

# The Road Ahead

**José Samperio**

Vice President and General Manager –  
North America On-Highway

*Cummins Inc.*









# POWERING A MORE PROSPEROUS WORLD

---

**73,600** Global employees

---

**104** Years of industry leadership

---

**190** Countries and territories

---

**10,600** Cummins certified dealer locations

---

**\$1.2B** Invested in research and technology in 2022

---

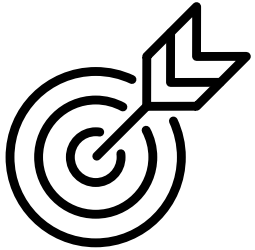


MOVING FORWARD

# THE ROAD AHEAD

---

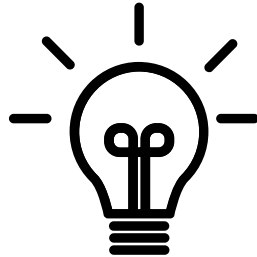
1



## LOOK DOWN

*Your fleet  
Your goals  
Your boundaries*

2



## LOOK UP

*Ask and learn  
Explore tech choices  
Take a wide view*

3

❏ **START** ❏

## STEP UP

*Find a place to start*

4



**WHERE ARE WE?**

WHERE ARE WE?

## KEY HIGHLIGHTS

---

1

**The trend to lower emissions is happening**  
*(regulations, customer push, internal ESG goals)*

2

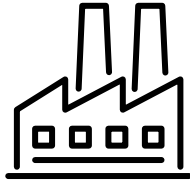
**Large and wide technology investments by OEMs**  
*(many OEMs, significant dollars, many technologies)*

3

**Infrastructure becoming a large part of the conversation**  
*(manufacturing, charging / fueling, service)*

**WHERE ARE WE GOING?**

# CRITERIA EMISSIONS VS. GREENHOUSE GASES



## CRITERIA AIR EMISSIONS (NO<sub>x</sub>, PM)

- Location *specific*
- *Health* related
- *Close to zero today*, but can be lowered



## GREENHOUSE GASES (CO<sub>2</sub>, others)

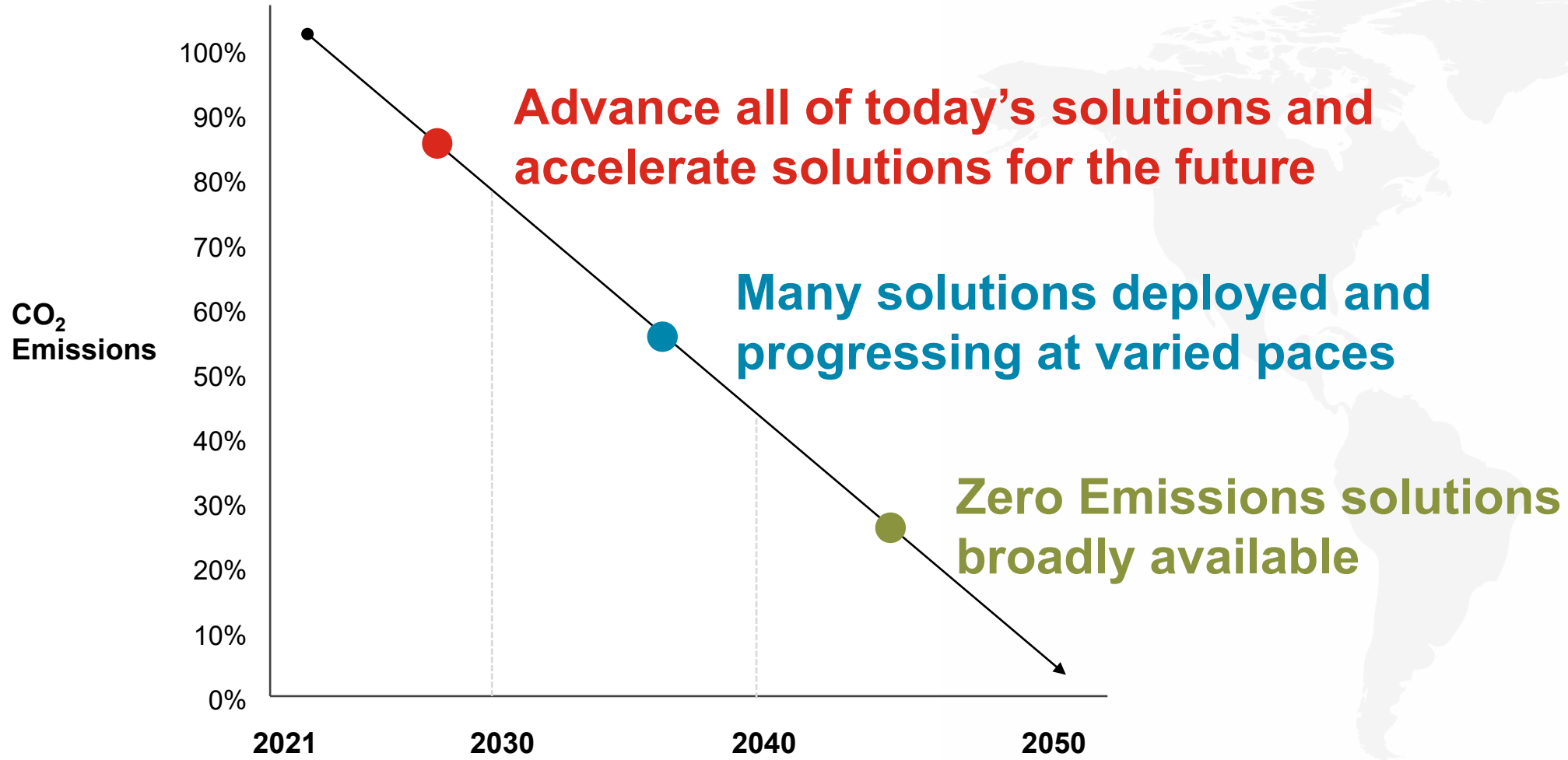
- Location *agnostic*
- *Climate* related
- *Zero well-to-wheel requires focus* on vehicle plus energy source



Zero Emissions



# OUR VIEW ON HOW THE TRANSITION UNFOLDS



*Driving factors: energy source decarbonization and infrastructure investment, regulatory advancements, and customer pull*

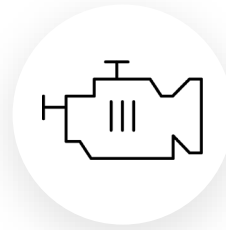
**WHAT ARE MY CHOICES?**

**ANY TECHNOLOGY THAT REDUCES  
EMISSIONS TODAY AND WORKS FOR  
YOUR BUSINESS IS GOOD**

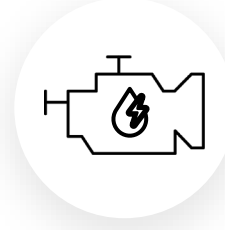
# REDUCING WELL-TO-WHEELS EMISSIONS

BY INNOVATING THE  
ENERGY SOURCES AND THE  
POWER SOLUTIONS

## POWER SOLUTIONS



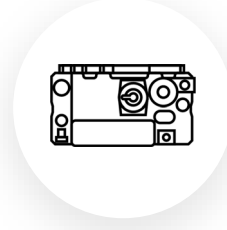
**ADVANCED  
ENGINES**



**HYBRID**



**BATTERY  
ELECTRIC**



**FUEL CELL  
ELECTRIC**

## ENERGY SOURCES



**LOW CARBON FUELS**

*Expand CNG, RNG,  
Bio/Renewable Diesel*



**ELECTRICITY**

*Decarbonize  
the grid*

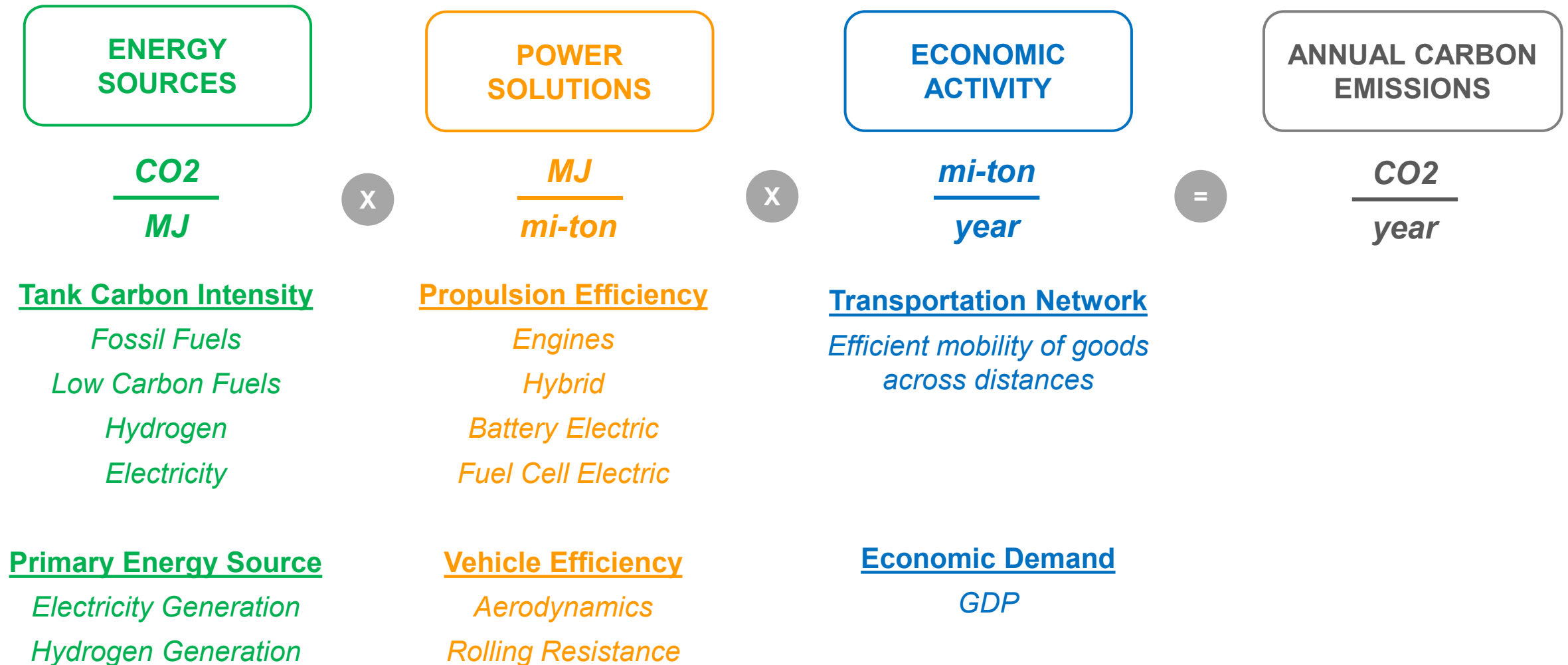


**HYDROGEN**

*Produce  
green H<sub>2</sub>*



# CARBON EMISSIONS FACTORS



# 4 CONSIDERATIONS FOR FLEETS

WHEN ADOPTING TECHNOLOGY



**Can the technology  
get the job done?**

*Can I complete  
the mission?*

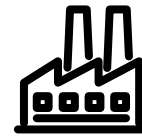
*Do I need to adjust  
my business ops?*



**Can my business  
afford it?**

*What is my TCO?*

*What are my  
boundaries?*



**What is the fueling  
infrastructure?**

*What experience  
do I have?*



**What is the service  
infrastructure?**

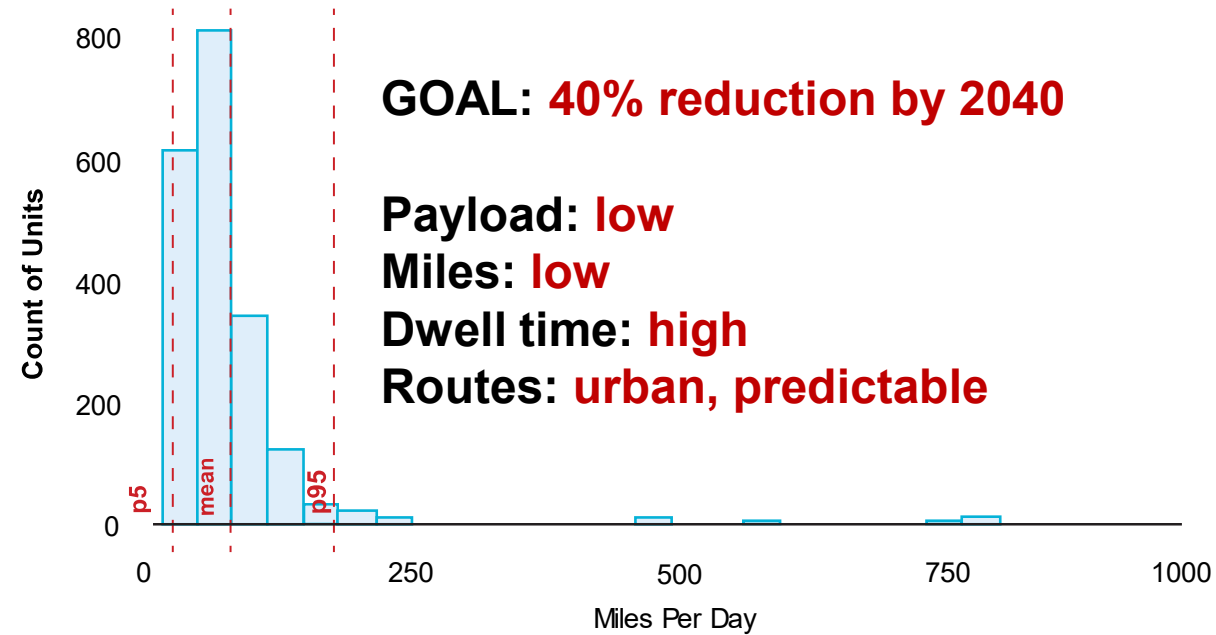
*How do I prepare  
for it?*

# LOOK DOWN

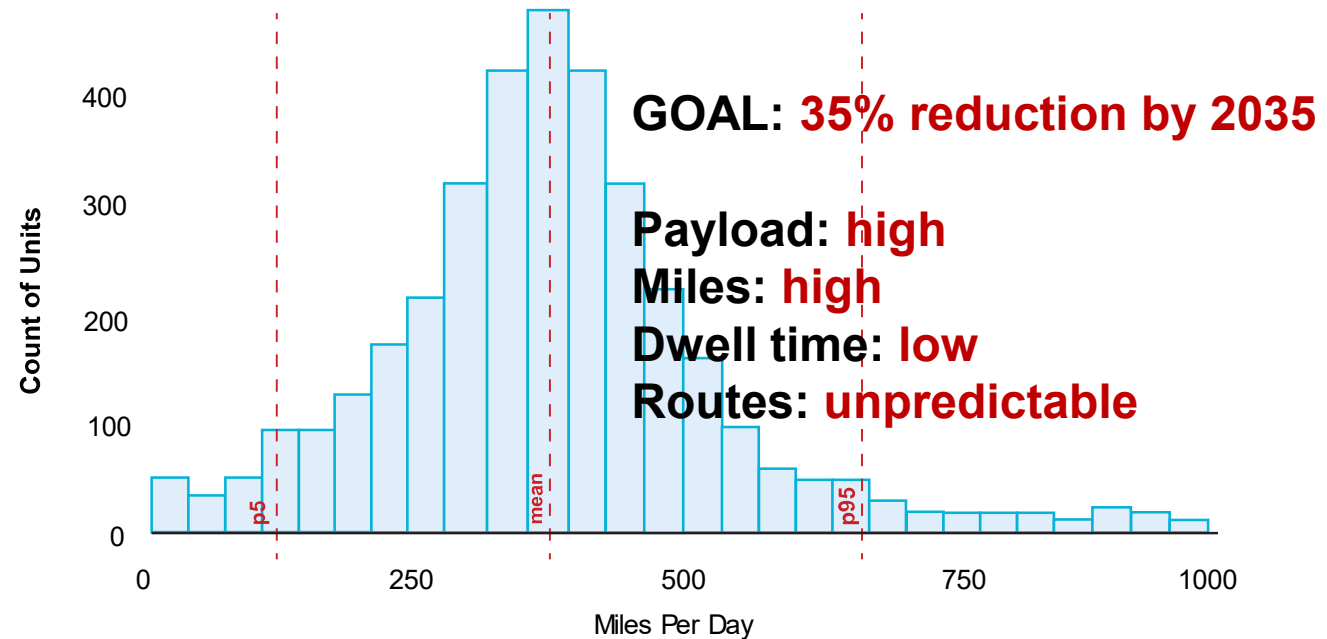
## FLEET COMPARISON

---

### FLEET 1 (miles / day distribution)



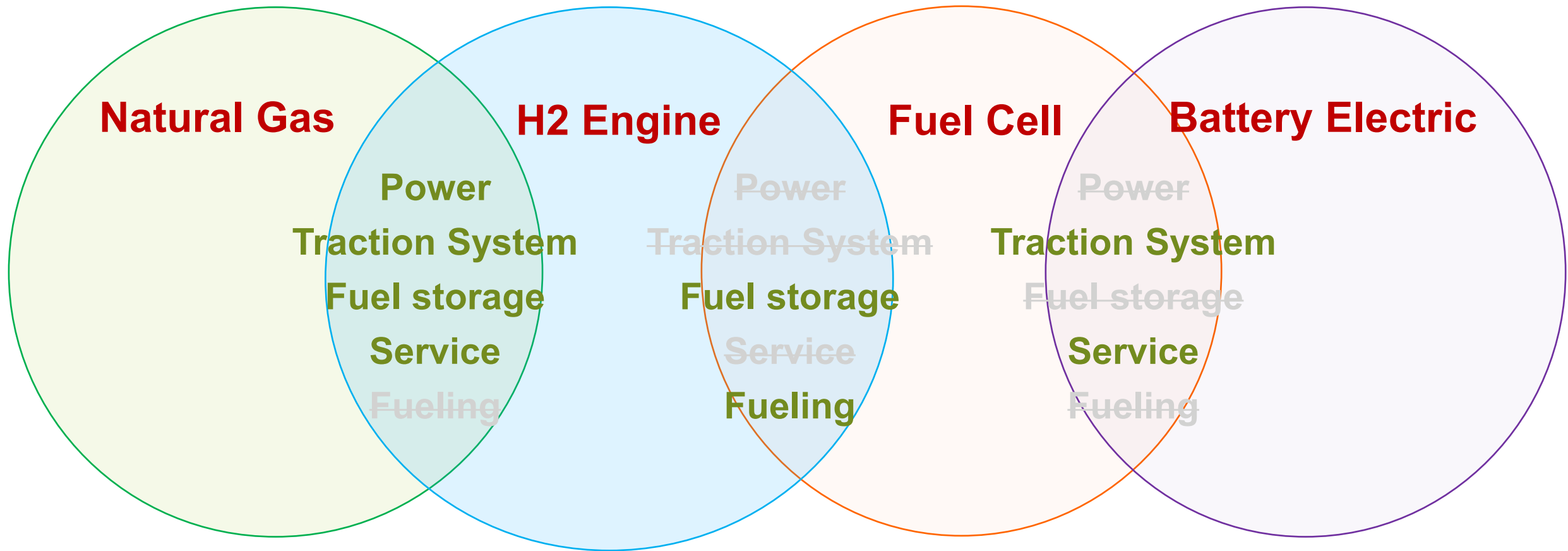
### FLEET 2 (miles / day distribution)



LOOK UP

# TECHNOLOGY CHOICES

---



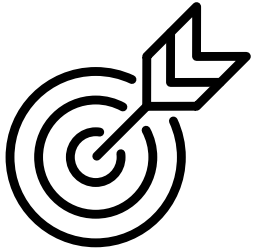


# REFLECTIONS

## THE ROAD AHEAD

---

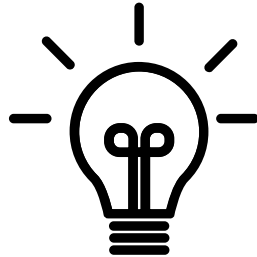
1



### LOOK DOWN

*Your fleet  
Your goals  
Your boundaries*

2



### LOOK UP

*Learn  
Explore tech choices  
Take a wide view*

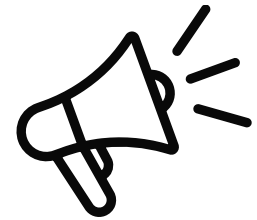
3

❑❑START❑❑

### STEP UP

*Find a place to start*

4



### SPEAK UP

*Share your  
experiences*

Q+A