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September 7, 2018

VIA OVERNIGHT (MONDAY) DELIVERY AND EMAIL

Melanie A. Bachman
Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, Connecticut 06051

Re: **PETITION NO. 1348** – Safari Energy, LLC, as agent for West Farms Mall, LLC, petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed construction, maintenance and operation of a 2.019-megawatt AC solar photovoltaic electric generating facility located at West Farms Mall, 1500 New Britain Avenue, West Hartford and 500 South Road, Farmington, Connecticut.

Dear Ms. Bachman:

Enclosed please find an original and fifteen (15) copies of Petitioner's responses to the Connecticut Siting Council's questions, as set forth in your letter dated August 30, 2018.

Should you have any questions, concerns or require additional information, please contact me at 617-646-2020 or Brendan Canavan of Safari Energy, LLC at 646-465-8116.

Very truly yours,



Matthew S. Cote
Counsel for Safari Energy, LLC

Enclosures

Petition No. 1348
West Farms Mall, LLC /Safari Energy, LLC
Interrogatories
Set One

Project Development

1. Pursuant to Connecticut General Statutes §16-50k(a), has Safari Energy, LLC (Petitioner) obtained a letter from the Connecticut Department of Energy and Environmental Protection (DEEP) that the proposed facility will not materially affect the status of core forest or a letter from the Connecticut Department of Agriculture (DOAg) that the proposed facility will not materially affect the status of prime farmland? Please submit any correspondence submitted to and/or received from DEEP and/or DOAg relative to the proposed facility.
 - The facility is proposed to be constructed on an existing, paved parking area serving a commercial shopping mall. There is no core forest nor is there prime farmland located in the proposed location of the facility and therefore no letter from the DEEP or DOAg is required. Attached are screenshots from the ArcGIS online maps showing farmland classifications (Exhibit A) and forestland habitat impacts (Exhibit B), and demonstrating that the proposed location does not include any such forest or farmland.

Proposed Site

2. Where is the nearest recreational area from the proposed site? Describe the visibility of the proposed project from this recreational area.
 - The nearest recreational area is Wolcott Park, which is approximately 1 mile northeast of the proposed site in West Hartford. The recreational area and proposed site are separated by residential neighborhoods and a shopping center, and the distance between them are great enough that the proposed solar canopies will not be visible from the park.
3. Where is the nearest national, state-designated, and/or local historic area from the proposed site? Describe the visibility of the proposed project from the nearby historic area(s).
 - The nearest historic area from the proposed site is the Newington Junction West National Historic District, which is approximately 1.2 miles east of the proposed site in West Hartford. The historic area and the proposed site are separated by residential neighborhoods, and the distance between them are great enough that the proposed solar canopies will not be visible from the historic district.
4. Page 11 of the Petition notes that, “The nearest residence to the boundary of the Site is 40 feet (to the north). The nearest residence to the proposed location of the parking canopies is 570 feet to the west...” What are the addresses of both of these closest residences?
 - The nearest residence to the boundary of the site is 310 South Rd in Farmington. The nearest residences to the proposed location of the parking canopies are numbers 24, 26, 28, and 30 Maple Ridge Drive.

Energy Production

5. Referencing Electrical Plan Drawing E200, the total direct current megawatts (MW DC) of System 1, System 2 and System 3 is approximately 2.7168 MW DC. The cover page of the Petition shows about 2.7618 MW DC. Explain.
 - The cover page of the Petition is a typo; the combined size of the canopy and rooftop systems is 2.7168 MW DC.
6. Would the proposed facility provide its total of approximately 2.02 MW AC at the points of interconnection or would this number be less due to losses?
 - Wiring and other losses will reduce the total by approximately 5% at the points of interconnection.
7. Can the project be designed to accommodate a future potential battery energy storage system?
 - There are no plans of adding a battery storage system at this site, and this is a standalone PV system. However, if in the future the mall wants to add a battery storage system, it can be accommodated.
8. Would the impact of soft shading, such as air pollution or hard shading, such as bird droppings or weather events, such as snow or ice accumulation, hail, dust, pollen, etc. reduce the energy production of the proposed project? If so, was this included in the proposed project capacity factor assumptions? Would any of these expose the solar panels to damage? If applicable, what type of methods would be employed to clear the panels of the bird droppings, prey shells, snow and ice accumulation, hail, dust or pollen and at what intervals?
 - While shading can impact the production of the facility, the energy production estimates for the Projects are based on and factor in local historic weather data over the last 50 years, including the impact of snow and other weather related losses. Localized site conditions such as dust pollen, etc. are a minimal factor in the Northeast due to consistent rainfall. Notwithstanding the foregoing, Safari Energy intends to wash the panels on an as needed basis to help ensure maximum production. Typically, this includes one washing per year, but additional washings can be scheduled as needed.

Site Components and Solar Equipment

9. What is the design wind speed of the solar panel mounts (both rooftop and canopy)? How are the panels adhered to the mounts? What prevents the solar panels from separating from either the racking or the foundation during high winds?
 - Canopy – The design wind speed is 115 MPH. This was defined by the Connecticut State Building code. The panels are attached to the steel framing using aluminum brackets. There are (4) clamps per module and they have the capacity to resist uplift wind forces in accordance with the building codes.
 - Rooftop – The design wind speed is 135 MPH. This was defined by the Connecticut State Building code. The panels are attached to the racking system using aluminum brackets. Specifically, serrated nuts and bolts through the module mounting holes. The racking system was wind tunnel tested and designed such that wind uplift forces are resisted by a

combination of ballast blocks and roof penetrations based on pressure coefficients obtained from wind tunnel testing.

10. The proposed solar panels are described as double-sided LGNeON cells. How much power is anticipated to be generated from the rear of the cells? Are the double-sided cells also proposed for the roof installation?

- This is manufacturer proprietary information. We plan to use the same panels for the canopy and roof.

11. Reference drawing titled, “Elevation Sketch of Roof Mounted Solar Modules.” What is the approximate distance from the top of the roof to the top edge of the proposed solar panels? What is the approximate distance from the top of the roof to the bottom edge of the proposed solar panels?

- The approximate distance from the top of the roof to the top edge of the proposed solar panels is 10 inches. The approximate distance from the top of the roof to the bottom edge of the proposed solar panels is 5 inches.

12. Reference Sheet S3.1 from United Structural Design LLC. Provide the distance from ground level to the highest point of a solar panel on a three-panel canopy and also on a six-panel solar canopy.

- The distance from ground level to the highest point of a solar panel is between 12-13 feet for both canopies.

Interconnection

13. Roughly what is the estimated peak load of the mall facility (in MW) relative to the proposed approximately 2.02 MW AC peak output of the proposed solar facility? Is there an already existing solar facility located on top of the mall? Roughly how many MW does the existing facility contribute to the mall’s peak load?

- The mall facility’s peak load is in excess of 5 MW AC.
- Yes, there is an existing system located on one section of the roof controlled by one of the anchor tenants. The existing solar facility is owned and operated by a different entity, and we do not have any knowledge of the system output. This system is tied to its own electric service and is not tied to the mall’s electric service.

14. Referencing Drawing E200, three PV systems are depicted: two for the canopies and one for the roof. Will these systems operate independently such that if an interconnection failure exists at one (or one system needs to be shut down for maintenance), the others will continue to operate?

- Yes, the systems operate independently. If one system fails or is shut down, the others will continue to operate.

15. Is it correct to say that because the solar arrays would connect to on-site electrical rooms, no new electrical feeders would have to be run out to the street? If this is not correct, please indicate if any new overhead or underground connections to Eversource’s distribution system would be required.

- Yes, no new electrical feeders need to be run out to the street.

16. Should the Eversource system experience an outage, will the PV systems still be operational to provide power to the mall?

- No, the systems will not be able to provide power to the mall in the event of an Eversource outage.

Public Safety

17. Would the solar facility have a protection system to shut the facility down in the event of a fault within the facility or isolate the facility during abnormal grid disturbances or during other power outage events?

- Yes, the facility has a protection system to shut the facility down or isolate the facility.

18. Would the project comply with the National Electrical Code, the National Electrical Safety Code and any applicable National Fire Protection Association codes and standards?

- Yes, the project will comply with the National Electrical Code, the National Electrical Safety Code and any applicable National Fire Protection Association codes and standards.

19. Would the proposed structural design and loading associated with the proposed rooftop and canopy solar installations comply with the Connecticut State Building Code (or other codes) as applicable? If this project is approved, could a final set of drawings of the proposed solar facility stamped by a Professional Engineer be provided to the Council post-approval?

- Yes, the proposed rooftop and canopy solar installations comply with the Connecticut State Building Code.
- Yes, a final set of drawing stamped by a Professional Engineer can be provided to the Council.

20. Where is the nearest airport and/or airfield? Would glare from the solar arrays have any impact on air navigation? Has a glare analysis been conducted? If not, under what circumstances would a Federal Aviation Administration (FAA) glare analysis be required? Would any notice to FAA be required because of the height(s) of the solar facility (e.g. as a physical obstruction)?

- The nearest airport is the Hurlbrink Heliport. It is approximately 1.5 miles northwest of the property line, and approximately 1.6 miles northwest of the project limit. Due to the distance from the airport, there is no impact on air navigation. No glare analysis has been conducted because FAA guidelines only require a glare analysis when the project is located on the airport or in the flight path. No notice to the FAA is required because the height of the solar facility does not exceed 200 feet.

21. Would the proposed solar facility present a fire safety or other hazard (ex. Lightning strike)?

- No, the proposed solar facility does not present a fire safety or other hazard. It is designed in compliance with applicable codes, including fire and electrical. This includes proper grounding of electrical components and usage of fire resistant materials.

22. With regard to emergency response:

a. Is outreach and/or training necessary for local emergency responders in the event of a fire or other emergency at the site?

- Safari offers training to all fire and emergency departments if requested.

b. How would site access be ensured for emergency responders?

- Emergency responders will have the same access to the site as before the canopy installation. For emergency responders' access to the facility itself, see subsection (c), below.

c. In the event of a brush or electrical fire, how would the Petitioner mitigate potential electric hazards that could be encountered by emergency response personnel?

- There are standard disconnects and signage to alert and direct first responders to de-energize the system.

23. Page 7 of the Petition notes that, "Appropriate means of disconnect to shut down the Facility in the event of an emergency will be located on the ground, but inaccessible to the general public. Once operational, Safari Energy will work with local fire and law enforcement officials to ensure they have the appropriate knowledge and access to provide their services to the Facility, if necessary." Would there be an emergency key box or a disconnect switch (for example) for first responders to perform an emergency shutdown of the facility?

- Yes, upon request Safari Energy can provide an emergency key box.

24. Would the proposed lighting plan (with its proposed foot-candle intensity) for under the proposed canopies comply with applicable codes? Could the lights be dimmed if the glare is found to be a problem?

- The proposed lighting plan will meet the applicable codes. The lights are designed to be dimmed upon request from local officials or mall personnel.

Environmental

25. Would any additional tree clearing have to be performed to reduce shading effects on solar panels, or is all tree clearing only required to physically accommodate the proposed project (e.g. the canopies)?

- We do not anticipate any additional tree clearing beyond what is described and depicted in the Petition. Trees shown to be within the building footprint of the canopies will be removed. Trees within the project limit that are casting significant shade on the parking canopies will either be trimmed or removed (see Exhibit K for Tree Removal Plan). Safari Energy will determine which trees casting shade should be trimmed, and which should be removed. The trees on the opposite side of West Farms Mall Road adjacent to the wetland area are outside of the project limits and are to remain.

26. For the purpose of demonstrating greenhouse gas emissions reductions for the proposed project (and as a supplement to page 8 of the Petition), please utilize the EPA Greenhouse Gas Equivalencies Calculator at <https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator> and submit the full results.

- Please see attached Exhibit C

Facility Construction

27. Would construction of the proposed facility involve disturbance of one or more total acres of land area? If yes, has the Petitioner submitted an application for a General Permit to DEEP?

- Only construction of the canopy portion of the proposed facility involves any disturbance of land area and the area of such disturbance is anticipated to be approximately 3,742.5 square feet, consisting of 260 square feet of disturbance for the canopy columns (2 square feet x 130 columns) and 3,482.5 square feet of disturbance for trenching. Such disturbance is less than one acre of land area.

28. Page 4 of the Petition notes that the solar parking canopy columns would be installed using helical coring. Is this essentially a drilling process? Approximately how deep into the ground would the Petitioner need to core to install the columns?

- Yes, this is a drilling process. The column depth can vary between 10-15 feet.

29. Where would the construction “staging area” or materials storage area be located?

- Construction materials will be stored within the project limit and away from adjacent wetlands and waterways, drainage ways, and steep slopes. The exact location of construction materials storage will be determined by Safari Energy and mall personnel.

30. What would be the construction timeline of the project from groundbreaking to full operation?

- Approximately 7 months.

31. Would any weekend construction hours be anticipated, or would all work be expected to be completed during the week (from 7:00 a.m. to 5:00 p.m.)?

- All work is expected to be done during normal work hours.

Maintenance Questions

32. How, or why, is a tilt of 5 degrees being proposed for the panel arrays? Will this relatively low tilt cause problems with snow removal? Is there a plan to remove snow accumulation?

- The roof array tilt is designed at 5 degrees to optimize production and economics. Safari Energy does not recommend removing snow due to safety concerns. See #33 for snow removal procedure.

33. Would snow accumulation on the solar panels affect the output of the facility? Under what circumstances would snow be removed? Describe snow removal methods and site access.

- While snow can impact the production of the facility, the facility energy production estimates are based on local historic weather data over the last 50 years, including the impact of snow.
- Only upon extreme weather events where roof collapse is a possibility would Safari Energy recommend removal of snow. Safari Energy would work with local officials and mall personnel during extreme weather events to provide access to the equipment and coordinate the process.

34. What accumulation of snow could the solar panel array structures (both rooftop and canopy) handle? Would the Petitioner clear snow from the panels when it approached the limit?

- The solar panel array structures are designed according to local building requirements including appropriate safety factors relating to load size. In the event where collapse is a possibility, see the answer provided to Question 33.,

35. Would any chemicals be used or only water for solar panel cleaning? Would this maintenance activity have any impacts to water quality?

- No chemicals will be used. The maintenance activity will not impact water quality.

36. Within the renderings in Exhibit K, the asphalt parking area where the canopies will be installed appears to be cracked in many areas, although the cracks may have been filled. Will the canopies interfere with any future maintenance and/or replacement of the asphalt in these areas?

- No, the canopies will not interfere with any future maintenance of the asphalt in these areas. It is our understanding that the mall plans to repave the parking lots in the near future, potentially before the solar installation.

37. The Petition states that the canopies would extend approximately 9 feet above grade. Box trucks tend to be on the order of 9' 6" high. Will access by box trucks or similar high profile vehicles be prohibited from accessing the area of the canopies? If so, how will this be accomplished?

- The canopies are approximately 9 feet above grade at the center and increase in elevation as they extend towards the drive aisles. One of the reasons the canopy area was selected is that the proposed area exclusively serves passenger vehicles. There are other means of access to the site for box trucks or similar high profile vehicles. In the case of a high-profile vehicle attempting to enter the lot, proper signage will be visible to discourage the vehicle from entering.

38. Would the proposed rooftop System 1 impact stormwater drainage on the roof? Would any roof storm drains be impacted? Which code(s) govern stormwater drainage on roofs, e.g. Connecticut State Building Code, International Building Code, etc.? Would the rooftop drainage system remain in compliance with such code(s) post-construction?

- No, the proposed rooftop System 1 will not impact roof storm drains and will not impact or impede the flow of water on the roof. As such, the installation of the System will have no effect on the existing compliance status of the rooftop drainage system.

39. The Petitioner proposes to include a 3/4" gap between panels to allow for rainfall drainage. What type of impact is anticipated from such drainage contacting either the pavement and/or parked vehicles below?

- As the canopies have no water quality implications and are being installed over an existing impervious surface, there is no expected impact to the pavement and/or parked vehicles below the canopies. Storm water is expected to fall onto the panel itself and drop through the gaps around the perimeter of each panel. Storm water will flow onto the pavement similar to the rainfall outside of the canopy areas. It will remain in the same catchment area as it does today and flow to the nearest catch basin into the Mall's existing conveyance system.

40. With stormwater drainage from the canopies through the 3/4" gaps, would this materially affect the existing parking lot drainage system, or would it require upgrades to such drainage system?

- Given the canopies allow storm water to flow onto the existing impervious areas as it does today, we do not anticipate any change to existing drainage patterns. The existing pavement will remain in place and any disruption to the pavement will be a result of the drilling in the footprint of the column. The canopies are being strategically placed so the columns do not interfere with the existing drainage network. The proposal does not include relocating any drainage pipes, manholes, or catch basins. Any column that may be in close proximity to a drainage network will need to be shifted to eliminate any conflicts during construction.

41. Does the Petitioner have any information concerning the underside of the canopy arrays and the potential for these areas to act as shelters or nesting areas for birds and/or insects?

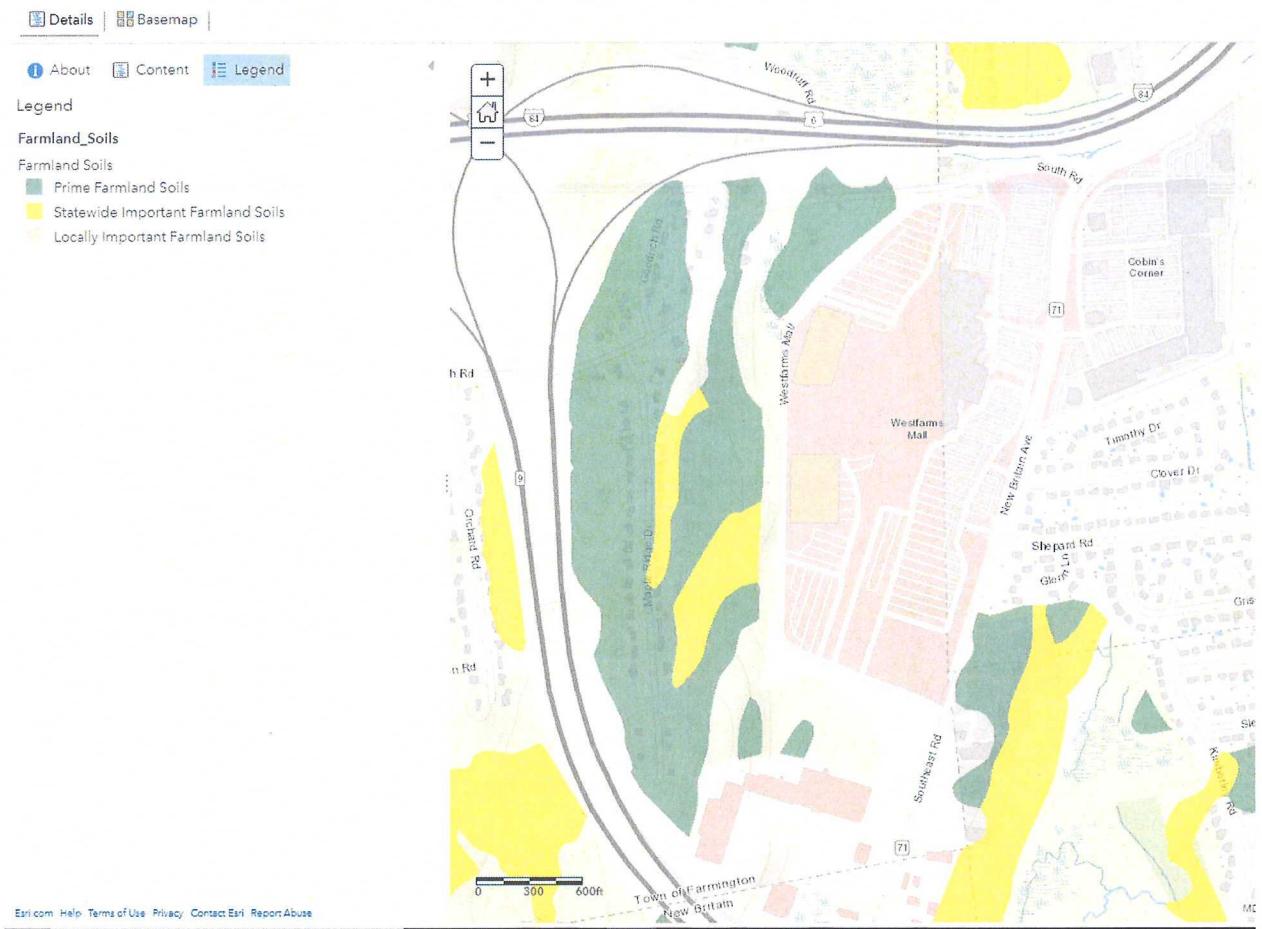
- In Safari Energy's 10 years of experience across hundreds of completed projects, we have never seen birds/insects use the canopy arrays for nesting. If in the event this happens, Safari Energy will work with mall personnel and local officials to resolve the issue.

42. What measures will be taken to prevent vandalism to the underside of the canopies; e.g., protection for wiring, graffiti, etc.?

- The portions of the undersides of the canopies containing exposed wiring are in excess of 10 feet tall and unreachable by pedestrians. Ground level wiring is protected by conduit and all operable switches/equipment are locked and inaccessible to people. In addition, mall security regularly patrols these areas for vandalism.

EXHIBIT A
ArcGIS Farmland Map

ArcGIS ▾ My Map



00835502.2

EXHIBIT B
ArcGIS Forestland Habitat Impact Map

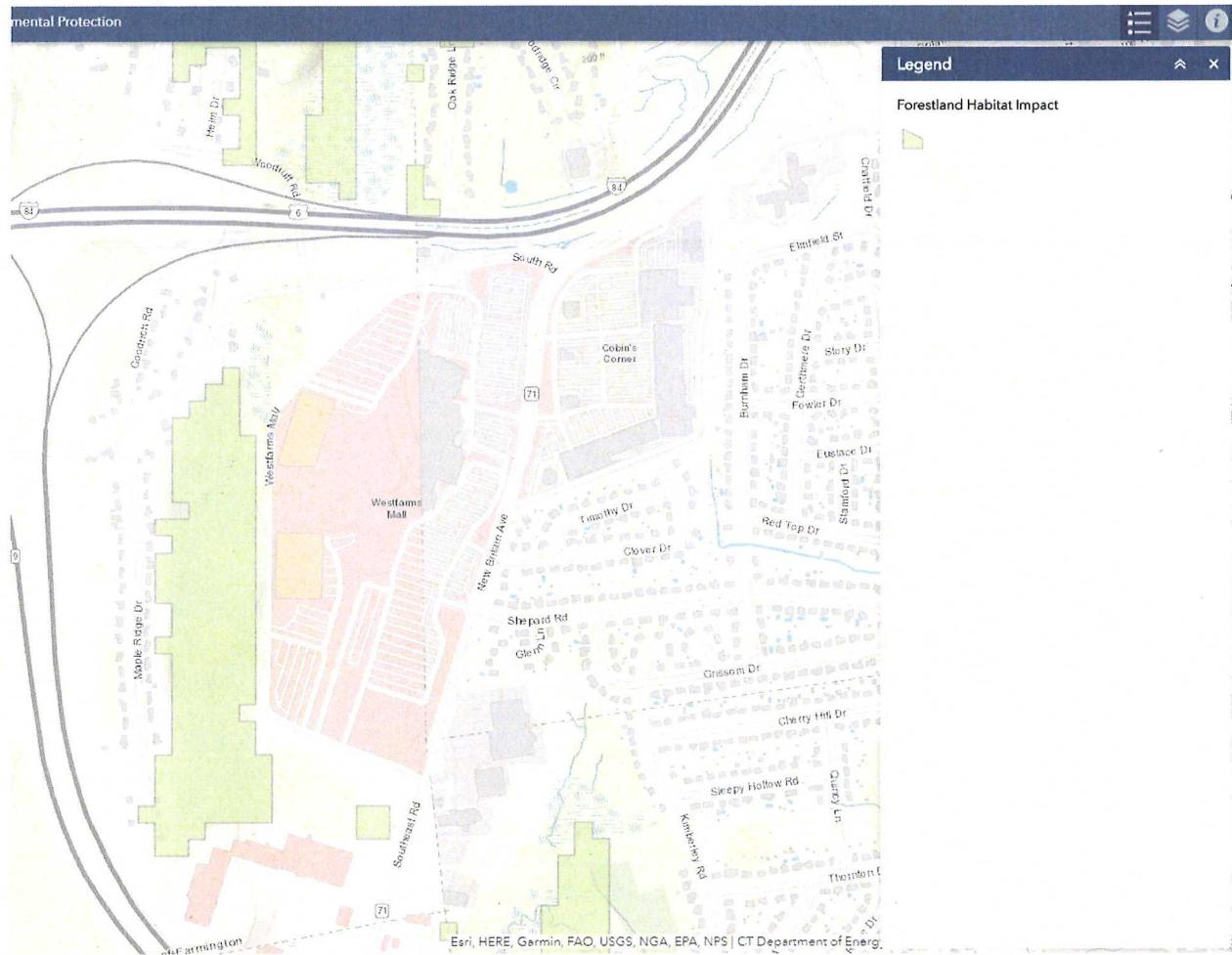


EXHIBIT C

9/5/2018

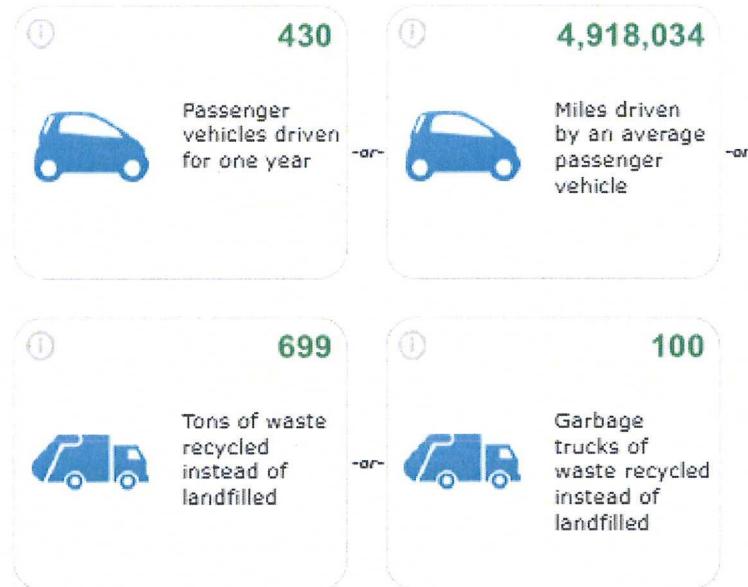
Greenhouse Gas Equivalencies Calculator | US EPA

Equivalency Results [How are they calculated?](#)

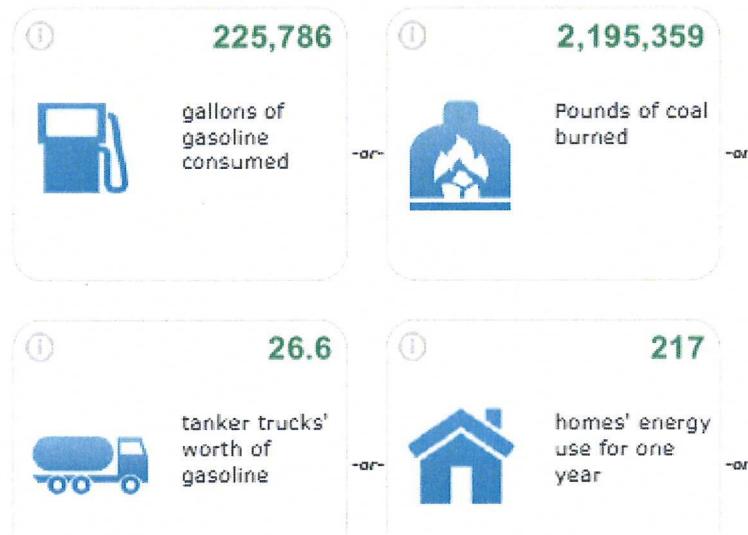
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2,007 Metric Tons ▾

Greenhouse gas emissions from

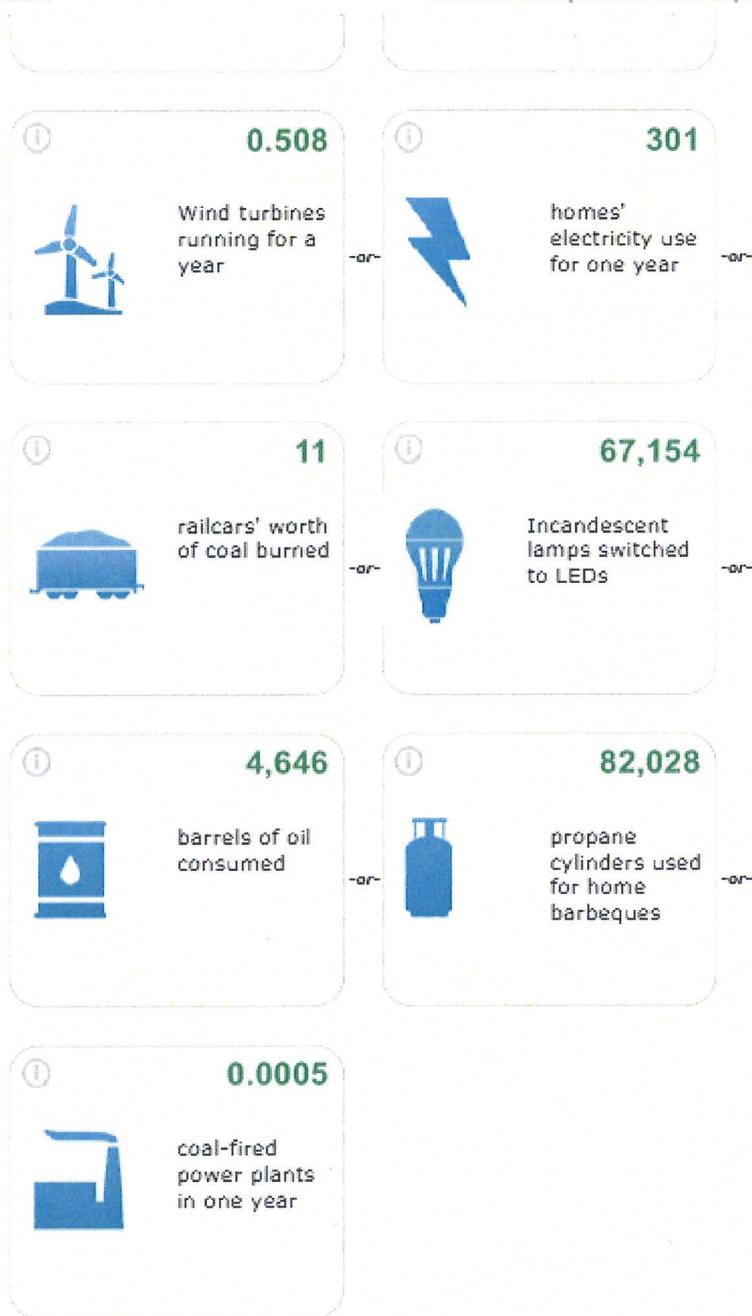


CO₂ emissions from



<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

1/3



Carbon sequestered by



9/6/2018

Greenhouse Gas Equivalencies Calculator | US EPA



tree seedlings
grown for 10
years



acres of U.S.
forests in one
year

①

16.4



acres of U.S.
forests
preserved from
conversion to
cropland in one
year