U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Workplace Charging: Comparison of Sustainable Commuting Options

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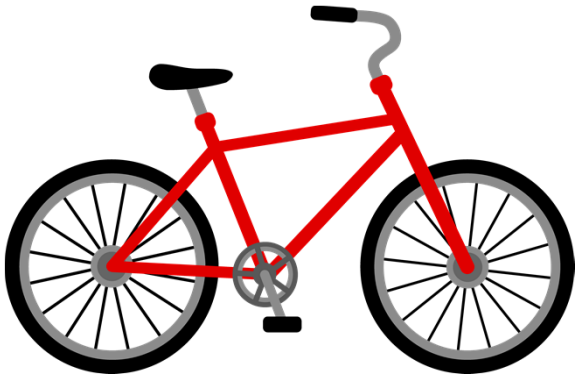
vehicles.energy.gov

Relevance of ROI calculation

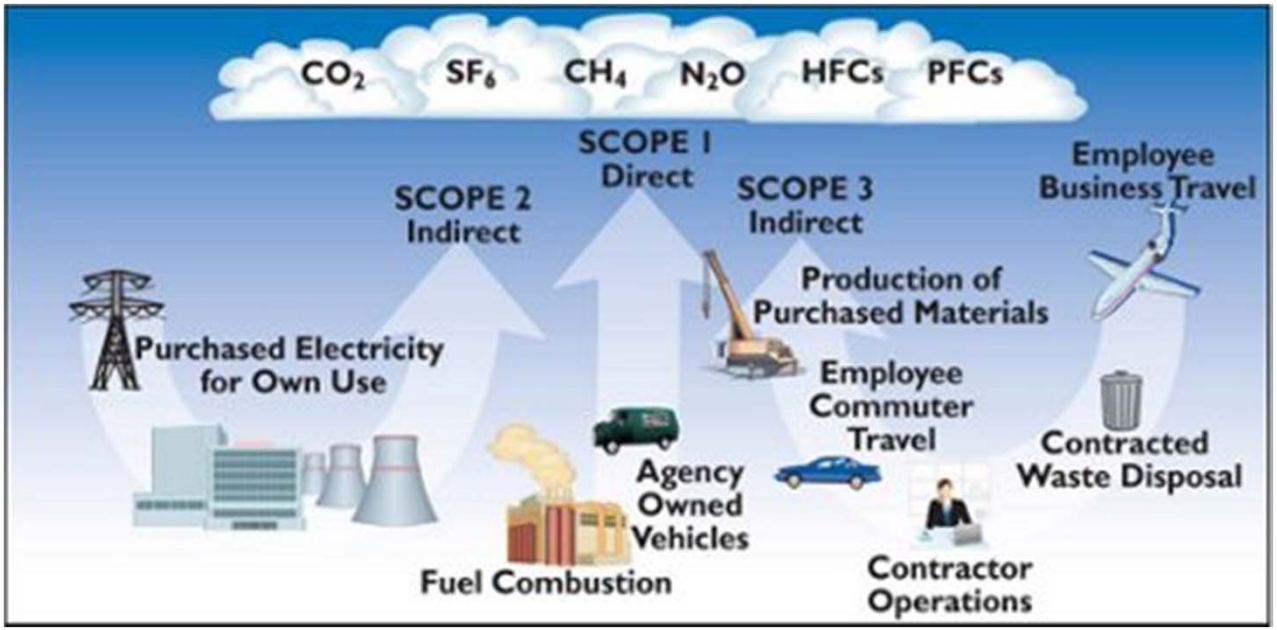
- Value Proposition for Employers
  - How are Lifecycle/Scope 3 GHG emissions affected?
  - What are my (employer) direct costs?
  - What is the Return on Investment (ROI)?
  - What are possible ancillary benefits?

- How does Workplace Charging compare to:
  - Transit Subsidies
  - Vanpool Subsidies
  - Bike Purchase Subsidies
  - Other Commuting Options?



Scope 1, Scope 3 Emissions—Transportation is Hard

- Direct and Indirect GHG emissions can be classified into “scopes”
  - Scope 1 emissions are direct emissions from sources owned or controlled by the entity
  - Scope 2 emissions are indirect emissions that result from the generation of purchased energy
  - **Scope 3** emissions include indirect GHG emissions from sources not owned or directly controlled by the entity but related to the entity’s activities.
- Ties to greener energy as part of a complete strategy



Transportation is Important—petroleum/security

- Transportation is responsible for 2/3 of U.S. petroleum usage
- On-Road vehicles responsible for 80% of transportation petroleum usage
- >240M Vehicles on the road

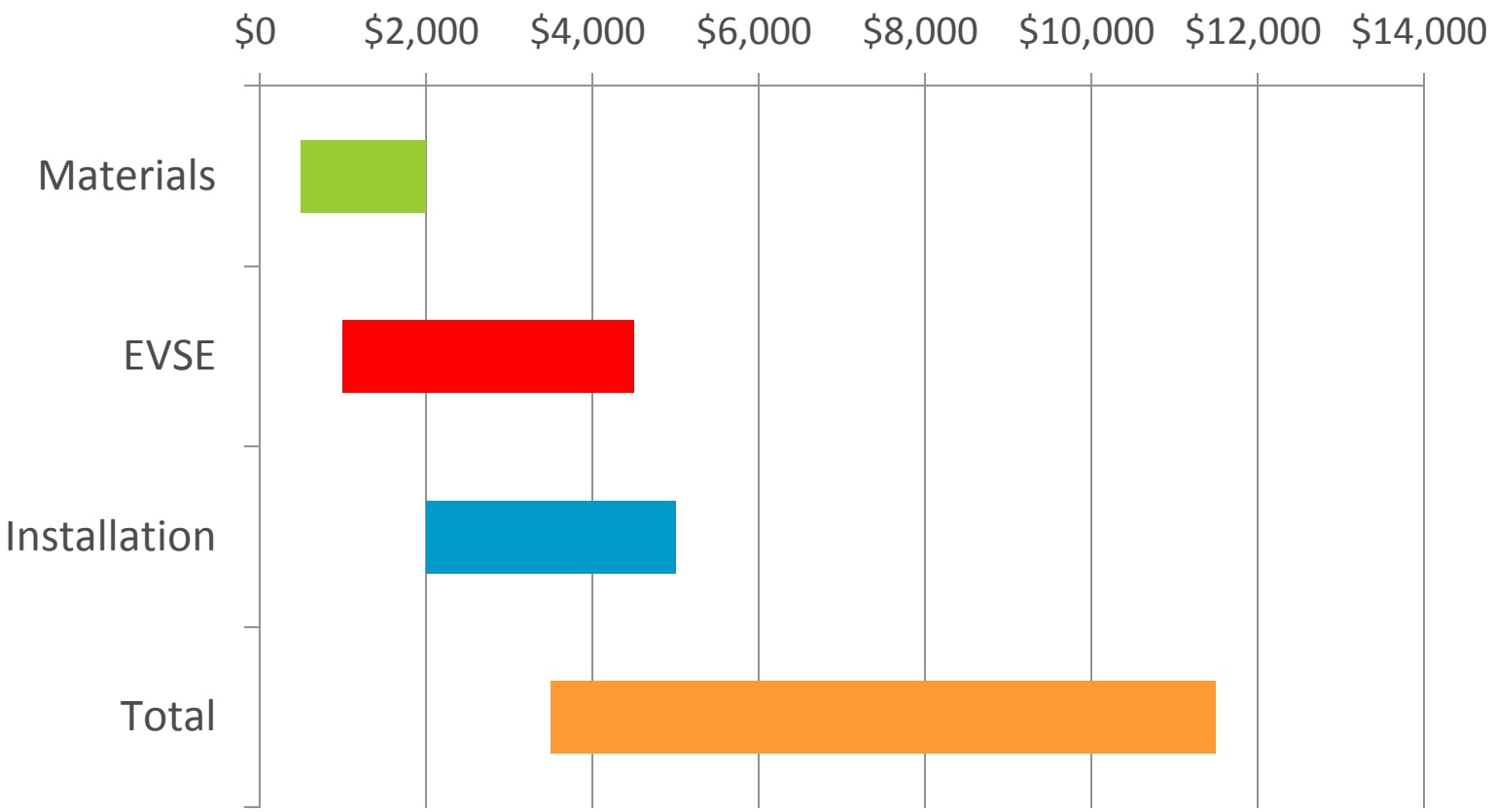
- Economic security, energy security, and environmental stewardship
- Changing energy landscape
  - Natural gas
  - **Electrification**
  - Fuel Economy Standards

The Cost of Oil is Not Just Monetary

ROI calculation background: EVSE assumptions

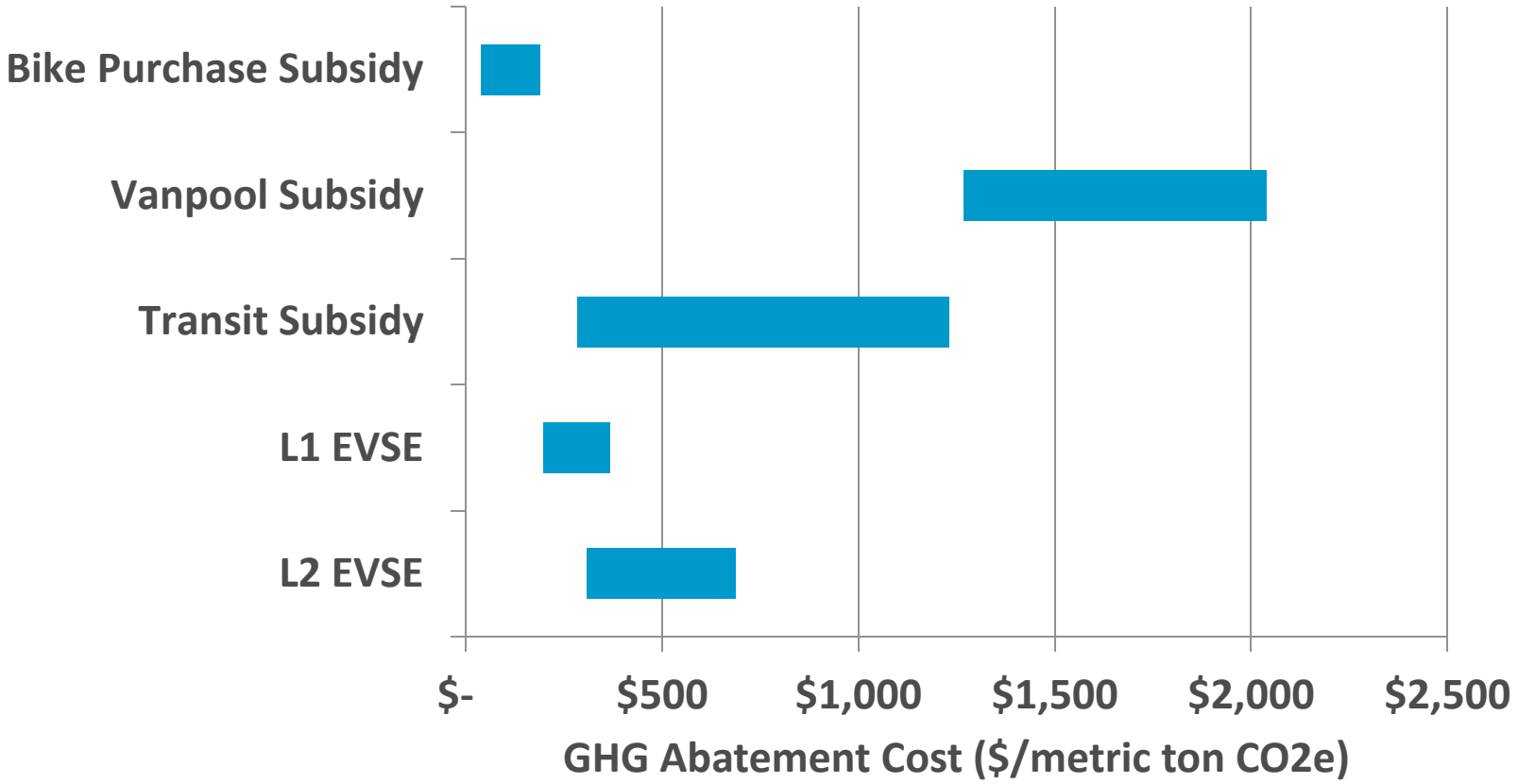
- 4 units
- 2.1 drivers per unit; 7 kWh per day per driver
- Conventional vehicle emissions: 440 g CO2e/mi
- EV Emissions (U.S. Average Grid Mix): ~1.4 lb CO2e/kWh (~223 g CO2e/mi)
- 10-year lifetime; 240 days of use per year
- Yearly network costs: $250
- Yearly maintenance costs: 2.5% of total
- $0.1032/kWh (Average Commercial Electricity Cost in 2013)

Breakdown of L2 Costs

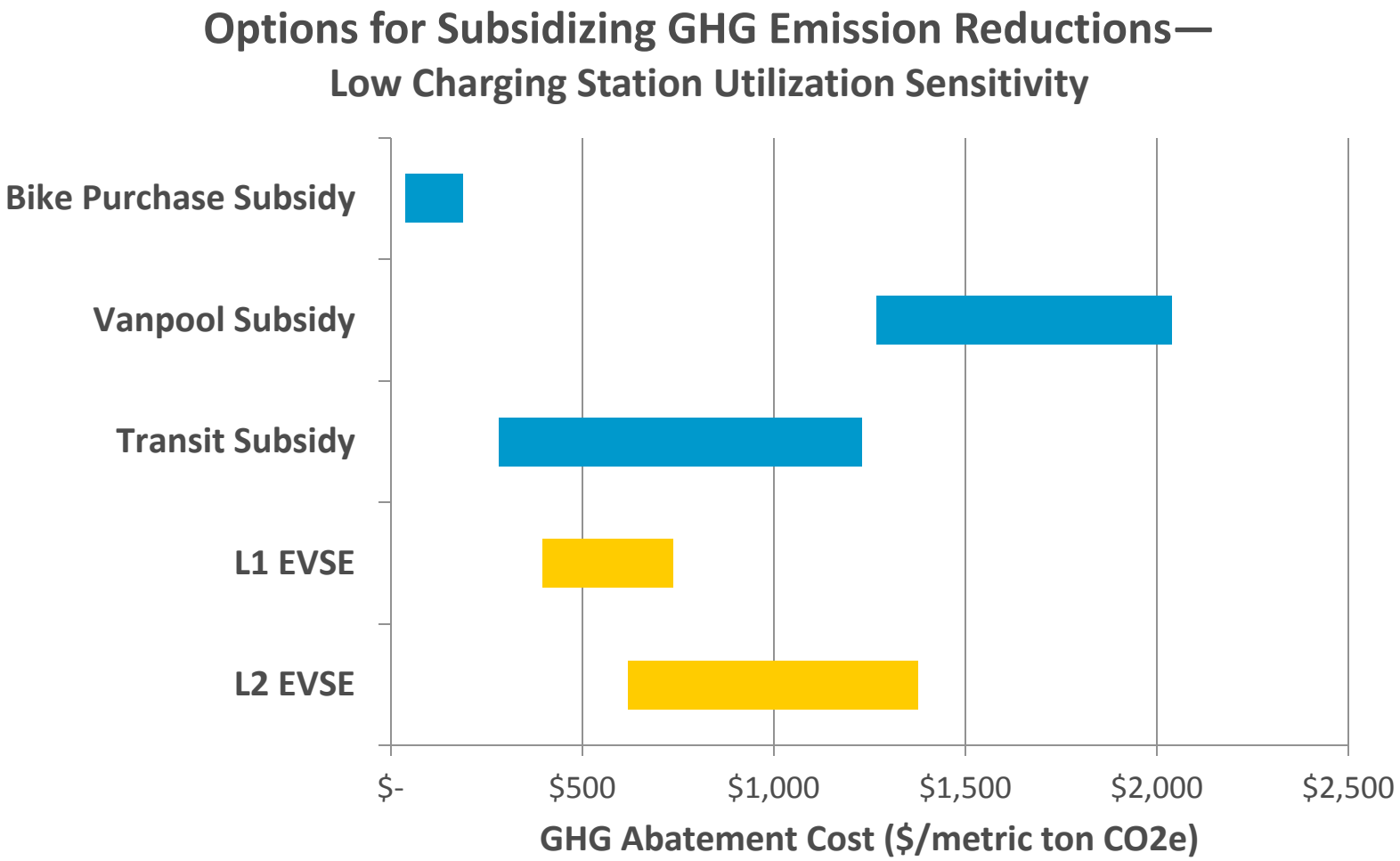


	2 units	4 units	6 units	8 units	10 or more units
Multi-unit installation discount	20%	30%	40%	50%	60%

WPC GHG ROI—Preliminary Estimates

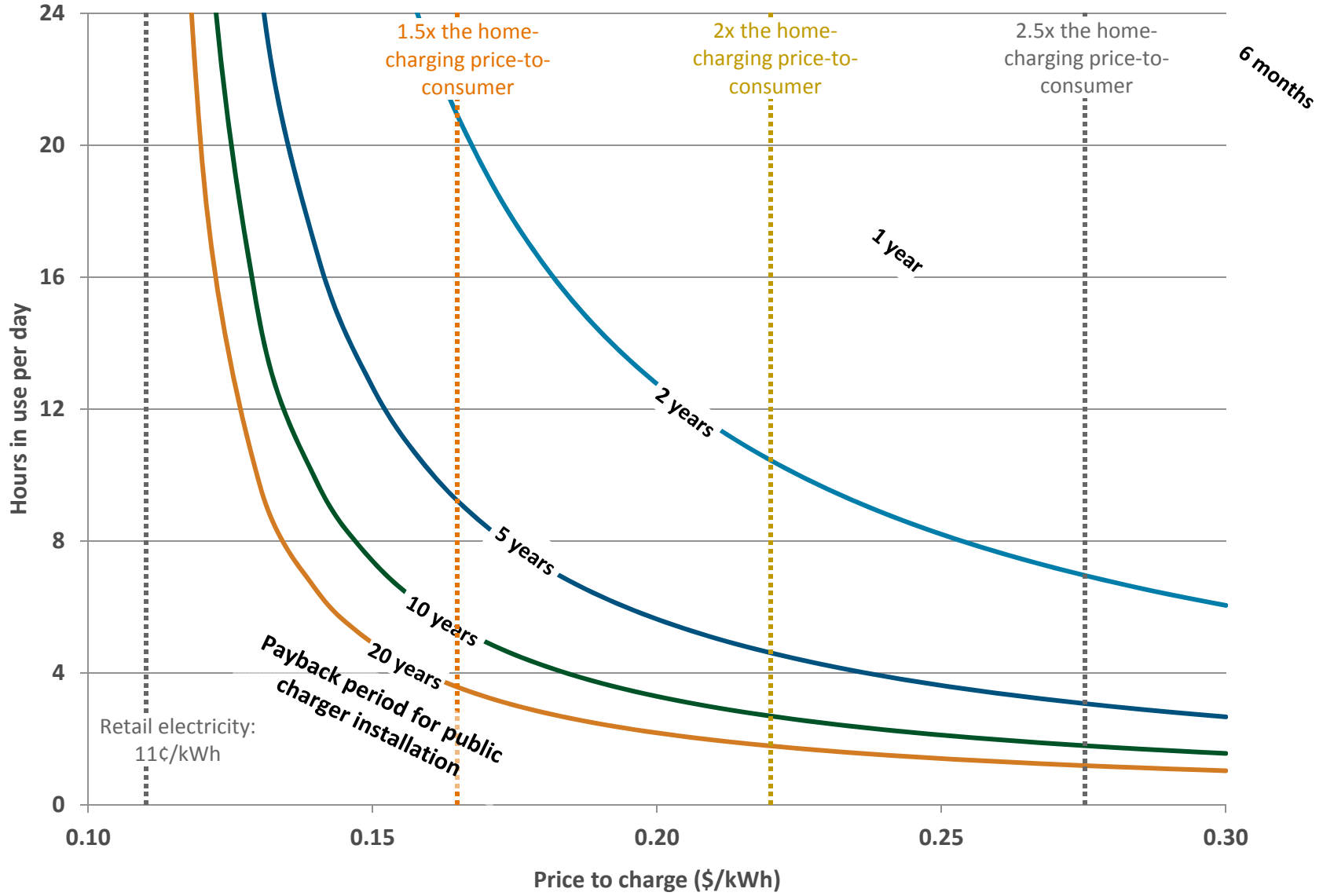


Utilization factors—ROI sensitivities



Changes assumption: 1 use per day (down from 2.1)

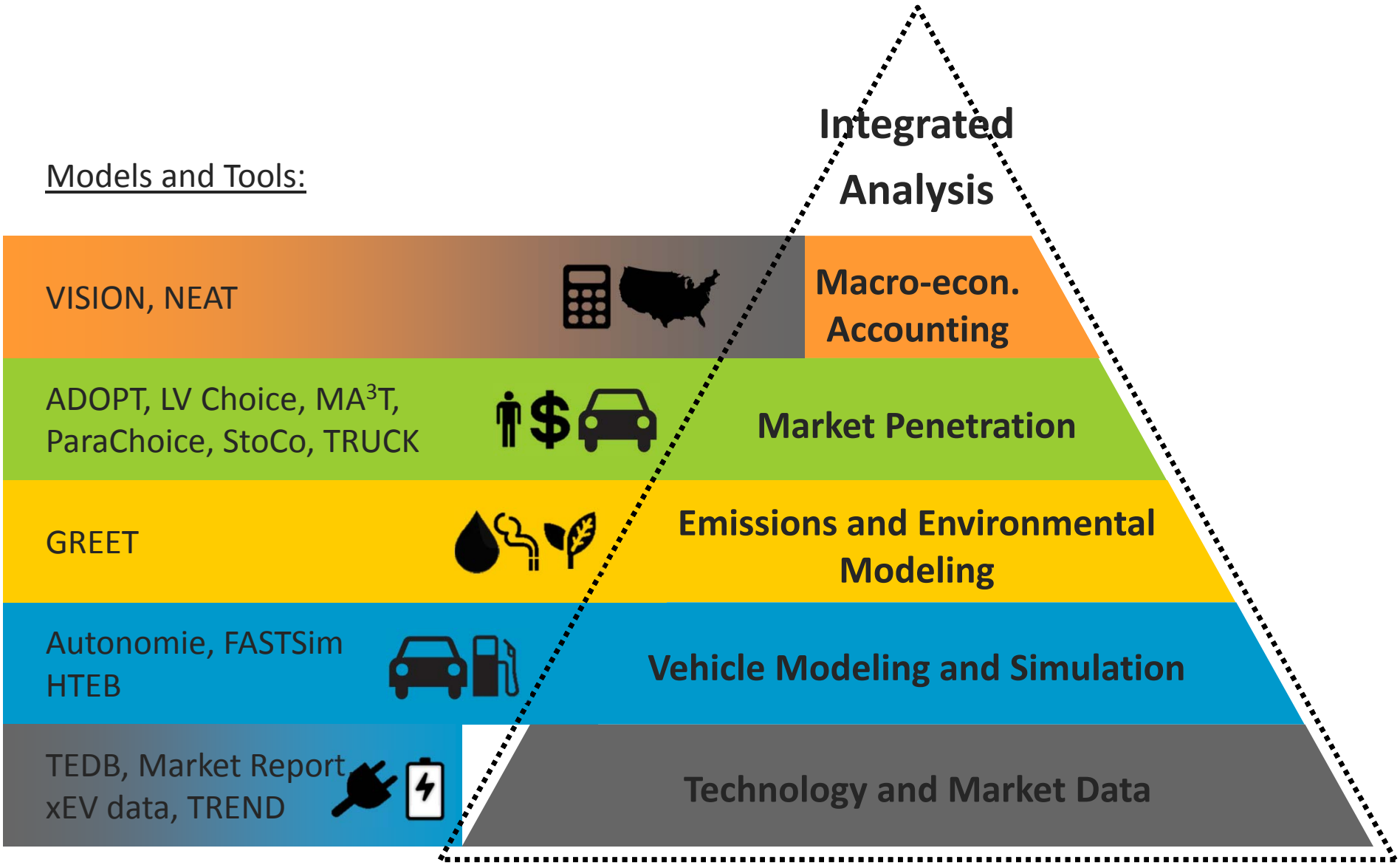
Utilization factors—ROI implications and anecdotes



Other Factors to Consider?

	Possible Pros	Possible Cons
Parking		Does not displace a parking spot or disincentivize single-occupancy driving
Administration	If unmetered, low administrative costs	Could raise questions of tax status
Flexibility	PEVs are options for commuters who can't or prefer not to use bicycling, transit, or other modes	
Employee Satisfaction	May be a strong incentive to attract or retain employees who have or support PEVs	May lead to concerns of fairness from employees without PEVs
Demand Charges	In future, could be part of demand response	If unmanaged, large numbers could affect peak demand
Systematic	Supports a transition to more electric drivetrain vehicles	Does not reduce (or could increase) congestion

Additional VTO Analytical Capabilities



Questions?

What other topics can Analysis address to inform the WPC?
Other Questions?

For questions about this presentation, please contact:

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ROI calculation background: assumptions

Vanpools

- 8.3 persons/van
- 100 mile daily commute
- 16 mpg per van
- up to $400 per vanpool

Transit subsidy

- $30/month (min to qualify for “Best Workplaces for Commuters”)
- up to $130/month (max for federal employees)

Bike purchase subsidy

- $200-$500 per participant
- Lifetime of 4 years
- Cost of lockers, showers, bike racks, infrastructure costs (bike lanes) etc. not included

DCFC