

# Appendix A: Public Chapter 1043, Acts of 2022



## State of Tennessee

### PUBLIC CHAPTER NO. 1043

#### SENATE BILL NO. 2797

By Walley, Lundberg, Bowling, Campbell, Crowe, Niceley, Reeves, Rose

Substituted for: House Bill No. 2761

By Gant, Vital, Reedy, Sherrell, Travis,

AN ACT to amend Tennessee Code Annotated, Title 4, Chapter 5; Title 6; Title 13; Title 65; Title 66; Title 67 and Title 68, relative to solar energy development.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF TENNESSEE:

SECTION 1. (a) The Tennessee advisory commission on intergovernmental relations (TACIR) is directed to perform a study of the overall effects of utility-scale solar energy development in this state. The study must include, but not be limited to, examinations of:

(1) Short-term and long-term projections on the amount of acreage needed to accommodate utility-scale solar development;

(2) Hazardous waste as defined in § 68-212-104, that may exist in photovoltaic modules, energy storage system batteries, or other equipment used in utility-scale solar energy development;

(3) Federal regulatory requirements regarding decommissioning and managing end-of-life photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar energy development;

(4) Statutory and regulatory requirements in other states regarding decommissioning and managing end-of-life photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar energy development;

(5) Financial assurances and responsibilities of owners and operators in the event of natural disasters, pollution from solar energy system failures, decommissioning of a solar energy system, and end-of-life management of photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar development;

(6) Which federal and state regulatory agencies are responsible for certification and oversight to determine the proper installation and operation of utility-scale solar energy systems;

(7) The needed state infrastructure to facilitate the collection, transport, and disposal of utility-scale solar energy systems;

(8) Implications of utility-scale solar energy systems on the local property tax base;

(9) Local zoning and regulatory templates to ensure consistency throughout the state regarding local siting of utility-scale solar energy development;

(10) The importance of private property rights and the ability of a landowner to use or transfer interests in property;

(11) The importance of a variety of energy sources in this state's economic and community development recruiting efforts;

(12) The efforts of the Tennessee valley authority and local power companies to offer utility-scale sustainable power options; and

(13) Required lease terms and conditions to protect future property use and rights of lessors in the event of default or termination of a lease.

(b) The study must also examine, for the purpose of determining any necessary consumer protections, the installation of solar energy generation and storage on the property of residential electric customers.

(c) It is the legislative intent that this study be conducted within TACIR's existing resources.

(d) On or before September 30, 2023, TACIR shall report its findings and recommendations, including any proposed legislation, to members of the energy, agriculture and natural resources committee of the senate and members of the agriculture and natural resources committee of the house of representatives.


SECTION 2. This act takes effect upon becoming a law, the public welfare requiring it.

DRAFT

SENATE BILL NO. 2797

PASSED: April 27, 2022

  
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RANDY McNALLY  
SPEAKER OF THE SENATE

  
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CAMERON SEXTON, SPEAKER  
HOUSE OF REPRESENTATIVES

APPROVED this 11<sup>th</sup> day of May 2022

  
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BILL LEE, GOVERNOR

## **Appendix B: Responses to the 14 Points that Public Chapter 1043, Acts of 2022, Directed TACIR to Address**

### ***I. Short-term and long-term projections on the amount of acreage needed to accommodate utility-scale solar development***

- The Tennessee Valley Authority (TVA) plans to add 10,000 MW of solar generation by 2035 in its territory—not just in Tennessee—including 5,000 MW of carbon-free energy before 2029.<sup>1</sup>
  - To provide 10,000 MW of solar power, TVA is planning for 10 acres per MW, which would require 100,000 acres of land—0.3% of TVA’s entire service area.<sup>2</sup>
  - TVA does not have an estimate of how many MW of solar generation will be in Tennessee—it depends on developers’ analysis of where to site facilities and the connection to the grid.<sup>3</sup>
  - Even if all of TVA’s solar facilities were in Tennessee, that would be approximately 0.4% of all land and 1% of all farmland in the state.<sup>4</sup>
  - TVA’s 2019 Integrated Resource Plan (IRP) says that compared to other energy resources, solar facilities “have a relatively low level of impact to the land.”<sup>5</sup>
- Large, utility-scale ground-mounted solar photovoltaic (PV) systems—the main type in Tennessee—require between 5 and 10 acres per megawatt (MW) of generating capacity depending on the type of technology.<sup>6</sup>

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<sup>1</sup> Tennessee Valley Authority 2022.

<sup>2</sup> Interview with Chris Hansen, vice president, Origination and Renewables, Tennessee Valley Authority, November 14, 2022.

<sup>3</sup> Email received from Laura Duncan, senior project manager, Valley Pathways Study, Environment & Energy Policy, Tennessee Valley Authority, May 24, 2023.

<sup>4</sup> Based on a total 10,700,000 acres of farm operations in the state and 640 acres per square mile. US Department of Agriculture 2022; and US Census Bureau 2022.

<sup>5</sup> Tennessee Valley Authority 2019.

<sup>6</sup> Solar Energy Industries Association “Land Use & Solar Development;” Ong et al. 2013; and interview with Chris Hansen, vice president, Origination and Renewables, Tennessee Valley Authority, November 14, 2022.



- The Tennessee Solar Energy Industry (TenneSEIA) and University of Tennessee, Knoxville (UTK) are conducting a study in 2023 focused on land use for solar development in Tennessee.<sup>7</sup>
- A 2022 North Carolina study found that the state's more than 7,460 MW of installed solar PV "occupies 0.12% of the total land area of the state and 0.28% of agricultural land."<sup>8</sup>
- It is possible for land leased for utility-scale solar facilities to be returned to agricultural use when the facility is no longer in use, but there are potential challenges such as removal of topsoil and soil compaction during construction.<sup>9</sup>
- If enough landowners convert their land to solar, farmers leasing land could have a hard time competing with the price per acre for solar leasing, and local and regional farming economies could be affected.<sup>10</sup>
- Land management practices, such as simultaneous use of farmland for solar power generation and agriculture—sometimes called dual use or agrivoltaics—are being studied in other states and have potential to reduce environmental effects and even improve soil over the long term.<sup>11</sup>
- Because landowners can lease their land to solar companies for more than they could for farming, the additional revenue and resulting financial security could help farmers stay in operation in the long term.<sup>12</sup>
- While it is true that some of Tennessee's agricultural land has been developed for utility-scale solar and more will be needed—over the most recent 20-year period for which data is available, over a million acres of farm land has shifted to non-agricultural use.<sup>13</sup>

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<sup>7</sup> Interview with Forbes Walker, professor and environmental soil specialist, University of Tennessee Extension, and Christopher Clark, head, Karen Lewis DeLong, associate professor, and David Hughes, professor, Department of Agricultural & Resource Economics, University of Tennessee Institute of Agriculture, February 16, 2023.

<sup>8</sup> Brookshire, Carey, and Parker 2022.

<sup>9</sup> Hannum et al. 2022; and Solar Energy Technologies Office "Farmer's Guide to Going Solar."

<sup>10</sup> Hannum et al. 2022; and Hunter et al. 2022.

<sup>11</sup> National Renewable Energy Laboratory "Agrivoltaics Primer"; Macknick, Beatty, and Hill 2013; and Macknick et al. 2022.

<sup>12</sup> Hannum et al. 2022; and Solar Energy Technologies Office "Farmer's Guide to Going Solar."

<sup>13</sup> US Department of Agriculture 2017.

## **2. Hazardous waste as defined in Tennessee Code Annotated, Section 68-212-104, that may exist in photovoltaic modules, energy storage system batteries, or other equipment used in utility-scale solar energy development**

- Tennessee Code Annotated, Section 68-212-104, defines hazardous waste as “waste, or combination of wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may: (A) Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible illness or incapacitating reversible illness; or (B) Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.”
- The Resource Conservation and Recovery Act (RCRA) of 1976 gives the US Environmental Protection Agency (EPA) authority to regulate the generation, transportation, treatment, storage, and disposal of hazardous waste, and the Tennessee Department of Environment and Conservation (TDEC) administers the RCRA in Tennessee.<sup>14</sup>
- According to the US EPA “some solar panels are hazardous waste, and some solar panels are not hazardous waste, depending on the leachability of RCRA toxic materials present in the solar panel. . . . It is the responsibility of the generator of the solar panel waste to determine if solar panels are hazardous by performing the appropriate tests or by using generator knowledge.”<sup>15</sup>
  - “Solid waste, including solar panels, is hazardous waste if it exhibits any of the four characteristics of hazardous waste (toxicity, ignitability, reactivity, corrosivity). The most common reason that solar panels would be determined to be hazardous waste is if they meet the characteristic of toxicity.
  - Heavy metals like lead and cadmium may leach at such concentrations that waste panels would fail the toxicity characteristic leaching procedure (TCLP), a test required under RCRA to determine if materials are hazardous.”<sup>16</sup>

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<sup>14</sup> US Environmental Protection Agency 2022d; and Tennessee Department of Environment and Conservation “Hazardous Waste Program.”

<sup>15</sup> US Environmental Protection Agency 2022b. See also US Environmental Protection Agency 2022a.

<sup>16</sup> US Environmental Protection Agency 2022b.

- Materials in solar panels that could potentially be hazardous if they are present in high enough quantities include, but are not limited to, lead, cadmium, arsenic, hexavalent chromium, copper, and selenium.<sup>17</sup>
- “Depending on the local regulations, some components—typically some batteries or power transformers—may be considered hazardous or toxic waste.” But “from a regulatory point of view, PV panel waste still largely falls under the general waste classification,” and it is usually treated as non-hazardous solid waste.<sup>18</sup>
  - The main risk from lithium-ion batteries, which are used for energy storage, is fire risk if they are damaged or crushed.<sup>19</sup>
- Solar PV modules are designed and tested to endure harsh outdoor conditions for 25 years or more and are unlikely to leak materials, even if they are cracked or broken. A small percentage—an estimated average of 0.04%—break each year.<sup>20</sup>
- The TDEC Division of Solid Waste Management (DSWM) regulates the disposal of solid waste, including solar panels that are removed from sites in Tennessee.<sup>21</sup>
- There is competition for lithium-ion batteries—most are going into other industries such as electric vehicles (EV). Compared to EVs, energy storage system batteries are a small share of the market for lithium-ion batteries.<sup>22</sup>
- Most of the component materials of solar panels can be recycled, although such recycling is a new and evolving industry. The Solar Energy Industry Association (SEIA) has been developing a PV recycling network across the US and has one recycling partner in Middle Tennessee.<sup>23</sup>

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<sup>17</sup> Association of State and Territorial Solid Waste Management Officials 2022.

<sup>18</sup> Curtis et al. 2021a; and Weckend, Wade, and Heath 2016.

<sup>19</sup> US Environmental Protection Agency 2023b.

<sup>20</sup> Solar Energy Technologies Office “Farmer's Guide to Going Solar”; Summers and Radde 2003; Sinha et al. 2019; and interview with Craig Almanza, deputy director, and Lisa Hughey, director, Central Office Operations, Division of Solid Waste Management, Tennessee Department of Environment and Conservation, February 6, 2023.

<sup>21</sup> Interview with Craig Almanza, deputy director, and Lisa Hughey, director, Central Office Operations, Division of Solid Waste Management, Tennessee Department of Environment and Conservation, February 6, 2023.

<sup>22</sup> Curtis et al. 2021a.

<sup>23</sup> US Environmental Protection Agency 2023a; and Solar Energy Industries Association 2020.

### **3. Federal regulatory requirements regarding decommissioning and managing end-of-life photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar energy development**

- The only federal regulations specific to solar PV decommissioning and end-of-life management are those of the Bureau of Land Management (BLM) for development on its land.<sup>24</sup> BLM doesn't manage land in Tennessee.<sup>25</sup>
- “Decommissioning a PV system typically includes removing the PV array; removing all balance-of system (BOS) equipment (i.e., other parts of the PV system, excluding modules, which can include wiring, inverters, and the mounting system); and restoring the land or infrastructure (e.g., roofs and irrigation canals) to its original condition or for a new use.”<sup>26</sup>
- Solar decommissioning policies in the US vary by federal, state, and local jurisdiction, according to a 2021 policy survey by the National Renewable Energy Laboratory (NREL).<sup>27</sup>
- PV modules, batteries, and other equipment are not uniquely regulated by the US EPA—they are handled like any other waste stream, which depends on the materials and varies by jurisdiction.<sup>28</sup>

### **4. Statutory and regulatory requirements in other states regarding decommissioning and managing end-of-life photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar energy development**

- In addition to Tennessee, 22 states have statewide decommissioning policies, and several are considering legislation.<sup>29</sup> See table 4 for a summary of decommissioning plan and financial assurance requirements in other states and appendix L for more detail.

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<sup>24</sup> Weckend, Wade, and Heath 2016; and Curtis et al. 2021b.

<sup>25</sup> US Department of the Interior “Jupiter Inlet Lighthouse Outstanding Natural Area.”

<sup>26</sup> Curtis et al. 2021b.

<sup>27</sup> Ibid.

<sup>28</sup> Association of State and Territorial Solid Waste Management Officials 2022.

<sup>29</sup> TACIR staff review of other states' statutes.

- As of May 2023, three states—Arizona, New York, and Pennsylvania—have legislation pending that would enact solar panel decommissioning specific policies.<sup>30</sup>
- The policies share similarities with Tennessee’s policy, such as requiring a decommissioning plan and usually proof of financial assurance prior to construction and a minimum MW capacity, although MW thresholds vary. But unlike Tennessee’s law, eleven states<sup>31</sup> specify how the decommissioning cost is calculated, and all but Tennessee and Texas provide state or local government oversight authority (or both),<sup>32</sup> including allowing penalties for noncompliance.
- In Tennessee and Texas, disputes between landowners and solar companies regarding the decommissioning laws are resolved in the courts through civil actions.
- Tennessee’s decommissioning law is intended to protect landowners and communities from potential hazards and costs resulting from abandoned solar facilities when land is leased.<sup>33</sup> Silicon Ranch is the only solar energy company doing business in Tennessee that typically purchases land.<sup>34</sup>
- NREL recommends several best practices for managing end-of-life.<sup>35</sup> See appendix H.
- SEIA’s model decommissioning legislation is included as appendix K.
- North Carolina completed a decommissioning study in 2021 and a plan with recommendations for financial assurance in 2022.<sup>36</sup>

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<sup>30</sup> Arizona (H.B. 2618); New York (S.B. 1793); and Pennsylvania (S.B. 211).

<sup>31</sup> California, Illinois, Indiana, Kentucky, Louisiana, Montana, Ohio, Texas, Vermont, Virginia, and West Virginia.

<sup>32</sup> Washington has an optional statewide solar decommissioning program that allows solar project owners to comply with a state certification process in lieu of obtaining local city and county government approvals.

<sup>33</sup> Public Chapter 866, Acts of 2022.

<sup>34</sup> Interview with Luke Wilkinson, senior vice president of project development, Matt Beasley, chief commercial officer, and Matt Kisber, co-founder, chairman of the board, Silicon Ranch, August 3, 2022.

<sup>35</sup> Curtis et al. 2021c.

<sup>36</sup> North Carolina Department of Environmental Quality and Environmental Management Commission 2021; and North Carolina Department of Environmental Quality 2022.

- At least nine states—Georgia, Iowa, Massachusetts, New York, North Carolina, Oregon, Rhode Island, Texas, and Wisconsin—have model ordinances, templates, or other resources that local governments may—but are not required—to use in developing their local solar decommissioning policies.<sup>37</sup>
- Five states have acted to address PV waste and recycling.<sup>38</sup>
  - New Jersey and North Carolina have created a statewide task force.
  - California and Hawaii amended waste regulations to include PV modules as one of the waste streams that are subject to increased oversight.
  - Washington adopted a statutorily required extended producer responsibility program for PV modules.

**5. Financial assurances and responsibilities of owners and operators in the event of natural disasters, pollution from solar energy system failures, decommissioning of a solar energy system, and end-of-life management of photovoltaic modules, energy storage system batteries, and other equipment used in utility-scale solar development**

- Lenders and landlords typically require companies to have insurance that would cover them in the case of natural disasters like tornados, and there is no evidence showing that solar systems cause pollution while in operation or during decommissioning.<sup>39</sup>
- Tennessee’s decommissioning law, Public Chapter 866, Acts of 2022, (appendix E) requires solar power facility agreements to include a decommissioning plan with financial assurance to ensure that the person leasing the land removes components and restores the land to as close to the condition it was in before construction as reasonably possible.<sup>40</sup>
- Financial assurance must cover the decommissioning cost, which is defined as “the estimated cost of performing the removal and restoration obligations set forth in subsection (c), less the estimated salvage value of the components of the solar power facility as of the date of removal.”

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<sup>37</sup> Curtis et al. 2021b.

<sup>38</sup> Association of State and Territorial Solid Waste Management Officials 2022.

<sup>39</sup> Summers and Radde 2003; interview with Gil Hough, executive director, TenneSEIA, August 29, 2022, and email received April 5, 2023; and interview with Craig Almanza, deputy director, and Lisa Hughey, director, Central Office Operations, Division of Solid Waste Management, Tennessee Department of Environment and Conservation, February 6, 2023.

<sup>40</sup> Tennessee Code Annotated, Section 66-9-207.

- Tennessee’s law specifies a timeline for the provision of financial assurance:
  - (A) No less than five percent (5%) of the decommissioning cost on the date the solar power facility commences commercial operation;
  - (B) No less than fifty percent (50%) of the decommissioning cost on the tenth anniversary of the date the solar power facility commences commercial operation; and
  - (C) No less than the decommissioning cost on the fifteenth anniversary of the date the solar power facility commences commercial operation.
- Acceptable forms of financial assurance include: surety bond; collateral bond; irrevocable letter of credit; parent guaranty; cash; cashier's check; certificate of deposit; bank joint custody receipt; an approved negotiated instrument not described in the law; or a combination of the forms of security described in the law.
- Appendix L compares Tennessee’s decommissioning law to other states’ laws.

## **6. Which federal and state regulatory agencies are responsible for certification and oversight to determine the proper installation and operation of utility-scale solar energy systems**

- For large-scale projects with TVA agreements—most of the utility-scale facilities in Tennessee—a National Environmental Policy Act (NEPA) review is required, which is an extensive process. Under NEPA, all executive federal agencies are required to prepare environmental assessments (EAs) and environmental impact statements (EISs).<sup>41</sup> TVA reviews the businesses’ performance records and examines the projects before they become operational.<sup>42</sup>
- TDEC Division of Water Resources (DWR) carries out the US EPA Clean Water Act and regulates water quality in Tennessee by implementing stormwater regulations and enforcing permits for all development projects.<sup>43</sup>
  - There is no permit specifically for solar development, but the two permits that would apply are the construction general permit (CGP) and the

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<sup>41</sup> US Environmental Protection Agency 2022.

<sup>42</sup> Interview with Chris Hansen, vice president, Origination and Renewables, Tennessee Valley Authority, November 14, 2022, and email received March 22, 2023.

<sup>43</sup> US Environmental Protection Agency 2022c; interviews with April Grippo, deputy director, Ann Morbitt, integrated water resources consultant, and Karina Bynum, integrated water resources engineer, Division of Water Resources, Tennessee Department of Environment and Conservation, February 13, 2023, and March 10, 2023.

Aquatic Resource Alteration Permit (ARAP) if someone wants to alter a stream, river, lake, or wetland. All project developers are required to submit a site-specific aquatic resource inventory to receive a construction general permit, and when they have a permit, they must submit a stormwater pollution prevention plan saying how they will address water quality.

- Developers are required to get the permits, not the landowners or TVA.
- The most common stormwater issues during construction—erosion and sediment runoff—occur across industries.
- DWR staff does not perceive increased water quality or quantity issues resulting from large-scale solar facilities. They say solar projects generally minimize disturbance and environmental impact and have a better environmental outcome compared to other types of projects that have heavy construction.
- TDEC Division of Solid Waste Management (DSWM) would investigate if someone filed a complaint about leakage or burning materials on the site.<sup>44</sup>
- The state fire marshal’s office—part of the Tennessee Department of Commerce and Insurance—issues electrical permits. There isn’t a specific solar PV electrical permit, but residential and large-scale solar systems both require “qualified personnel” to install.<sup>45</sup>
- Solar installations can’t operate until they pass the electrical inspection by the fire marshal’s office.<sup>46</sup>
- Counties and municipalities can also have their own regulations that they enforce.<sup>47</sup>

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<sup>44</sup> Interview with Craig Almanza, deputy director, and Lisa Hughey, director, Central Office Operations, Division of Solid Waste Management, Tennessee Department of Environment and Conservation, February 6, 2023.

<sup>45</sup> Interview with Michael Morelli, director, electrical, residential building, marina inspections, State Fire Marshal’s Office, Tennessee Department of Commerce and Insurance, February 14, 2023.

<sup>46</sup> Ibid.

<sup>47</sup> Interviews with Michael Morelli, director, electrical, residential building, marina inspections, State Fire Marshal’s Office, Tennessee Department of Commerce and Insurance, February 14, 2023; and April Grippo, deputy director, Ann Morbitt, integrated water resources consultant, and Karina Bynum, integrated water resources engineer, Division of Water Resources, Tennessee Department of Environment and Conservation, February 13, 2023, and March 10, 2023.



- There are recommended best practices based on research for stormwater management at large-scale solar facilities.<sup>48</sup>

## **7. The needed state infrastructure to facilitate the collection, transport, and disposal of utility-scale solar energy systems**

- The primary infrastructure need for utility-scale solar facilities is access to the electric grid, specifically high transmission lines, which are expensive and difficult to construct because they often require the use of eminent domain.<sup>49</sup>
  - Large-scale solar facilities typically don't need additional infrastructure such as water, sewer, or new roads.
  - Based on interviews with stakeholders, the collection and transportation of solar panels—whether at beginning or end of life—is relatively easily done with existing roads and large trucks.
- The additional infrastructure is largely landfill space and recycling networks. Researchers are working to identify the most economical method of recovering materials from end-of-life solar panels.<sup>50</sup>

## **8. Implications of utility-scale solar energy systems on the local property tax base**

- Solar facility properties are assessed differently from other types of properties. Figure 1 shows the steps in the assessment process, and appendix F shows a hypothetical assessment done by the state and the estimated taxes.
- Tennessee Code Annotated, Section 67-5-601, directs that “the sound, intrinsic and immediate value of solar source property should not initially exceed twelve and one-half percent (12.5%) of total installed costs,” meaning that only 12.5% of installed costs of equipment are taxed. The statute requires the property owner to provide either a Green Energy Production Facility Certification from TDEC or a public utility filing to the Comptroller.

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<sup>48</sup> Hanson et al. 2021.

<sup>49</sup> Interviews with Gil Hough, executive director, TenneSEIA, August 29, 2022; Mike Bolin, vice president of utility advancement, and Chastity Hobby, environmental programs lead, Knoxville Utility Board, September 14, 2022; David Callis, executive vice President and general manager, and Mike Knotts, vice president of government affairs, Tennessee Electric Cooperative Association, September 9, 2022; and Jeremy Elrod, director of government relations, Brian Solsbee, executive director, and Savannah Gilman, government relations assistant, Tennessee Municipal Electric Power Association, August 30, 2022.

<sup>50</sup> Solar Energy Technologies Office “Solar Manufacturing Map”; Weckend, Wade, and Heath 2016; and National Renewable Energy Laboratories 2021.

- Solar facility properties are assessed as a public utility at 55%, which is higher than agriculture and residential real property (25%) and commercial and industrial real property (40%) assessments. As a result, solar facilities properties could generate more tax revenue for local governments.<sup>51</sup>
- A few studies have found that large solar facilities can have a small effect—on average—on the value of neighboring properties, but how much depends on various factors, especially distance from the facility.<sup>52</sup>

## **9. Local zoning and regulatory templates to ensure consistency throughout the state regarding local siting of utility-scale solar energy development.**

- Cities and counties have authority to implement zoning in Tennessee.<sup>53</sup>
- Statewide consistency is not likely, given that, as of 2020, of all 95 counties, 40 counties have adopted county zoning, 70 have subdivision zoning, and 74 have active planning commissions; out of a total 345 cities, 271 have municipal zoning and 267 have subdivision zoning.<sup>54</sup>
- Like other types of development, both large-scale and residential solar installations are subject to local zoning requirements and restrictions except on utility-owned land.<sup>55</sup>
- Some Tennessee counties have resolutions to regulate solar development within their jurisdictions including Bedford, Fayette, Franklin, Greene, Hardeman, Haywood, Jefferson, Sullivan and Washington Counties. The city of Brownsville has a solar ordinance, and the city of Memphis and Shelby County have a unified code that includes a solar ordinance. See appendix D.
- Other states have model solar zoning ordinances including Georgia, Kentucky, North Carolina, Illinois, Indiana, Iowa, Minnesota, and Wisconsin, and Tennessee also has a model ordinance. See appendices C and H.

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<sup>51</sup> Tennessee Constitution, Article II, Section 28; and interviews with Greg Moody, director, Office of State Assessed Properties, Office of the Comptroller, February 28, 2023; and Roger Woolsey, county attorney, Amy Tweed, county planner, and Chuck Jeffers, county property assessor, Greene County, January 23, 2023.

<sup>52</sup> Vasundhara and Lang 2020; Dröes and Koster 2021; and Elmallah et al. 2023.

<sup>53</sup> Tennessee Code Annotated, Sections 13-7-101 et seq. and 13-7-201 et seq.

<sup>54</sup> Skehan 2020.

<sup>55</sup> Tennessee Code Annotated, Sections 13-7-101 et seq. and 13-7-201 et seq.; and email received from Chris Hansen, vice president, Origination and Renewables, Tennessee Valley Authority, November 28, 2022.

- There are also best practices and several guides for local governments. See appendix H.
- To balance solar expansion with farmland preservation, states with high levels of solar generation have implemented solar siting policies, including: tax incentives and penalties to encourage farmland preservation, zoning and permitting, and programs for development on brownfields or marginal land.<sup>56</sup>
- In Tennessee, programs to incentivize land preservation include the private-nonprofit Land Trust for Tennessee, greenbelt program, Heritage Conservation Fund, and the new brownfield grant directed by Public Chapter 86, Acts of 2023.<sup>57</sup>

### ***10. The importance of private property rights and the ability of a landowner to use or transfer interests in property.***

- Zoning attempts to balance private property rights with communities' interests through regulations for land use.<sup>58</sup>
- Stakeholders agree that private property rights are important, and they also mostly agree that reasonable limits are good. For example, the Tennessee Farm Bureau believes in property rights and the free market, but they are also concerned about losing farm land to solar development.<sup>59</sup>
- Solar power facility agreements are structured in such a way that the landowner can sell their property even with the solar facility already in operation, and the agreement rights would transfer to the new landowner.<sup>60</sup>
- Moratoriums on zoning and development are legal if they have a limited timeframe and address a public interest without creating an unreasonable

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<sup>56</sup> Grout and Ifft 2018.

<sup>57</sup> Tennessee Department of Agriculture "Land Protection Options"; Tennessee Comptroller of the Treasury 2022; and Tennessee Code Annotated, Sections 11-7-101 et seq. and 68-212-220.

<sup>58</sup> Local Planning Assistance Office 2004; and Tennessee Advisory Commission on Intergovernmental Relations 2013.

<sup>59</sup> Tennessee Farm Bureau Federation "About Tennessee Farm Bureau"; and interviews with Kevin Hensley, director of public policy, Laura Leigh-Harris, former assistant director, and Shelby Vannoy, assistant director, Public Policy Division, Tennessee Farm Bureau Federation, July 25, 2022; and Charles Dacus, farmer and landowner in Fayette County, January 11, 2023.

<sup>60</sup> Email received from Gil Hough, executive director, TenneSEIA, April 5, 2023.

burden, but generally are not viewed favorably because they limit private property rights.<sup>61</sup>

## ***II. The importance of a variety of energy sources in this state's economic and community development recruiting efforts***

- TVA's asset mix is a balance of four characteristics—affordability, reliability, sustainability, and resiliency—and adds resources while keeping these in balance.<sup>62</sup>
- TVA considers solar to be closely tied to economic development. It is market driven—large companies are requiring 100% renewable energy sources to meet their carbon-free or carbon-neutral goals.<sup>63</sup>
- Tennessee Department of Economic and Community Development (ECD) staff agree that a diverse energy portfolio is important for economic and community development.<sup>64</sup>
  - ECD staff said that solar and renewable energy is at the forefront of conversations with companies and that TVA is at every initial meeting they have with companies.
  - ECD doesn't take a position on solar development but is concerned about land use, especially using industrial-zoned land for solar.
- “The state's efforts to promote economic development must be balanced against the need for environmental stewardship to protect and improve public health and preserve the state's natural assets, which are all required for a prosperous Tennessee.”<sup>65</sup>

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<sup>61</sup> Ashburn 2002; and email received from Melisa Kelton, county government consultant, County Technical Assistance Service, University of Tennessee Institute for Public Service, February 3, 2023.

<sup>62</sup> Tennessee Valley Authority 2019; Tennessee Valley Authority 2022; and interview with Chris Hansen, vice president, Origination and Renewables, Tennessee Valley Authority, November 14, 2022.

<sup>63</sup> Ibid.

<sup>64</sup> Interview with Chassen Haynes, senior director of business development, Tennessee Department of Economic and Community Development, January 24, 2023.

<sup>65</sup> Murray et al. 2014.

## **12. The efforts of the Tennessee Valley Authority and local power companies to offer utility-scale sustainable power options**

### **Tennessee Valley Authority (TVA)**

- TVA’s Renewable Energy Solutions Guide compares TVA’s offerings for renewables to help companies figure out which program makes sense for them and their customers.<sup>66</sup>
  - Dispersed Power Production: renewable electricity-generating facilities up to 80 MW sell all or excess generation to TVA at TVA’s monthly avoided cost.
  - Green Invest: TVA competitively procures “new-to-the-world” renewables within TVA territory to match customers’ renewable energy or carbon-neutral goals.
  - Green Switch: customers purchase \$2 blocks of 200 kWh of solar power.
- TVA also implemented the Power Supply Flexibility option.<sup>67</sup>
  - This option allows local power companies (LPC) with long-term agreements (typically 20 years) with TVA to produce or purchase 5% of their power—including renewable power—from entities other than TVA.
  - As of November 14, 2022, 80 distributors had signed flexibility agreements as part of their long-term partnership contracts with TVA, allowing them to obtain power from other sources.<sup>68</sup>
  - In 2022, the TVA board voted to modify the option by allowing LPCs to build solar facilities outside their territory and partner with other LPCs to generate up to 5%.<sup>69</sup>
- In 2022, the TVA board approved a pilot project to develop a utility-scale solar facility on one of its coal ash landfills at the Shawnee Fossil Plant in Kentucky.<sup>70</sup>

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<sup>66</sup> Tennessee Valley Authority “Valley Renewable Energy Solutions Guide.”

<sup>67</sup> Tennessee Valley Authority 2020; and Flessner 2022.

<sup>68</sup> Tennessee Advisory Commission on Intergovernmental Relations 2023.

<sup>69</sup> Flessner 2022.

<sup>70</sup> Keefe 2022.

## Local Power Companies (LPC)

- LPCs understand that solar energy growth is happening and are at different stages of adjusting to the transition. Land access and grid connection are the biggest challenges.<sup>71</sup>
- According to one LPC representative, the best way for LPCs to develop solar is to coordinate with their big customers.<sup>72</sup>
- Most LPCs in Tennessee have signed TVA’s power supply flexibility option.<sup>73</sup>
- Some LPCs are developing smaller projects—one to two MW—like community solar projects on marginal lands or brownfield sites.<sup>74</sup>
- Examples of LPC efforts include:
  - Knoxville Utility Board (KUB) has a 20% renewable goal because their customers want more renewable power and has contracted with TVA to purchase megawatts from west Tennessee to reach its goal. KUB staff say TVA’s 5% flexibility option helps.<sup>75</sup>
  - Nashville Electric Service (NES) is developing a utility-scale solar project outside its service territory through TVA’s flexibility option.<sup>76</sup>
  - Middle Tennessee Electric (MTE) offers its Green Switch 100, Cooperative Solar, and ProSolar programs and works with TVA through its Green

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<sup>71</sup> Interviews with David Callis, executive vice president and general manager, and Mike Knotts, vice president of government affairs, Tennessee Electric Cooperative Association, September 9, 2022; and Brian Solsbee, executive director, Jeremy Elrod, director of government relations, and Savannah Gilman, government relations assistant, Tennessee Municipal Electric Power Association, August 30, 2022.

<sup>72</sup> Interview with Mike Bolin, vice president of utility advancement and Chastity Hobby, environmental programs lead, Knoxville Utility Board, September 14, 2022.

<sup>73</sup> Interview with David Callis, executive vice president and general manager, and Mike Knotts, vice president of government affairs, Tennessee Electric Cooperative Association, September 9, 2022.

<sup>74</sup> Interviews with Mike Bolin, vice president of utility advancement and Chastity Hobby, environmental programs lead, Knoxville Utility Board, September 14, 2022; Kendra Abkowitz, chief sustainability and resilience officer, Office of Mayor John Cooper and Laurel Creech, former assistant director, General Services Division of Sustainability, Metropolitan Government of Nashville & Davidson County, February 14, 2023; and Jeff Dykes, chief executive officer, BrightRidge, June 2, 2023.

<sup>75</sup> Eggers 2022; and interview with Mike Bolin, vice president of utility advancement and Chastity Hobby, environmental programs lead, Knoxville Utility Board, September 14, 2022.

<sup>76</sup> Eggers 2022; and Eggers 2023.

Invest and Green Flex programs. MTE's goal is to maximize TVA's flexibility option using solar.<sup>77</sup>

- Paris Board of Public Utilities (BPU) partnered with Silicon Ranch to use TVA's flexibility option for the Paris Solar Farm–Puryear.<sup>78</sup>

### **13. Required lease terms and conditions to protect future property use and rights of lessors in the event of default or termination of a lease**

- Financial assurance required by Tennessee's decommissioning law protects landowners in the event of a developer defaulting.<sup>79</sup>
- Contracting and financing are critical—stakeholders recommend that landowners consult with legal counsel with expertise in utility-scale solar leases.<sup>80</sup>
- Appendix M describes federal and state tax incentives available for both utility-scale and residential solar development.
- There are resources available to help with leases and conditions to protect property and the parties involved. See appendix H.

### **14. For the purpose of determining any necessary consumer protections, the installation of solar energy generation and storage on the property of residential electric customers**

- Consumers who contract with a company to install a solar system on their residence are protected by Tennessee's consumer protection laws: the Consumer Protection Act and Home Solicitations Sales Act.<sup>81</sup>
- SEIA has a business code for solar companies "to promote transparency, good faith, and understanding in the U.S. solar energy industry."<sup>82</sup>

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<sup>77</sup> Middle Tennessee Electric "Renewables"; and interview with Brad Gibson, chief operating officer and Tim Suddoth, distributed energy resources coordinator, Middle Tennessee Electric, April 12, 2023.

<sup>78</sup> Silicon Ranch 2022.

<sup>79</sup> Tennessee Code Annotated, Section 66-9-207.

<sup>80</sup> Breger 2022; Hannum et al 2021; Nuckols 2020; Solar Energy Industries Association 2016; and interview with Will Giese, southeast regional director, Solar Energy Industries Association, December 7, 2022.

<sup>81</sup> Tennessee Code Annotated, Sections 47-18-101 et seq. and 47-18-701 et seq.

<sup>82</sup> Solar Energy Industries Association 2015.

- Stakeholders generally agree that fraud is mostly happening in the residential solar market, not the utility-scale market.<sup>83</sup>
- While most companies are acting in good faith, the Tennessee Attorney General’s Office has received complaints about a few and has taken legal action against the two residential solar companies that were doing business in Tennessee with the most consumer complaints.<sup>84</sup>
- The civil fine for violation of the Tennessee Consumer Protection Act is “up to \$1,000,” which is on the low end of civil fines in the 50 states.<sup>85</sup>
- Forty-four states have fines that are at least \$2,000 and up to \$50,000 per violation.<sup>86</sup>
- There are many resources available for homeowners who are considering installing solar on their property. Some other states have created resources for their residents. See appendix H.

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<sup>83</sup> Interview with Sam Keen, assistant attorney general, Kelley Groover, senior assistant attorney general, Alicia Daniels-Hill, assistant attorney general, and Claire Marsalis, director, Division of Consumer Affairs, Office of the Tennessee Attorney General, February 24, 2023.

<sup>84</sup> Flessner 2023; Tennessee Attorney General and Reporter 2022; and interview with Sam Keen, assistant attorney general, Kelley Groover, senior assistant attorney general, Alicia Daniels-Hill, assistant attorney general, and Claire Marsalis, director, Division of Consumer Affairs, Tennessee Office of the Tennessee Attorney General, February 24, 2023.

<sup>85</sup> Tennessee Code Annotated, Section 47-18-108(b)(3); and TACIR staff review of other states’ fines.

<sup>86</sup> TACIR staff review of other states’ statutes.



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## Appendix C: Tennessee Model Solar Zoning Ordinance

### RESOLUTION NO. [\_\_\_\_\_]

#### A RESOLUTION TO AMEND THE TEXT OF THE [\_\_\_\_\_] ZONING ORDINANCE ESTABLISHING REGULATIONS FOR SOLAR ENERGY SYSTEMS AS A PERMITTED USE IN THE [\_\_\_\_\_] DISTRICT AND ESTABLISHING REGULATIONS GOVERNING THE DEVELOPMENT OF SOLAR ENERGY SYSTEMS

WHEREAS, pursuant to Tennessee Code Annotated § 13-7-101 and § 13-7-102, a zoning ordinance and map have been adopted by [\_\_\_\_\_]; and

WHEREAS, the Planning Commission of the [\_\_\_\_\_] has recommended that the following described amendments be made in the text of the adopted zoning ordinance; and

WHEREAS, pursuant to Tennessee Code Annotated § 13-3-403(c), a public notice was published at least fifteen (15) days prior to the meeting.

NOW, THEREFORE, BE IT RESOLVED by the [\_\_\_\_\_] of the [\_\_\_\_\_] as follows:

1. **Definitions.** [\_\_\_\_\_] shall be amended to include the following definitions.

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, residential, or utility scale application. For purposes of this section, 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 includes all components of the electricity generating facility (inverters, transformers, switchgear, substations, communications infrastructure, and other ancillary or related equipment), but does not include transmission lines or generation tie lines connecting the SES to a utility-owned substation.

Integrated Solar Energy System (“ISES”) 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 ISES may be incorporated into, among other things, a building façade, skylight, shingles, canopy, groundmount system, light, or parking meter.

Accessory Solar Energy System (“ASES”) means an SES that is (i) structurally mounted to the roof of a house, building or other structure, (ii) located on property for which the primary use is not related to the production of energy, or (iii) located on the same property as the house, building or other structure in which the energy from the SES is consumed or on property adjacent thereto.

Ground Mounted Solar Energy System (“GSES”) means an SES that is structurally mounted to the ground and is larger than twenty (20) acres within the fenced area required by [\_\_\_\_\_] of this ordinance. If an SES qualifies as either an ISES or an ASES, it shall not be considered a GSES.

2. **SES Standards**. The following shall be inserted as [\_\_\_\_\_]:

[\_\_\_\_\_]. Development Standards for Ground Mounted Solar Energy Systems (“GSES”)

A GSES must conform to the following development standards:

- A. Fence. A GSES shall be enclosed by perimeter fencing of at least six (6) feet in height sufficient to prevent unauthorized access.
- B. Setbacks. A GSES shall be subject only to the following setbacks: (a) solar panel structures shall be set back at least fifty (50) feet from all property lines unless a lesser setback is approved by the Board of Zoning Appeals, and (b) solar panel structures shall be set back at least one hundred (100) feet from all residential dwelling units occupied at the time of site plan review. The setback requirements of this section do not apply to internal parcels within the same GSES.
- C. Landscape Buffering. A GSES shall have, to the extent reasonably practicable, a visual buffer of natural vegetation, fencing, and/or plantings, that upon maturation, would provide a visual screen to reduce the view of the GSES from residential dwelling units on adjacent lots that are occupied at the time of site plan review. Notwithstanding anything to the contrary this section, existing natural tree growth and natural landforms along the perimeter of a GSES that create a reasonably sufficient visual buffer shall satisfy the requirements of this section.
- D. Signage. A GSES shall have signs (a) stating the risks that may result from contact with a GSES, (b) identifying the owner or operator of the GSES, and (c) providing a 24-hour emergency contact phone number. All signs displayed with respect to a GSES shall comply with the requirements of the applicable zoning district for displaying advertisements.
- E. Decommissioning. Unless otherwise approved by the Board of Zoning Appeals, decommissioning of a GSES shall begin no later than twelve (12) months after a GSES has permanently ceased to generate electricity, at which time the owner or operator of the GSES shall restore and reclaim the site within twenty-four (24) months after a GSES has permanently ceased to generate electricity. Notwithstanding anything to the contrary, a GSES will not be considered to have permanently ceased to generate electricity unless it has failed to diligently pursue the production of, or restoration of the GSES’s ability to produce, electricity for at least twelve (12) consecutive months. The owner or operator of the GSES shall provide the Planning Commission with a copy of its decommissioning plan and evidence of its decommissioning security to the extent required pursuant to 2022 Tenn. Pub. Acts 866. No decommissioning security shall be required other than that provided for pursuant to 2022 Tenn. Pub. Acts 866.

- F. FAA. A GSES shall conform with any applicable Federal Aviation Administration requirements and, if required, secure any necessary approvals prior to commencement of construction of the GSES.
- G. Non-GSES Development. Notwithstanding anything provided herein, an ISES and ASES shall be permitted as of right so long as the primary use is permitted as of right in the applicable zoning district. Any other SES that does not qualify as a GSES will be permitted as of right in the [\_\_\_\_\_] zoning district(s), provided that the SES otherwise complies with the general standards for other permitted uses the applicable district.

3. [\_\_\_\_\_] **District**. “Solar energy systems” shall be inserted as Section [\_\_\_\_\_].

BE IT FURTHER RESOLVED that this Resolution shall become effective immediately upon adoption, the public health, safety and welfare requiring it.

Approved and adopted by the [\_\_\_\_\_] of the [\_\_\_\_\_] on

\_\_\_\_\_

\_\_\_\_\_  
[\_\_\_\_\_] , County/City Mayor

Attest:

\_\_\_\_\_  
[\_\_\_\_\_] , County/City Clerk

## Appendix D: Tennessee Local Government Solar Zoning Resolutions

### 4.066. RENEWABLE ENERGY DEVELOPMENT DISTRICT (REDD)

The purpose of the Renewable Energy Development District is to allow Bedford County government to establish special land use regulations related to the development of solar and other various renewable energy power generating technologies which generally consume enormous quantities of available lands and present a visual impact which industrializes the natural viewshed to near or adjoining parcels. Of special concern are areas of Bedford County considered to be predominantly rural and agricultural in nature.

Additionally, various other areas of Bedford County are considered unique in that a major investment in public infrastructure has taken place or have been planned using large sums of public funds. The protection of these public investments and assets on behalf of the taxpayer where government has made investments of public funds for future jobs growth and industry diversity for the citizens of Bedford County are paramount. Such areas may have been pre-planned by local government to eventually develop in a way, either civic, residential, commercial, or industrial, that will create housing, sustainable incomes, and job opportunities for its citizens. Planning for industry requires the necessary public infrastructure needed to encourage or incubate these types of developments.

Lastly, Bedford County boasts an undulating topography which lends itself to important cultural panoramic viewsheds intended to be protected as cultural assets. It is the intent of this section to provide suitable land resources for the development of renewable energy projects without any significant adverse economic or cultural impacts to these important investments and assets.

Any parcel lying outside of the **Bedford County Renewable Energy Overlay Zone (REZ)** intended for use as an NPU must first be re-zoned to the **Renewable Energy Development District (REDD)** zone classification. Parcels zoned A-1 which lie inside the adopted boundaries of the REZ, intended for use as an NPU shall qualify as a conditional use in the A-1 zone, needing only approval as a special exception from the **Board of Zoning Appeals (BZA)**.

g. Commercial, Non-Public Utility Power Generating Facility (NPU).

## 1. Commercial Solar Energy Development

### g. Use and Structure Provisions

#### 1) Uses Permitted

Solar NPU's (see Article II, Section 2.141) lying inside the boundaries of the **Bedford County Renewable Energy Zone** as defined by the Bedford County Renewable Energy Overlay Zone Map (see *Appendix C.*).

#### 2) Uses Permitted as Accessory Uses

- a) The construction of accessory structures used specifically for the operational or office/business needs of an NPU.
- b) The construction of electrical sub-stations and their physical connectivity to a public or private electrical grid.

#### 3) Prohibited Uses

Any use or structure not specifically permitted by right or special exception as presented in the Land Use Activity Table in *Appendix D* is prohibited. The use of a mobile home or similar structure as an office, storage space, retail space, or in any other manner is expressly prohibited.

#### 4) Development Standards:

See Article II, Section 2.141 (see also, *Appendix C. and Appendix D.*)

### h. Bulk, Yard, Density, and Intensity Regulations

The regulations appearing below in *Appendix C.* shall apply to both A-1 and *REDD* zone lots.

### Appendix C. Renewable Energy Development District – Bulk Regulations

Zoning District		Minimum Lot Area	Minimum Lot Width	Minimum Building Setback	Maximum Height	Maximum Lot Coverage
<b>A-1 (Conditional Use Only)</b>	NPU Inside the Bedford County Renewable Energy Overlay Zone	NONE	NONE	Front – 75 feet Side – 75 feet Rear – 75 feet	35 ft.	95%
	NPU Outside the Bedford County Renewable Energy Overlay Zone	NONE	NONE	Front – 400 feet Side - 375 feet Rear - 390 feet	35 ft.	66%

i. Special Allowances, Variances and Prohibitions

The regulations appearing below in *Appendix D.* apply to *REDD* zone lots and buildings or other structures located on any *REDD* zone lot or portion of a *REDD* zone lot including all new developments, enlargements, extensions, or conversions. Existing buildings, structures or use activities that do not comply with one or more of the applicable bulk regulations are classified as nonconforming and are subject to the provisions of **Article VI, Section 6.020.**

### Appendix D. Uses: REDD Permitted, Special Exceptions, Exemptions and Non-Permitted.

Zoning Overlay District	Permitted Uses	Special Exceptions	Zoning Exemptions	Prohibited Uses
<b>REDD</b>	NPU Equipment, fixtures, and structures associated with the collection, storage, and transmission of solar energy intended to produce an electrical product for sale and delivery to a public or private electrical grid.	NONE	NONE	Residential dwellings, Commercial Operations other than NPU, Industrial, mobile home, RV's, or other similar structures for any purpose.

#### **4.066.0 BEDFORD COUNTY RENEWABLE ENERGY OVERLAY ZONE (REZ)**

The **Bedford County Renewable Energy Overlay Zone** was established with the intent of creating large, designated areas of Bedford County which are deemed to be most appropriate areas for the development of large renewable energy projects such as commercial solar energy farms – NPU’s. NPU’s can be multi-hundred-acre sites which generally contain 10,000 to 25,000 or more solar panels and can, by themselves, have a considerable transformative effect on our rural village character and the agricultural landscapes and viewsheds important to the cultural fabric and history of Bedford County.

In addition, Bedford County has made significant investments of public funds toward the identification and planning of its high-growth areas deemed suitable for residential, commercial, and industrial development. These investments having been made in order to cultivate and attract business and industry for the creation and sustainability of stable employment opportunities, services, retail and adequate quality of life for its citizens and, in-kind, an educated workforce for attracting and maintaining existing industry. In those expenditures and efforts, it has invested large sums of its public funds for the improvement of the public infrastructure (water, sewer, gas, electric) required for those instant and long-term needs.

As renewable energy development projects such as the identified NPU do not require nor use the same public infrastructure (high-capacity water, sewer, or natural gas), it is critical that those public fund investments and the rare multi-hundred-acre improved lands, be properly planned and utilized in such a way as for local government to not be wasteful of public monies and of our most valuable resources.

The undulating and high-rolling natural topographies of Bedford County is also deemed inappropriate for these types of developments. Bedford County enjoys a mix of both flat and hill lands. The **Bedford County Renewable Energy Overlay Zone** is a boundary of lands identified to have a

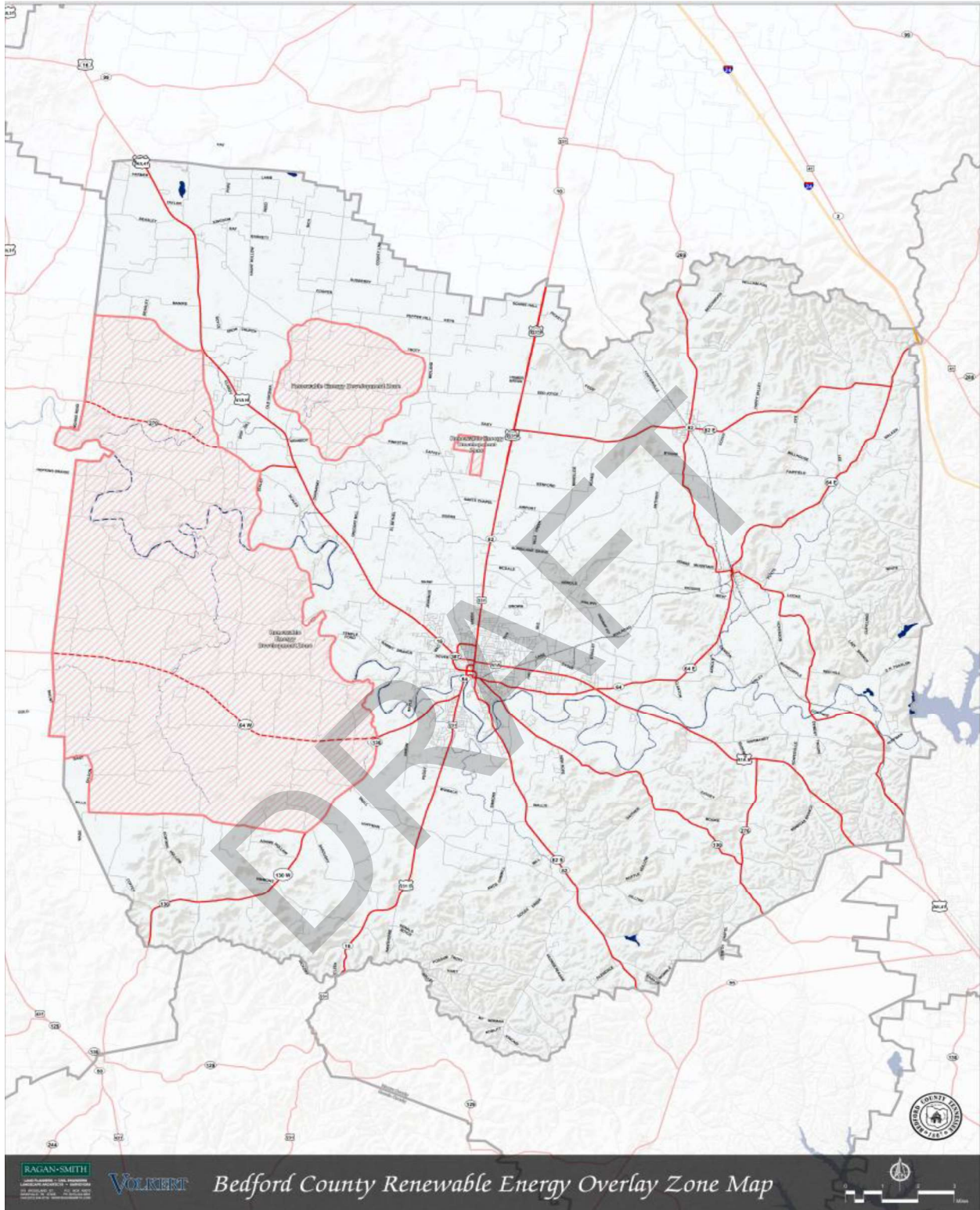


typical topography of less than 6% slopes and areas not identified by the Planning Department as being in high growth areas or areas where significant public infrastructure investments have been made or planned.

Applicants wanting to rezone lands for use as an NPU are eligible to apply for the **Renewable Energy Development District (REDD)** zoning classification in areas outside of the mapped **Bedford County Renewable Energy Overlay Zone**. However, any NPU approved for a zone lot outside of the designated **Bedford County Renewable Energy Overlay Zone** shall be subject to increased standards (i.e., Bulk, Density, Setbacks) as referenced in *Appendix C*, in order to mitigate adverse cultural viewsheds, protect agricultural areas from taking on an industrial appearance, and to protect area property values. NPU's desiring to locate inside the boundaries of the Bedford County Renewable Energy Overlay Zone shall qualify as a conditional use in the A-1 zone without the need to rezone the lot to **REDD** and are eligible for setback and bulk relief as referenced in *Appendix C*. due to its impact being deemed less adverse to nearby property.

#### **4.066.1 BEDFORD COUNTY RENEWABLE ENERGY ZONE MAP**

The Bedford County Renewable Energy Overlay Zone Map (see map below) has identified areas of Bedford County deemed most suitable for NPU development. Applicants desiring to develop NPU's in Bedford County are encouraged to find suitable lands in the designated (red shaded) areas defined on the said MAP (see Article IV, Section 4.066 (A)(1)(b.) appendix C. and Section 4.066 (A)(1)(c.) appendix D.). NPU developments inside the boundaries of this zone shall qualify as a conditional use under the A-1 zone.



- Areas shaded in red with diagonal lines are deemed appropriate areas for Renewable Energy Developments and NPU's and qualify as conditional uses under the A-1 Zone.
- Areas not shaded in red with diagonal lines shall be subject to more intensive setback regulations (see Appendix C) and must rezoned to **Renewable Energy Development District (REDD)**.

## Bedford County Tennessee Zoning Resolution

**BROWNSVILLE TN ZONING ORDINANCE – ALLOWED BY RIGHT IN GI (GENERAL INDUSTRIAL) AND RI (RESTRICTED INDUSTRIAL) ZONES ONLY**

SOLAR FARMS, subject to site plan review by the Board of Zoning Appeals and the following conditions:

- i. Solar farms shall be enclosed by perimeter fencing to restrict unauthorized access at a height of eight (8) feet.
- ii. Adequate screening shall be provided. This can be achieved by either the required perimeter fencing being constructed as a board-to-board privacy fence or by vegetative screening being placed beyond the perimeter fence to a density and height that adequately buffers the solar farm from any nearby uses.
- iii. Solar farms shall adhere to the setback, height, and coverage requirements of the district.
- iv. Solar farm structures must be setback a minimum of 500 feet from residential structures.
- iv. Solar farms must be located on lots of no less than 50 acres in size.
- v. Solar farms must not create increased noise levels that are discernible to nearby residential uses.
- vi. Solar farms must not produce glare that would constitute a nuisance to occupants of neighboring properties or persons traveling neighboring roads.
- vii. All electrical interconnection and distribution lines within the project boundary shall be underground.
- ix. Solar farms which become inactive for a period exceeding one (1) year shall be removed at the owners or operators expense and the site shall be returned to its natural state. This includes the obligation to dismantle and remove from the site all electrical generating equipment, cables, panels, foundations, buildings and ancillary equipment. To the extent possible, the operator shall restore and reclaim the site to its pre-project topography and topsoil quality. Any agreement between the operator and landowner for removal to a lesser extent than set forth in this paragraph shall be required prior approval by the board. The restoration activities must be complete within 18 months from the date the solar farm becomes inactive.
- x. The applicant shall submit to the board a decommissioning plan describing the manner in which the applicant anticipates decommissioning the project. The plan shall include a description of the manner in which the applicant will ensure that it has the financial capability to carry out the restoration requirements. The board may from time to time request the operator to submit a report describing how it is fulfilling this obligation. The board shall decide if it is prudent to include provisions that ensure financial resources will be available for decommissioning. This may include bonding or other methods of guaranteeing performance, such as establishing an escrow account into which the developer / operator will deposit funds on a regular basis over the life of the project which would allow the City of Brownsville to have access to the escrow account for the explicit purpose of decommissioning in the event of default. Financial provisions shall not be so difficult as to make the solar farm unfeasible.

tower's surface.

- “Guy Wire Supported Tower” is a tower requiring guy wires and/or ground anchors to support it.
- “Lattice Tower” is a self-supporting tower constructed of a lattice of structural members not connected to guy wires and ground anchors.
- “Monopole Tower” is a self-supporting tower consisting of a single pole not connected to guy wires and ground anchors.
- “Stealth Flagpole Tower” is a monopole tower with the proportions of a flagpole and an antenna array(s) hidden inside the tower.
- “Stealth Tree Tower” is a monopole tower with the appearance of a large tree and antenna array(s) hidden by the artificial tree limbs.

### Section 13 Solar Photovoltaic Facilities.

- 13.1 Procedure: A Solar Photovoltaic Facility shall be a use permitted as a special exception as provided hereinbelow. To assure the fullest possible possession of all facts relevant to the location and design of a prospective solar photovoltaic facility, as well as to prevent a premature or even needless expenditure of public resources, a five-step sequential procedure including two (2) System Impact Studies shall govern review and construction of any solar photovoltaic facility of more than fifty (50) kilowatts, as follows:
- 13.1.1 Distributor Study. The applicant at his expense shall obtain a first System Impact Study from the local electric distributor whose system the proposed solar photovoltaic facility will access, elaborating the distributor's requirements for the electrical power generated by the facility to be conveyed into its electrical grid and concluding that the facility will not impose new costs on the distributor's current customers. The Board of Appeals may require documentation that issues surfaced in the local electric distributor's System Impact Study have been resolved as part of the board's Location Review specified in Section 13.1.2.
- 13.1.2 Facility Location Review. The proposed site as delineated with reasonable precision shall undergo evaluation of its location by the Board of Appeals to determine whether the “Facility Location Standards” of Sections 13.2 and 13.4 will be satisfied. This review shall be a public hearing and shall incorporate the same hearing procedures as govern other special exception applications before the board. Should the Board of Appeals determine the location criteria are not satisfied it shall disapprove the proposed location. Should the Board of Appeals determine the location criteria are satisfied it shall approve the proposed location pending design approval and indicate any special provisions it requires be incorporated into the site design or concerns the design must address, provided such specification at that time shall not bar the Board of Appeals from later specifying additional design requirements or operational stipulations that were reasonably unforeseen as needed on initial review of the facility. Once location approval is obtained from the Board of Appeals all future evaluation by the Board of Appeals shall be limited to how the facility will be designed and not whether it may occur, provided that following location approval there is no alteration of topography or removal of land cover at the site. Location approval shall lapse after a period of five (5) years unless the Board of Appeals shall vote to extend it, with the duration of the extension to be as specified in the adopted motion, and should the Board of Appeals not vote to extend location approval the site may be resubmitted for Location Review after a lapse of one (1) year under the same procedures as governed the original application. For the duration there remains in effect location approval for a solar photovoltaic facility, the building commissioner shall notify any person applying for a building permit to erect or place a dwelling within five hundred (500) feet of the site that the facility is pending. Notwithstanding any policy of the Board of Appeals, once location approval is granted no reconsideration of such approval may occur except on the building commissioner's written recommendation citing just cause, or because there has occurred alteration of topography or removal of land cover at the site.
- 13.1.3 TVA Study. The Applicant at his expense shall obtain a second System Impact Study from

the Tennessee Valley Authority (TVA), elaborating TVA's requirements for the electrical power generated by the facility to be conveyed into its electrical grid. The Board of Appeals may require documentation that issues surfaced in the TVA System Impact Study have been resolved as part of its Design Review.

- 13.1.4 Facility Design Review. The proposed facility shall undergo evaluation of its design by the Board of Appeals both to determine whether the "Facility Design Standards" of Section 13.3 and 13.4 will be satisfied and whether the site as designed will be adequately buffered from view by current or reasonably foreseeable neighboring homesteads. This evaluation will be a public hearing and shall incorporate the same hearing procedures as govern other special exception applications before the board, except the public comment and discussion may address only matters of design. The Board of Appeals may revise and supplement design requirements at any time prior to final design approval. Site design approval shall lapse after a period of three (3) years unless the Board of Appeals shall vote to extend it, which duration of extension shall be as specified in the adopted motion. Should the Board of Appeals not vote to extend design approval the site may be resubmitted for Design Review after a lapse of one (1) year under the same procedures as governed the original application. For the duration there remains in effect design approval for a solar photovoltaic facility, the Building commissioner shall notify any person applying for a building permit to erect or place a dwelling within five hundred (500) feet of the site that the facility is pending. Notwithstanding any policy of the Board of Appeals, once design approval is granted no reconsideration of such approval may occur except on the building commissioner's written recommendation citing just cause, or because there has occurred alteration of topography or removal of land cover at the site.
- 13.1.5 Construction. No building permit at the site for any component of the solar photovoltaic facility shall issue prior to final design approval, and neither shall any certificate of occupancy be issued nor any generation of electricity commence until all specifications of the site plan have been satisfied and any required financial assurances have been submitted in the form and manner specified by the building commissioner.
- 13.2 Facility Location Standards. The following criteria shall be applicable at the stage of Location Review:
- 13.2.1 The facility shall be located only within an area designated Rural by the Fayette County Growth Plan, provided this provision may be waived within a city's Urban Growth Boundary by the consent of the relevant city as expressed by a Resolution of its legislative body adopted after a public hearing advertised in a newspaper of local circulation at least fifteen (15) day prior to the hearing.
- 13.2.2 The facility shall not be located in trespass of any utility easements whether as to infrastructure existing or prospective, mains or service lines.
- 13.2.3 No part of any site proposed for a solar photovoltaic facility may be further than one-and-a-half (1.50) miles from the centerline of an operational Tennessee Valley Authority right-of-way designed to convey at least 161,000 volts of electricity, unless the site is adjacent to a solar photovoltaic facility already in operation or under construction.
- 13.3 Facility Design Standards. The following criteria shall be applicable at the stage of Design Review:
- 13.3.1 The facility shall not install or cause the installation of any fill material in a floodplain.
- 13.3.2 All electrical interconnection and distribution lines within the facility shall be underground.
- 13.3.3 No structural component of the facility shall be more than 25 feet above natural grade.

- 13.3.4 Except in exceptional circumstance related to a physical feature of the approved solar site, no setback shall be required from a common lot line between two or more lots where such common lot line is entirely within the approved exterior boundary of the site, provided that all above-ground structural components of the facility shall maintain a minimum setback of thirty (30) feet from the approved exterior boundary of the site, which minimum the board of appeals may extend where warranted by conditions of drainage or visibility, especially in proximity to a public right-of-way.
- 13.3.5 Not less than twenty (20) percent and not more than forty (40) percent of the approved site location shall be designated for open space by the board of appeals, which open space shall not be occupied by any above-ground facility, and no minimum building setback specified in Article VII for the district in which the facility is located shall be considered a part of this open space.
- 13.3.6 The Board of Appeals may specify areas of topography or land cover that the facility must preserve.
- 13.3.7 A facility operations and management plan shall be part of the site plan – including, but not limited to, provisions for fencing, lighting, grass-cutting, preservation of landscape screening, drainage, and access, along with such design data as the Board of Appeals may require – along with a statement satisfactory to the county attorney and executed by a duly empowered company officer acknowledging the company's agreement that any continuing or repeated failure to fully comply with the approved operations and maintenance arrangements will be sufficient legal grounds for Fayette County to compel complete cessation and removal of the use.
- 13.3.8 Geometric and contextual data for the site design shall include state plane coordinates and otherwise shall be as specified by the building commissioner, with the Board of Appeals having prerogative to add but not subtract from the building commissioner's specifications.
- 13.3.9 No design of the facility or its site shall be approved by the Board of Appeals without a written declaration from both the local electric distributor whose system the proposed solar photovoltaic facility will access and the Tennessee Valley Authority that the proposed design does not incorporate any unsatisfactory element, provided that non-response by either authority beyond sixty (60) days after documented receipt of the design from the building commissioner shall constitute satisfaction of this requirement.
- 13.3.10 If the facility has been approved for location within an Urban Growth Boundary, the building commissioner shall afford the city's Board of Mayor and Alderman an opportunity of not less than thirty (30) days duration to review and comment on the design.
- 13.3.11 Once approved, the site plan, including all documents as well as diagrams, shall be recorded in the Office of the Fayette County Register at the expense of the party seeking the special exception.
- 13.4 The following criteria shall be applicable at the stages of both Facility Location Review and Facility Design Review:
- 13.4.1 The facility shall be located on a lot or contiguous leased site at least 150 acres in size and shall have not less than two (2) means of assured ingress/egress at least 200 feet apart at all points, which shall be constructed or improved as specified by the Board of Appeals.
- 13.4.2 Topography and land cover shall lend itself to concealment of the facility, and no alteration or removal of such elements shall occur without approval of the Board of Appeals.
- 13.4.3 No solar panels shall be installed within five hundred (500) feet of any existing livable dwelling



unit, whether or not occupied, not owned by the owner of the lot on which the facility is located, provided this shall not govern in any way the location of a dwelling unit.

- 13.4.4 No solar panels shall be located within five hundred (500) feet of the centerline of any State Road or Major County Road so designated by the map recorded at Plat Book 8, Page 46, in the Office of the Fayette County Register, provided the Board of Appeals may reduce this requirement to not less than one hundred (100) feet if natural or constructed topography and/or existing land cover will be adequate to fully screen the panels to the extent of five hundred (500) feet from centerline of the subject road.
- 13.5 The Board of Appeals shall require the approved facility design to include a written statement duly executed by the empowered party(s), running with the land, reciting the language of Sections 13.3.1, 13.3.2, 13.3.3, 13.3.4, and 13.4.2 and acknowledging that these provisions are continuing obligations governing the facility and that nonconformity with any of them shall be grounds for the Board of Appeals to revoke the special exception following documentation of the nonconformity at a public hearing and order complete cessation of the use and removal of the facility.
- 13.6 The Board of Appeals shall obtain satisfactory financial assurance that the facility will be fully disassembled and removed from the site within one (1) year after cessation of its function to generate electricity, which assurance may include a lien on the property.
- 13.7 In the course of facility location review and/or facility design review the Board of Appeals may impose such additional conditions and/or restrictions upon a proposed solar photovoltaic facility as it may deem necessary in furtherance of the intents and purposes of this Resolution, which conditions and/or restrictions shall be continuing obligations enforceable by revocation of the special exception and resort to such financial provisions as may have been required to the purpose of facility removal.
- 13.8 Because of the extensive time required to evaluate a proposed solar photovoltaic facility, particularly a large one, with its consequent potential to delay the projects of others, the process of facility location review and facility design review shall not be bound to a codified deadline but rather shall each be as specified in writing by the building commissioner within thirty (30) days after an application is submitted with full payment of the applicable fees along with a written request for such specification, and if the applicant is dissatisfied with the building commissioner's specification he may request the Board of Appeals to direct a faster review, which request shall be in writing and placed on the agenda of the Board of Appeals at its first regular meeting scheduled for two (2) weeks or more after the applicant makes the request. In its review the Board of Appeals may consider any element it deems relevant and may modify the building commissioner's specification as it believes proper, and to that end shall have the powers of the building commissioner.

**Section 14 Flag Lots Of Record.** No permissible building area of a flag lot of record created after April 24, 2007, shall be located behind the rear lot of record line of another flag lot of record having frontage on the same road, provided further that a flag lot of record created after August 25, 2015, shall have no permissible building area behind any rear lot of record line of another flag lot of record having frontage on the same road.

**Section 15 Location of Buildings.** No building location shall be established on any lot served or to be served by an individual sewage disposal system except in conformity with the requirements of the Tennessee Department of Environment and Conservation Division of Groundwater Protection or this Resolution, whichever is more restrictive.

**Section 16 Provisions Governing On-Site Subsurface Sewage Disposal Systems.**

- 16.1 Wherever there is not public sanitary sewer, a dwelling shall have on the same lot on which it

RESOLUTION NO: \_\_\_\_\_

**A RESOLUTION REGARDING COMMERCIAL RENEWABLE ENERGY PRODUCTION FACILITIES**

**WHEREAS** the County Commissioners of Franklin County are concerned about the ramifications of commercial renewable energy production facilities attempting to locate in Franklin County; and,

**WHEREAS** commercial renewable energy facilities such as, but not limited to, solar farms, wind farms, etc. consume large amounts of arable or potentially industrial or residential land; and,

**WHEREAS** the long-term environmental effects of such facilities are still undetermined; and,

**WHEREAS** the employment and economic benefits of such facilities are negligible; and,

**WHEREAS** Franklin County zoning currently allows for renewable energy facilities only when they are wholly owned and operated by utility companies; and,

**WHEREAS** Franklin County zoning currently allows for renewable energy production for private use on private land; and,

**WHEREAS** Franklin County is already home to a power production facility in the form of Tims Ford hydroelectric dam; and,

**WHEREAS** the Board of County Commissioners of Franklin County is of the opinion that commercial renewable energy facilities would not benefit the citizens of Franklin County; and,

**NOW, THEREFOR, BE IT RESOLVED**, by the Board of County Commissioners of Franklin County, Tennessee expresses to the Board of Planning and Zoning that such changes would not be welcomed; and,

**BE IT FURTHER RESOLVED** that this Resolution establishes an indefinite moratorium which shall prohibit the review, approval or creation of any renewable energy production facilities not currently allowed by Franklin County zoning; and,

**BE IT FURTHER RESOLVED** that this Resolution shall take effect upon adoption, the general welfare requiring it.

ADOPTED this \_\_\_\_\_ day of \_\_\_\_\_, 2022.

APPROVED:

ATTEST:

\_\_\_\_\_  
David Alexander, Mayor and Chair

\_\_\_\_\_  
Phillip Custer, County Clerk

**RESOLUTION SPONSORED BY:** King & Earle



2. The owner/operator shall reside on premise.
3. The center is licensed by the State of Tennessee.
4. The center is located on an arterial or collector road as shown on the Greene County Zoning Map.
5. The center is located on a lot of one acre or more.
6. Signage, fencing, and buffering requirements shall be determined by the Greene County Regional Planning Commission as part of the site plan review.

R. Small Woodworking Shops, provided:

1. One principal structure used for manufacturing not to exceed 1,600-sq. ft. in size.
2. Accessory structures shall be permitted provided they are not used for manufacturing.
3. Parking shall be gravel.
4. Hours of operation shall be daylight hours.
5. Design shall meet or exceed the minimum State requirements.
6. Maximum number of employees shall not exceed three (3).

S. Solar panel farms, provided:

1. Buffer Zones shall be:
  - (a) A minimum of fifty feet in width as measured from the exterior of the fence surrounding a solar farm;
  - (b) Maintained as green space for the entire width of the buffer zone, except for necessary intrusions for vehicular or power access, fencing, or drainage structures required elsewhere in these regulations;
  - (c) Used to preserve, where possible and practical, existing trees located in the buffer zone, provided that doing so will not block reasonable access for the solar farm.

2. Solar Farm Buffer Strips. Solar farm buffer strips shall:

- (a) Be located outside required fencing.
- (b) Be planted with evergreen shrubs and/or trees that are at a minimum of six feet in height at the time of planting and are staggered ten (10) feet on center.
- (c) The applicant may request credit or a waiver of buffer planting requirements if existing vegetation exists that meets the buffer planting standard.
- (d) Be maintained even if the solar farm is no longer operational and/or falls into disuse, unless and until the solar farm is dismantled and removed from the parcel(s) upon which it was constructed.
- (e) Required where the solar farm fencing would be visible off-site.
- (f) Be required where lease lines overlay exterior property lines, provided that separate tax parcels under the same ownership are considered one property for the purposes of this sub section.
- (g) Not be required within the interior of a solar farm development where areas leased from different property owners abut one another.
- (h) Be shown on plans submitted to and approved by the Enforcing Officer, who shall approve the design, width, height, opacity, growing period to maturity, time schedule for installation, and responsibility for perpetual maintenance.

3. Setbacks. Setback requirements to the lease/property line for any building or solar array shall be a minimum of fifty feet, except that the setback from any Residential Dwelling existing at the time of approval of the solar panel farm shall be three hundred (300) feet from the corner of the residential dwelling to the closest solar array. Residential Dwelling shall mean a permanent, not temporary, improvement used for residential purposes.

4. Fencing. All solar farms shall be enclosed with a fence measuring a minimum of six (6) feet in height that is topped with at

least three strands of barbed wire that shall be maintained in good condition to the satisfaction of the Enforcing Officer.

5. Land Development. Unless a variance is granted by the board of zoning appeals, the following requirements must be met.

(a) Pre-development drainage patterns shall be maintained so that post development surface water run-off does not exceed pre-development surface water run-off for a 25 year storm event.

(b) Soil shall be retained on-site through the appropriate use of silt fencing, straw bales, or other effective manner.

(c) The area of the solar farm located to the interior of the buffer zone shall be maintained in a grassed condition, with the exception of access driveways, building pads, utility facilities and necessary equipment supports.

(d) Grassed areas within the solar array shall be maintained in accordance with established and recommended procedures for maintaining hay crop and pasture weed management as recommended by the University of Tennessee Extension Service.

6. Glare. Glare studies shall be as required by state and/or federal regulations.

7. Additional Requirements. The following information shall be submitted to the Enforcing Officer prior to construction of the site. Proof that:

(a) The project has been approved by the utility, all applicable interconnection procedures necessary to deliver electricity to the local utility have been completed, as well as an executed interconnection agreement.

(b) The lease for the project contains wording to the effect that, at the end of the lease period or if the solar farm is no longer operational for a period of twelve consecutive months and the lessee or the landowner does not, within such twelve month period commence a good faith effort to make such solar farm operational, the solar farm shall be deconstructed within twelve months thereafter, and the land returned to the owner in substantially the same condition as prior to development.

(c) The property owner is ultimately responsible for the removal of the solar farm array. (Entirety of Section 601.1S added 7/20/15).

T. Tiny homes, as defined in 256 B, provided:

1. Units must meet the minimum size requirements of the International Building Code that is in place at the time of construction.
2. Those units built on-site must meet the International Building Code in effect at the time of construction.
3. Out-of-county on frame tiny homes must be inspected by a Tennessee state licensed structural engineer throughout the building process. The engineer must provide all inspection reports to the Greene County Building Commissioner. A full set of plans must accompany each home. Plans must be stamped by a Tennessee state licensed structural engineer. Plans must also show all anchoring information.
4. Site built homes, or manufactured tiny homes which have their wheels removed, must be situated on a permanent foundation with permanent connections to water, sewer/septic, and electric utilities.
5. Homes constructed in a manufacturing facility that retain their wheels shall provide underpinning, foundations and tie-downs per structural engineers requirements. (Added 7/17/17).

U. Campgrounds, provided:

1. They are five (5) acres or larger in size.
2. Site plans are submitted and approved by the Greene County Regional Planning Commission.
3. Buffers are provided as follows:
  - (a) A buffer area of at least fifty (50) feet in width shall be provided around the periphery of the campground.
  - (b) The outer twenty-five (25) of buffer area shall contain a landscape strip planted with evergreen trees, measuring a minimum of six (6) feet in height at the time of

**RESOLUTION # \_\_\_\_\_**  
**(Alternative / Option- 2)**

A RESOLUTION TO AMEND CHAPTERS 2, "DEFINITIONS", 5, "PROVISIONS GOVERNING FAR (FORESTRY, AGRICULTURE, RESIDENTIAL) DISTRICTS, 12, "PROVISIONS GOVERNING I-1 (LIGHT INDUSTRIAL) DISTRICTS, 13, "PROVISIONS GOVERNING I-2 (RESTRICTED INDUSTRIAL), AND 14, "PROVISIONS GOVERNING I-3 (RURAL INDUSTRIAL) DISTRICTS, OF THE TEXT OF THE HARDEMAN COUNTY ZONING RESOLUTION TO INCLUDE DEFINITION FOR SOLAR FARMS AND TO ALLOW FOR SUCH AS USES PERMITTED ON APPEAL IN FAR DISTRICTS AND USES PERMITTED IN I-1 (LIGHT INDUSTRIAL), I-2 (RESTRICTED INDUSTRIAL), AND I-3 (RURAL INDUSTRIAL

WHEREAS, pursuant to TENNESSEE CODE ANNOTATED, Sections 13-7-101 and 13-7-102, a Zoning Resolution and Map have been adopted by the Hardeman County Commission; and,

WHEREAS, the Hardeman County Commission deems it necessary, for the purpose of promoting the health, safety, prosperity, morals and general welfare of the County to amend said Resolution; and,

WHEREAS, in accordance with Tennessee Code Annotated, Section 13-7-105, the Hardeman County Planning Commission has reviewed and recommended that the following described amendments be made in the text of the adopted Zoning Resolution; and,

WHEREAS, in accordance with Tennessee Code Annotated, Section 13-7-105, the Bolivar Municipal-Regional Planning Commission has reviewed and recommended the following described amendments to be made in the text of the adopted Zoning Resolution; and,

WHEREAS, pursuant to TENNESSEE CODE ANNOTATED, Section 13-7-104, the Hardeman County Commission has given due public notice of a hearing on said amendments and has held a public hearing;

NOW, THEREFORE, BE IT RESOLVED by the Hardeman County Commission:

Section 1. That Chapter 2, DEFINITIONS, be amended by adding the following term:

"Solar Farm" – includes a use of land where a series of one or more solar collectors are placed in an area on a parcel of land for the purpose of generating photovoltaic power and said series of one or more solar collectors placed in an area on a parcel of land collectively has a nameplate generation capacity of at least 15 kilowatts (kw) direct current (DC) or more when operating at maximum efficiency. Solar Farm is also referred to as solar power plant or solar photovoltaic farm. "Solar collector" means 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 electric energy. However, notwithstanding anything to the contrary contained herein, the term "Solar Farm" shall not be construed to include, so as to prohibit, or have the effect of prohibiting, the installation of a solar collector that gather solar radiation as a substitute for traditional energy for water heating, active space heating and cooling, passive heating, or generating electricity for a residential property.

Further, notwithstanding anything to the contrary contained herein, the term "Solar Farm" shall not be construed in such a way as to prohibit the installation or mounting of a series of one or more solar collectors upon roofs of residential and/ or commercial structures regardless of whether the said series of one or more solar collectors collectively has a total nameplate generation of at least 15 kilowatts (kw) and direct current (DC) or more when operation at maximum efficiency.



Section 2. That Chapter 5, Provisions Governing (FAR) Forestry-Agriculture-Residential Districts, be amended by amending Section 5.02, Uses Permitted on Appeal, to include the following:

K. Solar Farms – provided the following standards are met and presented on a site plan approved by the Planning Commission:

- 1) Safety fencing. All Solar Farms shall be fenced around the exterior of the Solar Farm with an opaque or semi opaque fence of earth tone colors which shall be at least six (6) feet in height and which shall additionally have at least three strands of barbed wire run above such six feet. All fencing shall be constructed so as to substantially lessen the likelihood of entry into a Solar Farm by unauthorized individuals.
- 2) Gates and Locks. All gates to the fences of all Solar Farms shall be at least six (6) feet in height and which shall additionally have at least three strands of barbed wire run above such six feet. All gates to the fences of all Solar Farms shall remain locked at all times except for those times when the owner and / or operator, or their respective agents is / are using the gate for ingress and / or egress or is / are otherwise present and monitoring the Solar Farm(s).
- 3) Setbacks. Every Solar Farm shall be setback at least **50 feet** from all property lines of the parcel upon which the Solar Farm is located or to be located. Every Solar Farm shall be **50 feet** from the margin of any public road. Solar Farms shall be at least 100 feet from the stream banks of any navigable stream. All setbacks set forth herein shall be measured from the exterior of the fencing and gates which are required around the perimeter of all Solar Farms.
- 4) Evergreen Vegetative Buffer. A continuous evergreen vegetative buffer shall be present and maintained at all times around the perimeter of the exterior of the fencing and gates which are required around the perimeter of all Solar Farms. Nothing contained herein shall be construed so as to require such continuous evergreen vegetative buffer to block reasonable access to a Solar Farm. The evergreen vegetative buffer shall be composed of evergreen trees or shrubs of a type which at planting shall be a minimum of four (4) feet in height and which shall be maintained at maturity at a height of not less than six (6) feet in height. The evergreen trees or shrubs shall be spaced no more than ten (10) feet apart (from the base of tree or shrub to the base of tree or shrub). The evergreen vegetative buffer shall be carefully planted and shall be maintained in good condition. Failure to maintain the evergreen vegetative buffer shall constitute a violation of this resolution.

Section 3. That Chapter 12, Provisions Governing (I-1) Light Industrial Districts, be amended by amending Section 12.01, Uses Permitted, to include the following:

R. Solar Farms – provided the following standards are met and presented on a site plan approved by the Planning Commission:

- 1) Safety fencing. All Solar Farms shall be fenced around the exterior of the Solar Farm with an opaque or semi opaque fence of earth tone colors which shall be at least six (6) feet in height and which shall additionally have at least three strands of barbed wire run above such six feet. All fencing shall be constructed so as to substantially lessen the likelihood of entry into a Solar Farm by unauthorized individuals.
- 2) Gates and Locks. All gates to the fences of all Solar Farms shall be at least six (6) feet in height and which shall additionally have at least three strands of barbed wire run

above such six feet. All gates to the fences of all Solar Farms shall remain locked at all times except for those times when the owner and / or operator, or their respective agents is/are using the gate for ingress and / or egress or is / are otherwise present and monitoring the Solar Farm(s).

- 3) Setbacks. Every Solar Farm shall be setback at least **50 feet** from all property lines of the parcel upon which the Solar Farm is located or to be located. Every Solar Farm shall be **50 feet** from the margin of any public road. Solar Farms shall be at least **50 feet** from the stream banks of any navigable stream. All setbacks set forth herein shall be measured from the exterior of the fencing and gates which are required around the perimeter of all Solar Farms.
- 4) Evergreen Vegetative Buffer. A continuous evergreen vegetative buffer shall be present and maintained at all times around the perimeter of the exterior of the fencing and gates which are required around the perimeter of all Solar Farms. Nothing contained herein shall be construed so as to require such continuous evergreen vegetative buffer to block reasonable access to a Solar Farm. The evergreen vegetative buffer shall be composed of evergreen trees or shrubs of a type which at planting shall be a minimum of four (4) feet in height and which shall be maintained at maturity at a height of not less than six (6) feet in height. The evergreen trees or shrubs shall be spaced no more than ten (10) feet apart (from the base of tree or shrub to the base of tree or shrub). The evergreen vegetative buffer shall be carefully planted and shall be maintained in good condition. Failure to maintain the evergreen vegetative buffer shall constitute a violation of this resolution.

Section 4. That Chapter 13, Provisions Governing (I-2) Restricted Industrial Districts, be amended by amending Section 13.01, Uses Permitted, to include the following:

N. Solar Farms – provided the following standards are met and presented on a site plan approved by the Planning Commission:

- 1) Safety fencing. All Solar Farms shall be fenced around the exterior of the Solar Farm with an opaque or semi opaque fence of earth tone colors which shall be at least six (6) feet in height and which shall additionally have at least three strands of barbed wire run above such six feet. All fencing shall be constructed so as to substantially lessen the likelihood of entry into a Solar Farm by unauthorized individuals.
- 2) Gates and Locks. All gates to the fences of all Solar Farms shall be at least six (6) feet in height and which shall additionally have at least three strands of barbed wire run above such six feet. All gates to the fences of all Solar Farms shall remain locked at all times except for those times when the owner and / or operator, or their respective agents is/are using the gate for ingress and / or egress or is / are otherwise present and monitoring the Solar Farm(s).
- 3) Setbacks. Every Solar Farm shall be setback at least **50 feet** from all property lines of the parcel upon which the Solar Farm is located or to be located. Every Solar Farm shall be **50 feet** from the margin of any public road. Solar Farms shall be at least **50 feet** from the stream banks of any navigable stream. All setbacks set forth herein shall be measured from the exterior of the fencing and gates which are required around the perimeter of all Solar Farms.
- 4) Evergreen Vegetative Buffer. A continuous evergreen vegetative buffer shall be present and maintained at all times around the perimeter of the exterior of the fencing and gates which are required around the perimeter of all Solar Farms. Nothing contained herein shall be construed so as to require such continuous evergreen

vegetative buffer to block reasonable access to a Solar Farm. The evergreen vegetative buffer shall be composed of evergreen trees or shrubs of a type which at planting shall be a minimum of four (4) feet in height and which shall be maintained at maturity at a height of not less than six (6) feet in height. The evergreen trees or shrubs shall be spaced no more than ten (10) feet apart (from the base of tree or shrub to the base of tree or shrub). The evergreen vegetative buffer shall be carefully planted and shall be maintained in good condition. Failure to maintain the evergreen vegetative buffer shall constitute a violation of this resolution.

Section 5. That Chapter 14, Provisions Governing (I-3) Rural Industrial Districts, be amended by amending Section 14.01, Uses Permitted, to include the following:

F. Solar Farms – provided the following standards are met and presented on a site plan approved by the Planning Commission:

- 1) Safety fencing. All Solar Farms shall be fenced around the exterior of the Solar Farm with an opaque or semi opaque fence of earth tone colors which shall be at least six (6) feet in height and which shall additionally have at least three strands of barbed wire run above such six feet. All fencing shall be constructed so as to substantially lessen the likelihood of entry into a Solar Farm by unauthorized individuals.
- 2) Gates and Locks. All gates to the fences of all Solar Farms shall be at least six (6) feet in height and which shall additionally have at least three strands of barbed wire run above such six feet. All gates to the fences of all Solar Farms shall remain locked at all times except for those times when the owner and / or operator, or their respective agents is/are using the gate for ingress and / or egress or is / are otherwise present and monitoring the Solar Farm(s).
- 3) Setbacks. Every Solar Farm shall be setback at least **50 feet** from all property lines of the parcel upon which the Solar Farm is located or to be located. Every Solar Farm shall be **50 feet** from the margin of any public road. Solar Farms shall be at least **50 feet** from the stream banks of any navigable stream. All setbacks set forth herein shall be measured from the exterior of the fencing and gates which are required around the perimeter of all Solar Farms.
- 4) Evergreen Vegetative Buffer. A continuous evergreen vegetative buffer shall be present and maintained at all times around the perimeter of the exterior of the fencing and gates which are required around the perimeter of all Solar Farms. Nothing contained herein shall be construed so as to require such continuous evergreen vegetative buffer to block reasonable access to a Solar Farm. The evergreen vegetative buffer shall be composed of evergreen trees or shrubs of a type which at planting shall be a minimum of four (4) feet in height and which shall be maintained at maturity at a height of not less than six (6) feet in height. The evergreen trees or shrubs shall be spaced no more than ten (10) feet apart (from the base of tree or shrub to the base of tree or shrub). The evergreen vegetative buffer shall be carefully planted and shall be maintained in good condition. Failure to maintain the evergreen vegetative buffer shall constitute a violation of this resolution.

Section 6. BE IT FURTHER RESOLVED that this Resolution shall become effective immediately upon adoption, THE PUBLIC WELFARE REQUIRING IT.



Approved and adopted by the County Commission of Hardeman County, Tennessee.

\_\_\_\_\_  
Date

\_\_\_\_\_  
County Mayor

Attest:

\_\_\_\_\_  
County Clerk

DRAFT

## Haywood County Zoning Resolution

### Definitions:

Accessory Solar Collection System: – An accessory use, consisting of a panel(s), or other solar energy device(s), that collects, inverts, stores, and distributes solar energy for the purpose of electricity generation that solely serves the principal use of the property.

Solar Farm: - A utility-scale energy generation facility, principally used to convert solar energy to electricity, for the primary purpose of wholesale or retail sales of said electricity.

## CHAPTER V - PROVISIONS GOVERNING FORESTRY, AGRICULTURE, RESIDENTIAL (FAR) DISTRICTS

### 5.02 Uses Permitted on Appeal - Following public notice and hearing and subject to appropriate conditions and safeguards, the Board of Zoning Appeals may permit:

...

- I. Solar Farms, subject to site plan review by the Board of Zoning Appeals (BZA) and the following conditions:
  - i. As to protect the agricultural heritage and agricultural economy of Haywood County, the total acreage of all solar farms in FAR, I-1 districts and I-2 districts not exceed three (3) percent (10,252.8 acres) in Haywood County.
  - ii. Solar farm operations equipment enclosed by perimeter fencing to restrict unauthorized access.
  - iii. Adequate screening for solar farm operations that will be located on arterial status roads deemed a scenic highway by the State of Tennessee. This can be achieved by vegetative screening being placed beyond the perimeter fence to a density and height that adequately buffers the solar farm from any nearby uses. Screening along the side and rear of solar farm operations located on all other roads. This may be achieved by vegetative screening being placed beyond the perimeter fence to a density and height that adequately buffers the solar farm from any nearby uses. However, this requirement may be waived at the discretion of the Board of Zoning Appeals when the proposed solar farm operation is in an area in which the surrounding properties are primarily vacant.
  - iv. Solar farm operations shall have a front-yard setback requirement of 100 feet on Arterial Status Roads. Solar farm operations shall have a front yard setback of requirement of 60 feet on all other roads.
  - v. Solar farm operations shall adhere to the side and rear setback, height, and coverage requirements of the district.
  - vi. Solar farm operation structures must be setback a minimum of 500 feet from residential structures.
  - vii. Solar farm operations must be located on a site not less than 150 acres.
  - viii. Solar farm operations must not produce glare that would constitute a nuisance to occupants of neighboring properties or persons traveling neighboring roads.
  - ix. All solar facilities must meet or exceed the standards and regulations of the Federal Aviation Administration (FAA), and any other agency of the local, state, or federal government with the authority to regulate such facilities that are in force at the time of the application.
  - x. To ensure the structural integrity of the solar facility, the owner shall ensure that it is designed and maintained in compliance with standards contained in all

applicable local, state, and federal building codes and regulations that were in force at the time of the permit approval.

- xi. Lighting shall use fixtures to minimize off-site glare and shall be the minimum necessary for safety and security purposes.
- xii. Solar farms that become inactive for a period exceeding one (1) year shall be removed at the owners or operators' expense and the site shall be returned to its natural state. This includes the obligation to dismantle and remove from the site all electrical generating equipment, cables, panels, foundations, buildings, and ancillary equipment. To the extent possible, the operator shall restore and reclaim the site to its pre-project topography and topsoil quality. Any agreement between the operator and landowner for removal to a lesser extent than set forth in this paragraph shall be required prior approval by the board. The restoration activities must be complete within 18 months from the date the Building Official declares in writing to the solar farm operator the solar farm inactive.
- xiii. The applicant shall submit to the board a decommissioning plan describing the way the applicant anticipates decommissioning the project. The plan shall include a description of the way the applicant will ensure that it has the financial capability to carry out the restoration requirements.

The BZA may from time to time request the operator to submit a report describing how it is fulfilling this obligation. The BZA shall decide if it is prudent to include provisions that ensure financial resources will be available for decommissioning. This may include bonding or other methods of guaranteeing performance, such as establishing an escrow account into which the developer / operator will deposit funds on a regular basis over the life of the project that would allow Haywood County to have access to the escrow account for the explicit purpose of decommissioning in the event of default.

If the Solar Farm operation involves more than one property owner, a surety is required for each landowner. Financial provisions shall not be so difficult as to make the solar farm unfeasible.

#### **CHAPTER IX - PROVISIONS GOVERNING LIGHT INDUSTRIAL (I-1) DISTRICTS**

9.02 Uses Permitted on Appeal - The following uses and their accessory uses may be permitted on appeal if, in the opinion of the Board of Zoning Appeals, such use will not be detrimental to the district in which it is located, and subject to such conditions and safeguards as may be required by the Board of Zoning Appeals:

...

D. Solar Farms, subject to site plan review by the Board of Zoning Appeals and the following conditions:

1. Solar farms shall be enclosed by perimeter fencing to restrict unauthorized access at a height of eight (8) feet.
2. Adequate screening shall be provided. This can be achieved either by the required perimeter fencing being constructed as a board-to-board privacy fence or by vegetative screening being placed beyond the perimeter fence to a density and height that adequately buffers the solar farm from any nearby uses.
3. Solar farms shall adhere to the setback, height, and coverage requirements of the district.

4. Solar farm structures must be setback a minimum of 500 feet from residential structures.
5. Solar farms must be located on lots of no less than 100 acres in size.
6. Solar farms must not create increased noise levels that are discernible to nearby residential uses.
7. Solar farms must not produce glare that would constitute a nuisance to occupants of neighboring properties or persons traveling neighboring roads.
8. All electrical interconnection and distribution lines within the project boundary shall be underground.
9. Solar farms that become inactive for a period exceeding one (1) year shall be removed at the owners or operators expense and the site shall be returned to its natural state. This includes the obligation to dismantle and remove from the site all electrical generating equipment, cables, panels, foundations, buildings and ancillary equipment. To the extent possible, the operator shall restore and reclaim the site to its pre-project topography and topsoil quality. Any agreement between the operator and landowner for removal to a lesser extent than set forth in this paragraph shall be required prior approval by the board. The restoration activities must be complete within 18 months from the date the solar farm becomes inactive.
10. The applicant shall submit to the board a decommissioning plan describing the manner in which the applicant anticipates decommissioning the project. The plan shall include a description of the manner in which the applicant will ensure that it has the financial capability to carry out the restoration requirements. The board may from time to time request the operator to submit a report describing how it is fulfilling this obligation. The board shall decide if it is prudent to include provisions that ensure financial resources will be available for decommissioning. This may include bonding or other methods of guaranteeing performance, such as establishing an escrow account into which the developer / operator will deposit funds on a regular basis over the life of the project that would allow Haywood County to have access to the escrow account for the explicit purpose of decommissioning in the event of default. Financial provisions shall not be so difficult as to make the solar farm unfeasible.

## **CHAPTER X PROVISIONS GOVERNING RESTRICTED INDUSTRIAL (I-2) DISTRICTS**

### **10.01 Uses Permitted**

...

- K. Utilities limited to:
  1. Electric utilities including but not limited to solar farms, subject to site plan review by the Planning Commission and the following standards for said solar farms:
    - a. Solar farms shall be enclosed by perimeter fencing to restrict unauthorized access at a height of eight (8) feet.

- b. Adequate screening shall be provided. This can be achieved either by the required perimeter fencing being constructed as a board-to-board privacy fence or by vegetative screening being placed beyond the perimeter fence to a density and height that adequately buffers the solar farm from any nearby uses.
- c. Solar farms shall adhere to the setback, height, and coverage requirements of the district.
- d. Solar farm structures must be setback a minimum of 500 feet from residential structures.
- e. Solar farms must be located on lots of no less than 100 acres in size.
- f. Solar farms must not create increased noise levels that are discernible to nearby residential uses.
- g. Solar farms must not produce glare that would constitute a nuisance to occupants of neighboring properties or persons traveling neighboring roads.
- h. All electrical interconnection and distribution lines within the project boundary shall be underground.
- i. Solar farms that become inactive for a period exceeding one (1) year shall be removed at the owners or operators expense and the site shall be returned to its natural state. This includes the obligation to dismantle and remove from the site all electrical generating equipment, cables, panels, foundations, buildings and ancillary equipment. To the extent possible, the operator shall restore and reclaim the site to its pre-project topography and topsoil quality. Any agreement between the operator and landowner for removal to a lesser extent than set forth in this paragraph shall be required prior approval by the board. The restoration activities must be complete within 18 months from the date the solar farm becomes inactive.
- j. The applicant shall submit to the board a decommissioning plan describing the manner in which the applicant anticipates decommissioning the project. The plan shall include a description of the manner in which the applicant will ensure that it has the financial capability to carry out the restoration requirements. The board may from time to time request the operator to submit a report describing how it is fulfilling this obligation. The board shall decide if it is prudent to include provisions that ensure financial resources will be available for decommissioning. This may include bonding or other methods of guaranteeing performance, such as establishing an escrow account into which the developer / operator will deposit funds on a regular basis over the life of the project that would allow Haywood County to have access to the escrow account for the explicit purpose of decommissioning in the event of default. Financial provisions shall not be so difficult as to make the solar farm unfeasible.

3. Have a maximum of 30.0 percent slope.
  4. Be at least 300 feet up gradient or 150 down gradient from any well.
  5. Be at least 150 feet from any creek, stream, and the 1002 contour line for Douglas Lake or other water body.
  6. Be at least 165 feet from any property line.
- I. Driveway/Parking. The inner area shall be accessed by a gravel driveway at least eight (8) feet wide and have at least two (2) gravel parking spaces.
  - J. Monitoring. Owners or operators of any cadaver research center shall conduct quarterly studies of water quality down gradient at the edge of the property and prepare appropriate reports of its findings. Upon completion, monitoring reports shall be provided to the Jefferson County Environmental Department.

**7.9. Development Standards for Solar Energy Systems.** (Resolution 2015-34, 1-22-2016) Solar energy systems are considered a principal use of land if electricity generated is primarily sold or used off site. Conversely, solar energy systems which produce electricity solely for on-site use are considered accessory to the principal use of the property.

The following requirements apply to solar energy systems as a principal use.

- A. A detailed site plan showing the locations of buildings, driveways, fencing, solar panels, and other facilities drawn at a scale of no less than 1" = 50' shall be provided to the planning commission.
- B. The planning commission shall be provided with documentation showing that site and construction plans have been approved and that all federal and state requirements will be met.
- C. Solar panels shall be set back from front property lines a minimum of thirty (30) feet and twenty-five (25) feet from side and rear property lines.
- D. Associated buildings and appurtenances shall meet the minimum setback requirements for the district in which they are located.
- E. All on-site power lines and interconnections between producer and a utility shall be underground.

The following requirements apply to solar energy systems as an accessory use.

- A. Solar energy systems as accessory uses are allowed for all uses.
- B. Solar panels shall meet the setback requirements for the district in which they are located.

2. Noise emanating from the operation of a building mounted wind energy system(s) shall not exceed, at any time, the lowest ambient noise level that is present between the hours of 9:00 p.m. and 9:00 a.m. at any property line of a residential use parcel or from the property line of parks, schools, hospitals or churches. Noise emanating from the operation of a building mounted wind energy system shall not exceed, at any time, 5 dB over the lowest ambient noise level that is present between the hours of 9:00 p.m. and 9:00 a.m. at any property line of a non-residential use parcel.
3. Guy-wires shall not be permitted.
4. Building mounted wind energy systems shall not exceed 15 feet in height as measured from the highest point of the roof of the building excluding chimneys, antennae, and similar appurtenances.

**c. Wind Farms**

1. Large wind energy systems are permitted as principal uses by right in the IH districts and by special use approval and only in CA and EMP districts.
2. Large wind energy systems must be of monopole design, without guy wires.
3. Total height of each individual unit shall not exceed 500 feet.
4. Towers shall be set back a minimum of 110% the tower height from a participating property line. Towers shall be set back a minimum of 1000 feet from non-participating property lines. Towers shall be setback 150% the tower height or 500 feet, whichever is greater, from any public right of way or overhead utility line.
5. A wind tower shall be separated from every other wind tower by a sufficient distance so as to not interfere with the other wind tower, particularly in the event of a tower or portion thereof falling. There is no limit to the number of individual units that may be situated in a large scale wind farm so long as all setback requirements and other stated limitations are adhered to
6. The vertical distance from ground level to the tip of a wind turbine blade when the blade is at its lowest point shall be at least 75 feet.
7. The noise generated by the operation of a large wind energy system shall not exceed 55 dB as measured at any point on non-participating property adjacent to the parcel on which the large wind energy system is located.
8. Large wind systems shall be subject to any additional standards as set by MLGW for interconnection purposes.

**2. Solar Energy Systems**

**a. General Provisions**

1. Solar energy systems are permitted as an accessory use in all zoning districts, except for solar farms which are permitted as principal uses according to Chapter 2.5, Use Table.
2. Panels 4 square feet or less are exempt from these regulations.
3. All ground mounted electrical or control equipment shall be secured to prevent unauthorized access.
4. Equipment that is not functional or has not been used for a period of one (1) year must be removed.
5. Trees in the right-of-way may not be removed or damaged for increased access to sun.
6. Power grid interconnection shall be in accordance with MLGW standards and regulations.

**b. Freestanding Solar Energy Systems**

1. Free standing arrays are permitted in rear and side yards only.
2. Panel arrays must be setback either the minimum district setback or 110% the height of the panel array, whichever is greater, as measured from grade to highest point on the array.
3. Arrays may not exceed the height of the principal structure or 35 feet, whichever is less.
4. Electrical lines from the panel array must be in conduit and placed below ground.
5. Panels must be appropriately screened from neighboring properties and public rights-of-ways.

**c. Building Mounted Solar Energy Systems**

1. On single-family residential structures, panel arrays shall not extend more than 12 inches above the peak of any roof that is viewed from the street nor shall they extend more than 12 inches beyond any edge of the roof.

2. Where the panels are placed atop a flat roof they shall not extend more than five feet above the roof and shall be appropriately screened from the public right of way via the building's façade or similar mechanism.
3. Where panels are incorporated into or attached to the walls of a building they shall be appropriately glazed so as to prevent glare.

**d. Solar Farms**

1. Panel arrays shall meet all setback requirements of the respective district in which they are located. In no instance shall an array be setback less than 110% of the height of the array.
2. Solar farms shall adhere to interconnection standards established by MLGW.

**K. Blood Plasma Donation Center**

Blood plasma donation centers established before November 28, 2017, in the CMU-2 and CMU-3 districts may be modified, expanded or rebuilt on the same site without the issuance of a Conditional Use Permit.

**2.6.3 Commercial Use Standards**

**A. Adult-Oriented Establishment**

The governing bodies find that adult oriented establishments have a negative secondary effect on both the commercial and residential properties, resulting in blight and the downgrading of property values, increased criminal activity, and an adverse health impact. The following standards shall apply to all adult oriented establishments.

1. It shall be a violation of this development code for a person, corporation, or other legal entity to operate or cause to be operated any adult oriented establishment within one thousand five hundred (1,500) feet of:
  - a. A duly organized and recognized place of worship;
  - b. A public or private elementary, middle, junior high or high school;
  - c. A public or private day care facility or kindergarten;
  - d. A boundary of a residential zoning district, open zoning district or historic overlay district;
  - e. Any residential use;
  - f. A family recreation center;
  - g. A day care center;
  - h. A park; or
  - i. Any other adult oriented establishment.
2. For the purpose of this section, measurement shall be made in a straight line, without regard to intervening structures or objects, from the nearest property line of the premise where the adult oriented establishment is located, to the nearest property line of the premises of a place of worship, public or private elementary, middle, junior high or high school, public or private day care facility or kindergarten, residential use, family recreation center, day care center, park and any other adult oriented establishment, or to the nearest boundary of a residential zoning district or historic overlay district.
3. Adult-oriented establishments shall not be permitted on any site with a designated frontage. See Section 3.10.3.

**B. Bar, Tavern, Cocktail Lounge, Nightclub**

1. If located within the city limits of the City of Memphis then any bar, tavern, cocktail lounge or nightclub shall meet all requirements of Title 7, Alcoholic Beverages, of the City of Memphis Code of Ordinances.
2. If located within unincorporated Shelby County then any bar, tavern, cocktail lounge or nightclub shall be regulated in accordance with the requirements of Title 57 of the Tennessee Code Annotated. The use shall be located at least 500 feet from any single family residential district as measured from property line of the bar, tavern, cocktail lounge, or nightclub to the nearest boundary line of the single family residential district.

**C. Radio, TV, or Recording Studio**

Radio and television transmission towers subject to the following additional standards:

1. Radio and television towers shall not be located in the approach or landing zones of an airport or heliport.
2. The application for a special use permit shall be accompanied by the written recommendations of appropriate state and federal agencies.



- a. No such activity shall be permitted on a lot, unless it contains twice the lot area requirements of the district; however, campgrounds, shall require a minimum of three (3) acres.
  - b. The use shall comply with all of the district bulk regulations, applicable off-street parking requirements and landscaping and buffering standards.
  - c. Buffering standards as defined in the definitions shall be required alongside and rear lot lines and a thirty-foot (30) building setback shall be required on all property lines. The Planning Commission may require additional plantings and/or screening for buffering purposes.
  - d. All campgrounds shall be subject to the minimum applicable standards as also required for temporary commercial campgrounds (See Appendix B-106).
5. Educational Facilities - All uses classified in the educational facilities activity type shall be subject to the following supplementary regulations.
- a. The Board of Zoning Appeals may grant a variance from minimum yard requirements whenever an existing structure is proposed for conversion to a community education facility.
  - b. Any school in existence upon adoption of this resolution shall not be subject to the land area requirements of this section but shall be subject to all other code requirements including fire, electrical, plumbing and building codes if applicable.
6. Extensive Impact Facilities - In all districts where authorized as special exception (BZA) uses, Planning Commission approval (PC) required or uses permitted with supplemental provisions (SUP), the following supplementary regulations shall apply to uses classified in the extensive impact activity type.
- a. The location, size, and design of such facilities shall be such that the proposed development shall be compatible with the development within the surrounding area, thus reducing the impact upon the surrounding area.
  - b. The traffic generated by such facility shall be safely accommodated along arterial and collector streets without traversing local minor streets.
  - c. The proposed facility shall provide a basic community function or essential service necessary for a convenient and functional living environment in order to be located on the proposed site.
  - d. The off-street parking requirements shall be determined by the Planning Commission.
  - e. Renewable Energy for Utility-Scale/Commercial Production and/or Resale shall be permitted only in Planned Manufacturing Districts (PMD-1 and PMD-2). The following Supplemental Regulations Shall apply to all Renewable Energy Facilities (Solar and Wind/Turbine Facilities):
    - i. When such renewable energy structures and facilities are considered as the primary use of the property, the panels and equipment shall meet the primary/principal structure building setbacks of the district;
    - ii. Such land use shall require a comprehensive development plan for review by the Sullivan County Regional Planning Commission for approval per 5-104 Regulations and Procedures;
    - iii. Such commercial renewable energy (solar or wind/turbine) facilities shall not be located within one-mile of a designated historic overlay district or national register of historic properties or district. *(amended 01/20.2022)*
7. Health Care Facilities - In all districts where authorized as a use permitted with supplemental provisions (SUP), Planning Commission approval (PC) required or a special exception (BZA) use, the following supplementary regulations shall apply to uses classified in the health care activity type as indicated.
- a. Minimum Lot Area
    - i. No health clinic shall be permitted on a zone lot, unless it contains a minimum of ten thousand (10,000) square feet, or twice the lot area requirements of the district, whichever is greater.
    - ii. No hospital or center for observation or rehabilitation shall be permitted on a zone lot, unless it contains a minimum of five (5) acres.
  - b. Hospital, Centers for Observation or Rehabilitation - The minimum side and rear yards for hospitals and centers for observation or rehabilitation shall be fifty (50) feet for one (1) or two (2) story building.
  - c. All other regulations of the zone district shall apply.
  - d. There shall be provided along the entire site boundaries fencing, screening, and landscaping as appropriate to protect any surrounding residential area.

516. Renewable Energy- The intent of this section is to promote alternative renewable energy sources while maintaining the aesthetics and safety of the community in which they are proposed.

516.1 Solar Energy- Solar Panels and related equipment shall be permitted in all zones and in accordance with the following:

516.1.1 All panels and equipment shall be co-located on the primary dwelling or accessory structure if the property is zoned A-1, A-2, R-1, R-1A, R-1B, R-2, R-2A, R-3, R-3A, B-1, Planned Residential, Planned Residential Business.

516.1.1.1 Freestanding solar panels and associated equipment may be allowed on lots at least three (3) acres in size in the A-1 and A-2 zoning districts provided that no panel or equipment be located closer than 50' from any property line. No freestanding solar panel or associated equipment in the A-1 and A-2 district shall exceed 1,500 square feet of surface area or a maximum height of 20'

516.1.2 Solar Panels and equipment may co-located or be freestanding individual structures in the following zones: A-3, B-3, B-4, MS, M-1, M-2, and Planned Manufacturing districts. In the event the solar panels are the primary use of the property, the panels and equipment shall meet the primary building setbacks of the district, otherwise it may be treated as an accessory structure. A site plan is required if the panels and equipment are not co-located on a structure.

516.2 Wind Energy – Any single or combination of Wind Turbines greater than 10kW shall submit a site plan for approval by the Washington County Regional Planning Commission to ensure the conformity with the community. Wind Turbines and related equipment are permitted in all zones in accordance with the following:

516.2.1 The Turbine and equipment shall be located as on the same property as the primary use of property and the setback shall be at least the same distance as the height of the turbine from the ground if the property is zoned A-1, A-2, R-1, R-1A, R-1B, R-2, R-2A, R-3, R-3A, B-1, Planned Residential, Planned Residential Business.

516.2.2 The Turbine and equipment may be the primary or secondary use in the following zones: A-3, B-3, B-4, MS, M-1, M-2, and Planned Manufacturing districts.

# Appendix E: Public Chapter 866, Acts of 2022



## State of Tennessee

### PUBLIC CHAPTER NO. 866

#### SENATE BILL NO. 1925

By Walley, Bowling, Reeves, Rose, Stevens

Substituted for: House Bill No. 2056

By Hurt, Faison, Sherrell, Shaw, Ragan, Grills, Lamberth, Moon

AN ACT to amend Tennessee Code Annotated, Title 5; Title 6; Title 7; Title 65; Title 66, Chapter 9, Part 2 and Title 68, relative to solar energy.

WHEREAS, it is the intent of the General Assembly to establish reasonable and uniform requirements to protect landowners and communities from the potential hazards and costs associated with abandoned energy-generating facilities while also protecting property rights and the positive business environment in the State of Tennessee, the reliability of the electrical grid, and the ability of the State of Tennessee to encourage economic development, quality jobs, and business investments that require low-cost electricity from new renewable energy sources; now, therefore,

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF TENNESSEE:

SECTION 1. Tennessee Code Annotated, Title 66, Chapter 9, Part 2, is amended by adding the following language as a new section:

#### **66-9-207. Solar power facility agreements.**

(a) As used in this section, unless the context otherwise requires:

(1) "Decommissioning cost" means the estimated cost of performing the removal and restoration obligations set forth in subsection (c), less the estimated salvage value of the components of the solar power facility as of the date of removal;

(2) "Grantee" means a person, other than a public utility, as defined by § 65-4-101, who leases property from a landowner or holds an easement interest pursuant to a solar power facility agreement;

(3) "Landowner" means the owner or owners of a fee simple interest in land;

(4) "Premises" means the real property leased or granted by a landowner to a grantee pursuant to a solar power facility agreement;

(5)(A) "Solar power facility" means, collectively, a device or structure, or series thereof, that provides for the collection of solar energy for electricity generation, together with all facilities and equipment, other than any facility or equipment owned by a public utility, as defined by § 65-4-101, located proximate to and in support of the operation of such electricity generation device or structure, including, without limitation, all underground and aboveground electrical collection, distribution, and transmission lines; inverters; transformers; substations; energy storage facilities; telecommunications equipment and communication lines; meteorological towers; maintenance yards; switchgear; fences; and foundations supporting other components of the solar power facility; and

(B) "Solar power facility" does not include a solar-generating device or structure that is less than ten megawatts (10 MW) in size, measured in alternating current at the point of interconnection to the electrical grid, unless the application of this part is expressly provided for in the solar power facility agreement; and

(6) "Solar power facility agreement" means a lease or easement agreement for real property between a grantee and a landowner for the construction, installation and operation of all or a part of a solar power facility on such real property that generates electricity primarily for use and consumption off the premises.

(b) All solar power facility agreements:

(1) Must provide, at a minimum, that the grantee shall, upon or prior to the expiration or termination of the solar power facility agreement, safely remove or cause the removal of all components of the solar power facility located on the premises, except for any electrical or communications lines buried more than three feet (3') below the surface grade of the land, and restore the land comprising the premises to, as near as reasonably possible, its condition as of the date of the commencement of construction of the solar power facility; and

(2) Must either contain or provide that the grantee shall deliver to the landowner a decommissioning plan detailing the grantee's plan for performing or causing the performance of the obligations in subdivision (b)(1).

(c)(1) A solar power facility agreement must require the grantee to obtain and deliver to the landowner financial assurance in the following amounts to secure the performance of the grantee's removal and restoration obligations in subsection (b):

(A) No less than five percent (5%) of the decommissioning cost on the date the solar power facility commences commercial operation;

(B) No less than fifty percent (50%) of the decommissioning cost on the tenth anniversary of the date the solar power facility commences commercial operation; and

(C) No less than the decommissioning cost on the fifteenth anniversary of the date the solar power facility commences commercial operation.

(2) Acceptable forms of financial assurance must be set forth in the solar power facility agreement and must include one (1) or more of the following in the amount required by subdivision (c)(1):

(A) A surety bond;

(B) A collateral bond;

(C) An irrevocable letter of credit;

(D) A parent guaranty;

(E) Cash;

(F) A cashier's check;

(G) A certificate of deposit;

(H) A bank joint custody receipt;

(I) An approved negotiated instrument not described in subdivisions (c)(2)(A)-(H); or

(J) A combination of the forms of security described in subdivisions (c)(2)(A)-(I).

(3) A landowner has the right to expressly extend the date the financial assurance required by this subsection (c) is first delivered to the landowner to no later than the fifteenth anniversary of the date the solar power facility commences commercial operation.

(d) This section does not prohibit a local government from regulating solar power facilities pursuant to its zoning authority granted in title 13, except that a local government shall not impose removal or restoration obligations or require financial assurance securing such obligations that are more stringent than or additional to those provided for in this section.

(e) Except as provided in subdivision (c)(3), a provision of a solar power facility agreement that purports to waive a right or exempt a grantee from a liability or duty established by this section is void unless the landowner and the grantee are affiliated entities.

(f) A person who is harmed by a violation of this section is entitled to relief provided under title 29, chapter 14.

(g) The requirements of this section only apply to solar power facility agreements initially entered into on or after the effective date of this act. If a grantee and landowner agree to amend a solar power facility agreement initially entered into before the effective date of this act, the parties may include the rights and obligations established by this section, and this section must govern such amended agreements.

SECTION 2. The heading to a section in this act is for reference purposes only and does not constitute a part of the law enacted by this act. However, the Tennessee Code Commission is requested to include the heading in any compilation or publication containing this act.

SECTION 3. This act takes effect on June 1, 2022, the public welfare requiring it.

DRAFT

SENATE BILL NO. 1925

PASSED: March 28, 2022

  
\_\_\_\_\_  
RANDY McNALLY  
SPEAKER OF THE SENATE

  
\_\_\_\_\_  
CAMERON SEXTON, SPEAKER  
HOUSE OF REPRESENTATIVES

APPROVED this 14<sup>th</sup> day of April 2022

  
\_\_\_\_\_  
BILL LEE, GOVERNOR

## Appendix F: Hypothetical Property Assessment for Utility-Scale Solar Facility Compared to Farm Land

Property Assessment	Solar Facility	Farm land
<b>Personal Property</b>		
Initial Cost	\$100,000,000	not assessed
Valuation Percentage	12.50%	
Value	\$12,500,000	
Level of Assessment	55%	
Assessed Value	\$6,875,000	
Personal Property Reduction (15% reduction based on Northwest Airlines v. Tennessee State Board of Equalization)	85.00%	
Reduced Assessment	\$5,843,750	
<b>Real Property</b>		
Real Property (Land/Building) Appraisal	\$1,000,000	\$1,000,000
Level of Assessment	55%	25%
Real Property Assessed Value	\$550,000	\$250,000
<b>Personal and Real Property Combined</b>		
Personal Property Reduced Assessment - Solar Facility	\$5,843,750	na
Real Property (Land/Building) Assessed Value	\$550,000	\$250,000
Total Reduced Assessment	\$6,393,750	\$250,000
Equalization Ratio in Anderson County* (2022)	0.7295	0.7295
Total Equalized Assessment	\$4,664,241	\$182,375
<b>Taxes</b>		
Anderson County Tax Rate per \$100 of Assessment (2022)	0.026289	0.026289
<b>County Taxes</b>	<b>\$122,618</b>	<b>\$4,794</b>

\*Anderson County was chosen randomly.

Note: Initial cost of personal property and appraisal of real property are hypothetical.

Source: Tennessee Constitution, Article II, Section 28; Tennessee Code Annotated, Sections 67-5-101 et seq., 67-5-601(e), and 67-5-1301 et seq.; Northwest Airlines et al. v. Tennessee State Board of Equalization settlement agreement (1996); Tennessee Comptroller of the Treasury 2022; Tennessee Comptroller of the Treasury "2022 Tennessee Property Taxes"; and email from Jason Stewart, senior specialist, Office of State Assessed Properties, Tennessee Comptroller of the Treasury, November 4, 2022.



## Appendix G: Complaints Received by TDEC Division of Water Resources between January 2009 and May 2023

Concern Category	Total Number of Complaints Received	Number of Complaints Reported about a Solar Site	Number of Solar Sites	Year and Status of Complaints about Solar Sites
Ag/ Animal Waste	658	0	0	na
Bypassing Subsurface Sewage Disposal System (SSDS)	171	0	0	na
Dam	62	0	0	na
Dead Animals/Garbage in Creek	252	0	0	na
Discoloration/Appearance/Particulates	132	0	0	na
Drainage	1,165	0	0	na
<b>Erosion/Sediment</b>	<b>3,755</b>	<b>1</b>	<b>1</b>	<b>2017 - issue resolved</b>
Failing SSDS	392	0	0	na
Fish Kill	236	0	0	na
Illegal Dumping	1	0	0	na
Installing SSDS without Installers Permit	3	0	0	na
Junkyards	114	0	0	na
Leaks	26	0	0	na
Logging	643	0	0	na
Low Pressure/No Water	19	0	0	na
Mining	378	0	0	na
No SSDS	106	0	0	na
<b>Other</b>	<b>1,865</b>	<b>2</b>	<b>2</b>	<b>2011 - closed 2018 - no jurisdiction</b>
Pollution/Spills/Illicit Discharge	3,381	0	0	na
Pumper Illegally Disposing Septage	23	0	0	na
Pumper without Permit	2	0	0	na
SSDS Construction without Permit	29	0	0	na
Sewage Bypass/Overflow	2,244	0	0	na
Sinkholes	25	0	0	na
Sludge/Bio-solids	65	0	0	na
Source Water/Wellhead Protection	6	0	0	na
<b>Stormwater - Construction</b>	<b>1,780</b>	<b>2</b>	<b>2</b>	<b>2011 - closed 2023 - completed</b>
Stormwater - Industrial	200	0	0	na



Concern Category	Total Number of Complaints Received	Number of Complaints Reported about a Solar Site	Number of Solar Sites	Year and Status of Complaints about Solar Sites
Stormwater - Post-Construction	176	0	0	na
Stream Alteration	2,573	0	0	na
<b>Stream Debris</b>	<b>395</b>	<b>1</b>	<b>1</b>	<b>2011 - resolved</b>
Taste and Odor	12	0	0	na
Water Quality/Health Effects	102	0	0	na
Wells	9	0	0	na
<b>Wetlands</b>	<b>431</b>	<b>1</b>	<b>1</b>	<b>2023 - no problem found</b>
<b>Total</b>	<b>21,431</b>	<b>7</b>	<b>4*</b>	

\*A total of seven complaints were received about four solar sites. One solar site received four complaints.

Note: These complaints were received by the water pollution control program area as of June 14, 2023. A total of 7,913 complaints were also received by the water supply and groundwater protection program areas, but none of these were reported about solar sites. TDEC's dataviewer shows data from as early as 2009.

Source: Tennessee Department of Environment and Conservation "DataViewer - Division of Water Resources (DWR)"; and interview with Ann Morbitt, integrated water resources consultant, Division of Water Resources, Tennessee Department of Environment and Conservation, June 5, 2023.

## **Appendix H: Solar Development Resources for State and Local Governments, Developers, Landowners, and Homeowners**

This list is not intended to be comprehensive.

### **State Governments**

#### **Model Ordinances**

*Model ordinances provide a foundation for structured and consistent guidelines for jurisdictions. The following examples are model solar ordinances developed by states or stakeholder organizations.*

- Georgia (2018) – [Georgia’s Model Solar Ordinance – EPICenter at Georgia Tech \(gatech.edu\)](#)  
[The Georgia Model Solar Zoning Ordinance Guide](#)
- Illinois (2020) – [IL-Solar-Ordinance-2020.pdf \(growsolar.org\)](#)
- Indiana (2020) – [in-solar-ordinance-2020-december.pdf \(iu.edu\)](#)
- Kentucky (2020) – [Microsoft Word - 20-02A Kentucky Model Solar Zoning Ordinance.docx \(kyrc.org\)](#)
- Minnesota (2020) – [MN-Solar-Ordinance-2020.pdf \(growsolar.org\)](#)
- North Carolina (2014) – [Solar Template Ordinance Development.pdf \(energync.org\)](#)  
[Template Solar Energy Development Ordinance for North Carolina](#)  
[Planning and Zoning for Solar in North Carolina](#)
- SolSmart (2022) – [Best-Practices-Guidance-for-Solar-and-Zoning.v1.pdf \(solsmart.org\)](#)
- TenneSEIA (in conjunction with MTAS and CTAS) (2022) – [Model-Tennessee-Solar-Zoning-Ordinance-Final-4833-3498-8020-9.pdf \(tenneseiasolar.com\)](#)
- Wisconsin (2020) – [WI-Solar-Ordinance-2020.pdf \(growsolar.org\)](#)

#### **Guides for Solar Development**

*Some states have developed guiding documents and toolkits to help answer questions regarding solar development.*

Iowa (2020) – [iowa-solar-siting-resource-guide.pdf \(cfra.org\)](#)

Kentucky (2020) – [Kentucky Solar Toolkit \(arcgis.com\)](#)

## **State Environmental Offices Permitting Guidelines**

*State environmental offices have developed guidelines for solar development that outline the permitting process as well as potential areas of concern such as stormwater runoff.*

Kentucky (2022) – <https://eec.ky.gov/Environmental-Protection/Compliance-Assistance/Pages/default.aspx>

North Carolina (2018) – [download \(nc.gov\)](#)

Virginia (2022) – [Virginia Solar Energy Facility Guidance](#)

[Virginia Department of Environmental Quality “Renewable Energy”](#)

## **Local Governments**

### **Tennessee Local Government Ordinances**

*Counties and cities in Tennessee have begun developing ordinances for solar development in their jurisdictions.*

Municipal Technical Advisory Service – [Solar Ordinance | MTAS \(tennessee.edu\)](#)

Bedford County – [Zoning Resolution of Bedford County, Tennessee](#)

Fayette County – <https://fayettetn.us/wp-content/uploads/2022/03/Zoning-Resolution.pdf>

Greene County – [Greene County Zoning Resolution](#)

Hardeman County – Zoning Compliance

<https://hardemancounty.org/departments/zoning-compliance>

Haywood County – [haywood county zoning ordinance \(haywoodtn.gov\)](#)

Jefferson County – [https://jeffersoncountyttn.gov/wp-content/uploads/2021/07/Revised-Zoning-Resolution\\_April-2021.pdf](https://jeffersoncountyttn.gov/wp-content/uploads/2021/07/Revised-Zoning-Resolution_April-2021.pdf)

Sullivan County – Planning and Codes [https://sullivancountyttn.gov/?page\\_id=211](https://sullivancountyttn.gov/?page_id=211)

Washington County –

<https://www.washingtoncountyttn.org/DocumentCenter/View/1710/Washington-County-Zoning-Resolution-11-28-22-PDF>

City of Memphis/Shelby County –

<https://shelbycountyttn.gov/DocumentCenter/View/32499/ZTA-18-001-AS-APPROVED-FINAL>

## **Planning Guides and Tools for Local Governments**

*Stakeholders, government organizations, and states have developed tools for local governments to plan for solar development.*

American Planning Association (2019) – [Planning for Utility-Scale Solar Energy Facilities](#)

Massachusetts (2022) – <https://ag.umass.edu/clean-energy/research-new-initiatives/solarplanning>

National Renewable Energy Laboratory (2013) – [Best Practices for Siting Solar Photovoltaics on Municipal Solid Waste Landfills](#)

National Renewable Energy Laboratory – [SLOPE](#)

New York (2022) – [Solar Guidebook for Local Governments](#)

US Department of Energy (2023) – [US DOE](#)

Solar@Scale (2022) – [Solar@Scale: A Local Government Guidebook for Improving Large-Scale Solar Development Outcomes \(planning-org-uploaded-media.s3.amazonaws.com\)](#)

## **Developers**

*Other states and stakeholders have developed guides for solar development. Guides may be applicable to landowners as well.*

SEIA – [Model Leases and PPAs | SEIA](#)

Kentucky (2018) –

<https://eec.ky.gov/Energy/Documents/Consumer%20Energy%20Management%20and%20Access%20Guide.pdf>

International Finance Corporation (2015) – [Utility-Scale Solar Photovoltaic Power Plants: A Project Developer's Guide \(ifc.org\)](#)

National Renewable Energy Laboratory (2015) – [Solar Access to Public Capital Working Group Best Practices in Commercial and Industrial \(C&I\) Solar Photovoltaic System Installation.](#)

National Renewable Energy Laboratory (2015) – [Solar Access to Public Capital Working Group Best Practices in PV System Installation](#)

[National Renewable Energy Laboratory \(2021\) – Best Practices at the End of the Photovoltaic System Performance Period](#)

[US Department of Energy – Community Solar Basics](#)

## **Landowners**

*Government agencies, universities, and stakeholders have developed guides and considerations for landowners interested in leasing land for solar companies.*

American Farmland Trust (2021) – [AFT-PNW-solar-leasing-guide.pdf \(farmlandinfo.org\)](#)

Cornell University (2020) – [Considerations when Leasing Agricultural Lands to Solar Developers - Cornell Small Farms](#)

The National Agricultural Law Center – [Understanding Solar Energy Agreements](#)

National Renewable Energy Laboratory (2015) – [Standard Contracts and Securitization Resources | Energy Analysis | NREL](#)

North Carolina State Extension Office (2022) – [Legal Issues Surrounding Due Diligence for Solar Development | NC State Extension Publications \(ncsu.edu\)](#)

[NYSERDA Agriculture and Markets – “Fact Sheet: Landowner Considerations for Solar Land Leases.](#)

US Department of Energy OpenEI (2022) – <https://openei.org/wiki/InSPIRE/Primer>

US Department of Energy (2022) – <https://www.energy.gov/eere/solar/farmers-guide-going-solar>

## **Homeowners**

*Stakeholders and state and federal agencies have developed guides and resources for residential solar development.*

Tennessee Valley Authority (2022) – [TVA Green Connect](#)

[Solar Calculator \(tva.gov\)](#)

Middle Tennessee Electric (2022) – <https://mte.com/SolarInstallationProblems>

National Renewable Energy Laboratory (2020) – <https://www.nrel.gov/state-local-tribal/solar-consumer-protection.html>

Solar Energy Industries Association (2015) – <https://www.seia.org/initiatives/consumer-protection>

[https://www.seia.org/sites/default/files/SEIA%20Solar%20Business%20Code\\_Sep2015.pdf](https://www.seia.org/sites/default/files/SEIA%20Solar%20Business%20Code_Sep2015.pdf)

Solar Energy Industries Association (2022) – [residential consumer guide to solar power](#)

TDEC (2023) – [Energy \(tn.gov\)](#)

Forbes (2023) – [Best Solar Panel Installation Companies February 2023 – Forbes Home](#)

Interstate Renewable Energy Council (2023) – [Be Solar Smart Consumer Checklist - Interstate Renewable Energy Council \(IREC\) \(irecusa.org\)](#)

Consumer Reports (2023) – [How the Inflation Reduction's Solar Tax Credit Works - Consumer Reports](#)

Holland Law Firm (2021) – [Solar Panel Scams: When to Call a Consumer Protection Attorney \(hollandlawfirm.com\)](#)

US Department of Energy – [Using Electricity at Home: Energy Saver](#)

### **Guides to Solar Development – Other States**

*Other states have developed guides and considerations for residential solar development.*

California (2021) – [California Solar Consumer Protection Guide](#)

[PG&E Solar NEM Consumer Protection Requirements Per CPUC D. 21-06-026 \(pge.com\)](#)

Idaho (2022) – [Attorney General Issues Tips for Homeowners on Solar Installations - Idaho Office of Attorney General](#)

Illinois (2011) – [Letter Bill 1..5 \(illinoissolar.org\)](http://illinoissolar.org)

Georgia (2022) – <https://consumer.georgia.gov/solar-power-your-home>

North Carolina (2019) – [https://energync.org/wp-content/uploads/2019/08/NC\\_Solar\\_Consumer\\_GuidevWeb2.pdf](https://energync.org/wp-content/uploads/2019/08/NC_Solar_Consumer_GuidevWeb2.pdf)

South Carolina – [SolarGuideHomeowners.pdf \(sc.gov\)](http://sc.gov)

Massachusetts (2022) – [An Overview of the New Massachusetts Solar Consumer Protection Best Practices Guide | MassCEC](http://MassCEC)

Ohio – <https://myenergycoop.com/>

### **General**

American Farmland Trust and Smart Solar (2023) – <https://farmlandinfo.org/solar-siting/>

Clean Energy State Alliance (2023) – [Resource Library - Clean Energy States Alliance \(cesa.org\)](http://cesa.org)

Inside of Knoxville (2022) – [Solar Power: Where Does Tennessee \(and Knoxville\) Stand and Where Is It Going? | Inside of Knoxville](http://Inside of Knoxville)

Tennessee Valley Authority – [Valley Renewable Energy Solutions Guide](http://Valley Renewable Energy Solutions Guide)



# Appendix I: American Farmland Trust “Smart Solar on Farmland and Ranchland”



## Smart Solar<sup>SM</sup> on Farmland and Ranchland

Strengthening Farm Viability and Soil Health While Growing Renewable Energy

Over the next three decades, our nation’s electric power sector will transition from a fossil-fuel dependent system to a more distributed and decarbonized energy network. Driving this change are markets, where solar and other forms of renewable energy are now cost-competitive, as well as ambitious local, state, and federal policy goals to address climate change by dramatically reducing greenhouse gas emissions. Achieving these essential goals will require substantial increases in renewable energy and primarily solar, which, according to a 2020 U.S. Department of Energy study, may rise from 4% of our nation’s total energy production today to 45% by 2050. With dramatically increased funding for solar in the recently enacted Inflation Reduction Act, this pace should accelerate quickly.



American Farmland Trust’s new report found that **83%** of new solar could be sited on farmland.

projects that **83% of new solar built by 2040 could be sited on agricultural lands, with almost half located on our most productive land for producing food and crops.** This is corroborated by a 2021 Cornell University study by Katkar et

### DOE Solar Futures Decarb+E Scenario

Land area of utility-scale solar photovoltaics (projection in 2040)



Figure 1. Projected acres of utility-scale solar photovoltaics energy generation facilities by state in 2040.

According to the same DOE study, increasing solar generation to 45% could require nearly 7.4 million acres of land by 2040 and 10.4 million acres by 2050, with approximately 90% expected to occur in rural communities.

Further studies reveal that most solar development will take place on farmland. Modeling done by American Farmland Trust (AFT), through the *Farms Under Threat: 2040* analysis,

al. that found 82 to 85% of land suitable for solar to meet New York’s ambitious climate goals is farmland. Displacing farming from productive land could put more marginal farmland in production, leading to decreased productivity, farm viability, and food security, as well as increased environmental impact.

Solar developers often select high-quality farmland, since it is more likely to be flat, dry, clear, and close to existing infrastructure. And, according to research AFT conducted in 2021, developers are often willing to pay over 10 times the amount that landowners can make renting the land to farmers, with many offering the security of long-term leases lasting on



average 25–40 years. **The growth of solar development will reshape many rural landscapes and farm economies. It also has the potential to generate public backlash and permitting moratoria that could slow the achievement of decarbonization goals.**

Scientists agree that society needs to drastically reduce emissions to slow climate change and minimize future impacts from droughts, floods, and extreme heat—including on farmers and ranchers. In addition, solar energy leases can generate new streams of income for farmland owners, helping to keep the farm viable. But solar can displace farmer-renters, and large-scale solar may threaten the future viability of local economies dependent on agricultural production.

AFT's modeling reveals that, although solar development will be widely distributed across the country, projects will be concentrated in communities with favorable siting and transmission opportunities. For example, by 2040 Texas could have over 1 million acres of solar, and many Northeastern states could have solar on as much as 6% of their undeveloped land. In addition, large-scale solar projects could take hundreds or thousands of acres of a community's farmland out of production at once. This concentrated conversion will strain the viability of the farms that remain by decreasing land availability, increasing land prices, and reducing the viability of farm support services.

**But America needs both—renewable energy and productive, resilient farms and ranches. Smart Solar can be the solution.** In 2018 AFT began its efforts to help communities accelerate solar development in ways that strengthen farm viability.

### Smart Solar Principles

Smart Solar projects meet three main goals: they accelerate renewable energy development, strengthen farm viability, and safeguard land for farming and ranching. AFT developed the following Smart Solar Principles to guide policymakers, developers, and decisionmakers:

1. Prioritize solar siting on the built environment and land not well suited for farming. Concentrate solar development on rooftops, irrigation ditches, brownfields, and marginal lands.
2. Safeguard the ability for land to be used for agriculture. Policies and practices should protect soil health and productivity, especially during construction and decommissioning.
3. Grow agrivoltaics for agricultural production and solar energy. Agrivoltaic projects allow for farming underneath

and/or between rows of solar panels throughout the life of the project.

4. Promote equity and farm viability. Require inclusive stakeholder engagement, including farmers and underserved communities, to ensure widespread benefits from solar energy development.

Smart Solar means directing solar development to where it has the least negative impact on land well-suited for farming while protecting soil health, maintaining opportunities for farming, and ensuring equitable community benefits. Smart Solar elevates agricultural considerations and aims to accelerate renewable energy development by calming community fears over solar project impacts.

### Recommendations

Many stakeholders—from landowners to solar companies to government officials—have important roles to play to achieve a Smart Solar buildout. Legislative bodies can ensure laws and regulations reflect Smart Solar principles. Solar companies can adopt the principles into their operations. State and federal governments can provide guidance, resources, and incentives. Actions various stakeholders can take:

- Incorporate Smart Solar Principles into land-use plans, permitting processes, and policies to guide approval of specific projects.
- Fund and participate in local/regional planning and community engagement with broad stakeholder involvement including farmers, developers, transmission groups, tribes, and environmental justice stakeholders.
- Define community preferred sites (e.g., the built environment, contaminated lands, land not well-suited to farming) and priority protection areas; prioritize siting

on preferred sites with financial incentives and permit fast-tracking and disincentivize siting on protection areas with mitigation fees.

- Develop and require minimum standards to protect soil health and productivity based on the USDA NRCS soil health principles during construction, operation, and decommissioning.
- Fund research and create pilot programs to advance agrivoltaic projects and help determine which production systems should qualify for future agrivoltaic incentives.
- Invest in research to assess socioeconomic effects of solar on farm viability, land access, equity, and energy prices.



AGRI-SOLAR CLEARINGHOUSE

Agrivoltaics is the practice of installing solar panels on farmland so primary agricultural activities are maintained throughout the life of the project.

### RESOURCES

## Appendix J: Decommissioning Plan and Cost Estimate Example

\_\_\_\_\_ **Solar, LLC** Decommissioning Plan

Prepared and Submitted by \_\_\_\_\_ **Solar, LLC**

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

1. The land lease expires or is terminated; or
2. The solar energy system the (“SES”) does not produce power for a period of 12 consecutive months

\_\_\_\_\_ **Solar, LLC** (the “Operator”) of the SES will do the following as a minimum to decommission the SES:

1. Remove all Operator-owned equipment, conduits, structures, and foundations to a depth of at least three feet below grade; and
2. Remove all fencing unless the owner of the leased real estate requests in writing for it to stay in place; and
3. Take the following steps to restore the land:
  - a. Grade to maintain existing drainage patterns at the time of decommissioning unless stated otherwise by the leading Authority Having Jurisdiction (AHJ) or in any governing decommissioning ordinance;
  - b. Reseed the land using local non-invasive grasses; and
  - c. Maintain the grass for a total of three months after the seeding.

All such removal and decommissioning shall occur within 18 months of any aforementioned decommissioning condition.

The Operator is responsible for decommissioning the SES.

The Operator will provide the \_\_\_\_\_ **County Building and Planning Department** with an updated signed decommissioning plan within 30 days if the operator of the SES changes.

Any updates to this plan will be submitted to the \_\_\_\_\_ **County Building and Planning Department** by the party responsible for decommissioning the SES.

Operator: \_\_\_\_\_  
ABC Solar, LLC

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## Proposed Decommissioning Language to Be Included as Condition of Approval

\_\_\_\_\_ Solar, LLC

Located along \_\_\_\_\_

\_\_\_\_\_ Solar, LLC understands the concern regarding the decommissioning of the solar farm raised by stakeholders. The current language in the ordinance is copied below from Section \_\_\_\_\_:

“Solar farms, which have not been in active and continuous service for a period of one year, shall be removed at the owner or operators expense, and the site shall be restored to as natural condition as possible within six months of removal.”

The applicant, \_\_\_\_\_ Solar, LLC, has every intention to comply with the legal agreements governing the decommissioning of the facility. We have submitted our decommissioning plan as part of our zoning application and also have a requirement in our lease agreement to decommission the facility. Additionally, the decommissioning cost estimates prepared for a variety of sites across the \_\_\_\_\_ by different Professional Engineers (licensed PE’s in \_\_\_\_\_ and \_\_\_\_\_) state that at the end of the usable life of the solar project (40 years), the salvage value of the materials used on-site (steel racking, solar modules, etc.) will exceed the cost to decommission the facility. We have commissioned such a decommissioning estimate and it is attached. It shows that, as of September \_\_\_\_\_, \_\_\_\_\_, the salvage value greatly outweighs the decommissioning costs at the end of the usable life.

In order to go above and beyond the requirements in the ordinance, the applicant, \_\_\_\_\_ Solar, LLC, proposes that the below condition be added as part of the approval:

Prior to issuance of the building permit, the applicant must provide a decommissioning estimate, stamped by a professional engineer licensed in the state of \_\_\_\_\_, stating the costs to decommission the facility less the salvage value at the end of the usable life (“Costs to Decommission”). In the event that the Costs to Decommission are less than \$0.00 (for avoidance of doubt, that the costs are negative such that decommissioning the solar farm would have a positive financial outcome), no further action is needed from the Applicant. In the event that the Costs to Decommission are greater than \$0, applicant agrees to put forward a financial security (surety or performance bond, certified check or irrevocable letter of credit) in the amount of 125% of the Costs to Decommission or \$50,000, whichever is greater.

Sincerely,

\_\_\_\_\_

John Doe

Director of Development, \_\_\_\_\_ Renewables

Project:	████████ Solar, LLC	Engineer:	████████
Client:	████████	Issue Date:	████████
Location:	████████	Revision:	0

OPINION OF PROBABLE COST - PV PLANT DECOMMISSIONING - SAT - 74.97 Mwac

This opinion of probable costs is based on the engineer's experience in the design and construction of energy facilities and are subject to final engineering. This opinion is also based on our experience supervising the construction of PV plants and supervising the demolition of other non-PV facilities. The engineer accepts no liability for errors, omissions, or the accuracy and adequacy of this opinion. It is a violation of state law for any person, unless they are acting under direction of a licensed professional engineer to alter this document in any way. The engineer is unaware of a significant body of decommissioning PV plants with which to benchmark its opinion of cost. With the exception of the PV modules and inter-module wiring, none of the activities undertaken to disassemble a PV plant are unique to PV plants. Disassembly costs can be estimated similar to other types of facilities. While 3rd party software such as RS Means do contain data on PV plant disassembly, we have found that the data is not applicable to large ground-mounted systems.

This opinion assumes a third-party contractor, experienced in the construction and decommissioning of PV facilities will lead the effort. The reported costs include labor, materials, taxes, insurance, transport costs, equipment rental, contractor's overhead, and contractor's profit. Labor costs have been estimated using regional labor rates and labor efficiencies from the Bureau of Labor Statistics. This opinion assumes open-shop labor rates.

This opinion of cost has been split between plant disassembly, site restoration, and salvage which reflects the overall decommissioning process. The PV plant will first be disassembled, with all above and below grade components removed to a depth of 3 feet. This includes all buried cables, conduits, and foundations. Costs for disassembly are overall less than those for original assembly of the facility. While PV modules will need to be removed by hand to retain their salvage value, the racks, buried cables, and concrete can be removed by machine to increase efficiency. It is assumed that concrete, gravel, and fiber optic cable do not have salvage value and will be disposed off site. Other materials are assumed to have salvage value and can be sold at market prices.

It is expected that the entire site will be re-seeded with native grasses and vegetation. Planting of trees, shrubs, and other woody vegetation (re-forestation) or other beautification is not included in the costs. It is assumed that mulching and stabilization of seeded areas will only be required where gravel roads or concrete foundations were removed. As all cables will be direct buried, excavation to remove the cables will not be required, and the disturbance to those areas will be minimal. The remainder of site will already be vegetated and disassembly activities will not significantly disturb the vegetation. Seeding in those areas is included as a precautionary measure.

It is assumed that re-grading of the site to remove diversion dikes and retention ponds is not required. The earth-moving required to remove these features would likely trigger a NPDES (or state/local equivalent) permit, which would in turn require those same features to be installed to control stormwater on the site. In addition, it is assumed no new erosion and sediment control measure will be required for disassembly. These would have been put in place during the original construction, and would be required to remain in place and properly maintained for the project life.

Salvage values, if included, have been estimated using publicly available data from <http://www.scrapmonster.com>. Inverters were priced at the rate for Complete Computers, which is lower than what could be attained if they were disassembled on site. Transformers were priced at 80% of the market rate for Sealed Unit Transformers. PV modules may have residual value as functioning units, but were instead assumed to be priced a Low Grade Boards.

Inflation, if included in this estimate has been projected based on the Producer Price Indices for Final Demand Construction. PPI is a more appropriate measure than CPI as it is targeted to the specific commodity. Detailed assumptions and the total opinion of cost for decommissioning is provided on the next sheets. Inflation has not been assumed for salvage values.

Project: ██████████ Solar, LLC

Engineer: ██████████

Client: ██████████

Issue Date: ██████████

Location: ██████████

Revision: 0

PV PLANT ANTICIPATED DISASSEMBLY METHODS	
ITEM	DISASSEMBLY METHOD
PV Modules	Hand Removal. Place modules face down on pallets, tape wire ends, tied down and transport via skid-steer to staging location. Assumed 5% breakage, salvage value for crystalline, no salvage for thin-film. 1200 modules/day. 6-person crews
Inverters	Removal by crane and transport via flat-bed to staging location. Assume no disassembly. Assumed salvage value.
Transformers	Removal by crane and transport via flat-bed to staging location. Assume no disassembly. Oil removal performed by scrap facility. Assumed salvage value.
Racking Frame	Stabilize w/ machine. Cut legs and lower to ground level. Cut cross beams to appropriate size and transport via dump truck to staging location. Assumed salvage value.
Racking Posts	Remove via post-puller and transport via dump truck to staging location. Assumed salvage value.
Racking Wiring	Disconnect PV connectors, cut cable ties, and remove wires from cable tray. Transport via dump truck to staging area. Assumed salvage value.
Underground Cable	Excavate to cable depth at one end of trench. Use tractor or backhoe pull out all cables in common trench. Cables are direct buried so complete excavation of trenches is not required. Transport via dump truck to staging area. Assumed salvage value.
Fence	Machine roll fence fabric. Remove posts via post-puller and transport via dump truck to staging location. Assumed salvage value.
Concrete	Remove with excavator and jack hammer. Backfill and compact as needed. Transport via dump truck to staging area. Assumed offsite disposal.
Gravel	Remove with skid steer with sweeper. Transport via dump truck to staging area. Assumed offsite disposal.
Offsite Disposal	Assumed disposal at \$95/ton or \$45/CY including tipping fee.
Re-Seeding	Re-seed using an ATV-pulled drill seeder, at 5lbs bulk seed per acre of native grasses. Stabilize and mulch on areas where concrete or gravel was removed only.
Re-Grading	No bulk re-grading is included as this would alter site hydrology.
Erosion & Sediment Control	Install silt fence around project perimeter. Install tracking control at site entrance and replace once during disassembly. Remove at end of disassembly. We anticipate net soil disturbance is < 1 acre.
Energy Storage System	Assumes a containerized solution w/ up to 5MWh per container. Container has assumed salvage value. Batteries and racks have offsite disposal. Other components addressed as above.

Project: [REDACTED] Solar, LLC

Engineer: [REDACTED]

Client: [REDACTED]

Issue Date: [REDACTED]

Location: [REDACTED]

Revision:

0

GENERATION SUBSTATION ANTICIPATED DISASSEMBLY METHODS	
ITEM	DISASSEMBLY METHOD
Steel Structures	Disassembled, lowered by crane, and transported via flat-bed to staging location. Assumed salvage value.
Circuit Breakers	Removed from pads and transported via flat-bed to staging location. Assumed no salvage value, and no difference in recycling vs. disposal cost.
Power & Instrument Transformers	Removal by crane and transport via flat-bed to staging location. Assume no disassembly or oil removal of small units, oil drained from main power transformer prior to transport. Assumed salvage value.
Disconnect Switches	Removal by crane, disassemble, and transport via flat-bed to staging location. Assumed salvage value for metal components. Insulators assumed no value.
Insulators and Arresters	Removal from supports. Assumed no salvage value.
Primary Conductor	Cut cable and bus pipe at ends and transport to staging location. Assumed salvage value.
Underground Cable	Excavate to cable depth at one end of trench. Use tractor or backhoe remove all cables and conduits in common trench. Transport via dump truck to staging area. Assumed salvage value.
Pre-Fab Steel Buildings	Rough disassembly on site. Assumed salvage value.
Control Panels	Removal of electronic components. Rough disassembly. Assumed salvage value for electronic and metal components.
Fence	Machine roll fence fabric. Remove posts via post-puller and transport via dump truck to staging location. Assumed salvage value.
Concrete	Remove with excavator and jack hammer. Transport via dump truck to staging area. Assumed offsite disposal.
Gravel	Remove with skid steer with sweeper. Transport via dump truck to staging area. Assumed offsite disposal.
Offsite Disposal	Assumed disposal at \$95/ton or \$45/CY including tipping fee.
Re-Seeding & Re-Grading	Re-seed using an ATV-pulled drill seeder, at 3.2lbs per acre of native grasses. Use rough grading machine to lower substation pad to native elevation.

Project: Solar, LLC

Engineer:

Client:

Issue Date:

Location:

Revision: 0

OPINION OF PROBABLE COST - PV PLANT DECOMMISSIONING - 74.97 MW - ANNUAL INFLATION=1.3% - END OF LIFE: YEAR 40

DISASSEMBLY & DISPOSAL

Table with 5 columns: ITEM, DESCRIPTION, QUANTITY, UNIT PRICE, TOTAL. Rows include PV Modules, Inverters, Transformers, ESS, Racking, and Disposal items.

SITE RESTORATION

Table with 5 columns: ITEM, DESCRIPTION, QUANTITY, UNIT PRICE, TOTAL. Rows include Re-Seeding, Re-Grading, and Erosion and Sediment Control.

SALVAGE

Table with 5 columns: ITEM, DESCRIPTION, QUANTITY, UNIT PRICE, TOTAL. Rows include PV Modules, Inverters, Transformers, ESS, Racking, and various interconnection components.

TOTAL DISASSEMBLY, DISPOSAL, & SITE RESTORATION COST \$ 3,075,003.52
TOTAL SALVAGE VALUE \$ 5,688,764.43
NET DECOMMISSIONING COST \$ (2,613,760.91)

[Redacted signature area]

PE
Principal Project Manager

[Redacted signature area]
Date



# Appendix K: Solar Energy Industries Association Model Solar Facility Decommissioning Legislation

## DECOMMISSIONING OF SOLAR ENERGY FACILITIES

Sec.

1. DEFINITIONS.
2. REQUIRED AGREEMENT PROVISIONS ON FACILITY REMOVAL.
3. REQUIRED AGREEMENT PROVISIONS ON FINANCIAL ASSURANCE.
4. REQUIRED DECOMMISSIONING PLAN PROVISIONS.
5. SEPARATE FINANCIAL ASSURANCE NOT REQUIRED.
6. APPLICABILITY.
7. EFFECTIVE DATE.

### § 1. DEFINITIONS.

THE FOLLOWING WORDS AND PHRASES WHEN USED IN THIS CHAPTER SHALL HAVE THE MEANINGS GIVEN TO THEM IN THIS SECTION UNLESS OTHERWISE SPECIFIED:

(a) "SOLAR ENERGY FACILITY AGREEMENT." A LEASE AGREEMENT BETWEEN A GRANTEE AND A SURFACE PROPERTY OWNER THAT AUTHORIZES THE GRANTEE TO OPERATE A SOLAR ENERGY FACILITY ON LEASED PROPERTY.

(b) "SOLAR ENERGY FACILITY." A FACILITY THAT GENERATES OR STORES SOLAR ENERGY, AS DEFINED IN [relevant state law].

(c) "BUSINESS." A CORPORATION, PARTNERSHIP, SOLE PROPRIETORSHIP, LIMITED LIABILITY COMPANY, BUSINESS TRUST OR OTHER COMMERCIAL ENTITY. THE TERM INCLUDES NOT-FOR-PROFIT ORGANIZATIONS.

(d) "COMMENCEMENT OF CONSTRUCTION." THE TIME AT WHICH A GRANTEE, GRANTEE'S AGENT, OR STATE OR LOCAL PERMITTING AUTHORITY ISSUES FINAL AUTHORIZATION TO PROCEED WITH CONSTRUCTION OF A SOLAR ENERGY FACILITY.



(e) "COMMERCIAL IN-SERVICE DATE." THE DATE ON WHICH A SOLAR ENERGY FACILITY BEGINS PRODUCING ELECTRICITY FOR SALE ON A RETAIL OR WHOLESALE BASIS.

(f) "DECOMMISSIONING PLAN." A DOCUMENT ON FILE WITH THE COUNTY RECORDER OF THE COUNTY IN WHICH THE SOLAR ENERGY FACILITY IS SITED DESCRIBING THE PROCESS TO PERMANENTLY REMOVE A SOLAR ENERGY FACILITY FROM SERVICE, AND THE AMOUNT, FORM, AND TIMING OF FINANCIAL ASSURANCE THAT IS TO BE PROVIDED. THE FILING OF A DECOMMISSIONING PLAN DOES NOT OTHERWISE ENCUMBER OR RUN WITH THE SURFACE OWNER'S REAL PROPERTY.

(g) "DEPARTMENT." THE DEPARTMENT OF ENVIRONMENTAL PROTECTION [or like agency] OF THE STATE.

(h) "GRANTEE." THE OWNER OF A SOLAR ENERGY FACILITY ON LEASED PROPERTY.

(i) "PROFESSIONAL ENGINEER." HAS THE MEANING AS DEFINED IN [relevant state law].

## § 2. REQUIRED AGREEMENT PROVISIONS ON FACILITY REMOVAL.

A SOLAR ENERGY FACILITY AGREEMENT EXECUTED AFTER THE EFFECTIVE DATE OF THIS ACT MUST PROVIDE THAT THE GRANTEE IS RESPONSIBLE FOR DECOMMISSIONING THE GRANTEE'S SOLAR ENERGY FACILITY ON THE SURFACE PROPERTY OWNER'S PROPERTY IN ACCORDANCE WITH THIS CHAPTER NO LATER THAN 18 MONTHS AFTER THE FACILITY HAS CEASED PRODUCING ELECTRICITY, EXCEPT FOR INSTANCES WHERE THE GRANTEE IS ACTIVELY WORKING TO RECOMMENCE PRODUCTION OF ELECTRICITY, INCLUDING INSTANCES FOLLOWING THE OCCURRENCE OF A FORCE MAJEURE OR SIMILAR EVENT.

§ 3. REQUIRED AGREEMENT PROVISIONS ON FINANCIAL ASSURANCE.

(a) REQUIREMENT OF FINANCIAL ASSURANCE. THE OWNER OF A SOLAR ENERGY FACILITY WITH A SOLAR ENERGY FACILITY AGREEMENT EXECUTED 12 MONTHS AFTER THE EFFECTIVE DATE OF THIS SECTION, UNLESS BOUND TO A DECOMMISSIONING AGREEMENT WITH FINANCIAL ASSURANCE EXECUTED BEFORE THE EFFECTIVE DATE OF THIS SECTION, MUST PROVIDE A DECOMMISSIONING PLAN AND SUBMIT FINANCIAL ASSURANCE TO THE COUNTY RECORDER OF THE COUNTY IN WHICH THE SOLAR ENERGY FACILITY IS SITED. THE FINANCIAL ASSURANCE MUST CONFORM TO THE REQUIREMENTS OF THIS CHAPTER TO SECURE THE PERFORMANCE OF THE GRANTEE'S OBLIGATION TO DECOMMISSION THE GRANTEE'S SOLAR ENERGY FACILITY.

(b) AMOUNT OF FINANCIAL ASSURANCE. THE AMOUNT OF FINANCIAL ASSURANCE SHALL BE EQUAL TO THE COST OF DECOMMISSIONING THE SOLAR ENERGY FACILITY, LESS THE FACILITY'S SALVAGE VALUE.

(1) DECOMMISSIONING AND SALVAGE VALUE COSTS SHALL BE CALCULATED BY AN INDEPENDENT PROFESSIONAL ENGINEER AT THE EXPENSE OF THE GRANTEE.

(2) THE CALCULATION IN SUBSECTION (b) (1) SHALL BE UPDATED PERIODICALLY, BUT NOT LESS THAN EVERY 10 YEARS. WITHIN SIX MONTHS OF ANY SUCH UPDATE, THE GRANTEE SHALL SUBMIT NEW FINANCIAL ASSURANCE UNDER SECTION 4(d) IF THE CALCULATION DIFFERS FROM THE EXISTING FINANCIAL ASSURANCE AMOUNT. [1]

(c) FORMS OF FINANCIAL ASSURANCE. FINANCIAL ASSURANCE

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<sup>1</sup> Section 3(b) may also include the following optional subsection: "THE COST OF DECOMMISSIONING CALCULATED IN SUBSECTION (b) (1) SHALL BE INCREASED BY 10% TO ENSURE ADEQUATE FINANCIAL ASSURANCE IS PROVIDED OVER THE LIFE OF THE PROJECT, AND WHICH INCREASE SHALL BE REFLECTED IN THE GRANTEE'S FINANCIAL ASSURANCE FILING UNDER SECTION 4(d)."

SHALL BE PROVIDED BY A BOND, A PARENT COMPANY GUARANTY WITH A MINIMUM INVESTMENT GRADE CREDIT RATING FOR THE PARENT COMPANY ISSUED BY A MAJOR DOMESTIC CREDIT RATING AGENCY, OR A LETTER OF CREDIT.

§ 4. REQUIRED DECOMMISSIONING PLAN PROVISIONS.

(a) DEVELOPMENT OF FORM. THE DEPARTMENT SHALL DEVELOP WITHIN 180 DAYS, SUBJECT TO PUBLIC NOTICE AND COMMENT, A TEMPORARY STANDARD FORM FOR THE DECOMMISSIONING PLAN AND FINANCIAL ASSURANCE TO BE FILED WITH THE COUNTY RECORDER OF THE COUNTY IN WHICH THE SOLAR ENERGY FACILITY IS SITED IN ACCORDANCE WITH THIS CHAPTER.

(b) EXPIRATION. THE TEMPORARY STANDARD FORM DEVELOPED UNDER SUBSECTION (a) SHALL EXPIRE UPON THE PROMULGATION OF FINAL STANDARD FORM OR TWO YEARS FOLLOWING THE EFFECTIVE DATE OF THIS SECTION, WHICHEVER IS EARLIER.

(c) CONTENT. THE TEMPORARY AND FINAL STANDARD FORM FOR THE DECOMMISSIONING PLAN AND FINANCIAL ASSURANCE SHALL INCLUDE THE FOLLOWING PROVISIONS:

(1) UNLESS THE SURFACE PROPERTY OWNER AND GRANTEE MUTUALLY AGREE IN WRITING ON AN ALTERNATIVE CONDITION FOR RESTORING THE PROPERTY, THE GRANTEE'S DECOMMISSIONING PLAN SHALL:

(i) REMOVE ALL NON-UTILITY OWNED EQUIPMENT, CONDUITS, STRUCTURES, FENCING, AND FOUNDATIONS TO A DEPTH OF AT LEAST THREE FEET BELOW GRADE. THE GRANTEE SHALL NOT HAVE TO REMOVE EQUIPMENT AND MATERIALS THAT THE PUBLIC UTILITY REQUIRES TO REMAIN ON SITE.

(ii) REMOVE ALL GRAVELED AREAS AND ACCESS ROADS UNLESS THE SURFACE PROPERTY OWNER AGREES OTHERWISE IN WRITING.

(iii) RESTORE THE PROPERTY TO A CONDITION REASONABLY SIMILAR TO ITS CONDITION BEFORE THE COMMENCEMENT OF CONSTRUCTION.

(iv) RE-SEED ANY CLEARED AREAS, UNLESS AGREED IN WRITING BY THE SURFACE PROPERTY OWNER TO NOT RE-SEED.

(2) THE REQUIRED FINANCIAL ASSURANCE AS PROVIDED FOR UNDER SECTION 3.

(d) TIMING. THE GRANTEE SHALL FILE THE DECOMMISSIONING PLAN AND FINANCIAL ASSURANCE IN CONFORMANCE WITH SECTION 3 TO THE COUNTY RECORDER OF THE COUNTY IN WHICH THE SOLAR ENERGY FACILITY IS SITED PRIOR TO THE FIFTEENTH ANNIVERSARY OF THE COMMERCIAL IN-SERVICE DATE OF THE SOLAR ENERGY FACILITY.

#### § 5. APPLICABILITY.

THE REQUIREMENTS UNDER THIS CHAPTER SHALL NOT APPLY TO:

(a) A SOLAR ENERGY FACILITY WITH A NAMEPLATE CAPACITY OF 3 MEGAWATTS AC OR LESS.

(b) A NET-METERED SOLAR ENERGY FACILITY.

(c) THE OWNER OR OPERATOR OF A FARM WHO OWNS AND OPERATES A SOLAR ENERGY GENERATION FACILITY ON THE FARM PREMISES, REGARDLESS OF THE LOCATION OF CONSUMPTION OF THE ENERGY GENERATED THEREFROM.

#### § 6. PREEMPTION.

THE REGULATION OF SOLAR ENERGY FACILITY DECOMMISSIONING IS

A MATTER OF GENERAL STATEWIDE INTEREST THAT REQUIRES UNIFORM STATEWIDE REGULATION, AND THIS CHAPTER AND RULES ADOPTED UNDER IT CONSTITUTE A COMPREHENSIVE PLAN WITH RESPECT TO ALL ASPECTS OF SOLAR ENERGY FACILITY AGREEMENTS, FINANCIAL ASSURANCE, AND DECOMMISSIONING PLANS ASSOCIATED WITH SOLAR ENERGY FACILITIES WITHIN THIS STATE. ANY COUNTY, MUNICIPAL, OR OTHER LOCAL GOVERNMENTAL REGULATION OF MATTERS REGULATED BY THIS CHAPTER, OR THAT MATERIALLY IMPEDE OR FRUSTRATE THE PURPOSE OF THIS CHAPTER, SHALL BE PREEMPTED AND WITHOUT FORCE AND EFFECT.

§ 7. THIS ACT SHALL TAKE EFFECT AS FOLLOWS:

- (a) SECTION 4 SHALL TAKE EFFECT IMMEDIATELY.
- (b) THE REMAINDER OF THE ACT SHALL TAKE EFFECT IN 180 DAYS.

**Appendix L: Summary of Decommissioning Policies**

State	What Document(s) Conveys the Decommissioning Plan, If Any? (and notes about state)	Who Does the State Require Decommissioning Plan Be Provided To?	Who Does the State Require Financial Assurance Be Provided To?	What Document(s) Conveys the Financial Assurance?	Description of Financial Assurances	Types of Assurances Allowed	Decommissioning Oversight Authority and Penalties for Noncompliance
Tennessee	<p>Solar Power Facility Agreement</p> <p>Exemption allowed only if the landowner and the grantee are affiliated entities.</p> <p>Exemption for electrical or communications lines buried more than three feet below the surface grade.</p> <p>(T.C.A. § 66-9-207)</p>	Landowner	Landowner	Solar Power Facility Agreement	<p>(A) No less than five percent (5%) of the decommissioning cost on the date the solar power facility commences commercial operation;</p> <p>(B) No less than fifty percent (50%) of the decommissioning cost on the tenth anniversary of the date the solar power facility commences commercial operation; and</p> <p>(C) No less than the decommissioning cost on the fifteenth anniversary of the date the solar power facility commences commercial operation (T.C.A. § 66-9-207).</p>	<p>(A) A surety bond; (B) A collateral bond; (C) An irrevocable letter of credit; (D) A parent guaranty; (E) Cash; (F) A cashier's check; (G) A certificate of deposit; (H) A bank joint custody receipt; (I) A bank joint custody receipt; (J) An approved negotiated instrument not described in subdivisions (c)(2)(A)-(H); or (K) A combination of the forms of security described in subdivisions (c)(2)(A)-(I). Landowner can waive until 15 year mark (T.C.A. § 66-9-207).</p>	<p>Declaratory Judgments</p> <p>"A person who is harmed by a violation of this section is entitled to relief provided under title 29, chapter 14." (T.C.A. § 66-9-207(f))</p>
California	The Soil Management and Site Restoration Plan (Cal. Code Regs. tit. 14, § 3108).	Local city or county government; Then local city or county government submits the solar use easement application, the soil management and site restoration plan, and financial assurance documents to the California Department of Conservation for final review and approval (Cal. Code Regs. tit. 14 § 3101).	City or county in which the project is located.	Not specified: "It shall be the sole responsibility of the solar-use easement landowner to provide the city or county with sufficient information to demonstrate that the amount of restoration security is adequate to restore the solar-use easement lands in accordance with the approved management plan and the requirements of Government Code section 51191.3(c)."	Amount is based on the costs of site restoration and reclamation, cost of equipment, transportation, and labor necessary for infrastructure removal, liability insurance, contingency amount not to exceed 10% of the costs of site restoration; must be reviewed and resubmitted to the local government for approval every 5 years (Cal. Code Regs. Tit. 14, § 3111).	Performance bond	California Department of Conservation and local city or county government; Forfeiture of financial assurance (Cal. Code Regs. tit. 14 §§ 3111, 3115).
Hawaii	Owners of SEFs must comply with state decommissioning requirements, but no plan is required (Haw. Rev. Stat. § 205-4.5).	State law does not require submittal of a decommissioning plan; local regulations may apply.	Local county planning commission; Then local county planning commission must submit all special use permit application documents, including financial assurance documents, to the Hawaii Land Use Commission (Haw. Rev. Stat. § 205-4.5).	Special Use Permit Application (Haw. Rev. Stat. §§ 205-4.5, 205-6).	Requires financial assurance prior to operation Haw. Rev. Stat. § 205-4.5).	Instrument type is not prescribed by state statute or regulation; local regulations may specify.	Local Planning Commission or the Department of Natural Resources; Fine of up to \$5,000 (Haw. Rev. Stat. §§ 205-12, 205-13).
Illinois	Agricultural Impact Mitigation Agreement (conveys the decommissioning standards); Deconstruction Plan (505 Ill. Comp. Stat. 147/15).	Agricultural Impact Mitigation Agreement to the Department of Agriculture and the landowner; County government (505 Ill. Comp. Stat. 147/15).	County government	Agricultural Impact Mitigation Agreement	The facility owner must submit 10% before the end of the first year of operation, 50% before the end of the sixth year of operation, and 100% before the eleventh year of operation. The financial assurance must be based on the cost estimate as set forth within the decommissioning plan and includes cost estimate, which includes: number of solar panels, racking, and related facilities, original construction costs, size and capacity of the facility, and salvage value of the facility (Illinois Department of Agriculture. 2019. "Standard Agricultural Mitigation Agreement Form.").	Reclamation bond, surety bond, or another financial instrument acceptable to the county with jurisdiction (Illinois Department of Agriculture. 2019. "Standard Agricultural Mitigation Agreement Form.").	Local jurisdiction; Determined by the jurisdiction/variable (505 Ill. Comp. Stat. 147/15).

State	What Document(s) Conveys the Decommissioning Plan, If Any? (and notes about state)	Who Does the State Require Decommissioning Plan Be Provided To?	Who Does the State Require Financial Assurance Be Provided To?	What Document(s) Conveys the Financial Assurance?	Description of Financial Assurances	Types of Assurances Allowed	Decommissioning Oversight Authority and Penalties for Noncompliance
Indiana	Decommissioning and Site Restoration Plan (Ind. Code § 8-1-42-18).  Project assets may remain in place after decommissioning is complete if:(1) the location and condition of the assets conform with local regulations at the time of decommissioning; and(2) the written consent of the landowner is obtained.	The Permit Authority	The Permit Authority	Not specified.	The facility owner must submit 25% of the decommissioning cost not later than the start of the CSE system operation, 50% of the decommissioning costs not later than the 5th anniversary of the start of the CSE operation, and 100% of the decommissioning costs not later than the 10th anniversary of the start of the CSE operation. The financial assurance must be based on the cost estimate set in the decommissioning plan and calculated by a third party licensed or registered engineer or by another person with suitable experience in decommissioning of CSE systems, as agreed upon by the owner and the permit authority (Ind. Code § 8-1-42-18).	Surety bond, parent company guarantee, or an irrevocable letter of credit (Ind. Code § 8-1-42-18).	The Permit Authority; If site is not decommissioned within 1 year of proposed date, permit authority may engage contractors to enter site, remove and sell all CSE assets, and remediate the site; permit authority may also initiate proceedings to recover costs incurred (Ind. Code § 8-1-42-18).
Kentucky	Application to obtain a construction certificate from the Kentucky State Board on Electric Generation and Transmission Siting (Ky. Rev. Stat. § 278.706).	Public Service Commission (Ky. Rev. Stat. § 278.706).	Public Service Commission (Ky. Rev. Stat. § 278.706).	Application to obtain a construction certificate (Ky. Rev. Stat. § 278.706)	The amount of the financial assurance shall be determined by an independent, licensed engineer who is experienced in the decommissioning of solar electric generating facilities and has no financial interest in either the merchant electric generating facility or any parcel of land upon which the merchant electric generating facility is located (Ky. Rev. Stat. § 278.706).	Bond or other similar security (Ky. Rev. Stat. § 278.706).	Energy and Environment Cabinet; Subject to civil penalties not to exceed \$2,500 per day; the secretary of the Cabinet can draw upon the decommissioning bond and implement the decommissioning plan if the facility fails to complete the plan within 18 months of the facility ceasing to produce electricity (Ky. Rev. Stat. §§ 224.10-100(30), -285, 224.99-010).
Louisiana	Alternative Energy Source Lease: Decommissioning Application.  If any archaeological resource is discovered while conducting decommissioning activities, bottom-disturbing activities within 1,000 feet of the discovery shall immediately cease (La. Admin. Code tit. 43 § V.962).	Louisiana Department of Natural Resources (La. Admin. Code tit.43 § V.901).	Louisiana Department of Natural Resources	Alternative Energy Source Lease: Decommissioning Application	The Louisiana Department of Natural Resources determines the amount, which can be no less than \$500,000, and it may base the amount on the estimated costs of decommissioning, past due rent and payments incurred by the owner, any other monetary obligations, including insurance that the owner is required to maintain for the duration of the Alternative Energy Source Lease (La. Admin. Code tit. 43: V, §§ 953, 955).	Bond (La. Admin. Code tit. 43 § V.953)	Louisiana Department of Natural Resources; Forfeiture of financial assurance; Owner liability for facility removal and costs; Civil penalty up to \$300/day (La. Admin. Code tit. 43:V, § 969).
Maine	Not specified	Department of Environmental Protection or Maine Land Use Planning Commission (Me. Rev. Stat. tit. 35-A, §§ 3491, 3495)	Department of Environmental Protection or Maine Land Use Planning Commission	The Decommissioning Plan (Me. Rev. Stat. tit. 35-A, § 3495).	Requires financial assurance prior to approval of the decommissioning plan. Financial assurance is required to be updated 15 years after approval of the plan and no less frequently than every 5 years thereafter (Me. Rev. Stat. tit. 35-A, § 3495).	Performance bond, surety bond, irrevocable letter of credit, or other form of financial assurance acceptable to the Department of Environmental Protection or Maine Land Use Planning Commission, for the total cost of decommissioning (Me. Rev. Stat. tit. 35-A, § 3495).	Department of Environmental Protection or Maine Land Use Planning Commission (Me. Rev. Stat. tit. 35-A, § 3496); Penalties vary on which authority issues the permit.

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Minnesota	Site Permit Application (Minn. R. 7854.0500).	Minnesota Public Utilities Commission (Minn. Stat. Ann. § 216E.03)	Minnesota Public Utilities Commission	Site Permit Application (Minn. R. 7854.0500).	Requires financial assurance prior to issuance of the site license (Minn. R. 7854.0500).	Not specified	Minnesota Public Utilities Commission; Civil action to compel performance; Civil penalty of up to \$10,000/day (Minn. Stat. § 216E.17).
Montana	Not specified  Decommissioning activities must commence within 90 days after abandonment, unless the owner receives department approval of an alternative written plan for decommissioning (Mont. Admin. R. 17.86.102).	Montana Department of Environmental Quality (Mont. Admin. R. 17.86.102)	Montana Department of Environmental Quality (Mont. Admin. R. 17.86.115).	The Decommissioning Plan (Mont. Admin. R. 17.86.105).	Any time prior to the 15th year of operation; The Montana Department of Environmental Quality (DEQ) determines the amount, and may base the amount on the cost estimate submitted by the owner, the character and nature of the site, costs of managing, maintaining, and/or decommissioning the facility in the event of owner abandonment, and the current salvage value of the facility infrastructure. It is reviewed by the DEQ every 5 years (Mont. Admin. R. 17.86.102, 106, 115).	Surety bond or collateral bond (Mont. Admin. R. 17.86.115).	Montana Department of Environmental Quality; Civil penalty of up to \$1,500/day (Mont. Admin. R. 17.86.110; 75-26-304).
Nebraska	The state does not set any requirements for decommissioning plans. Instead, the statutes delegate the authority to the local governments which may prescribe decommissioning plans (Neb. Rev. Stat. Ann § 66-911.01).	Local jurisdictions (Office of the Register of Deeds) (Neb. Rev. Stat. Ann § 66-911.01).	Local jurisdictions (Office of the Register of Deeds) (Neb. Rev. Stat. Ann § 66-911.01).	The state does not set any requirements financial assurance. Instead, the statutes delegate the authority to the local governments which may prescribe financial assurance requirements (Neb. Rev. Stat. Ann § 66-911.01).	State law mandates compliance with local financial assurance requirements; The solar facility owner must describe any financial assurance instrument required by the local government where the facility is located as a condition of a solar agreement (Neb. Rev. Stat. § 66.911-01).	Not specified	Local jurisdiction; Determined by the jurisdiction/variable (Neb. Rev. Stat. § 66.911-01).
New Hampshire	Certificate for An Energy Facility Application (N.H. Rev. Stat. Ann. § 162-H:7).	New Hampshire Site Evaluation Committee (N.H. Rev. Stat. Ann. § 162-H:7).	New Hampshire Site Evaluation Committee (N.H. Rev. Stat. Ann. § 162-H:7).	Certificate for An Energy Facility Application (N.H. Rev. Stat. Ann. § 162-H:7)	Requires financial assurance prior to issuance of the site license and project construction (N.H. Admin. R. Site 301.08(d)(2)).	Letter of credit, performance bond, surety bond, or guarantee (N.H. Admin. R. Site 301.08(d)(2)).	New Hampshire Site Evaluation Committee; Revocation or suspension of Certificate of Site and Facility Application; Civil penalty of up to \$10,000/day or criminal charges (N.H. Rev. Stat. Ann. §§ 162-H-12, -19).
New Jersey	Conservation Site Plan and/or Landscaping or Revegetation Plan (N.J. Admin. Code § 2:76-2A.12).	New Jersey State Agriculture Development Committee or New Jersey Pinelands Commission (N.J. Admin. Code § 2:76-2A.12).	New Jersey does not require proof of financial assurance at a state level for solar facility decommissioning, but localities may impose financial assurance requirements (N.J. Admin. Code §§ 2:76-2A.12, 7:50-5.36).	Not specified	N/A	N/A	State Agriculture Development Committee or Pinelands Commission; Civil action (N.J. Admin Code §§ 2:76-2A.12, 7:50-8.1).
North Dakota	Not specified  The commission may waive a decommissioning requirement upon receipt of a request signed by the applicable landowner and finding good cause that the requirement be waived (N.D. Admin. Code § 69-09-10-05).	North Dakota Public Service Commission (N.D. Admin. Code § 69-09-10-06).	North Dakota Public Service Commission (N.D. Admin. Code §§ 69-09-10-01, -06).	The Decommissioning Plan (N.D. Admin. Code 69-09-10-01).	The facility owner must issue the first installment prior to construction. The owner must also issue the second installment after construction is complete but prior to facility operation. When the second installment is received, the first installment is returned. The first installment must be in an amount equal to 5% of the estimated costs of construction. The second installment must be enough to cover the costs of decommissioning (N.D. Admin. Code § 69-09-10-08).	Letter of credit, performance bond, surety bond, guarantee, cash escrow, or incremental bond schedule (N.D. Admin. Code 69-09-10-08).	North Dakota Public Service Commission; Forfeiture of financial assurance (N.D. Admin. Code § 69-09-10-09).



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Ohio	Not specified	Ohio Power Siting Board (Ohio Rev. Code Ann. § 4906.21).	Ohio Power Siting Board (Ohio Rev. Code Ann. § 4906.22).	Not specified	Requires financial assurance prior to beginning construction. The performance bond shall be equal to the estimate of the costs of decommissioning included in the decommissioning plan and shall be updated every five years (Ohio Rev. Code § 4906.221, 222).	Performance bond (Ohio Rev. Code Ann. § 4906.22).	Ohio Public Utilities Commission; Fine of not less than \$1,000 nor more than \$10,000 for each day of violation, or imprisoned for not more than 1 year, or both (Ohio Rev. Code Ann. § 4906.99).
Oklahoma	Solar Energy Agreement (Okla. Stat. tit. 60, § 820.1).	Local jurisdiction (Okla. Stat. tit. 60, § 820.1).	Local jurisdiction (Okla. Stat. tit. 60, § 820.1).	Solar Energy Agreement (Okla. Stat. tit. 60, § 820.1).	State law mandates compliance with local financial assurance requirements; The solar facility owner must describe any financial assurance instrument required by the local government where the facility is located as a condition of a solar agreement (Okla. Stat. tit. 60, § 820.1).	Not specified	Local jurisdiction; Determined by the jurisdiction/variable (Okla. Stat. tit. 60, § 820.1).
South Dakota	Not specified (S.D. Admin. R. 20:10:22:33.01) The commission may waive compliance with and provisions of this chapter if the utility or applicant demonstrates that an immediate, urgent need for a facility exists, and that the utility or applicant did not know that a need for the facility existed sufficiently in advance to fully comply with the provisions of this chapter. The commission may also waive compliance with any provisions of this chapter upon notice that a facility has been damaged or destroyed as a result of a natural disaster, or as a civil disorder, and there exists a need for construction of a new facility, or the relation of a previously existing facility or associated facility, in order to promote the public health, safety or welfare (S.D. Codified Laws § 49-41B-23).	S.D. Public Utilities Commission (S.D. Admin. R. 20:10:22:04).	S.D. Public Utilities Commission (S.D. Codified Laws § 49-41B-39).	Financial Security Agreement (S.D. Codified Laws § 49-41B-39).	The commission may require a bond, guarantee, insurance, or other requirement to provide funding for the decommissioning and removal of a solar energy facility. The commission shall consider the size of the facility, the location of the facility, and the financial condition of the applicant when determining whether to require some type of funding (S.D. Admin. R. 20:10:22:33.01).	Bond, guarantee, insurance, or other requirement to provide funding for the decommissioning and removal of a solar energy facility. The commission may not require any financial security from an owner of solar energy facilities who is also a public utility (S.D. Admin. R. 20:10:22:33.01; S.D. Codified Laws § 49-41B-39).	Public Utilities Commission; Class 1 misdemeanor and subject to civil penalty of \$10,000 (S.D. Codified Laws § 49-41B-34).
Texas	Solar Power Facility Agreement (Tex. Util. Code § 302.0004).	Landowner (Tex. Util. Code § 302.0004).	Landowner (Tex. Util. Code § 302.0005).	Solar Power Facility Agreement (Tex. Util. Code § 302.0005).	Grantee must deliver to the landowner an updated estimate, prepared by an independent, third-party professional engineer licensed in the state, of the cost of removal and the salvage value on or before the 10th anniversary of the commercial operations date of the solar power facilities and at least once every five years after the commercial operations date of the solar power facilities for the remainder of the term of the agreement and ensuring that the amount of the financial assurance remains sufficient to cover the amount required. (Tex. Util. Code § 302.0005).	Parent company guaranty with a minimum investment grade credit rating for the parent company issued by a major domestic credit rating agency, a letter of credit, a bond, or another form of financial assurance reasonably acceptable to the landowner (Tex. Util. Code § 302.0005).	Decommissioning oversight authority not specified  Injunctive relief to prevent further violations (Tex. Util. Code § 302.0003).

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Vermont	Certificate of Public Good (Vt. PUC Rule 5.906).	Vermont Public Utility Commission (Vt. PUC Rule 5.906).	Vermont Public Utility Commission (Vt. PUC Rule 5.906).	Certificate of Public Good (Vt. PUC Rule 5.906).	Requires financial assurance prior to issuance of the Certificate for Public Good and project construction; Must cover the costs of decommissioning and site restoration as set forth in the cost estimate submitted by the owner; Must be adjusted every 3 years to account for inflation (Vt. PUC Rule 5.904).	Letter of credit (Vt. PUC Rule 5.906).	Vermont Public Utility Commission; Civil penalty of up to \$100; Imprisonment up to 60 days (30 V.S.A. § 247).
Virginia	Site Plan and Written Agreement (Va. Code Ann. § 15.2-2241.2).	Local jurisdiction (Va. Code Ann. § 15.2-2241.2).	Local jurisdiction (Va. Code Ann. § 15.2-2241.2).	Site Plan and Written Agreement (Va. Code Ann. § 15.2-2241.2).	Requires financial assurance prior to construction; The financial assurance must be based on the cost estimate as set forth within the decommissioning plan (Va. Code Ann. §15.2-2241.2).	Bond, letter of credit, guarantee, certified fund, or cash escrow (Va. Code Ann. § 15.2-2241.2).	Local jurisdiction; Local jurisdictional entity may enter property without consent and begin decommissioning (Va. Code Ann. §15.2-2241.2).
Washington	Site Restoration Plan (Wash. Admin. Code § 463-72-040).	Energy Facility Site Evaluation Council (Wash. Admin. Code § 463-72-030).	Energy Facility Site Evaluation Council (Wash. Admin. Code § 463-72-030).	Site Restoration Plan (Wash. Admin. Code § 463-72-020).	Proof of financial security that is sufficient to manage the restoration of the site and that includes evidence of pollution liability insurance coverage and provides justifications for the amounts of the financial securities as proof that they will be sufficient to fund decommissioning and site restoration (Wash. Admin. Code § 463-72-040).	Site closure bond, sinking fund, or other financial instrument or security (Wash. Admin. Code § 463-72-040).	State of Washington Energy Facility Site Evaluation Council; Penalties of \$1,000-\$25,000 per day (Wash. Rev. Code § 80.50.150).
West Virginia	Not specified (W. Va. Code § 22-32-4).	Department of Environmental Protection (W. Va. Code § 22-32-4).	Department of Environmental Protection (W. Va. Code § 22-32-4).	The Decommissioning Agreement (W. Va. Code § 22-32-8).	To determine the bond amount, the DEP shall take into account the report submitted with an application and assess a bond value based upon the total disturbed acreage of land upon which the wind generation or solar generation facility is operated, less salvage value: Provided, That the amount of the bond required shall not exceed the total projected future cost of decommissioning, less salvage value (W. Va. Code § 22-32-4).	A surety bond or any other arrangement, including but not limited to letters of credit and escrow accounts payable to the State of West Virginia in a form acceptable by the DEP (W. Va. Code §§ 22-32-3, -4).	Department of Environmental Protection; Forfeited bond; DEP may take any necessary actions to decommission the facility; DEP may file suit to enforce the permit conditions, plans, and agreements to recoup the cost of decommissioning and reclamation in the circuit court of the county in which the facility is located (W. Va. Code § 22-32-6).
Wyoming	Waste Management Plan of the Permit Application (Wyo. Stat. §§ 18-5-502, -503)	County board of commissioners (Wyo. Stat. Ann. § 18-5-503).	Wyoming does not require proof of financial assurance for energy facility decommissioning; local regulations may apply	Not specified	N/A	N/A	County board of commissioners; Fine of up to \$10,000/day (Wyo. Stat. Ann. § 18-5-512).

## Appendix M. Financial Incentives for Solar Development

Program	Federal/ State/ Private	Agency/ Entity	Utility Scale or Small Scale	Incentive	Eligible Entities	Source
Green Energy Property Tax Assessment	State	Tennessee Comptroller of the Treasury and Tennessee Department of Environment and Conservation	Both	<ul style="list-style-type: none"> <li>- Property tax reduction</li> <li>- Solar facilities certified as green energy production facilities by Tennessee Department of Environment and Conservation are assessed at 12.5% of their installed costs</li> </ul>	Individuals, for-profit businesses, nonprofits	<p>Tennessee Code Annotated, Section 67-5-601</p> <p><a href="https://programs.dsireusa.org/system/program/detail/5216/green-energy-property-tax-assessment">https://programs.dsireusa.org/system/program/detail/5216/green-energy-property-tax-assessment</a></p>
Greenhouse Gas Reduction Fund Section 134(a)(1) - Zero-Emissions Technologies Grant Program (Solar for All)	Federal	US Environmental Protection Agency	Both	<ul style="list-style-type: none"> <li>- Grants</li> <li>- Funding for deployment of residential and community solar facilities and energy storage in low-income and disadvantaged communities</li> <li>- \$7 billion available for up to 60 grants</li> </ul>	States, tribal governments, municipalities, and nonprofits	<p><a href="https://sam.gov/fal/cffd228dd8a34254b68d497672a5235e/view">https://sam.gov/fal/cffd228dd8a34254b68d497672a5235e/view</a></p> <p><a href="https://www.epa.gov/greenhouse-gas-reduction-fund/about-greenhouse-gas-reduction-fund">https://www.epa.gov/greenhouse-gas-reduction-fund/about-greenhouse-gas-reduction-fund</a></p>
High Energy Cost Grant Program*  *Not currently accepting new applicants	Federal	US Department of Agriculture Rural Development Rural Utilities Service	Both	<ul style="list-style-type: none"> <li>- Grants</li> <li>- For projects that acquire, construct, extend, repair, upgrade, or otherwise improve facilities serving communities in which the average home energy costs exceed 275% of the national average under one or more high energy cost benchmarks published in grant announcement</li> <li>- Application window currently closed</li> </ul>	Individuals, for-profit businesses, federally-recognized tribes and tribal entities, nonprofits, and governments	<p><a href="https://www.rd.usda.gov/programs-services/electric-programs/high-energy-cost-grants">https://www.rd.usda.gov/programs-services/electric-programs/high-energy-cost-grants</a></p> <p><a href="https://programs.dsireusa.org/system/program/detail/4359/usda-high-energy-cost-grant-program">https://programs.dsireusa.org/system/program/detail/4359/usda-high-energy-cost-grant-program</a></p> <p><a href="https://www.ecfr.gov/current/title-7/subtitle-B/chapter-XVII/part-1709?toc=1">https://www.ecfr.gov/current/title-7/subtitle-B/chapter-XVII/part-1709?toc=1</a></p>

Program	Federal/ State/ Private	Agency/ Entity	Utility Scale or Small Scale	Incentive	Eligible Entities	Source
Powering Affordable Clean Energy (PACE) Program	Federal	US Department of Agriculture	Both	<ul style="list-style-type: none"> <li>- Loans and loan forgiveness</li> <li>- Loans can be used for solar, as well as wind, hydro, geothermal, biomass, or other renewables</li> <li>- Loan forgiveness ranges from 20% to 60% of loan depending on the characteristics of community served</li> <li>- Maximum loan \$100 million</li> <li>- Minimum loan \$1 million</li> <li>- Application window closes September 29, 2023</li> </ul>	For-profit businesses, nonprofits, and governments	<p><a href="https://www.rd.usda.gov/programs-services/electric-programs/powering-affordable-clean-energy-pace-program">https://www.rd.usda.gov/programs-services/electric-programs/powering-affordable-clean-energy-pace-program</a></p> <p><a href="https://www.usda.gov/media/press-releases/2023/05/16/biden-harris-administration-makes-historic-11-billion-investment">https://www.usda.gov/media/press-releases/2023/05/16/biden-harris-administration-makes-historic-11-billion-investment</a></p>
Renewable Energy Production Tax Credit (PTC)	Federal	US Internal Revenue Service and US Department of Energy	Both	<ul style="list-style-type: none"> <li>- Tax credit against federal income taxes*</li> <li>- Small credits—cents per kilowatt-hour produced during first 10 years facility in operation based on worker wages, use of US-made inputs (e.g. steel), size of facility, and location (e.g. low-income community, brownfield, or former coal mine)</li> <li>- Facility also eligible for accelerated depreciation</li> </ul> <p>*Tax-exempt entities—including electric cooperatives, other nonprofits, governments, and TVA—eligible to receive direct payments equal to the amount of credit otherwise available to for-profit entities.</p>	For-profit businesses, nonprofits, and governments	<p><a href="https://www.energy.gov/eere/solar/federal-solar-tax-credits-businesses">https://www.energy.gov/eere/solar/federal-solar-tax-credits-businesses</a></p>

Program	Federal/ State/ Private	Agency/ Entity	Utility Scale or Small Scale	Incentive	Eligible Entities	Source
Rural Energy for America Program: Renewable Energy Systems & Energy Efficiency Improvement Guaranteed Loans & Grants	Federal	US Department of Agriculture Rural Development	Both	<ul style="list-style-type: none"> <li>- Grants and loan guarantees</li> <li>- Grants for up to 50% of eligible project costs, \$1,500 minimum and \$1 million maximum</li> <li>- Loan guarantees for up to 75% of eligible project costs</li> <li>- Combined grant and loan guarantee funding up to 75% of total eligible project costs</li> </ul>	Agricultural operations with at least 50% of gross income coming from agricultural operations and small businesses in rural areas	<p><a href="https://www.rd.usda.gov/programs-services/energy-programs/rural-energy-america-program-renewable-energy-systems-energy-efficiency-improvement-guaranteed-loans#overview">https://www.rd.usda.gov/programs-services/energy-programs/rural-energy-america-program-renewable-energy-systems-energy-efficiency-improvement-guaranteed-loans#overview</a></p> <p><a href="https://programs.dsireusa.org/system/program/detail/917/usda-rural-energy-for-america-program-reap-grants">https://programs.dsireusa.org/system/program/detail/917/usda-rural-energy-for-america-program-reap-grants</a></p> <p><a href="https://programs.dsireusa.org/system/program/detail/2511/usda-rural-energy-for-america-program-reap-loan-guarantees">https://programs.dsireusa.org/system/program/detail/2511/usda-rural-energy-for-america-program-reap-loan-guarantees</a></p>
Sales Tax Credit for Clean Energy Technology	State	Tennessee Department of Revenue and Tennessee Department of Environment and Conservation	Both	<ul style="list-style-type: none"> <li>- Tax credit, refund, or exemption</li> <li>- Credit, refund, or exemption equal to 100% of the sales and use tax owed for purchases of machinery and equipment for facilities certified as green energy production facilities by Tennessee Department of Environment and Conservation</li> <li>- Whether to apply for credit, refund, or authority to make tax exempt purchases is at purchaser's discretion</li> </ul>	Individuals, for-profit businesses, nonprofits, governments	<p><a href="https://programs.dsireusa.org/system/program/detail/4919/sales-tax-credit-for-clean-energy-technology">https://programs.dsireusa.org/system/program/detail/4919/sales-tax-credit-for-clean-energy-technology</a></p> <p>Tennessee Code Annotated, Section 67-6-346</p> <p><a href="https://www.tn.gov/environment/program-areas/opsp-policy-and-sustainable-practices/certifications/opsp-certified-green-energy-production-facilities.html">https://www.tn.gov/environment/program-areas/opsp-policy-and-sustainable-practices/certifications/opsp-certified-green-energy-production-facilities.html</a></p> <p><a href="https://www.tn.gov/content/dam/tn/revenue/documents/tax_manuals/march-2023/Sales-Use-Tax.pdf">https://www.tn.gov/content/dam/tn/revenue/documents/tax_manuals/march-2023/Sales-Use-Tax.pdf</a></p>

Program	Federal/ State/ Private	Agency/ Entity	Utility Scale or Small Scale	Incentive	Eligible Entities	Source
Tennessee Solar Access Law of 1979	State	Tennessee State Government	Both	<ul style="list-style-type: none"> <li>- Easement—a nonpossessory right to use and/or enter onto the real property of another without possessing it</li> <li>- Authorizes property owners to negotiate and establish easements with neighboring property owners to ensure access to sunlight for solar facilities</li> </ul>	Individuals, for-profit businesses, nonprofits, governments	<p>Tennessee Code Annotated, Section 66-9-201 et seq.</p> <p><a href="https://programs.dsireusa.org/system/program/detail/18/tennessee-solar-easement-and-access-laws">https://programs.dsireusa.org/system/program/detail/18/tennessee-solar-easement-and-access-laws</a></p>
US Department of Energy Loan Guarantee	Federal	US Internal Revenue Service and US Department of Energy	Both	<ul style="list-style-type: none"> <li>- Loans and loan guarantees for deploying innovative clean energy technologies at commercial scale (Innovative Energy).</li> </ul>	For-profit businesses, nonprofits, and governments	<p><a href="https://www.energy.gov/lpo/innovative-clean-energy-loan-guarantees">https://www.energy.gov/lpo/innovative-clean-energy-loan-guarantees</a></p> <p><a href="https://www.energy.gov/lpo/articles/innovative-clean-energy-loan-guarantee-solicitation-current">https://www.energy.gov/lpo/articles/innovative-clean-energy-loan-guarantee-solicitation-current</a></p> <p><a href="https://www.energy.gov/lpo/articles/title-17-lending-reference-guide">https://www.energy.gov/lpo/articles/title-17-lending-reference-guide</a></p>
Energy Efficiency Loans	Private	Pathway Lending	Small Scale	<ul style="list-style-type: none"> <li>- Loans for the implementation of renewable energy projects.</li> <li>- For businesses (for-profit and nonprofit): 4% interest rate for 5 years, 6% rate for 10 years</li> <li>- For governments: 4% interest rate for 6 years</li> </ul>	For-profit businesses, nonprofits, governments	<p><a href="https://www.pathwaylending.org/energy-efficiency-loans/">https://www.pathwaylending.org/energy-efficiency-loans/</a></p>

Program	Federal/ State/ Private	Agency/ Entity	Utility Scale or Small Scale	Incentive	Eligible Entities	Source
Energy Efficient Mortgages	Federal	Federal Housing Authority	Small Scale	<ul style="list-style-type: none"> <li>- Financing</li> <li>- Loans insured by the Federal Housing Authority (FHA)</li> <li>- Loan amounts added to regular FHA mortgage</li> <li>- Maximum loan the lesser of (1) the cost of facility or (2) the lesser of 5% of (a) the home's adjusted value, (b) 115% of median single-family home price for area, or (c) 150% of national conforming mortgage limit</li> </ul>	Homeowners and homebuyers	<p><a href="https://www.energystar.gov/newhomes/mortgage_lending_programs/energy_efficient_mortgages">https://www.energystar.gov/newhomes/mortgage_lending_programs/energy_efficient_mortgages</a></p> <p><a href="https://programs.dsireusa.org/system/program/detail/742/energy-efficient-mortgages">https://programs.dsireusa.org/system/program/detail/742/energy-efficient-mortgages</a></p>
Energy Efficient Mortgages	Federal	US Department of Veterans Affairs	Small Scale	<ul style="list-style-type: none"> <li>- Financing</li> <li>- Loans insured by Veterans Affairs (VA)</li> <li>- Maximum loan varies: (1) max is \$3,000 if request based solely on documented costs; (2) max is \$6,000 if projected energy savings exceed increase in mortgage payments; (3) VA at its discretion may increase these amounts</li> </ul>	Qualified military personnel, reservists, and veterans	<p><a href="https://programs.dsireusa.org/system/program/detail/742/energy-efficient-mortgages">https://programs.dsireusa.org/system/program/detail/742/energy-efficient-mortgages</a></p> <p><a href="https://www.energystar.gov/sites/default/files/asset/document/VA_Pamphlet_26-7Revised.pdf">https://www.energystar.gov/sites/default/files/asset/document/VA_Pamphlet_26-7Revised.pdf</a></p>
Federal Investment Tax Credit for Residential Solar Photovoltaics (PV)	Federal	US Internal Revenue Service	Small Scale	<ul style="list-style-type: none"> <li>- Tax credit against federal income taxes; project needs to be created in tax year to be eligible for credit for that year</li> <li>- Credit ranges from 22% to 30% of investment based on what year solar facility was put in service</li> <li>- Program set to expire in 2035</li> </ul>	Individuals	<p><a href="https://www.energy.gov/eere/solar/homeowners-guide-federal-tax-credit-solar-photovoltaics">https://www.energy.gov/eere/solar/homeowners-guide-federal-tax-credit-solar-photovoltaics</a></p>

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Green Rewards	Federal	Fannie Mae	Small Scale	<ul style="list-style-type: none"> <li>- Financing</li> <li>- According to DSIRE "provides preferential pricing and up to an additional 5% of loan proceeds by including up to 75% of projected owner energy and water savings and 25% of projected tenant savings in the loan underwriting"</li> </ul>	Multifamily properties	<a href="https://multifamily.fanniemae.com/financing-options/specialty-financing/green-rewards">https://multifamily.fanniemae.com/financing-options/specialty-financing/green-rewards</a>
HomeStyle Energy Mortgage	Federal	Fannie Mae	Small Scale	<ul style="list-style-type: none"> <li>- Financing</li> <li>- Can borrow up to 15% of home's appraised value</li> <li>- Appraised value is based on future value once project completed</li> </ul>	Homebuyers	<a href="https://www.knowyouroptions.com/buy-overview/affordable-mortgage-options/homestyle-energy-mortgage">https://www.knowyouroptions.com/buy-overview/affordable-mortgage-options/homestyle-energy-mortgage</a> <a href="https://www.energystar.gov/newhomes/mortgage_lending_programs/energy_efficient_mortgages">https://www.energystar.gov/newhomes/mortgage_lending_programs/energy_efficient_mortgages</a> <a href="https://programs.dsireusa.org/system/program/detail/742/energy-efficient-mortgages">https://programs.dsireusa.org/system/program/detail/742/energy-efficient-mortgages</a>
Residential Energy Conservation Subsidy Exclusion	Federal	US Internal Revenue Service	Small Scale	<ul style="list-style-type: none"> <li>- Income deduction on federal income taxes</li> <li>- Subsidies provided directly or indirectly by utilities for purchase and installation of solar facility for a house, apartment, condominium, mobile home, boat, or similar property can be excluded from gross income</li> </ul>	Individuals and corporations	<a href="https://www.irs.gov/publications/p525#en_US_2022_publink1000229515">https://www.irs.gov/publications/p525#en_US_2022_publink1000229515</a> <a href="https://programs.dsireusa.org/system/program/detail/666/residential-energy-conservation-subsidy-exclusion-personal">https://programs.dsireusa.org/system/program/detail/666/residential-energy-conservation-subsidy-exclusion-personal</a>



Program	Federal/ State/ Private	Agency/ Entity	Utility Scale or Small Scale	Incentive	Eligible Entities	Source
Business Energy Investment Tax Credit (ITC)	Federal	US Internal Revenue Service	Utility Scale	<ul style="list-style-type: none"> <li>- Tax credit against federal income taxes*</li> <li>- Credit ranges from 6% to 80% of investment based on worker wages, use of US-made inputs (e.g. steel), size of facility, and location (e.g. low-income community, brownfield, or former coal mine)</li> <li>- Facility also eligible for accelerated depreciation</li> </ul> <p>*Tax-exempt entities—including electric cooperatives, other nonprofits, governments, and TVA—eligible to receive direct payments equal to the amount of credit otherwise available to for-profit entities</p>	For-profit businesses, nonprofits, and governments	<a href="https://www.energy.gov/eere/solar/federal-solar-tax-credits-businesses">https://www.energy.gov/eere/solar/federal-solar-tax-credits-businesses</a>

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Program	Federal/ State/ Private	Agency/ Entity	Utility Scale or Small Scale	Incentive	Eligible Entities	Source
Empowering Rural America (New ERA) Program	Federal	US Department of Agriculture	Utility Scale	<ul style="list-style-type: none"> <li>- Grants and loans</li> <li>- Funding can be used to purchase, build, or deploy renewable energy, as well as several other uses, including efficiency improvements, zero-emission systems, and carbon capture systems</li> <li>- Grant awarded for no more than 25% of project costs</li> <li>- Loan rates set either at US Treasury rate or as low as 2%</li> <li>- Can refinance existing loans of stranded assets if savings are used to finance eligible projects</li> <li>- Grant and loan combinations are acceptable</li> <li>- No single awardee may receive more than \$970 million</li> </ul>	Electric cooperatives (including their subsidiaries) that serve predominantly rural areas, existing or former USDA Rural Utilities Service borrowers, and former Rural Electrification Administration borrowers	<p><a href="https://www.rd.usda.gov/programs-services/electric-programs/empowering-rural-america-new-era-program">https://www.rd.usda.gov/programs-services/electric-programs/empowering-rural-america-new-era-program</a></p> <p><a href="https://www.usda.gov/media/press-releases/2023/05/16/biden-harris-administration-makes-historic-11-billion-investment">https://www.usda.gov/media/press-releases/2023/05/16/biden-harris-administration-makes-historic-11-billion-investment</a></p>
Modified Accelerated Cost Recovery System	Federal	US Internal Revenue Service	Utility Scale	<ul style="list-style-type: none"> <li>- Income deduction on federal income taxes</li> <li>- Allows businesses to recover investments through depreciation deductions on federal income taxes</li> <li>- Solar facilities depreciated on five-year schedule</li> </ul>	For-profit businesses	<p><a href="https://www.irs.gov/pub/irs-pdf/p946.pdf">https://www.irs.gov/pub/irs-pdf/p946.pdf</a></p> <p><a href="https://programs.dsireusa.org/system/program/detail/676/modified-accelerated-cost-recovery-system-macrs">https://programs.dsireusa.org/system/program/detail/676/modified-accelerated-cost-recovery-system-macrs</a></p>