

Madalyn Letellier

From: Anand Parikh [REDACTED] > on behalf of Anand Parikh
<[REDACTED]>
Sent: Wednesday, September 13, 2023 2:01 PM
To: City Clerk Contact; All City Council
Subject: Support of Green roof amendment : please do not exempt PV roofs

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Dear City Council members,

I am a resident of Somerville and wanted to write in support of the Green (Vegetated) Roof amendment.

With the density of our City, every tree and every little green space will:

- **Cool** the air,
- **Increase** biodiversity,
- **Preserve** buildings' energy through rooftop insulation,
- **Reduce** stormwater flooding,
- **Provide** habitat for pollinators, and
- **Contribute** to our goals of addressing climate change.

I also strongly favor that Photo Voltaic roofs not be exempt from this requirement. As it was clear in the presentation that was made during the committee meeting, solar panels and green roofs can coexist, in fact, vegetation makes the solar panels more efficient.

It is a win-win and a no-brainer.

Thanks for your consideration,

Anand Parikh

[REDACTED]
Somerville

Madalyn Letellier

From: Erin Hemenway <[REDACTED]>
Sent: Friday, September 15, 2023 3:50 PM
To: All City Council; City Clerk Contact
Subject: My comments on proposed zoning amendment for vegetated roofs

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I'm writing to follow up on my Sept. 7th spoken testimony to the Land Use Committee to express my support for amending the Somerville Zoning Ordinances to include a requirement that new and substantially renovated larger buildings have vegetated roofs. As one of the most densely populated cities in the country, we desperately need more greenspace. We need to do everything we can to increase our greenspace within the city to reduce urban heat island effects, decrease greenhouse gas emissions, improve the biodiversity within the city and absorb stormwater to reduce flooding impact after the extreme weather events that are becoming increasingly common. I am concerned that there are a couple of exemptions that, as currently written, would leave loopholes for developers of large buildings to skirt the spirit of the amendment and avoid installing meaningful vegetated roof space.

There are two specific exceptions in section 8.a.i of the draft amendment that I am concerned could unintentionally limit the meaningful adoption of vegetated roofs on new and renovated buildings in Somerville. I'm specifically concerned about the flat exemptions for roof mounted cellular\internet equipment and for photovoltaic panels.

Allowing a flat exemption for roof mounted cellular, radio and internet equipment will encourage developers and property owners to use the exemption as a way to increase revenue by renting out their open roof space, for example to lease the space to a cellular or wireless internet provider. If a property owner can claim their roof space is being used for such equipment while simultaneously collecting revenue, why would they ever do the work to develop and install an area of plantings when the city allowed them to avoid it with this exemption?

Allowing a flat exemption for photovoltaic devices could also encourage even well intentioned climate friendly developers to build out in a way that skirts the vegetation requirement. I respect that zoning changes need to preserve the city's goals for electrification and decarbonization and allow room for things like solar panels and heat pumps, but we need to be mindful of unintended consequences. There is tremendous national attention and funding for energy related initiatives since the passage of the Inflation Reduction Act in 2022, which means developers and owners will naturally be attracted to the financial benefits of installing renewables. Research indicates that colocating photovoltaic panels with vegetation can improve the output of the panels, thus furthering our city's net zero goals while also helping to cool and foster greater biodiversity at home.

The efficiency and output of photovoltaic (PV) panels is affected by the temperature of the panels. According to the National Renewable Energy Lab, the two most important factors that impact the maximum electrical output of a PV panel are the amount of sunlight it receives and the temperature of the PV module. The maximum power output of a module drops by 0.3% to 0.5% per degree increase in module temperature. (Ref: <https://www.nrel.gov/news/program/2022/increased-spacing-of-solar-panels-comes-with-benefits.html>)

The efficiency and output of PV panels starts to decrease at around 77 F (25 C). (Ref: <https://blog.ecoflow.com/us/effects-of-temperature-on-solar-panel-efficiency/>)

<https://www.solar.com/learn/do-solar-panels-work-less-efficiently-at-certain-temperatures/>

77 F is not even a particularly high temperature for many months out of the year in Greater Boston. When you consider that we already regularly see air temperatures in the 70s (F) or higher from April-October, it's easy to imagine that the surface temperature on materials in direct sunlight will likely be higher than the surrounding air temperature for many days out of the year, thus negatively impacting their efficiency.

Recent research indicates that biosolar roofs, which combine vegetation around PV panels, serve to cool the surface temperatures on the solar panels and the roof while also improving the output of the panels. A fascinating study in Sydney, Australia used two very similar buildings that were located next door to each other with very similar environmental and sunlight conditions. One building used a biosolar roof that combined solar with a green roof. The other building used a comparable conventional roof with an equivalent solar system. The researchers reported that using the biosolar roof reduced the temperatures on the solar panels themselves by 9.6 C (~17 F) and the roof surfaces by 6.9 (~12.4 F). The output of the panels increased by 21-107% depending on the month. Here is an accessible article by the researchers:

<https://theconversation.com/a-green-roof-or-rooftop-solar-you-can-combine-them-in-a-biosolar-roof-boosting-both-biodiversity-and-power-output-211347>). Their full final report is available here:

<https://opus.lib.uts.edu.au/bitstream/10453/150142/2/City%20of%20Sydney%20Final%20Report%20EPI%20R3%20201920005.pdf>

The biodiversity on the green roof was also improved; the researchers observed 4x as many birds, 7x as many arthropods, 2x as many slugs and snails. Additionally, there were unexpected bee species that were attracted to the vegetation on the biosolar roof. The world's pollinators are under threat due to climate and land use change, so a technique such as biosolar roofs, that foster pollinator habitats while also cooling the surface and improving PV panel efficiency should be our default standard. Rooftop vegetation can also serve as an insulation layer that mitigates temperature fluctuation inside the building between night and day, thus helping to improve energy efficiency and decrease the electricity consumption used to control the temperature within the building.

In his spoken testimony on Sept. 7th, Brendan Shea reminded us that as building technology improves over time, our renewable ways of powering buildings will change but our city will continue to need greenspace forever, long after the current city leadership and voting constituents like myself have yielded leadership and civic responsibility to our children and grandchildren. We should not lock ourselves to an amendment by centering it around current technology that dedicates space to rigid PV panel arrays. This is the time for Somerville to be the national leader. We need to craft a future facing amendment that works to ensure that meaningful greenspace will be incorporated from the start on every new and renovated large building roof within our city.

In summary, I would like the photovoltaic exemption to be removed, or at the very least modified to require and incentivize that any rooftop solar follow the biosolar model. I would like to see the exemption removed for cellular, radio and internet equipment. If we really want to encourage climate friendly development, it would be better to carve out an exemption or incentive for rooftop installations of energy storage that take advantage of large-scale emerging battery technology rather than an exemption for cellular\internet equipment, where current tenants of Greentown Labs are advancing this tech now. Wired vs tired, if you will. This could help the city to develop our local grid demand response capabilities as we can expect more extreme weather events in the future that will continue to impact our grid.

Thank you.

Erin Hemenway

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Madalyn Letellier

From: Cheryl C [REDACTED]
Sent: Sunday, September 10, 2023 3:28 PM
To: City Clerk Contact; All City Council
Subject: Support for Green Roofs in Somerville

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Hello,

I moved to Somerville in December 2022, and rent in Winter Hill. I am a working professional who intends to reside here for the long-term.

I strongly support the green roofs ordinance to require green roofs on large buildings, as proposed by Green & Open Somerville, and other advocates.

Cheryl Curry, she/her/hers

Madalyn Letellier

From: Heidi Meyer [REDACTED]
Sent: Thursday, September 7, 2023 10:30 PM
To: City Clerk Contact; citycouncil@somervillema.gic
Subject: Green roof proposal

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Civic officers:

Please pass the green roof proposal fair; our souls are heartsick about environmental destruction, and all ages, young, middle and old, need hope wherever it can be made.

Thank you for your consideration, and, for your hard-working commitment to our precious community.

Yours sincerely,

Heidi Meyer
Union Square