

CASE STUDY

EV 101

Learn from the Experts: Duke Energy



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Duke Energy Corporation, originally the Catawba Power Company, first broke ground with a hydroelectric power station along the Catawba River near India Hook, South Carolina in 1900. The company is now an American electric power and natural gas holding company headquartered in Charlotte, North Carolina and is at the beginning stages of adopting EVs into its fleet. We spoke with Mike Marlor, director of fleet strategy and governance at Duke Energy about what they've learned in the process of transitioning to EVs.

Work with internal experts to strategize on where to start with EV adoption.

Marlor makes it clear that bringing together a team of experts to guide you through the transition will save you a lot of time and headache. In Duke Energy's case, a team of data scientists worked with Marlor to determine which portion of the fleet to target for conversion. Because Duke Energy has vehicles in 49 states one factor to contend with as he maps out his plan is the variety of climates and geographies in which they operate. "If you're running a heater, you lose range, if you run an air conditioner a lot, you lose range, if you're driving up and down mountains, you lose range. So, there are some things you really have to factor in that you may not be considering at this point." Add to these considerations the necessity of strategizing about charging locations throughout the country, and suddenly it doesn't sound that far off base to engage with a data science team to plan ahead. "We're like everybody else: There's a steep learning curve and we're still learning quite a bit."

Develop a clear strategy for home charging for your EV fleet.

Ideally, some portion of your fleet will be able to charge at individual charging stations in employees' homes. Duke Energy is running a home charging pilot program to ease into the best charging strategy for their organization. "If you hook up an EV to your house, you're paying for that electricity." In order to streamline the payment methods used to circumvent a time-consuming, potentially faulty invoicing process, Marlor's drivers use WEX fleet cards for their fueling: "If you drive a

About Duke Energy:

A practical and methodical approach



Duke Energy is operating vehicles in 49 states out of 100+ operations centers.



Their fleet of 15,000 includes around 60% light-duty vehicles and 40% medium- and heavy-duty vehicles.



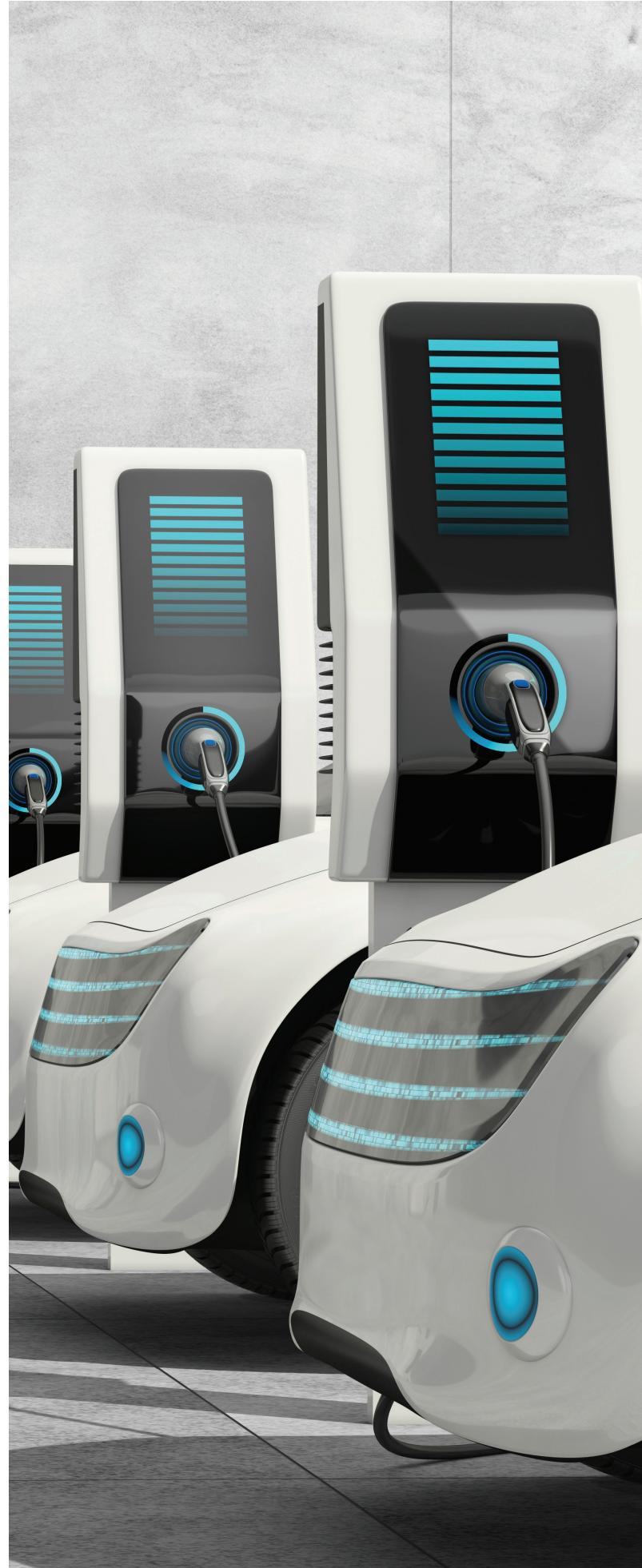
Duke Energy's executive leadership team has set a clear goal: by 2030, every light-duty vehicle will run on electricity.

Duke Energy's focus right now is on their light-duty vehicles. Once the technology catches up and heavy-duty electric vehicles are more accessible, they will have already converted their light-duty cars to electric.

company vehicle home, and you get fuel you use your fleet card, or if you're driving your personal vehicle on company business, you're reimbursed." What Marlor needs to figure out next is how to reimburse his drivers for charging. His hope is that he can do that with his existing fleet card partner, and while they have not yet established this process it's coming soon. He points to smart charger technology that Duke Energy is piloting that provides them with data about the EVs in their fleet. "We can actually physically see how long a vehicle's charged and how much electricity is being used. But again, that's another thing that's a pretty steep learning curve that we're having to get into place."

Consider a mixed fleet that includes both hybrids and electric vehicles.

Duke Energy has been strategizing about EV conversion for over two years now, and through that period of experimentation Marlor and his executive team have found that it makes the most sense for their business to develop a mixed fleet. "With our hybrid vehicles, if an employee has to go long distances, they always have the gasoline engine to back them up if they need it." Duke Energy is getting their first Ford Lightnings in October, and will be piloting the Ford Charger as well. These will be added to their existing mixed fleet of about 350 hybrid vehicles including some off-road Polaris electric vehicles, some Chevy Volts, Bolts, and Mitsubishi Outbacks. Marlor has become convinced that to build a sustainable fleet future for Duke Energy, hybrids will be part of the calculation: With the variables involved in the kind of work they do, Marlor believes they will need to have some capacity to run their vehicles on traditional fuel when faced with power outages, extreme weather, and difficult terrain.





Consider your vehicle life cycle plan when you strategize about adoption timing.

Marlor talks about how fleet management for Duke Energy has always considered vehicle life cycle when planning future fleet purchases. "We have a life cycle on our vehicles like most utility companies do. We don't want to jump in too hard with the first generation of EVs." For Marlor this "jumping in too hard" means locking into technology that will very soon be out-of-date given how quickly EV technology is advancing. As he considers a strategy for how to evolve his fleet, he's looking at his current stock of vehicles and trying to best plan when to convert, how many to convert, and at what point in the technological development of EVs to convert to best set Duke Energy up for success. Marlor suggests taking a good look at your life cycle plan and inserting EVs into that plan where it makes the most sense. For the vehicles at the very end of their life cycle, consider adopting some hybrid and EVs to replace them and be strategic about how many and what their work will entail.

Invest in a tool that will allow you to pull data and metrics on ICE, hybrid, and EVs all in one central location.

Marlor recommends investing in technology which will allow you to manage tracking, maintenance costs, and any other ancillary metrics even when you have a mix of different types of vehicles on the road. "We have telematics in all our vehicles and so we're pulling information out of telematics. And then we do most of our repairs in-house - we have in-house garages for which we maintain a database on all the repairs. We can pull reporting out of our technology on cost, mileage, repairs, whatever we need to know about our fleet." All of Marlor's fleet data is in one system making it easy to track and account for costs. Duke Energy's data tool will give them different metrics dependent on the type of vehicle they're interested in deriving data about and Marlor recommends finding a fleet partner that can offer that kind of one-stop shopping to increase efficiency for your business.

Strategize with your energy partners and the utility companies where your fleet will charge to ensure your grid is properly equipped.

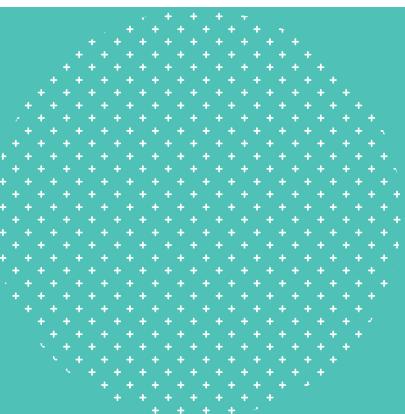
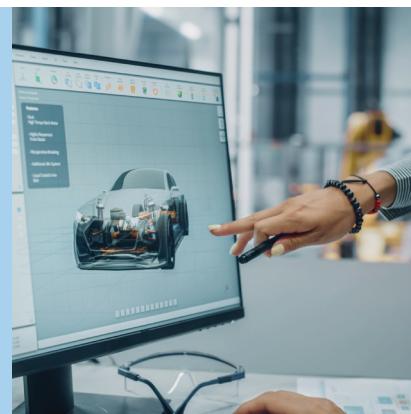
Duke Energy currently has 300+ charging depots across their footprint and Marlor has been working with his utility partners to build out the company's grid to better equip Duke Energy to add additional EVs. "We've been working on strengthening the grid and updating it to add capacity. That's been ongoing for several years now and it's just getting much more important."

Marlor is looking beyond just Duke Energy's impact on the grid and at the bigger picture of a national shift toward EV and what that might mean for future energy consumption. He has considered what could happen if a large corporation were to move into a neighborhood and decide to convert to an all-electric fleet. How can utilities, governments, and municipalities prepare for the energy demands to come? The cost to upgrade to the necessary amp service would be cost-prohibitive for much of the US population, so when the Biden administration is pushing for an all-EV answer by 2050 the fact that they are providing subsidies is much-needed and applauded. "Right now the grid is sustainable for what we have. But a lot of utilities are ramping up and are going to be adding to the grid or building capacity because that kind of infrastructure build is going to have to happen to add all these EVs that we have a goal to add nationally." As the increase in EV adoption continues to build in the US, developing a smart energy plan for your footprint will become more and more important.

We are on the cusp of new medium-and heavy-duty fleet technology - consider participating in that conversation and helping shape what's being built.

Marlor emphasizes the value of helping shape future vehicle technology. He suggests getting in on the conversation about what's being built in the medium-and heavy-duty arena while manufacturers are still in the development phase. "Some of the medium- and heavy-duty truck manufacturers are starting to come out with EVs. Freightliner has shown a hundred percent electric truck. I've seen it - it's a utility bucket. But I think we're a long way before we get a lot of adoption on those." Marlor points to cost and inadequate power as the two main reasons those higher powered EVs aren't yet a viable option for most businesses.

Meighan Read, a member of Duke Energy's fleet management team, is an EV ambassador for the organization sitting on a couple of relevant boards and engaging with vehicle manufacturers. "Meighan was in Detroit recently meeting with GM and she has relationships with a variety of Original Equipment Manufacturers (OEMs). There's a lot of back and forth. We're going to do a pilot with Ford in Florida and North Carolina with the new Ford Lightning. They're going to hook into our grid and provide power back to our grid and there's going to be more of that coming down the line as well." Having relationships with the people and organizations creating EV technology of the future will help ensure that you have a hand in making sure EVs serve companies like your own.





Do the research to ensure you are onboarding electric vehicles that meet the needs of your business, including weather considerations.

Marlor and others we've talked to all emphasize that it's crucial to analyze what electric vehicles make the most sense for each part of your fleet. Marlor cautions jumping in and buying a fleet of EVs without doing the necessary due diligence first. "Make sure you know exactly what it is you're going to be getting into, and make sure the electric vehicles you are looking to adopt meet your needs."

Beyond which vehicles make the most sense for the needs of your organization, Marlor also emphasizes the need to plan for how your fleet will charge given certain realities that are specific to landscape and regional factors. Duke Energy operates in a variety of regions where storm systems impact their operations. Hurricane season comes at the same periods of time in different locations every year and having a plan for how their vehicles will work where there's no power is an important consideration for Marlor when adopting any electric vehicles into his fleet. He urges caution and careful planning if your company is located in places where power outages are part of your operations planning. "Everybody at Duke Energy has two jobs. You have your regular job and then you have a storm role. My storm role is being responsible for getting fuel for our staging sites, whenever we set those up. If we had a major hurricane hit today, I need to be able to pick up the phone and have a hundred fuel trucks at any location in 48 hours. You convert that to needing to power 500 diesel and 500 EVs and the question becomes, how are you going to recharge those EVs? The storm has hit and you don't have any power." These are the kinds of things to consider with a national fleet facing a variety of weather and climate challenges.



Marlor has been following some of the EV startups as they make inroads into new electric vehicle technology. He has seen chatter about a product in development that responds to the issue of storm outages and to the question of how EVs can operate in a crisis situation where there is no power. The solutions in development are cost-prohibitive for Duke Energy and not efficient enough to justify the cost: They only charge two to three vehicles at a time making them impractical for utility use. "We're looking at battery storage that we can hook into the grid and keep in the grid. Then if we need the battery power when a storm hits, we unhook it from the grid and take it with us. We're not exactly sure what our approach will be yet, but we're looking at all the options."

For Marlor and Duke Energy and a lot of other fleet leaders, the best course of action is to take incremental steps toward adoption. "Stick your toe in and test the water first. With today's technology, I think of a cell phone, the way the cell phone was five years ago, and the way it is today - there's no comparison. They're light years apart. I suspect the same thing is going to happen with EVs."

"Make sure you know exactly what it is you're going to be getting into, and make sure the electric vehicles you are looking to adopt meet your needs."

Mike Marlor, director of fleet strategy and governance at Duke Energy

Take it slowly - be patient, the technology is still developing so you have time to be strategic.

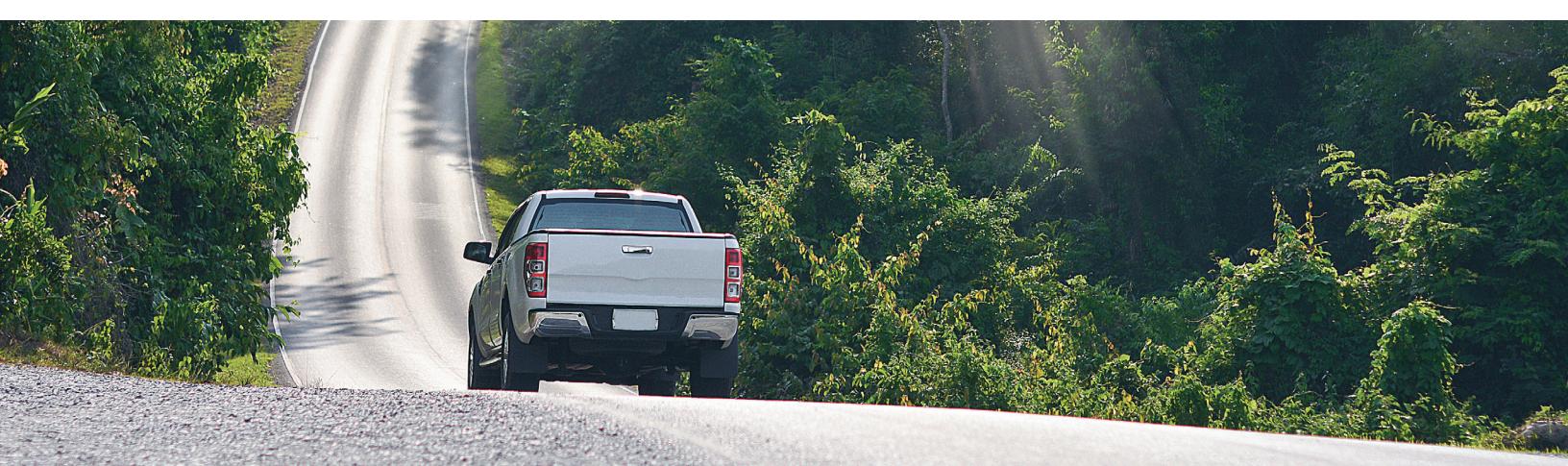
Marlor recommends taking the time to strategize in advance before making your first EV purchase. In hindsight he sees how Duke Energy would have been better positioned had they been given that advice. "We brought some vehicles in before we were really ready on the charging side. And we brought some vehicles in and assigned them in places that they shouldn't have been allocated. And I don't think we quite understood that at the beginning." Marlor gives examples of assigning hybrid vehicles to fleet drivers who had no way to charge the vehicle so they were running them on gas instead of battery, defeating the purpose of adding hybrid vehicles to his fleet.

The other recommendation from Marlor is to examine the usability of the vehicles you're considering adding to your fleet for each individual job they'll be tasked with doing. One example he gave was vehicle size. "If you're not familiar with the Chevy Bolt, it's a very small, compact vehicle and if you have somebody who has been using a minivan, and you're suddenly taking them out of that or a Ford F-150 and you're suddenly taking them out of that and putting them in a Bolt, you start to see some pain points there." It may seem unimportant, but getting a feel for what your drivers are used to and how they might feel about changes to their equipment will make a difference in how you approach acquiring your new fleet. Equally important, your transition will be smoother if you get a sense of the terrain your drivers need to traverse. "We have some folks who're driving in the mountains and some pretty decent hills in North Carolina. And they're all for this. They want

to be equipped with EVs so badly they can't stand it. We put them in the Chevy Volt. But they didn't last half a day, because of the terrain, and so we're having to temper people's expectations. 'Yeah, you really want this. But it's not practical for you yet.'" Marlor is encouraged by the EV enthusiasm coming from his staff and looks forward to the day when he can get them all in the vehicles they are clamoring for. This kind of practical information like vehicle size needs, and terrain and climate constraints are being brought by Duke Energy's Meighan Read to manufacturers and EV experts globally to help influence the future course of EV design and development.

Find a fleet partner who offers a mobility agnostic solution for your fleet card.

Marlor recommends that when setting up your EV plan you look to a fleet partner that offers a mobility agnostic solution. Ideally, you want to have a set-up like WEX offers where all of your fleet charges, data, and tracking are with one vendor. "No matter where we are, we're always going to have that need for charging when we're on the road. And so, then the whole question comes up, How do I pay for it? To be able to use the same card for fuel and for electric would be ideal." Even for the at-home charging, being able to keep track of which vehicles are being charged with home devices will be important for employee reimbursement. Partnering with a fleet company that grasps the complexities of financing home charging stations will increase your ability to efficiently and effectively transition to a more sustainable fleet solution.





Biggest hurdles for EV adoption going forward: practicality of use for your particular operations challenges, and cost.

Marlor acknowledges that transitioning to EV needs to be practical for your business. The EVs you adopt should be usable for whichever one of your fleet drivers has been allocated an EV for their use. So what makes the decision to convert a practical one? "I think range is a big part of that, and the vehicle size." Marlor suggests that for a lot of companies using a fleet of vehicles the size limitations of a lot of EVs in the marketplace today will prevent mass adoption. He's hopeful there will be versions of the Chevy Bolt developed that provide ample space for the tools and gear many fleet drivers need to bring along with them for a day's work. "The Chevy Bolt - like I said - is very small. There are not a lot of people who want to drive a really small vehicle, so I think as you get them a little bit bigger, I think there's going to be more adoption of those." Marlor points to cost and availability as practicality issues presently.

Think about an overall sustainability strategy and aim for a broad range of adjustments beyond just EV conversion.

While one of Duke Energy's sustainability goals is to operate a 100% EV light-duty fleet by 2030, they also have other sustainability goals they're developing in tandem with that including an overall carbon reduction plan. One example of a creative way Duke Energy is driving carbon reduction is through the use of electric power take-off (PTO). PTOs allow fleet managers to control where the electric is being used in manageable ways. "Where we have an Electric PTO, you would drive to a job site under your normal diesel power, and when you get there, you turn the engine off and turn on an electric PTO that runs all the boom functions. That should help us bring down our carbon footprint as well." Duke Energy has 80 PTOs in their fleet currently with plans to add 67 more later this year. Biotech and Altech are two manufacturers of PTOs both of which are part of Marlor's fleet.

 **Learn more about how WEX can help your business charge ahead with EV!**

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