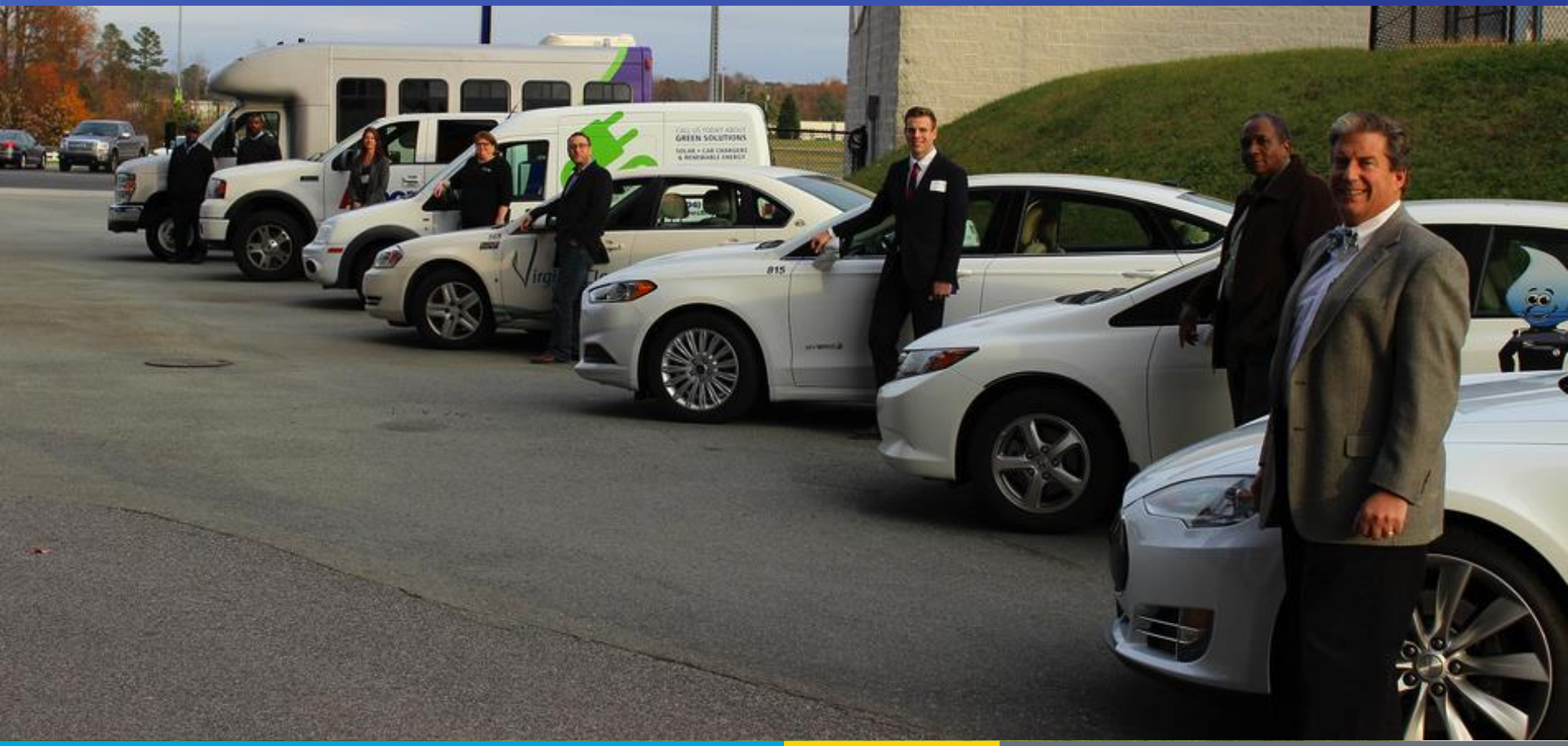


Clean Fuel Progress:

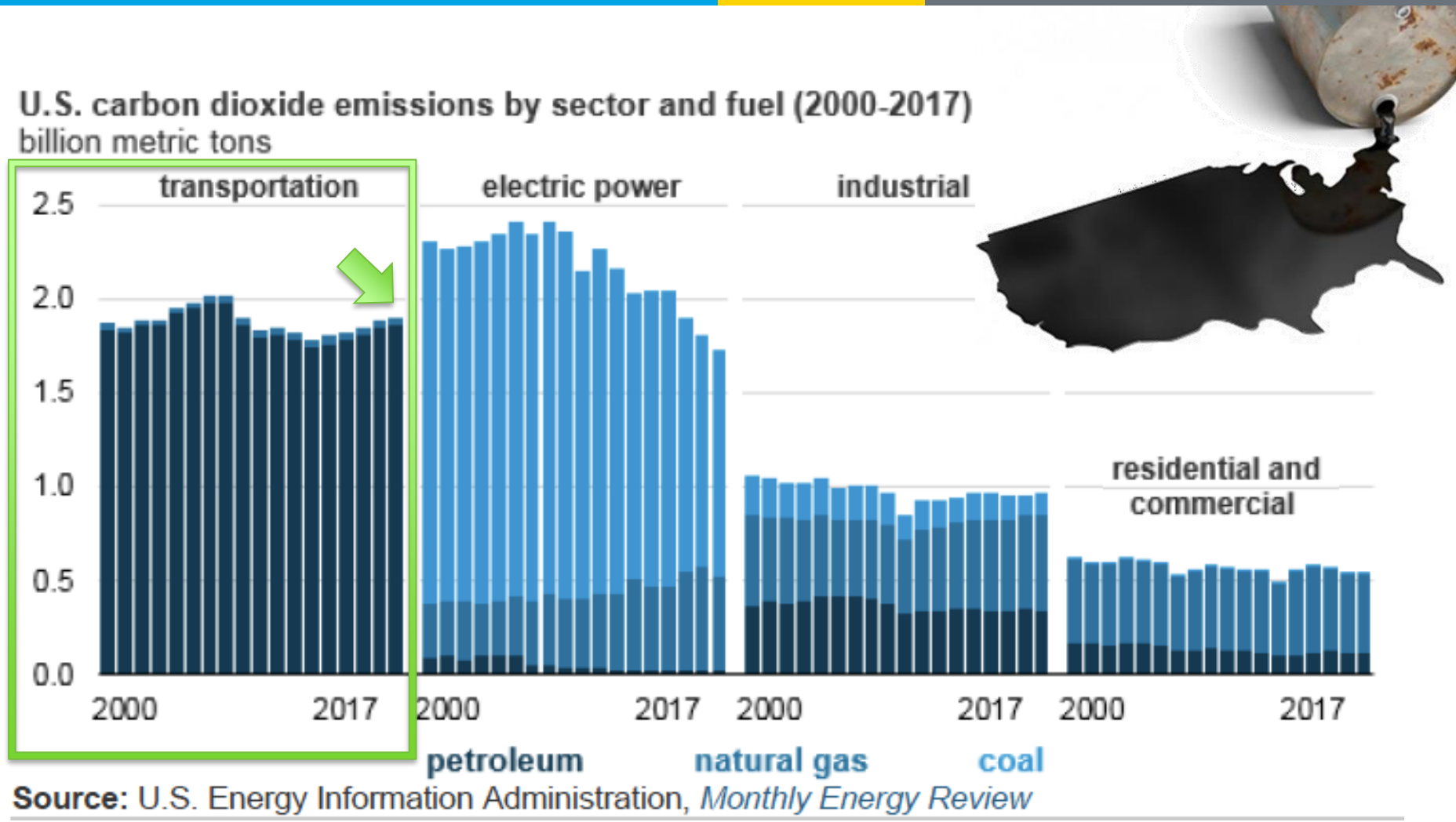
Electric Update

Alleyn Harned Virginia Clean Cities
540-568-8896
aharned@vacleancities.org

WHY - Health and Environment

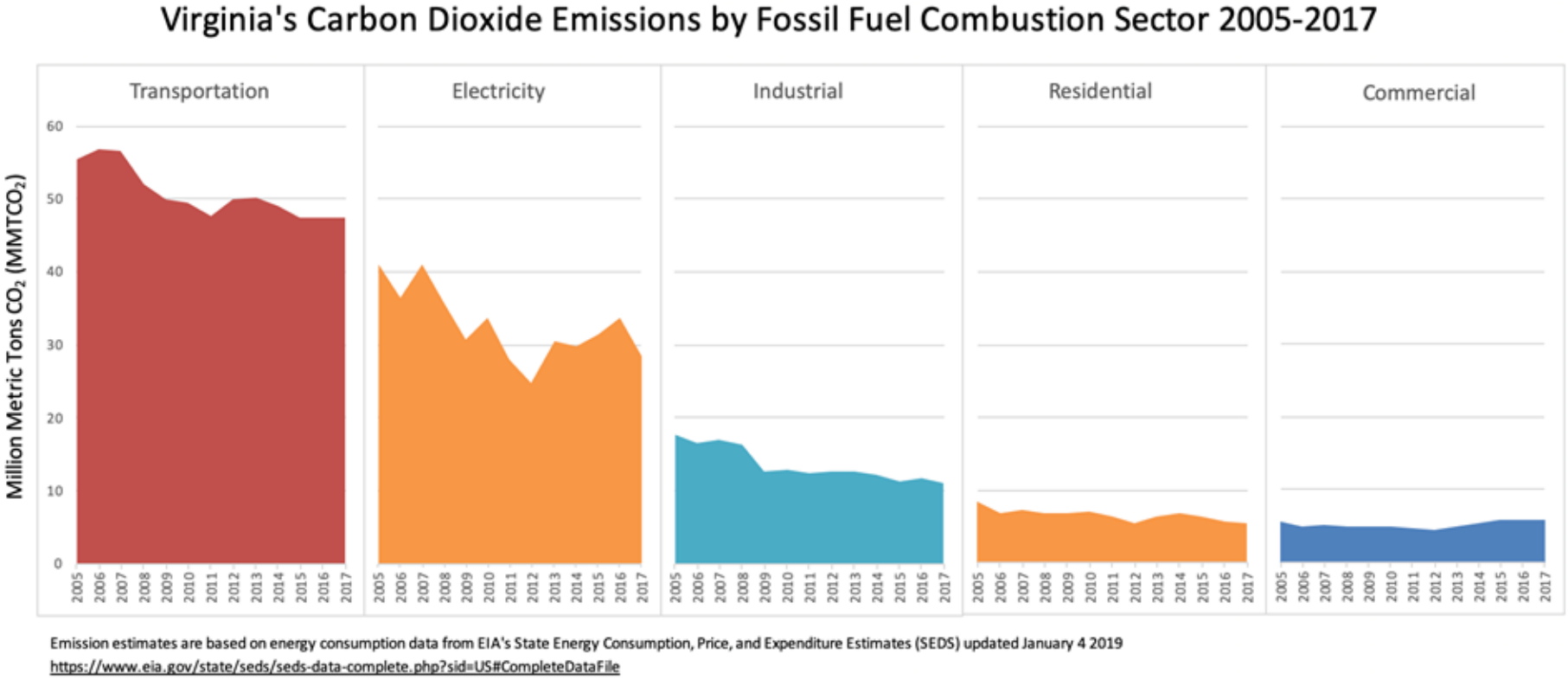
- **Carbon Monoxide (CO)**
  - Cardiovascular disease, damage nervous system 56-95% of US CO is emitted by vehicles
- **Nitrogen Oxides (NOx)**
  - Respiratory damage - 55% from vehicles
- **Particulate Matter (PM)**
  - Aggravates asthma, emphysema, bronchitis, heart disease,
    lung disease, and contributes to water pollution – directly from vehicles
- **Ozone**
  - Smog – reduces lung function
- **Greenhouse Gases (GHGs)**
  - Global pollutant, CO_2 most abundant – 48% of VA CO_2 is from oil used for vehicles

U.S. Carbon Dioxide



As of 2016, Oil for Transportation is largest CO2 Source / Sector

Emissions 45 million metric tons transportation CO2



Emission estimates are based on energy consumption data from EIA's State Energy Consumption, Price, and Expenditure Estimates (SEDS) updated January 4 2019
https://www.eia.gov/state/seds/seds-data-complete.php?sid=US#CompleteDataFile

- VA spends $50 million per day on oil for transportation - $11 Billion/year!
- 48% of VA CO^2 emissions is from oil-powered vehicles (gasoline/diesel). 50 MMT
- 59% of transportation GHG emissions are from light-duty vehicles - Cars we all drive!

Social Cost of Carbon
$51 to $150 per ton

Table ES-1: Social Cost of CO_2, 2020 – 2050 (in 2020 dollars per metric ton of CO_2)[3]

Emissions Year	Discount Rate and Statistic			
	5% Average	3% Average	2.5% Average	3% 95th Percentile
2020	14	51	76	152
2025	17	56	83	169
2030	19	62	89	187
2035	22	67	96	206
2040	25	73	103	225
2045	28	79	110	242
2050	32	85	116	260

1 Gallon = 20 lbs CO2

1 Gallon = $.50 to $1.50 CO2

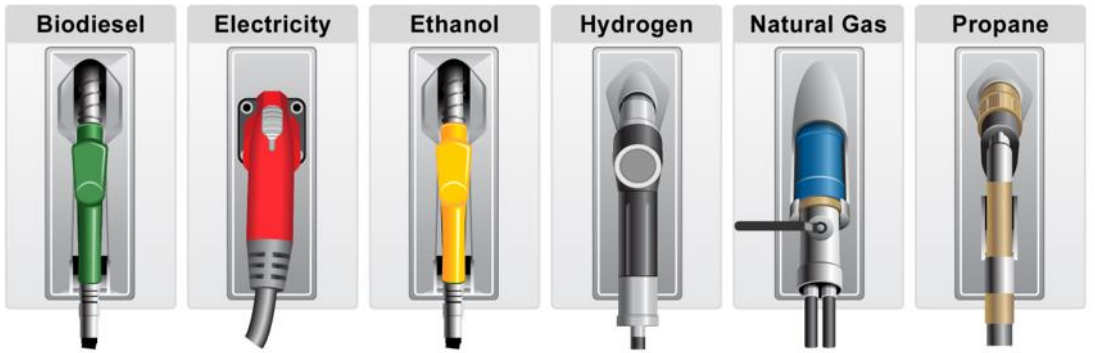
The estimates of the social cost of carbon allow agencies to understand the social benefits of reducing emissions of greenhouse gases, or the **social costs of increasing such emissions**, in the policy making process.

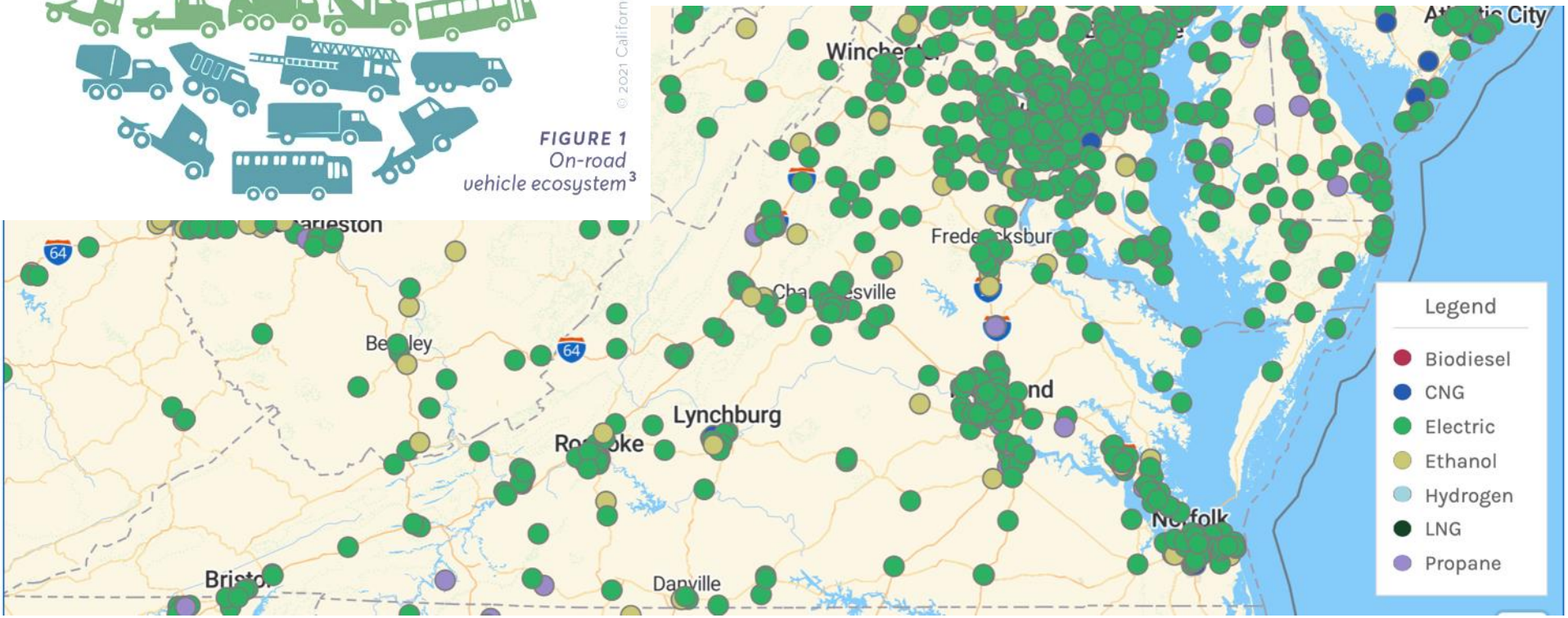
The monetary **value of the net harm to society associated with adding a small amount of that GHG to the atmosphere in a given year**. In principle, it includes the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services.

Vehicles and Infrastructure

© 2021 California Fuel Cell Partnership

FIGURE 1
On-road vehicle ecosystem[3]





Electric Bus Benefits

- **Operational**
  - Highly efficient
  - Lower operating costs
  - Fuel savings over imported diesel
- **Community**
  - Smoother quieter ride
  - No tailpipe pollution into communities
- **Utility / Region**
  - Use of local energy / domestic fuel benefits economy

Utility Opportunities

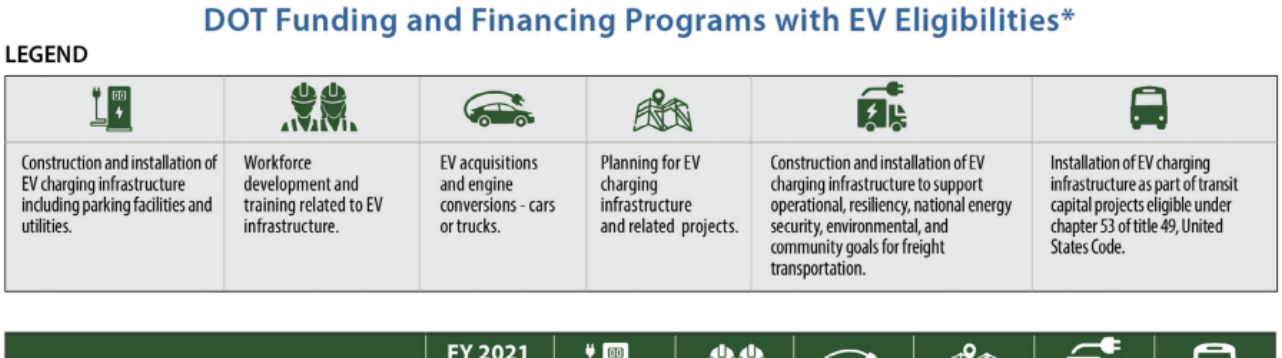
- **Dominion –** Smart Charging Infrastructure Pilot (SCIP)

Item	Multi Family	Workplace	DCFC	Transit
Utility Infrastructure (per site)	$-	$-	$35,000	$35,000
Customer Infrastructure (per site)	$9,000	$9,000	$33,000	$33,000
Network Fee (per charger)	$2,000	$2,000	$5,000	$5,000
Equipment (per charger)	$4,000	$2,700	$36,000	$53,000
Chargers per Site	Min = 1, Max =4	Min = 1, Max = 10	Min = 2, Max = 4	Min = 1, Max = 6
Program Limit	25 Stations	400 Stations	30 Stations	60 Stations

https://www.dominionenergy.com/virginia/save-energy/electric-vehicles/powering-smart-transportation

Funding Opportunities

- **EPA Diesel Emissions Reduction Act (DERA) 45%** - Annual competitive grant funds up to 45% of alternative fuel vehicle. Must be Class 5-8. 60% EV Conversion - Requires scrappage of existing diesel vehicle. Similar program used for
- **FTA LowNo Program 85%** - for zero or low emission buses and infrastructure $180 million likely more
- **FTA / DOT funding**:



Infrastructure Bill

- $7.5 Billion for EV Charging
- $5 billion for School Buses ($2.5 Electric + $2.5 EV/Low Emission)
- $5.6 billion Low No Transit
- +++

- Also: Reconciliation Bill