



# MODEL PLAN

## Career Pathways to Advance the Trades in HVAC Services

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PREPARED FOR:



**U.S. DEPARTMENT OF  
ENERGY**

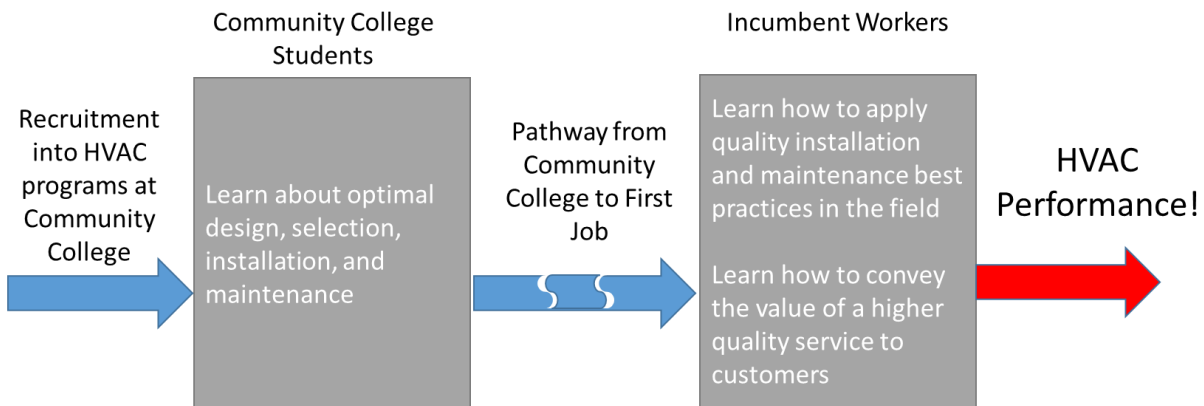
# Table of Contents

- 1. Introduction..... 2
- 2. Advisory Committee..... 3
  - Objectives of Advisory Committee ..... 3
  - Process of Forming Advisory Committee ..... 5
- 3. Curriculum..... 5
  - Objectives of Curriculum ..... 5
  - Process of Developing Curriculum ..... 6
- 4. Recruitment to the Trade..... 6
  - Objectives of Recruitment to Trade ..... 6
  - Process of Developing Recruitment Materials ..... 7
- 5. PATHways Program ..... 7
  - Objectives of PATHways Program..... 7
  - Process of Developing PATHways Program ..... 8
- 6. Evaluation and Revision ..... 9
  - Objectives of Evaluation and Revision..... 9
  - Process of Evaluating and Revising Materials ..... 9
- 7. Dissemination ..... 10
  - Objectives of Dissemination..... 10
  - Process of Dissemination ..... 11
- 8. Management of PATHS..... 11
  - Objectives of Management of PATHS ..... 11
  - Processes of Management of PATHS ..... 12
- 9. Appendix A: Inland Empire PATHS Pilot Program Goals..... 15
- 10. Appendix B: Inland Empire PATHS Pilot Program Logo ..... 16

# 1. INTRODUCTION

This document describes the principles behind the PATHS Program, implemented by Frontier Energy, Inc., under contract to the Department of Energy’s Office of Energy Efficiency and Renewable Energy. This is being piloted by Frontier Energy in the Inland Empire region of Southern California, but its intent is broader applicability.

PATHS—which stands for (Career) Pathways to Advance the Trades in HVAC Services—is an approach to workforce education and training for HVAC that aims to target the entire pathway from recruitment to trade schools, through classroom training, career preparation, workforce recruitment, on the job training, and formal workforce training to achieve a workforce with the necessary skills to design, install, and maintain HVAC systems for optimum performance. One of the principles of this approach is that integrating efforts along the entire pathway will result in the most seamless transfer of skills and achieve the best success.



The ultimate objective is to prepare technicians and contractors to deliver HVAC performance. To do this, training will be provided in the specific areas of proper use of tools to take readings of operational parameters, assess whether the measurements were taken correctly, interpret the results, identify a set of options to improve performance, and communicate these options to a homeowner and help them decide what needs to be done.

This document describes the PATHS program by presenting a model plan for implementation, describing the key elements included in such a program. This model plan will help others to achieve the same outcomes that Frontier Energy is aiming to achieve, and develop sustainable organizations that can continue this work into the future.

There are seven key elements in the PATHS Program:

- Advisory Committee
- Recruitment to the Trade
- Curriculum and Training
- PATHways Program
- Evaluation and Revision
- Dissemination
- Management of PATHS

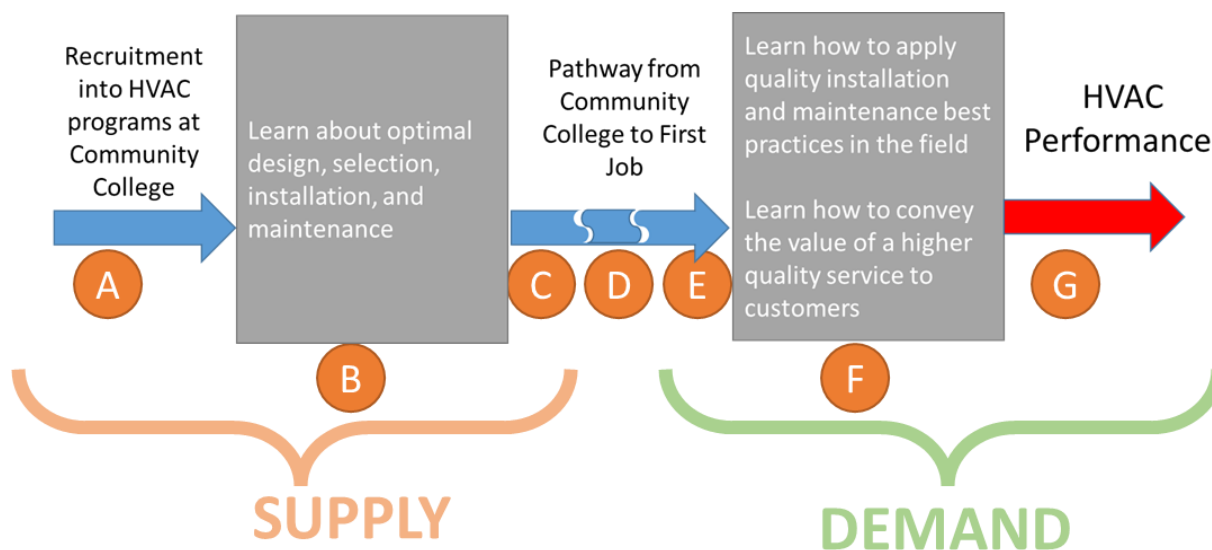
## 2. ADVISORY COMMITTEE

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### OBJECTIVES OF ADVISORY COMMITTEE

It is critical to engage with a broad range of stakeholders to ensure that the outcomes of the program are well tailored to the needs of the community that it will be serving. This engagement is ensured through the formation of an Advisory Committee, which reviews plans, reviews progress, oversees evaluation, and provides direction on recruitment materials, curriculum, and tools/resources.

The involved key stakeholder groups invited to join the Advisory Committee can be divided into “Supply” and “Demand.” Supply refers to all the constituents involved in getting trained technicians into the pool of possible workers, and Demand refers to the constituents involved in accessing those workers and ensuring that they are prepared to provide HVAC performance. The point “D” refers to Community Development entities, who sit in the middle of this picture, and have an interest in making sure that matchmaking happens and people advance from the Supply end to the Demand end.



	Role	Examples
A	Recruitment to Community College	High School Counselors, Shop Teachers, CCC Recruiters
B	Community College Instruction	CCC Administration, Dean, Faculty
C	Job Seekers	Technicians: New (current student, recent grad, 5 years in), Union Technicians
D	Community Development	Economic Development, Non-Profit Community Organizations, Councils of Government, Tribal Groups, Veterans
E	Job Providers	Contractors: Small, Large, Exemplar, National Association, Union
F	Technician / Contractor Training	DOE (BTO and contractors), Utility Trainers and Workforce Programs, Industry Trainers
G	HVAC Performance Advocates	Utility Program Managers, Manufacturers, Advocacy Groups

All interested parties in these categories are potential members of an Advisory Committee. This committee will have the responsibility to give specific guidance on the needs for the program. They will have the best knowledge of what is already available, and what is needed for an effective workforce, and the gaps between the two which need to be addressed through the program.

The size of the Advisory Committee must achieve a balance between being large enough to represent all affected stakeholders and yet small enough to be manageable. Effective facilitation and consideration of subcommittees that will dive deeper into specific issues can help a large Committee to be effective.

It is likely that as the Committee is being formed and as the program progresses, other stakeholders and related efforts will emerge. They should be engaged in the Committee as it progresses. It is important to reflect an evolving understanding of the related and affected efforts going on and being planned in the region, to avoid duplication of efforts and confusion among stakeholders, as well as to leverage efforts.

## **PROCESS OF FORMING ADVISORY COMMITTEE**

- Actively recruit members and make it clear what impact participation in the committee will have on the community and HVAC performance outcomes. Whenever possible, recruitment should be personalized, with individuals who know the candidates making personal appeals for participation.
- The Advisory Committee should meet at least twice a year.
- Their meetings must be effectively facilitated to ensure that even the less vocal members have input to the deliberations.
- The group must quickly reach consensus and determine actions that can scale the program from a regional pilot to a statewide program and into other states.
- Ideally, at least some of the meetings should be in person, held within the region, but it may be unavoidable that many—if not most—of the meetings will have to be virtual.

## **3. CURRICULUM**

### **OBJECTIVES OF CURRICULUM**

The PATHS program will develop and deliver curriculum for both students and incumbent technicians and contractors, and will help develop both technical and soft-skills. The curriculum development may also include development or procurement of supporting tools and resources.

There are three separate components of the training provided through the PATHS program:

- Training for community college students, covering principles, skills, and proper techniques for taking measurements and adjusting HVAC systems during installation and maintenance. This training is designed to be incorporated into an existing HVAC certification syllabus. The content will be delivered within approximately five lecture hours and associated exercises, potentially spread across multiple existing courses. Since making changes to curriculum in a public college system is often a process-intensive endeavor requiring high level approvals, the material can initially supplement existing course content, and then eventually be incorporated into proposals for new course components or even new courses. Curriculum includes course syllabus, PowerPoints, and instructor notes.

- The program will also design and develop technical training for incumbent technicians and contractors, covering proper use of tools to take readings of operational parameters, how to assess whether the measurements were taken correctly, and how to interpret the results and identify opportunities for improvement. This instruction should ideally be delivered in a hands-on format, ideally held at a contractor’s facility or training center.
- The program will also design and develop a soft-skills training program for incumbent technicians and contractors, covering skills and techniques for identifying options to improve performance, and communicate these options to a homeowner and help them decide what needs to be done. This is best delivered in an in-person format, although a well-designed virtual training can also provide the necessary interactivity. Curriculum includes PowerPoints and word documents and include syllabus, learning objectives, and exercises.

## PROCESS OF DEVELOPING CURRICULUM

- Conduct Literature search and review of existing programs and resources. Propose how existing course content would be modified.
- Recruit college instructor(s) and industry trainers who will participate in the program, including training, participation in the PATHways Program activities, and industry recruitment.
- Develop Knowledge, Skills, and Abilities (KSA) outline and learning objectives for the courses.
- Develop course syllabi, PowerPoints, instructor notes, or exercise materials.
- Design and develop, or procure resources and tools such as advanced instruments, templates, calculators, and marketing materials to assist in training. When possible, post on the project website. Any tools procured can be owned by the program or the instructors.
- Hold an Advisory Committee discussion of gaps to confirm that proposed content will address issues in the community.
- Continue to collaborate with and provide technical support to the instructor(s) who will incorporate the unit into their existing courses.
- Recruit contracting firms to participate in trainings for contractors and technicians.

## 4. RECRUITMENT TO THE TRADE

### OBJECTIVES OF RECRUITMENT TO TRADE

Few students or workers are aware of the benefits of a career in HVAC services. Materials designed to make a broader audience aware of the career have to be carefully crafted to effectively convey the appeal. There are severe shortages of trained HVAC technicians and contractors, so it is not

enough to train those already on the path, more people must be attracted to the path and then trained. Recruitment materials aimed at increasing awareness of the HVAC trade career path should have an emphasis on the non-traditional workforce, targeting individuals such as underemployed construction workers, older workers, veterans, women, and the disabled. When appropriate, they should be made available in languages beyond English. The objective of this outreach is to increase enrollment in HVAC certification courses, and facilitate recruitment of new workers by contracting firms.

## **PROCESS OF DEVELOPING RECRUITMENT MATERIALS**

- Work with Advisory Committee to identify the requirements for recruitment in the region, including gathering information about the available workforce and available and emerging jobs.
- Make and document design decisions that will guide development of industry recruitment materials.
- Develop prototype industry recruitment materials, including mockups of print or electronic promotional material or high-level storyboards of a video-based asset.
- Disseminate prototype materials by making the materials available to participating college faculty and contractor and technician trainers and trainees, Advisory Committee members, HVAC faculty at other campuses, and industry trade groups.
- Hold a webinar or focus group to present the prototype materials and solicit feedback to ensure materials are compelling to the target audiences.

## **5. PATHWAYS PROGRAM**

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### **OBJECTIVES OF PATHWAYS PROGRAM**

In order to ensure that the path is smooth from trade school to careers in HVAC services, it is important to intentionally bridge the gap between students and employers. This is typically done with career fairs at which employers provide information about their companies. But a richer program to provide meaningful interactions between students and employers will be more effective. This collection of efforts is referred to as the “PATHways Program.” The core of a PATHways Program will pair students either with contractors (potential employers) or with technicians (role models for their first job), and provide opportunities for students to meet at contractor places of business, job sites, or in the campus lab to exchange experiences. Ideally, it will be an engaging and ongoing relationship, and can include regular meetings (in person or virtual), formal or informal social events (lunch, golf events...), and attending trade shows or industry



events together. This can result in internships. Another element of a PATHways Program can include providing substantial support, potentially including stipends or advanced instruments to qualified students to keep after they graduate. Job seekers who already have tools and know how to use them are seen as already having made a commitment to the trade and will be more attractive to employers.

## **PROCESS OF DEVELOPING PATHWAYS PROGRAM**

### Recruitment:

- Use Advisory Committee and other participating individuals to help recruit faculty, students, contractor/technician trainers, and individual contractors and technicians.
- Provide information to potential participants and reach out individually as needed.
- Ask individuals who agree to participate in the PATHways Program to sign participation agreements. This agreement will ask them to commit to adhering to best practices for HVAC services and participating in a least two PATHways events (e.g., trainings, job fairs).

### Engagement:

- Host a virtual introductory meeting with all PATHways Program Participants for introductions and to explain options (mentoring, internships, site visits, job fairs, job shadowing).
- Organize school visits from participating contractors and technicians.
- Ask participating contractors and technicians to invite participating students to shadow them as they work.
- Organize trips for all participating individuals to attend local trade conferences and meetings.
- Organize other more social gatherings of all participants, such as golf outings, escape room, or a dinner with awards

### Mentorship:

- Match participating contractors and technicians (mentors) with participating students (mentees), and provide individual introductions.
- Provide funding for mentors and mentees to get together over meals several times over the course of the program.
- Encourage mentors and mentees to get together or hold phone calls or virtual meetings approximately monthly throughout the course of the program. Encourage them to attend trade meetings together.
- Encourage mentors and mentees to work on a project together: maybe as pairs, or as a part of a larger project including other mentors and mentees. If appropriate, encourage them to present what they did at a suitable industry venue or at school.

**Tracking:**

- Keep track of mentor/mentee assignments and engagement.
- Routinely contact mentors/mentees and all participants to track interactions that includes mentoring, internships, job shadowing, site visits, and job fairs.

**Special Support:**

- Find funding to provide special support to students, such as stipends to help them get a good start in their first job, or instruments to show potential employers that they are committed to the trade.
- Provide other complementary services via a program website, including templates, calculators, materials, and employment placement.

## 6. EVALUATION AND REVISION

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### OBJECTIVES OF EVALUATION AND REVISION

It is important to evaluate the effectiveness of a PATHS program, and if time and budget allow, to modify program materials in response to the findings of the evaluation. Evaluations should be conducted of the trainings and course materials, as well as the Industry Recruitment Materials and the PATHways program. The evaluation should be based on a number of inputs, such as interviews and surveys with students and instructors before and after training, statistical and demographical data such as enrollment and course completion from participants and (if possible) control groups, statistical sales and installation data from the participating contractors, regional permit data and utility data, enrollment in the program, expected enrollment in the future, effectiveness of knowledge transfer, use of program resources, and the usefulness of training components. Another source of data for evaluation is analytics describing access to the program website and the effectiveness of dissemination should also be evaluated. After the evaluation is complete, a plan should be developed for revising the program elements, whether or not it is within scope to actually carry out the revisions. As with any evaluation, setting evaluation criteria before beginning the evaluation is a good practice. The Advisory Committee should have a meaningful role in establishing the evaluation criteria and reviewing the draft evaluation and plans for revision.

### PROCESS OF EVALUATING AND REVISING MATERIALS

- Determine and document specific evaluation criteria to determine whether the program should be modified or if it merits continuation. These criteria potentially include enrollment in the pilot, expected enrollment in the future, effectiveness of knowledge transfer, impacts on sales and installation, use of program resources, and the usefulness of training components.

- Conduct interviews and surveys with at least half of the enrolled pilot learners and instructor(s) prior to program to establish pre-program baseline, and again after the program to identify post-program knowledge and skills.
- Collect statistical and demographical data such as enrollment and course completion from the pilot programs and control groups, statistical sales and installation data from the pilot contractors and regional permit data and utility data.
- Collect data from the program website, including user reviews, and analyze the use and usefulness of the tools, resources, and information.
- Analyze all feedback from interviews, observations, and surveys and other collected data to assess the usefulness of the training components, industry recruitment materials, and the PATHways Program.
- Facilitate the Advisory Committee in its consideration of recommended program changes to improve the outcomes and encourage broader adoption, and of whether or not the program merits continuation.
- Work with Advisory Committee to identify specific required revisions to the training curricula, Industry Recruitment materials, and PATHways Program materials.
- Develop a plan to revise program resources.
- Produce revised curriculum, Industry Recruitment materials, and PATHways Program resources.
- Facilitate the Advisory Committee as it vets revised materials and processes.

## 7. DISSEMINATION

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### OBJECTIVES OF DISSEMINATION

Because there is so much to learn about how best to provide workforce education and training, it is important for anyone who implements a program to do what they can to disseminate their findings. This will help others in the region or other regions to carry out their own efforts. Dissemination should be geared towards providing materials that can be shared, but also to convey lessons learned and best practices. Dissemination is often an afterthought, and it is assumed that if the information is posted on the website, it will be found by others. However, active engagement with the entities who need the information and effective planning for dissemination can boost its effectiveness. The Advisory Committee should be enlisted to share the results within their own organizations and professional networks. Goals and timelines for dissemination are helpful, as are securing commitments for dissemination. Dissemination activities can include preparing slidesets that can be distributed to Advisory Committee members to make their own presentations, as well as press releases, and brief summaries that can be included in newsletters and trade press. Colleges, trade organizations, utilities, and associated governmental entities often have

communication channels that can be tapped effectively. Tracking dissemination can be helpful in ensuring that it is not neglected.

## PROCESS OF DISSEMINATION

- Develop a plan for dissemination of all developed materials, and conduct outreach to Advisory Committee members and other interested stakeholders.
- Secure letters with specific commitments to disseminate the materials to potential students or workers.
- Make the curriculum and industry recruitment materials available with a Creative Commons license on the program website.
- Disseminate information about the curriculum and the PATHS Program to contractors and technicians—via trade associations, the Contractor State License Board, utility programs, and other trade allies—and to faculty and students in CCC HVAC certification courses so they can access the materials and enroll in the program.
- Develop and document best practices and lessons learned in a written report about the program that can be provided to similar workforce development initiatives.
- Deliver presentations via industry events and organizations, utility coalitions, and to local and state energy officials.
- Deliver a presentation on the program’s findings in a final project review with project funders.
- Write technical papers and make conference presentations about the best practices developed and lessons learned.

## 8. MANAGEMENT OF PATHS

### OBJECTIVES OF MANAGEMENT OF PATHS

Effective management of the PATHS program is critical to its success. This management includes providing the staffing to oversee the program, tracking its progress and successes, convening the Advisory Committee, and coordinating dissemination of results. Specific areas of concern are planning, communication, and ensuring sustainability.

Planning includes establishing goals for the program and tracking its progress. If goals are not being met, the program should be reviewed and changes made to its processes. Communications include both internal communications, to ensure that all actors are well coordinated, and external communications, to ensure that entities outside the program can learn about it. Sustainability includes efforts to ensure that the program will continue after its initial funding is completed. If the

program demonstrates success, it should be possible to obtain funding from any of a number of other sources to continue.

## PROCESSES OF MANAGEMENT OF PATHS

### Plan:

- This Model Plan document should provide a good starting point for a Program Plan. It can be customized for use by other entities implementing a PATHS Program.
- The plan should include numeric goals for participation in the program, including numbers of students and contractors/technicians trained, instructors, Advisory Committee members, community college faculty participating, respondents to surveys and interviews, commitments to disseminate materials, and website visitors. Appendix A provides some of these numeric goals for Frontier Energy’s Inland Empire pilot.

### Communications:

- Inward communications include communications between and among the program administrators, project sponsors, PATHways students, PATHways contractors and technicians, participating faculty and instructors, and the Advisory Committee.
- Internal communications expectations should be established, such as:
  - Program administrators will meet periodically and correspond by email with all project staff and subcontractors.
  - Program administrators will meet periodically and correspond by email with project sponsors.
  - Program administrators will meet periodically and correspond by email with participating faculty and instructors.
  - Program administrators will *not* communicate directly with students, contractors, or technicians who are being trained, except with approval by instructors.
  - Communications between mentors and mentees need not include program administrators, unless it is helpful in keeping the relationship going. Mentors will advise program administrators about approximately how often they communicate with mentees.
  - Program administrators correspond by email or phone with individual Advisory Committee members
  - Periodic email announcements will be broadcast by program administrators to the Advisory Committee (with or without individual members’ emails exposed).
- Outward communications are focused on developing a program website with the objective to allow readers to accomplish the following:
  - Learn about the program and its objectives, with separate pages to provide information on the Advisory Committee, Recruitment to the Trade, Curriculum, PATHways Program, and Dissemination.

- Download resources developed by the program. This includes curriculum, reports, and model PowerPoints.
- Collaborate with other program stakeholders. This can include a protected space for Advisory Committee members to review and provide comments on developed materials, or a protected space for PATHways Program participants to share social-media type communications.
- Get more information about the program or other things that are relevant to the program. This includes a request to be added to a mailing list or to receive information, or links to websites of the project sponsors, participating organizations, Advisory Committee member organizations, other resources relevant to training or HVAC system performance, community organizations. It should have special links for organizations who are interested in setting up a PATHS program in their community. Logos of participating organizations and sponsors should be shown.
- The program website should have a simple and yet descriptive URL. The URL for the Frontier Energy Inland Empire pilot is hvacpaths.org or hvacpaths.com.
- Other outward communications should utilize intentional branding, including using the term “PATHS”, and using a program logo.
- If appropriate, the program logo should utilize the metaphor of a “pathway.”
- If appropriate, the logo might be designed to have a similar look and feel and terminology of logos of other PATHS programs, but customized for different regions. The logo used for Frontier Energy’s pilot program in the Inland Empire region is provided in Appendix B.

#### Sustainability:

- The Advisory Committee should guide the PATHS program from the beginning to ensure long-term sustainability, to sustain PATHS activities. A long-term sustainability plan should be developed as part of the program plan, with a goal to continue the program locally, or to scale it beyond the scope of the original award to potentially impact building industry professionals nationwide.
- Near the end of the program, the program plan should be reviewed and modified as needed to improve future programs’ acceptability to participants and effectiveness at facilitating the career path from student to practitioner, and to revise processes that may have created barriers or unintended consequences to participation, and to ensure future sustainability of organization.
- By the end of the program, it should be possible to use the training pilots as a mechanism to recruit a next cohort. The last phase of the program should include securing agreements from additional campuses, and additional industry or utility HVAC training programs to use the training and recruitment materials. It should also include provision of onboarding support to new PATHS trainers and work with them to launch additional student and contractor/technician trainings, and PATHways structures.

- A range of potential models should be considered for continuing the program, such as identifying an existing organization such as trade associations, educational programs, manufacturers, utility (IOU, CCE, or REN), or community-based organization (perhaps a member of the Advisory Committee?) to incorporate the program into their ongoing programs, create a new entity with a dues-structure, and/or leverage workforce development contracts.
- Identify other private or public local, regional, state, or federal sources of funding for ongoing activities. There is a significant policy emphasis on workforce education and training, and particularly on disadvantaged workers, and there is likely to be a large array of potential funding sources.

## 9. APPENDIX A: INLAND EMPIRE PATHS PILOT PROGRAM GOALS

- 5: Hours of student training
- 15 project partners in AC
- 1: community college faculty member signed up to include training in existing course
- 3: sets of initial curriculum materials
- 3: sets of revised curriculum materials
- 5: hours of hands-on technical training for technicians
- 8: hours of soft-skills training for technicians/contractors
- 10: students enrolled in first student class
- 30: students enrolled throughout program
- ½: participants in each class and technician training receiving pre-survey or interview
- ½: participants in each class and technician training receiving post-survey or interview
- 10: contractors/technicians participating in PATHS programming
- 10: students participating in PATHS programming
- 2: PATHS programming events for contractors, technicians, and students
- 5: letters from AC members committing to distribute draft recruitment materials
- 100: potential students or workers receiving draft recruitment materials
- 15: partners attend webinar to provide feedback on recruitment materials
- 1: video based asset developed
- 5: contracting firms participating in technician technical and sales trainings
- 5: technicians per firm participating in technician technical and sales trainings
- 25: technicians participating in technician technical and sales trainings
- 100: unique visitors to website per year
- 300: contractors, technicians, and potential workers view or receive recruitment materials
- 500: faculty, students, and potential students view or receive recruitment materials
- 3: faculty or trainers signed up to provide future trainings
- 1: report about program to document best practices and lessons learned
- 1: PPT presentation about program to share best practices and lessons learned
- 1: presentation to a wider audience about program to share best practices and lessons learned
- 1: website to share best practices and materials
- 1: set of diagnostic tools provided to community college



- 1: set of diagnostic tools provided to each participating contractor firm
- 1: set of evaluation criteria for program
- 1: evaluation report
- 1: meeting of AC to review program evaluation

## 10. APPENDIX B: INLAND EMPIRE PATHS PILOT PROGRAM LOGO

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Under construction.