HIF GLOBAL FAQ

What are eFuels?

Electricity based fuels, or eFuels, are clean, carbon neutral, drop-in fuels produced from renewable energy, green hydrogen and carbon dioxide (CO_2) taken from the atmosphere, or an industrial or biogenic source. eFuels provide transportation and storage solutions to the challenge of intermittent and remote renewable resources and a recycling system for carbon dioxide (CO_2) in our atmosphere.

How compatible are eFuels with existing engine technology? Why are eFuels called "drop-in" fuels?

eFuels are the same as the conventional fuels we use today - just cleaner and renewable. They are 100% compatible with existing engines and infrastructure (including pipelines that are used to transport liquid fuels). eFuels are considered a "drop-in" fuel, meaning they can be used by existing engines and infrastructure without needing any modifications at all . . . they can simply be dropped right in.

What modifications have to be made to cars or gas stations to use eFuels?

None. No modifications are required for existing cars, airplanes, ships, trucks, pipelines or fueling stations to use eFuels.

What type of energy will be used to make the eFuels?

eFuels take renewable energy and use it to turn air and water into fuel. Electricity from renewable energy will be used to produce green hydrogen by separating a molecule of water into oxygen and hydrogen, which, when combined with carbon dioxide (CO_2), creates the liquid eFuels. Renewable electricity may be produced from wind, solar or hydroelectric sources.

What is the carbon footprint of eFuels? Why are eFuels carbon neutral?

eFuels are considered carbon neutral because they are made from renewable energy and recycled carbon dioxide (CO_2). However, there may be some emissions resulting from raw materials supplies and product shipments that need to be included when considering the carbon footprint of eFuels' lifecycle. Our products and processes will be carefully reviewed by specialist life cycle analysis consultants to ensure that any relevant emissions are taken into account in determining the final carbon intensity (CI) score.

How can this be "neutral" if cars will emit carbon when they burn the fuel?

eFuels are considered carbon neutral because the carbon that is emitted when eFuels are burned was already in the atmosphere or is residual from industries, and it is recycled as a part of the eFuels production process. When people use eFuels, the petroleum they otherwise would have used is being kept in the ground, instead of being burned and releasing more carbon into the atmosphere.

How much energy does this fuel produce compared to conventional fuels?

eFuels are chemically equivalent to existing gasoline, methanol, or jet fuel. They have the same energy output as current fuel sources.

How does the eFuel compare to the conventional fuel it replaces?

eFuels have equal performance, are cleaner for the air and have a lower carbon intensity compared to conventional fuels. eFuels are chemically equivalent to traditional gasoline, methanol, or jet fuel, therefore the performance of the eFuels in engines is identical to conventional fuel. Because eFuels are created from clean air and water, they do not contain impurities, such as sulfur and other polluting particulates, which can be present in fossil fuels. The energy-creating carbon in eFuels comes from recycled carbon dioxide (CO_2) that is already in our atmosphere instead of bringing new carbon out of the ground as fossil fuel, so the carbon intensity of eFuels is very low to zero.

Is the production of eFuels impacted by available wind and sun?

eFuels are transportation and storage solutions to the challenge of remote and intermittent supply of renewable resources. The production of eFuels will be impacted by the geographic and hourly availability of the wind and sun; however, converting the wind and sun to a liquid fuel will enable transportation of the energy to demand centers using existing infrastructure over long distances *and* storage of the energy in liquid form, which is stable, volume efficient, and does not degrade over time. Furthermore, in areas where renewable electricity can be interconnected with an existing grid, the intermittency of the wind and sun can be balanced with the grid to improve the capacity utilization of the eFuels production to support their competitiveness.

How much land is needed to produce eFuels? What impact does and eFuels facility have on land access and use, as well as natural scenery in the area?

Approximately 250 acres (100 hectares) are required for hydrogen production and the chemical plant facilities. We intend to secure between 500 and 1,000 acres for each commercial site to assure room for construction and offsets. We strive to be good neighbors and intend to have a visually pleasing site and will screen with trees or other features if/where required.

What are the by-products / waste / contaminants of eFuels production?

The primary by-product from producing eFuels is pure oxygen, which may be released to the atmosphere. There may be small amounts of waste and contaminants removed from water treatment, which will be permitted and disposed of properly.

What is the environmental benefit of eFuels?

eFuels positively impact the environment by displacing fossil fuels, enabling the fossil fuel based carbon dioxide to remain underground, stored as the earth intended. eFuels also create a recycling system for carbon dioxide already in the atmosphere, providing a way to re-use the energy of the carbon emitted by our forefathers and transition to a circular sustainable economy. eFuels provide a transportation and storage solution to bring remote and unused renewable energy to population centers. eFuels are used by existing infrastructure, reducing the need for new construction outside the eFuels facility.

How safe are eFuels?

eFuels are chemically equivalent to gasoline (or jet fuel or shipping fuel, depending upon their proposed application). As with traditional fuels, eFuels are toxic substances that can cause health problems through inhalation or physical contact. So as long as customary protocols are practiced when handling eFuels, the product is safe.

How will eFuels be transported?

eFuels are chemically equivalent to existing liquid fuel products, so they can be transported via existing methods (such as pipelines, ships, or trucks) without requiring modifications of any kind.

How long until we see mass production of eFuels? When can I put this in my car?

eFuels are already in production. Mass production of eFuels is expected from 2026.

What companies are involved in HIF's eFuels process?

There are a number of large global companies working with HIF to bring eFuels to consumers and businesses worldwide. To date, these companies include Bechtel, Siemens, Porsche, Enel Green Power, Exxon Mobil, Haldor Topsoe, Baker Hughes and Gasco, among others.

How much do eFuels costs compared to conventional fuels?

eFuels are competitive now with fossil fuels in markets that have carbon pricing structures. Until recently, the high cost of renewable energy and carbon capture meant that eFuels were viewed as an unrealistic decarbonization option. Renewable energy costs, however, have dropped by 70 – 90%

over the past decade. As a result, large-scale eFuel production facilities – located in areas with the world's best renewable energy resources – can produce eFuels at competitive prices. Increased production capacity and increased equipment efficiency as eFuels are produced at scale are expected to reduce costs even further.

Are eFuels delaying our global transition to electric vehicles?

We view eFuels and electric vehicles as complementary solutions working together to minimize the effects of climate change and accelerate the transition to a decarbonized economy. Electric vehicles and eFuels will both play an important role in achieving sustainable mobility.

If the world is moving toward a fully electric transportation system, why will we still need to produce eFuels at scale?

There are more than 1.5 billion vehicles in use today, and all of them will continue to require gasoline – or a gasoline substitute like eFuels – for the foreseeable future. In addition, there are currently no plans to electrify airplanes and other large transportation vehicles; they will still require fuel sources like eFuels. Toward that end, decarbonizing these existing vehicles while we transition to EVs will play a key role in mitigating the impacts of a changing climate.