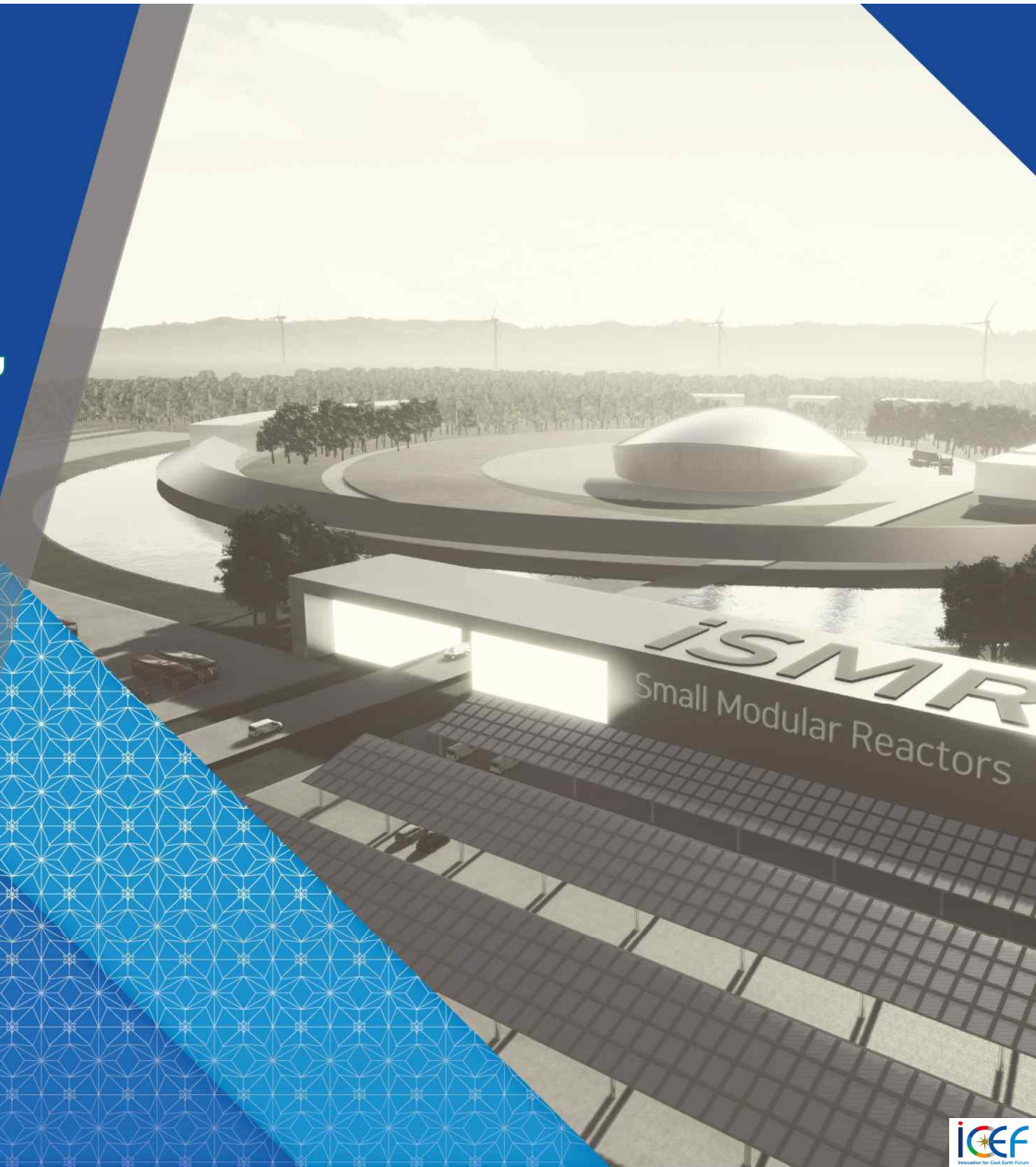

Powering a **CARBON-FREE** Future,
Together with
i-SMR & SMART NET ZERO CITY

10. October, 2024

Ho Cheol Shin,
A Head of KHNP Central Research Institute

 KOREA HYDRO & NUCLEAR POWER CO.,LTD



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- I | **i-SMR(Innovative Small Modular Reactor)**
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- III | **Conclusion and Suggestions**

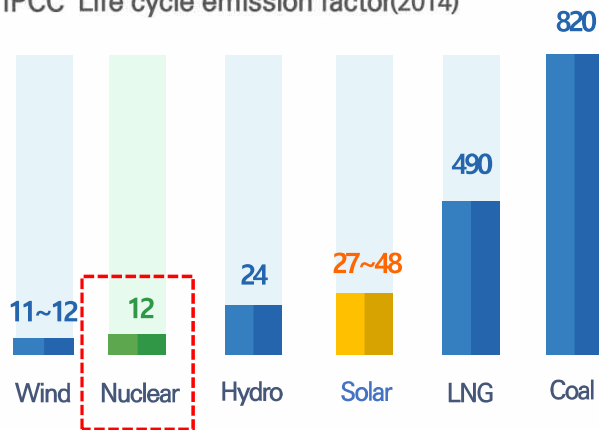
I. i-SMR “ Energy Trends ”

SMR as optimal model for global energy trends : *Decarbonization, Decentralization, Digitalization*

Decarbonization

Importance of environment

IPCC* Life cycle emission factor(2014)



IPCC(Intergovernmental Panel on Climate Change)

“SMR: Lowest carbon footprint”

Decentralization

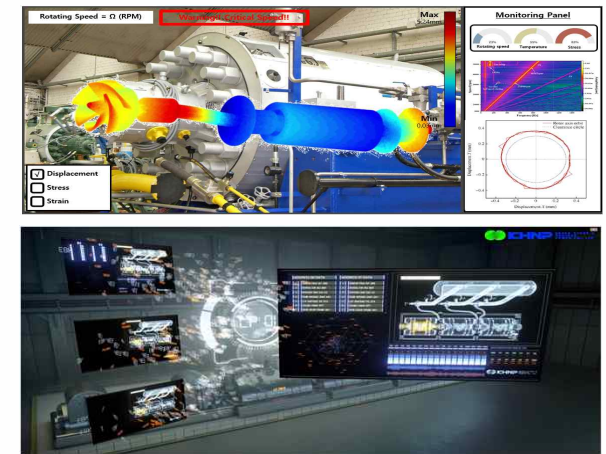
Paradigm shift to small scale



“Small independent grid”

Digitalization

4th IR technologies



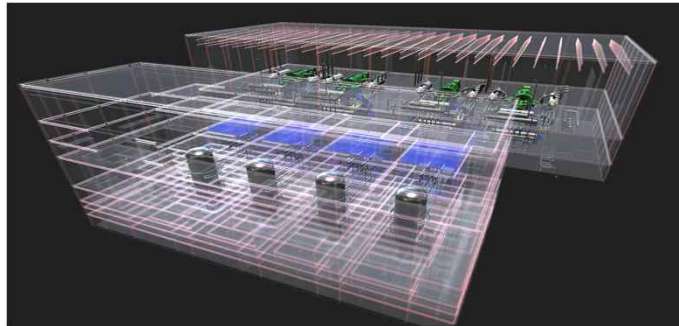
“Cutting-edge digital technologies”

I. i-SMR “ Introduction ”

Goals : Innovative SMR (i-SMR) to lead global SMR market in 2030s

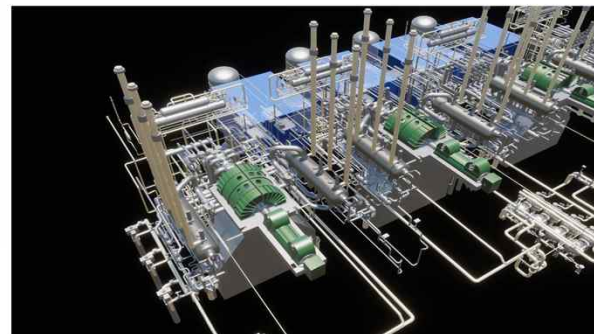
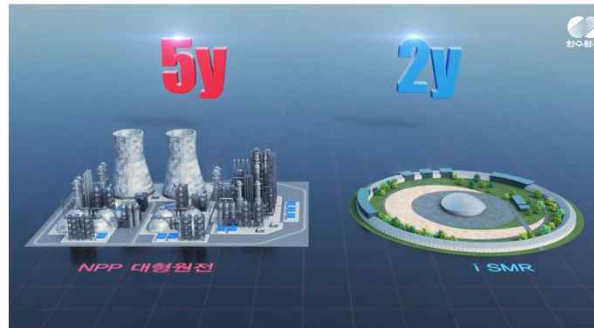
Safety

· Core Damage Frequency : $1.0 \times 10^{-9} / M \cdot Y$



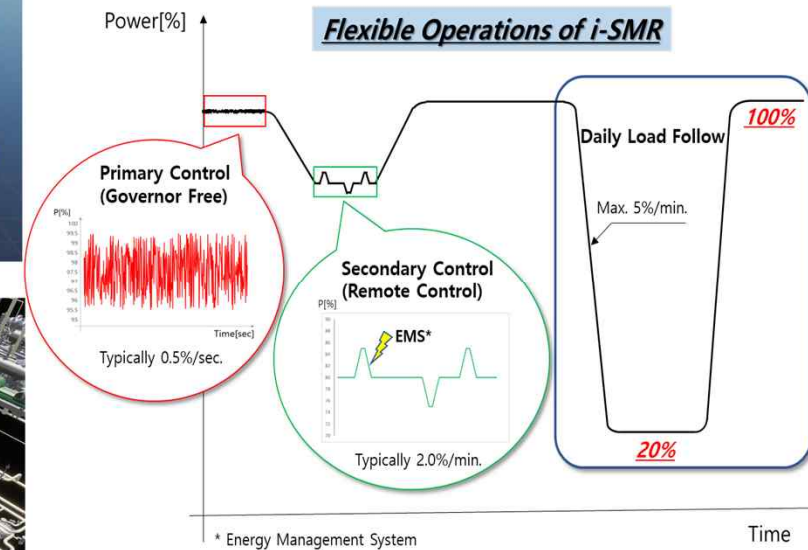
Economic Feasibility

· Construction cost : \$3,500 /kWe
· Generation cost : \$65 /MWh



Flexibility

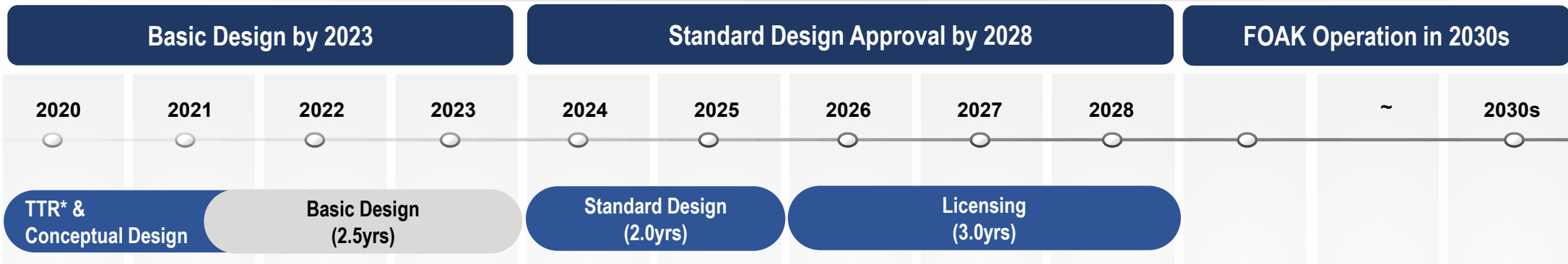
· Power range : 100%–20%–100%
· Linear power variation rate: 5%/min



I. i-SMR “ Development Status and Plan ”



☑ Target Goal: Standard Design Approval(SDA) by 2028, First Of A Kind(FOAK) Operation in 2030s

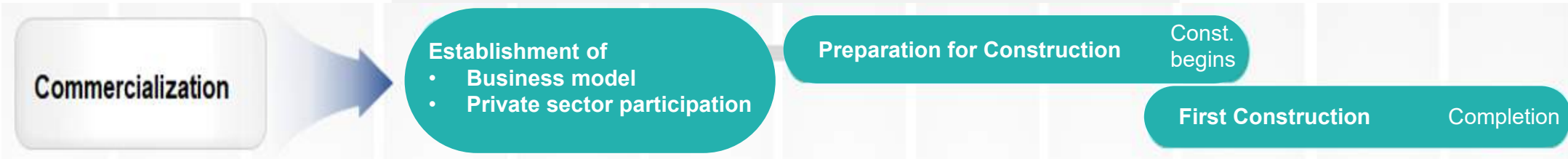


Industries

KHNP project (KAERI, KEPCO E&C/NF, DOOSAN etc.)

National R&D Projects

MSIT(Ministry of Science and ICT)/MOTIE(Ministry Of Trade, Industry & Energy)



➤ After National BPLE** determined, detailed implementation plan will be fixed.

** BPLE: Basic Plan for Long-term Electricity Supply and Demand

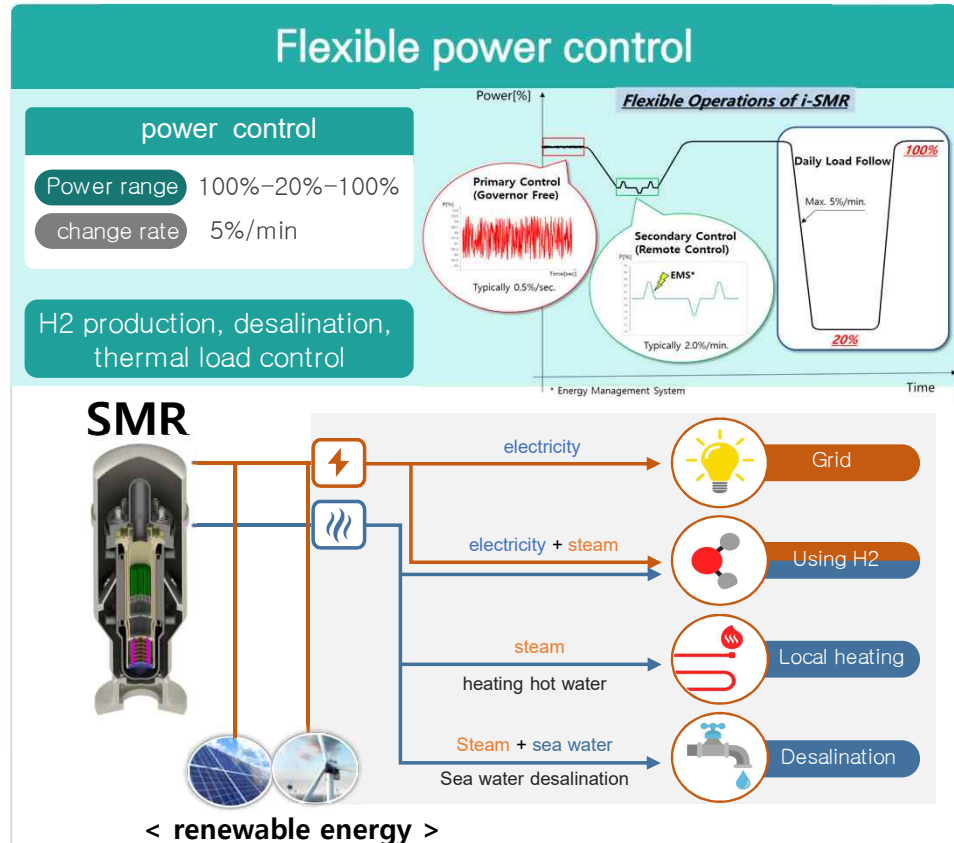
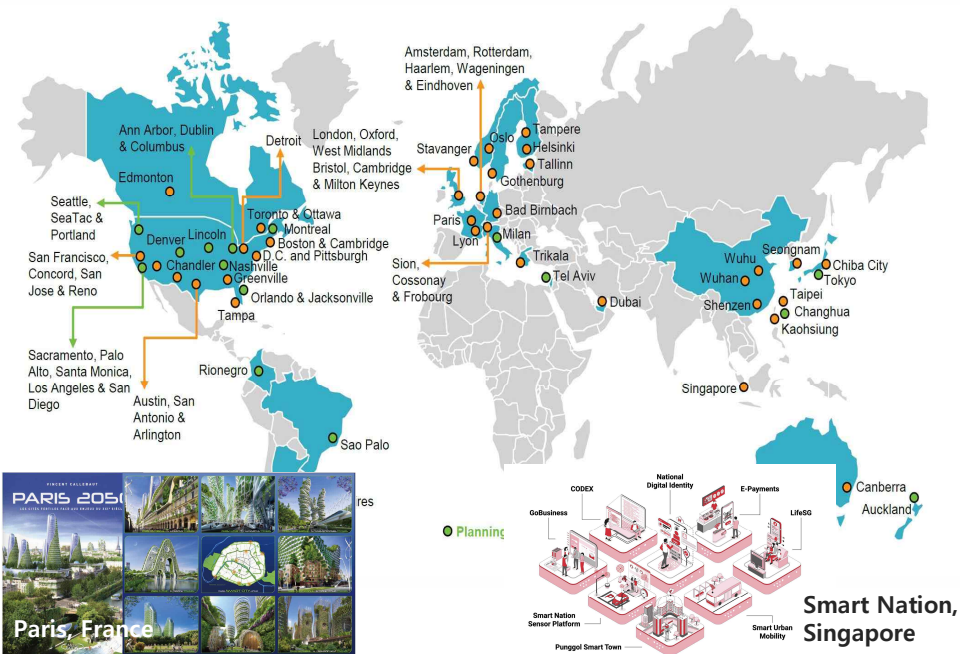
* TTR: Top-Tier Requirement

II. SSNC "Global Needs"

Combining i-SMR & Smart city to materialize advantages and visualize model
 → Carbon-neutral city design & Feasibility evaluation centered on i-SMR

i-SMR Smart Net-zero City "SSNC" Vision

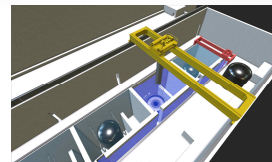
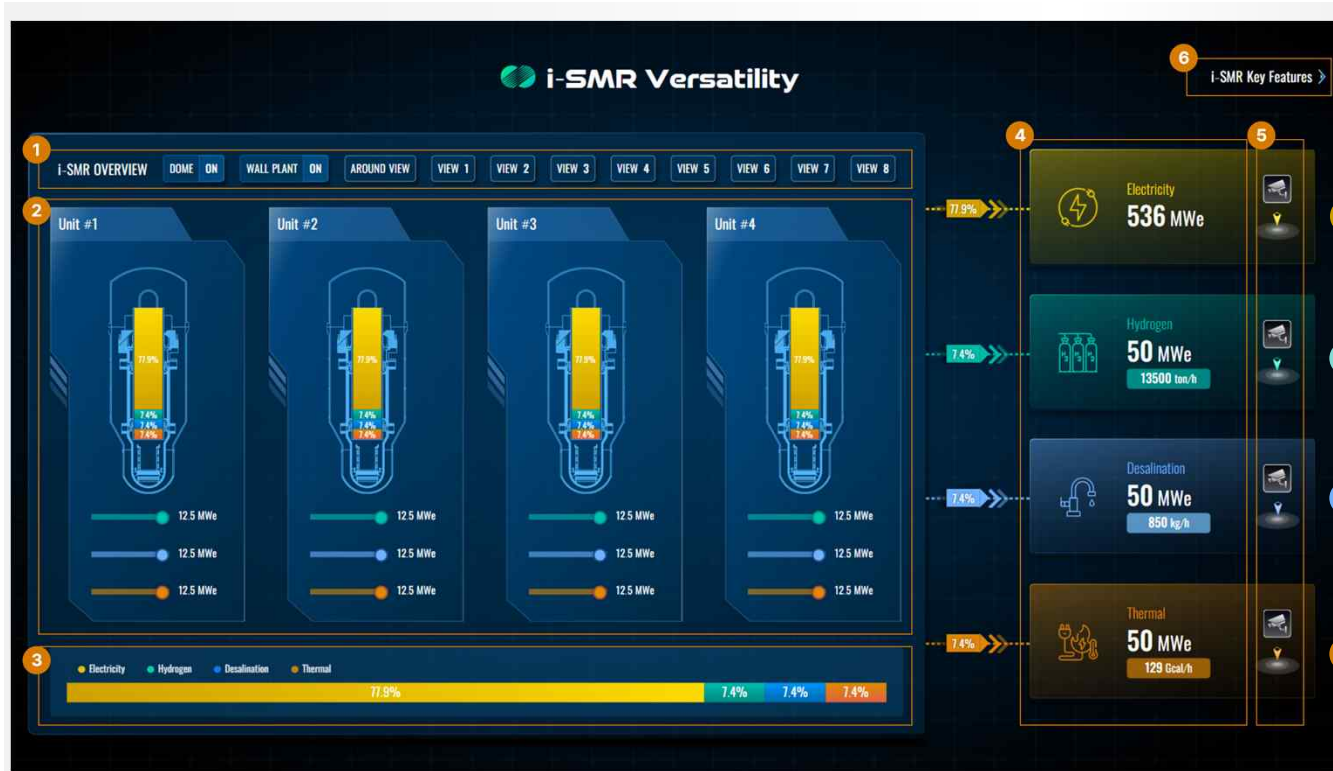
Smart City Development



Ref. Bloomberg Philanthropies, Aspen Institute, Bloomberg New Energy Finance

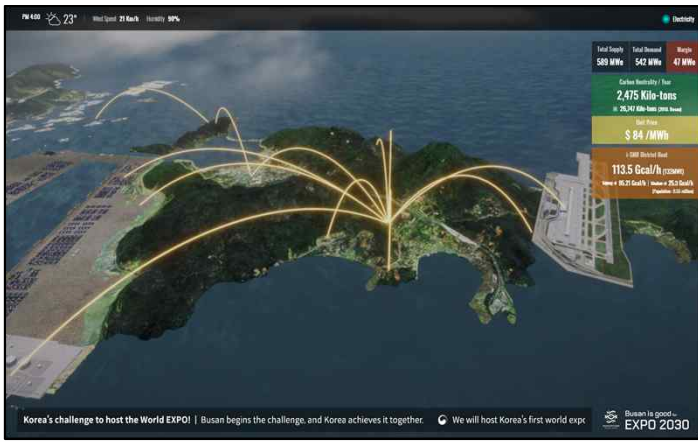
II. SSNC “ Development of Simulation Software ”

i-SMR Versatility Simulation

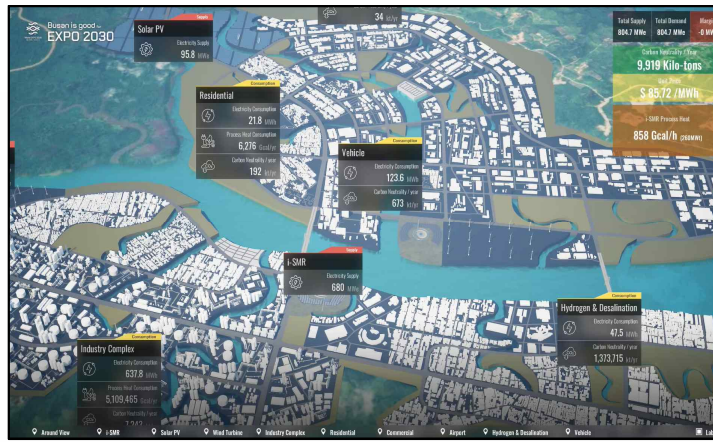


II. SSNC “ i-SMR & SSNC Demonstration ”

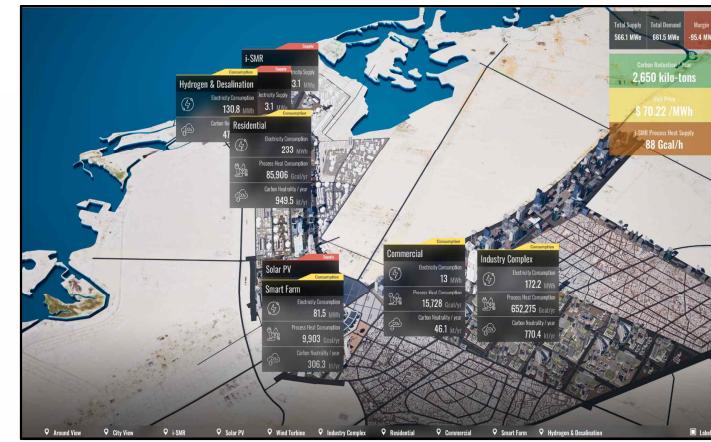
Coastal



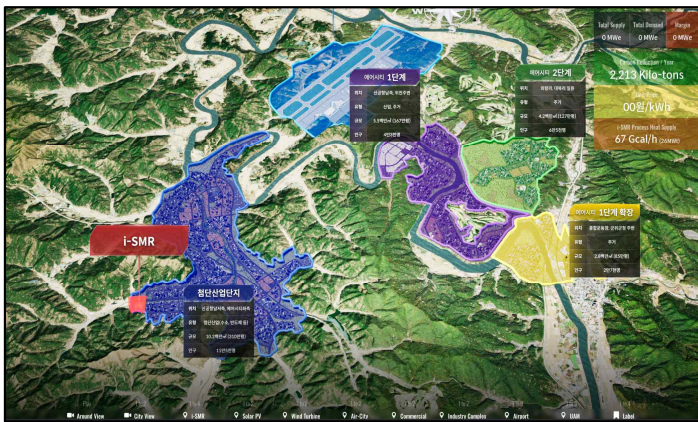
Forest



Desert



Inland



i-SMR Versatility



i-SMR business models



II. SSNC “ Movie Clips ”

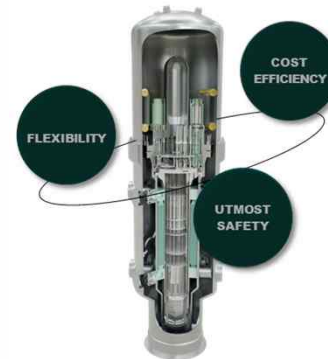


SSNC Promotional Video (1:20)

III. Conclusion and Suggestions

1. Sustainable Energy Solutions for CARBON NEUTRALITY

i-SMR & SSNC



2. What should we do to accelerate the commercialization of SMR?

- 1) Need to establish a cooperation system for designers, builders, operators, regulators, and suppliers.
- 2) Need to standardize regulations and industry standards

Thank You for your listening



Korea Hydro & Nuclear Power Co., Ltd.

