

Energy & Mobility

Toyota's vision

TOYOTA
MIRA

Erwin Jongh
Zero Emission Champion
Louwman & Parqui / Toyota & Lexus The Netherlands



AKIO TOYODA

*“To create a car which is cleaning the air,
which does prevent people from accidents, let people
just smile when they drive coast to coast at affordable
cost .”*

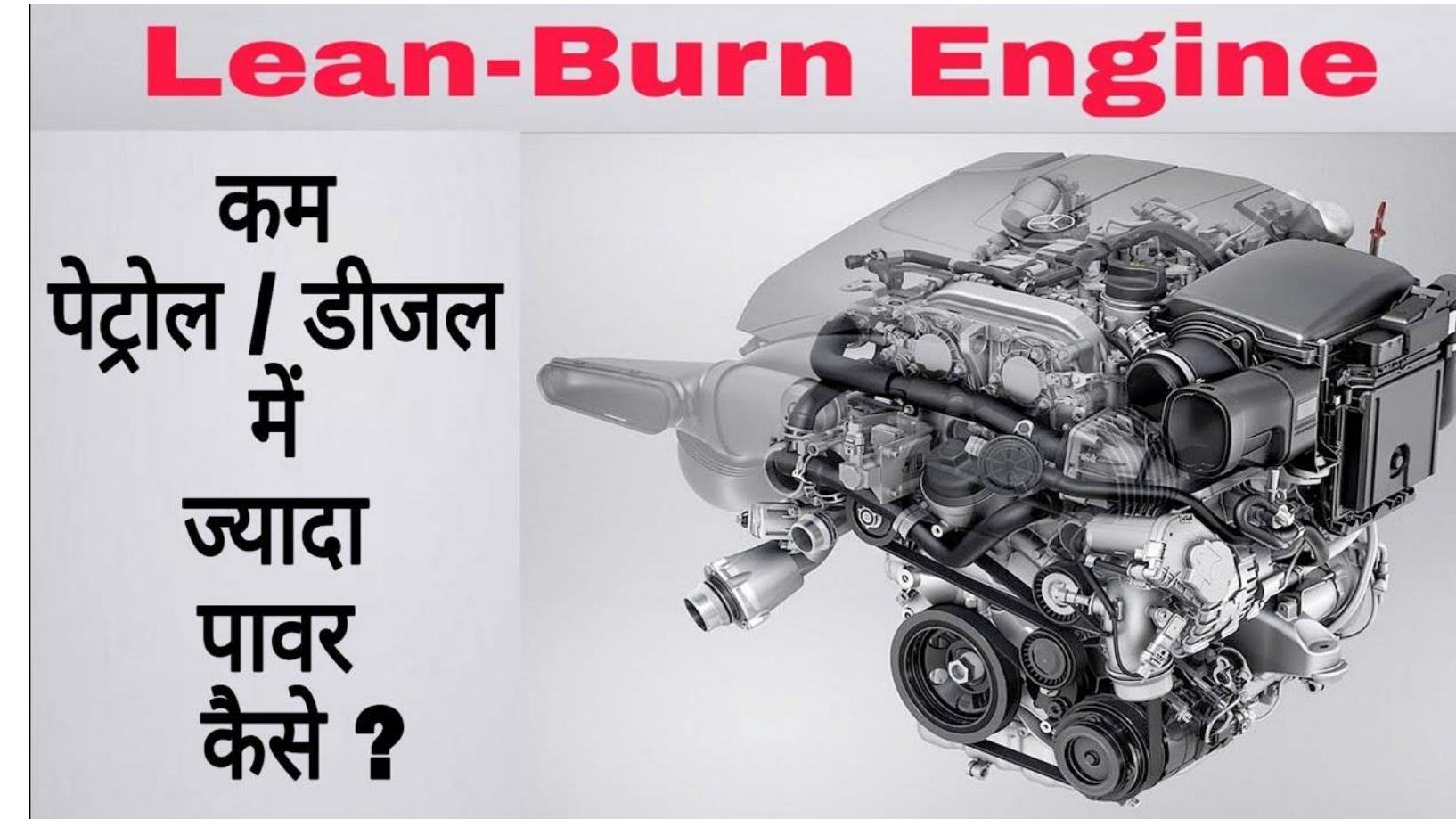
“Ever better mobility for all.”



CREATING CARS WHICH ARE KIND TO PEOPLE AND THE EARTH (1970-1997)



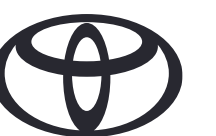
1977 Gasturbine Hybrid



1984 Lean-burn engines



1995 reveal 1st gen. Prius Hybrid



BATTERY ELECTRIC

Battery electric without charging infra: Full Hybrid
Production 1997-2022



Battery electric in small scale



HYDROGEN ELECTRIC

1997 – 2011 small series FCHV



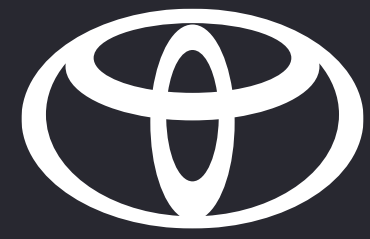
March 11th 2011



HYDROGEN ELECTRIC

2014: 1st mass produced Hydrogen Electric car in the world revealed





THE BATTLE



MOBILITY FOR THE FUTURE: WILL IT BE BATTERY ELECTRIC OR HYDROGEN ELECTRIC?



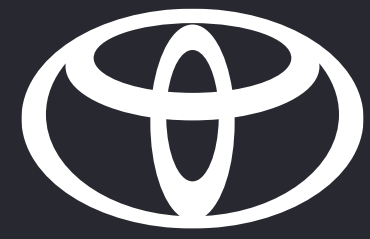
Hydrogen is 2,5 times less efficient
Hydrogen is for industry only
Hydrogen is not green
There are no stations for hydrogen

Toyota doesn't believe in BEV
Other people say...

There are not enough chargers
BEV range is poor in winter
Charging with gas-produced electricity
You need always to que up and wait when charging

Toyota only believes in Hydrogen





THE ROAD TOWARDS ZERO EMISSION

TO CREATE A BETTER WORLD WITHOUT EMISSIONS

1) Less mobility :

working from home (hybrid-working)

- less emissions
- less traffic jams and delays
- less injuries

2) New mobility :

sharing cars and bundle with other mobility solutions

- fixed company car or flexible poolcar?
- pool car combined with bike and public transport?
- combining Van's with cargo-bikes



Toyota: transition from car manufacturer towards mobility company

Louwman: passion to create mobility to people

'ever better mobility for all'

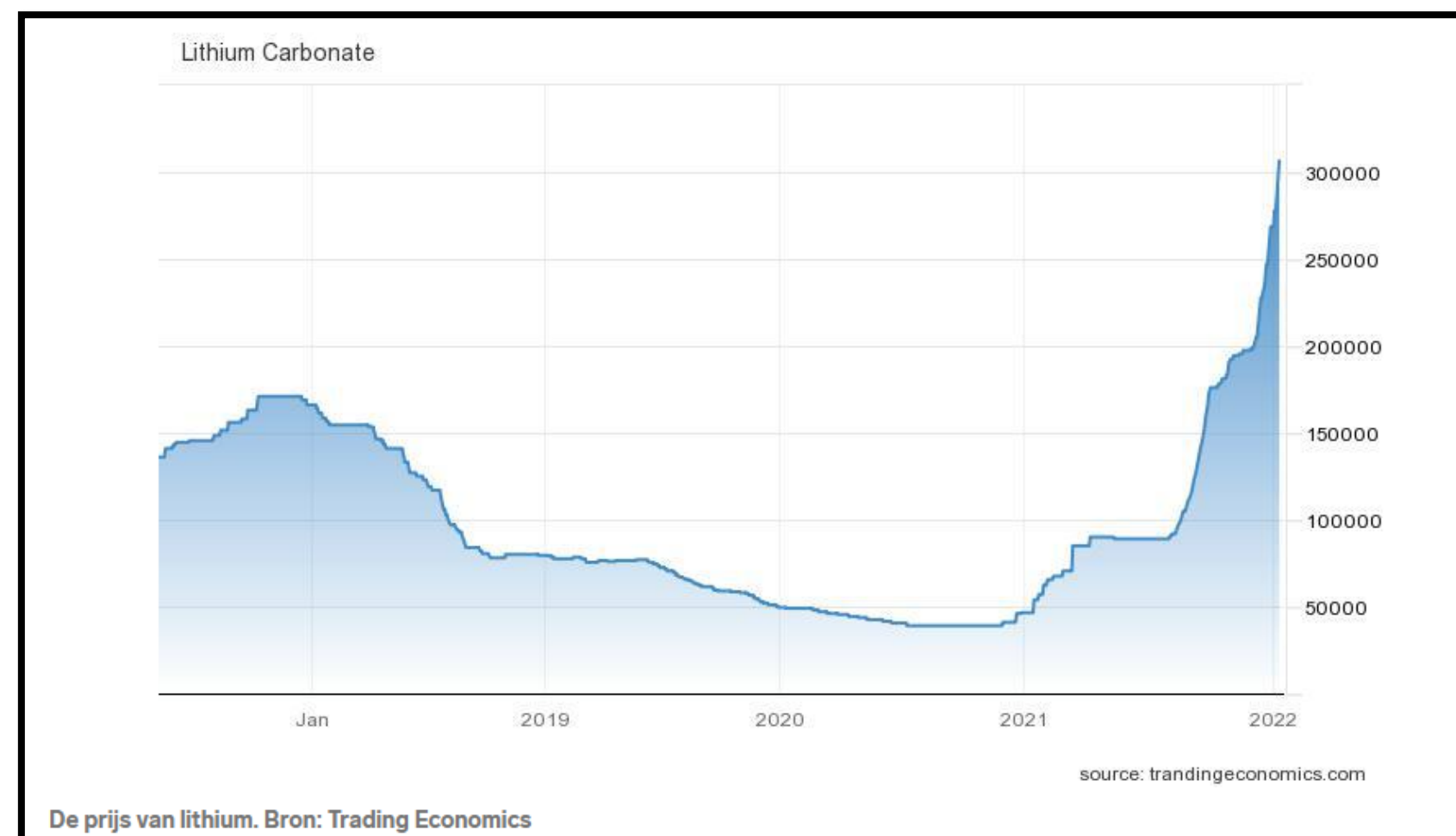
'mobility for life'



TO CREATE A BETTER WORLD WITHOUT EMISSIONS

3. The availability of raw materials

- for battery electric vehicles we do need Lithium
- Lithium mining and production is dominated by China
- EU raw material report: battery production capacity is 35% of total demand by 2030



TO CREATE A BETTER WORLD WITHOUT EMISSIONS

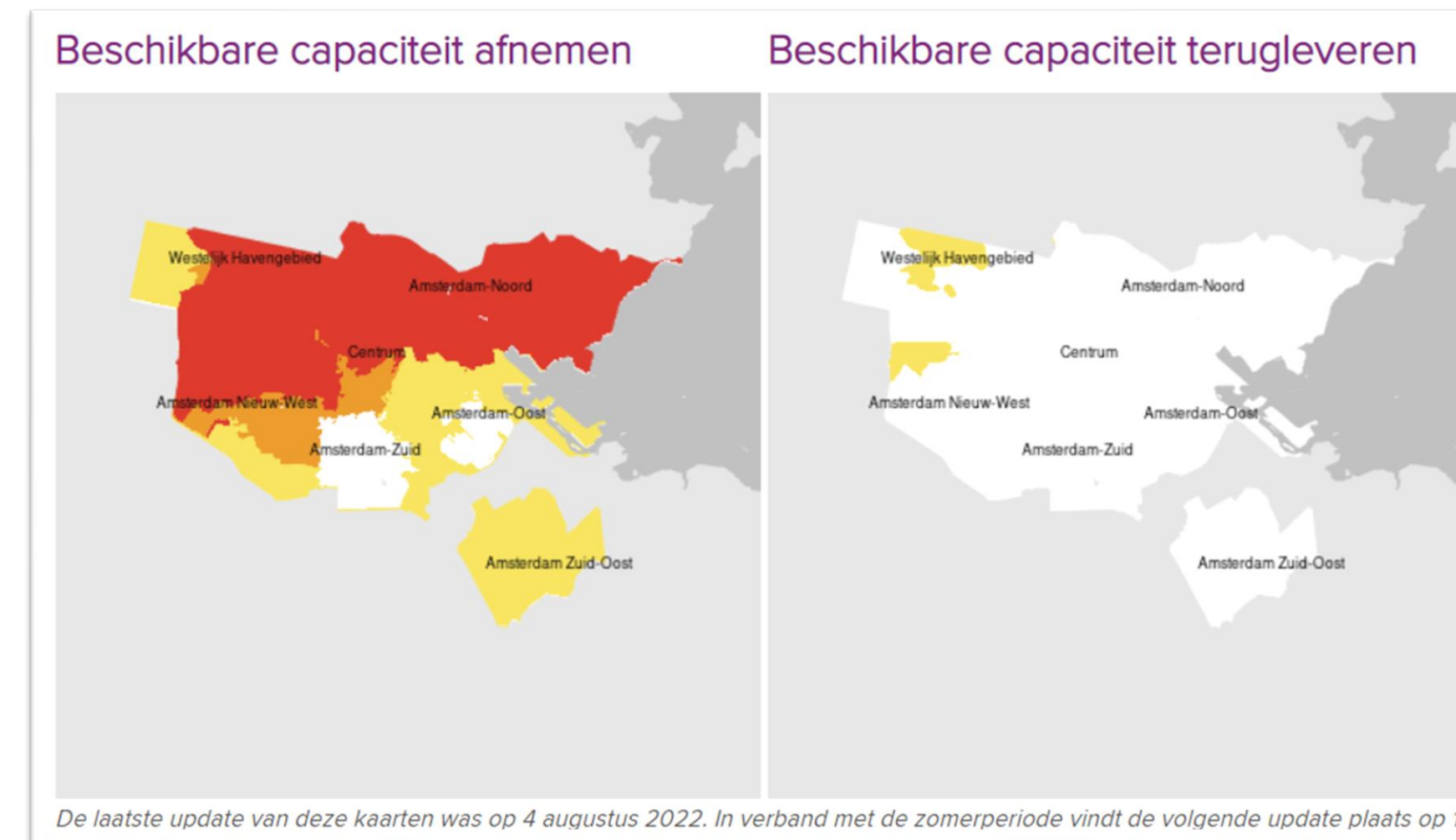
What we can as Toyota do with Lithium battery capacities:

Hybrid Electric	1 kWh	50-80% electric drive w/o emissions	no power grid dependency
Battery Electric	50kWh 71,4kWh 100kWh	100% electric drive	full power grid dependency
Hydrogen Electric	1,3kWh	100% electric drive	no power grid dependency



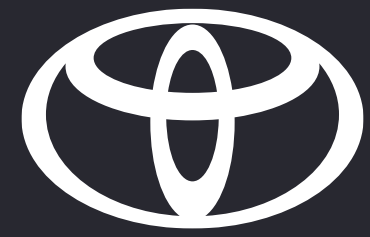
TO CREATE A BETTER WORLD WITHOUT EMISSIONS

4. Availability of green energy and the energy grid



Stroomnet Limburg en Brabant vol: TenneT stopt met aansluiten nieuwe klanten





DON'T CREATE NEW
DEPENDENCIES BY
CHOOSING FOR BEV ONLY

THE 2030 FOSSIL FREE ENERGY BALANCE

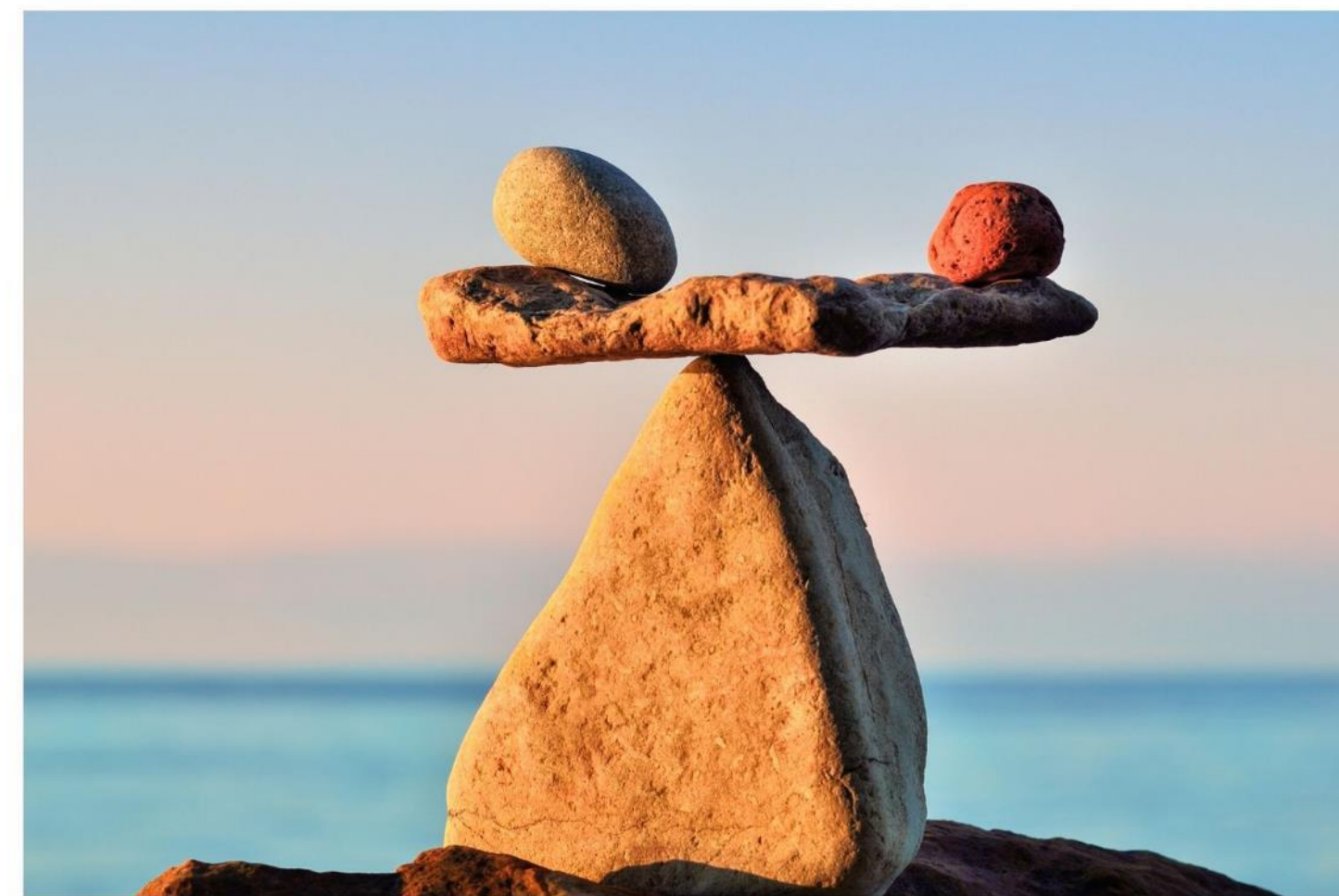
Local produced green energy from solar and wind

- direct to the grid
- short-term-storage (battery)

Import of green hydrogen

- imported by pipeline and vessels
- local green hydrogen production

Toyota Battery Electric



Toyota Hydrogen Electric



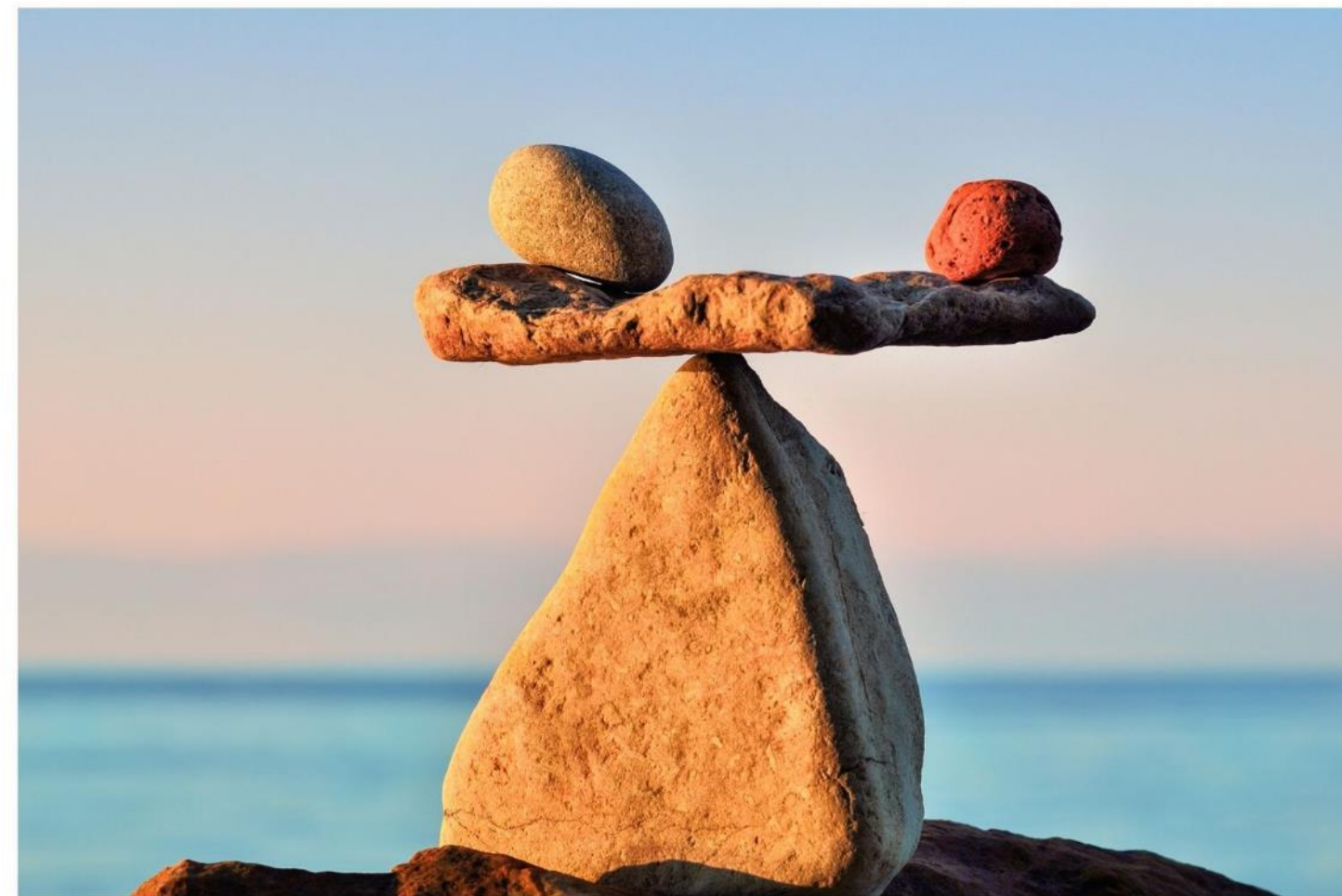
THE 2030 FOSSIL FREE ENERGY BALANCE

Toyota Battery Electric



Using the electricity grid

- When charging infra is there
- Powerfull electricity grid
- Large batteries
- charging at home or on the run



Toyota Hydrogen Electric



Using the gas grid

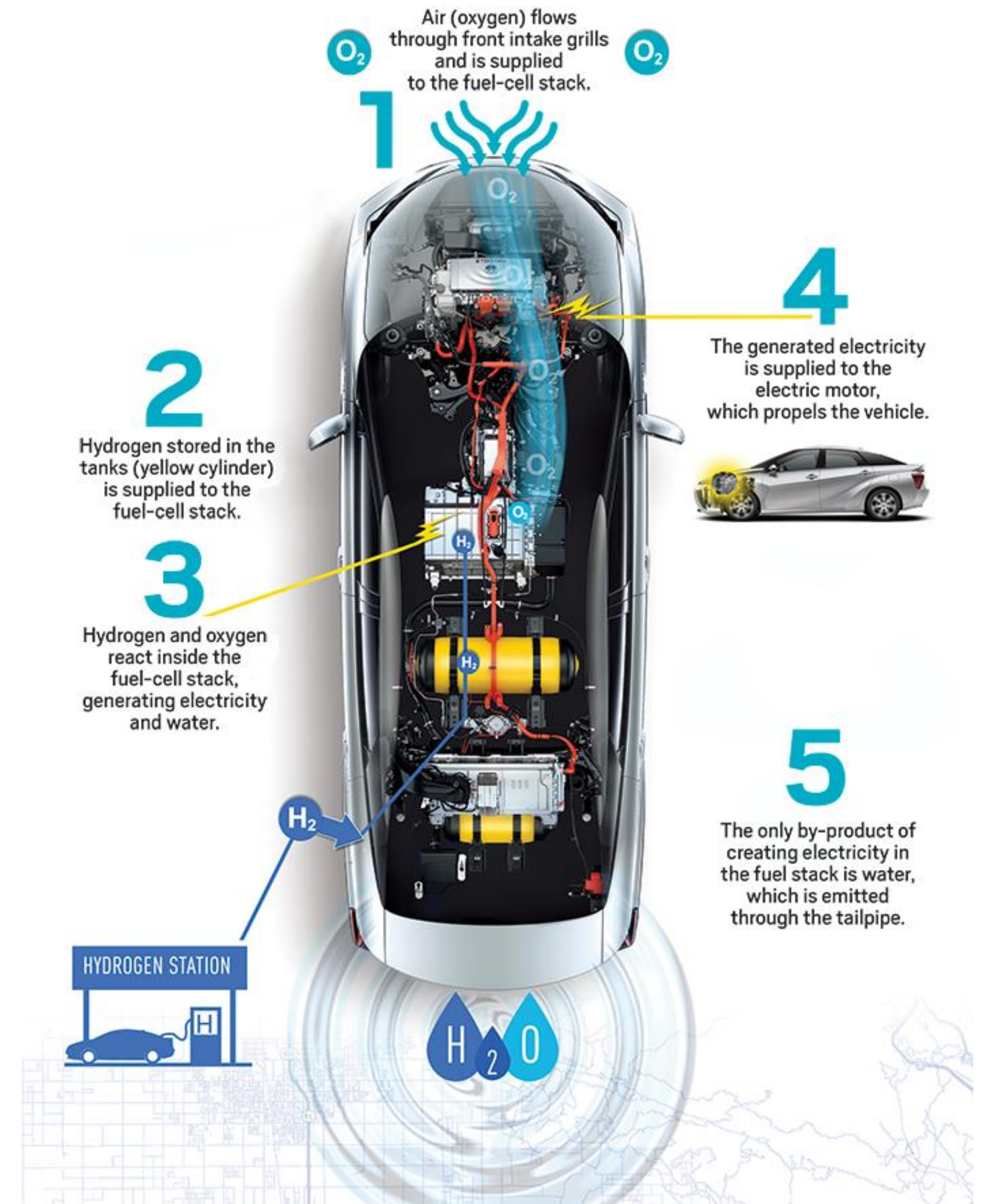
- Without charging infra
- When the grid is overloaded
- minimum battery (1,3kWh)
- refueling in only 3-5 minutes

And whatever suits the customer the best



HYDROGEN ELECTRIC CAR EXPLAINED

- 100% electric engine
- Producing electricity from hydrogen with Fuel Cell
- Refueling hydrogen in 3-5 minutes
- Only 1,3kWh battery required
- Long range up to 720km and stable during winters





ELECTRICITE
ZERO EMISSION
GEH₂
GROUPE ELECTRO HYDROGENE

Time to shift
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ASSEMBLE PAR **Enerlia**

PARIS EODV
TOYOTA
START YOUR IMPOSSIBLE

CAETANO

Hydrogen \rightarrow WaterOut

FUELCELL

H₂.City Gold

CAETANO

HYDROGENE

1ST TOYOTA VEHICLE WHICH IS CLEANING THE AIR

No CO2

No NOx

Air purification: 4,7 million liters of air per 10.000km

Let's go **BEYOND** zero emission!



NEW MIRAI: AMBASSADOR OF THE ENERGY TRANSITION ON WHEELS

The Toyota Mirai demonstrates your companies ambitions towards a fossil free society.



BATTERY ELECTRIC OR HYDROGEN ELECTRIC?

Use local green electricity from the local grid when possible

.... and use green produced and imported hydrogen in addition

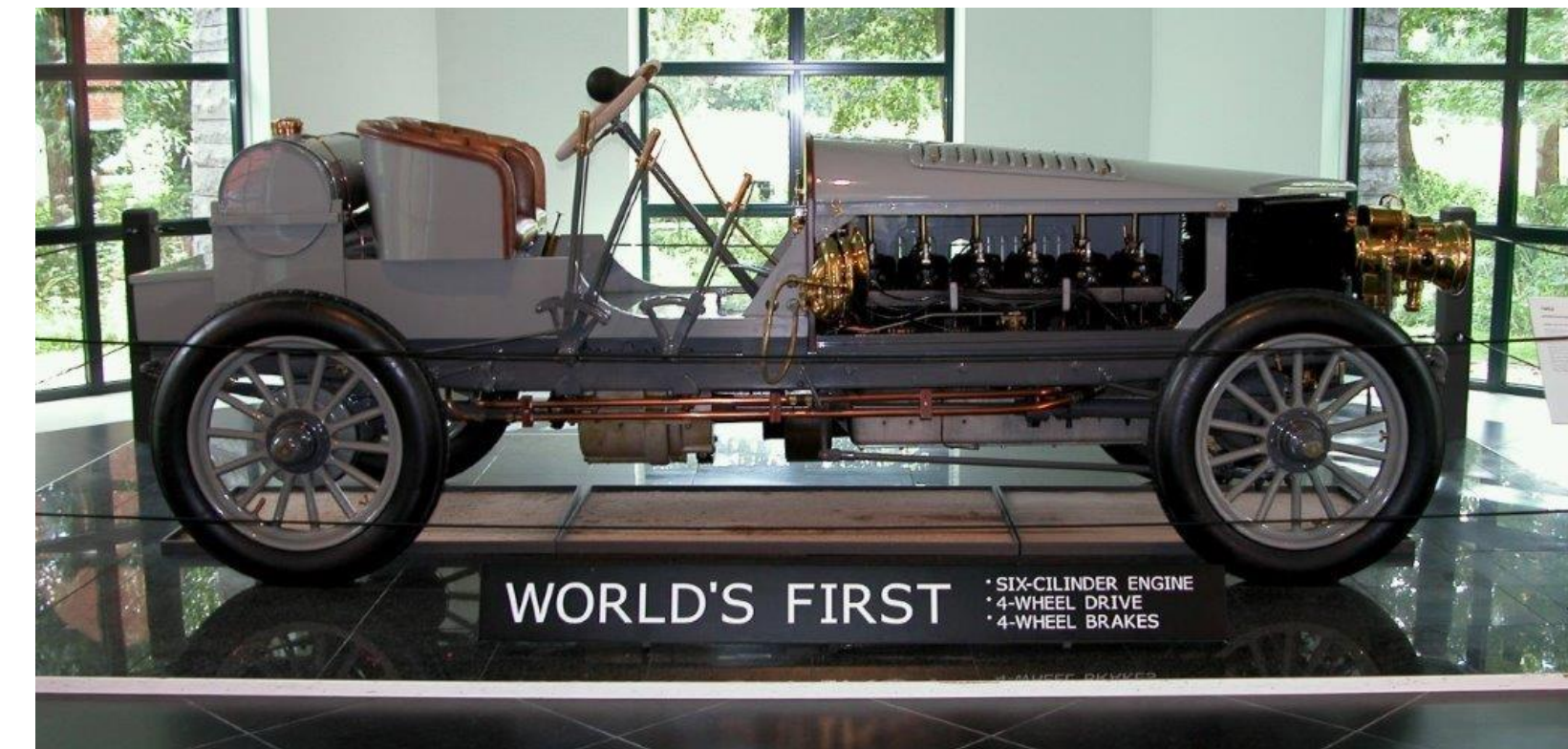
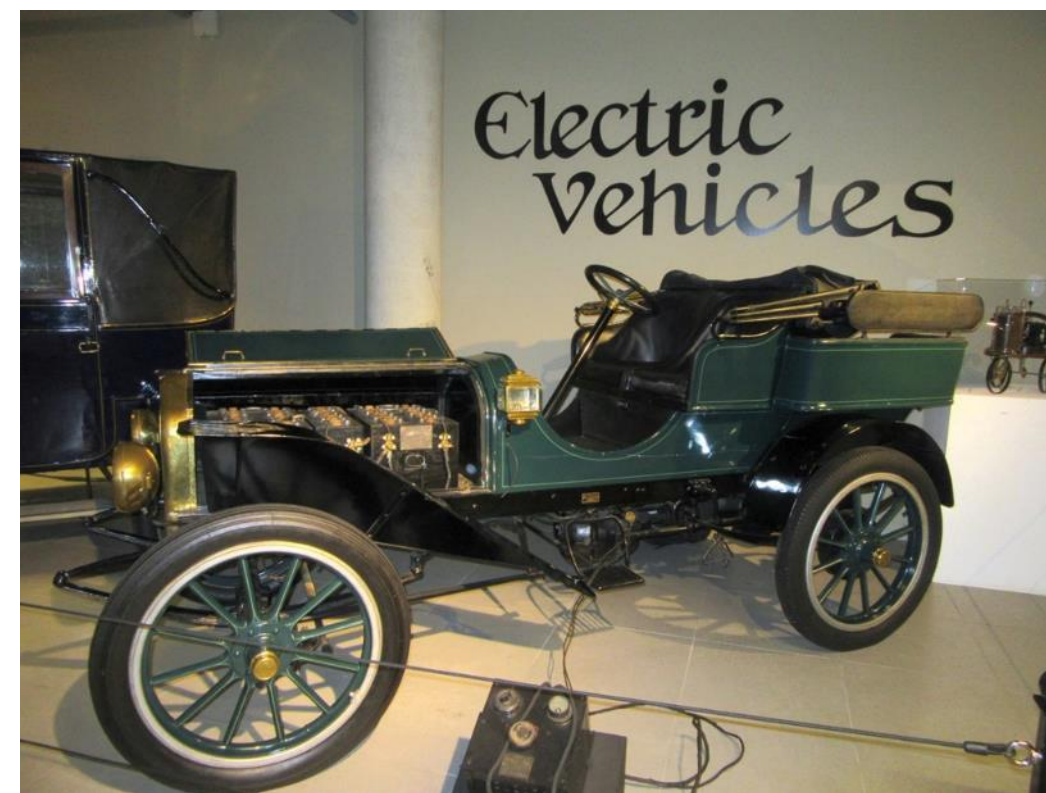


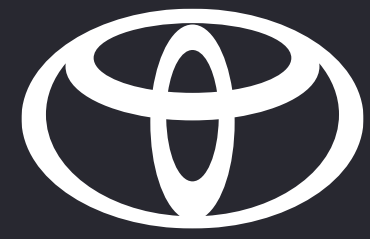
Independence & flexibility



THE LOUWMAN MUSEUM

Louwman & Parqui since 1923





THANK YOU,
ENJOY.

