Importance of Energy Awareness in the United States

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Energy Awareness in the State of Nebraska

There was a recent energy event held in Norfolk, Nebraska called the Go Big Future. It demonstrated the importance of energy planning. This demonstrated how sustaining a diverse energy portfolio is essential to local industry, and long-term growth in the economic side of things.

Article source: gobigfuture.com

KidWind

Hanny Arram Center for Success students to compete at KidWind STEM competition in Kansas

Central Nebraska Today
Kearney Public Schools
Feb 10, 2026 | 2:24 PM

KEARNEY — Students from the Hanny Arram Center for Success (HACS) will travel to Colby, Kan., to compete in the KidWind Challenge on Thursday, Feb. 12, 2026, at the Colby Community College Student Union.

KidWind is a hands-on STEM competition that challenges students in grades 4–12 to design, build, and test their own wind turbines. The competition includes turbine performance testing, a written quiz, and a formal presentation, encouraging students to apply science, engineering, and problem-solving skills in a real-world setting. The event is part of a statewide series designed to inspire interest in renewable energy and engineering careers.

Representing Hanny Arram Center for Success at the competition are:

Abby Casey, Ethan Coulter, Viktor Collins, Izabella Erickson, and Keegan Shultz-Ramer are shown at an event in Colby, Kanas.

KidWind

KidWind is a student based project that we participated in to help us understand the use of wind turbines, and how it contributes to energy.

Hanny Arram Center for Success students earn most improved award at KidWind

Central Nebraska Today
Kearney Public Schools
Feb 24, 2026 | 7:13 AM

Students representing HACS include Keegan Schultz-Ramer, William Bovey, Izabella Erickson, Abby Casey, and Viktor Collins, (Kearney Public Schools, Courtesy)

KEARNEY — Students from the Hanny Arram Center for Success (HACS) were recently recognized with the Most Improved Award at the KidWind STEM competition, an honor that celebrates growth, perseverance, and dedication throughout the learning and design

Nebraska Rural Community Schools Association (NRCSA)

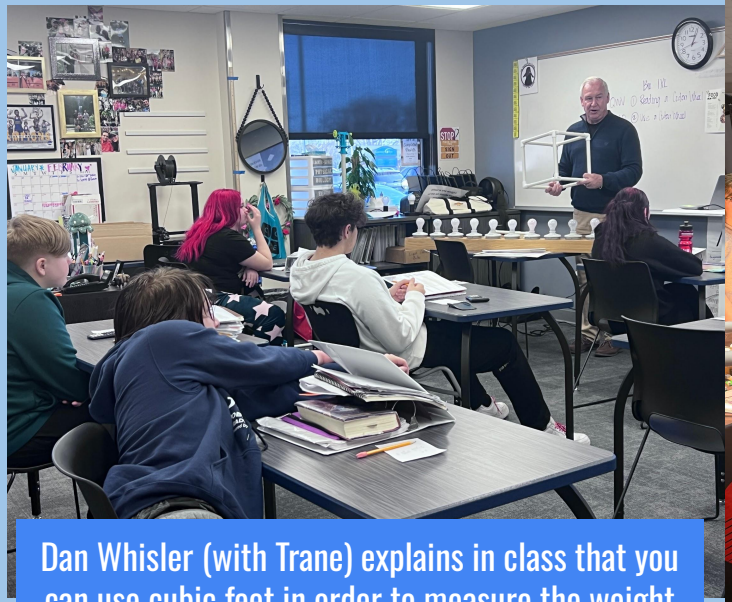
Represents over 88,000 students in 222 member schools.

Two groups of students collaborated with Trane representatives to collect data and share about energy usage in the United States and Nebraska using the Electric Connections game.

Weight of Air

Trane is a global brand specializing in high-quality heating, ventilation, and air conditioning (HVAC) systems.

This relates a lot to energy usage along schools as Kearney High is a humongous building that needs constant HVAC to keep it regulated.



Dan Whisler (with Trane) explains in class that you can use cubic feet in order to measure the weight of air in any space.

Here we are showing someone how 12 cubic feet of air weighs 1 pound (0.08 lbs/cu. ft. at STP)

NRCSA

TRANE | TRANE TECHNOLOGIES

e - "Where does our electricity come from?"

Electric Connections
GAME INSTRUCTIONS

About 35 percent of the nation's energy is consumed by the electric power sector to generate electricity for homes, commercial businesses, and industry. We use a variety of nonrenewable and renewable energy resources to make electricity. Some energy sources produce a substantial amount of the electricity we consume, while others produce very little.

Individual Instructions

Your task is to rank the ten sources of energy in order of their contribution to U.S. electricity production. Place a number **one** by the source that provides the **largest amount** of electricity, a number two by the source that provides the second largest, down to a number ten by the one that provides the least amount of electricity. Use critical reasoning skills to determine the order.

Group Instructions

Starting at the top of the list, ask members to contribute any knowledge they have about each energy source. Brainstorm by asking group members questions such as:

- Is this source limited to a certain area of the country?
- Are there any problems or limitations associated with this source?
- Have you ever seen a power plant that uses this particular source of energy?

One person in the group should take notes. Once the group has gone through the list, it should divide the ten energy sources into three levels of importance: the top three most significant energy sources, the middle four moderately significant energy sources, and the bottom three least significant energy sources. The group should then rank the ten sources of energy in order of their contribution to U.S. electricity production.

SOURCES USED TO GENERATE ELECTRICITY

SOURCE	YOUR RANK	G
BIOMASS		
COAL		
GEOTHERMAL		
HYDROPOWER		
NATURAL GAS		
PETROLEUM		
PROPANE		
SOLAR		
URANIUM		
WIND		

al - _____

Worksheet used to collect data from individuals based on their knowledge of what sources are used for electricity.

Answers provided post-test and discussion about Nebraska electricity sources were shared.

Ele
U.S. ELECTRIC POWER GENERATION SOURCES

SOURCES USED TO GENERATE ELECTRICITY

SOURCE	STATISTICS		RANK	YOUR RANK	ERROR POINTS
BIOMASS	In 2022, biomass produced 13.1 billion kilowatt-hours (1.26% of the nation's total. Biomass electricity is usually from burning wood waste, landfill gas, and solid waste.	1.26%	7		
COAL	96 percent of the nation's coal is consumed by electric power plants to produce electricity. In 2022, coal produced 829.0 billion kilowatt-hours of electricity, which represented 19.54 percent of the nation's total.	19.54%	2		
GEOTHERMAL	In 2022, geothermal power plants produced 17.0 billion kilowatt-hours of electricity, mostly from facilities in the western United States. This produced 0.40 percent of the nation's electricity.	0.40%	9		
HYDROPOWER	6.03 percent of U.S. electricity is generated by more than 1,500 hydroelectric power plants nationwide. Hydroelectric power plants produced 256.0 billion kilowatt-hours of electricity in 2022.	6.03%	5		
NATURAL GAS	Natural gas produced 1,689.5 billion kilowatt-hours of electricity, generating 39.82 percent of the nation's electricity. Natural gas turbines provide electricity during peak hours of demand.	39.82%	1		
PETROLEUM	Petroleum provided 0.55 percent of U.S. electricity, generating 23.3 billion kilowatt-hours of electric power in 2022.	0.55%	8		
PROPANE	There are no statistics available for propane's contribution to electricity generation. Very little propane is used to produce electricity.		10		
SOLAR	Solar energy provided about 3.43 percent of U.S. electricity in 2022, amounting to 145.0 billion kilowatt-hours of electricity. Most solar energy is generated by solar thermal systems or photovoltaic arrays.	3.43%	6		
URANIUM	92 nuclear reactors provided the nation with 18.18 percent of its energy needs in 2022. Nuclear energy produced 771.7 billion kilowatt-hours of electricity.	18.18%	3		
WIND	Wind energy produced 434.8 billion kilowatt-hours of electricity in 2022, providing 10.25 percent of the nation's electricity. Most wind-generated electricity is produced in Texas, Iowa, and Kansas.	10.25%	4		

ERROR POINTS TOTALS _____

Error points are the absolute difference between your ranks and EIA's (disregard plus or minus signs).

Data Energy Information Administration, Monthly Energy Review

SCORING:
0-12 Excellent
13-18 Good
19-24 Average
25-30 Fair
31-36 Poor
37-42 Very Poor

8 ©2024 The NEED Project Energy Games and Icebreakers www.NEED.org

Useful energy links:

www.need.org

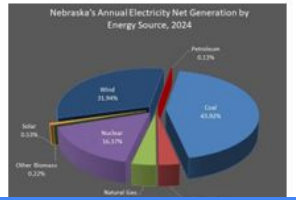
www.spp.org

www.eia.gov

Energy Flow Charts | Flowcharts (Lawrence Livermore National Laboratory)

Annual Electricity Generation in Nebraska by Fuel Type | DWEE NE

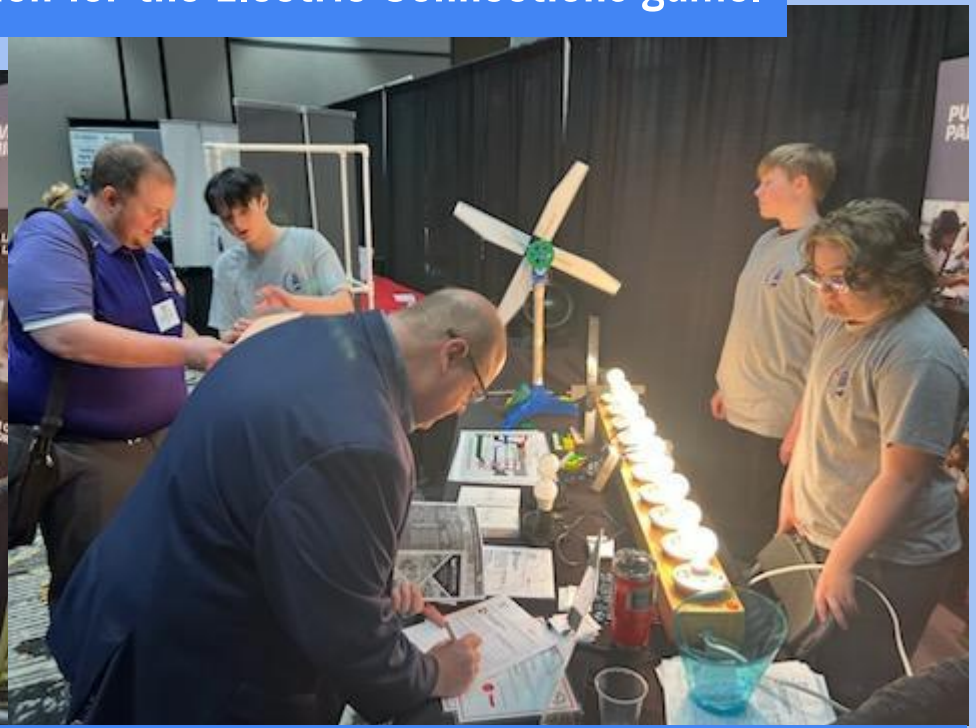
- **SPP 2024 Energy Production by Fuel Type**
- (Jan. 1 - Dec. 31, 2024): 290,267 GWh
  - 38.0% wind
  - 28.4% natural gas
  - 24.7% coal
  - 5.3% nuclear
  - 3.1% hydro
  - 0.4% solar
  - 0.1% other



Worksheet source: need.org

NRCSA

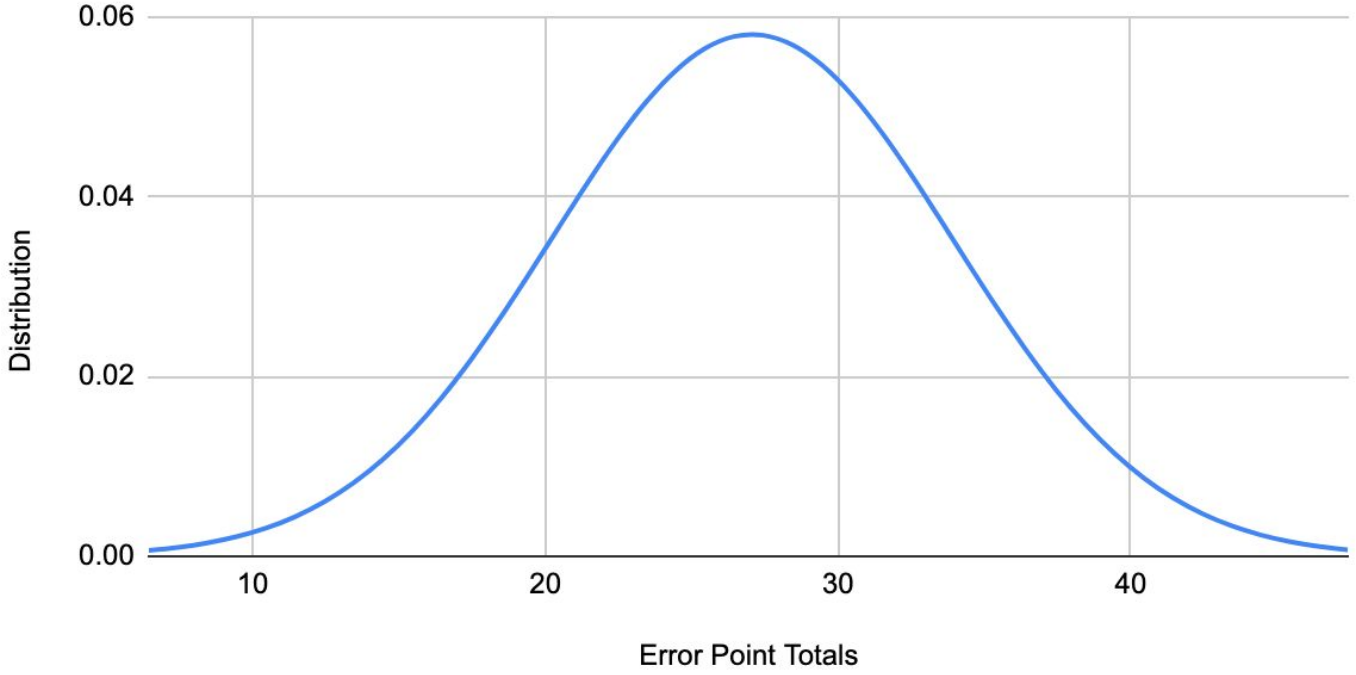
Requesting guest participation in data collection for the Electric Connections game.



Upon data collection, actual U.S. rankings were shared with participants. Data included the Southwest Power Pool (SPP) map and Nebraska SPP data specifically.

Electric Connections - Results (Educational Staff)

US Electric Power Generation Sources (source: need.org)

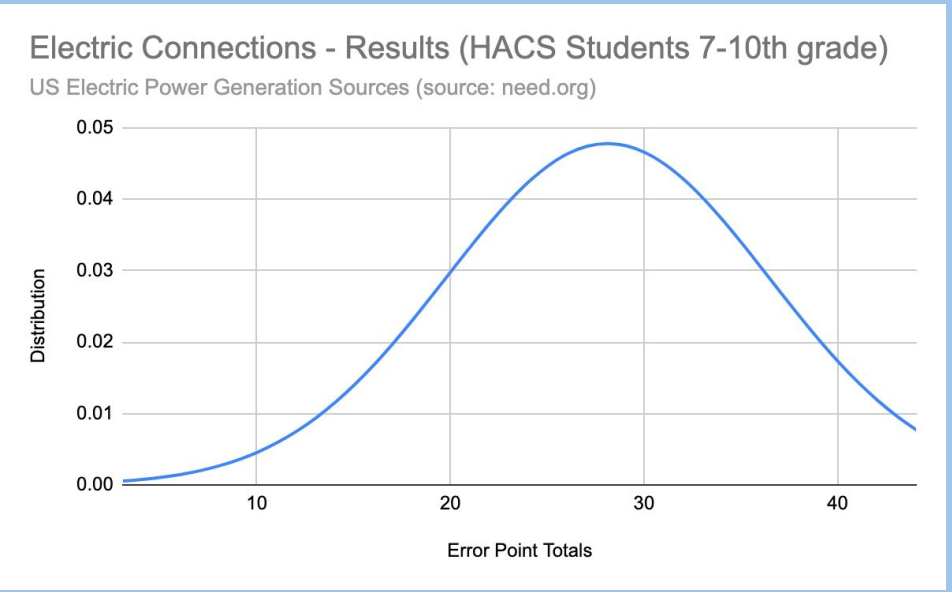


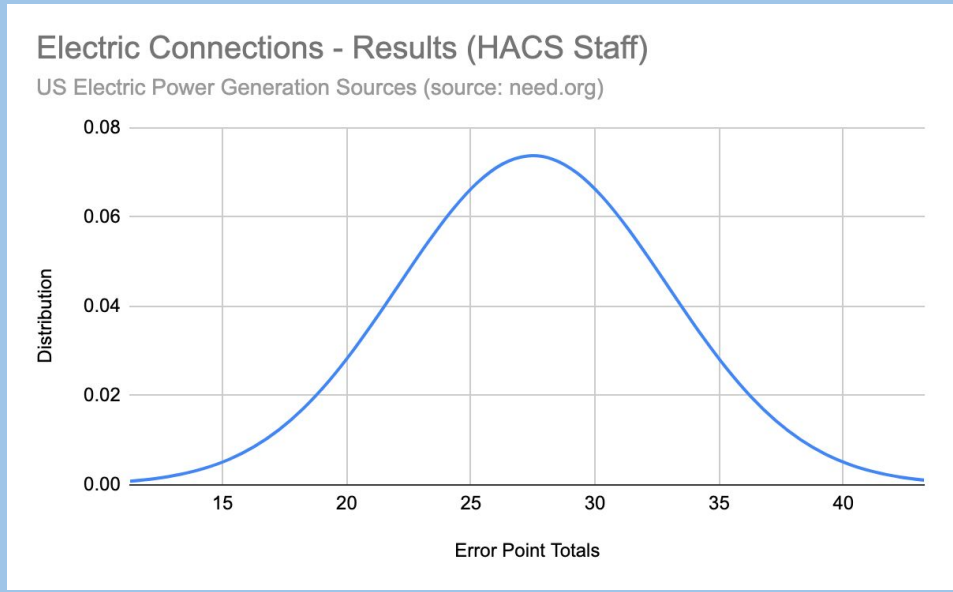
Of the conference attendees (33 participants) 12.1% scored good, 27.3% average, 36.4% fair, 15.2% poor, and 9.1% very poor.

SCORING:

0-12 Excellent
13-18 Good
19-24 Average
25-30 Fair
31-36 Poor
37-42 Very Poor

HACS Student and Staff Data





Of the student body (16 participants) 25% scored average, 31.3% fair, 25% poor, and 12.5% very poor.

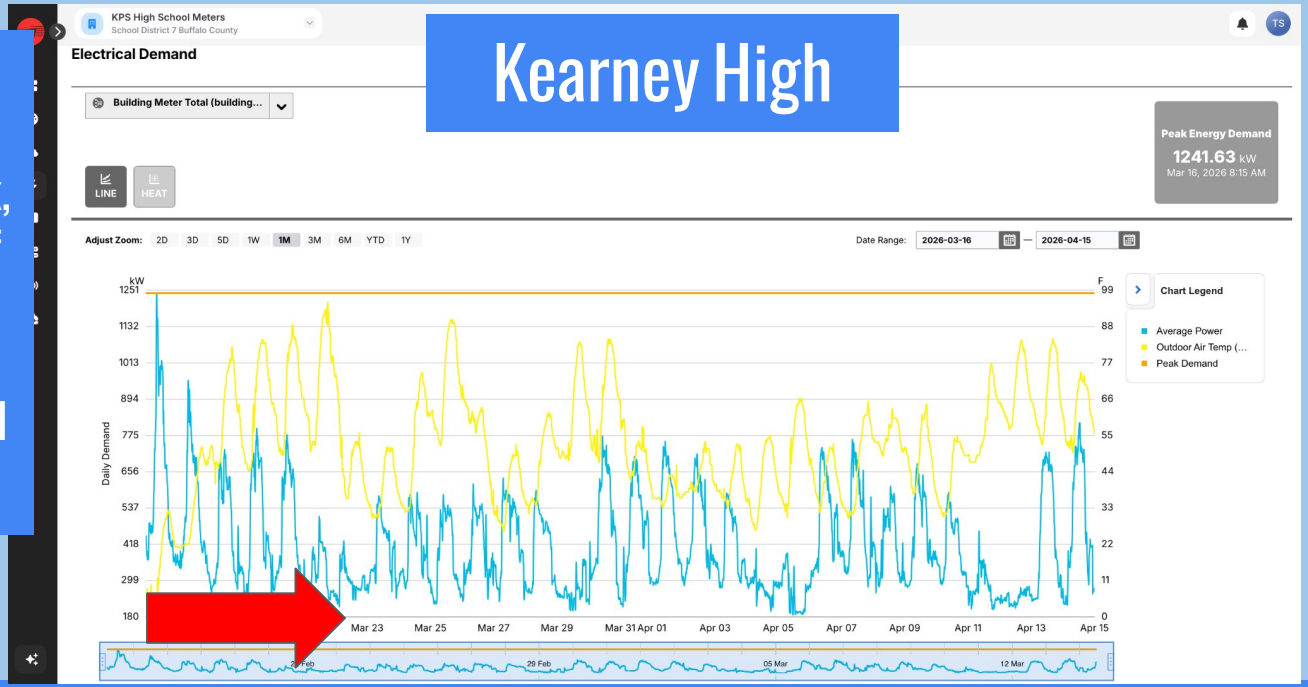
As a staff (6 participants) 16.6% scored good, 16.6% average, 33.3% fair, and 33.3% poor.

SCORING:

0-12 Excellent
13-18 Good
19-24 Average
25-30 Fair
31-36 Poor
37-42 Very Poor

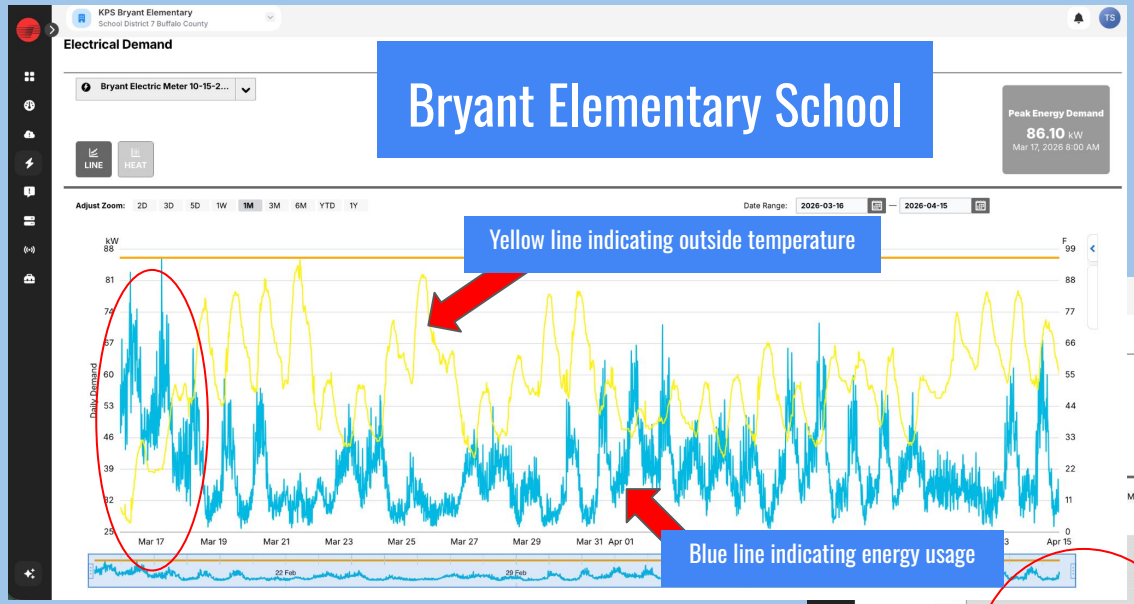
Energy Awareness at a Local Level - Trane Connect

These down periods (red arrow) of energy are due to spring break, but there isn't as big of a difference to normal energy usage due to Speech and Debate still partaking as normal.



With 40% of our energy use taking place in buildings, Trane is working with us as an industry partner to learn how to analyze energy use in our district and explore opportunities to increase energy efficiency using data analysis.

Trane Connect



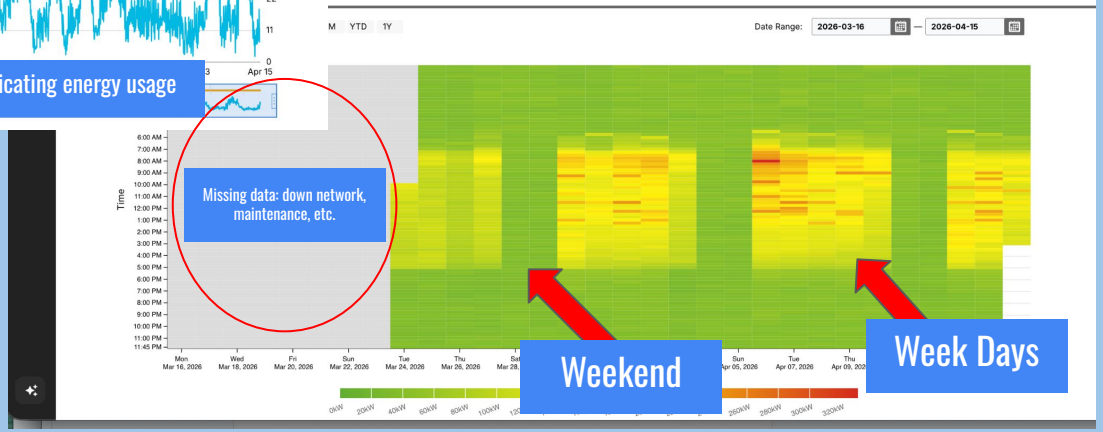
Bryant Elementary School

Yellow line indicating outside temperature

Blue line indicating energy usage

We are currently unaware of why there is no data for a 5-day span for Sunrise, but for Bryant you can see a cold-snap around the 17th (circled data to the left), resulting in a lot of energy usage.

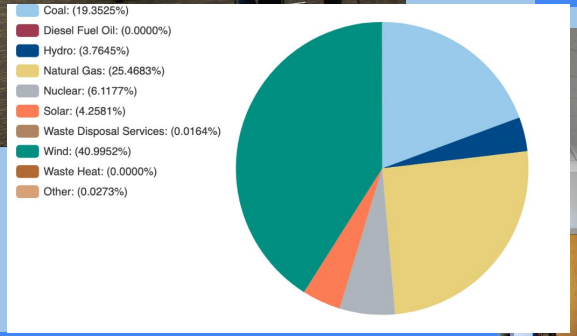
Sunrise Middle School



We are able to see energy use in our district buildings. The heat map to the right shows energy usage from dark green being low (kW) to red high energy use. It is broken down into week days and collected in 15 minute increments.

Board of Education Meeting

Presenting to the Board of Education on our experiences from the KidWind Challenge and data from the NRCSA conference.

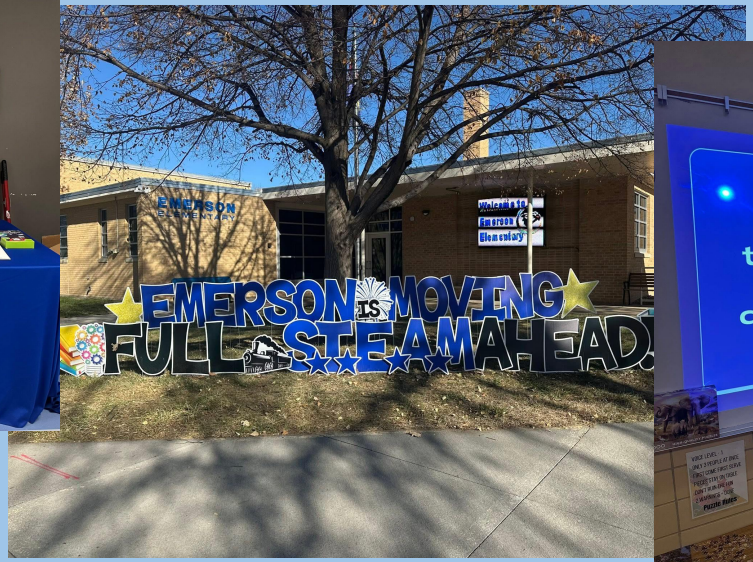


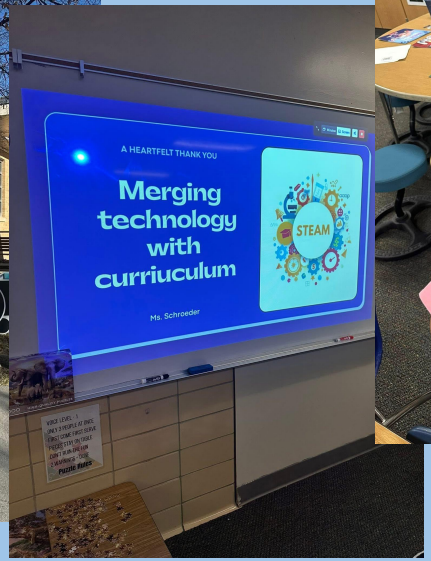
Data from the Electric Connections survey was shared with the Board and our superintendent was shocked by the percentage of wind energy used being almost 32% for Nebraska!

Graph source: spp.org

Future Events

Partnership with Emerson Elementary School, STEM Night and STEM activities with the youth, further educating them on energy usage and applications of energy, also hoping to include more schools within Nebraska in KidWind.





HANNY ARRAM CENTER FOR SUCCESS

EMERSON ELEMENTARY
Home of the Eagles

Reflection

In all, energy awareness is important across the United States due to energy being the most important thing throughout our lives. Energy does everything for us, but some people don't quite grasp how much energy we use or where all the energy comes from. We see this among our data collected from HACS students and staff, where students average "fair" or "poor." Energy distribution is so much more than just power lines and plants. If people don't know how much energy they use, or where it comes from, they get careless. This is why we're currently making it our goal to spread the awareness on energy about where it comes from, how it gets there, and how much of it actually comes to you versus what you're paying for.