

**ST. CLAIR COUNTY HEALTH DEPARTMENT  
REGULATION 25-01**

**REGULATION REGARDING SOLAR ENERGY AND  
BATTERY ENERGY STORAGE FACILITIES**

**Section 1: Title**

This Regulation shall be known as the St. Clair County Solar Energy and Battery Energy Storage Facilities Regulation.

**Section 2: Authority**

This Regulation is adopted pursuant to the authority conferred upon local health departments by the Michigan Public Health Code (the “Code”) 1978 PA 368, as amended. The St. Clair County Health Department (the “Health Department”) is a local health department as defined by the Code. The Code requires the Health Department to “continually and diligently endeavor to prevent disease, prolong life, and promote the public health through organized programs, including prevention and control of environmental health hazards; prevention and control of diseases; prevention and control of health problems of particularly vulnerable population groups....” MCL §333.2433(1). The Code provides that the Health Department may adopt regulations to “properly safeguard the public health and to prevent the spread of diseases and sources of contamination.” MCL §333.2435(d). Regulations adopted by the Health Department “shall be at least as stringent as the standard established by state law applicable for the same or similar subject matter.” MCL §333.2441. Health Department regulations “supersede inconsistent or conflicting local ordinances.” MCL §333.2441. To ensure compliance with the laws enforced by the Health Department, the Health Department may inspect, investigate, or authorize an inspection or investigation to be made of, any matter, thing, premise, place, person, record, vehicle, incident, or event. MCL §333.2446.

**Section 3: Jurisdiction and Enforcement**

This Regulation applies to Energy Facilities, as defined herein, located in whole or, in part within St. Clair County. The Health Officer shall be responsible for administering and enforcing this Regulation, including all amendments hereafter adopted unless otherwise expressly stated.

## **Section 4: Purpose**

In support of this Regulation, the St. Clair County Health Department hereby finds and declares the following:

1. There has been interest in establishing solar energy facilities with a nameplate capacity of 50 megawatts or more and battery energy storage facilities with a nameplate capacity of 50 megawatts or more and an energy discharge capability of 200 megawatt hours or more within rural areas of St. Clair County. Such facilities are defined within this regulation and shall be referred to collectively as Energy Facilities.
2. Energy Facilities create noise caused, in part, by inverters which convert direct current from solar panels or battery storage to alternating current usable for transmission to end users. The primary sources of noise from inverters include lower frequency fan noise, as well as high frequency noise (similar to a coil whine).<sup>i</sup> High frequency noise “is a significant contributor to total noise emissions” of inverters.<sup>ii</sup> Audible noise created by inverters “can range from a minor annoyance to a source of permanent injury to the ears.”<sup>iii</sup>
3. In 1974, the Environmental Protection Agency recommended a 55 dBA outdoor noise level and 45 dBA indoor noise level to prevent activity interference and annoyance with respect to humans.<sup>iv</sup>
4. In 2010, the World Health Organization recommended that a maximum of 35 dBA be permitted in classrooms to allow for good teaching and learning conditions and 30 dBA in bedrooms to promote good sleep quality.<sup>v</sup>
5. In 1974, the EPA noted the primary considerations in evaluating noise in rural / unpopulated areas are “the protection of human hearing and the prevention of adverse effects on domestic and wild animals.”<sup>vi</sup> According to the EPA, “although quiet is not always of paramount importance in such areas, many individuals enjoy the special qualities of serenity and tranquility found in natural areas.”<sup>vii</sup> Accordingly, the EPA determined that when evaluating noise in such areas “a clear distinction should be made between natural and man-made noise.”<sup>viii</sup>
6. A 2022 study concluded that 58.2% of rural/remote residents have a high expectation of peace and quiet, whereas only 21.8% of urban residents have the same expectation.<sup>ix</sup> The study further noted that although environmental noise exposures may be below levels associated with hearing impairment, they can result “in interference with communication, relaxation, leisure activities, and sleep.”<sup>x</sup>

7. A 2018 report concluded that: (i) “for the large-scale studies, positively assessed soundscapes (e.g., reduced noise annoyance) are statistically significantly associated with better self-reported health conditions” and (ii) “for the small-scale studies, positively assessed soundscapes (e.g., pleasant, calm) are statistically significantly associated with faster recovery from environmental stressors.”<sup>xi</sup>
8. In 2018, the World Health Organization (“WHO”) concluded “noise can lead to auditory and non-auditory effects on health... noise is a non-specific stressor that has been shown to adversely affect human health, especially following long-term exposure.”<sup>xii</sup> Such adverse effects on human health are due to “psychological and physiological distress as well as disturbance of the organism’s homeostasis and increasing allostatic load.”<sup>xiii</sup> The WHO confirmed that the “main recognized effects from environmental noise include annoyance, cardiovascular disease, cognitive impairment and effects on sleep, affecting in particular vulnerable population groups as pregnant women, etc.”<sup>xiv</sup> The WHO recommended reducing environmental noise levels to 45dB or below as noise above such level is “associated with adverse health effects.”<sup>xv</sup>
9. If not properly constructed, maintained, and operated, noise generated by Energy Facilities has the potential to cause negative health consequences for individuals residing near the facilities.
10. Visual pollution is defined as “a set of elements that can offend human vision, spatial orientation, physical, mental health and have psychological and economic effects on a community.”<sup>xvi</sup> Visual pollution in urban areas differs from rural areas due to the characteristics of each.<sup>xvii</sup>
11. Visual pollution in rural areas may consist of new commercial or industrial structures and “may result in a less favorable experience for those who have previously enjoyed the original natural vision.”<sup>xviii</sup>
12. A 2024 study confirmed that visual pollution is “problematic in areas where industrial zones are located near residential neighborhoods or natural landscapes.”<sup>xix</sup>
13. Studies have confirmed that the visual presence of industrial type facilities “can lead to decreased quality of life for nearby residents, including reduced mental well-being and dissatisfaction with the local environment.”<sup>xx</sup>
14. Visual pollution can “significantly contribute to stress levels in individuals. Studies have demonstrated that exposure to visually chaotic and unappealing environments triggers physiological stress responses, including elevated cortisol levels and increased heart rate. This response is believed to be rooted in the human preference for visually harmonious and natural environments, where the brain can process information more effortlessly, leading to a state of relaxation. In contrast, environments polluted with

visual stimuli require more cognitive effort to process, contributing to a heightened state of stress and discomfort.”<sup>xxi</sup>

15. Visual pollution is also linked to increased levels of anxiety and development of depressive symptoms.<sup>xxii</sup>
16. If not properly constructed, maintained, and operated, Energy Facilities have the potential to create visual pollution resulting in negative or dangerous health consequences for individuals in such communities.
17. Energy Facilities may be constructed utilizing, among other things: (i) solar panels; (ii) electrical infrastructure; (iii) batteries; and (iv) above grade and below grade steel infrastructure.
18. The necessity of removing all above grade improvements to restore property to its original condition and natural state is self-evident.
19. Below grade steel pilings and other below grade infrastructure utilized by Energy Facilities pose a risk of corrosion if allowed to remain in the ground.<sup>xxiii</sup> Further, abandoned steel pilings pose a risk of injury, including by contact with farm implements. Corroded steel pilings pose an increased risk of infection caused by contamination with *Clostridium tetani*, if contacted. Abandoned steel pilings may also harbor stagnant water and form a breeding ground/habitat for mosquitoes, which is hazardous to public health.
20. In order to return property where Energy Facilities are located to its natural and usable state and to mitigate public health risks associated with the Energy Facilities it is necessary that all below grade infrastructure and facilities be removed when an Energy Facility is no longer operational.
21. In 2021, the National Renewable Energy Laboratory (NREL) estimated that decommissioning costs associated with a solar energy facility was \$368,000/MW.<sup>xxiv</sup>
22. Decommissioning costs for battery energy storage facilities are estimated to be \$91,500/MW.<sup>xxv</sup>
23. Based on the foregoing, it is determined that Energy Facilities pose credible threats to public health as follows: (i) negative health consequences created by noise generated by Energy Facilities; (ii) visual pollution created by Energy Facilities; and (iii) insufficient decommissioning plans and financial assurances related to Energy Facilities.

24. Residents in rural areas “struggle to access and use a health care system that does not meet their unique needs.”<sup>xxvi</sup> Data shows “persistent health disparities, including higher mortality and lower life expectancy, decreased or limited access to care, and increased distances to receive care” for rural Michigan residents.<sup>xxvii</sup>
25. Some local municipalities within the County have adopted zoning ordinances regarding siting Energy Facilities. In some cases, such Ordinances attempt to mitigate the potential negative public health consequences of Energy Facilities, however, in many cases they do not adequately do so.
26. Even if local ordinances adequately addressed negative public health impacts of Energy Facilities, the State of Michigan, pursuant to Public Act 233 of 2023 (“PA 233”), has established a state level permitting process for certain Energy Facilities that may apply regardless of local zoning ordinances.
27. Energy Facilities can be constructed, operated, and maintained in a manner which mitigates risks to and safeguards the public health.
28. To safeguard the public health and protect the public from the negative health impacts of Energy Facilities, it is necessary for the Health Department to adopt and enforce this Regulation, including the Minimum Standards detailed herein.

## **Section 5: Definitions**

For purposes of this Regulation, the following definitions apply:

**Authorization:** Authorization from the Health Department to construct and operate an Energy Facility.

**Battery Energy Storage Facility:** A battery system that absorbs, stores, and discharges electricity with a nameplate capacity of 50 megawatts or more and an energy discharge capability of 200 megawatt hours or more. Battery energy storage facility does not include either of the following: (i) Fossil fuel storage; or (ii) Power-to-gas storage that directly uses fossil fuel inputs.

**Energy Facility / Energy Facilities:** A Solar Energy Facility and/or a Battery Energy Storage Facility which is: (i) located or proposed to be located all or part in St. Clair County; and (ii) which is located or proposed to be located, in whole or part, in or adjacent to a Rural Area.

**Health Department:** The St. Clair County Health Department.

**Minimum Standards:** The standards detailed in Section 9 of this Regulation.

**Rural Area:** A 2020 US Census tract which has a population density of 500 people or less per square mile.<sup>xxviii</sup>

**Solar Energy Facility:** A system that captures and converts solar energy into electricity, for the purpose of sale or for use in locations other than solely the solar energy facility property with a nameplate capacity of 50 megawatts or more. Solar energy facility includes, but is not limited to, the following equipment and facilities to be constructed by an electric provider or independent power producer: photovoltaic solar panels; solar inverters; access roads; distribution, collection, and feeder lines; wires and cables; conduit; footings; foundations; towers; poles; crossarms; guy lines and anchors; substations; interconnection or switching facilities; circuit breakers and transformers; energy storage facilities; overhead and underground control; communications and radio relay systems and telecommunications equipment; utility lines and installations; generation tie lines; solar monitoring stations; and accessory equipment and structures.

**Tonal Noise:** A noise that contains prominent, discrete frequency components, or tones, rather than a continuous distribution of frequencies, sounding like a whistle, hum, or buzz, and is distinct from broadband noise which contains a wider range of frequencies.

## **Section 6: Health Department Authorization Required**

No Energy Facility shall be constructed prior to obtaining an Authorization from the Health Department pursuant to this Regulation. All Energy Facilities must be maintained and operated consistent with all applicable laws, ordinances and regulations and with at least the minimum standards required in this Regulation.

## **Section 7: Request for Authorization**

Prior to commencing construction of an Energy Facility, the owner, operator, and/or developer of an Energy Facility shall submit an Authorization Request to the Health Department. The Authorization Request shall contain at least the following:

- (a) The complete name, address, email address, and telephone number of the applicant.
- (b) The planned date for the start of construction and the expected duration of construction.
- (c) A description of the Energy Facility, including a detailed site plan, which depicts, at a minimum: (i) the layout of all proposed and existing structures; (ii) property boundaries and dimensions; (iii) existing and proposed landscaping and fencing; (iv) the location of all existing and proposed utilities; (v) all existing and proposed drainage systems; (vi) the topography of the property; (vii) all existing and proposed roads and means of access; (viii) all existing and proposed easements; (ix) a scale and legend; and (x) distances to the nearest structures located on all adjacent properties.
- (d) A description of the expected use of the Energy Facility.
- (e) The expected direct impacts of the proposed Energy Facility on the environment and natural resources and how the applicant intends to address and mitigate these impacts.
- (f) Information on the effects of the proposed Energy Facility on public health and safety.
- (g) A description of the portion of the community where the proposed Energy Facility will be located.
- (h) A statement and reasonable evidence that the proposed Energy Facility will not commence commercial operation until it complies with applicable state and federal

environmental laws, including, but not limited to, the natural resources and environmental protection act, 1994 PA 451, MCL §324.101 to §324.90106.

- (i) A summary of the community outreach and education efforts undertaken regarding the proposed Energy Facility, including a summary of any public meetings held.
- (j) Evidence of consultation, if any, with the Department of Environment, Great Lakes, and Energy (EGLE) and other relevant state and federal agencies.
- (k) A soil and economic survey report under section 60303 of the natural resources and environmental protection act, 1994 PA 451, MCL §324.60303.
- (l) If the proposed site of the Energy Facility is undeveloped land, a description of feasible alternative developed locations, including, but not limited to, vacant industrial property and brownfields, and an explanation of why such sites were not selected.
- (m) A stormwater assessment and a plan to minimize, mitigate, and repair any drainage impacts at the expense of the owner or operator. The applicant shall make reasonable efforts to consult with the county drain commissioner before submitting the application and shall include evidence of those efforts in its application.
- (n) A fire response plan and an emergency response plan.
- (o) A decommissioning plan that is consistent with agreements reached between the applicant and other landowners of participating properties and that ensures the return of all participating properties to their useful natural condition similar to that which existed before construction, including removal of all above-surface and below-surface facilities and infrastructure. The decommissioning plan shall include, but is not limited to, financial assurance in the form of a surety bond or an irrevocable standby letter of credit, in the amount of at least \$100,000 per megawatt nameplate capacity of the Energy Facility, as adjusted annually for inflation based upon the CPI-U from the date of this Regulation. To be acceptable, a surety bond must be posted and maintained by a surety authorized to do business in Michigan and which is rated A+ or better by A.M. Best. To be acceptable, an irrevocable standby letter of credit must be issued and maintained by a bank authorized to do business in Michigan with a 1 rating pursuant to the CAMELS rating system. St. Clair County shall be identified as named beneficiary on such surety bond or irrevocable letter of credit.
- (p) Itemization of all approvals or requests for approvals for the proposed Energy Facility requested or granted by the State of Michigan and any local unit of government, including, a statement whether a certificate has been requested pursuant to PA 233.
- (q) A summary of all materials to be utilized in the construction of the Energy Facility.
- (r) Other information reasonably required by the Health Department.
- (s) All agreements with the owner(s) of the premises where the Energy Facility is proposed to be located.
- (t) Authorization for the Health Department, or its agents, to inspect the premises where the proposed Energy Facility will be located and to conduct tests, including sound measurements and soil samples, signed by the applicant and the owner(s) of the premises.
- (u) A nonrefundable fee of \$25,000.00 payable to St. Clair County, which is designed to cover the costs incurred by the Health Department in reviewing the Request for Authorization, including, sound engineering, plan reviews and compliance monitoring.

An applicant shall supplement or correct information submitted in the Request for Authorization if information submitted is revised, becomes outdated, is inaccurate, or if additional information becomes available.

## **Section 8: Health Department Review of Request for Authorization**

The Health Department shall review a complete Request for Authorization to determine whether the applicant has demonstrated by substantial, competent and material evidence that the proposed Energy Facility meets or exceeds the Minimum Standards detailed in this Regulation. In making its determination the Health Department may: (i) inspect the premises where the proposed Energy Facility is to be located; (ii) conduct tests related to the premises where the proposed Energy Facility is to be located, including, sound measurements and soil samples; (iii) hold public hearings regarding the proposed Energy Facility; (iv) interview property owners in areas near the proposed Energy Facility; (v) meet with officials from the State of Michigan and/or local units of government to discuss the potential impacts related to the proposed Energy Facility; (vi) conduct independent investigations regarding the information detailed in the Request for Authorization; (vii) request additional information from the applicant; (viii) meet with representatives of the applicant to discuss the proposed Energy Facility; (ix) engage professionals to assist it with reviewing the Request for Authorization; and/or (x) take such other actions as deemed necessary to determine if the proposed Energy Facility meets the requirements of this Regulation.

After completing its review, the Health Department shall issue a written determination as follows: (i) granting Authorization to construct the proposed Energy Facility, with or without conditions; or (ii) denying Authorization to construct or operate the proposed Energy Facility with specified reasons supporting the denial. If the Authorization is granted, all conditions detailed in the Authorization, if any, must be fully complied with and all other required permits and permissions must be obtained prior to construction and operation of the Energy Facility. Authorization from the Health Department does not replace any authorizations or permits required from any other unit of government. Granting of Authorization by the Health Department does not relieve an Energy Facility from complying with this Regulation once operational nor is it a representation that an Energy Facility will comply with these Regulations once operational.

## **Section 9: Minimum Standards Applicable to Energy Facilities**

To be eligible to receive an Authorization, Energy Facilities must meet or exceed the following Minimum Standards. Regardless of whether Authorization was received, all Energy Facilities are required to operate and be maintained in such manner which meets or exceeds the below Minimum Standards.

- (a) Noise Mitigation. An Energy Facility shall be designed, operated and maintained such that when operating at full power output, as measured at any point at or beyond a non-participating property line of a parcel with an existing residential dwelling, it does not produce measurable Tonal Noise, and the broadband noise level from the Energy Facility does not exceed 45 decibels A-weighted averaged over a 10 minute period (dB(A) Leq).



- (b) Visual Pollution Mitigation. An Energy Facility shall be designed, operated and maintained such that it is obscured from view from adjacent roadways and from all points on adjacent non-participating properties including from all occupied stories of included buildings, including through use of opaque gating or fencing at points of vehicular access, perimeter berms, or a buffer of at least 25' in ground depth consisting of sufficiently dense natural healthy vegetation including deciduous trees, or a combination thereof, which is sufficient to obscure the Energy Facility from view.
- (c) Decommissioning. An Energy Facility shall enter into a decommissioning agreement that ensures the return of all participating properties to their useful natural condition similar to that which existed before construction, including removal of all above-surface and below surface facilities and infrastructure. The decommissioning plan shall include, but is not limited to, financial assurance in the form of a surety bond or an irrevocable standby letter of credit, in the amount of at least \$100,000 per megawatt nameplate capacity of the Energy Facility, as adjusted annually for inflation based upon the CPI-U from the date of this Regulation. To be acceptable, a surety bond must be posted and maintained by a surety authorized to do business in Michigan and which is rated A+ or better by A.M. Best. To be acceptable, an irrevocable standby letter of credit must be issued and maintained by a bank authorized to do business in Michigan with a 1 rating pursuant to the CAMELS rating system. St. Clair County shall be identified as named beneficiary on such surety bond or irrevocable letter of credit.

## **Section 10: Enforcement**

The Health Officer, or his or her designee, shall enforce this Regulation with respect to all Energy Facilities. Violations of this Regulation shall be considered a public nuisance.

## **Section 11: Violations**

- (a) Pursuant to the Code, violations of this Regulation shall be considered a misdemeanor punishable by up to 6 months in prison and/or a fine of \$200. MCL §333.2443.
- (b) Violations of this Regulation are considered a public nuisance. The Health Department may issue an order to avoid, correct, or remove any violation of this Regulation and, if such is not complied with, proceed with all remedies available under the Code, including, MCL §333.2455.
- (c) The remedies provided for violations of the Regulation are not exclusive. The Health Department may enforce this Regulation and pursue violation pursuant to any means available under the law.

## **Section 12: Severability**

If any provision, clause, sentence or paragraph of this Regulation or the application thereof to any person or circumstances shall be held invalid, such invalidity shall not affect the other

provisions of this regulation which can be given effect without the invalid provision or application, and to this end the provisions of this regulation are declared to be severable.

### **Section 13: Effective Date**

This regulation shall be effective May 1, 2025, the date of its adoption by action of the St. Clair County Board of Commissioners.

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- <sup>i</sup> John Malen: Analysis of Noise Emissions of Solar Inverters; September 23, 2013; Pg. 13,15.
- <sup>ii</sup> John Malen: Analysis of Noise Emissions of Solar Inverters; September 23, 2013; Pg. 69.
- <sup>iii</sup> John Malen: Analysis of Noise Emissions of Solar Inverters; September 23, 2013; Pg. 1.
- <sup>iv</sup> EPA: Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety; March 1974.
- <sup>v</sup> World Health Organization: Noise; April 27, 2010. <https://www.who.int/europe/news-room/fact-sheets/item/noise>.
- <sup>vi</sup> EPA: Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety; March 1974.
- <sup>vii</sup> EPA: Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety; March 1974.
- <sup>viii</sup> EPA: Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare With an Adequate Margin of Safety; March 1974.
- <sup>ix</sup> Michaud, et al.: A Comparaison of Self-Report Health Status and Perceptual Responses Toward Environmental Noise in Rural, Suburban, and Urban Regions in Canada; March 2022; Pg. 1538.
- <sup>x</sup> Michaud, et al.: A Comparaison of Self-Report Health Status and Perceptual Responses Toward Environmental Noise in Rural, Suburban, and Urban Regions in Canada; March 2022; Pg. 1532.
- <sup>xi</sup> Aletta, et al.: Associations Between Positive Health-Related Effects and Soundscapes Perceptual Constructions: A Systematic Review; October 2018; Pg. 12.
- <sup>xii</sup> World Health Organization: Housing and Health Guidelines; 2018; Pg. 96.
- <sup>xiii</sup> World Health Organization: Housing and Health Guidelines; 2018; Pg. 96.
- <sup>xiv</sup> World Health Organization: Housing and Health Guidelines; 2018; Pg. 96.
- <sup>xv</sup> World Health Organization: Housing and Health Guidelines; 2018; Pg. 99.
- <sup>xvi</sup> Nawaz and Wakil: Visual Pollution Consent, Practices and Management Framework ; 2022 ; Pg. 9.
- <sup>xvii</sup> Nawaz and Wakil: Visual Pollution Consent, Practices and Management Framework ; 2022 ; Pg. 23.
- <sup>xviii</sup> Gao, et al.: A Systematic Literature Review and Analysis of Visual Pollution; July 2024; Sec. 3.1.
- <sup>xix</sup> Hassan and Khalil: Visual Pollution: Causes, Health Impacts, and Mitigation Strategies for Enhancing Environmental Aesthetics and Public Well-Being – A Review; November 2024; Pg. 5070.
- <sup>xx</sup> Hassan and Khalil: Visual Pollution: Causes, Health Impacts, and Mitigation Strategies for Enhancing Environmental Aesthetics and Public Well-Being – A Review; November 2024; Pg. 5070.
- <sup>xxi</sup> Hassan and Khalil: Visual Pollution: Causes, Health Impacts, and Mitigation Strategies for Enhancing Environmental Aesthetics and Public Well-Being – A Review; November 2024; Pg. 5070.
- <sup>xxii</sup> <sup>xxii</sup> Hassan and Khalil: Visual Pollution: Causes, Health Impacts, and Mitigation Strategies for Enhancing Environmental Aesthetics and Public Well-Being – A Review; November 2024; Pg. 5070.
- <sup>xxiii</sup> Matcor: Steel Pile Corrosion: Protecting Our Solar Infrastructure; December 2022.
- <sup>xxiv</sup> NREL: Best Practices at the End of the Photovoltaic System Performance Period; February 2021; Table 2.
- <sup>xxv</sup> EPRI: Recycling and Disposal of Battery-Based Grid Energy Storage Systems: A Preliminary Investigation; December 2017. <https://www.epri.com/research/products/000000003002006911>.
- <sup>xxvi</sup> Wright, et al.: Rural Michigan Farmers' Health Concerns and Experiences: A Focus Group Study; Journal of Primary Care & Community Health; September 2021; Pg. 1.
- <sup>xxvii</sup> Wright, et al.: Rural Michigan Farmers' Health Concerns and Experiences: A Focus Group Study; Journal of Primary Care & Community Health; September 2021; Pg. 1.
- <sup>xxviii</sup> <https://maps.geo.census.gov/ddmv/map.html>.