CEWD State Energy Education Report
CALIFORNIA
Supported by ACTE & Meeder Consulting Group, LLC
February 22, 2010

Summary

The Center for Energy Workforce Development (CEWD) has been awarded a planning grant by the Bill and Melinda Gates Foundation. The purpose of the grant is to determine the readiness of eight states to implement the Get Into Energy Career Pathway for the skilled utility technicians. This report provides information about the states' education structure and ability to support the implementation of the career pathway.

Current Postsecondary Education Systems and Policies

Governance

The California Postsecondary Education Commission is the comprehensive planning and **coordinating body for postsecondary education** in California. The commission consists of 16 members, nine of whom represent the general public, five of whom represent the major systems of California higher education (the California Community Colleges, the California State University (CSU), the University of California (UC), the independent colleges and universities, the State Board of Education) and two student representatives. This commission operates to advise the legislative and executive branches with advice on major fiscal, policy and programmatic issues concerning the entire system.

Supply

There are currently 680 postsecondary institutions within the state. These schools consist of:

- 74 Regional Occupational Centers and Programs (ROCPs)
- 109 community colleges
- 144 public universities and colleges
- 130 accredited private universities and colleges(WASC)
- 223 state-approved or exempt private colleges

Postsecondary Transitions

Due to autonomy of local faculty at higher education institutions, **student transfers** are typically negotiated on a campus-to-campus basis rather than operating under system-wide course transferability agreements. Faculty at each college and university are responsible for setting its campus's program requirements. The state is hoping to eventually move to a statewide pattern of transfer in the near future, but nothing formal is currently being done. A summary on student transfers in California can be found here.

Articulation Agreements

Despite informal transfer agreements, the state's community colleges and technical colleges have many **articulation agreements** with high schools – including courses related to the energy industry (e.g., welding and electrical design engineering). The consortium states that many of the articulation agreements with high schools are negotiated from high school instructor to college instructor and that it is an expensive and arduous process.
A database of state HS/PS articulated agreements can be found here.

This database is the result of a project called Statewide Career Pathways: Creating School to College Articulation, which works to provide an opportunity for high school and college faculty to meet, collaborate and develop articulation agreements. Agreements posted vary by discipline and may include alignment of course skills, concepts and sequences, advanced placement possibilities and credit by examination options. While schools and colleges have already participated in many efforts to align curriculum and develop articulation agreements (especially through Tech Prep programs), this project hopes to meet several needs identified by faculty members. This project will:

- Develop a database of articulation agreements, accessible across the state
- Provide opportunities and support for faculty at schools and colleges to meet and develop agreements
- Create outreach strategies to encourage participation of students, parents and schools/college personnel

The state's community colleges and technical colleges also have **articulation agreements** with state universities for programs related to the energy industry. The database for postsecondary articulation agreements is called ASSIST.

ASSIST is a computerized student-transfer information system that can be accessed online. It explains how course credits earned at one California college or university can be applied when transferred to another. ASSIST is the official repository of articulation agreements for California's colleges and universities and therefore provides the most accurate and up-to-date information available about student transfer in California.

Dual Enrollment

By law, all students in California must be provided the opportunity of **dual enrollment** programs. These programs may take place at a secondary or postsecondary institution. Admission to the program is determined by the secondary institution, while course content is subject to approval by the postsecondary institution. The student is responsible for paying for at least a portion of the college credits earned.

In early 2008, the Community College Research Center (CCRC) was awarded a three-year grant of $4.4 million from the James Irvine Foundation to manage and evaluate a new career and technical education dual-enrollment initiative. Known as the Concurrent Courses: Pathways to

College and Careers Initiative, the new project aims to strengthen college and career pathways for low-income, academically struggling and under-represented students in California by providing them with rigorous, supportive and career-focused dual-enrollment opportunities. The initiative will support the following eight secondary-postsecondary partnerships, selected through a competitive process:

- Arthur A. Benjamin Health Professions High School, Sacramento (Sacramento City College)
- City College of San Francisco, San Francisco (San Francisco Unified School District)
- Long Beach Unified School District, Long Beach (Long Beach City College, California State University Long Beach)
- Los Angeles City College, Los Angeles (Hollywood Senior High, Downtown Business Magnets High, Miguel Contreras Learning Complex)
- North Orange County ROP, Anaheim (Anaheim Union High School District, Cypress Community College, Fullerton Community College)
- Santa Barbara City College, Santa Barbara (Santa Barbara High School District, Carpinteria High School District, South Coast ROP)
- Shasta Union High School District, Shasta (Anderson Union High School District, Shasta Community College, Shasta ROP)
- Tulare Joint Union High School District, Tulare (College of the Sequoias)

Accelerated Associate Degree

Several postsecondary institutions offer **accelerated associate degree programs** within the state, but a vast majority of them focus on healthcare. The consortium stated that fast-track education is an area where they are starting to see growth, but the focus thus far has been more on certifications and credentialing and not on an Associate's degree.

Accelerated Associate's degrees are located at the following institutions:

- Fullerton College – Accelerated Associates of Science
- San Joaquin Valley College – Accelerated Associates of Arts
- East Los Angeles College – Accelerated Associates of Nursing
- Fresno City College – Accelerated Associates of Nursing
- Los Angeles Pierce College – Accelerated Associates of Nursing
- Moonpark College – Accelerated Associates of Nursing
- Pasadena City College – Accelerated Associates of Nursing
- Sacramento City College – Accelerated Associates of Nursing
- West Coast University-Inland Empire – Accelerated Associates of Nursing
- West Coast University-Los Angeles – Accelerated Associates of Nursing
- West Coast University-Orange County – Accelerated Associate of Nursing

Early College High Schools

Early college high schools are small schools designed so that students can earn both a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree. Early college high schools have the potential to improve high school graduation rates and better prepare students for high-skill careers by engaging all students in a rigorous, college preparatory curriculum and compressing the number of years to a college degree. There are 28 early college high schools in California. A complete list of schools in California can be found here.

Virtual High Schools

There is one state **virtual high school** in California – Southern California Virtual High School. Launched as a partnership between online learning company Advanced Academics, Inc., and Hacienda La Puente Unified School District (HLPUSD), Southern California Virtual High School will offer a comprehensive, online, tuition-free program for area students. Through this school, students receive their accredited coursework and are taught primarily through online methods. At this time, this virtual academy does not offer any energy programs.

Need-based Financial Aid

Under the California Student Aid Commission and the Cal Grant program, several different **grants are available to low-income students** for postsecondary education.

Cal Grants (state aid) are free money guaranteed to every high school senior that applies on time and meets income, eligibility and GPA requirements. The following apply to low-income students.

Cal Grant B is disbursed incrementally and is designed for economically disadvantaged students. The initial grant covers some tuition and nominal fees such as books and other college expenses. After the first year, successful recipients are eligible to receive other tuition funds from other grant programs.

Cal Grant A Competitive Awards are disbursed on a needs basis and to students with a maintained GPA of 3.0 or higher. Students qualifying for this grant option must be enrolled in a two- or four-year program.

Cal Grant B Competitive Awards are administered to only the most economically disadvantaged students. A minimum GPA of 2.0 is required and enrollment in at least a one-year program.

Postsecondary Awareness and Planning

As previously mentioned, the Concurrent Courses: Pathways to College and Careers Initiative works to encourage low-income youth to enter postsecondary programs. This initiative, funded by the James Irvin Foundation through June 2011, was created to demonstrate the feasibility of using dual enrollment programs to enhance college and career pathways for low-income youth

who are struggling academically or who are within populations historically underrepresented in higher education.

The Career Ladders Project (CLP) aims to improve post-secondary career pathway access and completion for underserved populations. The CLP pursues policy initiatives and makes research-based recommendations regarding career ladder programs in California community colleges. The CLP also provides strategic advice and technical assistance to community colleges and their workforce partners in building regional career pathway and bridge programs.

Recent projects include work on the career pathway in process technologies for the energy, petrochemical, and water treatment employers in Contra Costa County, and the regional biotechnology career pathway system in the greater Bay Area. With the sponsorship of the Walter S. Johnson Foundation, the CLP is currently developing Gateway programs offering bridges to college and careers for disadvantaged youth and young adults in six California counties. The CLP operates under the auspices of the Foundation for California Community Colleges, a 501(c)(3) organization.

The Bill and Melinda Gates Foundation is funding a study focused on increasing opportunities for low-income youth to attend a postsecondary institution. The Foundation issued granted funds to the University of California-Los Angeles ($7.6 million over five years) to support the University of California's All Campus Consortium on Research for Diversity to conduct a research project focused on low-income young adults' opportunities and obstacles on the path to postsecondary education. The objective of the study is to deepen understanding of the needs, desires and challenges faced by 16- to 26-year-olds in several high-poverty California communities, and to use this information to create better conditions for student success in postsecondary education and the labor market.

Energy Workforce Programs

California has 67 postsecondary institutions that currently offer **energy industry workforce programs**, including general energy, nuclear, electric and gas.

These programs are being offered at the following schools:

- Allan Hancock College
- Antelope Valley College
- Baldwin Park Adult & Community Education
- Butte College
- Cerritos College
- CET-San Bernardino
- CET-Sobrato
- Chabot College
- City College of San Francisco
- American River College
- Bakersfield College
- Barstow Community College
- Cabrillo College
- CET-El Centro
- CET-San Diego
- CET-Watsonville
- Chaffey College
- Coastline Community College

- College of San Mateo
- College of the Redwoods
- College of the Siskiyous
- El Camino College-Compton Center
- Everest College-San Bernardino
- Fresno City College
- Glendale Community College
- Imperial Valley College
- Laney College
- Long Beach City College
- Maxine Waters Employment Preparation Center
- Modesto Junior College
- Napa Valley College
- Palomar College
- Pomona Unified School District Adult and Career Education
- Rio Hondo College
- San Diego City College
- San Joaquin Delta College
- Santa Ana College
- Shasta College
- Solano Community College
- Southwestern College
- Ventura College
- Wyotech-Fremont
- Yuba College
- College of the Canyons
- College of the Sequoias
- Cuesta College
- El Camino Community College District
- Foothill College
- Fullerton College
- Hartnell College
- Institute for Business and Technology
- Las Positas College
- Los Angeles Valley College
- Merced College
- Mt San Antonio College
- Palo Verde College
- Pasadena City College
- Reedley College
- San Bernardino Valley College
- San Diego Mesa College
- San Jose City College
- Santa Rosa Junior College
- Sierra College
- Southern California Institute of Technology
- Taft College
- Victor Valley College
- Wyotech-Long Beach

In addition to the existing programs, there are **several different energy programs in development**. According to the consortium, the Los Angeles Unified School District is working on a program for power line utility work. Through the PowerPathways project at PG&E, the energy industry is also developing additional energy courses that cater directly to the needs of California's energy workforce.

Energy Consortium Coordination with Postsecondary

There has been little **coordination between the consortium with postsecondary institutions** to offer energy industry (e.g., line worker, technician, plant operator, pipefitter, welder, etc.) training programs, but the consortium expects to play a larger role in the future.

Of the different energy-related curricula being used at community colleges, technical colleges, and universities, most have been developed by staff and vendors with the direct input of industry. Project Lead the Way's program for engineering is one example of a vendor-developed program.

Apprenticeship

There is at least one **energy-related apprenticeship** being offered by the energy industry. Under the PowerPathway model at PG&E, an extensive apprentice system is available for many of its career paths. Apprenticeship training programs provide specialized on-the-job training and related academic training to eligible union-represented employees who wish to become certified in a particular trade. PG&E offers formalized, state-certified apprenticeship training programs for 33 job classifications which can last anywhere from 18 to 42 months. Upon completion of an apprenticeship training program, participants will be fully qualified for certification by the state of California. Industry is also playing a role in educating an energy workforce. Training programs currently offered are:

- Utility Worker
- Apprentice Lineworker
- Apprentice Electrician
- Apprentice Communication Technician
- Apprentice Instrument Technician
- Apprentice Welder
- Apprentice System Operator

More information can be found here.

PowerPathway courses can qualify candidates to become eligible for employment and prepare them for possible selection into the PG&E apprenticeship program.

Teacher/Faculty Externships

The energy industry has offered **externships to faculty and administrators**. In the Sacramento region, LEED has coordinated externships. PG&E has also hosted a train-the-trainer model with postsecondary instructors. While the latter is not a true externship, the consortium thought it was a valuable experience as it allowed teachers to have hands-on experience.

Current Energy Education Programs

Organizational Model

California has identified 15 California Industry Sectors that are similar to the national career clusters initiative but that specifically reflect the California economy. Each industry sector contains a number of more specific **career pathways, totaling 58** all together, that are aligned to current and future California employment opportunities.

Each career pathway also includes three to 12 specific pathway standards, with two to six subcomponents per standard. These pathway standards reflect what is necessary for success in each specific pathway and build on appropriate standards from business and industry.

The 15 industry sectors are:

- Agriculture and Natural Resources
- Arts, Media and Entertainment
- Building Trades and Construction
- Energy and Utilities
- Engineering and Design
- Fashion and Interiors
- Finance and Business
- Health and Human Services
- Hospitality, Tourism and Recreation
- Manufacturing and Product Development
- Public and Private Education Services
- Public Services
- Retail and Wholesale Trade
- Transportation
- Information Technology

High School Energy-related Programs

The state does have a high school **career pathway that addresses the energy industry**. Under the Energy and Utilities industry sector, the following are available:

- Electromechanical Installation and Maintenance
- Energy and Environmental Technology
- Public Utilities
- Residential and Commercial Energy and Utilities

According to the consortium, elements within these programs of study are aligned to the Get Into Energy pathway model – specifically in the areas of the welding standards.

Energy education is also being provided by **California's Partnership Academies** (CPA). These three-year programs for 10th- through 12th-graders provide rigorous academics and CTE in one of 15 industry sectors, preparing students for college and careers. CPAs are each structured as a "school-within-a-school" to create a close, family-like learning environment. Academies typically serve 100 to 150 students, and each academy has a career theme that includes CTE courses linked with academic courses. In California, there are 340 funded academies. Approximately 33,000 students served in grades 10-12. A majority of these academies provide dual enrollment opportunities.

Currently, CPAs must enroll at least half of their students from the population at risk of dropping out of high school. Even with this at-risk population, academies are producing excellent results. Since 2003-2004, schools are typically graduating 95 percent of the 12th-graders in CPAs. Below are academies in the state that focus on energy education.

The New Energy Academy was established by PG&E, in partnership with the California Department of Education (CDE) and CaliforniaALL. Beginning in the fall of 2009, PG&E funded a pilot curriculum development program, bringing together representatives from education, industry and government with the shared goal of creating exceptional learning opportunities for participating students. The result was the development of the New Energy Academy, a

program that integrates academic and technical STEM-based education focused on energy and environment.

Five new energy academies will be launched in the 2010 school year at five participating high schools:

- Berkeley High School (Berkeley) - Berkeley Unified School District
- Foothill High School (Sacramento) - Twin Rivers School District
- Edison High School (Fresno) - Fresno Unified School District
- Independence High School (Bakersfield) - Kern County School District
- Venture Academy (Stockton) - San Joaquin County Office of Education

The Taft Union High School Taft Oil Technology Academy introduces students to a variety of career opportunities in the oil and technology industries and equips youth with the background to make sound choices for their future.

The Green Academy at Oakland Technical High School prepares students for participation in the energy sector of the new green economy, with academic and practical training in the sciences. Through partnerships with researchers and practitioners of sustainable energy, students will participate in applying the concepts of green energy and be prepared for both further academic training and employment.

The Energy and Utilities Academy at Independence High School focuses on Energy and Utilities and the pathway Energy and Environmental Technology. In the electrical power industry, Bakersfield and Kern County have several cogeneration facilities that employ technicians and operators, and this academy is working to fill the pipeline of future workers.

The curriculum differs among the academies. Participants in the development of the curriculum for the New Energy Academy include:

- Teachers from each of the selected high schools who serve as contributors, evaluators and learners of course content
- PG&E energy and renewable experts who provide guidance on mapping courses to careers
- The California Department of Education, which provides technical support and administrative oversight based on its successful California Partnership Academy model

During the first year of the Academy, students will participate in an introductory course focused on the utility/energy sector. This course, along with exposure to different careers in the industry, will provide a foundation for subsequent technical and academic courses to be developed over the next two years. The entire curriculum will provide students with the ability to apply knowledge across different situations, enhance their critical thinking skills, and connect

classroom learning to the real world. As a result, they'll successfully graduate from high school ready for both college and to begin their careers in a wide variety of industries.

Curriculum

The consortium did not have information concerning what types of curricula are being used in the other academies listed, but related that most of them are likely staff- and industry-developed.

Current Certificates and Credentials

The consortium does not yet play a role in **developing energy industry credentials** or recommending industry credentials to use, but they plan to be more proactive. The consortium has played an advisory role on the "energy efficiency" side and has worked with the community college system on related certifications. The consortium has also participated in the development of the Power & Electrical System certificate.

California has regional programs with the Central Coast Consortium and Work2Future that offer the ACT **National Career Readiness Certificate.** Through these programs, both of which began in July 2009, individuals may test for their certificate at over 30 locations.

Several **Association of Energy Engineers (AEE) certifications** are available for testing in California as well. Currently, the following exams can be taken remotely at ACT testing centers: Certified Energy Manager, Energy Manager in Training, Certified Carbon Reduction Manger, and Certified Lighting Efficiency Professional. The following exams are expected to be available for testing at ACT centers in the near future: Certified Measurement and Verification Professional, Certified Power Quality Professional, and Certified Energy Auditor.

These credentials may be tested for at two locations – California State University Fresno and San Jose City College.

The SkillsUSA Work Force Ready System provides assessments for Career and Technical Education that are supported by industry, education and policy leaders. California participates at both the secondary and postsecondary levels and there are currently 6 regions in the state that participate. There are energy industry-related competitions at both the secondary and postsecondary levels.

State Level Policy Development

State Policies and Programs

California has several **policies in place to assist and advance energy workforce development** in the state. The California Energy Commission is the state's primary energy planning and policy agency. Through this agency, the California Clean Energy Workforce Training Program was created. Almost $75 million will be invested in the Clean Energy Workforce Training Program to

create a well-trained workforce capable of filling the jobs necessary to promote renewable energy development, climate change strategies, vehicle fuel technology and green buildings.

The California Energy Commission, the California Employment Development Department, the Employment Training Panel, and the California Workforce Investment Board, in collaboration with The Green Collar Jobs Council, are leading a statewide partnership of state agencies, educational institutions, local workforce investment boards, community organizations and employers to deliver 21st century training programs for workers with all levels of experience.

Further, Governor Arnold Schwarzenegger recently announced grant awards for the California Clean Energy Workforce Training Program (CEWTP). Thirty-four local workforce investment boards (LWIBs) and community colleges will receive $27 million in workforce training funds offered by Employment Development Department, the California Workforce Investment Board and the California Energy Commission through a solicitation for proposals.

The CEWTP is the largest state-sponsored green jobs training program in the nation. The selected LWIBs and community colleges will lead regional workforce training partnerships around the state that will train approximately 5,600 workers for jobs in clean energy. The program will focus on occupations in energy efficiency, water efficiency, renewable energy (distributed generation and utility-scale), and alternative and renewable transportation technologies. Funding will come from the American Recovery and Reinvestment Act (ARRA) and the federal Workforce Investment Act as well as the Alternative and Renewable Fuel and Vehicle Technology Program. For a full list of grant recipients and their project summaries can be found here.

Low-income Youth

California offers **state programs that focus on assisting low-income youth**. The California Workforce Investment Board houses the State Youth Vision Team (SYVT) which is designed to link public, private, for profit and nonprofit resources to connect youth most in need, ages 14-24, with youth serving agencies and high-growth employment opportunities. The Team's website includes a complete list of all programs they offer (none of which is specifically *just* for education).

California Youth @ Work, which began in summer 2009, targets low-income youth ages 14-24. Youth participants will learn how to search for a job, appropriate workplace behavior, and technical skills, in addition to gaining work experience in paid positions. Youth still in high school will typically receive minimum wage ($8hour) or a stipend; older youth will typically earn $9-$10/hour. Some areas have formed partnerships with their water districts and power utilities (e.g., PG&E and Sempra Energy) to train youth for tomorrow's jobs. This program is funded through state WIB and federal WIA dollars.

Advisory Structures

The state energy consortium serves the function of a **state-level advisory committee** – representing only the energy industry – that regularly interacts with postsecondary faculty and administrators.

At this time, the consortium does not participate in a **multi-industry-sector advisory committee** that regularly interacts with postsecondary faculty and administrators, but the members are interested in looking into such an opportunity.

The consortium does regularly interact with leaders from the **adult and youth workforce development systems.** There are several representatives from the Workforce Investment Board participating in varying degrees on the consortium.

There is also representation from **the state economic development agency** on the consortium.

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Current Postsecondary Education Systems and Policies

Governance

The postsecondary institutions in Georgia are divided into three different state-wide **governance systems**, The University System of Georgia, The Technical College System of Georgia, and Georgia Private Colleges and Universities.

The University System of Georgia has 35 total colleges and universities in the following categories:

- Research Universities (4)
- Regional Universities (2)
- State Universities (13)
- State Colleges (8)
- Two-Year Colleges (8)

The Technical College System of Georgia consists of 28 technical colleges with two university system technical divisions and 31 satellite campuses. The system provides a broad range of career opportunities through a variety of certificate, diploma, and associate degree programs; continuing education programs; and economic development programs.

There are approximately 40 private colleges and universities in the state. (www.wikipedia.org)

Thus, the **total number of possible postsecondary delivery institutions in the state is 103**.

Postsecondary Transitions

Georgia has no state policy on **transferability from one degree program to another**. However, it is done on an institution by institution basis.

The University System of Georgia has the following forms on their website (www.usg.edu) which address articulation agreements with TCSG.

Articulation Agreements with Technical College System of Georgia Institutions

- Form for Establishing a New Agreement
- Procedures and Criteria for Establishing a New Agreement

The University System of Georgia also has the following policy regarding transferring credit from the Technical College System of Georgia (TCSG).

2.17 Acceptance of Core Coursework and Placement Test Scores from TCSG Colleges

Last reviewed: January 2010

BoR POLICY MANUAL 3.3.5, COLLABORATION BETWEEN THE USG AND THE TECHNICAL COLLEGE SYSTEM OF GEORGIA (TCSG)
EFFECTIVE DATE: 1/2002

According to a January 2002 agreement between the USG and the TCSG known as the "Mini-Core Project," basic skills courses in English and mathematics with common course content transfer between USG and Commission on Colleges (COC)-accredited TCSG institutions, and comparable placement and exit test results are honored between systems.

Articulation Agreements

Dual Enrollment & Articulation: Currently, the Georgia Department of Education (under the direction of Board Rule 160-4-2-.34 Dual and Joint Enrollment Programs and in collaboration with other education agencies) offers multiple opportunities for students to earn postsecondary credit while still in high school. In FY 2006, there were 6,239 students who participated in dual enrollment and 953 students participating in joint enrollment.

- **Articulated Credit**—A program for students who take high school courses aligned with postsecondary courses that have been locally approved as having an acceptable level of matching course competencies. The student receives the postsecondary credit upon completion of high school, enrollment into a postsecondary college and validation of the student's attainment of the course competencies through one of three methods.
- **Dual Enrollment**—A process through which high school students take courses from a state public or private postsecondary institution while still enrolled as a high school student. The dual-enrolled students receive credit both at the high school and at the postsecondary institution.
- **Joint Enrollment**—A process through which high school students take courses at a state public or private postsecondary institution while still enrolled as a high school student and receive credit only at the postsecondary institution.
- **ACCEL Program**—A lottery-funded dual-enrollment program administered by the Georgia Student Finance Commission (GSFC) that, under rules promulgated by the GSFC, provides for eligible juniors and seniors to take certain courses (academic only, degree-

level courses) from postsecondary institutions that count for high school graduation credit and postsecondary credit.

- **DUAL Enrollment/HOPE Grant Programs**—Provides for eligible juniors and seniors to take certain technical courses (certificate- or diploma-level courses) from a list chosen and approved by the Georgia Department of Education from courses proposed by the Georgia Department of Technical and Adult Education.
- **Early College**—A program jointly operated by the state Board of Education and the Board of Regents that allows identified students to participate in a dual-enrollment program prior to the 11th grade. Early College represents a "new kind" of institution for students aged 14 to 20 who are not well-served through traditional high schools.
- **Gateway to College**—A program jointly operated by the state Board of Education and the Board of Regents that allows identified students to participate in a dual-enrollment program prior to the 11th grade. Gateway to College, located exclusively on a college campus, is a form of early college for students aged 16 to 20 who have already dropped out of high school.

Statewide articulation agreements will continue to be developed between secondary schools and postsecondary institutions to provide students with a non-duplicative sequence of instruction leading to diplomas, certificates and/or degrees in designated CTE programs. Beginning in state fiscal year 2008, the state will begin updating all previously existing state articulation agreements. The list of courses eligible for articulation will be updated based on the phases of the curriculum revision process, beginning with Phase I statewide articulation agreements being updated by August 2007. Subsequent course lists will be updated in sequential years based on the implementation of Phase II (August 2008) and Phase III (August 2009). The statewide articulation agreements will reflect the newly developed secondary curriculum. Local education agencies can use these to develop local articulation agreements with postsecondary institutions in their regions. (acteonline.org)

The Technical College System of Georgia (TCSG) offers **dual enrollment with high schools** in the following programs/courses related to the energy industry:

- Air Conditioning Technology
  Electrical Construction & Maintenance
  Electrical Control Systems
  Electronics
  Industrial Mechanical Systems
  Industrial Wiring
  Mechanical Engineering Technology
  Plumbing
  Welding

  (Sharon Haworth at TCSG)

Virtual High Schools

There are **three virtual schools in Georgia that address secondary education**. They are listed below:

- Georgia Cyber Academy (GCA) [34]
- Georgia Virtual School[35]
- Eagle's Landing Christian Academy[36]

Effective January 1, 2010, the Georgia Virtual Academy became known as the *Georgia Cyber Academy (GCA)*. Due to the request from the Georgia Department of Education during the charter renewal process, they changed the school's name in an effort to minimize confusion with other state-run entities. The Georgia Cyber Academy is a tuition-free public school that uses the K[12] curriculum, which is accessed via an online school as well as through more traditional methods. GCA serves K-8 students who reside within the state of Georgia.

Georgia Virtual School (GAVS) is part of the Georgia Department of Education's Office of Technology Services. GAVS is fully accredited and operates in partnership with Georgia parents and schools to offer high school level courses across the state.

Eagle's Landing Christian Virtual Academy is a K-12 virtual academy, is a private school, and is accredited by SACS and the Georgia Accrediting Commission.

The Technical College System of Georgia (TCSG) also has a **virtual college**, known as The Georgia Virtual Technical College. It serves as the central point of reference for all online courses and programs offered through TCSG. (www.gvtc.org)

Early College High Schools

Early college high schools are small schools designed so that students can earn both a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree. Early college high schools have the potential to improve high school graduation rates and better prepare students for high-skill careers by engaging all students in a rigorous, college preparatory curriculum and compressing the number of years to a college degree. There are 14 "Early College" high schools in Georgia. A complete list of schools in Georgia can be found at www.earlycollege.org.

Accelerated Associate Degree

Georgia has **associate accelerated degree programs** available to students, mostly in nursing and online degree programs. Two examples on nursing are noted below.

- Bainbridge College, Division of Nursing, Associate Degree
  The LPN-ADN Advanced Placement Track program is a one day per week, 3 semester program for the LPN who desires to advance their career and become a Registered

Nurse. The program begins annually in the summer semester (June) with completion at the end of spring semester (May).

- Darton College, Division of Nursing, Associate of Science
  Students can complete these programs in approximately 13 months rather than the two years necessary for a traditional nursing program.

Need-based Financial Aid

There are several different **tuition aids** and **initiatives that serve low-income students** entering postsecondary education in Georgia. In addition to serving low-income students, many of these initiatives serve racial minority students. Below are several examples.

- The University System of Georgia has initiatives called "Bridge Programs" that serve low-income and racial minority students.
- Early College High Schools make special efforts to reach first generation students, low-income students, and racial and ethnic minority students. As stated before, Georgia has 14 Early Colleges across the state.
- The HOPE Grant program is for students seeking a technical certification or diploma, regardless of the student's high school grade point average or graduation date.
- The ACCEL program is for students at eligible high schools that wish to take college level coursework for credit towards both high school and college graduation requirements. Students that meet requirements to be eligible receive an award that covers tuition, approved fees, and a book allowance of up to $100 per quarter or $150 per semester, if enrolled at least half-time (six or more hours).

The programs listed below are administered by Georgia Student Finance Commission and are designed to assist low-income students in their postsecondary education.

Scholarships - Money for college that does not have to be repaid. Awards may be based on past academic performance, special areas of study, academic excellence or other criteria.

- HOPE Scholarship
- Robert C. Byrd Honors Scholarship
- Charles McDaniel Teacher Scholarship
- Georgia's HERO Scholarship Program

Grants - Money available for college that does not have to be repaid. Awarded may be based on financial need, past academic performance, service to the community or special areas of study.

- Georgia's HOPE Grant Program
- Georgia Tuition Equalization Grant Program
- Accel Program
- Law Enforcement Personnel Dependents Grant
- Public Safety Memorial Grant

- North Georgia College & State University ROTC Grant
- Georgia HOPE GED Grant
- Georgia's LEAP (Leveraging Educational Assistance Partnership) Grant

Service Cancelable Loans - Student loans which will not have to be repaid if certain conditions are met, such as working in a certain field or military service.

(www.GAcollege411.org)

Energy Workforce Programs

The number of postsecondary institutions that currently offer an **energy industry workforce program** (i.e. line worker; technician; plant operator; pipefitter, welder) is 39. These are listed below: (CEWD school reports)

1. Albany Technical College
2. Altamaha Technical College
3. Appalachian Technical College
4. Athens Technical College
5. Atlanta Technical College
6. Augusta Technical College
7. Bainbridge College
8. Central Georgia Technical College
9. Chattahoochee Technical College
10. College of Coastal Georgia
11. Columbus Technical College
12. Coosa Valley Technical College
13. Dalton State College
14. Dekalb Technical College
15. East Central Technical College
16. Flint River Technical College
17. Georgia Southwestern State University
18. Griffin Technical College
19. Gwinnett Technical College
20. Heart of Georgia Technical College
21. Lanier Technical College
22. Lincoln College of Technology
23. Middle Georgia Technical College
24. Moultrie Technical College
25. North Georgia Technical College
26. North Metro Technical College
27. Northwestern Technical College
28. Ogeechee Technical College
29. Okefenokee Technical College
30. Sandersville Technical College
31. Savannah Technical College
32. South Georgia College
33. South Georgia Technical College
34. Southeastern Technical College
35. Southwest Georgia Technical College
36. Swainsboro Technical College
37. Valdosta Technical College
38. West Central Technical College
39. West Georgia Technical College

All of the energy industries (general, nuclear, fossil, gas) are currently represented in these programs of study.

Energy Consortium Coordination with Postsecondary

The state energy industry consortium, GEICC, is coordinating with **postsecondary institutions to offer energy industry (i.e. line worker; technician; plant operator; pipefitter, welder) training programs**. There are currently 8 technical colleges involved in their efforts. Listed below are the training programs offered at the colleges.

- Albany Tech
  - Electrical Power Tech (nuclear)
  - Electromechanical Engineering Tech (oil and natural gas)
  - Electronics Tech (nuclear; oil and natural gas)
  - Carpentry Tech (industrial construction)
  - Construction Tech (industrial construction)
  - HVAC Tech (industrial construction; oil and natural gas)
  - Industrial Mechanical Tech (transmission/generation)
  - Industrial Systems Tech (nuclear; transmission/generation)
  - Welding Tech (oil and natural gas; industrial construction)
- Altamaha Tech
  - Electrical Control Systems Tech (nuclear)
  - Electrical Power Tech (transmission/generation)
  - Electrical Tech (oil and natural gas)
  - Electronics Tech (nuclear; oil and natural gas)
  - Instrumentation Tech (oil and natural gas)
  - Industrial Mechanical Tech (oil and natural gas)
  - Industrial Systems Tech (nuclear; transmission/generation)
  - Under development: Nuclear Energy Technology Associate's Degree using NEI curriculum (nuclear)
- Augusta Tech
  - Electrical Control Systems Tech (nuclear)
  - Electrical Power Tech (nuclear)
  - Electrical Tech (industrial construction)
  - Electronics Tech (nuclear; oil and natural gas)
  - Electronics/Computer Engineering Tech Industrial Mechanical Tech (oil and natural gas)
  - Industrial Systems Tech (nuclear; transmission/generation)
  - Mechanical Engineering Tech (oil and natural gas)
  - HVAC Tech (industrial construction; oil and natural gas)
  - Wiring Tech (industrial construction)
  - Welding Tech (oil and natural gas; industrial construction)
  - Under development: Nuclear Energy Technology Associate's Degree using NEI curriculum
- DeKalb Tech
  - Construction Tech (industrial construction
  - Electrical Control Systems Tech (nuclear)
  - Electrical Lineworker Apprentice (electric utility)
  - Electronics Tech (nuclear; oil and natural gas)
  - Electronics/Computer Engineering Tech (oil and natural gas)
  - HVAC Tech (industrial construction; oil and natural gas)

- Industrial Mechanical Tech (transmission/generation)
- Industrial Systems Tech (nuclear; transmission/generation)
- PLC Tech (oil and natural gas)
- Utility Locating Tech (oil and natural gas)
- Welding Tech (oil and natural gas; industrial construction)

- Lanier Tech
  - Electrical Control Systems Tech (nuclear)
  - Electrical Tech (oil and natural gas)
  - Electrical Utility Tech (electric utility)
  - Electronics Tech (nuclear; oil and natural gas)
  - Industrial Mechanical Tech (transmission/generation)
  - Industrial Systems Tech (nuclear; transmission/generation)
  - HVAC Tech (industrial construction; oil and natural gas)
  - PLC Tech (oil and natural gas)
  - Welding Tech (oil and natural gas; industrial construction)
  - Wiring Tech (industrial construction
- North Georgia Tech
  - Electrical Control Systems Tech (nuclear)
  - Electrical Lineworker Apprentice (electric utility)
  - Industrial Maintenance Tech (transmission/generation)
  - Industrial Systems Tech (nuclear; transmission/generation)
  - PLC Tech (oil and natural gas)
  - Welding Tech (oil and natural gas; industrial construction)
- Okefenokee Tech
  - Electrical Lineworker Apprentice (electric utility)
  - Electrical Technician (industrial construction; oil and natural gas)
  - Electrical Maintenance Tech (nuclear)
  - Electronics Tech (nuclear; oil and natural gas)
  - Industrial Systems Tech (nuclear; transmission/generation)
- South Georgia Tech
  - Electrical Lineworker Apprentice (electric utility)
  - Electronics Tech (nuclear; oil and natural gas)
  - Industrial Electrical Tech (transmission/generation)
  - Industrial Fluid Power Tech (transmission/generation)
  - Industrial Mechanical Tech (transmission/generation; oil and natural gas)
  - Industrial Systems Tech (nuclear; transmission/generation)

There are approximately 3,900 students collectively being served in these programs. (ENERGE Grant Enrollment Report of Fall Quarter 2009 provided by Sharon Haworth of TCSG)

The **curriculum being used at the technical colleges** listed above is developed with input of industry, specifically for the Electrical Line worker and Electrical Utility Technology programs, as well as for the two nuclear programs at Augusta Tech. The EUT program was developed with both industry input and vendor input. Some curriculum is staff developed; two examples cited by Roberta Hall were for new projects at Central Tech and GA Northwestern Tech. The curriculum being used for the Electrical Line worker Apprentice Program is available for anyone to purchase through Alexander Publications. Electrical Utility Technology associate degree program is a TCSG program and will be shared within the TCSG, but specific areas will need to be purchased through the vendor.

(GEICC conference call)

Lanier Tech offers an **internship** through its EUT associate's program. The electrical line worker program offers one week of OBI (Observation Based Instruction) where the students report to an operating headquarters of a local utility to observe and participate in routine work.(Sharon Haworth from TCSG).

Teacher/Faculty Externships

Energy industry externships are not currently offered to faculty and administrators in postsecondary institutions through GEICC. However, Sharon Haworth talked about GEICC wanting to expand a pilot program that they began in 2008 with secondary teachers through the ENERGE grant to the postsecondary faculty of the 8 colleges involved with the ENERGE grant. She specifically talked about Albany Technical College. (GEICC conference call)

Apprenticeship

The energy industry does have **relationships with construction trades apprenticeship programs** (carpentry, steelwork, electrical, plumbing) with content tailored to needs of the energy industry. There are people who are members of the Georgia Energy and Industrial Construction Consortium (GEICC) that represent construction trades such as the Atlanta Electrical Contractors Association, the Construction and Education Foundation of Georgia, the North Georgia Buildings Trade Council, the Southeast Iron Workers, the Carpenters Regional Council, and the United Association of Plumbers and Pipefitters. (GEICC membership list)

Current Energy Education Programs

Organizational Model

Georgia has **62 career pathways** currently available for students in its secondary education system. The following is a breakdown of how many pathways in each of the state's career clusters.

- Agriculture – 7
- Architecture, Construction, Communications and Transportation – 12
- Arts and Humanities – 4

- Business and Computer Science – 8
- Culinary Arts – 1
- Education – 2
- Engineering and Technology – 5
- Family and Consumer Sciences – 4
- Government and Public Safety – 6
- Healthcare Science – 8
- Marketing, Sales and Service – 5

The **Energy Systems Pathway** is one of the 5 pathways in the Engineering and Technology career cluster with a focus on energy related careers. The following courses are in the Energy Systems Pathway:

21.42500 Foundations of Engineering and Technology

21.45100 Energy and Power Technology

21.45700 Appropriate and Alternative Energy Technologies

CAREER PATHWAY RELATED COURSES:

21.45200 Foundations of Electronics

48.54300 CADD Solid Modeling

06.41700 Entrepreneurship

07.41100 Principles of Accounting I

21.4480 Energy Systems Internship

(GA Dept. of Education website)

Ron Barker, Technology Education Program Specialist at the Georgia Department of Education, provided the following information regarding the Energy Systems Pathway.

The first course in the Energy Systems Pathway is Foundations of Engineering and Technology and we have great curriculum resources for this course as it is the first course in the Engineering Pathway which has been completed. The information is on-line. The second and third courses in the Energy Systems Pathway have only the "Elements and Standards" in place at this time. We do have a recommended text "Energy, Power, and Transportation" by Dr. Len Litowitz who has been to Georgia, and presented, during two of our last three October teacher conferences.

The content for these courses centers around electrical, mechanical, fluid, and thermal concepts and principles; the engineering problem solving process; alternative energies; green concepts; practical hands on projects that reinforce the content; academic integration; Science, Technology, Engineering, and Math (STEM) concepts (NOTE: with emphasis on Engineering and

Technological Literacy arenas of study); and additional areas are dealt with in the sites teaching these courses.

The state is working with the Technical College System of Georgia (TCSG) to determine if there are postsecondary programs of study to which these courses could articulate. There is also potential to work with the Southern Polytechnic and State University as well as other engineering or engineering technology programs in the state.

High School Energy-related Programs

Georgia has **career academies across the state**, but is limited in the number that only addresses the energy industry. Below are several initiatives that support career academy implementation in the state.

In April 2007, the Atlanta Public Schools announced plans to accelerate and expand its high school transformation initiative through a $10.5 million investment from the Bill & Melinda Gates Foundation. The school district has transformed traditional high schools into small schools or small learning communities ensuring that all students receive a high-quality education that prepares them for the challenges of today's global economy.(acteonline.org)

Atlanta Public Schools Small Schools Project (sponsored by Bill & Melinda Gates) has small schools with an Engineering focus at South Atlanta High, D.M. Therrell High, and New Schools at Carver.

Building on Atlanta's success, Georgia began the Georgia Career Academies Project (GCAP). In 2007, $15 million in funding was awarded to create the following career academies: Hapeville Charter Career Academy, Golden Isles Career Academy, Floyd County College and Career Academy, Effingham Career Academy, and the PREP Academy. In 2008, $16 million in funding was awarded to create 6 more career academies and another round of funding awarded in 2009 for 4 more new ones and to 2 existing. There are now 20 (5 of these were created solely with local funds before the GCAP funding became available) of these career academies across the state.

Other known academies and high schools with an energy focus are listed below:

- Jenkins School of Engineering in Savannah (sponsored by GA Power)
- DeKalb County School System (has 5 schools w/ wall-to-wall career academies – some of these address engineering and construction)
- DeKalb County Arabia Mountain School of Engineering & Construction
- ARC Johnson in Augusta

Debra Howell, chairman of the Georgia Energy and Industrial Construction Consortium (GEICC), spoke about the DeKalb County Arabia Mountain School of Engineering & Construction and ARC Johnson in Augusta being schools with a focus on energy and that GEICC needed to be involved

in what they were doing. She furthermore said that the schools are utilizing the Energy Systems Pathway - with emphases on engineering.

Curriculum

The **known curriculum** being used in some of the schools mentioned above are Project Lead the Way curriculum and the state CTAE courses in the Energy Systems pathways, and Engineering and Technology pathways.

Some of the curriculum being used at the high school level is industry developed. Debra Howell of GEICC stated that those high schools where GEICC has partnerships, "there is industry input, but more so in an advisory capacity." Curriculums like PLTW is vendor developed and those CTAE curriculums are developed at the state department of education.

The state's technical colleges do coordinate with high schools on curriculum development. The twenty charter career academies receiving Georgia Career Academy Project funds are required to have a post-secondary partner, either a Technical College or University System college with a technical division. Most of these career academies offer **dual enrollment** courses in which the colleges would be required to coordinate with the high schools on curriculum.

Teacher/Faculty Externships

One example of **energy industry externships** offered to teachers and administrators at the secondary level was implemented by the GEICC Policy and Education committee. They piloted a teacher externship program with one secondary school district during the 2008-09 school year. Debra Howell stated that they will host more in 2010 and beyond. (GEICC conference call)

Current Certificates and Credentials

Credentials

Information regarding the energy industry-related certifications in Georgia is listed below.

Ron Barker, Technology Education Program Specialist at the Georgia Department of Education, stated that there are currently no energy industry-related certifications available for the secondary Energy Systems Pathway to date. He noted that this is a relatively new area of study which is moving into a spotlight at this moment in time. However, there are energy industry-related certifications in other Georgia career pathways in Engineering and Technology.

Georgia is a Work Ready state and has several energy industries that recognize The Georgia Work Ready Certificate as a portable credential easily and universally understood and valued by employers, educators and recipients. The Certificate shows that an individual has certain fundamental skills needed in the workplace. The Work Ready assessment is administered through ACT's nationally accredited WorkKeys® system.

Georgia does support NCCER credentialing. 14 training and certification cites in Georgia were located on the NCCER website (http://www.nccer.org/findCenter.asp).

SkillsUSA Georgia is a nonprofit corporation registered with the Secretary of State's office. They have a thirteen-member Board of Directors. The Board is a policy making group comprised of SkillsUSA Georgia Advisors, other educators, and members of business and industry. They receive funding through monies allocated by the Georgia General Assembly and distributed to through the Georgia Department of Education. Other sources of funding include membership dues, and registration fees for attending two yearly conferences. The organization provides training in both leadership and skills training, incorporating what is learned in the classroom into participation in over 100 competitions. (http://www.skillsusageorgia.org/purpose.htm)

Since 1981, the Association of Energy Engineers (AEE), has certified more than 15,000 professionals, enabling them to receive special recognition for their expertise in a variety of specialized areas of the energy, power, green facilities, industry. AEE's certification programs are recognized by such government agencies as the U.S. Department of Energy and the U.S. Agency for International Development, as well as by Fortune 1000 corporations, utilities and energy service companies. AEE offers approximately 20 energy industry-related certifications in Georgia. A complete listing can be found at www.aeecenter.org.

State Support for Credentials

There are two main avenues of **state support for credentials** in Georgia, through the Governor's Office of Workforce Development and the Hope Program.

The Governor's Office of Workforce Development (GOWD) was created by Governor Sonny Perdue in August 2006 to improve the job training and marketability of Georgia's workforce and drive future economic growth for the state. The office administers Work Ready, a voluntary workforce assessment system measuring "real world" skills that employers believe are critical to job success. The assessment is free to all citizens in Georgia and is administered by the Technical College System of Georgia. (www.gaworkready.org)

HOPE — Helping Outstanding Pupils Educationally — is Georgia's unique scholarship and grant program that rewards students with financial assistance in degree, diploma, and certificate programs at eligible Georgia public and private colleges and universities, and public technical colleges. HOPE is funded entirely by the Georgia Lottery for Education, which also funds Georgia's statewide prekindergarten program. Since the HOPE Program began in 1993, over $4.6 billion in HOPE funds have been awarded to more than 1.2 million students attending Georgia's colleges, universities, and technical colleges. The **HOPE Grant** program **is for students seeking a technical certification or diploma**, regardless of the student's high school grade point average or graduation date. (www.gacollege411.org)

Recommending Credentials

The **state energy industry consortium**, GEICC, **does play a role in recommending energy industry credentials**. GEICC has recommended and adopted the use of the CEFGA, NCCER, and WorkReady credentials in programs at both the secondary and postsecondary levels. Debra

Howell specifically talked about the use of "stackable credentials" for the Electrical Utility Technology A.S. Degree program that GEICC was instrumental in developing in conjunction with TCSG. (GEICC conference call)

State Level Policy Development

State Policies and Programs

Georgia has several different **state-level programs working to advance energy workforce development in the state**.

The Commission for a New Georgia identified six strategic cluster areas in the state to concentrate on growth, industry presences and innovation potential. Those six cluster areas include aerospace, agribusiness, energy and environmental, health care and elder care, life sciences, and logistics and transportation. The Georgia Centers of Innovation emerged from this initiative in 2003. These centers were placed strategically throughout Georgia in mid-sized cities and were designed to enhance long-term economic opportunities for Georgians, nourish the state's homegrown industries and encourage new companies to invest and build in Georgia. The Georgia Department of Education's Division of Career, Technical and Agricultural Education and the Department of Technical and Adult Education are collaborating with the Centers for Innovation to align program offerings with these economic and career opportunities for youths and adults. (www.acteonline.org)

Georgia Work Ready was created to ensure that Georgia's workers have the best skills, easy access to training and world-class job opportunities. The backbone of the initiative is the Work Ready Certificate, which assesses the real world skills of Georgia's workers. Georgians can use their Work Ready Certificate to prove their work readiness to potential employers. Georgia also offers gap training aimed at helping to improve Certificate scores, enabling career growth and continued on-the-job success. This, combined with an innovative job profiling process that accurately identifies the exact skills required for specific jobs is helping create the perfect match between Georgia workers and jobs.

For Georgia's fastest-growing industries - aerospace, advanced communications, advanced manufacturing, bioscience, energy and logistics - we have built Georgia's Work Ready Regions, designed to bring together our industry assets with regional leaders to deliver competitive advantages for Georgia companies. Work Ready Regions are educating the state's emerging workforce - high school students, technical college and college students - for exciting careers in cutting-edge industries. In addition to existing education, corporate and infrastructure assets, each Work Ready Region is lead by an industry leader and has assembled a regional industry network to ensure its growth plan meets businesses' current and future needs. There are currently two Georgia Energy Work Ready Regions in the state. (www.gaworkready.org)

Georgia's "Quick Start" program is an internationally acclaimed workforce development program that provides training to qualified new, expanding and existing industries. For more

than 40 years, Quick Start has provided customized workforce training free-of-charge to qualified businesses in Georgia. Today, the program is one of the state's key assets for supporting new and expanding industries. Quick Start delivers training in classrooms, mobile labs or directly on the plant floor, wherever it works best for a company. (www.georgiaquickstart.org)

Low-income Youth

Georgia offers several **state programs that focus on assisting low-income youth**.

Under the American Recovery and Reinvestment Act of 2009, there are provisions providing relief to low- and moderate-income families and to states facing serious budget shortfalls. Georgia is one of the states receiving this stimulus money.

Rent Assistance From Housing Choice Voucher Program

This is an assistance program that helps low income families and individuals with paying rent, and works with them to rent decent and safe dwelling units in the private rental market. The program helps maintain their rent payments at an affordable amount

After School Services

This program is available for youth ages 6 through 19. The majority of youth served in this program come from low-and moderate income families. The primary components of after school and summer programs include academic enrichment activities, physical activity, health education, and teen employment opportunities.

PeachCare for Kids

This is a low cost or free health insurance program for children up to age of 19 to help families pay for medical bills and health care expenses. This plan is free for children under age six.

Subsidized Child Care - Childcare and Parent Services (CAPS)

This assistance program will help Georgia families pay for early childhood and school age care programs, and help pay for child care bills. State subsidized care is available for kids from the age birth to age 13, or up to age 18 if the children has special needs.

Advisory Structures

The energy industry, through GEICC, does have a **state-level advisory committee** structure that regularly interacts with postsecondary faculty and administrators. Debra Howell stated that the GEICC executive committee and board of directors have representation from postsecondary levels and secondary levels that interact on a regular basis. (GEICC conference call)

The energy industry does participate in **multi-industry-sector advisory committees** that regularly interact with postsecondary faculty and administrators. Debra Howell stated that many of the members of GEICC serve on various advisory committees for programs offered by

the Technical College System of Georgia. She also commented about CTAE committees also serving this function. (GEICC conference call)

The energy industry consortium also regularly interacts with leaders from the **adult and youth workforce development systems**. Debra Howell and Suzanne Powell of GEICC stated that they regularly interact with the leaders in the following organizations: (GEICC conference call)

- Construction Education Foundation of Georgia (CEFGA)
- Skills USA
- First Robotics
- Regional workforce boards (one example given was East Central Workforce Board in Augusta)
- Internship programs with WIA
- MAGIC Camp (women in construction)
- Summer Energy Camps

There is also interaction between the energy industry consortium and leaders from the state **economic development agency**. Suzanne Powell stated that each industry in GA has a designated economic development representative that is directly engaged in what is going on with the consortium and that GEICC regularly interacts with Debra Lyons of the Governor's Workforce Development initiative. (GEICC conference call)

GEICC also sponsored forums with the Department of Labor, education, & industry in Waynesboro, GA and plans to hold future forums in various locations across the state. (Sept. 2009 Public Power newsletter)

CEWD State Energy Education Report
Florida
Supported by ACTE & Meeder Consulting Group, LLC
February 22, 2010

Summary

The Center for Energy Workforce Development (CEWD) has been awarded a planning grant by the Bill and Melinda Gates Foundation. The purpose of the grant is to determine the readiness of 8 states to implement the Get Into Energy career pathway for skilled utility technicians. This report provides information about the state's education structure and ability to support the implementation of the career pathway.

Current Postsecondary Education Systems and Policies

Governance

The postsecondary institutions in Florida are divided into two different state-wide **governance systems**. There is a Florida State University System with 11 state universities and a Florida Community College system with 28 community colleges. There is also an Independent Colleges & Universities of Florida (ICUF) system which is a diverse association of 28 private, not-for-profit, educational institutions all based in Florida and accredited by the Southern Association of Colleges & Schools (SACS). Thus the total number of possible postsecondary delivery institutions in the state is 67. This number does not include the Technical Education Centers or industry training centers across the state.

Postsecondary Transitions

The policies governing **transferability from one degree program to another** in Florida are listed below.

Independent Colleges and Universities of Florida Agreement – Florida's community colleges have an articulation agreement with the Independent Colleges and Universities of Florida (ICUF). The agreement establishes the provisions for the transfer of Associate in Arts degree students into private colleges and universities. It guarantees that community college Associate in Arts degree students will enter as juniors, receive at least 60 credit hours toward their bachelor's degree, and receive recognition for the general education core taken at the community college. (study on acceleration mechanisms in FL.,Dec.2003)

Due to the variation in credit awarded for equivalent programs across the state, Florida is moving beyond local articulation agreements and is developing statewide articulation agreements that will enhance and standardize the transfer of credit among delivery systems. Beginning with the 2000-01 academic year, students awarded Associate in Science degrees in select programs were guaranteed admission to any state university with guaranteed articulated course credit toward a designated program. (www.acteonline.org)

There are currently 9 AS programs that articulate to BS programs in the university system. Of these 9, only one is focused on the energy industry.

The following Associate in Science degree programs shall articulate into a baccalaureate degree in the designated university programs under the provisions of Rule 6A-10.024 - Articulation Between Universities, Community Colleges, and School Districts and the career ladder agreements contained herein: (www.fldoe.org/articulation)

The following associate degree in the energy industry has such agreements:

- Electronics Engineering Tech. (CIP 1615030301) articulates to
- Electronics Engineering Technology (CIP 15.0303)
- Engineering Technology General (CIP 15.1101)

Articulation Agreements

Dual Enrollment & Articulation: The Florida State Board of Education has adopted a "Seamless Articulation and Maximum Access" goal as one of the four goals in their K-20 system. This seamless articulation model provides career ladder opportunities for students as they acquire college credit while still in high school. These credentials and/or credits may articulate to a technical center, community college or four-year college or university.

The linkage between secondary and postsecondary education programs in Florida is accomplished with the implementation of several strategies to ensure seamless articulation. Acceleration options provide opportunities for secondary career and technical education students to participate in dual enrollment, early admission, advanced placement, credit by examination, the International Baccalaureate Program and Tech Prep. Acceleration mechanisms shorten the time needed to complete postsecondary certificate or degree requirements, broaden the scope of available options after high school and increase the depth of content available to students in a particular subject.

Dual enrollment enables secondary students to earn elective credits toward a high school diploma while completing requirements for a postsecondary certificate or degree offered at technical centers or community colleges. Tuition and fees for dual-enrollment courses are waived. There is no cost to school districts for college tuition. Students who attend a Florida public college or university are exempt from registration, matriculation or laboratory fees for courses taken through dual enrollment. Additionally, instructional materials assigned for use within dual-enrollment courses must be available to students free of charge. (www.acteonline.org/profile)

Virtual High Schools

Florida has one virtual school, founded in 1997 by President and CEO Julie Young, the **Florida Virtual School** (**FLVS**) is an American online middle and high school with a new full time elementary school program through Connections Academy. According to its website, "FLVS is

part of the Florida public education system and serves students in all 67 Florida districts. FLVS also serves students, schools, and districts around the nation through tuition-based instruction, curriculum provision, and training."

Early College High Schools

Early college high schools are small schools designed so that students can earn both a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree. Early college high schools have the potential to improve high school graduation rates and better prepare students for high-skill careers by engaging all students in a rigorous, college preparatory curriculum and compressing the number of years to a college degree. At this time there are no early college high schools in Florida, but the following is what the Florida department of education defines "early college" to be.

The Florida Community College System works with local school districts, private secondary schools and home school families to provide Dual Enrollment or "Early College" postsecondary options to over 30,000 eligible students annually. The term Early College is synonymous with "Dual Enrollment" in the Florida Community College System. (www.fldoe.org)

Accelerated Associate Degree

In Florida, **associate accelerated degree programs** are available to students through the following mechanisms available to students in secondary education.

Dual enrollment programs provide a way for high school students to simultaneously meet high school requirements while earning college credits. These programs provide families with cost savings for college tuition and decrease the time it takes students to earn a degree. Students can also earn college credit through successful completion of Advanced Placement (AP®), International Baccalaureate® (IB), Cambridge Advanced International Certificate of Education (AICE), and College‐Level Examination Program (CLEP) exams. Of the various **acceleration mechanisms**, AP is the most widely used in Florida. The Florida Legislature has provided school districts and teachers with financial incentives for students who pass their exams. In 2008 about 130,000 students took at least one AP exam3 while 33,000 students participated in a dual enrollment (DE) program through a Florida College. Dual enrollment participation varies widely throughout the state, caused at least in part by less monetary incentives for school districts to participate. (study on acceleration mechanisms in FL.,Dec.2003)

Need-based Financial Aid

Florida has a wealth of **tuition aids** and **initiatives that serve low-income students** entering postsecondary education. Below are just a few examples found.

Florida leads the nation in helping low-income and minority college-bound students access financial aid. In only its second year, Florida's College Goal Sunday program served more

students from low-income and minority households than any other state participating in the national initiative.

Florida College Goal Sunday was held February 25th at 49 sites in urban and rural communities across the state to help college-bound students complete the Free Application for Federal Student Aid (FAFSA), a form needed to receive state and federal grants and loans for college tuition. The Florida Department of Education (DOE) received a grant from the Lumina Foundation to launch the program two years ago. In its pilot year, approximately 900 people attended events held at 20 sites across the state. This year the program attracted more than 4,600 people, including approximately 2,000 students who participated, to access millions of dollars available in financial aid. For more information about College Goal Sunday, visit www.fldoe.org/collegegoalsunday.

Below is a list of State of Florida Grant and Scholarship Programs administered by the Office of Student Financial Assistance.

- Access to Better Learning and Education Grant Program
- Cost of Attendance and Adult Norm-Referenced Disability Testing
- Critical Teacher Shortage Student Loan Forgiveness Program
- Critical Teacher Shortage Tuition Reimbursement Program
- Federal Academic Competitiveness Grant and The National Science & Mathematics Access to Retain Talent Grant
- First Generation Matching Grant Program
- Florida Bright Futures Scholarship Program
- Florida Public Postsecondary Career Education Student Assistance Grant Program
- Florida Resident Access Grant Program
- Florida Student Assistance Grant Program
- Florida Work Experience Program
- José Martí Scholarship Challenge Grant Fund
- Mary McLeod Bethune Scholarship Program
- Robert C. Byrd Honors Scholarship Program
- Rosewood Family Scholarship Program
- Scholarships for Children and Spouses of Deceased or Disabled Veterans and Servicemembers
- Talented Twenty Program

Postsecondary Awareness and Planning

In addition to the above mentioned programs, Florida has **other initiatives that encourage low-income youth to enter postsecondary education** programs.

Black Male College Explorers Program

The Black Male College Explorers Program provides a continuance of academic support in middle and high schools for students to matriculate to a university or college upon completion of the 12th grade. This program is a prevention/intervention program designed specifically to prevent black males from dropping out of high school, facilitate their admission to college, and significantly increase their chances of earning a college degree. Schools identify at-risk black makes in grades 7th-11th. Selected students stay on campus for five weeks and participate in highly concentrated developmental experiences. (www.fldoe.org)

Take Stock in Children Program

Take Stock in Children provides mentors and college scholarships for low-income children between 6th and 9th grades in order to enhance their likelihood of college preparation and attendance. This program helps low-income children succeed by providing college and vocational-technical scholarships, volunteer mentors, student advocates, tutoring, and community support. (www.fldoe.org)

According to Florida Department of Education's Office of Equity and Access, 25 community colleges have a College Reach-Out Program (CROP) serving low-income and educationally disadvantaged students in grades 6-12. Miami Dade, Polk and Valencia have Upward Bound programs serving low income/first generation high school students. The CROP and Upward Bound programs provide tutoring services to high school students in academic subjects, including STEM subjects. (www.fldoe.org/STEM Initiatives in Community Colleges)

Energy Workforce Programs

The number of postsecondary institutions that currently offer an **energy industry workforce program** (i.e. line worker; technician; plant operator; pipefitter, welder) is 44. These are listed below: (CEWD school reports)

1. Atlantic Technical Center
2. Brevard Community College
3. Brewster Technical Center
4. Commercial Diving Academy
5. D G Erwin Technical Center
6. Daytona State College
7. First Coast Technical College
8. Florida Community College
9. George Stone Career Center
10. Hillsborough Community College
11. Indian River State College
12. Lake-Sumter Community College
13. Lake Technical Center
14. Lee County High Tech Center Central
15. Lindsey Hopkins Technical Education Center
16. Lively Technical Center
17. Manatee Technical Institute
18. Marion County Community Technical and Adult Education Center
19. McFatter Technical Center
20. Miami Dade College
21. Mid Florida Tech
22. Okaloosa Applied Technology Center
23. Palm Beach Community College
24. Palm Beach State College
25. Pasco-Hernando Community College
26. Pensacola Junior College

27. Pinellas Technical Education Center
28. Polk State College
29. Radford M Locklin Technical Center
30. Ridge Career Center
31. Robert Morgan Educational Center
32. Saint Johns River Community College
33. Santa Fe College
34. Seminole Community College
35. South Florida Community College
36. St Petersburg College
37. Taylor Technical Institute
38. Tom P Haney Technical Center
39. Traviss Career Center
40. Tulsa Welding School
41. University of Florida
42. Washington-Holmes Technical Center
43. Westside Tech
44. Withlacoochee Technical Institute

All of the energy industries (general, nuclear, fossil, gas) are currently represented in the programs of study at the institutions listed above.

Energy Consortium Coordination with Postsecondary

The state energy industry consortium, FEWC, is coordinating with **postsecondary institutions to offer energy industry (i.e. line worker; technician; plant operator; pipefitter, welder) training programs**. There are currently 12 colleges involved in their efforts. Listed below are the training programs offered at the colleges.

- Engineering Technician Program
- Electrical Power Technology
- Electrical Distribution Technology

There are the following additional programs in development:

- Electrical Power Program (Central Florida Community College)
- Alternative Energy Engineering Technology Certificate Program (Gulf Coast Community College)
- Lake City Community College (program title to be determined)
- Tallahassee Community College (program title to be determined)

The **curriculum being used at the colleges** that are coordinating with FEWC, through the Banner Centers for Energy, is a combination of staff developed and industry-developed, but is not vendor developed. (FEWC Conference Call)

Teacher/Faculty Externships

Energy industry externships: Jose Farinos of Indian River State College stated that their instructors have externships at Florida Power and Light. (FEWC Conference Call) There may be others, but this was the only example given on the conference call.

Apprenticeship

The energy industry does have **relationships with construction trades apprenticeship programs** (carpentry, steelwork, electrical, plumbing) with content tailored to needs of the energy industry.

The FEWC will continue to expand its membership to include contractors, their associations and labor organizations who provide contract labor essential to utility construction and operations. The workforce needs of both direct and indirect hires to the energy industry will be considered together because they rely on very similar job skills, and in many cases, compete for the same labor pool. (www.fewc.org)

Current Energy Education Programs

Organizational Model

Florida has **57 career pathways** currently available for students in its secondary education system.

The Division of Workforce Education has customized program-of-study templates based on the state career-clusters model pathway template. Eligible recipients will be required to submit their programs of study on the customized state-approved template. The state has developed 57 sample programs of study for the career cluster pathways as a resource for eligible recipients. (www.acteonline.org)

Florida does have **career pathways that address the energy industry**. The DOE website list the following pathway related to the energy industry in the STEM area:

- Engineering and Technology

Jennifer Grove, chair of the Florida Energy Workforce Consortium (FEWC) talked about another Florida Energy Framework that they have collaborated with the DOE on. This framework is not listed yet on the DOE website, but is to be available in August of 2010. (FEWC Conference Call)

High School Energy-related Programs

Florida has many **career academies** across the state and many of them address the energy industry. General energy, engineering, and construction are the areas being addressed for the academies that Jennifer Grove spoke about. (FEWC Conference Call) The list below is from FEWC and shows the partners of the consortium that offers support to the career academy.

1. Gulf Power Academy at West Florida High School of Advanced Technology – Pensacola (Escambia County) – Gulf Power Company
2. Gulf Power Welding Technology Institute at Locklin Tech – Milton (Santa Rosa County) – Gulf Power Company
3. Gulf Power Electrical Technology Institute at Locklin Tech – Milton (Santa Rosa County) – Gulf Power Company

4. Gulf Power Institutes at Laurel Hill School – Laurel Hill (Okaloosa County) – Gulf Power Company
5. Dunnellon H.S. – "Power Industry Academy" (Marion County) – Progress Energy
6. Marion Technical Institute (H.S.) – "Electrical/Lineman Academy" (Marion County) – Progress Energy
7. Dixie County H.S. – "Welding Career Academy" (Dixie County) – *opening Fall 2010* – Progress Energy
8. Williston H.S. – "Welding Career Academy" (*In the planning stages*) (Levy County) – Progress Energy
9. Bronson HS - Construction academy (Levy County) - Progress Energy
10. Withlacoochee technical Institute - Mechanical academy (for application to power plants) (Citrus County) - Progress Energy
11. Anclote H.S. – Power Industry Academy (*In the planning stages*) (Pasco County) – Progress Energy and TECO
12. Philip Randolph Energy, Manufacturing, and Construction Academy – (Duval County) - JEA
13. Allen D. Nease Academy of Mechanical Engineering – (St Johns County) - JEA
14. Bartram Academy of Architectural Design – (St Johns County) - JEA
15. Creekside Academy of Environmental and Urban Planning – (St Johns County) - JEA
16. Englewood Construction Academy – (Duval County) - JEA
17. Middleburg Academy of Architecture and Construction – (Clay County) - JEA
18. Orange Park Academy of Engineering and Design – (Clay County) - JEA
19. Pedro Menendez Academy of Architectural and Building Sciences – (St Johns County) - JEA
20. Robert E. Lee Engineering Academy – (Duval County) - JEA
21. Terry Parker Coastal and Environmental Sciences Academy - (Duval County) – JEA
22. Lakeland Electric Power Academy at Tenoroc H.S. In Lakeland. (Polk County) – Lakeland Electric
23. Westside Tech Alternative Energy Academy – Westside Tech (Orange County)

Curriculum

The most **common curriculums being used** in the above-mentioned career academies are NCCER and Project Lead the Way. Some curriculum currently being used at the high school level is a combination of industry & vendor developed. However, with the development of the FL Energy Framework, the curriculum will need to be developed with materials and professional development for teachers. This new curriculum will be mostly industry developed with the help of FL state-level curriculum experts at the DOE. Jennifer Grove of Gulf Power, furthermore stated that the Energy Framework was created with input from secondary, post-secondary, and industry experts. (FEWC Conference Call)

Teacher/Faculty Externships

Energy industry externships are being offered to teachers and administrators at the secondary level through FEWC. Jennifer Grove stated that Gulf Power hosts the instructors from the secondary career academies over the summer. Betsy Livingston of Lakeland Electric spoke about hosting externships for middle school teachers. (FEWC Conference Call)

Current Certificates and Credentials

Credentials

Information regarding the energy industry-related certifications in Florida is listed below.

The following certificates are from the current CAPE Industry Certification Funding List, approved by the State Board of Education. (www.fldoe.org/workforce)

- Certified Welder – AWELD001
- FAA Powerplant Mechanic – FEDAA010
- NCCER Electrical - Level 1 – NCCER010
- NCCER Electrical - Level 2 – NCCER038
- NCCER Electrical - Level 3 – NCCER039
- NCCER Electrical - Level 4 – NCCER040
- NCCER Electronic Systems Technician - Level 1 – NCCER013
- NCCER Electronic Systems Technician - Level 2 – NCCER041
- NCCER Electronic Systems Technician - Level 3 – NCCER042
- NCCER Electronic Systems Technician - Level 4 – NCCER043
- NCCER Welder - Level 1 – NCCER061
- NCCER Welder - Level 2 – NCCER062
- NCCER Welder - Level 3 – NCCER063

The following certificates are available at the postsecondary level through the community colleges affiliated with the Banner Centers for Energy & Alternative Energy:(Banner Centers PPT)

- Electric Power Technology Certificates in Solar PV and Solar Thermal (Indian River State College)
- Electrical Distribution Technology Certificates for line worker, basic and advanced (Lake-Sumter Community College)
- Electrical Distribution Technology Certificate for Electric Line Service Repair (South Florida Community College)
- Solar PV, Solar Thermal, Hot Water Heating, Green Building Certificates (Tallahassee Community College)

The following are some of the degrees, certifications or licenses required within the alternative energy arena:

- Solar or Electrical Contractor
- North American Board of Certified Energy Practitioners (NABCEP) Certified PV, Solar Thermal or Small Wind Turbine Installer
- Graduate of an Electrical of Other Construction Trade Apprenticeship Program
- North American Board of Certified Energy Practitioners (NABCEP) Entry Level Certificate of Knowledge in PV
- Academic or Non-Credit Certificate Program Recipient (three to six courses)
- Architecture or Engineering Degree
- Associate in Science (A.S.) or Associate in Applied Science (A.A.S) Degree in Electronics, Building Sciences, Electrical or Mechanical Construction, Energy Management, Engineering Technology or Renewable Energy Technology Program
- Two or Four-Year Degree in Computer Science, Business, or Political Science
- Bachelor in Engineering Technology Degree in Construction, Mechanical Design or Electrical Systems
- Post-Graduate Degree in Science or Engineering

Based on direction from the Greenforce Florida Team, the Department of Education is working collaboratively with a group of stakeholders to fast-track the development of the career pathways, standards, benchmarks and frameworks for several solar industry occupations. Through the efforts of the Greenforce Florida Team a green-collar workforce will be prepared to serve Florida's growing alternative energy industries.

State Support for Credentials

Florida receives the third largest allocation of federal Perkins funds behind California and Texas. The Program of Study Elements as defined in Perkins IV requires that a program of study lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree. Students enrolled in CTE programs at both the secondary and postsecondary levels benefit from Perkins IV funds.

The SUCCEED Florida -- Career Paths Program was established by the 2007 Florida Legislature to establish secondary and professional academies that integrate academic and career curricula through a career-based theme. One of the funding allowances under SUCCEED Florida is to provide career education certification, pursuant to section 1003.431 Florida Statutes.

Florida Ready to Work is an innovative, new workforce education and economic development program. The centerpiece of the program is the Florida Ready to Work credential, a career readiness certificate – signed by Governor Charlie Crist – that certifies that a Florida student/jobseeker has the fundamental job skills necessary to succeed in today's rapidly changing and competitive economy. Florida Ready to Work is sponsored and funded by the State of Florida. The program is administered by the Florida Department of Education in partnership with the Florida Agency for Workforce Innovation. The program is being

implemented by regional workforce boards, community colleges, high schools, and other workforce development and education partners statewide. (www.floridareadytowork.com)

Recommending Credentials

The **state energy industry consortium**, FEWC, **does play a role in recommending energy industry credentials**. They began discussions with Florida Department of Education staff to begin development of an Energy Technician certification curriculum for implementation in the 2010-2011 school year. (CEWD Consortium Overview)

Jennifer Grove stated that at this point the FEWC was only recommending energy industry credentials. She said that they wanted to see what the national credential will be so that they will be aligned to what it will be. She also stated that the FL DOE were putting together credentials. Jose Farinos, the dean of the Advanced Technology Division of Indian River State College, talked about a "nuclear" credential that he is helping to create with INPO that will be transferable to any nuclear power plant in the country. (FEWC Conference Call)

State Level Policy Development

State Policies and Programs

Florida has several different **state-level programs working to advance energy workforce** development in the state.

In Executive Order 07-128, Governor Crist directed the Action Team to develop recommendations for "strategic investments and public-private partnerships in Florida to spur economic development around climate-friendly industries and economic activity that reduces emissions in Florida" as well as "strategies and mechanisms for the long-term coordination of Florida's public policy in the areas of economic development, university-based research and technology development, energy, environmental protection, natural resource management, growth management, transportation, and other areas as needed to assure a future of prosperity for Floridians in reducing greenhouse gas emissions." To address this charge, the Technical Working Group (TWG) of Government Policy and Coordination was formed.

Overview of Policy Recommendations and Estimated Impacts

The Government Policy and Coordination TWG organized its recommendations around five major initiatives:

- targets, reporting, funding, and accountability measures;
- public awareness and education;
- inter-governmental planning coordination and assistance;
- green business development; and
- a proposal to introduce core competencies into professional licensing.

Workforce Florida, Inc. was created by Governor Jeb Bush and the Florida Legislature with the passage of the Workforce Innovation Act of 2000, Chapter 445, Florida Statutes. A 45-member board appointed by the Governor oversees and monitors the administration of the state's workforce policy, programs and services carried out by the 24 business-led Regional Workforce Boards and the Agency for Workforce Innovation. Direct services are provided at nearly 100 One-Stop Centers with locations in every county in the state.

Workforce Florida, Inc., which is charged with serving as a catalyst for developing workforce talent in Florida, created the Employ Florida Banner Centers in 2006. They were given the name Banner Centers because they are designed to serve as the leading resource and focal point for ensuring the state's economic priority for increasing talent in high-skill, high-wage targeted sectors is being addressed. Banner Centers partner with industry in targeted sectors to identify training needs and, among other things, create new curricula. A key objective is to create timely and relevant training that can be shared across multiple educational institutions for access by businesses in other areas of the state, thus reducing duplication. There are currently two Banner Centers that address the energy industry, The Banner Center for Alternative Energy (housed at the University of Central Florida) and The Banner Center for Energy (housed at Indian River State College). (www.workforceflorida.com)

GREENFORCE FLORIDA is a working group of industry, labor and education leaders who believe that Florida is positioned to be at the epicenter of the emerging green industry and understands its future demands. GREENFORCE FLORIDA is committed to Florida's leadership role, assisting our nation and the people of our great state, by preparing the workforce for jobs future and present, thus encouraging green industries to Florida.

Low-income Youth

Some of the **programs that focus on assisting low-income youth** found on the Florida Department of Education website are listed below.

The Bureau of Federal Educational Programs (BFEP) operates in the context of the Department's vision, mission, and guiding principles to provide leadership and support for educationally disadvantaged and low-income students, migratory children, neglected, delinquent or homeless children and youth.

The following BFEP programs are available to low-income youth through public education in Florida:

- Title I Part D: Neglected, Delinquent, and At-Risk Education Program (N&D)
  The purpose of Prevention and Intervention Programs for Children and Youth who are Neglected, Delinquent, or At-Risk is to improve educational services for children and youth in local and State institutions for neglected or delinquent children and youth so that such children and youth have the opportunity to meet the same challenging State

academic content standards and challenging State student academic achievement standards that all children in the State are expected to meet.

- Title VI: Rural & Low Income Schools Program (RLIS)
  The purpose of this program is to address the unique needs of rural local educational agencies (LEAs). RLIS provides additional resources to assist rural LEAs in increasing student achievement and meet the goals of Title VI.
- Title X: Homeless Education Program (HEP)
  The McKinney-Vento Education for Homeless Children and Youth Program is designed to address the problems that homeless children and youth have faced in enrolling, attending, and succeeding in school. Under this program, state educational agencies must ensure that each homeless child and youth has equal access to the same free, appropriate public education, including a public preschool education, as other children and youth.

Black Male College Explorers Program

The Black Male College Explorers Program provides a continuance of academic support in middle and high schools for students to matriculate to a university or college upon completion of the 12th grade. This program is a prevention/intervention program designed specifically to prevent black males from dropping out of high school, facilitate their admission to college, and significantly increase their chances of earning a college degree. Schools identify at-risk black makes in grades 7th-11th. Selected students stay on campus for five weeks and participate in highly concentrated developmental experiences.

Take Stock in Children Program

Take Stock in Children provides mentors and college scholarships for low-income children between 6th and 9th grades in order to enhance their likelihood of college preparation and attendance. This program helps low-income children succeed by providing college and vocational-technical scholarships, volunteer mentors, student advocates, tutoring, and community support. Each child signs a contract agreeing to maintain good grades, to remain drug and crime free, and to meet with his/her mentor regularly to receive the scholarship. Each child is assigned a caring adult mentor who meets with the student at his/her school for one hour once a week.

Advisory Structures

The energy industry, through FEWC, does have a **state-level advisory committee** structure that regularly interacts with postsecondary faculty and administrators. Jose Farinos, the dean of the Advanced Technology Division of Indian River State College, spoke of a state-level advisory committee that he is a part of through the Banner Center for Energy that meets twice a year. (FEWC Conference Call)

The energy industry does participate in **multi-industry-sector advisory committees** that regularly interact with postsecondary faculty and administrators. Jennifer Grove spoke of

twelve such state-level multi-industry advisory committees. She also said that the FEWC chairs serve on the energy targeted Banner Center advisories. A policy-level advisory council called the "Council of Workforce Business Competitive Council" was also mentioned as an example. (FEWC Conference Call)

The energy industry consortium also regularly interacts with leaders from the **adult and youth workforce development systems**. Jennifer Grove gave two examples. The first is a youth program that targets ages 16 – 24 called the "Powerful Summer Program" which Gulf Power hosted during 3 different weeks last summer and developed a template to be used throughout the state for others to replicate. The second one is through their involvement with Workforce Florida's youth committee. Andra Cornelius of Workforce Florida is a co-chair of the FEWC. (FEWC Conference Call)

There is also interaction between the energy industry consortium and leaders from the state **economic development agency**. Through various awareness raising activities at the state level, through partnering with critical agencies such as Workforce Florida, Inc. and the engagement of Andra Cornelius, Vice President of Workforce Florida and Co-Chair of the FEWC, and through gubernatorial appointment of Jennifer Grove, Co-Chair of the FEWC, to the Workforce Florida, Inc. Board and her service on the Sustainability/Infrastructure Committee of WFI, energy workforce development has become a key area of focus for the state. (CEWD Consortium Overview)

The following state economic agencies have frequent interaction with the FEWC: Florida Economic Development Council, Florida Chamber, Enterprise Florida, Florida Council of 100, and Workforce Florida. Jennifer Grove also stated that the presidents of energy companies serve on many of these councils and that there is a distinct alignment between the strategic plans of Workforce Florida and Enterprise Florida. (FEWC Conference Call)

CEWD State Energy Education Report
Indiana
Supported by ACTE & Meeder Consulting Group, LLC
February 22, 2010

Summary

The Center for Energy Workforce Development (CEWD) has been awarded a planning grant by the Bill and Melinda Gates Foundation. The purpose of the grant is to determine the readiness of 8 states to implement the Get Into Energy career pathway for skilled utility technicians. This report provides information about the state's education structure and ability to support the implementation of the career pathway.

Current Postsecondary Education Systems and Policies

Governance

The postsecondary institutions in Indiana are divided into several state-wide **governance systems**. There are a total of 46 colleges and universities in the state of Indiana.

The following are **public colleges and universities** which encompass several "systems."

- Ball State University
- Indiana State University
- Indiana University System
  - Indiana University (Bloomington)
  - Indiana University East (Richmond)
  - Indiana University Kokomo
  - Indiana University Northwest
  - Indiana University South Bend
  - Indiana University Southeast
- Indiana University-Purdue University Joint Campuses
  - Indiana University-Purdue University Columbus (IUPUC)
  - Indiana University-Purdue University Fort Wayne (IPFW)
  - Indiana University-Purdue University Indianapolis (IUPUI)
- Ivy Tech Community College of Indiana
- Purdue University System
  - Purdue University
  - Purdue University Calumet
  - Purdue University North Central
  - Purdue University College of Technology
- University of Southern Indiana
- Vincennes University

The following are **private liberal arts colleges**:

- Bethel College (Indiana)
- DePauw University
- Earlham College
- Franklin College
- Goshen College
- Grace College & Seminary
- Hanover College
- Marian College (Indiana)
- Saint Joseph's College, Indiana
- Saint Mary-of-the-Woods College
- Saint Mary's College (Indiana)
- Wabash College

The following are **private colleges and universities**:

- Ancilla College
- Anderson University
- Art Institute of Indianapolis
- Butler University
- Calumet College of St. Joseph
- Christian Theological Seminary
- Concordia Theological Seminary (Fort Wayne campus)
- DeVry University
- Holy Cross College
- Huntington University
- Hyles-Anderson College
- Indiana Institute of Technology
- Indiana Wesleyan University
- Kaplan College
- Manchester College (Indiana)
- Martin University
- Oakland City University
- Rose-Hulman Institute of Technology
- Saint Meinrad School of Theology
- Taylor University
- Trine University (formerly known as Tri-State University)
- University of Evansville
- University of Indianapolis
- University of Notre Dame

- University of Saint Francis
- Valparaiso University

Ivy Tech Community College of Indiana (usually shortened to **Ivy Tech** or **Ivy Tech Community College**) is Indiana's largest and only community college system, encompassing 24 campuses in 14 regions.[2] The community college system now has more than 120,000 students.[3]

Postsecondary Transitions

Indiana has the following state policy on **transferability from one degree program to another**.

Indiana has instituted the Core Transfer Library (CTL), a statewide effort to help students transfer college credits among public college and university campuses. CTL courses will meet the general elective requirements of undergraduate degree programs and most will also count toward specific degree requirements if an equivalent course is taught at the selected college or university campus. Currently nine courses listed in the CTL are CTE courses. Plans include increasing the number of CTE courses on this list or beginning development of a parallel list for technical courses. When completed, these opportunities will enable students to simultaneously earn secondary and postsecondary credit while in high school and smoothly transition to certificate, associate and/or baccalaureate degree programs. (www.acteonline.org)

Articulation Agreements

Dual Enrollment & Articulation: During the completion of the Indiana career pathways/programs of study, the secondary and postsecondary teachers and administrators are also going to work on developing statewide articulation agreements. The state will be starting with the CTE areas that already have multiple local agreements in place. The basis of the statewide agreements will be the statewide secondary standards. There is a common numbering system at the postsecondary level, but postsecondary CTE standards are still being developed. (www.acteonline.org)

Virtual Schools

Indiana has virtual schools that address both secondary and postsecondary education. They are listed below:

The mission of the Indiana Virtual Learning Consortium (IVLC) is to promote the growth of high-quality virtual educational opportunities for Indiana students and schools. The Indiana Virtual Learning Consortium is committed to working collaboratively to improve the quality of virtual education in the state of Indiana. The following virtual providers are part of the IVLC. http://www.bsu.edu/academy/ivlc/about.htm

The Indiana Academy for Science, Mathematics, and Humanities is a public two-year residential high school for gifted and talented students throughout Indiana. Additionally, the Indiana Academy provides distance learning opportunities to high school students throughout the U.S. The Indiana Academy offers distance learning options in five advanced placement courses,

eight foreign language courses as well as physics I, astronomy and West in the World. For more information about the Indiana Academy's distance learning program please visit our website at http://www.bsu.edu/academy/distance/.

Indiana Online Academy is a virtual high school supported by CIESC in partnership with more than 90 traditional high schools working closely with the guidance counseling staff in each of the high schools. The Indiana Online Academy offers 40 Core courses and Advanced Placement courses which have been developed and are facilitated by highly qualified and Indiana certified high school teachers. www.indianaonlineacademy.org

In 1999, Indiana University High School (IUHS) was created by the Indiana University School of Continuing Studies. IUHS offers over 100 individual high school courses as well as a general, a college prep, and an academic honors diploma. Dual-credit courses also are available. All courses are offered through a traditional correspondence course format with over half available in an online format, too. http://iuhighschool.iu.edu

The Indiana Virtual Academy (IndVA) offers online high school level courses to all Indiana students. These courses range from basic English, math, science, and social studies to advanced level courses. Courses can be taken for credit recovery, scheduling conflicts, increase local school offerings, homebound illness or special needs, etc. The IndVA also offers a complete summer school program. www.IndVA.org

Ivy Tech Community College is a leader in providing dual credit to Indiana high school students through classes offered both in the high school and at Ivy Tech Community College campuses located throughout the state. Ivy Tech Community College is also a leader in offering online classes which may allow students to earn high school credit and college credit at the same time if permission is given by their high school. Through the Indiana Core Transfer Library and other transfer agreements most Ivy Tech Community College courses will transfer to other institutions.

Indiana College Network (ICN) is a cooperative service of Indiana's colleges and universities and their educational partners. It's operated by the Indiana Higher Education Telecommunication System (IHETS), one of the nation's foremost state educational technology organizations, and governed by the Indiana Partnership for Statewide Education (IPSE), a key leadership committee. IHETS was established by the Indiana General Assembly in 1967, and IPSE created the Indiana College Network in 1994, making it the first such "**virtual university consortium**" in the country. All members are accredited by the North Central Association's Higher Learning Commission. High school programs are accredited by NCA's Commission on Accreditation and School Improvement. (http://www.icn.org/about_icn/who_we_are_and_what_we_do.html)

Early College High Schools

The Center of Excellence in Leadership of Learning (CELL) at the University of Indianapolis created the Indiana **Early College High School** Network in 2006 to unite schools and communities around this innovative approach to education. The network offers school study tours, professional development opportunities, and technical assistance to promote Early College. Using strong connections, strategic alliances and cooperative leadership, the network develops the motivation and momentum to support the Early College High School model so all Indiana students have the opportunity to recognize and reach their potential as college-bound students. There are currently 3 endorsed early college high schools, 12 schools in the emerging phase, and 8 schools in the exploring phase.
(http://cell.uindy.edu/ECHS/indianaECHSnetwork.php)

Since 2007, Indiana has been opening and supporting New Tech High Schools across the state. Currently, there are 22 **New Tech High Schools** in Indiana. These schools use technology and integration of 21st-century skills to create learning opportunities that prepare students to be successful in college and the workplace. On March 9, 2009, KnowledgeWorks Foundation held a national press conference with Governor Daniels to announce a $10 million grant to the New Technology Foundation to expand the network of schools. (www.acteonline.org)

Accelerated Associate Degree

Indiana does have **associate accelerated degree programs** available to students; below are just a few examples.

The University of Indianapolis is a private university in Indiana and ranked among the best universities in the Midwest. It offers a range of undergraduate, master's and doctoral programs, as well as accelerated degree programs in the School for Adult Learning for individuals working toward a bachelor's degree by taking evening classes in Indianapolis. The adult degree programs are accelerated, flexible and accessible. In the January 2010 term 425 adults are taking classes in the accelerated degree program in the School for Adult Learning at the University of Indianapolis. (http://blog.uindy.edu/blog/accelerated-degree-programs)

The following information on accelerated degree programs can be found on the Indiana Tech website: http://www.indianatech.edu/ACADEMICS/Pages/default.aspx

- **Accelerated:** The College of Professional Studies (CPS) focuses on nontraditional learners by offering classes in an accelerated format. These classes meet once a week (usually evenings or weekends) for 5-week or 6-week sessions. Students in accelerated programs are usually employed full-time and seeking career advancement or a change of career. They attend classes at Indiana Tech locations throughout the state. Click here for more information on accelerated degree programs.
- **Online:** The College of Professional Studies also offers online degree programs. These classes are also accelerated, spanning 5 or 6 weeks. However, students can access the

material on their own timeframe from anywhere they have broadband Internet access. Click here for more information on online programs.

Need-based Financial Aid

There are several different **tuition aids** and **initiatives that serve low-income students** entering postsecondary education in Indiana.

Governor Mitch Daniels, in his 2007 State of the State Address, proposed the creation of the Hoosier Hope Scholarship program. This program would give students attending four-year institutions $5,000 annually for tuition, fees, books and other expenses, while those attending two-year institutions would receive $2,500. These amounts may be increased by the state over time as higher education costs increase. The scholarships would take the form of forgivable loans that would not have to be repaid if the student stays in Indiana to work for three years after graduation. (www.acteonline.org)

In 2008, the Indiana Commission for Higher Education adopted Reaching Higher: Strategic Initiatives for Higher Education in Indiana, with specific recommendations in six key focus areas: (www.acteonline)

- moving from access to success
- making college more affordable
- preparing K-12 teachers, school leaders and students for college success
- focusing the role of community colleges
- strengthening Indiana's major research universities
- and embracing accountability for results

The following information was found on the Indiana Government website (http://www.in.gov/ssaci/2335.htm) and has a wealth of information pertaining to financial aid.

This page contains links to several sites that provide information about additional sources of financial aid such as scholarships and loans. These are easy to use sites and are for the most part FREE!

- **College Board Online**
  When you think of the College Board, you probably think of the SAT, and you're right; however, this site also provides a financial aid calculator, a scholarship search feature, as well as a Financial Aid Services area that discusses tips on financial planning for students and parents. The site also provides useful background information about student loans.
- **College Fund/UNCF**
  The College Fund/UNCF is an educational assistance organization. This site provides information about study abroad programs, scholarships, graduate studies, and other

programs. All together, the College Fund offers more than 450 programs for students, faculty, and member colleges.

- **DriveOfYourLife**
  Indiana Youth Institute's DriveOfYourLife.org - totally free, Indiana-specific career exploration resources for teenagers to learn about themselves, potential jobs, and the education to make their future possible.
- **fastWEB(Financial Aid Search Through the WEB)**
  This is one of the best sites on the Web to start your scholarship search. fastWEB provides free, detailed information. Step-by-step instructions are provided, so this site is easy to use. You will also be prompted to create your own private account name with your own private mailbox. Any information you request will be sent to your fastWEB mailbox so no one will have access to your information.
- **FinAid (The SmartStudent Guide to Financial Aid)**
  This is a very comprehensive site with information about all types of financial aid. In addition, you are provided with a glossary of terms to help decipher some of the confusion in the financial aid world. FinAid also provides links to other reliable financial aid sites on the Web.
- **Hope and Lifetime Learning Education Tax Credit**
  There may be certain tax credits for which you or your parents are eligible. The Hope credit and the lifetime learning credit may reduce the amount of federal income tax paid based on the costs of college. Please see the information below for more details. This information is not meant to replace that of the IRS or other qualified tax advisor. Please see IRS Publication 970 (http://www.irs.gov/pub/irs-pdf/p970.pdf) for additional information as well.

Energy Workforce Programs

The number of postsecondary institutions that currently offer an **energy industry workforce program** (i.e. line worker; technician; plant operator; pipefitter, welder) is 17. These are listed below:

Indiana University-Northwest
Indiana University-Purdue University-Fort Wayne
Indiana University-Purdue University-Indianapolis
Ivy Tech Community College-Bloominton
Ivy Tech Community College-Central Indiana
Ivy Tech Community College-East Central
Ivy Tech Community College-Kokomo
Ivy Tech Community College-Lafayette
Ivy Tech Community College-Northcentral
Ivy Tech Community College-Northeast
Ivy Tech Community College-Northwest
Ivy Tech Community College-South Central
Ivy Tech Community College-Southwest
Ivy Tech Community College-Wabash Valley
Oakland City University
Purdue University-Main Campus
Vincennes University

All of the energy industries (general, nuclear, fossil, gas) are currently represented in these programs of study.

Energy Consortium Coordination with Postsecondary

The state energy industry consortium, IEC, is coordinating with **postsecondary institutions to offer energy industry (i.e. line worker; technician; plant operator; pipefitter, welder) training programs**. IEC launched 3 energy programs at Ivy Tech Community College campuses across the state in 2009. Career Development Certificate program and Associate of Applied Science degree in the following three areas:

1. Electric Line Technology
2. Natural Gas Technology
3. Power Plant Technology

The **curriculum for the above programs was jointly developed by industry and staff**. There is one portion that is vendor developed by MEA, but it is only the online portion of the program. (IEC Conference Call)

According to IEC, there are no articulation agreements between community colleges and high school courses in energy-specific programs. However, they stated that there are articulation agreements for other CTE courses like welding and auto-mechanic programs.

Teacher/Faculty Externships

Energy industry externships are not currently offered to faculty and administrators in postsecondary institutions through IEC. They indicated that they would love to offer externships, but there is no funding at this time to do so. (IEC Conference Call)

Current Energy Education Programs

Organizational Model

Indiana has **81 career pathways** currently available for students in its secondary education system.

Indiana DOE staff from CTE and other academic subjects (science, mathematics, fine arts, etc.) developed the Indiana Career Cluster Pathways, modeled on the work completed at the national level. These 81 pathways encompass all 16 federal career clusters and will serve as the foundation for the programs of study (POS) required under the Perkins Act of 2006. (www.acteonline.org)

The **energy industry-related pathways** are:

- Engineering and Technology (4 CTE courses using PLTW curriculum)
- Science, Technology, Engineering and Mathematics

High School Energy-related Programs

Indiana has **career academies across the state**, Indiana views career academies as one of many options for local schools to choose to help better serve high school and middle school students. According to the Career Academy Support Network, there are 19 career academies in Indiana. However, all 19 of these career academies either focus on information technology or finance, none with a focus on energy-related careers. (www.acteonline.org)

According to the National Academy Foundation website, Indiana currently has 5 NAF academies. However none of them address the energy industry. (www.naf.org)

Curriculum

One **known curriculum** being used in high school CTE programs that address energy is Project Lead the Way. Indiana is committed to supporting and expanding Project Lead the Way in the state's area career centers, middle, junior/senior and comprehensive high schools. Currently there are 293 PLTW engineering secondary schools and four PLTW engineering postsecondary institutions. There are 16 PLTW biomedical secondary school programs as well. (www.acteonline.org)

Current Certificates and Credentials

Credentials

Information regarding the **energy industry-related certifications in Indiana** is listed below.

There are several state-identified Technical Skill Assessments (TSAs) for students in secondary CTE programs. Indiana will continue to identify and implement additional TSAs in future program years. Recently, end-of-course assessments for four secondary CTE courses have been developed, piloted and revised.

Identification and development of appropriate assessments will be a major focus for Indiana over the next five years. The preferred outcome will be end-of-pathway assessments for each program of study. IDWD and IDOE will work in conjunction with the postsecondary institutions to identify and/or develop assessments and industry-recognized certifications that measure technical skill attainment of CTE concentrators. Indiana will begin in-depth work on this process by researching assessments available or currently under development through other national organizations and projects such as NASDCTEc, NOCTI, National Consortium for Health Science and Technology Education, and the ASK Business Institute. By December 31, 2008, a strategy outlining a process for development and/or adoption of technical assessments for all POS will be completed. It is anticipated that a significant amount of Perkins state leadership funds will be expended on this effort over the next five years. (www.acteonline.org)

Indiana does not support a state, regional, or national career readiness certificate through the National Work Ready program.

Indiana does participate in the SkillsUSA Work Force Ready System program. SkillsUSA Indiana is home to more than 70 schools which support local chapters. Students in these chapters can participate in regional, state, and national competitions each year. (http://www.skillsusaindiana.org/)

Indiana does support NCCER credentialing. The 17 training and certification cites in Indiana were located on the NCCER website (http://www.nccer.org/findCenter.asp).

State Support for Credentials

Indiana does offer **state support for credentials** through various programs. Below are a few found through the Indiana Department of Workforce Development. (http://www.in.gov/dwd/2500.htm)

The Workforce Acceleration Grant is designed to help Hoosiers pay for education and training to prepare for 21st Century jobs. The program provides eligible Hoosiers with up to $3,000 per academic year to help cover tuition, fees and book costs for an associate's degree or a vocational certification at more than 50 colleges and universities across the state. Workers at least 18 years old, who have the legal right to work in the U.S., and are pursuing an Associate Degree or post-secondary certificate that leads to a high wage or high-demand occupation are eligible. In addition, workers must fall into one of the two groups:

Low-Income participant:

- Family receives federal, state, or local public assistance (TANF, SNAP, etc); or
- Total family income at or below federal poverty level ($23,239 for family of four); or
- 70% of lower living-standard income level (based upon previous six months income)

Unemployed Worker:

- Unlikely to return to previous occupation/career field; AND
- Falls into ONE of the following categories
  - Unemployed through no fault of their own
  - Received notice of impending layoff;
  - Spouse of dislocated worker (earning less than 50% of family income);
  - Self-employed, but business closed as a result of economic conditions.

The Skills Enhancement Fund (SEF) provides financial assistance to businesses committed to training their workforce. Trainees must be Indiana residents. SEF reimburses eligible training expenses over a two-year term. Companies may reapply for additional SEF funds after their initial two-year term. IEDC typically does not provide reimbursement for training that is required by law.

Eligible Training Activities for SEF

- Basic Skills: Traditional basic skills (reading, writing and math).
- Transferable Skills: Skills that enhance an employee's general knowledge, employability and flexibility in the workplace (welding, computer skills, blueprint reading, problem solving, team participation, etc.).
- Company-Specific Skills: Skills that are unique to an individual company's workplace, equipment and/or capita investment.
- Quality-Assurance Skills: Skills that are intended to increase the quality of the company's product (Statistical Process Control [SPC], Total Quality Management [TQM], ISO and QS).

Governor Daniels' Strategic Skills Initiative (SSI) was developed to address Indiana's critical job shortages and to increase opportunities and wages for Hoosier workers. Throughout the state, money has been awarded and solutions identified to encourage economic growth and better paying jobs across the state's 11 economic growth regions. As a result of the SSI planning process, eleven Economic Growth Regions' (EGRs) identified fifteen high-wage industries and occupations were identified with significant shortages. The DWD ultimately sponsored 46 different solutions with an allocation of $14,234,793. Thirty-two percent of the solutions were in the healthcare sector, 24% were skills-based solutions in a variety of industry sectors, 17% of the solutions focused on advanced manufacturing, and 12% focused on bio-technology. Interestingly, 9% of the solutions funded focused on career awareness activities for youth.

Recommending Credentials

The **state energy industry consortium**, IEC, **does play a role in recommending energy industry credentials**. They were instrumental in developing the energy industry credentials (certificates and A.S. degrees) for all three energy-related programs at Ivy Tech Community College listed in part one of this report. Furthermore, graduates from these programs are automatically granted an interview with energy industry companies that are hiring. (IEC Conference Call)

State Level Policy Development

State Policies and Programs

Indiana has several different **state-level programs working to advance energy workforce development in the state**.

Indiana received Department of Labor Workforce Innovation in Regional Economic Development (WIRED) grants in 2006 and 2007. These grants are being used to:

- better meet workforce needs through CTE and STEM education, regional collaboration and focused workforce development
- better integrate economic development and workforce development for job creation
- fund entrepreneurship
- develop transportation, distribution and logistics capabilities for economic growth

- promote broadband access to accelerate communication, education and economic development (www.acteonline.org)

See also above information on state support for credentials for more programs that advance energy workforce development in the state.

Low-income Youth

Indiana offers several **state programs that focus on assisting low-income youth**. (See also the information above on tuition aids and initiatives for low-income youth.)

The State Student Assistance Commission of Indiana's (SSACI) mission is to make college affordable through need-based grants and to allow choice by granting awards to those attending public, independent & proprietary colleges. SSACI attempts to increase college preparation through its Twenty-first Century Scholar program and by giving increased grant amounts to those graduating from high school with Core 40 and Academic Honors Diplomas. The State of Indiana, through the State Student Assistance Commission of Indiana (SSACI), has been offering assistance to its college-bound citizens since 1965. The following links below give information on each of the programs offered:

- Information about State of Indiana Grants
- Frank O'Bannon Grant (formerly the Indiana Higher Education Grant) Program
  - Higher Education Award
  - Freedom of Choice Award
- Hoosier Scholar Award
- Twenty-first Century Scholars Program
- Twenty-first Century Scholars GEAR UP Scholarship
- Nursing Scholarship
- Minority Teacher/Special Education Services Scholarship
- Robert C. Byrd Honors Scholarship
- Summer State Work Study Program
- Indiana National Guard Supplemental Grant
- Part-Time Grant Program
- Child of Certain Veterans and Public Safety Officers Supplemental Grant Program

Learn More Indiana is a guide on how to get to college so that students of all ages can achieve the dream of a degree. Learn More Indiana is **Indiana's college and career connection** and helps students and parents:

- Check out colleges and career training programs
- Explore different careers including the fastest growing Indiana occupations

- Keep academics on track through grade-specific checklists and tips for supporting life-long learning
- Find ways to save and pay for college

Through a comprehensive Web site (www.learnmoreindiana.org), Learn More Indiana provides a one-stop resource to help students, parents and adult learners plan for college and careers

Learn More Indiana also offers a free Helpline (1-800-992-2076), which is available 24 hours a day, 365 days a year, to answer questions. Skilled individuals are always ready to provide college and career information whenever it is needed.

Advisory Structures

The energy industry does not have a **state-level advisory committee** structure that regularly interacts with postsecondary faculty and administrators. However, the IEC, did indicate that the energy industry has partnered with Purdue University to a small extent. (IEC Conference Call)

The energy industry does participate in **multi-industry-sector advisory committees** that regularly interact with postsecondary faculty and administrators. The IEC stated that there are several different regional committees within the state that generally meet quarterly and are run by Ivy Tech Community College. (IEC Conference Call)

Indiana CTE programs have an active system of general and program-area advisory committees in place at the local and regional levels. These advisory committees include business/industry/labor representatives, parents, academic and CTE teachers, administrators, postsecondary faculty and counselors. Program advisory committees meet at least twice a year to plan for the efficient and effective delivery of CTE programs and services. Sample activities undertaken by the committees are development of equipment replacement plans, judging senior projects and providing input on course standards and curricula. (www.acteonline.org)

The energy industry consortium regularly interacts with leaders from the **adult and youth workforce development systems**. The State Workforce Board is active on the IEC consortium. She said that several representatives from the Board are regularly at their meetings. (IEC Conference Call)

Currently there is no interaction between the energy industry consortium and leaders from the state **economic development agency**. The consortium would like to change this. IEC stated that they are working towards organizing a meeting that would brief different government agency heads on their initiatives. (IEC Conference Call)

CEWD State Energy Education Report
MINNESOTA
Supported by ACTE & Meeder Consulting Group, LLC
February 22, 2010

Summary

The Center for Energy Workforce Development (CEWD) has been awarded a planning grant by the Bill and Melinda Gates Foundation. The purpose of the grant is to determine the readiness of 8 states to implement the Get Into Energy Career Pathway for the skilled utility technicians. This report provides information about the states' education structure and ability to support the implementation of the career pathway.

Current Postsecondary Education Systems and Policies

Governance

Minnesota's **governance system** for postsecondary institutions consists of two public postsecondary systems and one state agency dealing with postsecondary education.

With its 32 institutions, including 25 two-year colleges and seven state universities, the Minnesota State Colleges and Universities (MNSCU) system is the largest single provider of higher education in the state of Minnesota. The colleges and universities operate 54 campuses in 47 Minnesota communities and serve about 250,000 students in credit-based courses. Overall, the system produces about 33,500 graduates each year. In addition to credit-based courses, the system offers customized training programs that serve about 153,200 employees from 6,000 Minnesota businesses each year.

The MNSCU system is separate from the University of Minnesota which is governed by a Board of Regents whose 12 members are elected by the legislature, one from each of Minnesota's eight congressional districts and four from the state at large. The University has five main campuses.

The Minnesota Private College Council, which oversees 17 private, four-year liberal arts schools, the Minnesota Career College Association and the Minnesota Association of Private Postsecondary Schools represent the private postsecondary institutions in the state.

Supply

All combined, there are 81 possible postsecondary delivery institutions in the state.

Postsecondary Transitions

For students interested in **transferring from one degree program** to another (i.e., from an Associate's degree program to a four-year-degree program), there is a state policy called the Minnesota Transfer Curriculum that specifically addresses this issue. This collaborative effort

among all two- and four-year public colleges and universities in the state is designed to help students easily transfer their work in *general* education. Completion of a defined transfer curriculum at one institution enables a student to receive credit for all lower-division general education upon admission to any other institution.

However, if a student's studies have progressed passed general education courses, the individual postsecondary institutions must negotiate what courses would be transferable.

Articulation Agreements

The state's community colleges and technical colleges do have **articulation agreements** with state universities for programs in the energy industry, but each institution is responsible for developing the agreements with other schools. Some institutions have agreements with all or nearly all of the colleges and universities in the state, while others have agreements with a more limited number of colleges or universities.

There are no known articulation agreements between state community colleges and technical colleges with high schools for courses in the energy industry at this time. These agreements are typically negotiated on a campus-to-campus basis, so the consortium stated there are most likely some agreements being developed.

Dual Enrollment

Minnesota offers a wide array of **dual enrollment** options to students under a program called the *Postsecondary Enrollment Options Program*. This legislated program requires schools to provide students with dual enrollment opportunities. The state has also set participation guidelines preventing students from taking more than the equivalent of two years of coursework through the program and prohibiting schools from offering students developmental or remedial coursework. Students pay no tuition or associated costs.

Need-based Financial Aid

There are several different **tuition aids** available to students entering postsecondary education, but Minnesota has one main program that focuses on assisting low-income students. The Minnesota State Grant Program is designed for Minnesota students and families from all economic backgrounds to have the opportunity to invest in and obtain a postsecondary education that bests meets their educational needs.

The State Grant program is Minnesota's largest needs-based financial aid program. The program coordinates the federal Pell Grant Program with the State Grant program in assisting Minnesota families. Federal Pell Grant funds are counted before state taxpayer contributions are made through the State Grant program. Awards are based on the difference between what students and their families are expected to contribute to pay for the education and the actual price of attending a particular college or university.

Under the program, all applicants are required to contribute at least 46 percent of their price of attendance out of savings, earnings, loans, or other assistance from school or private sources. The grant operates under the concept of "shared responsibility," which divides the responsibility of paying for a student's higher education between the student, parents, and government.

A unique element to this particular grant – State Grants are available to students attending school less than half-time, making Minnesota one of only a dozen states that provides need-based grant aid to those taking just a course or two at a time. This allows recipients to work full-time and attend school with the benefit of financial assistance.

Minnesota also offers the Federal Supplemental Educational Opportunity Grant (SEOG) which can provide additional grant money to a student's financial aid package if he or she has demonstrated financial need. Undergraduates or career technical education students who are enrolled at least half-time are eligible. Priority is given to students already receiving a Pell Grant.

In addition to these statewide aid programs, each institution offers its own array of grants and scholarships based upon a wide range of student characteristics.

Postsecondary Awareness and Planning

Minnesota offers a few **initiatives that encourage low-income youth** to enter postsecondary education programs. The Minnesota Minority Education Partnership, which is the only state-led initiative, is a collaboration of schools, communities, families, businesses, policymakers, and organizations that provide education programs and services to raise the academic achievement of students of color in schools, colleges, and universities. The state provides one-third funding; membership fees and private grants provide two-thirds funding.

Under a nationwide, federally-funded program, Minnesota also offers seven separate TRiO programs. TRiO is a nationwide, federally-funded organization committed to providing educational opportunity for all Americans regardless of race, ethnic background or economic circumstance. Specifically for low-income youth, the programs provide financial aid information, application assistance and neutral college access. This program's goal is to help students overcome class, social and cultural barriers to higher education.

Low-income students are also offered the opportunity to participate in alternative-education programs which serve a small roll in linking low-income youth to postsecondary education. While this program focuses primarily on K-12 education, alternative education is an important function in Minnesota K-12 public education, offering flexible, individualized learning environments for students – including pathways that articulate to postsecondary institutions. Students are eligible to attend when they are "at risk" of educational failure.

Accelerated Associate Degree

There are three community college and technical schools in Minnesota offering at least one **accelerated Associate's degree** or certificate program. Normandale Community College offers an accelerated Associate in Science Degree in Business, which is a cohort program designed for working adults. This college also offers an accelerated Associate in Science degree in Hospitality Management. Rochester Community and Technical College offers an accelerated Associate of Arts (AA) degree. This is the only school in Minnesota that offers the accelerated option online as well at a campus. North Hennepin Community College Associate in Science Accelerated Program.

Early College High Schools

Early college high schools are small schools designed so that students can earn both a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree. Currently, there are no early college high schools in Minnesota.

Virtual High Schools

There are several **virtual high schools** in Minnesota. Through these schools, students receive their coursework from an accredited, publicly-funded institution, and are taught primarily through online methods. Online learning offers students the ability to engage in opportunities to which they might not otherwise have access, for example, taking a class not offered at their local school or creating a more flexible schedule. Minnesota public school students have the choice of enrolling in full-time or supplemental (taken in place of a course period during the regular school day). To read the complete *Online Learning Option Act*, access the link to the Revisor's Office under related links.

All online courses offered through certified programs are:

- taught by Minnesota licensed teachers,
- meet or exceed state academic standards,
- transfer to other public school districts and
- apply to high school graduation.

At this time, these virtual academies do not offer any energy programs. For a complete list and map of online schools in Minnesota, visit http://education.state.mn.us/MDE/Academic_Excellence/School_Choice/Public_School_Choice/Online_Learning/index.html.

Energy Workforce Programs

Minnesota has 23 postsecondary institutions that currently offer **energy industry workforce programs** including general energy, electric and gas. At this time, there are no nuclear programs being offered.

These institutions include:

- Alexandria Technical College
- Anoka Technical College
- Central Lakes College-Brainerd
- Dakota County Technical College
- Dunwoody College of Technology
- Fond du TLac Tribal and Community College
- Hennepin Technical College
- Hibbing Community College – A Technical and Community College
- Lake Superior College
- Leech Lake Tribal College
- Mesabi Range Community and Technical College
- Minneapolis Community and Technical College
- Minnesota State College-Southeast Technical
- Minnesota State Community and Technical College
- Minnesota State University-Mankato
- Minnesota West Community and Technical College
- Northland Community and Technical College
- Northwest Technical College
- Ridgewater College
- Riverland Community College
- Saint Cloud Technical College
- Saint Paul College – A Community and Technical College
- Summit Academy Opportunities Industrialization Center

There are a nuclear specialty program, a biodiesel program and a solar program currently in development. These programs will be part of an expansion to the Energy Technical Specialist degree which is offered at two Minnesota West campuses (Granite Falls and Canby) as well as online.

The nuclear special program initiative is being led by Xcel Energy, St. Cloud Technical College, and Dakota County Technical College, and the curriculum will be aligned with the Nuclear Energy Institute.

A biodiesel and solar certification are also in development.

Under the leadership of the Minnesota Training Partnership for a Sustainable Energy Economy, the state energy industry consortium has been coordinating with postsecondary institutions to offer **energy industry training programs**. Consortium members from industry and education recently developed the concept of a Core Curriculum for technicians that would deliver the skills and knowledge common to multiple energy sectors – plus specialty areas to deliver the skills and knowledge specific to a single energy sector. The energy industry sectors included in the curriculum are:

- coal-fired electric generation
- natural gas-fired electric generation
- wind power generation
- natural gas distribution
- ethanol production
- biodiesel production
- solar power generation

In addition to the Core Curriculum, most other energy programs being used throughout Minnesota are also developed in partnership with industry input and faculty members. There are a few vendor programs being used for individual courses, but this is not the norm.

Apprenticeship

At this time, the state energy consortium does not have a strong relationship with construction trades **apprenticeship programs** tailored to needs of the energy industry. The consortium is forming an Apprenticeship Committee to address this issue.

Teacher/Faculty Externships

Energy industry externships have not been offered to faculty and administrators thus far. While a few industry partners and community colleges have offered energy-focused train-the-trainer opportunities, there have been no existing long-term educational/work opportunities for secondary and postsecondary faculty. This is an area the consortium would like to look into but for budgetary and staffing concerns.

Current Energy Education Programs

Organization Model

In order to provide career technical education throughout the state, Minnesota created career fields which serve as the organizing structure for administering the 16 nationally-recognized career clusters and **81 pathways**. The fields represent the broadest aggregation of careers. Students are normally exposed to career field exploration in middle school and early high school. Career fields have been identified as:

- Agriculture, Food, & Natural Resources
- Arts, Communications, & Information Systems
- Engineering, Manufacturing, & Technology
- Health Science Technology
- Human Services
- Business, Management, & Administration

To view the framework of the Minnesota career fields, career clusters and pathways, visit http://www.ci.minneapolis.mn.us/cped/docs/Framework.pdf.

High School Energy-related Programs

The state does offer two **high school career pathways** that directly address the energy industry – an ethanol pathway and a wind pathway. While these pathways favor a "green" program of study, there are several elements within the program that align to the Get Into Energy pathway model.

Minnesota believes that career academies are a tool for career guidance, a platform to organize sequences of courses and a way to improve the quality of CTE. Currently, there are seven career

academies in Minnesota according to the Career Academy Support Network. While there are no formal energy-focused career academies, it is an area that the consortium would be interested in exploring in the future.

Regarding the coordination between community colleges and high schools or technical schools on **curriculum development**, to the consortium's knowledge, this has been done on a case-by-case basis – not as a statewide initiative.

Curriculum development at the high school level varies from school to school. The consortium stated there are instances of faculty drafting curricula for energy courses, as well as vendor developed programs that contain energy standards (i.e., the PLTW engineering program). There is no strict guideline for curriculum development at this time.

Current Certificates and Credentials

Minnesota schools offer a large variety of programs related to the energy industry. The list below includes energy-related careers. Each career field offers at least one certification. For an exhaustive list of what certifications are offered, visit http://www.iseek.org/industry/energy/careers/certificationCareers.

- Architects, Except Landscape and Naval
- Boilermakers
- Chemical Plant and System Operators
- Civil Engineers
- Construction and Building Inspectors
- Electrical Engineers
- Electrical Power-Line Installers and Repairers
- Electrical and Electronic Engineering Technicians
- Electrical and Electronics Repairers, Commercial and Industrial Equipment
- Electricians
- Electro-Mechanical Technicians
- Gas Plant Operators
- Heating, Air Conditioning, and Refrigeration Mechanics and Installers
- Helpers--Installation, Maintenance, and Repair Workers
- Industrial Engineering Technicians
- Industrial Machinery Mechanics
- Mixing and Blending Machine Setters, Operators, and Tenders
- Nuclear Power Reactor Operators
- Operating Engineers and Other Construction Equipment Operators
- Petroleum Pump System Operators, Refinery Operators, and Gaugers
- Pipelayers
- Plumbers, Pipefitters, and Steamfitters
- Power Distributors and Dispatchers

- Power Plant Operators
- Stationary Engineers and Boiler Operators
- Welders, Cutters, Solderers, and Brazers

The state does not currently have a special program to pay for students to test for an energy credentials.

In July 2009, Minnesota regionally adopted and has been issuing **National Career Readiness Certificates** since July 2009. Additionally, several **Association of Energy Engineers (AEE) certifications** are available for testing in Minnesota as well. Currently, the following exams can be taken remotely at ACT testing centers: Certified Energy Manager, Energy Manager in Training, Certified Carbon Reduction Manger, and Certified Lighting Efficiency Professional. The following exams are expected to be available for testing at ACT centers in the near future: Certified Measurement and Verification Professional, Certified Power Quality Professional, and Certified Energy Auditor.

These credentials may be tested for at three locations - **Alexandria Technical College**, **Hennepin Technical College**, and the **University of Minnesota UCCS Test Center**.

The SkillsUSA Work Force Ready System provides assessments for Career and Technical Education that are supported by industry, education and policy leaders. Minnesota participates at both the secondary and postsecondary levels and there are chapters in 29 technical colleges and 50 high schools or cooperative centers. There are energy industry-related competitions at both the secondary and postsecondary levels.

The state energy industry consortium recently played a large role in developing **energy industry credentials**. As previously mentioned, consortium members from industry and education developed the concept of a Core Curriculum.

Colleges in the consortium then partnered with industry to pursue and receive a $1 million U.S. Department of Labor grant to help fund this project. The resulting Energy Technical Specialist A.A.S. degree is being delivered as a shared degree by a partnership of 10 colleges in the Minnesota State Colleges and Universities system, with funding from the U.S. Department of Labor. Combined with specialized certificates offered by partner colleges, this represents a stackable credentials model.

These credentials are based on the results from the state funded Energy Core Skills Study. This study, which the state believes to be unique because of the level of detail on occupational skills, compares technician skills for 7 industries:

- natural-gas fired electric generation
- coal-fired electric generation
- natural gas distribution

- wind power
- solar power
- biodiesel production
- ethanol production

Besides earning an energy technical specialist degree, students will be able to earn an additional certificate in one of four specialties – ethanol production, biodiesel production, wind energy generation and maintenance, and solar energy installation and maintenance. The certificate programs will be available online.

The consortium also led the development of a bridge program to prepare workers for entry into the Energy Technical Specialist degree and the certificates funded by the U.S. DOL grant. The project is a partnership between St. Paul Adult Basic Education, Ramsey County Workforce Center, and Minnesota State Colleges and Universities and is funded through a state grant.

State Level Policy Development

State Policies and Programs

Minnesota has several different **state-level programs** working to advance energy workforce development in the state.

The energy technical specialist degree is the result of the Minnesota Training Partnership for a Sustainable Energy Economy. This partnership is led by 10 colleges in the Minnesota State Colleges and Universities system. Participants involved in the partnership are from education, the workforce system, and the energy industry – including the Minnesota Energy Consortium. Since its inception three years ago, the partnership has helped over 1,500 individuals to be served through recruitment, training, placement, retention

The Office of the Chancellor coordinates the partnership and is responsible for management of the U.S. Department of Labor High Growth Job Training Initiative grant, which is the major funding source.

The Partnership is designed to:

- build and sustain system-wide mechanisms that cultivate traditional and renewable energy industry productivity and growth,
- engage Minnesota's workforce to grasp increasing and emerging career opportunities in the renewable energy,
- develop clear and robust pathways for students to pursue energy careers that are in step with labor force needs across Minnesota, and
- increase enrollments in energy training programs in order to expand the pipeline of skilled workers ready for employment or promotion.

The partnership will complement and enhance Minnesota's U.S. Department of Labor Workforce Innovation in Regional Economic Development (WIRED) grant project, which supports economic development in southwestern Minnesota through creation of a renewable energy marketplace.

These workforce solutions are funded by a grant awarded under the High Growth Job Training Initiative as implemented by the U.S. Department of Labor's Employment and Training Administration.

In July 2009, the partnership also launched Energy Careers, a state energy education and employment website funded in part by a High Growth Job Training Initiative grant to Minnesota State Colleges and Universities from the U.S. Department of Labor's Employment and Training Administration and also by a grant awarded to the Southwest Minnesota FIRST Collaborative under WIRED.

Energy Careers is a part of ISEEK, Minnesota's comprehensive career, education, and job resource. The site was created and is maintained by iSeek Solutions, a Minnesota partnership formed in 1999. The Executive Board for Energy Careers works with the state's workforce development and education authorities to develop and inform energy policy and to strategize services for the career planning, education, and workforce development within the energy industry.

Most recently, in January of this year, the formation of the Minnesota State Energy Sector Partnership (MSESP) was announced. This partnership is funded by a $6 million U.S. Department of Labor grant to develop a statewide energy sector strategy through a comprehensive partnership and development of a Sector Plan. The goal of this entity will be to provide training, job placement, and related activities that reflect a comprehensive statewide energy sector strategy including the Governor's overall workforce vision, State energy policies, and training activities that lead to employment in targeted industry sectors.
Minnesota's targeted industries include:

- the energy-efficient building, construction, and retrofit industries;
- the renewable electric power industry; and
- the biofuels industry.

The MSESP will serve as a steering committee throughout the life of the grant to inform the planning and implementation of the State's energy sector strategy and ensure the overall success of the grant. Each member will be expected to promote an integrated system of education, training, and supportive services that promotes skill attainment and career pathway development for workers in the energy efficiency and renewable energy industries.

Low-income Youth

Minnesota offers several state programs that focus on assisting **low-income youth**.

The Minnesota Youth Program provides short-term employment and training services to low-income and at-risk youth, ages 14 to 21, in all 87 counties. Participants are extremely disadvantaged and face multiple challenges such as substance abuse, criminal history, mental health issues, cognitive learning limitations, in addition to being poor. Youth who are lacking both academic and "applied" skills have the opportunity to work on skills considered critical for current and future workplace needs. Services available under the program include (but are not limited to):

- Education and job training
- Work experience
- Mentoring services
- Post-secondary exploration, career guidance and planning
- Community involvement and leadership development
- Support services

Services are provided through a network of public and private nonprofit youth service providers, WorkForce Centers, and partnerships with local education agencies.

The YouthBuild program provides specialized training for youth and young adults between the ages of 16 and 24 who are at risk of not completing or have not completed their high school education. Participants are trained in construction and other fields in the building trades, basic academic skills, and leadership. They also receive construction-based work experience.

Targeted participants include:

- High school dropouts and potential dropouts
- Youth at risk of involvement with the juvenile justice system
- Chemically dependent youth
- Youth with disabilities
- Homeless youth
- Teen parents
- Public assistance recipients

The Workforce Investment Act (WIA) Youth Formula Grant provides economically disadvantaged teenagers and young adults between the ages of 14 and 21 with year-round employment and training services. Participants must be economically disadvantaged and must have at least one of the significant barriers to employment (i.e., school dropout, homeless, etc.) in order to be eligible for services.

Services focus on 10 basic elements, including:

- Paid and unpaid work experiences, internships
- Adult mentors

- Leadership development
- Occupational skills training
- Alternative secondary school services
- Comprehensive guidance and counseling
- Support services
- Summer employment opportunities
- Tutoring, study skills training / dropout prevention strategies
- Follow-up services

Advisory Structures

The energy industry does not currently participate in a **state-level advisory committee** (representing only the energy industry) that regularly interacts with postsecondary faculty and administrators. While this is a role that the consortium would eventually like to play, it is not yet happening. There is communication between industry and faculty at the local and district level.

The energy industry does have representation on a **multi-industry-sector advisory committee** that regularly interacts with postsecondary faculty, administrators, and government agencies. The Chair for the Minnesota Governor's Council is from Xcel.

The energy industry consortium also regularly interacts with leaders from the **adult and youth workforce development systems**. As mentioned previously, through a partnership with St. Paul Adult Basic Education, Ramsey County Workforce Center, and Minnesota State Colleges and Universities, a bridge program was created to prepare workers for entry into the Energy Technical Specialist degree and the certificates funded by the U.S. DOL grant.

There is also interaction between the energy industry consortium and leaders from the state **economic development agency**, but this interaction tends to be more local. Each technical program is required to have a representative from the economic development agency on their advisory board.

CEWD State Energy Education Report
North Carolina
Supported by ACTE & Meeder Consulting Group, LLC
February 22, 2010

Summary

The Center for Energy Workforce Development (CEWD) has been awarded a planning grant by the Bill and Melinda Gates Foundation. The purpose of the grant is to determine the readiness of 8 states to implement the Get Into Energy career pathway for skilled utility technicians. This report provides information about the state's education structure and ability to support the implementation of the career pathway.

Current Postsecondary Education Systems and Policies

Governance

The postsecondary institutions in North Carolina have three **governance systems,** the North Carolina Community College System (NCCCS), the University of North Carolina System, and Private Colleges and Universities. There are 58 Community Colleges, 16 Public Four-year Institutions, and 36 Private Colleges and Universities. Thus, there are a total of 110 possible postsecondary institutions available in the state. This does not include the private business and trade schools across the state.

Postsecondary Transitions

North Carolina has the following state policy on **transferability from one degree program to another**.

The North Carolina Comprehensive Articulation Agreement (CAA) is a statewide agreement governing the transfer of credits between N.C. community colleges and N.C. public universities and has as its objective the smooth transfer of students.

This agreement has been approved by the Board of Governors of the University of North Carolina and the N.C. State Board of Community Colleges. The CAA provides certain assurances to the transferring student; for example, the CAA identifies community college courses that are appropriate for transfer as electives. Courses that will satisfy pre-major and general education requirements are also specified. (www.northcarolina.edu/aa/articulation/index.htm)

Articulation Agreements

Dual Enrollment & Articulation:

There are several options for CTE students to earn college CTE credit while still in high school in North Carolina. First, North Carolina has had a statewide articulation agreement between community colleges and high schools that has been in place since 1999. The current 2005

agreement is flexible and allows for local schools to create more agreements locally and nationally based on emerging education and workforce needs. Second, there is a statewide articulation agreement between North Carolina's community colleges and public four-year universities to help ease the transition for students. Third, North Carolina passed the Huskins Bill, which makes college-level academic, technical and advanced vocational courses available for the enrichment of high school students that would not otherwise be available to them. Huskins course enrollments consist entirely of high school students taught by community college faculty and are at the same academic standard as if taught to community college students. Concurrent enrollment permits high school students to enroll in a community college course. Unlike Huskins courses, high school students are enrolled with community college students and are admitted on a space-available basis. (www.acteonline.org)

Virtual Schools

There are **virtual schools in North Carolina that address secondary and post-secondary education**. They are listed below:

The North Carolina Virtual Public School (NCVPS) is committed to raising achievement and closing learning gaps with 21st century innovation by providing access to world class learning opportunities for all North Carolina students. NCVPS provides the vehicle for school districts to accomplish the State Board of Education's goals of producing 21st century learners, professionals, leaders, and systems by providing easily accessible, online learning opportunities for the state's most valuable resource: its children. NCVPS offers over 72 courses-including Advanced Placement (AP), world language, and credit recovery courses-to students across the state of North Carolina. (www.ncvps.org/about/)

The North Carolina School of Science and Mathematics uses cutting edge technologies to provide a variety of educational experiences to students and educators throughout the state of North Carolina. Broadcasting from four NCSSM studios equipped with sophisticated videoconference equipment, NCSSM teachers interact with distant sites utilizing learning management systems, integrated webinar tools and video streaming. Department personnel are highly trained in instructional technologies and their application to content areas. Honors and Advanced Placement courses in high school science, math, and humanities are provided to expand the participating schools' curricula. Programming for students in grades K-12 includes interactive, hands-on enrichment activities. Program opportunities for teachers include professional development and mentoring. (www.dlt.ncssm.edu/distance_learning/)

The Virtual Learning Community is a collaborative effort of all of North Carolina's Community Colleges to increase the quality and availability of online learning and support services. The VLC began as an idea of the Distance Learning Consortium and VLC Steering Committee. In 1999, this idea became a reality. The VLC has been growing ever since. Hundreds of educators from the NCCCS have participated. Thanks to the NC General Assembly, North Carolina high school students can earn college credits through the Learn & Earn Online (LEO) program. The LEO

program began in the 2007-08 school year. Qualified students in participating high schools can take a variety of online college-credit courses at no cost to them or to their families. Students can earn both high school and college credit for completed courses. (www.nccommunitycolleges.edu)

Early College High Schools

Early college high schools are small schools designed so that students can earn both a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree. Early college high schools have the potential to improve high school graduation rates and better prepare students for high-skill careers by engaging all students in a rigorous, college preparatory curriculum and compressing the number of years to a college degree. There are 61 "Early College" high schools in North Carolina. A complete list of schools in North Carolina can be found at www.earlycolleges.org.

Accelerated Associate Degree

North Carolina has **associate accelerated degree programs** available to students. The top priority on former Governor Mike Easley's education agenda was the expansion of the Learn and Earn program to all high schools statewide so every student would have the opportunity to jump-start his or her college education or gain high-level career skills without the burden of any tuition charges. Learn and Earn allows students to attend a high school located on a college campus and, in no more than five years, earn a high school diploma and finish with two years of college credit or earn an associate's degree at no cost. In spring 2009, North Carolina high school students registered for a total of 5,429 college-level courses through Learn and Earn Online. This number represents a significant increase from the 1,421 classes students registered for at the inception of the program in fall 2007. (www.acteonline.org)

In April 2009, Gov. Purdue and the North Carolina Community College System announced the "12 in 6" Program that will create community college programs in 12 career areas, each requiring less than six months to complete. Currently, the 12 in 6 programs include nursing assistant, phlebotomy, plumbing, carpentry, welding and HVAC installation. (www.acteonline.org)

Need-based Financial Aid

There are several different **tuition aids** and **initiatives that serve low-income students** entering postsecondary education in North Carolina.

EARN grants are $4,000 annual grants for low- or middle-income North Carolina high school students that are enrolled at a North Carolina public university or community college and remain in good academic standing, and the expansion of the Learn and Earn Online program. Learn and Earn Online allows qualified students in participating public high schools to take a variety of online college-credit courses at no cost to them or to their families. Students earn both high school and college credit for completed courses. (www.acteonline.org)

The University of North Carolina System has a Financial Aid Office whose mission is dedicated to assisting students with meeting college costs and with the process of applying for financial resources necessary to attend college. (www.northcarolina.edu)

The North Carolina Community College System has many financial aid opportunities to assist low-income students in meeting educational expenses for college including tuition, fees, books, childcare, transportation and modest living expenses. Financial aid is available in the form of grants, scholarships, work study and a variety of loans. The Financial Aid Office on each community college campus is available to assist students with the process of applying for the various forms of aid available. (www.nccommunitycolleges.edu)

Energy Workforce Programs

The number of postsecondary institutions that currently offer an **energy industry workforce program** (i.e. line worker; technician; plant operator; pipefitter, welder) is 57. These are listed below: (CEWD school reports)

Alamance Community College
Asheville-Buncombe Technical Community College
Beaufort County Community College
Bladen Community College
Blue Ridge Community College
Brunswick Community College
Caldwell Community College and Technical Institute
Cape Fear Community College
Catawba Valley Community College
Central Carolina Community College
Central Piedmont Community College
Cleveland Community College
Coastal Carolina Community College
College of the Albemarle
Craven Community College
Davidson County Community College
Duke University
Durham Technical Community College
Fayetteville Technical Community College
Forsyth Technical Community College
Gaston College
Guilford Technical Community College
Halifax Community College
Haywood Community College
Isothermal Community College
James Sprunt Community College
Johnston Community College
Lenoir Community College
Martin Community College
Mayland Community College
McDowell Technical Community College
Mitchell Community College
Montgomery Community College
Nash Community College
North Carolina State University at Raleigh
Pamlico Community College
Piedmont Community College
Pitt Community College
Randolph Community College
Richmond Community College
Roanoke-Chowan Community College
Robeson Community College
Rockingham Community College
Rowan-Cabarrus Community College
Sampson Community College
South College-Asheville
South Piedmont Community College
Southeastern Community College
Southwestern Community College
Stanly Community College
Tri-County Community College
Vance-Granville Community College

Wake Technical Community College
Wayne Community College
Western Piedmont Community College
Wilkes Community College
Wilson Community College

All of the energy industries (general, nuclear, fossil, gas) are currently represented in these programs of study.

Energy Consortium Coordination with Postsecondary

The state energy industry consortium, CEWC, is coordinating with **postsecondary institutions to offer energy industry (i.e. line worker; technician; plant operator; pipefitter, welder) training programs**. The North Carolina Community College System, with support from energy industry grants, developed a mobile career lab focused on STEM related careers. The CEWC supported the lab development by providing career materials and videos on energy related jobs. Another example of coordination with post-secondary institutions is in conjunction with NEI and INPO. The CEWC companies continue to be very busy supporting existing Nuclear Uniform Curriculum partnerships which include Duke Energy with Spartanburg Community College and Progress Energy with Florence Darlington Community College. New partnerships under development include South Carolina Electric & Gas with Midlands Technical College and Shaw Power with Central Piedmont Community College. These partnerships do and will provide a pipeline for nuclear technicians in operations, welding, radiation protection and NDE. (CEWD 2009 State Energy Workforce Consortia Updates)

The **curriculum being used at the technical colleges** is a combination of industry and staff developed. Leilani Bush of Duke Energy stated that input is being given by different advisory groups working through the CEWC and that there is currently a technical training group in Charlotte that works with local community colleges to develop education tools and recruit instructors for energy related programs. Leilani was not sure about vendor-developed curriculum as this depends on the individual schools. She also stated that staff instructors at individual schools do work with industry folks on curriculum, but there is nothing formal being done throughout the state. (CEWC Conference Call)

Current Energy Education Programs

Organizational Model

North Carolina classifies all careers into these **11 career pathways.**
(www.nccareeroutlook.com/career_pathways**)**

- Agricultural and Natural Resources Technologies
- Arts and Sciences
- Biological and Chemical Technologies
- Business Technologies
- Commercial and Artistic Production Technologies
- Construction Technologies

- Engineering Technologies
- Health Sciences
- Industrial Technologies
- Public Service Technologies
- Transport Systems Technologies

The following high school electives are available to students in the Engineering Technologies pathway.

- Career Management
- Communication Systems
- Computer Applications I
- Computer Engineering Technology I
- Computer Engineering Technology II
- Digital Communication Systems
- Digital Media I
- Drafting I
- Drafting II - Engineering
- Drafting III Engineering
- Electronics I
- Electronics II
- Foundations of Information Technology
- Fundamentals of Technology
- Intro to Trade and Industrial Education (ITIE)
- Manufacturing Systems
- Networking Administration II
- Networking Engineering Technology II
- Networking Engineering Technology III
- Networking I
- PLTW Pre-Engineering I
- PLTW Pre-Engineering II
- Principles of Technology I
- Principles of Technology II
- Scientific and Technical Visualization I
- Scientific and Technical Visualization II
- Small Business/Entrepreneurship
- Structural Systems
- Technology Advanced Studies
- Technology Apprenticeship
- Technology Co-op Method
- Technology Internship
- Technology Education Careers Internship
- Trade and Industrial Advanced Studies
- Trade and Industrial Apprenticeship
- Trade and Industrial Education Co-op Method
- Trade and Industrial Education Internship
- Trade and Industrial Cooperative Training I
- Transportation Systems

High School Energy-related Programs

North Carolina has **career academies across the state**.

On July 3, 2003, The Innovative Education Initiatives Act was signed into law and created policy waivers and a dedicated funding source for innovative high school models like career academies. In North Carolina, career academies are very prevalent and are mentioned several times in state CTE guides as an effective and innovative way to teach CTE. According to the Career Academy Support Network, there are 31 career academies in North Carolina. (www.acteonline.org) However, none of these listed career academies with CASN have an energy industry focus.

According to a briefing paper on career academies presented by North Carolina Public Schools, there are the following statewide statistics. (www.ncpublicschools.org/docs/cte/briefing/academies.pdf)

- 133 Career Academies Statewide (2008)
- 15,088 Student Enrollment (2008)

Popular Career Academies:

- Health/Medical (36)
- Business/Finance (15)
- Information Technology (12)
- Engineering (7)

The same briefing paper listed the following as examples:

- Apex High School Academy of Information Technology, Wake County
- Atkins Academic and Technology High School, Winston-Salem Forsyth County
- Central Academy of Technology and the Arts, Union County
- Highland School of Technology, Gaston County
- J.F. Webb School of Health and Life Sciences, Granville County
- Ledford High School Academy of Biotechnology, Davidson County
- Philip O'Berry Academy of Technology, Charlotte Mecklenburg
- Pitt County Health Sciences Academy, Pitt County

Curriculum

The **curriculum being used at the high school level** in CTE courses through the Technology Education program is designed to provide middle and high school students essential and enduring 21st Century skills. It is a STEM (Science, Technology, Engineering, and Math) program that uses languages, technologies, sciences, and the arts to understand, communicate, and design. The program has three principle curriculum strands: core technology, visualization and pre-engineering.

The Core Technology Strand consists of one middle school and eight (8) high school courses. The core strand provides students with a broad understanding of technology and its importance and its effects upon society, the economy and the environment. The core program weaves academic and technical concepts and skills using modeling and other strategies. Students apply, design and build conceptual, mathematical, graphic, and physical models to better understand enduring STEM concepts. In addition to academic technical skill development, students acquire higher level problem solving and critical-thinking skills as well as teaming and other essential "soft" skills.

The Visualization Strand is comprised of two courses that use simple and complex graphic tools to focus on the sciences. Students develop data and conceptually-driven graphic models of core concepts of biology, earth and environmental, physical, and the social sciences. This strategy permits the students to develop complex technical skills while developing increasingly sophisticated understandings of the sciences through communication, understanding, and analysis of core scientific concepts.

The Pre-engineering Stand is comprised of four (4) middle school and eight (8) high school courses developed by PLTW (Project Lead the Way). Both the middle and high school programs integrate STEM concepts. In the middle school program, students use engineering technology to design engineering graphics and models, and electronic devices and robots. The high school program is designed for students interested in pursuing careers in engineering, engineering technology, or related science fields. It introduces students to the scope, rigor and disciple of engineering and covers a broad range of subjects such as digital electronics, computer integrated manufacturing, civil engineering and architecture, aerospace, and biotechnical engineering. (www.ncpublicschools.org/cte/technology/)

Teacher/Faculty Externships

One example of **energy industry externships** offered to teachers and administrators at the secondary level in the summer of 2009. Approximately 15 6th – 12th grade teachers were invited to Charlotte for a week to participate in plant tours, classes, and other energy-related lessons. The goal of this externship was to have the participants provide input into the drafting of an energy curriculum for K-12. (CEWC Conference Call)

Current Certificates and Credentials

Credentials

Information regarding the energy industry-related certifications in North Carolina is listed below.

According to a briefing paper on CTE Certifications and Credentials presented by North Carolina Public Schools, there are the following credentials available to students through CTE courses. (www.ncpublicschools.org/docs/cte/briefing/certification.pdf)

Examples of certification programs that our CTE courses are preparing students for include:

- ASE automotive technician
- Certified Nursing Assistant (CNA)
- Cisco Certified Network Associate (CCNA®)
- CompTIA A+® computer engineering technician
- CompTIA Network+ network technician
- Cosmetology state license
- NCCER construction craft

- ServSafe Food Safety®

North Carolina's first Career Readiness Certificates (CRC) were issued in 2005. Supported by the Commission on Workforce Development, the CRC initiative promotes individual career development and skills attainment and confirms to an employer that an individual possesses the basic workplace skills of reading, applied math and information locating. More than 500 job seekers qualified for the certificates signed by Governor Michael Easley. More information can be found at the Career Readiness Certificates website. Career seekers can obtain a Career Readiness Certificate by taking WorkKeys assessment. Individuals who do not initially achieve the certificate can pursue targeted training and education through the Community Colleges and Career Centers. (www.crcnc.org)

The SkillsUSA Work Force Ready System provides assessments for Career and Technical Education that are supported by industry, education and policy leaders. North Carolina participates at both the secondary and postsecondary levels and there are currently 8 regions in the state that participate. There are energy industry-related competitions at both the secondary and postsecondary levels. (www.SkillsUSANC.org)

The following came from the April 2009 North Carolina State Board of Education Meeting notes concerning the NCCER certifications and credentials.

Construction Education Programs Certification and Credentials (GCS 8) - State Board members, while meeting as the State Board of Career and Technical Education, discussed a proposed new policy that would ensure that construction education programs (carpentry, electrical trades and masonry) offered in the state's public schools are National Center for Construction Education Research (NCCER) certified. The NCCER program leads to various trade certifications and credentials. Students also could earn community college credits while in high school. Teacher and program certification would occur during the 2009-2010 school year with teachers assessing and registering students in the national registry in August 2010. (www.ncpublicschools.org/stateboard/highlights/2009/04highlights)

State Support for Credentials

One example of **state support for credentials** in North Carolina is through the Commission on Workforce Development and the Career Readiness Certificates. Any job seeker in the state can take the WorkKeys assessments for free at 60 public test locations through the community college system or workforce centers.

Recommending Credentials

The **state energy industry consortium**, CEWC, **does not currently play a role in recommending energy industry credentials**. However, the consortium has recently been reorganized and refocused due to a change in leadership. The consortium now has 3 subcommittees (Labor Market Analysis & Information, Career Awareness/ Education, and Funding & Policy) that will

be working towards accomplishing different action items – some of which will pertain to credentials. (CEWC Conference Call)

State Level Policy Development

State Policies and Programs

North Carolina has several different **state-level programs working to advance energy workforce development in the state**.

Recognized by *The Wall Street Journal, The Chronicle of Higher Education* and *The Associated Press* for its **free, customized training programs**, North Carolina has a proven track record as a great place to do business. The North Carolina Community College System, established in 1958, began a visionary program that continues to be recognized as the nation's most sophisticated job-training service. The Customized Training Program supports the economic development efforts of the State by providing education and training opportunities for eligible businesses and industries. Amended in 2008, this program **integrates** the New and Expanding Industry Training Program and the Customized Industry Training Program to more effectively respond to business and industry (G.S. 115D-5.1e). The Customized Training Program also includes the former Focused Industry Training Program and shall offer programs and training services to assist new and existing business and industry to remain productive, profitable, and within the State. The program was developed in recognition of the fact that one of the most important factors for a business or industry considering locating, expanding, or remaining in North Carolina is the ability of the State to ensure the presence of a well-trained workforce. The program is designed to react quickly to the needs of businesses and to respect the confidential nature of proprietary processes and information within those businesses. (www.nccommunitycolleges.edu/Business_and_Industry/CustomizedTraining.htm)

The North Carolina Commission on Workforce Development recommends policies and strategies that enable the state's workforce to compete in the current and future global economy. The North Carolina State of the Workforce Report projects the state's labor market demand and supply during the next decade. The report identifies several key issues that will likely arise given current trends and if there were no major economic shifts. While we cannot, by any means, control all of the factors that influence our economic future, we could make policy choices to influence our direction. The report identifies several key facts about the industry's workforce needs and available talent that have potentially significant implications for the State's future economic prosperity. (www.nccommerce.com/en/WorkforceServices)

Gov. Bev Perdue announced today (June 25, 2009) that the U.S. Energy Department has approved North Carolina's $75.9 million Energy Plan to improve energy efficiency, promote greater use of renewable energy resources and create more green jobs. The program will be funded through the state's share of federal American Recovery and Reinvestment Act funds. Through American Recovery and Reinvestment Act funding to the State Energy Program, North

Carolina is significantly increasing its investments in energy efficiency and renewable energy, building its sustainable energy economy and workforce and promoting innovation and development of new energy technologies and resources. The federal Energy Department has given the state the go-ahead to start the program and spend $30.4 million. **$8.85 million will be spent growing North Carolina's green workforce.** Through its community college and university systems as well as other workforce development agencies, North Carolina will develop a multi-level program to meet the training and workforce needs of the emerging green economy. The curricula will address current and projected workforce needs in sectors related to energy efficiency, renewable energy, and alternative fuels. The program will include regional training hubs as well as other on-site, distance and immersive learning components. (www.energync.net/resources/docs/.../PerdueSEPrelease06-25-09.pdf)

Low-income Youth

North Carolina offers **state programs that focus on assisting low-income youth**; below are just a few.

Title I is designed to support State and local school reform efforts tied to challenging State academic standards in order to reinforce and amplify efforts to improve teaching and learning for students farthest from meeting State standards. **Individual public schools with poverty rates above 40 percent may use Title I funds, along with other Federal, State, and local funds**, to operate a "schoolwide program" to upgrade the instructional program for the whole school. Schools with poverty rates below 40 percent, or those choosing not to operate a schoolwide program, offer a "targeted assistance program" in which the school identifies students who are failing, or most at risk of failing, to meet the State's challenging performance standards, then designs, in consultation with parents, staff, and district staff, an instructional program to meet the needs of those students. Both schoolwide and targeted assistance programs must be based on effective means of improving student achievement and include strategies to support parental involvement. Includes:

- Improving Basic Programs Operated by Local Educational Agencies
- Reading First
- Early Reading First
- William F. Goodling Even Start Family Literacy Program
- Improving Literacy through School Libraries
- Education of Migratory Children
- Prevention and Intervention Programs for Children and Youth Who are Neglected, Delinquent, or At-Risk
- Close-Up Fellowship
- Comprehensive School Reform
- Advanced Placement
- School Dropout Prevention

(http://www.ncpublicschools.org/federalprograms/titleI/)

The North Carolina General Assembly has appropriated thirteen million dollars ($13,000,000) to support programs and initiatives that target students at risk of dropping out of school. Grants will vary in amounts up to a maximum of one hundred seventy five thousand dollars ($175,000). The grants will be for innovative programs and initiatives that target students at risk of dropping out of school and demonstrate the potential to be developed into effective, sustainable, and coordinated dropout prevention and re-entry programs in middle schools and high schools. Grants will be geographically distributed throughout the State and the eight educational regions. (http://www.ncpublicschools.org/dropout/grants/)

The North Carolina State Education Assistance Authority (NCSEAA) provides the State a number of services. These services include the following:

- Administers inter-institutional programs of student financial assistance, created by state and federal law, as well as private resources, designed to help North Carolinians meet the cost of higher education.
- Publishes and distributes annual publications that assist students, parents, financial aid administrators and school counselors as they investigate financial assistance for postsecondary education. Publications are available on the Internet at http://www.CFNC.org.
- Obtains and insures capital for educational loans made available under North Carolina's Federal Family Education Loan Program (FFELP).
- Maintains an aggressive student loan collection system for recovery of defaulted and matured student loan obligations.
- Promotes access to financial aid opportunities through outreach activities with school counselors and financial aid administrators, so they can assist students and families in planning for postsecondary educational opportunities.
- Administers North Carolina's "529" National College Savings Program.
- Assists state government officials, The University of North Carolina, the North Carolina Community College System, and the North Carolina Independent Colleges and Universities in various matters pertaining to financial aid.

(http://www.ncseaa.edu/About_NCSEAA.htm)

Advisory Structures

The energy industry does have a **state-level advisory committee** structure that regularly interacts with postsecondary faculty and administrators. At the postsecondary level, business and industry advisory committees are very active at the local level. At regular intervals, these committees meet with college faculties and administrations to ensure that the programs are meeting the needs of industry and the community. (www.acteonline.org)

The energy industry does participate in **multi-industry-sector advisory committees** that regularly interact with postsecondary faculty and administrators. The Energy Production Infrastructure Center (EPIC) was formed by UNC Charlotte and several energy-industry

companies, including Duke. This Center will address the shortage of trained engineers capable of servicing and replacing an aging fossil fuel and nuclear infrastructure as well as developing future infrastructures for wind, solar, and biofuels. (CEWC Conference Call)

The energy industry consortium also regularly interacts with leaders from the **adult and youth workforce development systems**. Leilani Bush and Jenna Miller of the CEWC stated that there are members from adult and youth workforce development on their consortium. (CEWC Conference Call)

There is also interaction between the energy industry consortium and leaders from the state **economic development agency**. Leilani Bush and Jenna Miller of the CEWC stated that there are members from state economic development agencies on their consortium. (CEWC Conference Call)

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OHIO
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Summary

The Center for Energy Workforce Development (CEWD) has been awarded a planning grant by the Bill and Melinda Gates Foundation. The purpose of the grant is to determine the readiness of 8 states to implement the Get Into Energy Career Pathway for the skilled utility technicians. This report provides information about the states' education structure and ability to support the implementation of the career pathway.

Current Postsecondary Education Systems and Policies

Governance

Governance for postsecondary institutions is divided up among three organizations. The Ohio Board of Regents has statutory responsibility for authorization of private, nonprofit colleges and universities to operate in Ohio. This entity consists of a nine-member advisory board to the chancellor with two ex-officio representatives from the state legislature. Members of the Board of Regents are appointed by the governor with the advice and consent of the senate.

Responsibilities of the board include developing an independent annual report on the Condition of Higher Education in the Ohio, and issuing an annual performance review of the chancellor. The board is also responsible for advising the chancellor on issues of statewide importance affecting higher education.

Proprietary schools, including for-profit/proprietary vocational-technical schools, are approved by the Ohio State Board of Career Colleges and Schools. This Board monitors and regulates Ohio's private, for-profit, post-secondary career colleges and schools to ensure compliance with minimum standards set by Ohio Revised Code (ORC) Chapter 3332. During fiscal year 2008, the Board registered 291 schools and approved over 1,900 programs.

The Board consists of eight members: the Superintendent of Public Instruction or their designee, the Chancellor of the Board of Regents or their designee, and five members appointed by the Governor. The Ohio Department of Education approves vocational schools.

Supply

There are currently 133 postsecondary institutions in Ohio. These schools consist of:

- 13 state universities
- 24 state university branch and regional campuses
- 46 liberal arts colleges and universities

- 2 free-standing state-assisted medical schools
- 15 community colleges
- 8 technical colleges
- 25 independent non-profit colleges

Postsecondary Transitions

The **statewide policy on transferability** is called the Ohio Articulation and Transfer policy. This policy is designed to facilitate the transfer of students and credits from any state-assisted college or university to another. It encourages faculty recognition of comparable and compatible learning experiences and expectations across institutions. It also encourages students to complete "units" of educational experience as they progress (e.g., transfer assurance guides, transfer modules, associate and baccalaureate degrees).

According to the consortium, some postsecondary institutions already have policies in place regarding transferability for a few energy programs. This is an area that other schools hope to expand in the near future. An example of this is Cincinnati State's new programs pertaining to renewable energy and smart grid technology in the associate degree levels that are transferrable to the University of Cincinnati's bachelor degree levels.

Articulation Agreements

The state's community colleges and technical colleges are in the process of developing updated **articulation agreements** with state universities for programs in the energy industry. According to the consortium, articulated credit for energy programs are relatively new among Ohio postsecondary institutions, but with technical degrees in courses such as welding, mechanical engineering, electrical engineering, and technical English, articulation agreements have been in place for several years back.

Under the provisions of H.B. 66 (ORC 333.162), an articulation and transfer initiative is being developed to better address linking secondary and postsecondary institutions. Specifically, this bill establishes a collaborative effort among the Ohio Board of Regents, the office of career-technical & adult education of the Ohio Department of Education, public secondary/adult career-technical education institutions, and state-supported institutions of higher education. Criteria, policies, and procedures will be set that allow students (including secondary students) to transfer to a wider range of agreed-upon equivalent technical courses.

Currently, **high school articulation agreements** are negotiated on a school-to-school basis. Due to the fact all Tech Prep programs have to articulate to at least one postsecondary institution, there are several schools that do have agreements for content related to energy. According to the consortium, the Hocking Hills school district has worked aggressively to develop articulated credit with Cincinnati State, Cincinnati Community College and Scarlet Oaks Vocational School.

Dual Enrollment

Established in 1989, Postsecondary Education Options (PSEO) gives high school students the opportunity to complete college course work on a college campus and earn either college credit or both high school and college credit. Also, **dual credit** is available through distance learning and Tech Prep. Local districts determine how the program is implemented. There is no state funding; local school districts pay for students' tuition, fees, books, and supplies if students enroll in dual credit for both high school and college credit.

Accelerated Associate Degree

There are two postsecondary institutions in Ohio offering at least one **accelerated Associate's degree** or certificate program. Lakeland Community College offers an Accelerated Associate of Arts and an Accelerated Associate of Applied Business. Ohio Christian University offers an Accelerated Associate of Business Management and Accelerated Associate of Christian Ministry.

Early College High Schools

Early college high schools are small schools designed so that students can earn both a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree. Early college high schools have the potential to improve high school graduation rates and better prepare students for high-skill careers by engaging all students in a rigorous, college preparatory curriculum and compressing the number of years to a college degree. There are 10 early college high schools in Ohio. A complete list of schools in Ohio can be found at http://www.earlycolleges.org/schools.html#Ohio.

Virtual High Schools

According to the Ohio Department of Education, there are no state **virtual high schools** in place at this time. There are four accredited not-for-profit online schools in the state that include the following:

- Electronic Classroom of Tomorrow (ECOT)
- Ohio Connections Academy (OCA)
- Ohio Virtual Academy (OHVA)
- Virtual Community School of Ohio

Need-based Financial Aid

Ohio offers **tuition aids** to assist low-income students in their postsecondary education. The Ohio College Opportunity Grant (OCOG), introduced as a recommendation of the Statewide Consultation on Financial Aid & Student Costs in 2002, is Ohio's new and improved needs-based financial aid program. OCOG expands the reach of needs-based financial aid to more students and families. For more than thirty years, the Ohio Instructional Grant Program (OIG) has provided needs-based grants to low-income Ohio students, but the methodology it used to determine financial need was limited and out-of-date. OIG used a table-based approach in

determining need that only considers two variables: family income and the number of dependent children in the household. The consultation recommended shifting to the federal methodology of Expected Family Contribution, commonly referred to as "EFC," as the factor for determining need. EFC uses a much more expansive approach by considering more variables such as family assets, student income, number of family members in college, and the age of the parents.

Postsecondary Awareness and Planning

Throughout Ohio, there are several initiatives designed to **encourage low-income youth to enter postsecondary education programs**.

In April 2009, Governor Ted Strickland introduced a new initiative called Urban Youth Works. This initiative funds workforce development and some education initiatives targeting low-income urban youth in fiscal year 2010. For the purpose of this initiative, urban areas are defined as Ohio cities that have a total population greater than 10,000 and that are located in a county that includes at least one city with a population of at least 50,000. Although it is funded and administered under the WIA, education programs are an allowable activity. Organizations in the following cities are eligible to apply for this grant.

- **Franklin County:** Columbus, Dublin, Westerville, Gahanna, Reynoldsburg, Grove City, Upper Arlington, Hilliard, Whitehall, Worthington, Bexley.
- **Cuyahoga County:** Cleveland, Parma, Lakewood, Euclid, Cleveland Heights, Strongsville, North Olmsted, Westlake, North Royalton, Garfield Heights, Shaker Heights, East Cleveland, Maple Heights, Solon, South Euclid, Parma Heights, Brook Park, Rocky River, Mayfield Heights, Berea, Broadview Heights, Fairview Park, Middleburg Heights, Bay Village, Lyndhurst, Warrensville Heights, Bedford Brecksville, University Heights, Seven Hills, Beachwood, Bedford Heights, Brooklyn, Richmond Heights.
- **Hamilton County:** Cincinnati, Norwood, Forest Park, Sharonville, Blue Ash, Loveland, Reading, Montgomery, Springdale.
- **Lucas County:** Toledo, Sylvania, Oregon, Maumee.
- **Summit County:** Akron, Cuyahoga Falls, Stow, Barberton, Green, Hudson, Twinsburg, Tallmadge, New Franklin, Norton, Macedonia.
- **Stark County:** Canton, Massillon, North Canton.
- **Montgomery County:** Dayton, Kettering, Huber Heights, Trotwood, Riverside, Centerville, Miamisburg, Vandalia, Clayton, West Carrollton City, Englewood.
- **Mahoning County:** Youngstown, Alliance, Struthers, Medina, Wadsworth.
- **Lorain County:** Lorain, Elyria, North Ridgeville, Avon Lake, Avon, Amherst, Vermilion.
- Richland County: Mansfield.

The Ohio Department of Education-Career Tech offers Career-Based Intervention (CBI) Resources and information related to CBI, a career-technical program for students ages 12-21 in grades 7-12 who are identified as disadvantaged (academically, economically or both) and who

have barriers to achieving academic and career success. This program, which serves students at risk of academic failure, ensures recipients receive a minimum of 118 hours of annual instruction (can be a multi-year program) and access to a wide range of services tailored to their needs. Through CBI, students receive assistance in six areas: academic intervention, employability skills, career exploration, implementation of a career plan, work-based learning (paid, unpaid or a combination of both), and participation in a career pathway with options for further education and jobs.

Also, the state offers the federally funded program GEAR UP – a national program launched by the Higher Education Amendments of 1998, which encourages more young people to have high expectations, stay in school, take challenging courses, and attend college. This program supported by federal funding for local partnerships and state grants.

KnowledgeWorks Foundation today announced that it has received a $7.4 million investment from the Bill & Melinda Gates Foundation to strengthen the work of the Ohio High School Transformation Initiative (OHSTI), a statewide effort focused on providing a high-quality high school education for students in some of Ohio's most underserved communities.

KnowledgeWorks will continue to partner with nine participating school districts to improve curriculum, instruction, assessment, professional development, and student supports to help schools and students meet challenging performance goals. This three-year investment will build on earlier OHSTI grants which helped transform large urban high schools into academically rigorous small schools, ultimately preparing up to 15,000 students in 44 schools for college and work success.

This initiative funds workforce development initiatives targeting low-income urban youth in fiscal year 2010. The state provided $6.7 million for the program and fund grants ranging from $50,000 to $500,000 through an open, competitive RFP process. Priority was given to those proposals effectively serving the highest number of youth in a 12-month timeframe, and to programs that best lead to permanent jobs.

Energy Workforce Programs

Ohio has 43 postsecondary institutions that currently offer **energy industry workforce programs** including general energy, nuclear, electric and gas.

These programs are being offered at the following schools:

- Akron Adult Vocational Services
- Akron Testing Laboratory & Welding School
- Al-Win Training
- Ashland County-West Holmes Career Center
- Ashtabula County Joint Vocational School
- Auburn Career Center
- Belmont Technical College
- Buckeye Joint Vocational School
- Butler Tech-D Russel Lee Career Center

- C Collins Career Center
- Career and Technology Education Centers of Licking County
- Cleveland Municipal School District Adult and Cont
- Columbiana County Vocational School
- Community Services Division-Alliance City
- Construction Craft Academy
- Elite Welding Academy
- Gallia Jackson Vinton Joint Vocational School District
- Hobart Institute of Welding Technology
- Hocking College
- Jefferson Community College
- Lakeland Community College
- Lorain County Community College
- Madison Adult Career Center
- Mahoning County Career and Technical Center
- Miami University-Oxford
- Miami Valley Career Technology Center
- Ohio Hi Point Joint Vocational School District
- Owens Community College
- Penta County Joint Vocational School
- Pickaway Ross Joint Vocational School District
- Pioneer Career and Technology Center
- Polaris Career Center
- Scioto County Career Technical Center
- Terra State Community College
- Tri-County Adult Career Center
- Tri-Rivers Career Center
- University of Cincinnati-Main Campus
- University of Cincinnati-Raymond Walters College
- Upper Valley Joint Vocational School
- Vatterott College-Cleveland
- Warren County Career Center
- Washington County Career Center-Adult Technical Training
- Wayne County Schools Career Center

According to the consortium, there are **no additional energy programs currently in development**. However, the consortium, the regional economic development efforts and the Ohio Green Pathways Advisory Panel are all working towards development of these programs. The GIE pathway model is being shared with the expectation that it will be at least part of the Ohio Green Pathway Model.

Energy Consortium Coordination with Postsecondary

The consortium has been coordinating with postsecondary institutions to offer energy industry (i.e., line worker; technician; plant operator; pipefitter, welder) **training programs**. The consortium knew of at least five programs being offered, but stated that there are possibly a few others.

A Power Plant Technology program is being offered at three different technical colleges through Youngstown State and First Energy. These programs are specifically for line workers.

Montgomery County Community College offers an associate's in nuclear engineering technology. The program is a partnership between MCCC and Exelon Nuclear, along with Lakewood Community College in Ohio.

Through these programs, industry internships are generally available to students.

The **curriculum** being used at these community colleges, technical colleges, and universities have been developed together by faculty and industry.

Apprenticeship

Ohio has over 900 registered **apprenticeship programs** that teach high-level skills for today's workplace. Each program includes, at minimum, 2,000 hours of structured on-the-job training and 144 hours per year of related technical instructions. The energy industry is working to build relationships with construction trades apprenticeship programs (such as carpentry, steelwork, electrical, and plumbing) with content tailored to needs of the energy industry. The Ohio Department of Jobs and Family Services provides an extensive list of possible apprenticeships available within state – several with energy-related skills, including pipefitters. For a complete list of apprenticeships available, visit http://jfs.ohio.gov/workforce/jobseekers/apprentice_toc.stm.

Teacher/Faculty Externships

While there are no known true **energy externships** for faculty and energy program administrators, industry partners do host tours and overviews of programs for faculty members. Duke Energy also has a program in conjunction with Northern Kentucky University that certifies retired plant operators to become technical teachers. There has been discussion about doing this in Ohio.

Current Energy Education Programs

Organizational Model

There are currently **44 career pathways** available for students. Ohio uses 16 nationally-recognized Career Clusters. They include:

- Agricultural and Environmental Systems
- Arts and Communication
- Business and Administrative Services
- Construction Technologies
- Education and Training
- Engineering and Science Technologies
- Finance
- Government and Public Administration
- Health Science
- Hospitality and Tourism
- Human Services
- Information Technology
- Law and Public Safety
- Manufacturing Technologies
- Marketing
- Transportation Systems

Ohio does not currently have a career pathway that solely addresses the energy industry. However, the state is in the process of introducing a Green Career Pathway which includes several courses related directly to the energy industry. In July 2009, Ohio Green Pathways was launched as a collaboration of the University System of Ohio and the Ohio Environmental Council. This program links education and training opportunities available in the University System of Ohio with jobs in green industries across the state.

The Ohio Green Pathways project works to develop the University System of Ohio's capacity to produce a green collar workforce by:

- Expanding access to affordable education and defined career pathways for green industries
- Increasing the number of graduates and attracting more degree holders from out of state
- Building and marketing Ohio's green job pathways as an economic development tool to help businesses find quality employees and attract businesses to Ohio

Curriculum

Some of the standards and courses directly apply to an energy pathway. A key component of the project is the development of a program catalog and Web site that showcases all green programs in the University System of Ohio, and identifies and organizes current best practices in green education and training programs in Ohio and around the country.

High School Energy-related Programs

Currently, there are no high school career academies that address the energy industry.

The consortium stated that the state's community colleges typically coordinate with high schools and technical schools on curriculum development. There is also industry input where appropriate. Duke Energy is offering curriculum guidance to Cincinnati Public Schools.

Current Certificates and Credentials

Ohio has promoted alignment of their career pathways to industry standards wherever possible. According to the Ohio Department of Education's Career-Technical Competency Assessments (OCTCA) General Information, there are no **energy certifications** available to students at this time. However, there are some credentials that are related to the energy industry including the NCCER Certificate of Completion-Electrical Trades. For a complete list of the credentials offered under the OCTCA, visit http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=1733&ContentID=13224&Content=78312.

Since the summer of 2008, Ohio currently has five career centers regionally issuing the ACT National Career Readiness Certificate. According to the Career Readiness Consortium, over 37,000 certificates have been issued since the state began offering this credential.

Additionally, several **Association of Energy Engineers (AEE) certifications** are available for testing in Ohio as well. Currently, the following exams can be taken remotely at ACT testing centers: Certified Energy Manager, Energy Manager in Training, Certified Carbon Reduction Manger, and Certified Lighting Efficiency Professional. The following exams are expected to be available for testing at ACT centers in the near future: Certified Measurement and Verification Professional, Certified Power Quality Professional, and Certified Energy Auditor.

ACT testing centers are located at: Columbus State Community College, CTEC Career Technology Education Centers, Pickaway Ross Career and Tech Center, Sinclair Community College, James A. Rhodes State College, and University of Akron Wayne College.

The SkillsUSA Work Force Ready System provides assessments for Career and Technical Education that are supported by industry, education and policy leaders. Ohio participates at both the secondary and postsecondary levels and there are currently 5 regions in the state that participate. There are energy industry-related competitions at both the secondary and postsecondary levels.

The consortium has not played a role in **developing energy industry credentials** or recommending industry credentials to use, but they do expect to participate in the development of credentials in the near future (as do regional economic development boards and the Ohio Green Pathways Advisory Panel). The GIE pathway model is being shared with the expectation that it will be at least part of their model.

State Level Policy Development

State Policies and Programs

The Ohio Energy Office (OEO), which resides within the Ohio Department of Development (ODOD), is working to **advance energy workforce development** and grow the economy of the state by connecting companies and communities to financial and technical resources to deploy renewable energy technologies and energy efficiency.

Recently, the OEO offered grants on a first-come, first-served basis to support the implementation of certain energy-efficiency projects. Projects must be installed in Ohio, and in the service territory of one of the state's four investor-owned utilities: American Electric Power, Dayton Power & Light, Duke Energy (formerly CINergy) or FirstEnergy. The Ohio Energy Office offers a multi-phase energy efficiency program for manufacturing facilities.

The University of Cincinnati, Cincinnati State and the Workforce Investment Office partnered together and applied for this grant. They have yet to hear whether they were successful.

The Ohio Department of Jobs and Family Services Office of Workforce Development Technical Assistance Unit is focusing on Green Jobs initiatives. According to their report, some of these jobs will be energy-related. Their goal is to share best practices and offer information to the workforce development community on innovative models. The Labor Market Information Bureau is also engaged in an extensive research project that involves identifying and cataloging Green Jobs. This report shares information gathered from the workforce development community. The Unit will continue to benchmark best practices across the state and nationally.

Ohio's Department of Energy Office also maintains the Advanced Energy Fund which supports wind and solar manufacturing operations.

In September 2009, Governor Strickland, together with Ohio Board of Regents Chancellor Eric D. Fingerhut, announced Ohio's Centers of Excellence in advanced energy. The nine Centers, located at eight universities throughout the state, are committed to focusing their academic and research activities on advanced energy development to strengthen Ohio as a global leader in the advanced energy economy and to meet the requirements of Senate Bill 221.

Senate Bill 221 gives Ohio the third most aggressive advanced energy portfolio standard in the nation, mandating that 25 percent of all electricity sold in Ohio come from advanced energy sources by 2025.

The Centers are located at the following universities:

- **Bowling Green State University**: *Sustainability and the Environment*
- **Case Western Reserve University:** *Great Lakes Energy Institute*
- **Central State University**: Emerging *Technologies*
- **University of Cincinnati:** *Sustaining the Urban Environment*
- **University of Dayton:** *Von Ohain Fuels & Combustion; and Strategic Energy and Environmental Informatics*
- **The Ohio State University:** *Climate, Energy, and the Environment*
- *Ohio University: Energy and the Environment*
- **University of Toledo:** *Advanced Renewable Energy and the Environment*

The Centers of Excellence, as outlined in Ohio's 10-year Strategic Plan for Higher Education, will position the University System of Ohio to be a leader in innovation and entrepreneurial activity by developing distinct missions for each institution that are recognized by students, faculty and business leaders, while eliminating unnecessary competition for resources within the state.

Ohio is already ranked in the top five for clean energy job creation, energy efficiency and environmentally friendly production jobs, according to the Pew Charitable Trusts, and is first in the nation for renewable and advanced energy manufacturing.

Low-income Youth

Ohio's Workforce Investment Act (WIA) Youth Program is designed for eligible **at-risk youth**, ages 14-21, who require additional assistance to succeed in educational or employment. The program includes opportunities for assistance in academic or occupational learning; development of leadership skills; and preparation for further education, additional training, and employment. Ohio is working to achieve these goals by:

- Using recruitment strategies customized for out-of-school youth
- Involving partners and community partners in identifying out-of-school youth
- Attracting out-of-school youth who are busy with work and adult responsibilities

- Meeting out-of-school youths' immediate, short-term needs first (e.g., employment) while keeping them enrolled to meet long-term needs (e.g., basic skills, occupational skills)
- Using engagement strategies that keep out-of-school youth involved and participating in long-term program activities
- Helping out-of-school youth look beyond immediate needs and concerns to long-term career advancement and improvement
- Working with youth to identify short-term and long-term employment goals suitable for the local labor market and for their own interests, aptitudes, and abilities
- Involving out-of-school youth in developing their own customized individual service strategy
- Providing supportive services as appropriate to enable out-of-school youth to continue in program activities

The Ohio Department of Job and Family Services (ODJFS) is responsible for administering the statewide WIA Youth Program and activities and overseeing local area implementation.

Advisory Structures

At this time, the energy industry does not have a **state-level advisory committee structure** (representing only the energy industry) that regularly interacts with postsecondary faculty and administrators. According to the consortium, the industry itself is fairly insular.

The energy industry does not currently participate in a **multi-industry-sector advisory committee** that regularly interacts with postsecondary faculty and administrators

There is interaction between the consortium and leaders from the **adult and youth workforce development** systems. The consortium is beginning to focus on this relationship and workforce development is represented in the consortium. Leaders from the **state economic development agency** are also represented on the consortium.

CEWD State Energy Education Report
WASHINGTON
Supported by ACTE & Meeder Consulting Group, LLC
February 22, 2010

Summary

The Center for Energy Workforce Development (CEWD) has been awarded a planning grant by the Bill and Melinda Gates Foundation. The purpose of the grant is to determine the readiness of 8 states to implement the Get Into Energy Career Pathway for the skilled utility technicians. This report provides information about the states' education structure and ability to support the implementation of the career pathway.

Current Postsecondary Education Systems and Policies

Governance

The Washington Higher Education Coordinating Board (HECB) is responsible for providing **governance to postsecondary institutions** in the state. This state agency is governed by a 10-member citizen board that administers the state's student financial aid programs and provides strategic planning, coordination, monitoring, and policy analysis for higher education in Washington.

The Washington Friends of Higher Education: Independent Colleges of Washington is a voluntary organization responsible for coordinating collaborative activities of the private colleges and universities in Washington.

Supply

There are currently 64 postsecondary institutions in Washington. These schools consist of:

- 2 major research institutions
- 4 comprehensive institutions
- 34 community and technical colleges
- 24 private colleges and universities

In addition to the 64 institutions listed above, there are five branch campuses, 10 university centers, and numerous teaching sites.

Postsecondary Transitions

Washington recently took steps to improve **student transfers** from two-year colleges to four-year colleges. In 2006, under a new legislative initiative, the two-year college system moved forward in creating opportunities for more students to access four-year degrees. The bill authorized the community and technical college system to pilot four applied bachelor's degrees, thus expanding educational opportunities to students. The bill also expanded the role

of the university branch campuses by allowing them to offer lower-division classes and increasing their capacity for community and technical college transfer students at the junior and senior levels.

Further opportunities for increasing transitions from sub-baccalaureate programs to baccalaureate degree options were established with the same legislation. The bill increased partnerships between the two-year and four-year institutions through contracted agreements. Students can now complete a bachelor's degree, awarded by a public college or university, on a two-year college campus.

Washington currently offers the following transfer degree options:

- Associate of Science - Transfer Degree (AS-T)
- Direct Transfer Agreement Associate Degree (DTA)
- Applied Associate of Science in Technology (for transfer to Bachelor of Applied Science)

Completion of a transfer Associate's degree gives the student priority consideration in admission to public universities. At this time, there is no comprehensive website for transfer information, but an Academic Guidance and Planning System (Academic GPS) is under development.

Articulation Agreements

Washington State's Tech Prep program is comprehensive and largely responsible for developing **articulation agreements** between community colleges, technical colleges and high schools. These agreements are called Tech Prep Agreements.

Each agreement is negotiated at the local Tech Prep consortium level. Secondary faculty members are encouraged to draft their own agreements and submit them to the local consortia for approval and coordination. In some cases, it is possible for Tech Prep consortia to arrange an out-of-district agreement linking to a college program offered somewhere else in the state. At this time, there is not a statewide database of each existing agreement.

The consortium stated that articulation agreements in energy programs are currently offered at several institutions – mostly community and technical colleges – across the state. For example, the Tech Prep consortium at Centralia College has agreements with at least two local high schools in energy courses.

All of the state's 34 community and technical colleges are partners to Tech Prep, and 334 public high schools in 204 districts participate in the program.

Dual Enrollment

Washington State's **dual enrollment** program, Running Start, offers students a more comprehensive college experience that, in many ways, replaces the final years of high school.

Students may concurrently earn high school and postsecondary course credit. Washington districts may also enter into agreements with Oregon and Idaho community colleges to allow students in grades 11 and 12 to earn high school and college credit at the same time. Running Start courses are offered on community college campuses and students generally take their full course load through the program.

Accelerated Associate Degree

According to the consortium and further research, there are no **accelerated Associate degree** programs being offered in the state.

Early College High Schools

Early college high schools are small schools designed so that students can earn both a high school diploma and an Associate's degree or up to two years of credit toward a Bachelor's degree. Early college high schools have the potential to improve high school graduation rates and better prepare students for high-skill careers by engaging all students in a rigorous, college preparatory curriculum and compressing the number of years to a college degree. There are five early college models in Washington. A complete list of the schools can be found here.

Virtual High Schools

There are several **virtual high schools** in Washington. None of these programs are run by the Washington Department of Education, but rather are independent charter schools or district-run programs. In 2005, Governor Chris Gregoire signed a law that expanded the definition of a full-time student to allow districts to claim funding for students receiving instruction through digital programs, which includes online learning. Some school districts used this broader definition to expand or create their own online learning program, while other districts contracted services, to varying degrees, to supply online services. At this time, these virtual academies do not offer any energy programs. These schools consist of the following:

Program	Operating District	Number of WA Students	Operating Model
Digital Learning Commons	NA	67,000 (potential students)	Non-profit, state-subsidized online resource provider
Washington Learning Source	NA	NA	Broker of online courses and resources
Federal Way Internet Academy	Federal Way	299	District run program
Washington Virtual Academy	Steilacoom and Monroe Districts	2233	District contract with K12, Inc.
Everett Online High School	Everett	700	District run program;
Evergreen Internet Academy	Evergreen	75	District run program
Insight School of Washington	Quillayute Valley	1137	District contract with Insight Schools

Program	Operating District	Number of WA Students	Operating Model
Columbia Valley Virtual Academy	Valley	364	Consortium of district-level program in eleven districts
Spokane Virtual Learning	Spokane	300	District run program
Achieve Online	Kittitas and Marysville Districts	156	District contract with Advanced Academics

Need-based Financial Aid

Washington ranks third in the nation in the level of funding, more than $200 million per year, for **need-based financial aid** for enrolled students. In addition, the state provides about $2.8 billion to public institutions to help reduce the total cost charged to students.

The College Bound Scholarship provides incentives for students and families who otherwise might not consider college as an option because of its cost. The amount of the scholarship is based on tuition rates at Washington public colleges and universities and will cover the amount of tuition and fees (plus $500 for books) not covered by other state financial aid awards.

Low-income 7th and 8th grade students who sign a pledge by June 30 of their 8th grade year are eligible. Students promise to graduate from high school, demonstrate good citizenship, and seek admission to a college or university. Family income will be re-checked and college admission confirmed after the student graduates from high school.

The State Need Grant (SNG) program helps the state's lowest-income undergraduate students pursue degrees, hone skills, or retrain for new careers. Students can use the grants at eligible institutions (public two- and four-year colleges and universities, and many accredited independent colleges, universities, and career schools) in Washington.

The State Work Study program helps students from low- and middle-income families earn money for college while gaining experience in jobs related to their career goals. Students can use the grants at public two- and four-year colleges and universities and many accredited independent four-year colleges and universities.

Postsecondary Awareness and Planning

Washington State currently offers one main initiative that encourages **low-income youth to enter postsecondary education programs**.

Washington's GEAR UP program encourages low-income middle and high school students to stay in school, study hard, have high expectations, and go to college. GEAR UP stands for Gaining Early Awareness and Readiness for Undergraduate Programs and is a partnership of the Higher Education Coordinating Board, Office of the Governor, the University of Washington, College Success Foundation, and a number of national, state, and local organizations. The new program focuses on preparing 1,000 low-income seventh graders for college success by

providing intensive tutoring, mentoring, and college/career planning information throughout their middle and high school years. This program is federally funded.

Energy Workforce Programs

According to the CEWD school reports, Washington State has 27 postsecondary institutions that currently offer at least **energy industry workforce programs** including general energy, fossil and gas.

These institutions include:

- Bates Technical College
- Bellingham Technical College
- Big Bend Community College
- Centralia College
- Clark College
- Clover Park Technical College
- Columbia Basin College
- Edmonds Community College
- Everett Community College
- Grays Harbor College
- Green River Community College
- Lake Washington Technical College
- Lower Columbia College
- Olympic College
- Peninsula College
- Perry Technical Institute
- Pierce College at Fort Steilacoom
- Renton Technical College
- Seattle Community College-North Campus
- Skagit Valley College
- South Puget Sound Community College
- Spokane Community College
- University of Washington-Seattle Campus
- Walla Walla Community College
- Washington State University
- Wenatchee Valley College
- Yakima Valley Community College

At this time, the consortium is not aware of any specific **energy programs in development**, but different organizations (both industry and government) are focusing on creating several different green and energy pathways as part of the grant funds from the American Recovery and Reinvestment Act.

Additionally, state Legislature recently approved grant funding to develop or strengthen courses in green technology (construction, manufacturing, power/energy) and Science, Technology, Engineering and Mathematics (STEM) (CTE courses that integrate the teaching of science and math in the same way that they would be integrated and applied by engineers and technology experts). The grants are issued on a competitive basis to middle and high schools, school districts and skills centers.

The consortium has applied for one of these state grants, but has not yet heard whether they were successful in their bid.

Energy Consortium Coordination with Postsecondary

The **consortium is coordinating with postsecondary institutions** to offer energy industry (e.g., line worker, technician, plant operator, pipefitter, welder) training programs. The Center of

Excellence for Energy Technology is housed at Centralia College and heads up this initiative. A complete list of the programs being offered is listed here. The consortium has played a very large role in developing the programs that were chosen.

According to the consortium, several programs align to portions of the GIE model. An example would be their line worker model. Full reports and for specific skill standards for Power Generation, Wind Technician, Combustion Turbine Technician, Electrician, BPA Transmission, Millwright, Lineman and Instrument/Control/Relay/Meter Technician, and others can be found here.

While a majority of the **energy training programs** being offered in Washington are housed at Centralia College, at least 19 other postsecondary institutions are involved in offering training programs:

- Electrical Technology
- Industrial Electrical Technology
- Environmental Technologies and Sustainable Practices
- Energy Technology Power Operations
- Power Utilities Technology
- Nuclear Technology: Instrumentation and Control
- National Sustainable Building Advisor
- Energy Management
- Energy Technology Power Operations
- Energy and Science Technology
- National Sustainable Building Advisor
- Residential Energy Auditor
- HVAC and Electrical
- Energy Systems, Wind Technology, and Irrigation Technology

A list of programs and certifications can be found here.

The consortium stated that the curriculum being used at the 19 community colleges delivering **energy programs is mostly** industry **and staff developed**. There was an exception for a program that is vendor developed – an online general physics course written by a Canadian company called Pan Global Publishing.

Apprenticeship

The energy industry has a strong **relationship with the construction trades apprenticeship programs** (e.g., carpentry, steelwork, electrical, and plumbing) with content tailored to needs of the energy industry. There are several programs available for secondary and postsecondary students that pertain to the energy industry. Several energy-related apprenticeship opportunities can be found here.

Washington State Department of Labor and Industries has the Apprenticeship Registration and Tracking program. Accessible by website, all apprenticeships registered through the state are available for viewing and career planning.

In 2006, a legislative initiative called Running Start for the Trades was born. This program is designed to expand opportunities for graduating secondary school students to enter registered apprenticeship programs. With over 2,000 students having taken advantage of this program, the program's goal is being realized across the state in the form of clear, articulated pathways for high school students to access registered apprenticeships upon graduation.

Teacher/Faculty Externships

At this time, there are **no energy industry externships** being offered to faculty and administrators. The consortium stated that these are problematic due to bargaining agreements. In lieu of externships, there are train-the-trainer programs where people from industry work to train the instructors at the post-secondary level, and also a summer program where the Centralia College instructors visit various energy plants over several days.

Current Energy Education Programs

Organizational Model

Washington State uses the 16 national career clusters as an organizational tool for its secondary and postsecondary programs. Programs of study in Washington State are identified by both cluster and pathway in aligning secondary to postsecondary education. Pathways differ from school-to-school in number and subject matter.

The state also has a very strong Tech Prep program. With 21 consortia located throughout Washington, Tech Prep students are pursuing a wide variety of degrees and certifications through Washington's 34 community and technical colleges (CTC). The courses offered at each consortium differ depending on resources, faculty availability and articulation agreements.

According to the program guide at the Centralia Center for Energy Excellence, several energy courses are at least part of a pathway towards an energy-related career. The Tech Prep programs around the state offer several of these energy-related courses. The Centralia Tech Prep consortium offers these energy-related programs.

Curriculum

Also, the **energy curriculum** being used at the Centralia Energy Program is articulated to high school-level courses (first two courses of that college program) so that a student from a high school who has had the articulated courses can pick up the college program with the 3rd course of the curriculum.

The state community colleges coordinated with high schools and industry on **curriculum development**. For example, the curriculum being used at Centralia College was developed in

partnership with secondary and postsecondary faculty members and industry members. The curriculum at the River Ridge Energy program was a sole staffed-developed effort.

High School Energy-related Programs

At this time, there are no **high school academies** that address the energy industry in Washington State.

Current Certificates and Credentials

There is a wide variety of **energy industry-related certifications** currently available to secondary and postsecondary education students. A complete overview of each program can be found here. The certifications and degrees available at the Washington Community College System include:

- AAS Electrician
- AAS Electro Mechanical Technology
- AAS HVAC and Refrigeration
- AAS Instrumentation and Control Technology
- Certificate Electro Mechanical Technology
- AAS-T Degree Industrial Electrical Technology
- Certificate of Achievement Electronics Technology
- Certificate of Achievement Industrial Electrical
- Certificate of Achievement Programmable Logic Controller
- Certificate of Accomplishment Electrical Technology
- AAS-T Degree Environmental Technologies and Sustainable Practices
- Energy Management Specialist Certificate
- Solar Photovoltaic System Specialist Certificate
- AAS Energy Technology Power Operations
- Power Utilities Technology Certificate of Proficiency
- AAS Degree Nuclear Technology: Instrumentation and Control
- Solar/Photvolotaic Design Certificate
- National Sustainable Building Advisor Certificate
- ATA Degree in Energy Management
- Energy Management Core Certificate of Completion
- Residential Energy Auditor Certificate of Completion
- Commercial Lighting Auditor Certificate of Completion
- Energy Accounting Specialist Certificate of Completion
- Energy Efficiency Technician Certificate of Completion
- AAS Energy Technology Power Operations
- AAS Degree Energy and Science Technology
- Bio Energy Certificate
- Energy Technology Certificate

- National Sustainable Building Advisory Certificate
- AAS Energy Technology Power Operations
- National Sustainable Building Advisor Certificate
- Residential Energy Auditor Certificate
- Multifamily Energy Auditing Certificate
- Commercial Building Performance Certificate
- AAS Multi-Occupational Trades
- AAAS Degree Clean Energy Technology
- Zero Energy Building Practices Certificate
- Solar Photovoltaic Designer Short Term Certificate
- Zero Energy Building Practices Short Term Certificate
- Energy Audit 1: Residential Short Term Certificate
- Energy Audit 2: Commercial Short Term Certificate
- AAS Degree HVAC
- AAS Degree Electrical Maintenance and Automation
- Residential Energy Auditor Certificate
- AAS Degree Irrigation Technology
- AAAS Degree Wind Technology
- AAAS Degree Energy Systems Technology-Electrical
- AAAS Degree Energy Systems Technology-Refrigeration and Air Conditioning
- Wind Technology Certificate
- Energy Systems Technology-Electrical Certificate
- Energy Systems Technology-Refrigeration and Air Conditioning Certificate
- AAS Energy Technology Power Operations (via Centralia College)
- ATS Environmental Systems and Refrigeration Technology
- Energy Technology Certificate
- National Sustainable Building Advisor Certificate

Because the consortium is also the Centralia College Center for Energy Excellence, the consortium has had a large role in **developing and recommending energy industry credentials** to be used. The consortium works closely with industry and government in an advisory role as well as a resource hub for industry trends, best practices, innovative curriculum, and professional development opportunities.

Recently, through a grant from the Bill and Melinda Gates foundation and the National Association of Manufacturing, Washington now has one location (Shoreline Community College) that offers testing for the state career readiness certificate (CRC). The CRC is comprised of 3 WorkKeys assessments: Reading for Information, Applied Math, and Locating Information. According to the CRC Consortium, several hundred individuals have received the CRC in the state. There is currently no government agency participation in this certification.

The SkillsUSA Work Force Ready System provides assessments for Career and Technical Education that are supported by industry, education and policy leaders. Washington participates at both the secondary and postsecondary levels and there are currently 5 regions in the state that participate. There are energy industry-related competitions at both the secondary and postsecondary levels.

According to their website, there are no ACT testing centers where American Energy Engineer **(AEE) credentials** can be obtained.

State Level Policy Development

State Policies and Programs

Washington State has several **state policies** in place to assist and advance energy workforce development in the state.

In January 2010, Governor Gregoire announced more than $13 million in Recovery Act grants that will help Washington State prepare workers to enter the energy efficiency and renewable energy industries, as well as clean-energy occupations within other industries. The funding is made available through the U.S. Department of Labor as part of the Recovery and Reinvestment Act. The Recovery Act includes $500 million in green jobs training programs.

The following recipients have received funding to help **train skilled energy workers** in Washington State:

- Northwest Energy Efficiency Council, $3.87 million. NEEC will utilize this funding for the Sound Energy Efficiency Development project, which will train and place participants in energy efficiency assessment occupations. Approximately 473 participants will be trained through this funding.
- Oregon Manufacturing Extension Partnership, $5 million. This project will help build a skilled workforce in Southwest Washington and Northwest Oregon to support companies that generate power and assist local manufacturers in retooling their workforce. Approximately 1,670 participants will complete education and training, and it's anticipated that 1,325 participants will receive a degree or certificate.
- H-CAP, Inc., $4.63 million. H-CAP will use this grant to provide training for workers in Washington state, California, Maryland, New York and the District of Columbia. Participants will be trained in the new and emerging green occupations in the health care industry. Nationwide, approximately 3,000 job seekers will receive training. In addition, H-CAP will also evaluate the environmental impact of the project in terms of reductions in energy, pollution, waste and water usage as a result of new cleaning methods.

Additionally, the WSU Extension Energy Program recently released the first of a two-part study indentifying trends and workforce issues in the energy efficiency industry in Washington. The

report, called *Energy Efficiency Trends and Workforce Development in Washington State*, can assist employers as well as educators and trainers to support continued growth in the energy efficiency industry.

Low-income Youth

Washington has two state programs that focus on assisting **low-income youth**.

The Building Bridges program provides at-risk high school students and dropouts with the opportunity to earn a diploma while receiving valuable industry training that will help them jump-start a career. During the school year the mission expands to include a deeper level of outreach to high school dropouts as well as skill-building activities with at-risk middle school youth. The goal of Building Bridges is dropout prevention, intervention, and retrieval. The program seeks to develop a wide comprehensive network of services to increase academic success and graduation rates for students who are at risk of dropping out, including youth in foster care, the juvenile justice system, and Special Education, as well as those who have already dropped out of school.

The Workforce Investment Act's Youth Program serves low-income young people ages 14 to 21 who have significant employment or educational barriers. They may receive counseling, tutoring, job-training, mentoring or work experience. Other service options include summer employment, study-skills training or instruction toward obtaining a GED. More information can be found here.

Advisory Structures

There are 12 workforce development councils across the state that receive WIA Youth funding. In collaboration with their youth councils and service partners, each local council determines how it will provide youth services. WIA Youth funding has made it possible for local areas to forge strong partnerships with school districts, industry and youth-focused non-profit organizations.

The energy industry has a **state-level advisory committee structure** (representing only the energy industry) that regularly interacts with postsecondary faculty and administrators. The advisory board for the Center of Excellence for Energy state energy consortium serves this purpose and regularly interacts with postsecondary faculty and administrators. In a typical example of this interaction, instructors will share an equipment list with the consortium to get their feedback on appropriateness for the industry before purchasing the equipment.

Leaders from the **adult and youth workforce development** systems are represented on the consortium, as are leaders from the **state economic development agency**.

The consortium stated that they also participate on a multi-industry-sector advisory committee that regularly interacts with postsecondary faculty and administrators, but there were no details given about this committee.