

Reducing GHG Emissions from Transportation

Greenhouse gases (GHG) include carbon dioxide, methane, nitrous oxide, ozone, chlorofluorocarbons, and hydrofluorocarbons



Sustainability Showcase

September 23, 2018

From Pope Francis:

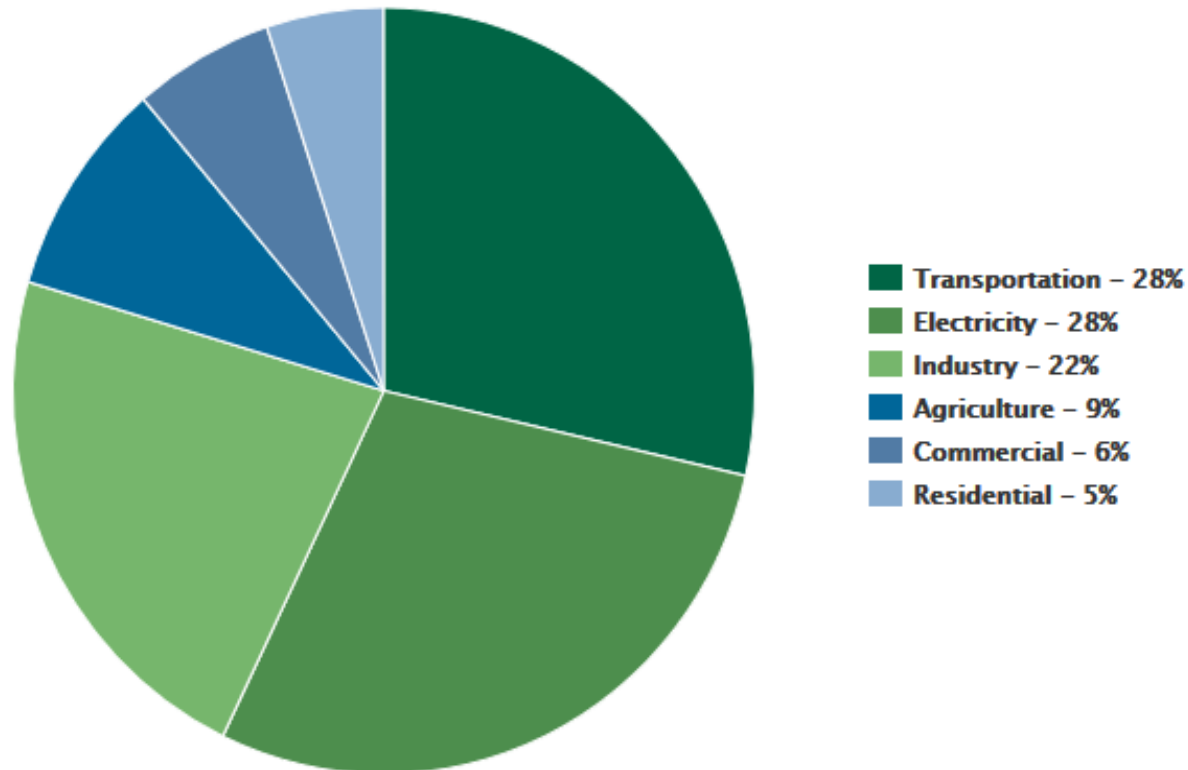
“There is an urgent need to develop policies so that, in the next few years, the emission of carbon dioxide and other highly polluting gases can be drastically reduced, for example, substituting for fossil fuels and developing sources of renewable energy.”

-- *Laudato Si'* ¶ 26



Transportation is the leading source of GHG emissions in the U.S.

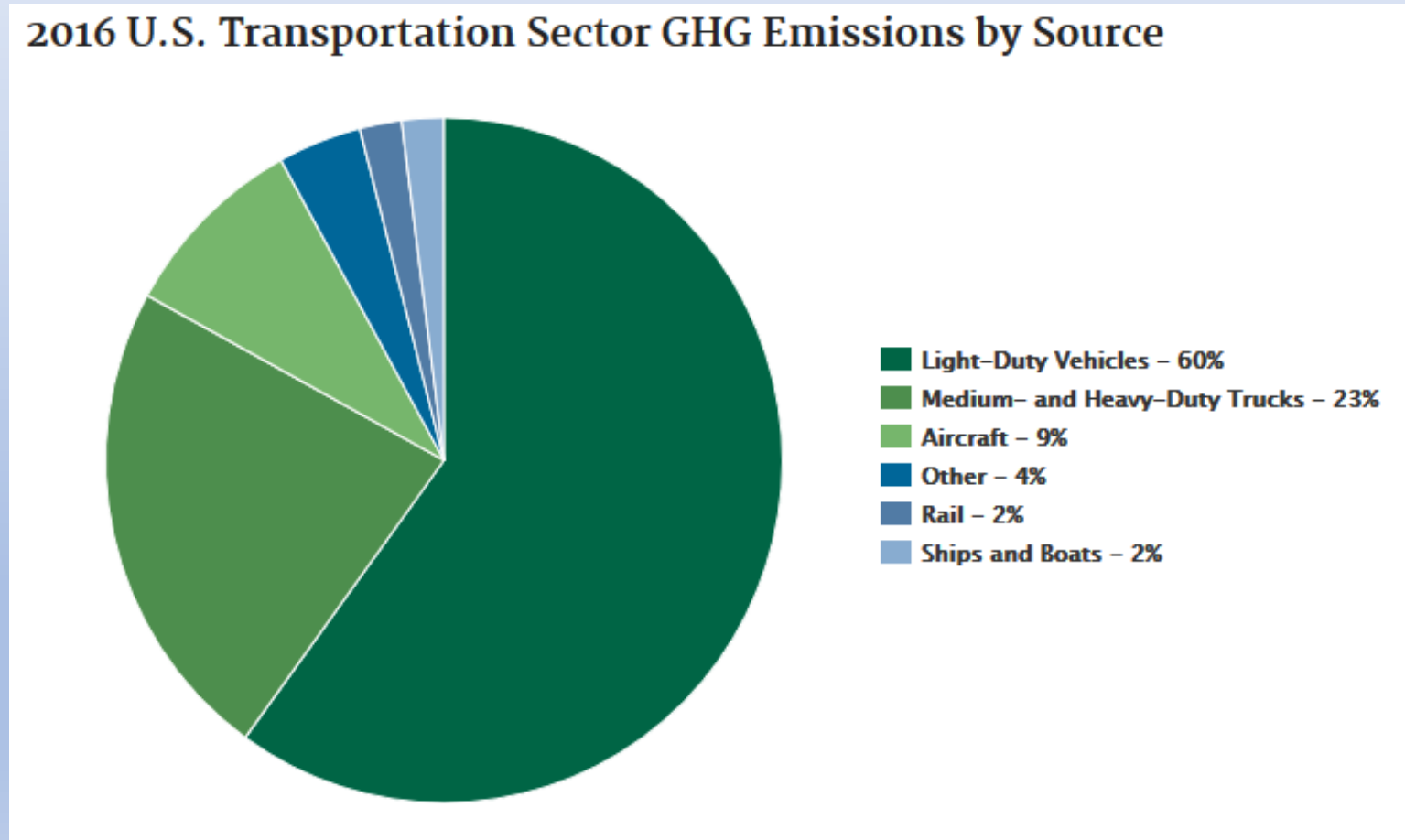
2016 U.S. GHG Emissions by Sector



Billion metric tons/year:

- Transportation 1.9
- Electricity 1.8
- Industry 1.4
- Agriculture 0.6
- Commercial 0.4
- Residential 0.3

Cars and other light-duty vehicles are by far the leading source of GHG emissions in the U.S. transportation sector



Best and worst ways to get
around locally

Best ways to get around (lowest GHG emissions plus significant health benefits)



Local bike shops are an excellent resource for information on bicycle commuting and the latest bike gadgets and safety equipment.

Next best ways to get around (lower GHG emissions plus reduced congestion)



For someone who commutes 20 miles per day round trip, switching to public transportation could reduce his/her carbon footprint by 4,800 pounds annually.

Least desirable way to get around (highest GHG emissions)



Driving a typical car is generally the least environmentally friendly way to get around locally.

See future slides for tips on reducing your GHG emissions from driving.

Best and worst ways to travel
an intermediate distance
(300-500 miles)

Best way to travel 300-500 miles (lowest GHG emissions)

Interurban buses have much lower emissions per passenger than cars, trains, or planes.



Next best ways to travel 300-500 miles (higher GHG emissions)



Driving a fuel-efficient car, particularly with one or more passengers, and taking a train are the next most environmentally friendly ways to travel.

Least desirable way to travel 300-500 miles (highest GHG emissions)

Flying is generally the least environmentally friendly way to travel over medium distances, although a full plane will produce less emissions per passenger than a typical car with only the driver. And flying may be unavoidable for longer distances.

See future slides for tips on reducing your GHG emissions from flying.



Reducing GHG emissions from driving

Reducing GHG emissions from driving

- Drive more efficiently

- Avoid rapid acceleration and sudden braking
- Observe the speed limit—gas mileage usually decreases significantly at speeds above 50 mph
- Avoid hauling cargo on your roof
- Remove unnecessary items that add weight
- Avoid idling
- Use cruise control on highways



Reducing GHG emissions from driving (cont.)

- **Keep your vehicle in good shape**

- Keep your engine properly tuned
- Keep tires properly inflated
- Use the recommended grade of motor oil



- **Plan and combine trips**

- Combine errands into a single trip
- Avoid commuting during peak rush hours if possible
- Drive your most fuel-efficient vehicle
- Telecommute if possible
- Use carpools and ride-share programs



Reducing GHG emissions from driving (cont.)

- Choose a more efficient vehicle
 - Selecting which vehicle to purchase is the most important fuel economy decision you'll make.
 - **Fueleconomy.gov** has gas mileage estimates and other information for vehicles from the current model year back to 1984.



Reducing GHG emissions from driving (cont.)

- Choose a more efficient vehicle (cont.)

- In terms of energy efficiency and GHG emissions:
 - Conventional vehicles (cars, SUVs, vans, pickups) are the least environmentally friendly; and generally the larger they are, the more emissions they produce.
 - Hybrid vehicles are significantly better, although they still produce tailpipe emissions.
 - Plug-in hybrid (PHEV) vehicles are better yet, especially if the car's range allows you to rely on the car's battery most of the time.
 - All-electric vehicles (EVs) are the best, producing no tailpipe emissions.

Reducing GHG emissions from driving (cont.)

- Comparison of four EVs (listed in alphabetical order)
 - Chevrolet Bolt (small station wagon): 119 miles per gallon equivalent (MPGe), 238-mile range, \$37,495+
 - Hyundai Ioniq (midsize car): 136 MPGe, 124-mile range, \$29,500+
 - Nissan Leaf (midsize car): 112 MPGe, 151-mile range, \$29,990+
 - Tesla Model 3 Long Range (midsize car): 130 MPGe, 310-mile range, \$49,000+



Reducing GHG emissions from driving (cont.)

For the greatest reduction in GHG emissions, pair an EV with a rooftop solar system!



Reducing GHG emissions from flying

Reducing GHG emissions from flying

- **Fly less often**—when possible, use conference calls, Skype, etc., or choose a less polluting mode of transportation (bus, train, or fuel-efficient car carrying two or more people).
- **Fly nonstop**—takeoff and landing are the most fuel-intensive parts of a flight, so try to avoid connecting flights.
- **Fly coach**—the emissions associated with flying in business class are about three times as great as flying in coach (the bigger seats mean fewer people are being moved for the same amount of fuel).



Reducing GHG emissions from flying (cont.)

- **Pack lightly**—the less weight the plane has to carry, the less fuel it will burn.
- **Shut the window shades** before takeoff and after landing when it's hot outside, to reduce the amount of fuel needed to cool the plane.
- **Purchase carbon offsets** to compensate for the emissions from your flight. Make sure the program you use provides verification of the offsets by an independent third party.



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