

Power Green Associates

The Revival

Joseph Maricevic

Xiao Lin Wang

Paul Fiore

Gabriela Melghem

Eric Aguilar

Table of Contents

Mission Statement	1
Abstract	1
Gantt Chart	2
Research	3
Budget	4-5
Project Narrative	6-7

Grant Project

Group Name: Power Green Associates

Project Title: The Revival

Mission Statement:

Power Green Associates takes the role of urban planning in different contexts: socially, economically, and politically. While offering quality service and design to our clients, we strive to form an interactable, cost efficient, and comfortable space. We respect the environment by focusing on sustainability and implementing ways to reduce carbon footprint as our main priority.

Abstract:

Pollution in urban centers are slowly killing its inhabitants, just take a look at the conditions in Chinese cities. Though not as bad here in New York City, sustainability and reducing our carbon emissions when constructing buildings can further enhanced to better the community living in them and the surrounding environment. First, we plan to tackle the problem economically. Designing and constructing green space is costly and is not financially beneficial to property developers. Therefore tax incentives or tax breaks are given by the local government (i.e the city council or albany) and/or by the federal government to these developers so that these types of spaces may be built.

The idea of giving economic incentives, in the manner it is today, has been in use since late 2015. However, instead of favoring the wealthy corporations, these tax breaks will be given to small businesses and single landlord-owned apartments and or co-op's. The individuals on the lower classes would benefit much more and number of low rise buildings in New York City is still much of the architecture of the landscape. Our team comprises of architects/planners and learning these ideas in school allows us to have an extensive knowledge of sustainability and green building design. The goals set forth by the goals of the fund-raising board are in parallel with our intentions and goals.

Gantt Chart:

Task Name	10/28	10/30	11/4	11/6	11/11	11/13	11/18	11/20	11/25	11/30	12/1
Abstract	Green	Blue	Blue								
Gantt Chart		Blue	Purple								
Research		Purple	Green	Green							
Budget		Purple	Red	Purple	Red						
Group Name, Project Title, Mission Statement		Purple									
Project Narrative		Orange	Orange	Purple	Orange	Red	Orange	Green			
Presentation				Blue	Blue	Purple	Blue	Purple	Orange	Red	Green

Key:

Joseph Maricevic

Xiao Lin Wang

Paul Fiore

Gabriela Melghem

Eric Aguilar

Research:

- Architect, Engineer, Construction Manager, Planner
- Green roof is where the surface of a building is congested with vegetation
- Green roof can attract birds and insects
- Can aid in reducing stormwater runoff
- Last 40+ years
- Environmental, social, and economic benefits
- Serves as a form of insulation for the structure
- Adds visuals to a boring environment
- System of layers: root barrier, irrigation system, drainage
- Adds warmth in the winter while producing a cooling effect in the summer
- Take proper measurements of the selected or desired area before starting to build
- Consider the weight before and after the creation of the green roof due to increase of load from water absorption later on
- Drainage plays a crucial role when designing a green roof
- Construction workers earn about \$16 per hour
- Formula for measuring heat loss: $Q = U * A * T$ (U = value of material, A = area, T= temperature)
- Green roof can be placed on low income housing units and commercial buildings
- Consider regular maintenance cost
- Green roofs cover ONLY .15% of roofs in NYC

Shading

“Shading reduces surface temperatures below the plants. These cooler surfaces, in turn, reduce the heat transmitted into buildings or re-emitted into the atmosphere. For example, a multi-month study measured maximum surface temperature reductions due to shade trees ranging from 20 to 45°F (11-25° C) for walls and roofs at two buildings.⁷ Another study examined the effects of vines on wall temperatures, and found reductions of up to 36°F (20°C)” (Wong, 2)

Decrease in PM

“Researchers estimate that a 1,000-square foot (93 m²) green roof can remove about 40 pounds of PM from the air in a year, while also producing oxygen and removing carbon dioxide (CO₂) from the atmosphere.²² Forty pounds of PM is roughly how much 15 passenger cars will emit in a year of typical driving.” (Wong)

Reduction in Energy Costs due to Cool Roofs

“Green roofs, by reducing heat transfer through the roof of a building, can improve indoor comfort and reduce heat stress associated with heat waves. The use of cool roofs (see “Cool Roof” chapter) provides similar indoor air temperature benefits. These improvements in building comfort can yield human health benefits, particularly in non-air conditioned buildings.” (Wong, 8)

Wong (2005) U.S. Environmental Protection Agency. 2008. "Green Roofs." In: Reducing Urban Heat Islands: Compendium of Strategies.

Budget:

CATEGORY	MATERIAL	UNIT COST	QUANTITY	TOTAL
<u>Support</u>				
	Wood Frame	\$6 / Square Feet	500	\$3,000
	Concrete	\$6 / Square Feet	500	\$3000
<u>Insulation</u>				
	Insulation	\$3 / Square Feet	500	\$1,500
<u>Water Proof</u>				
	Bitumen Felt	\$2 / Square Feet	500	\$1,000
<u>Drainage</u>				
	Soil	\$12 / Cubic Yard	500	\$6,000
<u>Filter</u>				
	Fertilization	\$.08 / Square Feet	500	\$40
<u>Vegetation</u>				
	Sedum	\$.20 / Square Feet	500	\$100
	Sempervivum	\$.20 / Square Feet	500	\$100
	Moss	\$4 / Square Feet	500	\$2000
<u>Rainwater Drain Installation</u>				
	Stormwater drains	\$55 / Linear Foot	100	\$5500
<u>Equipment</u>				
	Drill	\$500	1	\$500
<u>Transportation</u>				
	Truck	\$500	1	\$500
<u>Labor</u>				
	Construction Manager	\$45 / Hour	1 (Duration of	\$45

			project)	
	Construction Worker	\$12 / Hour	15 (Duration of project)	\$180
	Civil Engineer	\$30 / Hour	1 (Duration of project)	\$30
	Architect	\$25 / Hour	1 (Duration of project)	\$25
<u>Cost</u>				
Total Budget				\$20 Million
Total Cost				\$20 Million

Project Narrative:

The most current climate change prediction made by the United States Environmental Protection Agency states the following, “Assuming that these historical geological forces continue, a 2-foot rise in global sea level by 2100 would result in the following relative sea level rise: 2.3 feet at New York City.” (USEPA) Green initiatives and carbon emission reductions are not simply about caring for the earth or fulfilling an abstract duty to mother nature. It is existential, and requires sustainable action immediately. In session seventy-three of the United Nations General Assembly, a meeting on Climate and Sustainable Development, United Nations General Assembly President, María Fernanda Espinosa Garcés, citing the findings of the latest Intergovernmental Panel on Climate Change (IPCC) report as she warned that, “Eleven years is all we have ahead of us to change our direction.”

Our group, the Power Green Associates, wishes to address Climate Change, a problem without a straightforward solution, by introducing several different initiatives to contribute to the greater good, and survival, of our community and the world. This project, titled, The Revival, is an urban planning project that will reduce the carbon footprint of New York City. To do our part in solving this problem that plagues the entire world we intend to construct green spaces on the roofs of city buildings while creating a greater emphasis on sustainability during the process building construction.

The idea for this project is to be inclusive of the entire community, to involve people of all socio-economic backgrounds. We believe that the planning should not involve a complete take-over of wealthy corporations that will only look towards benefitting a small population of people. Saving the planet must involve the invitation of those who have not had a say in how to protect their precious green earth. In history, it has been quite expensive to design these green spaces on rooftops and have negatively affected participants financially. We intend on adopting Resolution No. 66 which calls upon the State Legislature and the Governor to pass, “...legislation that would increase the real property tax abatement for the installation of a green roof to \$15 per square foot.” These tax breaks via local and federal government will encourage low income building owners to participate in the construction of green space. We intend on focusing on the lower class, small businesses and single landlord-owned apartments many of whom reside in low rise buildings, which is ideal for the creation of green roof spaces. Additionally, our project will fund low-income landlords who would be otherwise unable to afford greenspace.

There are a variety of companies that have created green spaces for large buildings such as Barclay's Center with the help of National Grid, and Highview Creations that has completed over 56 projects. We intend to offer a similar impact of ample resources through tax breaks that further increases property value, and other benefits that come with the creation of green rooftops. This we believe will raise a participation rate among all people in New York City. The Revival is a living, breathing, project that intends to create a greater earth; with the help of the city of New York that we intend to turn into a movement. This project promises to serve this city for as long as it exists.

When introducing this problem to the group, we noticed a statistic that was almost jaw dropping: Green roofs cover .15% of all roofs in NYC. It is evident how few green roofs exist and it is a waste of a flat roof surface that New York City's buildings are comprised of. Given New York City's high population density, living spaces are small and expensive. It is difficult to find a private outdoor space that one can enjoy and relax in. Therefore, it is crucial for our team to promote the increase of green roofs.

By creating a vibrant space on the roofs of buildings, residents will have an increase interaction and promote the overall wellness of an entire community. We are talking about not only an environmental benefit, but that of a social and economical value.

The debate of whether a rooftop is a private or public space is ongoing. Rooftops are private and accessible only to residents of the building itself, yet it is still considered a public space because everyone in the building has access to it. On a wider spectrum, those walking by the residents are able to look up and observe people on the roof. Hence, measuring the usefulness of our project is simple. When we monitor the increase of those occupying the space, we can directly view the social impact. Furthermore, we can determine the effectiveness of the insulation by using the heat loss formula, $Q = U * A * T$ (U = value of material, A = area, T= temperature) which provides the economic aspect. Under this equation we can truly see that a green rooftop is an effective form of insulation. According to Dr. Stuart Griffin from The Earth Institute at Columbia he has claimed that “[the] green roof can reach 87% reduction in heat gain and a 37% reduction in heat loss.” With these numbers in mind, our group will be able to find a common percentage to base our difference in heat loss throughout the project. While we were provided with statistics in heat gain and heat loss, we will focus in on the 37% provided by Dr. Griffin. With this equation, we will measure the heat loss once a month from the beginning of the project, before the installment of the green rooftop, to the completion of it, then following up each month to create statistics that could be compared from the original heat loss. There will obviously be a negative trend in the recording of the heat loss after each month. For 12 months we will record the heat loss of the buildings and compare each month and create an average heat loss during those 12 months. We will also compare the percentage of heat loss from the beginning of the installation to the end of the 12 months. We will give a range of $\pm 5\%$ from the 37% that was provided by Dr. Stuart Griffin to make up for human error and other possible technical errors that could have existed during the installation of the green rooftop. While also on the topic of comparison of month to month for this project our group will put into consideration regular maintenance and its cost.

Another economic aspect that can be documented is water absorption and drainage. In order to be able to accurately measure water absorption and drainage, we will have to discuss what goes into the creation of the rooftop. According to the NYC Department of Design and Construction, there are seven layers of a green roof: structural support/roof, membrane protection layer, water retention + drainage layer, water retention + aeration layer, filter, soil substrate, and the plant material. These all play integral parts to ensure the water absorption and drainage functions properly. Not to create any difference in statistics, we will be utilizing identical materials in every building we intend to create green rooftops on. The drainage will also be treated with the same method as the heat loss recording. David Smiley, an assistant professor of architecture and urban studies from Barnard College claims that green rooftops have the ability to absorb 70% of rainwater that would have drained away preventing overflows of raw sewage. We will compare the beginning to the end of the 12-month inspection period to be able to come close to the 70% marker with a range of $\pm 10\%$ within the 70%. We will be able to calculate how much water has been retained and conclude that green rooftops aid in retention and drainage. With this also in mind, we will have to consider the weight before and after the creation of the green roof due to increase of load from water absorption later on.

There is an incredible amount of detailing that is required to create such an impactful projects such as The Revival. Such a long-term project requires the most amount of effort that could allow this to become the socio-economic impact that our group wants to create. There are many aspects to keep track

of and there are many people that should be included in the process of this urban renewal. To reiterate, we are focused on those who have not had a say in their city, low income New Yorkers will be the priority when it comes to tax breaks, inclusion and other socio-economic benefits that follow. All in all, this is a project that intends to make the earth a greater place to live on, we intend to save the earth one square foot of green at a time. We hope to not only be able to impact the earth, but also to change the lives of those living in NYC.

Works Cited

US EPA (January, 2017) "Future of Climate Change | Climate Change Science."

United States Environmental Protection Agency

Wong (2005) U.S. Environmental Protection Agency. 2008. "Green Roofs." *In: Reducing Urban Heat Islands: Compendium of Strategies.*

Belson, Ken. "Green Roofs Offer More Than Color for the Skyline." The New York Times, The New York Times, 28 Aug. 2008, <https://www.nytimes.com/2008/08/28/nyregion/28roof.html>.