



NOVEMBER 2021

THE WHEAT BELT CONNECTION

CHRYSLER PACIFICA RESEARCH PROJECT

PART ONE OF A TWO-PART SERIES

By Jason Weigle - Business Support Analyst

Over the last 12 months, Wheat Belt has leased a Chrysler Pacifica Hybrid Plug-In Electric Vehicle (HPEV) to test drive. The goal of this project is to better understand how HPEVs function in terms of energy use and performance, allowing us to better understand the benefits and drawbacks of HPEVs in our area. The following is an introduction into the world of electric vehicles and some of the experiences we've had with the van.

There are three types of electric vehicles currently on the market. Hybrid electric vehicles (HEVs) use a battery powered motor to support the gasoline engine to extend gas mileage. The battery is recharged through regenerative braking, where equipment attached to the brake system charges the battery when the brakes are used. Many Toyota Prius models are HEVs.

A Battery Electric Vehicle (BEV) runs purely on battery power. The battery is charged by plugging a charger into the vehicle's battery port or through regenerative braking. Tesla's vehicles are all BEVs.

An HPEV is a vehicle which uses both gasoline and electricity to power engines. Most HPEVs will use battery power until the battery is depleted or the vehicle's power needs shift the vehicle's power source over to the gasoline engine. Like BEVs, HPEVs are recharged through plug-in chargers or through regenerative braking.

At home chargers for BEVs and HPEVs typically fall into one of two levels. Level 1 chargers typically use the 120 voltage that most homes have. These

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LUCKY DRAWING

Congratulations to Joe and Cyndi Van Newkirk, our September "Lucky Winners"!

Joe and Cyndi operate a Purebred Hereford Seedstock Ranch in the Oshkosh area. Their ranch is also their hobby! The Van Newkirk family includes two sons, Nick (Celina) and Kolby (Meg), one daughter Sara (Matt) Cover and four grandchildren: Lorenzo, Barrett, Sloan and Blair. Joe and Cyndi cherish spending time with family.

If you would like to be included in our next \$50 drawing, and avoid the \$5 delinquent fee, please send your payment before the 16th of the month.

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Chrysler Pacifica cont'd from 12-A

chargers are slower, sometimes taking up to 12 or more hours to recharge batteries. Level 2 chargers typically run on 240 volts; this means they can charge faster, with some chargers being able to charge fully depleted batteries in 4-6 hours.

The level 1 and 2 chargers are different than the fast charging stations you see along the road. Fast charge stations use high voltage chargers, and in some cases direct current chargers, to charge batteries very quickly (typically in less than an hour). In all cases, the speed of charging depends on battery size and how much the battery has been drained.

Range in electric vehicles is the number of miles the vehicle can travel on one battery charge. For BEVs, range is solely based on stored battery energy, while with HEVs and HPEVs, range is a combination of gasoline and stored battery energy.

Since it's difficult to compare miles from gas to miles from kilowatt hours, you'll see the term miles per gallon equivalent or MPGe used with electric vehicles. The US Environmental Protection Agency uses a conversion factor of 33.7 kilowatt hours (kWh) of electricity providing the same power as 1 gallon of gas in determining the MPGe. Like the more familiar

fuel economy indicator of miles per gallon (MPG), MPGe helps the consumer compare fuel economy across different models of vehicles and different types of electricity/gasoline combos. Like MPG, the higher the MPGe number is, the more efficient the vehicle is in utilizing energy given city and highway driving conditions.

Wheat Belt's Pacifica has been used nearly every business day since last July. From January 1st through July 31st, Wheat Belt employees drove the van 3,816 miles, using 1,165 kWh of electricity and 63.3 gallons of gas. The vehicle's primary mileage has been from mail runs to Sidney each business day. We've also used the van to run errands, to go on business trips, and for educational programming. It's been driven in all types of weather and conditions, and is kept in a garage overnight.

We've found that we can typically get 30 miles on one battery charge (or two trips into Sidney from Wheat Belt's office) – regardless of weather, heating/AC use, or the person driving the van. We've found that we use anywhere from 13-17% of the battery's charge going into town and 23-30% of the charge coming back to the office.

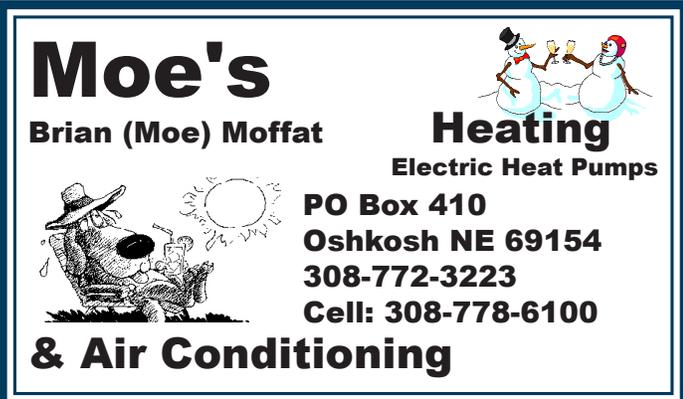
The main difference in power use is terrain: it's mostly downhill from the office into Sidney and uphill coming back. Regenerative braking during the trip adds several percentage points of power back to the battery. We've also found that cruise control improves battery performance by several percent, likely due to the vehicle's computer assigning power in a consistent manner rather than the constant variability of a human driver.

The van has ranged from 23.5 to 83.7 MPGe during the period we've been keeping records. The lower numbers are somewhat misleading because these

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months have also been the months where we've filled the gas tank. For example, between January 1st and March 31st, we drove 1,508 miles but only needed to fill the tank once near the end of March. Thus, the MPGe for January (79.4) and February (70.6) were higher than the one for March (30.6), which scored lower due to the gasoline showing in the MPGe calculations that month. To overcome the fueling issue, the MPGe for the overall period was calculated. Over seven months, the 3,816 miles, 1,165 kilowatt hours, and 63.3 gallons of gas works out to an overall MPGe of 39.0 for the van.

We also looked at the MPGe numbers for winter and non-winter driving. The MPGe for winter months (November-March) was higher than the non-winter months (April-October), 60.2 MPGe vs. 49.6 MPGe. We believe the winter number is higher due to our trips being shorter during these months; thus, the vehicle mostly ran on battery power until the weather improved in March. We've used the vehicle more since the end of winter and the trips have tended to be longer, bringing gasoline into the equation and thus lowering the overall MPGe numbers in the non-winter period.

So do electric vehicles make sense in our area?

STAY TUNED FOR PART TWO - DECEMBER 2021 ISSUE



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EMPLOYEE SPOTLIGHT

Valerie Richards Joins Wheat Belt as Accounting Specialist



We are happy to introduce Valerie Richards!

Valerie is responsible for record keeping, work order management, accounts payable, accounts receivable invoicing, fleet management and records management.

She was previously employed at Logan County for 20 years.

The Richards moved from Sterling to Sidney in 2015, Valerie does not miss the daily

drive and appreciates the extra 1-1/2 hours of time to spend with her family.

Valerie is trained and certified in Massage Therapy, however chose a different path which led her to a successful career in Accounting.

Valerie and her husband, Justin, have two children; their daughter is a high school senior and their son is an 8th grader. She enjoys being active in the community, reading, and running, including 10k races.

She appreciates the opportunity to learn about the electric industry and is happy to be a part of the Wheat Belt Team!

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ends Sunday, November 7.
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ENERGY SAVINGS FILL-IN-THE-BLANK

Saving energy at home can help your family save money and help our environment. Test your energy efficiency knowledge by completing this fill-in-the-blank activity.

Tip: Use the word bank for help. Don't forget to check your answers in the key below!



- Turning off the tap water while brushing your teeth can save up to four _____ of water per minute.
- Energy vampires, like TVs and phone chargers, consume _____ even when they're not in use. Turn these devices off to save energy.
- Turning off _____ every time you leave the room saves energy.
- Wash clothes in _____ water to reduce the load on your water heater.
- LED light bulbs typically use 75% less energy than _____ light bulbs.
- To save energy, only run full loads when running the _____.

Word Bank:

incandescent	dishwasher
electricity	gallons
lights	cold

Answer Key: 1) gallons 2) electricity 3) lights 4) cold 5) incandescent 6) dishwasher

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 Christmas - December 24, 2021
 New Year's Day - January 3, 2022



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