



In Partial Fulfillment of the Requirements for the Degree of

## **Master of Sustainability Solutions (MSUS)**

**Kenia Ampuero**

Will present her Master's Applied Project

### **Backyard Biodiversity**

#### **Abstract**

As urbanization continues to expand, critical wildlife is loss. Residential landscapes, that are friendly to wildlife, can help protect biodiversity and advance sustainability. Urbanites who landscapes their yards to attract wildlife, can also gain greater knowledge and appreciation of nature. This project proposed an educational approach to encourage four households in the Victory Acres neighborhood in Tempe, Arizona to landscape their gardens with more than just aesthetics and food production as their goals. I developed a booklet on backyard biodiversity to provide the residents with information about the kinds of plants they could incorporate in their yards to attract pollinating species such as butterflies, bees, and birds.

Throughout the project, it was found that the process of using the guideline to change the landscaping of their yards, changed how the residents thought about gardening and biodiversity. All residents acquired a basic understanding of how important biodiversity is and the mutual dependence between humans and their ecosystem. The booklet also included information that enabled residents to use companion planting to increase yields, attract beneficial insects, control pests, and provide access to healthy, affordable, fresh, and chemical-free produce. These efforts contributed to the project's goals of maximizing nature conservation efforts and reducing the disconnect between people and nature.

Thursday, April 26, 2018  
9:00 a.m.  
Wrigley Hall, room 401

Faculty, students, and the general public are invited.



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## **Master of Sustainability Solutions (MSUS)**

**Katie Phillips**

Will present her Master's Applied Project

### **Beneath the Streets: New Tools for Managing Degrading Sewer Infrastructure**

#### **Abstract**

Infrastructure degradation is a chronic problem for fats, oils, and grease (FOG) pretreatment programs at wastewater utilities, which can lead to harmful bypass and high loss of a renewable energy feedstock. Not only does this exacerbate the potential for environmental harm, but not taking advantage of this resource leaves most FOG anaerobic digestion programs non-resilient and non-scalable. It is vital that there are strategies utilizing a sustainability perspective and integration of hard and soft infrastructure management principles to address this infrastructure degradation issue before there can be fully implemented zero-waste, FOG resource recovery initiatives. This applied project sought to answer the question, "How can municipalities sustainability manage the issue of degrading FOG pretreatment infrastructure?" with an emphasis on providing an applied example where a sustainability approach can mitigate complex, infrastructure problems. In partnership with the City of Tempe's Environmental Services Section, this project addressed the issue of degrading infrastructure by crafting and implementing a comprehensive Infrastructure Assistance Program (IAP). Designed to assist food service establishments (FSEs) and wastewater utilities, the IAP provides pathways for preventing FOG infrastructure degradation through initiatives that bolster hard and soft infrastructure to support a more efficient means of achieving compliance and local goals for resource recovery and renewable energy.

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## **Master of Sustainability Solutions (MSUS)**

**McCady Findley**

Will present his Master's Applied Project

### **Pac-12 Changemaker Program**

#### **Abstract**

In sports, there is a decades long history of athletes using their platform as sports icons to open discussions into societal issues. While people like Muhammad Ali and LeBron James are the most well-known, college athletes have a similar platform that can be used for change. This project explored the question of how to engage student athletes in sustainability on a more consistent basis from an institutional level within the Pacific-12 (Pac-12) Conference. Student athletes are notoriously time constrained, and therefore an adequate value proposition had to be developed to drive participation. The Pac-12 Changemaker Program was formed around the value proposition of allowing student athletes to speak up about causes that they are passionate about, and using sustainability as a lens to promote the cause and advocate for systemic change through the university's social media. A model was formed that could be replicated across multiple campuses, and be flexible enough to take advantage of existing opportunities. The model was piloted and subsequently adopted on Arizona State University's campus, in conjunction with University Sustainability Practices, the Zero Waste Department, and Sun Devil Athletics. Major outcomes from the pilot include a handbook outlining the model, guidance for engagement, and recommendations for implementation. Feedback from student athletes indicates that the process has to be as efficient as possible, as athletes are too constrained to carry the burden of the effort. Student athletes are also worried about having a polarizing opinion, indicating the need for a robust collaborative process before speaking out.

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## **Master of Sustainability Solutions (MSUS)**

**Devon Rood**

Will present her Master's Applied Project

### **The Duck Curve and Energy Storage: A Policy Recommendation for a Sustainable Solution**

#### **Abstract**

Before the rise in renewable energy, few people considered the consequences of adding large amounts of intermittent power onto the grid. As renewable energy has become more prevalent, utility companies must adapt their business practices to accommodate these unique sources of power. This is leading to challenges on how best to manage a grid with large amounts of renewable power.

The ever-decreasing costs of solar and innovative financing options have led to an increase in the number of distributed solar systems, especially in certain parts of the U.S. Arizona Public Service (APS), the largest electricity provider in the state of Arizona, has more than 70,000 distributed solar customers on their grid and the number of solar customers increases every day. With this increase in distributed solar customers comes the solar duck curve- the phenomenon whereby solar produces energy during times of low demand. Because distributed solar is causing this phenomenon and is causing problems for the utility companies, they often have a negative view of distributed solar. However, with the use of storage, the duck curve problem may be mitigated.

This project examines the sustainability of three storage options: pumped hydro electric storage, compressed air energy storage, and Lithium-ion batteries. Using a number of sustainability indicators, this project makes a policy recommendation to APS on the most sustainable choice for large-scale energy storage.

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## **Master of Sustainability Solutions (MSUS)**

**Meghan Tierney**

Will present her Master's Applied Project

### **Sustainable NASCAR Events at Richmond Raceway**

#### **Abstract**

While sustainability professionals have introduced the sports industry to sustainability initiatives and their business, environmental, and community benefits, they are not yet widely adopted into the enterprises' missions. NASCAR is no exception. The sports industry is uniquely positioned to advance sustainability. Since its events rely on a large network of actors to operate and their fans have diverse backgrounds, their influence is extensive. With average crowds larger than the Super Bowl, NASCAR races have significant influence and the opportunity to impact their host communities. This project provided analysis and recommendation to NASCAR Green and Richmond Raceway (RR), an urban NASCAR racetrack in Richmond, Virginia. The analysis provided strategies for the track to reduce negative impacts and enhance sustainability at its events. Initiatives address environmental, social, and economic impacts in the areas of energy efficiency, water efficiency, waste management, fan engagement, and community embeddedness. The process included an internal analysis of current track operations and an external analysis of current best practices in the sports industry. The recommendations complement the goals of the circular economy and the United Nations Sustainable Development Goals (SDG). They also address how RR can utilize sustainability to meet its business goals--increase profit, mitigate/manage risks, and advance the NASCAR brand. Recommendations include a solar ramada installation, glycerin fueled diesel generators, financing options, waste diversion operations, water efficiency measures, wetland preservation and arboretum, and championing the City of Richmond sustainability and carbon emission goals.

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