

Weekly Progress – ECEN 201 Project

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January 18, 2025 Meeting

<https://discord.gg/ddYTMgvM>

-Vehicle of choice per criteria of the project constraints:

- GMC Hummer EV
- The ev3x trim was also considered - manufacturer's specs are somewhat pending
- EV stats:
 - <https://insideevs.com/news/682686/gmc-hummer-ev-epa-range-efficiency/>
 - Good info from GMC's website from Keanu:
<https://www.gmc.com/electric/hummer-ev/pickup-truck>
- Special emphasis on mathematical dimensional analysis – see some of the work by Keanu; area provided below for you to show the work on scratch paper or whatever medium of your choice. Pay attention to kilowatt hours, range, etc.

-Meeting minutes/agenda

- Shared document started (William)
- At least one meeting a week could be implemented
- Add your contributions per week
- Excel worksheet will be implemented for our chart to show statistics

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January 20, 2025 Meeting

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-(Keanu) Line chart with connecting dots

- X-axis: 0 –15 days
- Y axis: Energy left of the EV

-Meeting minutes/agenda

- Determining class roles
- We will use a templated data table and fill out our own unique data of the Wattage used for the appliances

-We will need to average the time used for each appliance multiplied by the wattage (in hours if manufacturer's specs display wattage per hour) then divide out this average by 126kW -William

<https://www.amazon.com/dp/B0CZLZZ6BB?tag=track-ect-bing-usa-137293-20&linkCode=osi&th=1>

- On average, data showed **a single-door refrigerator, the type without a freezer, uses 804 watts per day (34 watts per hour).**
- On average, data showed that **refrigerators with freezers (all types) use 1,429 watts per day (60 watts per hour).**

Common **residential refrigerators can use between 350 and 1,200 starting watts**, depending on the refrigerator's compressor size, efficiency, and age.

This cooler has a large capacity and doesn't need room for ice like your typical chest cooler. It comes with:

- Chill solar cooler: AC adapter, 12V power cord, and two bungee cords
- Solar panel 30+: 30 Watt solar panel, DC coaxial cable
- Power Bank: 144Wh power bank, soft-touch C

GOSUN's Chill solar refrigerator will keep your food safe when you're far away from the grid.

GOSUN's Chill solar cooler is what you want on your next camping trip or off-grid adventure. This solar chest refrigerator comes with its own 30 Watt solar panel and power bank. So you have everything you need without buying extra equipment.

This package is more than just a cooler though; **it's your bug-out solar refrigerator.**

It has a touch screen to control the cooling environment from -4 to -68 degrees F.

With the included power bank, it charges the Chill cooler as well as your tablets and phones.

And when you connect the solar panel, **you charge everything up with the power of the sun.**

Once charged, it will keep your food items nice and cool for up to 14 hours.

Then plug it into either an AC plug-in, DC volt cord, the power bank, or solar panels, and your food will never spoil.

Best Incandescent

Chromalux Full-Spectrum Neodymium Bulb

Product Details: Wattage: 100 | Color Temperature: Not listed but similar to daylight | Lumens: 1,450 (clear bulb) or 1,380 (frosted) | Shape Code: A15 | Base Code: E26 | Bulbs in Pack: Four

Lightbulb usage: $0.1 \text{ kW} \times 3 \text{ bulbs} \times 5 \text{ hours} = 1.5 \text{ kWh a day}$

Laptop Wattage usage (William):

Laptop	Wattage	Estimated Working Hours (Hours)	Estimated Power Needed Daily (Watt-hours)	Estimated Working Days (Days)
MacBook Air	30W	8	240 Watt-hours	30
Dell Inspiron 17	50W			

Chart reference: UGREEN

References:

UGREEN. (August, 23, 2023). *Laptop Power Consumption: How Many Watts Does a Laptop Use per Day/Month/Year?* <https://www.ugreen.com/blogs/home-battery-backup/laptop-power-consumption-how-many-watts-does-a-laptop-use>

iPhone	Wattage	Estimated Working Hours (Hours)	Estimated Power Needed Daily (Watt-hours)	Estimated Working Days (Days)
iPhone	10.78	8.5 hrs	8	12
iPhone	10.78	8.5 hrs	8	12

Requires [a power adapter with a minimum power output of 20 watts](#)

(Constantine): Energy consumption of an electric stove = stove's power rating (kW) x cooking duration (h)

Suppose you run a 2,000W (2kW) electric stove for 60 minutes (1 hour). Let's calculate its actual power usage

$$\text{Energy (kWh)} = \text{Power (kW)} \times \text{Time (hours)}$$

$$\text{Actual energy consumption} = 2 \times 1 = 2\text{kWh}$$

Therefore, it shows that the stove will consume 2kWh of electricity per session.

[How Many Watts Does an Electric Stove Use? - Renogy United States](#)

<https://www.amazon.com/Elite-Gourmet-EDB-302BF-Countertop-Temperature/dp/B09RX2WGD3>

an LCD TV

[Amazon.com: FPD 43 Inch Smart TV Full HD 1080p LED TV Frame Flat Screen Television with Google Cast Streaming Live Ultra Thin Android TV, Bluetooth,Hdmi,WiFi,\(Palette-Series.2025\) : Electronics](#)

a portable water heater

a portable water heater	Wattage	Estimated Working Hours (Hours)	Estimated Power Needed Daily (Watt-hours)	Estimated Working Days (Days)
	1.4 KW	2 hrs.	2	7

[Amazon.com: GE Appliances 10 Gallon Versatile Plug and Play Electric Water Heater with Adjustable Thermostat, Easily Installs Where You Want It, 120 Volt : Everything Else](#)

<https://www.amazon.com/Immersion-Portable-Electric-Real-Time-Thermometer/dp/B0DH382G5X>

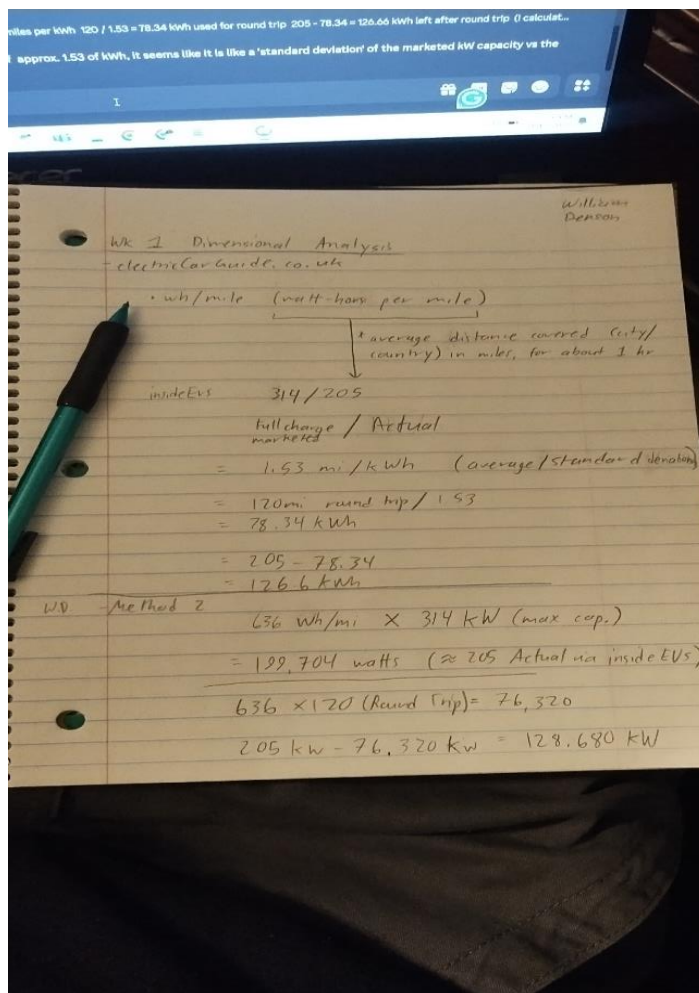
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William Denson – Contributions (APA Works Cited page at bottom)

Mathematical contribution:



- The mathematical work includes my work of my version of the calculations at the bottom which is very close to Keanu's. A standard deviation of the marketed wattage is contrasted with the actual wattage reported by insideEVs which is 205 kW in capacity (Kane, 2023).

Weekly Progress Report:

- Keanu and I hosted the first meeting setting up the parameters for the meetings moving forward.
 - ✚ The report of this document includes the time needed to showcase the feasibility of the Hummer EV's wattage storage and the 120 mile round trip.

Agenda:

- The meeting agenda is set for all of us to meet regularly to discuss the Excel spreadsheet and kilo-watt hour information for all the appliances needed for the campsite. Figuring out the wattage per hour took up most of the time and the emphasis on mathematical proficiency in this project was a key point for the meetings onward. This first week also includes a peer review of the appliances we want to use.

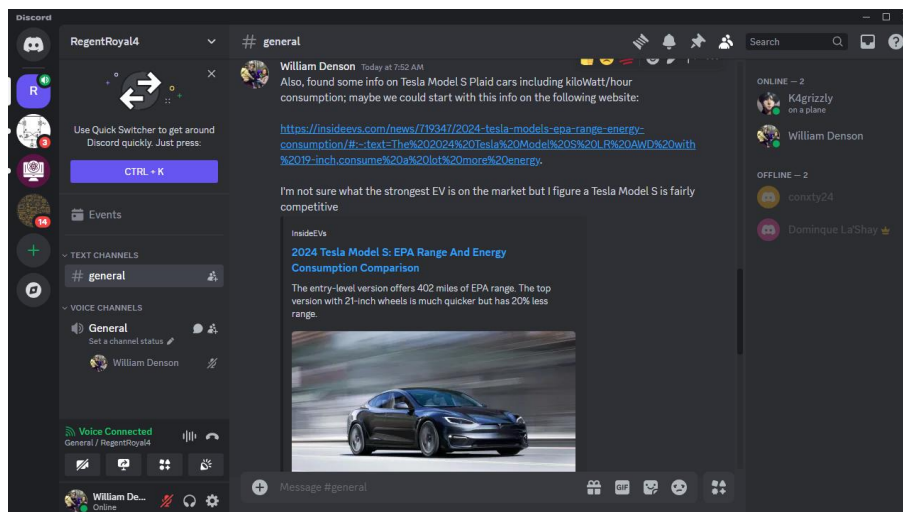
Member contributions:

- Keanu and I have set up the documents needed for initial brainstorming and data logging. The complexities of the Hummer's total wattage is taken into account and this was discussed in our first voiced member's meeting.

Progress made:

- Significant progress has been made for setting up the initial work needed for determining the ideal car model to use for the project. Continuing progress will be implemented by adding to the Excel spreadsheet and shared Word document. The Excel spreadsheet will show either progress bars or line graphs to show the added appliances needed to meet the criteria of the project.

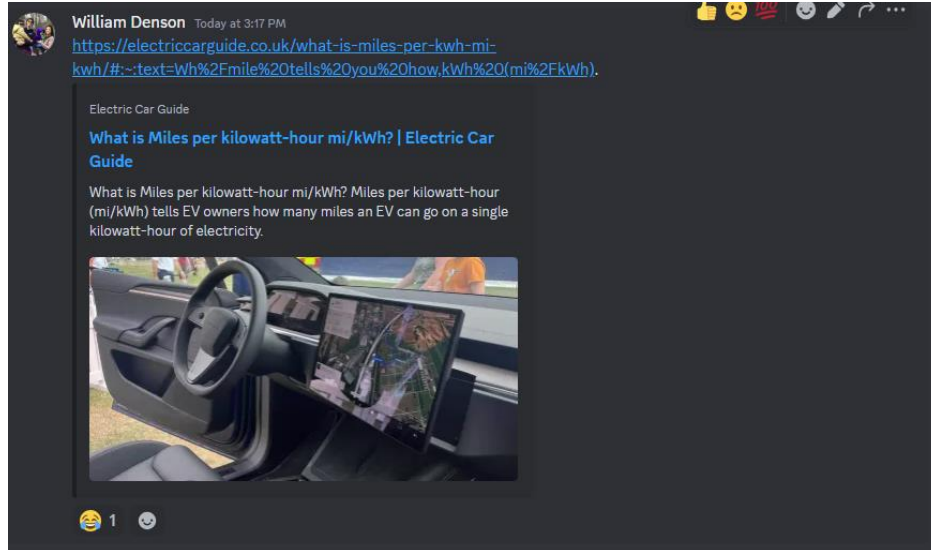
Initial contribution of a Tesla for wattage range for sedans vs heavier vehicles:



- Keanu made the decision to use the Hummer EV to meet project criteria
- I contributed to the general EV information for kilowatt hours:
- I made a source contribution for mathematical dimensional analysis for calculating power for watthours per mile (wh/mi)

<https://insideevs.com/news/682686/gmc-hummer-ev-epa-range-efficiency/>

[https://electriccarguide.co.uk/what-is-miles-per-kwh-mi-kwh/#:~:text=Wh%2Fmile%20tells%20you%20how,kWh%20\(mi%2FkWh\)](https://electriccarguide.co.uk/what-is-miles-per-kwh-mi-kwh/#:~:text=Wh%2Fmile%20tells%20you%20how,kWh%20(mi%2FkWh))



The source helps show how the wh/mi (watt hours per mile) is an average range of city and highway use (or even offroad use) towards the cabin. This will aid us in determining how persons X and Y will utilize the appliances – I determined that understanding the base mathematical models will help us in determining the appliance usage.

- I started the Word document that is shared between us all:
- <https://1drv.ms/w/c/42ef77127c4616fd/EX92HFR5PmtEuhA79CWHWawBtAaKdxPsNLgwu1a2mtCYoQ?e=bYHp7L>
- Account: William.acson@gmail.com

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References

Ellmore, J. (2024). *What is Miles per kWh (mi/kWh)?* Retrieved from Electric Car Guide: [https://electriccarguide.co.uk/what-is-miles-per-kwh-mi-kwh/#:~:text=Wh%2Fmile%20tells%20you%20how,kWh%20\(mi%2FkWh\).](https://electriccarguide.co.uk/what-is-miles-per-kwh-mi-kwh/#:~:text=Wh%2Fmile%20tells%20you%20how,kWh%20(mi%2FkWh).)

GMC. (n.d.). Retrieved from <https://www.gmc.com/electric/hummer-ev/pickup-trucks-suvs>

Kane, M. (2023). *GMC Hummer EVs Receive Shocking EPA Rating: True Electron Guzzlers*. Retrieved from Inside EVs: <https://insideevs.com/news/682686/gmc-hummer-ev-epa-range-efficiency/>