THE PAST FOUNDATION

Clean Technologies Early College High School

Program Design for Ninth-Grade Enrollment, Fall 2014

Ballston Spa Central School District
Ballston Spa, New York
Dr. Joseph P. Dragone, Superintendent

KNOWLEDGE CAPTURE PROGRAM
PAST Foundation

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March 31, 2014

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Program Background

The Clean Technologies Early College High School (Clean Tech ECHS) is currently enrolling the first 9th grade student cohort for the 2014-15 school year. The projected 9th grade enrollment is 60 students, and extends access to more than 20 school districts in the region, building total Clean Tech ECHS student enrollment to approximately 170 freshmen, juniors and seniors. This marks the fourth year of the program's continued growth, advancing planned future expansion to enroll 250 students in grades 9-12. The program was developed in partnership with the Hudson Valley Community College (HVCC) and the New York State Energy Research and Development Authority (NYSERDA) and is located at the HVCC TEC-SMART campus.

Together with over 25 business and industry partners, including Cisco, Global Foundries and TRC Solutions, the Clean Technologies Early College High School offers a model for an early college education program focused on careers in STEM related fields...

Together with over 25 business and industry partners, including Cisco, Global Foundries and TRC Solutions, the program offers a model for an early college education program focused on careers in STEM related fields including science, technology, engineering and math. The Clean Tech ECHS program is a grant recipient of supporting funds from NYSERDA and the New York State Education Department grant, Pathways in Technology Early College High School Program (P-TECH).

This report provides a summary of the views of Clean Tech ECHS staff and program partners regarding outreach and recruitment of 9th grade students, as well as planned program components to support phased transition for the 9th grade students from their traditional high school to the early college high school program. This transition will occur over a two-year period including summer sessions, allowing students to remain at their home high school during the 9th and 10th grades while they are preparing for coursework at the TEC-SMART campus during their junior and senior years.

The report is based on interview and focus group data gathered during December 2013 to February 2014 with Clean Tech ECHS staff and program partners (n=10) . In the discussion that follows, key components of the 9th grade program plan are reviewed, including ways to build on existing program recruitment practices, as well as ideas about 9th grade student and parent needs for successful engagement with the program. Special concerns associated with recruitment of females and other under-represented students in science, technology, engineering and math (STEM) disciplines are also reviewed in this report.

Clean Tech ECHS Program Outreach and Recruitment

Recruiting students to the program over the past three years has built enrollment of 110 junior and senior students from across 20 school districts. Current regional outreach efforts to expand program enrollment continues through an established and effective multi-pronged approach to support outreach to prospective students and parents. *Table 1: Clean Tech ECHS Current Outreach Activities*, provides an overview of outreach activities identified by program staff and partners. The table shows full engagement of staff, as well as students, parents and partners in conducting outreach utilizing various media as well as direct communication, both on campus and in communities.

Main components of the recruitment program have included ongoing communication with individual school administrative staff, school counselors, as well as teachers, including math, science, and technology teachers across the region that now includes eight additional districts (bscsd.org/cleantech.cfm). Holding recruitment events for school counselors and teachers at the TEC-SMART campus has effectively created a process for sharing information with home high school staff about the Clean Tech ECHS program, who can then share information with students at schools throughout the region (3004-22). In February 2014, the Clean Tech ECHS program also offered a regional webinar for school counselors to increase access to program information (3003-18).

Parents and students interested in the program have also been invited to evening recruitment events. These fall and spring semester events have presented a range of speakers who can share firsthand experience at Clean Tech, providing a forum for faculty, administrative staff and school leaders, currently enrolled students, and their parents to talk about early college high school program benefits. These events have been very successful in reaching out to prospective parents and students typically attracting 150-200 people, and most recently an estimated 250 people were in attendance from across the region (3021-13).

Holding recruitment events for school counselors and teachers at the TEC-SMART campus has effectively created a process for sharing information with home high school staff about the Clean Tech ECHS program, who can then share information with students at schools throughout the region (3004-22).

Recruitment of Under-Represented Students

An important aspect of the program has been to build outreach and recruitment opportunities directed to females who are considered to be under-represented in STEM fields (2021-13; 2022-13; Integrated STEM Experiences, M. Honey, Ed., 2014). Currently, Clean Tech ECHS female student enrollment has grown from 10% in the first year of the program, to 28% of the total present enrollment of 110 students (3021-13). Building enrollment of under-represented students including at-risk and disadvantaged youth is also a current priority of the program. Extending regional access to Clean Tech ECHS offers the opportunity to gain a rich diversity in student enrollment. Goals to build Clean Tech ECHS program diversity mirror industry goals for growing a skilled 21st century workforce and increasing diversity through broad-based programs that can attract under-represented groups

Table 1: Clean Tech ECHS Current Outreach Activities (Spring 2014)

Outreach Initiator	Outreach Activities	Prospective Students	Prospective Parents	Regional Counselors	Regional Teachers	Community Partners	Home Schools
Clean Tech Administration	Use images of girls in marketing efforts	✓	✓	✓	✓	✓	✓
	Hold evening program recruitment events	✓	✓	✓	✓	✓	✓
	Girls in STEM program for 7th grade girls	✓					
	Save the Date' sent for Clean Tech events	✓	✓	✓	✓	✓	✓
	Tours	✓	✓	✓	✓	✓	✓
	Website updates	✓	✓	✓	✓	✓	✓
	Individual follow-up sessions	✓	✓				
	Conduct webinar for those who cannot attend program recruitment events			✓	✓		✓
	Economic/STEM Industry Initiatives					✓	
	Meet and present program information at home schools						✓
	Special outreach events, including visiting international educators, dignitaries and elected officials					✓	
	Supporting partnerships/program development with 2yr/4yr higher education institutions					✓	
Clean Tech Counselor	Weekly email blast	✓	✓				
	Invitation to tour Clean Tech campus			✓			
	Meet with regional high schools and middle schools at home school and at Clean Tech campus			✓			
	Work together to identify prospective students			✓			
	Promote Clean Tech through Counselor Association meetings			✓			
Clean Tech Teachers	Orientation events	✓	✓				
	Program recruitment evening events	✓	✓	✓	✓	✓	✓
	Telephone calls		✓				
	Website		✓				
Clean Tech Students	Female students help with marketing to girls	✓					
	Student ambassadors	✓	✓	✓			✓
	Female students mentoring younger girls at STEM events	✓					
	Orientation events	✓	✓				
	Expos in the community	✓	✓	✓	✓	✓	✓
	Expos at Clean Tech for the public, press invited	✓	✓	✓	✓	✓	✓
Clean Tech Parents	Orientation events	✓	✓				
	Program recruitment evening events	✓	✓	✓	✓	✓	✓
Clean Tech Partners	Orientation events	✓	✓				
	Program recruitment evening events	✓	✓				
	Webinar evites		✓	✓	✓		✓
	Clean Tech program information via email distribution		✓	✓	✓		✓
	Chamber of Commerce promotes recruitment events on website					✓	

including females as well as ethnic minorities, at-risk and disadvantaged students to explore STEM career opportunities (3002-26).

Beginning with the 2014-15 academic year, Clean Tech ECHS will include school districts in urban areas such as Albany and Troy, enrolling inner-city youth from areas where demographics may help increase enrollment of not only female students, but also students with diverse socioeconomic and ethnic backgrounds (3003-18). Students ranging in multicultural characteristics, including fluency in languages other than English, may increase with enrollment of urban area students in the Clean Tech ECHS program (3004-111).

During the 2013-14 school year, 15% of enrolled Clean Tech ECHS students qualified to receive free and reduced lunch from 20 participating districts (3021-13). The Ballston Spa Central School District as a whole currently includes 25% of the student body that meet criteria for free and reduced lunch (3022-13). Students who are considered at-risk or disadvantaged are those who may face socioeconomic constraints and particular types of barriers to higher education and may have low expectations for attending college (3003-54; 3004-56). However, as one individual observed, these students often do not suffer from lack of academic ability, noting, "They're not weak of skills" (3514-100). These students may also not necessarily be the "A" students, but may exhibit other characteristics such as a "keen interest or a potential that they could do well in a different type of atmosphere" where they can connect with previously unexplored interests in STEM disciplines (3004-36).

For some students, lack of awareness of STEM-related jobs and essential skills that can increase their ability and options to enter a professional STEM career is a key factor impacting student perceptions about the possibilities for their future (3003-48; 3004-56).

At-risk, under-performing students may also experience a different set of challenges associated with limiting factors that potentially influence their expectations for post-high school jobs and types of occupations open to them. For some students, lack of awareness of STEM-related jobs and essential skills that can increase their ability and options to enter a professional STEM career is a key factor impacting student perceptions about the possibilities for their future (3003-48; 3004-56). Additionally, these students often find it difficult to relate their formal education with relevant issues impacting their home life and community. However, when involved with exploring authentic, real-world issues students can show dramatic improvements in skills and engagement in learning, whether in formal programs or out-of-school informal education programs (Integrated STEM Experiences, M. Honey, Ed., 2014).

School counselors, teachers and others experienced in working with at-risk students are familiar with the profile of youth who typically face different types of challenges impacting lower income families including lack of access to technology (e.g., computers and smart phones) and the Internet (3003-114; 3004-56). Additionally, students with parents who work multiple jobs, or who are the first generation in their family to apply to college may also need additional guidance in considering career options and educational pathways

associated with STEM fields. This is not necessarily because of lack of parental interest, but simply due to lack of time or lack of experience and understanding of college application processes and limited awareness of potential scholarships available to students who qualify for financial aid (3004-56).

Strategies for Reaching Out to Under-Represented Students

Recruiting STEM professionals to step forward as role models for females and other under-represented students involves a multi-faceted approach to support targeted marketing campaigns and outreach that focuses on diversity in the workforce, including females and individuals from different ethnic backgrounds who are STEM professionals (3001-15b; 3003-102).

Table 2: Proposed Outreach Activities for Under-Represented Students reflects different ways to build on current outreach and recruitment activities that respond to special concerns associated with under-represented students. The set of issues identified by Clean Tech ECHS staff and partners defines a range of challenges for increasing enrollment of under-represented students, and potential solutions to effectively meet goals to increase student diversity at Clean Tech. Several major issues were identified that include overcoming perceptions of what STEM education is about, increasing access to recruitment meetings by going out to different communities to meet with families who may not feel comfortable or who may be unable to travel to the TEC-SMART facility, and increased partnering with community-based and social service agencies who can help to inform families about the program in new ways (3514-61, 146; 3004-48).

Recruiting STEM professionals to step forward as role models for females and other under-represented students involves a multi-faceted approach to support targeted marketing campaigns and outreach that focuses on diversity in the workforce, including females and individuals from different ethnic backgrounds who are STEM professionals (3001-15b; 3003-102). This may involve using imagery of these individuals in the workplace, or inviting industry speakers to regional events and to the Clean Tech ECHS campus (3002-26). Creating opportunities for career professionals to talk with students with similar backgrounds, to share their experiences in meeting challenges resembling a student's own circumstances can often make the difference in reaching out to increase awareness and interest in STEM fields (3513-145). As program enrollment of under-represented students increases, these students should also be encouraged to become role models and participate in student-to-student outreach activities (student ambassadors) seeking to engage females and ethnic minorities in dialogue about career possibilities in STEM fields (3003-120; 3004-40).

A major hurdle in attracting females to STEM-related events is the perception held by many that, "its only about math," suggesting that outreach could include creative ways to connect with girls. A different approach can incorporate ideas that encompass "more about the

possibilities around the core of STEM" to increase awareness and interest in related fields like marketing and finance (3001-15, 3002-16; 3002-26). Collaborative efforts to build female interest in STEM disciplines have grown through sponsorship by local, regional and national groups, targeting events to middle- and high-school age girls. Using a database created from participant information from these events has supported the Clean Tech ECHS recruitment efforts to provide enrollment and program information to parents and their daughters (3003-26). Additionally, recruitment for 9th grade enrollment can also benefit from working with middle-school counselors and science, math, and technology teachers who can encourage young students to get informed about the Clean Tech ECHS program and carry information home to their parents (3004-24).

Table 2: Clean Tech ECHS Proposed Outreach Activities for Under-Represented Students

Outreach Initiator	Outreach Activities	Prospective Students	Prospective Parents	Regional Counselors	Regional Teachers	Community Partners	Home Schools
Clean Tech Staff	Hold community events to build awareness of STEM	✓	✓				✓
	Education targeted to under-represented students regarding the broad range of STEM related career pathways	✓					
	Expand perception of STEM to related career options and skills that may interest female students	✓					
	Host recruitment evening events at home schools		✓				✓
	Conduct more comprehensive outreach to educate parents about the transdisciplinary approach at Clean Tech		✓				
	Increase home school understanding of Clean Tech program						✓
Clean Tech Counselor	Work with under-represented families in specialized programs through trusted local organizations and community-based service agencies		✓				
	Bring regional counselors to campus			✓			
	Work with middle school counselors to identify under-represented prospective students			✓			
	Explain economic benefits of program to families of under-represented students through home school counselors			✓			
Clean Tech Teachers	Conduct outreach at STEM and tech businesses		✓				
	Meet parents in locations central to their workplace for brown bag lunch meetings		✓				
Clean Tech Students	Female students and other under-represented student ambassadors reach out to similar populations in their home schools	✓					
Clean Tech Partners	Launch National Girls Collaborative	✓					
	Create messaging that connects education to career and income potential	✓	✓	✓			
	Provide access to regional STEM events with free passes	✓					
	STEM professionals conduct outreach activities	✓					
	Show diversity of people working in STEM fields	✓					
	Create more occasions to discuss STEM career opportunities			✓			
	Encourage counselors to think globally about STEM related jobs			✓			
	Host recruitment evening events at community libraries	✓	✓				
	Work with Girls Inc. to coordinate program recruitment evening events					✓	

Outreach to Parents of Under-Represented 9th Grade Students

Recruitment of 9th grade students involves a greater role for parents of young students who may not be ready to make decisions about their education and future options for college and career (3004-24). Therefore, 9th grade recruitment efforts must be designed to engage parents more directly to communicate about the opportunities and benefits of the Clean Tech ECHS program for career options, including the early college high school pathway to earning an associates degree in a STEM-related field at no cost to the family (3004-42).

...carefully crafted outreach for 9th grade parents should convey information about the Clean Tech ECHS program design that emphasizes the value of a program in transdisciplinary, hands-on, problem based learning and pathways to earning college credit for college-level courses completed prior to high school graduation (3514-61, 155).

The potential hurdles to reaching under-represented groups involve a number of factors (Hunter et.al. 2010). As role models for their children, parents may not be aware of STEM careers and therefore, not likely to see how high school education can alter their child's eventual choice of occupation as an adult. For these parents, carefully crafted outreach for 9th grdae parents should convey information about the Clean Tech ECHS program design that emphasizes the value of a program in transdisciplinary, hands-on, problem based learning and pathways to earning college credit for college-level courses completed prior to high school graduation (3514-61, 155). In this case, messaging for parents is critical, promoting STEM education in terms of potential job skills and possible career options that can help to ensure economic security for their children (3003-48; 3512-63).

Another aspect of expanding outreach to inner city youth and their parents involves holding recruitment events in different communities, opening access to families who may not have the time or the ability to travel to the TEC-SMART campus for an evening event (3003-50). Additionally, holding recruitment events in different communities throughout the region can also overcome reluctance to participate outside the neighborhood school community, where lack of familiarity with faculty and other parents and students may present a barrier to real engagement (3514-61; 3003-50; 3021-13).

Ideally, reaching parents of at-risk youth might potentially be designed to meet parents in their communities in libraries, community centers, and other places that could be centrally located to their jobs, holding 'brown-bag lunches,' or other ways to build parent awareness of the Clean Tech ECHS program (3514-146). Getting the word out through collaboration with trusted and familiar community-based organizations and local family services agencies can offer new opportunities to promote Clean Tech and increase parental awareness in communities throughout the region (3003-42; 3004-46, 48).

Clean Tech ECHS Program Plan for 9th Grade Student Transition 2014-2015

The first 9th grade cohort of students will begin a five-day summer program held at the Clean Tech ECHS campus in July 2014. Their introduction to the Early College High School will be conducted as a bridge program designed to provide experience in multiple activities including meeting their Clean Tech ECHS instructors and beginning their first project. An important aspect of this summer session will be focused on creating a process that will enhance a sense of community within the 9th grade cohort, and initiate steps to build and sustain social relationships with their fellow students as well as with the Clean Tech ECHS instructors (3004-52). The latter aspect of the program is critical for the 9th grade cohort who will continue to meet as a group for field trips and other planned after-school and weekend activities throughout the 2014-15 school year, but who will work virtually from their home high school utilizing online technology to complete their Clean Tech ECHS course work and team-based projects during their freshman and sophomore years (3004-88; 3021-14b; 3022-14).

The summer program will also launch a structured process for students to begin exploration of STEM-related issues, gain experience working in teams and developing collaborative skills, and creating a work plan to complete their first project during the fall of 2014. The summer bridge program will also provide the first opportunity for Clean Tech ECHS instructors to engage with the 9th graders in guiding research and design strategies for their projects, and begin assessing student skill levels and abilities (3514-109).

Table 3: 9th Grade Student Transition Goals and Challenges presents an overview of a range of issues identified by Clean Tech ECHS staff and partners that are important components of the plan for the first 9th grade student cohort. Many of these issues revolve around creating a many-faceted process for preparing 9th grade students for the Clean Tech ECHS program that considers essential aspects of social development as well as skill acquisition during their freshmen and sophomore years. During this two-year period they will transition into the early college program in preparation for a successful entry to junior year coursework, as well as shifting from their home high school to attend school at the TEC-SMART facility. Table 3 reflects a series of critical steps that these students will need to master, and envisioned ways in which their learning experiences will build the full skill set that will be essential for academic success as well as personal growth.

In the last section of this report ideas to enhance strategies for recruiting under-represented students are presented in a brief list identified by program staff and partners during discussions held December 2013 to March 2014.

Table 3: Clean Tech ECHS 9th Grade Student Transition Goals and Challenges

Goals	Activities
Student buy-in [social and emotional]	Slow transition allows students to integrate the program through low pressure academics; being part of a cohesive group can help to create a sense of investment in the program
Student investment	Ownership of learning
	Community building
Build confidence level	Engaging industry speakers that represent diversity of workforce and reflect diversity of student body
	Prepare students academically before they get to campus
Student comfort level	Expose students to communication using new terminology to build comfort level
Student engagement	Engage students through high quality interface
Community building	Summer bridge program team building activities
	Continue to involve students in after-school and weekend fieldtrips
	Group work on site at the Tec-Smart campus
Student support	Maintain constant communication with home school
Students get to know teachers	Continue to build summer bridge activities
Teachers get to know students	Teacher Professional Development to support grade level course development
	Student engagement in different types of program activities provides teachers with the opportunity to address individual needs
	Summer bridge program
	Educate students on what everyday Clean Tech activities look like so they know what skills to work on
	Learn more about student interests as they enter the program
	Work with students on site before they are 11th graders
Assess and address knowledge and skill gaps	Get to know the students and their individual needs so once they are on campus they are set to go
Building skills	Phase in skills starting with social relations for team building
	Collaborative skills
	Course designed to teach college course level skills
	Program partner mentors assigned to each student
	Scaffolding in research, group work, building goals every two weeks, coming together on campus or in field trips
Soft skills [life skills]	Give students opportunity to be grounded before arriving on campus
	Students have support from staff and home high school while in college
Time to transition to high school	Educating students on what the Clean Tech program entails; approach in slow integration and and support for 9th grade students transition to traditional high school and the Clean Tech program
Group work	Summer bridge program
Workforce type learning	Blended interactive program, remote and on site; use of new technology platforms for virtual work
Challenges	**Solutions**
Building 'on-ramps' for students coming in later	Create ways for students to opt into the program as 10th graders; consider the needs of 11th graders coming into the program as juniors with no prior Clean Tech experience
Overcoming distance learning barriers	Work with partners to develop infrastructure for distance learning
Logistics and transportation	Communication with home school and families
Technology for remote learning	Explore partner resources; interface to support remote communication should be as easy as Facebook to engage students
Access to technology and internet	Seek grant funding to provide more computers and internet access to [home] schools
	Clean Tech provides laptops
	Community and partner resources
Parents disenfranchised from education	Lack of experience with higher education system including assisting with application process; help with forms; recognizing constraints and help parents to find solutions

Program Strategies for Building Student Diversity in Grades 9-12

Each of the interviewees and focus group participants contributed to a discussion about their vision and understanding for how program goals to build the 9th and 10th grade program can be integrated into the fall and spring program of the 2014-15 school year. Ideas for potential ways to enhance the planning process to support full implementation in coming years for the 9-12 program, as well as related goals for recruiting and sustaining enrollment of under-represented students were also identified by program staff and partners.

Many of the issues that have been presented in this report, including the discussion on "Proposed Outreach," suggest ideas and innovative ways to enhance understanding and build effective recruitment strategies. The following five suggestions reflect an additional set of ideas for the program as a whole. It should be noted that these represent aspects of work-in-progress, and whether in the planning stage or "on the list" of ideas for further action, they comprise an important set of related proposed ideas to consider for future program development.

- Continue to expand the communication network regionally, building contacts for community organizations and other local agencies; add these new contacts to weekly program updates and announcements; follow-up with visits and phone communication to increase ties to communities and understanding of the connections that are being developed through new outreach strategies.

- Work with Clean Tech ECHS partners, including industry and business, social services agencies, and others who can help to build a resource network to support outreach to lower income families; use the existing communication network to build a regional "asset map" identifying groups that are working with disadvantaged, under-represented youth.

- Seek funds or in-kind support to increase internet access and promote use of virtual networks and new technologies to support access for 9th and 10th grade students to CleanTech high school instructors as they complete coursework and virtual teamwork; create a structured design for 9th and 10th grade students to experience "blended learning," bringing students together to work in ways that will also support virtual teamwork essential to advancing their projects to completion.

- Seek funds to enhance summer sessions for 9th and 10th grade students as a key component for identifying gaps in critical skills, and to sustain the grade-level cohort experience as part of the Clean Tech ECHS learning community.

- Conduct professional development for Clean Tech ECHS staff on diversity and issues related to identifying particular needs of under-represented students including both academic as well as non-academic issues; involve teachers in identifying demographics, including recent shifts in social and cultural regional demographic characteristics of the partner school districts.

The Appendix that follows includes supporting documents and information providing additional details about the ethnographic research conducted to support production of this report. We thank

the Clean Tech ECHS staff and partners for their commitment to this effort and for taking time to share their vision and plans for Clean Tech Early College High School student success.

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APPENDIX A:
KNOWLEDGE CAPTURE RESEARCH METHODOLOGY

Ethnographic Case Study Research

The PAST Foundation Knowledge Capture Program (KC) produced this report on the Clean Technologies Early College High School Program Design for Ninth-Grade Enrollment, Fall 2014. The KC research team relies on ethnographic methods to conduct field research, working collaboratively and directly with school faculty, students, parents, program partners, as well as community members involved with the Clean Technologies Early College High School (Clean Tech ECHS). This study focuses on outreach and recruitment of the first 9th grade student cohort enrolling in the fall of 2014.

The Knowledge Capture approach to this study builds upon the grassroots actions and particular experiences of stakeholders including program administrators, staff and industry partners engaged in planning for school expansion to incorporate 9th and 10th grade students. In this view, we gain systematic insights into program strategies, resources and supporting partnerships that are helping to define critical components integral to building enrollment of the Clean Tech ECHS. In the 2013-14 school year, the program enrolled (110) 11th and 12th grade students from across (20) school districts. In this study we document the range of actions undertaken to extend regional outreach to expand enrollment in Clean Tech ECHS to new school districts, and support recruitment and enrollment of the first 9th grade student cohort. These actions involve efforts to increase enrollment of female students as well as others who are under-represented in STEM fields including ethnic minorities, at-risk and disadvantaged students. In this report, we document issues associated with critical challenges for building enrollment of under-represented students in STEM education, and draw from ideas and exploration of creative solutions being implemented by the Clean Tech program.

Ten individuals participated in this research through one-on-one interviews or focus group discussion, providing information based on their observations and experiences in collaborative work to design and implement the 9th grade outreach plan. Individuals were audio recorded, and responses to a set of open-ended questions were transcribed. The discussion questions were designed to explore different perspectives on goals and strategies for achieving envisioned outcomes (see Appendix B). Additionally, the KC team analyzed available published information drawing from local news sources, the school website, and other state and national reporting on the Clean Tech ECHS program.

Ethnographic protocols require anonymity of study participants. Therefore, each individual interviewed for this study was assigned a four-digit code number identity. These code numbers appear in the report narrative as a reference to interview data. The second number in the citation indicates a particular response in the interview transcript (e.g., 3001-25). Case study citations are intended to underscore information based upon "insider" knowledge of the actions underway. Documenting implementation strategies in this process also has the potential for creating a model for early college high school programs, offering the reader the opportunity to gain strategic insights on effective approaches to building student diversity in STEM education.

APPENDIX B:
RESEARCH QUESTIONS

Discussion Questions for Clean Tech ECHS Interview and Focus Group Participants

1. As the ECHS continues to build its enrollment, what are the challenges for increasing enrollment of under-represented students?

    a) What are the main characteristics of under-represented students?

2. Do you think that there are specific challenges or barriers to a STEM education/career pathway facing under-represented students?

3. What are the various ways in which the ECHS can reach out to under-represented students?

    a) Are there district or regional resources that are available to help support outreach to under-represented students and their parents?

    b) What role would you like to play in developing outreach for the first 9th grade student cohort?

4. Do you anticipate that under-represented/underserved students may need a particular type of outreach to encourage enrollment at the ECHS? If so, how would you characterize the issues that need to be addressed?

5. What changes in student diversity are you seeing in the region generally that the ECHS/HVCC program can accommodate to build the Clean Tech ECHS program and help to meet workforce needs and goals for academic and career success for under-represented students?

6. In your view, are there ways to design existing educational resources to improve the academic and career success of under-represented students that will also contribute to meeting regional workforce development goals?

7. Ideally, what are the main skills that students should possess on entering the ECHS?

8. What types of issues do you think teachers must address to meet the needs of under-represented students enrolled at the ECHS campus?

    a) How would you characterize these issues for the currently enrolled ECHS students?

    b) Do you see differences between the ECHS student learning issues and the traditional high school student?

    c) Are there differences in the way teachers address learning issues for female and male students?

9. Are teachers at any point in their careers given training to build awareness for different types of needs that may occur with culturally diverse students?

    a) If so, what are the essential aspects of diversity awareness for teachers?

    b) Do you see a need for ongoing training?

    c) If not, do you see any value in providing training?

10. The new 9th grade cohort of students will be enrolled in "distance learning" courses in January of 2015. These students will remain at their home high schools while co-enrolled at the ECHS. In your view, what type of support will these students need to be successful in their DL courses?

    a) Are there strategies to support these students or other resources to assist students prepare for distance learning courses?

11. In your view, will gaining "virtual" participation skills have value for career development?


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