

Technical Volume
2813-1505
New Buildings Institute
Resilient Southwest Building Code Collaborative

DE-FOA-0002813

Project Location: Arizona statewide; New Mexico statewide; best practices shared across Southwest states and jurisdictions.

Interest Areas Addressed: State and Local Code Adoption; Workforce Development; Implementation and Compliance; Innovative Approaches; Equity, Energy and Environmental Justice; Partnerships

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Team Organizations: International Code Council (ICC); LISC Phoenix; Southwest Energy Efficiency Project (SWEEP); Urban Sustainability Directors' Network (USDN); CUADRO Design; Quest Energy Group

State and Local Partners: Arizona Governor's Office of Resiliency; New Mexico Energy, Minerals, and Natural Resources Department; City of Albuquerque, NM; City of Avondale, AZ; City of Flagstaff, AZ; City of Glendale, AZ; City of Las Cruces, NM; City of Mesa, AZ; City of Phoenix, AZ; City of Scottsdale, AZ; City of Tempe, AZ; City of Tucson, AZ; Coconino County, AZ

A. PROJECT OVERVIEW

Unique climate challenges face the southwestern United States, where major population centers are subject to extensive and extreme heat, making the largest source of energy demand mechanical cooling. Additionally, water and energy are more tightly intertwined than in other regions. Glen Canyon Powerplant and Hoover Dam combined generate around nine billion kilowatt-hours of hydroelectric power each year for use in Arizona, California, Colorado, Nevada, New Mexico, and Utah. More than three-quarters of the water supply in Arizona comes from either the Colorado River or groundwater pumping – energy intensive ways to secure water. With water levels on the Colorado River declining due to overconsumption and a changing climate, this dual supply of power and water is at risk for more than six million people.

The Resilient Southwest Building Code Collaborative, which formed out of a November 2022 convening of eight Arizona cities to develop the core concepts proposed here, represents a growing partnership between Arizona and New Mexico communities, with support from a wide range of technical, workforce development, and community-based partners. The structure of the Collaborative for the purposes of this project has been established as follows:

The Collaborative Structure		
Core Project Team	Committed to a substantial role that will be memorialized in a Memorandum of Understanding if funded.	New Buildings Institute (NBI; applicant), International Code Council (ICC), LISC Phoenix, City of Tucson
Beyond the core project team, the Collaborative includes:		
Technical Partners	Partners committed to participating in the project (funded and unfunded).	Southwest Energy Efficiency Project (SWEEP), Urban Sustainability Directors' Network (USDN), CUADRO Design, Quest Energy Group, Institute for Energy Solutions (IES), U.S. Green Building Council (USGBC), Arizona Construction Trades, Sustainable Cities Network (SCN)
Jurisdictional Partners	State and local agency partners participating in the project in a specified manner per their Letters of Commitment.	Arizona Governor's Office of Resiliency; New Mexico Energy, Minerals, and Natural Resources Department (EMNRD); City of Avondale, AZ; Coconino County, AZ; City of Flagstaff, AZ; City of Glendale, AZ; City of Las Cruces, NM; City of Mesa, AZ; City of Phoenix, AZ; City of Scottsdale, AZ; City of Tempe, AZ
Community Benefits Partners	Community-Based Organizations (CBOs) and Workforce Development partners per Partnership Letters. Precise roles will be refined during the initial phases of project.	Wildfire AZ, Unlimited Potential, Sonora Environmental Research Institute (SERI), Cihuapactli Collective, Foundation for Senior Living (FSL), Retail Arts Innovation Livability Community Development Corporation (RAIL CDC), Coconino Community College, Mesa Community College, Pima Community College, Gateway Community College
The Collaborative intends a transparent and inclusive process and supports additional organizations and jurisdictions joining the project. The team will continue, post application, to seek additional participants.		

PROJECT GOAL. The collective local action proposed is intended to improve consistency between jurisdictions in their adoption of advanced building codes and reduce the burden of implementation by the building industry. A shared model code and implementation guide, enhanced training opportunities, supported by extensive stakeholder engagement, are expected

to make the broad adoption of more energy efficient codes more accessible and feasible across the region.

IMPACT OF DOE FUNDING. For this collaborative, existing national guidance on sustainability and net zero energy construction has limited utility. Much of the federal and non-profit guidance around net zero energy buildings is based on heating being the largest energy demand. While issues of water efficiency are addressed in many sustainability codes, none aid in understanding the impact of the massive operational emissions that come from delivering water. As a result, southwestern communities need to develop a regionally appropriate version of national model codes to effectively address these energy and water efficiency and climate resilience challenges. The scope and scale of this project require external funding to successfully implement as it is beyond the purview and budgets of individual cities, but it is also necessary to achieve the collaboration and broad stakeholder engagement needed for statewide action without the benefit of state-level involvement in building codes. The funding also supports meaningful engagement, above and beyond a typical building code development and adoption process, by allowing financial support to grassroots community organizations that are essential to minimizing harms and guiding benefits to disadvantaged communities but are typically asked to provide their input for free. Funding this collective action creates a critical mass that is attracting involvement from communities in other states.

B. TECHNICAL DESCRIPTION

RELEVANCE AND OUTCOMES. The Collaborative represents a partnership between a growing number of Arizona communities, the population of which currently totals just under half (47%) the state's population, and communities in New Mexico. The project has four main objectives, underlain by guiding principles that the process and outcomes are holistic, scalable, equitable, and innovative:

- 1. Expand equitable public engagement** to reflect input of those who design, construct, and use buildings, and especially those whose health, safety, and financial state are most impacted by the quality of the buildings they use. An equity advisory panel will be established to provide guidance throughout the project and ensure underrepresented voices are adequately heard and respected. By working with community-based organizations (CBOs) that support disadvantaged communities, the project will incorporate community goals around equity and resilience into the proposed outcomes through extensive and transparent public engagement. The Community Benefits Plan lays out in more detail how this project intends to work with community-based organizations and disadvantaged communities to ensure this involvement. Supporting disadvantaged communities is not simply about addressing these broader concerns in the development of building codes. To ensure meaningful, relevant, and equitable planning processes tied to the development of technical codes and the workforce curricula, the project team will contract with CBOs to assist in guiding the code development process to ensure that meaningful benefits accrue to disadvantaged communities. Several project collaborators have recently been awarded grants, both through DOE and philanthropic sources, to undertake work that will help inform this proposed project including identifying strategies to bolster energy security in disadvantaged and energy-burdened neighborhoods and tying health outcomes more explicitly to weatherization efforts. The latter will build a case for healthcare funding to

supplement energy efficiency improvements above and beyond the traditional weatherization program limitations. Smaller and more resource-constrained jurisdictions often do not have the means to develop their own climate action or equity plans. This project will provide a template for these jurisdictions to achieve equitable energy standards and climate resilience through building codes. Under the leadership of LISC Phoenix, community partners will work with grassroots community groups to promote influence on and acceptance of updated building energy codes, address barriers and challenges to engagement, and understand where more efficient building energy codes can make the biggest impact in housing and businesses expenses. Recognizing that lived experience is just as important as professional staff participation, participants will be provided stipends for their involvement and their contributions will be validated through transparent, clear, and culturally relevant communication.

2. Develop regional climate codes by focusing on climate resilience, energy equity, and housing affordability. Considerations including energy use intensity, thermal comfort, and passive survivability will factor into code development. The project team will engage technical advisory groups assembled from design, engineering, research, and local government experts to aid in establishing the basis for the codes and roadmap. The codes will be supplemented by (1) an Extreme Heat Appendix that will seek to maximize resilience to urban heat island and climate change-driven extreme heat events, (2) a Green Existing Buildings Appendix that will more carefully tailor elements of the International Green Construction Code (IgCC) to existing buildings and build on existing grant-funded efforts to bolster energy security in disadvantaged and energy burdened neighborhoods, and (3) a net zero energy roadmap, using the custom southwestern amendments as the basis. Getting to net zero energy in an affordable fashion will require a balance of tried-and-true building techniques, including those informed by indigenous populations, and cutting-edge innovations that focus on reducing the cost of energy efficiency advances. Currently identified project resources include firms that specialize in large-scale and innovative green construction in the southwest, others that draw from their multi-generational heritage in the region and focus on affordability in green construction and retrofits, and researchers that are expanding the knowledge base around how to build sustainably in cities prone to extreme heat and water challenges. This project, for example, will leverage the work of the Southwest Urban Corridor Integrated Field Laboratory (SW-IFL), recently funded by DOE, to inform the expected outcomes. Researchers with SW-IFL have offered to serve on technical advisory panels for this project, and multiple jurisdictional partners serve on a SW-IFL stakeholder advisory group, both of which will ensure cross pollination between the projects. All technical documents will be reviewed with community stakeholders to ensure it builds on and continues to address concerns raised in the public engagement process.

3. Develop a living implementation guide including best practices, tools, and other resources to help communities undertake adoption and implementation of advanced building codes. The guide will cover processes related to adoption, equitable engagement, and code compliance and implementation. Resources may include cost assessments, illustrated guides, draft job descriptions for energy and green code review and inspection staff, lists of certified third-party companies, and a draft RFP for third-party energy reviewer services. As jurisdictions adopt the model code, their experience will be used to refine the guide. A major partner on this portion of

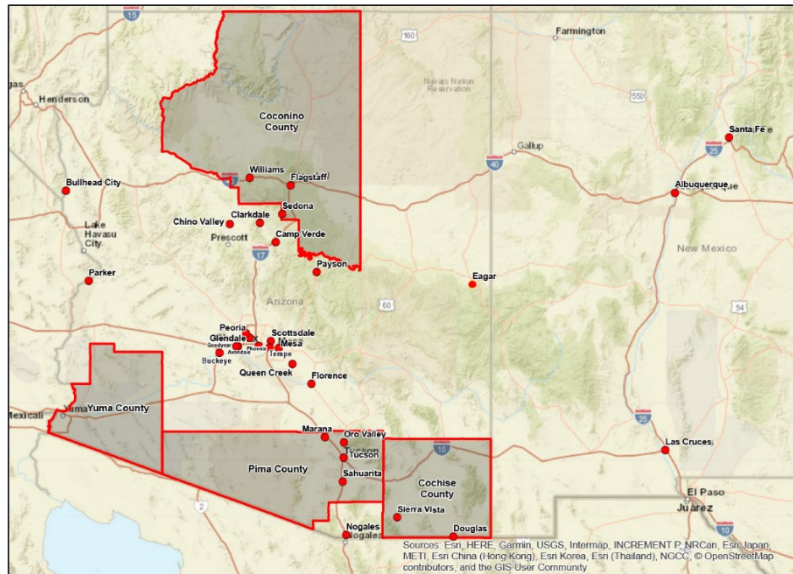
the project, the City of Scottsdale, which adopted the 2021 IECC and IgCC as mandatory code in December 2022, sees compliance with advanced energy codes as a key current challenge. As a partner on this project, they are working to identify how to improve their review and enforcement capabilities and, based on that experience, help guide the development of resources and training to support other jurisdictions. The Institute for Energy Solutions at the University of Arizona is seeking permission to provide matching funding to jointly support a position to assist with the development of the implementation guide. By reviewing models for this project, such as the LaHouse Home and Landscape Resource Center through LSU's College of Agriculture, the aim is to create a repository of trusted information that supports people and jurisdictions across the spectrum of adoption and implementation.

4. Develop an enhanced energy, equity, and climate resilience workforce curriculum to improve code compliance, expand access to building related job opportunities for marginalized communities, and build a stronger pipeline of construction and trades workers, particularly among urban youth, tribal youth, and marginalized individuals to address both a rural building and trades resource gap and labor shortages that are contributing to a statewide housing affordability crisis. LISC Phoenix will lead the effort to engage existing workforce development entities, such as community colleges, to address this workforce gap. For example, the project will amplify existing programs and resources at Coconino Community College that were enhanced using now-lapsed ARRA funding that can serve as a model for workforce development in rural communities that face real constraints to adopting newer codes due to a lack of local building-related services such as blower door testing. LISC will also focus on the key role tribal youth can fill in this type of workforce development. SWEEP will develop educational materials aimed at youth from more urban focused disadvantaged communities, and marginalized individuals, such as the recently incarcerated, to educate them on the opportunities for and advantages of a building industry career. This education will be paired with surveys to identify points of appeal that can be used to develop resources to better support the engagement of these communities.

One major focus of the Collaborative is to support communities regardless of where they are currently on the code adoption spectrum and to ensure the outcomes of this work will be accessible to all communities. This includes developing building codes that reflect the range of community priorities such as greenhouse gas emission reduction, climate resilience, energy equity, and housing affordability. A code that emphasizes the climate realities of the southwest needs to include considerations such as energy use intensity, thermal comfort, passive survivability, indoor air quality, and use of captured or recycled water. The work proposed in this application is intentionally structured to provide the necessary and diverse support to a wide variety of communities engaged with the Collaborative. Some jurisdictions are ready to move to the 2024 I-Codes, including Tucson; others have already adopted the 2021 I-Codes, such as Scottsdale, and are now focused on ensuring compliance; some have ambitious goals for moving to net zero energy construction, like Flagstaff; while others are not sure whether they have the resources, capacity, or political support needed to move beyond their current codes. The proposed project will develop a pathway for communities to transition building construction to net zero energy, while emphasizing affordability, energy equity, climate resilience, and innovation, by: supporting cities ready to adopt the 2024 ICC model codes, including the IECC;

providing a pathway for cities with stronger commitments to transition to net zero energy and resilience based codes; and providing resources and training to help other communities adopt more advanced codes sooner than they would have otherwise.

The Collaborative believes it is better to encourage action by other communities through reducing barriers versus setting minimum standards for participation. While formal involvement of communities is desired, as indicated by a Letter of Commitment, additional jurisdictions are welcome to participate in this project regardless of whether they were able to make that level of commitment. The Collaborative held a stakeholder meeting prior to submission of the



application to solicit input on the proposal and encourage additional organizations to participate if the project is funded. A total of 37 jurisdictions either participated in developing the proposal or registered for the stakeholder meeting and either attended or received the meeting recording. These include 16 Arizona and three New Mexico cities, 12 Arizona towns, four Arizona counties, and two Arizona Tribes.

FEASIBILITY. Jurisdiction partners assembled for this project represent most areas of Arizona and bridge into New Mexico. The jurisdictional partners represent a range of community sizes (from the largest city in Arizona to a rural county of 145,000 residents), climates (from low desert cities to high desert mountain communities), economic conditions (7.3% to 23.4% poverty), and demographics (less than 20% to more than 67% non-white; median age from 25 to nearly 60). Collectively, they have commitments to improve the energy and water efficiency of their building stock, mitigate climate change by reducing greenhouse gas emissions, adapt to the unavoidable climate impacts facing the region, advance community equity, and improve the availability of safe and affordable housing. In support of these commitments, these partners have formed the Collaborative to drive significant action for increased sustainability in the region and have the necessary political and practical experience to advance solutions from the Collaborative at the local level to prove viability.

A key risk acknowledged by the Collaborative is that proactive, progressive action by Arizona cities can lead to preemption by the legislature. The Collaborative acknowledges this risk but feels that not moving toward net zero energy buildings will result in significant harm to communities. The recently elected state administration, especially with the announcement of an expanded energy agency, appears to be creating a more supportive atmosphere for this work. Building industry representatives have expressed some concern over the potential cost impact

of adopting more stringent energy codes. The Collaborative was formed on the very notion that collective action will create consistency across each jurisdiction's codes, which helps mitigate potential cost increases. Also, broadening the voices represented at the table and placing a clear focus on affordability will shift the dialogue around this code amendment and adoption process in a way that facilitates more sustainable outcomes by demonstrating that the industry's concerns are an important consideration in the project. The benefit of many partners is coupled with the risk of effectively managing their individual contributions to the project.

A major strength of this project is that most participating jurisdictions have committed cross-disciplinary teams from both sustainability and building programs. The building staff bring knowledge of building codes, experience with code amendment processes, and relationships with building industry stakeholders. These partners are also able to engage their local building code boards or commissions in the project, increasing buy-in and the likelihood of model code adoption. The sustainability staff bring training in equity, including how it relates to buildings; knowledge of climate risks and resilience; and relationships with community-based organizations, including those that work with disadvantaged communities. This partnership of sustainability staff, including specialists in energy and water conservation and climate planning, and building staff, offers an opportunity to expand the considerations typically part of a local code adoption process to focus explicitly on other key community values such as energy equity, housing affordability, and comfort and safety of residents in extreme heat. Energy burden and insecurity need to be central considerations in the development of building codes. As electricity becomes cleaner and more buildings are electrified, arguments for energy efficiency based solely on greenhouse gas emission reductions are weakened. To reach climate resilience and equity in buildings, it is essential that code development also focuses on cost burden and associated health risks that are unrelated to electricity's carbon intensity.

The strength in numbers approach taken in this project is intended to make it easier for more communities to adopt by offering a shared template that is published by an entity, ICC, that is familiar to and trusted by all building departments. The additional support for adoption and implementation of the code by providing resources and training that will be available to jurisdictions outside of this formal partnership will also increase the likelihood of broad adoption.

IMPACTS. A core element of the project includes the local jurisdictional partners that adopt and implement codes. These partner jurisdictions are all considering adoption of the 2021 or 2024 I-Codes, including the IECC, or have recently adopted the 2021 IECC. According to the DOE impact calculator, if half the population of Arizona (the size of the Collaborative to date) updates to a combination of the 2021, 2024 or custom southwest codes for new construction, the project will achieve **an energy cost savings of \$533,504,200 and CO2 reduction of 2,647,000 metric tons over five years.** Aligned with the PNNL reports on AZ and NM code updates, **this should produce over 30,000 new jobs.** Additionally, if a quarter of the population of Arizona adopted provisions related to existing buildings, the project will achieve an **additional savings of \$1,884,700,000 in energy cost and 10,308,000 metric tons of CO2 over five years.** This is a **combined savings potential of over 2.4 billion dollars and 12.9 million metric tons of CO2.** The Collaborative will look to expand its impact to cover all of Arizona and New Mexico, and neighboring states and

jurisdictions, to provide greater resilience benefits to the residents and business owners across the southwest.

An additional impact of this work will be avoided health impacts of extreme heat. According to the Arizona Department of Health Services, from 2015 through 2019, Arizona averaged 2,870 emergency room visits and 685 hospitalizations per year due to heat-related illness. In 2021, there were 338 heat-associated deaths in Maricopa County alone; a 69.8% increase from 2019. Approximately 84% of these deaths involved homes with a non-functioning air conditioner, the electricity to the home being turned off, or the occupant not using a functioning air conditioner. These statistics point to the increasing energy insecurity of low-income households that struggle to maintain their homes and afford basic utilities. By focusing on equity and climate resilience in tandem, the project can reduce mortality and morbidity associated with extreme heat, improve health outcomes related to indoor air quality, and reduce the financial strain of utility bills.

C. WORKPLAN

GOALS AND OBJECTIVES. The primary goal of this project is to transform building construction practices across the southwest to achieve highly efficient and climate resilient buildings and communities while preserving affordability and regional characteristics, through the development and implementation of equitable and resilient technical, education, and workforce solutions.

TECHNICAL SCOPE AND TASK SUMMARY. The proposed project is four years in length, broken out over three budget periods and eleven tasks (one project management task and ten project delivery specific tasks). Each budget period is focused on a core set of tasks and milestones to advance the Collaborative's impact across community, workforce, and traditional building code and policy stakeholders. The proposed project does not involve the construction, alteration, or repair of infrastructure in the United States. The scope is proposed as:

Task 1.0: Project Management and Planning. NBI will oversee all project management, develop, maintain, and implement the project in accordance with a Project Management Plan (PMP).

Budget Period 1 Scoping, Assessment, and Engagement (M1-18)

Engage in creating necessary infrastructure to ensure project success and long-term impacts.

Task 2.0: Developing Inclusive and Equitable Engagement. Develop engagement plan, infrastructure, and relationships needed. Engage community groups to influence codes updates, address barriers and challenges, and understand biggest impacts in expenses, comfort and other identified priority areas. Develop a plan and website to provide transparency and support engagement, including a body to provide guidance throughout the project.

Task 3.0: Scoping Resilience Codes. Establish technical infrastructure and solicit input from local jurisdictions. Establish and convene Technical Advisory Groups (TAG) to support the development of the resilience codes. Assess current code status and goals around energy and water efficiency, climate resilience and equity to refine the scope of resilience codes.

Task 4.0: Baseline Education and Assessing Implementation Needs. Begin education on 2021 IECC for recently adopting and interested jurisdictions and stakeholders. Identify challenges with

enforcement and implementation of energy codes and assess resource needs across stakeholder groups. Determine resources to support energy and resilience code implementation.

Task 5.0: Workforce Training Assessment and Partnerships. Survey stakeholders on anticipated staffing needs for code implementation, existing curricula and opportunities for improvement, and barriers to entry to the industry. Complete workforce assessment report and begin development of curriculum.

Budget Period 2 Developing Codes and Implementation Resources (M19-36)

Execute community engagement plan, refine workforce training curriculum, and develop full content of southwest resilient codes suite.

Task 6.0: Execute Community Engagement plan. Community engagement will focus on execution of community engagement plan as well as engage community to comment on the development of resilience codes and workforce programming to ensure needs are met. Engage community groups to influence updates of building energy codes, address barriers and challenges, and understand where codes can make the biggest impact in expenses, comfort and identified priority areas.

Task 7.0: Develop Resilience Code(s). Amend 2024 model codes to address regional climate risks and support equitable development including amendments to 2024 I-Codes, Extreme Heat and Green Existing Buildings Appendices, and Net Zero Energy Roadmap.

Task 8.0: Code Education and Implementation Resources Development. Develop living implementation guide resources to support implementation of energy and resilience codes. Continue education with 2024 IECC.

Task 9.0: Workforce Training Curriculum and Pilot. Finalize workforce development program curriculum that targets disadvantaged communities, focusing on direct and train-the-trainer methods. Pilot early training modules to refine curriculum and approach.

Budget Period 3 Building Implementation Capacity (M37-48)

Launch living implementation guide and deliver education and workforce training.

Task 10.0: Building Implementation Capacity. Launch living implementation guide and education sessions including best practices, tools, education, and other resources to help communities undertake the adoption and implementation of advanced building codes. Deploy education to participating jurisdictions, communities, and industry for code amendments and appendices. Engage with state governments to ensure resources developed are embedded in state policy planning after the project closes. Provide access to codes and certifications for participating jurisdictions and workforce and equity partners.

Task 11.0: Training to Build the Workforce. Complete workforce training curriculum with first round of trainees. Connect successful participants with local jurisdictions, businesses, firms, contractors, trade organizations, job recruiters.

Milestone Summary, Go/No-Go Decision Points and End of Project Goal

Milestone	Description	Verification Process	Timeline
TASK 1: Project Management			

MS 1.1	Complete project management plan	PMP provided to DOE	Q1
MS 1.2	Ensure continuation application approved	Application provided to DOE	Q5
MS 1.3	Ensure continuation application approved	Application provided to DOE	Q11
TASK 2: Develop Inclusive and Equitable Engagement			
MS 2.1	Establish and Convene Advisory Panel	Roster and minutes provided	Q2
MS 2.2	Launch project website	Link and web content provided	Q2
MS 2.3	Complete community engagement plan	Draft document provided	Q5
MS 2.4	Contract with CBO partners	LOC for partnership provided	Q6
MS 2.5	Facilitate cross-partner meeting	Agenda, attendance, minutes	
TASK 3: Scoping Resilience Codes			
MS 3.1	Establish TAG	Roster provided	Q2
MS 3.2	Complete 12 TAG meetings	Minutes provided	Q6
MS 3.3	Complete scope for resilience codes	Scope document provided	Q5
TASK 4: Baseline Education and Assessing Implementation Needs			
MS 4.1	Complete 6 2021 trainings	Attendance records provided	Q3
MS 4.2	Complete education and training report	Report provided	Q5
MS 4.3	Finish implementation guide framework	Framework provided	Q4
TASK 5: Workforce Training Assessment and Partnerships			
MS 5.1	Complete program assessment report	Report provided	Q4
MS 5.2	Establish workforce partnerships	LOC for partnership provided	Q3
MS 5.3	Draft workforce training curricula	Curricula provided	Q6
M18/Q6: Go/No-Go Decision Point. If the project team is not able to complete the resilience codes (MS 5.2, 5.3, 5.4), draft resources and course curriculum (MS 7.1 and 7.2) and workforce training pilot has begun (MS 9.2), the project will not be able to sufficiently move to BP3.			
TASK 6. Execute Community Engagement plan			
MS 6.1	Complete 6 meetings of advisory panel	Minutes provided	Q12
MS 6.2	Complete 6 community meetings	Minutes provided	Q12
MS 6.3	Complete 4 technical/equity meetings	Minutes provided	Q12
TASK 7: Develop Resilience Codes			
MS 7.1	Publish public comment drafts	Draft codes provided	Q9
MS 7.2	Publish final resilience code drafts	Final draft provided	Q11
MS 7.3	Publish final roadmap draft	Final draft provided	Q10
TASK 8: Code Education and Implementation Resources Development			
MS 8.1	Draft guides and resources	Drafts provided	Q11
MS 8.2	Draft education modules	Drafts provided	Q10
MS 8.3	Complete 6 2024 IECC trainings	Attendance records provided	
TASK 9: Workforce Training Curriculum and Pilot			
MS 9.1	Finalize WF training plan	Plan provided	Q8
MS 9.2	Begin workforce pilot	Attendance records provided	Q9
M36/Q12: Go/No-Go Decision Point. If the project team is not able to complete the resilience codes (MS 5.2, 5.3, 5.4), draft resources and course curriculum (MS 7.1 and 7.2) and workforce training pilot has begun (MS 9.2), the project will not be able to sufficiently move to BP3.			
TASK 10: Building Implementation Capacity			
MS 10.1	Complete implementation guide and website	Documents and link provided	Q13
MS 10.2	Complete 12 education sessions	Attendance records provided	Q16
MS 10.3	Ensure certifications are completed by jurisdictions	Test results list provided	Q15
TASK 11: Training to Build the Workforce			
MS 11.1	Students complete workforce program	Roster of graduating students	Q14
MS 11.2	Trainees connect with employers	Annotated roster of students	Q16

M48/Q16: End of Project Goal. The Collaborative will have produced four southwest specific resilience code options, implementation, and training resources to support their adoption, and distributed them to all Collaborative jurisdictions as well as at least five interstate partners. In addition, the Collaborative will have trained the equivalent of 20% of the workforce (both in new and existing professionals) across Collaborative geography in the new codes and materials.

Project Schedule

Task / Project Quarter	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TASK 1: Project Management																
MS 1.1																
MS 1.2																
MS 1.3																
EXPAND EQUITABLE PUBLIC ENGAGEMENT																
TASK 2: Equitable Engagement																
MS 2.1																
MS 2.2																
MS 2.3																
MS 2.4																
TASK 6: Execute CEP																
MS 6.1																
MS 6.2																
DEVELOP REGIONAL CLIMATE CODES																
TASK 3: Scoping Codes																
MS 3.1																
MS 3.2																
MS 3.3																
TASK 7: Develop Codes																
MS 7.1																
MS 7.2																
MS 7.3																
DEVELOP A LIVING IMPLEMENTATION GUIDE																
TASK 4: Implementation Needs																
MS 4.1																
MS 4.2																
MS 4.3																
TASK 8: Resource Development																
MS 8.1																
MS 8.2																
MS 8.3																
TASK 10: Building Capacity																
MS 10.1																
MS 10.2																

MS 10.3																			
DEVELOP AN ENHANCED ENERGY, EQUITY, AND CLIMATE RESILIENCE WORKFORCE CURRICULUM																			
TASK 5: Workforce Partnerships																			
MS 5.1																			
MS 5.2																			
MS 5.3																			
TASK 9: Workforce Pilot																			
MS 9.1																			
MS 9.2																			
TASK 11: Workforce Training																			
MS 11.1																			
MS 11.2																			

PROJECT MANAGEMENT. NBI will serve as the primary project coordinator and have overall responsibility for the project’s success, including serving as prime contractor and overall project administrator and coordinator. NBI will be responsible for coordinating project team members. The Principal Investigator for the proposed project will be Sean Dennison, bringing experience in leading successful large scale, multipartner projects and knowledge of code and building policy development, education, and stakeholder engagement.

Because the project requires coordination across such a diverse and large stakeholder pool, the City of Tucson will serve as the local government collaborative leader, providing constant boots on the ground support to all Collaborative partners to ensure success of the project. The rest of the team is structured with the following roles. Where tasks involve more than one team member, coordination through Task level meetings will occur to ensure handoffs and interdependencies of roles are used to enhance project outcomes.

Team Member	Role	Primary Tasks
AZ Office of Resiliency	State partner	All
NM EMNRD	State partner	All
City of Tucson	Local Government Collaborative Leader	All
NBI	Prime, focus on code and resource development	All
ICC	Focus on code technical support, resources, and education	3,4,7,8,10
LISC	Focus on workforce training and community engagement	2,5,6,8,9,10,11
SWEEP	Support on workforce and regional dissemination and convening	2,4,8,9,10,11
USDN	Support on community engagement and national dissemination and convening	2,6,8,10
CUADRO Design	Support on community engagement and technical development	2,3,6,7
Quest Energy Group	Support on technical development	3,7

The primary risks associated with achieving the end of project goal are the lack of interest, willingness, or time to engage from key stakeholders in the development of the workforce training curriculum, resilience code suite, and living implementation guide. The project team has received direct commitments from Collaborative members along with community and workforce organizations. These commitments, along with the foundational work of the Collaborative and

the growth it has seen without funding in place, make the project team believe the potential for lack of interest and willingness does not exist. The project team has also allotted sufficient time to develop dedicated plans (MS 2.3, 4.2, 5.1) that will keep the team on track for the duration.

Risks associated with overall project logistics include communications amongst the many project partners, along with budget and time management. NBI has extensive experience managing complex projects and teams in remote locations. NBI utilizes a secure cloud platform (SharePoint) for data storage and file transfer. NBI will establish regular check-in calls within the tiers of the Collaborative Structure as necessary to monitor progress and allow for sharing of successes and strategies across the project. NBI also has experience in management and accounting of federal funding awards. NBI maintains all financial controls and records in secure software with fail-over back-up and complies with all accounting and audit best practices.

MARKET TRANSFORMATION PLAN. To meet the ultimate goal of the project, the project team is focused on the investment of time and expertise to complete the described milestones, or outputs of the project. These outputs are targeted at specific segments of the building industry in the southwest, including both current and needed workforce participants and the broader community, to meet the long term outcome of all new and existing building construction being in compliance with regionally applicable resilience codes that reduce climate impacts felt by residents in the southwest. Short and intermediate results will include the adoption of updated and regionally specific codes, training of professionals in and entering the workforce, and publication of resources to support the broader transformation. The project team has identified critical stakeholders from the state down to jurisdiction levels, and brought in leadership partners with national, regional, and local experience that can help achieve these outputs and outcomes.

D. TECHNICAL QUALIFICATIONS AND RESOURCES

The assembled project team has capabilities and connections across the southwest and nationally in community engagement, workforce training, and code and policy development and implementation to be able successfully execute the work to meet the Collaborative's needs.

Project Lead, **New Buildings Institute (NBI)**, is a nonprofit organization pushing for better energy performance in buildings. NBI works collaboratively with industry market players—governments, utilities, energy efficiency advocates and building professionals—to promote advanced design practices, innovative technologies, public policies, and programs. NBI also develops and offers guidance and tools to support the design and construction of carbon neutral buildings. NBI is a recognized leader in advanced building policies, known for the development of both technical and needed supportive and educational content through collaboration with industry experts and government stakeholders. NBI commits 42% FTE over four years to the project.

All partners will enter a contractual relationship with NBI, following all flow down requirements of DOE grantees and subrecipients after award negotiation between DOE and NBI. Decisions will be made collaboratively with the core project team. However, NBI will be the ultimate decision maker if required. All publications will include logos or names of all partner organizations involved with research and writing of content. All publications will cite project partners and DOE funding. All partners, and NBI, will cede all IP to DOE and public domain that are developed under the funding of this project. Project management communications will be maintained through

regular calls, video meetings, and in-person meetings with team members. NBI will lead all project reporting per the schedule and mechanisms established by DOE during the award.

The **International Code Council (ICC)** is the leading global source of model codes and standards and building safety solutions including product evaluation, accreditation, technology, training, and certification. ICC's codes and standards are used to ensure safe, affordable, and sustainable communities and buildings worldwide. ICC brings extensive experience in the development of energy codes and the tools necessary for deployment including education and training, certifications, user guides, checklists, and enforcement best practices. In addition to this specific project, outcomes can be shared widely through ICC chapters across the country, integrate into national-level resources and be made available on its Digital Codes platform, thus amplifying the impact of the project beyond the southwest. ICC commits 33% FTE over four years to the project.

LISC Phoenix has an impressive track record of Arizona-based community development work including authentic community engagement and building capacity within local community-based organizations and tribal communities. LISC Phoenix can also leverage the extensive experience of other branches of this national organization. LISC Phoenix brings to the project an ethic and intent to listen closely to community partners to gauge their strength and readiness, create clear lines of communication and a decision-making structure which gives community members the power to determine and own the change they want to see, and collaborate closely with communities to move their voice and preferences to the center of each conversation and decision, all leading to more equitable outcomes. LISC commits 72% FTE over four years to the project.

Arizona's State Energy Office (SEO), disbanded under the previous administration, was reconstituted by the newly-elected Governor as the **Office of Resiliency**. The office is so new that, as of this writing, they do not yet have a website or official published mandate other than a focus on water, energy, and land use solutions and to "help coordinate efforts with the many departments, tribal governments, universities, organizations, and others involved in this effort." The Collaborative is excited to see how the mission of the Office develops under the leadership of [Director Maren Mahoney](#), who has worked extensively in energy policy as program manager for Arizona State University's Energy Policy Innovation Council, a policy advisor at the Arizona Corporation Commission, and a consultant supporting business engagement in state energy efficiency, demand response, and building electrification policies and regulations.

New Mexico's SEO, the **Energy, Minerals and Natural Resources Department (EMNRD)**, strives to make New Mexico a leader in developing reliable supplies of energy, and energy-efficient technologies and practices, with a balanced approach toward conserving our renewable and non-renewable resources while protecting New Mexico's natural, cultural, and recreational resources. EMNRD will leverage their current DOE funding to expand early impact of the Collaborative, offering the developed virtual trainings of the Collaborative to their current partners and a broader number of NM communities statewide.

The **City of Tucson** is committed to achieving carbon neutrality by 2030, as announced by the Mayor and City Council. As part of their commitment to achieving that goal, and supporting surrounding communities in doing the same, the City is providing a dedicated project coordinator to assist the assembled project team. Leslie Ethen, Sustainability Manager in Tucson's Planning

and Development Services Department, will draw on her previous experience and her relationships with the network of local jurisdictions, to provide on-the-ground assistance to project partners and coordinate the involvement of other communities. Overall, the Collaborative has committed participation from 11 cities/counties, and staff from the jurisdictional partners plan to devote a collective 2,500+ hours per year to support the project.

The **Southwest Energy Efficiency Project (SWEEP)** is a public-interest organization promoting greater energy efficiency and clean transportation in Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming. This high-growth region where energy efficiency efforts were lagging and air pollution was a growing concern has seen great strides in the last 20 years, due in large part to the efforts of SWEEP. SWEEP is a trusted regional partner on energy efficiency, buildings, utilities, state and local government action, and coordination with national and local partners. SWEEP commits 10% FTE over four years to the project.

Urban Sustainability Directors Network (USDN) brings local government sustainability practitioners together to learn, collaborate, and accelerate the work of local sustainability. By equipping them with the knowledge, resources, and partnerships they need to succeed, USDN helps advance change across the field of practice. The aggregate impact and influence of the collective work makes an equitable, resilient, and sustainable society more attainable. USDN will amplify lessons, best practices, and products through USDN's network of more than 260 local governments using its knowledge base, digital tools, all-network workshops, and annual meeting. USDN commits 5% FTE over four years to the project.

CUADRO Design is a Chicanx owned, Tucson, AZ - based design firm committed to ethics of sustainability, equity and authenticity. CUADRO is committed to building with materials and systems that are sustainable for the desert and is open to exploring new modes of working in these awakening times. CUADRO Design brings a focus on traditional and affordable building practices that have been demonstrated to be effective for energy and water efficiency and climate resilience in the southwest. CUADRO commits 5% FTE over four years to the project.

Quest Energy Group is a multidisciplinary consulting engineering firm focused on providing sustainability solutions to the building and utility industry including energy analysis/modeling, energy code compliance, investment grade audits, building commissioning and sustainability consulting. Quest has experience collaborating on a range of building types and construction delivery methods including single family, multi-family, industrial/laboratory, and large scale multi-phased developments. Quest operates out of Arizona, but regularly performs work across the United States, bringing a mix of local application and national expertise. Quest commits 5% FTE over four years to the project.

SERVICES PROVIDED BY DOE/NNSA FFRDCS. Technical assistance from PNNL will be requested to provide cost-effectiveness evaluations of proposed code amendments, providing energy and emissions savings and impacts estimates of improved codes using PNNL developed standardized building prototypes, customizing COMcheck and REScheck software tools, and developing stretch code modules to amend model codes for deeper energy and emissions savings based on work of collaborative.