

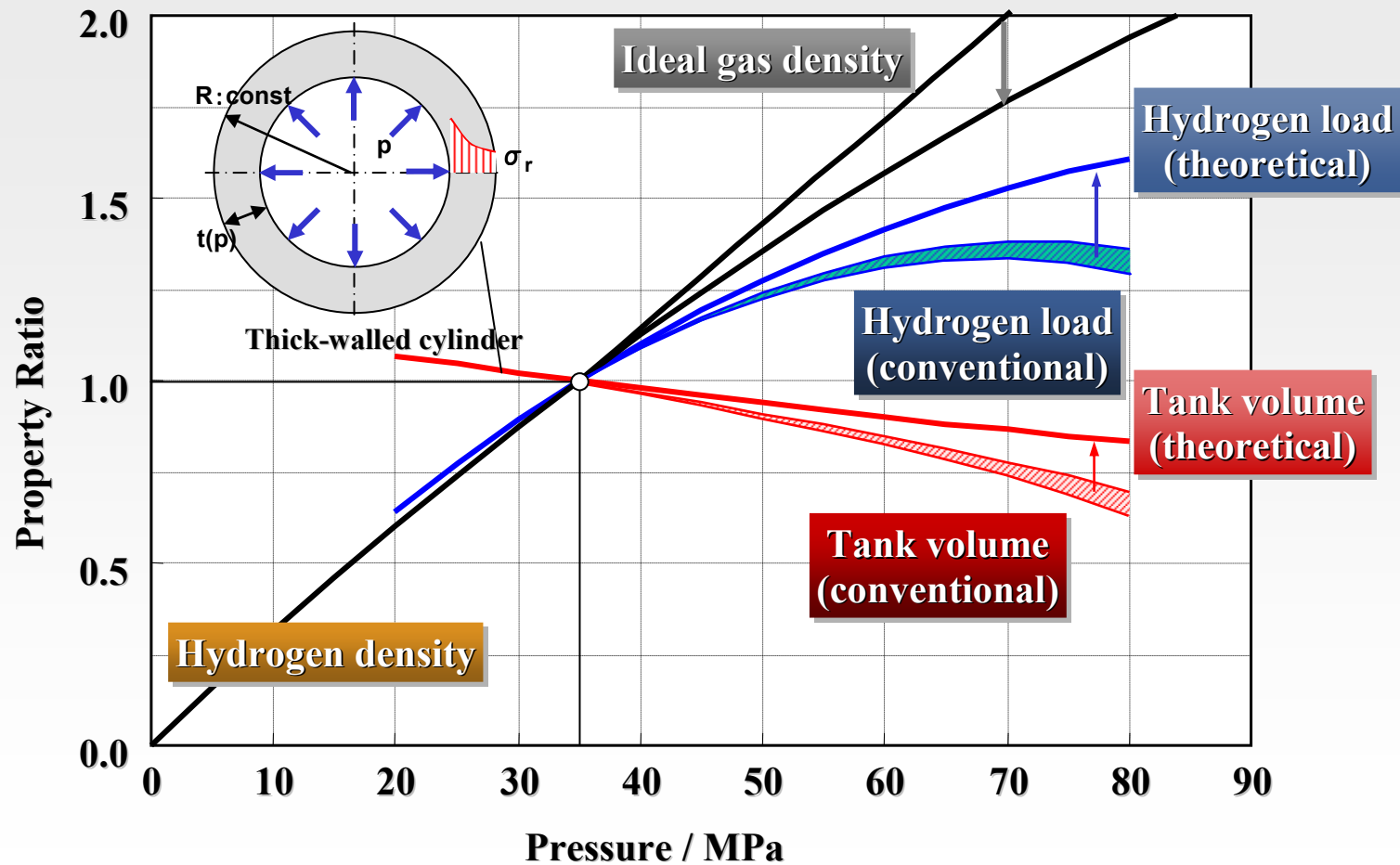
# Storage concepts and impact on H2 infrastructure

## WORKSHOP 3

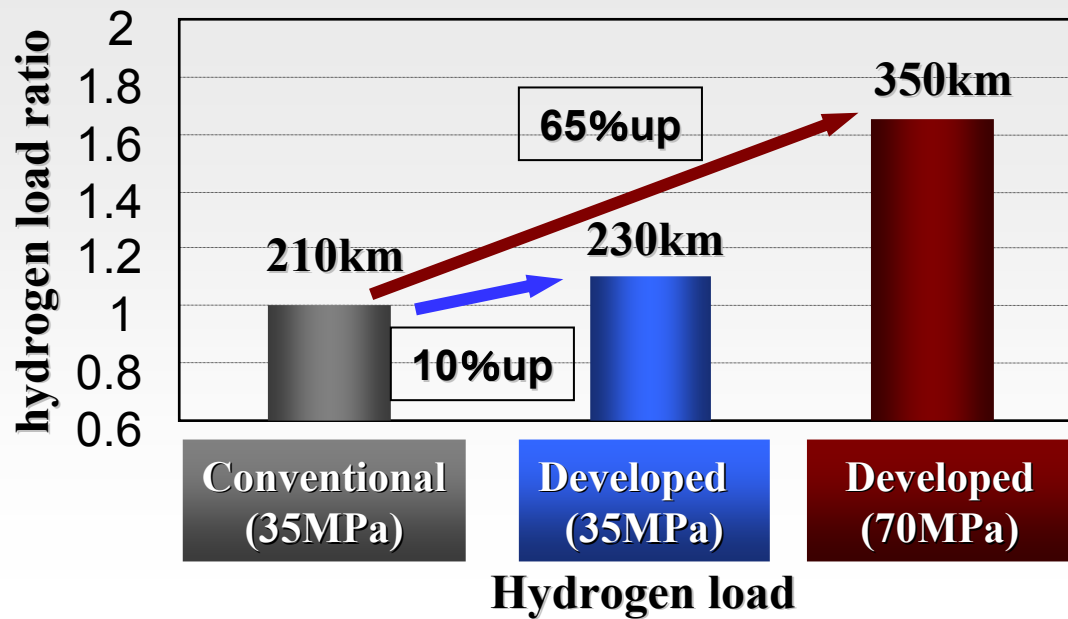
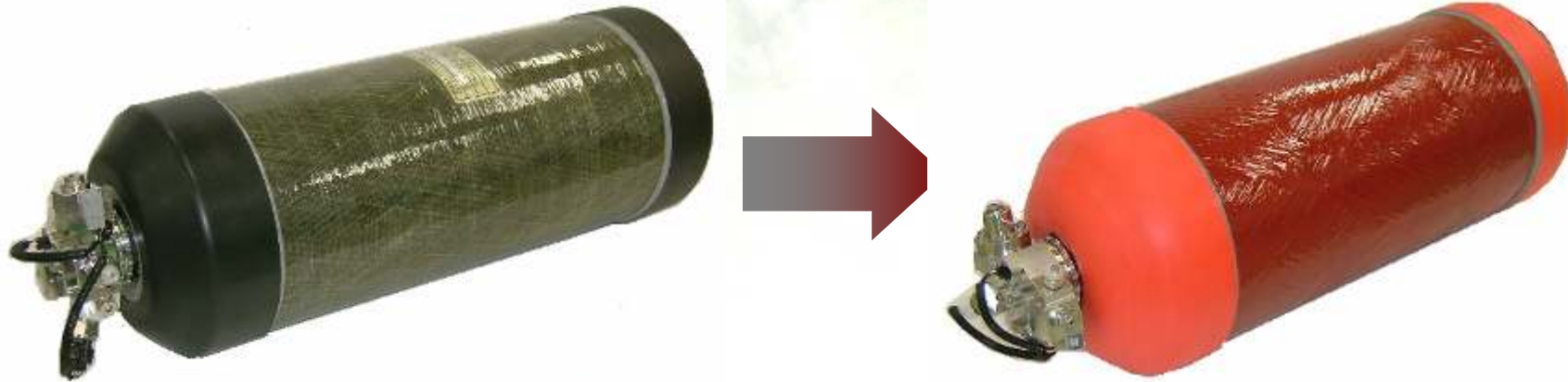
Pressure Level: 35MPa, 70MPa?

Statements from Toyota

# Gas storage density is limited by strength/volume ratio of CFRP



# V4 Tank Developed by Toyota



## Current FCV's cruising range



Improved version of TOYOTA FCHV successfully completed Osaka-Tokyo (560 km) trip *without refueling* on Sept. 28, 2007.

- Fuel efficiency: 25% Up (\*)

- Amount of Hydrogen: Approximately 1.9 times\* ( 70MPa tanks)

(\* Compared with '05 model TOYOTA FCHV)

On the other hand, it sacrifices ....

- Luggage space (for the case of SUV it has luckily large space)

- Cost reduction

- Life-cycle assessment

## 70 MPa Tank experience

- **Pros**
  - High potential of Hydrogen storage
  - High Volume efficiency compared with 35MPa
  - Strong against collision
  - Short charging time (w/pre-cool)
- **Cons**
  - LCA disadvantage due to Carbon fibers ( Energy intensive process)
  - Weight
  - High cost
  - Pre-cool is necessary
  - Infrastructure side cost up ( Expensive compressor, storage)
- **Future**
  - Cheap, low energy demanding carbon fiber must be developed
  - Further optimization of winding and regulation is necessary