



# The Path to Zero: Decarbonizing the Indiana Toll Road

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# About the Indiana Toll Road



- 157 miles across northern Indiana, operated by the Indiana Toll Road Concession Company (ITRCC)
- Owned by IFM and other world-leading investors





# About Climate Change

[purdue.ag/climate-report](http://purdue.ag/climate-report)

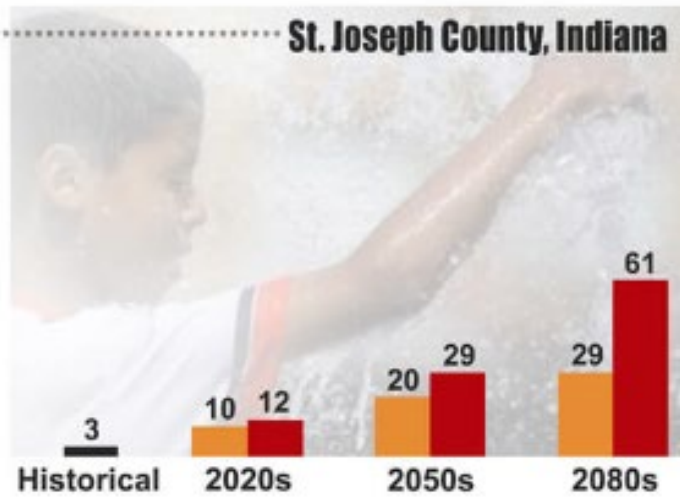
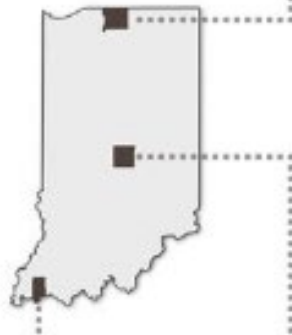
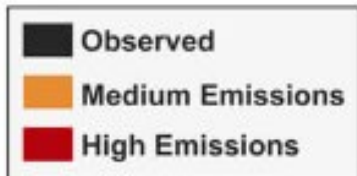


## IN CCIA

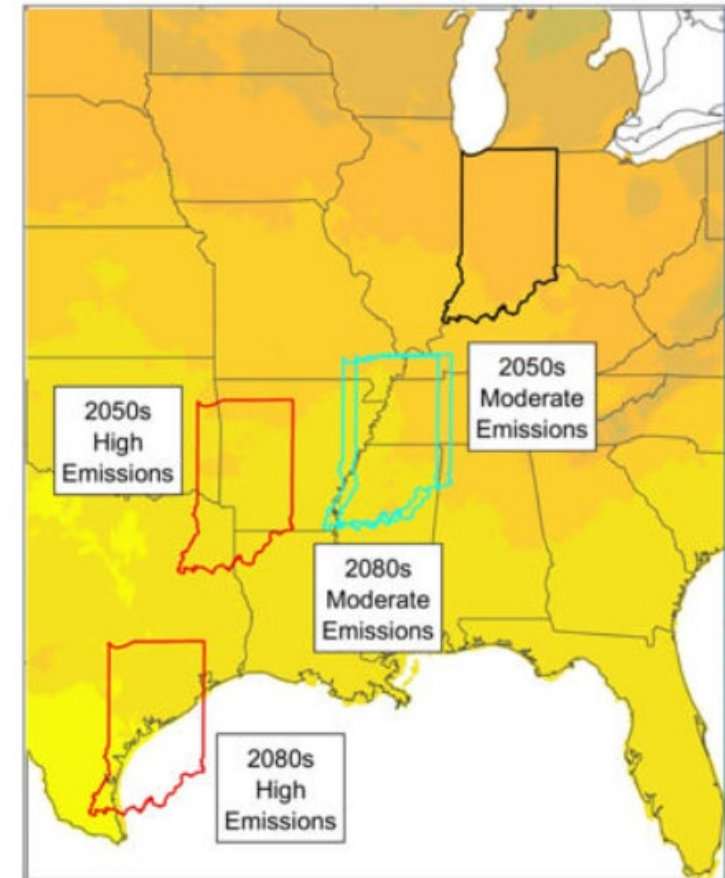
### Indiana Climate Change Impacts Assessment

## Extreme Heat

Number of Days With High Temperature  
Above 95°F



## Summer Analog





# The Path to Zero

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 | What is Net Zero?

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 | Whose emissions?

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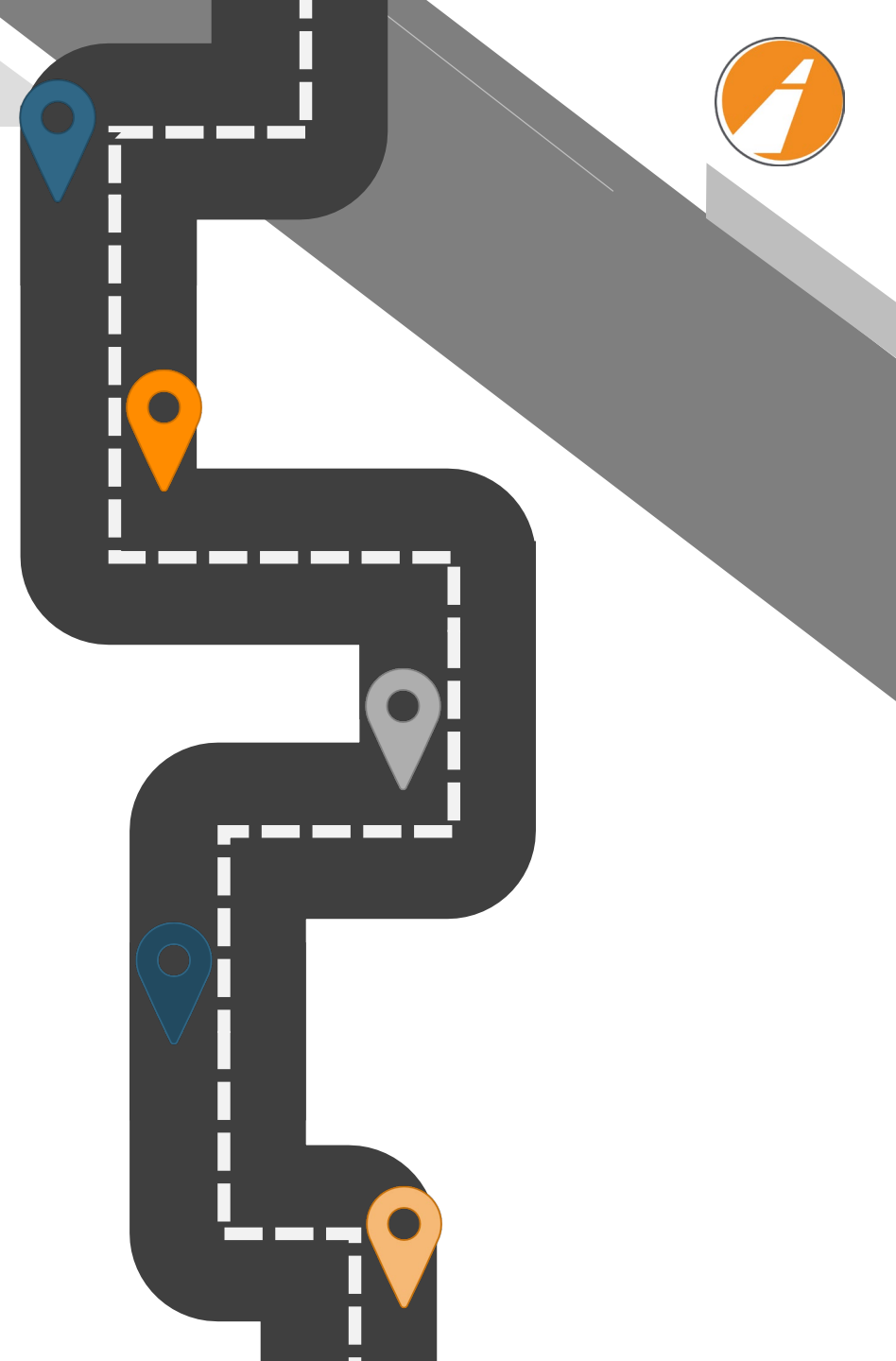
 | Baseline

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 | Reduction Plan

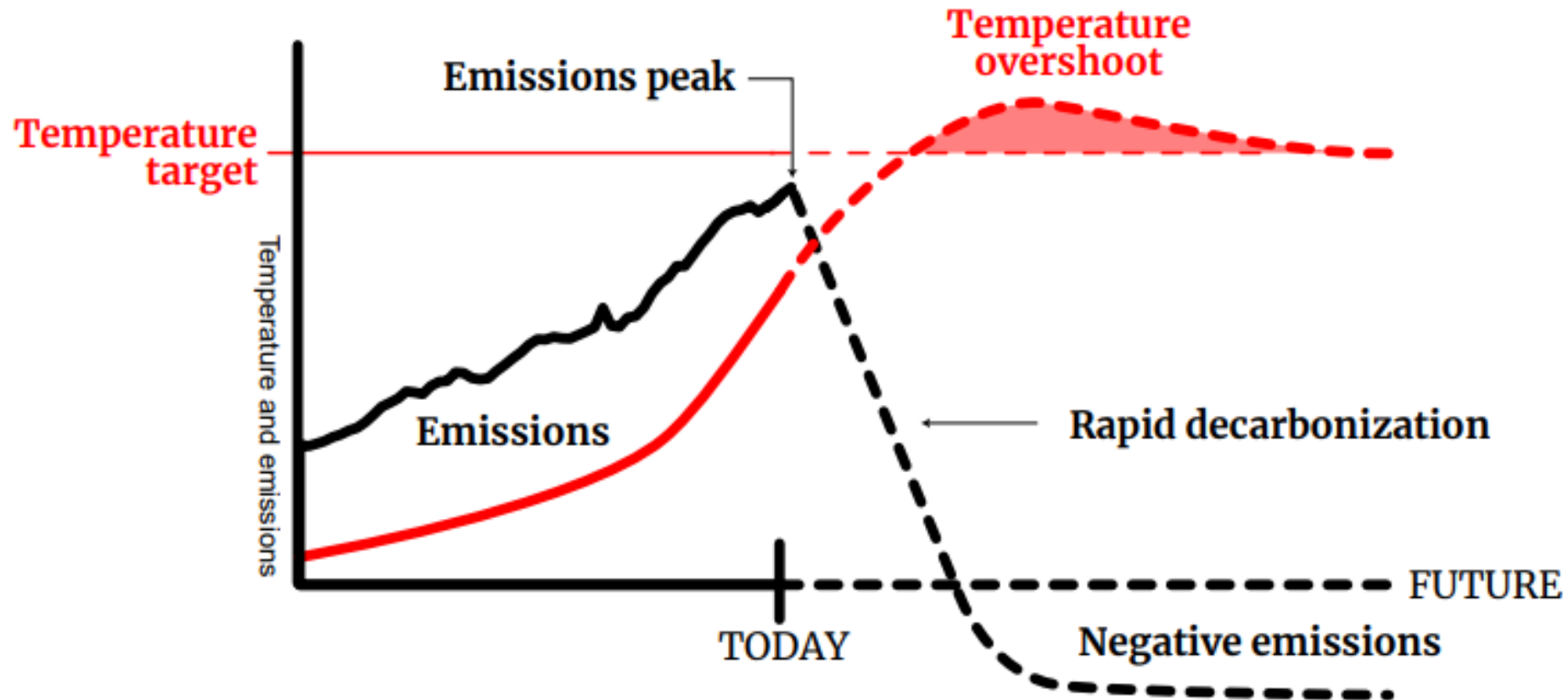
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 | Implementation





# What is Net Zero?



- IPCC, 2018, “Understanding the IPCC Special Report on 1.5°C”

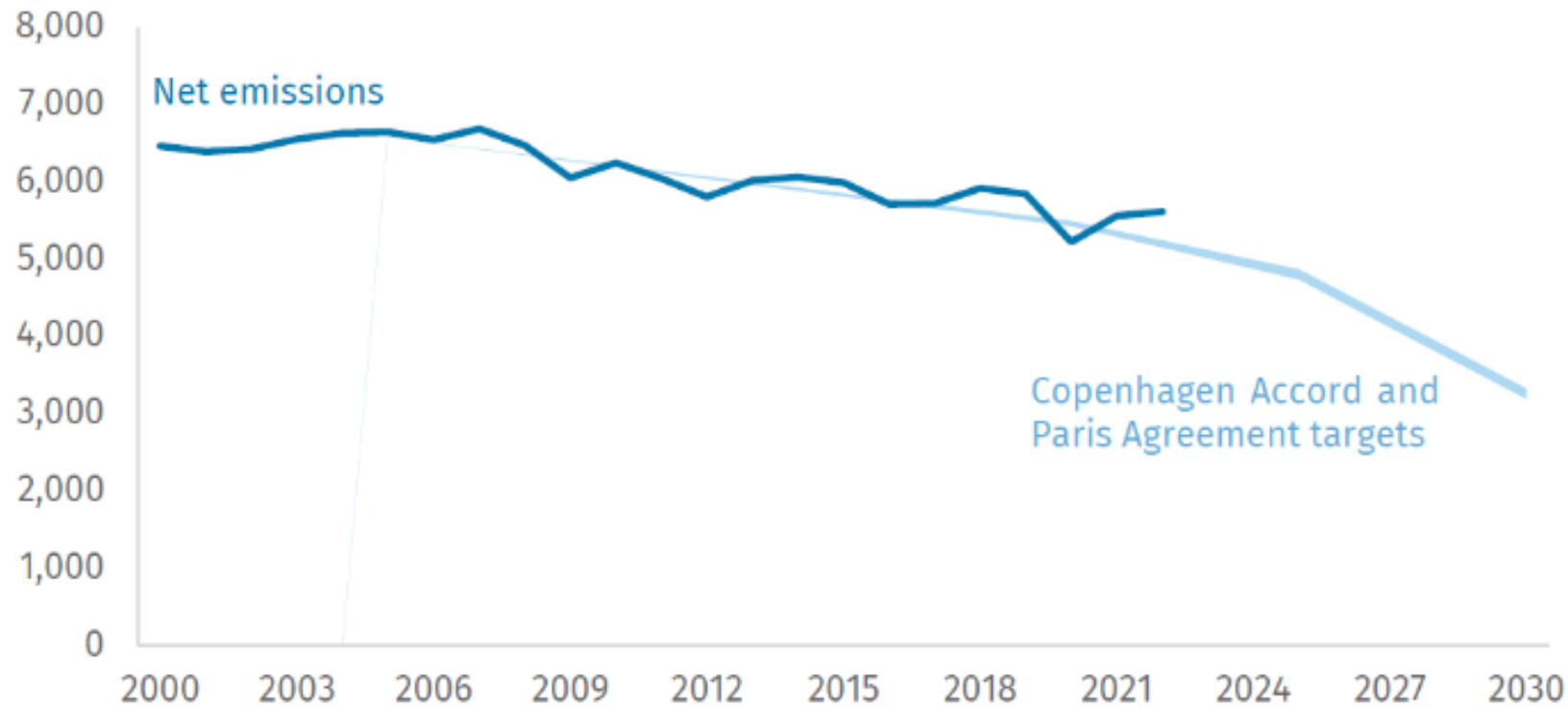


# What is Net Zero?

FIGURE 7

## Net US GHG emissions relative to international commitments

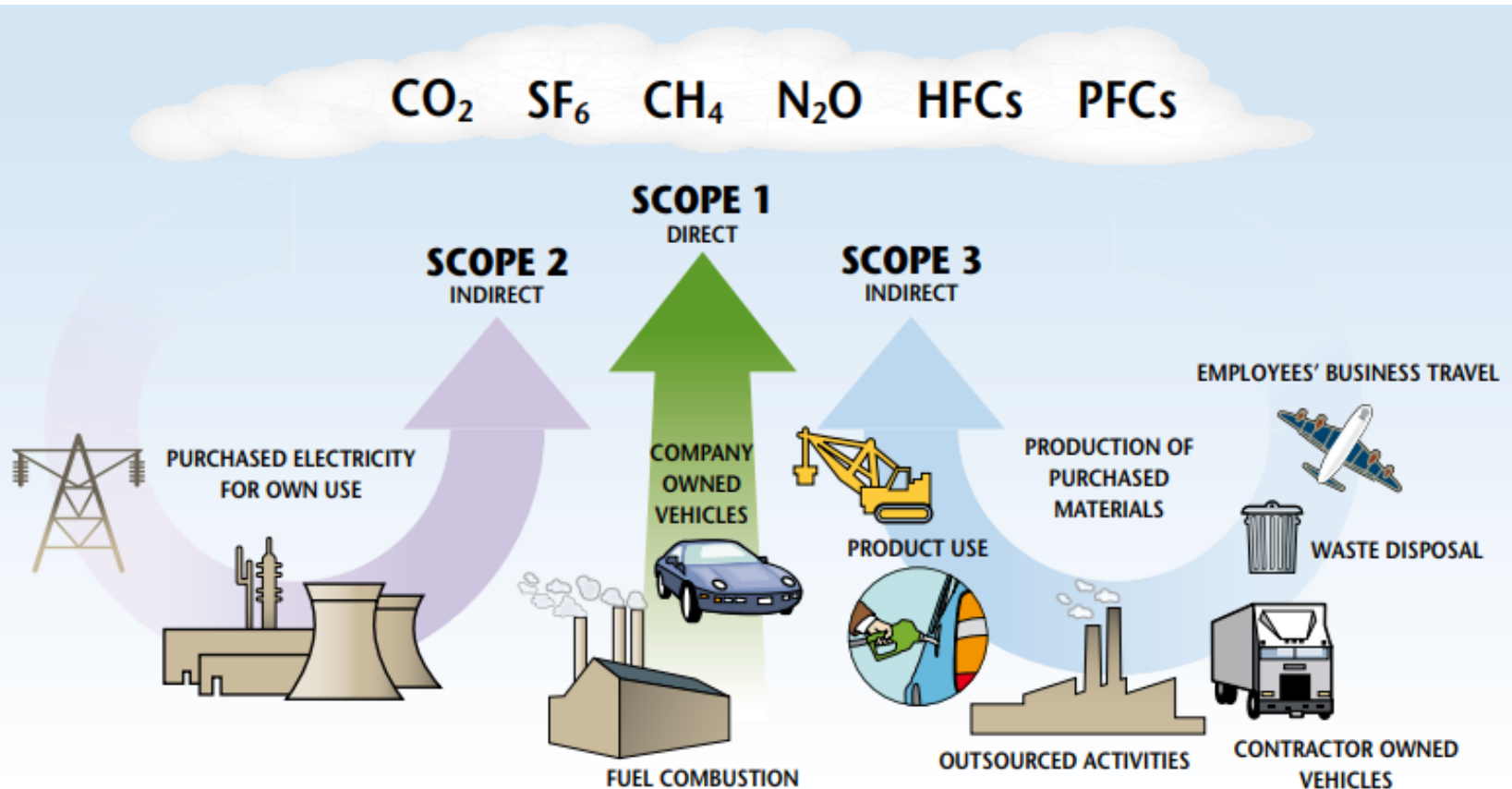
Million metric tons CO<sub>2</sub>e, IPCC definitions, excludes international bunkers



Source: Rhodium Group



# Whose emissions?



Source: Bhatia and Ranganathan, 2004

## Scope 1:

### *Direct Emissions*

- *Gasoline / diesel*
- *Propane / natural gas*
- *Refrigerants*

## Scope 2:

- *Purchased electricity*

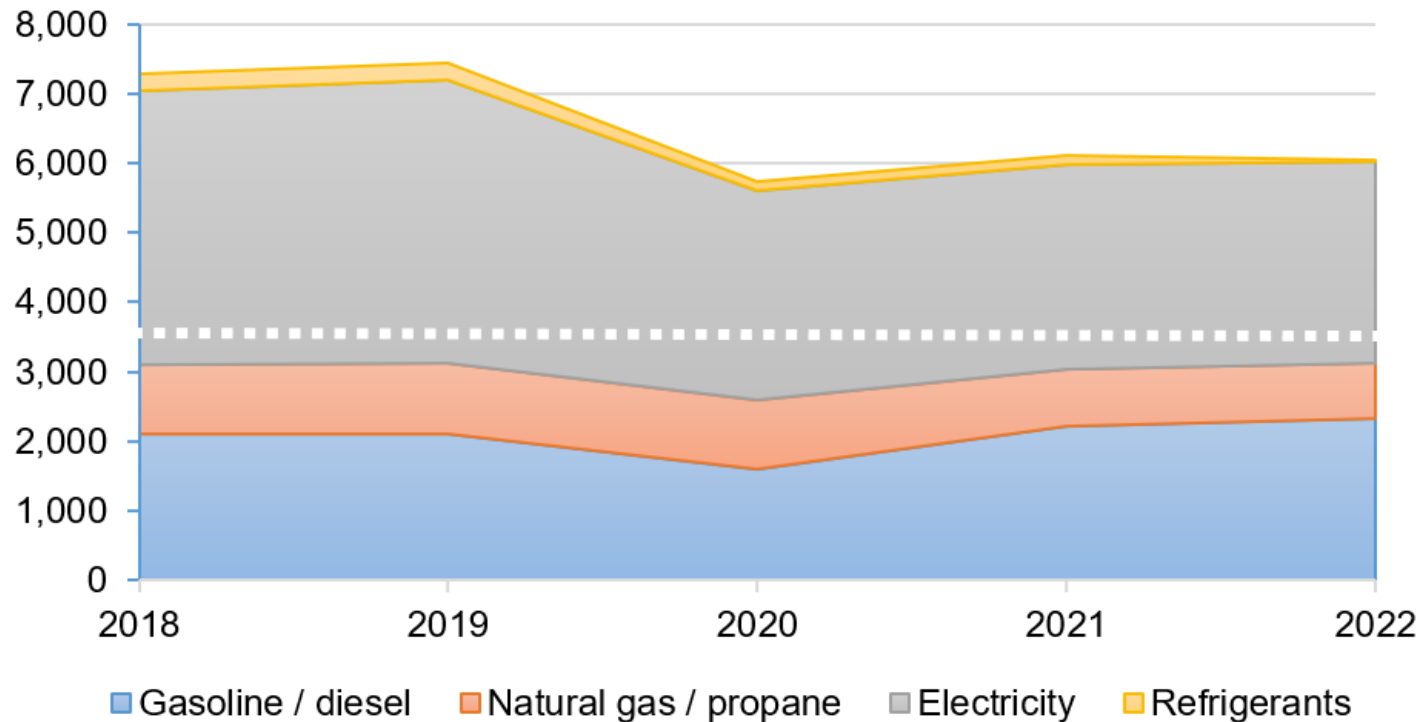
## Scope 3:

- *Patron fuel usage*
- *Etc, etc, etc...*



# Creating a Baseline

MT CO2-equivilent



## Why track GHGs?

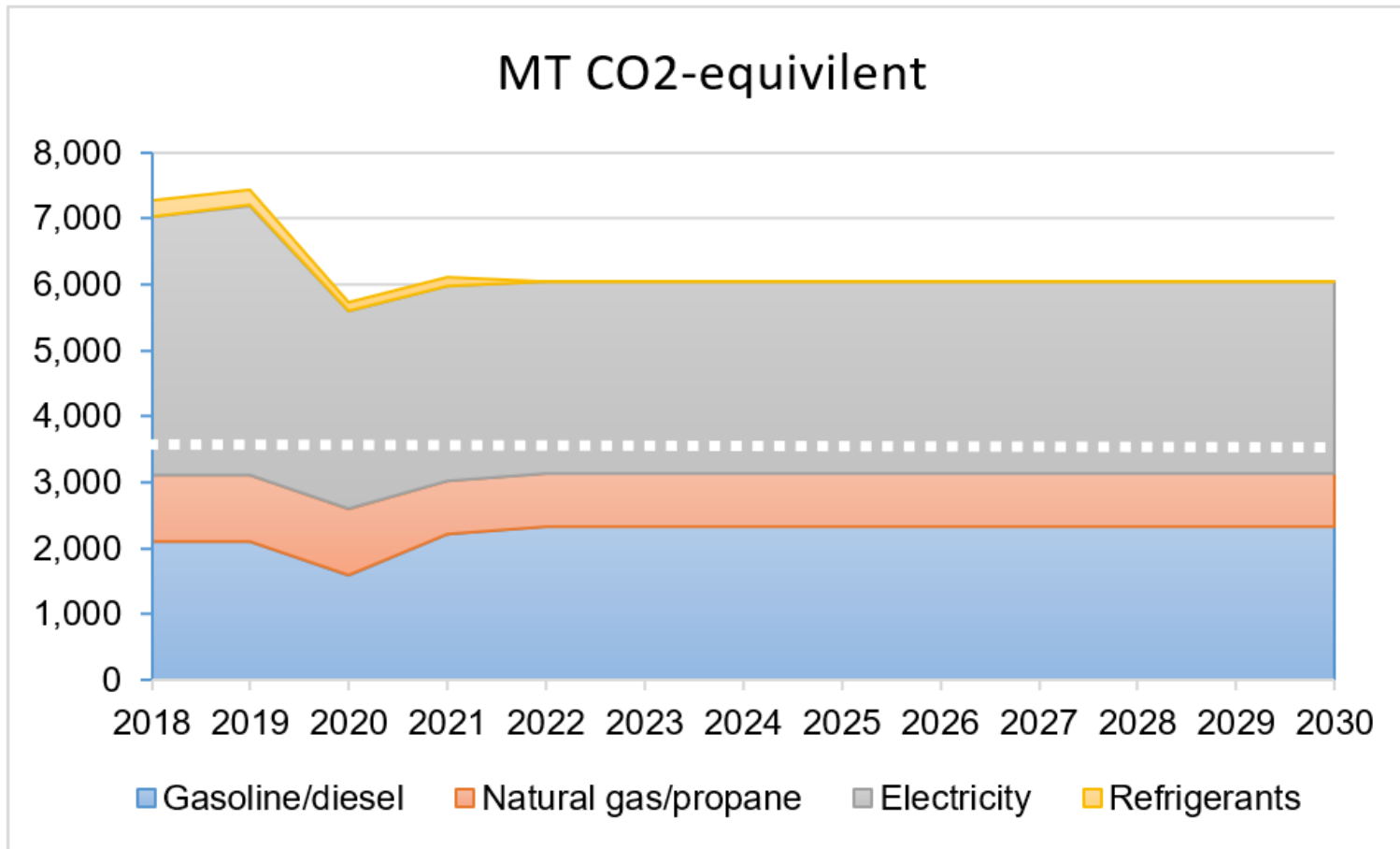
**“What gets measured, gets managed”**

- > Establishing a baseline allows organizations to take action to reduce their footprint.
- > GHG inventorying can also help identify opportunities for operational and financial efficiencies.





# Reduction Plan

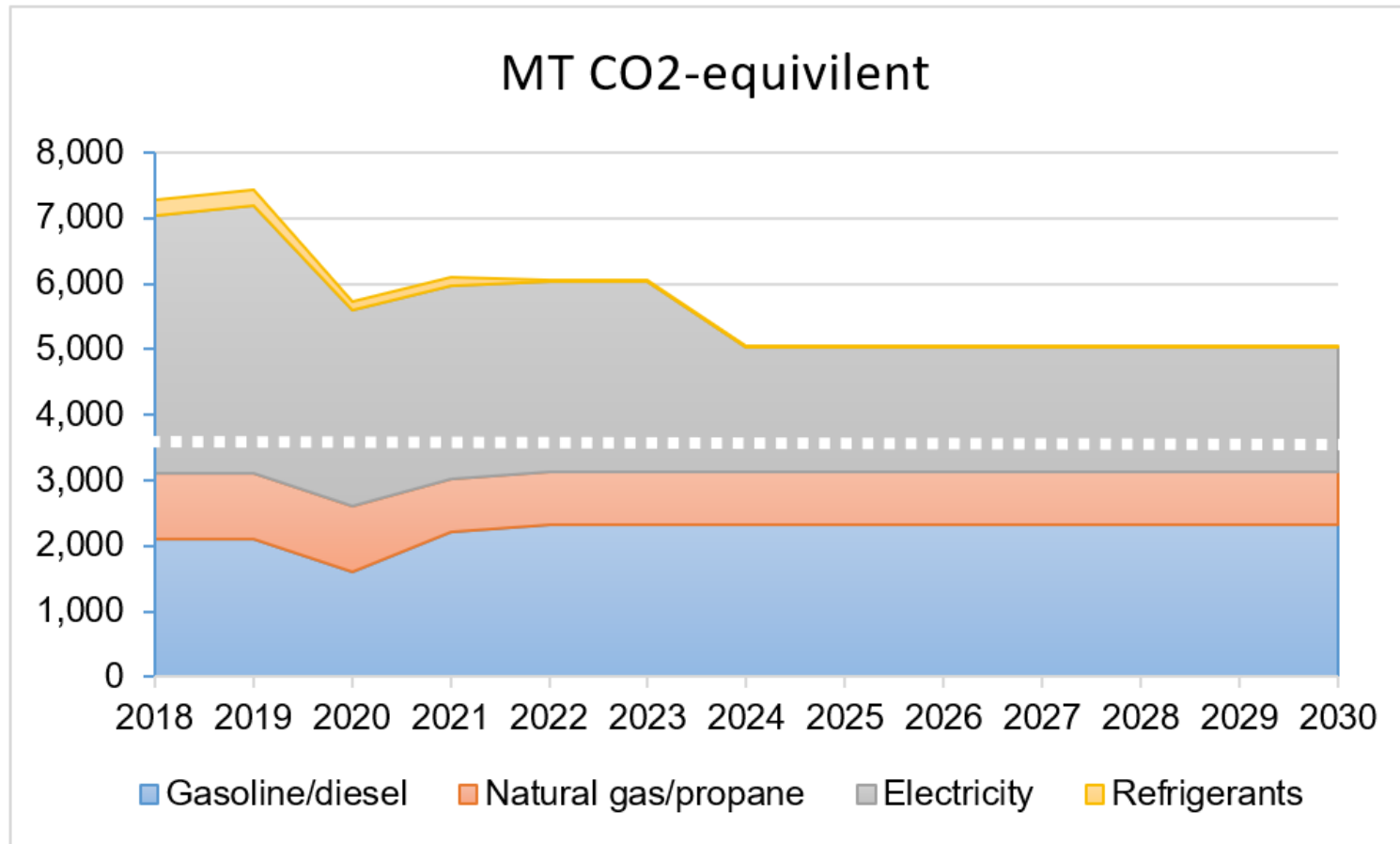


## Potential Interventions

- \*Solar energy
- \*Power purchase agreements
- \*Energy efficiency
- \*Fleet alternatives – electric, hydrogen, CNG, etc.
- \*Carbon sequestration (vegetation management)



# Reduction Plan



## Coming in 2023...

*“Project Soleil”*

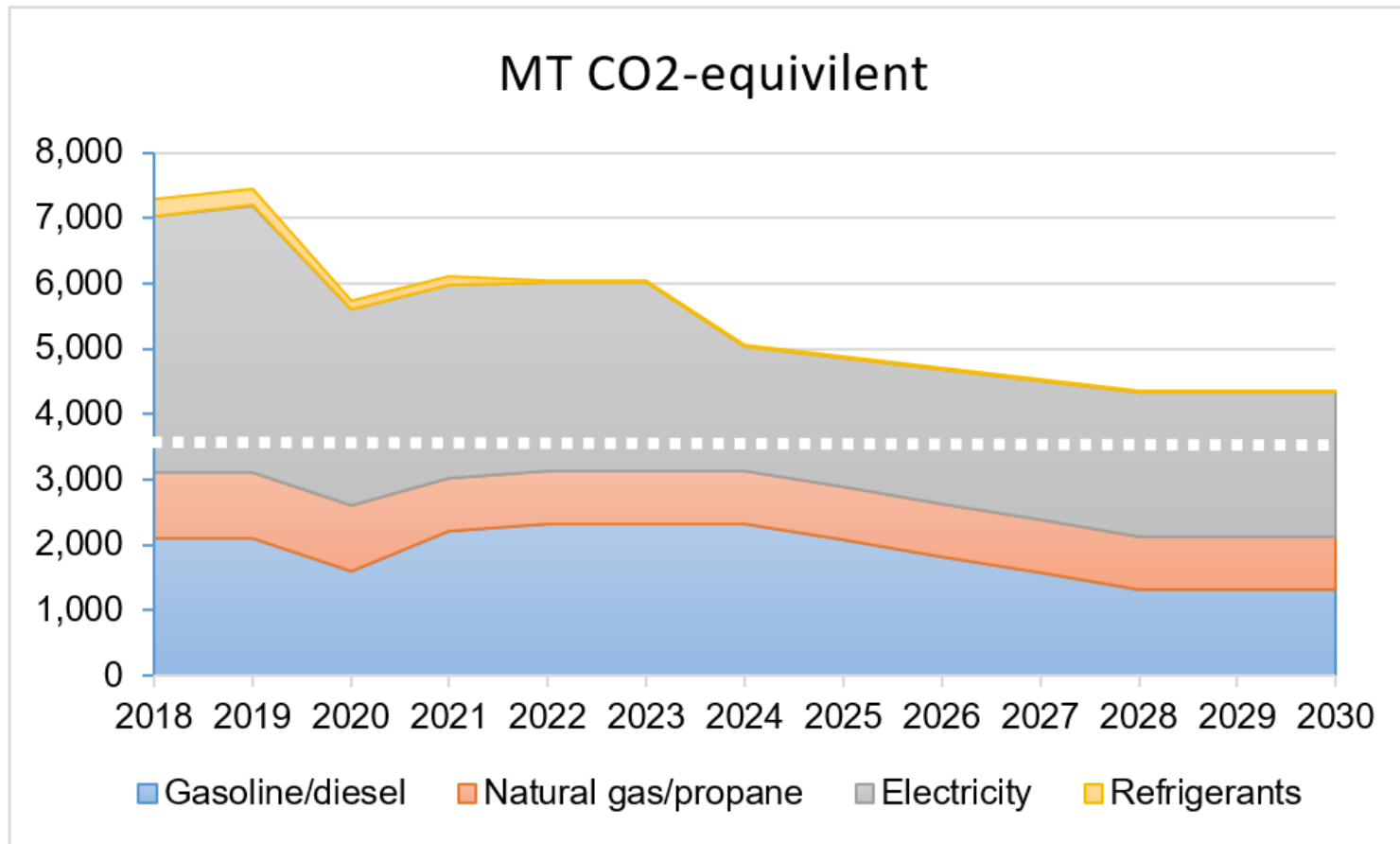
*\*Solar energy installations at 16 locations on the ITR*

*\*1/3 of total electric demand*

*\*1,000 MT reduction*



# Reduction Plan



## Fleet Electrification

*\*Light Duty*

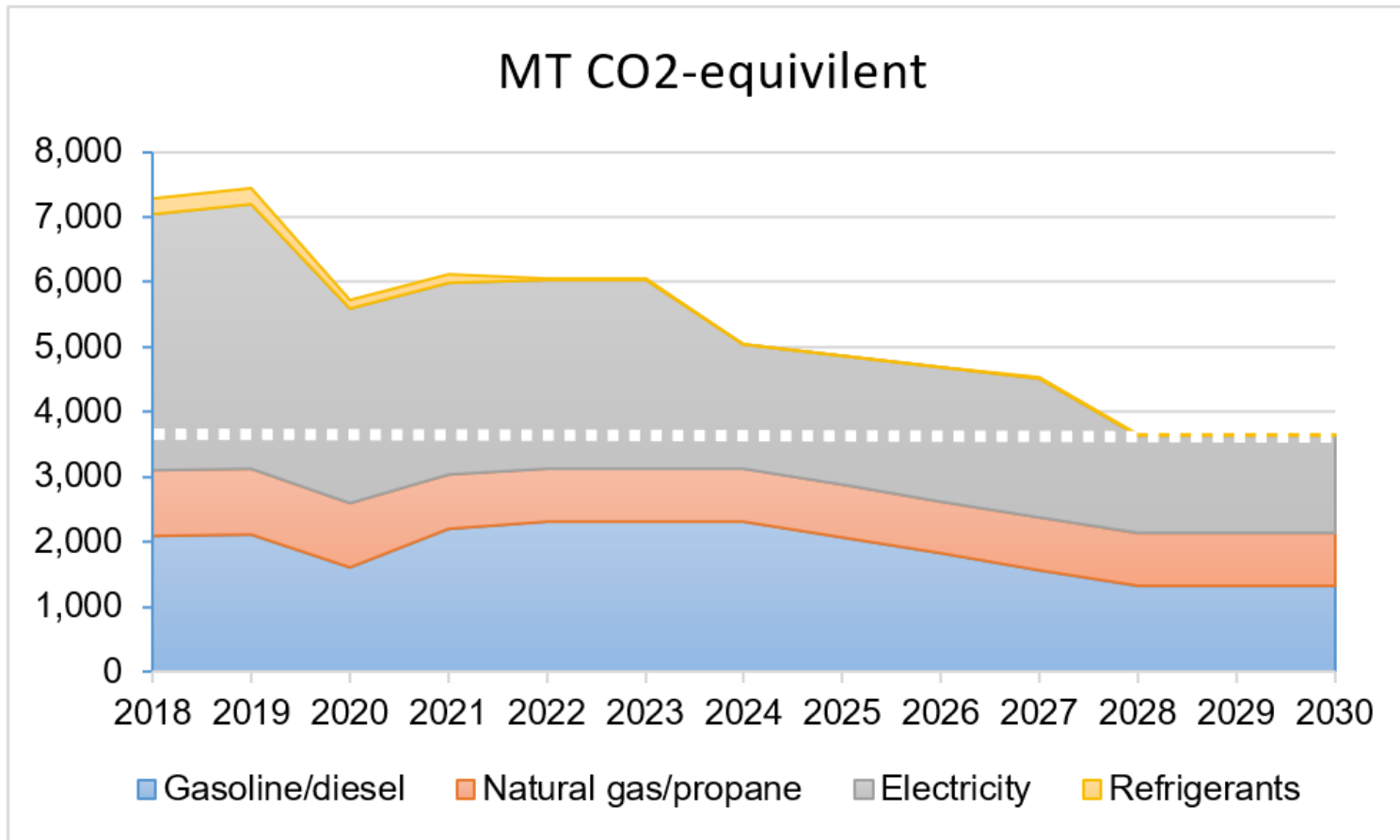
*\*Emissions & financial savings on fuel ~60%*

*\*Replaced through four-year attrition*

*\*700 MT reduction*



# Reduction Plan



## Solar Phase 2

- \*Ten additional locations*
- \*More complicated (costly) installations*
- \*Less favorable interconnection terms*
- \*Microgrids?*
- \*700 MT reduction*



# Implementation

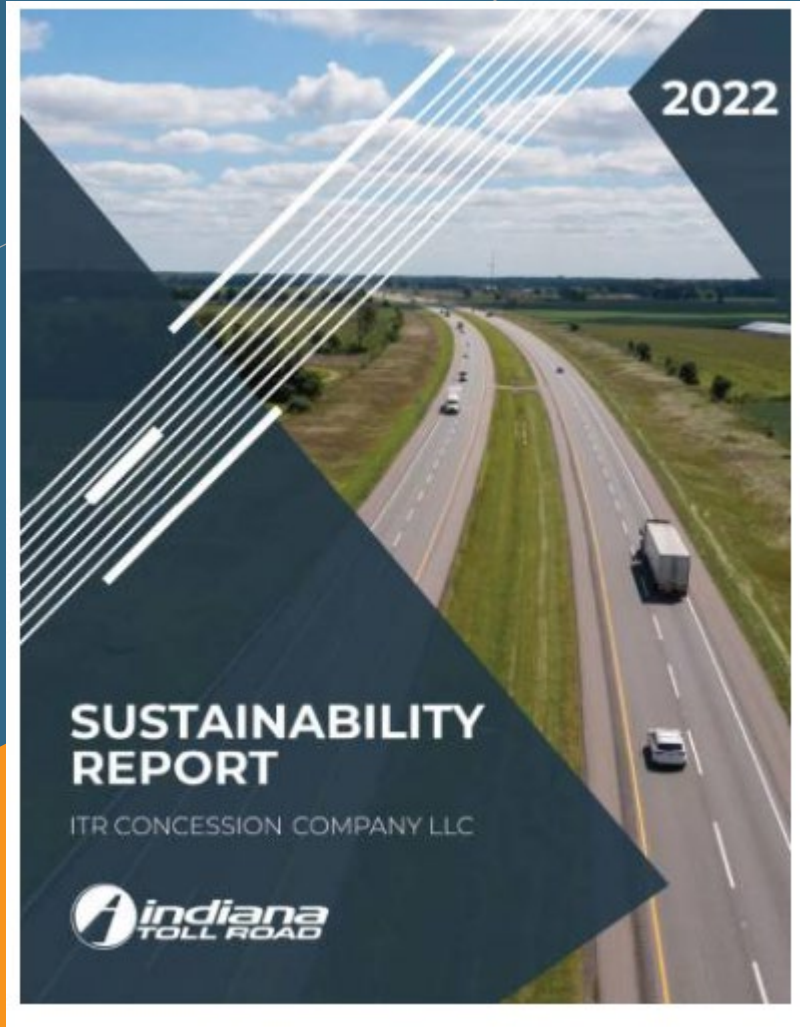
## Challenges

- \*Demanding use case*
- \*Potential disruption to operations - behavioral changes*
- \*Technological & regulatory changes*
- \*No commercial options for heavy duty*
- \*Some low-hanging fruit picked*



## Opportunities

- \*No lack of data*
- \*Lower & more predictable OPEX for fuel, maintenance*
- \*Increased resiliency from fuel disruptions*
- \*Attracting new talent*



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