

# Wood Innovations Project Application – Part 1: Cooperator Contact Information (FY2015)

**Check one:**  
**Category 1:**  
 SWET \_\_\_\_\_  
 Wood Energy  X   
 Wood Markets \_\_\_\_\_  
**Category 2:** \_\_\_\_\_

|                    |                        |                      |                          |
|--------------------|------------------------|----------------------|--------------------------|
| APPLICANT LOCATION | State: <b>Nebraska</b> | City: <b>Lincoln</b> | County: <b>Lancaster</b> |
|--------------------|------------------------|----------------------|--------------------------|

## COOPERATIVE AGREEMENT AND PROJECT INFORMATION

**Cooperative Agreement Applicant** — *Name of person officially responsible for cooperative agreement and funding requirements*

|                           |                            |                          |
|---------------------------|----------------------------|--------------------------|
| Name: <b>Jeanne Wicks</b> | Phone: <b>402 472-3171</b> | Fax: <b>402 472-9323</b> |
|---------------------------|----------------------------|--------------------------|

Title: **Director, Office of Sponsored Programs**

|                              |  |                  |                        |
|------------------------------|--|------------------|------------------------|
| <b>Organization/Company:</b> | The Board of Regent, University of Nebraska for University of Nebraska-Lincoln |                  |                        |
| <b>Bureau/Division:</b>      | Office of Sponsored Programs   |                  |                        |
| <b>Section/Program:</b>      |  |                  |                        |
| <b>Street Address:</b>       | 2200 Vine Street   |                  |                        |
|                              | 151 Whittier Research Center   |                  |                        |
| <b>City:</b>                 | Lincoln  | <b>State:</b> NE | <b>Zip:</b> 68583-0861 |
| <b>E-mail Address:</b>       | unlosp@unl.edu   | <b>Web Site:</b> |                        |

**Key Project Contact** — *Responsible for management/coordination of the project; if named above, check here →*

|                           |                            |                          |
|---------------------------|----------------------------|--------------------------|
| Name: <b>Scott Josiah</b> | Phone: <b>402 472-1467</b> | Fax: <b>402 472-2964</b> |
|---------------------------|----------------------------|--------------------------|

Title: **Director and State Forester**

|                              |                         |                  |                        |
|------------------------------|-------------------------|------------------|------------------------|
| <b>Organization/Company:</b> | Nebraska Forest Service |                  |                        |
| <b>Bureau/Division:</b>      | Woody Biomass           |                  |                        |
| <b>Section/Program:</b>      |                         |                  |                        |
| <b>Street Address:</b>       | 102 Forestry Hall       |                  |                        |
| <b>P.O. Box:</b>             |                         |                  |                        |
| <b>City:</b>                 | Lincoln                 | <b>State:</b> NE | <b>Zip:</b> 68583-0815 |
| <b>E-mail Address:</b>       | sjosiah2@unl.edu        | <b>Web Site:</b> |                        |

## COOPERATIVE FUNDING AND PROJECT COST

|   |   |
|---|---|
| <b>Cooperator Funding:</b> \$ 96,071                                | <b>Requested U.S. Forest Service Funding:</b> \$ 77,400 |
| Funding Ratio (Cooperator: U.S. Forest Service): ( <b>55 : 45</b> ) | Total Cost: \$ 173,471                                  |

**A. Project Title: Chadron District Energy Project**

**B. Length of Project: 1 year**

**C. Costs**

|                                  | Forest Service<br>Funds Requested                        | Cooperator Match<br>(Match Type) |
|----------------------------------|--|----------------------------------|
| <b>Personnel</b>                 | -  | \$3,125 (Cash)                   |
| <b>Benefits</b>                  | -  | \$1,132 (Cash)                   |
| <b>Travel</b>                    | -  | \$1,500 (Cash)                   |
| <b>Contractual</b>               | \$77,400   | \$41,678 (Cash)                  |
| <b>Direct Charges</b>            | \$77,400   | \$47,435 (Cash)                  |
| <b>Indirect Charges</b>          | -  | \$48,636 (In-kind)               |
| <b>Total</b>                     | \$77,400   | \$96,071                         |
| <b>Year 1 Total Project Cost</b> | <b>\$173,472 (USFS : Cooperator Match Ratio = 45:55)</b> |                                  |

**D. Abstract:** The Chadron District Energy Project partnership is seeking funding for contracted services to complete project engineering feasibility, cost analyses, and regulatory evaluation related to developing a woody biomass district energy system. The district energy system will involve expanding the existing woody biomass boiler system on the campus of Chadron State College (CSC) to 3 nearby Chadron Public School (CPS) buildings, the City of Chadron's (CoC) planned community pool complex, and Chadron Community Hospital (CCH). The project-funded engineering study will evaluate the partner facilities as a single energy user, provide an economic analysis, system design including steam infrastructure routing, suggested in-facility technology upgrades, required CSC boiler upgrades necessary to meet the increased district energy demand, and estimate overall project conversion costs. These facilities have completed individual initial feasibility studies outlining the feasibility and benefits related to upgrading their facilities to wood energy. This newly commissioned study will combine these individual, economically-viable options into Nebraska's first district energy system. The development of the Chadron District Energy System would dramatically increase the market demand for woody fuel derived from fuels reduction and forest management activities in Nebraska's fire-threatened Pine Ridge forested region, specifically the Nebraska National Forest's Pine Ridge Landscape Restoration project.

## **E. Project Narrative (4 pages)**

### ***Current State of Nebraska's Pine Ridge Forests***

While wildfire in Nebraska's Pine Ridge region has been a major topic of concern since the 2000s, the record-setting 2012 fire season will likely be known as the season during which wildfire changed the culture of Pine Ridge forestry going forward. Burning approximately 170,000 acres of forest and grassland from June to September, the 2012 Cottonwood, Wellnitz, West Ash Creek, and Douthit fires led to dramatic shifts in the ideology of managing the densifying forests and mitigating the associated wildfire threats. The 2012 fires not only opened the eyes of state and federal forestry staff to the increasing intensity and size of Pine Ridge wildfires, it also drove home the fact that areas which had burned only 6 years prior to 2012, were burning again. Increasing wildfire frequency, especially areas burning repeatedly over such a short period of time, left several areas of the Pine Ridge devoid of a seed bank necessary to re-generate the forests after these fire events. The Nebraska National Forest (NNF) was not spared during the 2006 and 2012 wildfire seasons. The 2006 Spotted Tail and 2012 West Ash Creek fires both included parts of the NNF, burning approximately 15,000 acres and 18,000 acres of NNF land, respectively.

These factors have led to increased efforts on private, state, and US Forest Service (USFS) forestland to reduce forest fuel loads through thinning of unburned forests, thinning previously burned forests, and removing excess vegetation surrounding remaining "islands" of green trees within wildfire footprints. These management activities, while very important in mitigating fire threats to the forest, are often very expensive; costing as much as \$1,250 per acre to thin the forest and pile the low-value forest residue.

Up until the early 2000s, the Pine Ridge was home to a significant logging and timber industry which supported several sawmills in the region. The industry facilitated the management of the region's forests for the production of lumber, posts and poles, and railroad ties. It also created an incredible infrastructure of logging roads, often used as firebreaks and access roads for wildfire suppression efforts. After the timber industry left the Pine Ridge in the early 2000s, the region was left with rapidly regenerating, low-quality forests and logging road infrastructure in need of maintenance.

New markets for low-value forest residue generated from fuels reduction activities must be developed. The development of these markets will lower the cost of forest management, provide economic development opportunities for communities and businesses, and provide financial benefits to facilities utilizing wood chip fuel to accommodate their energy needs.

### ***Current Forest Management Activities***

As a result of the 2012 wildfire season, state investments in wildfire management and suppression, wildfire training, fuels reduction, and forest thinning were dramatically increased in an effort to minimize the landscape-level effects of wildfire, in the form of the Wildfire Control Act of 2013. New financial assistance programs have been made available to state and private forest landowners for thinning of unburned and previously burned forests, replanting or reseeding burned areas, and removing burned vegetation around pockets of green forest.

In October 2014, the NNF completed the required Environmental Assessment (EA) for their Pine Ridge Landscape Restoration (PRLR) project, completing efforts to satisfy National Environmental Policy Act (NEPA) requirements (**Appendix A**). This work allows the NNF to begin landscape-scale forest thinning and fuels management. This project is aimed at improving undesirable conditions created by the 2006 Spotted Tail Fire and the 2012 West Ash Creek Fire and reducing the threat of stand-replacing wildfires in adjacent areas not impacted by fire events.

Conditions of high concern include fire hazards in the form of live and dead woody fuels adjacent to private land, communities, public infrastructure and public roads. Other important conditions to be addressed include overly dense forest stands in which the intensity of potential fire behavior can be reduced, and the broad-scale desired conditions of the land and resource management plan can be pursued, through thinning or related silvicultural treatments.

While these activities are routinely credited with reducing the impacts of wildfire on treated lands, they also generate an abundance of low-value waste wood.

### ***Current Available Wood Energy Markets***

Another outcome from the 2012 wildfire season was the first-ever establishment of state funding dedicated to development of markets for forest products. These funds were established in an effort to create market drivers for increasing the management of the state's forests. Out of these new state investments in market development, came the TREES Heat Nebraska program (**Appendix B**). This program was established to provide technical and financial assistance to groups interested in wood energy system development. This program provides cost-share funding for initial wood energy feasibility studies as well as cost-share for the construction and installation of wood energy systems.

Chadron has been Nebraska's woody biomass innovation icon since the conversion of Chadron State College (CSC) to wood energy heating in 1991. A progressive collaboration of college administrators, foresters, wood products stakeholders, and a key state senator foresaw the social, economic, and environmental benefits to be realized through the early adoption of wood energy at CSC. Again taking a lead role in wood-based renewable energy advocacy, the campus added a wood-fired absorption chiller system in 2002. This expansion of the woody biomass system not only further removed the college from fossil fuel reliance, but increased the positive environmental impacts of the system on the surrounding forests by creating a larger, year-round demand for woodchips. Today, this college campus of 3,000 students heats and cools over one million square feet with approximately 9,000 tons of ponderosa pine woodchips produced from the Pine Ridge, providing an annual economic infusion of \$500,000 into Chadron's local economy.

### ***Pre-proposal Wood Energy Investigations***

Over the past several years, there have been many individual efforts to expand wood energy markets in the Pine Ridge. Stakeholders including CSC, Chadron Public Schools (CPS), the City of Chadron (CoC), and Chadron Community Hospital (CCH) have completed efforts to expand the region's wood energy market.

- **CSC** – “**Biomass Fuel Evaluation.**” (2011, Appendix C.) *Purpose:* Evaluate the option of increasing boiler size to meet energy demand, as not all on-campus buildings are able to be connected to the current wood energy system. *Conclusion:* Replacing the smaller 6,000 lb/hr boiler with a 12,000 lb/hr boiler would increase peak capacity, offset 50,000 additional therms of natural gas (increasing wood demand by 20%), and produce a viable payback period. “**Woodchip Boiler 2 Analysis.**” (2013, Appendix D.) *Purpose:* Evaluate replacing versus repairing the 6,000 lb/hr boiler after it had a failure resulting in a bulge in the pressure vessel. *Conclusion:* Due to lower upfront costs, the boiler was temporarily repaired at this time.
- **CPS** – “**Feasibility Study of Alternative Energy Sources for CPS.**” (2005, Appendix E.) *Purpose:* Determine most economical, long-term method to heat the schools. *Conclusion:* Extending the CSC system to include the schools was the most economically viable woody biomass option.
- **CCH** – “**Engineering Feasibility Study of a Biomass Heating Plant for CCH.**” (2005, Appendix F.) *Purpose:* Evaluate the possibility of implementing a wood energy system, similar

to CSC. **Conclusion:** The addition of a modular wood fired boiler to the proposed dual fuel fire tube boilers would be the most economically viable heating option.

- **CoC** – In 2013, in order for CSC to meet educational accreditation requirements, the CoC decided to enclose an existing open-air pool complex. During 2015, CoC will be working with Burbach Aquatics, LLC to design a community pool and meeting complex; currently designed at 166' x 157' exterior wall dimensions constructed with insulated tension membrane construction. In 2014, Chadron voted to increase sales tax by \$0.005 to fund the pool enclosure project.

### **Proposed Project**

In 2015, CSC and associated community stakeholders are once again leading by example for wood energy innovation in Nebraska, initiating the “Chadron District Energy Project” to combine these individual efforts into Nebraska’s first district energy system. With an RFP (**Appendix G**), the partnership acquired bids from nationally-recognized wood energy project analyst firms (**Appendix I**) for the completion of a district energy feasibility, design, cost, and analysis. The bid from Tetra Tech, Inc. (Tt) was selected as the best of 3 options, based on outcomes and bid scope (**Appendix H**).

#### ***Phase A – Needs Assessment***

Tt proposes to assess the needs of the community infrastructure. Using this data, Tt will create a summary of the facilities and their condition, fuel, efficiency, capacities and future loads. Tt will develop an analysis showing the facilities required to meet future loads. This will include estimated repair/replacement needs of current equipment and expected dates for the repair/replacement. Tt will indicate the required facilities for fossil fuel use as well as biomass uses. The list will include a comparison of equipment for the district heating/cooling option versus biomass systems at each facility. The list will be used to determine capital and operating costs for the various alternatives.

#### ***Phase B – Cost Assessment and Economic Analysis***

Tt will develop capital and operating cost for the alternative configurations developed during the Facilities phase of the study. A baseline of maintaining status quo will be the baseline for comparison of alternatives. The status quo option will include the needed repairs/replacements as determined during the Needs Assessment portion of the study. This option will then be expanded to include capital and operational cost for the system “as-is” plus any needs to meet future expansion plans.

The same level of detail will be developed for utilizing biomass fuels at the college, the schools, the pool and the hospital. Once the capital and operating costs are developed for the individual systems, a similar level of detail will be developed for the district energy option. The district energy option will develop a base selling price for steam and chilled water that will provide a break even cost of operation. A sensitivity analysis will then be developed on the selling prices to evaluate the overall economic impact on the college of becoming a district energy utilizing a rate of return on investment approach to the cost of developing the district energy system. The analysis will show the relative savings to proposed users of the district energy facility under each pricing option. These costs will be placed in a matrix showing the relative lifecycle cost (capital, fuel and operating) for the alternatives and shown in a comparative matrix.

Once the lifecycle cost profiles are developed it will be possible to look at variations on the alternatives by adding or removing facilities.

### ***Phase C – Regulatory Analysis and Project Report***

It will develop a matrix of the required regulatory issues with the proposed alternatives including a review of whether the district energy facility would be a regulated utility under Nebraska Utility Commission regulations, air permitting requirements, local zoning issues, required acquisition of rights-of way and adequacy and transportation of fuel supplies.

It will compile the information gathered and produce recommendations as to the best development pathway for the bioenergy project.

### ***Magnitude of the Impact in Markets Generating Renewable Energy***

The development of a district energy system in Chadron would drastically increase regional demand for wood fuel. This project has the potential to increase market demand from 9,000 tons to between 15,000 and 20,000 tons. This increase in demand would not only increase the use of low-quality wood, but it would decrease energy costs for the individual facilities and organizations, increase the income for wood fuel processing businesses, and facilitate economic development.

This project would also serve as a demonstration of non-traditional partnership development for other forested areas across the state with similar organizations and forest resources. The Niobrara Valley and Missouri River Corridor have sizeable forested regions as well as large facilities. This project would showcase the importance of forest fuels management, benefits of woody biomass energy, and opportunities for partnerships between local, city, state, and federal entities.

### ***Benefits to National Forest System Lands/Source of Biomass Removed***

The PRLR project identified 11,110 acres in need of hazardous fuels reduction and/or forest management thinning treatments under the current project action plan. Across the Pine Ridge, an average acre undergoing fuels reduction thinning practices generates approximately 15 tons of residue. Thus, we estimate that over the course of the PRLR project, the NNF will generate over 160,000 tons of biomass. At a USFS-estimated cost of \$40-60/acre to burn the piles of material, the NNF would be forced to spend an additional \$450,000 to \$670,000 to manage the piles. The expansion and construction of the wood energy systems identified in this proposal would increase the market demand for wood chip fuel and reduce these enormous management costs.

As a result of the work done by NNF staff in 2014 to complete necessary planning and activities in order to comply with NEPA and the proximity of NNF to the proposed wood energy systems, NNF would become the prime option to provide fuel to this district energy system.

### ***Job Creation and Retention***

The current woody biomass energy system at CSC has been fueled by woodchips provided by a single chipping contractor since the early 1990s. Currently employing 2-3 employees, this contractor has been working only intermittently throughout the year to provide woodchips to the college as there is not enough demand to support a year-round, full-time chipping effort for wood energy. The expansion of the Chadron's wood energy markets as a result of this project, would not only provide an increased woodchip market to ensure strong job retention into the future, but also require additional in-woods jobs to provide wood fuel to this market.

### ***Methods and Reasoning for Selecting Focus Areas***

The Pine Ridge is one of Nebraska's most iconic forested regions. It also produces the largest amount of forest residue in the state. The Pine Ridge was selected as an opportunity to expand existing, insufficient wood markets, utilize a large resource of wood residue from a diverse group of landowners (private, state, and federal), benefit from an existing local understanding of wood energy, increase business opportunities for existing wood chip processing firms, and catalyze the interest in wood energy at Nebraska's largest woody biomass facility.

## **F. Program of Work (3 pages)**

### **Statement of Need, Goals, and Objectives**

Increasing pressure on Pine Ridge forests from wildfire and forest health threats have led to an unprecedented amount of work being done to reduce forest fire fuels and thin forests on private, state, and National forests. While these activities will continue to dramatically improve forest conditions and reduce the threats of future stand-replacing, catastrophic wildfires, they are also generating an abundant resource of low-value waste wood, estimated at 35,000 to 40,000 tons of biomass each year. Current wood energy markets can absorb approximately 9,000 tons of Pine Ridge wood residue, annually. This project has the potential to facilitate the expansion of the wood energy market to almost double the existing demand for wood chip fuel in the region.

**Goal 1:** Evaluate capacity of CSC woody biomass system to support expansion.

*Objective 1:* Quantify additional on-campus and off-campus energy needs.

*Objective 2:* Identify current system limitations to meet on-campus energy needs.

*Objective 3:* Review the ability of existing on-campus steam line infrastructure to achieve project-related steam distribution goals.

*Objective 4:* Develop a boiler recommendation which meets the project-related energy needs.

**Goal 2:** Determine individual facility upgrade and construction needs for wood energy adoption.

*Objective 1:* Recommend necessary technology for each facility to utilize district energy steam for energy needs.

*Objective 2:* Evaluate on-site steam line options for supplying facilities with steam.

*Objective 3:* Develop cost estimates for required facility and energy system upgrades.

**Goal 3:** Establish a conversion plan for the district energy system.

*Objective 1:* Utilizing information currently available and information uncovered during the contracted study, develop a final project design to achieve the project heating needs.

*Objective 2:* Develop an estimated total cost estimate which can be used to leverage final project conversion financial assistance.

*Objective 3:* Outline methodology for CSC to bill customers for steam generation.

### **Project Methods**

Once funding has been allocated to this project, the Notice to Proceed will be completed in late April/early May, initiating the beginning of the project. At that time, a project kickoff meeting will occur with all stakeholder and Tt. At this time Tt will begin working with project partners to achieve the deliverables set forth in their scope of work. After an estimated 4 months of work, the stakeholder will reconvene to review results and proceed with recommended next steps.

### **Project Communication and Outreach**

The results from this project will generate opportunities beyond just those identified in this proposal. The information regarding full district energy feasibility, facility-related upgrade and construction considerations, partnership dynamics, and total project cost will be disseminated throughout the extensive outreach networks of the NFS. Social and traditional media outlets will be utilized to outline the efforts put forth by this partnership to develop markets for low-value waste wood. Regional outreach workshops to share information about this energy project and others conducted by NFS (including greenhouse-scale woody biomass, coal/wood co-firing, and municipal building biomass options), will be conducted with stakeholder groups across Nebraska, providing learning opportunities for facilities to realize their potential wood energy options.

## **Project Monitoring Plan**

Project monitoring and communication will be vital to this project. Tt firmly believes that good communication between the consultant and client is the basis for any successful project, and as such, has developed a robust communication plan. To eliminate confusion and cross talk, Tt's project management team will coordinate with Chadron stakeholders primarily via a single Tt point of contact.

Project management of the project will include a project kickoff meeting with Chadron stakeholders to confirm the project scope of work, methods, budget and timeline of deliverables. Following the project kickoff meeting the Tt team will provide monthly updates to Chadron stakeholders, and will be available for progress meetings upon request.

## **Relevant Aspects of the Project**

### ***Feasibility and Planning Studies***

This proposal is the result of significant individual efforts made by the partners to pursue wood energy options. Following the lead of CSC, these groups took it upon themselves to complete feasibility studies and planning efforts to incorporate woody biomass into their energy portfolio. The feasibility studies completed for CPS and CCH determined that while wood energy would yield significant savings if adopted, pursuing these opportunities alone would reduce project feasibility and economic benefits. It was suggested that grant assistance and partnerships be developed to achieve their wood utilization goals. This project would continue to lead this project group down the path towards wood energy.

### ***Forest Management Situation***

Since 2001, the NFS has leveraged \$5.5 million dollars of federal funding for fuels reduction cost-share. Beginning in 2007, the state of Nebraska begin providing additional state funding to cost-share for fire fuels management. With the recent passage of the Wildfire Control Act of 2013, the state of Nebraska again increased the amount of available funding for fuels reduction work in the state's fire-threatened forests. NFS utilized a portion of these funds to leverage an additional \$500,000 of state funds from the Nebraska Environmental Trust to complete thinning operations in and around previously burned areas. These funds provide the financial assistance to landowners to manage approximately 3,000 acres of forest each year. As a result, the NFS facilitates the removal of approximately 45,000 tons of woody biomass each year from Nebraska's threatened forests.

With the completion of NEPA requirements in 2014, the NNF has initiated the PRLR project. This project identified 11,110 acres of forest in need of thinning and fuels reduction. The implementation of the PRLR project will generate additional woody biomass on top of an already abundant resource of currently under-utilized wood material.

Given the current market in the Pine Ridge for woody material, the majority of the woody biomass generated from management will go un-utilized and destroyed in prescribed fire operations. The expansion of the Chadron wood energy market will remove these resources from the forest, generate positive economic benefits as wood energy fuel, and reduce forest management costs for private, state, and federal landowners through the reduction of prescribed fire activities.

### ***Partner Participation***

The partnership developed for this project represents years of work gathering information, leadership changes, shifting ideologies, and collaboration to get to this proposal. The timely combination of NNF preparedness to begin the PRLR project, increasing funding for fuels reduction on state and private forestland, CSC's need to determine long-term wood energy options



as a result of the need to replace an existing boiler, aging energy systems at the CPS facilities, CoC’s need to enclose and expand the pool and community center facility, and the desire of CCH to initiate their plan to adopt wood energy has strengthened this partnership and district energy concept to an unprecedented level. These partners have evaluated their individual energy needs, but currently do not have the information necessary to expand CSC’s energy system to a district energy strategy. This Request-For-Proposals, subsequent proposal, and the current conditions of the partner facilities and Pine Ridge forests have this project positioned as the Pine Ridge’s best opportunity to expand long-term wood energy markets.

**Impacts on Wood Energy Markets**

***Local Impacts (Short-term)***

Nebraska’s forest resources are best described as regional forests with distinct characteristics, history, geography, culture, challenges, and opportunities. The Pine Ridge is one of the few forested regions in the state with a history and culture of forest products utilization and markets, along with the Niobrara River Valley and the Missouri River Corridor. This project will facilitate increased local wood utilization through the expansion of the existing wood energy markets to include 5 new facilities, potentially doubling the demand for wood energy fuel within the region.

***Statewide Impacts (Long-term)***

While Nebraska’s forest resources are described as being very distinct in regards to forest characteristics, culture, and opportunities, the communities, citizens, and businesses in these regions are all faced with similar challenges and needs. Regions such as the Niobrara River Valley, Loess Canyons, Central Loess Hills, and the Missouri River Corridor are home to communities, citizens, and businesses in need of economic development, forest products market development, business development, and utility cost savings. This project will demonstrate further wood energy market innovation with regards to technology, collaboration, and partnership to communities across the state with similar project potential. The completion of this project, and subsequent system development, will act as a model for communities with similar components including schools, municipal buildings, and healthcare facilities.

**Project Timeline**

|                        |   |
|------------------------|---|
| April/May, 2015        | The partnership will initiate the Notice to Proceed with Tetra Tech, Inc. This will signify the beginning of project work. During this period, a kickoff meeting will occur in Chadron, bringing together project stakeholders and Tt to confirm the project scope. |
| May-August, 2015       | In their project bid, Tt allocated 4 months for the completion of this project. During these months, Tt will collaborate with stakeholders to achieve the deliverables set forth in Tt’s 3 Phase strategy.  |
| August/September, 2015 | After the completion of the project deliverables, the stakeholders will reconvene in Chadron to meet with Tt and review project outcomes and establish next steps.  |

**G. Qualifications of Staff, Organization, and Partners (1.5 pages)**

| <b>Name (Organization)</b>  | <b>Qualifications</b>  |
|---|--|
| <p>Dr. Scott Josiah<br/>Director, State Forester (NFS)</p>          | <p>10 years as Director and State Forester with NFS; position includes oversight of all federally and state-funded programs as well as strategic planning, budget oversight, and partnership development. Collaborated to fund and complete feasibility studies at the University of Nebraska – Lincoln (East Campus), Peru State College, and the Nebraska College of Technical Agriculture (NCTA converted to wood in 2012).</p>               |
| <p>Adam Smith<br/>Forest Products Utilization Team Leader (NFS)</p> | <p>6 years of experience with NFS; position responsibilities include woody biomass utilization project development, wood energy feasibility, wood fuel supply chain development, financial and technical assistance, program management and partnership development.</p>   |
| <p>Dale Grant<br/>Vice President (CSC)</p>                          | <p>16.5 years of experience with CSC; first 8 years as Comptroller and the last 8.5 years as Vice President for Administration and Finance. Current position involves supervision of the Boiler Plant.</p>   |
| <p>Dr. Caroline Winchester<br/>Superintendent (CPS)</p>             | <p>5 years of experience as Superintendent; serve as CEO of the district which includes oversight of the budget and facilities, on-campus utility management and planning and oversaw the feasibility studies of the 3 CPS buildings included in this proposal.</p>  |
| <p>James O'Rourke<br/>Board of Education Member (CPS)</p>           | <p>Newly-elected member; Official responsibilities include decision making as part of the Chadron Public Schools Board of Education. Involved in the initiation of discussions between project entities in 2014. Professor Emeritus at Chadron State College having established the Range Management Program at CSC. Private land owner/rancher with property including thinned ponderosa pine forest adjacent to U.S. Forest Service lands.</p> |
| <p>Wayne Anderson<br/>City Manager (CoC)</p>                        | <p>2.5 years as CEO of the City of Chadron with direct oversight of the City budget and all facilities; provides input on direction for community development and is responsible for management and outcomes of all municipal projects.</p>  |
| <p>Harold Krueger<br/>Chief Executive Officer (CCH)</p>             | <p>30+ years of experience at Chief Executive level in Health Care Management. Position includes budget and facilities oversight and long-term planning.</p>   |
| <p>Tetra Tech, Inc</p>  | <p>Internationally renowned engineering firm; proposed project team has conducted more than 200 similar waste to energy projects.</p>  |

#### **H. Project Outcomes, Annual Progress Reports, and Final Reports (0.5 pages)**

- Completed feasibility and economic report from Tetra Tech, Inc.
- 2 education and outreach publications (“Case Study – Chadron District Energy Options” and “District Energy Potential in Nebraska”)
- Annual progress reports will be completed on a calendar basis, providing an overview of progress and accomplishments by goals and objectives included in the approved Cooperative Agreement narrative.
- A detailed final progress report is required and will include the following items:
  - Final Summary Report: A brief overview of accomplishments by goals and objectives included in the approved Cooperative Agreement narrative.
  - Final Accomplishment Report: Includes various assessments, reports, case studies, and related documents that resulted from the project’s activities.
  - Final reports will be added to the WERC Wood Innovations Web site.

#### *Post-proposal Strategy (Sustainability of Project Outcomes)*

Once the proposal-funded study has been completed, if the results are favorable, the partners in the proposal will then work together to pursue capital for system construction. Funding source options include... 1) TREES Heat Nebraska – grants offered by Nebraska Forest Service for the construction of wood energy systems, 2) Nebraska Task Force for Building Renewal – State funded task force which provides funds for state facility upgrades, 3) Nebraska Environmental Trust – Nebraska lottery-funded grant program which provides funding to projects that generate a positive benefits for the environment, 4) Legislative Initiative – The proposal partners could also work with the Nebraska state legislature to develop a special initiative to fund system construction based on positive environmental and economic impacts.

## I. Budget Summary and Justification (2 pages)

### ***Personnel***

Cooperator's Share – Over the timeline of the project, the Forest Products Utilization Team Leader of NFS (state-funded staff) will make 2 trips to Chadron, NE from Lincoln, NE; first trip to host Tt for the kickoff meeting and second trip will be to meet with the partners to review project findings. Each visit will require 3 days of staff time. This staff member would be involved with this project for approximately 5 hours each week for the 4 month duration of the project. Including travel time, this project will require approximately 138 hours of staff time.

- **Personnel Total: 138 hours \* \$22.64 per hour (Salary) = \$3,125 (Cash Match)**

### ***Fringe Benefits***

Cooperator's Share – Based on the information above, there will be 138 hours of staff time and benefits provided by NFS towards the completion of this project.

- **Fringe Benefits Total: 138 hours \* \$8.20 per hour (Benefits) = \$1,132 (Cash Match)**

### ***Travel***

Cooperator's Share – Round trip from Lincoln to Chadron is approximately 900 miles. The current NFS pool vehicle mileage rate of \$0.54 per mile.

- 900 miles round trip \* \$0.54 per mile \* 2 trips = \$970

Each trip will require a 2 night stay. The rate for a hotel room at the Best Western Inn and Suites is approximately \$80/night (hotel has a direct billing agreement with NFS).

- 4 nights in hotel \* \$80 per night = \$320

Based on the available meal options, on the first travel day to Chadron, staff would require \$35 for lunch and dinner. Once in Chadron, \$45 would be required for breakfast, lunch, and dinner. On the trip home from Chadron, staff would require \$25 for breakfast and lunch.

- \$105 for meals per trip \* 2 trips = \$210
- **Travel Total: \$970 + \$320 + \$210 = \$1,500 (Cash Match)**

### ***Contractual***

The "Request-for-Bids" generated 3 bids (**Appendix H**). It was determined that the bid provided by Tetra Tech, Inc. (Tt) best fit the needs and scope of the project. The quote received from Tt was \$119,078 (inclusive of travel, overhead costs, and other ODC's), with a four month completion timeline. Tt proposes to bill on a monthly percent complete basis by Phase, below.

|   |                  |
|---|------------------|
| <b>Phase A – Needs Assessment</b>                         | \$66,556         |
| <b>Phase B – Cost Assessment &amp; Economic Analysis</b>  | \$29,785         |
| <b>Phase C – Regulatory Analysis &amp; Project Report</b> | \$22,737         |
| <b>Total</b>  | <b>\$119,078</b> |

### ***Forest Service Share***

- \$77,400 (Direct Charges)

Cooperator's Share – The TREES Heat Nebraska program of the NFS provides funding for the completion of feasibility studies and cost-shares on the construction and development of wood energy systems. For this project, the NFS, via the TREES Heat Nebraska program is providing \$41,678 for the completion of the contractual services of the engineering firm.

- \$41,678 (Cash Match)
- **Contractual Total - \$119,078**

### ***Indirect Charges***

Forest Service Share - NFS, a department within the Institute of Agriculture and Natural Resources at the University of Nebraska – Lincoln (UNL) maintains an indirect cost rate with the

University of 39%. However, NFS has an agreement with UNL which allows NFS to utilize indirect costs originating from US Forest Service - State and Private Forestry funding, as “unrecovered indirect,” allowing those would be costs to be used as in-kind match. Thus, NFS is requesting no funding for indirect costs (ensuring all Forest Service investments will go directly towards achieving the deliverables of the project).

Cooperator’s Share – As a result of the unrecovered indirect agreement with UNL, NFS will provide the equivalent of 39% of the direct project costs as in-kind match.

- **Indirect Charges Total: \$124,835 (Direct Charges) \* .39 = \$48,636 (In-kind Match)**

**a. Budget Table**

| <i>Categories</i>               | <i>I<br/>Forest Service Share</i> | <i>II<br/>Cooperator’s Share</i> | <i>III<br/>Total</i> |
|---------------------------------|-----------------------------------|----------------------------------|----------------------|
| 1. Personnel                    |                                   | 3,125                            | 3,125                |
| 2. Fringe benefits              |                                   | 1,132                            | 1,132                |
| 3. Travel                       |                                   | 1,500                            | 1,500                |
| 4. Equipment                    |                                   |                                  |                      |
| 5. Supplies/Materials           |                                   |                                  |                      |
| 6. Contractual (identify below) | 77,400                            | 41,678                           | 119,078              |
| 7. Construction                 | Not Applicable                    |                                  |                      |
| 8. Other (identify below)       |                                   |                                  |                      |
| 9. Direct charges               | 77,400                            | 47,435                           | 124,835              |
| 10. Indirect charges            |                                   | 48,636                           | 48,636               |
| 11. Total                       | 77,400                            | 96,071                           | 173,471              |
| 12. Percentage of Total         | 45%                               | 55%                              | 100%                 |

**Explanation and details for Category 6 (Contractual):**

After the project is funded, the partnership will initiate the Notice to Proceed. This will begin the 4 month process by Tt to complete the scope of work provided in their bid. These efforts include 3 Phases; A- Needs Assessment, B – Cost Assessment and Economic Analysis, and C – Regulatory Analysis and Project Report. This process would begin with a kickoff meeting, followed by monthly updates, completion of scope of work, and final report presentation to stakeholders. The quote received from Tetra Tech, Inc. was \$119,078 (inclusive of travel, overhead costs, and other ODC’s). Tetra Tech, Inc. proposes to complete the scope within four calendar months from the Notice to Proceed date. Tetra Tech proposes to bill on a percent complete basis by Phase on a monthly basis.

**b. Cooperator Contributions Table (not including U.S. Forest Service contributions)**

|               | <i>Cooperator</i>       | <i>Cash</i> | <i>Materials</i> | <i>In-Kind Services</i> | <i>Total</i> |
|---------------|-------------------------|-------------|------------------|-------------------------|--------------|
|               | Nebraska Forest Service | 41,678      |                  | 54,393                  | 96,071       |
| <i>Totals</i> |                         | 41,678      |                  | 54,393                  | 96,071       |