Commerce Committee

Tuesday, November 14, 2023
3:00 PM - 5:00 PM
Webster Hall (212 Knott)

Meeting Packet

Paul Renner
Speaker

Bob Rommel
Chair

The Florida House of Representatives

Commerce Committee

Paul Renner
Speaker

Bob Rommel
Chair

Meeting Agenda

Tuesday, November 14, 2023
3:00 PM – 5:00 PM
Webster Hall (212 Knott)

I. Call to Order

II. Roll Call

III. Welcome and Opening Remarks

IV. Presentation and Discussion on Florida's Energy Future (Electrification, Smart Grids, Hydrogen):

Tom Ballinger, Director, Division of Engineering
Public Service Commission

Brian Lloyd, General Manager of Projects
Duke Energy Florida

David Lukcic, Senior Director, Operational Technology & Strategy
Tampa Electric Company

Tim Oliver, Vice President of Development
Florida Power & Light Company

Jim Nebergall, General Manager of the Hydrogen Engine Business
Cummins, Inc.

Michael Maten, Director of EV Policy and Regulatory Affairs
General Motors

V. Closing Remarks

VI. Adjournment

Public Service Commission

Overview of Florida Public Service Commission's Role in Electric Utility Planning

Presentation to the

Florida House of Representatives Commerce Committee

Tom Ballinger
Director, Division of Engineering
Florida Public Service Commission
November 14, 2023

FPSC Jurisdiction

Chapter 366, F.S.

- Authority over all electric utilities for the planning, development, and maintenance of a coordinated electric grid to assure an adequate and reliable supply of energy.

- If inadequacies exist, the Commission has the authority to require repairs, improvements, additions, and replacements of utility generation, transmission, or distribution facilities.

- Prescribe fair and reasonable rates and charges for investor-owned utilities in order to ensure the reliable provision of service.

FPSC Jurisdiction

Chapter 366, F.S.

- Goal is to achieve a balance between the cost of providing service and the reliability of the service provided.
- First step of process is the Ten-Year Site Plan (TYSP) review.

Ten-Year Site Plans

Chapter 186, F.S.

- The intent of the Ten-Year Site Plans is to give state, regional, and local agencies advance notice of proposed power plants and transmission facilities.

- Utilities provide forecasts of customer energy needs and resulting generation and transmission requirements to maintain reliability.

- Recent plans include impacts of increased solar generation resources and electric vehicle adoption.

Ten-Year Site Plans

Chapter 186, F.S.

- Ten-Year Site Plans are not a binding plan of action on electric utilities. As such, the Commission's classification of a Ten-Year Site Plan as suitable or unsuitable has no binding effect on the utility.

- The Commission's annual reviews can be found at:

https://www.floridapsc.com/ten-year-site-plans

Impact of Electric Vehicles

- In 2012, the FPSC reported on the effects of Electric Vehicle (EV) charging on the grid. (See 366.94(4), F.S.)

- At that time, EVs were estimated to account for less than 0.01 percent of all energy consumed. This value was projected to increase to approximately 0.33 percent by 2021. Similar impacts on peak demand were also estimated.

- As such, EVs were not expected to drive the need for any new generation over this ten-year period.

Impact of Electric Vehicles

- Clustering of EV chargers in residential neighborhoods or public quick charge stations could impact the distribution system.

- Full report can be found at:

https://www.floridapsc.com/pscfiles/website-files/PDF/Publications/Reports/ElectricGas//Electric_Vehicle_Charging_Report.pdf

Impact of Electric Vehicles

- In 2018, the FPSC provided an update to the 2012 EV report.
- While the market for all-electric vehicles and plug-in hybrid vehicles had expanded, the EV market was still considered a niche market representing a small percentage (3-4%) of total vehicles sold each year.
- Again, no material effect on need for new generation. Any need for distribution upgrades would be localized and isolated.

Impact of Electric Vehicles

- Since EV charging is most likely to impact distribution system, time-of-use rates are a useful strategy to mitigate potential increases in peak demand associated with EV charging, by encouraging EV owners to charge during off-peak hours.

- Full report can be found at:

https://www.floridapsc.com/pscfiles/website-files/PDF/Utilities/ElectricGas/ElectricVehicles//2018/2018_Electric_Vehicle_Charging_Study_Update.pdf

Impact of Electric Vehicles

- Utilities have an obligation to serve all of a customer's load as it changes over time. As previously mentioned, EV impacts are incorporated into utility load forecasts for the TYSP process. The values below are only for 7 reporting utilities.

- In Florida, EVs are estimated to grow from approximately 279,000 in 2023 to approximately 2.6 million by 2032.

- Public charging stations are projected to grow from approximately 11,000 to 49,000 during this same time period.

Impact of Electric Vehicles

- By 2032, EV energy consumption is projected to be 3.9% of total energy consumed, 4% of summer peak demand and 1.8% of winter peak demand.

- EV impact is growing, but also being closely monitored by the utilities and reviewed by the FPSC through the TYSP review.

Electric Utility EV Charging Programs

- In recent years, utilities have sought and been granted approval for EV charging programs.

- Duke Energy's 2021 EV charging program
  - 100 fast-charge stations
  - Tariff for a fast-charge fee collected from EV owners who used DEF stations. Fee based on average cost for charging provided by other fast-charge operators
  - Rebates for commercial/industrial customers installing level 2 or fast-charge stations
  - Residential customer credit ($10/month) if they observe off-peak charging

Electric Utility EV Charging Programs

- Florida Power and Light's 2021 EV pilot charging program (2022-2025)
  - Public fast-charging stations
  - Residential level 2 chargers
  - Commercial fleet charging
  - Evaluation of emerging EV technologies and enhancements to software to support charging programs
  - Education component to increase awareness

- Tampa Electric's 2021 EV pilot charging program
  - 200 level 2 chargers
  - 4 fast-charge stations

Questions?

Tom Ballinger
Director, Division of Engineering
Florida Public Service Commission
tballing@psc.state.fl.us
(850) 413-6680

Duke Energy Florida



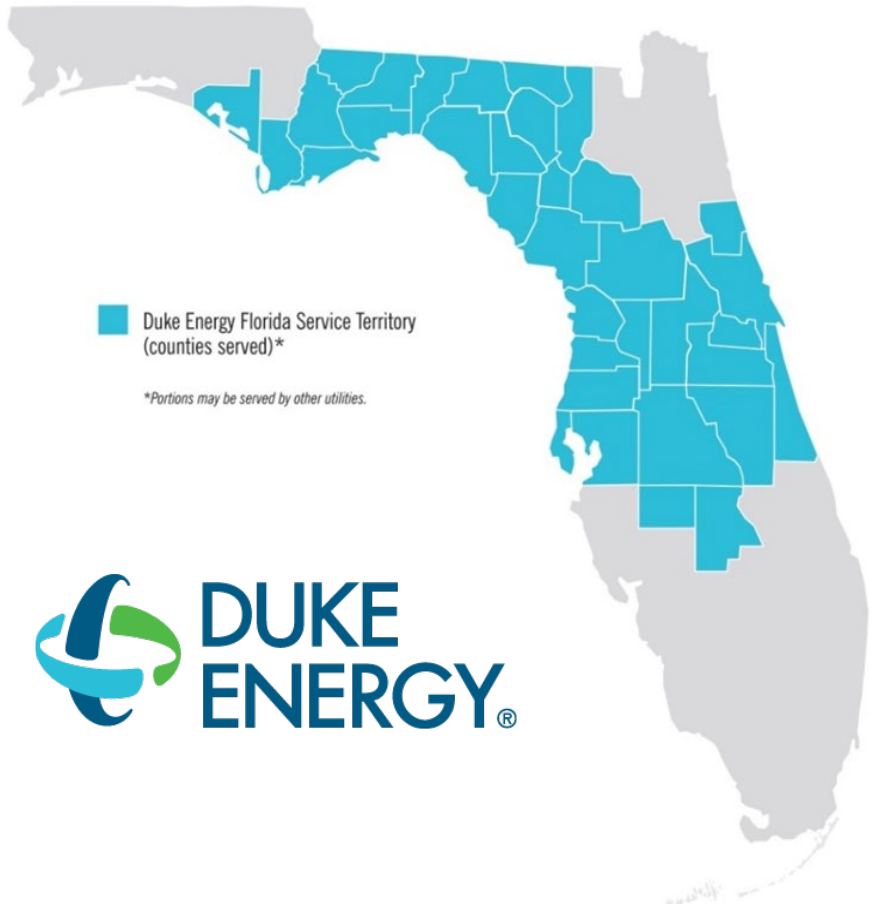
Building a Smarter Energy Future

Brian Lloyd, Duke Energy Florida
General Manager Major Projects

NOV. 14, 2023

BUILDING A SMARTER **ENERGY FUTURE**

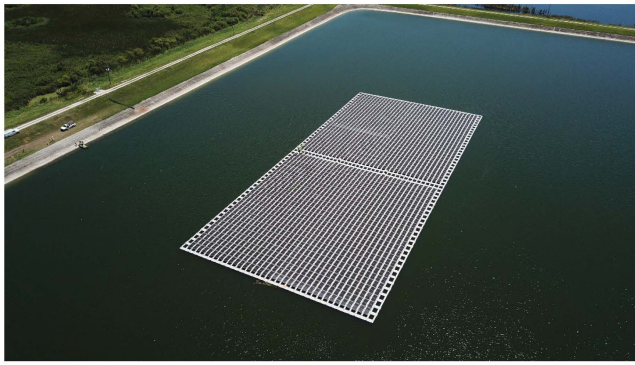
- **Solar Investments**
- **Energy Storage Systems**
- **Strengthening the Grid**
- **Smart Thinking Grid**
- **Smart Meters**
- **Supporting Customers**



DUKE ENERGY®

SOLAR INVESTMENTS







ENERGY STORAGE SYSTEMS







STRENGTHENING THE GRID



POLE INSEPCTIONS **& UPGRADES**

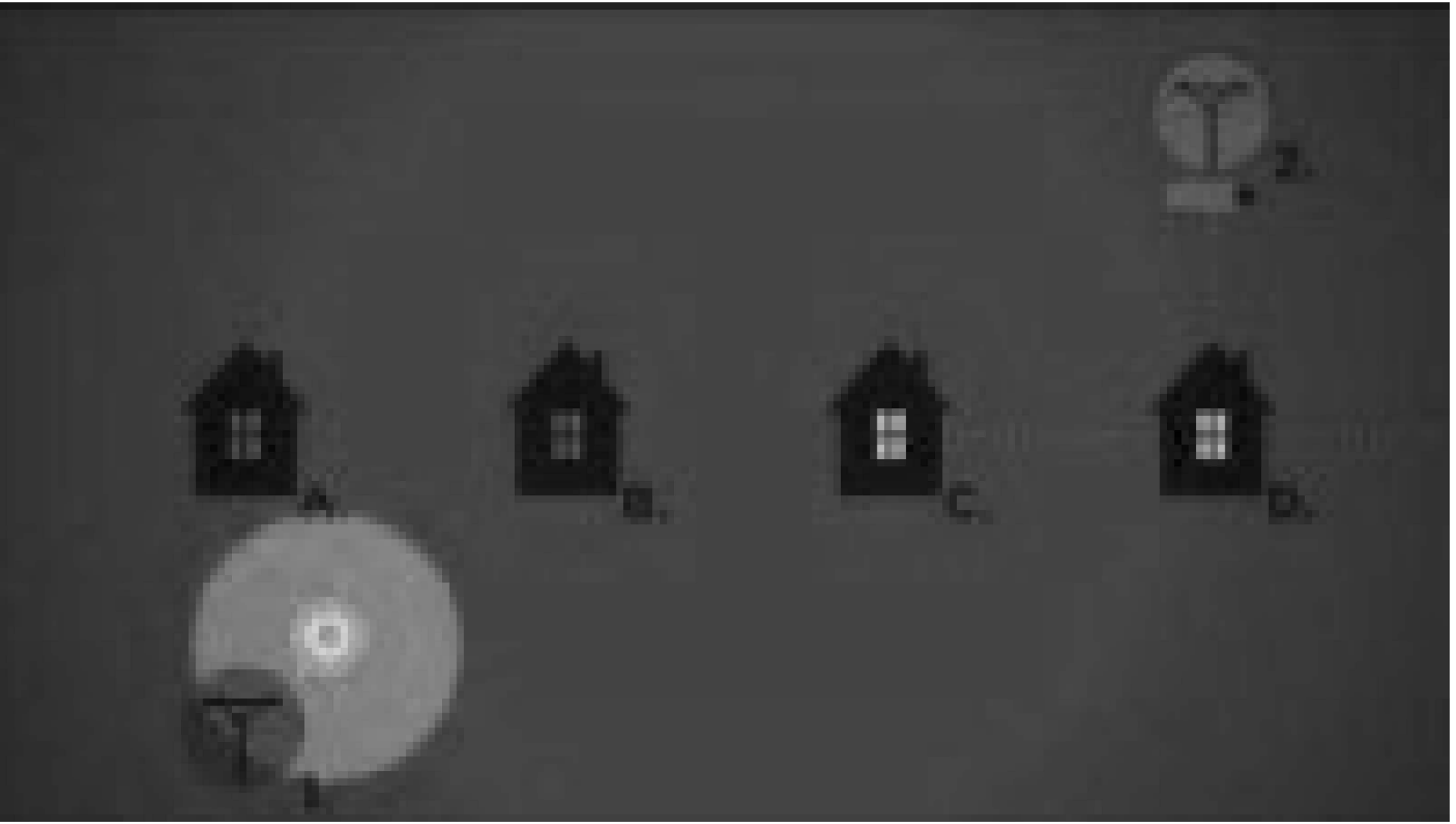
- Since 2021, the company has hardened more than **12,000 poles** on its distribution system and **4,000 poles** on its transmission system.

VEGETATION **MANAGEMENT**

- Depending on the type of distribution lines, we trim on **three-five-year** cycles.

- In 2022, our transmission team performed planned maintenance work on more than **500 miles**.

SMART-THINKING GRID



SMART-THINKING GRID



SELF-HEALING TECHNOLOGY

- During Hurricane Ian - more than **160,000 outages** avoided, saved nearly **200 million minutes.**
- During Hurricane Idalia - more than **17,000 outages** avoided, saved more than **5 million minutes.**

SMART METERS

Smart meters are the gateway to more customer options and control.





SUPPORTING **CUSTOMERS**



Increasing outreach to more eligible customers unaware of assistance through **direct digital campaigns.**



Evolving tools for call center staff so agents can refer customers to open local agencies with greater precision.



Expanding **participation in Energy Efficiency, Clean Energy** and other program and services to mitigate high bills.



Increasing **external community engagement.**



Investing in **technology enhancements** to support the need to continue increasing customer assistance.



My Energy Bill+ Subscription program with special terms for low-income customers.



Shared Solar and Clean Energy Connection (CEC) Community solar-type program that offers preferential terms to low-income customers. Already active in Florida.



BUILDING A **SMARTER** ENERGY FUTURE®

Tampa Electric Company

TECO
TAMPA ELECTRIC
AN EMERA COMPANY

NOVEMBER 14, 2023

Grid Modernization Transformative Journey
Florida House Commerce Committee

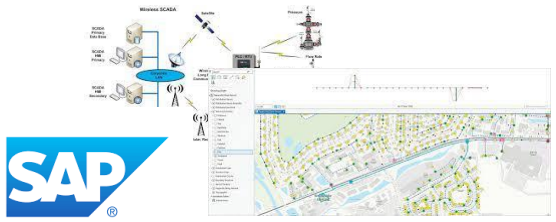
David Lukcic PE
Senior Director, Operational Technologies & Strategy

Grid Modernization Transformative Journey and Maturation

Foundational

Initial systems were implemented to provide the ability to better support customers and improve reliability:

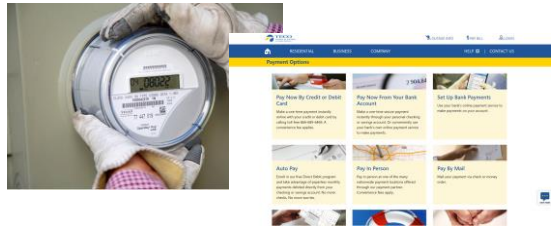
- *Energy Management System (EMS)*
- *Supervisory Control and Data Acquisition (SCADA)*
- *Outage Management System (OMS)*
- *Geographical Information System (GIS)*
- *SAP- Customer Relationship Billing (CRB)*
- *Mobile Dispatching*
- *Pole Hardening system*



Interactive

Foundational Grid Modernization interactive solutions are introduced with near real time information that provides visibility to the network in order to respond to customer needs and to provide new services:

- *Advanced Metering Infrastructure (AMI)*
- *Advanced Distribution Management System (ADMS)*
- *LED Lighting/ GenX Network*
- *Grid Scale Solar*
- *Customer Portal*



Intuitive / Resilient / Connected

Tools to improve reliability and provide support / services at the Grid Edge will be areas of focus during this period:

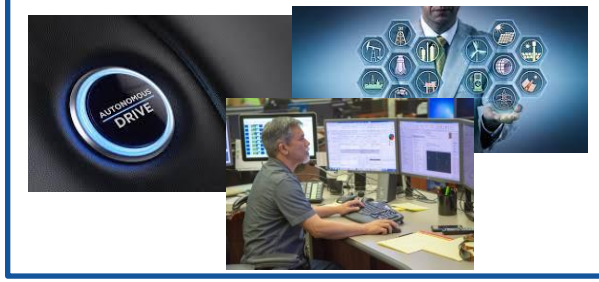
- *Storm Protection Plan (SPP)*
- *Fault Location Isolation & Service Restoration (FLISR)*
- *PLTE*
- *Distributed Intelligence Applications*
- *Data Analytics Platform (DAP)*
- *Distributed Energy Resource Management (DERMS)*
- *Bearss Operations Center*
- *Customer Experience Digitization*
- *Asset Management*
- *Grid Edge Devices*
- *Renewables and Storage*



Autonomous / Flexible / Transactional

Solutions in the final phase will be transactional and bring autonomy, flexibility via:

- *Distributed Energy Resources (DERs)*
- *Electric Vehicles (EV's)*
- *Green House Gas (GHG) Management (80% Target)*
- *Artificial Intelligence / Machine Intelligence (AI/ML)*
- *Neural Distribution Networks*
- *Distribution System Operator*
- *Aggregation and DER Power Trading*



Past | **Present** | **Future**

TECO TAMPA ELECTRIC AN EMERA COMPANY

Yesterday's Distribution Circuits



Power Transformer



Circuit Breaker



Capacitor Bank



Circuit Reclosers



Automatic Lateral Switch



Smart Meter
AMI
Distributed Intelligence



Customer



Voltage Regulator
(Only on System
where voltage
increase is needed)



Customer



Monitoring & Control
(Legacy System)

TECO TAMPA ELECTRIC AN EMERA COMPANY

Today's Evolving Distribution Circuits



Power Transformer



Circuit Breaker

Monitoring & Control – ADMS



Primary Line Sensor





Voltage Regulator

Fault Indicator – Padmount Line Sensor



DR
Demand Response Programs

Circuit Reclosers





Capacitor Bank

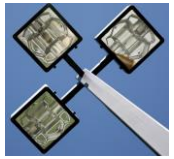
Smart Meter
AMI
Distributed Intelligence



Vehicle-to-Grid (V2G)



Smart Street Light – Smart Cities



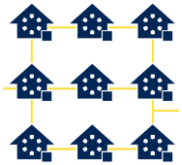


Electric Vehicle Charging Station

Automatic Lateral Switch



Microgrids



Fault Indicator – Lateral Line Sensor



Solar



Battery Storage



Customer



Circuit Reclosers



Customer



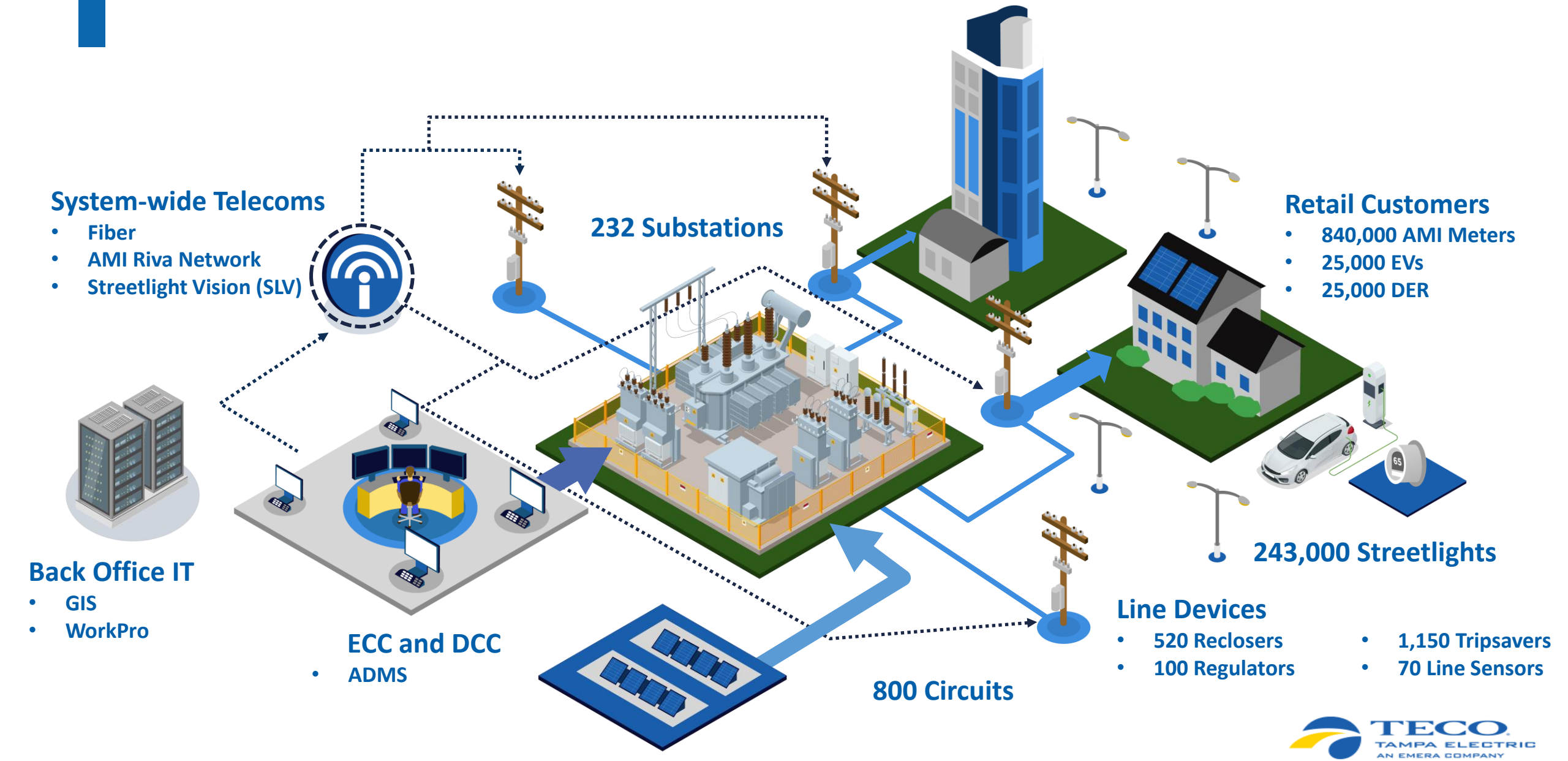
TECO TAMPA ELECTRIC
AN EMERA COMPANY

Tampa Electric's Examples of Active Grid Modernization Initiatives

- Enabling automation capabilities to drive improved customer reliability and storm resiliency.
- Controlling DER's, EVs and battery storage systems to manage costs and affordability.
- Deploying technology to maintain grid stability in a world with more renewable, intermittent generation resources.
- Designing in safety from an enterprise view on all protection equipment and device coordination.
- Adopt standardized customer smart inverter standards to enable effective utility interconnections.
- Leveraging industry leading AMI data and functionality.
- Distributive intelligence to actively manage the grid real time.
- Retooling all back-office functions like GIS and the work management systems.
- Expanding telecommunications capacity to enable smart grid and smart city applications.

TECO TAMPA ELECTRIC AN EMERA COMPANY

TEC's Distribution System By the Numbers – Current State



System-wide Telecoms
- Fiber
- AMI Riva Network
- Streetlight Vision (SLV)

232 Substations

Retail Customers
- 840,000 AMI Meters
- 25,000 EVs
- 25,000 DER

243,000 Streetlights

Back Office IT
- GIS
- WorkPro

ECC and DCC
- ADMS

800 Circuits

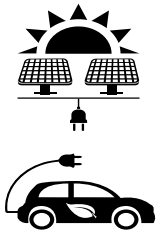
Line Devices
- 520 Reclosers
- 100 Regulators
- 1,150 Tripsavers
- 70 Line Sensors

TECO TAMPA ELECTRIC AN EMERA COMPANY

Our Transformation to a Modernized Distribution System

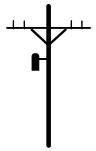
The investments necessary to exchange electric flows and information across domains from TEC's systems to the grid edge, preparing TEC to operate most effectively in a decentralized world.

Customer DER Infrastructure



- Smart Inverter/Smart Charging
- Interconnection Standards
- V2G Integration
- EV Charging / DER Infrastructure
- DAP Awareness Use Cases

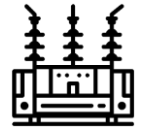
Line Devices



- Switchgear/Reclosers
- Line Sensors
- Regulators
- Automatic Lateral Switch
- Premium Network Services
- Cap Banks

Substations

- Circuit Breaker / Digital Relays
- RTU Upgrades and Network Capabilities
- Load Tap Changers
- Power Transformer Replacements



Telecommunications



- AMI/SLV Network Convergence
- **Private LTE**
- Fiber Buildout
- Substation Ethernet Buildout

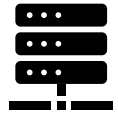
Control Systems OT



- Diagnostic & Drone Center
- RCC Tool Expansion
- Mobile Dispatching Upgrade
- ADMS Upgrades
- DERMS
- Line Sensing Software

Back Office IT

- GIS Replacement
- WMS
- Distribution Design Tool
- CRB Device Expansion
- Distribution Planning Tool Upgrade



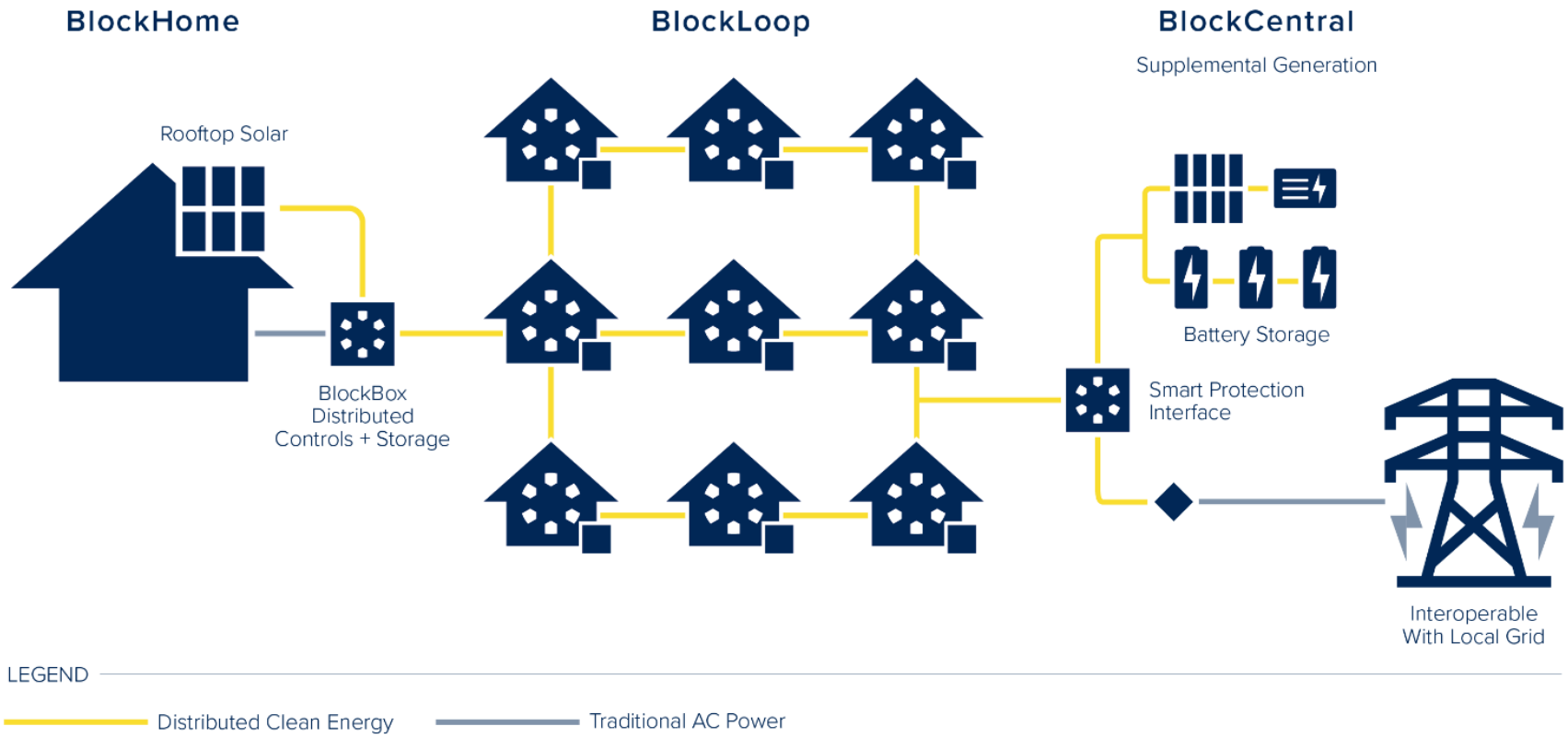
⇆ Bi-directional power flows

⇢⇠ Information flows

TECO TAMPA ELECTRIC AN EMERA COMPANY

BLOCKENERGY™
SMART PLATFORM

BlockEnergy is a distributed energy platform that is **owned by utilities** with high levels of renewables and superior resilience. Utilities can now offer communities a **local renewable energy system** that brings them solar energy and storage at their home, while remaining a grid asset. Its smart distributed controls make it **easy to scale**. BlockEnergy can **operate independently of the Grid, or act as a Grid resource.** Its **data-rich** digital platform integrates seamlessly into existing SCADA systems and its design aggregates hundreds of rooftop solar connections into a single point of common coupling.



TECO TAMPA ELECTRIC
AN EMERA COMPANY



Glossary Appendix

- Advanced Distribution Management System (ADMS)
- Advanced Metering Infrastructure (AMI)
- Artificial Intelligence / Machine Intelligence (AI/ML)
- Bearss Operations Center (BOC)
- Customer Relationship Billing (CRB)
- Data Analytics Platform (DAP)
- Diagnostic and Drone Center (DDC)
- Distribution Control Center (DCC)
- Distributed Energy Resources (DERs)
- Distributed Energy Resource Management System (DERMS)
- Electric Vehicles (EVs)
- Energy Control Center (ECC)
- Energy Management System (EMS)
- Fault Isolation & Service Restoration (FISR)
- Fault Location Isolation & Service Restoration (FLISR)
- Geographical Information System (GIS)
- Green House Gas (GHG) Management
- Private Long-Term Evolution (PLTE)
- Remote Terminal Unit (RTU)
- Renewable Control Center (RCC)
- Storm Protection Plan (SPP)
- Streetlight Vision (SLV)
- Supervisory Control and Data Acquisition (SCADA)
- Vehicle Grid Integration (VGI)
- Vehicle-to-Grid (V2G)
- Work Management System (WorkPro / WMS)

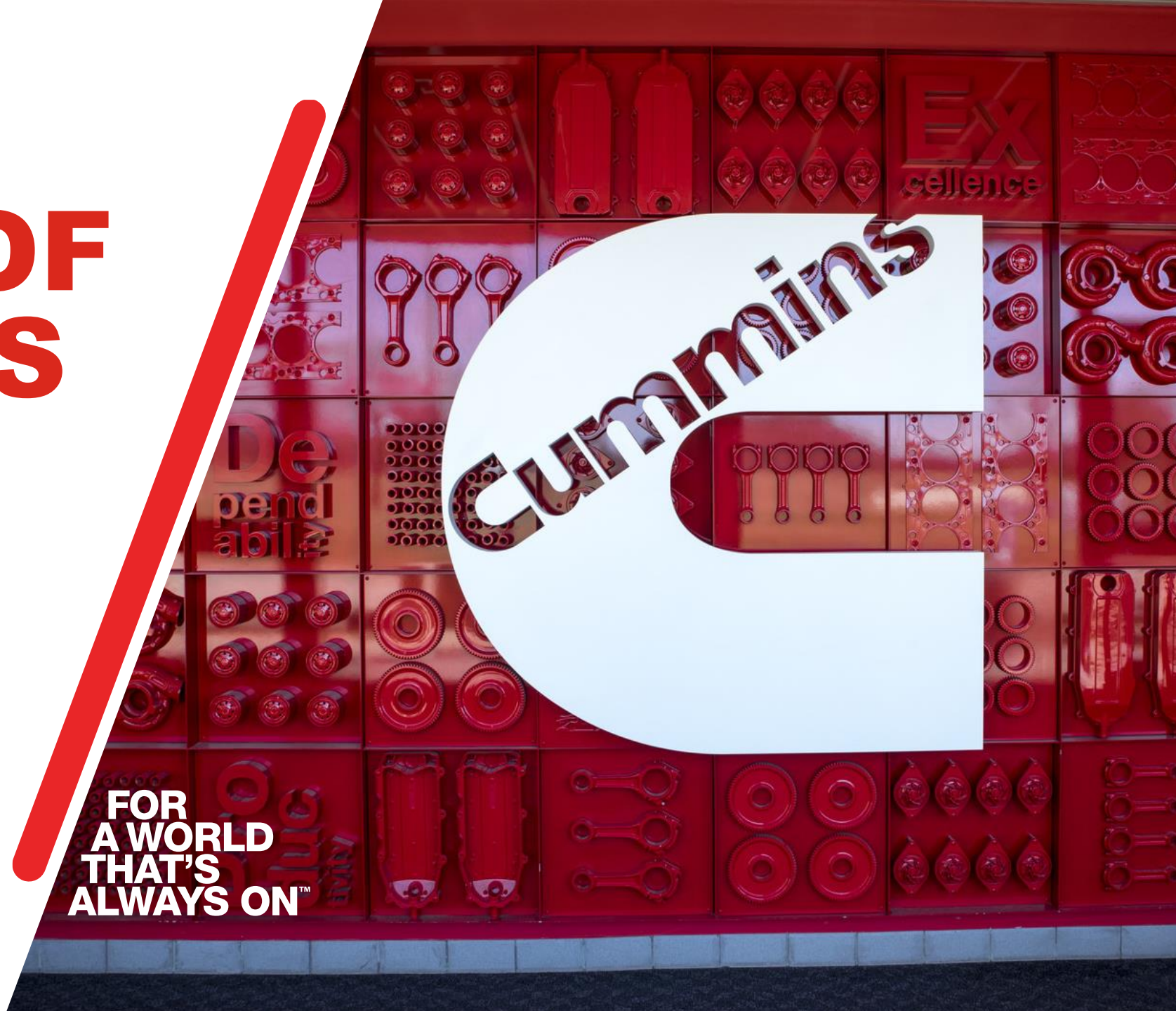
THIS IS THE

POWER OF CUMMINS

Jim Nebergall

General Manager - Hydrogen Engines
Cummins Inc.

Public



A history rooted in innovation, now powering a more prosperous world

Founded in 1919

Cummins was founded by Clessie Cummins and W.G. Irwin, who believed in the power of ideas and had a shared vision of what ingenuity and hard work could achieve.

Powering a more prosperous world for more than 100 years

190	**Countries and territories***
73,600	**Global employees**
104	**Years of industry leadership**
10,600	**Cummins certified dealer locations**
$1.2B	**Invested in research and technology in 2022**

** Approximation of countries and territories with Cummins service*

As published in the 2022 10K found on cummins.com.

Destination Zero:

Our company strategy to achieve zero emissions by reducing greenhouse gas (GHG) emissions and supporting the transition to decarbonized power



Lower emissions today



Reduce well-to-wheels emissions



Drive wide-scale customer adoption



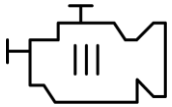
Achieve zero emissions by 2050

Visit the Destination Zero site for more information

REDUCING WELL-TO-WHEELS EMISSIONS

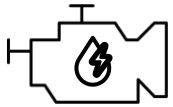
BY INNOVATING THE ENERGY SOURCES AND THE POWER SOLUTIONS

POWER SOLUTIONS

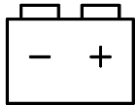


ADVANCED ENGINES

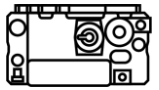
Diesel | Natural Gas | Hydrogen



HYBRID



BATTERY ELECTRIC



FUEL CELL ELECTRIC

ENERGY SOURCES



LOW CARBON FUELS

Expand CNG, RNG, Bio/Renewable Diesel



ELECTRICITY

Decarbonize the grid

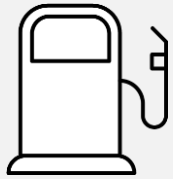


HYDROGEN

Produce green H_2

Different Use Cases: Complementary Technologies

Diesel



Versatile
Reliable
Low Cost
Ubiquitous

Use Case

Regulations

Incentives

Decarbonization Goals

Infrastructure

Business Model

…

Zero Greenhouse Gas (GHG) Technologies

- Hydrogen Fuel Cell
- Hydrogen Internal Combustion Engine (ICE)
- Renewable Natural Gas
- Renewable Diesel

- Battery Electric Vehicles

Urban | **Regional** | **Long Haul**

Daily Mileage (miles)
Daily Usage (hours)

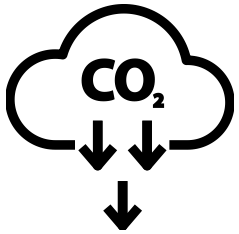
200
Up to 4

400
Up to 6

ON-HIGHWAY TRUCKS AND FLEETS

THE BACKBONE OF U.S. ECONOMY

1



25% GHG contribution
within the transportation sector

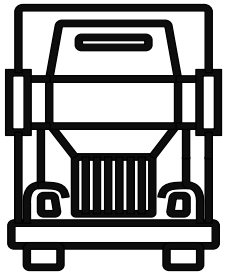
2



~70% of U.S. goods
(by tonnage) are transported by trucks

~$1 trillion freight revenue
from trucking

3



~10M trucks
transport goods within U.S.

~750k fleets
that own or lease these trucks

- 95% operate <10 trucks
- 99% operate <100 trucks

Why Hydrogen for Trucking

ZERO-CARBON

CAN GET THE JOB DONE

FAST REFILL TIME

MULTIPLE POWER SOLUTIONS – ENGINE & FUEL CELL

GLOBAL HYDROGEN ECONOMY DEVELOPING

LOCAL RESILIENCE

ENERGY INDEPENDENCE

FUEL DISTRIBUTION MIMICS DIESEL FUEL

FUELING INFRASTRUCTURE

FUEL COST

PERMITTING

Headwinds

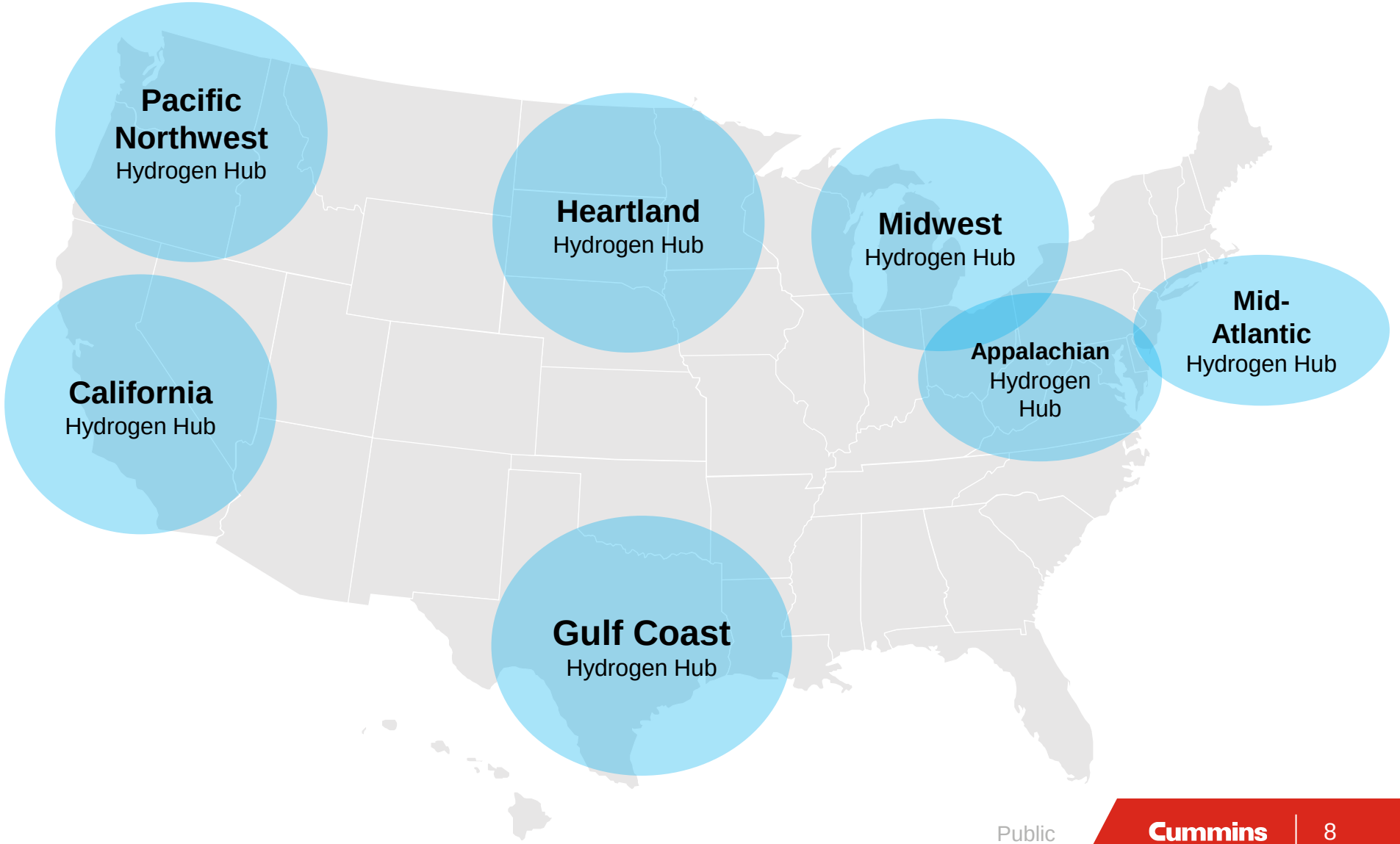
Barriers



Public

REGIONAL HYDROGEN HUBS

- Hydrogen infrastructure build out is happening regionally.
- Hydrogen transportation corridors are developing.



THE HYDROGEN ECONOMY HAS STARTED IN FLORIDA



FLORIDA POWER & LIGHT COMPANY (FPL) -- FPL OKEECHOBOEE CLEAN ENERGY CENTER

25MW Hydrogen Production Facility

- Cavendish NextGen Hydrogen Hub
- Cummins Electrolyzers, sold under the Accelera by Cummins brand, use green electricity to split water molecules into hydrogen and oxygen
- Then the hydrogen is blended with natural gas to produce lower carbon electricity to decarbonize the electrical grid









THANK YOU!

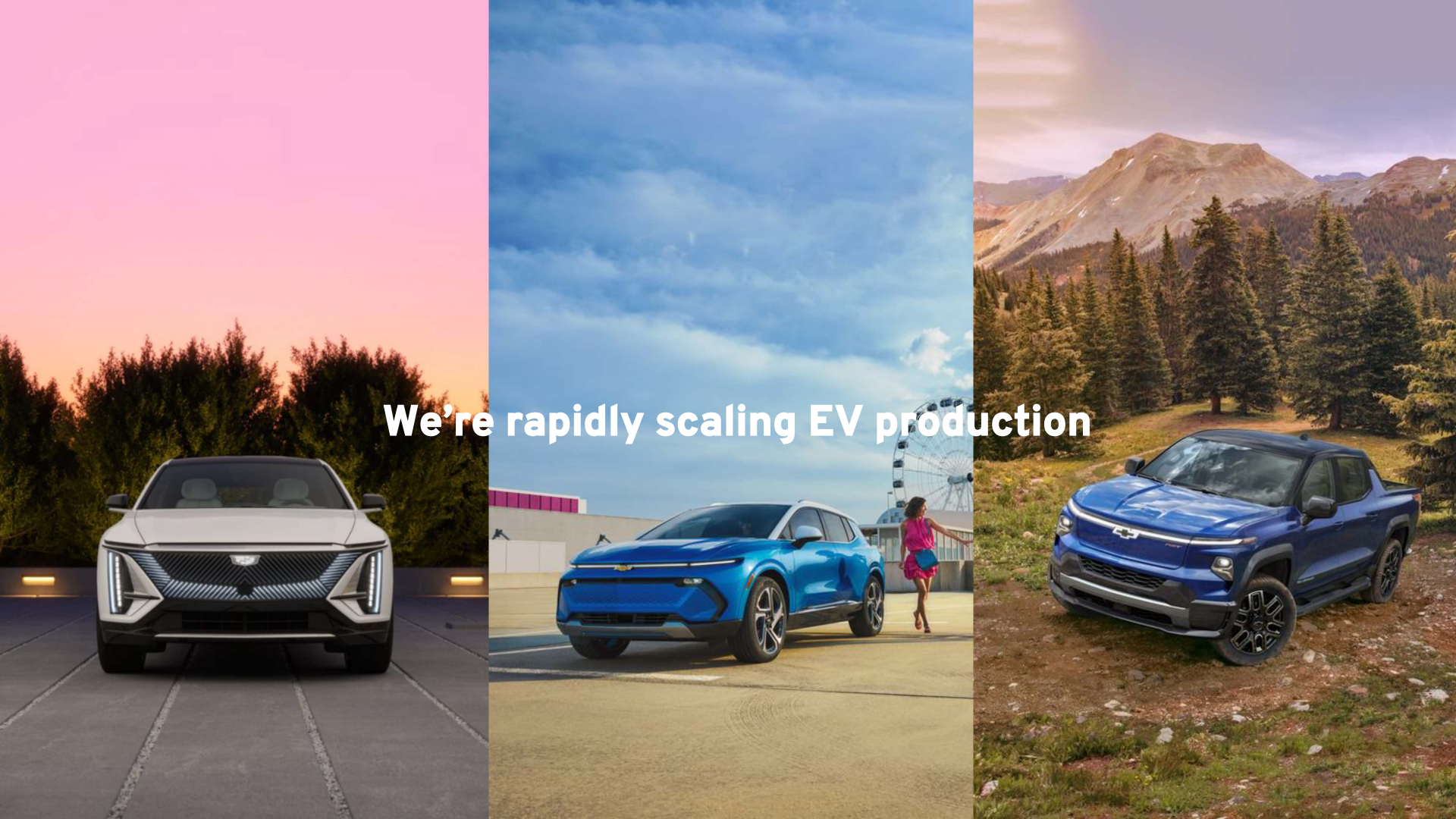
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EV Infrastructure & Charging

Michael Maten
Director, EV Policy and Regulatory Affairs – General Motors
November 2023


We’re rapidly scaling EV production

US EV Launches - Ultium



Underpinning our EV launches
in the US is the
Ultium architecture



ultium

Enough Cells For More Than One Million EVs per Year



Lansing, MI | Late 2024

Warren, OH | Open

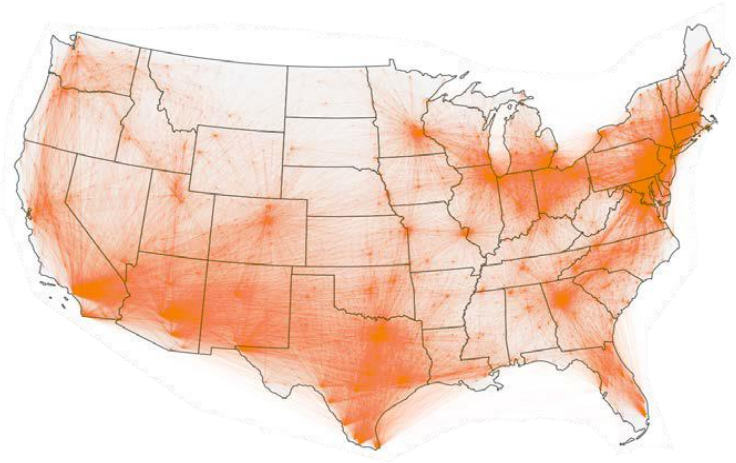
New Carlisle, IN | 2025 (with Samsung SDI)

Spring Hill, TN | Late 2023

=160 GWh/Year

NREL: Projected US Charging Infrastructure Need by 2030

NREL 2030
Charging Analysis



County-to-country origin-destination flows

Scaling Up
Meeting Public Charging Demand

1

Highway & Local Communities

182,000 DC fast charging ports

- Todays Network **~31,000** ports
  $27-44 billion

2

Near Work & Home

1 million public L2

- Today's network: **109,000** L2 chargers
  $5-11 billion

Plus **26.8 million privately accessible L1/L2** at single family homes, multi-family, workplaces

expanding access & improving experience

2020	2021	2023	2024+
metro	home	highway	superchargers
Support EVgo to build 3,250 DCFC in top 50 metros	Free or subsidized turnkey home installation	Co-invest with PFJ to build 2,000 highway DCFC every 50 miles	Access to Tesla's Superchargers from 2024, 12,000 fast chargers and growing

recently announced

Charging Joint Venture, deploying 30,000 DC chargers across North America

GM HONDA BMW STELLANTIS MERCEDES KIA HYUNDAI

NACS Adoption

- **Industry is moving to the North American Charging Standard**
  - First GM EV with NACS in CY2025
  - Nearly all OEMs have announced NACS adoption

- **GM customers will be able to access Tesla Superchargers**
  - **2x** the fast chargers available today
  - Combined Charging System (CCS)-to-NACS adapter available early 2024



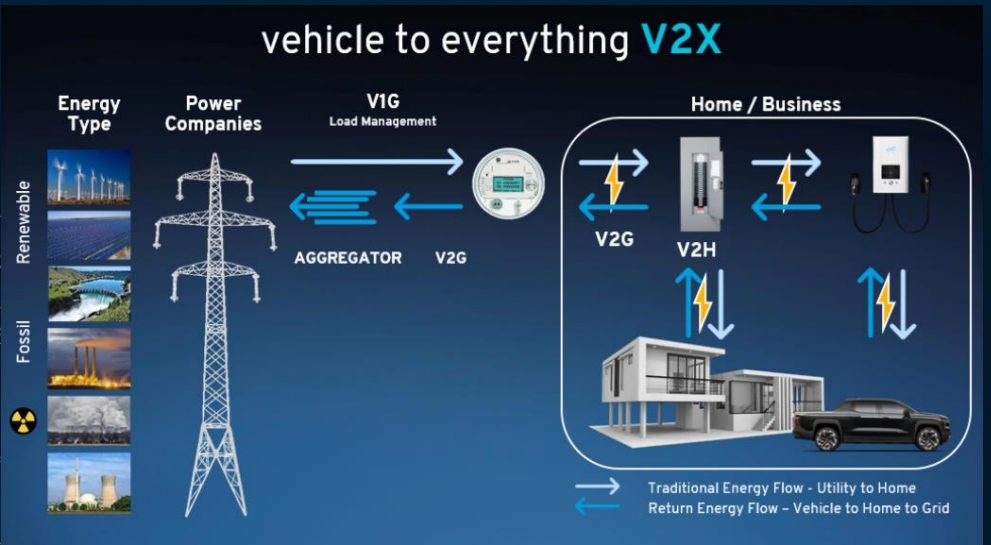
WHY?

- **Accelerate convergence to a single standard**
- **Accelerate customer confidence & EV adoption**
- **Benefit from NACS**
  - Availability, ergonomics, reliability, etc.

Vehicle-Grid Integration (VGI)

EVs are smart, flexible load that can provide widespread benefits for FL

- Reduced impact on the grid
- Avoided infrastructure investments
- Lower electricity costs
- Grid resiliency and renewable integration
- Emergency backup power



V1G – Unidirectional Managed Charging

- Start, stop, slow charging to align with grid needs
- Reduces grid impacts and upgrades
- Saves money for customers and businesses
- Minimal customer impact

V2X – Bidirectional Charging

- Bidirectional flow of electricity into / out of vehicle
- Can provide home backup in case of outage (V2H)
- Potential to sell power back to the grid (V2G)

EVs and other distributed energy resources can be aggregated to create "virtual power plants"

EV INFRASTRUCTURE AND GRID INTEGRATION

Policy Opportunities



Proactive Utility & Grid Planning



Additional Funding



Streamlined Permitting & Approval Processes

Ongoing Work



Equipment Standardization



Charging Reliability & Customer Experience



Research & Roadmaps


Thank you.