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# Why Hydrogen?

- Climate change
- Clean energy transition
- Energy security
- New industry

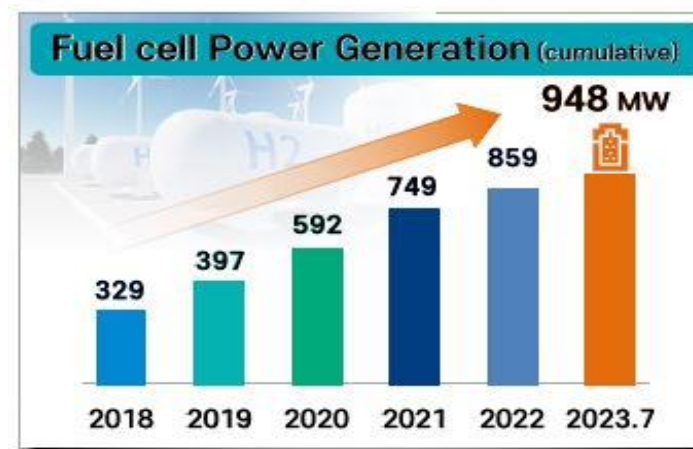
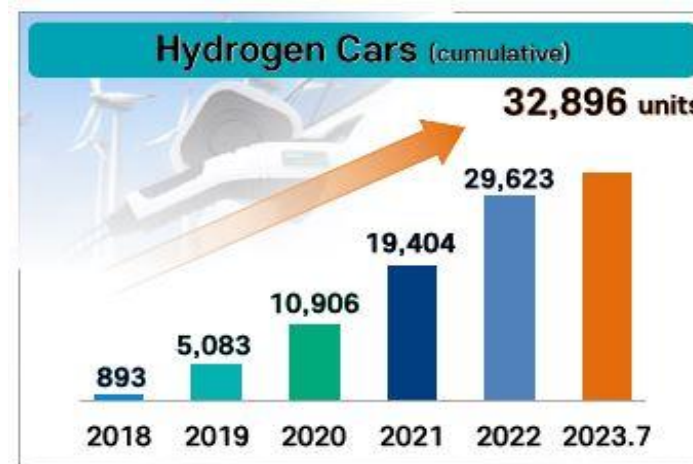
# Approach

- Pragmatic and balanced
- Tech-driven and –neutral
- Holistic and systemic
- Consultative and facilitating

# Milestone

- Hydrogen Economy Roadmap (Jan 2019)
- Hydrogen Law (Jan 2021)
- Hydrogen Economy Action Plan (Nov 2021)
- New Policy Direction (Nov 2022)

# Achievement



# H2 Power Generation Tender - Background

- 3<sup>rd</sup> National Energy Plan (2019~2040)
- 10<sup>th</sup> Basic Plan for Electricity Supply and Demand (2022~2036)

| Year |                  | Nuclear | Coal  | Gas (LNG) | Renewables | Hydrogen /Ammonia   | Others | Total |
|------|------------------|---------|-------|-----------|------------|---------------------|--------|-------|
| 2030 | Generation (TWh) | 201.7   | 122.5 | 142.4     | 134.1      | 13.0<br>(6.1/6.9)   | 8.1    | 621.8 |
|      | Share (%)        | 32.4    | 19.7  | 22.9      | 21.6       | 2.1                 | 1.3    | 100   |
| 2036 | Generation (TWh) | 230.7   | 95.9  | 62.3      | 204.4      | 47.4<br>(26.5/20.9) | 26.6   | 667.3 |
|      | Share (%)        | 34.6    | 14.4  | 9.3       | 30.6       | 7.1                 | 4.0    | 100   |

# Principles

- Environmental benefits
- Technology development
- Economic feasibility
- Impact on power system
- Industrial ecosystems

# Structure and Operation

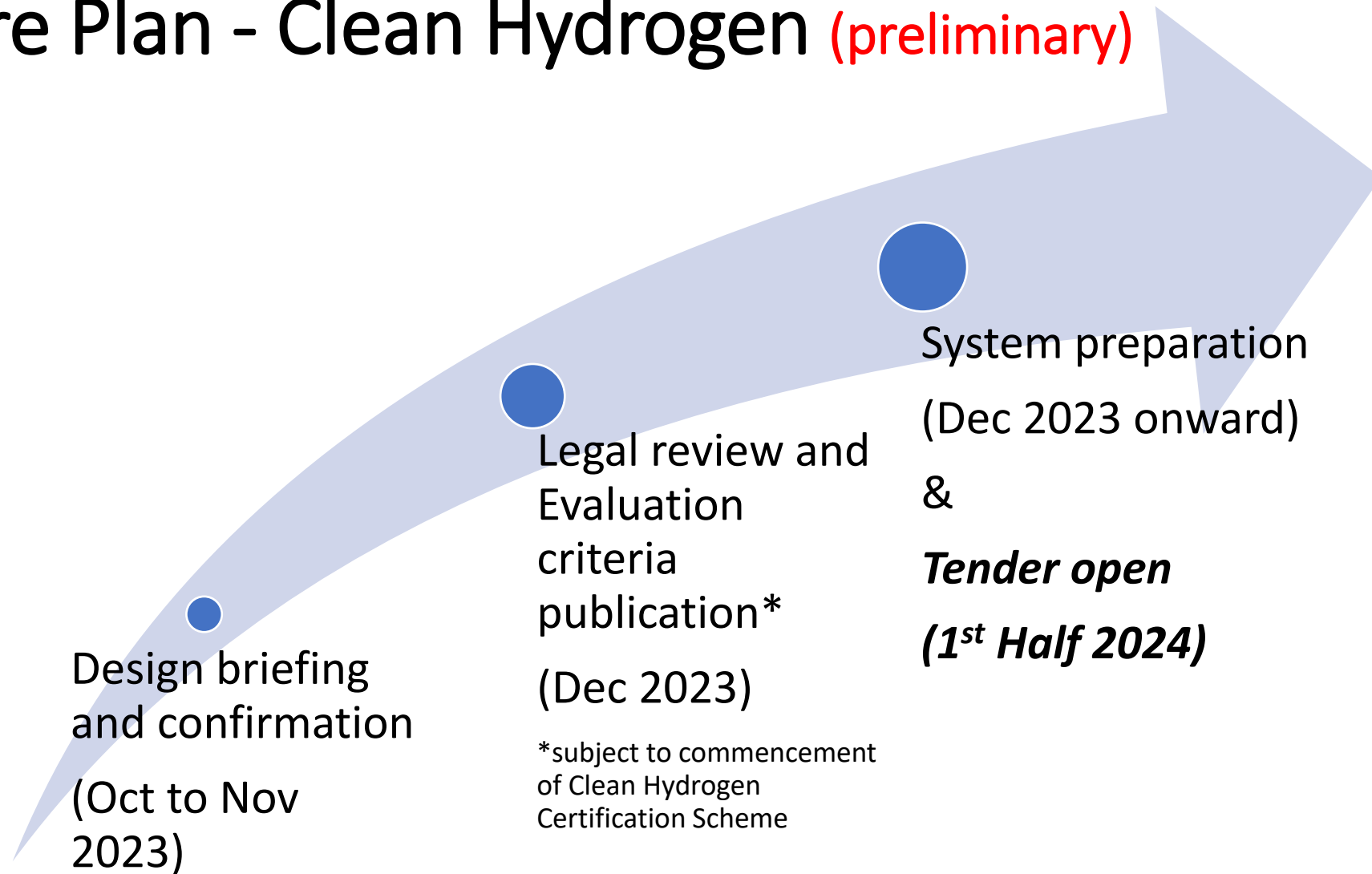
|                              | General   | Clean   |
|------------------------------|---|---|
| <b>Goal</b>                  | Distributed Gen.  | Low carbon Gen.                                   |
| <b>Type of H<sub>2</sub></b> | SMR, By-product   | Clean<br>( $\leq 4\text{kgCO}_2\text{eq/kgH}_2$ ) |
| <b>Opening cycle</b>         | Once a year (additional opening if necessary)                                   |   |
| <b>Prep period</b>           | 2 yrs.  | 3 yrs.  |
| <b>Contracting price</b>     | Pay as bid  |   |
| <b>Contracting party</b>     | (sale) Hydrogen power generators<br>(purchase) KEPCO, CES                       |   |
| <b>Contracting term</b>      | 20 yrs.   | 15 to 20 yrs.                                     |
| <b>Operating rules</b>       | (contract) Bidding Market Rules<br>(Ops. & Settlement) Electricity Market Rules |   |

# Tender (Notice) Volume

- Based on annual purchase volume

| H <sub>2</sub> type | 2023    | 2024        | 2025        | 2026        | 2027      | 2028                                    | 2029 | 2030 |
|---------------------|---------|-------------|-------------|-------------|-----------|---|------|------|
| <b>General</b>      | Bidding | Prep 2 yrs. | 1,300 GWh   |             |           |   |      |      |
|                     |         | Bidding     | Prep 2 yrs. | 1,300 GWh   |           |   |      |      |
|                     |         |             | Bidding     | Prep 2 yrs. | 1,300 GWh |   |      |      |
|                     | 2023    | 2024        | 2025        | 2026        | 2027      | 2028                                    | 2029 | 2030 |
| <b>Clean</b>        |         | Bidding     | Prep 3 yrs. |             | 3,500 GWh | 6,500GWh<br>(increasing co-firing rate) |      |      |
|                     |         |             | Bidding     | Prep 3 yrs. |           | 3,000 GWh                               |      |      |

# Future Plan - Clean Hydrogen (preliminary)



# Clean Hydrogen Certification Scheme - Design Principles

- Greenhouse gases reduction
- Technology-neutral
- Flexibility
- Life cycle assessment (LCA)
- Phased threshold



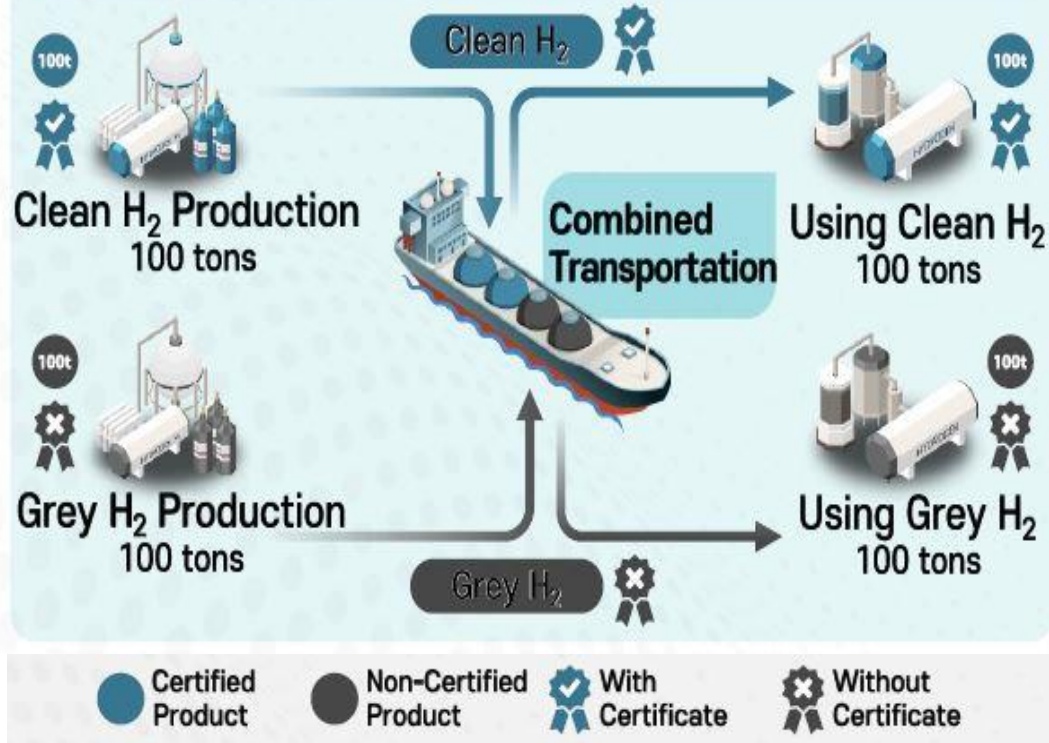
# Clean Hydrogen Certification Scheme - Operation

- Threshold ( $\leq 4\text{kgCO}_2\text{eq/kgH}_2$ )
  - 1<sup>st</sup> phase: well-to-gate
  - 2<sup>nd</sup> phase: well-to-gate / well-to-port
  - 3<sup>rd</sup> phase: well-to-wheel
- Final product
  - 1 kg of hydrogen
- GHG accounting
  - 2021 LCI DB
  - 5 categories (green, blue/turquoise, by-product, bio/waste, pink)

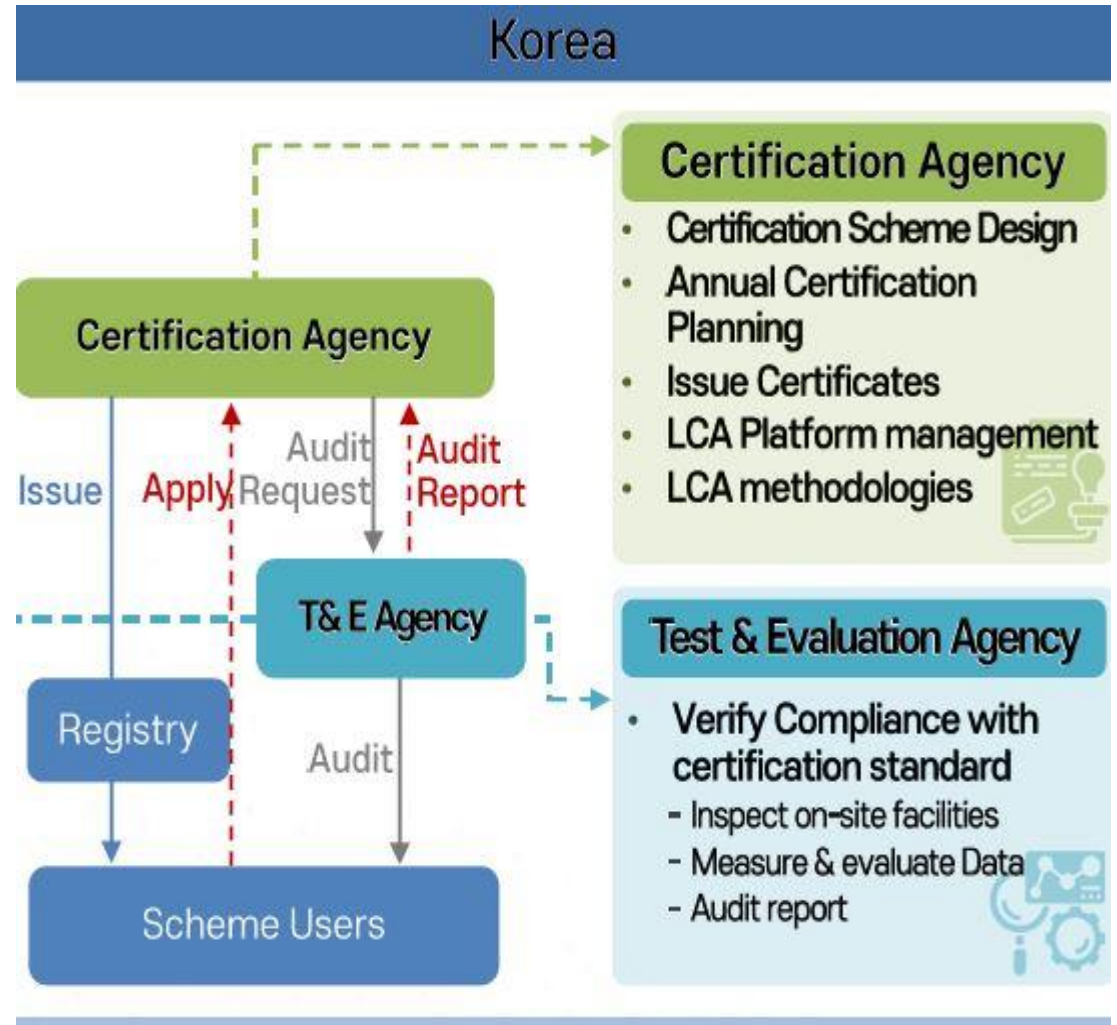
# Chain of Custody

## Mass Balance Trade H<sub>2</sub> with Certificate

- Grey and Clean H<sub>2</sub> can be transport together
- Bring transparency to the clean H<sub>2</sub> trade



# Governance



# Next Steps

- Enforcement ordinance promulgated and took effect
- Regulatory review and agency designation ongoing
- Pilot project commencing in 2024

|                      | 2023<br>~Jun          | 2023<br>Jul        | 2023<br>Aug                | 2023<br>Sep                   | 2023<br>Oct            | 2023<br>Nov        | 2023<br>Dec        | 2024 and<br>Onwards    |  |
|----------------------|-----------------------|--------------------|----------------------------|-------------------------------|------------------------|--------------------|--------------------|------------------------|--|
| <b>Scheme Design</b> | Consultation (Public) | Final Draft        | Consultation (Ministerial) | Preparation for Pilot Project |                        |                    | Agency Designation | Pilot and Consultation |  |
| <b>Decree Review</b> | Preliminary Notice    | Legislative Review |                            |                               |                        |                    | Promulgation       | Enforcement            |  |
|                      |                       |                    |                            |                               | Deliberation (Cabinet) |                    |                    |                        |  |
|                      |                       |                    |                            |                               |                        |                    |                    |                        |  |
| <b>Admin. Rules</b>  |                       |                    |                            |                               | Admin. Notice          | Regulatory Review* | Enforcement        |                        |  |