

2019 Dane County Departmental SMART Fund

Funding Opportunity Description

The Sustainability Subcommittee of the Public Works and Transportation Committee is responsible for distributing grant money to county departments from a dedicated fund in the county's capital budget. This fund supports the county's goal of becoming more sustainable by, for example, investing in initiatives that reduce greenhouse gas emissions by implementing systems that result in more efficient energy use and investments in renewable energy production at county facilities. The fund is a foundational part of the county's continued efforts to ensure that important natural resources and ecosystem services are maintained for current and future generations while working to increase equity and inclusion in all that we do. The fund can be used by your department to help you implement strategies identified in the [Dane County Government Sustainable Operations Plan](#), to supplement current budget items that do not have enough funds to incorporate additional sustainable measures, or to fully fund projects that are not in the current budget, but that will improve the sustainability of county operations and reduce long-term costs.

The subcommittee will select projects to fund based on their consistency with the sustainability principles adopted by the Dane County Board (on October 18, 2012) to guide county government management, operations, and policy making, as well as based on their ability to further implement the [Dane County Government Sustainable Operations Plan](#). The subcommittee will consider applications that might not provide a large financial return on investment but that can be demonstrated by the applicant department to incorporate strong sustainability education benefits for county staff and the public. The subcommittee will also look favorably at innovative pilot projects that test new sustainability technologies in county operations and that can be demonstrated by the applicant department to hold promise for additional future benefits for county facilities.

Benefits of this fund:

- Alignment of departments and staff toward a common understanding of sustainability
- Clarity and consistency in assessing and organizing actions and programs for sustainable government operations
- Enhanced policies and programs incorporating a sustainability perspective
- Enhanced reputation as a proactive contributor to a more sustainable community
- Education of county staff and public on sustainability issues
- Reduced operating costs

Dane County's Sustainability Principles:

Dane County strives to operate in a sustainable way that will:

- Reduce and eventually eliminate county government's contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals;
- Reduce and eventually eliminate county government's contribution to dependence upon persistent chemicals and wasteful use of synthetic substances;
- Reduce and eventually eliminate county government's contribution to encroachment upon nature and harm to life-sustaining ecosystems (e.g., land, water, wildlife, forest, soil, ecosystems); and
- Reduce and eventually eliminate county government's contribution to conditions that undermine people's ability to meet their basic human needs.

Eligible Applicants:

Dane County Departments

Award Information:

Application Deadlines: There are 3 application deadlines for 3 rounds of funding. Solicitations for applications will go out via email about 1 month before each deadline.

1. **February 6, 2019** — At this time up to 50% of the funds will be awarded.
2. **June 3, 2019** — At this time up to an additional 25% of the funds will be awarded.
3. **October 4, 2019** — At this time the remainder of the funds will be awarded.

The subcommittee generally makes award decisions within a couple of weeks of the application deadline depending on complexity of the proposals and the subcommittee meeting schedule.

Examples of types of projects that would be eligible:

- Renewable energy or energy efficiency improvement investments for county facilities, such as solar lighting, LED lighting upgrades, energy efficient boilers, etc.
- Purchase of new or upgraded equipment that will improve the overall efficiency of facilities and reduce greenhouse gas emissions, reduce the use and disposal of toxic products, reduce maintenance costs and/or staff time using the equipment, and/or facilitate better tracking, measurement, and verification of sustainable outcomes in county operations
- Water conservation improvements

Application and Submission Information:

Apply electronically to Lisa MacKinnon at Mackinnon@countyofdane.com and Greg Brockmeyer at Brockmeyer@countyofdane.com.

Please include the following in your application:

- 1) A detailed description of your proposed project
- 2) How the project, if carried out, will meet the county's sustainability principles
- 3) How the project, if carried out, will implement specific goals, objectives, and strategies identified in the [Dane County Sustainable Operations Plan](#). Indicate which goals, etc.
- 4) How the county might build upon the sustainability outcomes of the proposed project
- 5) How your department intends to track and measure the outcomes of the project, if funded, such as cost savings, energy reductions, maintenance reductions, etc., who will be responsible for measurement and verification, and an estimated timeline for delivery of measurement and verification of outcomes.
- 6) Budget Sheet: Include all costs of achieving the objectives of the project.
- 7) Estimated cost savings to the county due to implementation of the project and the payback period.
NOTE: Include here information on estimated Focus on Energy incentive savings if your project is eligible for FOE incentives (see <https://focusonenergy.com/business> or contact Lisa MacKinnon for assistance in getting this information) or other financial incentives that will offset the cost to the county

Questions are to be directed to Lisa MacKinnon at 267-1529 or Greg Brockmeyer at 266-4519.

Project Information:

Please provide the following information (take as much space as you need to provide details):

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| Department: Address: 210 Martin Luther King Jr Blvd. Madison, WI 53703 | Total project costs: \$153,600 Funding amount in current budget: \$0 Funding amount requested: \$153,600 |
| Project Title: Extensive Living Roof Project – City County Building | |
| Project Location: 210 Martin Luther King Jr Blvd – Madison, WI 53703 | |
| <p>Project Description:</p> <p>Install extensive living roof systems on each of the first floor roof Sections on the MLK elevation of the City County Building (approximately 3,800 total square feet). The living roof systems are to be installed as extensive systems, with a maximum depth of 6 inches, and will consist of low maintenance plant material, growing media, filter fabric, moisture retention/drainage panel, insulation, root barrier, protection course, and waterproofing membrane.</p> | |
| <p>Describe how the proposed project moves the county toward meeting the following Sustainability Principles. (See the guiding questions in the box below.) Responses to this section will be used to determine the relative level of sustainability for each project.</p> <ul style="list-style-type: none"> • Reduce and eventually eliminate county government’s contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals; • Reduce and eventually eliminate county government’s contribution to dependence upon persistent chemicals and wasteful use of synthetic substances; • Reduce and eventually eliminate county government’s contribution to encroachment upon nature and harm to life-sustaining ecosystems (e.g., land, water, wildlife, forest, soil, ecosystems); and • Reduce and eventually eliminate county government’s contribution to conditions that undermine people’s ability to meet their basic human needs. <p>Include in your description any estimated reductions of GHGs / CO2 equivalent emissions related to your proposal. Please use the following calculator to do this: http://www.epa.gov/cleanenergy/energy-resources/calculator.html</p> <p>Vegetative roofs provide many benefits that would help the county move toward meeting its established Sustainability Principles including: improve storm-water management by reducing runoff and improving water quality, conserve energy, mitigate the urban heat island, increase longevity of roofing membranes, reduce air pollution, sequester carbon, and provide habitat for wildlife. The plants in a vegetative roof also filter air particulates while producing oxygen in the urban environment.</p> | |

Describe how the proposal furthers implementation of the Dane County Government Sustainable Operations Plan goals, objectives, and strategies in your department and/or countywide. Please identify specific plan goals, objectives, and strategies accomplished.

Climate Change Mitigation and Adaptation Goal (committing to reduce greenhouse gas emissions generated by all county operations and facilities):

- Vegetative roofs help to reduce the Urban Heat Island Effect, a condition in which urban environments absorb and trap heat. Roads, asphalt parking lots, and rubber and asphalt rooftops absorb heat and reradiate it, which slows cooling at night. Urban Heat Islands can increase temperatures up to 8 degrees Fahrenheit over temperatures in surrounding rural areas and prolong and intensify heat waves in cities. (City of Chicago, 2008) Living roofs help to mitigate this effect by interfering with the radiation of the roofing membrane and through the evaporative cooling effect from the transpiration of the plant material.
- Monitoring of two in-service extensive living roofs in Toronto, Canada revealed that living roofs are also effective in reducing heat flow through the roofing system, thus lowering the energy demand for heating and cooling in a building. Thermal data collected in 2002 showed that even in the first year of monitoring, when the vegetation was not fully established, the extensive green roofs being monitored reduced the building's energy demand. This benefit was especially pronounced in the summer. (Liu and Minor, May 2005) Decreased heating and cooling demand of a building leads to decreased greenhouse gas emissions from the heating and cooling equipment.

Water Goal (demonstrating wise water use in county government operations to ensure access to clean and abundant water for current and future generations):

- A major benefit of living roofs is their ability to absorb storm-water and release it slowly over a period of several hours. Vegetative roof systems have been shown to reduce storm-water runoff by 50-100% during most rains resulting in an average of about 50% -75% total water retention from rainfall over a typical year. (Johnson, September 2008) Vegetative roofs share many engineering features with conventional storm water management basins, and compared to many at-grade storm water management practices, vegetative roof covers are unobtrusive and reliable. (Miller, October 2016) Typical of many urban situations, vegetative roofs may offer the only practical "at-source" technique for controlling runoff on the City County Building, which does not have ample space on the ground to readily accommodate other methods of water retention and filtration.

County Buildings and Facilities Goal (ensuring Facilities Management uses standards, policies, and practices that promote resource efficiency and performance with an emphasis on occupant and user health and well-being):

- Unlike traditional black tar roofs, living roofs reduce energy costs by absorbing heat instead of attracting it and providing additional insulation for buildings. This natural protection against extreme heat enables living roofs to last twice as long as traditional roofs. (City of Chicago, 2008) The multiple layers of the vegetative roof protect the underlying roof materials from the elements in three ways: protection from mechanical damage (from wind-blown dust and debris, humans, and animals); shielding from ultraviolet radiation; and buffering temperature extremes which minimizes damage from daily expansion and contraction of roofing materials. Current data has led many researchers to expect that living roof installations will last 50 years and longer before they require significant repair or replacement. (Miller, October 2016) A longer roof lifespan equates to reduced waste generated during re-roofing and reduced need for petroleum-based roofing material used in a roofing replacement.

Describe how the county might build upon the outcomes of the proposed project to work toward greater sustainability.

The experience gained through the installation of vegetative roof systems on the selected roofs of the MLK elevation of the city county building could be utilized to expand or duplicate the effort on additional roof sections of the city county building or other county-owned buildings in the downtown Madison district. Many municipalities across the nation are similarly integrating vegetative roofing systems on urban rooftops into their regional sustainability efforts.

Does the proposed project include a strong sustainability education component? If yes, describe the educational component, who it will reach, and how it will be communicated.

An educational component to this project exists in the fact that the environmental benefits provided by green roofs are essentially derived from their functioning as ecosystems. The important services of improved storm-water management, better regulation of building temperatures, reduced urban heat-island effects, and increased urban wildlife habitat provided by vegetative roofs are attributed to the biotic and abiotic components that contribute to the overall ecosystem within the vegetative roof. Learning and understanding the interactions between these ecosystem elements, especially the relationships among growing media, soil biota, vegetation, and the interactions between community structure and ecosystem functioning are important for improved green-roof function. (Oberndorfer, 2007) This knowledge of living roof function can be shared with county employees and members of the general public through media exposure and/or web-based information sharing.

Does the proposed project pilot an innovative new sustainability-advancing technology in county operations and can it be demonstrated by the applicant department to hold promise for additional future applications in county facilities? If yes, describe the elements of the innovative technology being proposed.

The installation of living roofs on the City County Building would pilot a new innovative sustainability-advancing technology in county operations. Vegetative roofs are becoming an innovative way for cities world-wide to respond to the growing threat of global climate change. ("France decrees new rooftops must be covered in plants or solar panels", 2015) Additional opportunities can be explored in other county facilities that operate in the urban expanse where the benefits of living roof systems can be realized.



A photo of Chicago City Hall's green roof shows the contrast between a vegetated and non-vegetated roof. The temperature differences between the vegetated and non-vegetated sections of roof are claimed to be as much as 70 degrees.

Source: https://www.chicago.gov/content/dam/city/depts/zlup/Sustainable_Development/Publications/Green_Urban_Design/GUD_booklet.pdf

[Questions continued on next page]

Describe how your department will track and measure outcomes of the proposed project (i.e., annual cost savings, annual energy savings, resource use reductions, maintenance reductions, etc.). Include a timeline for measurement and reporting outcomes, and the staff member contact who is responsible for conducting the tracking and measurement and reporting back.

Building-wide energy tracking will be paired with monitoring of the specific heating and cooling needs of the HVAC zones that encompass the City Parks and City Assessor Departments which lie beneath the roofs proposed for living roof installations. Heating and cooling assessments will be performed on a monthly basis, with particular scrutiny during periods of extreme weather conditions. Storm water retention will be assessed by visually monitoring roof drains for water intake during and after major storm events.

SOURCES:

City of Chicago. 2018. Adding Green to Urban Design: A City for Us and Future Generations. Adopted by City Plan Commission on November 20, 2008. Internet Address: www.chicago.gov

France decrees new rooftops must be covered in plants or solar panels. The Guardian, March 19, 2015. Internet Address: <https://www.theguardian.com/world/2015/mar/20/>

Johnson, Peter, 2008. Web. A Review of Storm water Management Data and Research. Department of Energy and Environment Green Roof Performance Measures, September 2008. Internet address: <https://doee.dc.gov/>

Liu, K. K. Y.; Minor, J. May 2005. Web. Performance Evaluation of an extensive Green Roof. National Research Council Canada: Greening Rooftops for Sustainable Communities. Internet Address: <https://nrc-publications.canada.ca>

Miller, Charlie, 2003. Extensive Green Roofs. Whole Building Design Guide, November, 2003. Internet address: www.wbdg.org

Oberndorfer, Lundholm, Bass, Coffman, Doshi, Dunnett, Gaffin, Köhler, Liu, Rowe, 2007. Green Roofs as Urban Ecosystems: Ecological Structures, Functions, and Services. BioScience, Volume 57, Issue 10, 1 November 2007. Internet Address: <https://doi.org/10.1641/B571005>

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Guiding questions for the project description. Applicants should include a detailed discussion of the work planned and/or the technical approach used that illustrates what the project will achieve and how it will comply with and implement the county's four sustainability principles and the Dane County Government Sustainable Operations Plan. The following questions provide a guideline to help your department frame and describe the project. Please feel free to address additional issues.

- Will this project reduce wasteful dependence upon fossil fuels, underground metals, and minerals?
- Will this project ensure that the smallest possible amount of resources is used?
- Has the proposal included green procurement standards for required goods, materials, and services?
- Will this project lead to a decrease in greenhouse gas emissions?
- Will this project reduce the need for fossil fuel-dependent transport, increase public transit use, or increase walking and bicycling?
- Will this project support businesses that emit less polluting or hazardous substances to air, water, soil and ecosystem services?
- Will this project raise awareness about waste prevention and recycling and will it help reduce the amount of waste going into the landfill?
- Will this project still be relevant when looking at the demographic changes ahead?
- Will this project consider the most up-to-date technology for recycling and waste reduction?
- Will this project use products that are non-polluting or come from an environmentally friendly source that will reduce negative impacts of the project on the environment, e.g., FSC wood, non-toxic, and non bio-accumulative chemicals?
- Will this project avoid the risks of water, air, and soil contamination?
- Will this project support the provision of environmental and social services in a certain area (e.g., flood prevention, water purification, air cleaning)?
- Will this project be beneficial in helping the county to adapt to the effects of climate change (e.g., changes in precipitation, flood and drought risks, heat emergencies, etc.)?
- Is this project avoiding negative impacts on water bodies, wetlands, etc., and is this project supporting the establishment and management of protected areas in water bodies, wetlands, etc.?
- Is this project proposing activities to raise awareness about water scarcity, water conservation, or water recycling and will this lead to an improvement of the water quality of a certain water body?
- Will this project still be beneficial once the funding is used and what, if any, public funding will need to be used for ongoing maintenance?
- Will this project support jobs in the eco-technology field and/or does this project include training for relevant stakeholders in renewable energy and other clean and sustainable technology?
- Has this project developed a strategy for measuring anticipated outcomes of the project?
- Has this project developed a strategy for how to disseminate results or best practices?
- Will this project improve equity outcomes for everyone?
- Will this project improve access to community services and facilities for all people of the community?