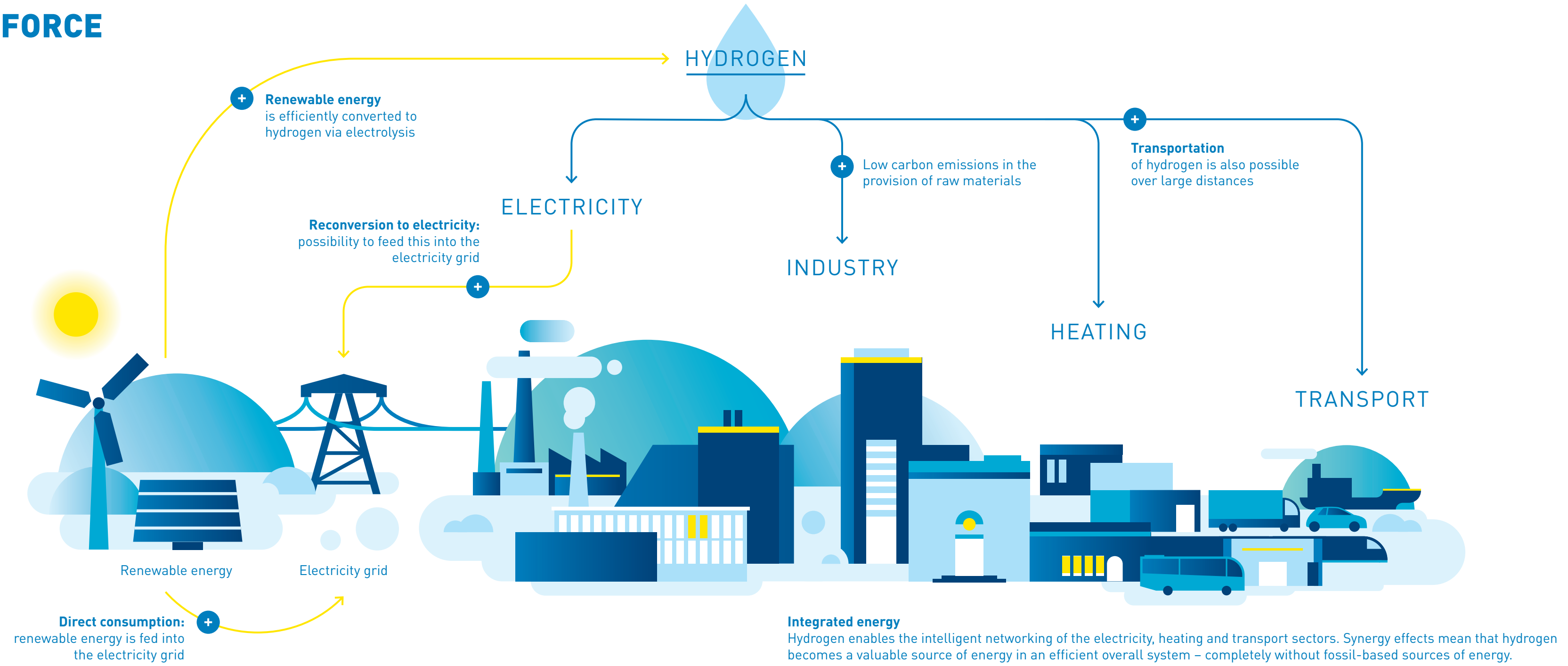


A CLEAN SOLUTION

HYDROGEN AS THE KEY FOR THE ENERGY TRANSITION

ENERGY TRANSITION

THE DRIVING FORCE



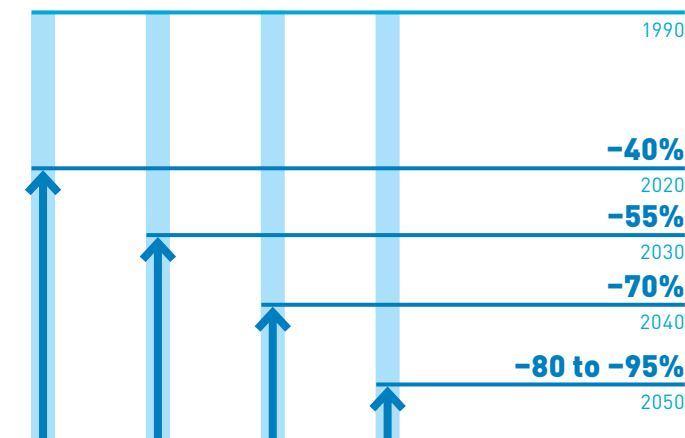
CLIMATE PROTECTION

THE MATERIAL OF THE FUTURE.

TO ENABLE THE AGREED CLIMATE GOALS TO BE ACHIEVED THROUGH THE EXPANSION OF RENEWABLE ENERGY, A SOURCE OF ENERGY THAT CAN BE STORED AND IS TRANSPORTABLE IS REQUIRED: HYDROGEN.

A CLEAR GOAL

Clean air for everyone: as part of its energy concept, the federal government is striving to substantially reduce greenhouse gas emissions by 2050.



Targets for the reduction of greenhouse gas emissions.

Source: the energy concept of the German federal government

IN 2015
4.7 TWH
OF ELECTRICITY WAS LOST THAT COULD HAVE BEEN STORED AS HYDROGEN.

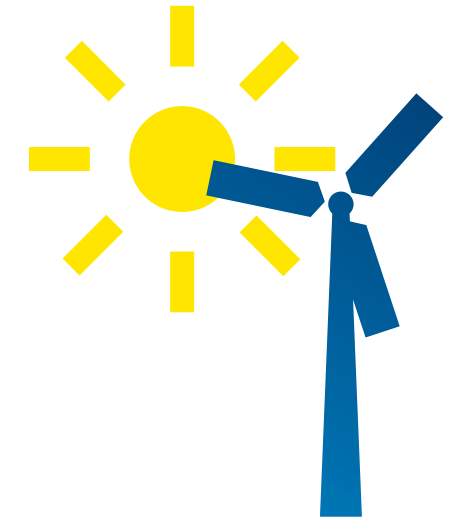
Source: Bundesnetzagentur

THAT IS THE EQUIVALENT OF THE ENERGY CONSUMPTION OF ALMOST

300,000
HOUSEHOLDS IN GERMANY.

THAT IS THE EQUIVALENT OF THE ENERGY CONSUMPTION OF APPROXIMATELY

700,000
FUEL CELL PASSENGER VEHICLES.



ENERGY IN STORE

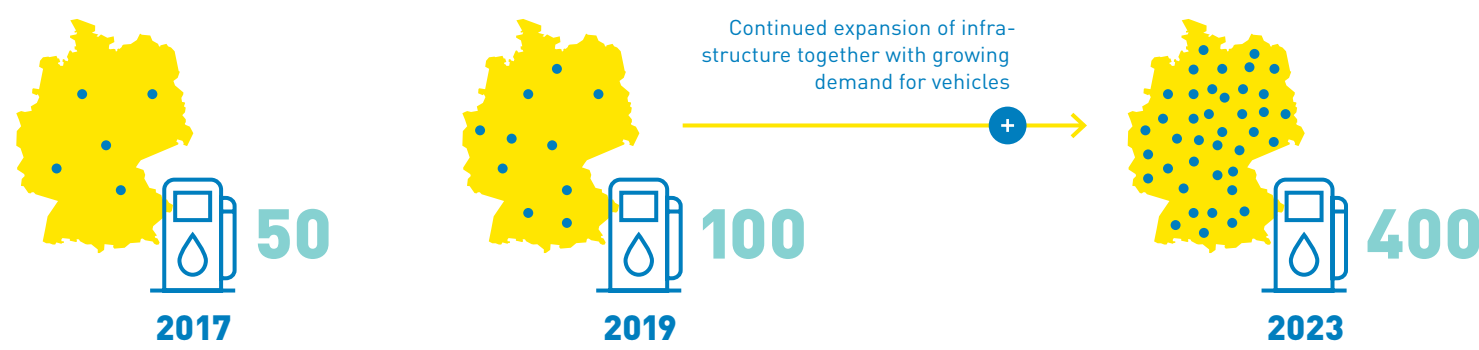
Hydrogen is an efficient storage medium. Surplus power generated from renewable sources can be stored in vast quantities over many months.

MOBILITY

HYDROGEN MOBILISES

NO MATTER IF CAR, LORRY, BUS OR TRAIN: HYDROGEN AS AN ALTERNATIVE FUEL PROVIDES THE POSSIBILITY FOR EMISSION-FREE DRIVETRAINS FOR ALL VEHICLE TYPES.

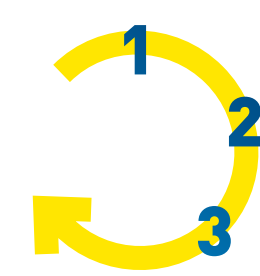
FILLING UP ON NEW ENERGY



Just like petrol and diesel, hydrogen can be refuelled at the filling station pump. To provide the necessary infrastructure, up to 400 H₂ refuelling stations are to be operational in Germany by 2023, depending on the actual demand.

FILL THE TANK IN 3 MINUTES

Refuelling with hydrogen is as fast and convenient as with conventional vehicles.



CLEAN ENERGY FOR ON THE GO

Fuel cell passenger cars go further. On average, a hydrogen car with a full tank currently has twice the range of an electric car with a fully charged battery.



Average range: comparison between passenger cars with hydrogen drive and battery.

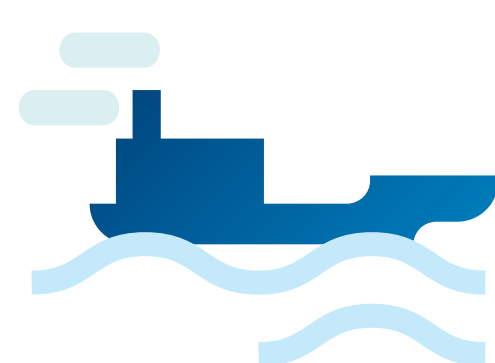
* Average range of all electric vehicles sold in 2015. Source: Statista 2017

A FUEL WITH NO EMISSIONS

Fuel cell vehicles drive emission free. The reaction of hydrogen and oxygen produces neither nitrogen dioxides, CO₂ nor fine pollutant particles. The only by-product produced is: water vapour.

FRESH AIR AT THE HARBOUR

Ships arriving and mooring at port lead to high levels of air pollution at harbours. Fuel cells on board allow for low-emission, efficient energy supplies.

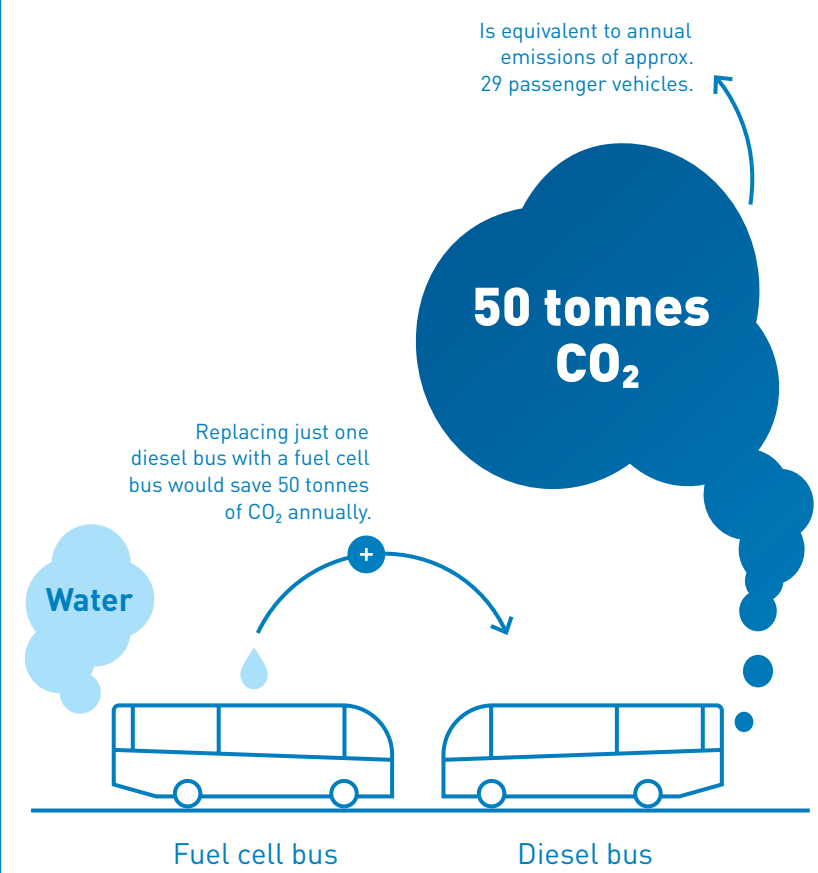


LOWER EMISSIONS AT THE AIRPORT.

The deployment of hydrogen will make airports cleaner and quieter. Vehicles on the airport apron, travel operations and the on-board power supply could all become emission free.



BUS LANE: WITH NO CO₂ FOOTPRINT



ON TRACK FOR EMISSION-FREE TRAVEL

50% of the German rail network remains not electrified. Here, diesel trains are deployed. A train with a hydrogen-based drivetrain could save 700t of CO₂ annually. And the electrification of further routes would no longer be necessary.



HOUSEHOLDS

ENERGY FOR THE HOME

EVERYTHING UNDER ONE ROOF: FUEL CELL HEATING SYSTEMS ENABLE THE EFFICIENT SUPPLY OF POWER AND HEAT WITHIN ONE'S OWN FOUR WALLS.



HYDROGEN: A PROVEN PARTNER OF INDUSTRY

HYDROGEN HAS ALREADY BEEN DEPLOYED IN DIVERSE APPLICATIONS FOR MANY YEARS IN THE PRODUCTION OF METAL AS WELL AS IN THE ELECTRICAL AND CHEMICAL INDUSTRIES.



THE INDUSTRIAL FUEL CELL

A single fuel cell system can deliver electrical performance ranging from just a few kilowatts up to 1.4 megawatts.

1.4
MEGAWATTS

NEW EXPORT POTENTIAL

The production of fuel cell heaters, fuel cells, electrolysers and complete systems creates new jobs and export possibilities.

