

2020 Initiatives Proposal Form

Thank you for your interest in submitting a proposal to the 2020 Initiatives process.

Please complete this form, save it to your hard drive, and then email a copy to W

[w@stocktonca.gov](#) You will then be contacted by the appropriate 2020 Initiative Team representative > ' ^ (] o.] š š } Ć •

Proposals will be evaluated based on general criteria including the following:

- ± h v] À Ć v p š Ć
- ± Clearly addressing one of the four LEGS themes from the 2020 strategic plan
- ± Specific budget details provided
- ± Realistic outcomes identified
- ± Assessment measures specified

Please consider the strategic(LEGS) theme?"

- ± What specifically do you wish to accomplish with your project?
- ± How will Stockton, as a whole, benefit?

Expected Results

- ± How will your department(s) that will assume the various work tasks?

- ± What is your project's "finish line"?

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The tables below allow for summaries of about 350 words. Additional information can be included as an attachment.

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Green Lighting Initiative in the PAC

Mark E. Mallett & Daniel Wright
2020 Sustainability Project Proposal

Additional Details

Narrative

This project, a Sustainability initiative, is seeking funding to replace significant parts of the Stockton Performing Art Center's (PAC) stage lighting, now mainly done with incandescent and halogen-lamped instruments, with energy efficient LED (Light Emitting Diode) technology. Over the past few years, the performing arts industry has undergone a remarkable set of transformations, as theatre/performing arts facilities, theatre companies and producers have developed an awareness of the ecological or environmental costs associated with presenting a theatrical production. This project aligns with that increased environmental awareness in society and in the theatrical industry.

Stage lighting, in particular, incurs environmental costs that are both direct – i.e., the charges for electrical service and heating and cooling systems – and indirect, most notably in a theatre's waste stream. Contemporary theatrical lighting – the lighting employed in conjunction with and part of a theatrical performance – requires a number of lighting instruments, each individually controllable in terms of on/off state, mounting position and aim at a particular part or section of the stage, and intensity or brightness; color is achieved using mylar-based plastic color media(gel). The illumination from such instruments is produced by incandescent or halogen lamps rated at 500-1,500 watts, and together often comprise an inventory of over one hundred individual units.

For general, or "wash" illumination (i.e., large areas such as backdrops or quadrants of the stage space), this means that each specific color requires a unique set of instruments, gels and electrical circuits or dimmers; a second or third color each requires its own second or third inventory of instruments. Lighting a full-stage backdrop, for instance, typically employs three different washes, which when mixed together at appropriate intensities produce any of a broad range of colors and intensities/brightnesses. Employing LED technology would cut the number of required instruments by at least one third.

Capable of creating specific and unique colored light as well as intensities, the lamps in the new LED instruments use considerably less electrical energy than a traditional incandescent lamp, generate less heat, and are markedly longer-lived. By way of example, running 60 500w lighting instruments (a relatively standard configuration) in washes for 16 hours/week at \$0.13/kWh costs around \$93.60, or \$2,808 over a 30-week performance year; LED

instruments would cost \$18.72/week or \$561.60 for the 30-week season. Using the same example, 102,360 BTUs of heat are generated, versus 6,824 arising from one third the number of LED instruments.

In addition, the life-span of the LED array means that lamp replacement might be needed every 20,000 hours, rather than the 200 hours expected of contemporary incandescent lamps, and obviates the need for disposable color media, reducing the overall waste stream significantly. The longer usable lifespan of the LED instruments and reductions in waste also promise, through the financial savings, to not only pay for themselves but provide a return on the purchase investment as well.

This project has two fundamental objectives. First, and most critical, is the realization of savings and/or reductions in electrical load (primary metric), as well as overall inventory of equipment required, labor hours, consumables (lamps, color media) and the heat generated by the lighting instruments. The second purpose is directed at the Learning leg: the introduction of "green" concerns as a component of the Performing Arts curricula. Students will necessarily engage with issues of environmental concern, fostering an awareness of the environmental impacts of such facilities as theatres or performing arts centers, future theatre professionals will understand their responsibilities as stewards of finite resources. They will also gain opportunities for practical experiences with the new technology, and so be better prepared to enter the professional arena.

The method for assessment of the expected energy and cost savings are also, in the main, already established. In Spring 2017, the theater staff, working with members of the Sustainability Program, participated in an initiative to install "loggers" which were then used to obtain sample measurements of the electrical loads drawn by the PAC stage in different configurations. Thus this existing instrumentation is already set up, this facilitating the gathering of clear and objective evidence of the extent of energy savings realized from this project. The direct involvement of the students, which is expected to continue through the implementation of this project, will contribute to Stockton's educational mission as well.

The PAC is a university wide resource with the following Mission Statement:

The Stockton Performing Arts Center of Stockton University seeks to provide audiences from across the region with the opportunity to experience a wide variety of cultural programming by professional touring companies of regional, national and international stature. By showcasing companies of artists whose established or emerging reputation within the areas of music, dance and theatre reflects the highest artistic standards, the Center is able to occupy a unique position among multidisciplinary organizations serving not only the southern New Jersey Shore

Region but also the multi-state area of New Jersey, Pennsylvania, New York and Delaware. The Center is committed to contributing to Stockton University's educational mission and to engaging students in the performing arts and other disciplines through its quality and diverse programming.

Thus this project will not only have university wide impact, as required for this funding, it will in some sense have regional impacts as well. In summary, this project will enable the PAC to continue to pursue its wide ranging mission and programming, with lessened environmental impact, at a lower cost, and in fact with enhanced artistic and technical capabilities due to the versatility of the new generation LED instruments.

Assessment Plan

This project will involve replacement of the existing incandescent "General Illumination" lighting instruments in the PAC inventory with LED-based instruments. Specifically, the instruments to be replaced will include the sixty-three cyclorama lighting instruments (Cycs) and forty-eight PAR instruments currently used.

This project will assess three areas: (1) energy savings, (2) cost savings, and (3) student involvement and learning.

Energy Savings: The loggers installed to establish the base-line electrical-load data will remain in place, and data will continue to be harvested. The electrical loads drawn by these instruments will be monitored over the course of the project, which will enable us to provide clear and objective evidence of the direct energy savings resulting from the use of the more energy efficient LED lights.

Cost Savings: Beyond the energy savings, the LED instruments have much longer bulb lives, and no longer need color media other similar consumables. They will require less labor to use and maintain. An analysis of these related expenses will be performed at the end of the project by comparison the post-LED expenditures with the expenditures the previous (pre-LED) fiscal years, thus again providing clear and objective evidence of the direct cost savings of this project.

Student involvement: Data on student involvement will be collected as part of this project, such as numbers of students involved, time estimates of their involvement, related reports or other assignments produced by the students, and self-assessment via student questionnaires.

Additional Details

This project requires a one-time, up front initial investment. Without even factoring in the energy savings, the longer usable lifespan of the LED instruments and reductions in waste promise sufficient financial savings to not only pay for themselves but provide a return on the purchase investment as well.

The purpose and scope of this project has been discussed with Dean Honaker (ARHU), who is supportive. It was Dean Honaker who generously helped to underwrite the acquisition of the loggers already employed to measure electrical loads in the PAC theatrical stage lighting.