

Implementation of Codes through Baseline Field Studies

Topic Area 3 **Control Number 1824-1571**

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Project Overview

In response to the U.S. Department of Energy (DOE) Funding Opportunity Announcement (FOA) FOA-0001824 Topic Area 3, the National Association of State Energy Officials (NASEO) has partnered with the **PARTNER**, the Colorado Energy Office and the Nevada Governor's Office of Energy for a proposal to study residential energy code compliance in Colorado and Nevada. The project team represents both Colorado and Nevada-based and regional/national organizations that have a strong experience with energy code training, stakeholder engagement and outreach, and management of multi-year DOE projects.

A.1. Background

The National Association of State Energy Officials (NASEO) is the only national non-profit association for the governor-designated energy officials from each of the 56 states and territories. Formed by the states in 1986, NASEO facilitates peer learning among state energy officials and serves as a resource for and about state energy offices. Since its formation NASEO has partnered with State Energy Directors and their staff to provide technical assistance and support with regard to building energy codes since its formation. NASEO has a successful history of working with the DOE and other key stakeholders to complete energy code field studies using the DOE methodology. Currently, NASEO is the lead organization for the Texas energy code field study, an approximately \$1.4 million, 4-year project that leverages NASEO's significant staff and organizational experience in energy codes. This experience positions NASEO to successfully manage energy code field studies in Colorado and Nevada.

A.2. Project Goal.

Colorado and Nevada are two of the fastest growing states in the country¹, making them excellent opportunities to evaluate building industry practices with regard to building energy codes. Colorado is a home rule state, and each jurisdiction adopts its own energy codes. Nevada is a de facto home rule state with respect to energy codes, as the state has no mechanism to require adoption of the code at the local level even though the state has adopted a statewide code. When looking at code adoption in Nevada the state looks similar to any other home rule state.

This project will conduct energy code field studies in Colorado and Nevada and provide education and training on energy code topics identified as high impact in each state. The field study data will support several outcomes. First, it will be used to develop targeted training and outreach to address key building industry practices identified as opportunities for improved energy efficiency; second, it will inform parallel energy code outreach efforts in the two states, such as those by utility supported code trainings; third, it will provide a dataset demonstrating how energy codes are implemented by industry in different jurisdictions within home rule states. This project will recruit and train up to five energy code experts in each state to serve as energy

¹ United States Census Bureau. Idaho is Nation's Fastest-Growing State, Census Bureau Reports. December 20, 2017. <https://www.census.gov/newsroom/press-releases/2017/estimates-idaho.html>. Accessed June 1, 2018. From 2016 to 2017, Colorado was 8th in numeric growth and 9th in percentage growth. For the same period, Nevada was 2nd in percentage growth.

code ambassadors who will be a resource in their region and be positioned to provide future energy code trainings. These energy code ambassadors will be a resource for building officials, builders, and energy raters beyond the conclusion of the project, and will be a valuable outcome of the education, training and outreach effort. The energy code ambassadors will serve as resources to answer questions about energy code applicability, providing trainings, and increase awareness of the benefits of energy codes. Finally, the second field study will enable an impact evaluation of the education, training and outreach effort to gauge its success and determine which tactics worked and which did not. This information can be used to improve the efficacy of future energy codes training not only in the project states but across the country.

A.3. DOE Impact-

The Colorado and Nevada energy offices in the respective states have supported ongoing energy code training efforts using federal funding and state resources, however, they have had limited resources to gather data on building industry practices. Both state energy offices are interested in understanding the impact of building industry practices on energy use of residential buildings in their state. DOE funding will enable NASEO and its partners to gather this information by completing field studies which can be used to inform future energy code education, training, and outreach, as well as to build up a base of knowledgeable code officials to provide training and serve as in-state resources on energy code topics in the future.

DOE funding will allow for a significant increase in energy code training available in both states. DOE funding will enable our team's and the states' recruitment and training of new energy code ambassadors in the state. Currently, there are a limited number of experts available to provide code trainings in both Nevada and Colorado, and the number of available experts has declined over the past five years. Through the project, our teams' strong code training experts and activities will result in the recruitment and training of new experts to support building officials, builders and energy raters to ensure that residential buildings in Colorado and Nevada provide residents with the benefits of better indoor air quality, comfort and energy efficiency that are delivered by meeting the requirements of energy codes.

Research and Project Plan

B.1. Project Objectives.

This project will occur in three phases in each state. The goal of Phase I is to complete a field study to serve as a baseline measure of building industry practices in each state where a study is conducted. The goal of Phase II is to conduct an education, training and outreach program to reach building officials, builders and energy raters across each state, and to recruit 4 or 5 energy code experts to serve as energy ambassadors in different regions of each state. The goal of Phase III is to complete a second field study of building industry practices to determine the impact of the education and training effort on energy code compliance.

A primary objective of this project is to train two groups of energy code ambassadors in Colorado and Nevada who will be able to provide training in their region of the state and serve as

a resource on energy code topics. The project will complete baseline and post-training energy code field studies in the two states to determine standard building industry practices with regard to energy codes and determine the impact of energy code training delivered through the project. The project will also significantly increase the education, training and outreach on energy code topics to building officials, builders and home energy raters in the two states.

We have identified the following objectives.

- **Objective 1:** Develop pre- and post-program building industry standard practice studies (Phase I and Phase III) that are statistically significant for the states of Colorado and Nevada per the Department of Energy methodology.
- **Objective 2:** Implement a robust energy code education, training, and outreach program (“Phase II”) over two years that prioritizes stakeholder engagement and relationship-building and that measurably increases residential compliance rates.
- **Objective 3:** Increase the number of energy code experts in Colorado and Nevada to support building code practices that align with energy code requirements in the two states.

B.2. Technical Scope

Technical Scope Summary. We have developed three tasks for this project. The first three tasks correspond to the Project Objectives above, plus a project management task. We envision three overall phases: (1) performance of baseline energy code field studies in each state to determine current building code practices; (2) enhancing energy code education, training, and outreach to builders, building officials, and home energy raters in both states; and (3) the post-program building industry standard practices study. The phases will have some overlap; for example, planning for the Education, Training and Outreach Program will begin while the pre-program building industry standard practices study is underway. For each period, we have identified appropriate milestones, decision points, and outcomes below.

Decision points will occur at the end of the first field studies and prior to beginning the second field study. The first “Go/No-go” decision will be made at the conclusion of the baseline field study. If the field study data is representative of the building industry practices of the state, and if the compliance rate is found to be less than 90% in a state, then the project will continue in that state. The second “Go/No-go” decision will be made at the end of the second budget period. If fewer than two-thirds of the proposed trainings have been completed in one of the states, the project will not continue in that state.

B.3. Work Breakdown Structure and Task Description Summary

NASEO will be the lead organization on this project. **PARTNERS** will be subcontractors to NASEO. NASEO will provide project management of all parts of the field studies in Colorado and Nevada. The field study in Colorado will be completed by **PARTNER**, and the field study in Nevada will be completed by **PARTNER**. **PARTNER** will complete the education, training and outreach in Nevada. **PARTNER** will complete the education, training and outreach in Colorado. The study will be comprised of three phases. Phase I and Phase III are the field studies and will occur in the first and third year of the project. Phase II is the education, training and outreach

portion of the project, and will extend across all three years of the project, from approximately quarter 3 to quarter 8.

Budget Period 1

Phase I-Baseline Field Studies

Task 1 Summary: NASEO and the project team will complete an initial study of building industry standard practices in Colorado and Nevada, to determine the pre-Education, Training, and Outreach Program baseline (Phase I). In order to achieve this task, NASEO will complete contracts with code study contractors (CSCs) **PARTNER** (Colorado) and **PARTNER** (Nevada) to conduct the initial studies. The CSCs will be responsible for identifying homes under construction or at final construction (but without occupants) and obtaining permission to enter the site and gather data for the study. The CSCs will supply this information to NASEO and to Pacific Northwest National Laboratory (PNNL) for review. The CSCs will follow sampling plans developed by PNNL.

The CSCs will be responsible for identifying homes to be sampled in accordance with the state sampling plans developed by PNNL. The CSCs will recruit builders, obtain permission to access job sites, visit each sample home, collect the data in written or electronic format, and provide data to PNNL in a format approved by PNNL and the NASEO project team. Once all samples have been collected and provided to PNNL, the NASEO project team will be available to review draft reports for accuracy and clarity. When the final PNNL reports for the Colorado and Nevada field studies are complete, NASEO will publicize the final results at its Annual Meeting, website, and via email newsletter.

Subtask 1.1: Conduct a baseline study of building practices in Colorado. (M1-M8).

Subtask 1.1.a: Complete contract with **PARTNER** for field study data collection in Colorado. (M1-M2)

Subtask 1.1.a Summary: Complete contract agreement with **PARTNER** to conduct code compliance study.

Deliverable 1.1.a: Complete contract with **PARTNER** for Colorado field study by end of Q1 of project.

Subtask 1.1.b: Complete field study data collection in Colorado. (M2-M7)

Subtask 1.1.b Summary: Collect representative data from homes in Colorado in accordance with the state sampling plan.

Milestone 1.1.b: Complete data collection for the pre-compliance field study in Colorado in the third quarter of the project.

Subtask 1.1.c: Submit Colorado data to PNNL for analysis. (M6-M9)

Subtask 1.1.c Summary: NASEO and the project team will submit project data to PNNL for analysis and be available to respond to questions and review draft documents before the final document is published.

Deliverable 1.1.c: Submit all data to PNNL by end of Q3 of the project.

Subtask 1.1.d: Publicize the results of the first phase of the Colorado field study. (M9-M30)

Subtask 1.1.d Summary: NASEO and the project team will publicize the results of the field study to stakeholders from industry, code officials, and other interested parties.

Milestone 1.1.d: Final Colorado Field Study Report is published. Results will be presented in a NASEO forum such as webinar, presentation, or at the NASEO Annual Meeting. NASEO Project Team will participate in the cohort meeting at the National Energy Codes Conference (or appropriate venue as directed by DOE).

Subtask 1.2 Conduct a baseline study of building practices in Nevada. (M1-M8).

Subtask 1.2.1: Complete field study data collection in Nevada. (M2-M7)

Subtask 1.2.1 Summary: Collect representative data from homes in Nevada in accordance with the state sampling plan.

Milestone 1.2.1: Complete data collection for the pre-compliance field study in Nevada in the third quarter of the project.

Subtask 1.2.2: Submit Nevada data to Pacific Northwest National Laboratory for analysis. (M6-M9)

Subtask 1.2.2 Summary: NASEO and the project team will submit project data to PNNL for analysis and be available to respond to questions and review draft documents before the final document is published.

Deliverable 1.2.2: Submit all data to PNNL by end of Q3 of the project.

Subtask 1.2.3: Publicize the results of the first phase of the Nevada field study. (M9-M30)

Subtask 1.2.3 Summary: NASEO and the project team will publicize the results of the field study to stakeholders from industry, code officials, and other interested parties.

Milestone 1.2.3: Final Nevada Field Study Report is published.

Deliverable 1.2.3: Results will be presented in a NASEO forum such as webinar, presentation, or at the NASEO Annual Meeting. NASEO Project Team will participate in the cohort meeting at the National Energy Codes Conference (or appropriate venue as directed by DOE).

Phase II

Task 2 Summary (M8-M30):

Task 2, the Education, Training, and Outreach program (Phase II) will be achieved through a coordinated effort led by NASEO which will engage energy code trainers and experts from **PARTNER** (Colorado trainer) and **PARTNER** (Nevada trainer) to provide targeted trainings to building officials, builders, and energy raters in the two states. In addition to providing trainings to a large number of building officials, builders, and home energy raters, the NASEO project team will recruit and train 4 or 5 energy code ambassadors in each state who can serve as experts and resources in their region of the respective states.

The Education, Training, and Outreach program will be accomplished by delivering targeted training to local building officials. These trainings will be developed with input from NASEO, **PARTNER**, industry partners, and others. The trainings will be delivered via in-person presentations, webinars, and presentations at building code events such as state International Code Council chapter meetings or conferences.

The Education, Training, and Outreach Program will take place in all three budget periods.

Subtask 2.1: Education and outreach to Colorado building inspectors, builders and code officials. (M7-M28)

Task Summary: NASEO will work with partners to develop a group of experts on energy code topics in Colorado who can serve as resources in their respective states. These experts will serve as ambassadors and subject matter experts to support increased energy code compliance in the state.

Subtask 2.1.a: NASEO and the project team will develop training materials and resources to address key energy efficiency measures based on opportunities identified in the field study in Colorado. (M6-M30).

Subtask 2.1.a Summary: NASEO and its project team will leverage the PNNL report and data collected in Phase I, the energy code field study to develop materials to support energy code training for building inspectors, builders, and energy code officials in Colorado.

Deliverable 2.1.a: Hold a kick off meeting in Colorado.

Deliverable 2.1.a: Complete development of initial educational materials by end of Q3 of the project.

Subtask 2.1.b: Recruit and train 4-5 energy code experts to serve as energy code ambassadors in specific regions of Colorado. (M8-M36)

Subtask 2.1.b Summary: Recruit 4-5 energy code ambassadors, with state/partner support, from geographically diverse regions of Colorado and provide them with sufficient training to enable them to serve as an energy code resource.

Deliverable 2.1.b: Train 4-5 energy code ambassadors by the end of Quarter 6 of the project.

Subtask 2.1.c: Deliver targeted energy code training to building officials, builders, and energy raters across Colorado. (M9-M28)

Subtask 2.1.c Summary: Deliver webinars, in-person trainings, and presentations to building officials, builders, and energy raters across the state.

Deliverable 2.1.c: Deliver six trainings per quarter for a total of 42 over the course of the project.

Subtask 2.2: Education and outreach to Nevada building inspectors, builders and code officials. (M7-M28)

Subtask 2.2 Summary: NASEO will work with partners to develop a group of experts on energy code topics in Nevada who can serve as resources in their respective states. These experts will serve as ambassadors and subject matter experts to support increased energy code compliance in the state.

Subtask 2.2.1: NASEO and the project team will develop resources to address key energy efficiency measures based on opportunities identified in the field study in Nevada. (M6-M30).

Subtask 2.2.1 Summary: NASEO and its project team will leverage the PNNL report and data collected in Phase I, the energy code field study to develop materials to support energy code training for building inspectors, builders, and energy code officials in Nevada.

Deliverable 2.2.1: Hold a kick off meeting in Nevada.

Deliverable 2.2.1: Complete development of initial educational materials by end of Q3 of the project.

Subtask 2.2.2: Recruit and train 4-5 energy code experts to serve as energy code ambassadors in specific regions of Nevada. (M8-M36)

Subtask 2.2.2 Summary: Recruit 4-5 energy code ambassadors, with state/partner support, from geographically diverse regions of the state and provide them with sufficient training to enable them to serve as an energy code resource.

Deliverable 2.2.2: Train 4-5 energy code ambassadors by the end of Quarter 6 of the project.

Subtask 2.2.3: Deliver targeted energy code training to building officials, builders, and energy raters across Nevada. (M9-M28)

Subtask 2.2.3 Summary: Deliver webinars, in-person trainings, and presentations to building officials, builders, and energy raters across the state.

Deliverable 2.2.3: Deliver three trainings per quarter for a total of 24 over the course of the project.

Budget Period 1 Go/No-Go Decision Point: The go/no-go decision point will be made at the conclusion of the field studies. If the field sample data collected is sufficient to produce a representative sample of building industry practices, and if code compliance in the states is less than 90%, the project will continue.

Budget Period 2 Education, training and outreach

The Education, Training and Outreach Program will begin in Budget Period 1 and continue in Budget Periods 2 and 3.

Subtask 2.1.c: Recruit and train 4-5 energy code experts to serve as energy code ambassadors in specific regions of Colorado. (M8-M36)

Subtask 2.1.c Summary: Recruit 4-5 energy code ambassadors from geographically diverse regions of the state and provide them with sufficient training to enable them to serve as an energy code resource.

Deliverable 2.1.c: Train 4-5 energy code ambassadors by the end of Quarter 6 of the project.

Subtask 2.1.d.: Deliver targeted energy code training to building officials, builders, and energy raters across Colorado. (M9-M28)

Subtask 2.1.d Summary: Deliver webinars, in-person trainings, and presentations to building officials, builders, and energy raters across Colorado.

Deliverable 2.1.d: Deliver six trainings per quarter for a total of 42 over the course of the project.

Subtask 2.2.c: Recruit and train 4-5 energy code experts to serve as energy code ambassadors in specific regions of Nevada. (M8-M36)

Subtask 2.2.c Summary: Recruit 4-5 energy code ambassadors from geographically diverse regions of the state and provide them with sufficient training to enable them to serve as an energy code resource.

Deliverable 2.2.c: Train 4-5 energy code ambassadors by the end of Quarter 6 of the project.

Subtask 2.2.d: Deliver targeted energy code training to building officials, builders, and energy raters across Nevada. (M9-M28)

Subtask 2.2.d Summary: Deliver webinars, in-person trainings, and presentations to building officials, builders, and energy raters across the state.

Deliverable 2.2.d: Deliver three trainings per quarter for a total of 24 over the course of the project.

Budget Period 2 Go/No-Go Decision Point: If fewer than two-thirds of the proposed trainings have been delivered, the project will not continue.

Budget Period 3 Post-Training Building Industry Standard Practices Field Study (Phase III)

Task 3 Summary: The Post-Training Program Building Industry Standard Practices Field Study will follow the same procedures as the baseline Building Industry Standard Practices Field Study. NASEO and the project team will complete a second study of building practices in Colorado (Task 5) and Nevada (Task 6) (Phase III). In order to achieve this task, NASEO will complete subcontract amendments with code study contractors (CSCs) to conduct the studies. The CSCs will be responsible gathering data for the study. The CSCs will supply this information to NASEO and to Pacific Northwest National Laboratory (PNNL) for review. The CSCs will follow the sampling plans developed by PNNL.

The CSCs will be responsible for identifying homes to be sampled in accordance with the sampling plan developed by PNNL. The CSCs will recruit builders, obtain permission to access job sites, visit each sample home, collect the data in written or electronic format, and provide data to PNNL in a format approved by PNNL and the NASEO project team. Once all samples have been collected and provided to PNNL, the NASEO project team will be available to review draft reports for accuracy and clarity. When the final PNNL reports for the Colorado and Nevada field studies are complete, NASEO will publicize the final results at its Annual Meeting, website, and via email newsletter.

Subtask 3.1: Post-training field study - Colorado (M28-34)

Subtask 3.1 Summary: NASEO and the project team will complete a second field study to determine the impact of the education and outreach training completed in Phase II of the project. This field study will collect a representative sample of homes in the state of Colorado to determine the degree of compliance with building energy codes. This study will help the participants understand the impact of the education and training efforts and will inform future education and training efforts in the field study states and in other communities.

Subtask 3.1.a.: Complete post-training field study data collection in Colorado. (M28-M32)

Subtask 3.1.a. Summary: Collect representative data from homes in Colorado in accordance with the state sampling plan.

Milestone 3.1.a.: Complete data collection for the pre-compliance field study in Colorado by the end of the 9th quarter of the project.

Subtask 3.1.b: Submit Colorado data to PNNL for analysis. (M30-M33)

Subtask 3.1.b Summary: NASEO and the project team will submit project data to PNNL for analysis and be available to respond to questions and review draft documents before the final document is published.

Milestone 3.1.b: Submit all data to PNNL by end of 11th quarter of the project.

Subtask 3.1.c.: Publicize the results of the first phase of the Colorado field study. (M33-M36)

Subtask 3.1.c. Summary: NASEO and the project team will publicize the results of the field study to stakeholders from industry, code officials, and other interested parties.

Milestone 3.1.c.: Receipt of finished report from PNNL.

Deliverable 3.1.c.: Results will be presented in a NASEO forum such as webinar, presentation, or at the NASEO Annual Meeting. NASEO Project Team will participate in the cohort meeting at the National Energy Codes Conference (or appropriate venue as directed by DOE).

Subtask 3.2: Post-training field study (M28-34)

Subtask 3.2 Summary: NASEO and the project team will complete a second field study to determine the impact of the education and outreach training completed in Phase II of the project. This field study will collect a representative sample of homes in the state of Nevada to determine the degree of compliance with building energy codes. This study will help the participants understand the impact of the education and training efforts and will inform future education and training efforts in the field study states and in other communities.

Subtask 3.2.1.: Complete post-treatment field study data collection in Nevada. (M28-M34)

Subtask 3.2.1. Summary: Collect representative data from homes in Nevada in accordance with the state sampling plan.

Milestone 3.2.1.: Complete data collection for the pre-compliance field study in Nevada by the end of the 11th quarter of the project.

Subtask 3.2.2.: Submit Nevada data to PNNL for analysis. (M30-M33)

Subtask 3.2.2. Summary: The NASEO project team will submit project data to PNNL for analysis and be available to respond to questions and review draft documents before the final document is published.

Deliverable 3.2.2.: Submit all data to PNNL by end of 11th quarter of the project.

Subtask 3.2.3.: Publicize the results of the first phase of the Nevada field study. (M33-M36)

Subtask 3.2.3 Summary: NASEO and the project team will publicize the results of the field study to stakeholders from industry, code officials, and other interested parties.

Milestone 3.2.3.: Receipt of the final report from PNNL.

Deliverable 3.2.3.: Results will be presented in a NASEO forum such as webinar, presentation, or at the NASEO Annual Meeting. NASEO Project Team will participate in the cohort meeting at the National Energy Codes Conference (or appropriate venue as directed by DOE).

Task 4.0: Project Management (M1-M36)

Task 4 Summary: This is a standard task for project management and reporting to DOE. NASEO's location in the Washington, D.C. area will help facilitate strong communication with DOE staff throughout the project. NASEO does not anticipate any barriers with this task. We have significant experience working with DOE on multi-year cooperative agreements and have strong accounting, project management, and reporting capabilities.

Milestone 4: Continuation applications for budget periods 2 and 3.

End Goals of Project: Complete field studies of building industry standard practices in the states of Colorado and Nevada, which both behave like home rule states with regard to code adoption. The results of the field studies will inform state energy plans that will likely be developed in the coming years in Colorado and Nevada by providing data showing the impact of energy codes on energy consumption for each state. Conduct a rigorous Education, Training and Outreach Program to increase the awareness of energy efficiency measures in each state. Recruit and train 4-5 energy code experts to serve as energy code ambassadors in each state by the end of the education, training and outreach portion of the project. The Education, Training and Outreach Program will create an expert pool for trainers for the Colorado and Nevada energy offices to engage and leverage beyond the life of this project, which will ensure increased compliance with energy codes. The State Energy Offices and **PARTNER** will be able to use the results of the field study to guide future energy code efforts. The larger pool of energy code trainers will create improved awareness of building energy codes and improved building practices.

B.4. Milestone Summary

Milestone Summary Table							
Recipient Name:		National Association of State Energy Officials					
Project Title:		Implementation of codes through baseline field studies					
Task Number	Task or Subtask (if applicable) Title	Milestone Type (Milestone, Go/No-Go Decision Point, End of Project Goal)	Milestone Number* (Go/No-Go Decision Point Number)	Milestone Description (Go/No-Go Decision Criteria)	Milestone Verification Process (What, How, Who, Where)	Anticipated Date (Months from Start of the Project)	Anticipated Quarter (Quarters from Start of the Project)
Budget Period 1							
1	Conduct a Baseline building practices studies in Colorado and Nevada (Phase I)						
1.1.1	Complete field study data collection in CO	Milestone	M1.1.b	Complete data collection	All required samples obtained	M7	Q3
1.1.2	Submit Colorado data to PNNL	Milestone	M1.1.c	Submit data	Submit all data	M9	Q3
1.1.3	Publicize the results of the CO field study	Milestone	M1.1.d	Distribute the baseline field study report	Field study report distributed via NASEO newsletter	M12	Q4
1.2.1	Complete field study data collection in NV	Milestone	M1.2.b	Complete data collection	All required samples obtained	M7	Q3
1.2.2	Submit NV data to PNNL	Milestone	M1.2.c	Submit data	Submit all data	M9	Q3

1.2.3	Publicize the results of the NV field study	Milestone	1.2.d	Distribute the baseline field study report	Field study report distributed via NASEO newsletter	M12	Q4
2	Education, training and outreach in Colorado and Nevada (Phase II)						
2.1.b.1	Hold a kick off meeting in CO	Milestone	M2.1.b.1	Kick off meeting with project partners in CO	Project partners will meet to discuss results of field study, plan Task 2. Agenda provided to DOE	M8	Q3
2.1.b.2	Develop initial training materials	Deliverable	D2.1.b.2	Develop training materials based on results of field study	Initial training materials submitted to DOE for review	M6-M30	Q4
2.1.c	Recruit and train 4-5 energy code ambassadors	Deliverable	D2.1.d	Recruit energy code ambassadors	DOE will be provided with a list of code ambassadors	M8-M18	Q6
2.1.d	Conduct 6 trainings this budget period	End project goal	M2.1.d.1	Conduct 6 trainings	Quarterly reporting will provide training summary	M12	Q4
2.2.b.1	Hold a kick off meeting in NV	Milestone	M2.2.b.1	Kick off meeting with project partners in Nevada	Project partners will meet to discuss results of field study, plan Task 2. Agenda provided to DOE	M8	Q3
2.2.b.2	Develop initial training materials	Deliverable	D2.2.b.2	Develop training	Initial training materials	M6-M30	Q4

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				materials based on results of field study	submitted to DOE for review		
2.2.c	Recruit and train 4-5 energy code ambassadors	Deliverable	D2.2.c	Recruit energy code ambassadors	DOE will be provided with a list of code ambassadors	M8-M18	Q6
2.2.d	Conduct 4 trainings this budget period	Deliverable	D2.2.d.1	Conduct 4 trainings	Quarterly reporting will provide training summary	M12	Q4
		Go/No Go decision point	Go/No-go 2	Go/No-go 2: Go if: A. Pre-program compliance study in individual states show <90% compliance. B. Field data fulfills sampling plan.		M12	Q4
Budget Period 2							
2.1.d	Conduct 6 trainings in CO this budget period	Deliverable	D2.1.d.2	Conduct 6 trainings	Quarterly reporting will provide summary	M15	Q5
2.2.d	Conduct 4 trainings in NV this budget period	Deliverable	D2.2.d.2	Conduct 4 trainings	Quarterly reporting will provide summary	M15	Q5
2.1.d	Conduct 6 trainings in CO this budget period	Deliverable	D2.1.d.3	Conduct 6 trainings	Quarterly reporting will provide summary	M18	Q6
2.2.d	Conduct 4 trainings in NV this budget period	Deliverable	D2.2.d.3	Conduct 4 trainings	Quarterly reporting will provide summary	M18	Q6
2.1.d	Conduct 6 trainings in CO this budget period	Deliverable	D2.1.d.4	Conduct 6 trainings	Quarterly reporting will provide summary	M21	Q7

2.2.d	Conduct 4 trainings in NV this budget period	Deliverable	D2.2.d.4	Conduct 4 trainings	Quarterly reporting will provide summary	M21	Q7
2.1.d	Conduct 6 trainings in CO this budget period	Deliverable	D2.1.d.5	Conduct 6 trainings	Quarterly reporting will provide summary	M24	Q8
2.2.d	Conduct 4 trainings in NV this budget period	Deliverable	D2.2.d.5	Conduct 4 trainings	Quarterly reporting will provide summary	M24	Q8
		Go/No-Go decision point	Go/No-Go 2	If fewer than two-thirds of the proposed trainings have been delivered in a state, the project in that state will not continue.		M24	Q8
Budget Period 3							
2.1.d	Conduct 6 trainings this budget period	Deliverable	D2.1.d.6	Conduct 6 trainings	Quarterly reporting will provide summary	M27	Q9
2.2.d	Conduct 4 trainings this budget period	Deliverable	D2.2.d.6	Conduct 4 trainings	Quarterly reporting will provide summary	M27	Q9
2.1.d.	Conduct 6 trainings this budget period	Deliverable	D2.1.7	Conduct 6 trainings	Quarterly reporting will provide summary	M30	Q10
2.2.d	Conduct 4 trainings this budget period	Deliverable	D2.2.d.7	Conduct 4 trainings	Quarterly reporting will provide summary	M30	Q10
3	Post-training field study in Colorado and Nevada (Phase III)						
3.1.b	Complete field study data collection in CO	Milestone	M3.1.b	Complete data collection	All required samples obtained	M32	Q10
3.1.c	Submit Colorado data to PNNL	Deliverable	D3.1.c	Submit data	Submit all data	M33	Q11

3.1.d	Publicize the results of the CO field study	Deliverable	D3.1.d	Distribute the baseline field study report	Field study report distributed via NASEO newsletter	M36	Q4
3.2.b	Complete field study data collection in NV	Milestone	M3.2.b	Complete data collection	All required samples obtained	M32	Q10
3.2.c	Submit NV data to PNNL	Deliverable	D3.2.c	Submit data	Submit all data	M33	Q11
3.2.d	Publicize the results of the NV field study	Deliverable	D3.2.d	Distribute the baseline field study report	Field study report distributed via NASEO newsletter	M36	Q12

B.5. Go/No-go Decision Points

Budget Period 1 Go/No-Go Decision Point: The go/no-go decision point will be made at the conclusion of the field studies. If the field sample data collected is sufficient to produce a representative sample of building industry practices, and if code compliance in the states is less than 90%, the project will continue.

Budget Period 2 Go/No-Go Decision Point: If fewer than two thirds of the proposed trainings have been delivered, the project will not continue.

Project Management Plan. NASEO, as the project prime, will oversee project management. NASEO will subcontract to **PARTNER** and the CSCs (tasks 1 and 3) and the energy code education, outreach and training contractors (task 2). This structure is advantageous for several reasons: first, NASEO has significant experience managing contracts (including a similar codes project in Texas), working with DOE on cooperative agreements, and tracking project schedules and budgets; second, the CSC will not report to the entity implementing the Education, Training and Outreach Program, which will enable full objectivity; and third, NASEO's geographic proximity to DOE will facilitate strong communication on this project.

NASEO's approach to project management includes bi-weekly calls with subcontractors during critical work periods, yearly in-person team meetings, and storage of final and draft project documents, such as subcontracts, workplans, final deliverables, Gantt charts, marketing materials, and curriculum/training resources. NASEO's subcontracts with other partners will describe required communication practices, reporting periods, and any scope changes to the current workplan that arise in the negotiation period with DOE. Future project refinements will be made through agreements between NASEO and the relevant subrecipient(s), including contract amendments for significant changes to roles/responsibilities or partner deliverables. NASEO will work with DOE on any changes in scope and will convene calls to gather input from the impacted parties before making a final decision, in consultation with DOE, prior to pursuing subcontract changes.

A key source of risk in multi-year, multi-partner projects is turnover among staff leads. Therefore, NASEO has required each subrecipient to identify at least two team members. A second source of risk for this project will be securing the necessary 20% cost-share. NASEO and **PARTNER** have identified cost-share sources (e.g., **organization list**) to meet the required 20%. Given challenges with predicting future funding availability, NASEO and **PARTNER** have committed to providing the necessary cost-share, likely through these sources; however, if these sources do not contribute as planned, NASEO is committed to meeting cost-share gaps through other sources.²

Technical Qualifications and Resources

NASEO, the project lead, has significant institutional experience leading large, multi-year projects requiring coordination of multiple stakeholders and partners, including experience leading a similar study and training effort using the DOE Field Study Methodology in Texas. The project team brings together a group of experts with significant experience and knowledge of energy codes in Colorado and Nevada. The project team and their extended networks are uniquely positioned to execute the proposed plan for a number of reasons:

1. Mastery of the coordination, stakeholder networking, and project management functions that will allow the project team to launch and administer this project efficiently and effectively;

² NASEO and the project team may be able to obtain additional funding from foundations, trade associations, and affiliate members.

2. Breadth and depth of expertise in building codes, the unique natures of Colorado and Nevada energy policy issues, education and training, and the Colorado and Nevada building industry market;
3. Access to or leadership of already-existing networks of home builders, home energy raters, and education partners, and proven, relationship-based deployment channels by which compliance training can be deployed (e.g., Colorado and Nevada Codes Collaboratives, and 35+ private-sector members; NASEO's 70+ private-sector members and relationships with national associations and their state chapters); and
4. Demonstrated experience conducting energy code field studies in states across the country and in the region, as well as familiarity with the DOE methodology from participation in previous field studies.

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There are no additional equipment needs for this project beyond the equipment already possessed by the project team members and project organizations. The project team will identify appropriate low- or no-cost venues for trainings which will happen in the jurisdictions.

Key team members, (see resumes in Appendix A) are poised to commit a significant level of time and expertise to support the project. The project management plan delineates the roles and work to be performed by each organization. Within each organization, the following key participants will leverage their skills and expertise to support the project.

Time commitment from key staff:

NASEO

Ed Carley, Program Manager, 20%

Education, Training and Outreach Contractors–

Organization

Contact, title

Code Study Contractors – time estimates for field studies only.

Contractor

Name, title, 25%

Contractor

Name, title – 30% support

Appendix A: Resumes