Florida Public Service Commission
Electric Vehicle Workshop
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Emerging Industry

- Plug-in electric vehicles (PEVs) present a potential for increased load

- What is our role?
  - How do we facilitate adoption of PEVs in our market?
  - How do we ensure a positive customer experience?

- What will we need to do now / later in order to ensure we are a relevant participant in the future?

Tampa Electric Fleet

- Sixteen Chevy Volts
  - Sales and Marketing
  - Community Affairs
  - Energy Conservation
  - Meter Reading
- Three Nissan LEAFs
  - Sales and Marketing
  - Meter Reading
- Two Plug-in Hybrid Prius
  - Community Affairs
  - Fleet Services
- Twenty-one Bucket Trucks with Plug-in Electric Booms
  - System Services/Repair

Educating our Customers

- Communications plan for all PEV-related activities and milestones
  - News releases / Press events / Speakers' Bureau
  - Social media/ Local media/ Community events
    - Project Get Ready
    - Clean Cities Coalitions
    - Electric Drive Transportation Association
    - Edison Electric Institute
  - Website

- Link PEVs to a sustainable energy future to strengthen reputation as a utility committed to the environment.

- Promote value of our product
  - Economical and environmentally more favorable than gasoline
  - Reliable and domestic

Data Collecting

- Up to 20 charging stations at company facilities for Tampa Electric fleet use
  - Will be collecting data from stations

- Public charging infrastructure is being developed in service area
  - Approximately 50 public charging stations in our service area
  - Working with customers/stakeholders to access charging data

- Completed residential distribution system impact study looking at impact of home charging station load
  - Will be applying national data on home charging behavior to studies
  - Current level of PEV expansion suggests grid impacts are years away from being concerning

PEV Market Potential

- Forecasting of future penetration of PEVs is in early stages; estimates vary widely but penetration has mostly been below forecasts so far

- Our approach
  - Apply EIA methodology to Tampa Electric service area
    - % of new PEV sales by year
    - Compared this estimate to other forecasts
      - OUC, SCE, Berkeley, JD Powers, Fortune Magazine

  - Developed low, medium and high scenarios

Distribution System Impact Study

Purpose:

- Evaluate PEV load on typical underground, overhead and commercial circuits to determine system impacts

Questions:

- How much PEV penetration will cause system expansion or improvements?
- Will existing residential and commercial transformers and service conductor support added PEV load?
- Are there significant differences when charging PEV's on-peak or off-peak?

Residential Distribution System Impacts

- Overall
  - Residential transformers & service cable rating adequate for modeled PEV load
  - T&D planning cycle will identify and accommodate incremental residential PEV load for modeled PEV load and system improvements can be made during budget cycles

Commercial Distribution System Impacts

- Overall
  - PEV commercial loads will likely occur during on peak times
  - Line and Substation upgrades will be required
  - Tracking of commercial charging stations necessary, clustered charging load and potential for Level 3 charging installation at much higher voltage

Conclusions

- Growth and saturation rate for PEVs is widely speculative.
  - Low, Med, High Scenarios of 10k-50k cars by 2020
- Depending on the market penetration and the charging patterns, PEVs may impact TEC's generation expansion plan
- Residential home chargers would have minimal impact to the distribution system; clustering could be an issue on peak
- Commercial charging stations would require infrastructure upgrades and location monitoring
- It would be more beneficial if PEV charging is done off peak