

Power, Structural & Technical Systems (PST) & Energy & Natural Resources (ENR) Crosswalk

Skilled to Meet the Moment: Students working with power, mechanics, electricity, or construction, you are already teaching energy.

- ✓ PST courses already deliver **core energy competencies**
- ✓ Strong alignment with **Perkins V, CTE approval, and workforce needs**
- ✓ Energy careers fit naturally into **Ag mechanics and engineering pathways**

PST (AFNR) Standard	ENR Standard	Shared Focus	Example Lesson Meeting Both Standards
MN.PST.01 – Physics & Engineering Principles	MN.ENR.01 – Energy Foundations	Force, work, power, efficiency	Calculate mechanical advantage and power losses in a belt- or gear-driven system.
PST.01.01 – Mechanical Systems & Safety	ENR.01.01 – Workplace Safety	OSHA & hazard mitigation	Conduct a shop safety audit using OSHA-style hazard categories and PPE selection.
MN.PST.03.02 – Electrical Systems	ENR.01.03 – Laws of Electricity	Circuits & power	Build and test electrical circuits; calculate watts and efficiency.
PST.03.01 – Engines & Power Units	ENR.02 – Clean Energy	Energy conversion	Compare emissions and efficiency of gasoline vs. ethanol-powered engines.
MN.PST.04 – Construction & Woods	ENR.01.05 – Energy & Environment	Built environment	Design an energy-efficient ag building using insulation, layout, and materials.
PST.06 – Biotechnology & Energy	ENR.02 – Clean Energy	Renewable systems	Produce biodiesel or ethanol and evaluate energy output and impacts.
PST.06.01.08 – Energy Benchmarking	ENR.03.03 – Efficiency	Energy use analysis	Perform an energy audit of a shop or barn using BTUs or EUIs.
MN.PST.05 – AFNR Technology	ENR.03 – T&D Systems	Monitoring & control	Use sensors or PLC logic to simulate load control or system monitoring.

Career Callouts: Where PST + ENR Skills Lead

Energy & Utilities

Lineworker • Substation Technician • Power Plant Operator • Utility Maintenance Technician

Renewable Energy & Advanced Systems

Wind Turbine Technician • Solar Installer • Energy Systems Technician • Controls Technician

Manufacturing, Fabrication & Construction

Industrial Maintenance Technician • Fabricator • Agricultural Construction Manager

Engineering, Controls & Technology

Electrical Technician • PLC/Automation Technician • Engineering Technician

PST-Focused Mini Lesson Bank

1. Power Transmission Efficiency Lab

Measure speed, torque, and power across belts, chains, or gears and calculate efficiency losses.

2. Electrical Troubleshooting Challenge

Students diagnose faults in a wired circuit using meters, schematics, and safety procedures.

3. Renewable Energy Build & Test

Assemble a small solar or wind system and measure voltage, current, and power output.

4. Engine Fuels Comparison Lab

Run or simulate engines on different fuels and analyze efficiency, emissions, and cost.

5. Energy Audit Project

Conduct a real-world energy audit of a shop, greenhouse, or farm structure and propose upgrades.



MINNESOTA STATE
Energy Center of Excellence