**Project Narrative**

**Arizona Board of Regents (ABOR)**

**Accelerating Climate Pollution Reductions through Arizona's Higher Education Institutions**

1. **Overall Project Summary and Approach**
   1. Description of GHG reduction measures

The Governor’s Priority Climate Action Plan (PCAP) identified on-site renewables generation plus battery storage (Measure 4) and fleet electrification (Measure 7) at universities as priority measures to reduce GHG emissions in Arizona. The Arizona Board of Regents (ABOR), as an eligible applicant, oversees the three state universities: Arizona State University (ASU), Northern Arizona University (NAU), and University of Arizona (UArizona), who are sub awardees on this proposal. Each university was an early signatory to the American College & University Presidents’ Climate Commitment starting in 2007 with ASU as a founder and founding signatory. Each university has also signed onto Second Nature’s Climate Commitment, agreeing to reach climate neutrality while integrating climate adaptation and community capacity-building to deal with the changing climate. Each of ABOR’s universities is at the forefront of climate science and solutions research, innovative sustainability and climate solutions academic programs, and operational actions to reduce greenhouse gas (GHG) pollutants. All three have aggressively worked to implement green building standards on new buildings and deep energy retrofits of existing buildings, among many other measures.

With collective action and in alignment with: 1) the EPA’s strategic plan *goal 1* “*tackling the climate crisis*” and *objective 1.1 “reduce the emissions that cause climate change”;* 2) the Arizona Governor’s PCAP priority measures for universities—Measure 4, on-site solar and battery and Measure 7, fleet electrification, and 3) each of the universities’ decarbonization strategies and goals, we propose the following measures to be implemented across the three state universities:

On-Site Solar and Battery Storage

* Build 5,954 kW-dc capacity of on-site solar that will generate 10,642,031 kWh annually
  + ASU—1,764 kW solar capacity on two parking garage solar canopies
  + UArizona—2,190 kW solar capacity on five parking lot solar canopies
  + NAU—1,450 solar capacity on three parking lot canopies and 555kW fixed ground mount
* Install 4,900 kW capacity of battery storage with discharge capabilities of 18,200 kWh
  + ASU—3MW battery storage
  + UArizona—900kW battery storage
  + NAU-1 MW battery storage

Fleet Electrification and Fleet EV Charging Infrastructure

* Replace 80 light-duty trucks, vans, and SUVs with a mix of like-for-like electric vehicles and smaller-capacity neighborhood electrical vehicles
  + ASU—24 vehicles
  + UArizona—29 vehicles
  + NAU—27 vehicles
* Replace 4 40-foot full-sized diesel buses with equivalent electric buses at NAU
* Replace 2 small diesel buses with equivalent electric buses at UArizona
* Install 39 level 2 chargers (20 at UArizona and 10 at NAU)
* Install 6 150kW chargers (2 at UArizona and 4 at NAU)

Each of the universities is dedicated to reaching carbon neutrality through an all-encompassing approach to decarbonization. This commitment involves a strategic blend of innovative and sustainable practices, technology implementation, and community engagement to drastically cut emissions and promote environmental stewardship.

Key pieces of our university decarbonization strategies include a significant expansion of onsite solar, battery storage, and installation of infrastructure to promote the conversion of the university fleet to zero-emissions vehicles.

**Major features, tasks, and milestones to ensure success of solar and battery deployment in delivering climate pollution reduction from Arizona’s state universities.**

On-Site Solar and Battery Storage

Major Features: The proposed solar facilities will consist of 11 solar installations with 8 solar canopies located on parking lots, one traditional ground mount system and two on parking garages. The battery storage has been scaled to this new solar production to enable flexible uses of clean energy storage. Together, these projects will improve each university’s energy resilience and reliability by storing excess solar power during peak production times and distributing it during peak demand or periods of high marginal emissions, reducing each university’s demand on the local electrical grid and providing a demand response resource, particularly during periods of increasingly common extreme heat in Arizona.

Additionally, sites identified on each campus were selected in part for the additional benefits they will provide, including shade for campus users, reducing the impacts of the urban heat island effect, as well as providing visibility for students, faculty, and staff to learn about clean energy technologies and provide living laboratory opportunities for research and teaching. The addition of on-site solar production will also generate cost savings for the universities that can reduce pressure on student tuition or be used to accelerate additional GHG mitigation measures.

Tasks: To accomplish the successful deployment of on-site solar and battery storage, we have provided a detailed timeline up to the point of system operation. Critical tasks will include the issuance of RFPs, the selection of construction companies, pre-construction engineering and design and permitting, construction, and commissioning. Biannual measurement and verification of GHG reductions and reporting will occur throughout the project period.

Milestones: Assuming the grant is awarded in October 2024, the universities will have completed the RFP process, selected one or more contractors, and initiated construction by the end of 2025. A significant amount of construction should be completed by the end of 2026 but given current supply chain dynamics, completion of all construction and grid interconnection is planned no later than December 2027. To be conservative, GHG emission reductions were assumed to start at the end of 2027.

Risks: This timeline considers the risks of potential supply chain dynamics and procurement lead times and ensures all elements of this measure are operational well within the five-year performance period. Given each university’s extensive experience with large capital projects, we do not foresee additional risks that would significantly impact hitting critical milestones.

Full implementation will displace carbon-intensive grid electricity and lead to measurable GHG emissions reduction, CAPs and HAPs.

**Major features, tasks, and milestones to ensure the success of fleet electrification in delivering climate pollution reduction from Arizona’s state universities.**

Fleet Electrification and Fleet EV Charging Infrastructure

Major Features: The University of Arizona and Northern Arizona University will invest in electrical upgrades and the installation of electric vehicle chargers. Arizona State University currently has ample EV charging infrastructure on campus and thus did not propose any additional infrastructure to enable its fleet electrification efforts. The new and existing charging infrastructure at UArizona and NAU will enable a rapid acceleration of vehicle electrification, consistent with their climate goals. CPRG funding will enable the purchase of very visible electric campus shuttle buses providing thousands of rides each day while enabling the transition of internal combustion light-duty trucks and SUVs to electric vehicles, including neighborhood electric vehicles.

The gasoline and diesel-powered vehicles to be replaced with electric vehicles are used daily and lead to significant idling and pollution generation in areas with high pedestrian traffic. These campus vehicles are ideally suited for electrification. Replacing these vehicles first will reduce point source pollution and noise pollution, while elevating the culture of sustainability on campus through the increased visibility of EV use. This charging capacity will not only enable the partial conversion of these internal combustion vehicle fleets to electric but will provide significant capacity to accelerate vehicle EV transition in future years.

Tasks: To accomplish the successful installation of EV charging infrastructure, we have provided a detailed timeline. Critical tasks will include the contracting of EV installation and associated electrical upgrades, installation of charging infrastructure, the procurement of electrical vehicles and buses, and the training of fleet mechanics and users on EV operations. Biannual measurement and verification of GHG reductions and reporting will occur throughout the project period.

Milestones: Assuming the grant is awarded in October 2024, the universities will immediately initiate an RFP process for charging installation, selection of contractors, and initiating construction by Fall of 2025. Once contractors have been selected, the vehicle procurement process will begin, and the first electric vehicles and buses will be purchased and put into operation. Each sub-awardee has a different timeline for vehicle procurement and deployment, but most light-duty and passenger vehicles will be operational by the end of 2025. Additional vehicle procurement will continue at a much smaller scale throughout the 5 years of the award. Given the status of the EV market, we anticipate an ample supply of suitable light-duty replacements with EVs, but we may encounter some risks of delay with the procurement of the light- and heavy-duty electric buses. GHG emission reductions associated with these measures were calibrated with the planned in-service dates of each of the universities.

Risks: This timeline considers the risks of potential supply chain dynamics and procurement lead times and ensures all elements of this measure are operational well within the five-year performance period. Given each university’s extensive experience procuring vehicles and buses, we do not anticipate internal delays but the potential for battery and manufacturing delays associated with the electric bus market.

Full implementation of this measure will eliminate tailpipe emissions, displace carbon-intensive grid electricity and lead to measurable GHG emissions reductions, as well as the co-benefits of reductions in CAPs and HAPs.

* 1. Demonstration of funding need

The Arizona Board of Regents provides oversight for the university sub awardees and submits annual university budget requests to the Governor’s Office for inclusion in the Governor’s budget. This budget is then submitted to the Arizona State Legislature for consideration in their annual appropriations. The budgets appropriated to the universities have been constrained over the past 15+ years as more of the funding to sustain these institutions of higher education has shifted from state taxpayer support to student tuition and fees. Investing in climate pollution reduction measures has been constrained by this statewide budget in addition to ABOR’s goal of the universities providing accessibility and affordability thereby not shifting the costs of these initiatives to student tuition and fees. Amid these challenges, each of the universities continues to strive towards its decarbonization efforts, highlighting a critical need for comprehensive and sustained funding solutions, including the funds available through this CPRG opportunity.

Given these current and historical budgetary constraints, the individual university sub awardees have sought out additional federal and private funding to finance their decarbonization efforts. The individual universities have pursued the following funding opportunities to advance their carbon neutrality goals in the past 5 years:

UArizona: In 2023, UArizona was part of a proposal led by Second Nature from the Department of Energy’s Renew America Nonprofits program to bolster energy efficiency initiatives. Despite being one of nearly 200 sub-applicants, the bid was not successful. Beyond this opportunity, UArizona has not yet explored additional opportunities due to our relatively recent foray into transformative institutional sustainability and climate action activities.

NAU: In 2023, NAU sought EPA funding from the Diesel Emissions Reduction Program to electrify two buses, with the application still under review. In 2020, NAU research faculty, Facility services, the Pacific Northwest National Laboratory (PNNL), and Trane submitted a DOE proposal “NA-ComMiT: Northern Arizona Connected Community and Microbed Testbed” to develop and study a microgrid and its feasibility across the United States. The grant would have installed a 1MW battery on campus, but it was unsuccessful.

Prior to the passage of the Inflation Reduction Act, most all federal monetary incentives for clean energy and clean transportation were not available to our non-profit institutions of higher education. With the Inflation Reduction Act, each of the universities are now eligible for electric vehicle as well as solar and battery direct pay incentives. While the IRS is still finalizing the process, each of the universities intend to apply to the Treasury for direct pay associated with the qualifying measures in this proposal and have taken into consideration these available resources to cover the full cost of these measures. In other words, the sub awardees, when possible, plan to front the 30% cost of the solar and battery measures in anticipation of applying for and receiving the 30% direct pay from the treasury.

To sustain and scale these initiatives beyond those included in this proposal, we are committed to exploring additional decarbonization funding sources with philanthropic organizations, public-private partnerships, government grants (e.g. DOE- “Grid Resilience Innovation Partnerships, Energy Efficiency and Conservation Block Grant Program), and other innovative financing mechanisms such as community investment initiatives, DOE loan programs, and the soon to be launched Greenhouse Gas Reduction Fund.

Collectively, the budgets submitted by the sub awardees include a cost share of $1,927,000 towards the fleet electrification and charging measure based on available and planned vehicle replacement budgets 2025-2030. CPRG finding will allow these to be fully electric.

* 1. Transformative impact

ASU, NAU, and UArizona are each advancing toward climate neutrality and decarbonization of university operations. These collective efforts encompass the expansion of onsite solar power, enhanced battery storage, and the development of infrastructure and investments to accelerate fleet electrification. These initiatives are integrated into broader strategies that include moving towards a carbon-free microgrid system for enhanced resiliency and implementing large consumer demand response programs.

The three universities largely rely on central utility plants for heating and cooling. As these systems are decarbonized, the need to provide reliable electrical redundancy and resiliency to climate extremes and potential grid outages grows. Installation of these solar and battery arrays would provide reliable and scalable power generation options to increase each university’s resiliency to extreme heat events and provide the opportunity to develop microgrids, a topic of great interest at each of these institutions. Such measures not only promise substantial emissions reductions on each campus but also serve as scalable and replicable models for other institutions in the realm of higher education and beyond.

In addition to infrastructure developments, each university is committed to growing research in clean energy solutions and the training of students in cutting-edge renewable energy and electrification technologies, effectively turning these investments into dynamic teaching and research learning labs. This educational component ensures that the next generation of professionals is well-versed in sustainable practices and that the clean energy workforce is ready to contribute to ongoing market transformations and a just energy transition.

The projects spearheaded by each university have the potential to research and demonstrate the economic and environmental viability of large-scale renewable energy and fleet electrification initiatives, including vehicle to grid capabilities. Success in these areas can significantly lower market barriers and fast-track the adoption of innovative GHG reduction technologies. The public nature of our institutions enhances the visibility of such projects, helping to influence public perception, shape policy development, and stimulate investments in renewable energy and electrification. This can lead to widespread market shifts towards sustainable practices.

The GHG reduction measures being implemented by each university are critical not only for meeting each university’s climate neutrality targets but also for driving broader transformative impacts. By pioneering new, visible, sustainable development pathways in various sectors, we are making significant contributions to global climate change mitigation efforts, setting the stage for additional, substantial GHG emission reductions, and preparing our students for a global just energy transition.

1. Impact of GHG reduction measures
   1. Magnitude of reductions 2025-2030

Successful implementation of the two proposed measures is modeled to cumulatively reduce GHG emissions by a combined 14,462 MTCO2e by 2030. The proposed on-site solar measures are anticipated to reduce GHG emissions by 12,692 MTCO2e by 2030 and the electric vehicle deployment measures are anticipated to reduce GHG emissions by 1,770 MTCO2e by 2030. We did not attempt to quantify the potential GHG reductions by the battery storage as we do not have sufficient information on marginal utility emissions at this time through our regulated monopolies, however, we have qualitatively addressed this potential at the end of this section.

Durability of GHG reductions—permanence

All three sub awardees have successfully installed solar generation capacity on their campuses. These systems have continued to produce power as they were built in locations compatible with campus master planning and have not been disturbed over time. The sites selected for solar installation in this project include ground mount systems, parking canopy systems and rooftop parking garage canopy systems within the framework of campus master planning and thus will remain permanent over their expected lifetimes. The selected sites for charging infrastructure will also remain permanent for the fleets that they will serve for the long term. The universities will build cost structures for internal charging to cover the depreciation of these charging systems so that they will be maintained and replaced at end of their lives. Purchased vehicles are primarily targeted to enable shuttle and facility vehicle electrification, consistent with each university’s goals to decarbonize operations. As these vehicles are rotated out of the inventory, they will be replaced with zero-emission vehicles.

* 1. Magnitude of reductions 2025-2050

The proposed projects are anticipated to reduce GHG emissions by a combined 55,577 MTCO2e by 2050. The proposed solar projects are anticipated to reduce GHG emissions by 46,446 MTCO2e by 2050, while the fleet electrification and charging infrastructure upgrades are anticipated to reduce GHG emissions by 9,130 MTCO2e by 2050.

We did not attempt to quantify the GHG emissions impact of the battery storage, however, we do anticipate that additional energy storage capacity can have a positive impact on reducing GHG grid emissions. In the solar and battery measure, batteries play a crucial role in enhancing grid reliability and emissions reduction. They act as a buffer, storing excess energy during periods of low demand and releasing it during peak demand. By providing rapid response capabilities, batteries help stabilize the grid and ensure a steady supply of electricity. They serve as a valuable demand response resource, allowing us to manage peak and low-demand hours. During peak hours, batteries discharge stored energy, reducing the strain on the grid and avoiding costly peak-time electricity purchases. Conversely, during off-peak hours when electricity prices are lower, batteries charge up. This optimization improves cost efficiency and grid performance.

We intend to enable carbon reductions through battery management of storage and discharge. The specific quantification of impacts is not available currently because we lack precise numerical measurements of the effects. In the future, we plan to achieve this by leveraging dynamic marginal emissions data and incorporating our battery operations to achieve this goal. This real-time approach maximizes the evaluation of the impact of load shifting decisions with data now becoming available through organizations like WattTime that provide 5-minute marginal emissions granularity, allowing us to capture rapid fluctuations charge when energy is clean and discharge when the grid is the most carbon-intensive. This enables us to respond swiftly to changes in grid conditions, ensuring that our interventions are timely and impactful.

Durability of GHG reduction measures—permanence

All three sub awardees have successfully installed solar generation capacity on their campus in previous decades. These systems have continued to produce power as they were built in locations compatible with campus master planning and have not been disturbed over time. The sites selected for solar installation in this project include ground mount systems, parking canopy systems and rooftop parking garage canopy systems within the framework of campus master planning and thus will remain permanent over their expected lifetimes. The selected sites for charging infrastructure will also remain permanent for the fleets that they will serve for the long term. The universities will build in cost structures for internal charging to cover the depreciation of these charging systems so that they will be maintained and replaced at end of life. Purchased vehicles are primarily targeted to enable shuttle and facility vehicle electrification consistent with the respective university goals to decarbonize operations. When these vehicles are rotated out of the fleet they will be replaced with zero-emission vehicles.

* 1. Cost effectiveness of GHG reductions
* Cost effectiveness of both measures (2025-2030): $48,418,105/14,462MT=$3,348/MT
* Cost effectiveness of solar and storage measure (2025-2030): $40,295,217/12,692.2MT= $3,1745/MT
* Cost effectiveness of Vehicle electrification and charging measures (2025-2030): $7,138,165/1769.8MT=$4,033.32/MT

Qualitative narrative explaining factors affecting cost effectiveness.

The cost effectiveness of the proposed solar and battery measure is primarily affected by four key factors. First, the three sub awardees have selected four different types of solar installations including, ground mount, parking lot solar canopies in low elevation desert environments as well as high desert snow load bearing solar canopies solar, and finally, parking garage solar canopies. Aside from the ground mount system, these other types are significantly more expensive per watt. The second factor affecting the cost effectiveness measures is the high cost of labor and materials at Northern Arizona University. The third factor is the application of sub awardee negotiated overhead rates to modified direct costs. Finally, we were unable to quantify the avoided grid emissions from the discharge of battery capacity at times when marginal emissions are greatest. We will manage these batteries to accomplish this goals but it is unquantified at this time.

The cost effectiveness of the vehicle electrification and charging measure is affected primarily by the high cost of battery electric buses and the high cost of associated charging infrastructure. The charging infrastructure does not reduce emissions but is the enabling infrastructure for the transition to a fully electrified fleet. Installed changing infrastructure will enable additional vehicle electrification through annual planned vehicle replacement and opportunistic funding opportunities that we hope to take advantage of to convert more vehicles to electric prior to 2030.

The one factor affecting the calculated GHG reductions from these measures is that we modeled these against a model of the carbon intensity of the grid decreasing over time if the utilities implement their planned plant retirements and lower carbon improvements. The GHG reductions would be larger if we had assumed the carbon intensity of the grid today for the purposes of the analysis.

* 1. Documentation of GHG reduction assumptions

Emissions reductions associated with these measures were developed using high quality, thorough and reasonable assumptions and comprehensive calculations that should be considered conservative. Our quantification of GHG reductions utilized GWP from the IPCC 5th AR to calculate CO2e reductions. For both the fleet electrification and solar and battery storage systems, modeled future grid emissions were based on the state’s GHG inventory and projections of planned coal plant retirements. This means that we did not project existing eGrid factors into the future, but rather used a model of future grid emission factors developed by Dr. Richard Rushforth for the City of Phoenix that incorporate a decrease in GHG intensity from planned coal plant retirements across the region. Because the state utilities have no regulatory mandate to decrease grid emissions, these calculations do not include their voluntary pledges for decreasing grid emissions. These future grid emissions factors used are documented in the detailed GHG reduction accounting spreadsheet.

On-Site Solar and Battery Storage

Future solar electricity generation was estimated from third party developers for each of the climates where these systems will be installed. Projects were assumed to begin operations in 2027 although some may come online sooner. Degradation of solar panels was assumed at 0.6% per year and the panels are assumed to produce energy through 2050. Emissions reductions from displaced grid electricity into the future were calculated against future modeled eGrid emissions.

Fleet Electrification and Fleet EV Charging Infrastructure

Current fleet emissions were calculated based on either actual 2023 mileage or 2023 fuel consumption by vehicle type (diesel buses, light-duty trucks/SUVs, and light-duty cars) and projected into the future for vehicles proposed to be replaced. Future emissions associated with the proposed fleet conversion were based upon the projected year in service and the grid emissions to power the planned replacement using the adjusted eGrid factors. These vehicles are planned to be replaced with zero emissions vehicles when they reach the end of their lifetimes and, it is likely that those replacements will be significantly more efficient than current models, thus the emissions reductions could be significantly higher but were not assumed in this model.

1. Environmental results
   1. Expected outputs and outcomes (co-pollution reduction)

The actions proposed by ABOR to be implemented at the three state universities will lead to significant environmental and social outputs and outcomes as follows:

Outputs:

Measure 4: On-site solar and batteries at universities

* + Number of solar installations & installed capacity
  + Number of battery storage installations & installed capacity

Measure 7: Zero Emissions Vehicles

* + Number of sites upgraded for electric charging
  + Number and type of EV chargers installed
  + Number of zero-emissions vehicles in operation
  + Number of areas upgraded for electrification
  + Number of EV chargers installed

Outcomes:

* Reduction in annual and cumulative metric tons of GHG emissions:
  + From 2025 through calendar year 2030 for both fleet electrification and on-site solar and batteries
  + From 2025 through calendar year 2050 for both fleet electrification and on-site solar and batteries
* Reduction in annual and cumulative CAP and/or HAP emissions overall as well as in low-income and disadvantaged communities specifically:
  + From 2025 through calendar year 2030 for both fleet electrification and on-site solar and batteries
  + From 2025 through calendar year 2050 for both fleet electrification and on-site solar and batteries
* Reduced exposure to hazardous air pollution or unhealthy ambient air quality
* Increased resilience to climate change impacts from on-site solar and battery storage
* Increased staff capacity to implement GHG reduction measures
* Engagement of campus community in living laboratory with these technologies
* Increased community awareness of clean energy technologies

Estimate Decreased CAP/HAPs for both measures

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **TOTAL** |  |  |  |  |  |  |
|  | SO2 (metric tons) | NOX (metric tons) | PM2.5 (metric tons) | PM10 (metric tons) | VOC (metric tons) | CO (metric tons) |
| **2025-2030** | 4.2 | 10.7 | 1.7 | 0.2 | 1.4 | 14.1 |
| **2025-2050** | 24.2 | 58.6 | 9.6 | 0.8 | 6.7 | 65.9 |

* 1. Performance measures and plans

ABOR and the three universities will closely manage and monitor all the proposed initiatives by convening quarterly project meetings, leading communications among the project team, monitoring project progress and performance, managing project costs, preparing, and submitting required reports, engaging faculty, staff, students, and community partners, and providing quality assurance and quality control (QA/QC) throughout the entire course of the implementation period.

The program evaluation plan will reflect the progress of the activities proposed in comparison with the outputs, outcomes, impacts, and timeline as defined in Sections 3.a and 3.c. Outputs will be measured by the amount or number of solar infrastructure, batteries, and EV chargers installed, and the number of electric vehicles and charging infrastructure procured, on time and within budget. Similarly, the number of metric tons of greenhouse gas emitted each year after the installation of the proposed features will be compared with the amount of GHG currently emitted, and the difference will provide an overall reduction in GHG as well as other criteria air pollutants and hazardous air pollutants. These metrics will be generated from each university’s annual GHG inventory process and classified by each measure. The results of these inventories will be shared with each campus community annually. To reflect the program’s impact, we will develop surveys for the community to measure and better understand the benefits of this program, in terms of the number of jobs created, reductions in energy costs, and student learning and integration of these technologies into academic programs and research. Program progress and performance will be evaluated quarterly and reviewed during project meetings.

* 1. Authorities, timeline and milestones

**Measure 4: On-site renewables generation and battery storage**

Authorities

* All three universities have the authority to install any equipment on university owned property, to enter into contracts with the necessary subcontractors, and to make purchases of all proposed assets.

Responsible Parties

* Arizona Board of Regents:
  + The Arizona Board of Regents will oversee the execution and reporting of the sub awards.
* ASU:
  + Capital Project Management Group is responsible for management of the procurement and construction process and will coordinate with the office of University Sustainability Practices to execute.
  + Energy Innovations (Gerald DaRosa) is responsible for managing technical aspects of the project, including technical management of engineering contractors.
* NAU:
  + Facility Services project management (Stephanie Bauer) will manage the procurement, contracting, and construction process and coordinate contractors.
  + Utility Services (Jordan Sundin and Erin McAnally-Trejo) will be responsible for managing technical aspects, and the siting of the solar and battery systems.
* UArizona:
  + University Facility Services manage all campus facilities, grounds, and utilities. They will be responsible for the siting of the solar and battery projects, and for the coordination and management of applicable contractors led by Christopher Kopach, Associate Vice President
  + Parking and Transportation Services manages parking garages and parking lots on campus, including the lots where the solar arrays, batteries, and EV chargers will be installed. Led by Jim Sayer, Executive Director

Timeline

November 2024-March 2025 (Months 1-5):

* + Complete permitting (Universities are Authority having Jurisdiction)
  + Complete preliminary engineering to finalize scope
  + Initiate and complete the RFP selection process

April 2025-November 2025 (Months 6-12):

* + Select construction contractors
    - Milestone: Complete engineering design by November 2025
  + Order major equipment (long lead items)
  + Initiate interconnect agreements with utility

December 2025-August 2027 (Months 12-32):

* + Lead time for major equipment.
    - Milestone: Receive all equipment by August 2027.
  + Procure balance of materials and equipment
    - Milestone: Mobilize and begin construction by July 2027

September 2027-November 2027 (Months 32-36):

* + Complete construction and commission all equipment
  + Finalize interconnection agreements with utility
  + Milestone: Commercial Operation Date by November 2027
  + Apply for IRA incentives

November 2024-November 2029 (Entire construction and reporting period)

* + Monthly reporting on status of construction throughout construction process
  + Quarterly meetings with ABOR and all sub awardees
  + Annual engagement and communication with university stakeholders and community members on project progress, outcomes and issues.
  + Reporting on GHG reduction performance at the end of Year 1, then annually throughout the five year reporting period

**Measure 7: Enable zero emission fleets**

Authorities

* All three universities have the authority to install any equipment on university owned property, to issue RFP’s, to enter into contracts with subcontractors, and to make purchases of all proposed assets.

Responsible Parties

* + - ABOR: The Arizona Board of Regents will be responsible for overseeing the execution and reporting of the sub awards.
    - ASU: University Fleet Management manages ASU’s facilities fleet and will be responsible for buying the proposed EVs and retiring internal combustion engine vehicles. Fleet Management will coordinate the purchase of new EVs with ASU’s University Sustainability Practices and Parking and Transit Services to ensure alignment with ASU’s EV strategy and data governance. Marc Campbell will lead these efforts.
    - NAU: Stephanie Bauer, Jordan Sundin and Erin Stam at NAU will be responsible for installation of charging infrastructure. Purchase of vehicles will be led by shuttle manager Rafael Rivera and fleet manager Matthew Mitchell at NAU.
    - UArizona: University Facility Services manages a facilities fleet, and they will be responsible for buying the proposed EV’s and decommissioning the replaced internal combustion vehicles. UFS will also be responsible for siting and project management for the installation of the various EV charging infrastructures. Parking and Transportation Services manages and operates the fleet of transit buses on campus. PTS will be responsible for the purchasing and subsequent maintenance of the new EX heavy-duty buses.
    - Christopher Kopach, Associate Vice President
    - Jim Sayer, Executive Director

Timeline-Enable zero emissions fleets

November 2024-May 2025

* UArizona and NAU, RFPs issued for the installation of EV charging infrastructure
* Selection of contractor
* Initiate purchasing of year one tranche of vehicles
* Milestone 1: Contractor selected

June 2025-November 2025

* Charging infrastructure installed
* Delivery of Year 1 vehicles
* Apply for IRA vehicle direct pay rebates
* Milestone 2: Charging Installation complete
* Milestone 3: Vehicles in service for Year 1

December 2025- November 2026:

* Purchase and delivery of year two vehicles
* Apply for IRA vehicle direct pay rebates
* Milestone 4: Vehicles delivered and in service

December 2026- November 2027:

* Purchase and delivery of year three vehicles
* Milestone 5: Vehicles delivered and in service

December 2027- November 2028:

* Purchase and delivery of year four vehicles
* Milestone 6: Vehicles delivered and in service

December 2028- November 2029:

* Purchase and delivery of year five vehicles
* Milestone 7: Vehicles delivered and in service

November 2024-November 2029 (Entire construction and reporting period)

* + Monthly reporting on status of construction and procurement
  + Quarterly meetings with ABOR and all sub awardees
  + Annual engagement and communication with university stakeholders and community members on project progress, outcomes, and issues.
  + Reporting on GHG reduction performance at the end of Year 1, then annually throughout the five year reporting period

1. Low-income and disadvantaged communities
   1. Community benefits

In 2023, the three universities under ABOR authority, collectively enrolled a total of 253,024 undergraduate students, representing broad socio-economic diversity. In alignment with ABOR’s strategic goals of access and affordability, 66,415 (32.2%) of these students received Pell Grants, with a total value of $289,620,107 and overall, 75% of enrolled undergraduates receive gift aid. Additionally, 51,477 (20%) represent first-generation college students, demonstrating each university’s commitment to admitting and supporting students from low-income backgrounds. The student body benefitting from this proposal is also diverse in terms of race and ethnicity with 51% classified as non-white, 25% Hispanic enrollment, and 1.4% Native American.

These socio-economic and demographic data reflect each university’s dedication to serving the diversity of the state with inclusive campus communities. They bring together students from diverse backgrounds, enriching the academic experience for everyone.

Each university is a federally recognized Hispanic Serving Institution, with additional programs to serve the needs of Native American students. These two communities are particularly vulnerable to climate change impacts in Arizona due to their close connection to the land and reliance on natural resources. By engaging with tribal and Hispanic communities, the universities not only contribute to climate resilience but also strengthen cultural ties and promote mutual understanding.

All three universities prioritize supporting Native American students on their educational journeys. NAU provides full tuition coverage for Native American students, regardless of their family income. Through the Access2Excellence (A2E) program, NAU extends this aid to members of Arizona’s 22 federally recognized tribes. ASU offers the American Indian Funding program, covering tuition and mandatory fees based on financial need. Similarly, UArizona provides the Arizona Native Scholars Grant (ANS), ensuring tuition and fees are covered for Native, Arizona resident undergraduates.

ABOR’s universities are embedded within their local communities and these actions will benefit not only the diverse student body each year but the neighborhoods encompassing and adjacent to the universities. (A full listing of each university census tracts is included as an appendix)

At NAU, located in Flagstaff, Arizona, the majority of the campus is not located in a CEJST disadvantaged census tract, but a portion of campus and an adjacent neighborhood (tract # 04005000800) is considered disadvantaged. The vehicles targeted for EV conversion replacement operate for up to 12 hours a day on NAU’s campus. Emissions exposure at campus bus stops is likely much higher than in surrounding areas. Emissions exposures are also likely higher for low-income students who do not own vehicles and walk, bike, or use the shuttle buses to commute between classes. The EJ index indicated that the campus and surroundings are in the 80-90th percentile for ozone and the 90-95th percentile for traffic proximity. Additionally, 95-99 percent of individuals are below 200% of the federal poverty line. Flagstaff in general is highly vulnerable to the effects of climate change with both campus census tracts assessed with over 90% share of properties at risk of fire and 77-92% at risk for flood in 30 years.

At University of Arizona, located in Tucson, Arizona, none of the census tracts encompassing campus are considered disadvantaged however adjacent census tracts are considered disadvantaged. Key concerns on campus tracts include in excess of 80th percentile for diesel PM exposure and 86-96 percentile of current asthma among adults. The campus is also in the 73-86 percentile for impervious surfaces which aggravates the urban heat island effect.

At Arizona State University, the majority of the campus is not located in a CEJST disadvantaged census tract, but a portion of campus and an adjacent neighborhood (tract # 04013319103) is considered disadvantaged. All census tracts containing ASU campuses affected by these measures have high levels of diesel particulate matter exposure over 90th percentile and 61-86th percentile for traffic proximity and one tract in 98th percentile for housing burden. Census tracts intersecting ASU also have 75-88% of impervious surface contributing to the urban heat island effect.

The integration of solar panels, batteries, and electric fleets will positively impact the communities surrounding each university. Some specific benefits include: 1. **Renewable Energy Generation and Reduction of Greenhouse Gas Emissions** to directly mitigate climate change and contribute to a cleaner, less polluted, and healthier environment for the surrounding community and those where fossil generating plants are located. 2. **Energy Storage and Grid Stability**: Pairing solar panels with battery storage systems enhances grid stability, reduces strain on the local power grid and improves overall energy resilience for the nearby residents. 3. **Cost Savings and Circular Economy**: Implementing these features will lower energy costs for the University, freeing up resources for academic programs, infrastructure, and student services and reducing pressure on tuition for low-income students. Additionally, investments in renewable energy infrastructure create jobs in installation, maintenance, and manufacturing, stimulating the local economy and providing employment opportunities for community members. 4. **Educational and Research Opportunities**: The proposed infrastructure will provide valuable educational and experiential learning opportunities for students and the community, promoting research, educational programs, and workshops on renewable energy and environmental stewardship. 5. **Improved Air Quality and Public Health**: Transitioning to electric fleets reduces air pollution and improves local air quality, leading to better respiratory health and overall well-being for community members, considering for example that at the University of Arizona more than 90 percentile of the adjacent community has asthma (CEJST Version 1.0). Additionally, by installing solar infrastructure, more shaded areas will be available to campus and community members to provide a relief from the intense heat (over 100F) during summer months - specially for vulnerable populations prone to heat-related illnesses-as well as making outdoor spaces more comfortable to foster community engagement, physical activity, and social interaction. 6. **Inspiration through Leadership and Innovation**: By adopting these initiatives the state’s public universities will demonstrate leadership in combating climate change and inspire other institutions, businesses, and community members to pursue similar sustainable practices. 7. **Resilience and Energy Independence**: Solar panels and batteries contribute to energy independence by diversifying the energy sources utilized. In the event of power outages or disruptions to the grid, solar energy can provide a reliable source of electricity, ensuring continuity in campus operations and serving as a community resource during emergencies.

In Arizona, where climate change impacts are acutely felt, state universities play a critical role in advancing climate awareness, resilience, and equity. By integrating solar panels, batteries, and electric fleets, the university communities set an inspiring example for sustainable practices and addressing local air pollution concerns.

Each university will monitor the efficacy of their actions in reducing GHGs and other air pollutants of concern in their annual reporting and potential impacts on diverse campus communities and downwind neighborhoods and communities.

* 1. Community engagement

Community engagement will occur on each of the university campuses for the implementation of this grant and will build on the engagement efforts each of the universities used to develop and implement their respective sustainability and climate action plans.

Through proactive collaboration meaningful dialogue and stakeholder participation, Arizona’s universities solicited advice, expertise, and perspectives of the community throughout their climate action planning process. To foster inclusivity, gather invaluable input, and ensure greenhouse gas reduction measures are both effective and equitable, Arizona universities continuously engage with the community and diverse entities including internal and external stakeholder groups, municipalities, counties, and non-governmental organizations.

Our strategies for engagement are multifaceted, reflecting our dedication to holistic and impactful approaches. First, we recognize the pivotal role of local municipalities in shaping climate action efforts. To facilitate this partnership, we will maintain regular communication channels with city officials, actively participate in city council meetings, and engage in relevant working groups or task forces focused on climate action resilience.

For example, NAU is engaged in the Northern Arizona Climate Partners, Arizona Forward Northern Council, the City of Flagstaff and Coconino County which brings together all important organizations working on climate action. This partnership is instrumental in aligning our climate action plan with the Flagstaff Climate Action and Adaptation Plan. By pooling resources, sharing best practices, and amplifying our collective impact, we can effectively reduce greenhouse gas emissions. NAU strategic goals are targeted for the university to have a social impact and engage the university community in addressing our region's challenges.

As part of the process to create the Sustainability & Climate Action Plan at the University of Arizona, members of the Office of Sustainability facilitated and participated in engagement sessions on how to create a plan that can be readily implemented and meaningfully addresses the University’s sustainability and climate challenges while also centering equity and the needs of not just the campus community but the Tucson community as well.

Arizona State University has been at the forefront of climate action and engagement for the state of Arizona. As part of that model of a “New American University,” ASU has developed institutional objectives to be socially embedded in our communities and to catalyze social change by being connected to social needs. This has been the backbone of ASU’s work with community partners and at-risk communities to develop climate solutions. The university has created numerous academic centers, such as the Knowledge Exchange for Resilience, to address environmental and energy justice issues, and help communities decarbonize in ways that meet their needs. Perspectives from those forums and interactions have helped inform ASU’s operational sustainability and community support.

Further, as a founding member of the Transportation Electrification (TE) Activator, a coalition of key regional stakeholders committed to advancing vehicle electrification for the benefit of all Arizonans, ASU works with partner municipalities (Tempe, Phoenix, and Mesa), utilities, corporations, and NGOs to empower all citizens to take part in the TE transformation and ensure the benefits of TE are shared equitably by all communities. Input received from all parties because of those efforts, especially at-risk and disadvantaged communities, has shaped ASU’s climate objectives and outcomes. ASU is currently developing a community stakeholder process to define the concept of a fully sustainable university. That inclusive effort will involve educating broad segments of the community about ASU’s sustainability vision and direction and inviting input to shape the next iteration of ASU’s sustainability goals, particularly around climate and air-quality issues. We also intend to continue working with the Transportation Electrification Activator and academic centers to advance and extend our support of climate equity.

Meaningful engagement with marginalized communities is at the heart of the state university’s climate action approach. We recognize that climate change disproportionately affects vulnerable populations. All sub awardees will host community forums to directly gather input from residents in low-income and disadvantaged neighborhoods as part of our monitoring strategy.

Our commitment extends beyond engagement; it encompasses the integration of stakeholder feedback into our decision-making processes. We will meticulously review feedback gathered from city officials, community members, and other stakeholders. Identifying common themes, concerns, and priorities will inform our decision-making and ensure alignment with community needs. We recognize that historical inequalities must be addressed, and university implementation of these measures should benefit marginalized populations by reducing exposure to air pollutants and reducing tuition pressure on low-income, first-generation college students. Establishing mechanisms for continuous dialogue is essential and each of the university sustainability offices will serve as the sub awardee points of contact to maintain open channels of communication to ensure that stakeholder input continues to shape our initiatives throughout the grant period.

The implementation of renewable energy and electric transportation initiatives will foster additional community engagement and collaboration between the university and local stakeholders. Community members will feel heard when these initiatives are implemented, promoting a sense of pride, while enhancing trust and cooperation. Furthermore, through active outreach and education opportunities such as workshops and training sessions about renewable energy and clean transportation technologies, the community will not only engage but also gain valuable experience and knowledge that can be transferred to other community members.

1. Job quality

The measures proposed will almost exclusively fall under the sourcing requirements set forth by the Build America, Buy America provisions of the Infrastructure Investment and Jobs Act (IIJA) as well as the prevailing wage requirements as determined by the U.S. Department of Labor. The universities will meet these requirements and will prioritize vendors that demonstrate strong environmental sustainability practices, support local and disadvantaged communities, and contribute to the advancement of clean and renewable energy technologies to the largest extent possible. Additionally, as fleet electrification occurs, we will work to provide training opportunities for employed mechanics to have the new skills required to maintain an expanded fleet of electric vehicles.

1. Programmatic Capability and Past Performance
   1. Past performance

The Arizona Board of Regents’ mission is to increase postsecondary access and attainment for Arizona students while addressing societal challenges via oversight of the three public universities: Arizona State University, University of Arizona and Northern Arizona University. ABOR has standing committees such as Strategic initiatives and Planning and University Governance and Operations that actively engage (along with board staff) grantees, manages the planning, implementation, metrics, reporting, oversight and reviews best practices for continuous improvement.

COVID-19 Pandemic Relief Funding:

* *Summary:* The Office of the Arizona Governor awarded funding from various Federal pandemic relief programs to the Arizona Board of Regents to further the agency’s educational mission and to advance the state’s postsecondary educational attainment goals as a key facet of economic recovery.
* *Reporting:*
  + The office has signed sub-grant award agreements with the Office of the Governor, responsible to provide program and financial updates to the Governor’s Office of Strategic Planning and Budgeting to support their compliance with Federal grant reporting requirements. All reports were submitted timely and per the terms of the program.
  + The office issues sub-grant award letters to the state’s public universities in order to further allocate the funds to specific programs. The office requires regular program and financial reporting from the universities in order to support the office’s reporting to the Governor’s Office.
* *CFDA numbers:*
  + Coronavirus State and Local Fiscal Recovery Funds (SLFRF)
  + GEER - CFDA 84.425R
  + EANS - CFDA 84.425C

Technology Research Infrastructure Funding:

* *Summary:* The Arizona Board of Regents receives funding from the State of Arizona’s Technology Research Infrastructure Fund (TRIF) to support public university research infrastructure and to invest in research that supports.
* *Reporting:*
  + The office issues grant agreements to universities for individual grant projects that cover program performance and financial accountability metrics.
  + The office receives annual reports from the universities related to project performance and publishes an annual report related to the overall grant portfolio. All reports were submitted timely and per the terms of the program.

Arizona Educational Attainment and Financial Aid Programs:

* *Summary:* The Arizona Board of Regents receives funding from the State of Arizona to support statewide educational attainment outreach and student financial aid programs that involve the participation of public and private postsecondary institutions in the state. These programs include:
  + Arizona Promise
  + Arizona Teachers Academy
  + Arizona Leveraging Educational Assistance Partnership
  + Arizona Teacher Student Loan Program
  + Arizona WICHE Student Exchange
  + Scholarship programs for Spouses and Dependents of Veterans and Law Enforcement and Correctional Officers
  + Veterinary Loan Assistance Program
* *Reporting:* The office enters into agreements with each participating institution related to program requirements, information sharing, and financial reporting. The office provides a variety of annual reports to the legislature, as outlined in each program’s guidelines, to present program and financial performance metrics. All reports were submitted timely and per the terms of the program.

Sub awardees’ Capabilities:

* ASU, NAU, and UArizona will be sub awardees on this grant and each have a long history, extensive staff, and infrastructure for managing large federal, state and industrial grants. In fiscal year 2023, the sub awardees have managed and successfully reported on over $2,192,000,000 in research and other sponsored project expenditures. The consistent success of the universities in securing significant federal funding attests to the quality of staff and the faculty to produce useful outputs and outcomes, meet reporting requirements, and maintain financial controls.
  1. Reporting requirements

EPA grants held by ASU, NAU, and UArizona are in compliance with EPA reporting requirements. The sub awardees have a long history of successfully working with the EPA and other federal agencies.

ABOR staff and the sub awardee key staff will provide semi-annual reports and a detailed final report. The semi-annual reports will summarize project outputs and outcomes, accomplishments, planned activities, and summary of expenditures. Sub awardees will also collaborate with ABOR to report on community engagement activities, mitigation of any environmental risks, and job quality. One year following the award and measures are being implemented, reporting will include quantification of GHG and co-pollutant emissions reductions, impacts on low-income communities as well as detailing planned and ongoing community engagement.

* 1. Staff expertise—

Bradley Kendrex, Ed.D., MPA

* Title: Vice President – Strategy, Administration, and Governance; Chief Financial Office
* Summary: Dr. Kendrex is an experienced chief financial and operating officer with 20 years of experience in public financial management. During this time, he has functioned as both a grantor and grantee, designing and navigating accountability requirements while ensuring that programs are executed according to funding agreements.
* Resume: Attached.

Ken Polasko, Ph.D.

* Title: Chief Research and Technology Commercialization Officer
* Summary: Dr. Polasko has 25 years of experience in project management in the development and commercialization of a wide range of technologies and a keen eye for linking research and innovation through higher education institutions
* Resume: Attached.

Kris Okazaki, MPA

* Title: Associate Vice President – Administration and ABOR Programs
* Summary: Ms. Okazaki has over 17 years of experience in governmental finance. Prior to her tenure with ABOR she oversaw a State agency’s 200-plus grants totaling over $1 billion, participated in the grant making process from application to audit. At ABOR she is responsible for numerous governmental and non-governmental agreements and contracts and oversees financial administration and reporting.

The Arizona Board of Regents’ team will be led by Dr. Kenneth Polasko and supported by domain experts financial and program management resident at ABOR. He will lead this initiative in close coordination with the sub awardees including the respective sponsored projects offices and the lead sustainability officers to track implementation, financial controls, and reporting.

NAU’s project team spans facilities, fleet operations, utilities, academics, and the office of sustainability. The project will be led by Dr. **Erik Nielsen**, NAU’s Chief Sustainability Officer who has led the expansion and growth of the office in his 1st year in the position. His primary role is to lead NAU’s efforts to decarbonize operations and reach carbon neutrality by 2030. **Stephanie Bauer**, Associate Vice President for Facilities, will oversee facilities projects for the installation of Solar, Battery and charging infrastructure. **Erin McNalley-Trejo**, energy and water manager and **Jordan Sundin**, our acting utilities director, will be engaged in the installation of EV charging and integration of solar and battery projects with existing utilities. **Dayna Cook** serves as the Office of Sustainability’s Data Analyst and manager responsible for measuring and monitoring NAU GHG inventory and other sustainability metrics. Dayna will serve as the point person tracking the effectiveness of the proposed measures.

NAU Transit Services is responsible for operating our shuttle buses and the conversion of our fleet to electrical vehicles. **Erin Stam** manages the budget for all fleets on campus with extensive procurement and multi modal transportation promotion as well as project management for our current commuter EV charging infrastructure. **Rafael Rivera** is the assistant director of the shuttle services with experience in business logistics and customer service. **Matthew Mitchell** is NAUs Fleet Manager and Assistant Director of Transportation services manager with nearly 13 years fleet procurement, operations, and maintenance.

UArizona’s project team consists of staff from the Office of Sustainability, University Facilities Services (UFS) including utilities, energy management, and design/construction, and Parking & Transportation Services (PTS). The project will be led by **Trevor Ledbetter**, the Senior Director for the Office of Sustainability, who has led the department for the last 5.5 years and whose primary role is to manage the integration and growth of sustainability and climate action efforts across the University. Trevor and his team will implement this project and will be responsible for measuring and verifying the greenhouse gas reductions that result from the project and ensuring the proposed timeline, milestones, and measurables are met and reported back to ABOR.

**Christopher Kopach**, Assistant Vice President of University Facility Services, oversees all campus facility operations and utility services and has led the department for nearly 15 years. Chris will manage the solar, battery, and electric vehicle charger installation projects and the purchase of the 29 light-duty electric vehicles that will replace UFS internal combustion fleet vehicles.

**Jim Sayre**, Executive Director of Parking & Transportation Services, manages all parking and transit services, including the on-campus transit system (Cat Tran). Jim will be responsible for supporting the installation of solar, battery, and EV charger installation projects as all proposed projects will be sited on surface parking lots. Jim will also purchase the heavy-duty electric buses for use in their fleet.

**Ryan Goodell**, Vice President for Facilities, Operations, & Campus Planning, will be engaged in the administrative management of all projects and in coordinating with additional campus units needed to administer the grant. Ryan is a member of the university’s senior leadership team and can secure final review and approval of all proposed projects.

ASU’s project team will be led by Marc Campbell, Assistant Vice President (AVP) of Sustainability, and Gerald DaRosa, Director of Energy Innovations. They will draw upon support and expertise from multiple units within the Business and Finance Office of the university, including Facilities Development and Management, Energy Initiatives, Parking and Transit Services, and University Sustainability Practices.

**Marc Campbell** serves as the AVP of Sustainability and Deputy Chief Sustainability Officer. He is responsible for the development and implementation of ASU’s sustainability strategy, including decarbonization, and has extensive experience directing fleet electrification. **Gerald DaRosa** serves as the Director of Energy Innovations and oversees the university’s procurement strategy for energy resources, including onsite solar development and contracted renewable energy. **Jonathan Eastmond** is Associate Director of Energy Innovations and has an extensive background in renewables consulting, power generation, and energy conservation. He will be responsible for managing solar and battery storage project implementation and data tracking from those systems. **Alex Davis,** Assistant Director of Sustainability, serves as co-lead in the development of ASU’s sustainability strategy, including electrified fleet transition, and will be responsible for electric vehicle data and metrics.

1. Budget and Timely expenditure of grant funds
   1. Budget detail

The Arizona Board of Regents (ABOR) serves as the state's governing body overseeing its public universities Arizona State University, Northern Arizona University, and the University of Arizona. ABOR's primary goal is to ensure effective oversight of resources to support the three institutions' goals and activities. For the purpose of this grant, ABOR is serving as a pass-through entity.

The majority of the budget resides at the three universities, sub awardees, where the projects will be staffed, planned, contracted, and implemented. ABOR's budget is primarily focused on a centralized program management team that will help facilitate the coordination of the projects at the three Arizona public universities. ABOR's team will work with experienced teams at the universities to deliver the project on time and within budget.

ABOR along with the three university sub awardees is committed to effective stewardship, financial management, and project execution. This strategic investment, along with effective management will serve the future needs of Arizona, stakeholders, and society.

**ABOR Budget Detail**

**PERSONNEL:**

Two ABOR personnel will commit 7.2 months of effort and primarily be responsible for monitoring, coordination and management with sub awardees, assisting in joint procurement efforts, pollution reduction monitoring and effectiveness of measures implemented by sub awardees, tracking milestones with sub awardees and expenditures, and semi-annual reporting to EPA and the Arizona Board of Regents. The budget is estimated based on an expected base salary of $70,000.

**FRINGE BENEFITS:**

The fringe benefit rate for the two individuals is 27.91% for all years of the project.

**EQUIPMENT:** N/A

**TRAVEL:** N/A

**PARTICIPANT SUPPORT:** N/A

**OTHER DIRECT COSTS:**

***Subawards***

We will have a subaward to Arizona State University in the amount of $14,984,000.

We will have a second subaward to Northern Arizona University in the amount of $16,423,602.

We will have a third subaward to the University of Arizona in the amount of $16,412,061.

Their budget breakdown and work details can be found in the attached budget narrative and itemized list of equipment.

**INDIRECT COSTS:**

The total amount of indirect costs requested are $61,220

Indirect costs are calculated on Modified Total Direct Costs (MTDC) using the 10% de minimus rate. MTDC includes salaries and wages, fringe benefits, materials and supplies, services, travel, and the first $25,000 of each subaward. Exclusions from MTDC include graduate student tuition remission, participant support, facility rental, subawards over the first $25,000, capital equipment, and scholarships/fellowships.

Given that ABOR is serving as a pass-through entity, we have apportioned the direct and indirect costs of each sub award and ABOR management costs and indirect costs to each of the two measures addressed in this proposal for the following breakdown of the overall budget by measure.

|  |  |
| --- | --- |
| **Measure** | **Cost** |
| AZ PCAP measure 4: Onsite Solar and Batteries | $ 40,295,217 |
| AZ PCAP measure 7: Fleet Electrification and charging infrastructure | $ 7,138,165 |
| Total | $ 48,418,105 |

* 1. Expenditure of awarded funds

ABOR and the Comptroller’s Offices for each sub awardee maintain accounting standards in compliance with federal regulation while the sub awardees’ Offices of Sponsored Projects oversee project reporting, expenditure tracking, and cost share. Grant funds will be managed and distributed according to University Cost Principles and following the timelines established in the proposal.

Each university’s ongoing compliance for sponsored projects (ensuring that all costs charged to sponsored projects are reasonable, allocable, necessary to the project, and comply with all funding statute requirements) provides this assurance, as do the results and outcomes of our most recent annual A-133 Statewide Single Audit (involving all three ABOR institutions) – conducted by the State of Arizona Auditor General’s Office.

Each of the sub awardee PIs and ABOR will receive monthly status of account reports from the respective Office of Sponsored projects to monitor spending and trends in spending consistent with the scope of the sub awards. These frequent updates allow for controls and procedures such that awarded grant funds will be expended in a timely and efficient manner within the grant period.

* 1. Reasonableness of cost

Costs included in the budget are driven primarily by the sub awardee budgets. We have included a detailed budget justification for the ABOR expenses as the pass-through entity and for each of the sub awardee budgets to demonstrate the reasonableness of the cost estimates. We have also included an itemized listing of all equipment proposed in the sub award budgets. Each sub awardee based its budget on estimates provided from solar and battery vendors and current electric vehicle and charging quotes. Each sub awardee will use competitive bidding to obtain the highest value for delivering the proposed outputs and outcomes across both measures.