Ansys

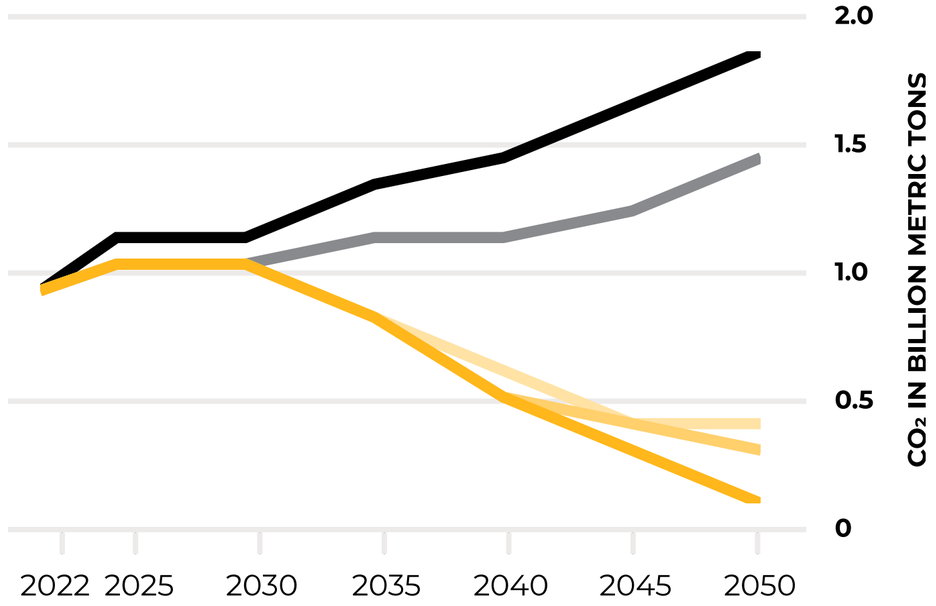
The net zero flight plan

The aviation industry currently produces 12% of all transport emissions, but, with the aid of simulation, is aiming to curb emissions and reach net zero by 2050.

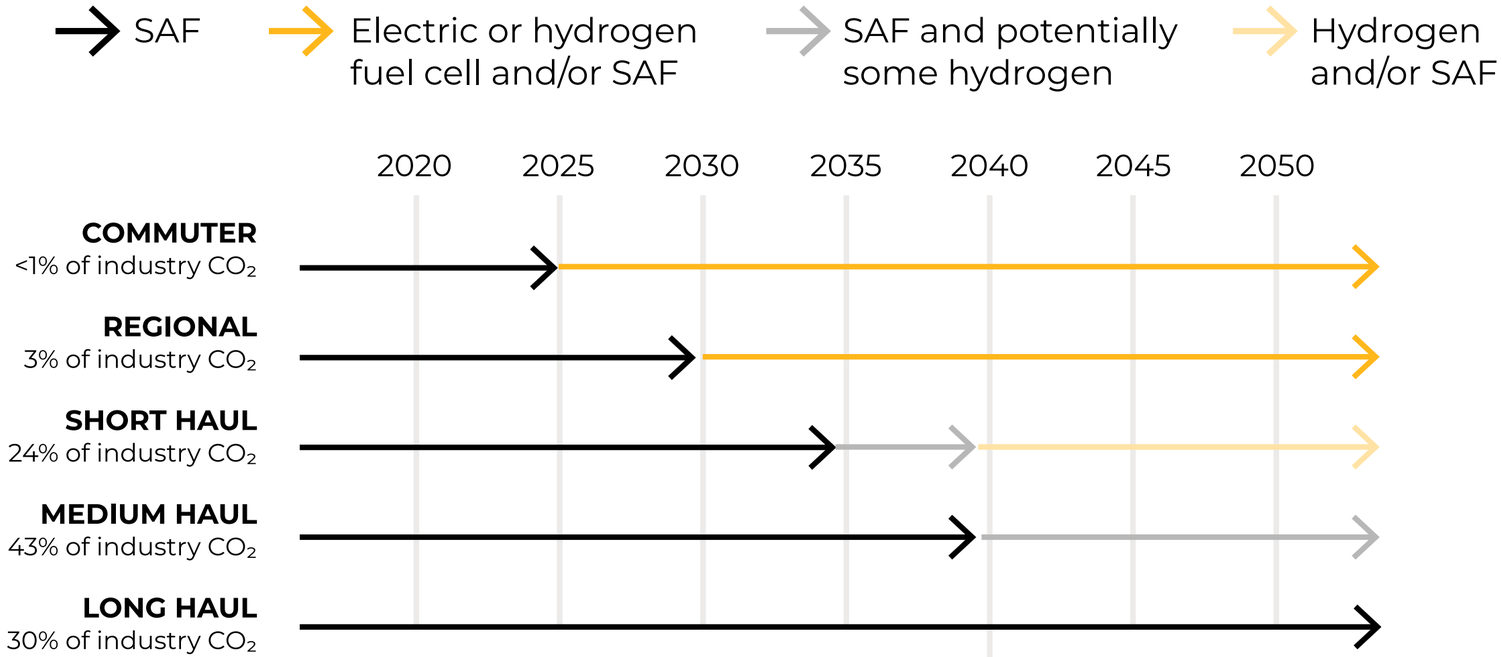
Emissions will dive as sustainable aircraft take off

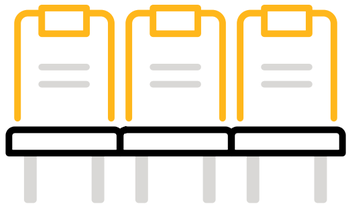
Aviation industry projected CO_2 emissions from 2022 to 2050 based on the deployment of low- and zero-carbon aircraft

- No action taken
- Improvements in aircraft, flight ops, and on the ground
- Sustainable Aviation Fuel (SAF) deployment
- Electric propulsion
- Hydrogen propulsion



Where low- and zero-carbon energy could be deployed in commercial aviation



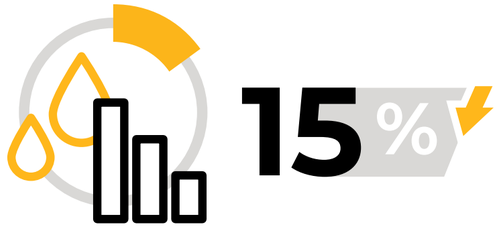


70%

By 2040, flights producing 70% of industry emissions could be shifted to low- or zero-carbon aircraft.

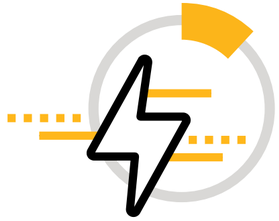
While commuter hybrid electric aircraft is nearly viable, a technology barrier and prohibitive costs will make long-haul aircraft a mammoth challenge.

SIMULATION IS HELPING THE AVIATION INDUSTRY OVERCOME BARRIERS TO REACH NET ZERO FASTER. ANSYS SIMULATION HELPS ENGINEERS TO ACHIEVE:



15%

reduction in fuel burn



12%

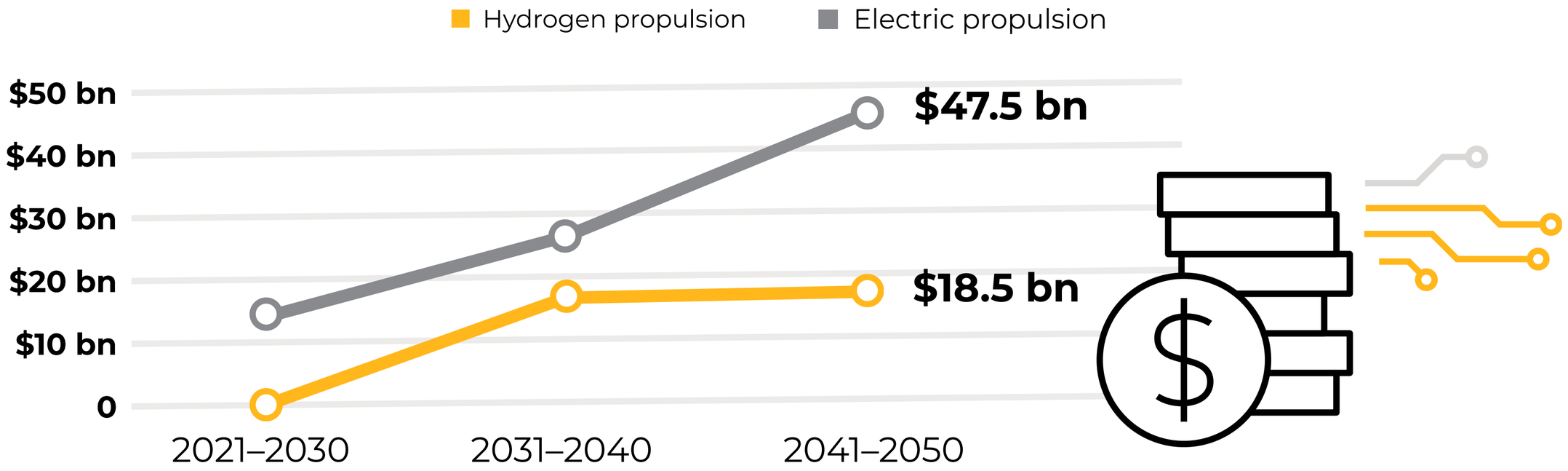
improvement in power density and energy efficiency

30%

improvement in maintenance cycle time

Lowering aviation acquisition costs with simulation

Cost of switching to electric- and hydrogen-powered aircraft worldwide from 2021 to 2050



Moving to hydrogen-powered aircraft could increase medium-haul ticket prices by 30% to 40%.

Simulation brings costs down in acquisitions:

58% more likely to meet product cost targets

30% maintenance cycle time improvements

30% acquisition labor efficiency improvements

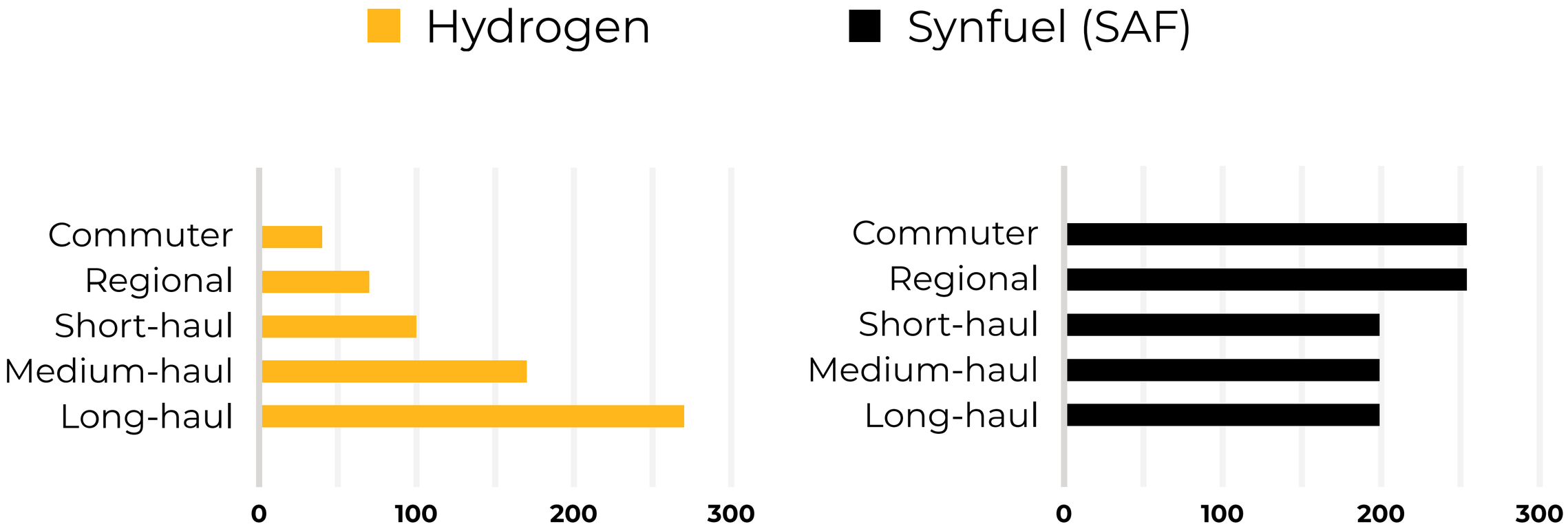
20% acquisition cycle time reduction

Carbon abatement and fuel costs for hydrogen and SAF-powered aircraft

> ***"Regarding commercial-fleet strategy, executives should consider not just fuel-price predictions but also the future cost of carbon."***
>
> ***McKinsey & Co***

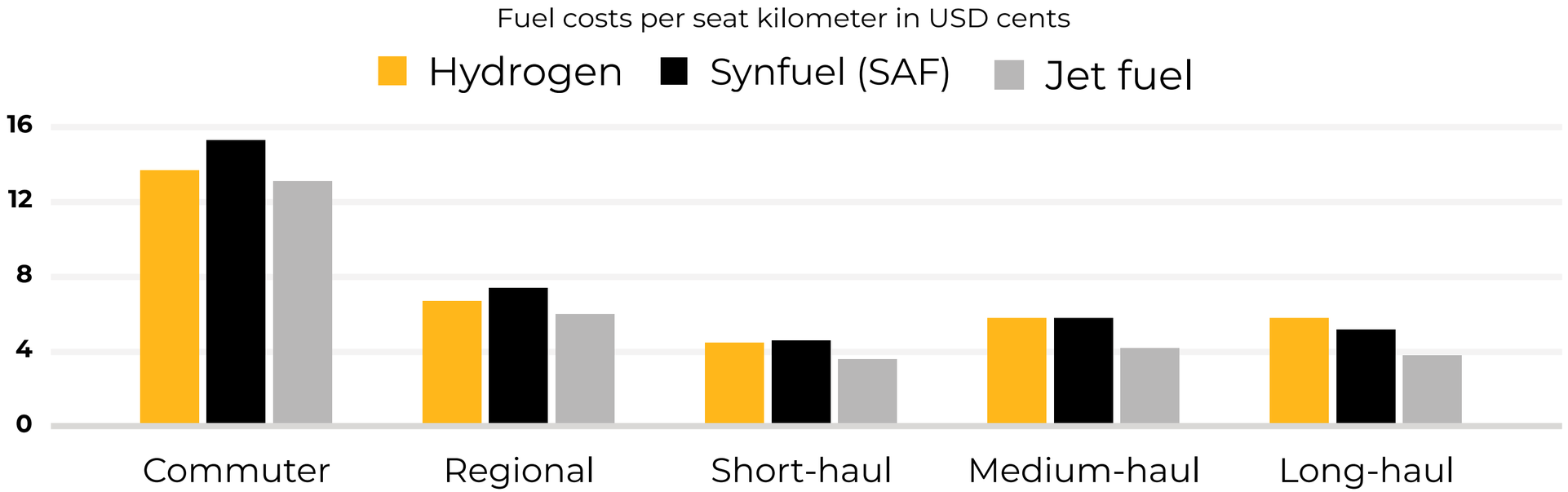
Total cost of ownership of aviation fuels by aircraft type in 2040

Abatement costs per ton of CO_2 abated in USD



Hydrogen abates more CO_2 dollar for dollar than SAF on commuter, regional, and short-haul flights.

Hydrogen fuel price is predicted to be **lower or the same as SAF for commuter through medium-haul flights.** While SAF for long-haul flights may reach cost parity to jet fuel sooner, hydrogen will probably not reach cost parity until 2050 or beyond. **Designing new aircraft optimized for hydrogen and fuel-burning efficiency is necessary; even as SAF ratios are allowed to increase, fuel supplies may be limited.**



Simulation dramatically reduces life cycle costs, accelerates innovation, slashes time to market, and reduces risk.

Take a leap of certainty with Ansys simulation for aerospace.

LEARN MORE

DOWNLOAD PDF

Sources: aerosociety.com, Ansys, atag.org, Hydrogen Council, McKinsey & Co, Oliver Wyman, ourworldindata.org, pv-magazine.com, Siemens, Statista