Request for Applications

Sun Grant Program
Western Region

2021

Center Initiatives Program
(U.S. Department of Agriculture)

Full Application Deadline: January 4, 2021
Sun Grant Program – Western Region

2021 Request for Applications - - Executive Summary

U.S. Department of Agriculture (USDA funds)

The Sun Grant Program – Western Region (SGW) announces the availability of competitive funds and seeks proposals from OSU graduate students in the following areas:

1) Decentralized and distributed feedstocks and energy systems; efforts will support deployment of commercial scale biomass electrical generation and co-generation efforts and production of biofuels and bioproducts from multiple feedstocks that exploit the economic benefits of complementary aggregation;

2) Novel feedstocks for bioenergy, bioproducts, and biofuels from agricultural or forestry residues; and

3) Life cycle analysis and sustainability

The SGW has identified the above named regional priorities from within USDA strategic areas, based upon prior regional priority setting workshops and consultation with regional experts. SGW seeks proposals with an emphasis on these strategic regional program areas.

Indirect costs are limited by USDA to 30% of total federal funds awarded (TFFA or 42.857% applied to total direct costs) or an institution’s negotiated indirect costs rate if a lower overall request. All indirect costs will be retained by the SGW for administration of grants. Integration, economics, marketing, policy, education or a combination of these overarching activities may be incorporated in any proposal.

Single Institution Proposals: Individual graduate students supported by a faculty mentor, or small teams supported by a faculty mentor, that address the Sun Grant mission and regional priorities may submit proposals requesting up to $40,000 per year for one year but are subject to appropriation of funds. All projects will have a one year life span with the final report to be submitted one year from the date of project award.

The mission of the Sun Grant Program is to focus the abilities of the nation’s land grant institutions in partnership with the private sector and federal laboratories to enhance national energy security and independence through the development, distribution and implementation of bio-based energy technologies, to promote bio-based diversification and environmental sustainability of the region’s agriculture, and to promote opportunities for bio-based economic diversification in rural communities.
1. FUNDING OPPORTUNITY DESCRIPTION

THE SUN GRANT PROGRAM

As readily accessible domestic sources of petroleum have waned, the United States has steadily increased its reliance on oil imported from other nations. The proportion of imported oil increased from about 30% of domestic consumption in 1970 to about 56% in 2000 (Report of the National Energy Policy Development Group, 2001). This trend has raised concerns about the nation’s energy security. Much of our imported oil originates from nations unfriendly to the U.S. with unstable or repressive governments.

Authorized by Congress in 2004, the Sun Grant Program is a national network of land-grant universities partnering to build a biobased economy. Sun Grant institutions are charged with making significant advances in biobased industries for the benefit of America’s independent farmers, rural communities, and public at large.

The Sun Grant Program was conceived to partner the national network of land-grant universities and federal laboratories to aid in building a biobased economy that would reduce reliance on imported fossil fuels and enhance economic diversification in rural areas of the United States. Potential products include: biofuels such as ethanol and biodiesel, electrical power, lubricants, plastics, solvents, adhesives, pharmaceuticals, cosmetics, and building materials. The Program will broaden the role that land-grant universities play by also focusing the efforts of these universities on renewable energy and biobased industries. Developing biobased businesses, based on availability of feedstocks, will also enhance development of rural communities.

The mission of the Sun Grant Program is to (1) enhance national energy security through development, distribution and implementation of biobased energy technologies; (2) promote diversification in and the environmental sustainability of, agricultural production in the United States through biobased energy and products technologies; (3) promote economic diversification in rural areas of the United States through biobased energy and product technologies; and (4) enhance the efficiency of bioenergy and biomass research and development programs through improved coordination and collaboration between the Department of Agriculture, the Department of Energy, other US Departments, and the land-grant colleges and universities.

The Sun Grant Program is organized as a network of five land-grant universities serving as regional Sun Grant Centers: South Dakota State University (North-Central), Oregon State University (Western), Oklahoma State University (South-Central), the University of Tennessee – Knoxville (Southeastern), and Penn State University (Northeastern).

These centers will facilitate federally funded research, extension, and education programs in their respective regions. These programs will embrace the multi-institution, multi-state, multi-disciplinary integrated approach that is at the heart of the land-grant method of addressing problems.
In summary, the Sun Grant mission is reflected in the following four goals:

a. To enhance national energy security through the development, distribution, and implementation of biobased energy technologies;

b. To promote diversification in, and the environmental sustainability of, agricultural production in the United States through biobased energy and product technologies;

c. To promote economic diversification in rural areas of the United States through biobased energy and product technologies; and

d. To enhance the efficiency of bioenergy and biomass research and development programs through improved coordination and collaboration among

   i. federal and state agencies and laboratories
   ii. land-grant colleges and universities, and
   iii. the private sector

SUN GRANT PROGRAM - WESTERN REGION

The Sun Grant Program Western Region Center (SGW), located at Oregon State University in Corvallis, Oregon, carries out administrative functions for the region composed of the States of Alaska, Arizona, California, Hawaii, Idaho, Nevada, Oregon, Utah, and Washington; and the territories of Guam and American Samoa; as well as the U.S. affiliated Pacific islands of the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau. The Pacific Subcenter is housed at the University of Hawaii-Manoa. The SGW and the Subcenter are cooperatively conducting the 2021 solicitation and review process.

SCOPE OF THE SOLICITATION

The SGW has received funding from the U.S. Department of Agriculture (USDA), National Institute of Food and Agriculture for Center selected projects that will further the Sun Grant and USDA missions. Projects will be expected to develop viable, alternative, biobased fuel and energy sources and products, while enhancing economic opportunities in rural areas. Western regional research priorities for the 2021 grant cycle address priority program areas identified by USDA, including: biomass and bioenergy production and technologies.

To make biobased economic diversification a reality, the region also needs education and outreach about the benefits and impacts of biobased industries and renewable energy as well as better economic and marketing data analysis. The SGW thus encourages proposals to provide education and outreach activities and, to the extent possible, include an economic analysis. Integration of a combination of these overarching activities are encouraged in all proposals.
INDIRECT COST LIMITATION

Indirect costs are limited by USDA to the lesser of the applicant’s official negotiated indirect cost rate or 30% of Total Federal Funds Awarded provided (TFFA). Thus, if the project is requesting $40,000 TFF, the indirect request is limited to $12,000 and direct costs would be $28,000 equating to a working rate of 42.857% applied to total direct costs.

PROGRAM PREFERENCES

The application ranking process will allocate points based on these factors. Scientific merit and regional relevance, however, will have a greater influence on ranking.

Proposals are expected to include a Project Logic Model (a generic logic model is available on the Sun Grant website). This description of the project illustrates the sequence of actions that describe what the project is and will do – how investments link to results. There are 6 core components in this depiction of the project:

1. **INPUTS**: resources, contributions, investments that go into the program
2. **ACTIVITIES**: things that are done
3. **OUTPUTS**: activities, services, events and products that reach people who participate or who are targeted
4. **OUTCOMES**: results or changes (in knowledge, application, behavior) for individuals, groups, communities, organizations, or systems
5. **Assumptions**: the beliefs we have about the program, the people involved, and the context and the way we think the program will work
6. **External Factors**: the environment in which the program exists includes a variety of external factors that interact with and influence the program action.

PROGRAM PRIORITIES

Proposals should clearly state how the project objectives address the following priority program areas:

- 1) Decentralized and distributed energy systems
- 2) Novel feedstocks for bioenergy, bioproducts, and biofuels from agricultural or forestry residues
- 3) Life cycle analysis and the sustainable production systems

In addition to the stated programmatic priorities, greater weight will be given to projects which also demonstrate they:

- a. enhance national energy security through the development, distribution, and implementation of biobased energy technologies;
- b. promote diversification in, and the environmental sustainability of, agricultural production in the United States through biobased energy and product technologies;
c. promote economic diversification in rural areas of the United States through biobased energy and product technologies; and

d. enhance the efficiency of bioenergy and biomass research and development programs through improved coordination and collaboration among:

   i. federal and state agencies and laboratories
   ii. land-grant colleges and universities, and
   iii. the private sector

Projects must meet one or more of the objectives in the program areas outlined below. Please note that proposals need not meet all of the objectives for any given program area to be considered for funding. Proposals must show displacement of petroleum through the enhancement of the biobased economy.

If you have questions regarding acceptability of a project topic, contact the SGW staff to discuss prior to submitting the Letter of Intent.

A. Decentralized and distributed energy systems

Projects meeting this goal should develop more decentralized and distributed systems which work better with regional biomass feedstocks. The projects should also have greater possibilities for capital retention within the region and for rural economic development. Projects should focus on methodologies and preprocessing technologies that will deliver a higher quantity and quality of raw materials to the processing or conversion facility in a sustainable fashion. Projects should also give attention to the development of valuable co-products for added rural economic development.

Goal:

To develop or improve smaller scale, decentralized or mobile conversion or processing technologies that address feedstock pre-processing, and produce efficient separations of biomass components parts, intermediate building block, separation efficiencies and process streams, and quantification of processing yields and efficiencies.

Objectives

1. To develop efficient, economical and environmentally sound, decentralized or mobile conversion processes for renewable crops, biomass residues or waste streams. Activities could include conversion efficiency, cost of production, enzymatic or thermo-chemical conversion.

2. To develop efficient, economical and environmentally sound, decentralized or mobile conversion processes for renewable crops, biomass residues or waste streams. Activities could include improvements in conversion efficiency, cost of production, biological or thermochemical conversion.
3. To develop integrated hub and spoke systems for the conversion of feedstocks into intermediate building blocks or biofuels and other bioproducts.
4. To mitigate environmental and social impacts associated with decentralized or distributed biofuel production using sustainable practices.

**Benchmarks/Desired Outcomes:**

**Short term**
1. Identify improved processing technologies for feedstock conversion and separation of biomass components.
2. Develop proof of concept.
3. Emission or discharge reduction or mitigation.
4. Intellectual products and technology transfer.

**Long Term**
1. Prioritize best choices for the region or subregion (e.g., tropics, arctic).
2. Make bioenergy production economically feasible.

**Evaluation/Metrics**
- Strong scientific and technical merit
- Demonstrated expertise and facilities
- Strong project management and appropriate budget
- Potential for rural and/or economic development
- Enhances social and environmental benefits
- Integration of research, extension and education efforts
- Transferability of results

**B. Novel feedstocks for bioenergy, bioproducts, and biofuels including agricultural or forestry residues**

New feedstocks are needed that can serve to provide biomass from marginal lands or in rotation with existing crops across the western United States. Included in these feedstocks are new crops and new approaches to utilizing residues from existing agricultural practices, forestry practices and utilization of invasive species. Approaches are encouraged that can integrate new energy crops or waste streams into existing land use practices that create new opportunities for economic diversification for producers and commercial opportunities for producers of bioproducts and intermediate chemicals for production of those products.

**Goal:**

To develop biomass feedstocks that can be produced under existing land use, cropping systems, or natural resource harvesting regimes without displacing existing food, fiber, and forage production activities.
Objectives:

1. Develop and evaluate feedstocks that can serve as economically efficient and sustainable biomass sources under existing cropping and rotation systems or evaluate crops that can be produced on marginal lands with reduced inputs of nutrients and water.
2. Evaluate existing waste streams from agricultural and forestry production that can provide a sustainable and economically efficient source of biomass for bioproduct production. These proposals should include an evaluation of conversion processes that can utilize these feedstocks.
3. Restoration of rangelands and forest lands may involve the removal of unwanted or invasive species. Develop processes and economic models for incorporating these biomass sources into an integrated process for producing revenue streams from restoration efforts by converting the biomass into bioproducts.

Benchmarks/Desired Outcomes:

Short-term
1. Identify useful feedstocks that complement existing land use.
2. Characterize production and process economics.
3. Create economic incentives for restoration.

Long-term
1. Describe new opportunities for biomass production within the region that is economically and environmentally compatible with existing land use.
2. Widen the portfolio of potential biomass feedstocks for the region.

Evaluation/Metrics
- Strong scientific and technical merit
- Demonstrated expertise and facilities
- Strong project management and appropriate budget
- Potential for rural and/or economic development
- Enhances social and environmental benefits
- Integration of research, extension and education efforts
- Transferability of results

C. Life cycle analysis and sustainable production systems

The public, including the international community, has expressed concern that production of bioenergy feedstocks will displace commodities that would otherwise be dedicated to food. Also, there are debates regarding indirect land use issues. Agricultural production is complex and is not easily predicted by correlative assumptions. Farming systems that will preserve food production needs as well as stewardship of natural resources are highly desirable, as is field research that provides standardized measurements of feedstock production impacts on the environment. Expert and multidisciplinary teams are needed to develop standardized measures
that will in turn benefit other teams involved in modeling, life-cycle analysis and sustainability studies.

**Goal**
To develop life cycle analysis and sustainability information systems, and models and analysis that can be used to improve economics and feasibility of biomass and bioenergy production.

**Objectives**
1. To analyze systems such as industrial ecology, feedstock transport and delivery, and biofuel transport and delivery infrastructure to improve their economics and feasibility and to evaluate or manage the carbon footprint of such systems.
2. To assess and mitigate transportation safety in such systems or along the supply chain.
3. To identify appropriate resources to develop the supply chain.
4. To devise strategies to mitigate environmental impacts associated with production of biofuels, such as greenhouse gas emissions, carbon, energy balance, and NOX emissions, among others.
5. To mitigate environmental and social impacts associated with decentralized or distributed biofuel production using sustainable practices.
6. To enhance existing supply chain assessment models such as Argonne’s GREET, the US Department of Energy has established the **GREET Model (The Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation Model)** as the recognized model for analyzing life cycle analysis of biomass and other fuel systems. The URL for accessing this public domain Excel model is: [http://greet.es.anl.gov/](http://greet.es.anl.gov/). Grant applications that propose to analyze feedstock and conversion process life cycle analysis should use GREET as the model framework or show how their model would improve upon the GREET model.

**Benchmarks/Desired Outcomes**

**Short-term**
1. Resources and input characterization.
2. Intellectual products and technology transfer that accrues.

**Long-term**
1. Increase in number of businesses established.

**Evaluation/Metrics**
- Strong scientific and technical merit
- Demonstrated expertise and facilities
- Strong project management and appropriate budget
- Potential for rural and/or economic development
- Enhances social and environmental benefits
- Integration of research, extension and education efforts
- Transferability of results
2. ELIGIBILITY INFORMATION

ELIGIBLE APPLICANTS

Each student must demonstrate competency to implement and complete a project, provide fiscal accountability, prepare project reports and demonstrate a willingness to share information with researchers and other interested parties. The student must have a faculty mentor to oversee the research and provide guidance and oversight.

REPORTING REQUIREMENTS

Quarterly reports (2-pages) and annual reports are required from all successful applicants and must be submitted in writing to the SGW.

It is important to disseminate information from SGW funded projects. At least one product of significance, i.e., Experiment Station report, Extension bulletin or white paper is required for all funded projects. Ideally, at least one peer-reviewed article would result for each year of SGW funded research. Investigators must acknowledge USDA and SGW in all publications and presentations.
3. PROPOSAL SUBMISSION INFORMATION

CONTENT AND FORMAT OF APPLICATION

Full proposal applications should include the elements listed below. Submissions omitting any of these items will be considered non-responsive. The components are to be entered into the online proposal system as directed. The proposal narrative should be completed in a word processing software and then uploaded into the system as a single pdf file.

Elements of the proposal include

1. PI BIOSKETCH
   The biosketch is essentially a 2-page resume or curriculum vitae.

2. SENIOR PERSONNEL
   Senior personnel are the key members of your project, i.e., faculty PI

3. TITLE PAGE

4. PROPOSAL SUMMARY (200 words or less)
   The proposal summary is broken down into key words, objectives, methodology, rationale, and expected outcomes. You can prepare your information and then copy and paste into the form boxes as appropriate.

5. FULL PROPOSAL NARRATIVE
   The page limit is 10 pages, double spaced, including graphics and tables, but excluding references, using a 12-point font, with at least 1-inch margins.

   The narrative must include the following:
   a) Statement of project goals and objectives
   b) Statement of project’s relevance to Sun Grant mission
   c) Significance of the work in its specific field and in the broader context of achieving the goals of the SGW and USDA. Please include descriptions of how the proposed work relates to other ongoing or completed work by the principal or other investigators and the implications of the work for public policy issues.
   d) Description of the project approach and activity (research, education, or extension). Describe the techniques and approaches to be taken to achieve the goals outlined above, including methods for analyzing and interpreting data.
   e) List of specific tasks to be performed, as an itemized list, and a timetable for completing those tasks
   f) Role of each member of the project team, including collaborators

   References should follow the proposal narrative but these pages are not included in the page limitation.
6. **BUDGET WORKSHEETS**
   Create a separate budget worksheet for the proposed work. Applicants must ensure they are using the appropriate indirect cost rate (30% TFFA or the institution’s negotiated indirect rate) Tuition must be included for graduate assistant support.

7. **BUDGET JUSTIFICATION/NARRATIVE**
   Include a detailed budget narrative through the provided online text boxes. The justification is used to fully explain your expenses and is broken down into the primary budget categories: Personnel, Equipment (>5,000), Expendable supplies and minor equipment; Travel; Other (subcontracts, consultants, computer time, publications, GRA tuition, etc.); F&A charges.

8. **SUGGESTED REVIEWERS**
   Provide names and contact information for up to three possible reviewers of your proposal.

9. **FILE ATTACHMENTS (REQUIRED)**
   a. Logic Model (diagram or narrative) (see generic model on SGW website)

10. **FILE ATTACHMENTS (OPTIONAL, AS NEEDED)**
    You may want to attach supporting documentation such as letters of support or subaward information (scope of work, budgets and budget narratives). Similar types of information should be compiled together, e.g., all subawards, all support letters, and it is recommended that you use PDF files. Such formats and consolidation facilitates the work of the reviewers.
4. PROPOSAL REVIEW INFORMATION

PEER REVIEW PROCESS and CRITERIA

1. All applications will undergo a review process, which will include a technical peer review by scientists working in the appropriate fields. Decisions will be made on the basis of the following factors:

- **Scientific and Technical Merit (50%)**
  - Originality and innovativeness of the concept and approach
  - Conceptual adequacy of research, as applicable
  - Clarity of objectives and presentation of information
  - Adequacy of methodology proposed
  - Feasibility of methodology to achieve objectives
  - Likelihood of success as proposed

- **Qualifications of the Investigator(s), Adequacy of Facilities, Project Management, and Costs (25%)**
  - Awareness of previous work or strategies
  - Appropriate expertise or collaborators included
  - Level to which stakeholders were involved in project planning and implementation
  - Planning and implementation strategies
  - Adequate outreach program and strategies

- **Project Relevance (25%)**
  - Appropriateness of the proposal in addressing Sun Grant’s mission and the research priorities of the region
  - Relevance to USDA strategic areas of interest
  - Degree to which there is potential for project implementation, adoption and impact
PROGRAMMATIC REVIEW

The Advisory Committee or their designee(s) will review the list of recommended projects and evaluate them against their relevance to the priority needs of the region. The SGW will seek to achieve a portfolio of research and education projects to address the bioenergy development priorities of the region. Therefore, relevance to meeting the priority needs of the region may form the basis for selection among projects deemed of equivalent merit and quality. The Advisory Committee will recommend a short list of priority projects to the SGW directors and USDA for their funding consideration.
5. AWARD ADMINISTRATION

PROGRAM MANAGEMENT
Program management will be handled by the SGW. Contracts and payments for the awards will be written and distributed from Oregon State University (OSU). Reports and reviews will be collected and maintained by OSU. Composite reports will be provided to USDA quarterly and annually. The latter will be submitted in narrative form and in the USDA Current Information System.

The SGW staff will be responsible for reviewing reports and providing feedback to investigators. The Advisory Committee will review final reports for potential impacts throughout the region and for adjustment of program priorities.

AWARD NOTIFICATION
SGW and the Subcenter will notify applicants in writing of grant decisions once approval is received from NIFA. As part of the grant decision, SGW may negotiate specific grant terms with investigators.

CONFIDENTIALITY/PROPRIETARY INFORMATION
Confidentiality will be maintained in the proposal review process, and proposals will not be used for any purpose other than evaluation of merit for funding. Applicants are encouraged to draw attention to confidential or proprietary information contained in the proposal or submitted reports.

REPORTING REQUIREMENTS
Quarterly and annual reports of progress must be submitted by each funded project to it to be considered for continuation of funding. A reporting template will be distributed along with a reporting schedule. Each project should include a budget item for PI travel to an annual Sun Grant symposium or conference to report project results. PI participation in this meeting is mandatory.

CONTACT INFORMATION:

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