

A large, leafy green tree stands on a grassy hill. The sky is filled with dramatic, dark blue and grey clouds. In the background, a line of evergreen trees is visible on the horizon.

A new ecosystem for net zero

# Green Pathfinder

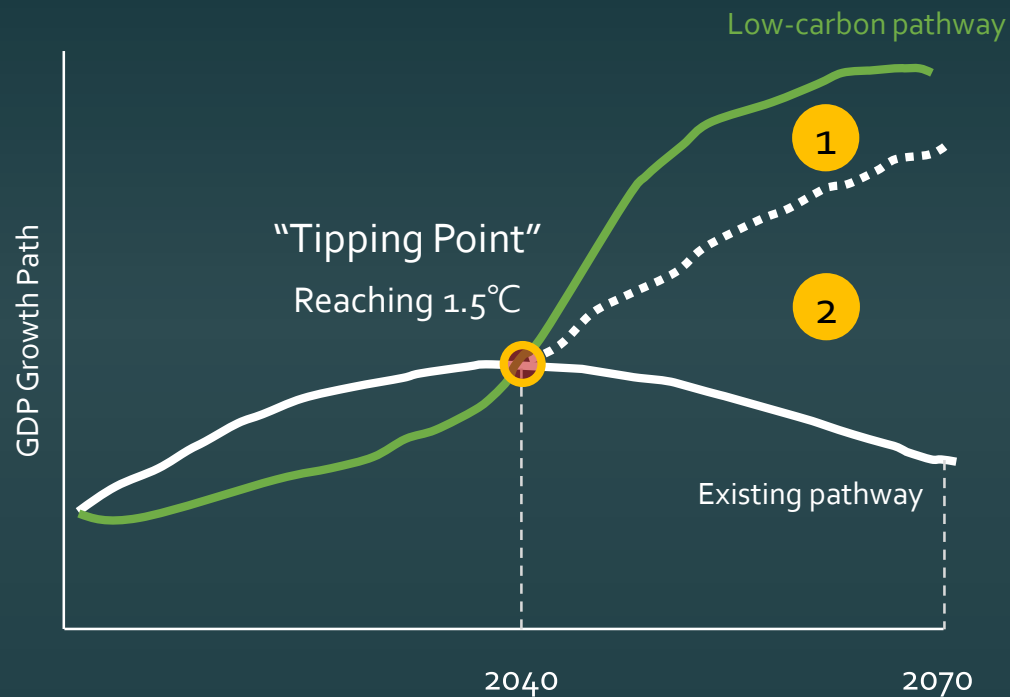
SK Inc. Green Investment Center

Nov., 2022

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# Combating climate change creates **New Opportunities** to capture

## 2050 Net Zero: 'Goal'



## Economic Growth 'Opportunities'

### 1 Create new economic values

NPV<sup>1)</sup>  
**\$43 Trillion**



New Industry



Employment



Asset Value Growth



### 2 Reduce cost of responding to climate crisis

NPV<sup>1)</sup>  
**\$178 Trillion**



Environment Recovery



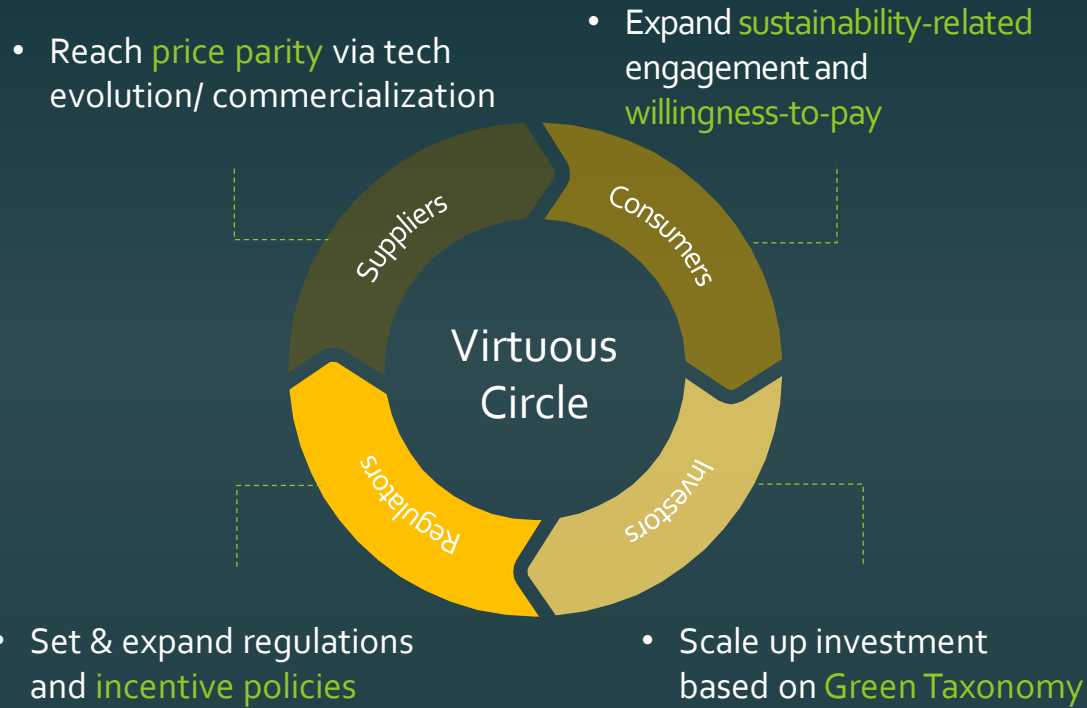
Health Issue



Decreased Productivity

# Leading Green Industry with Exponential Growth potential

## Drivers for Green Economy



## Tipping Point of Green Industry

2030

- Validating Net Zero progress
- Reinforcing decarbonization policies
- Proving economic feasibility
- Increased market value for decarb. assets

New Market Rule Setter

Entering into key green sectors

2021 2030 2050

Hyper Growth



# Value investor in decarbonization: Prevailing Strongholds

SK Inc. Green Investment Center

Vision

## Game Changer

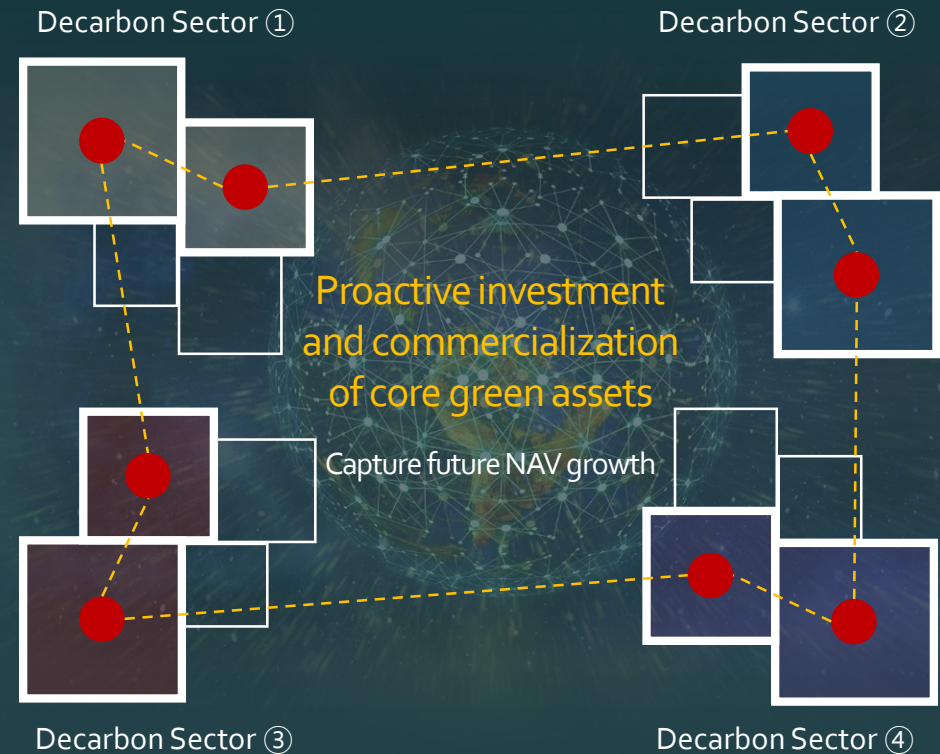
in achieving global Net Zero

Mission

## Decarbonizing Enabler

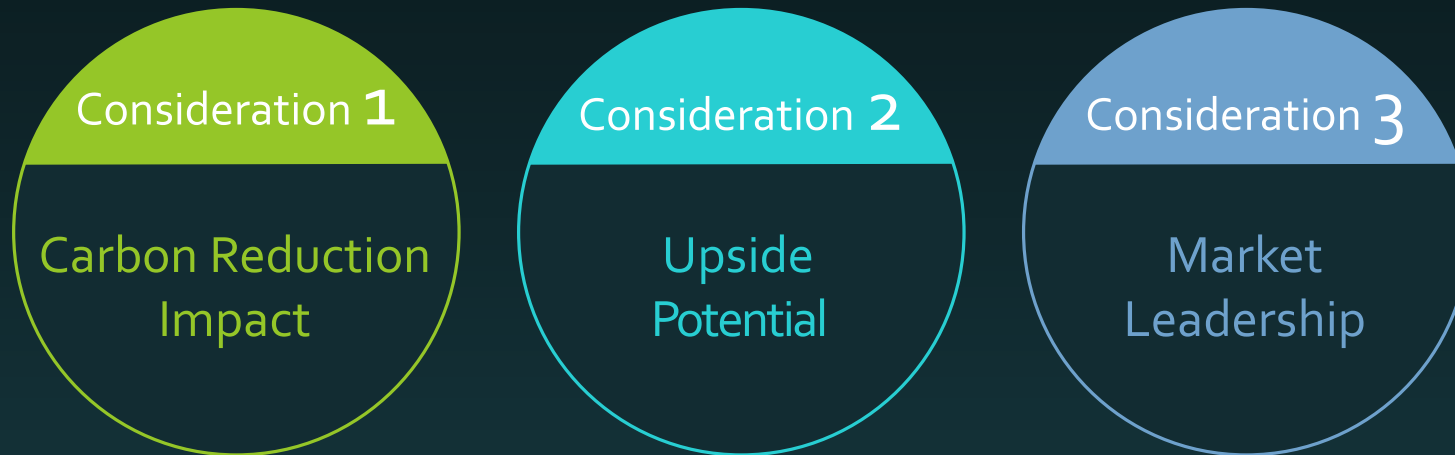
in energy and industry

Goal of Investment: 'Connecting the Dots'

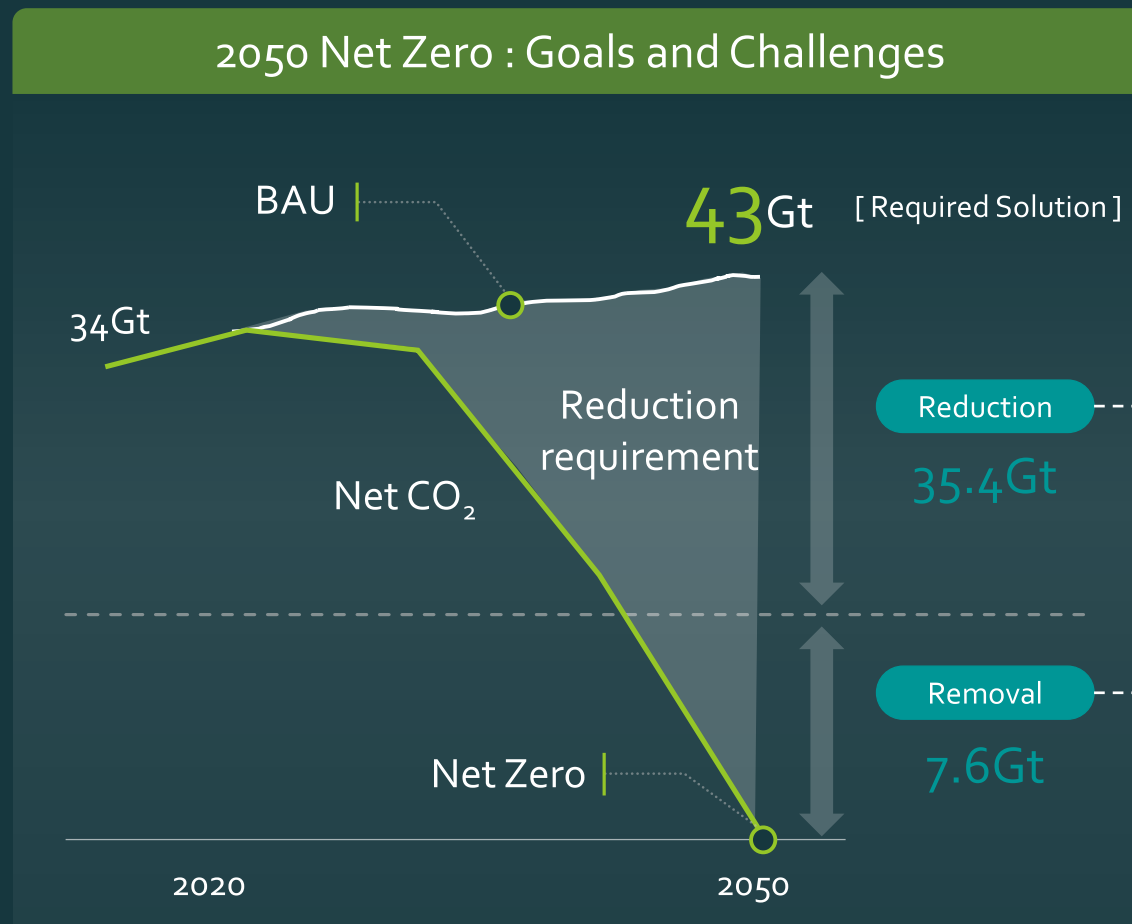


# Strategic Prioritization across the vast green universe

[ Prerequisite condition  
of SK's green investment ]



# Decarbonization Solution: 'Reduction' & 'Removal'



## Carbon Reduction Solution

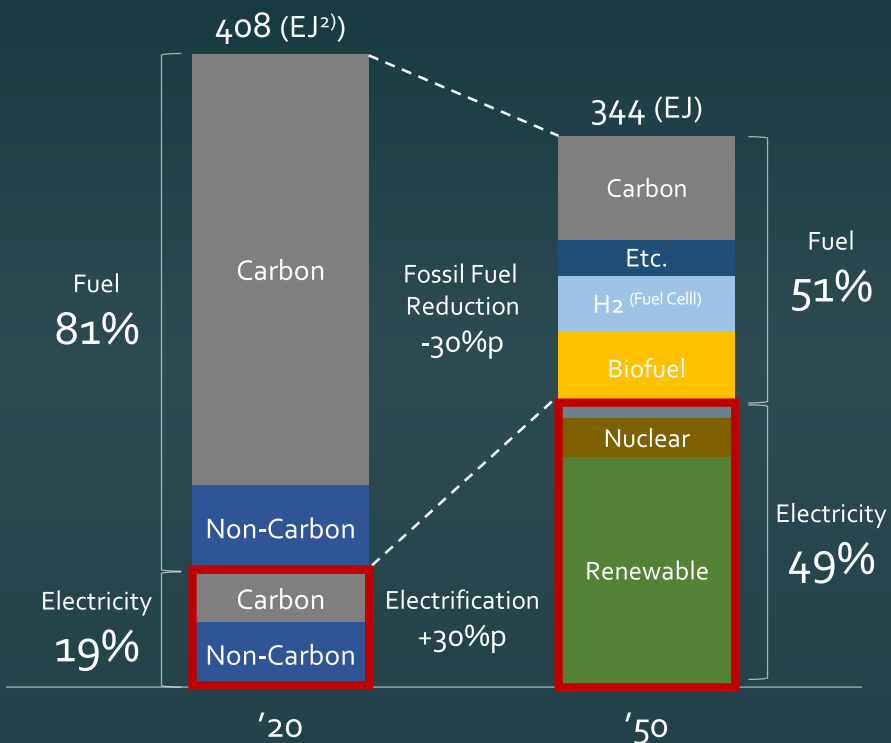
- Replace & reduce fossil fuels
    - Electrification, Clean Fuels
- Transforming the structure of GHG intensive industries
    - Agriculture · livestock, manufacturing (steel, cement, and etc.), and waste industries

## Carbon Removal Solution

- Maximizing the impact of first-hand GHG elimination
    - CCUS, Nature-based carbon removal

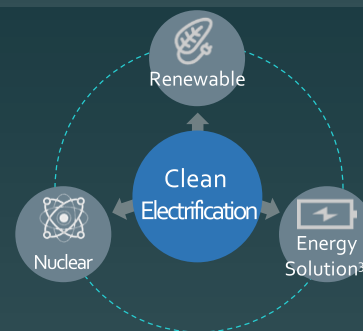
# Decarbonizing energy space through Electrification & Clean Fuels

## Outlook<sup>1)</sup> of Energy Mix



## Investment Focus

**a) Electrification:** Building carbonless power generation & consumption base



'30. TAM<sup>4)</sup>  
**\$650B**

- Increase carbon-free power by replacing fossil fuels
  - Renewable energy, SMR
  - Energy Solution<sup>※</sup>
  - ※ Home, Grid, Mobility

**b) Clean Fuels:** Securing core tech. and business to replace fossil fuels



'30. TAM<sup>5)</sup>  
**\$1,400B**

- Expand eco-friendly, low-carbon alternative fuels
  - Hydrogen • Ammonia / Biofuel
  - Fossil fuel w/CCS

1) IEA World Energy Outlook 2) 1 EJ (Exa Joule :108J) = 278 TWh 3) Energy Solution Core HW (EV, ESS, etc.) and SW Integration 4) Estimated by using Woodmac prospects 5) Estimated by considering IEA forecast and current fossil fuel market size



# Achieving NAV \$36.2B by 2030 through investing energy transition

## Implementation

① **Electrification:** Secure base for carbon-free generation, efficient consumption



- Pursue an asset play specialized in renewable energy for domestic and int'l markets
- Promote carbon-free nuclear business with advanced SMR technologies
- Build Energy Solution Platform for home, grid, and mobility (EV charging)



② **Clean Fuels:** Secure core tech. and business to replace the existing fossil fuels



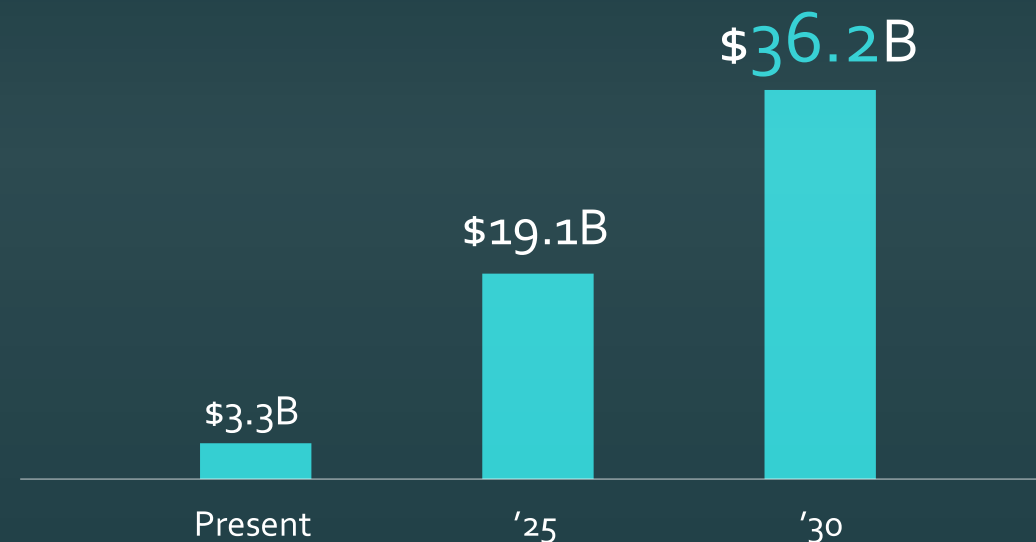
Alternative fuel  
(Hydrogen, Biofuel)

- Secure key technologies in carbon-free fuels (Hydrogen · Ammonia, Biofuel)
- Integrate the full value-chain including production, distribution, and demand

## Financial Target



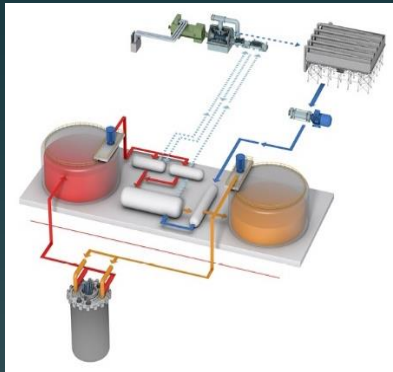
Achieve NAV of \$36.2B by 2030, via energy transition investments



# Developing **Carbonless Energy** based on advanced SMR technologies

## Technologies & Products

### Natrium™ Reactor System



- 345MWe sodium fast reactor
- Integrated Energy Storage
  - Molten salt technology
  - Boost output to 500MWe of power for +5.5hrs
- R&D with GE-Hitachi

### Wyoming Project (Natrium™)



- Location: Kemmerer, Wyoming
- Estimated COD: 2028
- The U.S. DOE<sup>1)</sup> authorized a grant of up to \$2B through ARDP<sup>2)</sup>
  - To be operated by PacifiCorp (\$1B investment)

## Progress & Business Plan

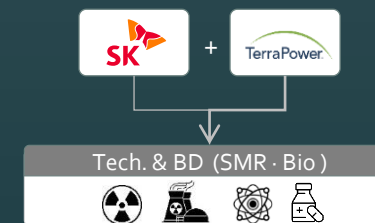
“ Entering SMR-based power generation market ”  
and expand its value chain in Korea and the U.S.

### Progress

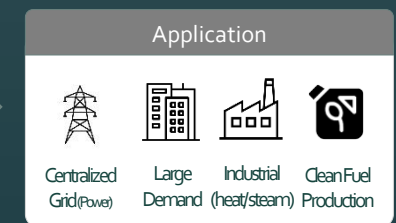
- Signed MOU for collaboration with TerraPower ('22. 5)
  - Jointly Develop 'the next-generational technologies' for SMR
- Invested \$250M to become the 2<sup>nd</sup> largest shareholder (w/ SKI)

### Business Plan

【 Advanced SMR technologies 】

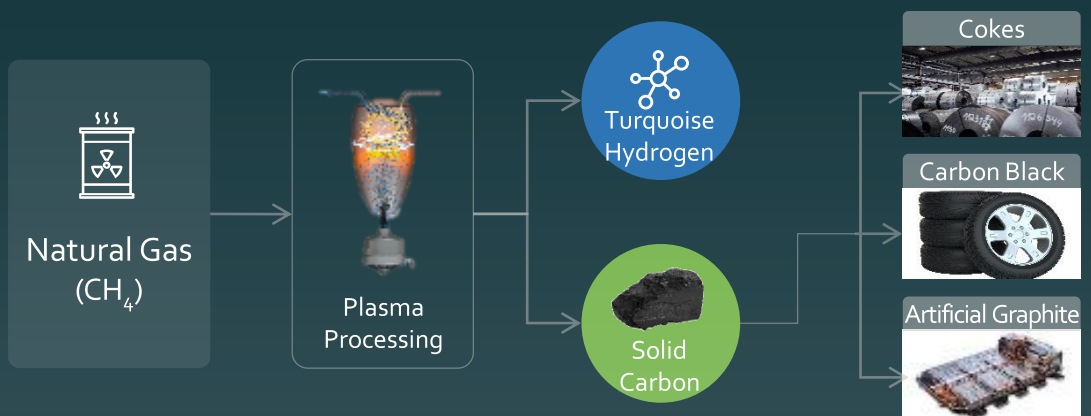


【 SMR Business Development 】



# Creating Clean Turquoise H<sub>2</sub> and Solid Carbon business with Monolith

## Technologies & Products



### Cokes

- Utilized as a reducing agent and fuel in the iron making process
  - To aid reduction CO<sub>2</sub> emission in the production of steel (~13%)

### Carbon Black

- Reinforces durability of rubber
  - To aid reduction of CO<sub>2</sub> emission in tire manufacturing (~80%)

### Artificial Graphite

- Used as anode materials for EV batteries
  - Eliminate CO<sub>2</sub> emission from existing petroleum based products

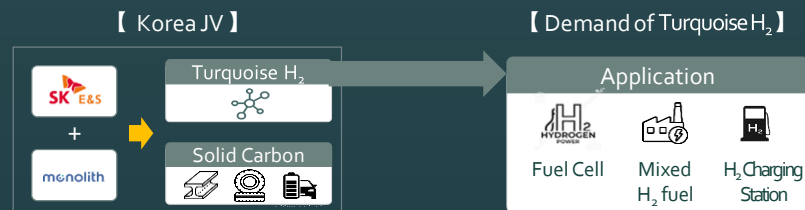
## Progress & Business Plan

“ Pursuing turquoise H<sub>2</sub> and solid carbon business via Korea JV with Monolith ”

### Progress

- Equity investment by SK Inc. ('21.6) and SK E&S ('22. 7)
  - Holds exclusive rights in Asia and one BoD seat
- Secured DOE<sup>1)</sup>'s first \$1B loan guarantee ('21. 12)
  - Largest loan to a Hydrogen co. since 2011
- MOU signed for carbon black (w/ Goodyear, Michelin)
- Expand turquoise H<sub>2</sub> demand whilst pursuing R&D toward high-value solid carbon application

### Business Plan

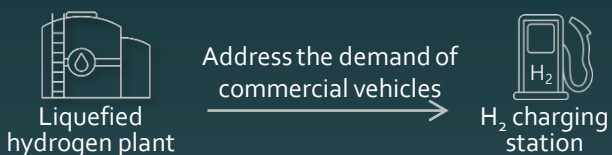


# Comprehensive approach via Full Integration of the H<sub>2</sub> Value Chain

## Upstream: Hydrogen Production

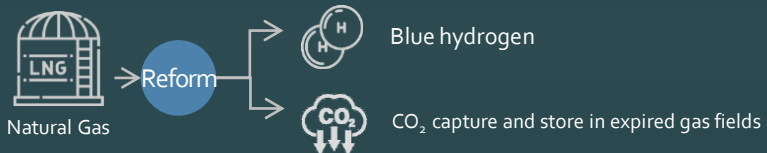
'23~

- Produce 30K tons/yr liquefied hydrogen (Nov., '23)



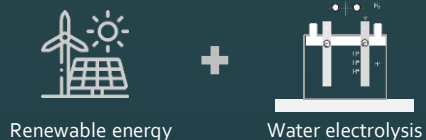
'26~

- Produce Blue hydrogen (250K tons/yr) using LNG and CCUS infra



'30~

- Produce green hydrogen using renewable energy and water electrolysis technology\* in Korea and Vietnam



\* Global partners' tech. such as Plug Power.

## Downstream: Hydrogen Consumption



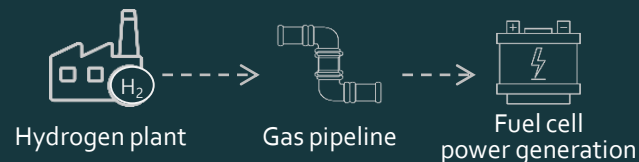
- Deploy 40 HRS and expand demand from commercial vehicles



PJT Size<sup>E</sup>  
\$2.5B

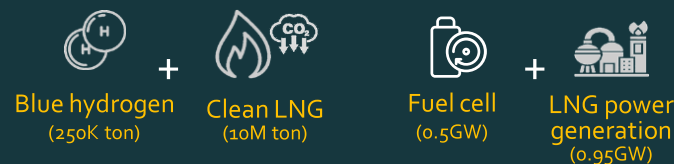


- Expand hydrogen fuel cells based power generation by CHPS program<sup>1)</sup>



PJT Size<sup>E</sup>  
\$2B

### 【 SK's contribution to eco-friendly electricity in Korea 】

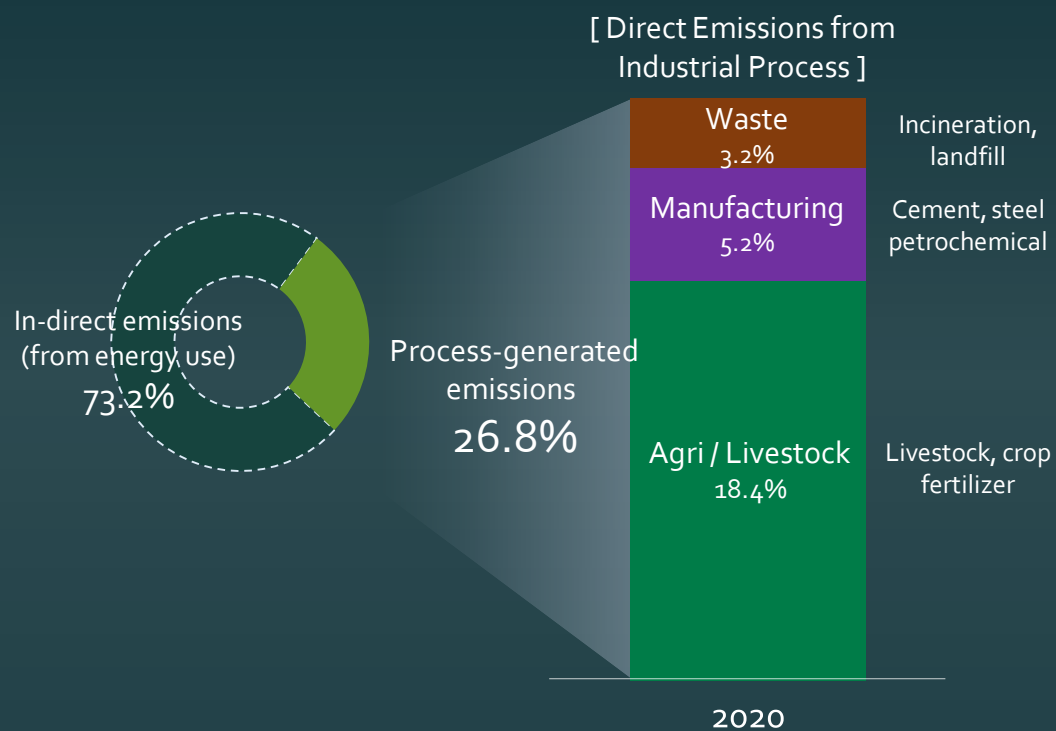


- As of '26, supply 15% of Korea's total electricity demand as eco-friendly electricity



# Reduce Direct GHG Emission from major Industrial Process

## Direct GHG Emissions from Industries<sup>1)</sup>



## Strategic Focus Areas

### a) Sustainable Food: Structural change of F&B industry



Sustainable Food

'30 TAM<sup>2)</sup>  
\$290B

- Alt. protein ingredients · products
  - PBM, Ferm., CBM, and Noble
- Vertical farming, Alt. fertilizer

### b) Green Industry: Solution for GHG intensive industry



Green Industry

'30 TAM<sup>3)</sup>  
\$170B

- Low-carbon cement process
- Electric furnace · Hydrogen steel
- Alt. resources in minerals/chemicals

### c) Circular Materials: Eco-friendly disposal and recycle of waste



Circular Materials

'30 TAM<sup>4)</sup>  
\$625B

- Waste-to-X
- White bio, biodegradation
- Plastic/battery Re-up-cycling

# Achieving NAV \$18.2B by 2030 through investing industrial transition

## Investment Strategy

### ① Sustainable Food: Structural change of agriculture industry



Sustainable  
Food

- Invest in core technologies and lead Asia expansion
- Secure anchor businesses in Up · Midstream sectors

### ② Green Industry: Reduction solution for GHG intensive industry



Green  
Industry

- Secure technologies to reduce emission during manufacturing process in cement and steel industry
- Secure alternative resources and solutions for nonferrous metal and chemical industry

### ③ Circular Materials: Eco-friendly disposal and recycle of waste



Circular  
Materials

- Commercialization of white bio products
- Secure recycling solution for plastic/EV battery

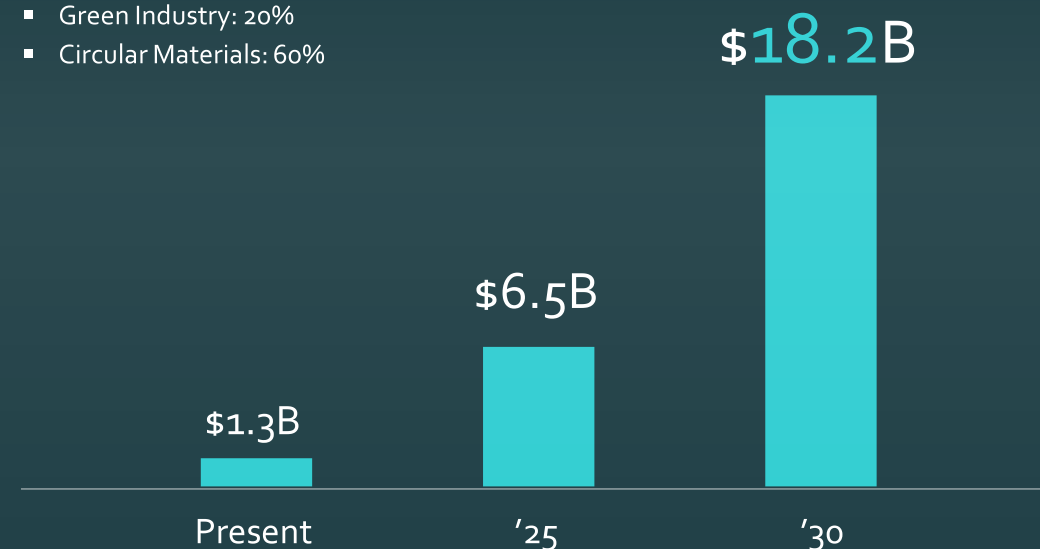
## Financial Target



Achieve NAV of \$18.2B in 2030  
via Industrial Transition investments



- Sustainable Food: 20%
- Green Industry: 20%
- Circular Materials: 60%



# Build leading-edge assets portfolio and **Expand Strategic Partnership**

## Sustainable Food Portfolio Overview

**PBM:** Invested in rising star in the PBM market of UK·EU



- Top-tier PBM player (2<sup>nd</sup> in brand awareness in U.K)
- 26 product lines including ground meat, patty through peas

**Fermentation:** Invested in leading fermentation companies in the U.S.



- Animal-free milk from flora is the first of its kind
- With gene recombination technology, microbes produce actual milk proteins



- A pioneer in novel protein industry
- Food ingredients produced through fermentation /refinement of microorganisms (founded in Yellowstone national park)

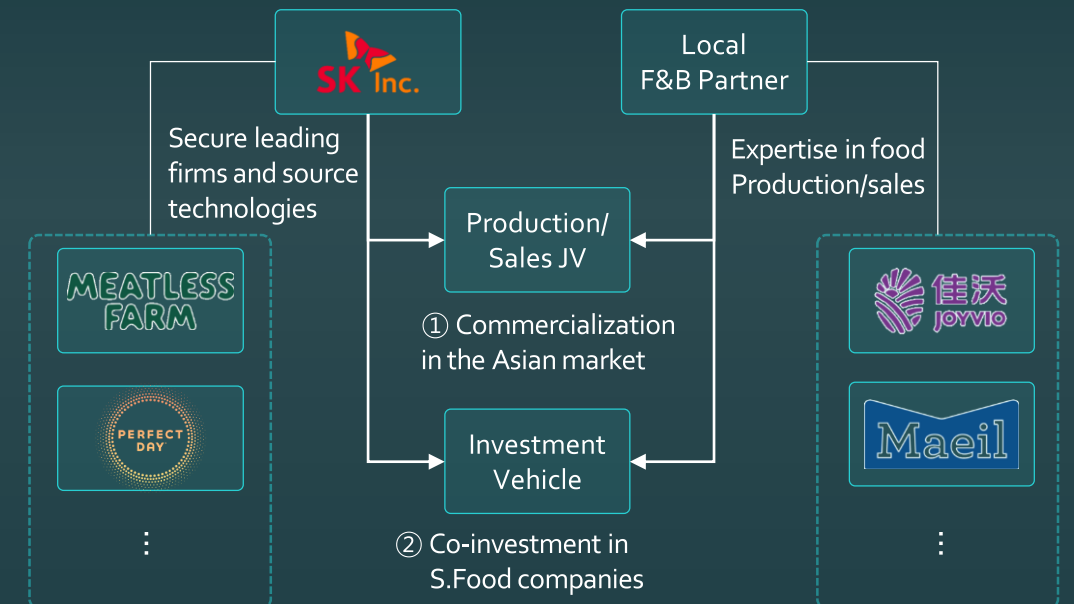
**CBM:** Invested in the leader of cell-based seafood



- Development of alternative sushi-grade salmon
- Built the world's first cell-cultured salmon pilot plant

## Collaboration with Local F&B Partners

“ Pursue strategic partnerships with local F&B players to expand S/F business in Asia ”

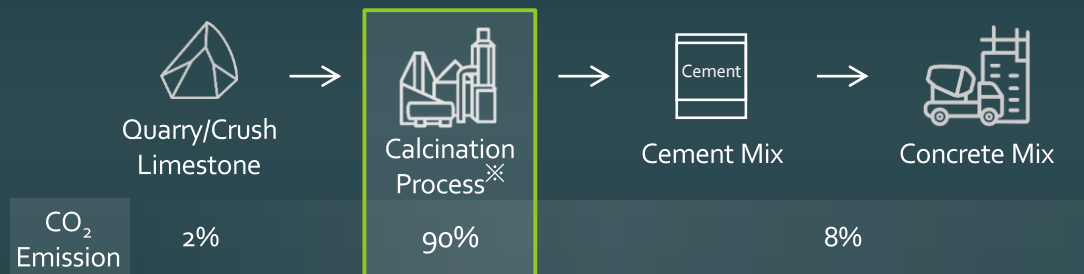


# Secure key technologies to reduce carbon in **Cement, Steel Industry**

## Solution for Cement Industry

“ Securing alternative technologies to solve the root cause of the cement industry ”

### 【 Production Process of Cement, Concrete 】



※ Process of producing cementitious material by heating limestone at high temperature (Chemical decomposition of limestone accounts for 60% of CO<sub>2</sub>)

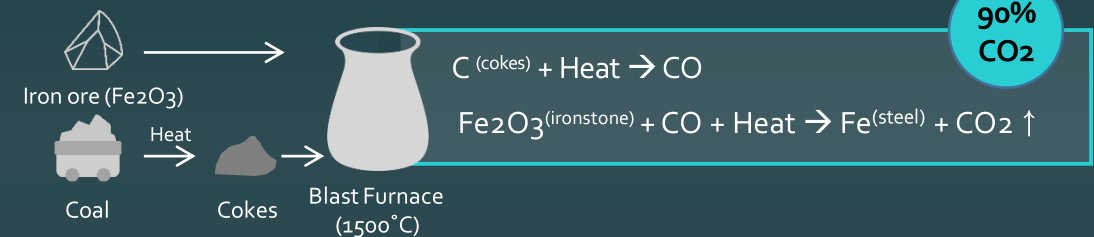
'30TAM<sup>1)</sup>  
\$70B

- Increased need for carbon reduction in the cement industry leads to the growth of low carbon cement market
  - 2030 Reduction target by 2030: 23% (IEA), Net Zero Declaration (GCCA<sup>2)</sup>)

## Solutions for Steel Industry

“ Seeking alternative ironmaking processes such as coal-free reduced iron technologies ”

### 【 Ironmaking Process<sup>※</sup> 】



※ Process of extracting iron by heating iron ore, cokes in the blast furnace (CO<sub>2</sub> emitted from energy use, reduction process of iron stone/cokes)

'30TAM<sup>3)</sup>  
\$10B

- Low-carbon steel market is expected to grow with innovation in steel making process (\$60B by '50)
  - 23% reduction target by 2030 (IEA), Net Zero Declaration by Eurofer



# Pursue Preemptive Investments and collaborate on Demo Projects

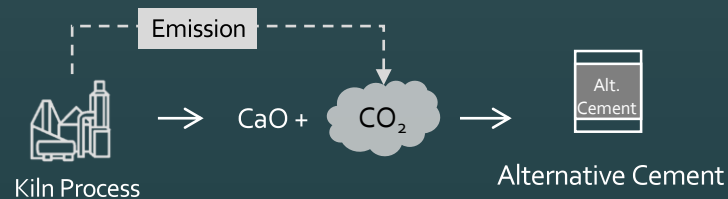
## Solutions for Cement industry: illustrative

**Raw material Processing:** Replace limestone with non-carbonate material



- Produce low carbon cement by using non-carbonate material
  - Carbonate(CO<sub>3</sub>) included in limestone is the primary source of process emission

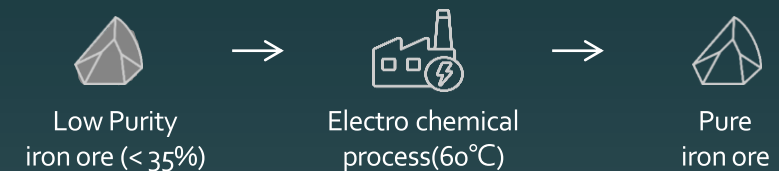
**Manufacturing process:** Reuse emitted CO<sub>2</sub> from kiln process



- Developing alt. cement using CO<sub>2</sub> emitted from kiln as raw material
  - Same physical properties as regular cement, less raw material and energy is required

## Solutions for Steel industry: illustrative

**Raw material processing:** Improving purity of raw material (iron ore)



- Increase purity through low temperature electrochemical reaction
  - Reduce energy use in ironmaking process

**Manufacturing Process:** Developing alt. process for iron ore reduction

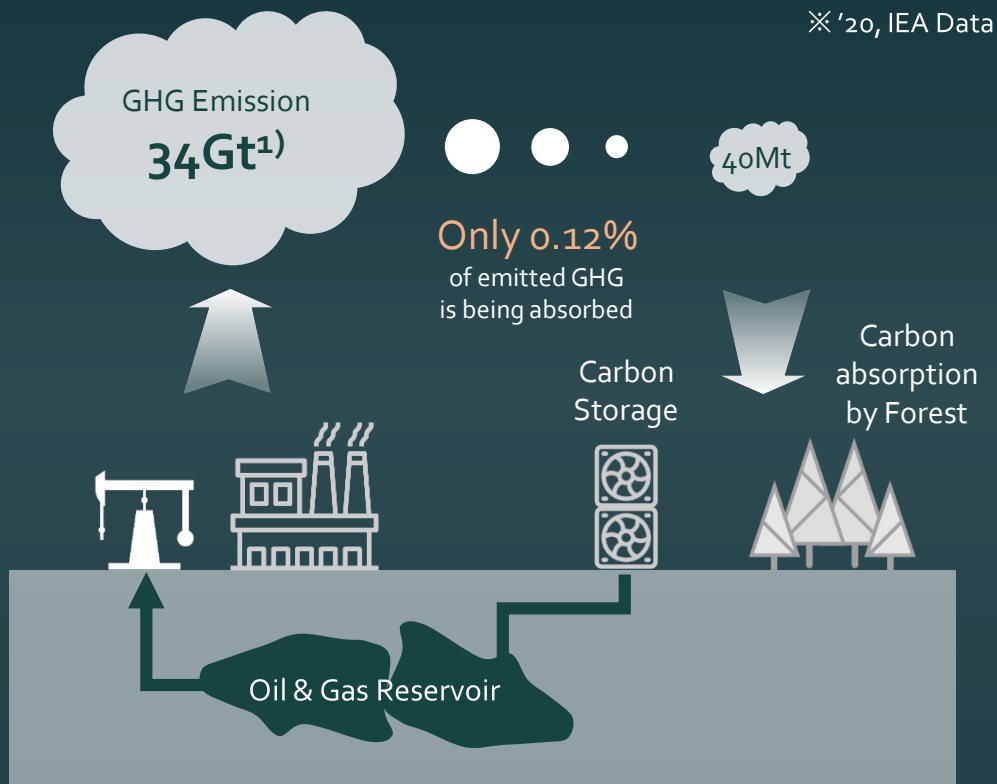


	Traditional method	New Solution (illustrative)
CO <sub>2</sub> emission	<ul style="list-style-type: none"> <li>1.85 tCO<sub>2</sub> / 1t steel production</li> <li>Energy use 60%: process emission 40%</li> </ul>	<ul style="list-style-type: none"> <li>1.6 tCO<sub>2</sub> / 1t steel production</li> <li>Energy use 100% (4 MWh / 1t steel)</li> </ul>

- Extracting iron from iron ore using electrolysis
  - Cokes-free process leads to reduction in CO<sub>2</sub> emission
    - ※ Further reduction if renewable energy is used

# Maximize post-removal of involuntary CO<sub>2</sub> emissions on the planet

## Current Status of GHG Absorption



## Strategic Focus Areas

① **CCUS**: Technologies to capture, utilize, and sequester carbon



CCUS

'30 TAM<sup>2)</sup>  
**\$115B**

- Carbon Capture, Transportation, Storage Solutions
- Technologies to convert carbon into resources

② **Nature Based Solution**: Natural sources to capture carbon



Nature Based Carbon Absorption

'30 TAM<sup>3)</sup>  
**\$77B**

- Forest-based carbon absorption projects (Afforestation, REDD+, etc.)
- Technologies to expand absorption effects of microorganism(soil) and algae(ocean)

# Achieve NAV \$12.4B by 2030 through investing Carbon Mgmt.

## Investment Strategy

### ① CCUS: CO<sub>2</sub> capture, removal, and conversion technologies



CCUS

- Build integrated CaaS (CCUS-as-a-Service) BM
- Invest in leading-edge carbon technologies
  - DAC, Utilization (mineralization, biological/chemical methods)

### ② Nature Based Solution: Forest, ocean to remove CO<sub>2</sub>



Nature Based Carbon Absorption

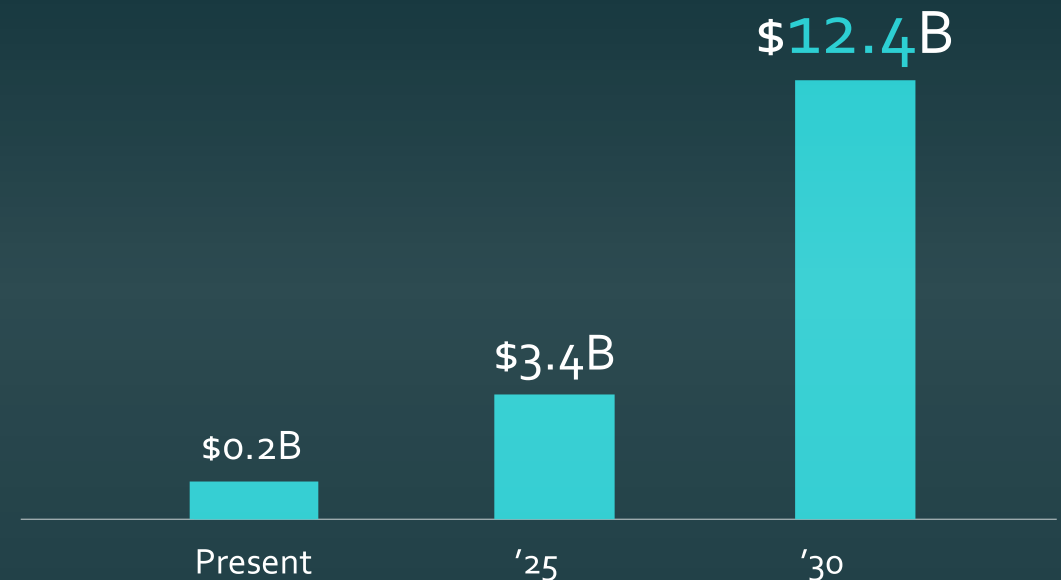
- Gain nature carbon credit via investments
  - Secure international forest developers and expand afforestation business
- Invest in bio-based carbon absorption technologies

## Financial Target

“

Achieve NAV of \$12.4B by 2030 via Carbon Mgmt. investments

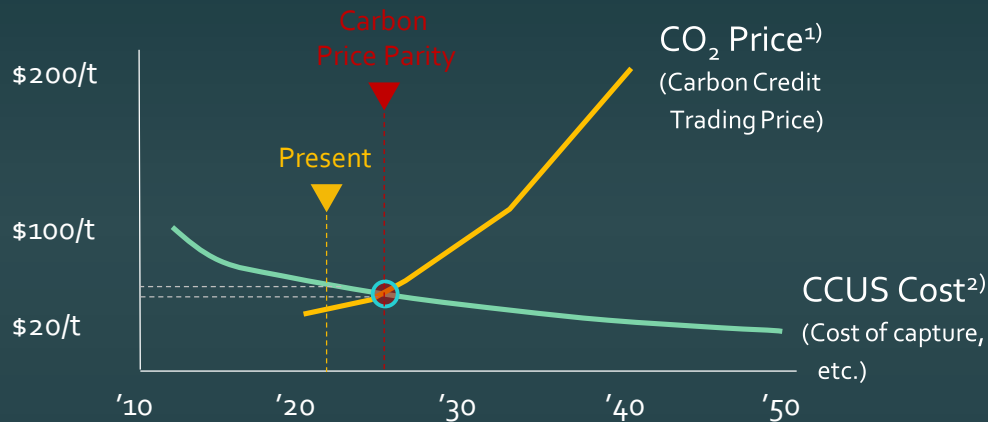
”



# Securing core technologies & infra to **Integrate CCUS Value Chain**

## CCUS Economics Outlook

“ Economics to be enhanced via evolution of CCUS technologies and regulatory support ”

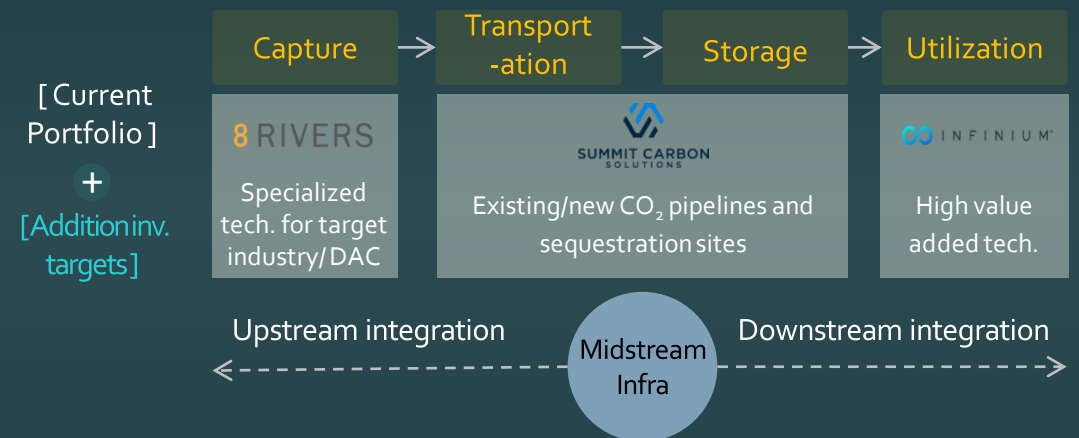


- CCUS cost to fall due to continued development of capture tech, which accounts for the majority (~80%) of the total cost
- Strong policy support for carbon removal (ex. IRA – 45Q)

## Key progress and plans

“ CaaS\* BM for industrial CO<sub>2</sub> emitters ”

\* CCUS as a Service: One-stop service from carbon capture to storage/utilization



- Target long-tail carbon emitters w/ little access to CCUS infra
- Structure business model as integrated carbon management service



# Secure core assets that lead growth of **Voluntary Carbon Credit**

## Investment Direction

“ Secure differentiating factors of projects in anticipation of the growth of VCM<sup>1)</sup> ”

【 Forecast of VCM's price & demand<sup>2)</sup> 】



### Increasing Demand

Growing demand through increasing Net-Zero declarations

### Limited Supply

Supply constraints due to long-term development of projects (c.f. CCUS)

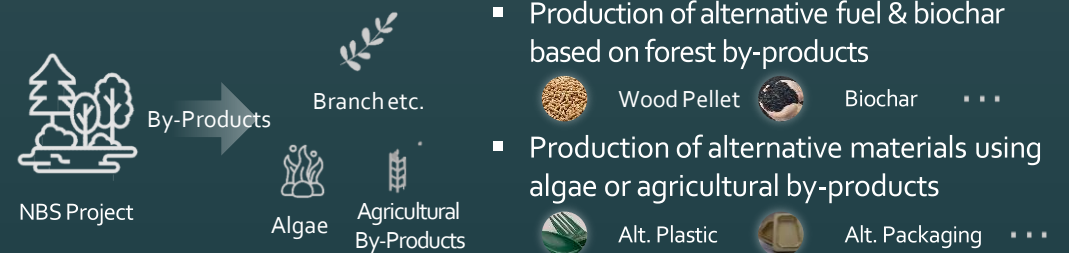
- Establishment of high-quality pipeline by preoccupying projects before the price rise

## Major Plan

### ① Securing PJT Development Capabilities : Global Developers



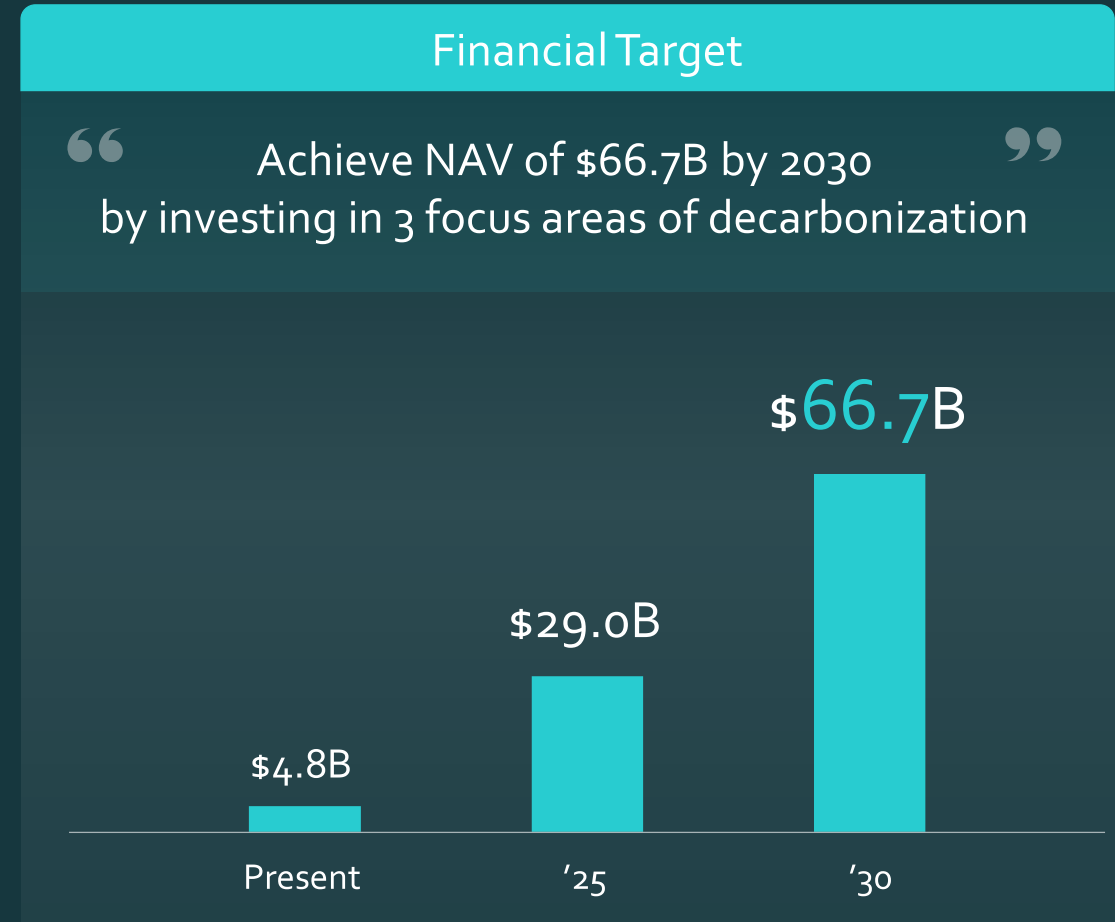
### ② New Project related to NBS<sup>3)</sup> : Innovative Technology Using By-Products



# Achieve NAV of \$66.7B in 2030 via investing 3 focus areas

※ NAV Target		Present	'25	'30
 Energy Transition	Electricification <sup>1)</sup>	\$1.8B	\$8.2B	\$20.9B
	Clean Fuels	\$1.5B	\$10.9B	\$15.3B
 Industrial Transition	Sustainable Food	\$0.3B	\$1.6B	\$4.7B
	Green Industry	-	\$1.0B	\$4.0B
	Circular Materials	\$1.0B	\$3.9B	\$9.5B
 Carbon Mgmt.	CCUS	\$0.2B	\$1.0B	\$6.4B
	Nature -Based Solution	-	\$2.4B	\$6.0B

■ SK Inc.   
 ■ Co-Investment   
 ■ Subsidiaries

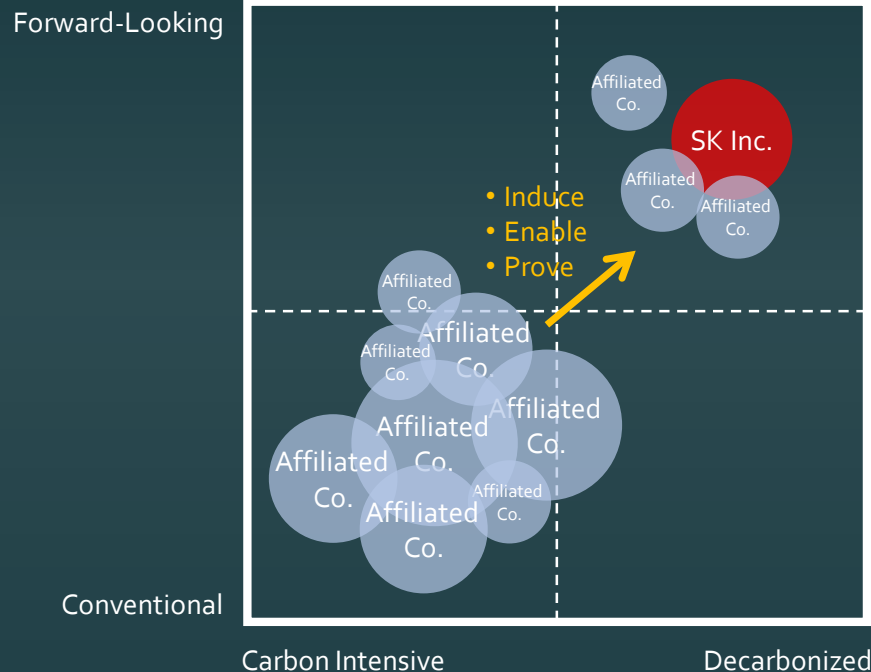


1: ...energy and energy solution are considered as co-investment, SK Inc. invests in nuclear energy independently

# SK Inc.: A **Enabler & Partner** for affiliates' green transformation

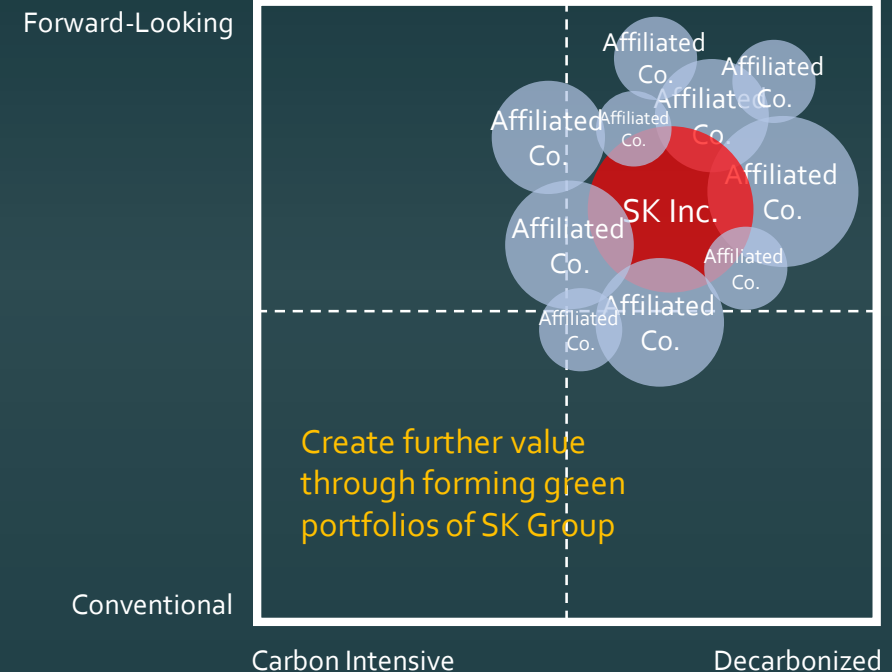
## Short-term: Green Pathfinder

Leading exploration new space and co-investment with affiliates

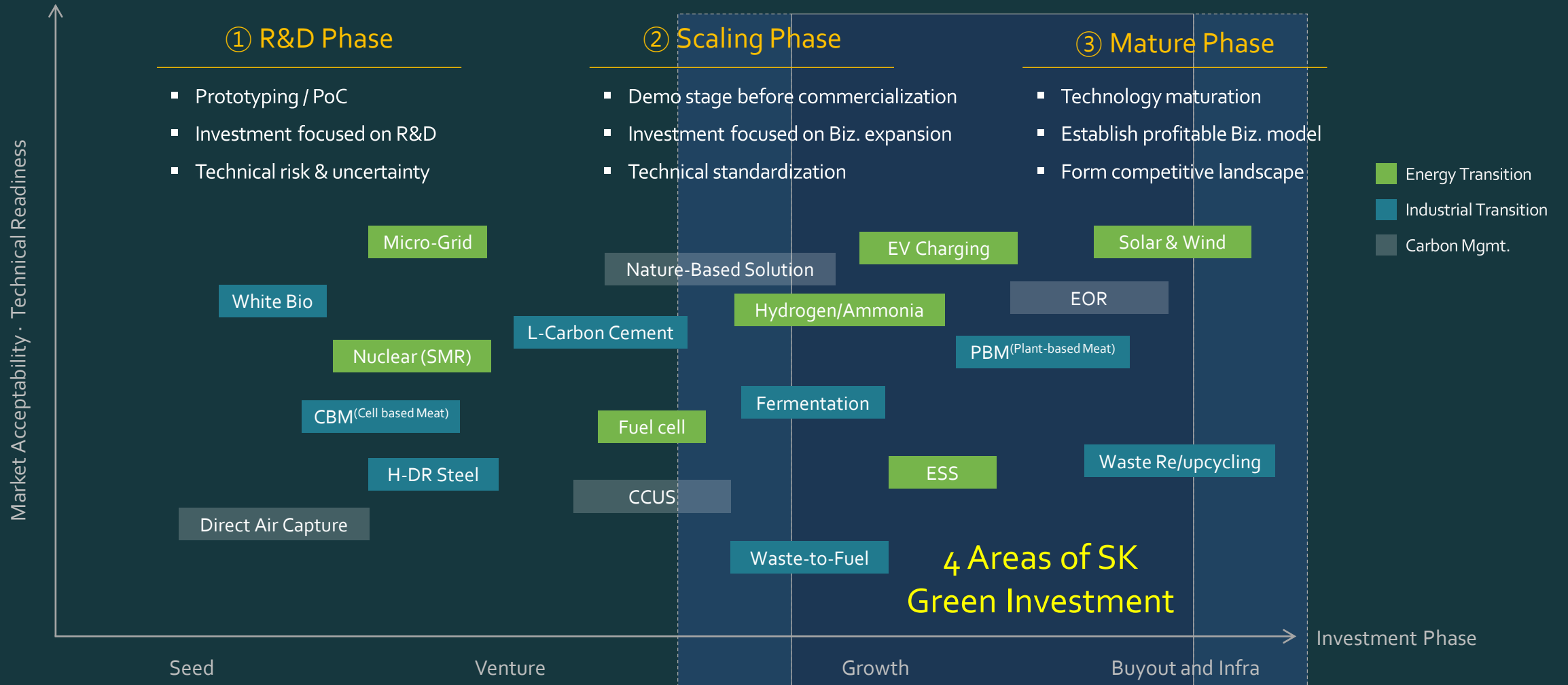


## Long-term: NAV Growth along with Affiliates

Turn SK Inc.'s investments into anchors and innovation platform of affiliates



# Sustain **Strategic Balance** between the embryos and the grown



# Building up vibrant portfolio in the Global Green Market

## SK Inc. Green Portfolio


### Energy Transition

 Fuel Cell (PEMFC)	 Small Modular Reactor	 SSCB/EV Charging	 Waste to Fuel
 Consumer ESS	 H <sub>2</sub> , Carbon Black		

### Industrial Transition

 Fermentation	 Fermentation	 Plant Based Meat	 Cell Based Salmon
----------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------

### Carbon Mgmt.

 Capture, Utilization
-------------------------------------------------------------------------------------------------------------

## SK Affiliates' major Green Portfolio



### Energy Transition

 Ammonia Cracking	 Offshore wind	 EV Charging
 Grid ESS		

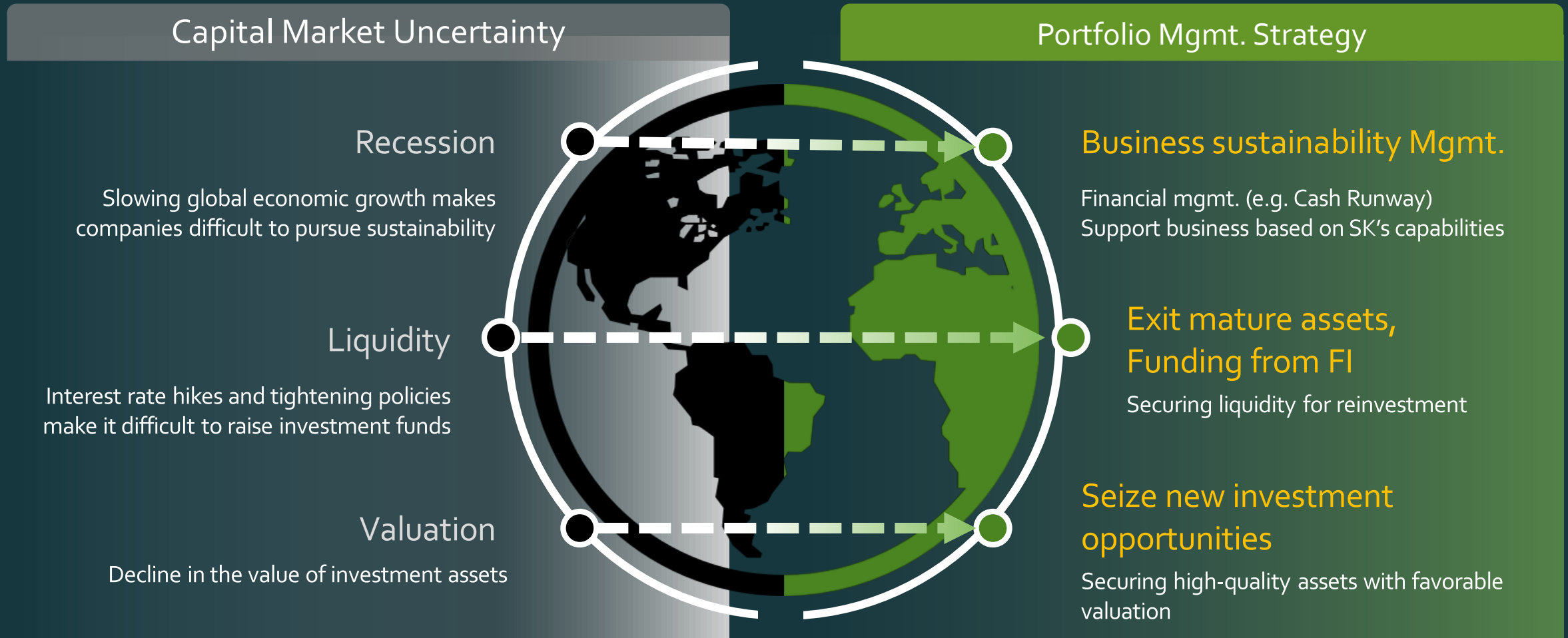
### Industrial Transition

 Waste Mgmt.	 E-Waste Mgmt.	 EV Battery Recycling
-----------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------

### Carbon Mgmt.

 Transportation & Storage	 Utilization (fuel)
-------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------

# Turning uncertainty from global volatility into Opportunity





# Robust Pipeline from SK's extensive global presence & partners



- 1 Encouraging portfolio's growth**
  - Support portfolio's commercialization via close engagement w/SK affiliates and each BD team
- 2 Leveraging regional buy & sell sides**
  - Potential regional investors to participate in SK's portfolio and deal opportunities
- 3 Accessing new deal flow**
  - Establishing co-pipeline with global partners
  - Cooperating with entrepreneurs from each industry

# Enhanced sector expertise by **Global Advisory Networks**

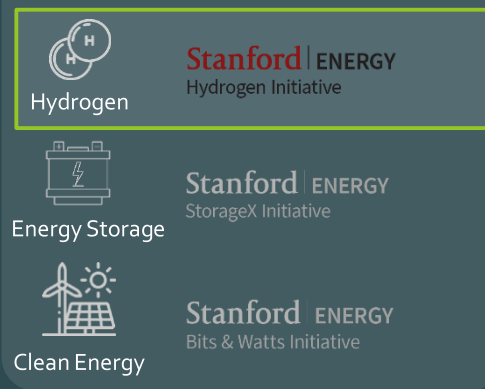
01	Energy Transition		02	Industrial Transition		03	Carbon Mgmt.	
	Breakthrough Energy Net Zero Tech·BM		Wood Mackenzie Renewable Energy, Energy Solution		Good Food Institute Overall S/F Industry		SK Innovation Environment Tech	
KEARNEY	Kearney Hydrogen		SECA Hydrogen, Energy Solution		Warner Advisors S/F Producing Tech·CMO		A&G Energy CO <sub>2</sub> Capture/Utilization	
	EY Parthenon Hydrogen, Carbon Neutral		Capstone Energy Policy		L.E.K. Consulting Overall Industry		Korea Institute of Energy Research CO <sub>2</sub> Capture	
	IHS Markit Energy Industry		Korea Institute of Energy Hydrogen, Fuel Cell		Black & Veatch Overall Industry		Ricardo CO <sub>2</sub> Capture/Utilization	
					KPMG Overall Industry		Summit Agricultural Group CO <sub>2</sub> Transportation/Storage	

# Cooperation with **Stanford Univ. and Breakthrough Energy**

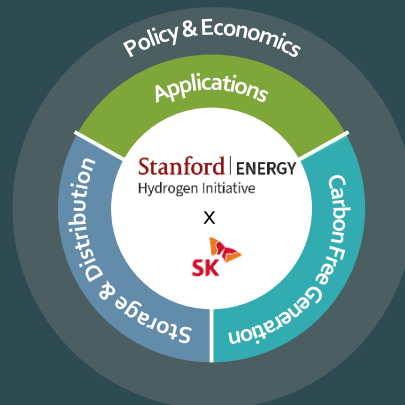
## Stanford: 'SECA' Stanford Energy Corporate Affiliates

Share and discuss progress with U.S government, industry, academia and politics through participation in the 'Hydrogen initiative' of Stanford Precourt Program

### Stanford ENERGY Corporate Affiliates



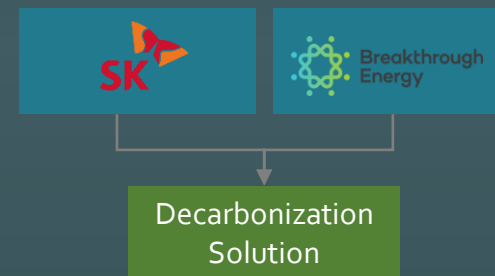
### 【 Hydrogen Initiative's agenda 】



## Breakthrough Energy: Comprehensive Collaboration

Joint investment for global decarbonization assets, seeking strategic cooperation opportunities among existing portfolios that both have

### 【 Joint Investment (illustrative) 】



### 【 Business Cooperation (illustrative) 】



Energy Transition | Industrial Transition | Carbon Mgmt.

# Solid **Collaboration Network** with various global capital partners

## Global 'Green' FI Network

## Domestic FI Network



**BlackRock**

**EQT**



**TEMASEK**

**Blackstone**

THE CARLYLE GROUP

**KKR**



**Brookfield**

**ANCHOR**



**SKYLAKE**  
Incubating Innovation



**SERCAPITAL**  
SUSTAINABLE. ENVIRONMENTAL. RENEWABLE.



**greenbelt**  
CAPITAL PARTNERS



## Envisioning

Leader of investment and business development  
in global decarbonization universe

**1%**

**&**

**2%**

SK Group's contribution to global carbon  
reduction in '30 : approx. 200 million tCO<sub>2</sub>

Proportion of NAV of SK green portfolio in  
global green market in '30





End of Document

2022. 11.