7460 with Proposed Lease, NEPA analysis & SGHAT Tool Results attached to FAA ADO Review & acceptance via Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) filing.

Limited information on low altitude flight paths in North Carolina.

Information about military airports and low altitude flight paths may be found in a 2012 report on military presence and land compatibility: 2012 NC Military Land Compatibility Report
http://portal.ncdenr.org/c/document_library/get_file?p_l_id=1169848&folderId=8979146&name=DLFE-57386.pdf. Local planning departments may have or be able to request maps of local low altitude flight paths.

APPENDIX G: Example Decommissioning Plan

This is a simple example decommissioning plan:

Decommission Plan for Big Bright Solar Farm, located at
123 Edge-of-Town Rd.
Piedmont-ville, NC 21234

September 10, 2013

Prepared and Submitted by Solar Developer ABC, the owner of Big Bright Solar Farm

As required by the Town/County of _____, Solar Developer ABC presents this decommissioning plan for Big Bright Solar Farm (the “Facility”).

Decommissioning will occur as a result of any of the following conditions:

- 1. The land lease ends
- 2. The system does not produce power for 12 months
- 3. The system is damaged and will not be repaired or replaced

The owner of the Facility, as provided for in its lease with the landowner, will do the following as a minimum to decommission the project.

- 1. Remove all non-utility owned equipment, conduits, structures, fencing, and foundations to a depth of at least three feet below grade.
- 2. Remove all graveled areas and access roads unless the owner of the leased real estate requests in writing for it to stay in place.
- 3. Restore the land to a condition reasonably similar to its condition before SES development, including replacement of top soil removed or eroded.
- 4. Revegetate any cleared areas with warm season grasses that are native to the region (~~Mountains, Piedmont, Sandhills or Coastal Plain~~ regions), unless requested in writing by the owner of the real estate to not revegetate due to plans for agricultural planting.

All said removal and decommissioning shall occur within 12 months of the facility ceasing to produce power for sale.

The owner of the Facility, currently Solar Developer ABC, is responsible for this decommissioning. Nothing in this plan relieves any obligation that the real estate property owner may have to remove the facility as outlined in the Special Use Permit in the event the operator of the farm does not fulfill this obligation.

The owner of the Facility will provide Town/County planning department and the Register of Deeds with an updated signed decommissioning plan within 30 days of change in the Facility Owner.

This plan may be modified from time to time and a copy of any modified plans will be provided to the planning staff and filed with the Register of Deeds by the party responsible for decommissioning.

SES Owner Signature: _____ Date: _____

Landowner (if different from SES Owner) Signature: _____ Date: _____

APPENDIX H: Abandonment & Decommissioning

This sample abandonment clause is provided for any jurisdiction who would like to consider including a clause on abandonment in their solar ordinance.

Abandonment

A SES that ceases to produce energy on a continuous basis for 12 months will be considered abandoned unless the current responsible party (or parties) with ownership interest in the SES provides substantial evidence (updated every 6 months after 12 months of no energy production) to the Zoning Administrator of the intent to maintain and reinstate the operation of that facility. It is the responsibility of the responsible party (or parties) to remove all equipment and facilities and restore the Parcel to its condition prior to development of the SES ²⁰

1. Upon determination of abandonment, the Zoning Administrator shall notify the party (or parties) responsible they must remove the SES and restore the site to its condition prior to development of the SES within three hundred and sixty (360) days of notice by the Zoning Administrator.
2. If the responsible party (or parties) fails to comply, the Zoning Administrator may remove the SES, sell any removed materials, and initiate judicial proceedings or take any other steps legally authorized against the responsible parties to recover the costs required to remove the SES and restore the site to a non-hazardous condition.

Some resources regarding decommissioning of SES

- First Solar (leading manufacturer of Cadmium Telluride PV modules) has a pre-funded recycling program for all of their modules: www.firstsolar.com/Sustainability/Environmental/Recycling-Service
- PV Cycle (www.pvcycle.org/) European PV recycling program. A good source for an example of a large scale PV module recycling program and for information on PV recycling.
- Solar Energy Industries Association (SEIA) information on PV recycling: www.seia.org/policy/environment/pv-recycling
- NC DENR information on electronics recycling in NC
- Silicon Valley Toxics Coalition (SVTC) Solar Scorecard: www.solarscorecard.com
- Green Guys, company in NC offering recycling services to the solar industry greenguys@pcgsolar.com

Current US PV Module Recycling Regulation:

End-of-life disposal of solar products in the US is governed by the Federal Resource Conservation and Recovery Act (RCRA), and state policies that govern waste. To be governed by RCRA, panels must be classified as hazardous waste. To be classified as hazardous, panels must fail to pass the Toxicity Characteristics Leach Procedure test (TCLP test). Most panels pass the TCLP test, and thus are classified as non-hazardous and are not regulated.

²⁰ Anywhere reference is made to restoring the parcel to condition prior to development of the SES (including removal of gravel, roads, and fencing), less restoration is acceptable when it is requested in writing by the parcel owner.

APPENDIX I: Solar PV and Fire Safety

Information on firefighter safety and emergency response needs

- Solar Energy Industries Association (SEIA) information on fire safety and solar:
www.seia.org/policy/health-safety/fire-safety-solar
- Underwriters Laboratory (UL) information and studies on fire safety and solar:
www.ul.com/global/eng/pages/offering/industries/buildingmaterials/fire/fireservice/pvsystems/
- California Office of the State Fire Marshal information for firefighters on solar PV:
www.gosolarcalifornia.ca.gov/solar_basics/fire_safety.php
- The Solar America Board for Codes and Standards (Solar ABCs) reports and information on fire and flammability for the solar PV industry and code officials: www.solarabcs.org/current-issues/fire.html
- Detailed Fire Protection Plan for solar farm in San Diego County, CA:
www.sdcountv.ca.gov/pds/regulatory/docs/3300-11-029_CEQA_REVIEW_120503/3300-11-029-FPP.pdf
- Online training on Solar for the fire and rescue community, provided by the North Carolina Office of State Fire Marshal:
www.ncdoi.com/OSFM/RPD/pt/Student_Review.aspx
- The 2012 version of the International Fire Code added requirements regarding roof-mounted and ground-mounted PV systems, including:
 - Marking: required on interior and exterior of direct-current (DC) conduit, enclosures, etc.
 - Locations of DC conductors: requirements regarding the location and pathway of DC wiring on and under a roof
 - Access and pathways: Module location restrictions designed to allow safe walkways and access for roof venting
 - Ground-mounted photovoltaic arrays: States that the access and pathway rules do not apply to ground-mounted systems, but they are required to provide a clear, brush-free area of 10 feet around the array.

This is section 605.11: Solar photovoltaic power systems in the International Fire Code, the exact language is available here:

http://publicecodes.cyberregs.com/icod/ifc/2012/icod_ifc_2012_6_par132.htm

APPENDIX J: Visual Buffering: Example NC Requirements

Visual buffering and screening is not specific to solar and has applicability to many other forms of development. However, solar has been subject to various screening/buffering standards of varying specificity throughout the state. The following are examples of buffering requirements in two jurisdictions (Brunswick and Guilford Counties) in the state at the time of publication of this template solar ordinance. In both cases there is a simple solar specific buffering requirement that refers to existing generic buffering specifications/requirements. Significant portions of the applicable county buffering specifications are included in this appendix to facilitate understanding the solar buffering requirement in each example.

Brunswick County

(UDO- Section 5.3.4.P)

Solar Farm (Rev. 01-Nov-10)

A Solar Farm developed as a principal use shall be permitted in accordance with Section 5.2., subject to the following:

...

3) Visibility

- (a) Solar farms with panels located at least 150 feet from an adjacent public street right-of-way, residentially-zoned property, or residential use shall not require screening.
- (b) Solar farms with panels located less than 150 feet from an adjacent public street right-of-way must meet the requirements of Section 7.2.8.B. Street Buffers and Section 7.2.9. Project Boundary Buffers.

(Section 7.2.8.B. Street Buffers and Section 7.2.9. Project Boundary Buffers.)

7.2.8. Street Buffers

Street buffers shall be required and existing vegetation should be used to satisfy these planting requirements where possible (see Section 7.1.5, Existing Vegetation). No vegetation or fence shall interfere with a required clear sight triangle at a driveway or intersection (See Section 6.2.4). Berms constructed in accordance with Section 7.2.10.B, Berms with Vegetation, are encouraged as a component of any street buffer and the Planning Director may allow up to 25% reduction in the required buffer depth with a berm.

....

B. Collector or Thoroughfare Street Buffers

All development located along either a collector or thoroughfare street shall be required to provide one of the following buffers along the entire street frontage.

1. One canopy tree per 100 linear feet of property frontage, located within a twenty-foot landscape buffer; OR
2. Two understory trees per 100 linear feet of property frontage, located within a twenty-foot landscape buffer; OR
3. Under utility lines only, two understory trees per 100 linear feet of property frontage, located within a 20-foot landscape buffer. No trees under utility lines shall have a natural height over 25 feet.

7.2.9. Project Boundary Buffers

Commentary: Project Boundary Buffers ensure a landscaped transition between different types of uses and/or zoning districts. At first glance, the following method may seem complicated. In reality, this is a fairly easy approach to implement. A few simple steps will provide the total amount of plants that are required to be in a buffer as well as the buffer depth.

A. Required Project Boundary Buffer Table

1. Description

- i. The buffer standards in the table below address the opacity of the buffer that is required on the property boundary between zoning districts, and in some instances within a zoning district.
- ii. An opacity of 0.2 screens 20% of an object, and an opacity of 1.0 would fully screen the adjoining development during summer months after five years of growth.

2. Measurements: Project boundary buffers shall be measured along a perpendicular line from the lot line.

3. How to Read the Buffer Table

- i. The required opacity of project boundary buffers is represented in the Table below by two numbers (for example, .2/.6).
- ii. The second number represents the total required buffer opacity between any two properties.
- iii. Where the proposed project adjoins vacant property, the first number represents the applicant's required buffer opacity.
- iv. Where the adjoining property is already developed with no buffer, the proposed project is responsible for providing the total required opacity (the second number).
- v. Where the adjoining property is already developed with a partial buffer, the proposed project is responsible for providing the remaining opacity required.
- vi. A zero means no project boundary buffer is required.

		ZONING DISTRICT of ADJOINING PROPERTY					
		Rural Low Density Residential	R-7500, R-6000, and SBR-6000	MR-3200 and N-C	C-I	C-LD and RU-I	I-G
ZONING DISTRICT of SUBJECT PROPERTY	Rural Residential	0 ¹ /0 ²	.2/.2	.4/.6	.2/.8	.2/.8	.2/1.0
	R-7500, R-6000, and SBR-6000	.2/.2	0 ¹ /0 ²	.2/.4	.2/.6	.2/.6	.2/1.0
	MR-3200 and N-C	.4/.6	.2/.4	0 ¹ /0 ²	.2/.6	.2/.6	.2/1.0
	C-I	.6/.8	.4/.6	.4/.6	0/0	.2/.4	.2/1.0
	C-LD and RU-I	.6/.8	.4/.6	.4/.6	.2/.4	0/0 ²	.2/1.0
	I-G	.8/1.0	.8/1.0	.6/1.0	.6/1.0	.4/.6	0/0
		¹ Non-residential uses locating next to vacant property shall be required to provide a 0.2 buffer. ² When locating a non-residential use in a Rural Residential, R-7500, R-6000, SBR-6000, MR-3200, NC, C-LD, or RU-I Zoning District next to an existing residential developed property, a 0.4 buffer shall be required. Non-residential uses locating next to other non-residential uses are not required to provide a buffer.					

4. Buffer Alternatives

The table below shows the required buffer depth (average) and plantings required for a project boundary buffer to satisfy the required opacity. Existing vegetation should be used to satisfy these planting requirements where possible (see Section 7.1.5, Existing Vegetation).

MINIMUM REQUIRED PROJECT BOUNDARY BUFFER Buffer Depth and Plants Required Per 100 Linear Feet				
Required Opacity[1]	Alternative 1 Plantings	Alternative 2 Plantings	Alternative 3 Plantings + 6-Foot (Height) Fence[2]	Alternative 4 Plantings + 6-Foot (Height) Wall[3]
0.2	10 feet 1 canopy 1 understory 7 shrubs	10 feet 1 canopy 2 understory 3 shrubs	Not available	Not available
0.4	20 feet 2 canopy 4 understory 25 shrubs	20 feet 2 canopy 6 understory 9 shrubs	Not available	Not available
0.6	30 feet 3 canopy 6 understory 34 shrubs	30 feet 3 canopy 8 understory 13 shrubs	20 feet width 0 canopy 3 understory 3 shrubs	15 feet width 0 canopy 3 understory 3 shrubs
0.8	50 feet 5 canopy 7 understory 43 shrubs	50 feet 4 canopy 10 understory 17 shrubs	35 feet width 0 canopy 5 understory 7 shrubs	25 feet width 0 canopy 5 understory 7 shrubs
1.0	80 feet 5 canopy 8 understory 49 shrubs	80 feet 4 canopy 11 understory 19 shrubs	60 feet width 0 canopy 5 understory 7 shrubs	40 feet width 0 canopy 5 understory 7 shrubs
Note: [1] Required Opacity x 100 = % Required Opacity (e.g., .2 times 100 = 20% Required Opacity). [2] When Alternative 3 is selected, the fence type must be 100% opaque and comprised of either wooden or vinyl material. [3] When Alternative 4 is selected, the wall must be designed in conformance with Section 6.8.5, Walls, and Section 7.2.10, Walls, Berms, and Fences within Buffers.				

Commentary: Suppose you are required to install a buffer with opacity of 0.6 and you elect to use Alternative 1. Your buffer would have to be 30 feet deep (on average) and you would have to plant 3 canopy trees, 6 understory trees, and 34 shrubs for every 100 feet of buffer length.

For full requirements: www.brunswickcountync.gov/Portals/0/BC/Files/Planning/UDO_Final.pdf

Guilford County

6.4-84 - Solar Collectors (Principal)

(D) *Screening:* Solar collectors and associated outside storage shall be completely screened with a vegetative buffer from view from all streets and adjacent residential uses. Required screening shall be at a type B Planting Yard Rate, except understory-trees may be substituted for canopy tree requirements.”

6-3.2. - Planting Yards.

(B) *Planting Area Descriptions:*

(4) Type B Planting Yard: A medium density screen intended to partially block visual contact between uses and create spatial separation. See Figure 6-G.

Planting Yard Rates						
Yard Type	Minimum Width (ft.)	Min. Avg. Width (ft.)	Maximum Width (ft.)	Canopy Tree Rate	Understory Tree Rate	Shrub Rate
Street Yard	8	8	25	2/100 lf;sup\sup;	NA ^c	17/100 lf
Type A Yard	40 ^a	50 ^a	75	4/100 lf/oc	10/100 lf/oc	33/100 lf/oc
Type B Yard	25 ^a	30 ^a	50	3/100 lf	5/100 lf	25/100 lf
Type C Yard	15 ^a	20 ^a	40	2/100 lf;sup\sup;	3/100 lf	17/100 lf
Type D Yard	5	5	10	-	2/100 lf	18/100 lf

Notes:

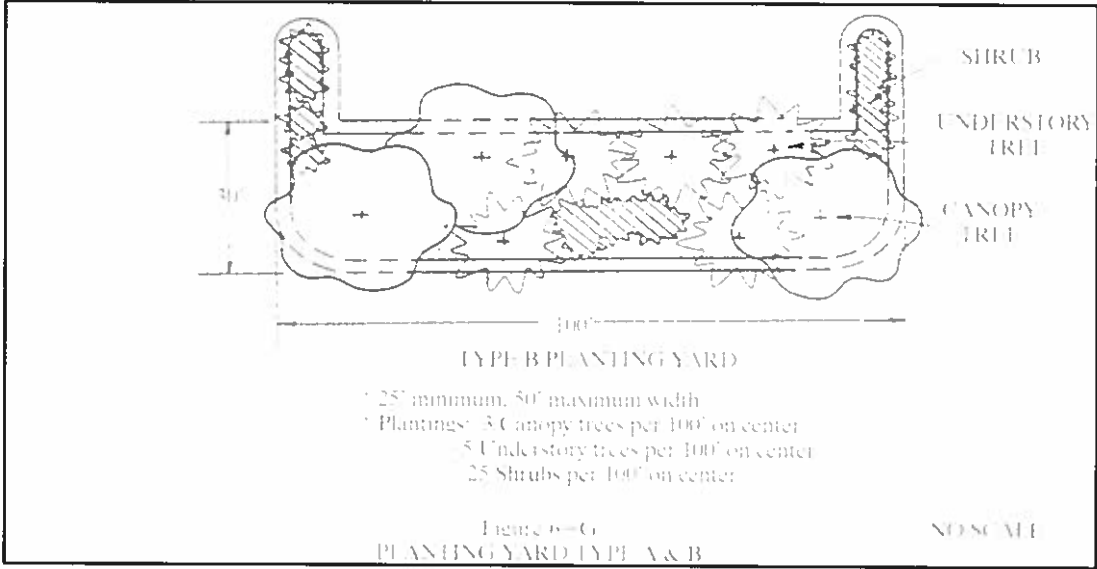
If: linear fee oc: on center

^a Walls, a minimum of five (5) feet in height, constructed of masonry, stone, or pressure treated lumber or an opaque fence, a minimum of five (5) feet in height, may be used to reduce the widths of the planting yards by ten (10) feet.

;sup\sup; In streetyards, Type C and Type D planting yards, and parking lots understory trees may be substituted for canopy trees at the rate of two (2) understory trees for each required canopy tree.

^c One (1) understory tree may be substituted for each required canopy tree if the Technical Review Committee determines that there would be a major conflict with overhead utility lines.

NOTE: On Lots of Record less than fifty-five thousand (55,000) square feet in area, no development shall be required to place required landscaping on greater than fifteen (15) percent of the site.



6-3.7. - Provisions for Preservation of Existing Trees.

(A) *General:* Any existing tree or group of trees which stands within or near a required planting area and meets or exceeds the standards of this Ordinance may be used to satisfy the tree requirements of the planting area. The protection of tree stands, rather than individual trees, is strongly encouraged.

For Full requirements go to Guilford Co. at www.municode.com/Library

These are two representative buffering requirements for solar found within North Carolina. As is evident, there are variances in descriptiveness and the level of intensity for each jurisdiction. This template ordinance does not favor these over any other alternatives. Appropriate requirements should be discussed and agreed upon by each jurisdiction.

APPENDIX K: Construction Waste Management Plan (CWMP)

Solar energy is generally considered an environmentally beneficial industry; however, its initial construction can produce large quantities of cardboard, wood, scrap metal, scrap wire, and clearing and grading wastes. Often the waste produced is sent to local landfills or burned on site. For level 2 and 3 SESs, these additional waste streams can place a burden on existing waste management and landfill resources at a local municipal and county level. A large percentage of this waste can be diverted from landfills to private recycling businesses with net costs approximating landfill disposal. According to a report published in 2010 by the North Carolina Department of Environment and Natural Resources (NCDENR) Division of Environmental Assistance and Outreach and the Recycling Business Assistance Center, the recycling industry in North Carolina consisted of over 630 private sector recycling businesses employing over 15,200 people and has been growing at 4.8% since 2008 (See Resources for link). In addition, NCDENR has launched a web based NC Recycling Markets Directory (see Resources below) to help identify local recyclers. As a result, developing a CWMP and finding a private recycling entity for construction waste(s) is arguably easier than ever before. Counties/municipalities that choose to adopt CWMP requirements can not only avoid straining their existing landfill and waste management resources, but can also help contribute to the growth of their local recycling industries. Similar ordinances requiring CWMPs for new construction have been ratified in California as well as Cook County, Illinois and King County, Washington (See below for further information)

CWMP Examples

- **CALGREEN CWMP**
 - www.hcd.ca.gov/codes/calgreen/CW-1.pdf
- **Sandia National Laboratories CWMP Template**
 - www.sandia.gov/engstds/ConstSpecs/Div_01/01505C_CWM_Waste_Mgt_Plan_Template-archived.pdf
- **King County, Washington**
 - <http://your.kingcounty.gov/solidwaste/greenbuilding/specifications-plans.asp>

Successful Construction Waste Management Ordinances

- **State of California's California Building Standard Code**
 - www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf
- **Cook County, Illinois - Ordinance requiring management of construction and demolition waste consistent with Cook County's existing Solid Waste Management Plan.**
 - <http://blog.cookcountyil.gov/sustainability/wp-content/uploads/2012/07/Substitute-Demolition-Debris-Diversion-Ordinance-July-23.pdf>

Level 3 SES Anticipated Waste - 20 MW SES in Halifax County

- Project goal to recycle 80% of all construction and demolition waste. Contact greenguys@pcgsolar.com for more information.
 - 140,000 lbs - cardboard waste
 - 32,000 lbs - scrap wire waste
 - 3,500 - wooden slatted pallets
 - 16 acres - Clearing and grading waste

Resources

- NC Recycling Market Directory
 - www.p2pays.org/dmrm/start.aspx
- California Department of Housing and Community Development- Construction Waste Management Forms
 - www.hcd.ca.gov/calgreen.html
- Green Guys - Waste Management and Site Services greenguys@pcgsolar.com
- Employment Trends in NC Recycling Industry - 2010
 - www.container-recycling.org/assets/pdfs/jobs/EmploymentTrendsInNC.pdf

General Template for Rules and Regulations

1. A developer of a Solar Plant in North Carolina shall be required to develop a Waste Stream Management Plan (WSMP) for the construction waste and debris at the site of the said Solar Energy System.
2. A developer of a Solar Plant in North Carolina shall be required to file the WSMP with the department of _____ in the County/Town/City wherein the Solar Energy System shall be erected and operated.
3. A WSMP shall only be acceptable if it contains a proper and adequate plan for the recycling of _____ (____%) percent of all of the waste, including but not limited to cardboard, wood, scrap metal, scrap wire, and clearing and grading wastes, from the construction site.
4. A developer shall be required to file with the department of _____ in the County/Town/City wherein the Solar Energy System shall be erected a Construction and Demolition Debris Summary Report (CDSR) within fifteen (15) days of the end of the construction of the solar plant.

General Template for Enforcement

1. Developer's failure to meet or exceed the provisions of the developer's CWMP shall constitute a violation of this Ordinance.
2. Developer shall have fifteen (15) days in which to cure this violation and make property notice to the County/Town/City.
3. Developer's failure to cure and notify the County/Town/City within the said fifteen-day (15) period shall result in a fine of _____ (\$ insert dollar amount here) dollars to be paid by Developer within thirty (30) days of the issuance of said fine or a lien will be placed on the property upon which the solar energy system has been constructed.

APPENDIX L: Template Solar Ordinance Working Group Participants

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Federal Aviation Association, Dana Perkins
Governor's office military affairs, John Nicholson
Granville County Planning Department, Dervin Spell
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Institute for Emerging Issues, Diane Cherry
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NC Dept. of Environment & Natural Resources (DENR), Trina Ozer

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APPENDIX M: Document Revision History

Date	Version	Revision Author	Revision Details
5/22/2014	Version 1.1	Tommy Cleveland, NCSC	Updated NCSEA contact to be Maggie Clark, moved Michael Fucci down in contact lists and added affiliation as Duke Grad Student.
11/24/2014	Version 1.2	Tommy Cleveland, NCCETC	Replaced NCSC logo with NCCETC logo, updated the Center's name in contact list
01/26/2016	Version 1.3	Tommy Cleveland, NCCETC	Edits for clarity in Appendix F: Airports, Off Airport recommended steps
01/26/2016	Version 1.3	Tommy Cleveland, NCCETC	Clarifying improvements to Section 9.C: Decommissioning. Subsections 4,5,6, and 7

Model Solar Ordinance

for Indiana local governments



Photo credit: Great Plains Institute

**Prepared by Great Plains Institute with support
from Sunshot and the Energy Foundation**



INDIANA UNIVERSITY
**ENVIRONMENTAL RESILIENCE
INSTITUTE**



**GREAT PLAINS
INSTITUTE**

Better Energy.
Better World.

Last Updated December 2020

Model Solar Ordinance – Indiana

Introduction

Indiana has high-quality and cost-effective solar energy resources – as good as many states to the south and consistently available across the entire state. As solar energy system components have become more efficient and less costly, an increasing number of solar energy systems have been installed in Indiana. Market opportunities for solar development have dramatically increased in Indiana over the last five years, such that communities must now address solar installations as land use and development issues. Solar energy components continue to improve in efficiency and decline in price; large-scale solar energy is expected to become the least expensive form of electric energy generation within a few years, surpassing wind energy and natural gas in the levelized cost of energy.

Model Solar Energy Standards

This ordinance is based on the model solar energy ordinance originally created for the Department of Energy's Phase I Rooftop Solar Challenge program in Minnesota, and updated for the three- state Grow Solar initiative, funded by Rooftop Solar Challenge Phase 2.

However, solar energy is much more than just low-cost energy generation. Households and businesses seeking to reduce their carbon footprint see solar energy as a strong complement to energy efficiency. Agricultural producers see solar energy as an economic hedge against price volatility in commodity crops. Utilities see solar's declining cost, high reliability, and free fuel as a means to put downward pressure on electric rates. Corporate, institutional, and municipal buyers are actively acquiring carbon-free solar generation to meet climate and clean energy goals. And innovative solar site designs are creating and capturing habitat and water quality co-benefits by using solar with habitat-friendly ground cover to restore ecosystem functions. Innovative solar site designs can also create and capture biodiversity and water quality benefit with vegetation plans that include perennial ground cover to enhance ecosystem functions that have been lost over the decades.

Solar Energy Issues

Local governments in Indiana are seeing increasing interest from property owners in solar energy installations and are having to address a variety of solar land uses in their development regulations. Given the continuing cost reductions and growing value of clean energy, solar development will increasingly be a local development opportunity, from the rooftop to the large-scale solar farm. Three primary issues tie solar energy to development regulations:

1. *Land use conflicts and synergies.* Solar energy systems have few nuisances. Nevertheless, solar development can compete for land with other development options, and visual impacts and perceived safety concerns sometimes create opposition to solar installations. Good design and attention to aesthetics can address most concerns for rooftop or accessory use systems, including historic and design standards. Good site placement and design standards for large- and community-scale solar can similarly resolve conflicts and create co-benefits from solar development such as restoring habitat, diversifying agricultural businesses, and improving surface and ground waters.
2. *Protecting access to solar resources.* Solar resources are a valuable component of property ownership. Development regulations can inadvertently limit a property owner's ability to access their solar resource. Communities should consider how to protect and develop solar resources in zoning, subdivision, and other development regulations or standards.
3. *Encouraging appropriate solar development.* Local governments can go beyond simply removing regulatory barriers and encourage solar development that provides economic development, climate protection, and natural resources co-benefits. Local governments have a variety of tools to encourage appropriately sited and designed solar development to meet local goals.

Components of a Solar Standards Ordinance

Solar energy standards should:

1. *Enable solar installations by-right for property-owners.* Create a clear regulatory path (an as-of-right installation) to solar development for accessory uses and – if appropriate – for principal uses such as large-scale solar and ground-mounted community shared solar installations.
2. *Create a clear pathway for principal solar uses.* Define where community- and large-solar energy land uses are appropriate as a principal or primary use, set development standards and procedures to guide development, and capture co-benefit opportunities for water quality, habitat, and agriculture.
3. *Limit regulatory barriers to developing solar resources.* Ensure that access to solar resources is not unduly limited by height, setback, or coverage standards, recognizing the distinct design and function of solar technologies and land uses for both accessory and principal uses.
4. *Define appropriate aesthetic standards.* Retain an as-of-right installation pathway for accessory uses while balancing design concerns in urban neighborhoods and historic districts. Set reasonable aesthetic standards for solar principal uses that are consistent with other principal uses that have visual impacts.
5. *Address cross-property solar access issues.* Consider options for protecting access across property lines in the subdivision process and in zoning districts that allow taller buildings on smaller (urban density) lots.
6. *Promote “solar-ready” design.* Every building that has a solar resource should be built to seamlessly use it. Encourage builders to use solar-ready subdivision and building design.
7. *Include solar in regulatory incentives.* Encourage desired solar development by including it in regulatory incentives: density bonuses, parking standards, flexible zoning standards, financing/ grant programs, and promotional efforts.

Different Community Types and Settings

The model ordinance language addresses land use concerns for both urban and rural areas, and thus not all the provisions may be appropriate for every community. Issues of solar access and nuisances associated with small or accessory use solar energy systems are of less consequence in rural areas, where lot sizes are almost always greater than one acre. Large-scale and community-scale solar (principal solar land uses) are much more likely to be proposed in rural areas rather than developed cities. However, urban areas should consider where community-or large-scale solar can add value to the community and enable economic development of a valuable local resource. Rural communities should address rooftop and accessory ground-mounted development, although the standards used in this model are designed more for the urban circumstances.

This ordinance includes language addressing solar energy as an accessory use to the principal residential or commercial use in an urban area, and language for principal solar uses more typically seen in rural communities. Communities should address both types of solar development.

Solar development is not one thing

Communities would not apply the same development and land use standards to an industrial facility and a single-family home, merely because both are buildings. Community and large-scale solar development is a completely different land use than rooftop or backyard solar. Standards that are appropriate for large-scale solar may well be wholly inappropriate for rooftop solar and may unnecessarily restrict or stymie solar development opportunities of homes and business owners.

How to Use this Model Ordinance

This Model Ordinance is based on research and best practices identified through working with over 100 Midwestern communities over the last ten years as solar energy markets evolved and expanded. The standards included in this model reflect the real-world controversies and opportunities the communities faced as the solar energy market grew. The portfolio of standards included in the model is intended to provide a reference for how communities can address those controversies and opportunities to make solar development more predictable, solar land use regulation more transparent, and regulatory standards more consistent across jurisdictions within the same solar market.

The model has been tailored to reflect Indiana-specific enabling statutes, ordinance practices, and community priorities currently seen in the state, with input from local planning, solar industry, and other experts. Because Indiana communities’ ordinances, comprehensive plans and other local planning documents naturally vary, not all provisions included in the Model Ordinance will be suitable for each individual community. Moreover, as this is a “best practices” document, communities may decide not to include one or more suggested provisions. A community may also be aware of elements not included in this Model Ordinance that they wish to include. These sorts of adjustments are to be expected.

Appendix A includes links to solar ordinances already adopted by Indiana communities. The authors have not reviewed these existing ordinances against the language provided in this Model Ordinance, but provide them for users’ convenience.

Model Ordinance

- I. **Scope** – This article applies to all solar energy installations in Model Community.
- II. **Purpose** – Model Community has adopted this regulation for the following purposes:

- A. **Comprehensive Plan Goals** – Model Community has goals in its Comprehensive Plan, including preserving the health, safety, and welfare of the community by promoting the safe, effective, and efficient use of solar energy systems. The solar energy standards specifically implement the following goals from the Comprehensive Plan:
 - 1. **Goal** – Encourage the use of local renewable energy resources, including appropriate applications for wind, solar, and biomass energy and energy storage.
 - 2. **Goal** – Promote sustainable building design and management practices to serve current and future generations.
 - 3. **Goal** – Assist local businesses to lower financial and regulatory risks and improve their economic, community, and environmental sustainability.
 - 4. **Goal** – Efficiently invest in and manage public infrastructure systems to support development and growth.
- B. **Infrastructure** – Distributed solar photovoltaic systems will enhance the reliability and power quality of the power grid and make more efficient use of Model Community’s electric distribution infrastructure.
- C. **Local Resource** – Solar energy is an underused local energy resource and encouraging its use will diversify the community’s energy supply portfolio and reduce exposure to fiscal risks associated with fossil fuels.
- D. **Consistency with Greenhouse Gas Reduction Plans** – Model Community has developed recommendations for greenhouse gas reductions, a purpose served by encouraging local solar development.
- E. **Improve Competitive Markets** – Solar energy systems offer additional energy choices to consumers and will improve competition in the electricity and natural gas supply markets.

Comprehensive Plan Goals

Tying the solar energy ordinance to Comprehensive Plan goals is particularly important for helping users (both Planning Commission and community members) understand why the community is developing and administering regulation.

The language here provides examples of different types of Comprehensive Plan goals, and other policy goals that the community may have that are served by enabling and encouraging solar development. The community should substitute its policy goals for these examples.

The Comprehensive Plan may not include goals that specifically address or would be enhanced by solar development (such as climate protection or local resource economic goals). While lack of a policy goal should not delay adoption of a solar ordinance, the community may wish to consider creating a local energy plan or similar policy document that provides guidance regarding solar development.

Climate Protection Strategies

Some local governments in Indiana have adopted climate resolutions, committed to national climate goals, or have otherwise identified greenhouse gas reduction or energy independence targets. Introductory language in solar ordinances can list those commitments. An increasing number of Hoosier local governments are using and promoting solar installations to meet their energy and greenhouse gas reduction goals, but there are many reasons other than climate-related goals for a community to prepare for solar developments.

III. Definitions

Agrivoltaics – A solar energy system co-located on the same parcel of land as agricultural production, including crop production, grazing, apiaries, or other agricultural products or services.

Building-integrated Solar Energy Systems – A solar energy system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems include, but are not limited to, photovoltaic or hot water solar energy systems that are contained within roofing materials, windows, skylights, and awnings.

Community-Scale Solar Energy System – A commercial solar energy system that converts sunlight into electricity for the primary purpose of serving electric demands off-site from the facility, either retail or wholesale. Community-scale systems are principal uses and projects typically cover less than 10 acres.

Community Shared Solar – A solar energy system that provides retail electric power (or a financial proxy for retail power) to multiple community members or businesses residing or located off-site from the location of the solar energy system.

Grid-tied Solar Energy System– A photovoltaic solar energy system that is connected to an electric circuit served by an electric utility company.

Ground-Mounted – A solar energy system mounted on a rack or pole that rests or is attached to the ground. Ground-mounted systems can be either accessory or principal uses.

Large-Scale Solar Energy System – A commercial solar energy system that converts sunlight into electricity for the primary purpose of wholesale sales of generated electricity. A large-scale solar energy system will have a project size greater than 10 acres and is the principal land use for the parcel(s) on which it is located. It can include collection and feeder lines, substations, ancillary buildings, solar monitoring stations and accessory equipment or structures thereto, that capture and convert solar energy into electrical energy, primarily for use in locations other than where it is generated.

Off-grid Solar Energy System – A photovoltaic solar energy system in which the circuits energized by the solar energy system are not electrically connected in any way to electric circuits that are served by an electric utility company.

Passive Solar Energy System – A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

Photovoltaic System – A solar energy system that converts solar energy directly into electricity.

Pollinator-Friendly Solar Energy – A community- or large-scale solar energy system that meets the requirements of the 2020 Indiana

Solar Definitions

Not all of these terms are used in this model ordinance, nor is this a complete list of solar definitions. As a community develops its own development standards for solar technology, many of the concepts defined here may be helpful in meeting local goals. For instance, solar daylighting devices may change the exterior appearance of the building, and the community may choose to distinguish between these devices and other architectural changes.

Differentiating Solar Uses by Size

Community-scale and large-scale systems are defined here as occupying less than 10 acres and greater than 10 acres, respectively. Some communities use a lower number (five acres) and some a higher number (up to 50 acres). An ex-urban city would likely use a lower number and a rural county could use a higher number. Community-scale is generally a size that can fit into the land use fabric of the community without assembly of separate parcels. Some communities have chosen not to distinguish between community- and large-scale, and instead use a single large-scale designation.

Pollinator Friendly Standards

As pollinator-friendly landscaping becomes more common for solar energy systems, organizations are publishing standards, checklists, and scorecards to help developers and local governments so they will not have to independently research the kinds of plants that are appropriate and so that landscaping described as “pollinator-friendly” can be assured to meet an independently established standard. In Indiana, examples include [Purdue University’s 2020 Indiana Solar Site Pollinator Habitat Planning Scorecard](#) and the [Michiana Area Council of Governments’ \(MACOG\) Technical Guide: Establishment and Maintenance of Pollinator-Friendly Solar Projects](#). Porter County, Indiana has adopted pollinator-friendly language in its [solar ordinance](#) that also provides a useful guide. Using a standard establishes a common foundation for what constitutes a pollinator-friendly installation and saves the local government the dilemma of devising and policing a habitat standard.

Solar Site Pollinator Habitat Planning Scorecard developed by Purdue University or another pollinator-friendly checklist developed by a third-party as a solar-pollinator standard designed for Midwestern eco-systems, soils, and habitat.

Renewable Energy Easement, Solar Energy Easement – An easement that limits the height or location, or both, of permissible development on the burdened land in terms of a structure or vegetation, or both, for the purpose of providing access for the benefited land to wind or sunlight passing over the burdened land.

Roof-Mounted – A solar energy system mounted on a rack that is fastened to or ballasted on a structure roof. Roof-mounted systems are accessory to the principal use.

Roof Pitch – The final exterior slope of a roof calculated by the rise over the run, typically but not exclusively expressed in twelfths such as 3/12, 9/12, 12/12.

Solar Access – Unobstructed access to direct sunlight on a lot or building through the entire year, including access across adjacent parcel air rights, for the purpose of capturing direct sunlight to operate a solar energy system.

Solar Carport – A solar energy system of any size that is installed on a carport structure that is accessory to a parking area, and which may include electric vehicle supply equipment or energy storage facilities.

Solar Collector – A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy. The collector does not include frames, supports, or mounting hardware.

Solar Daylighting – Capturing and directing the visible light spectrum for use in illuminating interior building spaces in lieu of artificial lighting, usually by adding a device or design element to the building envelope.

Solar Energy – Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

Solar Energy System – A device, array of devices, or structural design feature, the purpose of which is to provide for generation or storage of electricity from sunlight, or the collection, storage, and distribution of solar energy for space heating or cooling, daylight for interior lighting, or water heating.

Solar Hot Air System – (also referred to as Solar Air Heat or Solar Furnace) A solar energy system that includes a solar collector to provide direct supplemental space heating by heating and re-circulating conditioned building air. The most efficient performance includes a solar collector to preheat air or supplement building space heating, typically using a vertically mounted collector on a south-facing wall.

Solar Hot Water System (also referred to as Solar Thermal)– A system that includes a solar collector and a heat exchanger that heats or preheats water for building heating systems or other hot water needs, including residential domestic hot water and hot water for commercial processes.

Solar Mounting Devices – Racking, frames, or other devices that allow the mounting of a solar collector onto a roof surface or the ground.

Solar Resource – A view of the sun from a specific point on a lot or building that is not obscured by any vegetation, building, or object for a minimum of four hours between the hours of 9:00 AM and 3:00 PM Standard time on all days of the year, and can be measured in annual watts per square meter.

Solar-Ready Design – The design and construction of a building that facilitates and makes feasible the installation of rooftop solar.

Solar Resource

Understanding what defines a “solar resource” is foundational to how land use regulation affects solar development. Solar energy resources are not simply where sunlight falls. A solar resource has minimum spatial and temporal characteristics, and needs to be considered not only today but also into the future. Solar energy equipment cannot function as designed if installed in partial shade, with too few hours of daily or annual direct sunlight, or without southern or near-southern exposure. Many provisions of the model ordinance are predicated on the concept that a solar resource has definable characteristics that are affected by local land use decisions and regulation.

IV. Permitted Accessory Use. Solar energy systems are a permitted accessory use in all zoning districts where structures of any sort are allowed, subject to certain requirements as set forth below. Solar carports and associated electric vehicle charging equipment are a permitted accessory use on surface parking lots in all districts regardless of the existence of another building. Solar energy systems that do not meet the following design standards will require a conditional use permit.

A. Height – Solar energy systems must meet the following height requirements:

- 1. Building or roof-mounted solar energy systems shall not exceed the maximum allowed height in any zoning district. For purposes of height measurement, solar energy systems other than building-integrated systems shall be given an equivalent exception to height standards as building-mounted mechanical devices or equipment.
- 2. Ground or pole-mounted solar energy systems shall not exceed 15 feet in height when oriented at maximum tilt.
- 3. Solar carports in non-residential districts shall not exceed 20 feet in height.

B. Setback – Solar energy systems must meet the accessory structure setback for the zoning district and principal land use associated with the lot on which the system is located, as allowed below.

- 1. **Roof or Building-mounted Solar Energy Systems** – The collector surface and mounting devices for roof-mounted solar energy systems shall not extend beyond the exterior perimeter of the building on which the system is mounted or built, unless the collector and mounting system has been explicitly engineered to safely extend beyond the edge, and setback standards are not violated. Exterior piping for solar hot water systems shall be allowed to extend beyond the perimeter of the building on a side yard exposure. Solar collectors mounted on the sides of buildings and serving as awnings are considered to be building-integrated systems and are regulated as awnings.
- 2. **Ground-mounted Solar Energy Systems** – Ground-mounted solar energy systems may not extend into the side-yard or rear setback when oriented at minimum design tilt, except as otherwise allowed for building mechanical systems.

C. Visibility – Solar energy systems in residential districts shall be designed to minimize visual impacts from the public right-of-way, as described in C.1-3, to the extent that doing so does not affect the cost or efficacy of the system, consistent with Indiana Code 36-7-2-8. Visibility standards do not apply to systems in non-residential districts, except for historic building or district review as described in E. below.

- 1. **Building-integrated Photovoltaic Systems** – Building integrated photovoltaic solar energy systems shall be allowed regardless of whether the system is visible from the public right-of-way, provided the building component in which the system is integrated meets all required setback, land use or performance standards for the district in which the building is located.

Indiana Code Title 36. Local Government
§ 36-7-2-1

Sec. 8 . . . (b) A unit may not adopt any ordinance which has the effect of prohibiting or of unreasonably restricting the use of solar energy systems other than for the preservation or protection of the public health and safety.

(c) This section does not apply to ordinances which impose reasonable restrictions on solar energy systems. However, it is the policy of this state to promote and encourage the use of solar energy systems and to remove obstacles to their use. Reasonable restrictions on solar energy systems are those restrictions which:

(1) do not significantly increase the cost of the system or significantly decrease its efficiency; or (2) allow for an alternative system of comparable cost and efficiency.

Height - Rooftop System

This ordinance notes exceptions to the height standard when other exceptions are granted in the ordinance. Communities should directly reference the exception language, rather than use the placeholder language here.

Height - Ground or Pole Mounted System

This ordinance sets a 15-foot height limit, which is typical for residential accessory uses. Some communities allow solar to be higher than other accessory uses in order to enable capture of the lot's solar resource when lots and buildings are closer together. An alternative is to balance height with setback, allowing taller systems if set back farther – for instance, an extra foot of height for every extra two feet of setback. In rural (or large lot) areas, solar resources are unlikely to be constrained by trees or buildings on adjacent lots and the lot is likely to have adequate solar resource for a lower (10-15 foot) ground- mounted application.

2. **Aesthetic restrictions** – Roof-mounted or ground-mounted solar energy systems shall not be restricted for aesthetic reasons if the system is not visible from the closest edge of any public right-of-way other than an alley or if the system meets the following standards.
 - a. Roof-mounted systems on pitched roofs that are visible from the nearest edge of the front right-of-way shall have the same finished pitch as the roof and be no more than ten inches above the roof.
 - b. Roof-mounted systems on flat roofs that are visible from the nearest edge of the front right-of-way shall not be more than five feet above the finished roof and are exempt from any rooftop equipment or mechanical system screening.
 3. **Reflectors** – All solar energy systems using a reflector to enhance solar production shall minimize glare from the reflector affecting adjacent or nearby properties.
- D. Lot Coverage** – Ground-mounted systems shall meet the existing lot coverage restrictions for the zoning district except as defined below.
1. Ground-mounted systems shall be exempt from lot coverage or impervious surface standards if the soil under the collector is maintained in vegetation and not compacted.
 2. Ground-mounted systems shall not count toward the maximum number of accessory structures permitted.
 3. Solar carports in non-residential districts are exempt from lot coverage limitations.
- E. Historic Buildings** – Solar energy systems on buildings within designated historic districts or on locally designated historic buildings (exclusive of State or Federal historic designation) must receive approval of the local Historic Preservation Commission, or equivalent, consistent with the standards for solar energy systems on historically designated buildings published by the U.S. Department of the Interior.
- F. Plan Approval Required** – All solar energy systems requiring a building permit or other permit from Model Community shall provide a site plan for review.
1. **Plan Applications.** Plan applications for solar energy systems shall be accompanied by to-scale horizontal and vertical (elevation) drawings. The drawings must show the location of the system on the building or on the property for a ground-mounted system, including the property lines.
 2. **Plan Approvals.** Applications that meet the design requirements of this ordinance shall be granted administrative approval by the zoning official and shall not require Planning Commission review. Plan approval does not indicate compliance with Building Code or Electric Code.

Visibility and Aesthetics

Aesthetic regulation should be tied to design principles rather than targeted at a specific land use. If the community already regulates aesthetics in residential districts, this model language provides guidance for balancing between interests of property owners who want to use their on-site solar resources and neighbors concerned with neighborhood character. Substantial evidence demonstrates that solar installations have no effect on property values of adjacent properties. But where aesthetic regulation is used to protect community character, these standards provide balance between competing goals.

Building-integrated PV

Building-integrated solar energy systems can include solar energy systems built into roofing (existing technology includes both solar shingles and solar roofing tiles), into awnings, skylights, and walls.

Roof-Mounted Solar Energy Systems

This ordinance sets a threshold for pitched roof installations that they not be steeper than the finished roof pitch. Mounted systems steeper than the finished roof pitch change the appearance of the roof, and create additional considerations in regard to the wind and drift load on structural roof components. If the aesthetic impacts are not a concern to the community, the structural issues can be addressed in the building permit.

Roof Coverage and Fire Code

Roof coverage limitations are generally not necessary, as some of the roof is likely to be shaded or otherwise not suitable for solar energy. Coverage is an issue of concern in order to ensure ready roof access in the event of a fire. The new 2018 IRC adopted by Indiana provides guidance for consistency with fire code and roof access. The permitting best practice is to allow for fire marshal variances where appropriate on access pathways.

- G. Approved Solar Components** – Electric solar energy system components must have an Underwriters Laboratory (UL) or equivalent listing and solar hot water systems must have an Solar Rating & Certification Corporation (SRCC) or equivalent rating.
- H. Compliance with Building Code** – All solar energy systems shall meet approval of local building code officials, consistent with the State of Indiana Building Code, and solar thermal systems shall comply with HVAC-related requirements of the Energy Code.
- I. Compliance with State Electric Code** – All photovoltaic systems shall comply with the Indiana State Electric Code.
- J. Compliance with State Plumbing Code** – Solar thermal systems shall comply with applicable Indiana State Plumbing Code requirements.
- K. Utility Notification** – It is recommended that the interconnection application be submitted to the utility prior to applying for required permits. Grid-tied solar energy systems shall comply with interconnection requirements of the electric utility. Off-grid systems are exempt from this requirement.
- V. Principal Uses.** Model Community encourages the development of commercial or utility scale solar energy systems where such systems present few land use conflicts with current and future development patterns. Community and large-scale systems are either conditional or permitted with site plan review, and are excluded elsewhere.

A. Principal Use General Standards

1. Site Design

- a. Setbacks** – Community- and large-scale solar arrays must meet the following setbacks:
1. Property line setback from a non-participating landowner's property line must meet the established setback for buildings or structures in the district in which the system is located, except as otherwise determined in 1.a.6 below.
 2. Property line setbacks between separate parcels both of which are participating in the project may be waived upon agreement of the landowner(s).
 3. Roadway setback of 50 feet from the ROW of State highways and County and State Aid Highways (CSAHs), and 40 feet for other roads, except as otherwise determined in 1.a.6 below.
 4. Housing unit setback of 150 feet from any existing dwelling unit of a non-participating landowner, except as otherwise determined in 1.a.6 below. Participating landowner housing must meet building setbacks or required yards for the district in which the project is located.

Impervious Surface Coverage

Rather than consider the solar panel for a ground-mounted system as a roof, this provision recognizes that the ground under the panel can mitigate stormwater risks if it is kept in vegetation so that rainwater can infiltrate. Any effects are de minimis for a small array if the lot is otherwise within coverage ratios.

Historic Buildings

The standards set forth by the local historic preservation commission should be consistent with the standards for solar energy systems on historically designated buildings published by the U.S. Department of the Interior. If the local historic preservation commission does not have standards, local commissions should refer to the U.S. Department of Interior Standards and guidelines outlined at <https://www.nps.gov/tps/sustainability/new-technology/solar-on-historic.htm>

Plan Approval

This process is generally part of the process for obtaining a building permit. The standard that the model community typically uses for submittal requirements should be included here. If the community does not issue building permits, it can be tied to a land use permit instead. For rural areas or cities without zoning or building code standards, the plan approval section may be eliminated.

Use Standards

Most communities require a conditional use permit for large-scale solar development. The large size of such developments usually means that site-specific standards and design issues need to be considered. However, some communities have decided that sufficient oversight is provided by the Planning Commission in review of standards, and have chosen to list the use as permitted in appropriate districts. This is a decision to be made by each community in light of its oversight and review standards. To encourage large-scale solar development, list it as a permitted use.

5. Setback distance should be measured from the edge of the solar energy system array, excluding security fencing, screening, or berm.

6. All setbacks can be reduced by 50%, except that unwaived setbacks cannot be less than 30 feet, if the array has a landscape buffer that screens the array at the setback point of measurement.

b. Screening – Community- and large-scale solar energy systems shall be screened from existing residential dwellings.

1. A landscape plan shall be submitted that identifies the type and extent of proposed buffer and screening. Vegetation or another type of buffer can be proposed.

2. Screening shall be consistent with Model Community's screening ordinance or standards typically applied for other land uses requiring screening.

3. Screening shall not be required along highways or roadways, except as provided in 4. below, or along property lines within the same zoning district, except where the adjoining lot has an existing residential use.

4. Model Community may require screening where it determines there is a clear community interest in maintaining a viewshed.

c. Height – Large- and community-scale solar energy systems shall not exceed 20 feet.

Appropriate Setbacks

The community should consider balancing set-back requirements and screening requirements for principal use solar. Since the primary impact to neighbors of large-scale solar is visual, screening becomes less useful as the setbacks get larger (and vice versa).

The setback distances provided here are general examples that should be modified to be consistent with other setbacks already in the ordinance. Property line setbacks are typically not in excess of 50 feet, special setbacks for housing or existing sensitive land uses may be larger. Excessive setbacks that are unique to solar land uses, or that are designed for land uses with health and safety or significant nuisance risks such as industrial uses or animal agriculture, are unjustified given the low level of risk or nuisance posed by the solar array. It is common for a participating landowner to agree to a setback shorter than stated in the established ordinance. In that case, a waiver of the setback should be allowed.

Screening

The community should consider limiting screening of community- or large-scale solar to where there is a visual impact from an existing use, such as adjacent residential districts or uses. Screening standards should be consistent for solar with other land uses that have screening requirements. Solar energy systems may not need to be screened from adjacent lots if those lots are in agricultural use, are non-residential, or have low-intensity commercial use.

d. Ground cover and buffer areas (alternative A) – Community- or large-scale ground-mounted solar energy systems are required to adhere to the following standards. Additional site-specific conditions may apply as required by Model Community.

1. Ground around and under solar panels and in project site buffer areas shall be planted, established, and maintained for the life of the solar project in perennial vegetated ground cover meeting the definition of Pollinator-Friendly Solar Energy in Section III above.
 - a) All applicants shall submit a completed pollinator-friendly solar scorecard such as the 2020 Indiana Solar Site Pollinator Habitat Planning Scorecard developed by Purdue University, or a similar third-party solar pollinator standard designed for Midwest eco-systems and conditions.
 - b) When the scorecard results demonstrate the project does not qualify as pollinator-friendly, the applicant shall submit a landscaping plan detailing site conditions that prevent the site from being qualified and alternative means of meeting the water quality and habitat goals of the pollinator-friendly standard.
2. The site shall be planted and maintained to be free of invasive or noxious species, as listed by the Indiana Invasive Species Council. No insecticide use is permitted on the site. This provision does not apply to insecticide use in on-site buildings, in and around electrical boxes, spot control of noxious weeds, or as otherwise may be deemed necessary to protect public health and safety.
3. Projects maintained as pollinator-friendly compliant are exempt from landscaping requirements and post-construction stormwater management controls (as stated in Section V. A.2. below) that may be otherwise required under Model Community's development regulations, unless required due to special conditions by the plan commission or the Board of Zoning Appeals.

e. Ground cover and buffer areas (alternative B) – Community- or large-scale ground-mounted solar energy systems are required to adhere to the following standards. Additional site-specific conditions may apply as required by Model Community.

1. Ground around and under solar panels and in project site buffer areas shall be planted, established, and maintained for the life of the solar project in perennial vegetated ground cover.
2. To the maximum extent feasible for site conditions, perennial vegetation ground cover shall be based on a diverse seed mix of native species consistent with guidance specific to the local area provided by

Importance of Ground Cover

Establishing and maintaining regionally appropriate ground cover creates important co-benefits for the community and the property owner. Grasses can be harvested for forage and wildflowers and blooming plants can create pollinator and bird habitat. Maintaining the site in vegetation will build soils that can be turned back into agriculture at the end of the solar farm's life.

If appropriately established, these ground cover standards also likely reduce maintenance costs and limit the need for chemical weed management, which also improves water quality outcomes.

Options for Ground Cover Standards

Two options are offered for ground cover standards. Alternative A requires perennial vegetation consistent with local eco-systems that meets the definition of "pollinator-friendly habitat," demonstrated through completion of the Purdue University pollinator scorecard or a similar third-party Midwest relevant checklist. Pollinator-friendly or habitat-friendly ground cover is a solar best practice encouraged or required by communities and some states for solar development throughout the Midwest. The inherent visual and water quality benefits of pollinator habitat can provide a basis to exempt the project from other landscaping and water quality requirements.

Alternative B requires regionally appropriate perennial ground cover. If the developer elects to use pollinator-friendly ground cover and wants to label it as such, the Purdue (or other) scorecard must be used, and other landscaping and water quality requirements are waived.

Other alternatives are also available and can be considered. Some communities may choose to apply a pollinator standard only under certain conditions, such as for mitigating taking farmland out of production. Another alternative is to encourage compliance with a habitat standard but make requirement decisions on a case by case basis in the permit review process.

the Soil and Water Conservation District office or the Indiana Native Plant Society.

- 3. The owner/operator shall demonstrate site maintenance that is intended to remove invasive or noxious species, as listed by the Indiana Invasive Species Council, without harming perennial vegetation.
- 4. No insecticide use is permitted on the site. This provision does not apply to insecticide use in on-site buildings, in and around electrical boxes, spot control of noxious weeds, or as otherwise may be deemed necessary to protect public health and safety.
- 5. Plant material must not have been treated with systemic insecticides, particularly neonicotinoids.
- 6. Community- or large-scale ground-mounted solar energy systems that propose to install, establish, and maintain pollinator-friendly vegetative cover are to demonstrate the quality of their habitat by using guides such as Purdue University 2020 Indiana Solar Site Pollinator Habitat Planning Scorecard, or other third party solar-pollinator scorecards designed for Midwestern eco-systems, soils, and habitat.
- 7. Projects certified and maintained as pollinator-friendly compliant are exempt from landscaping requirements and post-construction stormwater management controls (as stated in Section V. A.2. below) that may be otherwise required under Model Community’s development regulations, unless required due to special conditions by the plan commission or the Board of Zoning Appeals.

f. Foundations – A qualified engineer shall certify, prior to application for building permits, that the foundation and design of the solar panel racking and support is within accepted professional standards, given local soil and climate conditions.

g. Power and communication lines –

- 1. Power and communication lines running between banks of solar panels and to nearby electric substations or interconnections with buildings shall be buried underground. Exemptions may be granted by Model Community in instances where shallow bedrock, water courses, or other elements of the natural landscape interfere with the ability to bury lines, or distance makes undergrounding infeasible, at the discretion of the zoning administrator.
- 2. Power and communication lines between the project and the point of interconnection with the transmission system can be overhead.

h. Fencing – Perimeter fencing for the site shall not include barbed wire or woven wire designs and shall preferably use wildlife-friendly fencing standards that include clearance at the bottom. Alternative fencing can be used if the site is incorporating agrivoltaics.

2. Stormwater and NPDES – Large- and community-scale solar projects are subject to Model Community’s stormwater management and erosion and sediment control provisions and Nonpoint Pollution Discharge Elimination System (NPDES) permit requirements. Solar collectors shall not be considered impervious surfaces if the project complies with ground cover standards, as described in A.1.d and e of this ordinance.

3. Other standards and codes – All large- and community-scale solar projects shall be in compliance with all applicable local, state and federal regulatory codes, including the State of Indiana Uniform Building Code, as amended; and the National Electric Code, as amended.

4. Site Plan Required – The applicant shall submit a detailed site plan for both existing and proposed conditions, showing locations of all solar arrays, other structures, property lines, rights-of-way, service roads, floodplains, wetlands, and other protected natural resources, topography, electric equipment, and all other characteristics requested by Model Community. The site plan should show all zoning districts and overlay districts.

Site Plan

Solar farm developers should provide a site plan similar to that required by the community for any other development. Refer to your existing ordinance to guide site plan submittal requirements.

5. **Aviation Protection** – For large- and community-scale solar projects located within 500 feet of an airport or within approach zones of an airport, the applicant must complete and provide the results of a glare analysis through a qualitative analysis of potential impact, field test demonstration, or geometric analysis of ocular impact in consultation with the Federal Aviation Administration (FAA) Office of Airports, consistent with the Interim Policy, FAA Review of Solar Energy Projects on Federally Obligated Airports, or most recent version adopted by the FAA.
6. **Agricultural Protection** – Large- and community-scale solar projects must comply with model community’s site assessment standards for identifying agricultural soils. Model Community may require mitigation for use of prime soils for solar array placement, including the following:
- a. Demonstrating co-location of agricultural uses (agrivoltaics) on the project site.
 - b. Using an interim use or time-limited Conditional Use Permit (CUP) that allows the site to be returned to agriculture at the end of life of the solar installation.
 - c. Locating the project in a wellhead protection area for the purpose of removing agricultural uses from high risk recharge areas.
 - d. Using pollinator-friendly ground cover, as defined in Section III.
7. **Decommissioning** – A decommissioning plan shall be required to ensure that facilities are properly removed after their useful life.
- a. Decommissioning of the system must occur in the event the project does not produce power for 12 consecutive months. An owner may petition for an extension of this period upon showing of reasonable circumstances that have caused the delay in the start of decommissioning.
 - b. The plan shall include provisions for removal of all structures and foundations to a depth of 48”, restoration of soil and vegetation and assurances that financial resources will be available to fully decommission the site.
 - c. Disposal of structures and/or foundations shall meet the provisions of the Model Community Solid Waste Ordinance.
 - d. Model Community may require the posting of a bond, letter of credit, a parent guarantee, or other financial surety to ensure proper decommissioning.
 - e. The value of the decommission bond or letter of credit should consider the salvage value of the solar equipment.

Aviation Standards, Glare

This standard was developed for the FAA for solar installations on airport grounds. It can also be used for solar farm and garden development in areas adjacent to airports. This standard is not appropriate for areas where reflected light is not a safety concern.

Agricultural Protection

The agricultural protection section applies only to those communities that have adopted agricultural protection standards in their development regulations that apply to multiple types of development. In those instances, this provision applies those same standards to solar development. The ordinance language is written for a community that requires assessment of soils, but not necessarily protection of those soils. Communities should carefully evaluate to what degree solar development should be subject to the community’s agricultural protection standards.

Solar and Prime Soils

Solar farms do not pose the same level or type of risk to agricultural practices or prime farm soil, as does housing or commercial development.

- *State stormwater standards require, in most cases, establishment of perennial vegetation over the solar project site by the end of construction. The groundcover at solar farms will protect agricultural soil, build nutrients, prevent erosion, and improve topsoil quality at the site.*
- *Some forms of agriculture can be co-located with solar development, including grazing, small crop production, and apiaries.*
- *Solar farms can be easily turned back to agriculture at the end of the solar farm’s life (now being estimated to be 35 years).*

B. Community-Scale Solar – Model Community permits the development of community-scale solar, subject to the following standards and requirements:

- 1. Rooftop shared solar systems permitted –** Rooftop systems are permitted in all districts where buildings are permitted.
- 2. Community-scale uses –** Ground-mounted community-scale solar energy systems must cover no more than ten acres (project boundaries), and are a permitted use in industrial and agricultural districts, and permitted with standards or conditional in all other non-residential districts. Ground-mounted solar developments covering more than ten acres shall be considered large-scale solar.
- 3. Dimensional standards -** All structures must comply with setback and height standards for the district in which the system is located.
- 4. Other standards -** Ground-mounted systems must comply with all required standards for structures in the district in which the system is located.

Drinking Water Protection

In identifying preferred areas or districts for solar principal uses, the community should consider co-benefits of solar energy development. One such potential co-benefit is protection of drinking water supplies. Solar energy development may be intentionally sited within vulnerable portions of public water supply systems as a best management practice to restore and protect perennial groundcover that reduces nitrate contamination of ground water supplies.

Defining Community-Scale Solar

The acreage size for community-scale solar garden (written here (10 acres) is the high end of project size for a one-megawatt system, but community-scale could be defined as high as 10 megawatts (100-acre project size). Community-scale solar is the size that can fit in to the landscape.

Community-Scale Solar or Solar Gardens

Community solar systems differ from rooftop or solar farm installations primarily in regards to system ownership and disposition of the electricity generated, rather than land use considerations. There is, however, a somewhat greater community interest in community solar, and thus communities should consider creating a separate land use category.

This language limits the size of the garden to ten acres, which is an installation of no more than one MW of solar capacity. Communities should tailor this size limit to community standards, which may be smaller or larger.

- C. **Large-Scale Solar** – Ground-mounted solar energy arrays that are the principal use on the lot are permitted under the following standards:
1. **Conditional use permit** – Large- and community-scale solar projects are conditional uses in agricultural districts, industrial districts, shoreland and floodplain overlay districts, airport safety zones subject to V.A.5. of this ordinance, and in the landfill/brownfield overlay district for sites that have completed remediation.

Large-Scale Solar Conditional Uses

Communities can determine if large -scale solar should require a conditional use or permitted-use permit for the community to consider the site-specific conditions. The districts listed here are examples. Each community needs to consider where large scale solar is suitable in the context of its zoning districts and priorities.

Example Use Table

Use Type	Residential	Mixed Use	Business	Industrial	Agricultural, Rural, Landfill	Shoreland	Floodplain	Special (Conservation, Historic Districts)
Large-scale solar	X	X	X	C/PS	C/PS	C	C	C
Community-scale solar	C	C	C	P	P	PS	PS	PS
Accessory use ground-mounted solar	P	P	P	P	P	P	C	C
Rooftop solar	P	P	P	P	P	P	P	PS

- P = Permitted
- PS = Permitted Special (additional separate permit or review)
- C = Conditional
- X = Prohibited

Solar as a Land Use

The above use table shows four types of solar development that are distinct types of land uses (two kinds of accessory uses, two principal uses), and a group of districts or overlays that are commonly used in Indiana.

- Rooftop system are permitted in all districts where buildings are permitted, with recognition that historic districts will have special standards or permits separate from the zoning permits.
- Accessory use ground-mounted systems are conditional where potentially in conflict with the primary district or overlay goal.
- Community-scale solar principal uses are either conditional uses or permitted uses, depending on the community decisions. Permitted uses are where a 10-acre development can be integrated into the landscape, and require special consideration in shoreland and floodplain overlay districts.
- Large-scale solar is prohibited in higher density districts and conditional or permitted with separate permit review in all other districts.

Both community- and large-scale solar is allowed in shoreland and floodplain overlay districts, because the site design standards requiring beneficial habitat ground cover not only ensure a low-impact development but in most cases result in a restoration of eco-system services from the previous (usually agricultural) use.

VI. Renewable Energy Condition for Certain Permits

- A. Condition for Planned Unit Development (PUD) Approval - Model** Community may require on-site renewable energy systems, zero-net-energy (ZNE) or zero-net-carbon (ZNC) building designs, solar-synchronized electric vehicle charging or other clean energy systems as a condition for approval of a PUD permit to mitigate for:
1. Impacts on the performance of the electric distribution system,
 2. Increased local emissions of greenhouse gases associated with the proposal,
 3. Need for electric vehicle charging infrastructure to offset transportation-related emissions for trips generated by the new development, and
 4. Other impacts of the proposed development that are inconsistent with the Model Community Comprehensive Plan.
- B. Condition for Conditional Use Permit - Model Community** may require on-site renewable energy systems or zero net energy construction as a condition for a rezoning or a conditional use permit.

VII. Solar Roof Incentives. Model Community encourages incorporating on-site renewable energy system or zero net energy construction for new construction and redevelopment. Model Community may require on-site renewable energy or zero-net- energy construction when issuing a conditional use permit where the project has access to local energy resources, in order to ensure consistency with Model Community’s plan to reduce greenhouse gas emissions.

- A. Density Bonus -** Any application for subdivision of land in the Districts that will allow the development of at least four (4) new lots of record shall be allowed to increase the maximum number of lots by 10% or one lot, whichever is greater, provided all building and wastewater setbacks can be met with the increased density, if the applicant enters into a development agreement guaranteeing at least three (3) kilowatts of PV for each new residence that has a solar resource.
- B. Solar-Ready Buildings –** Model Community encourages builders to use a solar-ready design in buildings. Buildings that submit a completed U.S. EPA Renewable Energy Ready Home Solar Photovoltaic Checklist (or other approved solar- ready standard) and associated documentation will be certified as a Model Community solar ready home, and be eligible for low-cost financing through Model Community’s Economic Development Authority. The designation will be included in the home’s permit history.

Renewable Energy Conditions, Incentives

The community can use traditional development tools such as conditional use permits, PUDs, or other discretionary permits to encourage private investment in solar energy systems as part of new development or redevelopment. This model ordinance notes these opportunities for consideration by local governments. In most cases, additional ordinance language would need to be tailored to the community’s ordinances.

For instance, a provision that PUDs (or other special district or flexible design standard) incorporate solar energy should be incorporated into the community’s PUD ordinance rather than being a provision of the solar standards.

Conditional use permits generally include conditions, and those conditions can include renewable energy or zero net energy design, but only if the conditions are clearly given preference in adopted policy or plans providing the Board of Zoning Appeals with clear guidance for approving the conditions. Explicit reference to climate or energy independence goals in the ordinance and explicit preference for such conditions will set a foundation for including such conditions in the permit.

Solar Roof Incentives

This section of the model ordinance includes a series of incentives that can be incorporated into development regulation. Most cities and many counties use incentives to encourage public amenities or preferred design. These same tools and incentives can be used to encourage private investment in solar energy. Communities should use incentives that are already offered, and simply extend that incentive to appropriate solar development.

Some of the incentives noted here are not zoning incentives, but fit more readily into incentive programs offered by the community (such as financing or incentive-based design standards).

C. Solar Access Variance – When a developer requests a variance from Model Community’s subdivision solar access standards, the zoning administrator may grant an administrative exception from the solar access standards provided the applicant meets the conditions of 1. and 2. below:

- 1. **Solar Access Lots Identified** - At least 20% of the lots, or a minimum number of lots to be determined by Model Community.
- 2. **Covenant Assigned** - Solar access lots are assigned a covenant that homes built upon these lots must include a solar energy system. Photovoltaic systems must be at least three (3) KW in capacity.
- 3. **Additional Fees Waived** - Model Community may waive any additional fees for filing of the covenant.

Solar-Ready Buildings

New buildings can be built “solar-ready” at very low cost (in some cases the marginal cost is zero). Solar energy installation costs continue to decline in both real and absolute terms, and are already competitive with retail electric costs in many areas. If new buildings have a rooftop solar resource, it is likely that someone will want to put a solar energy system on the building in the future. A solar ready building greatly reduces the installation cost, both in terms of reducing labor costs of retrofits and by “pre-approving” most of the installation relative to building codes.

A community’s housing and building stock is a form of infrastructure that, although built by the private sector, remains in the community when the homeowner or business leaves the community. Encouraging solar-ready construction ensures that current and future owners can take economic advantage of their solar resource when doing so makes the most sense for them.

Solar Access Subdivision Design

Some communities will require solar orientation in the subdivision ordinance, such as requiring an east-west street orientation within 20 degrees in order to maximize lot exposure to solar resources. However, many such requirements are difficult to meet due to site constraints or inconsistency with other requirements (such as connectivity with surrounding street networks). Rather than simply grant a variance, the community can add a condition that lots with good solar access actually be developed as solar homes.

Appendix A

The following list contains solar ordinances proposed and adopted in Indiana. This list has not been vetted by the authors of Indiana’s Model Solar Ordinance; instead, this list is intended to provide examples of what has already been adopted.

List of Solar Ordinances Adopted by Local Governments in Indiana Last Updated October 2020		
Local Government	Adoption Date	Ordinance Link
City of Goshen	2012; Amended in 2017	Goshen Zoning Ordinance > Solar Energy System Regulations
City of Plymouth	2017; Amended in 2019	City of Plymouth Zoning Ordinance Solar Energy Standards
City of South Bend	2019	South Bend Zoning Ordinance > Solar
Elkhart County	Dec 2014, Effective Feb 2015; Amended Jan 2020	Elkhart County Zoning Ordinance > Solar Panel Array
Fulton County	Unknown	Fulton County Zoning Ordinance > Solar Energy Systems Standard
Henry County	(proposed)	Draft Ordinance as of Oct 2020
Lake County	Sep 2020	Lake County Zoning Ordinance
Marshall County	2017; Amended Jan 2020*	Marshall County Zoning Ordinance > Solar Energy Systems
Porter County	Apr 2020	Porter County Unified Development Ordinance Amendment > Solar Ordinance Chaps. 2, 5 and 10
Posey County	Mar 2020	Posey County Zoning Ordinance > Renewable Energy Generation Systems for Cynthiana, Poseyville, and Mount Vernon
Posey County	Mar 2020	Posey County Zoning Ordinance > Renewable Energy Generation Systems for Unincorporated Areas
Pulaski County	Dec 2019, Effective Jan 2020	Pulaski County Unified Development Ordinance > Wind Energy Convergence and Solar Energy Systems
Randolph County	Jul 2020	Randolph County Solar Energy Systems Siting Regulations
Shelby County	Jul 2018	Shelby County Unified Development Ordinance > Commercial Solar Energy Systems Standards
St. Joseph County	Feb 2020	St. Joseph County Zoning Ordinance > Special Regulations for Renewable Energy Systems
Starke County	Jun 2019	Starke County Solar Energy Ordinance
White County	Jan 2019	White County Zoning Ordinance > Solar Farms and Solar Energy Systems

*under moratorium until 2021 to address decommissioning in the ordinance

Mollie Montelaro

From: Steven LeBlanc <leblancsm467@gmail.com>
Sent: Monday, June 28, 2021 12:00 PM
To: Mollie Montelaro
Subject: Comment on Senate Resolution No. 182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

As a private landowner in the State of Louisiana, I fully support solar farm development. Solar farms will produce environmentally friendly clean energy for our electric grid for years with little to no impact to our farm communities. Also, solar farms will take up less than one percent of available farmland in the state if allowed to reasonably develop.

The state should promote positive growth of clean energy and should not over regulate solar farms to the detriment of our future.

Mollie Montelaro

From: Jessica Hendricks <jessica@all4energy.org>
Sent: Monday, June 28, 2021 4:38 PM
To: Mollie Montelaro; Robin Narez
Subject: Comments on Act 301 and SR182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Good afternoon,

My name is Jessica Hendricks and I'm the State Policy Director with the Alliance for Affordable Energy. The Alliance for Affordable Energy safeguards Louisiana's future by protecting consumers' right to an affordable, equitable, and environmentally responsible energy system. The Alliance is the only dedicated consumer advocate in Louisiana for utility customers. We fight for consumers through education, clean energy, and energy efficiency.

Unfortunately the misinformation around land use conflicts has served to derail Louisiana's progress towards clean and affordable energy. We do not see a conflict between agricultural farms and solar farms, rather both industries have an opportunity to compliment each other. There are best practices already implemented in other states that address vegetative barriers, land maintenance and decommissioning bonds, and solar developments have historically co-existed with farmland, often on the same property. We also know that solar's peak production hours, between 12noon - 3pm, often coincide with farmers' peak energy demand.

Louisiana is currently at the crossroads of a dynamic energy transition and has an opportunity to capitalize on our solar potential. Solar power generates clean energy, creates jobs, attracts new industry, and helps keep electric bills low for Louisianans, some of which are still struggling through the COVID recession. With no associated fuel costs, solar power can help keep electric bills low for Louisianans. In a state with a very high energy burden whereas the most under-resourced Louisianans pay upwards of 20% of their monthly income on energy bills, lower electric bills need to be a top priority.

Louisiana has long since been an energy state, and as the energy industry is changing, we must change as well in order to continue to be an energy leader of the South.



Jessica Hendricks

State Policy Director
Alliance for Affordable Energy

p: [504.208.9761](tel:504.208.9761)
c: [225.366.9328](tel:225.366.9328)
w: www.all4energy.org e: Jessica@all4energy.org

A future where energy works for everyone.

Mollie Montelaro

From: Renee Boudreaux <lr**boudreaux@gmail.com**>
Sent: Monday, June 28, 2021 4:54 PM
To: Mollie Montelaro
Subject: Solar Farms

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Sent from my iPad. This email is sent to you that we support Solar Farms. We are supporters of oil & gas but also for solar which is in our future. We have seen Solar Farms in other states & they are well hidden from anything around them. It is the landowner's choice to have solar on their land. We would be ok to have a Solar Farm on our property.

Mollie Montelaro

From: Bruce Rainey <brainey04@gmail.com>
Sent: Monday, June 28, 2021 6:45 PM
To: Mollie Montelaro
Subject: Solar Farms

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

I am writing to express my concerns about the massive solar farms coming to the state. I live in Tangipahoa Parish where 3000 acres are being proposed within a 15 mile radius of my home. I have many concerns that our parish is addressing, but we need state regulation.
Please consider limiting the number of acres allowed in an area so that parishes do not become a solar hot spot. Our state is beautiful and many other states who have undertaken this renewable energy train are regretting it. (Ohio and Oregon) Sincerely, Betty Rainey

Mollie Montelaro

From: CHARLES J JR BOURG <bourg_c@bellsouth.net>
Sent: Monday, June 28, 2021 7:25 PM
To: Mollie Montelaro
Subject: Solar farms

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

Good Afternoon, i would like to voice my approval FOR solar farms in Louisiana. We need to embrace renewable energy and move forward with projects like solar farms to have alternative energy sources aling with Oil and Gas.
I firmly believe that land owners have the right to do what they wish with their property such as turning it into a solar farm.

Thank you,
Shari Bourg

Mollie Montelaro

From: Brenda OConnell <grammy.oconnell@gmail.com>
Sent: Tuesday, June 29, 2021 7:42 AM
To: Mollie Montelaro
Subject: Support of solar installations in the state

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

I was very encouraged to learn that there were efforts being made in Louisiana to invest in solar energy and to begin to do our part to stem the tide of global climate change by looking to renewable energy sources. I strongly support the efforts being made to begin to move away from dependance on fossil fuels. I believe that many of the concerns listed in the proposed legislation could be ameliorated.

Brenda O’Connell

Mollie Montelaro

From: Leslie Breaux <breauxfamily3@gmail.com>
Sent: Tuesday, June 29, 2021 7:51 AM
To: Mollie Montelaro
Subject: comments on senate resolution 182

EXTERNAL EMAIL: Please do not click on links or attachments unless you know the content is safe.

> Writing in support on the advancement of utility scale solar energy in Louisiana.

>

> Solar energy is a important step toward a cleaner environment. As a landowner in Louisiana, I welcome the site of solar developments on unused or underutilized land. I would love to see Louisiana recognized as a progressive state with regard to renewable energy. Louisiana should actively encourage the further development of solar farms.

Leslie B Breaux

Sent from my iPhone

Public Testimony

Terrence L. Chambers, Ph.D., P.E.

Thank you for allowing me to testify to you today. My name is Dr. Terry Chambers. I hold the Mosing Endowed Chair in Mechanical Engineering and serve as the Director of the Energy Efficiency and Sustainable Energy Center at the University of Louisiana at Lafayette. I have been doing solar energy research, education, workforce development, and outreach in Louisiana for 11 years, and have published 24 peer-reviewed scientific papers on that topic. I am the project lead for the 1.1 MW Photovoltaic Applied Research and Testing Lab at UL Lafayette, and I am a registered professional engineer in the State of Louisiana (PE.0029746). Although here as a member of the academic community, my comments do not necessarily represent the position of the University. I am not affiliated with, nor have I received any compensation from any of the parties interested in the outcome of this hearing. The purpose of my appearance is simply to serve as a resource for unbiased, accurate, up-to-date information with regard to solar energy technology, not to recommend or advocate for any particular public policy.

When deployed properly, according to all applicable codes and standards and industry best practices, solar energy is a safe and cost-effective way to provide reliable, low-cost, pollution-free electricity. Nationally and internationally, the solar industry is very mature, and codes and standards have been developed to ensure that solar energy is safe. For example, the National Electric Code (NFPA 70) specifically addresses the proper use and installation of solar energy equipment and requires all solar equipment to be tested and certified by a nationally recognized testing laboratory, such as Underwriter's Laboratory. The plans for any large-scale solar installation must be stamped by the appropriate Louisiana-registered professional engineers certifying that the site layout, drainage plan, electrical design, and structural design will protect the safety, health, and welfare of the public. The permitting authority and the utility generally insist upon third-party inspection and verification before interconnection approval is granted.

I have recently heard many concerns expressed by members of the public, some of which are based on incorrect information, and I would like to address some of those concerns, so that public policy can be based on accurate information. For example, while in use solar power plants do not create toxic run-off that will pollute the groundwater; they do not interfere with medical devices; they do not ruin the land so that it can't be used for farming again, and they will not use enough land to seriously alter the agrarian nature of the state. On the other hand, solar energy has many economic and environmental benefits. For example, solar and wind are now the cheapest form of electrical generation in the U.S., so by implementing solar, utility rates should either stay the same or go down, and low utility rates are most advantageous to our lower-income residents. Parishes can benefit from tax revenue that can be tens or hundreds of times higher than current use, and that tax money can be used to provide

additional drainage, police, fire, and other public services. Every year, every acre of a utility-scale solar farm will provide power for approximately 50 homes and provide the CO2 offset equivalent of planting over 4600 trees.

In terms of solar-related services offered by the University that may be of interest to the community, we have received a grant from the USDA to provide free or low-cost solar energy and energy efficiency audits to qualifying rural businesses and farmers, and if energy saving measures are determined to be cost-effective, there could be USDA funding to help implement the project. We offer tours of our solar facility upon request to interested members of the public, businesses, and public officials, and I am also happy to speak to interested groups upon invitation. We also offer solar energy education for engineers and workforce development courses for those who are desire to become solar energy professionals.

In summary, when implemented properly, solar energy is a safe and cost-effective way to generate pollution-free electricity, and our university offers many solar-related services that may be of interest to the community. Additional information and resources are included in the attached Appendices. Appendix A provides a resource guide related to solar energy in Louisiana, addressing health and safety impacts, land use and farming, property values, and applicable codes and standards. Appendix B provides resources to local governments regarding planning, zoning, permitting, and inspections. If anyone is interested in obtaining more information related to solar energy, my contact information is shown below, and I would be happy to help:

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Donald & Janice Mosing BORSF Endowed Chair in Mechanical Engineering
Director, Energy Efficiency and Sustainable Energy Center
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Website: eese.louisiana.edu

Appendix A

Solar Information for Louisiana Residents

Terrence L. Chambers, Ph.D., P.E.

7-26-2021

Energy Efficiency and Sustainable Energy Center
Energy Institute of Louisiana
University of Louisiana at Lafayette

Solar Guidance Documents from Other States

Because members of the public are often concerned about potential solar development in their state, those states have sometimes called upon their universities to provide a summary of answers to common concerns as a resource guide for public officials when making solar-related policy decisions. Two excellent examples are, "Health and Safety Impacts of Solar Photovoltaics," which was written by the North Carolina Clean Energy Technology Center [1], and "Clean Energy Results, Questions and Answers, Ground-Mounted Solar Photovoltaic Systems," created by the Massachusetts Clean Energy Center [2]. In a similar vein, this document attempts to summarize the issues of interest to Louisiana residents related to potential solar energy development.

Health and Safety Impacts of Solar Power Plants

Hazardous Materials

Although solar energy systems do contain small amounts of toxic materials, the issue has been studied intensively and the conclusion is that these materials do not present a danger to public health [3 – 6]. Solar cells are semi-conductors and contain the same type of semi-conductor materials as are used in the computer industry. Unlike computers, however, solar modules are designed to be installed outdoors. Because the semi-conductor would be ruined if exposed to the elements, the solar cell itself is encapsulated between two layers of plastic. In addition, the cells are protected either by a layer of tempered glass on both top and bottom, or by tempered glass on the top and a polymer sheet on the back. As result, the solar cell is completely protected from air and water during normal operation, and as such, rainwater does not wash any toxic materials into the soil. Even if the glass on the solar module is broken, the plastic encapsulant normally still keeps the semi-conductor portion of the modules from being exposed to the elements, thus preventing any harmful materials from escaping. In general, the toxic materials in a solar module will not leach out into the environment unless the solar module is so severely damaged that the encapsulant is compromised, and the cell pieces are fully immersed in water for an extended amount of time. Even then, according to the

International Energy Agency, the concentrations of the toxic materials in the water will remain “several orders of magnitude below regulatory screening thresholds [7].”

End of Life, Recycling, Decommissioning

The situation described above where a defective solar module is immersed in water for a long period of time does not occur during general use, but it could occur if the module were deposited in a landfill at the end of life. Therefore, it is not a recommended practice to place used modules in landfills, and local jurisdictions have the authority to prevent that from happening. Instead, it is recommended to refurbish the modules, if possible, and if not to recycle them at the end of their useful life [8 – 10]. Major module manufacturers and solar industry trade associations have recycling programs [11, 12], and recycling is highly recommended at the end of life.

In general, all components of a solar project can be removed from the property at the end of a solar project and the land can be restored to its original state. The solar modules can be unbolted and recycled. The steel racks that support the solar modules can be removed and either re-purposed or recycled. A decision can be made to either remove the underground PVC conduits that carry the electrical conductors, or to pull the conductors out and leave the conduits in the ground if they are deep enough to not interfere with the next intended purpose for the land. Many of the materials recovered at the decommissioning of a solar farm, including many tons of steel, have an inherent salvage value, making the decommissioning process less costly to the project owner than it would be otherwise. Decommissioning bonds could be considered as a reasonable precaution to take to ensure that neither the landowner nor the local jurisdiction will be left on the hook to decommission a solar power plant if the solar plant owner goes out of business.

O&M – Panel Washing and Vegetation Control

One common concern is that the chemicals used to wash the solar modules will be harmful to the groundwater. Louisiana has enough rain that the modules do not need to be washed very often. In the three years of operation of our solar farm at UL Lafayette, we have only washed the modules once, and that was to initiate a study on the effects of soiling. Washing of the modules was accomplished using tap water run through a deionization filter, a pressure washer, and a brush. No chemicals were needed. If any chemical at all were to be used to wash a solar module it would likely be a mild soap to remove a particularly stubborn bit of soiling.

Utility-scale solar plants typically have grass beneath the modules and between the rows. Vegetation control is primarily accomplished by planting a species of grass that has a limited height, so that it does not shade the solar modules, and then by mowing and weed eating as necessary. It is also possible to run sheep in a solar field to keep the vegetation down and to plant pollinator plants along the vegetative barrier around the solar facility. In general, herbicides are only used at strategic sites, such as along the fence lines and next to the

electrical equipment. When an herbicide is used, it is usually a general-use herbicide available over the counter, of the same type used in lawns and parks across the country, rather than a special use herbicide that requires a license.

Hurricanes

Existing local building codes already require all structures, including solar power plants, to be engineered to withstand the design windspeed for each location, as specified by the American Society of Civil Engineers (ASCE). Typical design windspeeds in Louisiana can vary from 110 mph to 140 mph, but solar racks can easily be designed to windspeeds of 150 mph or higher. The National Renewable Energy Lab used maintenance data from 50,000 operational solar energy systems and found that solar plants stand up well to hurricanes and hail [13]. This has been born out by the experience of solar plants in New Jersey and New York during Hurricane Sandy, and by solar plants in the US and Caribbean during Hurricane Mathew, which for the most part survived all of these devastating storms with only minor damage [1].

Electromagnetic Fields (EMF)

Photovoltaic systems do generate both electric and magnetic fields, which are sometimes called EMFs. The type and magnitude of the electric and magnetic fields generated by solar energy equipment is similar to the electric and magnetic fields produced by other electrical equipment that surrounds us every day, including electrical power lines, electrical sub-stations, cell phones, and microwave ovens. Because this is a persistent source of concern, a brief technical explanation seems warranted in order to help the public understand why the electromagnetic fields generated by solar power plants do not represent a unique danger to human health or safety.

The strength of an electric field is proportional to voltage, while the strength of a magnetic field is proportional to current. Both types of electromagnetic fields diminish exponentially with the distance from the source. Electric fields are very easily absorbed and are shielded by anything between a person and the source of the electric field, such as a tree, a fence, or a building. On the other hand, magnetic fields easily pass through most objects, including humans, making magnetic fields the more significant issue with regard to human health. There is also an important distinction between the static magnetic fields produced by DC electricity, and the “power frequency” magnetic fields produced by AC electricity. Static magnetic fields do not induce an electrical current in the human body, but very high current AC electricity does induce a power frequency magnetic field, which could potentially induce an electric current in the human body large enough to cause pain or headaches. Whether this presents a danger to public health has been studied extensively, including by the National Institute of Environmental Health, National Academies of Science, and the World Health Organization [14 - 16]. Following a comprehensive evaluation of this issue, the National Academies of Science concluded:

“Based on a comprehensive evaluation of published studies relating to the effects of power frequency electric and magnetic fields on cells, tissues, and organisms (including

humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects [16].”

Exposure limits for public safety have also been established by the IEEE and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) [17 - 18]. The typical electrical equipment that we use every day are designed to comply with IEEE and ICNIRP standards.

It is reasonable to ask whether solar power plants present a unique risk to human health, and This question has been asked when other solar projects have been proposed and studies have been performed to answer the question, including by the US Department of Energy [19], which concluded that:

“...the magnitude of EMF exposure measured at the perimeter of PV installations has been shown to be indistinguishable from background EMF, and is lower than that from many household appliances, such as televisions and refrigerators.”

These studies show that the DC voltage generated within the solar field produces a static electric field that will usually be largest at the end of the longest string of modules. The DC current produces a static magnetic field that does not induce a current in the human body. This static EMF is relatively small in magnitude and diminishes dramatically with distance, to the extent that it is “largely indistinguishable from the Earth’s natural magnetic field,” at a distance of 10 feet [20]. The inverters, AC combiner panels, and transformers in a solar field are the largest sources of power frequency EMF. The power frequency electromagnetic fields in a solar plant are of the same type and magnitude as would be found with traditional electrical equipment, including electrical substations, power lines, and the transformers we see around town and behind our houses. This magnetic field diminishes rapidly with distance and is nearly un-detectable at the fence of a solar facility. A recent peer-reviewed study entitled, “Electromagnetic Fields Associated with Commercial Solar Photovoltaic Electric Power Generating Facilities [21],” measured the EMF generated at two commercial solar power plants and concluded:

“Static magnetic fields were very small compared to exposure limits established by IEEE and ICNIRP. The highest 60-Hz magnetic fields were measured adjacent to transformers and inverters, and radiofrequency fields from 5–100 kHz were associated with the inverters. The fields measured complied in every case with IEEE controlled and ICNIRP occupational exposure limits. In all cases, electric fields were negligible compared to IEEE and ICNIRP limits across the spectrum measured and when compared to the FCC limits (≥ 0.3 MHz).”

I have personally confirmed this by taking EMF measurements at various locations throughout the University’s solar facility and along the fence line. The readings outside the fence were at

the ambient levels found throughout town and inside my own home, while the highest readings inside the fence were found beneath a power line that runs alongside the solar field to serve an adjoining neighborhood, but that is not even connected to the solar facility.

I have heard concern expressed about solar facilities potentially interfering with pacemakers. The standards to which Active Implanted Medical Devices (AIMSs) are manufactured requires them to be immune to EMF interference under “reasonable foreseeable” circumstances, which include exposure to EMFs associated with common electrical equipment and power lines, to the extent they are accessible by the general public. As a result, neither the US Food and Drug Administration (FDA) nor the UK’s Medicines and Healthcare products Regulatory Agency (MHRA) have ever seen a documented case of a patient having their implanted heart device interfered with by a high-voltage power line [22]. As discussed above, since the EMFs from a solar facility outside the fence are much lower than that of typical power lines, there is no reason to believe that EMFs from a solar facility would interfere with a pacemaker or other AIMS.

Electric Shock and Arc Flash

Solar energy plants are electrical power generation facilities, and as such there is a very real danger from electrical shock and arc flash. For that reason, building codes and the National Electric Codes require that warning signs and tall fences be installed to prevent the general public from inadvertently accessing any electrical equipment that could cause them harm. Qualified electrical technicians and other workers who are specially trained to identify and mitigate these types of hazards and can safely operate and maintain a solar facility.

Fire Hazards

The components that make up a solar field are mostly made of steel, glass and aluminum which are not flammable. In general, therefore, even if the grass underneath a solar array catches fire, the solar modules will not catch fire. On the other hand, an arc flash caused by a loose connector or a frayed wire could potentially generate enough heat to ignite the plastic backsheet, the encapsulant and the insulation on the wires for a solar module, making fire a realistic, although rare, possibility. Recent editions of the National Electric Code, which is published by the National Fire Protection Association, have a special chapter for solar facilities outlining the design requirements to ensure that solar energy systems are designed and installed in a way that will allow firefighters to perform their job safely. Because a solar module will create an electrical potential whenever it is in the sunlight, the NEC requires the installer of a solar energy system to provide an easily identifiable location where firefighters can de-energize the PV system so that they can safely fight a fire at a solar plant. The US Department of Energy has provided millions of dollars to fund the development of specialized training courses for first responders to allow them to learn how to deal with fires in or near solar energy systems. The International Renewable Energy Council (IREC) offers free DOE-sponsored training course entitled, “Solar PV Safety for Firefighters [23].” This course will provide answers

to common questions, such as, “Can you spray water on solar panels?” and, “Is a roof top solar array hazardous on a cloudy day?”

Noise

In general, solar farms are very quiet. The largest sources of noise in a solar facility will be the inverters, which emit an audible 60 Hz hum while in operation. Average sound levels at a distance of 10 feet from the inverter face vary over the range of 48 dB to 72 dB [24], which is about the same level of sound from a normal conversation, and it is less than the sound level of a toilet flushing [25]. Also, by way of comparison, OSHA requires employers to implement a hearing conservation program when noise exposure is at or above 85 decibels averaged over eight working hours [26], so in general, the sound levels inside a solar facility are not sufficient to require workers to employ hearing protection. Outside the fence of the solar array, the sound level approaches ambient levels.

Land use and Farming

There are currently somewhere on the order of 7 GW (7,000 MW) of solar projects in Louisiana that have been prospected and submitted to MISO for an interconnection permit. In reality, most of them will never be built for economic reasons. However, if we estimate an average of five acres per MW, and if all 7 GW of solar projects were actually built, they would only use about 35K acres, out of approximately 8M agricultural acres in the state, of which only about half is actually currently being used for farming. This represents less than one half of one percent of all farmlands, so it is unlikely that the proposed solar projects will significantly alter the agrarian nature of our beautiful state, and it seems unlikely that solar farms would create any serious disturbances in the ability of rice mills to receive enough product from nearby farms. Two industry trends will also tend to reduce the amount of land used for solar in the future. One trend is that the efficiency of solar modules has been increasing rapidly over the last twenty years. Another industry trend is to increase the ground coverage ratio in the design of the plant, which simply means that they are tending to put the rows of modules closer together to improve the cost-effectiveness of the projects. Since land use is directly related to module efficiency and ground coverage ratio, future solar farms will require less land to produce the same amount of electricity.

When farmland is used for solar, the land lays fallow for 25 – 35 years with grass planted beneath the solar panels. This may actually improve the quality of the land once it is returned to farmland. Agrivoltaics is a new area of intense study sponsored by the US Department of Energy. Agrivoltaics combine the production of solar energy with and other agricultural activities on the same land. Solar farms have already been successfully combined with farm animals such as sheep as well as certain crops, and a large amount of research activity is currently being devoted to this topic.

Property Values

At the residential scale, researchers at the Lawrence Berkeley National Laboratory performed an "Analysis of the Effects of Residential Photovoltaic Energy Systems on Home Sales Prices in California," and found that, "Across a large number of repeat sales model specifications and robustness tests, the analysis finds strong evidence that California homes with PV systems have sold for a premium over comparable homes without PV systems [27]."

At the utility scale there is a common perception that utility-scale solar projects will bring down property values, even among appraisers. Researchers at the University of Texas at Austin surveyed land appraisers and found that, "while a majority of survey respondents estimated a value impact of zero, some estimated a negative impact associated with close distances between the home and the facility, and larger facility size. Regardless of these perceptions, geospatial analysis shows that relatively few homes are likely to be impacted [28]."

For the UT-Austin study, it was found that those with a negative opinion had never actually performed a formal appraisal of a solar farm. However, when a study of the potential impact of a specific proposed solar farm at a particular site has been performed by certified appraisers, the results consistently show no negative effect on property values. For example, a State Certified General Appraiser in North Carolina was asked to do a study of the impact of nearby property values of a proposed solar farm and his conclusion was:

"The matched pair analysis shows no impact in home values due to the adjacency to the solar farm as well as no impact to adjacent vacant residential or agricultural land. The criteria for making downward adjustments on property values such as appearance, noise, odor, and traffic all indicate that a solar farm is a compatible use for rural/residential transition areas [29]."

In a more recent case (2020) of the same type in Virginia [30], a professional appraiser was asked to:

"...provide our professional opinion on whether the proposed solar farm will have any impact on adjoining property values and whether "the location and character of the use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located.""

The conclusion in Virginia by a completely different appraisal firm was almost identical to that in North Carolina:

"Based on my analysis of the neighborhood and properties surrounding the proposed solar site, and my analysis of other existing solar farms in similar locations, it is our professional opinion that the proposed solar electric power plant will not adversely affect the value of adjoining or abutting property.

It is also my professional opinion that the location and character of the solar facility, if developed according to the plan as proposed, will be in harmony with the area in which it is to be located.”

Codes and Standards

The DOE SunShot program recently funded a project to create a resource guide for states and municipalities regarding recommended standards and requirements for solar equipment, installation, and licensing and certification [31]. A partial list of the codes and standards that are applicable to solar energy equipment and installations is shown below.

- **Installation Requirements:**
 - National Electrical Code, NFPA 70
 - Must be installed by a qualified person and in accordance with manufacturer’s instructions
- **Product Listing**
 - UL 1703: Standard for Safety for Flat-Plate Photovoltaic Modules and Panels
 - UL 1741: Standard for Inverters, Converters and Controllers for Use In Independent Power Systems
 - IEEE 1547 - Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces
- **Design Qualification (reliability testing)**
 - IEC 61215: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval
 - IEC 61646: Thin-Film Terrestrial Photovoltaic (PV) Modules - Design Qualification and Type Approval
- **Performance Measurement**
 - ASTM E1036: Standard Test Methods for Electrical Performance of Non-concentrator Terrestrial Photovoltaic Modules and Arrays Using Reference Cells

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Appendix B

Solar Planning Resources for Local Governments

Terrence L. Chambers, Ph.D., P.E.

7-26-2021

Energy Efficiency and Sustainable Energy Center
Energy Institute of Louisiana
University of Louisiana at Lafayette

As an Authority Having Jurisdiction (AHJ), you have many tools that can influence, either positively or negatively, the amount of solar energy development that takes place within your jurisdiction. Some of the most important of these tools include: 1) planning and zoning, and 2) codes, permits, and inspections.

The US Department of Energy funds a program called SolSmart, which provides resources to local governments to help them make their community “solar ready.” The SolSmart program can also provide a national-level designation to any community that takes certain steps to foster the growth of a mature solar market in their jurisdiction. Why is this important?

“Local governments have tremendous influence over the prospects for solar energy growth. Unnecessary paperwork, red tape, and other burdensome requirements increase costs and discourage solar companies from moving to the area. By streamlining these requirements and taking other steps to encourage solar development, communities become “open for solar business.” And since the solar industry is a leading source of American job creation, attracting solar investment in your community is a great way to promote economic development and new jobs.” [1]

The SolSmart program provides a free toolkit for local governments to guide them through the many issues that can arise when considering solar development, including federal and state policies; stakeholder engagement; planning, zoning, and development; codes, permitting, and inspection; residential issues; utility engagement; community solar; market development and finance; solar development on public facilities and under-utilized land, and resiliency [2]. If the jurisdiction wants to apply for the national SolSmart designation, and if you need technical assistance to work through the process, you can request a free consultation from a SolSmart Advisor [3].

Planning and Zoning

A good solar ordinance will address three primary issues: land use conflicts and synergies; protecting access to solar resources; and encouraging appropriate solar development. The

Great Plains Institute has developed model solar ordinances for five states. What is the value of a model solar ordinance?

“Model solar ordinances help guide local governments in supporting and encouraging renewable energy development in their communities. Local governments can customize the provided zoning language for all scales of development, from rooftop to utility-scale solar installations. The model language addresses land use conflicts, methods for encouraging solar development, protecting access to solar resources, and solar energy standards [4].”

The model ordinance for Indiana has been recommended as the one most applicable to Louisiana and a good starting point [5]. The model ordinance includes specific language that could be adapted to meet the needs of your jurisdiction.

Another resource is a local non-profit organization called the Center for Planning Excellence (CPEX), located in Baton Rouge [6]. CPEX is a non-profit organization that coordinates urban, rural and regional planning efforts in Louisiana. The CEO of CPEX is Camille Manning-Broome, a member of the Governor’s Climate Initiatives Task Force, and an expert on renewable energy planning issues. Her email address is: camille@cpey.org

Codes, Permits and Inspections

As described in the SolSmart toolkit for local governments:

“Among all the ways local governments can influence solar energy development, the permitting and inspection process is one of the most important. Municipalities and counties often have direct oversight over permitting and inspection. Streamlining this process to facilitate solar energy construction, without compromising safety standards, can dramatically reduce the time and expense for solar installations. Conversely, an unnecessarily cumbersome process can delay installations and increase costs for consumers.” [7]

In general, solar installations will need to adhere to the same permitting and inspection requirements as other construction projects. The local jurisdiction has probably already adopted applicable codes for electrical, building, and fire protection for other types of construction (NEC, IBC, NFPA, etc.), and all of these codes now cover solar installations as well.

An AHJ will want to be able to review plans and issue permits for solar development at the residential, commercial, and utility scales. Permits at the utility scale may very well need to be issued after a detailed plan review on a case-by-case basis, but permits for small photovoltaic projects can easily be streamlined through a “simplified permit process.” The SolSmart program provides guidelines for local governments to create a standard process to simplify the structural and electrical review of the majority of small PV systems (in general less than 15 kW on a permitted roof). One benefit is that, “By implementing a streamlined and more

standardized permitting process, local governments can make installing solar faster, easier, and more affordable for their staff, local residents, businesses, and solar companies.”

The Solar America Board for Codes and Standards (SolarABCs) provides a simple “Expedited Permit Process [9], which could very easily be adopted almost without change in most jurisdictions. The process includes a standard permit application with fill-in forms and standardized one-line electrical diagrams.

The National Renewable Energy Lab (NREL) has also recently “launched a collaborative effort with key code officials, authorities having jurisdiction, and the solar industry to develop standardized plan review software that can run compliance checks and process building permit approvals for eligible rooftop solar systems [10].” The Solar Automated Permit Processing software (SolarAPP+), is provided free of cost to city and parish permitting departments. NREL personnel will help the jurisdiction set up the software, and will provide no-cost updates for code revisions and new technology. The software can stand alone or be integrated with existing government software and inspection platforms. Eligible solar applications that comply with all code requirements are approved instantly, while others are returned to the applicant for corrections.

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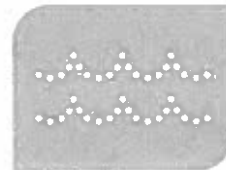
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Gulf States Renewable Energy Industries Association

Louisiana Department of Natural Resources Leadership,

The following recommendations touch upon the various topics of concern raised during the 2021 Regular Legislative Session and subsequent public comment hearings. Those areas include decommissioning bonds, offsets, land maintenance, and vegetative barriers. The recommendations of Gulf States Renewable Energy Industry Association are based upon industry members experience in other markets throughout the U.S. Our recommendations are intended to strike a balance that guarantees solar developers and landowners act as good stewards of Louisiana land, act as trusted and good intended neighbors of our residents, but also lead to rulemaking that does not kill an emerging and vital industry to our state economy. Please reach out to us with questions or interest in elaboration on any of the following topics.

Decommissioning Bonds:

Relevant states with best practice statutory language or existing decom/impact agreements:

- Texas:
 - Texas decommissioning and financial assurance instrument language is well designed. It lists several allowable forms of financial assurance and allows projects to pick whichever works best for them. "A solar power facility agreement must provide that the grantee shall obtain and deliver...evidence of financial assurance that...secure(s) the performance of the grantee's obligation to remove the grantee's solar power facilities located on the landowner's property...acceptable forms of financial assurance include a parent company guaranty with a minimum investment grade credit rating agency, a letter of credit, a bond, or another form of financial assurance reasonably acceptable..."
 - However, unlike Texas, the decommissioning plans and financial assurance typically is posted with the county or parish of jurisdiction, not the landowner. Although the landowner may be named.
- Illinois:

- Illinois has a financial insurance schedule over the life of a system outlined in this agreement:
 - On or before the first anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover ten (10) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
 - On or before the sixth anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover fifty (50) percent of the estimated costs of Deconstruction of the Facility as determined in the Deconstruction Plan.
 - On or before the eleventh anniversary of the Commercial Operation Date, the Facility Owner shall provide the County with Financial Assurance to cover one hundred (100) percent of the estimated costs of Deconstruction of the Facility as determined in the updated Deconstruction Plan provided during the tenth year of commercial operation. The Financial Assurance shall not release the surety from liability until the Financial Assurance is replaced. The salvage value of the Facility may only be used to reduce the estimated costs of Deconstruction if the County agrees that all interests in the salvage value are subordinate or have been subordinated to that of the County if Abandonment occurs.

Key Industry Recommended Considerations for Decommissioning Bonds:

- The amount of financial assurance for the decommissioning plan must be equal to the cost of decommissioning the project, minus the facility's salvage value.
- These costs should be determined by a third-party professional engineer, paid for by the developer of the project
- The cost calculation should be reassessed periodically to ensure it remains accurate over the lifetime of the project.
- Financial assurance may be in the form of a bond, parent company guarantee, letter of credit, , or an escrow account, along with any other forms deemed acceptable by the Parish of jurisdiction or the state of Louisiana.

Offsets:

- In general, any offset should not be overly restrictive on solar development beyond any other types of developments on ag land. If existing offsets exist between construction projects of comparable size and scope, then those same offset should apply.
- If DNR chooses to rigidly define such offsets, an industry standard average would be roughly: (These are maximum recommended offsets from experiences in other states, local governments and landowners may choose an appropriate offset under this ceiling.)
 - All offsets below should be to the nearest solar panel edge (array), not fence line, roads, communication lines, above or below ground collector, screening or other project equipment.

- 50 feet from property line of any nonparticipating property (leaseholder, good neighbor agreement, or otherwise)
- 150 feet from nearest outer wall of a dwelling of nonparticipating property
- Separate offsets could be permitted by rule in regards to inverters/substations.
- 50 feet from outside edge of the right of way (would be easier to implement than center of roadway)

Land Maintenance

- A recent study (link: <https://www.researchgate.net/publication/334164114>) suggests that even regular turf grass may be of benefit to erosion control, water retention, etc. Especially in areas where solar systems are constructed where there has been prior human-caused erosion i.e. agriculture sites.
- Solar native grassland planting may be cost prohibitive and regionally specific. If solar native grassland planting is considered, a variety of factors should also be considered, such as:
 - Cost of seed mix and seedling establishment.
 - Vegetation height restrictions.
 - Cost of seed and plant maintenance.
- [VA SB 1039](#) introduced legislation this year recommending the following: The project owner shall plant, establish, and maintain for the life of the commercial solar energy system perennial vegetated ground cover on the ground around and under the solar panels, and in the project site buffer areas. The use of pollinator seed mixes in the planting of ground covered is encouraged. A unit or permit authority may require a project owner to prepare a vegetation management plan that: (1) is compatible with each CSE system on the project site; (2) provides for the planting of noninvasive species and the use of native or naturalized species if the planting and use of noninvasive and native or naturalized species are: (A) appropriate to the region; (B) economically feasible; and (C) agreed to by the landowner...in order to reduce storm water runoff and erosion at the site and to provide habitat for wildlife and insects; and (3) provides for the site preparation and maintenance practices designed to control invasive species and noxious weeds.”

Vegatative Barriers

- To the extent that there are vegetative barriers required, we recommend that any guidelines regarding their construction be consistent with any guidance on native planting or otherwise.
- VA Pollinator program assigns a point value to percentages of native plants used for screening zones. While we don't recommend a “scorecard”, perhaps a way to offset native plant requirements could be through planting a percentage of that in a screening

zone. (Manual: [Appendix A, Section 1.1.1, Page 20](#)
[ENR 11-20-2015 113025.pdf](#))

- If a solar array (panels) is within 250 feet of a nonparticipating property dwelling, school, or church, the project owner shall install up to 300 linear feet of visual/vegetative screening.
- Vegetative screening should not be used as the starting point for offsets—they can be within a offset. Vegetative screening can be achieved by retaining existing plants or installing new plants.
- Best Practices by Industry in Other States Includes:
 - Staggered plants (versus a flat hedgerow),
 - Plant diversity: 3-5 different regionally appropriate evergreens,
 - Plant spacing roughly 10 feet apart,
 - Roughly 2-4 feet tall when planted (access to taller specimens in sufficient quantities is often not available), probably not taller than 20 feet at maturity (often options specified by landscaping engineers grow to 8 feet.

Drainage

- Louisiana's geography leads to relevant and necessary concerns regarding project drainage rules. GSREIA is not opposed to such rules but does request that any such rulemaking be no more burdensome than those opposed on other agricultural projects of the same scope and impact.