

*IndyGo*SM

Fuel Cell Bus Pilot Project



Key Staff

Need to thank...

- Paul Williams
- Thierno Balde
- Cheryl Purefoy
- Aaron Vogel
- Bart Brown
- Tim Cox
- Kevin France
- Brian Clem
- Mark Emmons
- Our operators
- Our maintenance team
- **Ballard, Sunline, New Flyer!**



Key Partners



Purpose of the Pilot

What we wanted...

- Touch, feel a fuel-cell bus
- Gather data about fuel cell performance during cold weather
- Understand more about fuel cell safety / performance / technical information
- Compare to battery electric performance

FCEB Characteristics

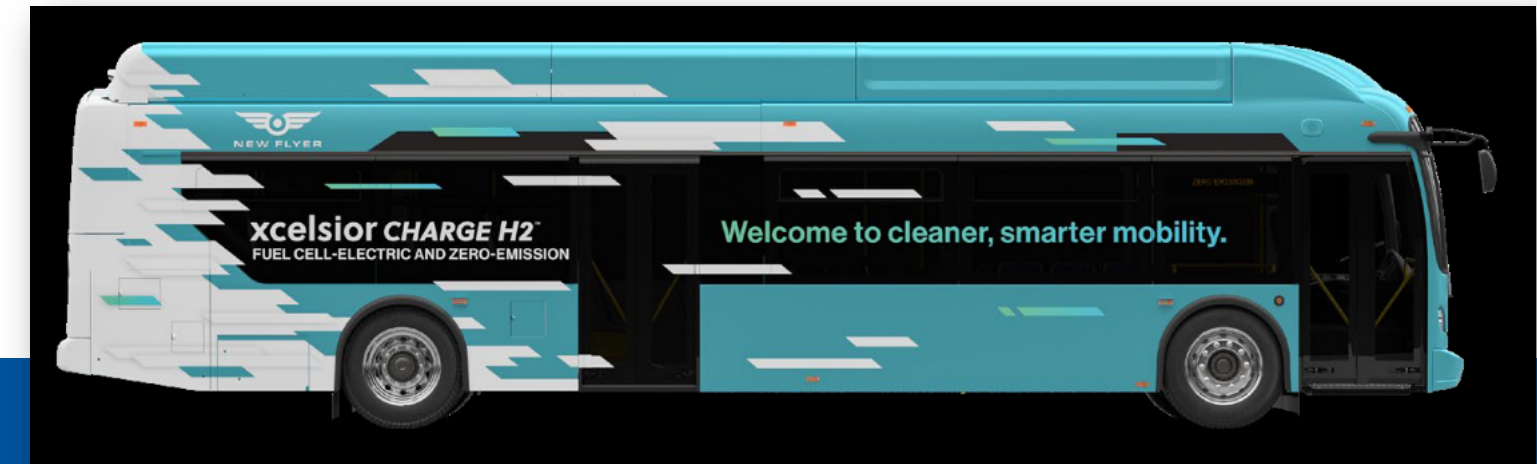
Benefits

- Better range – more miles / charge
- Faster refill time – 15-30 minutes
- Zero emission

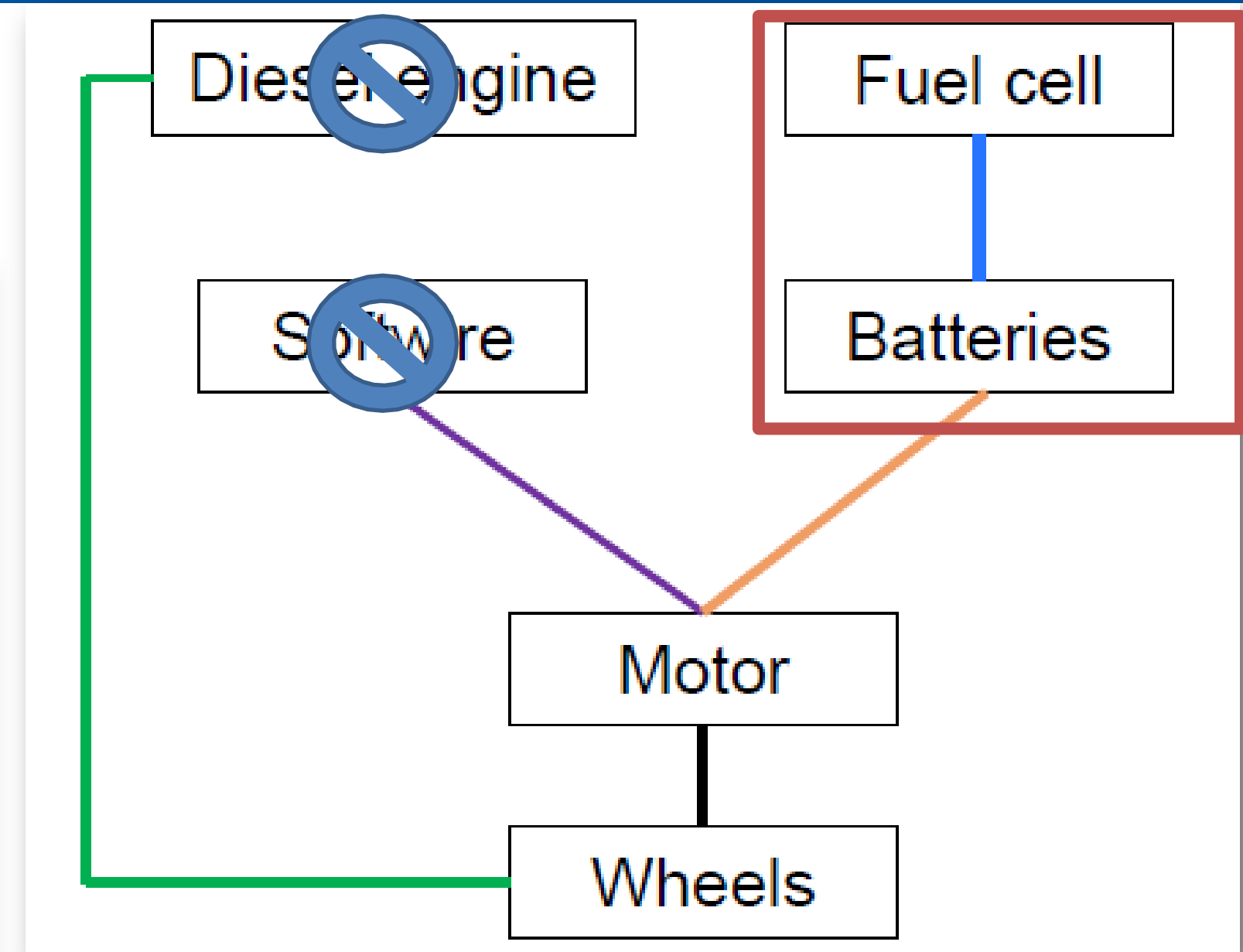
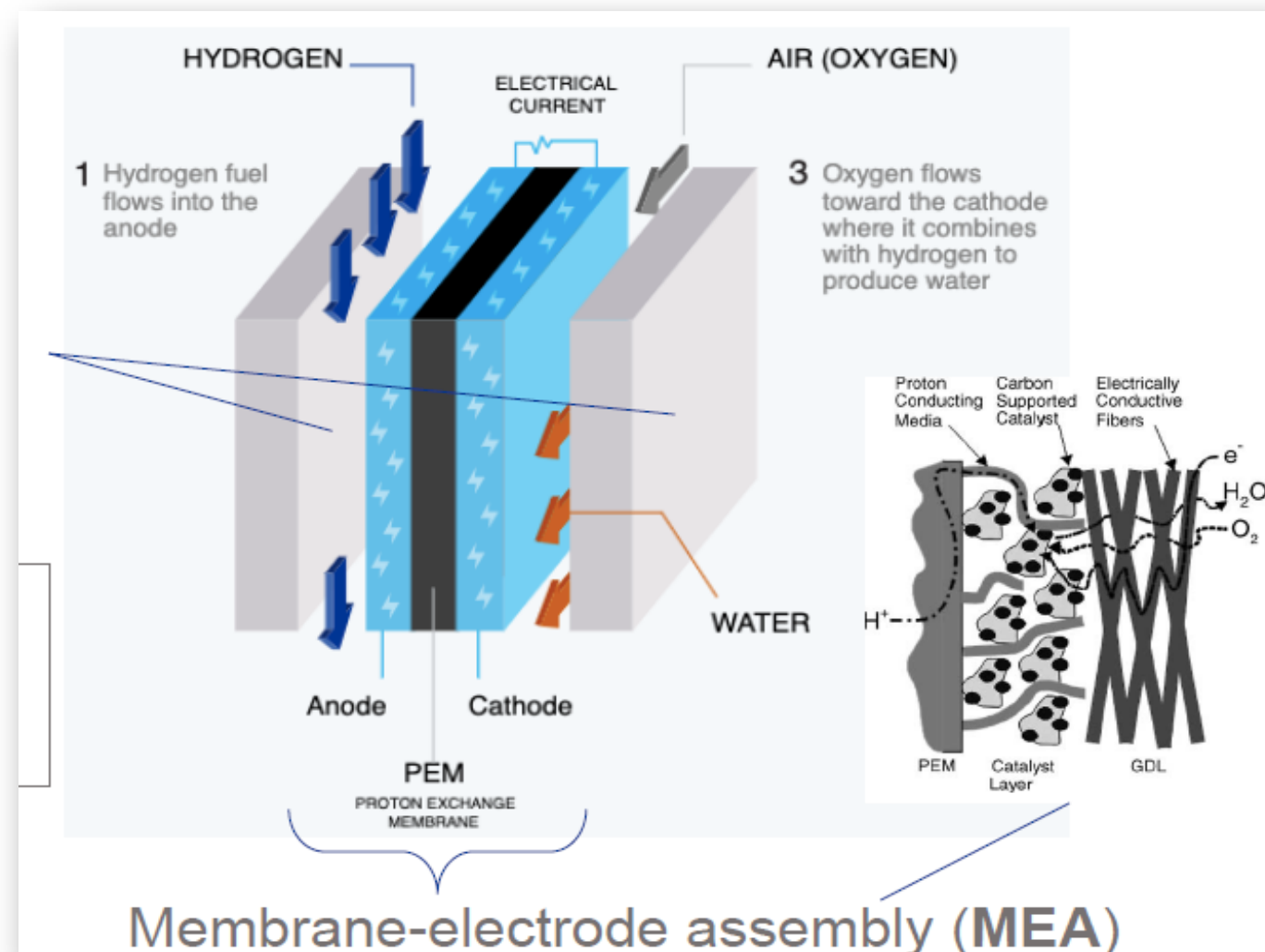
Challenges

- Limited lifetime data
- Higher capital costs than diesel/BEB
- Costs for storage, production, safety
- Workforce development and safety

How Fuel Cells Work



Hydrogen does not power the engine like CNG. It is used to power the batteries for propulsion.



Pilot Process

Coordination

- Worked with Sunline through Ballard/New Flyer to receive bus
- Received hydrogen fuel from AirProducts; delivery from OH
- Held biweekly calls to coordinate both externally and internally
- Collected data from operators and from onboard the NF vehicle

Outline of Pilot



1

The bus testing took place Monday through Friday the week of February 20th, 2022

2

The bus did not transport passengers and had both an IndyGo and New Flyer operator on board. Placed barrels to simulate pass. weight.

3

Bus followed a revenue vehicle.

4

The bus testing was performed on the current IndyGo Route #8

5

A BYD 60' BEB also ran the same time/route

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Typical Pilot Day

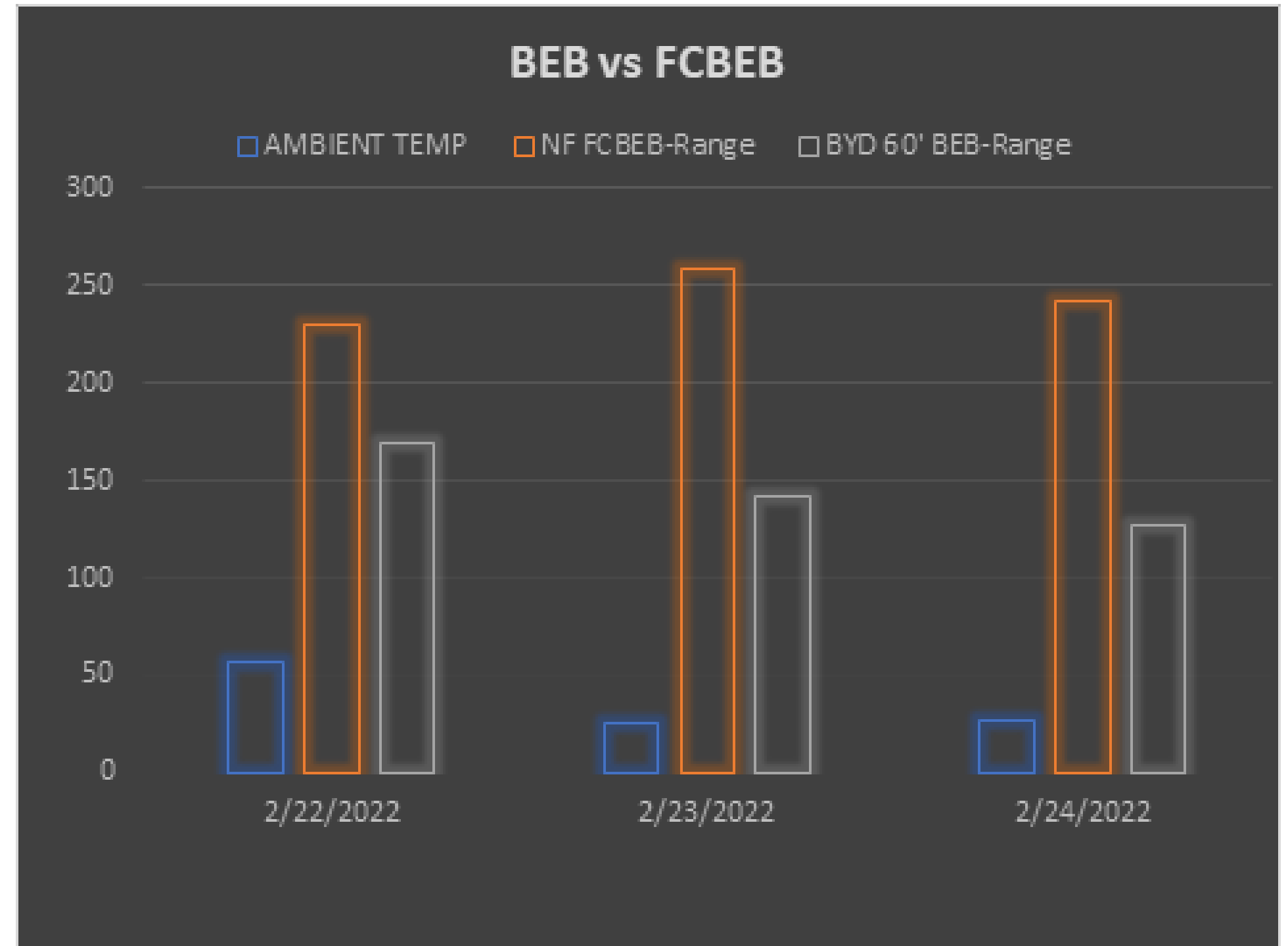
- 1 Buses prepare for 4:18 am pull out.
- 2 Buses run route until state of charge (SOC) for bus is too low, then return.
- 3 Upon return, bus is parked and refueled for the next day.



If there were problems, New Flyer and AirProduct technicians were available

Data Gathered

DATE	AMBIENT TEMP	NF FCBEB-Range	BYD 60' BEB-Range
2/22/2022	57	231	169
2/23/2022	25	258	142
2/24/2022	27	242	127



IndyGo Thoughts

- Good technical performance from FCEB
- Vehicle and fueling were safe
- Good to understand potential safety issues and prepare for them



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Next Steps

- Zero emission vehicle transition plan
 - Baseline assessment of agency conditions and readiness
 - Review of current market
 - Cost and environmental comparison of options; recommended technology
 - Implementation plan

Next Steps

- Zero emission vehicle transition plan
- Continue exploring opportunities with vehicle transition

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THANK
YOU

QUESTIONS?

