

## **Career & Technical Education (CTE) Standards Revision Project**

### **Cluster: Energy**

**Pathways: Fossil Energy Extraction, Processing & Distribution, Electromechanical Generation & Maintenance, Electrical Energy Transmission & Distribution, Renewable Energy Production, Energy Efficiency & Environmental Technology**

**The standards for this cluster area a result of a compilation of Energy standards from State CTE Standards developed in Ohio and California and introductory course standards from Colorado community colleges. The attached standards for each of the pathways identify links to Colorado core content standards which have been validated by content specialists in each of the core content areas.**

**Michael Womochil, Program Director, Agriculture, Natural Resources & Energy**

|  |  |
|--|--|
| <b>Career Cluster/Cluster Grouping:</b>  | <b>Energy</b>  |
| <b>Pathway(s):</b>   | <b>Cluster Foundation Knowledge &amp; Skills</b>   |
| <b>Prepared Completer Competencies: Eny 01. Technical Knowledge &amp; Skills</b>   |  |
| <b>High School Expectations</b>  |  |
| <b>Concepts and skills students know include:</b>  |  |
| ENY. 01.01 – Students understand the essential knowledge and skills common to all pathways in the Energy and Utilities sector.   |  |
| <b>Evidence Outcomes Students can:</b>   | <b>21<sup>st</sup> Century Skills and Readiness Competencies</b>   |
| <p>01.01 A Select, use, adjust, and maintain tools, equipment, systems, and products common to the school energy and utilities instructional program in a safe, effective, and appropriate manner.</p> <p>01.01 B Interpret the common energy and power technologies.</p> <p>01.01 C Identify the sources and systems of power and energy.</p> <p>01.01 D Diagram the energy resources currently in use or under research.</p> | <b>Academic Content Knowledge Alignment:</b>   |
|  | <b>Learning &amp; Behavioral Skills (Inquiry, Application in Society &amp; Technology &amp; Nature of...):</b> |

01.01 E Explain the basic theory of energy conversion processes and energy transmission systems and know their common applications.

01.01 F Know the fundamentals of energy extraction processes and conserving and storing systems.

01.01 G Use service resources, including print and electronic retrieval systems, to diagnose and solve technical problems.

01.01 H Recognize the essential elements of a clearance and tagging program.

01.01 I Understand the basic principles and proper selection and use of equipment designed for working in confined spaces and equipment designed for working at heights in a safe and appropriate manner.

01.01 J Interpret material safety data sheets and locate information on hazardous materials.

01.01 K Execute the fundamentals of lubricants and lubrication.

01.01 L Understand the basic principles associated with the use of fasteners and the skills required in good bolting practices.

01.01 M Research the need to participate in sector-related professional improvement activities, SkillsUSA, other career technical education leadership and skill associations, and related career pathway specializations.

01.01 N Comprehend complex details and specifications from both technical documentation and presentations.

01.01 O Examine the need and process to obtain and maintain industry-standard, technical certifications and affiliations with professional organizations, including the American Gas Association and the Institute of Electrical and Electronic Engineers, Incorporated.

|   |  |
|---|--|
| <b>High School Expectations</b>   |  |
| <b>Concepts and skills students know include:</b><br>ENY 01.02 Explore the history of energy.   |  |
| <b>Evidence Outcomes - Students can:</b>  | <b>21<sup>st</sup> Century Skills and Readiness Competencies</b> |
| <p><b>01.02 A</b> Explain the physical geography related to various forms of energy.</p> <p><b>01.02 B</b> Describe the geology of energy (i.e., how it all began). SCI 3.1a Sci 3.1b</p> <p><b>01.02 C</b> Identify the geographic locations of key energy hot spots for various energy types and the geopolitical challenges presented by their locations.</p> <p><b>01.02 D</b> Examine the political, social, economic and environmental roles of energy in the development of world history.</p> <p><b>01.02 E</b> Explore the current integration status of alternative and/or renewable energy</p> | <b>Academic Content Knowledge Alignment:</b>                     |
|   | <b>Learning &amp; Behavioral Skills:</b>                         |