

# Electricity and Electric Infrastructure

Let's learn about the R&D GREET model's capability to model electricity and electric infrastructure. This worksheet will help you harness the R&D GREET model in cases related to electricity.

## Electric generation mix scenarios

Where would you find the general settings for altering the electric generation mix in R&D GREET?

Answer here

**List the primary tabs used to modify the electric generation mix and calculate the emissions of the selected mix.**

Answer here

## Electric infrastructure scenarios

Where would you find the general settings for including the construction of electric infrastructure within the system boundary of the LCA calculation in R&D GREET?

Answer here

**List the primary tabs used to modify the general settings for electric infrastructure and calculate the emissions of the selected infrastructure construction.**

Answer here

## Electric generation mix in R&D GREET

Explore the major worksheets related to the electric generation mixes in R&D GREET.





### **CIDI renewable diesel from biooil**

Model a compression ignition direct injection (CIDI) internal combustion engine passenger car using renewable diesel from biooil in R&D GREET. All other settings should be set as default.

### **What are the well-to-wheel (WTW) GHG emissions in g CO<sub>2</sub>e/MJ?**

WTW GHG emissions =

### **50% coal/50% natural gas electricity**

Model a compression ignition direct injection (CIDI) internal combustion engine passenger car using renewable diesel from biooil produced with a 50% coal/50% natural gas electricity generation mix in R&D GREET. All other settings should be set as default.

### **What is the default electricity generation mix used in R&D GREET?**

Answer here

### **What are the well-to-wheel (WTW) GHG emissions in g CO<sub>2</sub>e/MJ?**

WTW GHG emissions =

### **FCV fueled by hydrogen produced in Florida**

Model a fuel cell electric vehicle (FCV) passenger car using gaseous hydrogen produced with a Florida-specific electricity grid (EIA Form-923) mix in R&D GREET. All other settings, including the hydrogen production method should be set as default.

### **What is the conversion factor for light water reactor (LWR) nuclear power plants used in R&D GREET? Include units**

Answer here





**What are the well-to-wheel (WTW) GHG emissions in g CO<sub>2</sub>e/MJ?**

WTW GHG emissions =

**What are the cradle-to-grave (C2G) GHG emissions in g CO<sub>2</sub>e/mile?**

C2G GHG emissions =

### **SUV BEV charged in WECC**

Model a 2022 sport utility vehicle (SUV) battery electric vehicle (BEV) using an NMC622 battery charged with a WECC electricity generation mix in R&D GREET. All other settings should be set as default.

**What are the well-to-pump and well-to-wheels GHG emissions in g CO<sub>2</sub>e/MJ?**

1 WTP GHG emissions =

2 WTW GHG emissions =

**What are the cradle-to-grave (C2G) GHG emissions in g CO<sub>2</sub>e/mile?**

C2G GHG emissions =

**Which phase of the fuel cycle (feedstock, fuel, or vehicle operation) is responsible for a reduction in C2G GHG emissions relative to employing the U.S. average grid mix?**

Answer here

### **Electric infrastructure in R&D GREET**

Explore the major worksheets related to the electric infrastructure in R&D GREET.



## Power-plant construction

Model a 2022 sport utility vehicle (SUV) battery electric vehicle (BEV) using an NMC622 battery charged with a WECC electricity generation mix in R&D GREET. **Include the emissions associated with constructing the power-plant from raw materials.** All other settings should be set as default.

**What are the cradle-to-grave (C2G) GHG emissions in g CO<sub>2</sub>e/mile?**

C2G GHG emissions =

**How do the C2G GHG emissions compare to the C2G GHG emissions that do not include the facility cycle?**

Answer here

## Onshore wind turbine

Model a 2022 passenger **car** battery electric vehicle (BEV) using an **NMC111** battery charged from a wind turbine located onshore the U.S. in R&D GREET. Include infrastructure emissions. All other settings should be set as default.

**What is the capacity factor for a wind turbine located onshore?**

Answer here


**What is the assumed lifespan of a wind turbine located onshore?**

Answer here

**What percentage of the wind turbine is made of recycled steel?**

Answer here





**What is the default installation type used for small residential solar photovoltaic systems?**

Answer here

**What are the cradle-to-grave (C2G) GHG emissions in g CO<sub>2</sub>e/mile?**

C2G GHG emissions =

**Offshore wind turbine**

Model a 2022 passenger car battery electric vehicle (BEV) using an NMC111 battery charged from a wind turbine located **offshore the U.S. in deep water** in R&D GREET. Include infrastructure emissions. All other settings should be set as default.

**What is the capacity factor for a wind turbine located offshore in deep water?**

Answer here

**What are the cradle-to-grave (C2G) GHG emissions in g CO<sub>2</sub>e/mile?**

C2G GHG emissions =

**How do the R&D GREET 2 C2G GHG emissions compare to the R&D GREET 2 C2G GHG emissions of the car charged from an onshore wind turbine?**

Answer here