

Establishment of Technology Research and Hydrogen Small Mobility Engine Research Associations

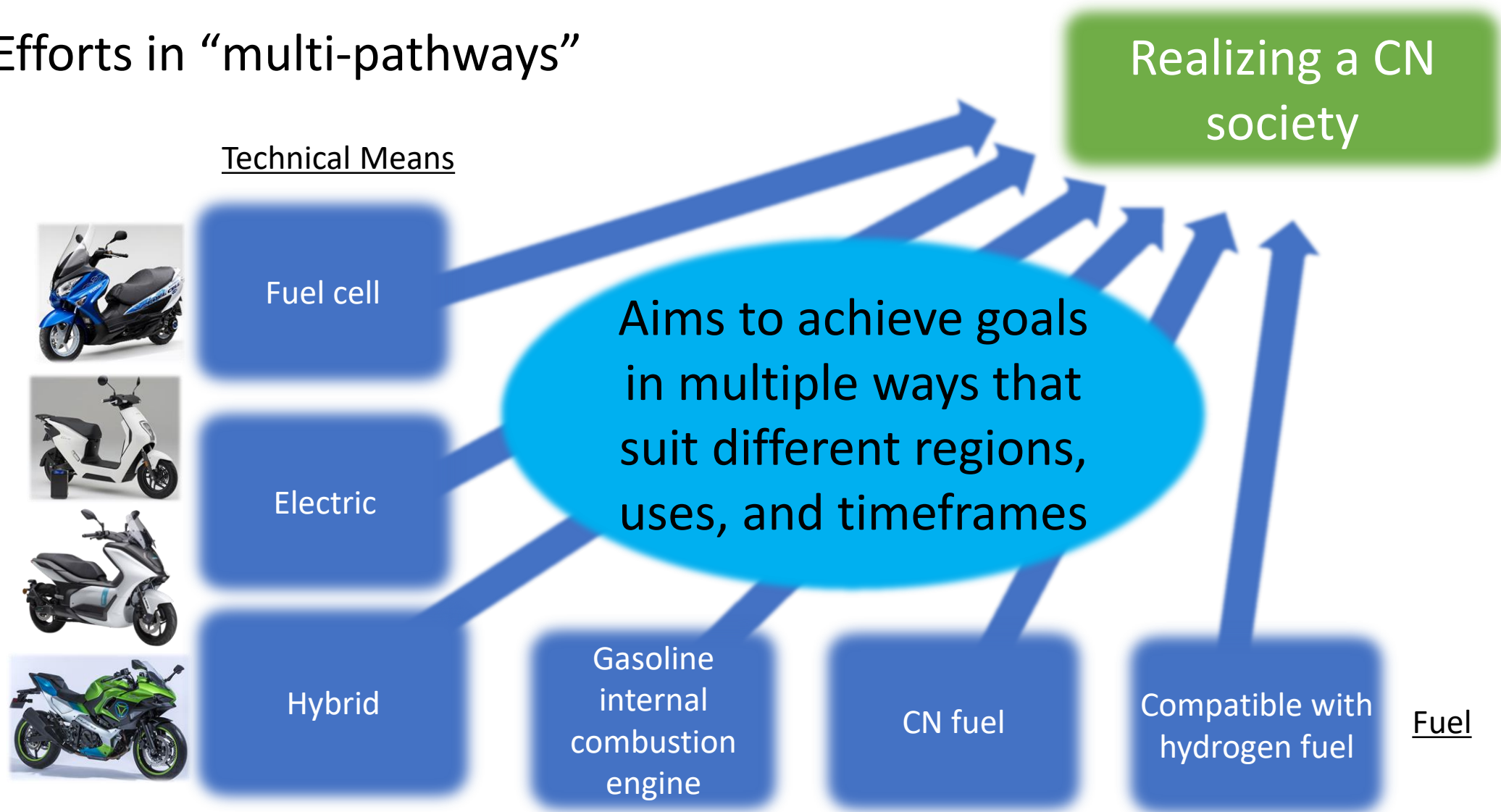


Summary

- Application for the establishment of a technology research association to conduct research on hydrogen engine systems for small mobility with four motorcycle companies & two other companies
Approved by Ministry of Economy, Trade and Industry in May 2023
- Collaborate with four motorcycle companies to conduct basic research on hydrogen fueled internal combustion engines for small mobility vehicles, mobility tanks, fuel supply system components, etc.
- In the future, we will invite overseas manufacturers and suppliers to join us and expand our circle of partners
- Expand the use of hydrogen and make it a “multi-pathway” initiative for the realization of a carbon neutral (CN) society

Environment Surrounding Carbon Neutrality (CN)

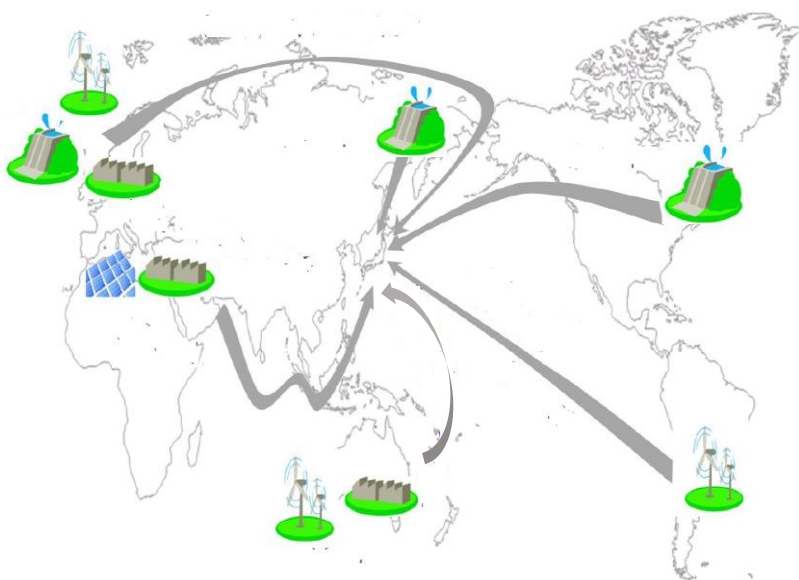
- Efforts in “multi-pathways”



Hydrogen Situation

- Hydrogen utilization for achieving CN

Make and transport



Energy
Security

Hydrogen

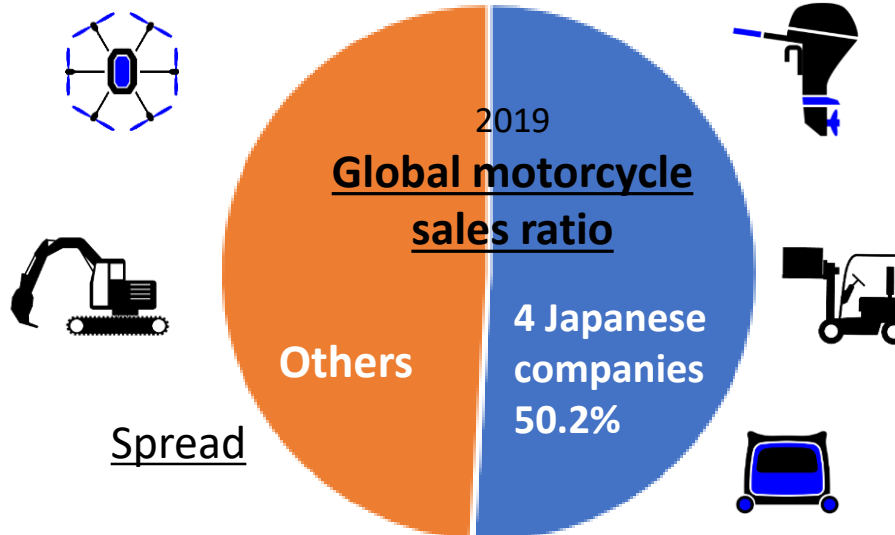
Environmentally
friendly

Industrial
competitiveness

Use

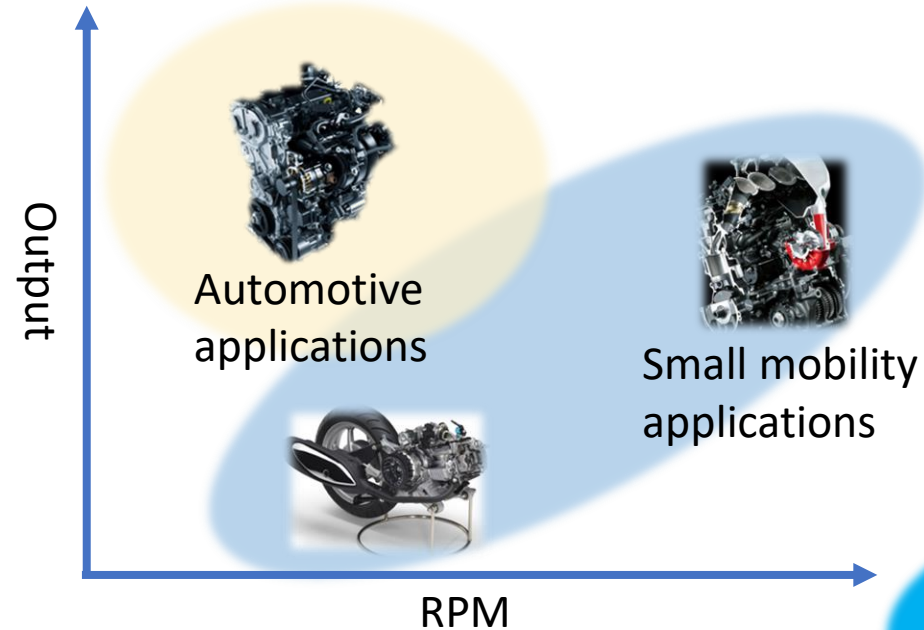


Adapting hydrogen fuel to small engines
will expand its use in small mobility



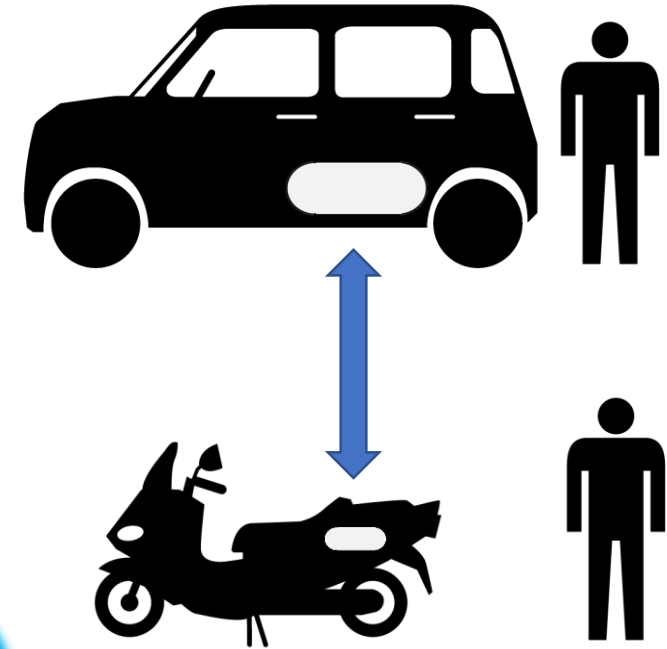
Why work with small mobility?

- Features of small mobility



Operation range and displacement are different from engines for 4-wheel options

Issues, High Difficulty



The vehicle type is small
It has small space for fuel

Speedy technology acquisition through basic joint research

Technology Research Association

Hydrogen **S**mall Mobility & **E**ngine Research Association

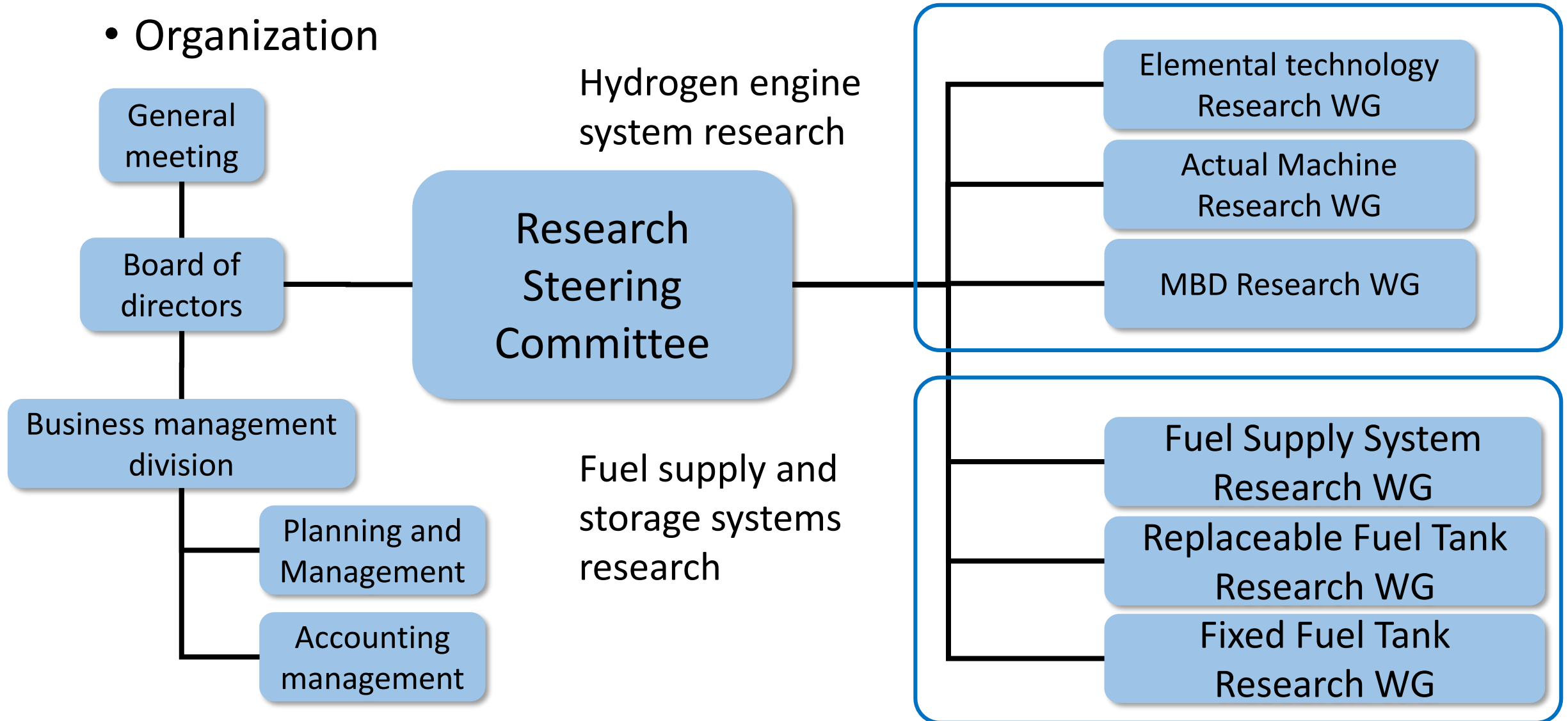
Abbreviation: HySE



***Hydrogen
Small mobility &
Engine technology***

Technology Research Association Organization/Members and Roles

- Organization



Technology Research Association Organization/Members and Roles

- Membership definitions and roles

Name	Founding member	Role
Full member	Kawasaki Motors Co., Ltd. Suzuki Motor Corporation Honda Motor Co., Ltd. Yamaha Motor Co., Ltd.	Organizational management, technology research, administrative management: Involved in everything
Research promotion special association members	Toyota Motor Corporation	Utilize hydrogen utilization in research with high technical knowledge
Business management special association member	Kawasaki Heavy Industries, Ltd.	Smooth operation with a high level of knowledge regarding hydrogen and technology group management

Technology Research Association Organization/Members and Roles

- Union member definitions and roles (expected to join in the future)

Name	Role	Qualification
Associate member	Participate in WG activities for technical research	Those who develop and manufacture engines for small mobility
General member	Regarding hydrogen engine system related parts, carry out activities as a theme by bringing in research for applying hydrogen fuel to own related parts	Component suppliers for small mobility, development engineering companies, etc.

*We are also considering a “supporting member” if they only want to provide information.

Role Allocation

- Each company takes a leading role, with the WG as a mixture of engineers from each company

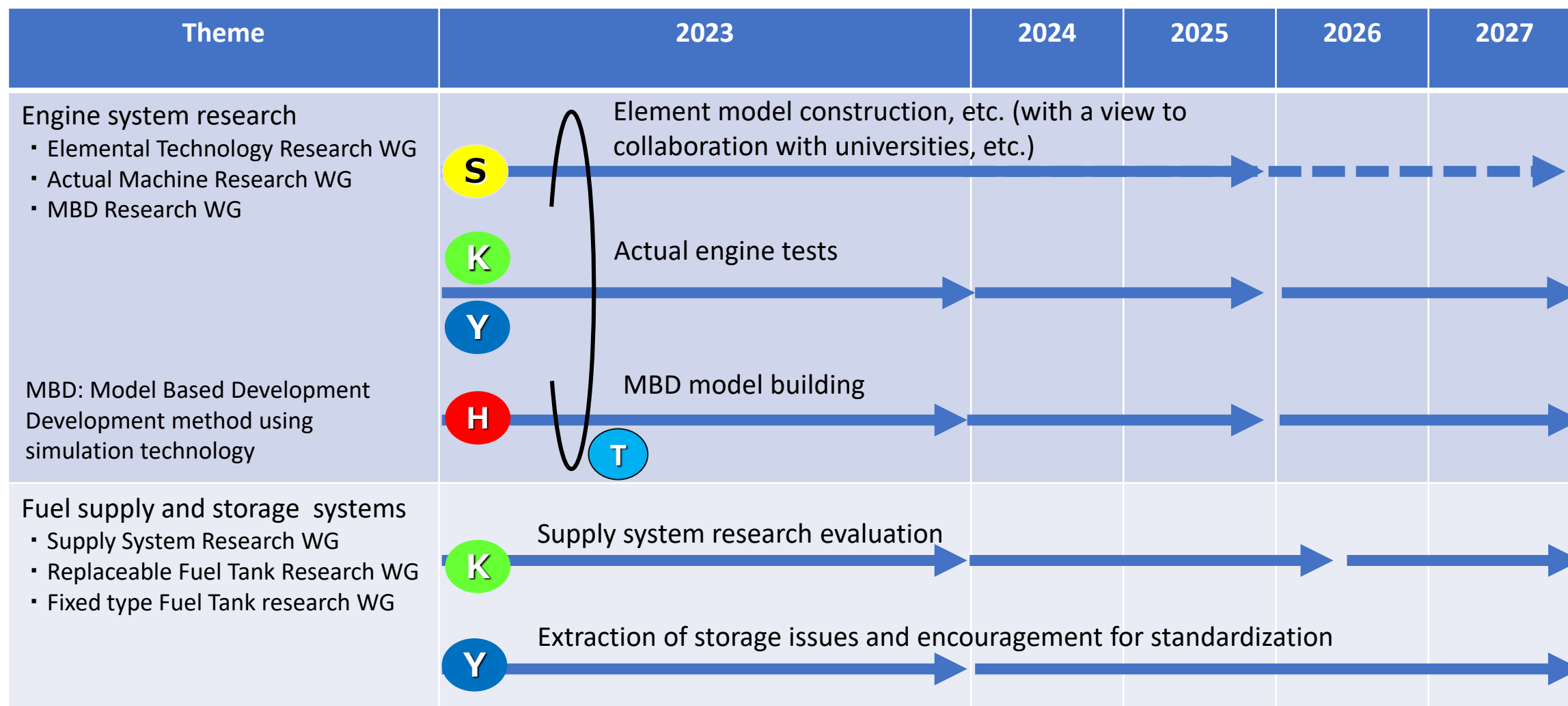
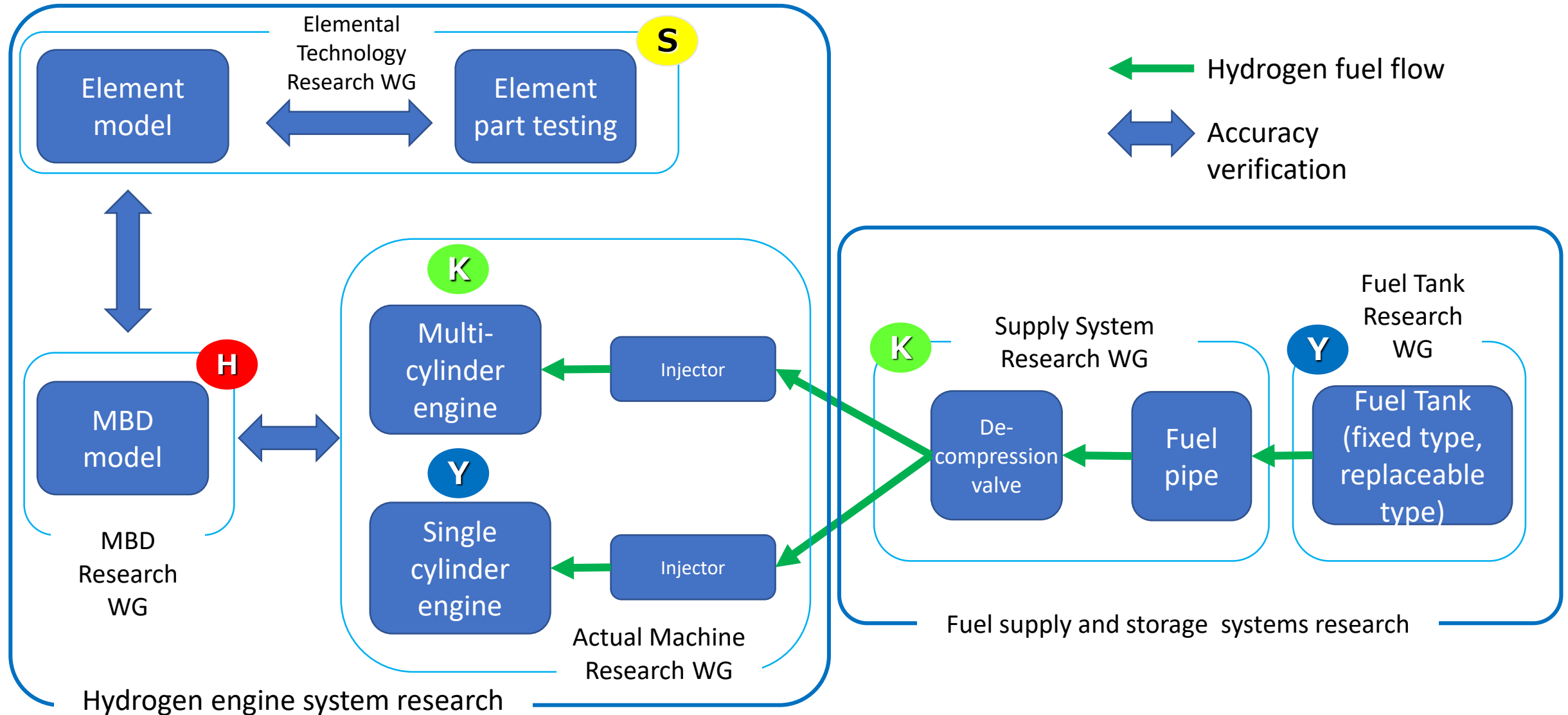


Image diagram of the division of research roles



Aims

- Acquisition of basic technology for the establishment of small mobility

Engine system research

External organizations
(universities, AIST, etc.)



Consignments, cooperations



Joint research areas
Knowledge / know-how



Linkage

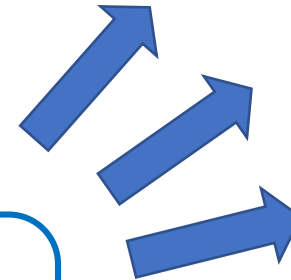
External organizations
(JAMA, etc.)

Fuel supply and storage systems
research

Motorcycle OEM

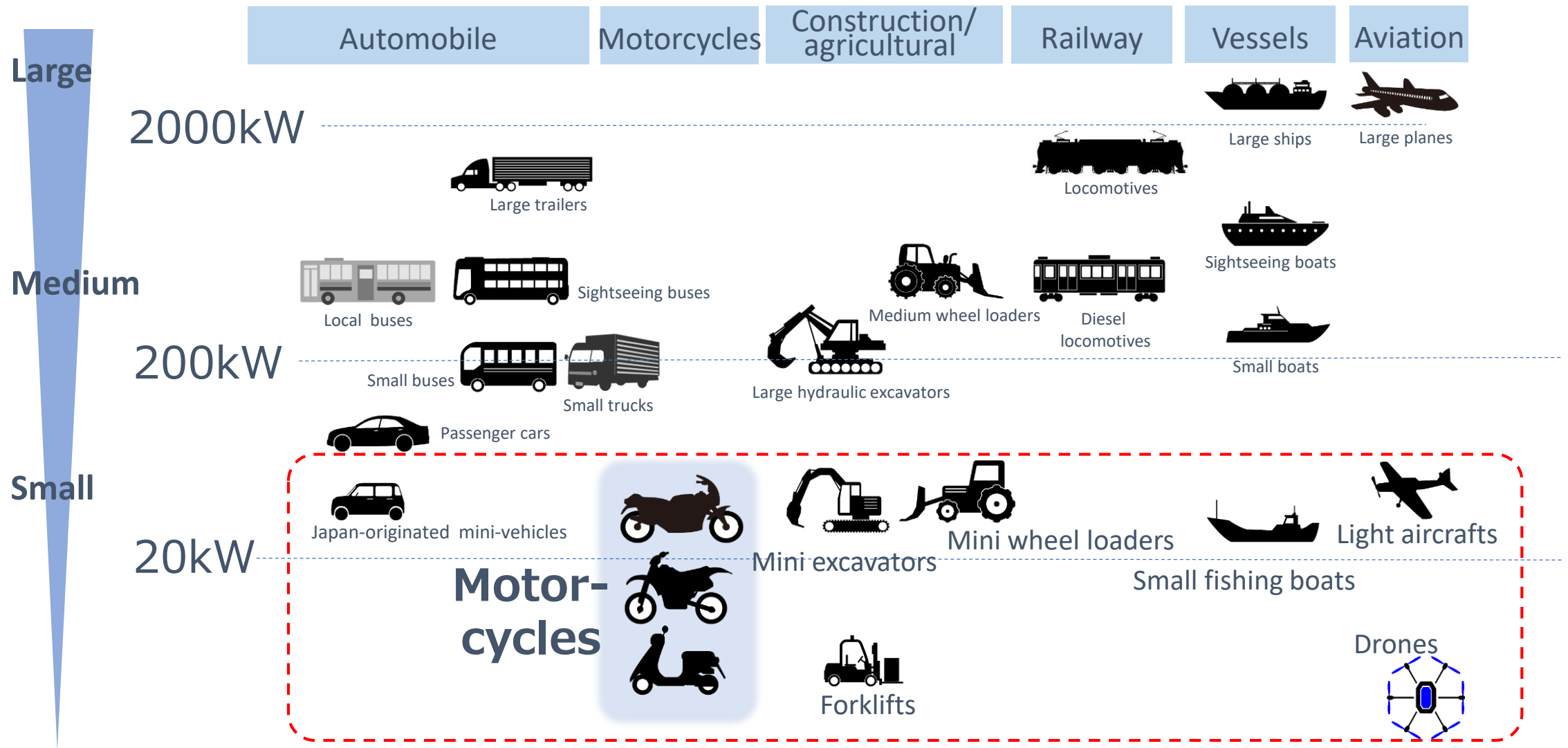
Small mobility OEM

Component suppliers



Models whose accuracy has been verified, back data, and storage technology suitable for small mobility will be the results of joint research by members, which will lead to the development of competitive products by individual members.

Spread of research results



Fundamental technology for motorcycles can be applied to other compact mobility