

Preface

Carbon-neutral fuel is fuel which produces no net-greenhouse gas emissions or carbon footprint. In practice, this usually means fuels that are made using carbon dioxide (CO₂) as a feedstock. Proposed carbon-neutral fuels can broadly be grouped into synthetic fuels, which are made by chemically hydrogenating carbon dioxide, and biofuels, which are produced using natural CO₂-consuming processes like photosynthesis.

The carbon dioxide used to make synthetic fuels may be directly captured from the air, recycled from power plant flue exhaust gas or derived from carbonic acid in seawater. Common examples of synthetic fuels include ammonia and methane, although more complex hydrocarbons such as gasoline and jet fuel have also been successfully synthesized artificially. In addition to being carbon neutral, such renewable fuels can alleviate the costs and dependency issues of imported fossil fuels without requiring either electrification of the vehicle fleet or conversion to hydrogen or other fuels, enabling continued compatible and affordable vehicles. In order to be truly carbon-neutral, any energy required for the process must be itself be carbon-neutral or emissions-free, like renewable energy or nuclear energy. ⁱ

In the present book, ten typical literatures about carbon-neutral fuel published on international authoritative journals were selected to introduce the worldwide newest progress, which contains reviews or original researches on carbon-neutral fuel. We hope this book can demonstrate advances in carbon-neutral fuel as well as give references to the researchers, students and other related people.

The Editorial Board of Academic Archives

Scientific Research Publishing

January 15th, 2026

ⁱ https://en.wikipedia.org/wiki/Carbon-neutral_fuel