



La mobilité hydrogène & flotte de taxis Hype à Paris

**La transition énergétique et
les financements européens**

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Chargé d'Affaires publiques

Toyota Motor Europe, Paris office

Nice, le 6 décembre, 2019

TOYOTA

Le groupe : Toyota/Lexus, Daihatsu et Hino



AA

1937



Corolla

1966



RAV 4

1994



1ère Prius

1997



Mirai

2017

- Date de création : 1937
- Chiffre d'affaires : 236 milliards d'euros
- Employés : 370,000 personnes
- Production monde 2018 : 10,6 millions de véhicules
- Ventes monde 2018 : 10,6 millions de véhicules
- **Ventes hybrides : 13,5 millions depuis 1997, pionnier & leader**
- Commercialisation : 170 pays
- Sites de production: 65 sites dont 12 au Japon
- **Budget R&D : Plus de 8 milliards d'euros chaque année**

Sources : Exercice fiscal clos le 31 mars 2018 (1 Euro = 128 yens)

Défis environnementaux

CHANGEMENT
CLIMATIQUE



QUALITE DE L'AIR



AUTONOMIE
ENERGETIQUE



DEFI ENVIRONNEMENTAL 2050 TOYOTA



New vehicle zero emissions



Life cycle zero emissions (raw materials, parts & manufacturing, use, recycling)



Plant zero emissions



Minimizing and optimizing water usage



Establishing a re-cycling based society

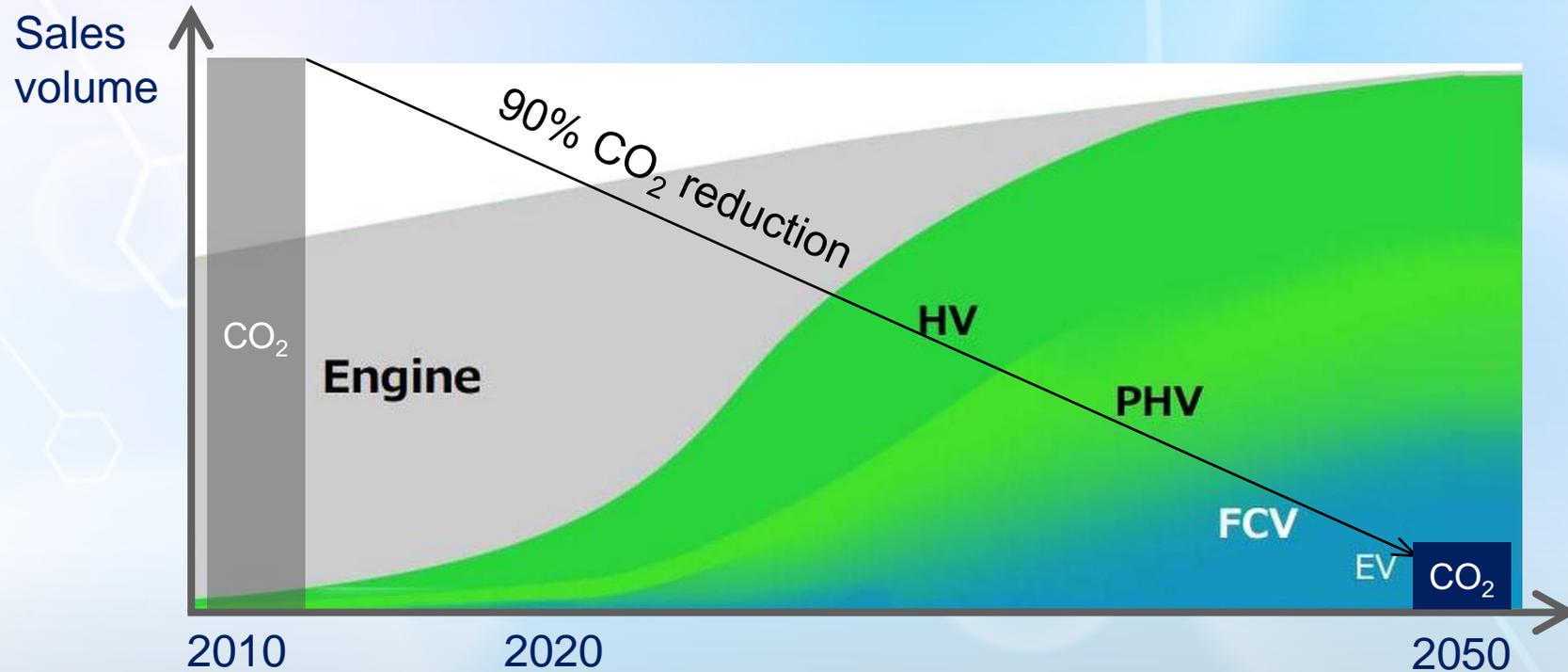


Establishing a future society in harmony with nature



TOYOTA

Mix de groupes motopropulseurs nécessaires pour atteindre 90% de baisse de CO₂



Electrification will increase dramatically after 2020

Complémentarité des technologies



Le 100% Hybride comme technologie pivot

Sustainable Mobility

Energy diversity

CO₂ reduction

Air quality

HYBRID ELECTRIC TECHNOLOGY

Gasoline,
diesel

Gaseous
fuels

Biofuels

Synthetic
fuels

Electricity

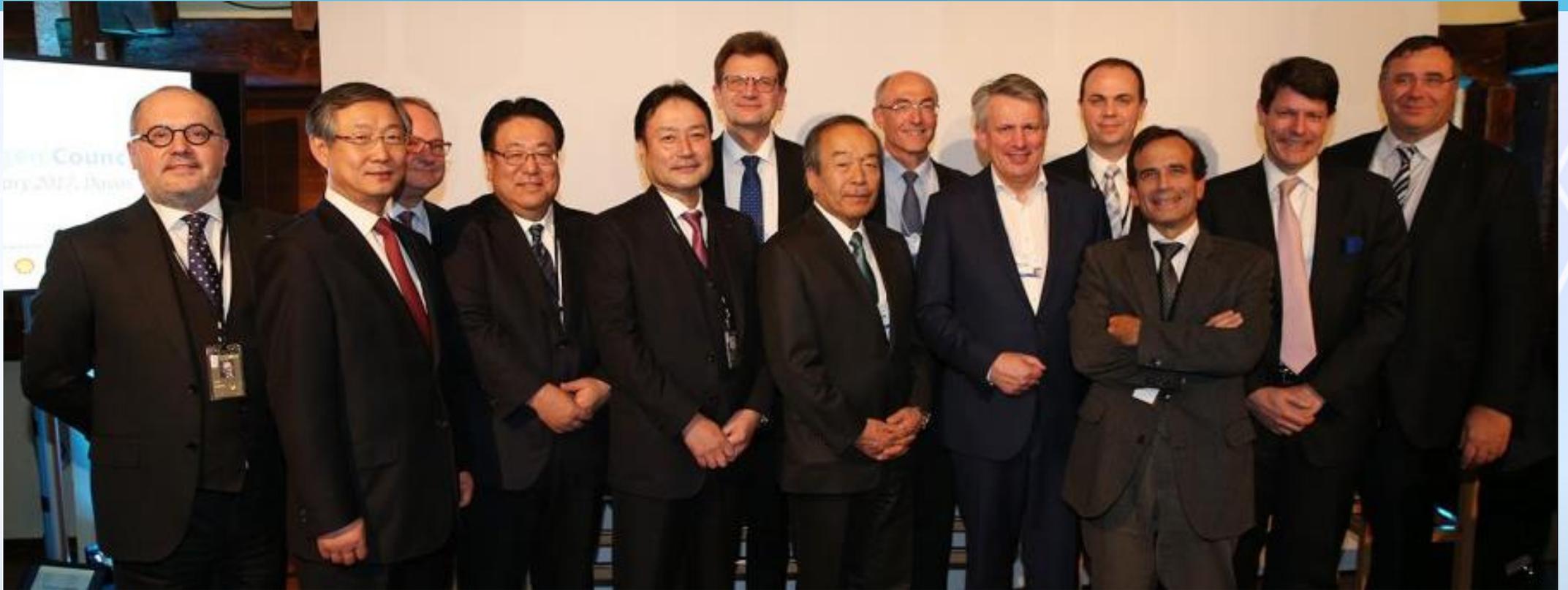
Hydrogen

Coopération pour créer la société de l'hydrogène



Zero CO₂ Challenge in cooperation with stakeholders

2017: création du Conseil de l'hydrogène



 **Air Liquide**  **ALSTOM**  **AngloAmerican**  **BMW GROUP**  **DAIMLER**  **ENGIE**  **HONDA**  **HYUNDAI**  **Kawasaki**   **THE LINDE GROUP**  **TOTAL**  **TOYOTA**

TOYOTA

En 2050 l'H2 permettra de réduire de 20% les GES



SOURCE: Hydrogen Council;

L'H2 dans les transports en 2050



5 m Buses



Planes



20% des trains diesel



400 m Cars



20 m Trucks



Ships

Atouts du véhicule hydrogène

Zéro émissions

Puissance et couple garantis

3-5 min de ravitaillement pour 500km* d'autonomie

Moteur électrique silencieux et sans à-coups

*Depending on driving style

TOYOTA

RATP & Caetanobus ont signé pour 3 mois d'expérimentation avec la pile H2 Toyota



- 3 month experiment – August to October 2020 - in real condition
- Between Porte d'Italie and Choisy-le-Roi (L185)
- Equipped with Toyota H2 stack

Hype, plus grande société taxi H2 au monde



Air Liquide | **hype** | **idex** | **TOYOTA** | 21.02.19
PARIS

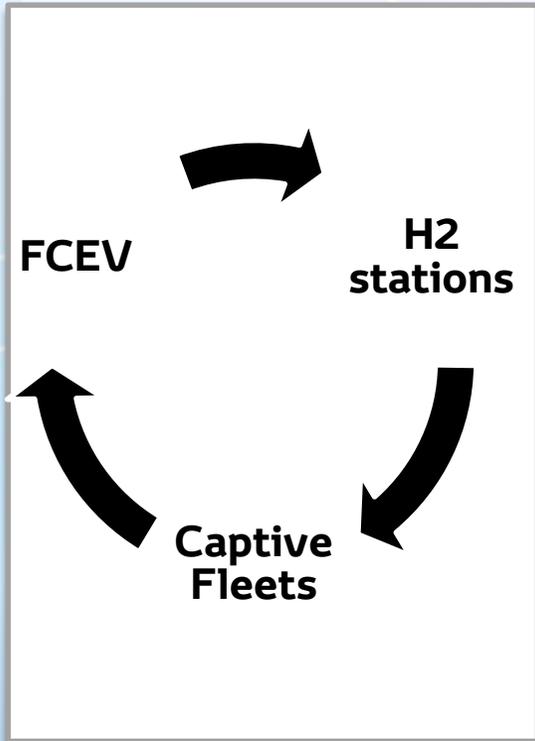
600 taxis hydrogène Hype pour fin 2020

Quatre partenaires créent une société commune en faveur de la mobilité hydrogène

Avec le soutien de

VILLE DE PARIS | **île de France** | **Commission Européenne** | **FCH**

Recette du succès: synchronisation des acteurs de l'hydrogène



	# of Mirai	# of stations <small>700 bar</small>	Cars/station	Fleet/Private
Germany	127	51	2.5	Fleet
Norway	50	7	7	Fleet
UK	74	9	8	Fleet
France	52	4	17	Fleet

Too many stations
Too few vehicles

X

Too few vehicles

X

Too few vehicles

X

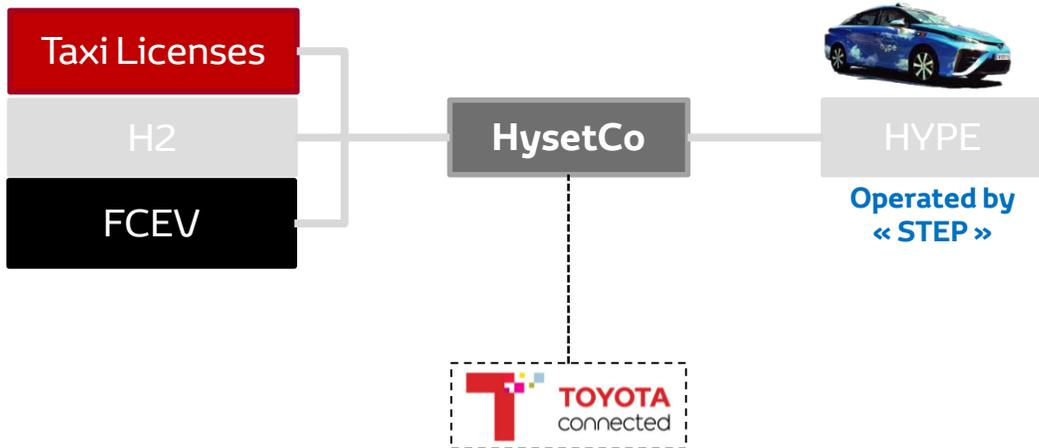
Synchronization as a success factor

✓

Aperçu de projet

“HysetCo, un investissement pour passer d’une entreprise de l’automobile à une de la mobilité”

**HysetCo’s purpose:
Combine assets of H2 « ride hailing » solution**



Project Roadmap

Phase 1 : reach 600 FCEV

2018	2020
U/O: 100	600

Development of unique FCEV Paris taxi company

- a) 500 new taxi licences
 - b) 600 units in operation
 - c) 5 H2 stations in Paris
- ✓ Prepare new services with MSPF

1 Fleet captive customer = STEP

Phase 2: TBD

2021	2022	2023	2024
Acceleration phase			

Extension of Z.E. “ride hailing” solution to other fleet actors

- ✓ Supply by HysetCo
- ✓ Toyota decision making vote
- ✓ Scalable Mobility solution to other Toyota Markets

Conquest potential : 17 000 taxis + 25 000 VTC

Infrastructures H2 en France – Etat des lieux

France: H2 development through “clusters”, based on the demand for FCV



Stations in operation in 2019: needs 700 bar HRS

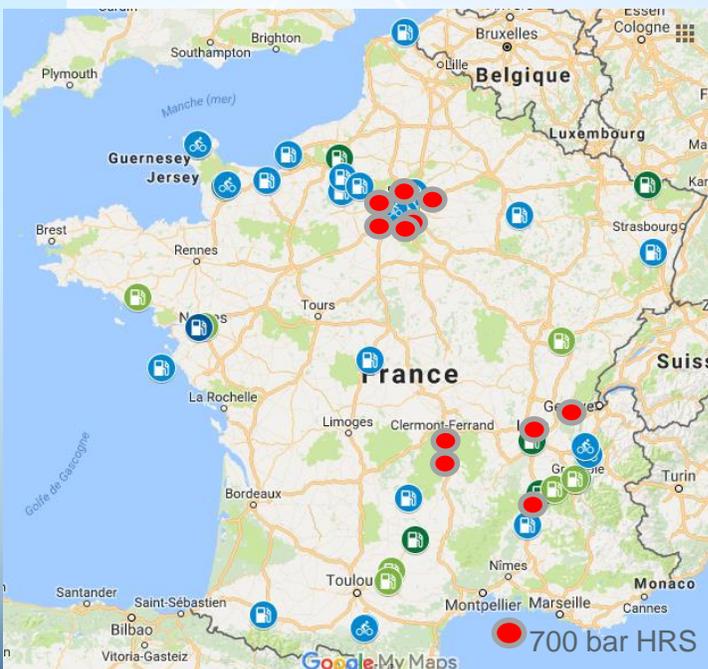
• 350 bar:

15

• 700 bar:

3

Paris-Alma, Paris-Orly and Paris-Versailles



700 bar planned stations for 2019 – 2021 (tbc)

Air Liquide	Paris Roissy Paris Grenelle	Q2'18 2021
Zero Emission Valley	Lyon Clermont-Ferrand Grenoble	3 by 2019 tbc 15 by 2020
McPhy	Grenoble	S2 2019
Ataway	Chambéry	S2 2019
ENGIE	Paris La Défense Paris Rungis Paris St Denis	S2 '19 S2 '19 S2 '19



Today: Hype taxi fleet @Paris city

2024: Paris Olympics & Paralympics

2030: Paris to ban diesel & petrol vehicles

2040: France to ban diesel & petrol vehicles sales

2050: France to be carbon free

De Tokyo 2020 à Paris 2024

Pose les bases pour la trajectoire vers Paris 2024

2020

DEPLOYMENT OF THE HYDROGEN SOCIETY



**Production of
30 000 Mirai /year
100H2 Bus H2 in Tokyo**



Avec la société des taxis H2 HYPE

2024

DEMOCRATISATION



**PARIS to become EU
capital of
hydrogen**

TOYOTA

Merci



**MOBILITY
FOR ALL**

TOYOTA

De Tokyo 2020 à Paris 2024

2020

**DÉPLOIEMENT SOCIÉTÉ
DE L'HYDROGÈNE**



**Production de
3 000 à 30 000 Mirai par an**



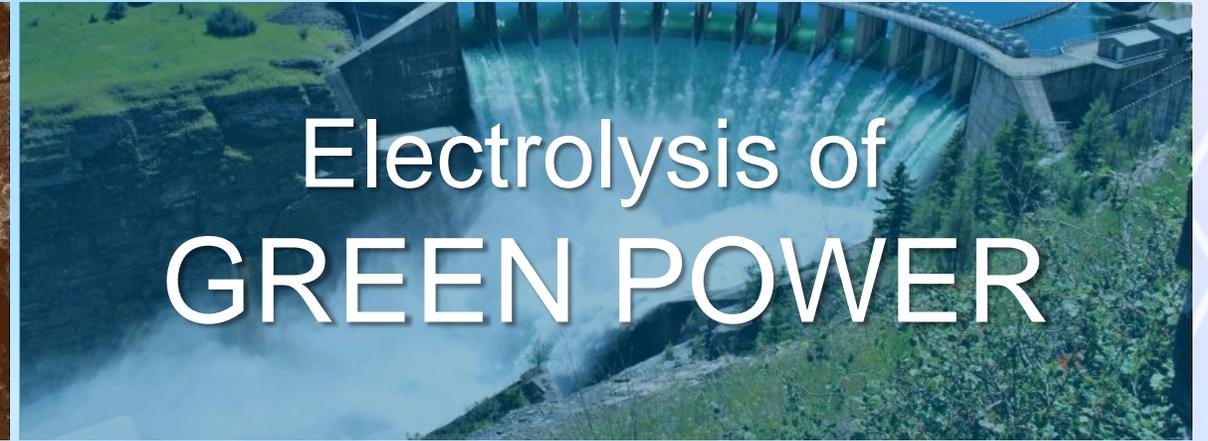
2024

DÉMOCRATISATION



**Paris : Capitale européenne
de l'hydrogène**

H2 can be produced by everything



Renewable energy – the way forward



Biomass



Hydro

Controllable



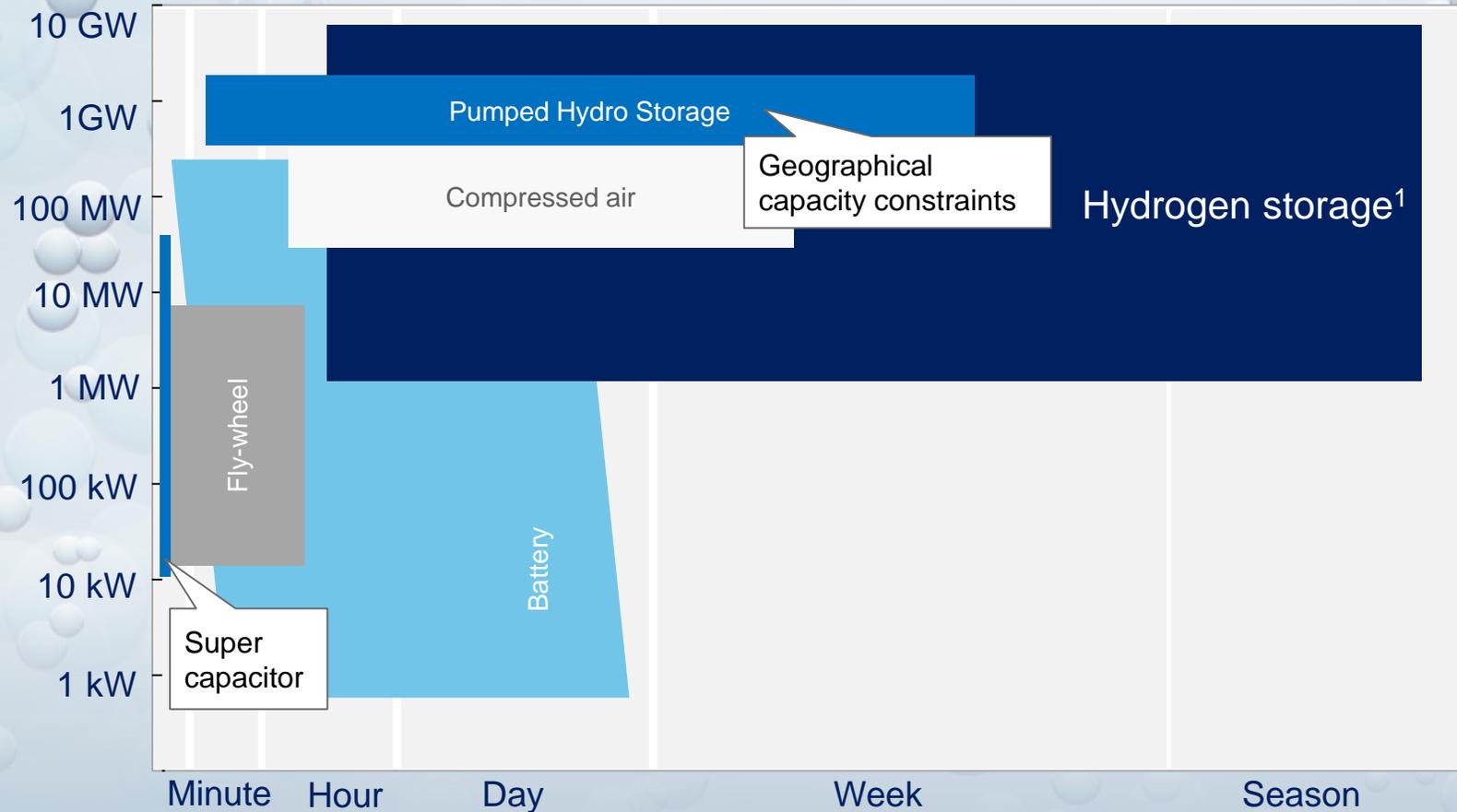
Solar



Wind

Fluctuates

H2 as a storage of renewables



Hydrogen is most promising for long-term and carbon-free seasonal storage

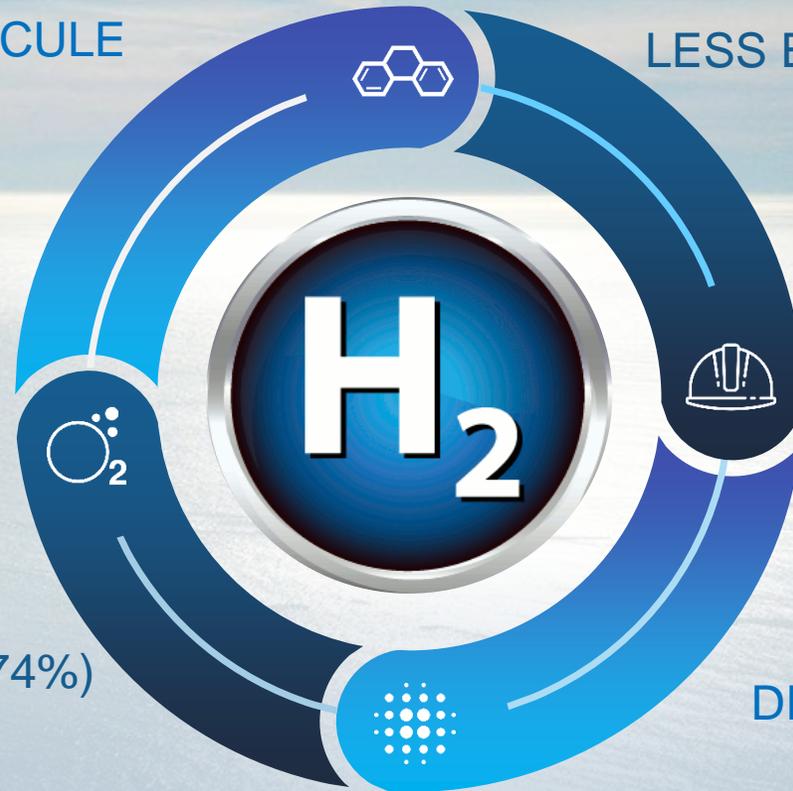
¹ IEA data updated due to recent developments in building numerous 1MW hydrogen storage tanks

Source: IEA Energy Technology Roadmap Hydrogen and Fuel Cells, JRC Scientific and Policy report 2013

And hydrogen is safe

01 STABLE MOLECULE

LESS ENERGY CONTENT
THAN LPG or CNG 02



04 NEEDS O_2 (4-74%)
TO COMBUST

DISPERSES QUICKLY 03

Source: [www.mathesongas.com/pdfs/products/Lower-\(LEL\)-&-Upper-\(UEL\)-Explosive-Limits-.pdf](http://www.mathesongas.com/pdfs/products/Lower-(LEL)-&-Upper-(UEL)-Explosive-Limits-.pdf)

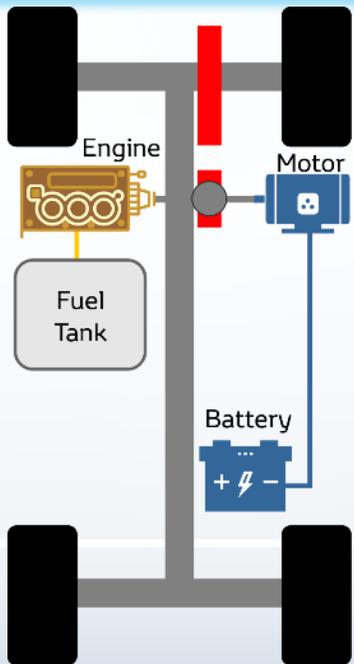
TOYOTA

Hybrid central to our technology roadmap

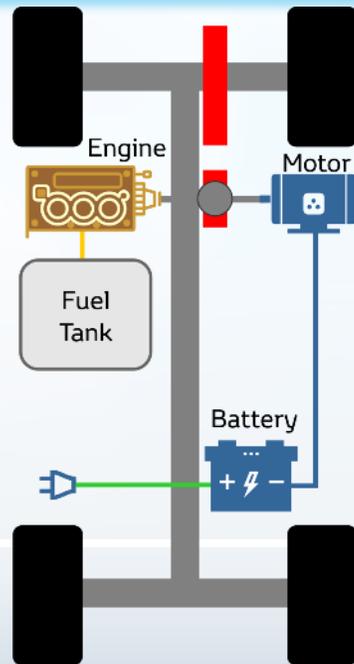
Using hybrid technology for Plug-In, EV and Fuel Cell



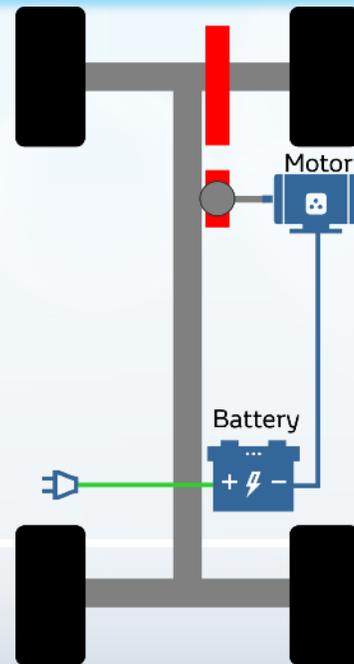
HYBRID



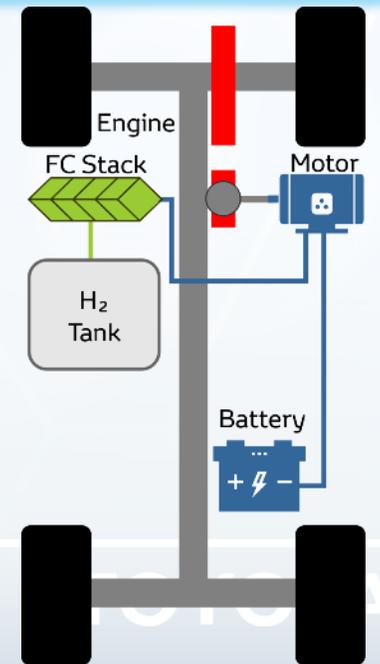
PLUG-IN HYBRID



ELECTRIC

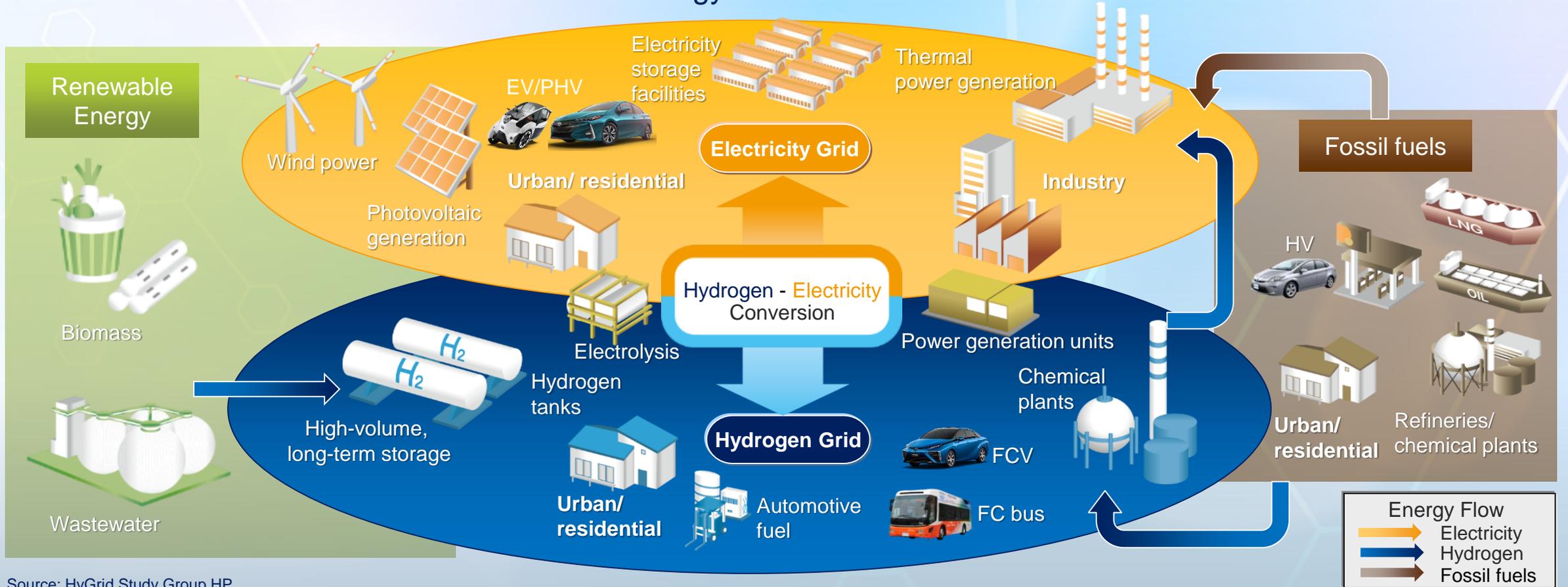


FUEL CELL



Future vision: HyGrid (Hydrogen Grid)

Minimum use of fossil energy and maximum use of renewables



Source: HyGrid Study Group HP

Advantages of FC Bus

Energy diversification

- Hydrogen can be produced using a wide variety of primary energy sources

Comfort

- Smooth and quiet operation
- Smooth start and good acceleration at low and medium speeds



TOYOTA FC BUS concept model 'SORA'

Zero emissions

- Zero CO₂ emissions during driving

Performance

- Range approx. 200km*
- Refuels in approx. 10 minutes

* City area driving pattern
Toyota measurements

Large power supply capability for emergencies

- approximately 4.5 days at evacuation center

HYPE, an Innovative way to create a H2 society align the infrastructure & vehicles at the right time



TOUJOURS
MIEUX
TOUJOURS
PLUS LOIN

Paris Infrastructure

> '19/'20 plan to invest in 5 stations -> TTL = 9

Current Stations in Paris Region:

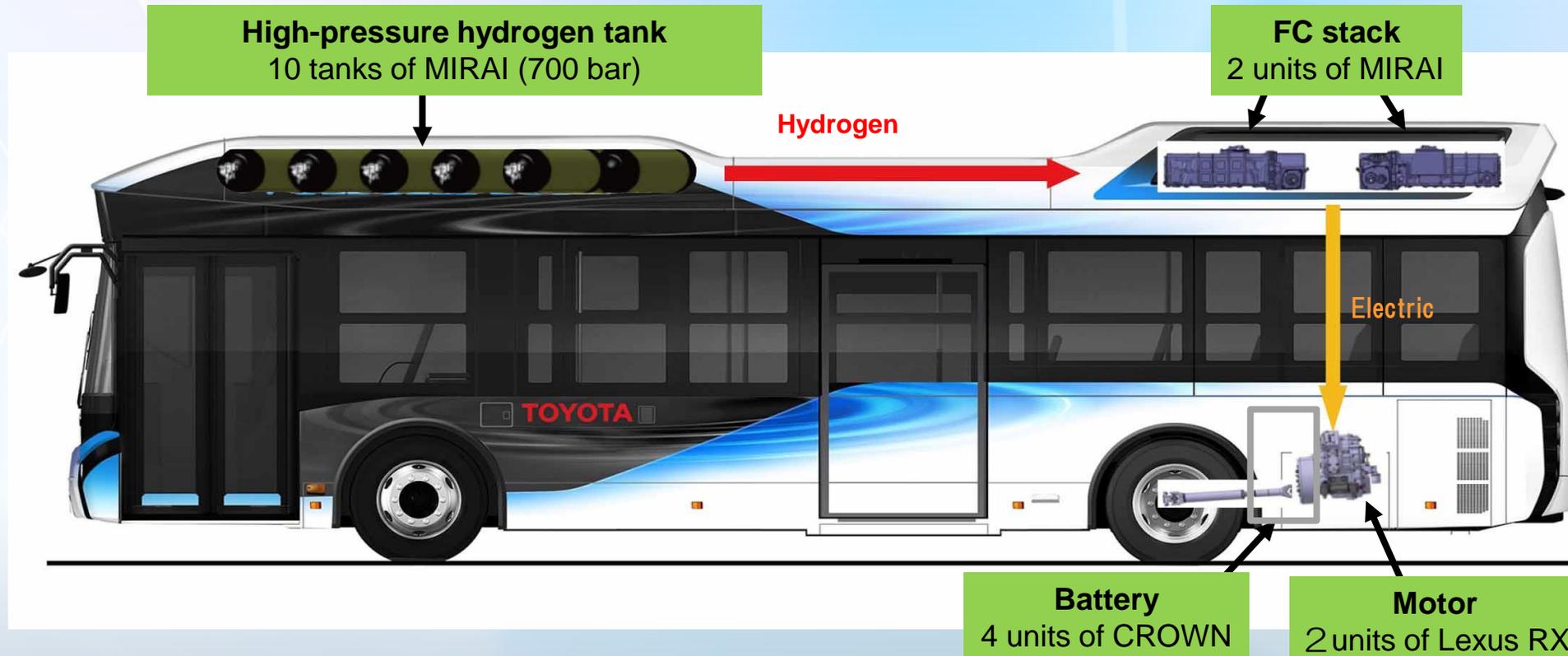
1. Alma : 40 kg/j
2. Orly : 200 kg/j
3. Roissy : 200kg/j
4. Les Loges : 50-100 kg/j (backup)

Future plans :

Location	Capacity	Timing
1. Créteil Phase 1	80kg/day	Sept '19
2. Station Usine 1 :	1000kg/day	Q1 '20
3. Station parisienne	200-500kg/day	Q1 '20
4. Roissy Phase 2	300kg/day	Mid '20
5. Station usine 2	1000kg/day	Q3 '20

Toyota FC Bus Introduction

To start from February 2017 for Tokyo, with a minimum 100 units by 2020 for Tokyo Olympics/Paralympics



The FC bus was developed using a unit of MIRAI.
Cruising range is approximately 200km

MIRAI: first mass-production Fuel Cell sedan

+ 3500 sold globally

230 sold EU

Launch in Japan

Launch in US and Europe

2,000 Mirai/year

10,000 Mirai/year

30,000 Mirai/year

2014

2015

2016

2019

2020+

TOYOTA