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13 : 00 ~ 14 : 30

Roppongi Grand Conference Center

# Cost of CCS

## - Current & Future Trends -

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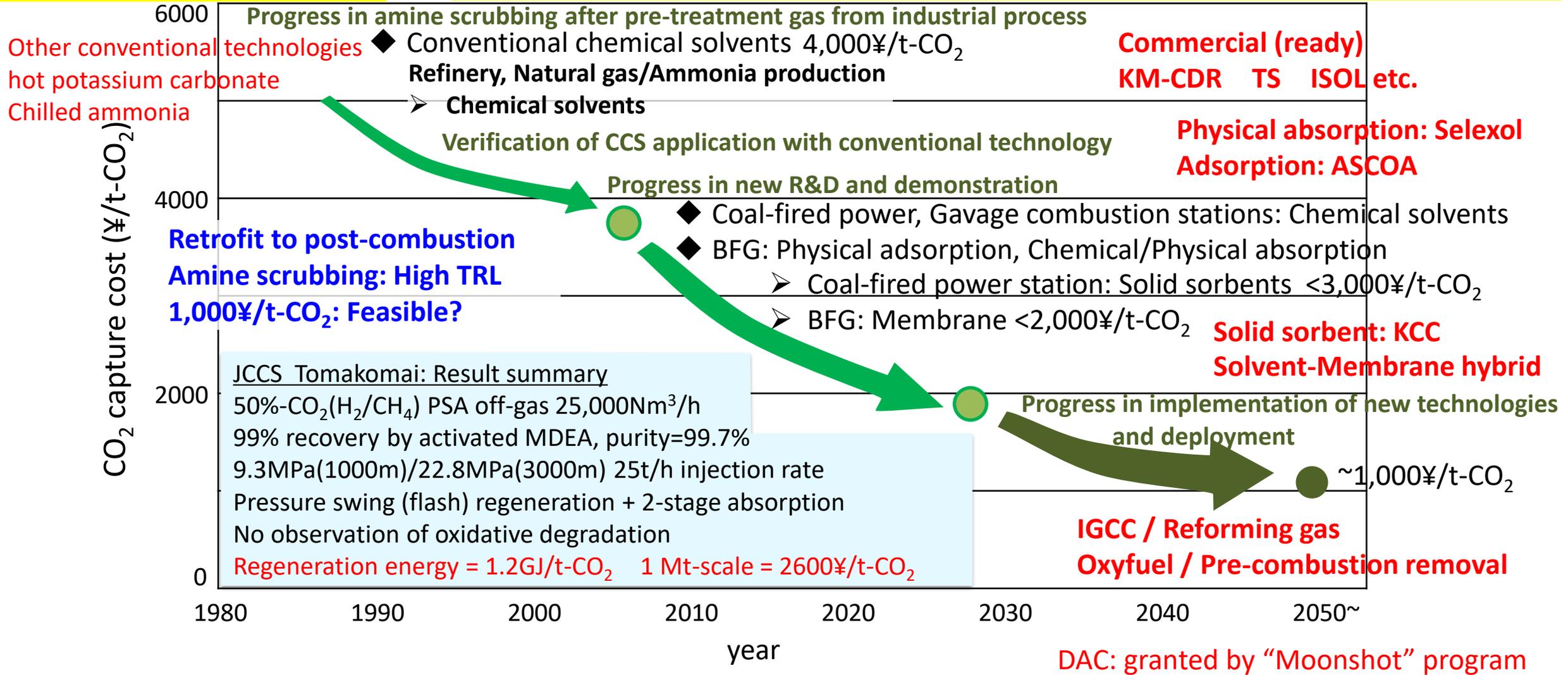
# Cost down of capture technologies

Different emission source

Cyclical ABS-RGN reactors: OPEX reduction due to RGN energy

Different suitable technology

Membrane reactors: CAPEX reduction for scale-up (e.g., module manufacturing)

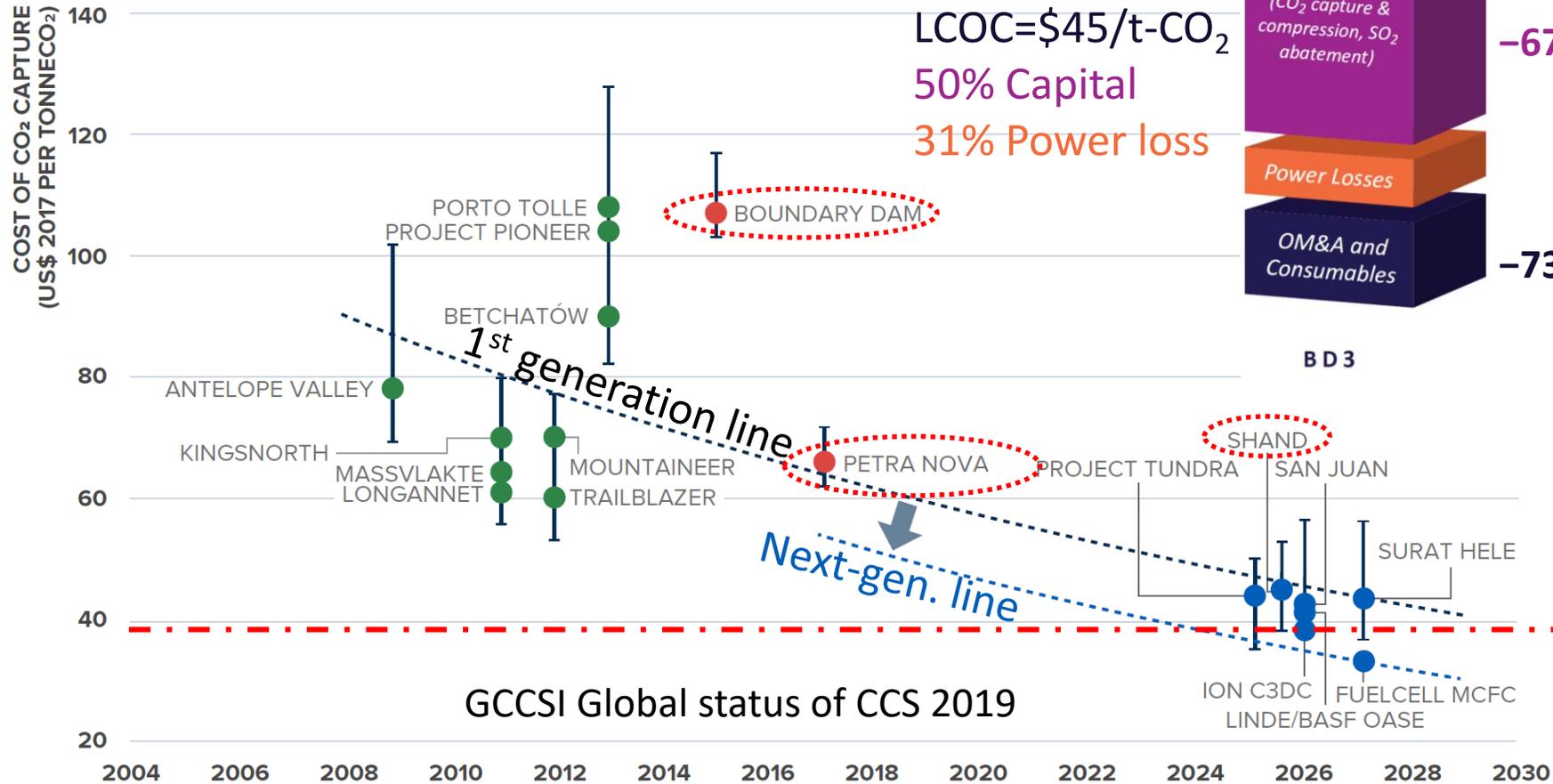


# Thermal PP: Additional modification for regeneration heat source

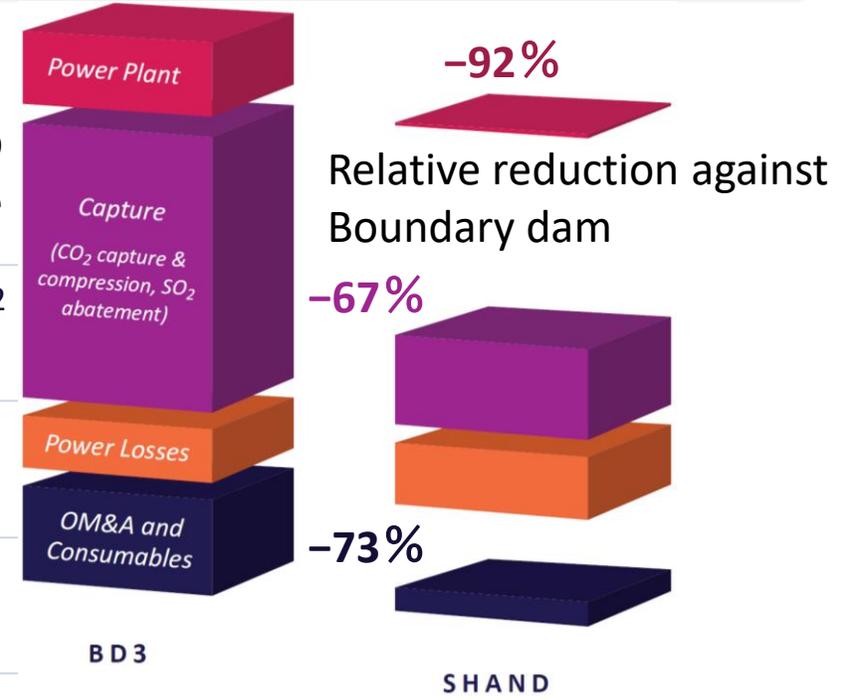
USC-PCPP, 300MW, 90% Capture

Replacing LP Turbine, High-pressure deaerator...

Shand CCS FEED  
International CCS Knowledge Centre



LCOC=\$45/t-CO<sub>2</sub>  
50% Capital  
31% Power loss



¥4,000

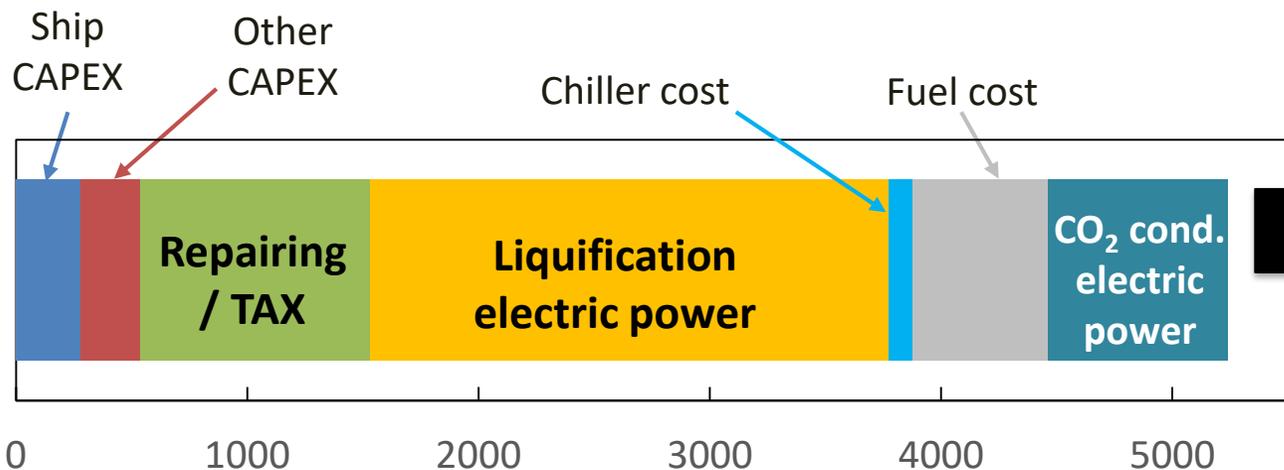
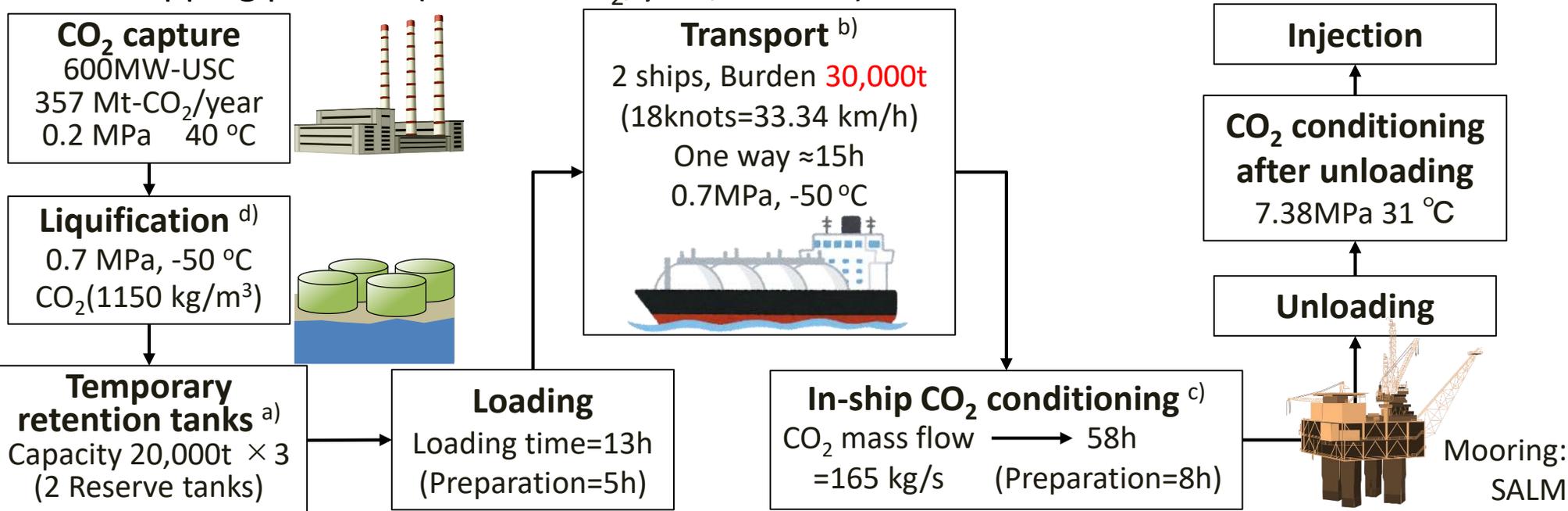
# Shipping cost of liquefied CO<sub>2</sub>

Shipping process (357 Mt-CO<sub>2</sub>/year, 500 km)

Legal CO<sub>2</sub> purity > 98%  
(H<sub>2</sub> separation)

EU recommendation:  
O<sub>2</sub>, CH<sub>4</sub> < 4%\*  
N<sub>2</sub>+Ar+H<sub>2</sub> < 4%  
Others: ~ppm

\*EOR requires lower concentration



**5236 [¥/t-CO<sub>2</sub>]**

**Liquification power cost:  
2241[¥/t-CO<sub>2</sub>] >40% share**

- a) Not include countermeasures for CO<sub>2</sub> leakage
- b) Not include periodical legal inspection (biannually for 2 Weeks)
- c) CO<sub>2</sub> conditioning in ship and on site
- d) Electricity does not include avoided CO<sub>2</sub> by CCS

Depreciation period:

- Ship + CO<sub>2</sub> conditioning → 15 years
- Other → 30 years