

Eco-Mobility 2025^{plus}
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**On the road to a
sustainable mobility**

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**“ Stone Age did not end due to a lack of
stones....”**

**Technological innovation and new
ideas changed our societies and our
lives.**

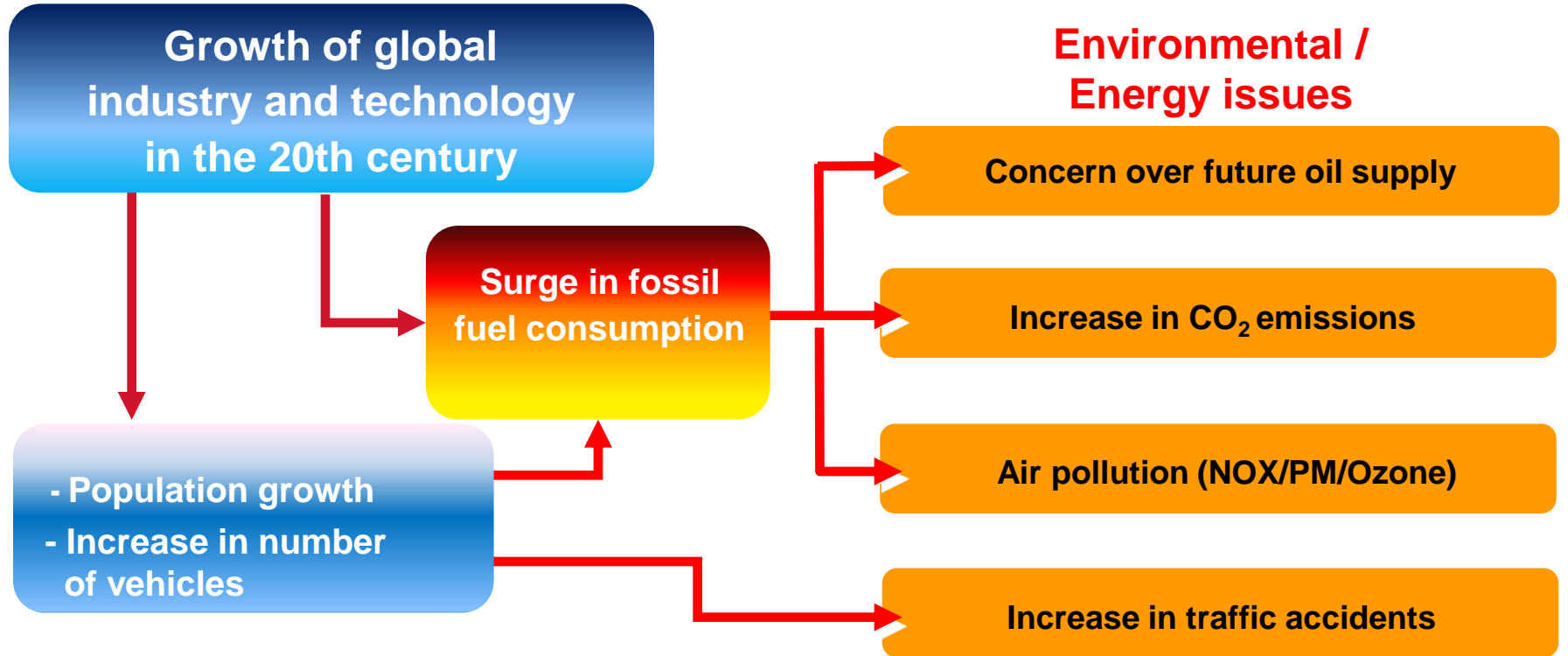
August 1888



Quelle: Daimler AG

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Issues surrounding vehicle use



Air Quality – A global challenge



COMFORT

Creating enriched and comfortable car utilization experiences for customers by providing a range of services that address various driving situations



SAFETY

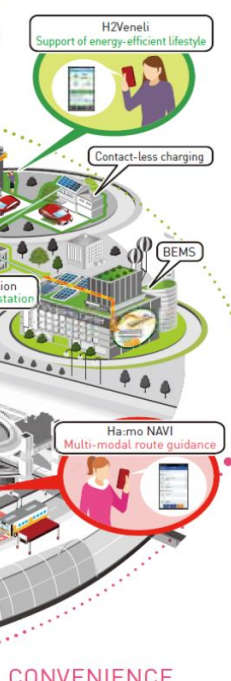
Toward the realization of Toyota's ultimate goal: zero casualties from traffic accidents

Services that constitute a smart mobility society

1. Vehicle Data Management System 2. Traffic Data Management System 3. Energy Data Management System

ECOLOGY

Optimizing energy use for the entire society and realizing stress-free and environmentally considerate living with a high quality of life



CONVENIENCE

Building a stress-free traffic environment where everyone can move around smoothly, exactly as they wish

Toyota's vision of a sustainable mobility

Toyota's environmental principles



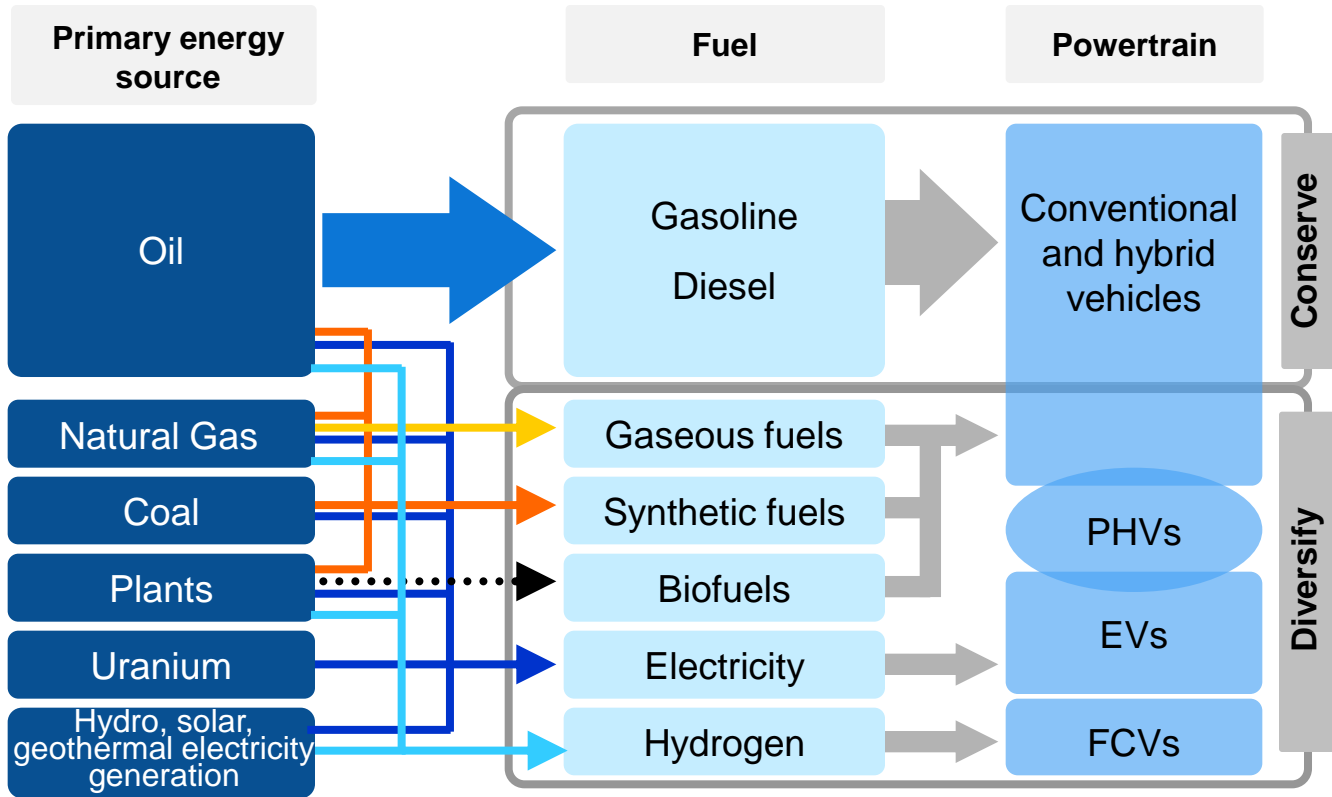
**Embracing
diverse energy
sources**

**Developing
efficient, low-
emission
vehicles**

**Driving real and
positive change
by popularizing
these vehicles**



Overview of energy sources, fuels and main powertrains

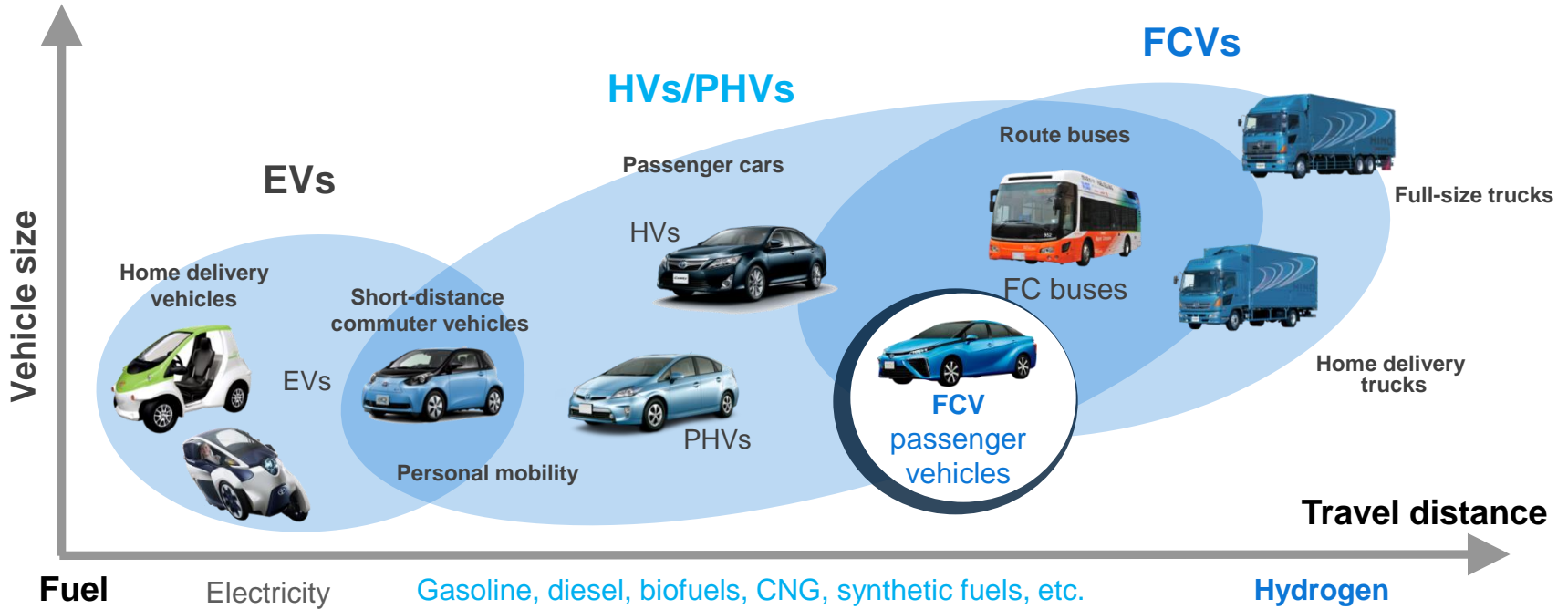


Characteristics of hydrogen versus other alternative fuels

	Electricity EVs	Hydrogen FCVs	Biofuel Internal combustion engines	Natural gas Internal combustion engines
Well-to-wheel CO ₂ emissions	+ / ++ / +++	+ / ++ / +++	+ / ++ / +++	++
Supply volume	+++	+++	+	++
Cruising range	+	+++	+++	++
Fueling/charging time	+	+++	+++	+++
Dedicated infrastructure	++	+	+++	++

+: Poor ++: Good +++: Excellent

The FCV in Toyota's vision of future global mobility



EVs: short-range; HVs & PHVs: general use; FCVs: medium- to long-range

More than 20 years of development by Toyota

**1996
FCEV**

Fuel cell stack and metal hydride hydrogen tank



**2001
FCHV-4**

Testing begins on public roads in Japan & US



**2002
Toyota FCHV**

World-first sale in US & Japan



**2011
FCV-R**

Sedan version with 700 km of cruising range (JC08 test cycle)



**2001
FCHV-3**

FC stack that achieves increased power output



**2001
FCHV-5**

Featuring an onboard Clean Hydrocarbon Fuel reformer



**2008
Toyota FCHV-adv**

Range and cold start capabilities improved



**2013
FCV Concept**

Concept version of FCV model 2015



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What are the advantages of hydrogen?

Can be obtained from a variety of primary energy sources

- From fossil fuels including natural gas
- From unused sewage sludge
- From water, using renewable energy sources such as solar or wind power

Zero CO₂ emissions

Zero CO₂ emissions during use

Wide range of uses

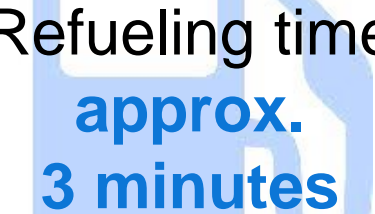
- Home or automotive fuel and power generation
- Used for over 200 years
- Extremely light and diffuses rapidly

High energy density

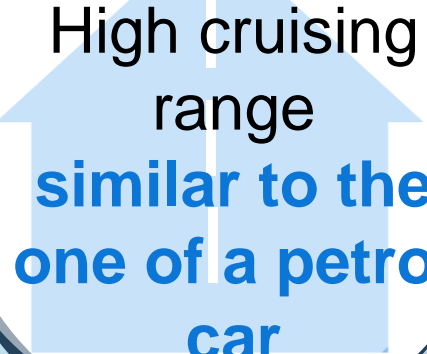
- Higher energy density than batteries, and is easier to transport and store
- Can be used to resolve uneven distribution of regional energy, and to compensate for fluctuations in supply from renewable energy sources



What are the unique advantages of the Toyota FCV?



Refueling time
**approx.
3 minutes**

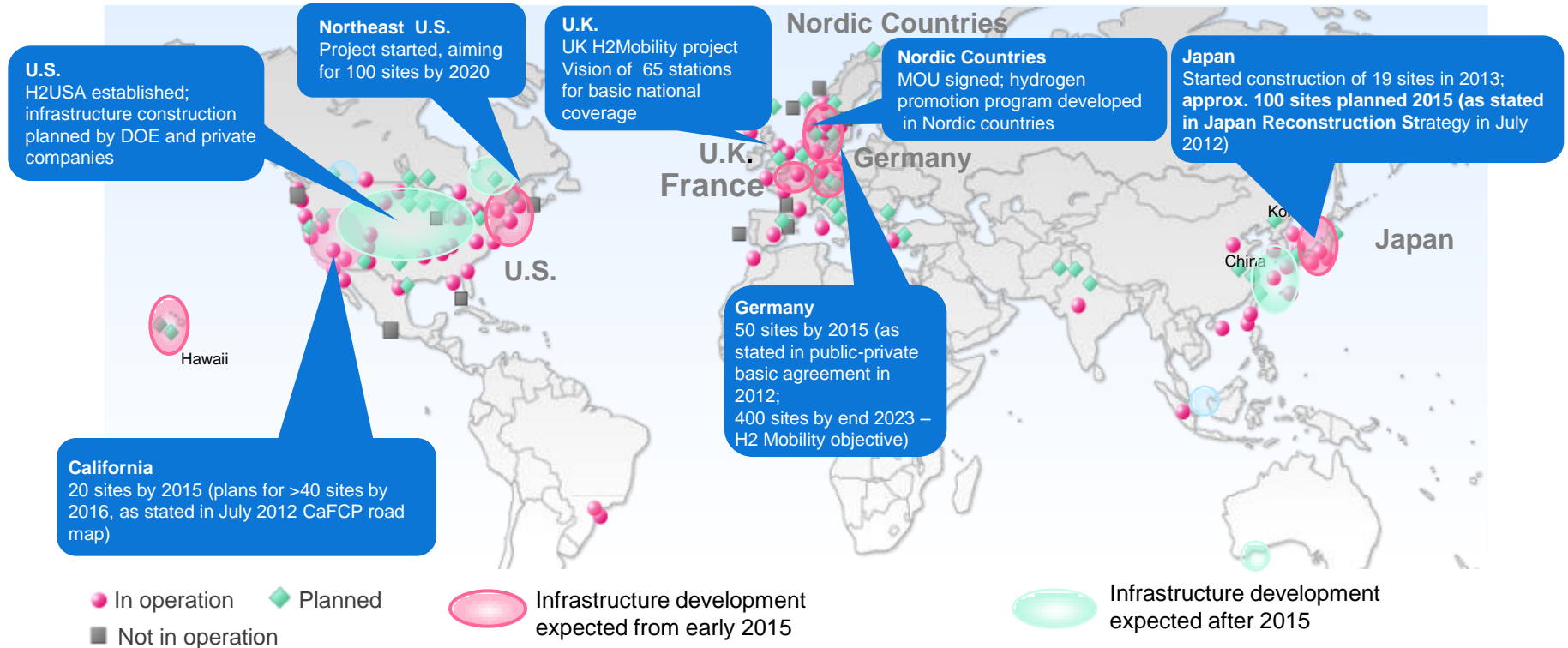


High cruising
range
**similar to the
one of a petrol
car**



Fun to drive
**smooth & quiet
superb
acceleration**

Where is hydrogen infrastructure being developed?



Several hundred hydrogen stations are planned by 2015 globally

State of infrastructure development in Europe

UK

15 stations intended by end 2015 ; vision of 65 stations for basic national coverage



Germany

50 stations confirmed by Q1 2016; 400 by end 2023 (H2 Mobility objective)



Denmark

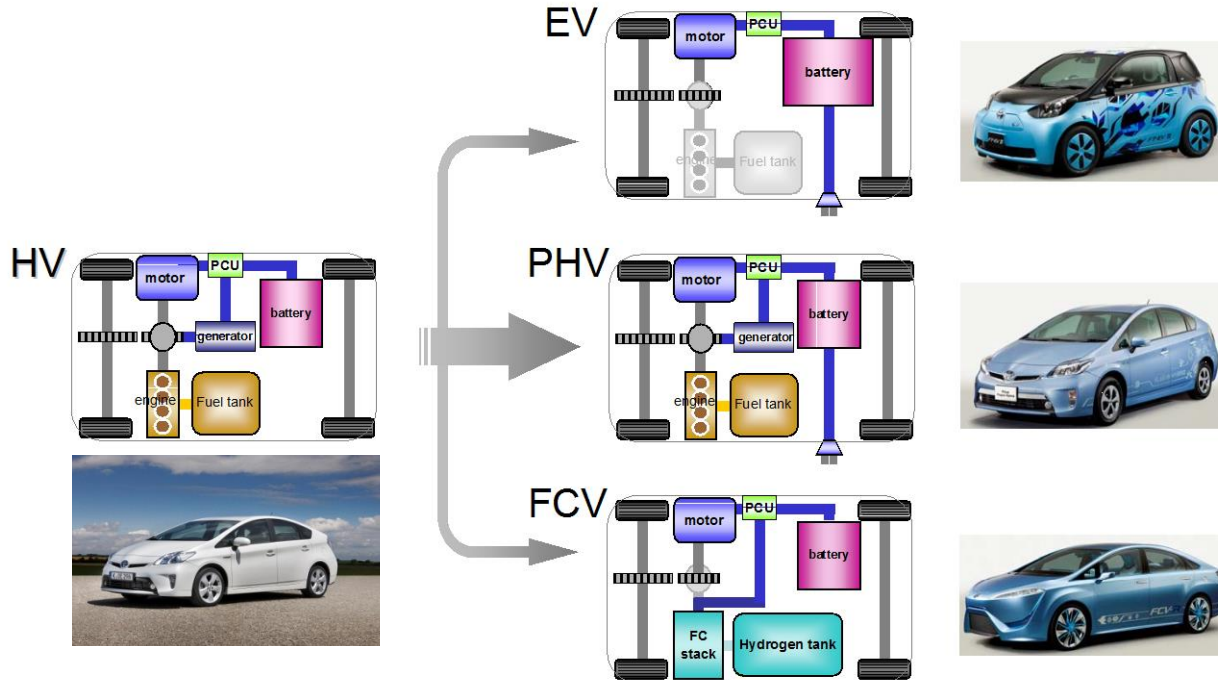
15 stations planned in Denmark + motorway coverage



*Copenhagen Hydrogen Network A/S a fit-for-purpose JV between AirLiquide and H2 Logic

At least 80 stations secured in key countries by the Q1 of 2016

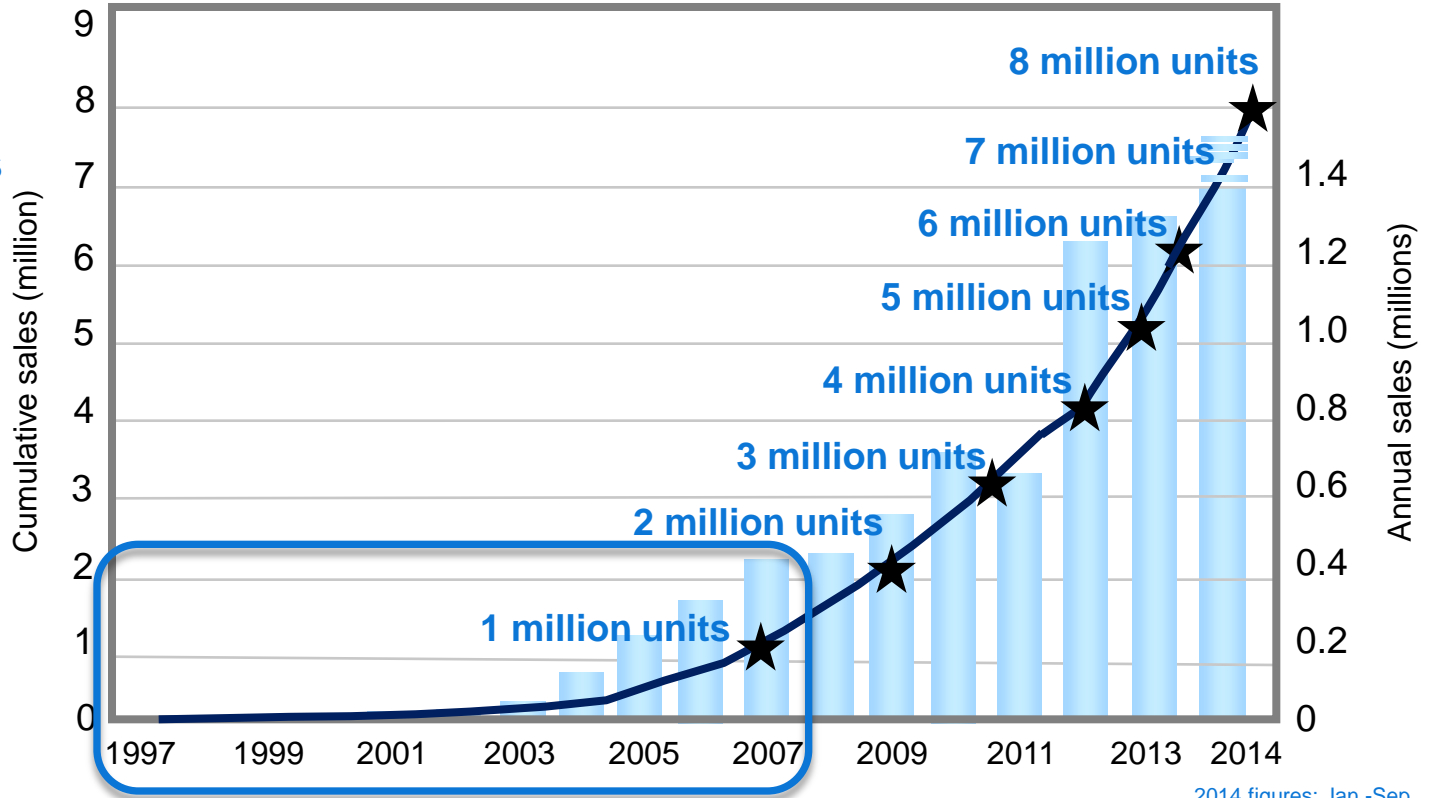
Hybrid technology as core technology



Popularizing hybrids also took time

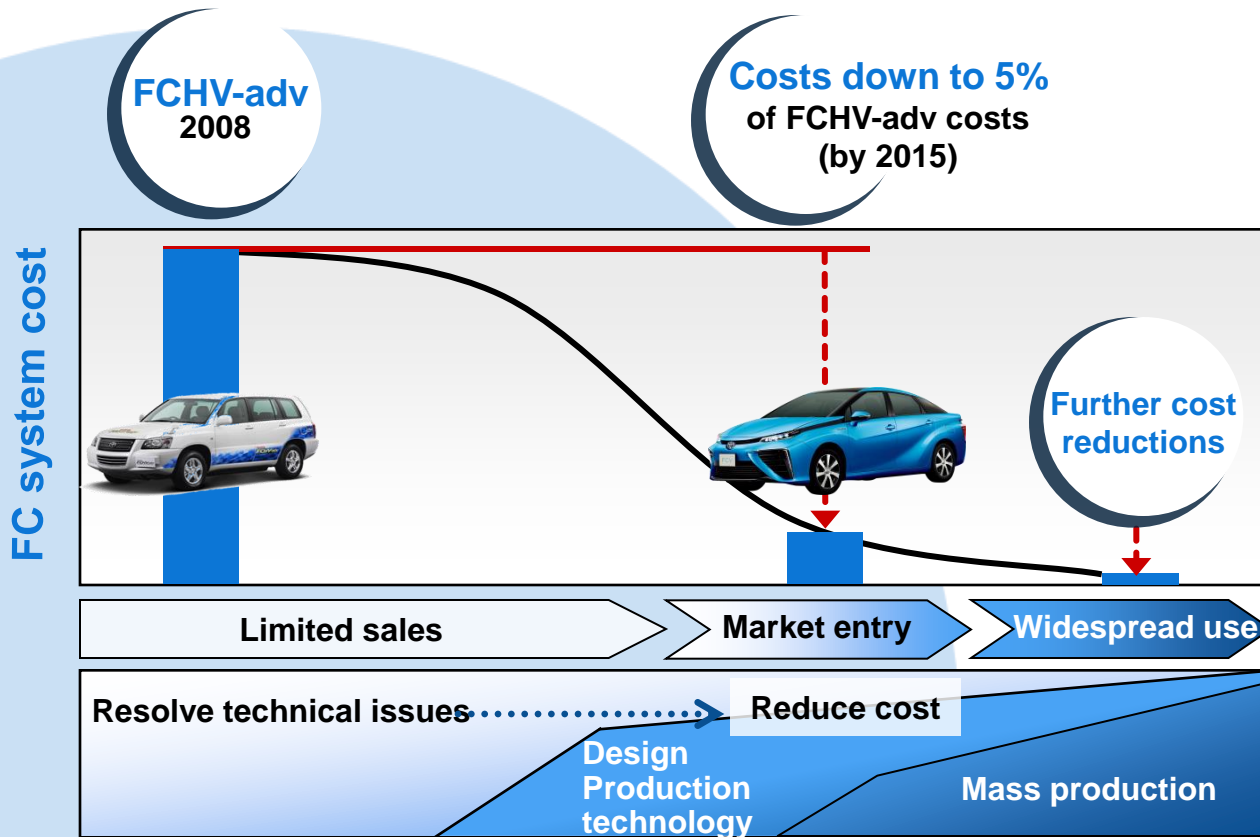
Global hybrid sales milestones

- **2012** 1 million units sold annually for the first time
- **Sep. 2015** Cumulative sales passed 8 million units

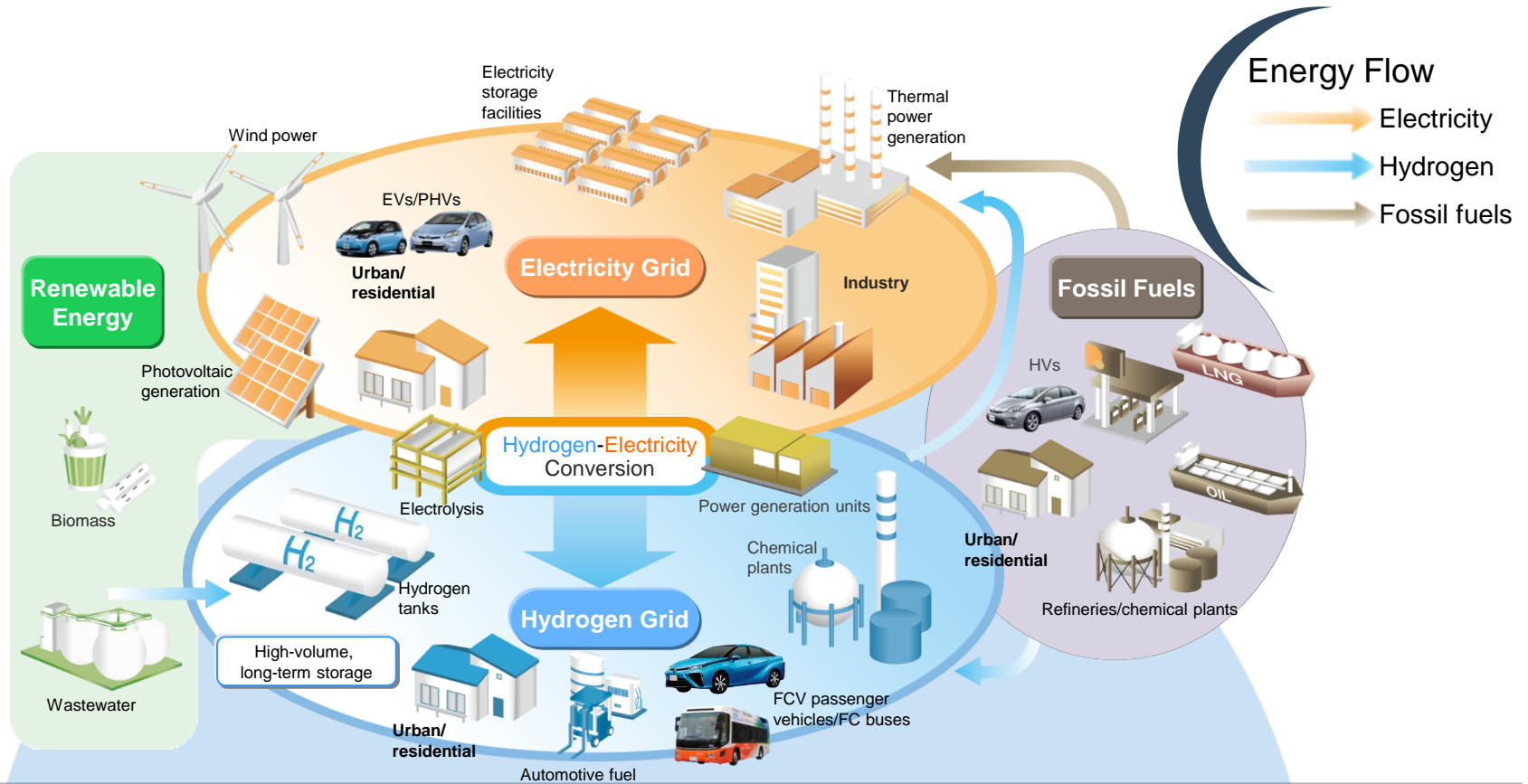


2014 figures: Jan.-Sep.

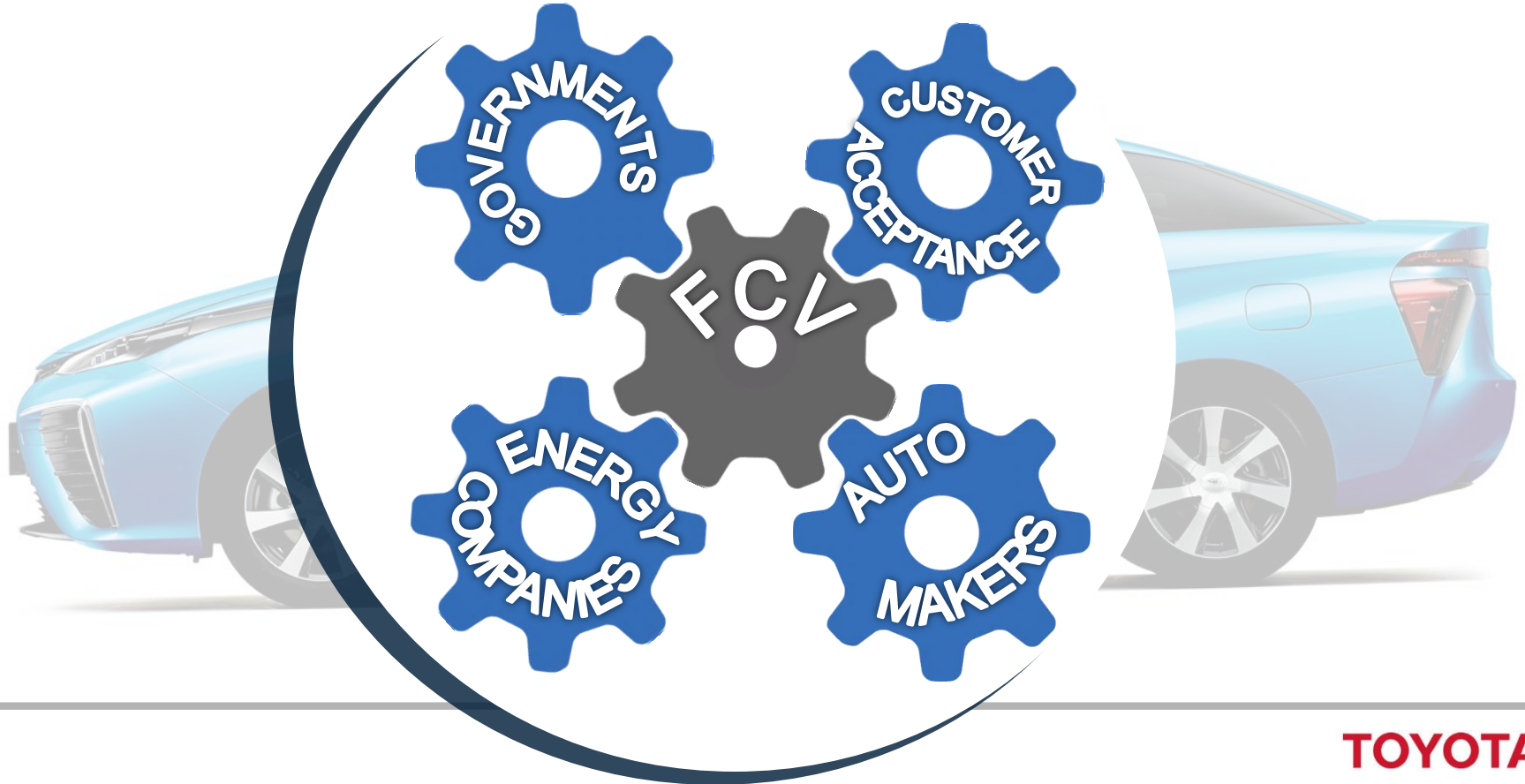
Achieving widespread use of FCVs in the future



The role of hydrogen in a sustainable society



Achieving widespread use of FCVs in the future



.... we already move ahead on the road to a sustainable mobility.....

**Thank you very much
for your attention!**

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