



10 East Church Street  
Bethlehem, Pa. 18018  
eacbethlehempa@gmail.com

April 25, 2019

Honorable Members of City Council,

As the City of Bethlehem continues to grow, we have an obligation to increase our sustainability, utilize alternative energy sources and reduce our overall carbon footprint. One way to achieve this is with the development of new policies and regulations that encourage the use solar energy. This is consistent with the City's goal in creating a Climate Action Plan.

The Bethlehem Environmental Advisory Council submits the attached proposal for an ordinance that would require new or retrofitted buildings over a certain size to obtain a Solar Energy System Assessment and, dependent upon the assessment, install solar panels.

Should you have any questions or would like to discuss this recommendation further, please do not hesitate to contact us.

Respectfully yours,

*Lynn Rothman*

Lynn Rothman, Chair

On behalf of the Bethlehem EAC:

Elizabeth Behrend  
Elisabeth Cichonski  
Kathy Fox  
Brian Hillard  
Mike Topping  
Brian Nicas (membership on the EAC pending)

cc: Mayor Donchez

**To:** Bethlehem City Council

**From:** Bethlehem Environmental Advisory Council, Solar Energy Committee

**Date:** April 25, 2019

**Subject:** Solar Energy Ordinance Proposal

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As the City of Bethlehem continues to grow, we have an obligation to increase our sustainability, utilize alternative energy sources and reduce our overall carbon footprint. One way to achieve this is with the development of new policies and regulations that support solar energy. This is consistent with the City's goal in creating a Climate Action Plan and allows us to lead the way as an example to other cities.

**Benefits of Solar Energy:**

- Solar energy will reduce greenhouse gas emissions in the city and region.
- Costs associated with the installation of solar panels have decreased at least 15 percent over the past four years (see Attachment 1).
- There are federal tax incentives for solar panels up to 30% through the end of 2019, decreasing to 26% through 2020 and 22% for 2021.
- Payoff times across the U.S. generally range from 6-9 years.
- There are multiple financing options. Newly enacted Commercial Property Assessed Clean Energy (C-PACE) allows building owners to finance clean energy and water conservation projects through their property tax bill. The investment is then tied to the building even when ownership changes.
- An owner of solar panels can obtain Solar Renewable Energy Credits (SRECs) from Pennsylvania, which are currently increasing in value.
- Pennsylvania allows net metering, which permits any unused produced energy to be sold back to a utility company.
- A study of residential solar systems shows that they increase property value, which would likely apply to commercial buildings.
- Over 242,000 Americans work in the solar industry and the industry generated \$17 billion in 2017.
- Job growth is #1 in the renewable energy sector, thus supporting local job growth in the alternative energy fields in the city.
- Solar energy can still be produced through indirect sunlight or on cloudy days (10-25%).
- There is an enormous amount of potential rooftop surface area, mainly in the industrial park region, but also in larger residential developments, college campuses, parking garages and other commercial buildings. There are also many acres of rooftop surface area available on existing structures that may be able to accommodate solar panels.
- Systems are low maintenance.
- As of 2016, solar energy and wind became the cheapest and most abundant source of energy in the world.

**(Note:** Most of the data referenced above can be found at [seia.org](http://seia.org).  
Property value study from Berkeley Lab: [\*New Solar Home Premiums: Calculating the Value Rooftop PV Adds to a Multi-State Sample of New U.S. Homes\*](#))

Therefore, the Bethlehem Environmental Advisory Council (EAC) recommends that Bethlehem City develop an ordinance requiring new or retrofitted buildings over a certain size to obtain a Solar Energy System Assessment and, dependent upon the assessment, install solar panels. Other cities with solar requirements for new construction include Lancaster, Santa Monica and San Francisco, CA, Watertown, MA, South Miami, FL, and Ann Arbor, MI. Beginning in 2020 the State of California will have solar requirements for all new construction, including homes.

Recommendations for an ordinance are outlined below and utilize ordinances from other cities in the United States, primarily the solar ordinance from Watertown, MA (which is attached as an appendix).

**Proposed Solar Ordinance** (Note: With the exception of minor changes, the proposed ordinance below is similar to the existing Watertown, MA ordinance)

**1. Definitions:**

- a. Solar Energy System: A device or structural design feature, a substantial purpose of which is to provide heating or cooling, electricity generation or water heating.
  - i. Solar Energy System, Active: A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector or another medium using mechanical, electrical, or chemical means.
    - 1. Solar Energy System, Ground-Mounted/Canopy: An active Solar Energy System that is structurally mounted to the ground and is not roof-mounted.
    - 2. Solar Energy System, Roof-Mounted: An active Solar Energy System that is structurally mounted to the roof of a building or structure.
- b. Solar-ready zone: The solar-ready zone area is 50% of the roof area that is either flat or oriented between 110 degrees and 270 degrees of true north, exclusive of mandatory access or set back areas as required by the PA and Bethlehem City fire codes.

**2. Requirements:**

- a. New buildings greater than or equal to ten thousand (10,000) gross square feet or containing ten (10) or more residential units shall include a solar energy system that is equivalent to the description in Table 1 of the roof area of all buildings. In cases where a site includes an uncovered parking structure, the structure shall also have a solar energy system installed to cover a minimum of 90% of its top level, which still allows for parking underneath. (See Attachment 2 for pictures)
- b. Existing buildings that are at least ten thousand (10,000) gross square feet or more, that are either newly designed or are retrofitted for a new tenant, must complete a solar assessment and comply with the solar panel ordinance.
- c. The square footage of the building will determine the percentage of the rooftop the should be covered by solar panels. See Table 1 below for recommendations:

**Table 1**

<b><i>Proposed Square Footage Range (Commercial and Industrial)</i></b>	<b><i>Minimum % of roof area to be covered</i></b>
10,000-50,000	50%
50,001 -500,000	40%
>500,000	30%

**3. Solar Energy System Assessments:**

- a. A solar assessment shall be submitted and the assessment must include, at a minimum:
  - i. An analysis for solar energy system(s) for the site detailing layout and annual production.
  - ii. Include the maximum feasible solar zone area of all structures and potential ground-mounted canopies.
  - iii. An initial solar energy system assessment shall be submitted with the required application for Site Plan Review.
  - iv. A final solar installation plan must be reviewed and approved by the appropriate planning and zoning departments prior to the issuance of building permits.

#### **4. Exemptions:**

- a. A project will not be required to install a solar energy system on the roof when there is no solar ready zone, or the solar-ready zone is shaded for more than 50 percent of daylight hours annually, or for building conversions with insufficient structural load capacity. A waiver would be determined by an independent solar assessment of the site. Furthermore, in the case of a mixed or ground mounted installation, the requirement may be reduced or waived if the assessment determines there is not a viable location to meet the solar requirement.
- b. Nonprofit organizations would not be required to follow the ordinance unless doing so voluntarily.
- c. If historical elements to the building will be adversely impacted based on recommendation of the city Historical Conservation Commission.

#### **5. Safety and Location Guidelines**

- a. Emergency Access – Solar energy systems shall be located in such a manner as to ensure emergency access to the roof, provide pathways to specific areas of the roof, provide for smoke ventilation opportunities, and provide emergency egress from the roof as required by PA and city fire code regulations.
- b. Safety – No roof-mounted solar energy system shall be located in a manner that would cause the shedding of ice or snow from the roof onto a porch, stairwell or pedestrian travel area.

#### **6. Effective Date:**

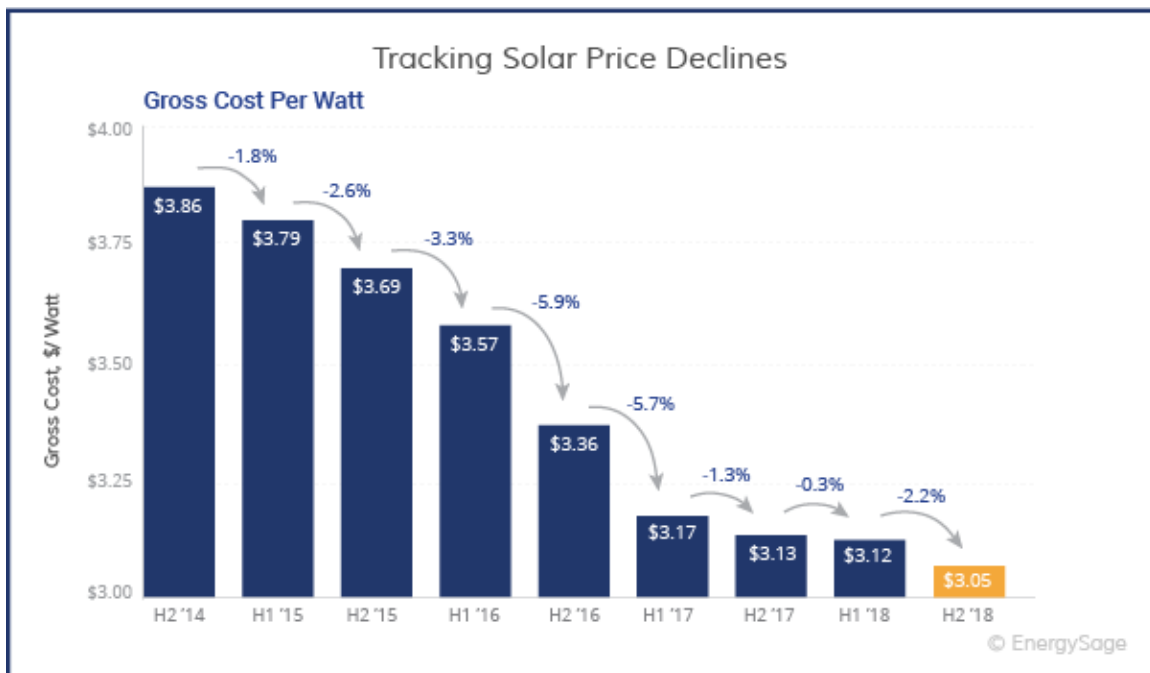
- a. All of the requirements set forth in the ordinance shall take effect immediately after review by the appropriate city boards and review/approval by City Council.

#### **Recommendations for citywide incentives include:**

- Allow a developer to build an additional story if they use solar panels on the roof or provide rooftop green space.
- Substitute green space as an option in place of solar panel installation.
- Density Bonuses: Grant density bonuses for applications for subdivisions, such that the maximum number of lots allowed increases by a certain amount provided that active and/or passive solar technologies are utilized by each building.

- Vacant Lot Preferences: When vacant parcels of land under City ownership are auctioned, the City can award a bid preference (up to a certain amount) when awarding the bid in exchange for a certain amount of solar installed on the fully-built out parcel.
- Expedited Approval: Speed up the permitting or zoning approval process for developments or buildings that meet certain active, passive, solar-ready, or net zero energy requirements.
- Provide a city property tax incentive for a limited time for industrial or commercial businesses that install solar panels.
- Assist in working with owners to obtain proper incentives for reimbursement.
- Develop a dedicated city Renewable Energy Officer (REO) to assist companies in meeting requirements, inspection and implementation of a solar energy plan.

## Attachment 1 Solar Price Decline Graph



## Attachment 2 Examples of Solar Panel Usage



Parking Deck coverage that still allows vehicle parking underneath the solar panels at Long Beach City College (Photo from [greenbuildingelements.com](http://greenbuildingelements.com))



Amazon Warehouse Rooftop Solar Panels (Photo from [cnet.com](http://cnet.com))



Target rooftop (Photo from solarreviews.com)



Photo by Powerparasol.com





Carroll College Student Building in Montana (Photo by Carroll.edu)



Photo by Godfreyhoffman.com



Photo credit by Blue Oak Energy Photovoltaics



Multifamily residential Unit (Photo by sunlightandpower.com)

# APPENDIX



## Watertown Town Council

Administration Building  
149 Main Street  
Watertown, MA 02472  
Phone: 617-972-6470

### ELECTED OFFICIALS:

Mark S. Sideris,  
Council President

Vincent J. Piccirilli, Jr.,  
Vice President &  
District C Councilor

Caroline Bays  
Councilor At Large

Anthony J. Donato  
Councilor At Large

Susan G. Falkoff,  
Councilor At Large

Anthony Palomba,  
Councilor At Large

Angeline B. Kounellis,  
District A Councilor

Lisa J. Fellner,  
District B Councilor

Kenneth M. Woodland,  
District D Councilor

### ORDINANCE # 89

2018 - O - 89

#### AN ORDINANCE AMENDING THE TOWN'S ZONING ORDINANCE TO REQUIRE SOLAR INSTALLATIONS IN CERTAIN NEW PROJECTS

**WHEREAS**, pursuant to Massachusetts General Laws Chapter 40A, Section 5 and Article IX of the Watertown Zoning Ordinance, the Zoning Ordinance may be amended from time to time; and

**WHEREAS**, on September 11, 2018 the Town Council of the City known as the Town of Watertown conducted a First Reading of a petition of Zoning Ordinance Amendment, and referred the Amendment to the Planning Board for Public Hearing; and

**WHEREAS**, the Planning Board held a duly advertised Public Hearing on October 10, 2018 in accordance with the requirements of M.G.L. c. 40A, Section 5 to discuss the Amendment language as recommended by Department of Community Development & Planning ("DCDP") staff, and where public comment was received; and

**WHEREAS**, the Planning Board, with five members present, the Planning Board voted unanimously to recommend approval of the request to amend the requirements of the Zoning Ordinance to require on projects of 10,000 square feet or more of commercial or industrial area or 10 or more residential units Solar Energy installations, and directed DCDP staff to submit the Planning Board's report and recommendations to the Town Council with respect to the proposed Amendment; and

**WHEREAS**, on November 27, 2018, the Town Council conducted a duly advertised Public Hearing with respect to the proposed Amendment where the Amendment was discussed and the report and recommendations of the Planning Board were received and considered.

**NOW THEREFORE BE IT ORDAINED** by the Town Council of the City known as the Town of Watertown that Title XV of the Watertown Code of Ordinances, Chapter 155, Zoning Ordinance, is hereby amended, with struck-through language deleted and bold underlined language inserted, as follows:

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**I. Note: Amend Section 9.03(a) to reference a new Section for Solar Energy Systems and its requirements:**

**SECTION 9.03(a) (Third Paragraph)**

Development in the NB, LB, CB, I-1, I-2, I-3, RMUD, and PSCD Districts greater than or equal to ten thousand (10,000) gross square feet or containing ten (10) or more residential units shall have complete an Solar Energy System Assessment, as required under Section 8.05~~energy-assessment completed to determine the viability of a rooftop photovoltaic system.~~ The Petitioner shall indicate, in writing, what actions/outcomes will be taken with a copy of the assessment, to DCDP.

**II. The following language would be a new Section under Article VII - Other Regulations**

**8.05 Solar Energy Systems**

**(a) Definitions:**

1. Solar Energy System: A device or structural design feature, a substantial purpose of which is to provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating.
  - a. Solar Energy System, Active: A solar energy system whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means.
  - b. Solar Energy System, Ground-Mounted / Canopy: An Active Solar Energy System that is structurally mounted to the ground and is not roof-mounted.
  - c. Solar Energy System, Roof-Mounted: An Active Solar Energy System that is structurally mounted to the roof of a building or structure.
2. Solar-ready zone: The solar-ready zone area is 50% of the roof area that is either flat or oriented between 110 degrees and 270 degrees of true north, exclusive of mandatory access or set back areas as required by the MA Fire Code.

**(b) Requirements:**

Development requiring site plan review approval under section 9.03 in the NB, LB, CB, I-1, I-2, I-3, RMUD, and PSCD Districts greater than or equal to ten thousand (10,000) gross square feet or containing ten (10) or more residential units shall include a solar energy system that is equivalent to a minimum of 50% of the roof area of all buildings. In cases where a site includes an uncovered

parking structure the structure shall also have a solar energy system installed to cover a minimum of 90% of its top level.

**(c) Solar Energy System Assessment:**

A solar assessment shall be submitted and the assessment must include, at a minimum:

1. An analysis for solar energy system(s) for the site detailing layout and annual production.
2. Include the maximum feasible solar zone area of all structures and potential ground-mounted canopies.
3. An initial solar energy system assessment shall be submitted with the required application for Site Plan Review under section 9.03
4. A final solar installation plan must be reviewed and approved by the Department of Community Development and Planning, prior to the issuance of a Building Permit

**(d) Exemptions:**

A project will not be required to install a solar energy system on the roof when there is no solar ready zone, or the solar-ready zone is shaded for more than 50 percent of daylight hours annually, or for building conversions with insufficient structural load capacity. Further, in the case of a mixed or ground mounted installation the requirement may be reduced or waived if the assessment determines there is not a viable location to meet the solar requirement.

**(e) Safety and Locations Guidelines:**

1. Emergency Access - Solar energy systems shall be located in such a manner as to ensure emergency access to the roof, provide pathways to specific areas of the roof, provide for smoke ventilation opportunities, and provide emergency egress from the roof, as required by the MA Fire Code, as updated.
  
2. Safety – No roof-mounted solar energy system shall be located in a manner that would cause the shedding of ice or snow from the roof into a porch, stairwell or pedestrian travel area.

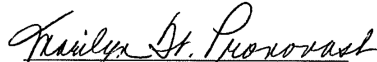
**III. Proposed language to clarify solar canopy installation by adding the following notes in Section 5.04 – Dimensional Regulations.**

**Coverage:** Solar energy systems shall not be included in calculations for building coverage or impervious cover as identified in Section 5.04 – Table of Dimensional Regulations.



\_\_\_\_\_  
Council Member

I hereby certify that at a Meeting of the Town Council for which a quorum was present, the above Ordinance was adopted by a roll call vote of 9 for, 0 against, 0 present on November 27, 2018

  
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Marilyn W. Pronovost, Council Clerk  
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Mark S. Sideris, Council President