# THE D&TE PROGRAM AT CHADRON STATE COLLEGE

## PAST, PRESENT, AND FUTURE ACTIVITIES IN RURAL ENERGY

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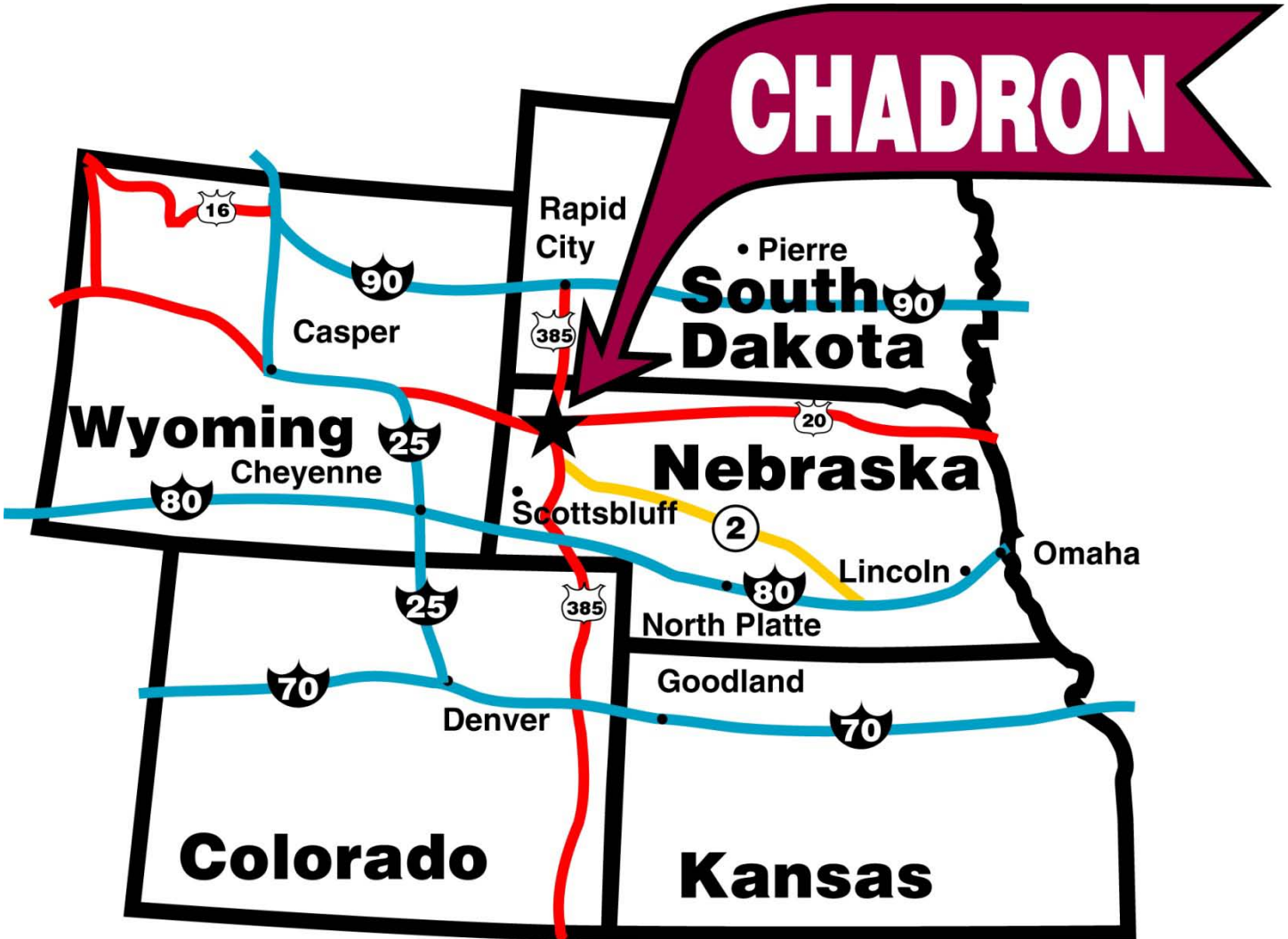
# Chadron State College

- Liberal Arts 4-year college
- Founded in 1911
- Student population: approx. 2500
- Over 40 major programs

DEPARTMENT OF APPLIED SCIENCES

- Agriculture &Range Management, Family & Consumer Sciences, Design & Technology Education

# Where is Chadron?



# The physical campus

24 Buildings

1.1 Million Sq. Ft.

# What is D&TE?

**Mission**

The mission of the design and technology academic program (formerly Industrial Technology Education) is to provide students with the educational preparation to enter careers in construction management and technology education. Design and technology education addresses the principles of graphic and technological communications, construction, manufacturing, and energy, power and transportation for the future educator in the middle school or secondary setting. Design and technology education prepares the future construction manager for productive and lucrative service in the High Plains region of the nation.

# What is D&TE, really?

- A prospective invented in the UK and now adopted by much of Europe, Australia, many nations in Asia and 5 states in the USA
- A program focused on solving problems through the design, construction and testing of physical solutions.
- Experimentation rather than just theory
- More hands-on than classroom

# Student outcomes

Students in this program will develop knowledge, skills, competencies and attitudes so they will be able to:

1. Demonstrate ability in the application of basic management principles as related to construction or educational environments within the regional and global economies.
2. Apply technical knowledge in manufacturing, energy, power and transportation, graphic and technological communications and construction in problem situations relevant to their study of construction or technology education.
3. Demonstrate behaviors and attitudes consistent to team building leadership strategies within the regional and global economies.
4. Develop a skill set of construction and educational processes as they apply to the regional as well as global economies.

# Student outcomes, really

1. Students will develop their problem-solving skills particular to technical problems.
2. Students will focus on building their understanding and abilities in the use of tools, materials, and processes.
3. Students will design, build, create, real solutions for real problems, will test out these solutions and make adjustments where necessary.

# Degree programs offered

1. **<u>The Degree of Bachelor of Applied Science</u> with a COMPREHENSIVE MAJOR IN CONSTRUCTION MANAGEMENT (2 + 2)**
2. **<u>The Degree of Bachelor of Science</u> with a SUBJECT MAJOR IN CONSTRUCTION MANAGEMENT**
3. **<u>The Degree of Bachelor of Science In Education</u> with a FIELD ENDORSEMENT IN DESIGN AND TECHNOLOGY EDUCATION (7-12)**
4. **<u>The Degree of Bachelor of Science In Education</u> with a FIELD ENDORSEMENT IN DESIGN AND TECHNOLOGY EDUCATION (7-12) 2+2 Partnership with Regional Two-year Institutions**

# 1 of 2: Minor in Rural Energy

**Rural Energy:** A student must complete the program listed below in addition to the General Studies requirements and a major in another discipline.

| | | |
|---|---|---|
| GEOS 137 | Environmental Geology | 3 |
| DTE 230 | DC/AC | 3 |
| DTE 239 | Energy, Power & Trans: Proc & Sys | 3 |
| DTE 345e | Control Electronics | 3 |
| DTE 345k | Residential & Commercial Wiring | 3 |
| DTE 390 | Internship | |
| | OR | |
| AGRI 390 | Internship | 3 |
| DTE 439 | Energy Generation & Sustainability | 3 |
| Total | | 21 |

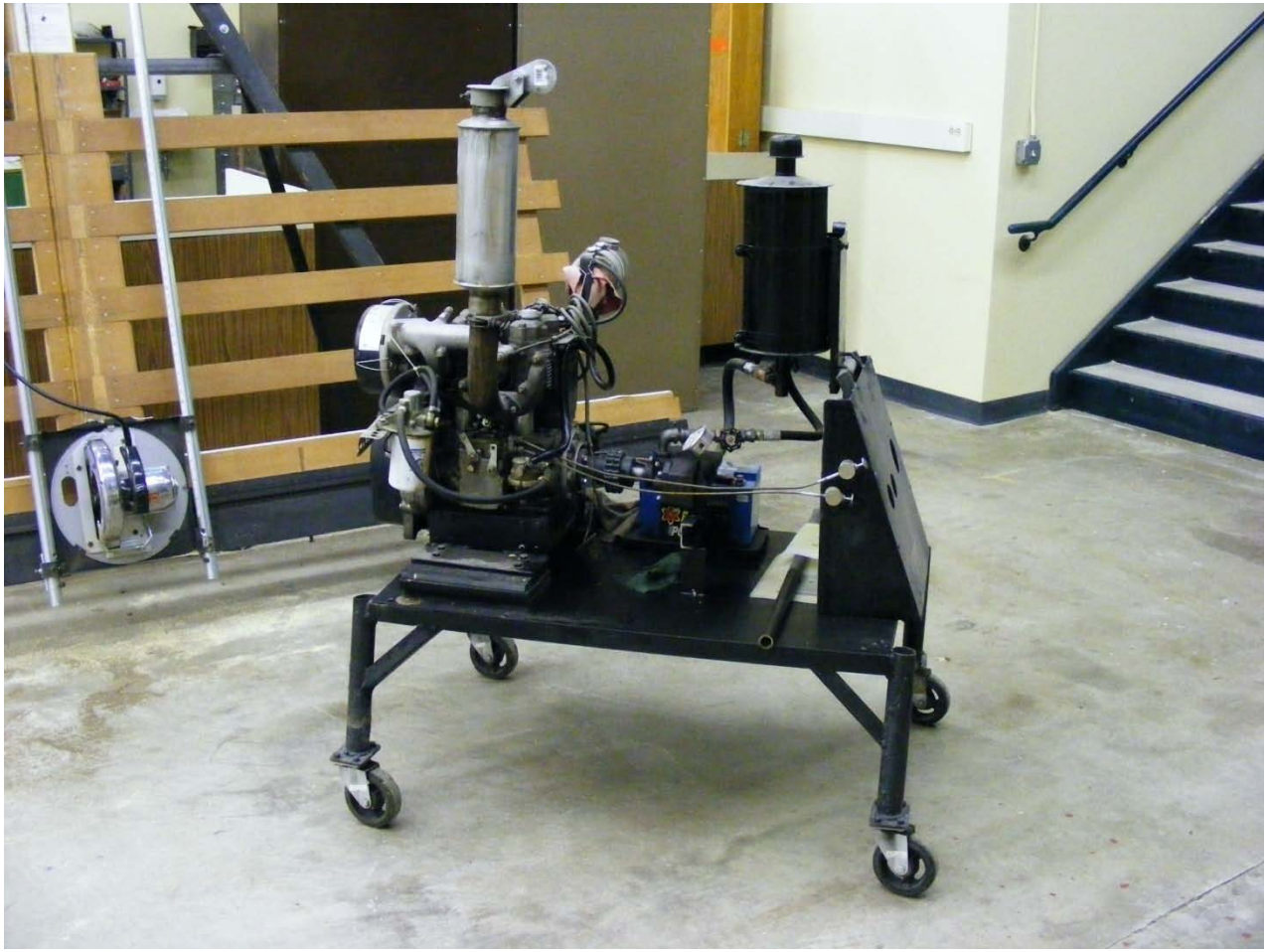
# History

- What CSC and the DTE (formerly ITE) program has been involved with related to energy over the last 8 years or so.

# Electric cars

# Silver reclamation units

# Biodiesel engines & dynamometers

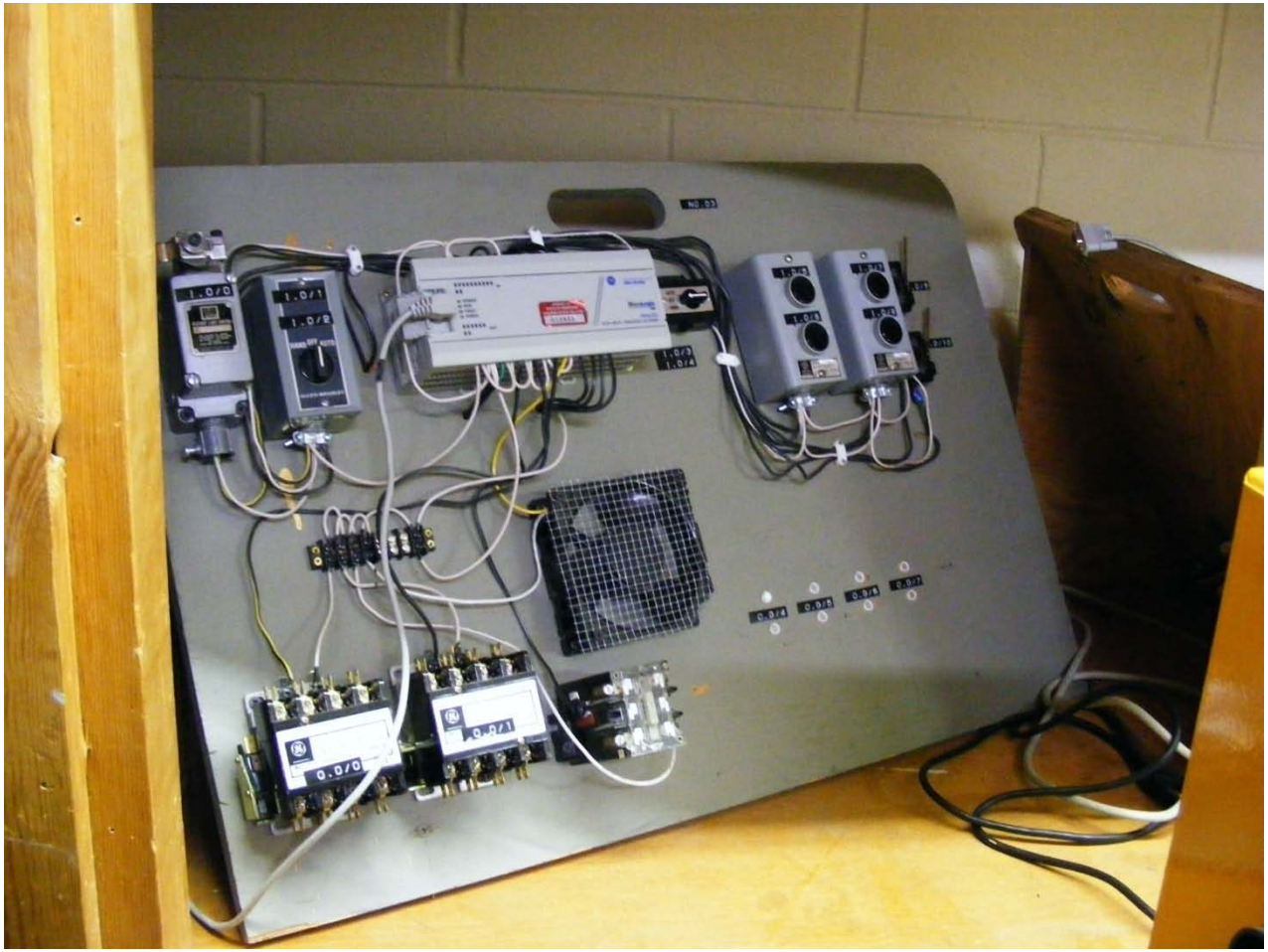


# Wind turbines

# Hydraulic rams

# Solar collectors

# Control electronics/plcs



# Robotics

# Wiring boards

# Fluid flow and measurement

# Annual high mileage vehicle competition

# Materials testing (1)

# Material testing (2)

# Field Trips

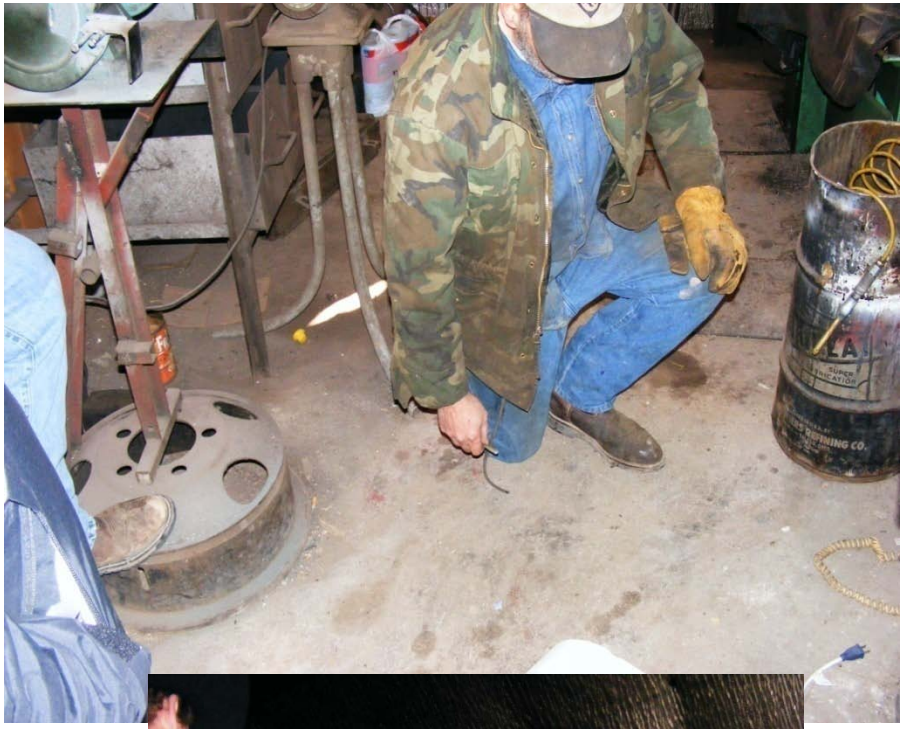
- Traveling to areas where people are doing things related to alternative and rural energy has been essential to our program.
- Most of our students come from small rural environments and so have had limited experiences regarding new and innovative activities in energy research and development.

# National Center for Research in Alternative Energy
# Golden, CO

# WRAY, CO

# WIND-HYDROGEN-POWER

# KANSAS SUNFLOWERS-POWER

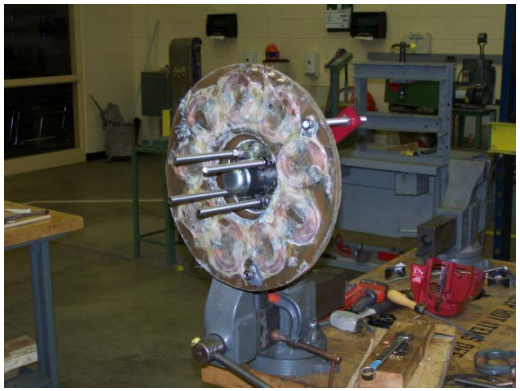


# Present endeavors?

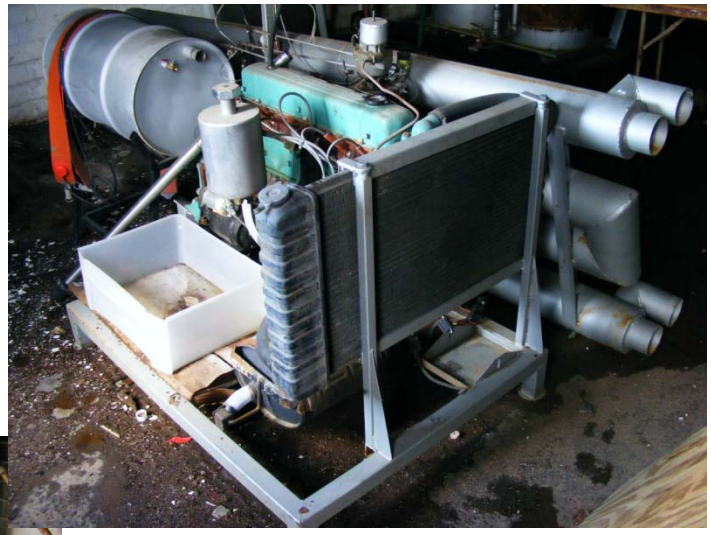
- Continued research in small scale wind technology
- Wood gasification & other biomass usage research.
- Alternative building methods
- Water conservation

# Rainwater reclamation

# Wind turbine construction



# Wood gasification



*"…we as a nation have put up more walls than ever, and in the process we have disconnected ourselves…from many of our natural allies and our natural instincts to embrace the world. America has shifted from a country that always exports its hopes to one that is seen as exporting its fears…The other disturbing trend …is a "dumb as we wanna be" mood. The prevailing attitude…is 'We'll get to it when we feel like getting to it and it will never catch up to us, because we're America"*
Friedman, page 8.

# QUESTIONS?