

PROJECTED CONTRIBUTION OF ADVANCED FUELS TO GERMANY'S RED II TARGETS IN 2030

POLICY CONTEXT

Germany currently incentivizes biofuels through its greenhouse gas quota for fuels in the Federal Immission Control Act [Bundes-Immissionsschutzgesetz] and a separate advanced biofuels target. The country may need to revise or supplement these policies in order to transpose the requirements of the EU Renewable Energy Directive for 2030 (RED II). The RED II establishes a 27% renewable energy target for 2030 along with a 14% sub-target for renewable energy consumption in road and rail transport to be met by fuel suppliers. The RED II also includes a 3.5% advanced biofuels sub-target for 2030, to be met with biofuels produced from lignocellulosic energy crops, wastes, and other advanced feedstocks. Renewable electricity supplied to the road and rail sectors can also count towards the 14% target, and receive credit multipliers of 4 and 1.5, respectively.

The volume of advanced, non-food based fuels that could potentially be produced in Germany over the 2021-2030 period using mostly domestic feedstocks is determined by three factors: cost-viability at a given level of policy support, feedstock availability, and the rate of facility deployment for advanced biorefineries.

KEY FINDINGS

- » High levels of policy support are necessary to meet the advanced fuels sub-target. Meeting the advanced fuels sub-target requires substantial investment in fuels made from either lignocellulosic energy crops, wastes, or residues, which are only cost-viable at policy support levels above €1 per diesel-equivalent liter. At incentive levels below €1 per diesel-equivalent liter, these fuels make a minimal contribution to Germany's advanced alternative fuel production. With incentives of €2 per diesel-equivalent liter (as shown in Figure 1 below), advanced fuels can provide 2.6% of overall transport energy demand, or 5.2% when current credit multipliers are applied.
- » Germany can achieve high GHG savings from advanced alternative fuels and renewable electricity in transport. With incentives of €2 per diesel-equivalent liter, renewable energy supplied to the transport sector can reduce 16 million tonnes of CO₂-equivalents annually, after taking into account indirect emissions.
- » Germany's current biofuel quota can be modified to support advanced biofuels. With the existing carbon penalty price of €470 per tonne of CO₂e, Germany could nearly meet the advanced biofuels sub-target in RED II, but only if the penalty price applies specifically to an increased national advanced biofuel target.
- » Cellulosic ethanol and gasification conversion pathways will be constrained by both cost and facility deployment rates. While feedstocks for either producing cellulosic ethanol or gasification are abundant, the 2030 timeframe presents a severe constraint for building out commercial-scale biorefineries and increasing production. While lignocellulosic feedstocks such as agricultural residues could be part of the long-term feedstock mix, the pace of deployment for new facilities would likely slow down the market penetration of these fuels over the next decade.
- » Electrofuels will be severely constrained by cost in 2030. Due to the expense of achieving additional dedicated renewable electricity generation in conjunction with energy losses during conversion, we estimate that negligible volumes of electrofuels will be available for Germany in 2030, though long-term opportunities will emerge as the cost of renewable electricity continues to decline.

» The 14% transport sector renewable energy target can largely be met through the increased deployment of electric vehicles and greater rail electrification. Based on announced sales targets and existing trends, increased vehicle and rail electrification is likely driven by policies other than the RED II. We estimate that renewable electricity

supplied to road vehicles will provide approximately 4.8% of road and rail sector energy demand—which increases to over 19% after including RED II multipliers. Continued rail electrification—already high in Germany—could increase renewable electricity's contribution to nearly 23% after taking into account credit multipliers.

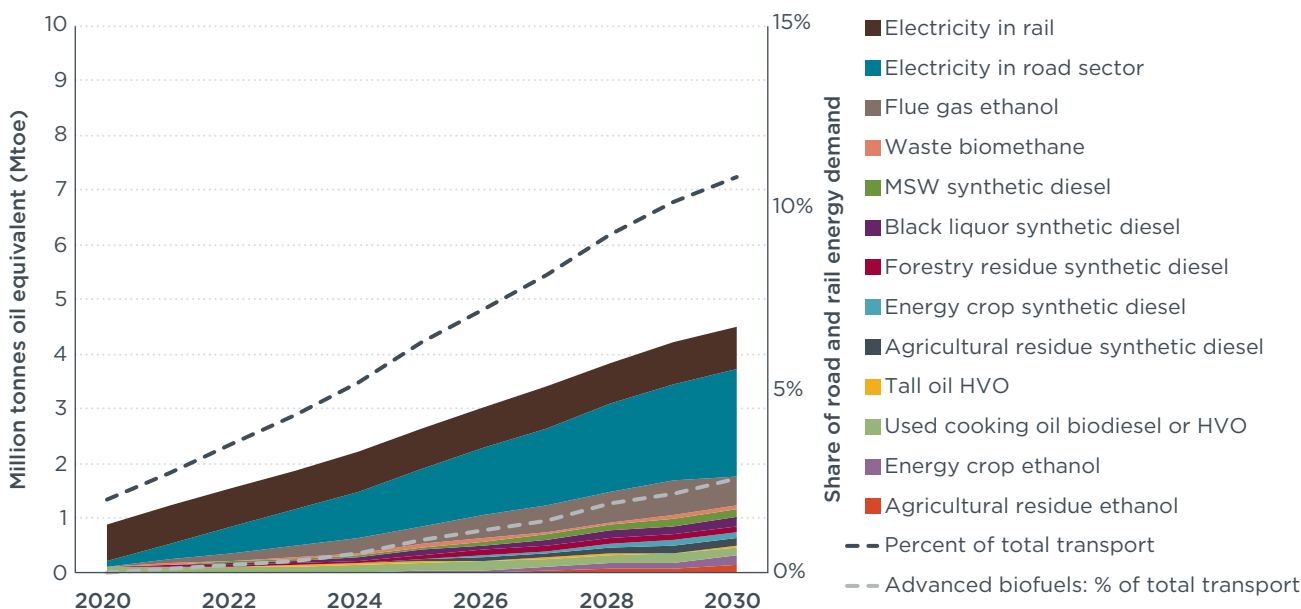


Figure 1. Projected volumes advanced alternative fuel volumes to 2030 with policy support of €2.00 per diesel-equivalent liter

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