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| 1. **Which vehicles in your fleet are good candidates for electrification?**
	1. Consider daily vehicle miles traveled (VMT) and assess travel consistency and garage locations.
	2. Estimate the daily energy needs for each vehicle.
	3. Review BEV and PHEV options while considering each vehicle’s rated electric range.
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| **EV Adoption Plan:** | **Pro Tips:*** Consistent parking locations create opportunities for daily charging.
* BEVs are ideal for use cases with a majority of daily VMT less than the rated range (e.g. 98% of days within the 250-mile Chevrolet Bolt range)
* Extreme temperature days can negatively impact driving range and may require mid-day charging.
* PHEVs are great for vehicles with varying travel & garage locations where frequent mid-day charging would be a challenge.
* Most BEV sedans operate at an efficiency around 3.6 mi/kWh so a 50 kWh battery pack should translate to 180 miles of range.

$$Energy \left(kWh\right)≈\frac{miles}{3.6}$$ |
| 1. **What type and how many EVSE units will be needed for these EVs?**
	1. Estimate recharge session duration for Level 2 EVSE, based on daily vehicle energy needs.
	2. Compare vehicle recharge times to typical dwell periods to estimate EVSE needs.
	3. Consider how vehicles could share EVSE infrastructure based on vehicle dwell and charge times.
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| **EVSE Requirements:** | **Pro Tips:*** Typical Level 2 EVSE operates around 7 kW (1.5 kW for Level 1)

$$Session \left(hrs\right)=\frac{Energy (kWh)}{Power (kW)}$$* Every 25 miles a vehicle travels will require about one hour to charge with most Level 2 EVSE units.
* Most fleet BEV applications use Level 2 charging, but some three-shift operations require DCFC and low VMT applications or PHEVs could use Level 1
* Depending on energy needs and usage patterns fleets do not always require a 1:1 ratio of EVSE to EVs
* The EVSE to EV ratio can become more flexible with more EVs based in a single location.
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| 1. **Will the total cost of ownership from these new EVs financially benefit fleet operations?**
	1. Consider the operation and maintenance cost reduction on a per mile basis.
	2. Estimate possible annual savings compared to existing vehicle based on estimated annual VMT.
	3. Compare the savings over the vehicle lifetime to the incremental acquisition costs.
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| **Potential Savings:** | **Pro Tips:*** Estimate EV energy cost per mile.

$$\frac{EV Energy Cost}{mile}=Eff. ×Electricity cost$$* Total mileage costs for ICE vehicles can be estimated using GSA Schedule lease rates.
* The GSA EV mileage rate must be added to the EV energy cost per mile.

$$\frac{EV Cost}{mile}=\frac{EV Energy Cost}{mile}+GSA mileage rate$$* Simplify mileage costs into annual vehicle costs

$$Annual Cost=\frac{EV Cost}{mile}×Annual VMT$$* Compare potential EV costs to existing vehicle costs to assess annual savings.

$$Annl. Savings=Annl. ICE Cost-Annl. EV Cost$$* Determine if the incremental payback period from the potential annual savings is less than the expected life of the vehicle.

$$Payback Period=\frac{Incremental Cost}{Annual Savings}$$ |
| 1. **What impact will these new vehicles have on facility load and electricity bills?**
	1. Review utility bill and rates, highlighting each rate that could be impacted by EV charging.
	2. Consider the facility peak demand and compare to expected vehicle charging sessions.
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| **Utility Bill Impact:** | **Pro Tips:*** The most important rates to consider will most likely be energy and demand charges.
* Energy charges will most likely see nominal increases relative to typical facility loads.
* Demand charges will be the biggest concern for fleets installing a large number of EVSE.
* The largest demand charge impact will occur if EVs are charging during the monthly facility peak.
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