



# AEG Mobility & Transportation Challenge

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**160,000**  
Employees globally

**70**  
Countries

**€61Bn**  
Revenues

**€12Bn**  
Investments in energy transition over 2019-2021

**24.8GW**  
Installed renewable capacity

**€182M**  
R&D spend

**+1,000**  
Researchers & Experts in 11 R&D centers

**€166M**  
Investment in innovative start-ups

**+100**  
University partners

**1<sup>st</sup>**  
Independent power producer in the world

**1<sup>st</sup>**  
Globally in microgrids

**1<sup>st</sup>**  
Globally in cooling distribution networks

**2<sup>nd</sup>**  
Globally in Electric vehicle charging stations

**2<sup>nd</sup>**  
Global supplier of technical installation services

**4<sup>th</sup>**  
Globally in heating distribution network

**Mobility**



**2<sup>nd</sup>**  
**Largest**  
provider of EV charging stations

**900M+ kWh**  
charged in 2018

**75,000+**  
installed charging stations globally

**\$3.2B in Savings**  
For US clients identified via data analytics over past 5 years

**1,000,000+ Sites**  
Under management (25% of Fortune 500) supported by our platform and analytics

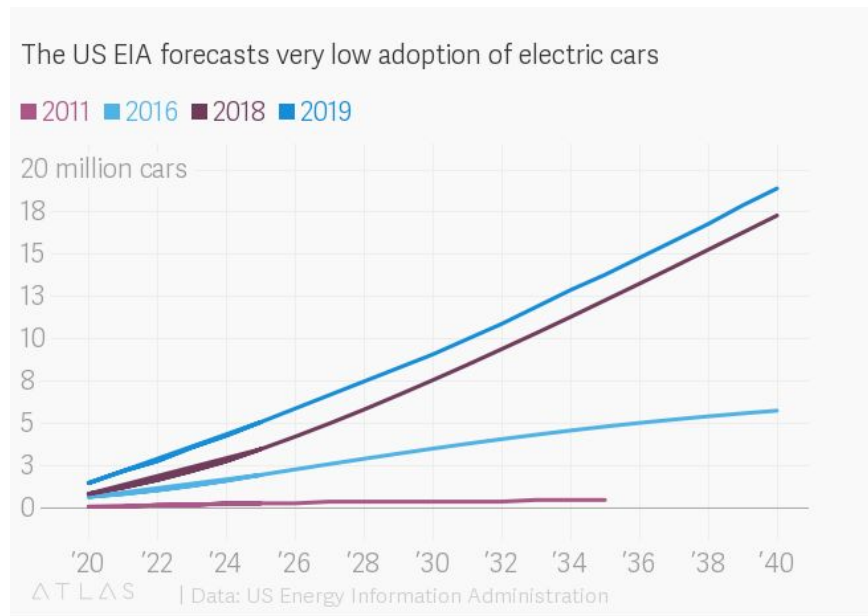
**55+ Countries**  
use ENGIE-provided chargers

**900 Experts & Researchers**  
In 11 R&D centers in North America

**Dozens**  
Of proprietary software and digital solutions

- **Global**
- **End to end services**
- **Objective**
- **Tried and tested**

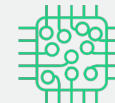
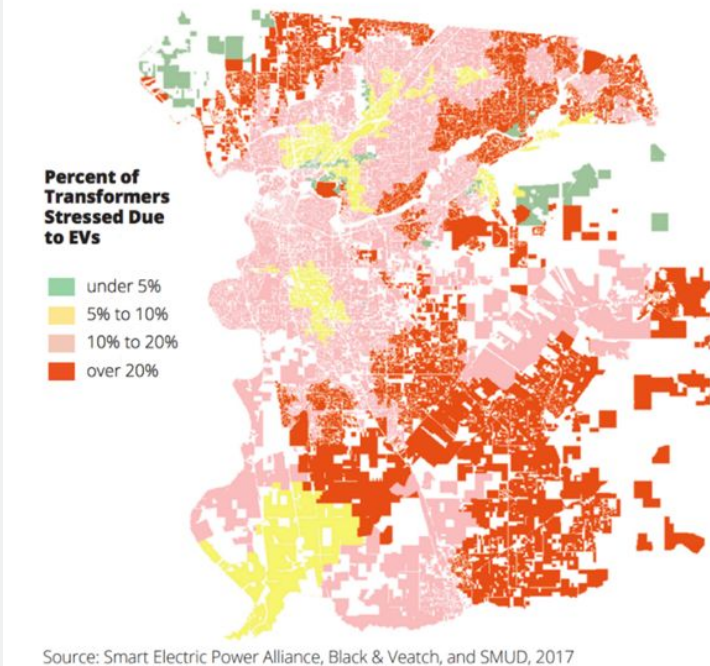
# Mass EV adoption is inevitable



- Each year, EV adoption forecasts are upwardly revised
- [13 states](#) followed CA's lead on GHG standards and/or ZEV mandate
- EV is still a **developing market** despite their current electric power demand may be minute

# EVs create major infrastructure opportunities & challenges

FIGURE: EV Impact on Transformers in SMUD Territory Through 2030

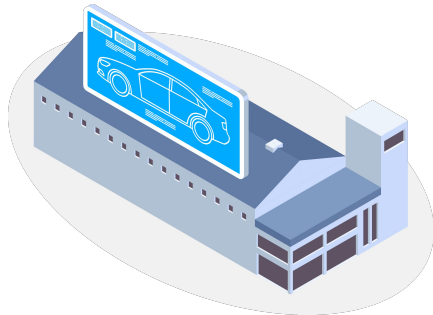


- EVs are **not dispersed evenly across all territories**, as there has already been real-world evidence that they are **clustered in particular areas**, such as California

# The vehicle decarbonization ecosystem is a complex marriage of several sectors

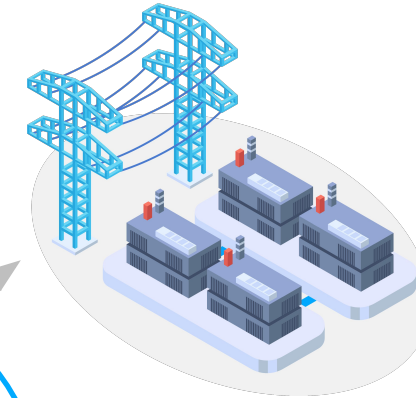
## The Vehicle Manufacturer

- How do we build an electric fleet business without end-to-end transparency & control over costs?
- What other products and services could we offer to fleet customers and what are the right business models to get paid for these? E.g. data, batteries, aggregators of load, resilience, v2g etc.
- What capabilities should we build in house vs partner?



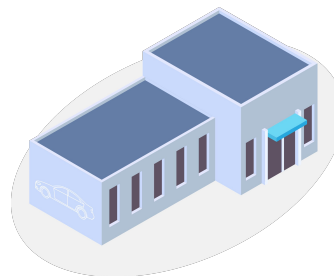
## The Electric / Gas Utility

- What are the right tariff or rate structures to encourage the optimum electricity consumption behaviors?
- How do we minimize the costs & timing of infrastructure upgrades?
- What regulated and deregulated revenue opportunities exist in using vehicles as local grid resources?



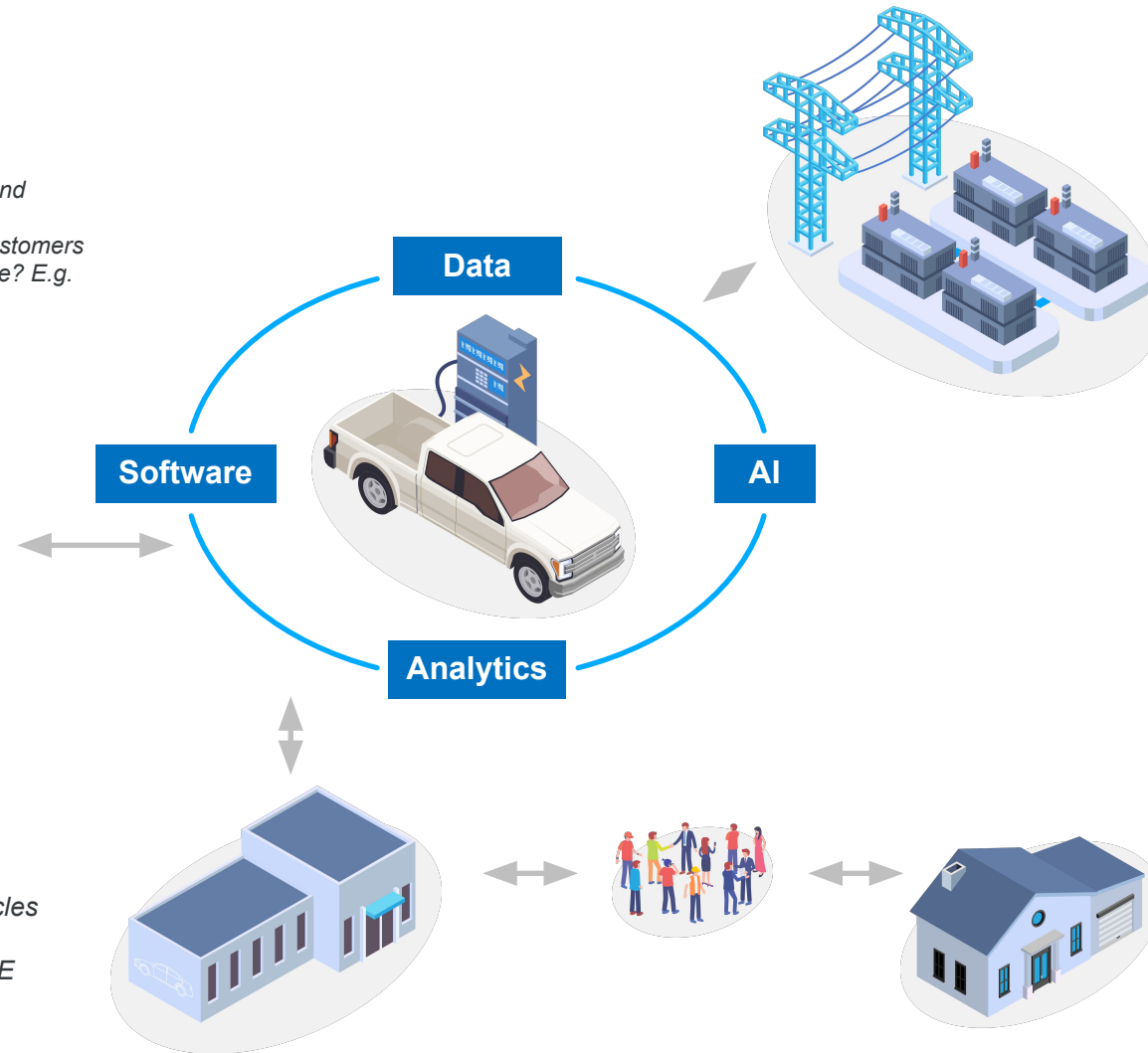
## The Corporation

- What is the most cost-effective fleet decarbonization solution?
- How can we seamlessly integrate zero emission vehicles into our operations?
- How do we manage a fleet in transition – with both ICE vehicles and ZEV in the portfolio?
- What technologies and vendors should we chose?
- Is there value that my fleet vehicles can provide the electric grid?

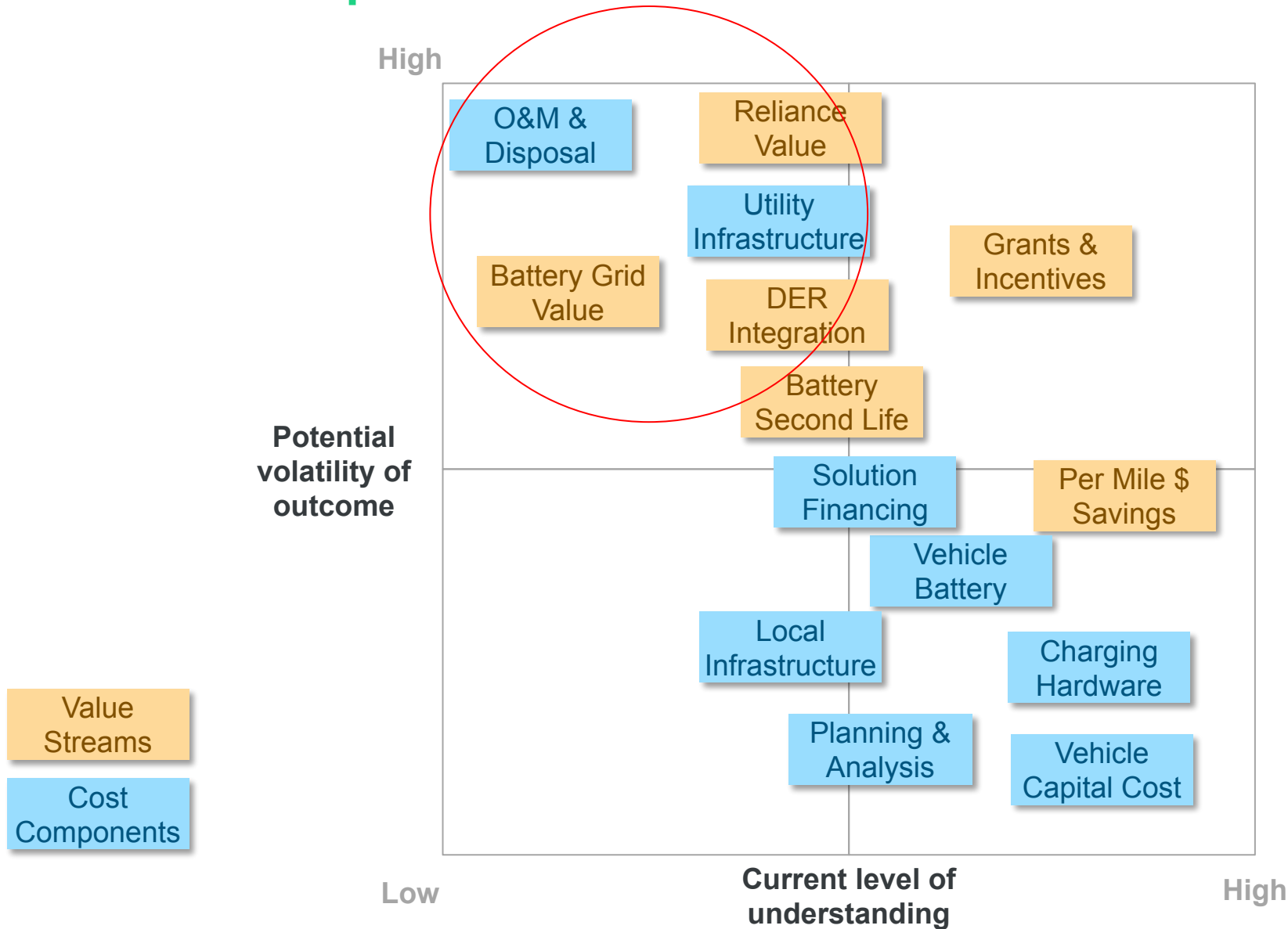


## The Employee / Resident

- When should I charge at home, when should I use public charging and when should I use charging at work?
- Is there value in me letting my utility / other company control my battery for non driving activity?



# Projecting and managing to an expected total cost of ownership for electric vehicles is complicated



# The **consequences** for not addressing “Total Cost of Ownership” transparency are **significant**



Slower EV adoption – greater financial risk to the consumer = hesitancy



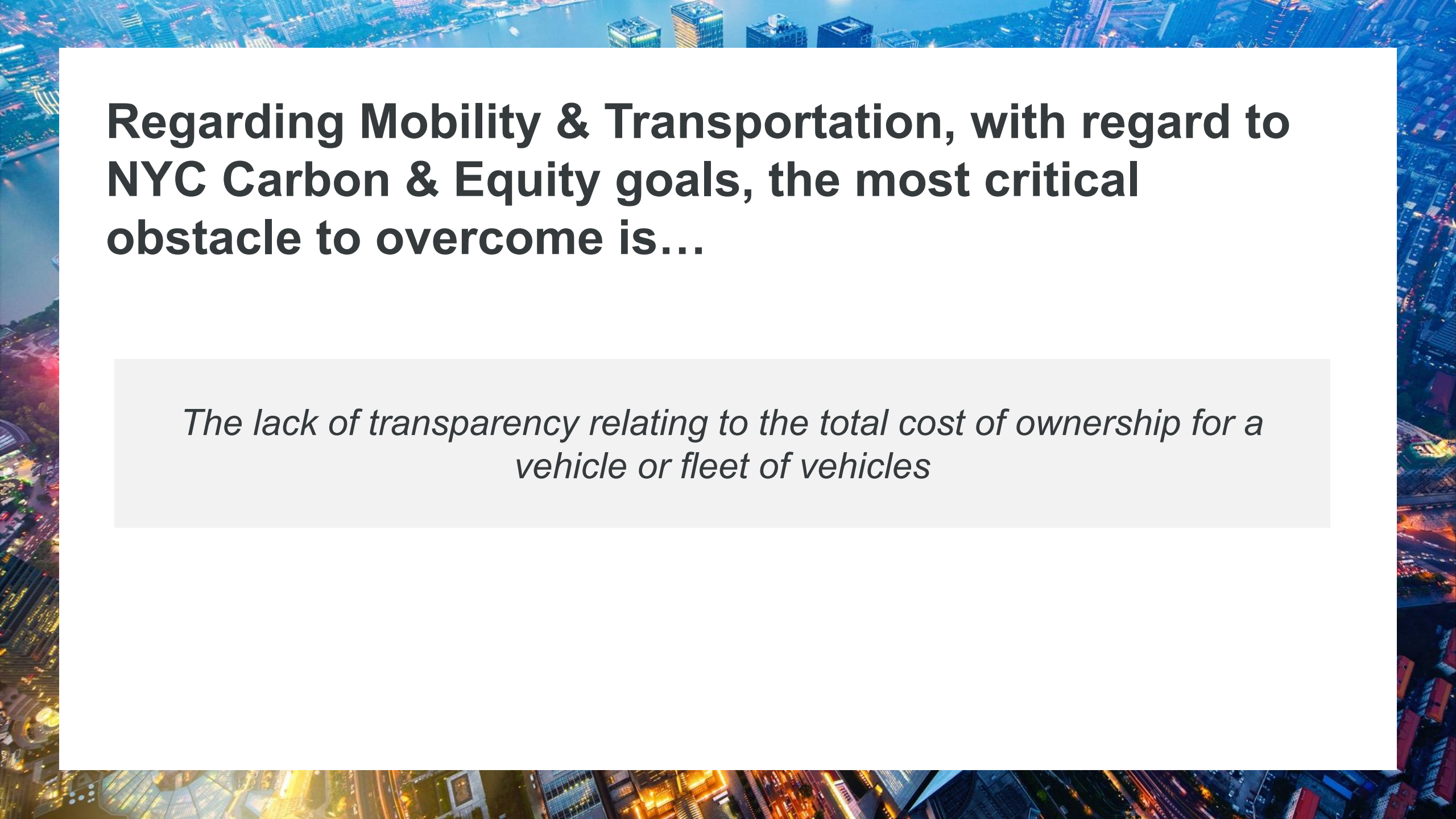
Inequitable access to clean transportation



Inability to scale solutions and draw out economies of scale



Lack of cost-effective financing options



**Regarding Mobility & Transportation, with regard to NYC Carbon & Equity goals, the most critical obstacle to overcome is...**

*The lack of transparency relating to the total cost of ownership for a vehicle or fleet of vehicles*



**Thank you!**

