



**CSW**  
Corporation for a  
**Skilled Workforce**

**Good Jobs. Thriving Communities.**

**Idaho State University  
Energy Systems Technology and  
Education Center (ESTEC)**

**Providing Opportunities for Women in  
Energy Related Careers**

**Interim Evaluation Report  
Summer 2016**

## POWER Careers Project Background

The POWER Careers project is housed in the Energy Systems Technology and Education Center (ESTEC) at Idaho State University (ISU). ISU's College of Technology is charged by the State of Idaho to provide technical education in eastern Idaho. The College primarily grants Associate in Applied Science (AAS) and technical certificates. In 2006, the ESTEC was formed following an Idaho National Laboratory study that identified a regional and national need for energy industry workers with leading edge technical skills. The study noted that the aging workforce and ongoing innovation in the energy industry required a transformation in new worker training.

ESTEC's mission is to cultivate the people, educational resources and applied research capabilities necessary to improve local, regional and national availability of trained workers in occupations that support the construction, operation and maintenance of current and future energy facilities. ESTEC's educational programs culminate in a two-year AAS degree that prepares students for entry-level professional technical positions. ESTEC's approach includes involvement of community organizations to communicate with, inform, and recruit non-traditional students including ethnic minorities, women, veterans, and other individuals and groups not currently well represented in the energy workforce.

In 2015, the National Science Foundation awarded \$796,639 to ESTEC for the Providing Opportunities for Women in Energy Related (POWER) Careers project. This project aims to address the issue of underrepresentation of women of all ages and ethnicities in ESTEC, as well as the significant under-representation of women across the engineering technology sector of the energy workforce. At the time of the grant proposal, women represented about 8% of students in ESTEC energy programs, and had never exceeded 15%.

### Project Goals and Objectives

The over-arching mission of POWER Careers is to achieve equity for women in energy technology career fields by increasing their successful participation in high quality, proven energy systems programs, using strategies that will help retain non-traditional women students through graduation and placement into professional positions. Project efforts will primarily target non-traditional aged women (and will include under-represented populations in southeast Idaho--Hispanics/Latinas, American Indians, and military veterans). Female students of all ages are welcome in the project.

POWER Careers aims to employ a continuum of supports and activities across the student experience, including mentors in the form of successful ESTEC graduates. The project has indicated that it will identify and address the recruitment challenges of a technical college serving a rural area, in part by working closely with community agencies that are in contact with potential students. The project also intends to engage industry in efforts to build a more diverse workforce and create workplace environments that are welcoming to female technicians.



The POWER Careers project has identified their grant and post-grant participant outcomes as:

- 50 women enroll in ESTEC over 3 years (these students will have met math and English entry requirements)
- 44 women begin coursework as planned
- 40 women will successfully complete the first semester of an ESTEC program
- 35 will successfully complete an AAS degree, 18 will complete during the grant period and an additional 17 will graduate with an AAS degree on-time but after the grant period (graduation date for these students will be Fall 19 through Fall 20)
- 33 women are placed in professional positions after graduation

Recruitment Projections	Fall 15	Spring 16	Fall 16	Spring 17	Fall 17	Spring 18
Historic female enrollment	4	3	3	3	4	3
Projection with POWER Careers	8	6	12	6	12	6

To achieve these participant outcomes and overall project objectives, POWER Careers has outlined five key goals:

- 1- Recruit and enroll women aged 25+ into ESTEC AAS programs;
- 2- Retain students to graduation with a supportive student learning community;
- 3- Place graduates into professional jobs;
- 4- Strengthen ESTEC partnerships with energy employers to further careers for women; and
- 5- Promote a culture of mentorship to encourage women who pursue STEM technical careers.

### POWER Careers Evaluation Background

Corporation for a Skilled Workforce serves as the external evaluator for this project. CSW is a 22-year-old national 501(c)3 organization that specializes in research and evaluation, planning and initiative development, and implementation and sustainability. CSW performs research, planning, evaluation and strategic advising, and has expertise in working closely with postsecondary institutions and workforce partners to develop a shared vision and roadmaps to success.



CSW will conduct formative and summative evaluation activities in order to identify and recommend continuous improvement efforts, as well as to help articulate whether, how, and the degree to which the POWER Careers project is successful in achieving its five key goals.

Through the evaluation, the project seeks to focus on two primary research questions:

- 1- How do improvements to educational strategies enhance student learning and performance for nontraditional age students from under-represented populations in rural areas within the energy field?
- 2- How do innovative and targeted student recruiting, retention and placement strategies; industry engagement and partnership building strategies; and mentorship engagement and training strategies increase the effectiveness of energy technician education programs in retaining, graduating, and placing students in STEM-related and energy-specific careers?

The following page outlines the logic model developed by the evaluator for this project. This logic model serves as a one-page summary of the project, as well as a critical guide for evaluation inquiries and related activities. The logic model aims to outline the various project activities and deliverables, and particularly how these activities are expected to eventually “add up” to the intended impacts and outcomes.

In May of 2015, at the very end of the academic year, CSW conducted a site visit to the POWER Careers project site to tour the ESTEC facility and ISU campus, interview POWER Careers project staff, meet with POWER Careers students, and interview other key administrative personnel, faculty and staff. The following report summarizes observations and insights gained during the site visit. *CSW is very grateful to the ESTEC faculty, staff and students, and especially to the POWER project staff, for their input, energy and candor during a very busy time of the academic year. Their insights and willingness to participate were invaluable.*



## POWER Careers Logic Model

Inputs/Assets	Outputs <i>Activities &amp; Deliverables</i>	Outcomes -- Impact		
		<i>Short</i>	<i>Medium</i>	<i>Long</i>
<p>Energy Systems Technology &amp; Education Center (ESTEC) existing:</p> <ul style="list-style-type: none"> <li>• Industry partnerships and Advisory Council</li> <li>• Faculty and staff</li> <li>• Students and graduates</li> <li>• Reputation and national recognition</li> </ul> <p>Leveraged Resources</p> <ul style="list-style-type: none"> <li>• Grants</li> <li>• CTE funding</li> </ul>	<p><b><u>Recruit and Enroll:</u></b></p> <ul style="list-style-type: none"> <li>• Develop new messages and materials featuring diverse female role models.</li> <li>• Identify (student) prospects.</li> <li>• Provide informational sessions.</li> <li>• Connect prospects to female ESTEC students/grads with "Technicians Talk".</li> <li>• Provide professional development to recruiters.</li> <li>• Develop equity and access strategies.</li> </ul> <p><b><u>Retain:</u></b></p> <ul style="list-style-type: none"> <li>• Implement pre-engagement program and First-Semester-to-Finish program.</li> <li>• Provide intensive math assistance as needed.</li> <li>• Establish/match students with ESTEC mentors.</li> </ul> <p><b><u>Place:</u></b></p> <ul style="list-style-type: none"> <li>• Build opportunities for diverse industry contacts early and throughout program.</li> <li>• Support participation in conferences, tours, i-ships.</li> <li>• Provide extensive job search assistance.</li> <li>• Present to key employers on working with and supporting diverse women in their workforce.</li> </ul> <p><b><u>Strengthen ESTEC partnerships:</u></b></p> <ul style="list-style-type: none"> <li>• Involve industry in messaging through ESTEC grads/employees, and in seminars for participants.</li> <li>• Develop new energy systems scholarship program.</li> <li>• Involve ESTEC Advisory Council members in POWER Careers Advisory Board.</li> <li>• Provide feedback on creating an inclusive and supportive workplace.</li> </ul> <p><b><u>Promote a culture of mentorship:</u></b></p> <ul style="list-style-type: none"> <li>• Engage ESTEC grads as mentors and train mentors on working with non-traditional students.</li> <li>• Expose students to mentors and value of mentoring.</li> <li>• Create opportunities for 2<sup>nd</sup> year students to mentor.</li> <li>• Continue engagement of grads (new professionals) as mentors.</li> </ul>	<p>Enhanced career pathway awareness.</p> <p>New pool(s) of prospective students receiving information about program.</p> <p>ESTEC students receiving retention supports.</p> <p>ESTEC students engaging with industry through a variety of means.</p> <p>ESTEC employers engaging with and supporting POWER program.</p> <p>ESTEC and POWER students and grads engaging in mentorship program.</p>	<p><b>Recruit and enroll</b> women age 25 years and older into ESTEC AAS programs.</p> <p><b>Retain</b> students to graduation with a supportive student learning community.</p> <p><b>Place</b> graduates in professional jobs.</p> <p><b>Strengthen ESTEC partnerships</b> with energy employers.</p> <p><b>Promote a culture of mentorship</b> to encourage women who pursue STEM technical careers.</p>	<p>Develop age-diverse, female professional energy technicians.</p> <p>Build lasting industry and professional technician engagement.</p>

### Assumptions

Women are underrepresented in ESTEC education and employment, despite being highly motivated. However, if recruitment and retention challenges are appropriately addressed, and non-traditional female students are aptly supported through the program and into industry, more women aged 25+ can obtain successful energy careers.

### External Factors

Lack of awareness among women of energy careers, lack of role models in industry, financial and familial barriers of many 25+ aged women, Idaho's population density and resulting access to resources.

## May 2015 Evaluation Site Visit

“We recognize that if women come here, have a good experience and go to work they will start a movement.” – Scott Rasmussen, Dean of ISU College of Technology

### ESTEC Programs

ESTEC, while part of the ISU College of Technology, operates as a separate department and Center within the greater university structure. As such, ESTEC has the ability to receive grants and conduct research. ESTEC was designed with a so-called “meta major” vision in mind – all its curriculum focuses on one area of energy. ESTEC thus functions like an academic major in which all parts are related.

For entry, ESTEC currently accepts the COMPASS, SAT, and ACT tests, with no requirements other than cut-off math scores. More than 50% of entering students require some kind of math remediation, which is done through the technical general education or math departments, or through the START program (more on this later in this document). Typically, students require one semester of math remediation, though some do need additional semesters. The first year of the ESTEC program is also offered at Eastern Idaho Technical College, so it’s a satellite first year operation.

As noted above, one of the primary goals of the POWER Careers project is to recruit and retain women into ESTEC AAS programs of study. These programs include:

- Energy Systems Nuclear Operations Technology
- Energy Systems Mechanical Engineering Technology
- Energy Systems Instrumentation Engineering Technology
- Cyber-Physical Security
- Energy Systems Electrical Engineering Technology

### Recruitment

Given that the project was just finishing the first academic year of performance, it is not surprising that a great deal of the activity to-date has focused on establishing recruitment opportunities, practices and materials. The POWER Careers project is primarily supported by the Project Manager, who performs much of the needed recruitment and programmatic support. At the time of the site visit, **POWER Careers had ten participants currently enrolled, and four who had already completed the program and graduated.**

Recruitment -- and the related themes of communication, messaging, outreach and marketing -- was a consistent topic of discussion across nearly every stakeholder interviewed during the site visits. Students, faculty, project staff and administration universally mentioned various aspects

of outreach and recruitment as challenging. **One of the key issues underlying these recruitment challenges appears to center on the *lack of awareness or understanding of the energy industry broadly, and specifically the programs and career pathway opportunities within that industry offered at ESTEC.***

As one administrator noted, “you don’t pursue a career that you don’t know exists”. Thus, students enroll either based on hearing through word-of-mouth from a trusted source, or knowing someone in one of these niche industries who sent them to ESTEC. These are not particularly sustainable nor reliable sources of recruitment in themselves, though identifying and capturing these sources may offer one starting point for growing recruitment efforts. At the time of the site visit, the POWER Careers program had not yet developed targeted messaging and marketing materials aimed at women.

This difficulty understanding the technical nature of ESTEC and its programs is true not just for potential (in this case – female) POWER Careers program participants, but also for parents or family members of potential participants, students in other ISU programs, and even non-ESTEC faculty and staff within the broader ISU community. Indeed, ESTEC staff and faculty frequently noted that the greater University has difficulty understanding ESTEC, its programs, language, and related job opportunities. ESTEC students echoed this issue, noting that they required a substantial amount of “education about ESTEC education” in order to understand the programs and prospective job opportunities available. This lack of understanding about and awareness of the opportunities inherent in ESTEC programs is not surprising given the technical nature of the programs offered. ***Effective translation and communication about these programs - and the range of very promising career opportunities they offer in a relatively short time span - is a critical aspect of the POWER Careers project.***

**Recommendation:** research promising practices and existing materials in outreach, recruitment and marketing of non-traditional programs and occupations to women and other under-represented populations. Develop and more intentionally disseminate these materials to women and women-serving organizations and businesses.

**Recommendation:** leverage the graduate thesis project currently underway by an ESTEC graduate focused on recruitment and mentoring. This project identified that many women are found in community or school outreach and express a high level of interest, but a large gap exists between that outreach and subsequent enrollment. This graduate project proposes to offer mentoring at the point of outreach, as well as an online learning support program for students during their program of study.



## Students

Several current and one former POWER Career participants were interviewed during the course of the site visit. The students were universally positive about their experience with the POWER Careers support offerings, as well as the ESTEC program overall. A few key themes emerged from the student discussions, as follows:

- Support is critical. Several students noted the male dominance of the field, and the general mentality (including among employers) that women are not a good or likely fit in the energy industry. **Overcoming this powerful cultural barrier requires a fair amount of grit on the part of the students, as well as significant personal and professional support.** Students mentioned receiving encouragement from their family and friends, as well as the community of staff, faculty and other female students within ESTEC.
- The opportunities are real. One student described being laid off from a large plant closing after a decade of work there. “I had no clue what I was going to do!” She anticipated having to work two jobs to make anything near her current salary. In the midst of this, she happened to meet the ESTEC recruiter at a social event, and they started talking about their respective jobs. Prior to this chance meeting, she had no idea about the career pathways available, and that **a two-year program would allow her to make a family-sustaining, good wage with continued career growth potential.**
- ESTEC is a best kept secret. As the anecdote above illustrates, and the section on recruitment also describes, ESTEC – in particular its programs and the real, immediate, good-paying job opportunities offered – is simply not known or understood. Beyond the obvious technical nature of the programs and the inherent difficulty in describing these to lay people, ESTEC students noted that **women are even less likely to associate themselves (or to be considered, even by employers needing workers) with this industry.**
- It’s hard, but it’s worth it. Students mentioned worrying a great deal about the academic rigor of the courses, as well as being the only female and/or significantly older than other students. As one student noted, “my kids told me – if it was easy, everyone would do it!” Another student said, **“It’s going to test everything. The reward is so much more than you can ever imagine.”**

## Industry and Community Engagement

Idaho state code requires a formalized Advisory Committee for every program. As such, ESTEC has formal committees that meet at least 2x/year and provide input and vision, and reflect on their experience with graduates. Faculty and staff indicated that they typically try to keep 10-16 companies on each Advisory Committee. The companies see serving on a Committee as an opportunity to have an inside track to graduates.

Clearly, the Advisory Committees are a natural first step in the POWER Careers aim to increase female representation in the energy industry, as well as opportunities to identify female mentors. POWER Careers project staff indicated that they intend to start working more





intentionally with those companies in terms of helping to improve the number of women being hired. They also hope these employers will host ESTEC related activities or other tours and events.

In partnership with the Center for New Direction, ISU offers the START program for non-traditional students, lower-skilled students or those returning from the workplace. The START program is an intensive, semester-long effort that focuses on offering developmental math skills, a writing course, and college success skills with lots of career exploration. Most of the START participants tour the College of Technology, which provides them critical exposure to ESTEC programs and career opportunities. The full-time counselor provided by the Center for New Direction, as well as the exposure to ESTEC and its structure, small class sizes, and faculty encouragement has been a strong support for ESTEC and connected participants to the POWER Careers program.

**Recommendation:** develop and grow a list of target partners to help with all aspects of recruitment, messaging, outreach and employment. Connect more strongly with the workforce development agencies and inform them of the POWER Careers project, START program, and other ESTEC and related offerings. Advertise at the local EBR1 museum. Identify parent groups to educate families of recent or future graduates about the opportunities in the energy industry. Identify other areas of non-traditional (for women) jobs and recruit females to higher-paying opportunities offered through ESTEC programs.

Currently, ESTEC graduates often leave the state to take jobs elsewhere. As a result, ESTEC staff worry that support from state agencies may be lower than it could be. ESTEC should develop a list of local, state-based or affiliated employers who have hired ESTEC graduates, to illustrate the opportunities locally for program participants.

### **Building the Mentor Pool**

While recruitment of students into the ESTEC program is of primary concern for the POWER Careers project, so too is recruiting mentors. A core issue for the project is that there are currently, at the time of the site visit, 35 total female graduates. The project staff rightly worried about involving these graduates without taxing or fatiguing them to the point of non-involvement. Further, most graduates are not local to ISU, so the project is developing avenues for virtual or distance engagement.

**Recommendation:** identify women in energy industry careers outside of ESTEC programs and specific scope. Related industries, or even not-very-related industries that are still nontraditional for women may offer excellent mentors and role models for current or prospective students, as well as critical outreach and recruitment connections and insight.

**Recommendation:** identify and consider a broad range of low-touch “asks” from mentors, including attending social events or virtual lunches, etc. Allow for mentors who do not (at least at first) assign to particular students, but rather serve as mentors in a more general and informal sense. Beware a too-tall ask from mentors early on, lest they shy away from further contact.



**Recommendation:** use a Customer Relationship Management tool and process (like the one in development by an ESTEC faculty member) to manage all of the relationships in play – student outreach, mentorship cultivation, and employer engagement. Centralize and streamline outreach across ESTEC faculty and staff, and share this information and approach with central campus to begin to build more specific bridges across the academic and technical programs.

### Summary

Overall, the POWER Careers project appears to be making good progress to meeting its participant outcomes goals. The students currently and previously involved with the project report feeling well supported and encouraged by the POWER Careers staff and the ESTEC Center. Further, the POWER Careers project staff appear to have a clear sense of the needs and next steps for meeting their recruitment and engagement objectives, and are on their way to identifying new opportunities, developing deeper relationships and establishing lasting partnerships.

