

13th Korea Green Innovation Days (KGID JEJU 2024), Nov. 4-6, 2024

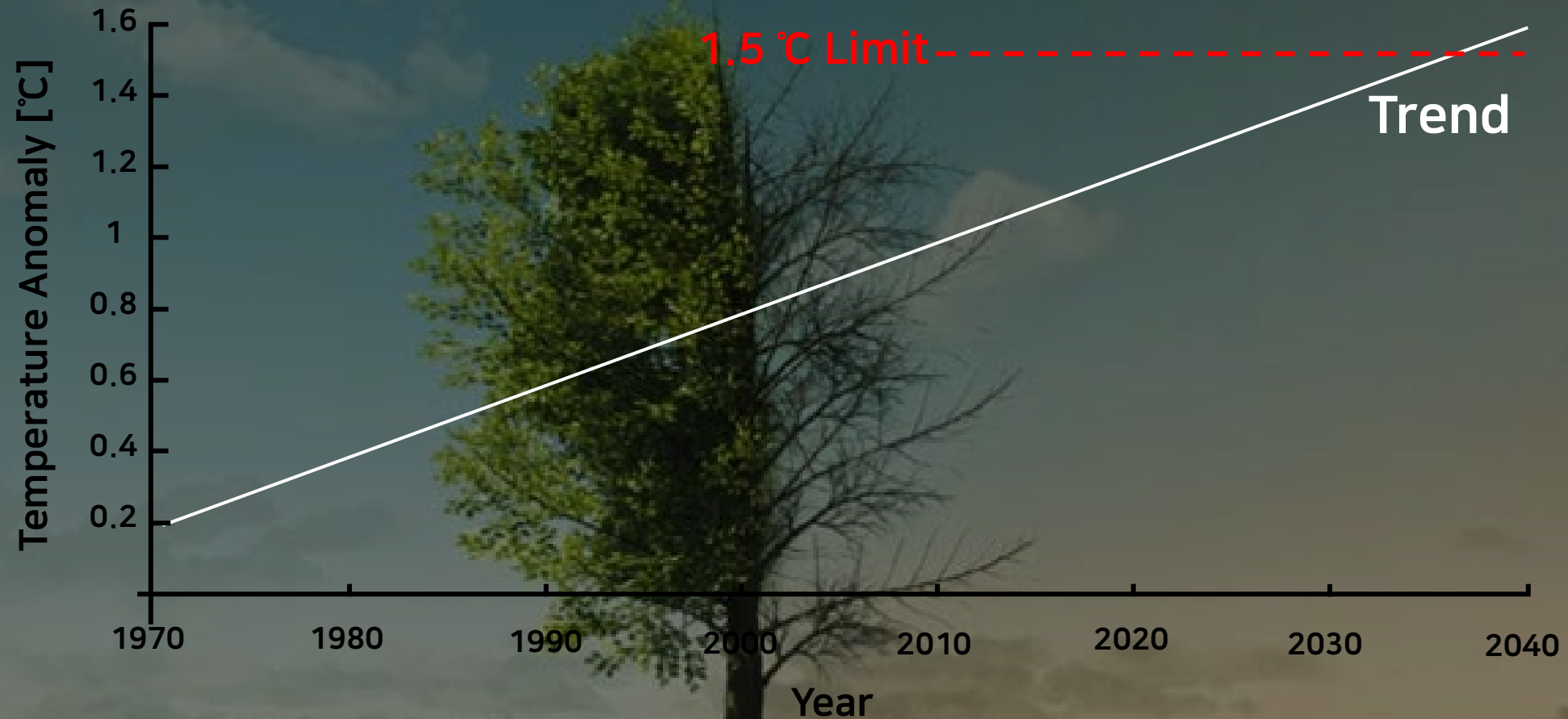


Production Technology for CO₂-Free Hydrogen Using Biogas Connected to Renewable Energy

Nov. 4, 2024

Jeong-Hwan Oh

Global Warming of 1.5 °C



If global warming continues at the current rate, it is expected to **exceed 1.5°C between 2030 and 2052.**

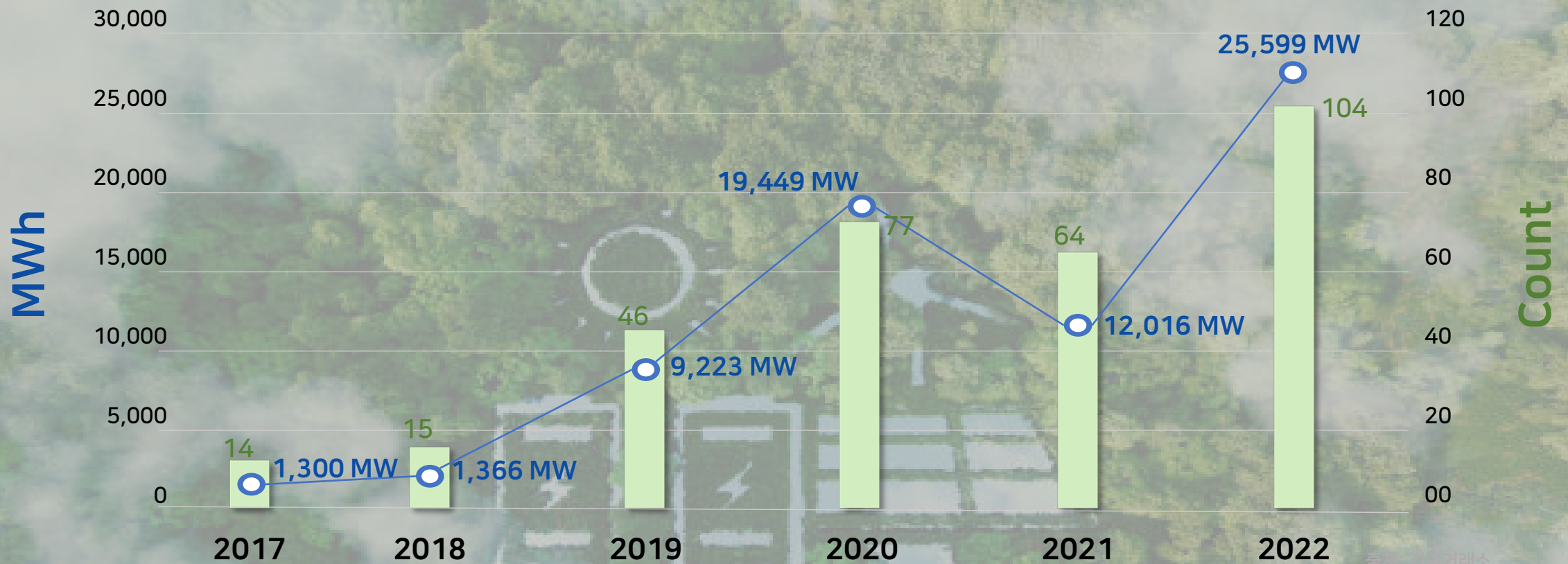
Average temperatures rise, rainfall and droughts increase.

More significant impact on the poor population



Transition from a **carbon society** to a **future energy society**

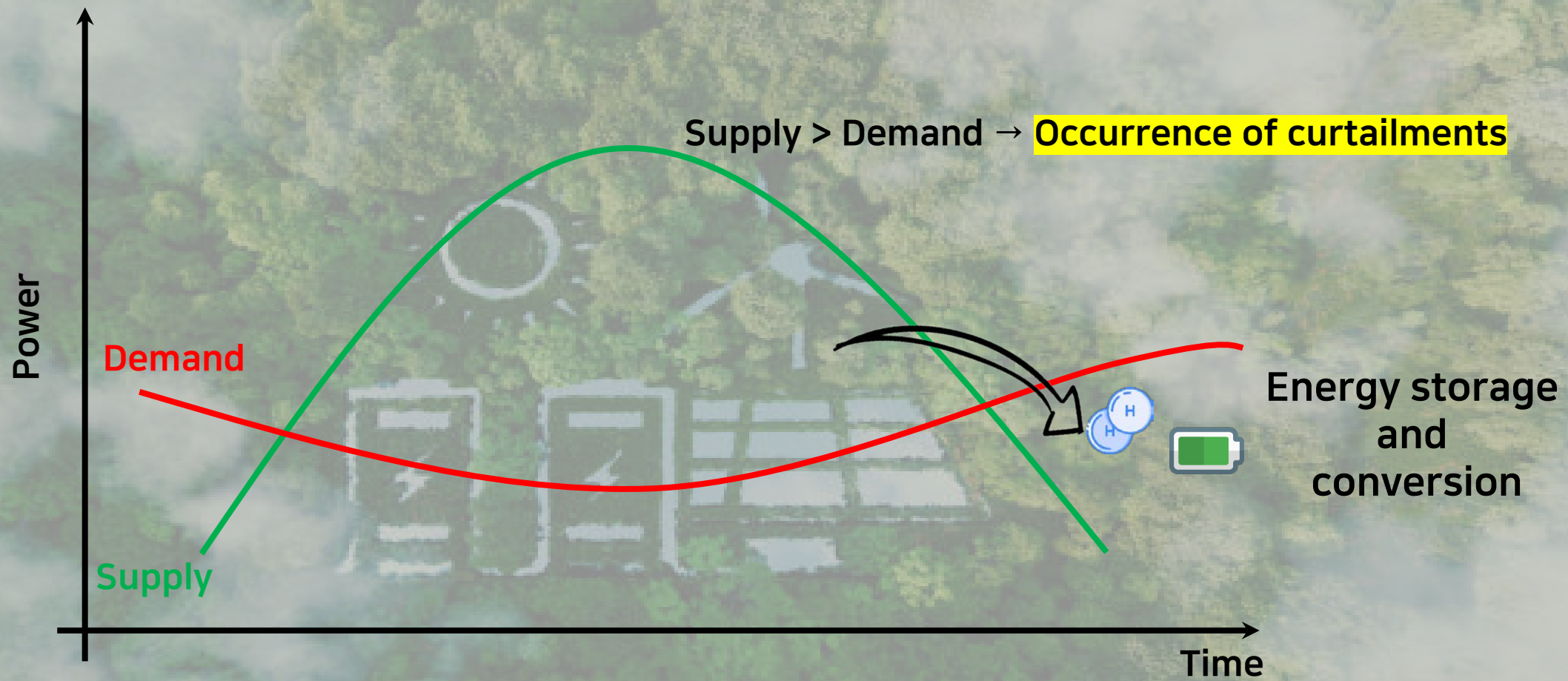
Curtailment of Wind Energy Production in Jeju Island



출처: 전력거래소

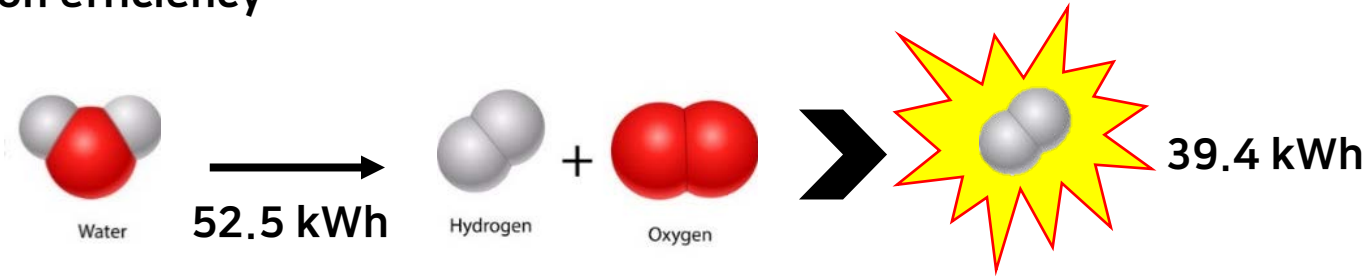
Increase in the count of curtailments, 320 counts from 2017 to 2022

As of 2022-2023, the loss was approximately 33 billion won



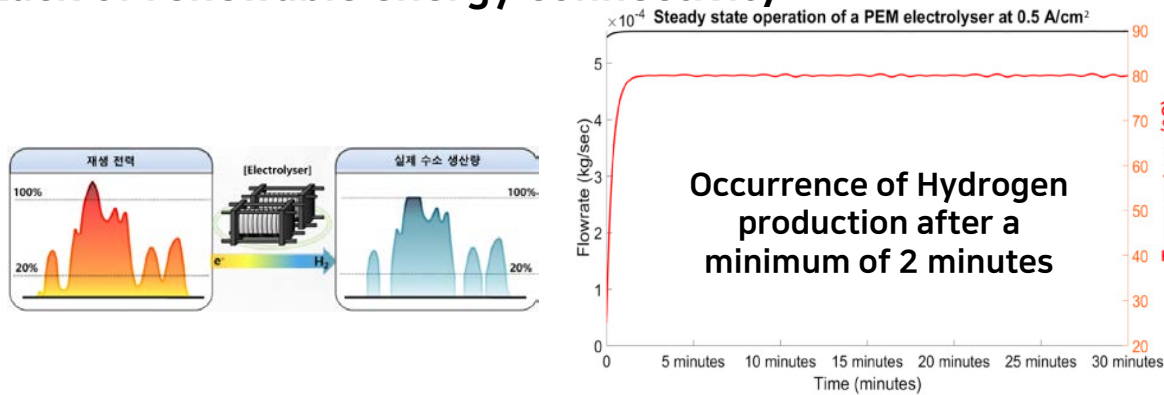
Green hydrogen – Water splitting

① Hydrogen production efficiency



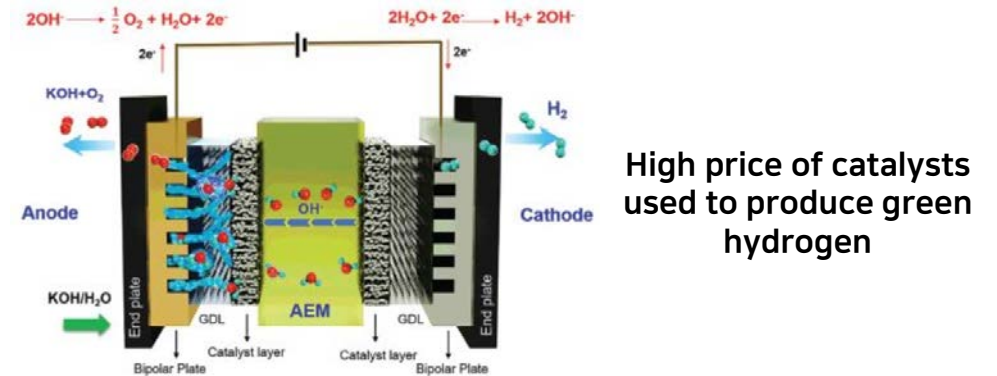
→ *The energy required for green hydrogen production is fundamentally higher than the energy generated from green hydrogen.*

② Lack of renewable energy connectivity



→ *It is limited in applying surplus power from renewable energy.*

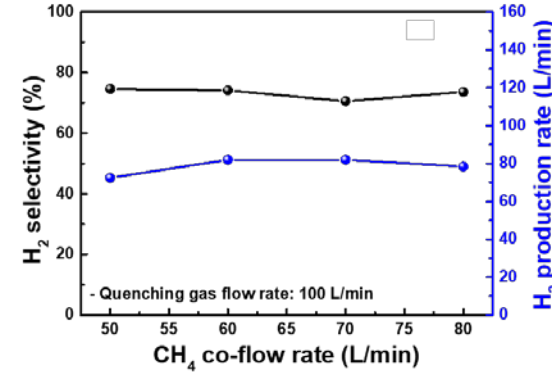
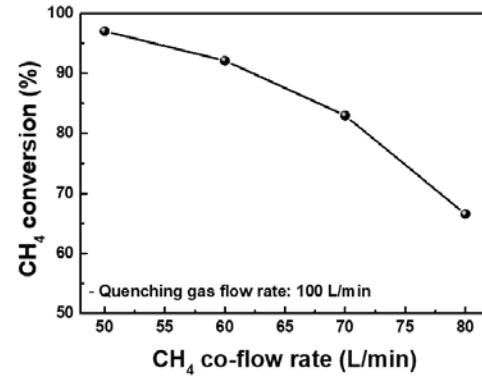
③ Catalysts costs



→ *It acts as a factor contributing to the increase in hydrogen production costs.*

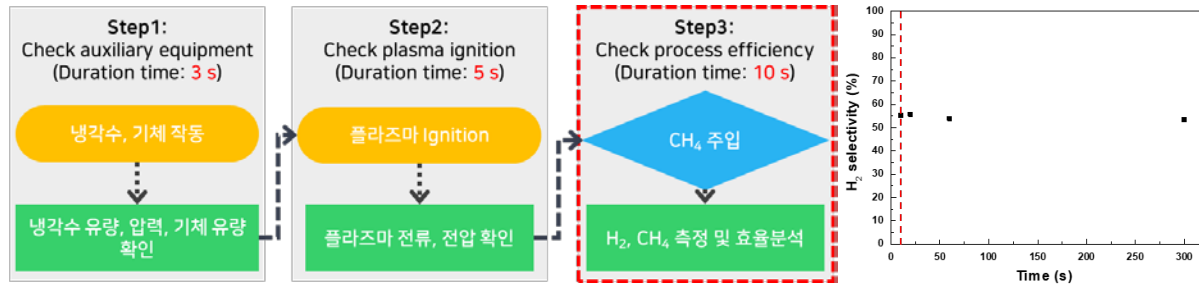
Plasma methane pyrolysis

① 40 kWh/kg-H₂ Hydrogen production efficiency



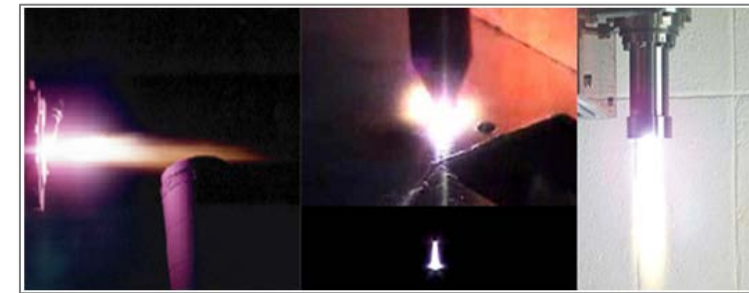
→ Achieving hydrogen production efficiency at the level of 40 kWh/kg-H₂ based on plasma system interpretation technology and expertise.

② Excellent renewable energy connectivity



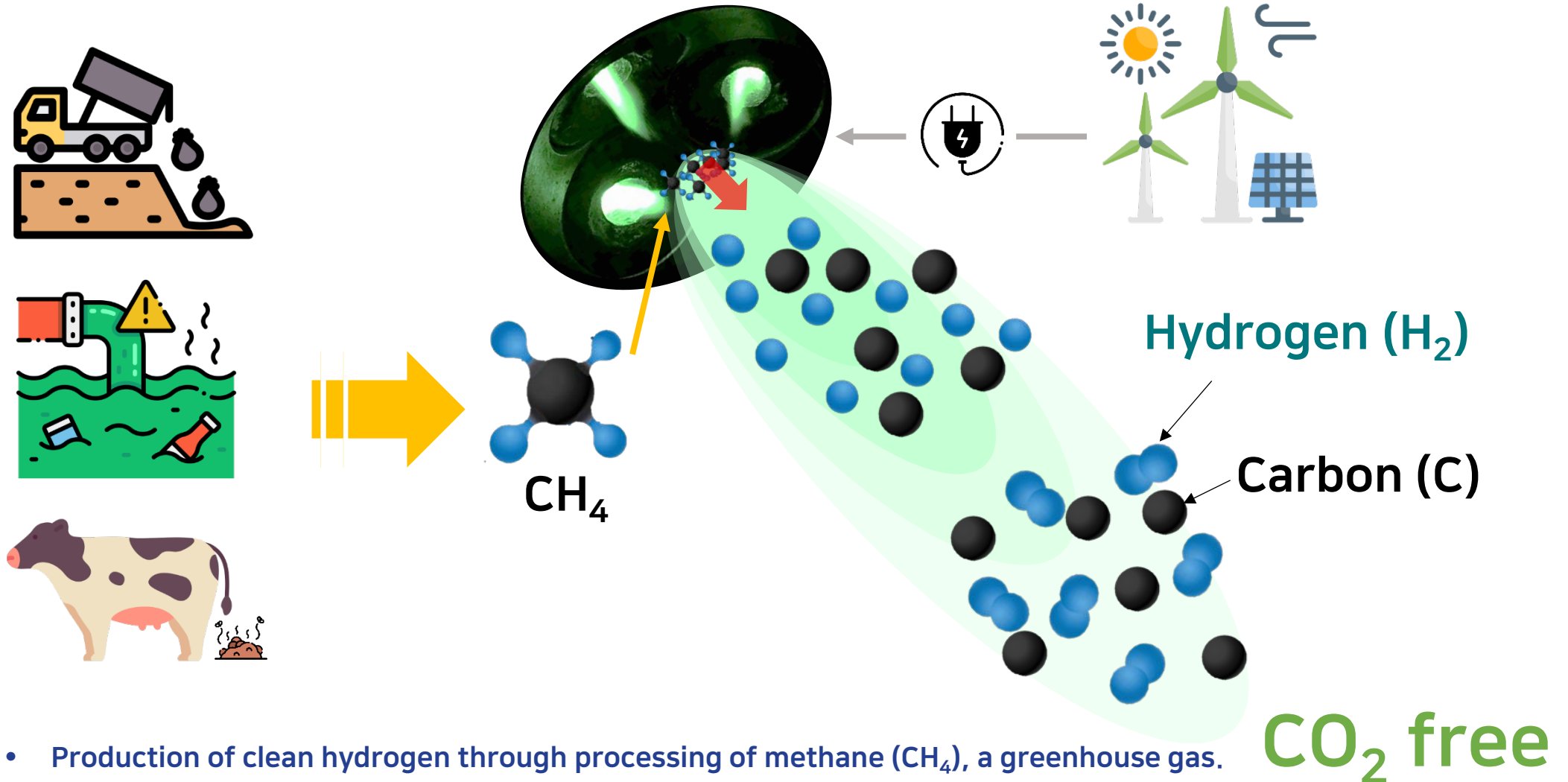
→ Hydrogen is produced within 10 seconds after power input, and its performance is confirmed to be maintained.

③ Non catalysts



→ Methane pyrolysis without a catalyst using thermal plasma technology.

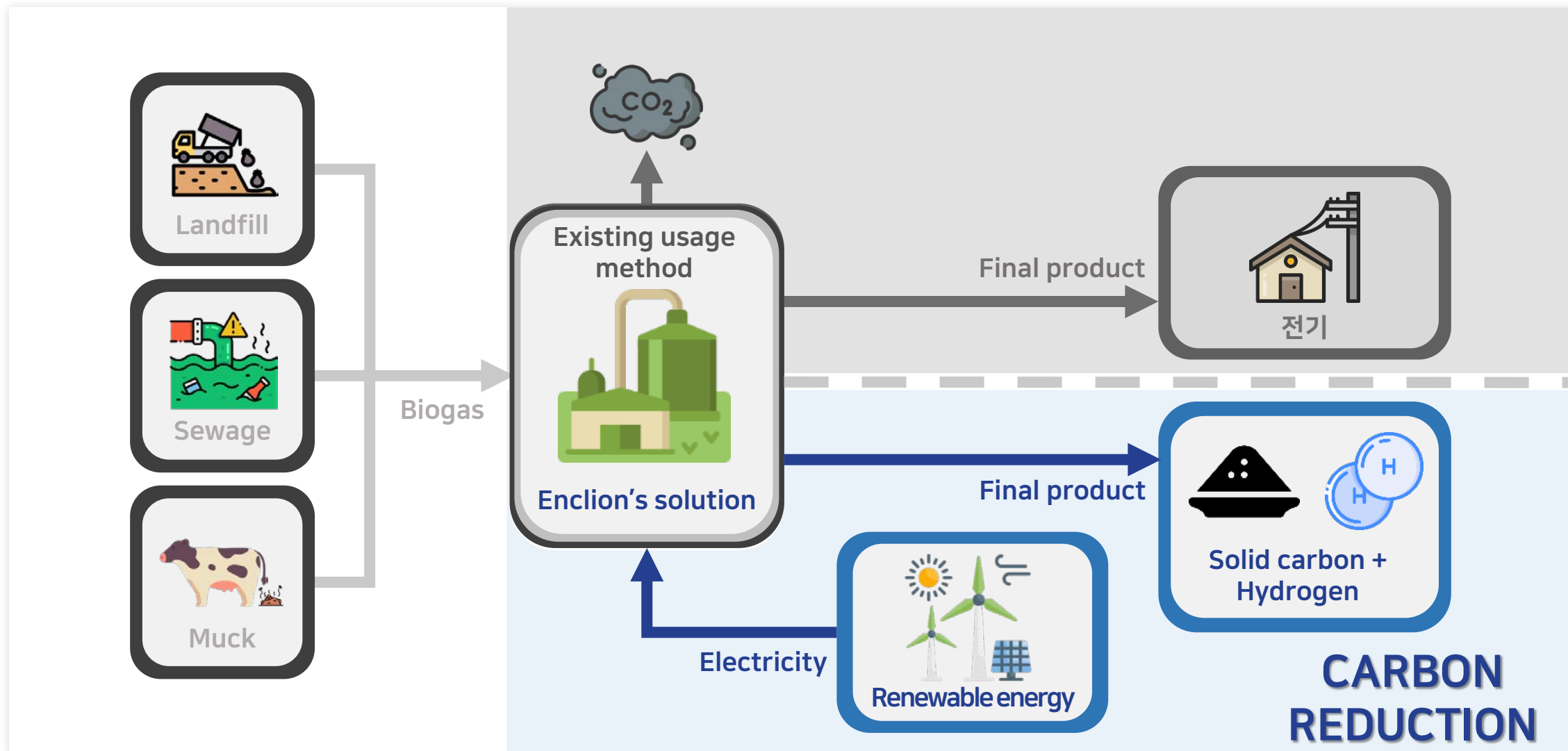
Plasma methane pyrolysis



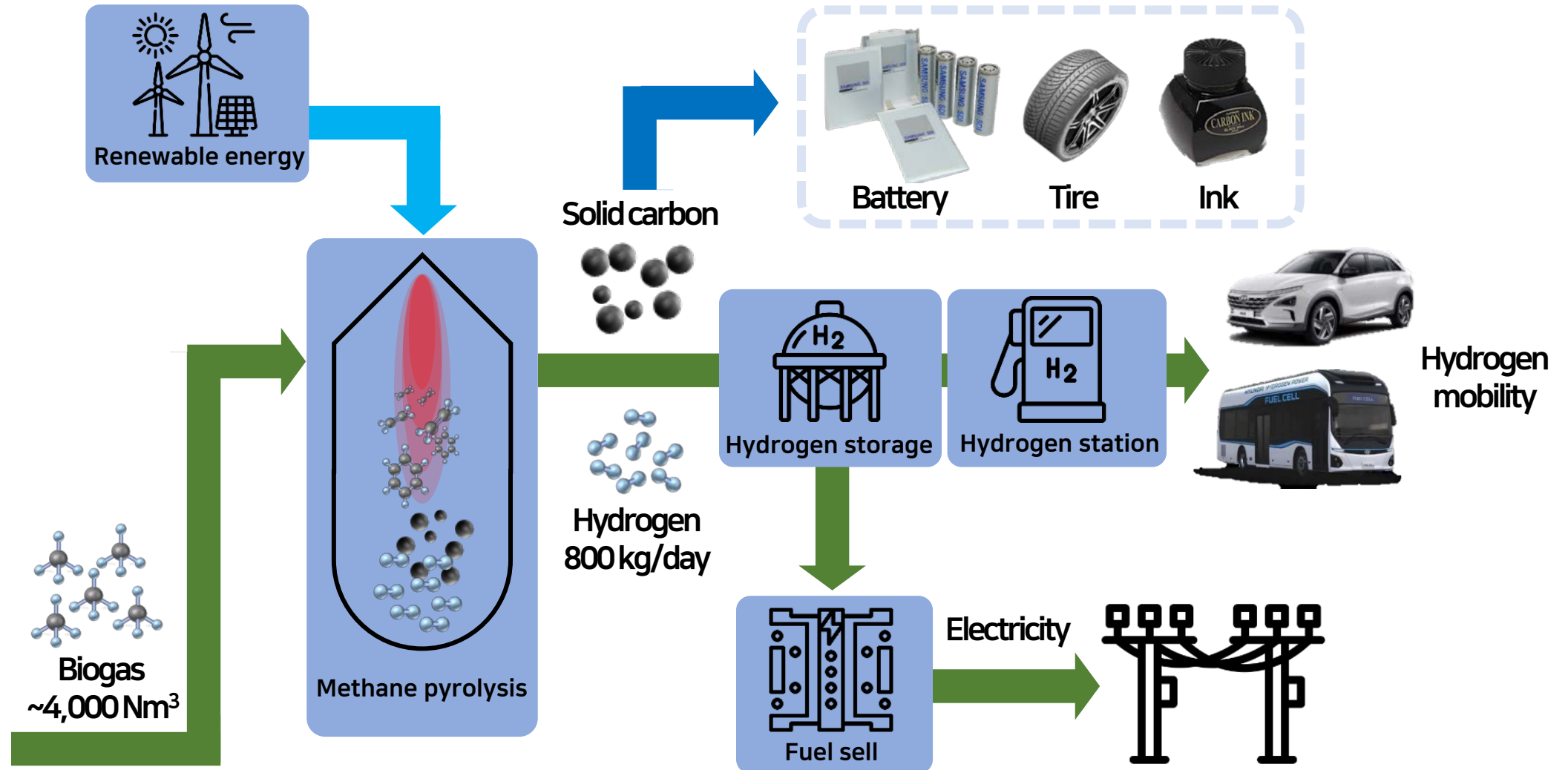
- Production of clean hydrogen through processing of methane (CH₄), a greenhouse gas.
- Higher power efficiency compared to green hydrogen

CO₂ free

Enclion's carbon cycle solution



Clean hydrogen production plant using biogas



Thank you for your attention

Sustainable Energy Cycle Solution

ENergy
& cyCLe
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