FORMAL PROJECT APPROVAL REQUEST

TO: Kit Duke
   AVP Facilities and Land Management

THROUGH: Brian Rogers
         Chancellor

THROUGH: Pat Pitney
         Vice Chancellor

THROUGH: Scott Bell, P.E.
         Associate Vice Chancellor

THROUGH: Gary Johnston
         Director

FROM: Jenny Campbell
      Sr. Project Manager

DATE: September 6, 2013

SUBJECT: Project Type: New Construction
         Project Name: Campus Wide Solar Array Installation
         Project No.: 2013065 CWSAI

cc: CWSAI (101)

<table>
<thead>
<tr>
<th>Total Project Cost</th>
<th>$ 4,000,000</th>
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<tbody>
<tr>
<td>Approval Level</td>
<td>FLMC</td>
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Non-Academic Project Program Resource Planning Status Report
UAF Solar Array Project
Campus Master Plan Amendment & Formal Project Approval

This project was initiated through an unsolicited proposal by Siemens Industries based on findings during the Fairbanks Campus Energy Audit. This project demonstrates UAF’s commitment to sustainable energy production and a complete energy portfolio concurrent with planning for a replacement solid fuel Combined Heat and Power plant.

The Campus Master Amendment approval is required prior to Schematic Design Approval.

Milestone #0
Mission Area Analysis: (Contained in UAF AHFC Energy Audit) Date: 09/28/12
Statement of Need: (Contained in UAF AHFC Energy Audit) Date: 09/28/12

Milestone #1
SAC Review: (This is a non-academic project) Date: N/A

Milestone #2
Preliminary Administrative Approval: Date: 04/30/13

Milestone #3
Statement of Requirements: (Developed in conjunction with FPA) Date: 09/26/13

Milestone#4
Business and Financing Plan: (Currently In Development) Date: ______
Operating Budget Request Date: N/A
Capital Budget Request: Date: N/A
Board Approval of FY13 Capital Budget Distribution: Date: N/A

Milestone #5
Campus Master Plan Amendment: Date: 09/26/13
Formal Project Approval: Date: 09/26/13
Schematic Design Approval: Date: ______

Milestone #6
Construction Started: Date: ______
Construction Completed: Date: ______
Beneficial Occupancy: Date: ______
Final Project Report: Date: ______
**University of Alaska Program Resource Planning**

**Academic, Budget and Project Planning Process**

**Rev. 9-8-11**

**Source Documents:**
- UA Strategic and Academic Plans
- MAU Strategic and Academic Plans
- MAU Department Program Review/Proposal
- Accreditation Reports
- MAU Campus Master Plan
- MAU Housing/Campus Life Strategic Plan

**Process Milestones**
- BOR Board of Regents
- MAU Major Academic Unit
- SAC Statewide Academic Council

**Statement of Requirements Components**
- Faculty/Staff
- FF&E
- Infrastructure
- Backfill, Other Second Order Impacts
- New Space, Remodeling
- Building Operations and Maintenance

**Time Frames**
- Steps 1-3 may require 1-9 months
- Steps 4-7 may require 1-3 months
- Steps 8-13 generally require 7-8 months
- Step 14 will vary depending on the size of the project (a few weeks to several years.)

**Project Type**
- Construction – New or Expansion, Large R&R
- Infrastructure – New or Expansion

**Steps:**
1. **Will this proposal require approval by President or BOR?**
   - YES: Follow MAU internal evaluation process
   - NO: MS 0

2. **Is this an Academic Program?**
   - YES: MAU produces an Academic Mission Area Analysis (MAA) & a Statement of Need (SON)
   - NO: MS 1

3. **MAU submits to SAC for review and concurrence**
   - YES: MS 1
   - NO: MS 1

4. **MAU develops a Preliminary Administrative Approval Request (PAA)**
   - Not required until after MS #3 unless MAU needs authority to spend to develop the SOR and Business Finance Plan.
   - Skip to Step 6.

5. **President approves PAA**
   - YES: MS 2
   - NO: MS 2

6. **MAU produces a Statement of Requirements (SOR)**
   - YES: MS 6
   - NO: MS 6

7. **Is this an Academic Program?**
   - YES: MAU submits MAA, SON and SOR to BOR, Academic and Student Affairs Committee for approval
   - NO: MS 7a

8. **MAU Develops Business and Financing Plan**


10. **President, FLMC and BOR approval of operating and capital budgets, and LRP**

11. **Governor and Legislature Action**

12. **UA BOR accepts Appropriated Budgets**

13. **Board of Regents Project Approval Processes**

14. **Project Agreement**
   - Formal Project Approval
   - Scoping/Design Approval
   - Change Requests
   - Project Bid/Award Reports
   - Final Project Report

14a. **Board Approval of Project Plan via the June Distribution List**

**Final Process Ends**
FORMAL PROJECT APPROVAL

Name of Project: Campus Wide Solar Array Installation
Project Type: New Construction
Location of Project: UAF, Fairbanks Campus, Campus Wide, Fairbanks
Project Number: 2013065 CWSAI
Date of Request: September 6, 2013

| Total Project Cost: | $4,000,000 |
| Approval Required:   | FLMC       |
| Prior Approvals:     | Preliminary Administrative Approval April 30, 2013 |

A Formal Project Approval (FPA) is required for all Capital Projects with a Total Project Cost in excess of $250,000.

FPA represents approval of the Project including the program justification and need, scope, the total project cost, and the funding and phasing plans for the project. Requests for formal project approval shall include a signed project agreement or facilities pre-design statement, the proposed cost and funding sources for the next phase of the project and for eventual completion of the project, and a variance report identifying any significant changes in scope, budget, schedule, deliverables or prescriptive criteria associated with a design-build project, funding plan, operating cost impact, or other cost considerations from the time the project received preliminary administrative approval. It also represents authorization to complete project development through the schematic design, targeting the approved scope and budget, unless otherwise designated by the approval authority.

Action Requested
The Facilities and Land Management Committee approves the Formal Project Approval request for the University of Alaska Fairbanks Campus Wide Solar Array Installation as presented in compliance with the amended campus master plan, and authorizes the university administration to proceed through Schematic Design. This motion is effective September 26, 2013.

Project Abstract
This project proposes to build a 1MWdc photovoltaic solar array in the field south of the Butrovich Building and west of the new terrain park, as seen in the attached plan. The array will consist of pole mounted fixed angle stationary or rotating solar panels.

The generated power from the array can be captured through one of two methods: either by directly tying into the UAF electrical grid or by connecting to GVEA’s grid. The preferred capture method is still being considered.
RATIONALE AND REASONING

Background:
The university received an unsolicited proposal from Siemens Industries, Inc., in May 2012, to provide UAF with up to One Mega Watt Direct Current (1MWdc) of solar power via a Power Purchase Agreement (PPA). When this proposal was received, UAF began investigating the concept of installing a large solar array on campus. UAF contracted with Siemens to scope such a project to determine its viability in terms of cost, solar output, aesthetics and palpability to the campus and Fairbanks community. UAF has been exploring power banking options with Golden Valley Electric Association (GVEA) as part of cost studies as well as coordinating with the Alaska Center for Energy and Power (ACEP) regarding the most cost effective and efficient methods of solar array installation connections to electrical grids.

In June 2013, UAF asked the Board of Regents’ Facilities and Land Management Committee (FLM) for formal project approval. The FLM Committee approved the request and placed it on the consent agenda for full Board consideration. The full Board denied the request, expressing concerns regarding cost and aesthetics that needed to be studied. Since that meeting, UAF has worked to address the Board’s concerns so the approval could be presented again in September 2013. Through this process, UAF has made significant progress and is able to present answers to the concerns raised.

Programmatic Need
The needs addressed in this project affect all units on campus. Power generation is costly in Alaska and UAF requires more electrical power than it can produce, creating a reliance on the fluctuating power costs of the local utility. The university currently purchases 7.3 percent of its electrical needs from GVEA. The proposed 1MWdc solar array will be able to offset more than 20 percent of the currently purchased power, at a rate fixed at the time of installation. Fuel oil prices in Fairbanks have tripled in the last eight years and the cost of electricity has doubled. Fixing the university’s power costs into the future will help UAF in the financial planning of the institution.

Additionally, this project demonstrates UAF’s commitment to sustainable energy production and a complete energy portfolio concurrent with planning for a replacement solid fuel Combined Heat and Power plant.

Strategic Importance
This project supports the student sustainability initiative begun in 2009. The basic purpose of the initiative is to bring awareness of sustainable practices to the campus with greener purchasing, installation of alternative energy systems and sustainable programs. This project is directly aligned with the initiative by helping to reduce the campus’ reliance on fossil fuels in favor of renewable energy. To show its support for the project, the Office of Sustainability and the Review of Infrastructure, Sustainability and Energy (RISE) Board have committed an annual appropriation of $25,000 to the project for the duration of the student sustainability fees the student body imposed on themselves in 2009.

The university is currently in the permitting process for a new solid fuel Combined Heat and Power plant to replace the existing 1960s-era Atkinson Power Plant. During the permitting process for a new coal fired plant, UAF believes it is vital to show the public its continued commitment to the investigation and implementation of renewable energy generation such as solar and wind. The installation of this solar power generation field is the first demonstration of UAF’s commitment to the public that it is serious about creating a complete energy portfolio.

Installing a solar array of this magnitude at UAF’s northern latitude has research opportunities for UAF as well. A common thought is that Alaska is not a state that should look to solar as a viable alternative energy option. Currently, ACEP is studying solar power generation as a viable energy source in rural
Alaska and is helping power companies in villages determine how they can most effectively tie a solar array to islanded power plants. UAF is well suited to help ACEP study this issue with its self-contained power plant and proximity to ACEP’s headquarters. A solar project is also of interest to the university’s engineering departments and can be utilized by students as a living laboratory.

**Impact Analysis**

Constructing a solar array in this visible location will attract attention and promote goodwill within the Fairbanks community. It will demonstrate the university’s commitment to venture into alternative power generation. While the university is committed to diversifying its power generation, it is also committed to doing so in an aesthetically appealing manner. The board’s concern that the university addresses specific aesthetic issues has been considered.

Aesthetic concerns raised by Board of Regents include potential glare for aircraft and the type of fence surrounding the array. UAF submitted an Obstruction Evaluation Airport Airspace Analysis with the Federal Aviation Administration (FAA) to ensure that the project does not pose a danger to pilots or air traffic control. A formal determination by the FAA was made in August 2013. The FAA ruled that the installation of a solar array in this location poses no hazard to air navigation. A copy of the determination is attached.

Potential glare for occupants in the Butrovich Building is anticipated to be negligible. With the 45 degree tilt away from the building any potential light reflection from the panels to the occupants higher on the hill will only occur at very low sun angle conditions. Under these conditions, it is anticipated that the sun itself will be causing more natural glare to the occupants than will the array.

The array is required to be fenced for safety reasons. It is important that only authorized personnel working on the array or maintaining the grounds be within the array area. The current fence design planned for the project is designed to blend with the botanical garden and UAF farm fencing concepts for an aesthetically pleasing, yet secure enclosure. A concept of the fence design is attached.

**Project Impact**

The walking and skiing paths that run through this field will be rerouted around the array as a part of the project. The disc golf course will also require relocation to accommodate the solar array. The exact location of the disc golf course around the array will be coordinated with the campus during design. Maps for new locations of walking and skiing trails are attached.

**Project Site Considerations**

UAF considered several other locations and configurations before determining the slope below the Butrovich Building is the ideal and only practical location for a 1MWdc photovoltaic installation. These locations consisted of the following sites: 1) smaller distributed building and roof mounted solar array, 2) the wedge-shaped slope below Tanana Loop combined with land near the railroad tracks and agricultural farm with similar solar exposures, and 3) vacant land on the north side of the university. In considering these sites, they were either not cost effective per kWh, required custom engineering at each location to prevent damage to the existing facilities, were physically too far away from the campus power grid connection point, or were deemed swampy and of the wrong aspect for solar collection to been seen as viable options to pursue.

The wedge-shaped slope directly below the Butrovich Building and the Greenhouse and above Tanana Loop is an ideal location and orientation for the proposed 1MWdc solar array. It has a gentle 10 degree south facing slope that provides unobstructed solar exposure year round. It has been clear of any trees and brush for several decades so uneven settling due to permafrost is unlikely. In addition, UAF has already conducted geotechnical studies and core samples in numerous areas throughout the hill so the soil
conditions are well understood. Another benefit of this location is the critical proximity to the campus wide power grid located in the adjacent utilidor that transects this slope. This proximity reduces interconnection costs and line losses for this solar array.

The anticipated 4-acre footprint of the 1MWdc solar array can be built and still accommodate the new service access road on the southwest side of the Butrovich Building, a 12-foot wide ski trail corridor relocation easement along lower fence line and Tanana Loop, and an adequate buffer between the existing terrain park to the east.

The hill itself has been the site of several excavations in recent years, has had its ground cover disrupted on numerous occasions, and harbors an invasive weed, bird vetch. During construction of the array, UAF proposes to eradicate the bird vetch and vegetate the slope with native groundcover. The end result will be a hillside that provides an energy resource for the university while creating a more uniform and attractive slope. Mandatory grounds maintenance will be provided around the array during the summer to ensure a consistent appearance and proper function of the photovoltaic equipment.

Special Considerations
The 2010 UAF Campus Master Plan will require a Board of Regents’ amendment to change the land use designation of the area encompassing the solar array from “Ecosystem Research, Instruction, and Recreation” to “Renewable Resources”. The UAF Master Planning Committee passed a motion supporting this land use change in November 2012. The Campus Master Plan Amendment is being presented for approval at the September 2013 meeting.

Proposed Funding Analysis and Plan
The university has determined that installing a 1MWdc solar array on the UAF campus has many benefits. However, in order to make the project financially viable, the university believes that a competitive bidding process should be undertaken. For this reason, UAF decided to discontinue negotiations with Siemens, Inc. (as allowed under the terms of their unsolicited proposal) and initiate an RFP solicitation for the project. UAF intends to work with ACEP and a specialty consultant in writing the RFP to ensure that all critical requirements of a solar array installation are met.

UAF intends to explore various procurement and funding options such as design-bid-build, a Power Purchase Agreement (PPA), and Lease to Own (LTO) during the RFP phase. The method employed will be determined based on which method allows the university to most economically receive power from the array. Waiting to determine which procurement and funding method to employ will give the university more negotiation options with the interested developer. Prior to Schematic Design Approval, the procurement method will be determined.

The estimated total project cost determined by Siemens during the concept phase is $4,000,000. At the June 2013 meeting, the board discussed a concern regarding the cost of the power generated when compared to purchasing GVEA power. The university heard that the board will accept the project if the power costs are equal to or less than purchasing power from the utility. This is challenging in that GVEA power costs fluctuate depending on many factors outside of the university’s control. Any financial arrangement that the university undertakes for the solar array will fix the power costs at a known rate for the duration of the project payback period, at which time the cost for power would decrease significantly. During the initial payback period, and depending on GVEA’s rate fluctuations, at times the cost of solar power could be higher than GVEA but at times the cost could be lower. The university believes that a fixed, known rate, agreed to at the project inception is a logical decision.

The university is exploring another option with GVEA to ensure that the cost of solar power mimics the cost to purchase power from GVEA. UAF approached GVEA with a proposal to allow UAF to use
GVEA’s existing load banks to accept and return generated solar power from the proposed array. UAF and GVEA would enter into a net metering contract whereby power delivered by UAF to GVEA would offset power purchased from GVEA. UAF would only pay for the net power received from GVEA. UAF’s generated power would have the same value as the power purchased from GVEA. This arrangement will be explored further should the board approve this FPA and allow UAF to move to an RFP, final design and Schematic Design Approval.

Total Project Cost and Funding Sources
Total Project Cost is estimated at $4,000,000. Funding source will be dependent on the financing and partnership arrangement selected as a result of the RFP process and will be known in advance of a request for Schematic Design Approval. Under a public private partnership, the selected developer will fund the construction and UAF would pay either a lease payment or a power purchase agreement on a monthly, quarterly or annual basis. If UAF pursues this project through an alternative energy research approach, the funding would be a combination of grants and loan financing.

Annual Program and Facility Cost Projections
This project will replace existing utility purchases from GVEA at a known fixed price. The development of financing options will occur prior to seeking Schematic Design Approval.

Administration seeks a project that provides energy savings or is cost neutral, but will also evaluate projects that offer minimal increases in cost in the short-term that eliminate long-term price volatility.

Project Delivery Method
The project may be completed as a design-bid-build or as a public private partnership through the use of a PPA or a LTO between UAF and an interested developer or as a research application grant and UA financed project. The delivery method will be determined at a later date as the design progresses and UAF has a chance to explore options and weigh the risks involved with each method. When the university asks for schematic design approval, the delivery method and the reasoning behind it will be presented to the board.

Schedule for Completion

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<td>Construction Documents</td>
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Affirmation
This project complies with Regents’ Policy and the amended Campus Master Plan.
Supporting Documents
   One-page Project Budget
   FAA Determination Letter Dated 8/21/2013 (w/ Sectional and Topo Maps)
   Drawings
      Site Plan
      Street view of array
      Aerial view of array
      Diagram of PV panel
      UAF Monthly Electrical Consumption Graph
      UAF Yearly Electrical Consumption Graph

Approvals
The level of approval required for FPA shall be based upon the estimated TPC as follows:

- TPC > $4.0 million will require approval by the board based on the recommendations of the Facilities and Land Management Committee (FLMC).
- **TPC > $2.0 million but not more than $4.0 million will require approval by the FLMC.**
- TPC > $1.0 million but not more than $2.0 million will require approval by the Chair of the FLMC.
- TPC ≤ $1.0 million will require approval by the AVP of Facilities and Land Management.
### UNIVERSITY OF ALASKA

**Project Name:** Campus Wide Solar Array Installation  
**MAU:** UAF  
**Building:** N/A  
**Campus:** Fairbanks  
**Date:** 20-Aug-13  
**Prepared by:** JLC  
**Project #:** 2013065 CWSAI  
**Acct #:**

**Total GSF Affected by Project:** N/A

### PROJECT BUDGET

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FPA Campus Wide Solar Array Installation
** DETERMINATION OF NO HAZARD TO AIR NAVIGATION **

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: Solar Panel UAF PV Array  
Location: Fairbanks, AK  
Latitude: 64-51-25.00N NAD 83  
Longitude: 147-50-45.00W  
Heights:  
- 550 feet site elevation (SE)  
- 12 feet above ground level (AGL)  
- 562 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

_____ At least 10 days prior to start of construction (7460-2, Part I)  
__X__ Within 5 days after the construction reaches its greatest height (7460-2, Part II)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed and maintained in accordance with FAA Advisory circular 70/7460-1 K Change 2.

This determination expires on 02/21/2015 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.  
(b) extended, revised, or terminated by the issuing office.  
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.
NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (800) 478-3576 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

If we can be of further assistance, please contact our office at (907) 271-5863. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2013-AAL-230-OE.

Signature Control No: 195204503-196656664
Robert van Haastert
Specialist

Attachment(s)
Map(s)
Solar Array Location & Preliminary Layout

Ground Mount Layout: 1 MW DC STC PV System for University of Alaska – Fairbanks

- BUTROVICH BUILDING (E)
- NEW LOADING DOCK ROAD
- EXACT PV ARRAY EXTENTS TO BE DETERMINED DURING FINAL DESIGN
- 12.47kV TRANSFORMER
- UTILIDOR EASMENT
- TERRAIN PARK AREA
- PV ARRAY
- SKI TRAIL
Photovoltaic Solar Module Diagrams

Note: Schematic design shown, to be finalized during final design review.
University of Alaska Fairbanks Yearly Electrical Consumption
Total = 60,305,000 kWh/year

- 92.8% kWh Generated by UAF
- 5.7% kWh Purchased from GVEA
- 1.6% kWh from Solar Array

Based on GVEA Utility Meter Data (2011 - 2012)