INNOVATION, RELIABILITY, AND DURABILITY:

Paving The Path Forward In Fleet Electrification

FIRSTstudent

INTRODUCTION AND KEYNOTE OVERVIEW

- Reliability and durability in electric transportation
- Innovation as the driving force behind progress
- Why collaboration across sectors is essential

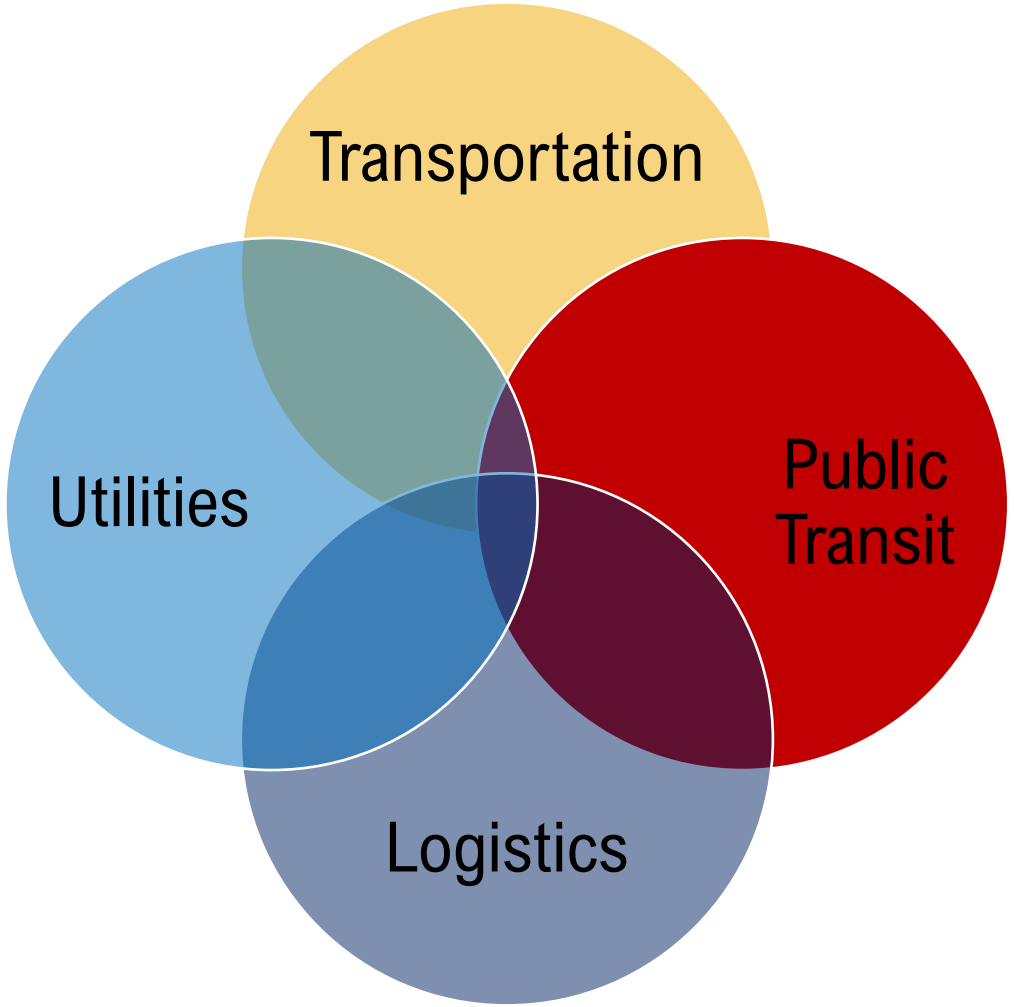
FIRST STUDENT'S FLEET ELECTRIFICATION

- 43 states and 8 Canadian provinces
- Over 60K employees
- 46,000 vehicles
- 1,327 customers
- Deployed over 360 ESBs successfully
- 1,682 EVs awarded
- Driver Training SME on the National Safety Council Steering Committee for Fleet Electrification
- Vast Transportation Management Expertise
- Award-Winning Safety Program
- Cutting-Edge On-Board Bus Technologies
- Industry-Best Fleet Maintenance
- Professional Routing Expertise
- Unmatched Scale/Purchasing Power
- Strong Relationships With:
  - OEM's
  - Parts Vendors
  - Industry Advocacy Associations
  - Funding/Grant Writers

INNOVATION AS THE ENGINE FOR PROGRESS

- Innovation drives electric transition in medium and heavy-duty vehicles
- Industries must work together to ensure future growth and adaptability
- Solving common challenges requires breakthrough thinking

IMPORTANCE OF COLLABORATION ACROSS INDUSTRIES



TRIANGLE OF SUCCESS FOR ELECTRIFICATION

Electric Vehicle

Charger

Charge Management System (CMS)

CHALLENGES IN HIGH POWER CHARGING

- High-power charging is essential but presents unique challenges
- First Student has deployed 362 ESBs and is working on deploying 1,700 more
- We have worked with over 40 different utilities – each with different requirements
- Aligning charger specifications, grid readiness, and utility coordination is complex
- Focus on solving high-power charging issues to ensure reliability

TRANSFERABILITY OF ELECTRIFICATION EFFORTS

Steelton-Highspire School District

- Two schools and approximately **1,350 students**
- **95%** of our students are economically disadvantaged
- Working with a **$11.7M deficit**
- Already had a 1.7 MW Solar Array
  - Powers **100%** of our electricity needs
  - **$2M** in energy savings over the next two decades
- **Six (6)** new electric school buses
- Incorporated First Student's **First Charge infrastructure solution**
  - Provide a level of **support in times of need**
  - Can be used for teachers and aids in **retention**
  - Opportunity for **public use for the community**
  - More charging stations will provide **more revenue** for the district

Photo Credit: ADAPT Creative; adaptcreativeco.com

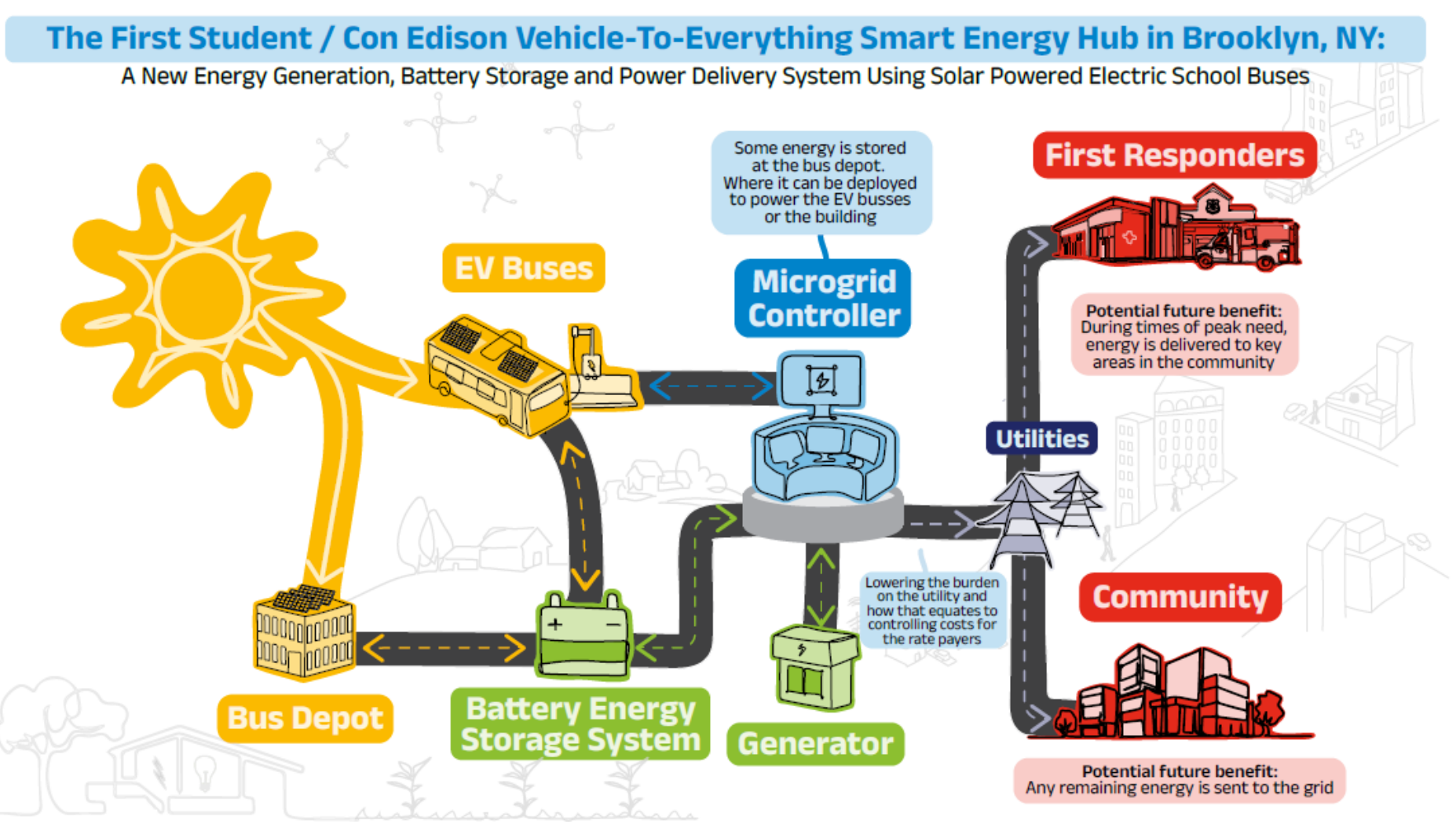
STRATEGIC PARTNERSHIPS

LESSONS LEARNED FROM UTILITY ENGAGEMENT

Utilities may offer additional funds beside state and federal support:

- **Make Ready Programs**
  - Reduces the cost of the EV-charging infrastructure
  - Covers some or all of the electric charging infrastructure.
  - Not a one-size-fits-all solution
    - Public or private?
    - Is the equipment covered in front of the meter and/or behind the meter
- **Business Case**
  - Factors such as power requirements, identifying the right vehicles, infrastructure support to reduce capital needs, etc.
- **Future Proofing**
  - Most utility programs limit service to actual or “committed” units deployed over a certain time period – this can impact future deployment of EVs

THE ROLE OF RESILIENCY IN ELECTRIFICATION



THE ROLE OF RESILIENCY IN ELECTRIFICATION

CYBERSECURITY AND GRID PROTECTION

As EV infrastructure becomes more integrated with the grid, protecting systems from cyber threats is essential to maintain operational safety and reliability.

- Impact of Bidirectional Charging (V2G)
- Aging Grid Infrastructure
- Potential Risks of Inadequate Security
- Grid Overload and Frequency Instability
- Collaborative Protection
- Liability and Risk Mitigation

BUILDING A RELIABLE FUTURE

- Reliability and durability are the cornerstones of successful electrification
- Early failures in EV deployment could stall adoption and damage public perception
- The industry must work together to ensure long-term success in electrification
- Continued collaboration will help solve challenges in high-power charging, resiliency, and reliability

THANK YOU

Q & A