

City of Nenana Outdoor Lighting Retrofit and Control System Project

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Project Partners: City of Nenana, Arctic Resource Group, LLC, Arctic Contracting, LLC, & Total Electric Supply Company.

Total Project Cost: \$ 157,106.00

Grant Funds Requested: \$ 126,906.00

Match Committed: \$ 30,200.00

The City of Nenana has no previous projects or grants from the Renewable Energy Fund or Denali Commission Emerging Energy Technology Grant Program.

The City of Nenana submitted an abstract to the Emerging Energy Technology Fund last year in response to RFA issued January 7, 2011. The previous project title was – City of Nenana Outdoor Lighting Retrofit and Control System.

City of Nenana Outdoor Lighting Retrofit and Control System

1. Project Summary

Project Description:

The City of Nenana is interested in replacing all of the existing energy inefficient HID luminaires (36 fixtures), to include High Pressure Sodium (HPS) and Mercury Vapor, on the roadways and streets in Nenana with energy efficient solid state LED roadway lighting. The project will not only improve the overall quality of the lighted environment of the city, but will also significantly reduce the city's current energy costs.

a. Project Eligibility:

LED luminaires and control systems that dim luminaires have been tested in Anchorage, AK and the technology is ready for implementation. The LED lighting system installed by the Municipality of Anchorage performed well on objective visibility detection distance testing compared to the standard HPS luminaires. In this testing, an LED system dimmed to 50% light output outperformed the standard HPS system with greater detection distances of objects.

Cost savings are expected to be greater than 70%; 50% through direct luminaire replacements and an additional 20-30% using the dimming control system. In addition, the durability and long life of the LED lighting system will significantly reduce maintenance costs. By our assessment, the Technology Readiness Level (TRL) is a seven (7).

b. Project Innovation:

This project will advance existing efforts in the state of Alaska and the broader US to transition from HID lighting sources to appropriate LED technologies. It will also install one of the most advanced roadway control systems available, demonstrating outdoor lighting control's efficiency potential and control strategies.

LED roadway lighting provides more effective lighting to the roadway compared to HID sources, thus requiring less energy to light a comparable roadway. They are particularly suited to Northern climates because LED performance and lifespan improve with colder weather. LEDs also have a longer useful life than HID light sources resulting in substantial maintenance savings. As solid state devices they are more robust and less subject to environmental damage. LED luminaries also offer more controlled light distribution than traditional outdoor luminaires.

Other quality issues will include decreasing sky glow, light trespass and decreasing glare. Determining a color temperature that is acceptable to the citizens and the least environmentally damaging will also be a part of the project.

Cities in the US, including Anchorage and Fairbanks have enjoyed energy savings, lower operating costs, and higher quality illumination using outdoor LED lighting.

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c. Priority:

Nenana is an ideal setting for this project because: it is a manageable size, it is located on the road system, it is located in a cold climate, and the cost of electricity is relatively high in the area. It is also accessible for other communities to observe the final results. This model could be duplicated for use in other villages in Alaska, as well as other communities around the country.

The City of Nenana is providing a substantial amount of in-kind equipment and man power for this project.

2. Technology Validation and Research Methodology

a. Objectives:

The project will replace all the roadway lighting in Nenana to achieve substantial energy efficiency savings and commission the first permanent controlled outdoor LED lighting system in Alaska. It would also be the first city in the US that has a completely controlled outdoor LED lighting system. The control system would verify the efficiencies of outdoor lighting controls, and test various dimming strategies e.g. curfew dimming, to better determine the best method for lighting controls in an Alaskan environment.

b. Methodology:

Real time energy use can also be recorded with the control system to show actual energy savings over a period of time compared to the base case. This will help future projects refine energy savings objectives. Subjective evaluations from the City's citizens will also provide feedback on color, glare, and general acceptance.

The city of Nenana owns, operates and maintains all luminaires that will be part of this project on the roadways and streets of Nenana. Nenana is located on the Alaska Highway system and all the needed project equipment and labor are available and ready.

3. Summary of Project Schedule and Summary of Project Budget

Project Schedule:

- 09/17/2012 – Issue Project RFP
- 09/27/2012 – Award Contract
- 09/28/2012 – Order Materials and Control Systems
- 11/20/2012 – Begin Installation
- 12/01/2012 – Project Complete
- 1/01/2013 – Begin Data Collection Specific to Project

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Project Budget

Grant Admin	Design, Procurement, and Commissioning Support	*Project Match by City of Nenana	Installation & Project Mgmt	Total Project Cost
\$25,000.00	\$80,306.00	\$30,200.00	\$21,600.00	\$157,106.00

**Project Match - City of Nenana In-Kind*

Equipment (Bucket Truck) = \$10,800.00

Man Power (2 men) = \$14,400.00

Administrative - \$5,000.00

Total Project Match = \$30,200.00

Grant Funds Requested = \$126,906.00

4. Project Team Qualifications

Arctic Resource Group, LLC a Fairbanks based company has pulled together a strong team to submit a successful application for Nenana. This project team pairs Arctic Resource Group, LLC, a successful interior Alaskan grants management and financial services company, Arctic Contracting, LLC a successful contracting group that among other projects built the road for the drilling program in Nenana, along with Total Electric Supply Company (TESCO). TESCO has been doing business in Fairbanks since 1965. They have continually and successfully provided the products for lighting retrofit projects on time and to the customers' satisfaction during their 47 years of business. They specialize in Energy Audits for lighting retrofit applications, design/build retrofit lighting projects, and new lighting design projects. They have successfully completed projects in Interior Alaska utilizing LED technologies that work in the Interior's extreme climate. Total Electric Supply Company specializes in providing innovative solutions to lighting problems in Alaska, they have recently completed the North Pole High School retrofit lighting project and the Delta LDS Church outdoor LED lighting project among others.

5. Discussion of Commercialization of Funded Technology

The project will show savings due to LED luminaire replacements, but also qualify and prove out the effectiveness of outdoor lighting controls for Alaskan villages and the US in general. The market size for outdoor lighting control systems would include all outdoor lighting, wall packs, flood lights, area lighting, and roadway lighting in the United States, including Alaska.

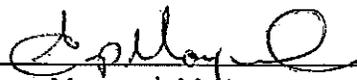
Alaska has one of the highest rural energy costs in the country; this project will allow residents a higher quality of lighting at a lower cost, giving small communities a better chance at sustaining their infrastructure. The higher quality of light also allows better safety and security in the community.

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Villages, cities, utilities and military installations all use outdoor roadway lighting systems in Alaska. The findings from the Nenana project will help guide other cities and communities in their use of outdoor lighting demand response (smart grid) lighting controls.

6. Signed Applicant Certification

By signature on this application, I certify that we are complying and will comply with the amount of matching funds being offered.



Jason Mayrand, Mayor
City of Nenana

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Date