ORDINANCE
OF
THE FISCAL COURT OF BOURBON COUNTY
COMMONWEALTH OF KENTUCKY

ORDINANCE NO. ________________

AN ORDINANCE AMENDING THE TEXT OF THE BOURBON COUNTY PLANNING AND ZONING ORDINANCE, ARTICLE VI, SECTION 6.3 UTILITY SCALE SOLAR ENERGY POWER GENERATING SYSTEMS

WHEREAS, the Fiscal Court of the County of Bourbon deems it appropriate and necessary for the health, safety and general welfare of the Citizens of Bourbon County to Amend the Bourbon County Planning and Zoning Ordinance, Article 6, to create Section 6.3 Solar Farms; and

WHEREAS, the Fiscal Court of the County of Bourbon, recognizes that significance of agriculture and agricultural land in the Commonwealth of Kentucky and in the County of Bourbon and believes that this text amendment furthers the purposes as provided for in KRS 247.801, KRS 100 and the Bourbon County Comprehensive Plan.

NOW THEREFORE:

BE IT ORDAINED by the Fiscal Court, County of Bourbon, Commonwealth of Kentucky as follows:

Zoning Ordinance for Bourbon County, Kentucky

Title: Zoning Ordinance Amendment – Regulation of Utility Scale Solar Energy Power Generation Systems (SEPGS) in Agricultural Districts.

Section 1: Purpose

The purpose of this ordinance is to regulate land use in Bourbon County, Kentucky, to protect its prime agricultural soils, support its agricultural economy, and preserve the county's environmental, scenic, and cultural resources. This ordinance is intended to ensure that utility-scale SEPGS do not compromise the county's farmland of prime importance, which is vital to both the local agricultural industry and broader economic interests such as equine farming.

Section 2: Definitions

Solar Farm: Any facility or installation primarily designed to generate electricity through solar photovoltaic systems, where the electricity produced is intended for commercial distribution or sale.

Prime Agricultural Soils: Lands defined by the U.S. Department of Agriculture and recognized in Bourbon County's land use planning as highly fertile and critical for agricultural production.

Section 3: Prohibition of Solar Farms in Agricultural Districts

1. Effective immediately, the establishment, construction, or operation of SEPGS within agricultural districts in Bourbon County, Kentucky, is hereby prohibited.
2. For the purpose of this ordinance, a SEPGS is defined as any facility or installation consisting of solar panels, arrays, or other solar energy collection devices, whether ground-mounted or roof-mounted, for the primary purpose of generating electricity for commercial sale or distribution.

Section 4: Exemptions

1. The development of utility-scale SEPGS on land designated as prime agricultural soils, farmland of statewide importance, and land within a 1-mile radius of designated rural historic districts in Bourbon County is hereby prohibited. These areas include:
2. Prime Agricultural Soils: Approximately 90,500 acres.
3. Farmland of Statewide Importance**: Approximately 68,700 acres.
4. Within a 1-mile radius of designated Rural Historic Districts**: Approximately 42,420 acres.

5. This ordinance shall not apply to:
    a. Residential solar energy systems installed on individual properties for personal use, provided such systems comply with all applicable zoning regulations and building codes.
    b. Solar energy systems utilized for agricultural purposes, such as water pumping, livestock operations, or crop irrigation, provided such systems are accessory to the primary agricultural use of the property.
    c. Zoning districts that allow solar energy systems as a permitted or conditional use.

Section 5: Justification and Findings

1. Agricultural Importance: Bourbon County's agriculture is vital to its economy, particularly in the equine sector, with an estimated $870 million value in equine inventory. The preservation of prime soils is necessary to maintain the agricultural viability of the area.
2. Environmental and Historic Preservation: Solar farms on prime agricultural land would negatively impact the county's unique environmental and historic landscapes. As part of the Inner Bluegrass region, Bourbon County's scenic byways and rural historic districts are critical for local heritage and tourism.
3. Comprehensive Plan Alignment: This ordinance aligns with the Bourbon County Comprehensive Plan (2017, reaffirmed in 2020), which emphasizes the preservation of agricultural land and encourages the protection of its rural character.
4. The attached detailed findings document the justification for prime farmland and related restrictions.

Section 6: Enforcement

1. Any person, entity, or corporation found to be in violation of this ordinance shall be subject to enforcement actions as outlined in the zoning regulations of Bourbon County, Kentucky.

Section 7: Severability

1. If any section, subsection, sentence, clause, phrase, or portion of this ordinance is for any reason held to be invalid or unconstitutional by a court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision, and the remainder of this ordinance shall remain in full force and effect.

Section 6: Effective Date

1. This ordinance shall take effect immediately upon its passage and adoption by the appropriate governing body of Bourbon County, Kentucky.

Section 7: Repeal of Conflicting Ordinances

1. All ordinances or parts of ordinances in conflict herewith are hereby repealed to the extent of such conflict.

Section 8: Publication

1. The Clerk of Bourbon County, Kentucky, is hereby directed to publish this ordinance in accordance with the requirements of state law.

Section 9: Amendments

1. This ordinance may be amended from time to time by the appropriate governing body of Bourbon County, Kentucky, in accordance with applicable laws and procedures.

All ordinances, or parts thereof, in conflict herewith, are to the extent of such conflict hereby repealed.

The provisions of this ordinance are severable and, if any provisions or part thereof shall be held invalid or unconstitutional or inapplicable to any person or circumstance, such invalidity, unconstitutionality or inapplicability shall not affect or impair the remaining provisions of this ordinance.

The statements contained in this Ordinance shall be construed so as to not conflict with any other Bourbon County Ordinances, laws or regulations of the Commonwealth or Federal Government

Introduced and given first reading at a meeting of the Fiscal Court, County of Bourbon, Kentucky held on the ____day of _____, 202__, and finally adopted, after second reading, at a meeting of the Fiscal Court, County of Bourbon, Kentucky held on the ____ day of ____, 20___.

This Ordinance shall be in full force and effect from and after its passage, publication and recording, according to law.

Dated this ________ day of ______________ 2024.

____
Hon. Michael R. Williams
Bourbon County Judge-Executive

____

Cynthia Wilson
Bourbon County Clerk

First Reading: ______________________

Second Reading: ___________________

Passage: __________________________

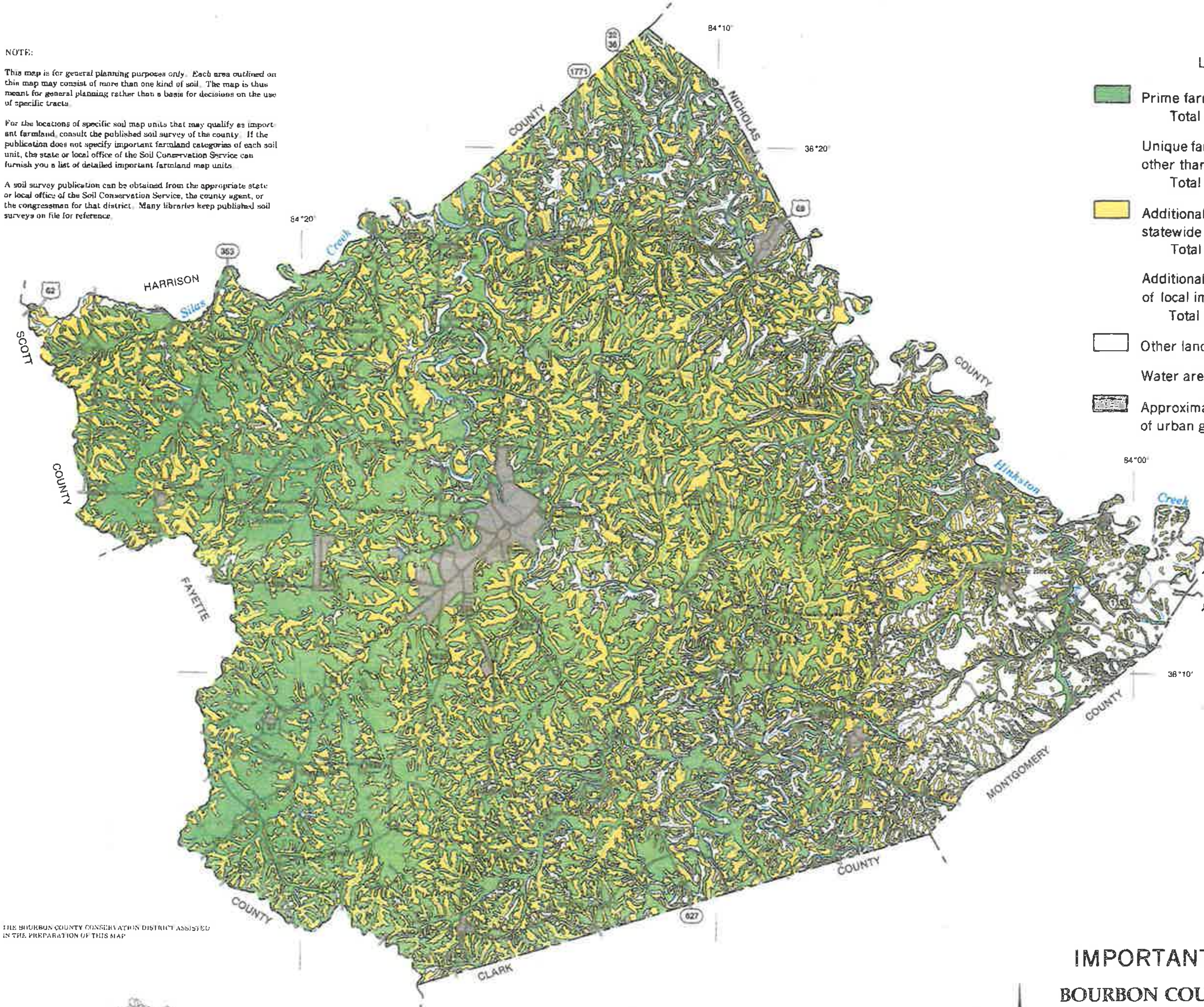
Publication: _______________________

NOTE:

This map is for general planning purposes only. Each area outlined on this map may consist of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

For the locations of specific soil map units that may qualify as important farmland, consult the published soil survey of the county. If the publication does not specify important farmland categories of each soil unit, the state or local office of the Soil Conservation Service can furnish you a list of detailed important farmland map units.

A soil survey publication can be obtained from the appropriate state or local office of the Soil Conservation Service, the county agent, or the congressman for that district. Many libraries keep published soil surveys on file for reference.



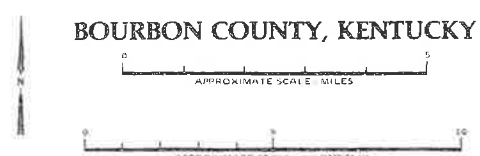
LEGEND

- Prime farmland
  Total acres - 90,500
- Unique farmland, other than prime
  Total acres none reported
- Additional farmland of statewide importance
  Total acres - 68,700
- Additional farmland of local importance
  Total acres none reported
- Other land - Total acres - 24,267
- Water areas none reported
- Approximate limits of urban growth - Total acres - 3,100

THE BOURBON COUNTY CONSERVATION DISTRICT ASSISTED IN THE PREPARATION OF THIS MAP

IMPORTANT FARMLAND

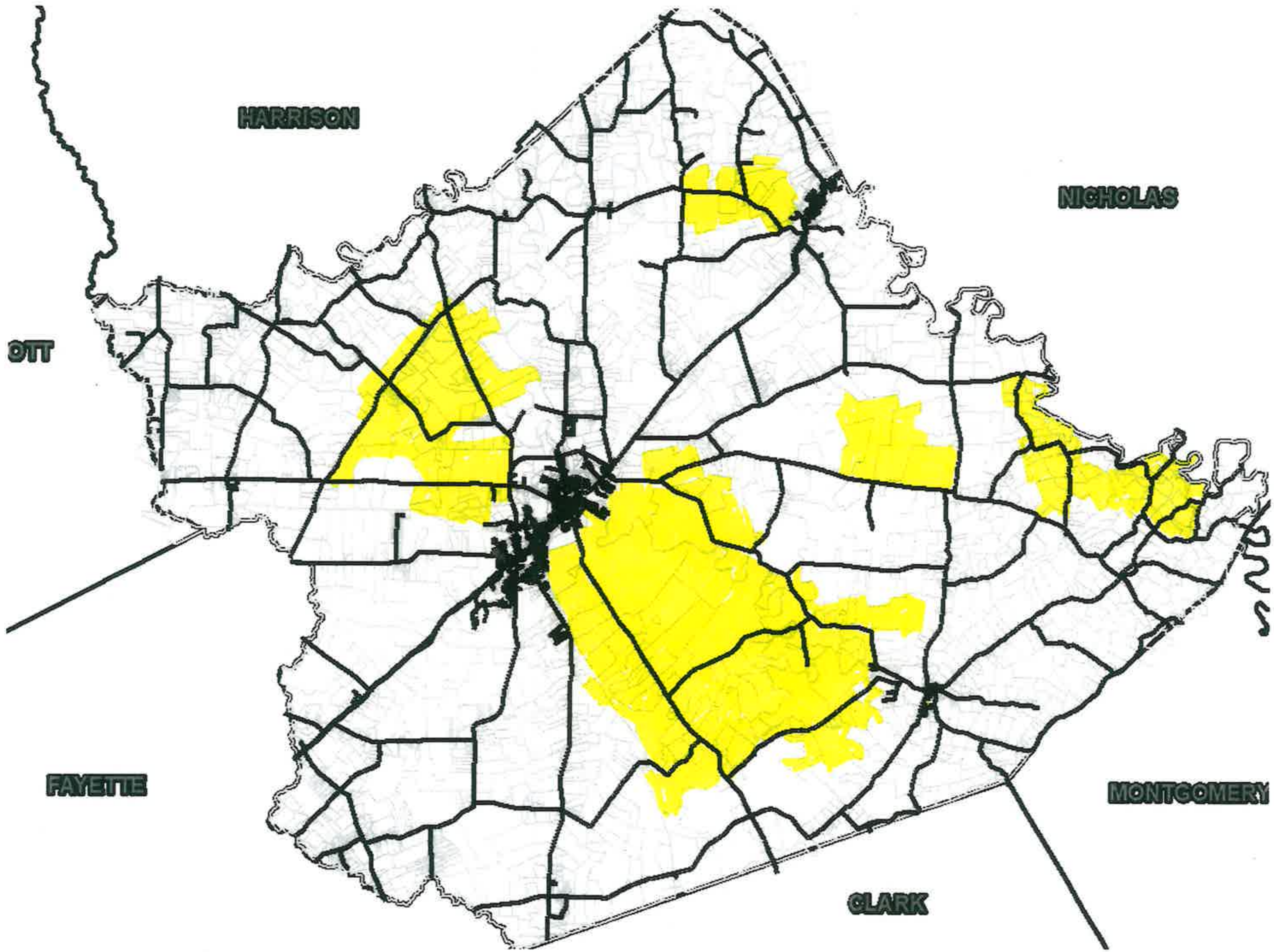
BOURBON COUNTY, KENTUCKY



BASE COMPILED FROM KENTUCKY GENERAL HIGHWAY MAP, POLYCONIC PROJECTION

Source: Important Farmland Map compiled from soil survey published 1982

4-R,38,734


HARRISON
NICHOLAS
OTT
FAYETTE
MONTGOMERY
CLARK

DRAFT GOALS & OBJECTIVES
BOURBON COUNTY ENVISION 2040 COMPREHENSIVE PLAN
12.21.2020

PLAN ELEMENT	GOAL	OBJECTIVE	
HOUSING	**GOAL 1**		**Expand and ensure a diverse range of housing choices.**
		H 1.a	Promote varieties of housing types and densities based on the local population, changing demographics and market demand.
		H 1.b	Expand middle income housing opportunities and integrate new units throughout the community.
		H 1.c	Establish an information clearinghouse for financial and technical assistance for stabilization and renovation of urban and rural housing.
		H 1.d	Plan for safe, affordable and accessible housing to meet the needs of older, disabled, and/or low-income residents.
		H 1.e	Design neighborhoods to have convenient and safe multi-modal access to jobs, education and services.
		H 1.f	Strategically plan for the extension of infrastructure.
HOUSING	**GOAL 2**		**Support infill and redevelopment within existing infrastructure as a strategic component of growth.**
		H 2.a	Study areas of opportunity for infill development.
		H 2.b	Enforce building and maintenance codes and ordinances to eliminate blighted and deteriorated areas in the county.
		H 2.c	Explore opportunities to combine development efforts with historic preservation and natural resource conservation.
		H 2.d	Delineate historic districts and develop design standards in alignment with established architectural types.
		H 2.e	Implement innovative programs, such as public infrastructure and land bank programs to facilitate sustainable development.
HOUSING	**GOAL 3**		**Provide well-designed neighborhoods while demonstrating sensitivity toward natural resource conservation.**
		H 3.a	Provide an opportunity for more planned unit developments and neighborhood concepts including townhouses and condominiums, apartment buildings, as well as commercial centers and work places within areas designated for future growth.
		H 3.b	Plan for development of existing rural settlements through the provision of approved sanitary systems and water supply.
		H 3.c	Pursue incentives and regulatory approaches that encourage creativity and sustainable housing development and redevelopment.
		H 3.d	Incorporate adequate greenspace and open space in all development projects, minimize disruption of natural features and promote, maintain and expand the urban tree canopy throughout Bourbon County.

		H 3.e.	Strive for positive and safe social interactions in neighborhoods, including but not limited to, neighborhoods that are connected for pedestrians and various modes of transportation and traffic calming techniques.
		H 3.f	Encourage energy-efficient development practices and resilient design features.
ECONOMIC GROWTH	**GOAL 1**		**Cultivate a vibrant community with a strong edcuation base that promotes a skilled technical workforce that attracts a diverse quality of jobs.**
		EG 1.a	Encourage a variety of cultures, ages, and income levels, resulting in a vibrant and diverse community.
		EG 1.b	Invest in quality of life measures that residents and business owners seek including parks, open space, historic resources, entertainment, public transportation, and public services.
		EG 1.c	Provide policies that promote equitable distribution and connectivity of accessible housing, recreation, and other community facilities.
		EG 1.d	Provide entertainment and other quality of life opportunities that attract and retain culturally diverse young professionals, and a work force of all ages and talents to Bourbon County.
		EG 1.e	Support and assist local education efforts of Pre-K through post-secondary institutions to produce an available and skilled labor pool.
		EG 1.f	Collaborate with business and industry leaders and educational institutions to foster a capable and skilled workforce. Reduce joblessness by creating or supporting agencies that address a Labor Ready Work Force.
		EG 1.g	Strengthen efforts to develop a variety of job opportunities.
		EG 1.h	Strengthen regulations and policies that promote the agricultural economy, including but not limited to local food production and distribution, agritourism and the equine industry.
		EG 1.i	Increase the resident employment base of Bourbon County.
ECONOMIC GROWTH	**GOAL 2**		**Make Bourbon County a place that encourages responsible economic growth and diversification.**
		EG 2.a	Allow compatible commercial and workplace uses within new and existing neighborhoods.
		EG 2.b	Encourage start-up and small-scale commercial businesses.
		EG 2.c	Identify and support targeted business sectors to diversify the economic base.
		EG 2.d	Ensure that sufficient land and infrastructure is available to accommodate new and existing industry.
		EG 2.e	Ensure a consistent and efficient planning and zoning climate.
		EG 2.f	Prepare for low impact development regulations in existing and proposed land uses.
ECONOMIC GROWTH	**GOAL 3**		**Promote the tourism industry as a vital component of broadening the county's overall economic base.**

		EG 3.a	Promote new and existing tourism businesses using Bourbon County's unique attractions.
		EG 3.b	Encourage cooperation among the various local interests that serve as attractions for visitors.
		EG 3.c	Coordinate with regional and state tourism entities.
ECONOMIC GROWTH	**GOAL 4**		**Revitalize the urban core of Millersburg, North Middletown, Paris, and the rural growth areas of Bourbon County.**
		EG 4.a	Encourage the reuse/redevelopment of declining commercial and industrial areas.
		EG 4.b	Enforce codes and ordinances to reduce vacancies and dilapidation.
		EG 4.c	Coordinate with other downtown organizations to develop an integrated streetscape to increase accessibility in order to attract customers.
PUBLIC HEALTH	**GOAL 1**		**Create and sustain equitable opportunities to promote physical and mental well-being.**
		PH 1.a	Provide responsive and dependable health delivery systems.
		PH 1.b	Nurture a culture of wanting to get involved and give back.
		PH 1.c	Foster partnerships and collaboration between public health organizations and a broad range of stakeholders.
		PH 1.d	Increase opporutnities and access to indoor and outdoor recreation opportunities.
PUBLIC HEALTH	**GOAL 2**		**Consider health impacts in all policy creation.**
		PH 2.a	Ensure policy development is inclusive and accomodates accessibility.
		PH 2.b	Reduce environmental impacts on community health.
		PH 2.c	Ensure access to public safety services/ER/clinics.
PUBLIC HEALTH	**GOAL 3**		**Support education initiatives on substance use disorder**
		PH 3.a	Support initiatives to address substance use disorder.
		PH 3.b	Improve accessibility to available resources.
		PH 3.c	Encourage workplace policies and incentives to effective substance use recovery.
		PH 3.d	Create more opportunities for long-term recovery.
PUBLIC HEALTH	**GOAL 4**		**Promote and improve access to fresh and affordable food.**
		PH 4.a	Increase accessible means of transportation for consistent access.
		PH 4.b	Educate on how to obtain and prepare fresh and affordable food.
AGRICULTURE & ENVIRONMENT	**GOAL 1**		**Protect and promote the local agricultural economy.**
		AE 1.a	Preserve farmland by creating and sustaining farm revenue.
		AE 1.b	Support Bourbon County farm owners and operators in their efforts to continue viable agricultural activities.
AGRICULTURE & ENVIRONMENT	**GOAL 2**		**Encourage and promote the conservation, protection, and restoration of Bourbon County's agricultural land resources.**
		AE 2.a	Preserve farmland by creating and sustaining farm revenue.
		AE 2.b	Preserve, protect, restore and enhance the environment and natural resources.

AGRICULTURE & ENVIRONMENT	**GOAL 3**		**Encourage conservation efforts by private organizations.**
		AE 3.a	Promote the protection of unique natural areas including by not limited to karst areas and natural resources such as water.
		AE 3.b	Educate about best practices that encourage improved water quality.
		AE 3.c	Integrate development with the natural environment by providing access to greenspace, trail networks, and parks.
HERITAGE & URBAN FORM	**GOAL 1**		**Enhance, preserve and protect the natural, historic, and cultural landscapes that give Bourbon County its unique identity.**
		HU 1.a	Protect the quality and integrity of existing structures and support preservation efforts.
		HU 1.b	Incentivize adaptive reuse to promote green building and sustainable development best practices.
		HU 1.c	Ensure rebuilds or new construction are true to urban form.
		HU 1.d	Preserve and maintain the natural features that are unique to Bourbon County.
		HU 1.e	Promote marketing/wayfinding for cultural assets.
HERITAGE & URBAN FORM	**GOAL 2**		**Support pedestrian and bike-friendly infrastructure.**
		HU 2.a	Repurpose unused railed to serve as bike/pedestrian connections (bike trails) in the county and throughout the region.
		HU 2.b	Incentivize connected, safe and accessible sidewalks.
		HU 2.c	Educate residents about how to share the road and/or explore opportunities to improve road sharing.
		HU 2.d	Make public amenities, workplace, and residential areas accessible by multi-modal transportation types.
		HU 2.e	Require in-fill development projects to be designed for pedestrian use and to be compatible with the existing character and long-term goals for the surrounding area.
HERITAGE & URBAN FORM	**GOAL 3**		**Create a vibrant downtown core.**
		HU 3.a	Promote streetscape and community revitalization strategies to attract private investment to downtown cores.
		HU 3.b	Promote adaptive reuse of structures and multi-functional spaces especially in communal areas.
		HU 3.c	Provide civic and governmental facilities in centralized and accessible locations and as highly visible focal points and symbols of community identity.
		HU 3.d	Integrate public art into our downtown areas.
LAND USE	**GOAL 1**		**Use viable, proven practices to reach land use decisions that achieve long-term economic and environmental sustainability and enhance quality-of-life.**
		LU 1.a	Collect accurate inventory of our infrastructure systems in existing incorporated areas.
		LU 1.b	Monitor the availability and absorption of vacant and underutilized land within existing developed areas.

		LU 1.c	Manage the locate of the future land use designations and city annexation to maximize efficiency of city networks and services.
		LU 1.d	Allow for flexible and harmonious land use and design patterns.
LAND USE	GOAL 2		Protect agricultural land to ensure the viability of farming and to enhance our developing tourist trade.
LAND USE	GOAL 3		Encourage sustainable development and redevelopment in identified areas where services are potentially available.
		LU 3.a	Allow for flexibility in land use and design patterns within zoning districts.
		LU 3.b	Encourage smaller lot development in rural growth areas.

BOURBON COUNTY UTILITY SCALE SOLAR ENERGY POWER GENERATING SYSTEMS ORDINANCE

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October 31, 2024

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BOURBON COUNTY UTILITY SCALE SOLAR ENERGY POWER GENERATING SYSTEMS ORDINANCE

BOURBON COUNTY UTILITY SCALE SOLAR ENERGY POWER GENERATING SYSTEMS ORDINANCE

REQUIRED FINDINGS

The predicate for the restriction of utility scale solar energy power generating systems (SEPGS) on prime farmland (90,500 acres), farmland of state wide importance (68,700 acres), as well as land within rural historic districts (42,420 acres) of Bourbon County is based on the following issues which pose an unreasonable and insurmountable threat to health, general welfare and quality of life.

SIGNIFICANCE OF THE AGRICULTURAL SECTOR

Bourbon County is one of six counties that constitute the Lexington Metropolitan Statistical Area (MSA) including Fayette, Woodford, Jessamine, Scott, and Clark. These counties constitute a significant portion of what is **uniquely** and geographically known as the **Inner Bluegrass**. This highly fertile area has been **recognized since the antebellum period** as a center for breeding quality livestock, especially thoroughbred racehorses.

According to the 2022 Kentucky Equine Survey, Bourbon County is one of only five counties in Kentucky with an equine inventory of over 5,000 horses; and is second only to Fayette.[1]

County	Equine Operations	Equine Inventory	Value of Equine
Bourbon	500	13,000	$ 870,640,000
Fayette	950	22,500	$2,407,328,000
Scott	650	5,700	$ 330,338,000
Shelby	800	5,900	$ 131,768,000
Woodford	650	11,000	$1,279,968,000

According to Jill Stowe, professor, agricultural economist and author of the report, "Overall, this report reinforces the **economic significance of equine agricultural**, which remain vibrant and strong as the **signature industry** in Kentucky."[2]

[1] University of Kentucky and Kentucky Horse Council, "2022 Kentucky Equine Survey": 20.
[2] Ibid.

In addition, Bourbon County is **third** among the top five counties in Kentucky, in terms of **agricultural sales**, which account for 20.0 percent of all agricultural revenue in Kentucky.[3]

Not only does the area have a reputation going back over two hundred years, but the breadth of its reputation extends world-wide. In 2006, the **World Monument Fund** included the **Bluegrass region** on its list of **Top Most Endangered Landscapes**, recognizing that "the bluegrass Region is one of America's most distinctive landscapes."[4]

Few agricultural regions of the country have a **real estate market demand that is international.** This is not only true because of the fertility of the soil, but the beauty of the landscape. Despite its threat due to development, the surrounding natural landscape is enhanced by the manicured condition of thoroughbred farms that populate the entire area. This **unique, protected and scenic landscape** is a large component of the property characteristics that constitute demand for the land. As a result of the **scenic viewsheds,** roadways throughout the region are designated by the state as **scenic byways.**

The Bluegrass State has a **robust tourism economy** that infuses the state with billions of dollars. In May 2024, Governor Andy Beshear announced, "2023 marked a new record year for Kentucky tourism, with $13.8 billion generated in economic impact and 95,222 jobs, as tourism remains a key piece of the commonwealth's booming economy." [5]

FARM LAND PRESERVATION

Throughout all of Bourbon County's Comprehensive Plans and accompanying Goals and Objectives, the primary theme has been farmland preservation. Bourbon County has had a nearly a **50-year history of active farmland preservation within the Courts**. Two of

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[3] Ibid.

[4] World Monument Fund, "2006 World Monuments Watch," https://www.wmf.org/project/blurgrass-cultural-landscape-kentucky.

[5] Office of the Governor, 2024, May 30, "*Gov. Beshear: Kentucky Tourism Industry Achieves Historic Success With Record Year for 2023 in Economic Impact*" (Press Release) kentucky.gov/Pages/Activity-stream.aspx?n=GovernorBeshear&prId=2199

these law suits were decided in favor of the appellants by the Kentucky Supreme Court (Green v. Grissom in 1982 and Simpson v. Laytart in 1998). The last two Comprehensive Plans have been successfully challenged to ensure that such agricultural preservation continues.

Other efforts by individuals to protect the agricultural sector include the creation of **Conservation Easements on 49 farms representing 14,200 acres.** In addition, **42,423 acres are within 6 Rural Historic Districts, the largest in Kentucky.**

District Name	Acreage	Date Listed
Cooper's Run Rural Historic District	8,935.00	12/23/98
Cane Ridge Rural Historic District	5,060.00	06/25/03
Little Rock-Jackstown Rural HD	2,400.00	03/31/04
Stoner Creek Rural Historic District	22,000.00	05/02/01
The Pocket Rural Historic District	2,000.00	04/22/03
West Millersburg Rural Historic District	2,028.00	05/04/07

It is for these reasons, as well as the geophysical characteristics of the land, that the real estate farm market, as well as the **international market for the thoroughbred horse industry,** is drawn to Bourbon County with the presumption that their investment will be secure.

Utility scale solar plants result in unusually severe long-term impacts to the agricultural sector which is the primary economic generator for the county. The following predicates, or findings, are supported by documentation provided by peer reviewed journals, university professors and recognized experts in their respective fields or court expert witnesses; and justify this ordinance's restriction of utility scale solar plants on prime farmland, farmland of state-wide importance and in rural historic districts of Bourbon County.

A. BOURBON COUNTY PLANNING AND ZONING CONSIDERATIONS

1. The current **2017 Comprehensive Plan** for Bourbon County is clear in its support of and **goal of preserving agricultural land**, and **especially prime**

agricultural land. In addition, the goals and objectives for the proposed plan, approved in 2020, reaffirmed this commitment. (Goals and Objections Attached).

a. Agriculture and Environment

- Protect and promote the local agricultural economy.
- Encourage and promote the conservation, protection and restoration of Bourbon County's agricultural land resources.
- Encourage conservation efforts by private organizations.

b. Heritage and Urban Form

- Enhance, preserve and protect the natural, historic and cultural landscapes that give Bourbon County its unique identity.
- Support pedestrian and bike-friendly infrastructure.
- Create a vibrant downtown core.

c. Land Use

- Use viable, proven practices to reach land use decisions that achieve long-term economic and environmental sustainability and enhance quality of life.
- Protect agricultural land to ensure the viability of farming and to enhance our developing tourist trade.
- Encourage sustainable development and redevelopment in identified areas where services are potentially available.

2. The zoning ordinance is one of several tools used to implement comprehensive plans. The Comprehensive Plan is the guideline for future development, while the zoning ordinance is a regulation designed to make the comprehensive plan a reality.

3. Some zoning regulations are related to concepts of public health and safety, however most are concerned with "general welfare." Primary objectives of **general welfare** include **protection of property values, lower public costs and enhancing the livability of residential neighborhoods.**

B. SUPREME COURT UPHOLDS AESTHETIC CONSIDERATIONS

1. With regard to using zoning ordinances to accomplish aesthetic objectives, the U.S. Supreme Court upheld the right of communities to **use zoning for aesthetics** in a landmark 1954 decision, Berman v. Parker.[6]

C. LEGISLATIVE CONSIDERATIONS

1. KY House Bill 4 was enacted in 2023 and relates to the approval of merchant electric generating facilities by the Kentucky State Board on Electric Generation and Transmission Siting. Section 6, KRS 278.718 states:

> The provisions of KRS 278.700, 278.704. 278.796, 278.708, and 278.710 **shall not supplant, any other state or federal law, including the powers available to local governments under the provisions of home rule** under KRS 67.080, 67.083, 67.850, 67.922, 67A.060, 67C.101, and 82.082. An ordinance, permit, or license issued by a local government shall have primacy over the provisions and requirements of KRS 278.700 and Sections 2,3, and 4 of this Act, and any conflict between an order of the board and a local ordinance, permits, or license **shall be resolved in favor of the local government's ordinance, permit, or license.**[7]

D. AMERICAN PLANNING ASSOCIATION AND UK AGRICULTURAL ECONOMICS RECOMMENDATIONS FOR SITING UTILITY SCALE SOLAR PLANTS

1. The **American Planning Association (APA),** in its advisory regarding utility scale solar facilities, states that "the emphasis for planners is on the direct land-use considerations that should be carefully evaluated (e.g. **zoning, neighbors, viewsheds and environmental impacts).**"[8]
2. According to APA, "Utility-scale solar facility proposals must be carefully evaluated regarding the size and scale of the use; the conversion of agricultural, forestry or residential use; and the potential environmental, social and economic impacts on nearby properties and the area in general." For

[6] Berman v. Parker, 348 U.S. 26 (1954), https://www.cga.ct.gov/2013/rpt/2013-R-0211.htm.
[7] House Bill 4 from 2023: https://apps.legislature.ky.gov/law/acts/23RS/documents/0140.pdf.
[8] Darren Coffey, AICP, "Planning for Utility-Scale Solar Energy Facilities," September/October 2019: 2.

example, "if a solar facility is close to a major road or cultural asset, it could affect the **viewshed and attractiveness of the area.**"[9]

3. Among the land use impacts noted by the APA that utility scale solar may have on nearby communities include "the removal of forest or agricultural land from active use. An argument often made by the solar industry is that this preserves the land for future agricultural use, and applicants typically state that the land will be restored to its previous condition." However, the APA acknowledges that it is "challenging" to restore. The organization also notes that, "it is important that planners consider whether the **industrial nature** of a utility scale solar use is **compatible** with the locality's vision. The **use of prime farmland** and ecologically sensitive lands (e.g. riparian buffers, critical habitats, hardwood forests) for these facilities should be **scrutinized.**[10]
4. According to the APA:

> Solar facilities can be appropriately located in areas where they are **difficult to detect**, the **prior use** of the land has been **marginal** and there is no designated future use specified (i.e., not in growth areas, **not on prime farmland** and **not near recreational or historic areas**). Proposed facilities adjacent to corporate boundaries, public rights-of-way or recreational or cultural resources are likely to be more controversial than facilities that are well placed **away from existing homes**, have natural buffers and don't change the character of the area from the view of local residents and other stakeholders.[11]

5. **Tourism** is recognized as a key sector for economic growth in many regions and any utility-scale solar facilities might be visible from a scenic by-way, historic site, recreational amenity, or similar resources could have **negative consequences** for those tourist attractions.[12]

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[9] Ibid.: 3.
[10] Ibid.: 4.
[11] Ibid.: 4.
[12] Ibid.: 7.

6. The APA acknowledges that "**negative impacts to property values are rarely demonstrated** and are **usually directly addressed by applicants** as part of their **project submittal.**"[13] (PAS Memo Attached).
7. The **University of Kentucky College of Agriculture**, in their May 2021 Economic Policy Update, state that "Ideally, solar panels should be used on more **marginal soils**…The local community should proactively adopt policies within its planning and zoning ordinances. The policies should complement the community's existing comprehensive plan. It is important to not make fragmented decisions and instead identify areas of the community, if any, best suited for utility-scale development."[14] (Update Attached).
8. **Secretary of Agriculture** Tom Vilsack, stated at the 2024 National Rural Electric Cooperative Association's annual meeting in San Antonio: "We're obviously **encouraging use of non-prime farmland** for purposes of renewable energy."[15]

E. PRECEDENTS FOR LIMITING SOLAR DEVELOPMENT

1. A May 2024 report from Columbia University's Sabin Center for Climate Change Law analyzed local and state opposition to renewable energy projects and found it has significantly increased since its prior year's publication by 55 new local restrictions. To date, the Sabin Center has documented local land use restrictions on renewables since 1995 and have found a total of **395 zoning restrictions in 41 states**, in addition to **19 state-level restrictions.**[16] However, these estimates are understated considering the "**193 rejections or**

[13] Ibid.: 7.
[14] Alison Davis, "Solar Farming Considerations," Economic & Policy Update, Vol. 21-5, May 2021. See also: Alison F. Davis, PhD, "Considerations for Future Utility Scale Solar Farm Developments," UK Department of Agricultural Economics, September 2020.
[15] Chuck Abbott, "Use 'Non-prime' Farmland for Renewable Energy, Says, Vilsack," *Successful Farming*, March 7, 2024.
[16] Matthew Eisenson, Jacob Elkin, Harmujh & Noah Schaffir, *Opposition to Renewable Energy Facilities in the United States: June 2024 Edition*, Sabin Center for Climate Change Law, June 2024.Columbia University

restrictions in Ohio alone," according to Robert Bryce, a 30-year author of energy related books, articles and documentary films, who complied a U.S. Renewable Rejection Database from which the Columbia University study was based. (Columbia Study and Rejection Database Attached).

2. According to the most recent update of Bryce's U.S. Data Base (September 22, 2024), there have been a cumulative of **735 rejections of combined wind and solar energy from 2015 to 2024,** of which 461 represent wind rejections or restrictions; while **274 represent solar restrictions** since 2017. The database indicates that solar rejections have increased from a total of 10 in 2020 to 264 in mid-2024, or a total increase of 2,540.0 percent.[17] [18] Since 2015, about **360 communities** across the U.S. have rejected or **restricted solar projects** from 2017 through 2022.[19] (Study Attached).
3. A 2021 state law in Ohio gave communities the right to prohibit solar development inside solar exclusionary zones. Over **25.0 percent** of the 88 counties in Ohio have **approved regulations** that limit utility scale solar plants.[20]
4. At least 7 townships in Michigan and 4 counties in Virginia **prohibit or substantially restrict** solar development on agricultural land.[21]
5. In May 2024, the **Italian government** issued a decree to **completely ban solar from agricultural land** to "avoid desertification" of such land.[22]

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[17] https://robertbryce.com/renewable-rejection-database/
[18] Robert Bryce, "Tally of US Wind & Solar Rejections Hits 735," Robert Bryce, *Substack*, September 22, 2024.
[19] Robert Bryce, "Solar Energy Rejections Soared in 2022," *Real Clear Energy*, January12, 2023.
[20] Aaron Burd, *Why Some Ohio Counties Are Restricting Solar Energy Farms*, NBC4i, May 30, 2024..
[21] Eisenson, *Op Sit*..
[22] Sergio Matalucci, *PV Magazine International*, May 7, 2024.

6. The **UK government** issued a warning to local authorities on May 15, 2024 urging them **not to grant** planning permission for solar farms on **high-quality** farm land unless it's deemed essential.[23]
7. The Lawrence Berkeley National Laboratory of the Department of Energy released a 2024 survey of alt-energy developers which indicated that **Community Opposition** is a leading cause of solar and wind project cancelations in the U.S.[24]
   a. According to Heatmap News, a publication for "climate, energy and sustainability professionals, "**Farms** are becoming one of the most powerful opponents to renewable energy in the United States, second perhaps only to the fossil fuel industry. And it's **frighteningly unclear how developers will resolve this problem – or if they even can.**"[25]
   b. As solar and wind has grown rapidly across the country, so too have protests against solar and wind power on 'prime farmland,' a loose term used by industry and government officials to describe property best suited for growing lots of crops. Towns and counties are banning the construction of solar and wind farms on prime farmland. State regulators – including those run by Democrats – are restricting renewable development on prime farmland, and **members of Congress** are looking at cutting off or **restricting federal funding to projects on prime farmland**."
8. In an effort to eliminate local control over solar plant siting decisions lawmakers in Michigan, New York, Illinois, Massachusetts, Minnesota, New Jersey, New Mexico, Florida and South Dakota, states with **100% carbon-free electricity goals,** are countering the trend of 15.0 percent of U.S.

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[23] Dimitris Mavrokefalidis, "UK Warns against Solar Farms on Farm Land, *Energy Live News*, May 15, 2024.
[24] Robert Bryce, "Tally of US Wind & Solar Rejections Hits 735," Robert Bryce, *Substack*, September 22, 2024.
[25] https://heatmap.news/plus/the-fight/spotlight/renewable-energys-farmland-free-for-all#

counties' which have adopted land-use restrictions, by **centralizing renewables permitting at the state level.**[26] [27] Maryland is another state where the Public Service Commission preempts local zoning authority for the approval of the construction and siting of energy generating systems.[28]

9. In an April 2024 letter to shareholders, JP Morgan chief executive officer, Jamie Dimon, stated, "in addition to reforming permitting, siting and interconnection issues for power generation and transmission, the U.S. may need to **invoke eminent domain to site local clean energy rapidly**."[29] [30]Eminent domain involves the seizure of, and compensation for, private land for public purposes.

F. CONCEPT OF CLIMATE CHANGE IS MISLEADING

1. The issue of "global warming," currently characterized as "climate change" is misleadingly based on the false premise that it is caused by fossil fuels and CO_2. The emphasis of **climate change** on governmental policy is largely the product of the **United Nations Agenda 21** (1992) and later Agenda 2030 (2016**) Sustainable Development Goal No. 13**: Climate Action. According to Goal 13:

> Every person, in every country in every continent will be impacted in some shape or form by climate change. There is a climate cataclysm looming, and we are underprepared for what this could mean.
>
> Climate change is caused by human activities and threatens life on earth as we know it. With rising greenhouse gas emissions, climate change is occurring

[26] Brian Martucci, "Carrots, Sticks or Both: State Efforts to Combat Anti-renewables NIMBYs," Utility Dive, August 22, 2024.
[27]Joey Cappelletti & John Hanna, "States with Big Climate Goals Strip Local Power to Block Green Projects, *AP News*, January 14, 2024.
[28] https://www..jdsupra.com/legal news/maryland-high-court-finds-state-71842/
[29] Ryan Kennedy, "Invoke Eminent Domain, Marshall Plan for Renewable Energy, Said JP Morgan CEO, " *PV Magazine,* April 7, 2023.
[30] Andrew Lee, "Wall Street Titan Jamie Dimon Says Seize Private Land for Wind and Solar Builds," *Wall Street Journal*, April 6, 2024.

> at rates much faster than anticipated. Its impacts can be devastating and include extreme and changing weather patterns and rising sea levels.
>
> If left unchecked climate change will undo a lot of the development progress made over the past years, it will also provoke mass migrations which will lead to instability and wars.
>
> To limit global warming to 1.5 degree C above pre-industrial levels, emissions must already be decreasing and need to be cut by almost half by 2030, just seven years away. But we are drastically off track from this target.
>
> Urgent and transformative going beyond mere plans and promises are crucial. It requires raising ambition, covering entire economies and moving towards climate-resilient development, while outlining a clear path to achieve net-zero emissions. Immediate measures are necessary to avoid catastrophic consequences and secure a sustainable future for generations to come.[31]

2. Despite the claim by the media that the "science is settled," this may not be the case, as indicated by numerous peer reviewed articles published by leading scientists in the United States specializing in this issue. Among those are a June 17, 2022 document prepared by Drs. Happer and Lindzen, of Princton University and MIT, respectively.[32] According to these "career physicists, science demonstrates there is **no climate related risk caused by fossil fuel and CO_2**, thus no scientific basis for the proposed rule and, if adopted, disastrous consequences result for people world-wide and the U.S. because it would reduce CO_2 and the use of fossil fuels."[33] (Study Attached).
3. In addition to numerous concurring U.S. articles, for example one is written by Wallace Manheimer, retired from the U.S. Naval Research Laboratory, states in the Abstract of his study:

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[31] https://www.un.org/sustainabledevelopment/climate-change/

[32] William Happer, Richard Lindzen, Comment and Declaration on the SEC's Proposed Rule, "The Enhancement and Standardization of Climate-Related Disclosures for Investors," File No. 87-10-22, 87 Fed. Reg. 21334 (April 11, 2022).

[33] Ibid.

> The emphasis on a **false climate crisis** is becoming a tragedy for modern civilization, which depends on reliable, economic and environmentally viable energy. **The windmills, solar panels and backup batteries have *none* of these qualities**. This falsehood is pushed by a powerful lobby which Bjorn Lomborg has called a **climate industrial complex**, comprising some scientists, most media, industrialists and legislators. It is somehow managed to convince many that **CO_2** in the atmosphere, **a gas necessary for life on earth**, one which we exhale with every breath, is an **environmental poison.**[34] (Study Attached).

4. A Greek article analyzed the CO_2 relationship in climate from the Phanerozoic period through modern times concluding that "there are **political and economic forces** driving the propagation of the anti-CO_2 narrative **under the guise of science**."[35] (Study Attached).

5. Although not a peer reviewed journal, *Global Research* published an article in 2023 documenting the many scientists disputing the **U.N. promoted** man-made climate change theory.[36] (Study Attached).

6. A recent study, published in 2024, "is the first study to use multiple regression analysis to demonstrate that the independent determinant of the annual increase in atmospheric CO2 concentration is SST (sea surface temperature), which showed strong predictive ability. However, human CO2 emissions were irrelevant. This result indicates that **atmospheric CO2 has fluctuated as natural phenomenon, regardless of human activity,"** as stated in the Abstract.[37] (Study Attached).

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[34] Wallace Manheimer, "While Climate Always Has and Always Will Change, There Is No Climate Crisis," *Journal of Sustainable Development*; Vol. 15, NO. 5, 2022.

[35] Demetris Koutsoyiannis, "Stochastic Assessment of Temperature-CO2 Causal Relationship in Climate from the Phanerozic through Modern Times," *Journal Mathematical Biosciences and Engineering*, July 10, 2024.

[36] Mark Keenan, "1500 Scientists Say 'Climate Change Not Duie to CO2 – The Real Environment Movement Was Hijacked," *Global Research*, February 23, 2023.

[37] Dai Ato, "Multivariate Analysis Rejects the Theory of Human-caused Atmospheric Carbon Dioxide Increase; The Sea Surface Temperature Rules," *Science of Climate Change*, Vol. 4.2 (2024).

7. The Abstract from most recent study by scientists at Colorado State University and USDA Forest Service, published in September 2024, "revealed that the observed decrease in planetary albedo along with reported variations of the Total Solar Irradiance (TST) explains 100% of the global warming trend and 83% of the GSAT (global surface air temperature) interannual variability as documented by six satellite-and ground-based monitoring systems over the past 24 years.[38] Changes in Earth's cloud albedo emerged as the dominant driver of GSAT, while TSI only played a marginal role. The new climate sensitivity model also helped us analyze the physical nature of the Earth's Energy Imbalance (EEI) as calculated as a difference between absorbed short wave and outgoing longwave radiation at the tip of the atmosphere.
   a. The 'Results' section of the study has a chart that shows how **global surface air temperatures (GSAT**) are controlled by **changes in sunlight absorption**, a factor that changes with **cloud's albedo factor**, **not from greenhouse gas emissions.**
   b. In other words, sunlight and clouds, not greenhouse gases, are responsible for climate change. (Study Attached).
8. On May 15, 2024, Florida Governor Ron De Santis signed HB 1645 legislation that **removed the word "climate'** in nine different places" within state statutes. The legislation banned power-generating wind turbines offshore or near the state's coastline, increased expansion of natural gas, reduced regulation for gas pipelines and increased protections against bans on gas appliances such as stoves. The legislation also required a study of small nuclear reactor technology; expanding the use of vehicles powered by

[38] Ned Kikolov and Karl F. Zeller, "Roles of Earth's albedo Variations and Top-p-the-Atmosphere Energy Imbalance in Recent Warming: New Insights from Satellite and Surface Observations, Geomatics 2024, 4, 311-341. https://doi.org/10.3390/geomatics4030017

hydrogen; and enhanced electric grid security.[39] "The sections of the existing law that will be erased include a provision for addressing the 'potential of global climate change' as a state energy policy, and a provision for the state to play a leading role in developing and implementing energy management programs aimed at promoting energy conservation, energy security, and the reduction of greenhouse gas emissions."[40]

G. GROWTH OF RENEWABLE ENGERGY

1. In 2021, the Department of Energy released a study that claimed solar "has the potential to power **40% of the nation's electricity by 2035**."[41] In 2020, solar generated **3.0 percent** of the electric supply.[42]
2. The latest data from USGS and LBNL[43] indicate that as of August 2024 there were **4,185 large-scale solar facilities** operational in **47 states** (plus the District of Columbia). As of 2021, there were 3,699 such facilities.
3. U.S. electrical production is currently (2024) composed of the following:

Natural Gas	43.1%
Nuclear	18.6%
Coal	16.2%
Wind	10.2%
Solar	**03.9%**[44]

4. **Despite the increase in solar plant construction since 2020 of at least 486 large scale plants, there has been less than a 1.0 percent increase in solar electrical generation from 2020 to 2024.**

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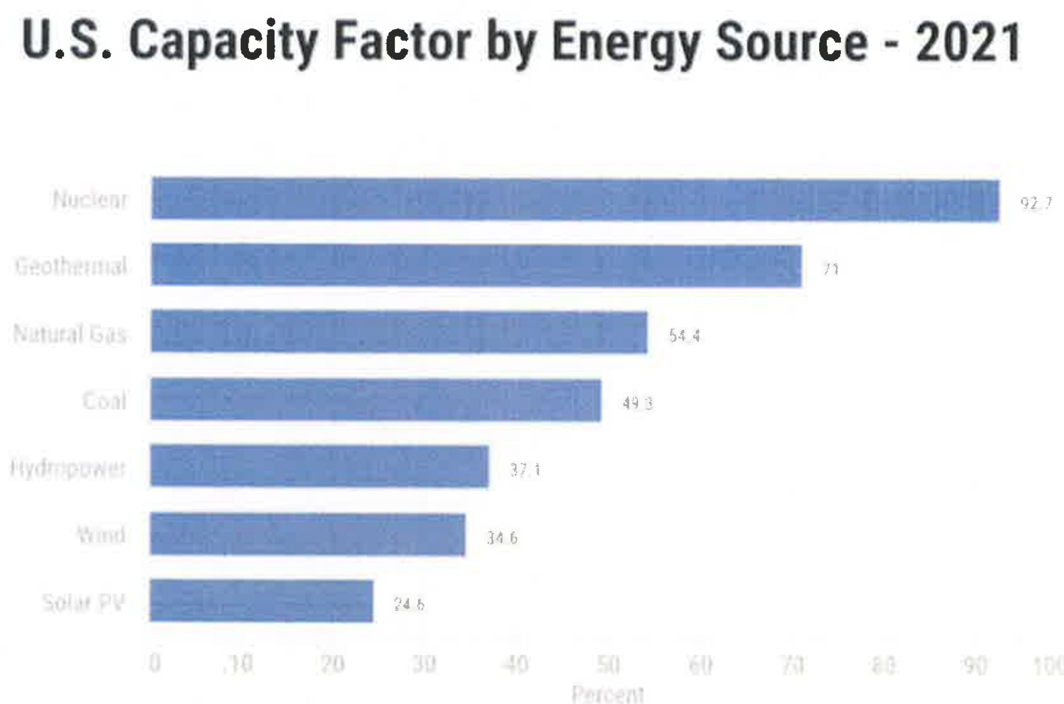
[39] The Associated Press, "Florida Gov. Ron De Santis Signs a Bill that Strikes Climate Change from State Law," NPR, May 16, 2024.
[40] Moohila Kaur Garg: "Climate Change Isn't Real, Ron DeSantis Erases Mentions of Climate Change from Florida Law," May 16, 2024, WIO News.
[41] Department of Energy, "DOE Releases Solar Futures Study Providing the Blueprint for a Zero-Carbon Grid," September 8, 2021.
[42] Ibid.
[43] United States Geological Survey and Lawrence Berkley National Laboratory.
[44] Steven Nelson and Ryan King, "Trump Vows to Make Electricity Cheap with 'Hundreds of New Power Plants' And Modular Nuclear Reactors," *New York Post*, August 29, 2024.

5. The following chart represents the capacity factor for the various power plants. The capacity factor measures how often a plant is running at maximum power.[45]



a. Solar had 3.0 percent share of the total U.S. generation capacity in 2020 and produced it 24.5 percent of the time. In 2024, solar had a 3.9 percent share of total generation capacity, but still produces it 24.5 percent of the time.

H. UTILITY SCALE SOLAR PRODUCTION IS AN INTERMITTANT SOURCE OF ELECTRICITY

1. According to Herbert Eckerlin, PhD, the underlying **developmental principle** of the power industry is that **electricity has to be guaranteed**. This guarantee

[45] Office of Nuclear Energy, "What is Generation Capacity," May 1, 2020. https://www.energy.gov/ne/articles/what-generation-capacity.

has become known in the power industry as "Maximum Continuous Operation," or MCR.

2. In practice, all companies that design and build power plants today have to "guarantee" that their power plants are capable of generating the **Megawatt Rating (MW)** of their power systems **continuously,** 24/7, 365 days per year.[46]
3. The MW rating of a power plant is the power that it can deliver continuously. This applies to all power plants — conventional and solar. However, it does **not apply comparably to solar** because its power generation is **not continuous.** The solar industry's **response** to this intermittency is **battery** backup. However, according to Dr. Eckerlin, additional solar farms will be required to keep the batteries charged.[47]
4. According to Dr. Eckerlin, "MCR has no meaning for solar farm operations because the sun's position, weather and time of day all have more dominating, unpredictable impacts on a solar farm's performance."[48] Achieving MCR even for **one 24-hour day** is virtually **impossible** for the following reasons.
   a. Solar power varies throughout the day-light hours because of the sun's movement across the sky, the weather, the cloud cover, seasonal variations, etc.
   b. Solar power is not generated for 12 hours during night time hours.
   c. Maximum solar power is reached for a couple of hours around noon on a sunny day in June/July. According to the National Climatic Data Center, Lexington, KY has the following annual days of sunshine:

City	Sunny	Partly Sunny	Total Sun
Lexington	89	101	190

[46] Herbert Eckerlin, Phd.: "Examining the Promises of the Solar Farm Industry Assigning 'False Megawatt Performance Promises' to Solar Farms." 2024 Unpublished Paper.
[47] Ibid.
[48] Ibid.

d. It is this two-hour peak solar power around mid-day that the solar developer uses to set the solar farm's MW rating.[49]

5. Related, and equally misleading concepts to the public, are megawatt (MW) production and MW hours. Utility scale solar facilities are rated by their potential MW production at their point of maximum output (approximately 2 hours a day on a sunny day). This production, in terms of MW, is used to relate intermittent solar output to that of dispatchable (conventional) sources, as if they are comparable. The following chart indicates that **direct comparison is misleading.**[50]

ABILITY TO GENERATE MW RATING

Conventional Power	Solar Power
(24/7 hr/day) x (365 days/yr)	(2hr/day) x (190 days/yr)
8,760 hr/yr	380 hr/yr
100.0%	4.34%

a. In this example, the **conventional** power plant is capable of generating its **MW rating** for 8,760 hours per year, or **100.0 percent** of the time. On the other hand, **solar power** is capable of generating its **potential MW rating** for a **maximum** of 380 hours per year, or **4.34 percent** (380/8,760) **of the time.**

6. Utility scale solar plants as a provider of electricity are characterized as an intermittent source because they are productive approximately 20.0 percent of the time, as opposed to dispatchable sources — coal, gas, or nuclear-powered plants that operate 100.0 percent of the time. When not generating electricity, some other electricity generator must step in to fill the gap. Due to federal law, almost all the power generated from solar plants must be purchased by the

[49] Ibid.
[50] Dr. Herbert Eckerlin, Emeritus Professor, Mechanical & Aerospace Engineering, North Carolina State University, Designer and former Director of NCSU Solar House and Faculty Chairman of the North Carolina Solar Center.

utility company for delivery to customers. As a result, dispatchable plants that fill the gap for solar must be idle when solar plants are generating electricity. This causes those plants to operate inefficiently which means that customers are actually **paying for twice the generating capacity** during those periods, according to Dr. Donald R. van der Vaart, former Secretary of the North Carolina Department of Environmental Quality.[51] (Article Attached).

7. For the last two years, **Tony Campbell**, President and CEO of East Kentucky Power Cooperative, has written to President Joe Biden to reconsider his policies that **undermine the reliability and affordability of electric service** by prematurely shutting down traditional power plants while allocating hundreds of billions of taxpayer dollars to incentivize unreliable alternatives. According to Campbell, the 24/7 reliability of renewables depends on developing dependable, cost-effective **utility-scale batteries** that can be mass-produced, but that **technology is years or perhaps decades away**.[52]
8. The North American Electric Reliability Corporation (NERC), the independent authority overseeing electric reliability in North America, published their "2023 Long-Term Reliability Assessment" in December. The study indicates that there are many areas where resource plans don't equate to a reliable system over the next 10 years. "The threat of **rolling blackouts** is increasing across the country as **fossil fuel power plants** are prematurely **retired,** and **replacement energy sources aren't capable of filling the gap."**[53] (Study Attached).
9. According to **Katelyn Bunning**, executive director of Dependable Power First Kentucky, "We're not going to have a reliable grid if we're transitioning

[51] Dr. Donald W. van der Vaart, "Gov. Cooper's 'Clean Energy,' Part 3: Raising Prices and Polluting More?" https://www.johnlocke.org/gov-coopers-clean-energy-plan-part-3-raising-prices-and-polluting-more/

[52]https://www.kentuckyliving.com/energy/co-op leader-advocates-for-kentucky-co-op-consumer-members/

[53] Joe Arnold, "The U.S. Is Phasing Out Reliable Energy Sources—Just When We Need Them The Most," *Kentucky Living*, February 2024.

solely to intermittent resources and retiring dispatchable owner plants. **One does not replace the other.**"[54]

10. The EPA's May 2024 Clean Power Rule **mandates a reduction** of greenhouse gas emissions by **90.0 percent** by the year 2032. Testifying before the Federal Electric Regulatory Commission, **Tony Campbell**, President and CEO of EKPC said, "The only way the proposed rule will not harm electric reliability is for EPA to withdraw it. EKPC and NRECA's (National Rural Electric Cooperative Association) overall position is that EPA's proposal **is unlawful and unworkable.**"[55]

11. A 2024 report by ICF, a global energy consulting firm, indicates that electricity growth will increase to 8.3% by 2028, 18.0 percent by 2033 and 37.0 percent by 2050 compared to 2024 levels. As a result of the increased demand "putting pressure on energy transition efforts"…The ICF report notes that **legacy plant retirements are already falling off**. Citing the U.S. Energy Information Agency, the report said power plant operators plan to retire 5.4 GW of generating capacity in 2024, compared with 13.5 GW in 2023 and the lowest of any year since 2008. As an example of the real-world implications of this trend, the report said earlier this year PJM asked Talen Energy to **delay the retirement of 844 GW of fossil-fueled capacity** in Maryland for three years."[56] [57]

    a. In addition, "The federal government and Michigan are investing close to $2 billion to **reactivate the Palisades nuclear reactor** located on Lake

[54] Ibid.
[55] Ibid.
[56] Michael Puttre, "Surgng Electricity Demand Puts Pressure on Utility Planning," *PV Magazine*, September 16, 2024.
[57] Shankar Chandramowli, et al, "Power Surge: Navigating U.S. Electricity Demand Growth," ICF Report, 2024.

Michigan's shore. Once it resumes operation, Palisades will become the first nuclear plant to restart **after being decommissioned.**[58]

b. The second announcement of a reactivated reactor is that of Three Mile Island which will sell power to Microsoft, demonstrating the **immense energy needs of the technology sector** as they build data centers to support **artificial intelligence.**[59]

12. Additional indications that industrial scale **solar generation is unreliable** are the following examples:

a. According to a Loomis, CA solar developer and installer, "solar panels may run about **10 to 25 percent less efficient** on warm, dry days reaching 90 degrees Fahrenheit or higher. The hotter the ambient air becomes, the **less efficient** your panels will be. When temperatures reach triple digits, most panels will start to lose about one percent of peak output for every additional degree the temperature increases…Tests have shown solar panels operate at their **most efficient in about 77 degrees** Fahrenheit."[60]

b. According to Ampt, a solar power conversion product manufacturer, inverters are **not surviving** the anticipated 25.0-year life span of solar facilities and are beginning to **fail at the 10-15 year mark**. To compound the problem, most of the manufacturers that were supposed to maintain and guarantee them have **gone out of business.**[61]

I. THE RENEWABLE INDUSTRY HAS DETERMINED THAT LITHIUM BATTERIES ARE THE SOLUTION TO UITLTY SCALE SOLAR PLANT INTERMITTANCY

[58] IER (Institute for Energy Research), "Biden-Harris Administration and Michigan to Bring a Decommissioned Nuclear Plant Back Online," September 6, 2024.

[59] Spencer Kimball, "Constellation Energy to Restart Three Mile Island Nuclear Plant, Sell the Power to Microsoft for AI," CNBC, September 20, 2024.

[60] https://energysavingspros.com/soslar-panel-efficiency-affected-temperature/

[61] Emma Penrod, "US Solar Farms Are Aging. Is It Time to Begin Repowering," *Utility Dive*, October 6, 2023.

1. Grid-scale lithium batteries are viewed as the solution to wind and solar intermittency. They store excess electricity when wind and solar output is high and release it when wind and solar output is low.[62] Until recently, the only way that such batteries were eligible for battery subsidies was to be teamed with utility scale solar facilities.
2. Each battery unit is the size of a tractor trailer. For example, the Desert Sunlight grid battery array, property of the Bureau of Land Management has a rated storage capacity of 230 MW and consisting of over 100 batteries. This is considered a medium sized storage facility.[63]
3. According to the U.S. Department of Energy's (DOE) Lawrence Berkely National Laboratory, there are currently 469 hybrid power plants in operation. Notably, 61.0 percent, or 288 are solar photovoltaic plus storage (solar-plus-storage) facilities. In 2023 alone, 66 of the 80 hybrids added were PV + Storage.[64]
4. It is well established that these units can **spontaneously burst into flames**. The nature of lithium battery fires is that they are **unable to be extinguished**. They can only be sprayed with water in order to **reduce the temperature** and to **keep the fire from spreading.** Compared to a battery power tractor trailer fire on an interstate in California that required 50,000 gallons of water or the 11 hour fire, **a grid scale battery** (10 to 20 times the size of the truck battery) would require **500,000 to a million gallons of water.**[65]

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[62] Steve Goreham, "If Green Energy Is the Future, Bring a Fire Extinguisher, *Wall Street Journal*," September 25, 2024.
[63] Thomas J. Shepstone, "Grid Scale Lithium Battery Fires: They're Going to Happen Unless Developers Stop Ignoring the Safety Problem," *Substack*.com, October 2, 2024.
[64] John F. Weaver, "Solar-Plus-Storage Dominating Future U.S. Power Grid," *PV Magazine*, September 25, 2024.
[65] Ibid.

5. Other potential sources of harm are huge amounts of contaminated water runoff, as well as toxic air emission, especially if the whole facility burns.[66] Among the **toxic emissions** are **hydrogen fluoride** (HF), which can be released in significant quantities (up to 600 ppm) and can be **life threatening.** Other harmful substances include **hydrogen cyanide**, **carbon monoxide** and various **fluorinated compounds**. The smoke from lithium-ion battery fires contains a complex mixture of chemicals, including **heavy metals** like cobalt and nickel, which are hazardous at relatively low exposure levels and can linger on surfaces after the fire has been extinguished.[67]
6. Energy analysis group Doomberg finds that battery storage is improving, but at a pace far below that which is needed:

> According to projections from industrial research firm Wood Mackenzie, the US is set to add **191.6 gigawatt houses (GWH) of battery backup systems** across residential, non-residential and grid-scale installations between 2022 and 2026. This sounds impressive until you realize the US produced **4,116,000 GWh of electricity on the grid in 2021 alone**. By our math, the Wood Mackenzie projection amounts to a grand total of **24 minutes** of total backup capacity added to the system over the quoted five-year period. (Emphases in original.)[68]

7. According to the Mackinac Center for Public Policy:

> Even major innovations in battery technology would do little to mitigate the change to unreliable energy sources. The push to wind and solar is a shift from cheap, reliable and energy-dense forms of power generation to subsidized, weather dependent, less efficient forms of generation. Wind and solar do not work as advertised by politicians, bureaucrats and activists. The replacement of traditional thermal generation with less-dense, less-reliable energy is **driven not by market demand** or technological reality,

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[66] Ibid.

[67] Thomas J. Shepstone, "Another Lithium Battery Fire! How Many More Before Some Major Catastrophe Take Place?" *Substack*, September 24, 2024.

[68] Joshua Antonini, "Better Batteries Won't Save the Energy Grid," Mackinac Center for Public Policy, August 28, 2024.

> but by **orders from capitol buildings** around the country.
>
> We get effectively nothing from this transition. The supply chains for wind and solar are dominated by China and other unfriendly nations. If the United States were able to achieve 100% renewable electricity generation and ban fossil fuels entirely, that would, using the IPCC's (Intergovernmental Panel on Climate Change) own MAGICC (Model for the Assessment of Greenhouse Gas Induced Climate Change) modeling, **lower global average temperatures by nine-tenths of one tenth of one degree Celsius in 2100.** The cost-benefit analysis shows we would end up **crippling our grid for nothing.**[69]

J. UTILITY SCALE SOLAR FARMS ARE FEASIBLE ONLY THROUGH TAX CREDITS AND INVESTMENT INCENTIVES

1. Utility scale solar plants **exist only because of the 30.0 percent investment tax credits** that solar developers receive. This incentive began with the Energy Tax Act of 1978 because renewables (wind and solar) are **dilute and intermittent, fatal qualities** when compared to fossil-fuel-generated electricity. The tax credit was tripled from 10.0 percent to 30.0 percent with the Energy Policy Act of 1992.
   a. "For example, Warren Buffet has acknowledged that wind energy projects are **not economically viable without government tax credits**. He stated, '…on wind energy, we get a tax credit if we build a lot of wind farms. That's the **only reason to build them**. They **don't make sense** without the tax credit."[70]
2. Despite over 40 years of subsidies, the 2022 omnibus Inflation Reduction Act (IRA) was a $220 billion package of tax breaks, subsidies and other incentives for the electric utility sector to invest in solar power, battery storage systems and other carbon-free technologies. The intent of the legislation was to

[69] Ibid.
[70] IER (Institute for Energy Research), The Inflation Reduction Act Bloats Tax Subsidies to Biden's Favorite "Green" Technologies, April 10, 2024.

increase solar generation from the **existing 2.8 percent to 45.0 percent** by mid-century.[71]

3. "The cost estimates for the energy and climate portion of the IRA were initially $369 billion through 2031, but the CATO Institute estimates that it will cost more than $1 trillion over the next 10 years and between **$2 trillion and $4 trillion by 2050**. However, the final tally of energy subsidies enabled by the IRA is difficult to predict because many energy-related **tax credits are uncapped.**"[72]
4. The IRA tax credit incentives not only include a 30% tax credit, but "projects can layer on adders like domestic content (10%), energy community (10%) for projects located in a defined energy communities location, and the low-income communities bonus credit for eligible solar and wind facilities (10%). Altogether, a project sponsor could enjoy a **tax credit incentive** benefit of **up to 60.0% of the total project cost.**"[73]
5. It has been calculated that solar subsidies amount to $50,000 per acre. For example, "according to the U.S. Energy Information Administration, a new solar facility in Minnesota costs around $1.3 million per megawatt (MW) of installed capacity. Each **MW of solar** consumes approximately **8 acres of land,** and the subsidy is 30 percent."

CALCULATING SOLAR SUBSIDIES

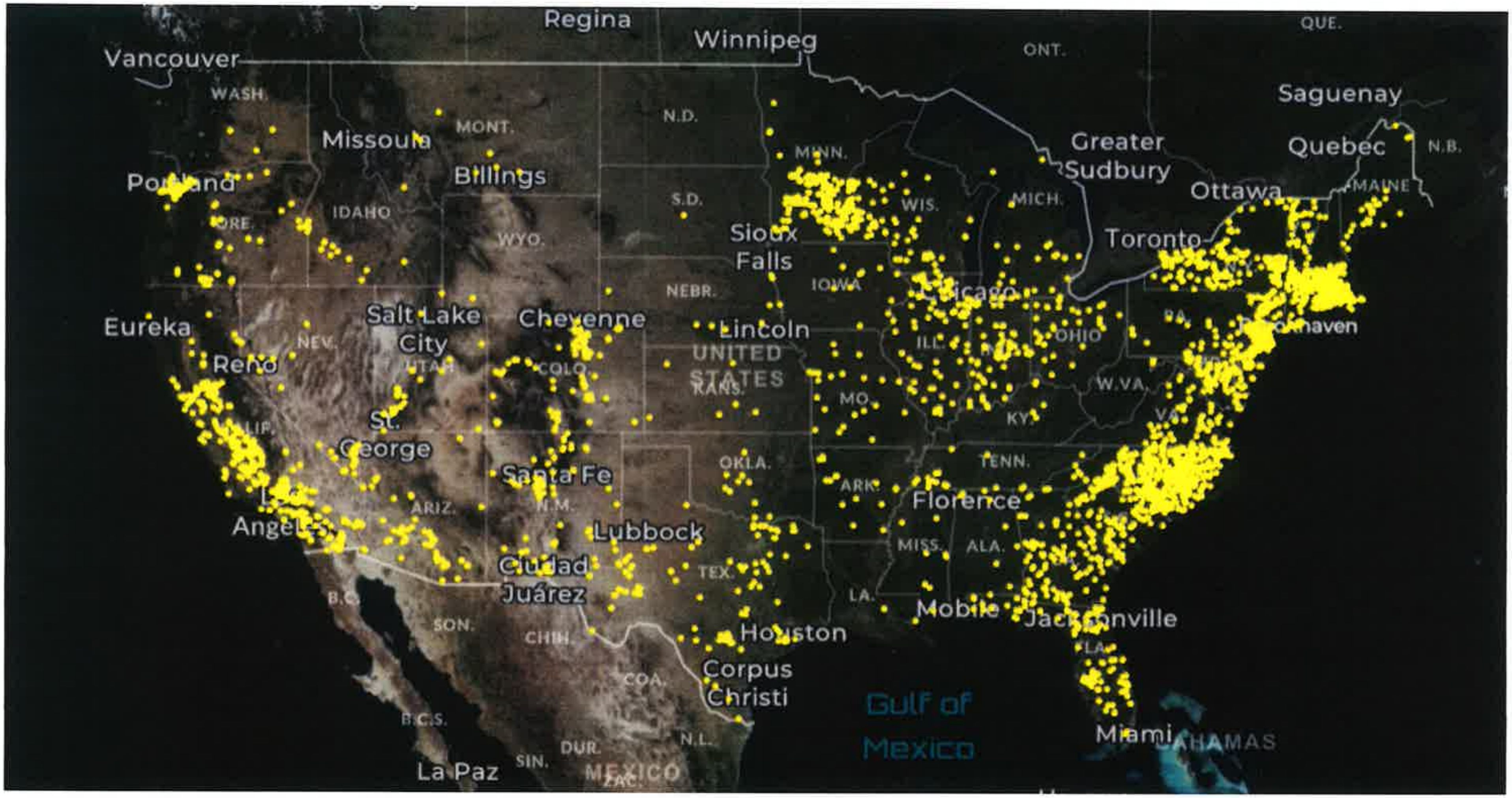
Cost per MW	$1,323,000
Acres per MW	8
Cost per Acre	$ 165,375
Investment Tax Credit	30%
Subsidies per Acre	**$ 49,613**

71 John Muraweski, Solar's Lofty Ambitions Are Consuming Ever-Larger Expanses of Land Below, " *RealClear Investigations*, December 7, 2022.
72 Travis Fisher and Josh Loucks, "The Inflation Reduction Act after Two Years: Spending Estimates Reach New Heights, but Green New Deal Supporters Want More," *Cato Institute Blog*, August 16, 2024.
73 Charles Dauber, "Maximizing the Value of IRA Tax Incentives While Minimizing Investment Compliance Risk," *Utility Dive*, April 8, 2024.

K. UTILITY SCALE SOLAR FACILITIES CONSUME VAST AMOUNTS OF PRIME FARM LAND COMPARED TO CONVENTIONAL GENERATING PLANTS

1. According to the USDA, in 2023, there were 76.2 million, or 8.0 percent fewer acres in farms than in 1997.[74]
2. Among the primary impacts of utility scale solar is the amount of land necessary for the production of electricity. According to a 2021 Princeton University Report and Bloomberg article, **renewables require 300 to 400 times more land than natural gas or nuclear plants**.[75] [76]
3. Statistics compiled by the U.S. Geologic Survey and the U.S. Department of Energy's Lawrence Berkley National Laboratory in the Large-Scale Solar Photovoltaic Database indicate that **4,185 such facilities with a total potential rated capacity of 70,060 MW exist in 47 states** and the District of Columbia, as of 2021, as shown on the following map.[77]
4. Since 2021, solar capacity has nearly tripled, according to a December 2023 report from the Solar Energy Industries Association (SEIA) and Wood Mackenzie.[78]
5. Farm land leases to solar companies are publicly traded. For example, Farmland Partners Inc. a farmland real estate investment trust (REIT) has leased about 9,000 acres nationwide to solar farms.[79]
6. Based on data from *Energy Tech*, a publication that informs large energy users on the latest technology, "**land-wise, a typical 500-MW**[80] combined cycle gas

[74] P.J. Huffstutter and Christoper Walljasper, "Insight: As Solar Capacity Grows, Sone of America's Most Productive Farmland Is at Risk," Reuters, April 29, 2024.
[75] https://www.public.news/p/finally-they-admit-renewables-are
[76] Eric Larson, et al, "Net-Zero America," Princeton University, October 29, 2021.
[77] Ibid.
[78] Ibid.
[79] Ibid.
[80] According to EIA, the U.S. Energy Information Administration, *Annual Electric Generator Report* and *Monthly Update to the Annual Electric Generator Report* (February 12, 2019: "The average combined-cycle power block installed between 2002 and 2014 was about 500 megawatts (MW). After 2014, power block capacity increased, reaching an average of 820 MW in 2017."


Regina
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Sioux
Falls
Toronto
IOWA
NEBR.
Eureka
Salt Lake
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Reno
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KY.
St.
George
TENN.
OKLA.
Santa Fe
ARK.
Florence
N.M.
ARIZ.
Angeles
Lubbock
MISS.
ALA.
Ciudad
Juárez
TEX.
LA.
Mobile
Jacksonville
B.C.
SON.
CHIH.
Houston
COA.
Corpus
Christi
Gulf of
Mexico
Miami
B.C.S.
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La Paz
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MEXICO
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7. power plant might take up **five to seven acres**. A **100-MW solar farm** might be spread out over **1,500 acres**, and a similar capacity wind farm could take **10,000 acres or more**, according to various reports."[81]
   a. With respect to the **500 MW conventional power plant** that requires **five to seven acres**, a **500 MW solar plant**, such as the one in Spotsylvania County, VA requires **6,300 acres.**

L. AGRICULTURAL LAND USED FOR SOLAR GENERATION CAN NEVER BE RETURNED TO ITS ORIGINAL PRODUCTIVITY

1. The solar industry claim that land used for industrial scale solar generation can **revert to agriculture at the end of the lease** or should other energy options replace solar in the future.[82] However, that claim is contested by numerous soil scientists, as well as the **Virginia Department of Environmental Quality**. The latter stated in a December 2022 report, that **"once altered,' **Virginia's prime agricultural soils and forest lands **'cannot be restored' to prime productivity."**[83] (Report Attached).
2. Solar industry studies have been reported in various academic journals that storm water controls,[84] as well as healthy vegetation and well drained soils,[85] can help run-off on solar farms.
3. However, according to the U.S. Environmental Protection Agency common solar farm construction practices, including clearing and grading large

[81]Rod Walton, "Morning Mull: Relative Construction Costs and Land Use of Solar, Wind and Natural Gas Plants," *Energy Tech*, 2020. https://www.energytech.com/print/content/21251823.

[82] John Muraweski, Solar's Lofty Ambitions Are Consuming Ever-Larger Expanses of Land Below, " *RealClear Investigations*, December 7, 2022.
[83]Ibid.
[84] Jeff Mullhollem, "Penn State Study Finds Solar Farms with Stormwater Controls Mitigate Runoff, Erosion," Penn State News, July 22, 2024.
[85] Rouhangiz Yavari Bajehbag, et al, "Quantifying Soil Moisture and Evapotranspiration Heterogeneity within a Solar Farm: Implications for Stormwater Management," *Journal of Hydrology*, Volume 638, July 2024.

sections of land can lead to **significant erosion** and major runoff of sediment into waterways without proper remediation.[86]

a. The Virginia Department of Environmental Quality declared in March 2022 that **solar farms would be considered to be "impervious area"** for the purposes of controlling stormwater runoff and erosion.[87]

b. Dr. Ronnie W. Heiniger, with the Department of Crop and Soil Sciences at the North Carolina State University, prepared a soil analysis for the proposed Lone Oak solar farm in in Madison County, Indiana (August 27, 2019). His study showed that the time of concentration of water leaving the site would be **29% faster,** in terms of velocity and force, once the **solar panels were installed.**[88]

c. According to Heiniger, the land use at the site was Class B with conventional tillage having a hydrologic soil group (81). "Recent tests have shown that after solar panels are installed the resulting land use that best describes **water permeability** is a **mix of roof (100)** and **pasture or range (79 for poor condition grass or range)**. In considering this mix the land use value for most constructed solar site should be 87."[89]

d. Heiniger concludes that, "The decrease in time of concentration and dramatic increase in volume of water from this property without a doubt will **increase the amount of surface water on neighboring properties** and increase the frequency of **flooding** with a high potential for **property damage**. Any grading or changes in field drainage due to construction has the potential to increase the negative impacts on drainage from these fields. In North Carolina, solar facilities have been directly impacted with

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[86]Huffstutter, op cit.
[87] Muraweski, op. cit.
[88] Dr. Ronnie W. Heiniger, "Report on Drainage Issues in Conversion of Land for Lone Oak Solar Complex," August 27, 2019.
[89] Ibid.

increases in drainage and a higher frequency of damage resulting from intense rainfall events."[90]

e. Drainage damage to adjacent properties is not an isolated occurrence. For example, **run off** from the Nestlewood Solar Facility near Hammersville in Clermont County, Ohio is **so severe** that it prompted the Clermont County Commissioners to **ban large solar and wind** farms in seven townships within the county.[91]

f. In May 2024, the Associated Press reported, a federal jury imposed a **$135.5 million penalty** on a Tennessee solar company, Silicon Ranch Corporation, and its contractor, Infrastructure and Energy Alternatives. According to the Court, the two companies allegedly developed a solar farm by clearing about 4 square miles of land without installing adequate soil control measures. During rains the eroded soil allegedly spilled as mud onto nearby property.[92]

g. In November 2022, the EPA and the Department of Justice **fined four solar farms** in Illinois, Alabama and Idaho for **polluting local waterways,** as a result of causing harmful buildup of sediment.[93]

h. A solar developer with multiple utility-scale solar farms in Virginia has been **cited for the third year in a row** for violating state environmental regulations.[94]

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[90] Ibid.

[91] Paula Christian, "Neighbors Worry about Flooding from Nestlewood Solar: 'We're Going to Lose Our Property Because of This," WCPO9 Cincinnati, January 11, 2024.

[92] Matteo Cavallito, "Solar Farms May Encourage Soil Erosion in U.S.," RE Soil Foundation Newsletter, September 7, 2023.

[93] https://www.popsci.com/environment/solar-farm-constuction-epa-water-violations/

[94] Matt Busse, "Solar Firm Energix Fined Again for Virginia Environmental Violations," *Cardinal News*, May 24, 2024.

i. Once top soil is destroyed or removed, it takes **1,000 years to generate three centimeters** (1.18 inches) **of top soil.**[95]

4. **Solar developers** claim that by allowing the land to **remain fallow** for the period of the lease is **beneficial.**

   a. However, **Ralph E. Hart, a soil scientist** in Western Kentucky, has studied the effect of allowing land to remain fallow. His study involved fallow land that was in a Federal Wildlife program for 10 years beginning in 2008 compared to comparable land on the same farm that continued to be cropped. The fields were cropped identically from 2019 to 2023 and despite fertility and lime applied as recommended per soil tests, the formerly **idled land lags far behind the continuously cropped land.**[96] (Study Attached)

   b. A 2022 **Italian study** examined soil under photovoltaic panels after seven years with and compared it with an adjacent soil not affected by the solar plant (GAP area). "The main results showed that seven years of soil coverage modified soil fertility with the significant reduction of water holding capacity and soil temperature, while electrical conductivity (EC) and pH increased. Additionally, **under the panels soil organic matter was dramatically reduced** (-61% and -50% TOC and TN, respectively compared to GAP area) inducing a parallel **decrease of microbial activity** assessed either as respiration or enzymatic activities."[97]

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[95] Chris Arsenault, "Only 60 years of Farming Left if Soil Degradation Continues," *Scientific American*, December 5, 2014.

[96] Ralph E. Hart, MMA, CCA, "Impact of Long Term Fallow Land," Unpublished Study, April 3, 2024.

[97] Matio Cristina Moscatelli, et al, "Soil Properties Changes after Seven Years of Ground Mounted Photovoltaic Panels in Central Italy Costal Area, " *Geoderma Regional*, Volume 29, June 2022.

M. UTILITY SCALE SOLAR PANELS ARE CONSTRUCTED OF HAZARDOUS MATERIALS

1. According to Dwight Clark, director of compliance and recycling technology at We Recycle Solar,[98] an Arizona company engaged in plant decommissioning and panel recycling: "Things that make a solar panel hazardous waste could be if a **cadmium telluride (CdTe) panel leaches lead**...Polycrystalline and monocrystalline panels can also leach materials what would make the panels hazardous waste, like **silver and lead and selenium**...If something leeches **above a certain level, its hazardous**."[99]
2. Cadmium telluride is "a stable crystalline compound made of cadmium and tellurium. It is mostly utilized as an infrared optical window and a semiconducting component in cadmium telluride photovoltaics. To create a p-n junction solar photovoltaic cell, **cadmium sulfide** is often placed between them. The principal application for this crystalline compound are as a component of solar cells and as an infrared optical window, it is ideally suited for the conversion of solar energy. As cadmium is present, **cadmium telluride is extremely poisonous.**"[100]
   a. Cadmium is one of the six most hazardous substances known to humans. It is the primary reason why cadmium telluride is hazardous. However, compared to cadmium metal, this chemical is significantly less hazardous. The hazardous qualities of this cadmium-tellurium combination are due to another factor. One study claims that the high reactivity of this chemical causes oxygen damage to the mitochondria, nucleus and membrane of live

[98] We Recycle Solar is the only company fully permitted by the EPA to properly handle all hazardous secondary materials in solar panels for recycling.
[99] "What Solar Plants Operators Need to Know about Panel Disposal," *Utility Dive*, February 26, 2024.
[100] Dr. C. Pallavi and Dr. Kaushal Bhavsar, "Cadmium Telluride Toxicity – Causes, Benefits, Risks and Recovery," *iClinic,* May 4, 2023.

cells. Usually, the hazardous cadmium chloride solution re-crystallizes from the cadmium telluride films."[101]

3. The National Renewable Energy Laboratory's (NREL) reliability team regularly receives "reports of glass breakage in silicon modules unrelated to direct damage from maintenance or storm impacts…The team found that over time, the **average quality of solar glass appears to be decreasing.**"[102]
    a. "A new study from Clean Energy Associates (CEA) shows that **83% of sites tested** as part of a global survey had **line cracks, 78% had a soldering anomaly and 76% had complex cracks.** The survey involved visual inspections combined with electroluminescence testing across 148 sites in 16 countries."[103]
    b. A 2021 study published in the journal *Energies* that examined leaching via weak spots in solar panels concluded that: "Our long-term experiments clearly demonstrate that it is possible to **leach out all, or at least a large amount, of the (toxic) elements from the photovoltaic modules."** (Study Attached).
4. According to the National Institute of Environmental Health Scientists, perfluoroalkyl and polyfluoroalkyl substances (PFAS) are toxic, persistent and bio-accumulative.[104] A physical scientist at the U.S. Environmental Protection Agency, Dr. Mark J. Strynar confirmed that certain **perfluorinated compounds are used in the production of solar panels**, having provided 39 records from the SciFinder databased used by the EPA to identify applications of PFAS with solar panels.[105]

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[101] Ibid.
[102] Ryan Kennedy, "Spontaneous Glass Breakage on Solar Panels on The Rise, *PV Magazine*, June 21, 2024.
[103] Emiliano Bellini, "New Survey Shows 'Massive Increase in PV Module Microcracks," PV Magazine, November 1, 2023.
[104] https://www.niehs.nih.gov/health/topics/agents/pfc
[105] https://nsjonline.com/article/2018/02/solar-panels-coould-be-a-source-of-genx-and-other-perflourinated-contaminents/

a. **PFAS coatings or films** can be used in several components of **solar panels.** PFAS reportedly increase durability, transparency, mechanical strength, and resistance to UV, heat, and dirt. PFAS are used in the rechargeable **batteries** that store the energy captured by solar panels.[106]

b. A 2024 paper noted that, "Studies have noted uses of PFAS in the energy sector including windmill coatings, semi-conductors and photovoltaic cells. Literature and patents also document use of PFAS as electrolytes in rechargeable, lithium-ion batteries." The study concludes that, "we **confirm the clean energy sector as an unrecognized and potentially growing source of international PFAS release**. Results underscore that environmental impacts of clean energy infrastructure merit scrutiny to ensure that reduced CO_2 emissions are not achieved at the expense of increasing global releases of persistent organic pollutants."[107] (Study Attached).

c. As a result of the presence of PFAS in solar panels, **communities have prohibited their use.** For example, the Town of Avon, New York adopted Local Law 3 of 2021 to their solar ordinance which prohibits using solar panels that "utilize or contain any amount of GenX chemicals or polyfluoronalkyl (PFAS) substances."[108] (Paper Attached).

5. Solar panels, or photovoltaic modules (PV) **contain base metals, precious/rare metals; metalloid and alkali metals, and polymeric materials used in encapsulants, backsheets and adhesives**. Some of these are considered environmentally hazardous, including **arsenic, barium,**

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[106] PFAS in Building Materials - Green Science Policy Institute

[107] Lithium-ion Battery Components Are at The Nexus of Sustainable Energy and Environmental Release of Per-and Polyfluoroalkyl Substances.," *Nature Communications*, July 8, 2024.

[108] Citizens for Sensible Solar, "PFAS and Other Compounds in Solar Panels, Wiring and Coatings," September 23, 2021. https://www.avon-ny.org/PDFs--Town%20Clerk/113-2021.pdf

cadmium, chromium, lead, mercury, selenium and silver.[109] A 2023 study summarizes relevant regulations and offers comprehensive overview of the strengths and limitations associated with these toxicity assessment procedures currently in practice.[110] (Study Attached).

a. A 2018 study examines **Perovskite solar cells** with regard to their **lead content** and concludes that "lead must, and can, be completely replaced by nontoxic elements in PSCs, and that this can ultimately be done without compromising their efficiency and stability."[111] (Study Attached).

6. Many solar panels are supported by **galvanized steel platforms**. That steel oxidizes over time and **releases zinc to the soil**, which can be toxic to plants at certain levels."[112] The steel supports are approximately 10.0 feet deep into the soil and the **zinc can alter soil microbial diversity** rendering the **subsoil infertile.**

N. DECOMMISSIONING

1. According to Dr. Ronnie W. Heiniger, "The **costs of mitigation** of potential residues either from **heavy metals** such as zinc from the support structures, cadmium from decaying panels, or from the use of herbicides to sterilize the soil is largely **unknown.**"[113] There are three main areas that must be addressed in returning solar facilities back to productive agricultural activities.[114] (Study Attached).

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[109] Fang Li, et al, "A Review of Toxicity Assessment Procedures of Solar Photovoltaic Modules," *Waste Management*, December 29, 2023.

[110] Ibid.

[111] Qi Zhang, et al, "Perovskite Solar Cells: Must Lead Be Replaced – And Can It Be Done?" *Science and Technology of Advanced Materials*, 2018.

[112] Dan Way, "Big Solar Farms May Be Stressing Agricultural Ecosystem," *Carolina Journal,* May 25, 2017.

[113] Dr. Ronnie W. Heiniger, "Cost of Reclaiming Land Currently Used for Solar Panels Back to Farmland," October 17, 2017.

[114] Ibid.

a. First, there is **the cost of the removal** of equipment including the **solar panels, the support structure, wiring, concrete stands, inverters, poles, fencing, and buffer vegetation.**

b. Secondly, **mitigation** of any **heavy metal or herbicide residues.**

c. Thirdly, the **costs of restoring the soil properties** that are essential to supporting crop productivity.

d. Each take **time** and **money** in order to restore the site to farmland.

2. Estimates for removal of the solar plant components vary from current cost of $30,000 to $50,000/MW,[115] [116] or up to **20.0 percent of the initial installation cost.**[117] (Studies Attached)

3. The **cost of soil reclamation** estimated by Dr. Heiniger in 2020, was **$1,780 per acre**, including mitigation of zinc: $1,500; mitigation of herbicide and compaction: $50; Application of lime and fertilizer cost: $1,780.[118]

4. Heiniger notes that, "if other contamination is found or other issues such as the need to install new ditches or drainage structures are discovered then these **costs could be substantially higher** or the site may **no longer be suitable for agricultural production.**[119]

5. According to Heiniger, "Clearly, **no grower could afford to decommission a site on his own.** The cost of equipment removal alone would be greater than any potential gain from returning it to agricultural production. Therefore, it is essential that the **solar operator** be held responsible **for the entire process.** The exact amount needed to properly address and decommission a large-scale solar plant will be difficult to determine given the rate of inflation of the

[115] Heidie Kolbeck-Urlacher, "Decommissioning Solar Energy Systems Resource Guide," Center for Rural Affairs, June 2022.
[116] Daniel Raimi, "Decommissioning US Power Plants: Decisions, Costs and Key Issues," *Resources for the Future*, 2017.
[117] https://thundersaidenergy.com/downloads/solar-power-decommissioning-costs/
[118] Heiniger, op. cit.
[119] Ibid.

various decommissioning expenses over the life (25-35 years) of the project. Bonds should be evaluated annually and increased accordingly."[120]

O. SOLAR LEASES AND GOOD NEIGHBOR AGREEMENTS DO NOT PROTECT THE INTERESTS OF THE PROPERTY OWNERS

1. Solar leases are generally confidential, but reportedly range from a low of $500 to $4,000 per acre, according to Farmers National Company, a farm management and services company. An Indiana ag lawyer, Todd Janzen, indicated they are typically range from $1,000 to $2,000 over a life of 20-plus years. The *Farm Journal* published a letter from a solar company offering a farmer "a rate of $3,200 to $4,500 per acre. The company offered an additional $1,000 if the farmer signed a letter of intent, plus $3,000 more upon signing the cash lease."[121]
2. When questioned by Farm Journal regarding the potential relationship between high lease rates and the Inflation Reduction Act (IRA), Secretary of Agricultural Tom Vilsack, stated that, "the program pays 50% of the cost of the installation. There's a tax credit that will give you another 40% of the value. So, **90% of the cost, of an individual solar operation**, of the windmill project, things of that nature can be **paid under the IRA**…In addition, we are creating a vehicle in which the PACE program and the NEW ERA program are providing significant resources to municipal utilities to convert from a fossil fuel generation and use to a more balanced portfolio of renewables. So, that resource is potentially a **forgivable loan program** that can significantly increase the opportunities in this space."[122]

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[120] Ibid.
[121] Tyne Morgan, "$4,500 Per Acre Plus a Signing Bonus? What Solar Companies Are Now Offering Farmers to Lease their Ground," *AGWEB, Farm Journal*, July 16, 2024.
[122] Ibid.

3. Although leases are confidential, many of the terms are publicly known. Some of the **risks of leasing land** to the solar companies include the fact that **all liabilities revert to the owner of the land, regardless of how the lease is structured.**

   a. **Taxes are converted** from agricultural exemption to **industrial value** upon construction. The **equipment tax** is paid by the solar company, but **the landowner will be liable if they are not paid.** Likewise, if the solar **company fails to pay contractors**, they can put **liens on the land.**

      i. For example, Eric Crowgey, a Wytheville, VA farmer entered into a lease that permitted him to raise sheep under the solar panels. During the permitting process the project was sold to a second American company, which was later bought out by an Israeli company, Energix. Disregarding the Department of Environmental Quality (DEQ) the Israeli company buried the top soil in rock and dirt, negating the ability to graze sheep, while accumulating more than $100,000 in fines. Energix has also been fined for violating erosion and sediment control rules at seven other Virginia sites. When the grading contractor was uncompensated by the developer, a **$300,000 lien was placed on Crowgey**, since the land is in his name. The **taxes had also not been paid.**[123]

      ii. On September 29, 2021, the **farmers** in Spencer County, Indiana that signed lease agreements with Grandview Solar **received mechanics liens in the amount of $9,065,413** as a result of the solar company, Sol Systems' failure to pay their Minnesota contractor, Ames Construction.[124]

[123] Zach Cooley, *SW VA Sun*, "Solar Dreams Turned into Nightmare for Wythe Farmer," June 18, 2024.
[124]Copy of Sworn Statement and Notice of Intention to Hold Mechanic's Lien (Grandview Solar Project), September 29, 2023,

b. The **rights of the landowner are subordinate to the solar company**. For example, in 2019, Dunns Bridge Solar LLC leased 445.0 acres of a 1,200.0 acre farm near Whitfield, Indiana. According to the lease, the developer would "not remove topsoil" from the property. However, sand was spread over the land beneath the panels. In response to the farmer's complaint, the **solar company would review** any remedial work needed to the land at the **end of its contract in 2073,** as per the terms of the lease agreement.[125]

   i. When developers use farmland as space for solar panels, they often don't want or need the whole field; instead, they typically use a portion directly in the middle and **leave the edges**, the least efficient soil in the field **to the farmer.**[126]

4. A standard provision in the solar leases **allows the developer to terminate the agreements at any time without cause**. According to Martin Machtan, a Wisconsin real estate attorney, "While the landowner has a one or 30 day contract, the developer obtains an ironclad commitment from the Landowner for 37 to 70 years. This means that the **income luring landowner can be cut off** in the blink of an eye. This sort of imbalance is an enormous red flag for an attorney or business owner and creates **tremendous risk.**"[127]

5. Another major issue that concerns Machtan is the **liability** that the contracts create. "Wind turbines and solar panels contain toxic chemicals and are being placed in agricultural areas not accustomed to industrial development. Weather-based energy facilities are a recipe for landowner

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[125] IER (Institute for Energy Research), "Solar Power Depletes Farmlands of Rich Soil," May 29, 2024.
[126] Clayton zBaumgarth, "As Solar Developments Continue, Land Leasers Stand to Lose the Most." *Indiana Public Media,* March 22, 2024.
[127] Marin Machtan, "Three Strikes for Wind & Solar," *Substack*, May 10, 2024.

disputes, litigation and environmental enforcement actions. Worse yet, the majority of contracts we have reviewed shift **limitless liability onto landowners.**"[128]

6. Machtan has concluded that, "after signing an easement or lease, **developers end up with more control of the land than landowners retain**. Every contract we have reviewed:
   a. gives **developers buildable rights** over the **entire** encumbered property;
   b. do **not allow landowners to exclude developers** or their agents from their property at any time;
   c. **require landowners to accept the externalities** of weather-based energy facilities including **noise, flicker, glare, electro-magnetic radiation, and health problems**;
   d. allow landowners **no authority** to decide where facilities are placed;
   e. make landowners **give up enormous control** of what they can do on their property.[129]
7. Some leases have also included the following provisions:
   a. The term of these leases are 30 years, beginning when the **project delivers electricity** to a grid, not when the lease is signed for construction begins.
   b. There is a clause stating the solar **developer can remove any or all solar facilities at any time**.
   c. The lease **allows the developer to install** poles and one or more substations that can be used to transfer the electricity off the property.

[128] Ibid.
[129] Ibid.

d. The **owner must agree** to use reasonable efforts to **cause the property not to be reclassified** from its present agricultural or open space exemption.

e. The **lessee** shall have the **right, to contest** by appropriate legal proceedings, **any law or ordinance**. The **owner shall reasonably cooperate** by joining in the signing of any reasonable protest pleadings contest or proceeding.

f. Neither the **bankruptcy nor the insolvency of lessee shall be grounds for terminating** the agreement or any interest therein.

g. Lessee has the right, **without obtaining the consent of the owner** to (a) grant subleases, separate easements, to one or more Assignees; (b) collaterally assign, **mortgage, encumber**, pledge or transfer all or any portion of its right, title or interest therein to one or more parties providing financing to Lessee, and/or (c) sell, lease, assign, transfer or otherwise convey all or any portion of its right, title or interest therein to one or more Assignees.[130]

8. Additional provisions from actual leases include the following

a. Section 8.3 – Owner needs to exercise extreme caution when in close proximity to avoid all **risks associated with electromagnetic fields**. Owner accepts warning and **waives any and all claims of injury.**

b. Section 10.3 – Owner acknowledges that certain aspects inherent to the operation of the solar energy facilities may result in some **nuisance**, such as **visual impact**, possible **increased noise levels**, possible **glare**, and other possible effects of electrical generation and transmission including without limitation, potential **interference** with radio, television, telephone, mobile telephone or other electronic devices. Without limiting the grant of easements made in Section 2 of this agreement,

[130]https://nosolarwind.com/news/33/commercial-solar-farm-and-project-leases.

owner understands and has been **informed by grantee that the project facilities on the property may result in some nuisance**, and hereby **accepts such a nuisance,** and owner **waives the right to object** to such a nuisance provide that grantee complies with its obligations in this agreement.

9. Mette, Evans & Woodside, Harrisburg, PA attorneys advise that:

    a. The lease must contain property decommissioning terms, such as the removal of both above-ground and below-ground solar improvements and the regrading of soil. A properly negotiated solar lease should also require the delivery of a security bond or other financial guarantee to the landowner that secures the performance of the decommissioning of the solar facility. **The landowner should also have the right to demand that such financial security be re-evaluated every few years** so as to ensure that the amount of the bond or security is **adequate** to cover the costs of decommissioning.[131]

10. Solar Companies enter into **"Good Neighbor" Agreements** with **properties adjacent** to proposed solar plants. By signing these agreements, the owner of the adjacent property **agrees** to the following **conditions** in **exchange for a monetary payment** (from a 2020 agreement).

    a. **Cooperation.** Owner shall **fully support** and cooperate with (name of solar developer's) development, construction, and operation of the Project, including (developer's) efforts to obtain from any governmental authority or any other person or entity any environmental impact review, permit, entitlement, approval, authorization, or other rights necessary or convenient in convenient in connection with the project...Owner agrees **not to oppose**, in any way, whether directly or indirectly, any such application or approval **at any administrative judicial, or legislative level.**

    b. **Consideration.** All terms in this Section 2 shall be subject to Owner comply with this Agreement (Solar Developer) shall pay Owner a **signing payment** of Two Thousand and 00/100 Dollars ($2,000.00) within 45 days after the Effective Date. Within 45 days of the date when (Solar Developer)

[131] Jacob H. Kiessling, Esq. "Solar Leases: Landowners Beware," ME&W, July 10, 2019.

begins construction…(such date being the "Construction Commencement Date") (Solar Developer) shall pay Owner a **one-time additional payment** of Fifteen Thousand Dollars and 00/100 ($15,000.00).

c. **Confidentiality.** Owner shall hold in confidence all information related to this agreement and the Project (collectively, the "Confidential Information.").

d. Some solar company agreements have a "tiered payment structure based on proximity to and property boundaries with the Project Area." A proposed 2021 Ohio project had "a $1,000 initial signing payment; and a lump sum payment issued at Notice to Proceed with Project Construction (NIP) based on the following: Tier 1 = $25,000; Tier 2 = $15,000; Tier 3 = $10,000; and Tier 4 = $7,500."

P. SOLAR DEVELOPER'S APPRAISERS HAVE DETERMINED UTILITY SCALE SOLAR PLANTS HAVE NO NEGATIVE IMPACT ON ADJACENT PROPERTY VALUES

1. Solar developers generally use the appraisal services of Cohn Reznick LLP Valuation Advisory Services and Kirkland Appraisals. These firms have concluded that solar farms have no detrimental impact on adjacent property markets nor their values.[132] (Attached SEIA Document).

   a. However, this claim has been refuted by numerous published peer reviewed studies, in addition to damage studies written by Mary McClinton Clay, MAI. The latter has also reviewed reports written by Cohn Reznick and Kirkland Appraisals for the Kentucky Siting Board and the Ohio Siting Board, as well as for planning commissions in Hardin County, KY; Pueblo County, CO; and Madison County, IN.

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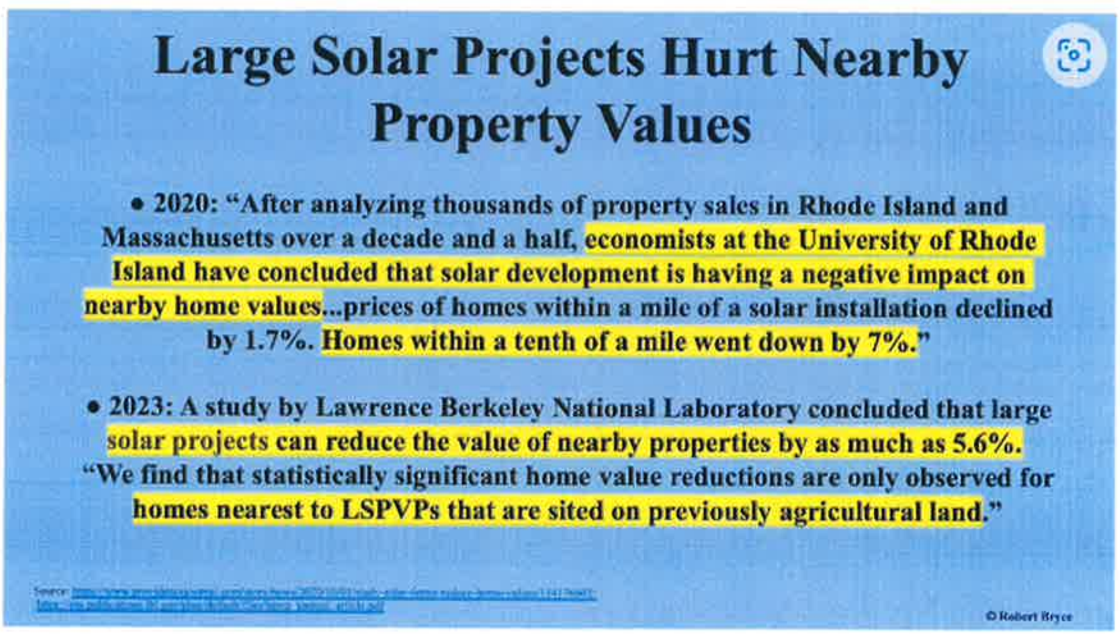
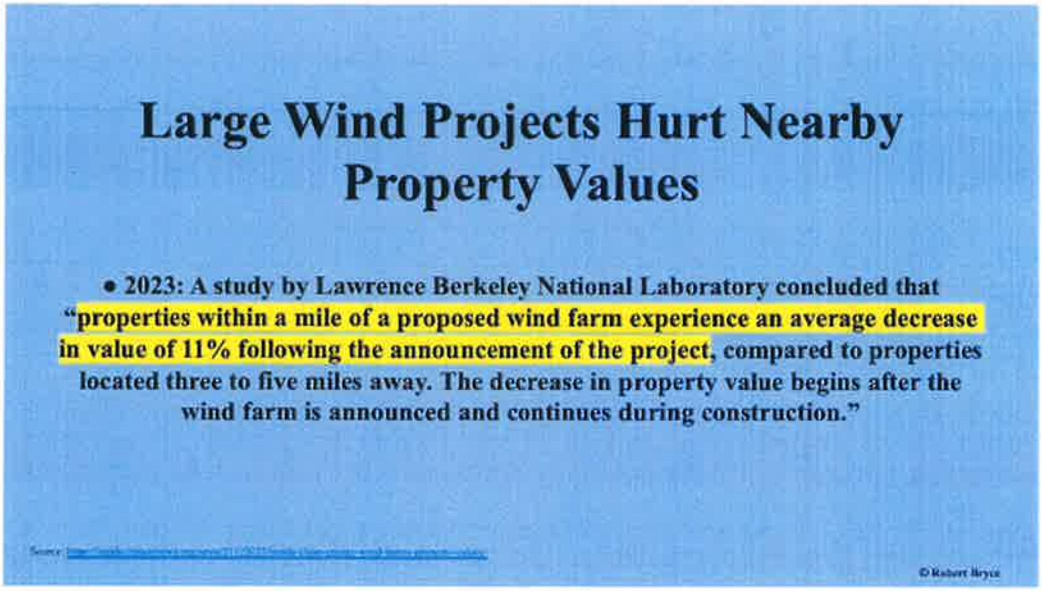
[132] SEIA, "Solar and Property Value," July 2019.

13. Real Estate appraisers used by solar developers claim "that a solar farm is a compatible use for rural/residential transition areas and that it would function in a harmonious manner with this area."[133]
14. The 2024 Lawrence Berkley National Laboratory (LBNL) survey of alt-energy developers, indicated that **visual concerns** to be the most common for both wind and solar, followed by sound for wind and loss of farm land for solar. [134]
15. Robert Bryce had cited the following LBNL studies that have documented diminution of property values in nearby properties to industrial scale solar plants.[135]



[133] Richard Kirkland,
[134] Robi Nilson, Ben Hoen and Joe Rand, "Survey of Utility Scale Wind and Solar Developers Report," Lawrence Berkley National Laboratory, 2024.
[135] Robert Bryce, "Tally of US Wind & Solar Rejections Hits 735," Robert Bryce, Substack, September 22, 2024.



16. A summary of the current peer reviewed articles (including those cited above) regarding the effect of utility scale solar projects on adjacent property values was prepared by Mary McClinton Clay, MAI. The **seven published sources unanimously document that utility scale solar farms have an adverse impact on nearby property values.** (Summary Attached.)
17. A damage study prepared by Mary McClinton Clay, MAI documents that utility scale solar plants, are in fact, detrimental conditions that are incompatible with rural residential improvements; and these industrial facilities diminish adjacent property values within a range of 6.0 percent to 30.0 percent. (Study Attached.)

Q. AGRIVOLTAICS ARE SUBTERFUGE TO MINIMIZE THE IMPACT OF INDUSTRIAL SCALE SOLAR POWER GENERATING SYSTEMS ON THE AGRCULTURAL ENVIRONMENT

1. Many solar developers claim that pollinators or sheep will be included in their proposal.

2. For example, Silicon Ranch, the Tennessee developer that has applied for a 797.0 acre solar plant on 1,200.0 acres in Fayette County, Kentucky "wants to **add sheep to the land to keep it agricultural.**"[136]
3. According to Loran Shallenberger, the Director of Regenerative Energy Operations for Silicon Ranch:
    a. "Solar projects **improve the land and soil**, often leaving them in **better condition** than many **conventional farms.**"
    b. "They keep soils healthy and land productive and help **maintain the agricultural way of life**."
    c. "Agrivoltaic solar farms…manage the land in a sustainable way…**without depleting soil** or **natural resources**, something **not all farms can claim.**"[137]
4. "Silicon Ranch was sued and ordered to pay millions of dollars to Georgia landowners who alleged the Lumpkin Solar Farm caused **damages to a 21.0 acre fishing lake** due to **poor erosion control** when the solar farm was constructed. In April 2023, a federal jury awarded Shaun Harris and Annie Harris of Stewart, Georgia, $135 million - $25 million in punitive damages against Silicon Ranch and the remaining damages against the contractor and a subsidiary of the contractor. A federal judge later reduced those damages to $5 million in November 2023."[138]
5. Solar "farms," by definition, and as previously described throughout these findings, would preclude any of the above three claims.
6. According to the lease agreements, the top soil will be removed and stock piled for use after decommissioning of the solar "farm." Without top soil it is

[136] Beth Musgrave, "Should an 800-acre Solar Farm Be Built in Eastern Fayette County? Some Aren't So Sure," Lexington Herald Leader, May 14, 2024.
[137] Loran Shallenberger, "Solar Production and Farming—Can and Should—Coexist in Fayette County: Opinion, Lexington Herald Leader, October 7, 2024.
[138] Musgrav e, op cit.

unlikely that the remaining ground would support the fertility requirements for pollinators or sheep, as stipulated in documents published by the University of New Hampshire and University of Kentucky Extension Services, respectively. (Extension Publications Attached).

7. Dr. Ronnie W. Heiniger, Cropping Systems Specialist at North Carolina State University addressed the issue of agrivoltaics in an email addressed to Denise Spooner, a member of the Madison County, Indiana Planning Commission on September 28, 2020.

    a. With regard to pollinators: "First of all, native flowers are already growing in pastures and the use of alfalfa and clovers in fields are all sources of nectar for bees. However, native flowers nor clovers, nor alfalfa, nor any of the native grasses are competitive species. They may persist for one or two years but then are replaced by tall grasses, shrubs, and in areas with more moisture, trees and other vegetation. In the prairies of Indiana, tall native grasses grew as a result of wildfires that helped control the shrubs and trees and allowed the grasses to become the dominant species. Are they saying they will burn the area under the solar panels every four or five years?"

    b. "They have said that they would plant flowers and native species under panels in North Carolina—but they have not done so. Why? Because they are too hard to maintain. Without burning or mowing these supposedly native species are overcome by weeds, shrubs, etc. There is no scientific evidence to support that this will save money nor any evidence that pollinators are increased when solar panels are placed in a field."

    c. Regarding sheep, "Yes, you can see pictures of sheep grazing under solar panels. I know sheep farmers will tell you what a great deal this is so they can sell their services to these solar companies. But the only sheep grazing under panels in North Carolina are where they are brought in for a photo opportunity and then within a day or two removed before they cause too much damage to the panels."

d. "The City of Portsmouth, VA tried to use sheep to control the vegetation on Cranney Island (300 acre tract) in the James River. They thought they could eliminate mowing—or at least that is what the sheep farmer told them. Two years later they sold the sheep and pronounced the effort a failure. Why? (1) It took a lot more sheep to control the grasses than anyone thought. (2) Sheep are picky eaters. They don't like weeds or most other vegetation, only specific grasses. So, they did NOT control all the vegetation and mowing was still necessary. (3) Sheep are hard to maintain. They have to have lots of fresh water, mineral supplements and they are prone to diseases and predators. How may solar installations do you see with watering facilities for providing fresh water to the sheep? How many have barns and places for the sheep to get out of storms? How many have facilities for the sheep to get mineral supplements? There are no solar installations in North Carolina with this type of support facilities for sheep and there are no sheep being used (other than for photo ops) to graze the vegetation."

e. "These sheep farmers love the hype but they know this is nothing more than a way to get in the paper and try to sell their wares. Why does the picture show the herd of sheep outside the panels? Because the sheep don't want to be there and neither does the solar company want the damage these sheep will cause."

f. Relative to no till farming, "less disturbance of the soil is better than lots of tillage. So, it could seem that putting the land into solar panels without disturbing the soil is a good thing, right? Well not so fast. In no till farming these benefits only occur once soil compaction is eliminated. Many no-till farmers give up on the practice of no till because they cannot find a way to overcome soil compaction caused by running machinery on the land. The result of compaction is a degradation of the soil because water cannot enter the soil but instead runs off the land. Air pockets in the soil are reduced and without air the soil biome cannot recover. This is the problem with solar installations – soil compaction. The use of frequent mowing in predicable patterns causes oil compaction. This leads to increased water runoff and anerobic soils. What about under the panels? Here is where the greatest benefit to the soil should be but because the panel shades this area the benefits are reduced. I think in the long term this is one of the better arguments solar developers have but then we would be better with just finding better ways to reduce tillage on all our land."

g. Regarding the claim that crops flourish under solar panels, "there is no mystery of why grasses grow better under the panels. It has nothing to do with water and everything to do with TEMPERATURE. The temperature under these panels is higher and it is outside the panel shade. Why? Because the panel uses only 20 to 25% of the incoming solar radiation. The rest of the sunlight energy must go somewhere. It goes into heating the panels themselves. These panels, in turn, radiate that heat energy to the ground underneath the panel. Plants grow according to temperature, not time. Therefore, under increased temperatures, plants develop quicker and grow more because they need to find sunlight which is limiting under the panels. The taller plants are a result of etiolation (an elongation of the stem caused by the lack of sunlight). There is more water because there is less evaporation from the soil due to the shading of the panels. The problem is, that under these conditions, the plants are not very productive in terms of producing fruit. These plants use up all their energy trying to grow taller and do not have enough to produce seeds, berries, etc. So, growing plants under these panels with the expectation of harvesting berries, melons, etc., is folly. What about the lack of sunlight? Plants are in the business of converting sunlight into biomass and reproductive structures. Without sunlight (or with less sunlight) plants are less productive."

8. In addition to Dr. Heiniger's description of an effective "heat island," a 2016 University of Maryland Study found that "large scale solar power plants raise local temperatures, creating a solar heat island effect…This study contradicts previous theoretical work and modeling studies that predict solar installations would decrease temperatures around them by intercepting some of the sun's potentially warming energy and converting it into energy."[139]
    a. The study defined the heat island effect as the difference in ambient air temperature around the solar power plant compared to that of the surrounding wild desert landscape. Findings demonstrated that temperatures around a solar power plant were 5.4-7.2 degrees F warmer than nearby wildlands.[140]
    b. A 2024 study "revealed the significant effect of the panels on surface heat flux, surface temperature and air temperature. The panels also appeared to affect near surface vertical turbulent heat and momentum fluxes. These effects intensify with increased incoming solar radiance."[141]
9. Efficiency is the reason farming has succeeded with dwindling numbers of acres available every year. Efficiency is also necessary with regard to the

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[139] Graham Binder, "Researchers Discover Solar Heat Island Effect Caused by Large-Scale Solar Power Plants," Phys.Org, November 7, 2016.
Barron-Gafford, G.A., et al." The Photovoltaic Heat Island Effect: Larger Solar Power Plants Increase Local Temperatures," *Sci. Rep.* 35070; doi:10.1038/srep35070 (2016).
[140] Ibid.
[141] Daniel Trevor Cannon, et al, "Daytime Thermal Effects of Solar Photovoltaic Systems: Field Measurements," *Journal of Renewable and Sustainable Energy,* September 24, 2024.

complex generation of electricity. It defies credulity why each enterprise would choose to constrain their respective operations when it is not required, other than to "ease concerns over the removal of productive land from agriculture."[142]

R. SOLAR ENERGY BREAKTHROUGH COULD REDUCE NEED FOR SOLAR FARMS

1. "Scientists at Oxford University Physics Department have developed a revolutionary approach which could generate increasing amount of solar electricity without the need for silicon based solar panels…Their new light-absorbing material is, for the first time, thin and flexible enough to apply to the surface of almost any building or common object. Using a pioneering technique developed in Oxford, which stacks multiple light-absorbing layers into one solar cell, they have harnessed a wider range of the light spectrum, allowing more power to be generated from the same amount of sunlight."[143]
2. According to Dr. Shuaifeng Hu, Post Doctoral Fellow at Oxford University Physics:

> We can envisage perovskite coatings being applied to broader types of surfaces to generate chap solar power, cush as the roof of cars and buildings and even the backs of mobile phones. If more energy can be generated in this way, we can foresee **less need in the longer term to use silicon panels or build more and more solar farms.**[144]

S. NET ZERO

1. With regard to the **pursuit of net zero emissions**, renewables, such as solar and wind, function differently than crude oil. Solar panels and wind turbines only

[142] Karen L. DeLong, et al, "Evaluating Potential Land Use of Utility Scale Photovoltaics (Solar Panels) on Farmland in Tennessee," University of Tennessee Institute of Agriculture, August 2023.
[143] https://www.ox.ac.uk/news/2024-08-09-solar-energy-breakthrough-could-reduce-need-solar-farms.
[144] Ibid.

generate occasional electricity, but manufacture nothing for society. Crude Oil is virtually never used to generate electricity, but when manufactured into petrochemicals, it is the basis for the more than 6,000 products that did not exist before the 1800's, some of which are depicted on the following illustration. **Without crude oil, there would be nothing that needed electricity.**[145]

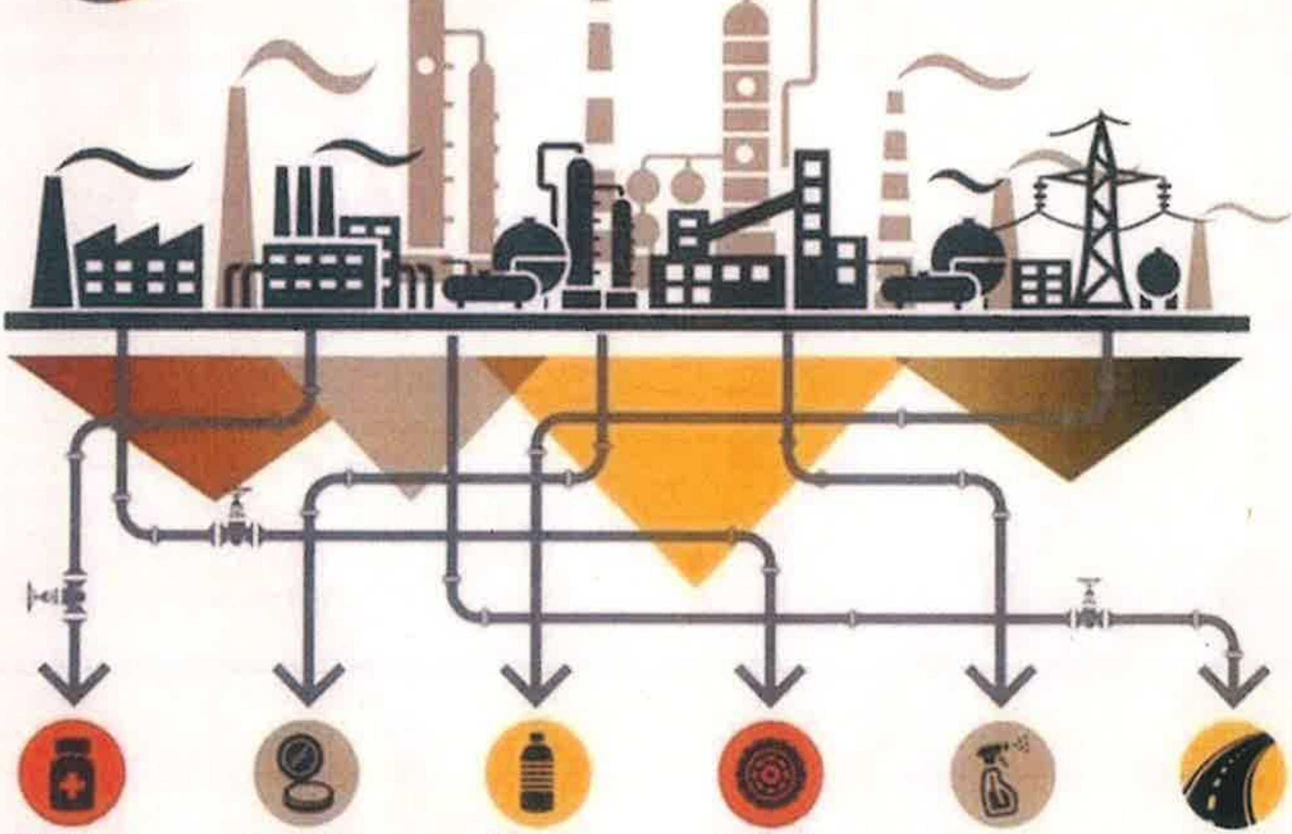
[145] Ronald Stein and Tom DeWeese, "The Dangerous Delusion of Biden and World Leaders of Transition to 'Just Electricity," *Energy New Beat*, July 16, 2024.

THE BIGGER PICTURE

Life Without Oil

NOT AS SIMPLE AS YOU MAY THINK

46% of oil goes to making gasoline, but what makes up the other 54%?



Medicine
Most over the counter medications, homeo-pathic products and vitamins are derived from benzine, a product of petroleum.

Cosmetics
Makeup and shampoo that has oils, perfumes, waxes and color are all produced with the help of petrochemicals.

Plastics
Almost all plastics are made from petrochemi-cals, from your iPhone to that bottle of water. It is 4-5% of the total petroleum consumption.

Synthetic Rubber
Thousands of products rely on rubber such as shoes, tires, wet suits, breast implants, gloves.

Cleaning Products
All those ingredients you can't pronounce in the ingredients list, all of which are very poisonous.

Asphalt
There are over 11 million miles of paved road in the world. Asphalt aka bitumen is the glue that binds the minerals together.

A few other products made with Oil

Insecticides, Ink, Floor Wax, Pens, Upholstery, Clothing, Boats, Sports Car Bodies, Nail Polish, Fishing Lures, Bags, Perfumes, Cassettes, Dishwasher Parts, Tool Boxes, Shoe Polish, Helmets, Caulking, Petroleum Jelly, Tape, Washers, Antiseptics, Curtains, Food Preservatives, Basketballs, Soap, Antihistamines, Purses, Dashboards, Cortisone, Deodorant, Footballs, Putty, Dyes, Panty Hose, Refrigerant, Percolators, Life Jackets, Rubbing Alcohol, Linings, Skis, TV Cabinets, Shag Rugs, Electrician's Tape, Tool Racks, Car Battery Cases, Epoxy, Paint, Mops, Slacks, Insect Repellent, Oil Filters, Umbrellas, Yarn, Fertilizers, Hair Coloring, Roofing, Toilet Seats, Fishing Rods, Lipstick, Denture Adhesive, Linoleum, Speakers, Plastic Wood, Electric Blankets, Glycerin, Tennis Rackets, Rubber Cement, Dice, Nylon Rope, Candles, Trash Bags, Paint, Water Pipes, Hand Lotion, Roller Skates, Surf Boards, Shampoo, Wheels, Paint Rollers, Shower Curtains, Guitar Strings, Luggage, Safety Glasses, Antifreeze, Awnings, Eyeglasses, Toothbrushes, Ice Chests, Combs, CD's & DVD's, Brushes, Detergents, Vaporizers, Balloons, Sun Glasses, Tents, Heart Valves, Crayons, Parachutes, Telephones, Enamel, Pillows, Dishes, Cameras, Anesthetics, Artificial Turf, Artificial Limbs, Bandages, Dentures, Model Cars, Folding Doors, Hair Curlers, Cold Cream, Movie Film, Soft Contact Lenses, Drinking Cups, Fan Belts, Car Enamel, Shaving Cream, Ammonia, Refrigerators, Golf Balls, Toothpaste, and of course Solvents, Diesel Fuel, Motor Oil, Bearing Grease etc. etc. etc.

EXECUTIVE SUMMARY

BOURBON COUNTY UTILITY SCALE SOLAR ENERGY POWERED GENERATING SYSTEMS ORDINANCE

SUMMARY OF FINDINGS

The summary provides the reader with an abbreviated, yet comprehensive review of the attached research paper in support of protecting prime farmland from utility scale solar developments with an ordinance. This would ensure the area would be protected from irreparable harm to the agricultural land and economy, the landscape, the environment, real estate values and the general well-being of the citizenry in Bourbon County. The research to reinforce this assertion is supported by documentation that was sourced from peer reviewed journals, university professors and recognized experts in their respective fields.

The findings also illustrate and document the history Bourbon County has in protecting the farmland from development that would damage the County's vibrant agriculture-based economy. Additionally, we will briefly discuss whether there is a climate crisis looming due to the use of fossil fuels. Sometimes, we must go back to the beginning and revisit our past before moving forward. As President, Franklin D. Roosevelt once said, "A nation that destroys its soil destroys itself."

HISTORY AND LEGAL PRECEDENT

Bourbon County is one of six counties in Kentucky known as the Inner Blue Grass. This highly fertile area has been **recognized since the antebellum period** as a center for breeding quality livestock, especially thoroughbred racehorses. Over two hundred years later, this statement still rings true. Few agricultural regions of the country have a real estate market demand that is international. It's not just the fertility of the land that makes it a desirable addition to a real estate portfolio, but the surrounding beauty of the natural landscape that is enhanced by the manicured condition of the thoroughbred farms. People purchase land here with the expectation their investment will be protected.

Bourbon County has had a nearly 50-year history of active farmland preservation within the Courts. Two of these lawsuits were decided in favor of the appellants by the Kentucky Supreme Court (*Green v. Grissom* and *Simpson v. Laytart* in 1998). Furthermore, the U.S. Supreme Court upheld the right of communities to use zoning for aesthetics in a landmark 1954 decision, *Berman v. Parker.*[1]

More recently, the 2017 Comprehensive Plan for Bourbon Country is clear in its support and goal of preserving agricultural land, especially prime farmland. In 2020, the goals and objectives for the proposed plan, reaffirmed the commitment. (Goals and Objections Attached). Such plans serve as the blueprint for crafting ordinances that promote and protect these objectives. The Comprehensive goals are the following:

a. Agriculture and Environment

- Protect and promote the local agricultural economy.
- Encourage and promote the conservation, protection and restoration of Bourbon County's agricultural land resources.
- Encourage conservation efforts by private organizations.

b. Heritage and Urban Form

- Enhance, preserve and protect the natural, historic and cultural landscapes that give Bourbon County its unique identity.
- Support pedestrian and bike-friendly infrastructure.
- Create a vibrant downtown core.

c. Land Use

- Use viable, proven practices to reach land use decisions that achieve long-term economic and environmental sustainability and enhance quality of life.
- Protect agricultural land to ensure the viability of farming and to enhance our developing tourist trade.
- Encourage sustainable development and redevelopment in identified areas where services are potentially available.

Other efforts by individuals to protect the agricultural sector include the creation of **Conservation Easements on 49 farms representing 14,200 acres.** In addition, **42,423 acres are within 6 Rural Historic Districts, the largest in Kentucky.**

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[1] *Berman v. Parker,* 348 U.S. 26 (1954), https://www.cga.ct.gov/2013/rpt/2013-R-0211.htm

LEGISLATIVE CONSIDERATIONS

KY House Bill 4 was enacted in 2023 and relates to the approval of merchant electric generating facilities by the Kentucky State Board on Electric Generation and Transmission Siting. Section 6, KRS 278.718 states:

> The provisions of KRS 278.700, 278.704. 278.796, 278.708, and 278.710 shall not supplant, any other state or federal law, including the powers available to local governments under the provisions of home rule under KRS 67.080, 67.083, 67.850, 67.922, 67A.060, 67C.101, and 82.082. An ordinance, permit, or license issued by a local government shall have primacy over the provisions and requirements of KRS 278.700 and Sections 2,3, and 4 of this Act, and any conflict between an order of the board and a local ordinance, permits, or license shall be resolved in favor of the local government's ordinance, permit, or license.[2]

ECONOMIC FACTORS OF AGRICULTURE AND TOURISM

According to the 2022 Kentucky Equine Survey, Bourbon County is ranked third among the top five counties in Kentucky, in terms of agricultural sales, which account **for 20.0 percent of all agricultural revenue in Kentucky.**[3] Bourbon County is also one of only five counties in Kentucky with an equine inventory of over 5,000 horses; and is only second to Fayette. With 500 equine operations, 13,000 horses and **an equine value of $870,640,000,** Bourbon County makes a significant economic impact within the equine agriculture sector.[4]

The American Planning Association (APA) recognizes **tourism** as a key sector for economic growth in many regions and any utility scale solar facilities that might be visible from a scenic by-way, historic site, recreational amenity, or similar resources could have negative consequences for those tourist attractions. [5] The Bluegrass State has a robust tourism economy that infuses the state with billions of dollars. In May 2024, Governor Andy Beshear announced, "2023 marked a new record year for Kentucky tourism, with $13.8

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[2] House Bill 4 from 2023: https://apps.legislature.ky.gov/law/acts/23RS/documents/0140.pdf.
[3] University of Kentucky and Kentucky Horse Council, "2022 Kentucky Equine Survey": 20.
4 Ibid.
5 Ibid.: 7

billion generated in economic impact and 95,222 jobs, as tourism remains a key piece of the commonwealth's booming economy." [6]

GROWING RESISTANCE FROM STATES AND FARMERS

Robert Bryce, a 30-year author of energy related books, articles, and documentary films compiled a U.S. Renewable Rejection Database. According to the most recent update to his rejection database (September 22, 2024), there have been a cumulative of 735 rejections of combined wind and solar energy from 2015 to 2024, of which 461 represent wind rejections or restrictions, and 274 represent solar restrictions since 2017.[7] **In 2021, an Ohio state law gave communities the right to prohibit solar development inside solar exclusionary zones. Over 25.0 percent of the 88 counties in Ohio have approved regulations that limit utility scale solar plants.**[8] Other states are following suit with at least 7 townships in Michigan and 4 counties in Virigina that prohibit or substantially restrict solar development on agricultural land.[9]

According to Heatmap News, a publication for "climate, energy and sustainability professionals, "Farms are becoming one of the most powerful opponents to renewable energy in the United States, second to perhaps the fossil fuel industry.[10]

EROSION OF PRIVATE PROPERTY RIGHTS BY LAWS, AND PREDATORY SOLAR LEASES

The use of eminent domain by states to seize land for renewable energy projects has been discussed by corporate America. In an April 2024 letter to shareholders, JP Morgan chief executive officer, Jamie Dimon, stated, "in addition to reforming permitting, siting and

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[6] Office of the Governor, 2024, May 30, "*Gov. Beshear: Kentucky Tourism Industry Achieves Historic Success With Record Year for 2023 in Economic Impact*" (Press Release) kentucky.gov/Pages/Activity-stream.aspx?n=GovernorBeshear&prId=2199

[7] https://robertbryce.com/renewable-rejection-database/

[8] Aaron Burd, *Why Some Ohio Counties Are Restricting Solar Energy Farms,* NBC4i, May 30, 2024.

[9] Eisenson, *Op Sit.*.

[10] https://heatmap.news/plus/the/the-fight/spotlight/renewable-energys-farmland-free-for-all#

interconnection issues for power generation and transmission, the U.S. may need to invoke eminent domain to site local clean energy rapidly.[11] [12]

In an effort to eliminate local control over solar plant siting decisions, lawmakers in Michigan, New York, Illinois, Massachusetts, Minnesota, New Jersey, New Mexico, Florida and South Dakota, states with 100% carbon free electricity goals, have centralized permitting for these projects at the state level. Thereby, limiting the control cities and counties in those states have to prohibit the development of these projects in their area.[13] [14] Maryland is another state where the Public Service Commission preempts local zoning authority for the approval of the construction and siting of energy generating systems. [15]

Besides the use of eminent domain to deprive Americans of their private property rights, solar leases and good neighbor agreements do not protect the interests of the property owners. While solar leases are generally confidential, according to Farmers National, the leases range from $500 to $4,000 per acre.[16] Therefore enticing property owners to sign lease agreements that are predatory by nature and not in the best interest of the landowner.

According to Martin Machtan, a Wisconsin real estate attorney, "While the landowner has a one or 30 day contract, the developer obtains an ironclad commitment from the Landowner for **37 to 70 years.** This means the **income luring landowner can be cut off in the blink of an eye.** This sort of imbalance is an enormous red flag for an attorney or business owner and creates **tremendous risk.** Machtan states, "Wind turbines and solar panels contain toxic chemicals and are being placed in agricultural areas not accustomed to industrial development. Weather-based energy facilities are a recipe for landowner disputes,

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[11] Ryan Kennedy, "Invoke Eminent Domain, Marshall Plan for Renewable Energy, Said JP Morgan CEO," *PV Magazine,* April 7, 2023

[12] Andrew Lee, "Wall Street Titan Jamie Dimon Says Seize Private Land for Wind and Solar Builds," *Wall Street Journal*, April 6, 2024.

[13] Brian Martucci, "Carrots, Sticks or Both: State Efforts to Combat Anti-renewables NIMBYs," Utility Dive, August 22, 2024.

[14] Joey Cappelletti & John Hanna, "States with Big Climate Goals Strip Local Power to Block Green Projects, *AP News*, January 14, 2024.

[15] https://www..jdsupra.com/legal news/maryland-high-court-finds-state-71842/

[16] Tyne Morgan, "$4,500 Per Acre Plus a Signing Bonus? What Solar Companies Are Now Offering Farmers to Lease their Ground," *AGWEB, Farm Journal*, July 16, 2024.

litigation and environmental enforcement actions. Worse yet, the majority of contracts we have reviewed **shift limitless liability onto landowners."** [17]

Other provisions of these contracts include clauses that the property owner must waive all claims of injury from the risks associated electromagnetic fields generated from the solar field and accept nuisances associated with these developments such as increased noise levels, possible glare and other potential effects. [18]

In 2019, Dunns Bridge Solar LLC leased 445.0 acres of a 1,200.0 acre farm near Whitfield, Indiana. According to the lease, the developer would "not remove topsoil" from the property. However, sand was spread over the land beneath the panels. In response to the farmer's complaint, the solar company would review any remedial work needed to the land at the **end of its contract in 2073**, per the terms of the lease agreement.[19]

Often solar companies enter into **"Good Neighbor" Agreements** with properties adjacent to proposed solar farms. These contracts lock adjacent property owners into confidentiality agreements and force them to fully cooperate with and not oppose any efforts of the developer to construct the development.[20]

FUTURE OF FARMING AND ENVIRONMENTAL CONSIDERATIONS

The American Planning Association (APA) asserts in its advisory regarding utility scale solar facilities that "the emphasis for planners is on the direct land-use considerations that should be carefully evaluated, **(e.g. zoning, neighbors, viewsheds and environmental impacts).**[21]

The solar industry claim that land used for industrial scale solar generation can revert to agriculture at the end of the lease or should other energy options replace solar in the

[17] Martin Machtan, "Three Strikes for Wind & Solar," *Substack*, May 10, 2024.
[18] https://nosolarwind.com/news/33/commercial-solar-farm-and-project-leases
[19] IER (Institute for Energy Research), "Solar Power Depletes Farmlands of Rich Soil," May 29, 2024.
[20] Jacob H. Kiessling, Esq. "Solar Leases: Landowners Beware," ME&W, July 10, 2019
[21] Darren Coffey, AICP, "Planning for Utility-Scale Solar Energy Facilities," September/October 2019: 2.

future.[22] However, that claim is contested by numerous soil scientists, as well as the **Virginia Department of Environmental Quality**. The latter stated in a December 2022 report, that **"once altered,** Virginia's prime agricultural soils and forest lands **'cannot be restored' to prime productivity."** [23] (Report Attached).

Solar developers will often claim that it is beneficial for future agricultural production to allow swaths of farmland to remain fallow for the duration of the lease. However, soil scientist Ralph E. Hart, a soil scientist in Western Kentucky, refutes this assertion. He conducted a study that compared land that was allowed to remain fallow for a period to that of land used continually in agricultural production. The fallow land was in a Federal Wildlife program for 10 years beginning in 2008 and was compared to land that continued to be cropped in this area. The fields were cropped identically from 2019 to 2023 and despite fertility and lime applied as recommended per soil tests, **the formerly idled land lags far behind the continuously cropped land.**[24]

Another study examined soil under photovoltaic panels after seven years and compared it with adjacent soil not affected by the solar plant (GAP area). "The main results showed that seven years of soil coverage modified soil fertility with the significant reduction of water holding capacity and soil temperature, while electrical conductivity (EC) and pH increased. Additionally, under the panels soil organic matter was dramatically reduced, inducing a parallel decrease of microbial activity…"[25]

According to the U.S. Environmental Protection Agency (EPA) common solar farm construction practices, including clearing and grading large sections of land can lead to significant erosion and major runoff of sediment into waterways without proper

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[22] John Muraweski, Solar's Lofty Ambitions Are Consuming Ever-Larger Expanses of Land Below," *RealClear Investigations*, December 7, 2022.
[23] Ibid.
[24] Chris Arsenault, "Only 60 years of Farming Left if Soil Degradation Continues," *Scientific American*, December 5, 2014.
[25] Matio Cristina Moscatelli, et al, "Soil Properties Changes after Seven Years of Ground Mounted Photovoltaic Panels in Central Italy Costal Area," *Geoderma Regional*, Volume 29, June 2022.

remediation.[26] **It is important to note that once topsoil is removed, it takes 1,000 years to generate three centimeters (1.18 inches) of topsoil.** [27]

Dr. Ronnie W. Heiniger, with the Department of Crop and Soil Sciences at North Carolina State University, prepared a soil analysis for the proposed Lone Oak solar farm in Madison County, Indiana. His study showed that the time of concentration of water leaving the site would be 29% faster, in terms of velocity and force, once the solar panels were installed. [28] Heiniger concluded that, "the decrease in time of concentration and dramatic increase in volume of water from this property without a doubt will increase the amount of surface water on neighboring properties and increase the frequency of flooding with a high potential for property damage."[29]

Drainage damage to adjacent properties is not an isolated occurrence. In Clemont County, Ohio, run off from the Nestlewood Solar Facility is so severe that it prompted the County Commissioners to ban large solar and wind farms in seven townships within the County.[30]

In May 2024, the Associated Press reported, a federal jury imposed a **$135.5 million penalty** on a Tennessee solar company, Silicon Ranch Corporation, and its contractor, Infrastructure and Energy Alternatives. According to the Court, the two companies allegedly developed a solar farm by clearing about 4 square miles of land without installing adequate soil control measures. During rains the eroded soil allegedly spilled as mud onto nearby property.[31] **(Note: Silicon Ranch is the company that wants to place a solar installation in Fayette County near the Bourbon County line.)**

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[26] Huffstutter, op cit.
[27] Chris Arsenault, "Only 60 years of Farming Left if Soil Degradation Continues," *Scientific American*, December 5, 2014.
[28] Dr. Ronnie W. Heiniger, "Report on Drainage Issues in Conversion of Land for Lone Oak Solar Complex," August 27, 2019
[29] Ibid.
[30] Paula Christian, "Neighbors Worry about Flooding from Nestlewood Solar: 'We're Going to Lose Our Property Because of This," WCPO9 Cincinnati, January 11, 2024.
[31] Matteo Cavallito, "Solar Farms May Encourage Soil Erosion in U.S.," RE Soil Foundation Newsletter, September 7, 2023.

From the data provided by experts, one could logically assert that the ability of our country to grow food for our citizens could very well be at risk, if we continue to use farmland for these projects.

SOLAR PANELS ARE CONSTRUCTED OF HAZARDOUS MATERIALS

Dwight Clark, director of compliance and recycling technology at We Recycle Solar, [32] stated, "Things that make a solar panel hazardous waste could be if a cadmium telluride (CdTe) panel leaches lead…Polycrystalline and monocrystalline panels can also leach materials what would make the panels hazardous waste, like silver and lead and selenium…If something leeches above a certain level, its hazardous." [33] Cadmium of one of the six most hazardous substances known to humans. One study claims that the high reactivity of the cadmium-tellurium combination causes oxygen damage to the mitochondria, nucleus and membranes of live cells.[34]

The National Renewable Energy Laboratory's (NREL) reliability team regularly receives "reports" of glass breakage in silicon modules unrelated to direct damage from maintenance or storm impacts…"[35] **Other toxins that pose a threat to human and environmental health are perfluoroalkyl and polyfluoroalkyl (PFAS). These substances are toxic, persistent and bio-accumulative.**[36] Such perfluorinated compounds are used in the production of solar panels, as confirmed by Dr. Mark J. Strynar, a scientist with the U.S. Environmental Protection Agency. [37] A 2024 study concluded that, "we confirm the clean

[32] We Recycle Solar is the only company fully permitted by the EPA to properly handle all hazardous secondary materials in solar panels for recycling.
[33] "What Solar Plants Operators Need to Know about Panel Disposal," *Utility Dive*, February 26, 2024.
[34] Dr. C. Pallavi and Dr. Kaushal Bhavsar, "Cadmium Telluride Toxicity – Causes, Benefits, Risks and Recovery," *iClinic,* May 4, 2023.
[35] Emiliano Bellini, "New Survey Shows 'Massive Increase in PV Module Microcracks," PV Magazine, November 1, 2023.
[36] https://www.niehs.nih.gov/health/topics/agents/pfc
[37] PFAS in Building Materials - Green Science Policy Institute

energy sector as an unrecognized and potentially growing source of international PFAS release." [38]

These panels also contain precious/rare metals and some of these are considered environmentally hazardous, including arsenic, barium, cadmium, chromium, lead, mercury, selenium and silver.[39] Additionally, many solar panels are supported by galvanized steel platforms. **"Steel oxidizes over time and releases zinc, which can be toxic to plants at certain levels." [40] The steel supports are approximately 10.0 feet deep into the soil and zinc can alter soil microbial diversity rendering the subsoil infertile.**

SOLAR IS AN INTERMITTENT SOURCE OF POWER AND CONSUMES VAST AMOUNTS OF LAND COMPARED TO CONVENTIONAL POWER

According to Herbert Eckerlin, PhD, the underlying developmental principle of the power industry is that electricity has to be guaranteed. This guarantee has become known in the power industry as "Maximum Continuous Operation" (MCR). In practice, all companies that design and build power plants today have to "guarantee" that their power plants are capable of generating the Megawatt Rating (MW) of their power systems continuously, 24/7, 365 days per year.[41]

The MW rating of a power plant is the power that it can deliver continuously. This applies to all power plants — conventional and solar. However, it does not apply comparably to solar because its power generation is not continuous. The solar industry's response to this intermittency is battery backup. However, according to Dr. Eckerlin, additional solar farms will be required to keep the batteries charged.[42]

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[38] Lithium-ion Battery Components Are at The Nexus of Sustainable Energy and Environmental Release of Per- and Polyfluoroalkyl Substances.," *Nature Communications*, July 8, 2024.
[39] Fang Li, et al, "A Review of Toxicity Assessment Procedures of Solar Photovoltaic Modules," *Waste Management*, December 29, 2023.
[40] Dan Way, "Big Solar Farms May Be Stressing Agricultural Ecosystem," *Carolina Journal,* May 25, 2017.
[41] Herbert Eckerlin, Phd.: "Examining the Promises of the Solar Farm Industry Assigning 'False Megawatt Performance Promises' to Solar Farms." 2024 Unpublished Paper.
[42] Ibid.

According to Dr. Eckerlin, "MCR" has no meaning for solar farm operations because the sun's position, weather and time of day all have more dominating, unpredictable impacts on a solar farm's performance." [43] **Achieving MCR even for one 24 hour day is virtually impossible for the following reasons.**

a. Solar power varies throughout the day-light hours because of the sun's movement across the sky over 24 hours, the weather, the cloud cover, seasonal variation.
b. Solar power is not generated for 12 hours during night time hours.
c. Maximum solar power is reached for a couple of hours around noon on a sunny day in June/July. According to the National Climatic Data Center, Lexington, KY has the following annual days of sunshine:

City	Sunny	Partly Sunny	Total Sun
Lexington	89	101	190

d. It is this two-hour peak solar power around mid-day that the solar developer uses to set the solar farm's MW rating.[44]

Related, and equally misleading concepts to the public, are megawatt (MW) production and MW hours. Utility scale solar facilities are rated by their potential MW production at their point of maximum output (approximately 2 hours a day on a sunny day). This production, in terms of MW, is used to relate intermittent solar output to that of dispatchable (conventional) sources, as if they are comparable. The following chart indicates that **direct comparison is misleading.**[45]

[43] Ibid.
[44] Ibid.
[45] Dr. Herbert Eckerlin, Emeritus Professor, Mechanical & Aerospace Engineering, North Carolina State University, Designer and former Director of NCSU Solar House and Faculty Chairman of the North Carolina Solar Center.

ABILITY TO GENERATE MW RATING

Conventional Power	Solar Power
(24/7 hr/day) x (365 days/yr)	(2hr/day) x (190 days/yr)
8,760 hr/yr	380 hr/yr
100.0%	4.34%

In this example, the conventional power plant is capable of generating its **MW rating** for 8,760 hours per year, or **100.0 percent** of the time. On the other hand, solar power is capable of generating its **potential MW rating** for a **maximum** of 380 hours per year, or **4.34 percent** (380/8,760) **of the time.**

Numerous experts have sounded the alarm that the transition from conventional power sources to renewables will lead to soaring electricity prices and rolling blackouts. Tony Campbell, President and CEO of East Kentucky Power Cooperative, has written to President Biden over the last two years asking him to reconsider policies **that undermine the reliability and affordability of electric service by prematurely shutting down traditional power plants while allocating hundreds of billions of taxpayer dollars to incentivize unreliable renewables.**[46] Campbell has also testified before the Federal Electric Regulatory Commission commenting in regard to the EPA's 2024 Clean Power Rule, "The only way the proposed rule will not harm electric reliability is for EPA to withdraw it. EKPC and NRECA's (National Rural Electric Cooperative Association) overall position is that EPA's proposal is unlawful and unworkable." [47]

According to Katelyn Bunning, executive director of Dependable Power First Kentucky, "We're not going to have a reliable grid if we're transitioning solely to intermittent resources and retiring dispatchable owner plants. **One does not replace the other."** [48] Indicative of the intermittent nature of the renewable energy sector, two nuclear reactors have been recommissioned to provide for the short fall.

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[46] https://www.kentuckyliving.com/energy/co-op leader-advocates-for-kentucky-co-op-consumer-members/

[47] Joe Arnold, "The U.S. Is Phasing Out Reliable Energy Sources—Just When We Need Them The Most," *Kentucky Living*, February 2024.

[48]Ibid.

LITHIUM GRID SCALE BATTERIES — SOLUTION OR HAZARD?

The renewables industry has asserted that lithium batteries will provide adequate energy storage from the intermittent sources of solar and wind, and this will guarantee a continuous power supply to the grid. What they fail to mention are the impracticalities and associated dangers.

Each battery unit is the size of a tractor trailer. For example, the Desert Sunlight grid battery array, property of the Bureau of Land Management has a rated storage capacity of 230 MW and consisting of over 100 batteries. This is considered a medium sized storage facility.[49] Furthermore, Energy analysis group Doomberg finds that battery storage is improving, but at a pace far below that which is needed:

> According to projections from industrial research firm Wood Mackenzie, the US is set to add **191.6 gigawatt houses (GWH) of battery backup systems** across residential, non-residential and grid-scale installations between 2022 and 2026. This sounds impressive until you realize the US produced **4,116,000 GWh of electricity on the grid in 2021 alone**. By our math, the Wood Mackenzie projection amounts to a grand total of **24 minutes** of total backup capacity added to the system over the quoted five-year period. (Emphases in original.)[50]

Additionally, it is well established that these units can spontaneously burst into flames. **The nature of lithium battery fires is that they are unable to be extinguished.** They can only be sprayed with water in order to reduce the temperature and to keep the fire from spreading. Compared to a battery powered tractor trailer fire on an interstate in California that required 50,000 gallons of water or the 11-hour fire, a grid scale battery (10 to 20 times the size of the truck battery) would require 500,000 to a million gallons of water.[51]

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[49]Thomas J. Shepstone, "Grid Scale Lithium Battery Fires: They're Going to Happen Unless Developers Stop Ignoring the Safety Problem," *Substack.*com, October 2, 2024.

[50] Joshua Antonini, "Better Batteries Won't Save the Energy Grid," Mackinac Center for Public Policy, August 28, 2024.

[51] Thomas J. Shepstone, "Grid Scale Lithium Battery Fires: They're Going to Happen Unless Developers Stop Ignoring the Safety Problem," *Substack.*com, October 2, 2024.

Other potential sources of harm are huge amounts of contaminated water runoff, as well as toxic air emission, especially if the whole facility burns. Among the toxic emissions are hydrogen fluoride (HF), which can be released in significant quantities (up to 600 ppm) and can be life threatening. Other harmful substances include hydrogen cyanide, carbon monoxide and various fluorinated compounds. The smoke from lithium-ion battery fires contains a complex mixture of chemicals, including heavy metals like cobalt and nickel, which are hazardous at relatively low exposure levels and can linger on surfaces after the fire has been extinguished.[52]

THE SUBTERFUGE OF AGRIVOLTAICS AND HEAT ISLAND EFFECT

It is claimed by proponents of agrivoltaics that adding sheep, pollinator flowers or some crops to industrial solar installations will manage the land in a sustainable way. They also claim these installations will preserve the land for future farming endeavors. However, data gathered from university studies and cropping specialists disagree with this statement.

When construction begins on solar installations, it is generally agreed upon within the lease that the topsoil will be removed and stockpiled for use after decommissioning of the solar "farm." Therefore, without the presence of topsoil, it is highly unlikely that the remaining ground would support the fertility requirements for pollinators or sheep as stipulated in documents published by the University of New Hampshire and University of Kentucky Extension Services (Extension Publications Attached).

Dr. Ronnie W. Heiniger, Cropping Systems Specialist at North Carolina State University addressed the issues of agrivoltaics in an email addressed to Denise Spooner, a member of the Madison County, Indiana Planning Commission on September 28, 2020.

Listed in the section below are some of the main points made by Dr. Heiniger:

a. **Pollinators:** In North Carolina solar developers have stated, "they would plant native flowers and species under the panels—but they have not done so. Why? Because they

[52] Ibid.

are too hard to maintain. Without burning or mowing these native species will be overcome by weeds, shrubs, etc. **There is no scientific evidence to support that this will save money nor any evidence that pollinators are increased when solar panels are placed in a field."** He also addressed how in Indiana native pollinator flowers, clovers and alfalfa grow in fields and are a source of nectar for bees. Furthermore, these are not competitive species, therefore they die out in one to two years and are replaced by other types of vegetation. Such vegetation in Indiana is a result of wildfires. He stated, "Are they saying they will burn the area under the solar panels every four or five years?"

b. **Sheep:** "…But the only sheep grazing under panels in North Carolina are where they are brought in for a photo opportunity and then within a day or two removed before they cause too much damage to the panels." Additionally, "the City of Portsmouth, VA tried to use sheep to control the vegetation on Cranney Island (300 acre tract) in the James River. They thought they could eliminate mowing—or at least that is what the sheep farmer told them. Two years later they sold the sheep and pronounced the effort a failure. Why? (1) It took a lot more sheep to control the grasses than anyone thought. (2) Sheep are picky eaters. They don't like weeds or most other vegetation, only specific grasses. So, they did NOT control all the vegetation and mowing was still necessary. (3) Sheep are hard to maintain. They have to have lots of fresh water, mineral supplements and they are prone to diseases and predators. How may solar installations do you see with watering facilities for providing fresh water to the sheep? How many have barns and places for the sheep to get out of storms? How many have facilities for the sheep to get mineral supplements?"

c. **No till farming:** "…less disturbance of soil is better than lots of tillage…. Well not so fast. In no till farming these benefits only occur once soil compaction is eliminated. Many no-till farmers give up on the practice of no till because they cannot find a way to overcome soil compaction caused by running machinery on the land. **The result of compaction is a degradation of the soil because water cannot enter the soil but instead runs off the land. Air pockets in the soil are reduced and without air the soil biome cannot recover…This leads to increased water runoff and anerobic soils."**

d. **Crops flourish under panels:** "…there is no mystery of why grasses grow better under the panels. It has nothing to do with water and everything to do with TEMPERATURE. **The temperature under these panels is higher and it is outside the panel shade**. Why? Because the panel uses only 20 to 25% of the incoming solar radiation. The rest of the sunlight energy must go somewhere. It goes into heating the panels themselves. These panels, in turn, radiate that heat energy to the ground underneath the panel. Plants grow according to temperature, not time. Therefore, under increased temperatures, plants develop quicker and grow more because they need to find sunlight which is limiting under the panels. The taller plants are a result of etiolation (an elongation of the stem caused by the lack of sunlight). There is more water because there is less evaporation from the soil due to the shading of the panels. **The problem is, that under these conditions, the plants are not very productive in terms of producing fruit. These plants use up all their energy trying to grow taller and do not have enough to produce seeds, berries, etc…. Without sunlight the plants are less productive."**

HEAT ISLAND EFFECT

In addition to Dr. Heiniger's description of an effective "heat island," a 2016 University of Maryland Study found that "large scale solar power plants raise local temperatures, creating a solar heat island effect…This study contradicts previous theoretical work and modeling studies that predict solar installations would decrease temperatures around them by intercepting some of the sun's potentially warming energy and converting it into energy."[53] **The findings of this study demonstrated that temperature around a solar power plant were 5.4 -7.2 degrees F warmer than nearby wildlands.**

A 2024 study "revealed the significant effect of the panels on surface heat flux, surface temperature and air temperature. The panels also appeared to affect near surface vertical turbulent heat and momentum fluxes. These effects intensify with increased incoming solar radiance." [54]

SOLAR PANELS ARE BECOMING AN OUTDATED TECHNOLOGY

"Scientists at Oxford University Physics Department have developed a revolutionary approach which could **generate increasing amounts of solar electricity without the need for silicon based solar panels**…Their new light-absorbing material is, for the first time, thin and flexible enough to apply to the surface of almost any building or common object. Using a pioneering technique developed in Oxford, which stacks multiple light-absorbing layers into one solar cell, they have harnessed a wider range of the light spectrum, allowing more power to be generated from the same amount of sunlight."[55]

1. According to Dr. Shuaifeng Hu, Post Doctoral Fellow at Oxford University Physics:

> We can envisage perovskite coatings being applied to broader types of surfaces to generate chap solar power, such as the roof of cars and buildings and even the backs of mobile phones. If more energy can be generated in this way, we can foresee **less need in the longer term to use silicon panels or build more and more solar farms.**[56]

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[53] Graham Binder, "Researchers Discover Solar Heat Island Effect Caused by Large-Scale Solar Power Plants," Phys.Org, November 7, 2016.
[54] Daniel Trevor Cannon, et al, "Daytime Thermal Effects of Solar Photovoltaic Systems: Field Measurements," *Journal of Renewable and Sustainable Energy,* September 24, 2024.
[55] https://www.ox.ac.uk/news/2024-08-09-solar-energy-breakthrough-could-reduce-need-solar-farms.
[56] Ibid.

SOLAR EXISTS ONLY THROUGH TAX CREDITS

Utility scale solar plants exist because of the tax credit subsidies and incentives offered by Federal legislation, such as the Inflation Reduction Act (IRA) which can fund **up to 60.0 percent of the total cost of the project.** [57] Even billionaire businessman, Warren Buffet, has acknowledged that wind energy projects are not economically viable without government tax credits. He stated, "…on wind energy, we get a tax credit if we build a lot wind farms. That's the only reason to build them. They don't make sense without the tax credit." [58]

SOLAR PLANTS NEGATIVELY IMPACT REAL ESTATE VALUES

A 2024 Lawrence Berkley National Laboratory (LBNL) survey of alt-energy developers indicated that **visual concerns** are the most common for both wind and solar. Although solar developer's appraisers claim that solar farms are compatible with the landscape and do not adversely affect property values, numerous peer reviewed articles have been published that contradict these claims. **Mary McClinton Clay, MAI has summarized seven such articles that without exception document the adverse impact of solar farms on adjacent property values.**

THE CLIMATE AND THE USE OF FOSSIL FUELS

Contrary to popular misconceptions, climate change due to greenhouse emissions has been debunked by numerous recent peer reviewed journal articles which are attached to the findings. In conclusion, solar panels and wind turbines only generate occasional electricity, but manufacture nothing for society. Crude oil is virtually never used to generate electricity, but when manufactured into petrochemicals, it is the basis for the more than 6,000 products

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[57] Charles Dauber, "Maximizing the Value of IRA Tax Incentives While Minimizing Investment Compliance Risk," *Utility Dive*, April 8, 2024.
[58] IER (Institute for Energy Research),: The Inflation Reduction Act Bloats Tax Subsidies to Biden's Favorite "Green" Technologies, April 10, 2024.

that did not exist before the 1800s. **Without crude oil, there would be nothing that needed electricity.**[59]

[59] Ronald Stein and Tom DeWeese, "The Dangerous Delusion of Biden and World Leaders of Transition to 'Just Electricity," *Energy New Beat*, July 16, 2024.