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CHEROKEE NATION®



Secretary of Natural Resources Division

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Cherokee Nation and vehicle electrification

In the beginning...



D8P
D8P D8P



...we had no EV's!



...build it and they will come.



...and they did.

...and then the kept coming.



Chuck Hoskin, Jr.
Principal Chief
Cherokee Nation



...no good deed goes unpunished.

...too much so.



Lessons learned

- **Fuel Anxiety:**

- **The entire concept of vehicle electrification is deemed with a significant amount of suspicion** (somewhat akin to how the introduction of soccer in the early 1970's was thought a communist infiltration plot by some)
- **There are 2 kinds of people...those that do like EV's and those that do not** (precious little in-between)



Why is this not cool?!?!.

- **Initial Fleet Purchases:**

- Good deals, OEM's have been very helpful
- Tax credits???

- **Initial driving impressions:**

- “Wow, this is a real car...I thought it would be like a golf cart!”
- Money talks!

Lessons learned...cont.

- **Range Anxiety:**
 - It is real...an affliction suffered more by Boomers than Millennials
 - For the most part it is unwarranted (here in OK)
- **Misc:**
 - Most gas pumps work...most EV charging stations work, but there is an issue of availability
 - **DO NOT BUY CHARGERS REQUIRING HAND-WINDING OF CORDS!!!**
-women hate them!-
 - What you buy today was outdated last year☹
 - Level II works...but nobody wants it. **“GIVE ME LEVEL III AND NOT ONE OF THOSE CHEAP 60Kw UNITS!”**
 - Solar integration looks good and is inexpensive....but the integration is hard and Utilities hate it.
- **The Future:**
 - Level III IS GOING to tax the capacity of Utilities (we need to look at these newer BBU units).
 - The “switch” seems inevitable...because of greed and laziness
- **The 3 types of liars:**
 1. Liars
 2. D@mn liars!
 3. Contractors and subcontractors....construction is hard/very technical/expensive

Lessons learned...cont.

- **Utilities:**
 - They need education!
 - They can be very cooperative...or not (remember “fuel anxiety”)
 - “Chicken or the Egg”...demand rates/charges can squirrel things quickly
 - Their 3 biggest woes when it comes to electrification
 1. Capacity
 2. Capacity, and
 3. Capacity...right now, the power is not there for the future.
- **Interconnectivity and Commissioning:**
 - Expect problems
 - Demand interconnectivity...it is going to happen anyway
 - Draft contracts carefully...incorporate “percentage of operability”
 - Choose Cons and Subs wisely...beware the low bid!
 - Prices are increasing rapidly!!!

Heavy Duty!



Transit



...it's a long story

Transit



Transit



Never pass up a chance to pass on the language 😊

School Bus



...it is not a long story

Lessons learned

- **Fuel Anxiety...**there are 2 kinds of people...those that do like EV's and those that do not (including HD vehicle managers). **GET THE RIGHT PEOPLE ON BOARD FIRST!**
- **Initial Fleet Purchases:**
 - Finding good deals...forget it, you are going to pay...a lot.
 - Do the math, cradle to grave, include infrastructure, then proceed.
- **Initial driving impressions:**
 - “Wow, this is a real truck...I thought it would be like a golf cart!”
 - Money talks...much louder than in the LD spectrum.
- **Range Anxiety:**
 - It is real...and ignored at one's own peril.
 - Season, weather, roads, load, topography, etc.
- **Misc:**
 - Most diesel pumps work...most EV charging stations work, but there is a **BIG** issue of availability (can you afford redundancy?).
 - What you buy today was outdated last year⊗...this industry seems to be changing more rapidly than in the LD world.
 - Level II...nope. Level III and do not spare the kW's.

Lessons learned...cont.

- **The Future:**
 - Level III IS GOING to tax the capacity of Utilities (we need to look at integration in the beginning stages of construction).
 - The “switch” seems inevitable...because of economics
- **The 3 types of liars:**
 1. Liars
 2. D@mn liars!
 3. Contractors and subcontractors....construction is hard/very technical/expensive
- **Utilities:**
 - They need education!
 - They can be very cooperative...or not (remember “fuel anxiety”)
 - “Chicken or the Egg”...demand rates/charges can squirrel things quickly
 - Their 4 biggest woes when it comes to electrification
 1. Capacity
 2. Capacity
 3. Capacity, and
 4. Capacity...right now, the power is not there for the future.

Lessons learned...cont.

- **Interconnectivity and Commissioning:**
 - Expect MAJOR problems
 - Demand interconnectivity...OEM's are engineering, designing, and building in vacuums. No economic model can withstand the additional costs of proprietary infrastructures.
 - Expect failures...this tech is much newer and far less tested than in the light duty realm
 - Redundancy...can you afford it?
 - Draft contracts carefully...incorporate interconnectivity and “percentage of operability”
 - Choose Cons and Subs wisely...beware the low bid!
 - Vehicle prices are moderating...infrastructure costs are increasing geometrically!!!
- **Too much a good thing:**
 - Success can be dangerous
 - Success can lead to unobtainable demands
 - Search out the programs...NOW!

Electric Vehicles...



...do not be shocked by their success.