

Summary of Expansions and Revisions in GREET™1_2013 Version

Systems Assessment Section
Center for Transportation Research
Argonne National Laboratory

October 2013

This release of GREET1_2013 model includes the following major updates:

1. Added marine fuel pathways including marine fuels production and commercial vessel operations between various origin and destination pairs. Detailed information on the life-cycle stages of marine fuel production from various feedstock sources such as crude oil, natural gas, renewable natural gas, coal, cellulosic biomass, plants and algal oil, and data on marine vessel operations such as tankers, container ships and bulk carriers can be found in the following Argonne National Laboratory (ANL) report <http://greet.es.anl.gov/publication-marine-fuels-13>.
2. Added sorghum-based ethanol pathways, including grain, sweet, and forage sorghum. Detailed information on the life-cycle stages of sorghum-based ethanol pathways are documented in the following ANL paper <http://www.biomedcentral.com/content/pdf/1754-6834-6-141.pdf>.
3. Added biodiesel production pathway from tallow. Detailed information on life-cycle stages for that pathway are documented in the following ANL report <http://greet.es.anl.gov/publication-tallow-13>.
4. Updated electric power sector technology shares, efficiencies and emission factors by technology based on 2010 data from EIA and EPA, and expanded the available generation mixes in GREET to include 11 electric utility regions. Detailed information on the electricity sector updates in GREET1_2013 are documented in the following ANL report <http://greet.es.anl.gov/publication-electricity-13>.
5. Updated methane (CH₄) emissions estimates for various life-cycle stages in natural gas pathways in GREET1_2013 based on latest data from EPA and other sources in the literature. Detailed information on these updates can be found in the following ANL report <http://greet.es.anl.gov/publication-ch4-updates-13>.
6. Updated transportation and distribution parameters for various transportation mode in GREET. These include emission factors, energy intensity, mode shares and distances for various pathways in GREET. Detailed information on these updates are documented in the following ANL report <http://greet.es.anl.gov/publication-tansportation-distribution-13>.
7. Updated land use change (LUC) data for various biofuels production pathways and introduced new modeling options. Detailed information on these updates are documented in the following ANL CCLUB manual <http://greet.es.anl.gov/publication-cclub-manual>.
8. Updated cellulosic biomass feedstock parameters including farming energy and fertilizers use, T&D, and dry matter losses. Detailed information on these updates are documented in the following ANL report <http://greet.es.anl.gov/publication-feedstocks-13>.

9. Updated fertilizers and nutrients use for biofuels pathways. Detailed information on these updates are documented in the following ANL paper <http://www.sciencedirect.com/science/article/pii/S2211926413000854>.
10. Updated petroleum refining efficiency for various refinery products. Detailed information on the updates are documented in the following ANL report <http://greet.es.anl.gov/publication-petroleum-eff-13>.
11. Updated light duty vehicles (LDV) tailpipe emission factors. Detailed information on these updates are documented in the following ANL report <http://greet.es.anl.gov/publication-vehicles-13>.
12. Updated hydrogen production based on latest DOE H2A models. Detailed information on these updates are documented in the following ANL report <http://greet.es.anl.gov/publication-h2-13>.
13. Updated urban share of criteria air pollutants (CAP) emissions for LDVs and for petroleum and electricity pathways. Detailed information on these updates are documented in the following ANL reports <http://greet.es.anl.gov/publication-vehicles-13>, <http://greet.es.anl.gov/publication-petroleum-eff-13>, and <http://greet.es.anl.gov/publication-electricity-13>, respectively.