



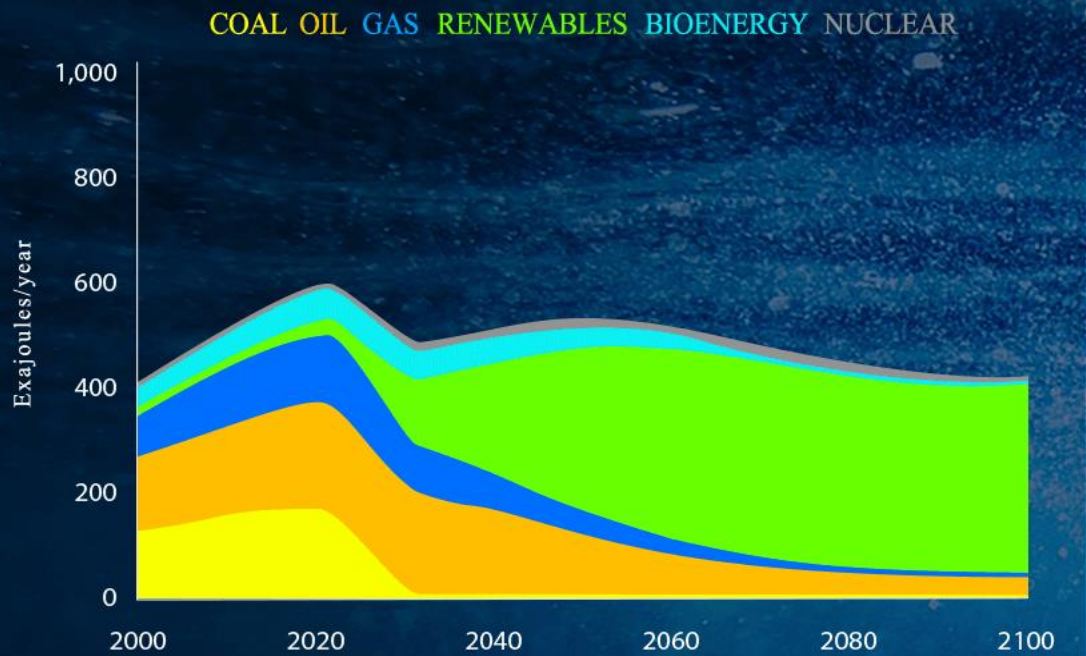
THE FUTURE IS WORTH IT

TCC GROUP
2021 Q1
INVESTORS'
CONFERENCE



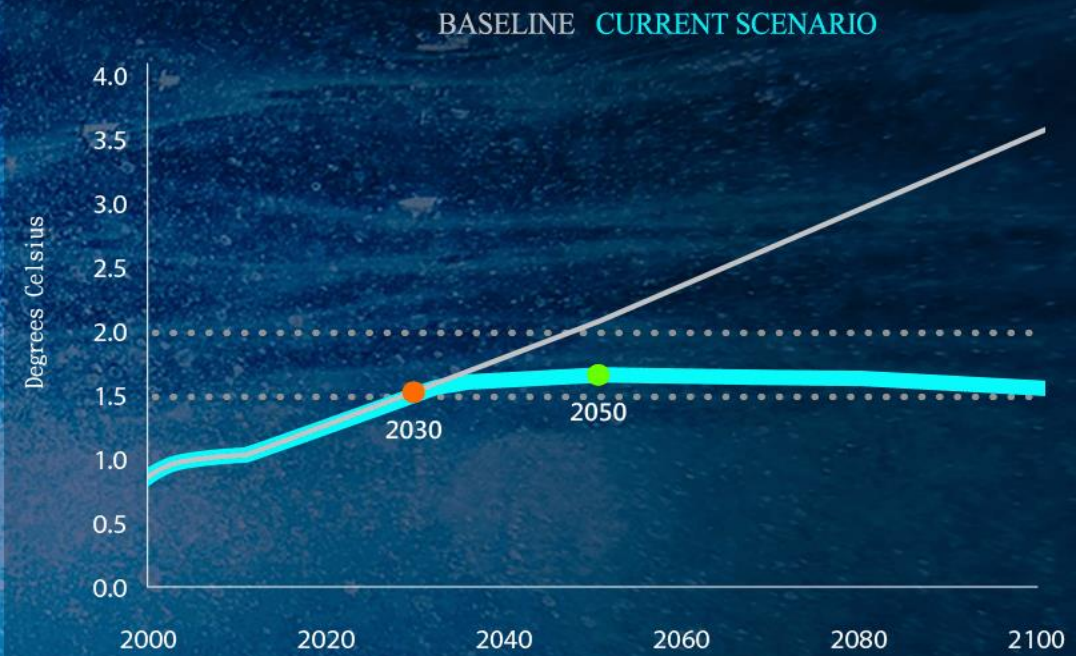
MIT Energy-Rapid Overview and Decision-Support (En-ROADS)

Global Sources of Primary Energy



+1.5°C

Temperature Change



Energy Usage Percentage



Carbon Pricing



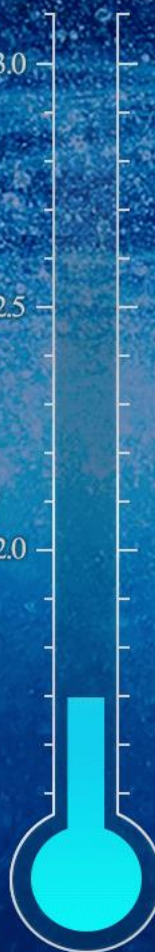
Buildings and Industry



Transport



Carbon Removal



A True Green Company

CO₂ Emission

Electricity **41%**



Coal-Fired Power Plant



Biofuel



Renewable Energy



Transportation **25%**



Battery



Energy Storage System



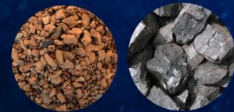
EV Charging Station



Manufacturing **24%**



Alternative Fuel / Material



Waste Treatment



Carbon Capture



Low Carbon Building Material



Low Carbon Environment

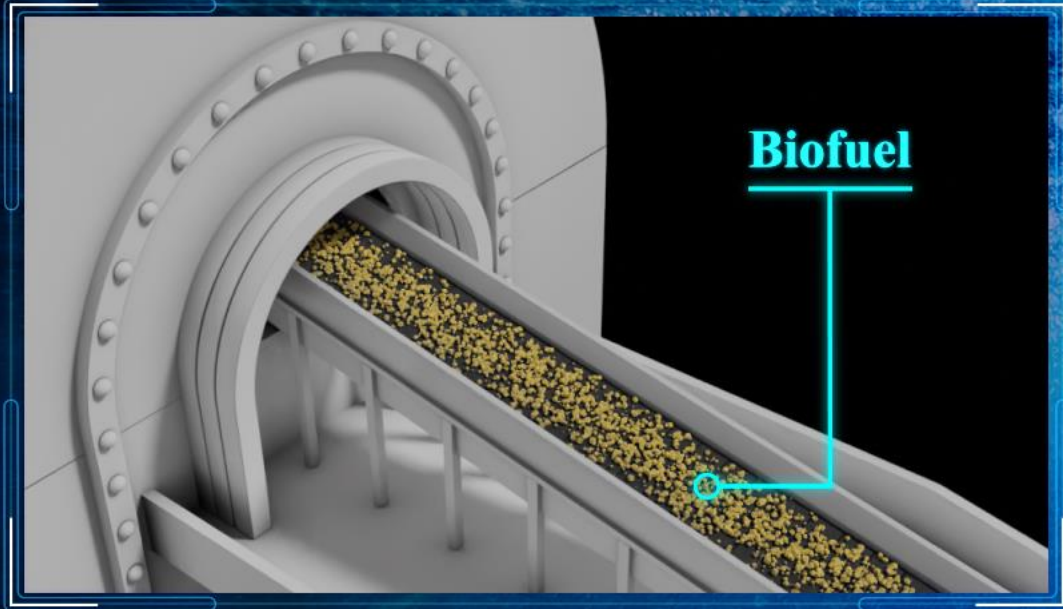






..... **Low Carbon Energy Transformation**

Hoping Power Transformation



Target: Reduce CO₂ emissions per kwh to the natural gas power plant level



Continuous Transformation to Low Carbon Energy



Renewables

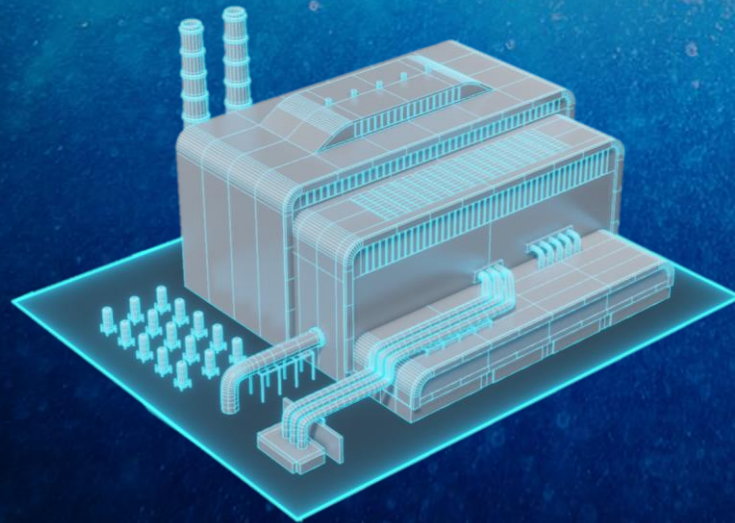
2025

Target: 500MW

Natural Gas

2026

550MW x2



**Future Electricity
Provided by TCC**

50%↑

CO₂ Emissions/kWh

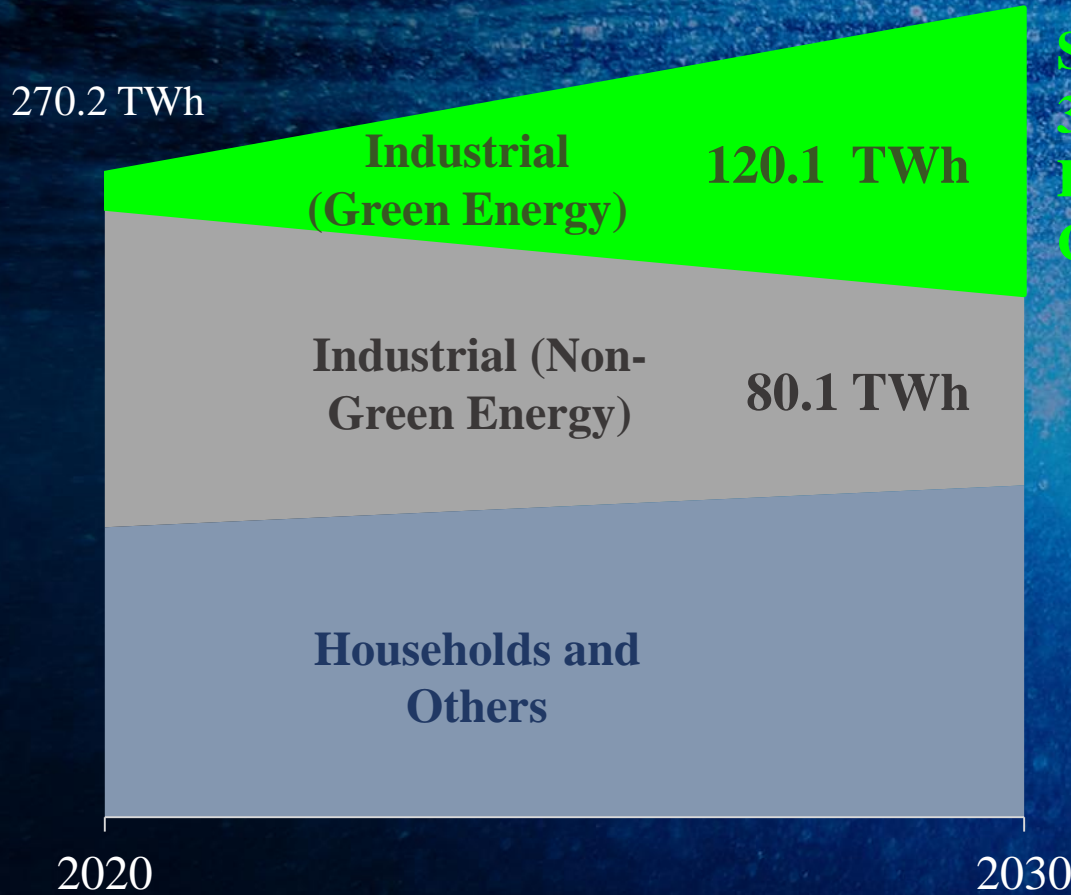
54%↓

RE100 to Amplify Taiwan Green Energy Demand



Total Electricity Use by Type (Taiwan)

339.4 TWh



Energy Storage Supply Shortage to Expand

Shortage:
38.5GW
Installation
Capacity

GWh

3

2.5

2

1.5

1

0.5

0



Battery Energy Storage System Functions

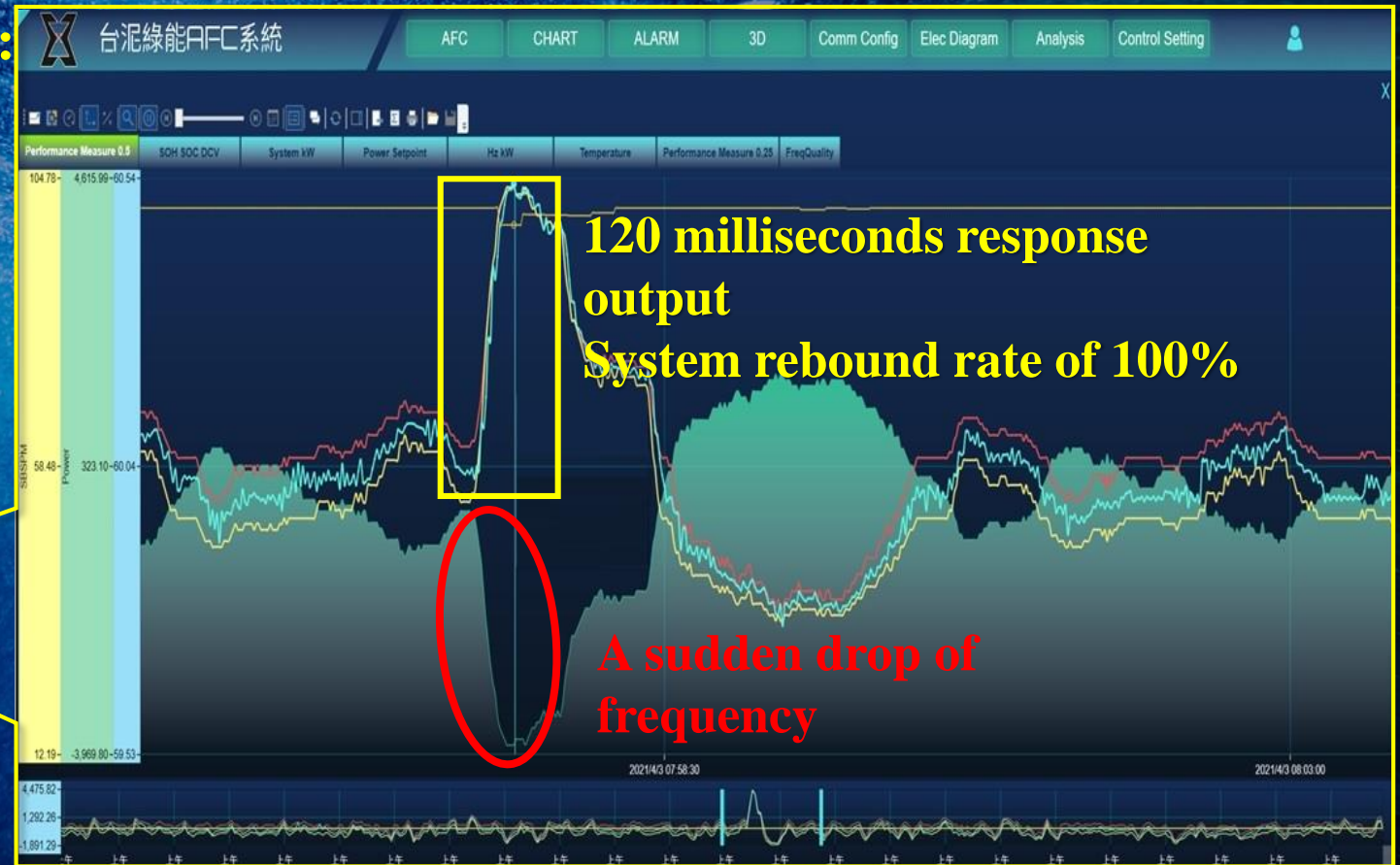
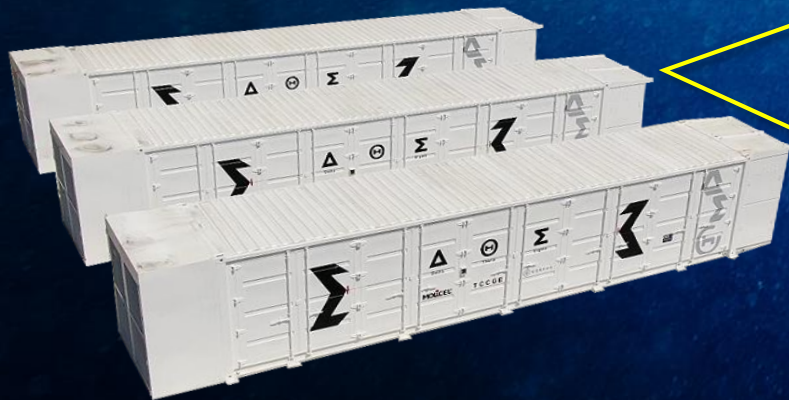


TCC Changbin AFC Results

1. Automatic Frequency Control (AFC):
Manage frequency to minimize volatility

2. Stabilize Voltage:
Prevent sudden voltage change causing unstable electricity

3. Maintain Uninterrupted Electricity Supply



TCC & NHQA Synergy



	TCC	NHQA	TCC+NHQA
Energy Storage System	1.8MWh	6MWh	6 MWh
Energy Management System (EMS)	△	✓	✓
Power Conditioning System (PCS)	△	✓	✓
System-Grade BMS	✓	✓	✓
Cabinet BMS	✓	△	✓
Module BMS	✓	△	✓
Battery Cell	✓	△	✓
EV Charging Station		DC Fast Charger	DC Fast Charger
AC Charging System	None	✓	✓
DC Fast Charge System	None	✓	✓
Vehicle-to-Grid System	None	✓	✓

✓ : In-house

△ : Outsource

NHQA Technology and Market Potential



Advanced Battery Energy Storage (BESS)



- 1.130 patents and a full product line
- 2.High capacity density ESS: 6MWh@40ft
- 3.Global ESS Presence
 - Completed: 300MWh
 - Under Development: 600MWh

eMobility



- 1.EV DC fast charge system combined with ESS
- 2.V2G grid provide bidirectional energy transfer technology
- 3.The world's largest V2G project with FCA (700EV/25MW)

Microgrid

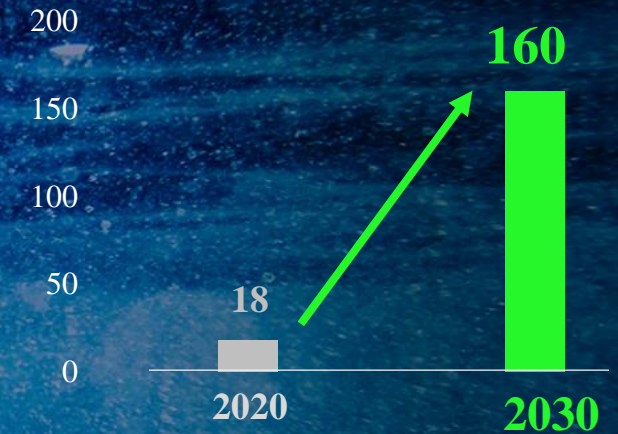
Hydrogen



- 1.AI energy management system
- 2.Cloud monitoring platform with real-time feed
- 3.Rapid integration of hydrogen manufacture and storage used for power generation

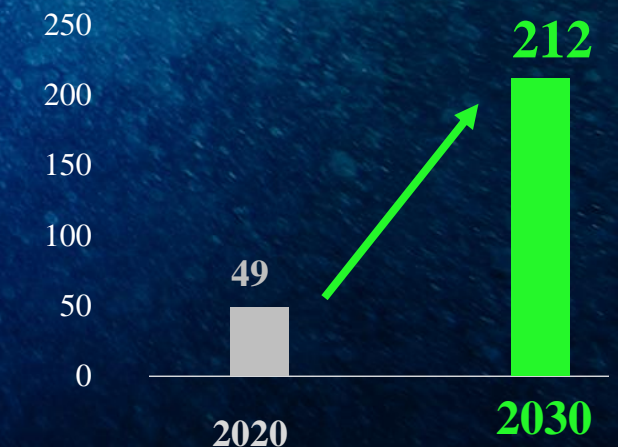
ESS Market

Unit: US Billion



Charging Station Market

Unit: US Billion

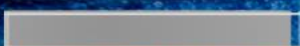


EV Market Potential

2020

Fuel Cost

Gas-fueled vehicle: US\$9.32/100KM

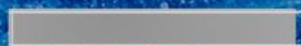


US\$2.90/100KM

2025

Assumption: Same as 2020

Vehicle Price

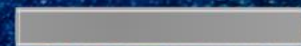


NT\$1.6 Million



NT\$800,000

Charging Time



8 Hours



15 Minutes

2020 EV Sales Share

2025 Estimated EV Sales Share



STELLANTIS

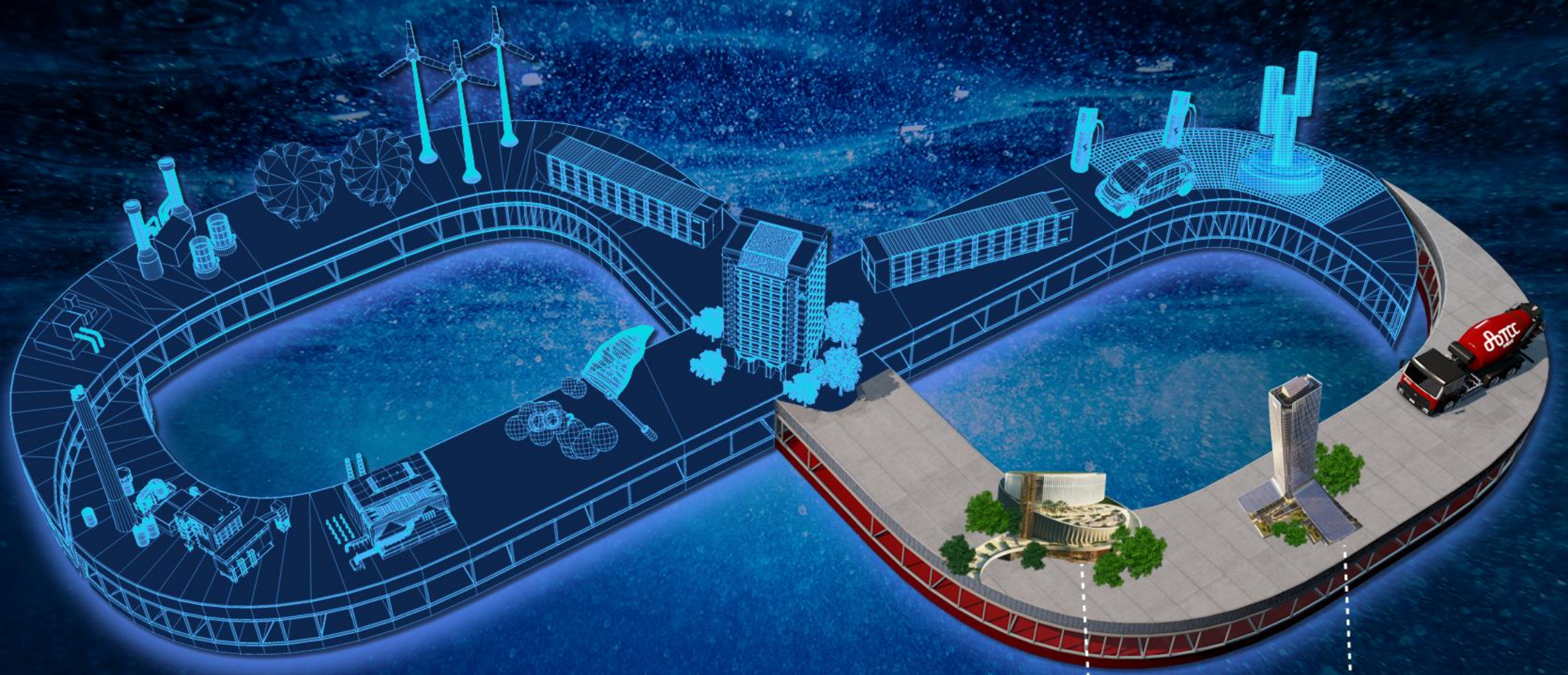


All vehicles in EU to be electrical in 2025
(around 3.38 million vehicles)

Global EV Sales CAGR

23%





Waste Treatment -----

Low Carbon Building Material Transformation -----

Low Carbon Cement & RMC

Processed Volume



Alt.Cement
0.91 Mil. Tons

Alt.Clinker
5.68 Mil. Tons

Alt.Material
1.60 Mil. Tons

Alt.Fuel
0.90 Mil. Tons



2020 Total CO₂ Emissions Reduction
(Greater China Region)

6.20 Mil. Tons
(-13%)

1st company to
have cement
product carbon
footprint label

- Carbon reduction effects data of alternative clinker is calculated based on the clinker ratio of CNS Portland Type I cement.
- Carbon reduction effects data of alternative cement is calculated based on the cement ratio of ready-mixed concrete.
- Carbon reduction % is comparing to the scenario where no alternative fuel, material and clinker were used in 2020. (Only includes cement plants carbon reduction data in scenario)

Waste Treatment & Carbon Reduction Volume



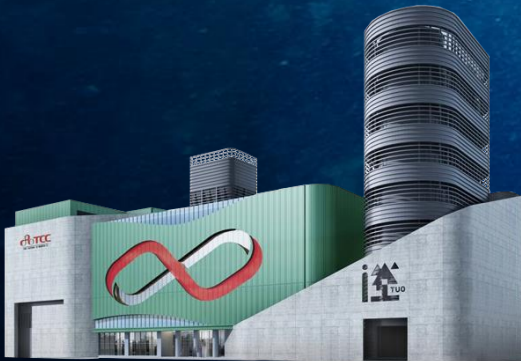
Unit: Ton



Hoping DAKA,
Hualien



Shaoguan,
Guangdong



Jurong,
Jiangsu



Guigang,
Guangxi

Waste
Treatment
Capacity

Carbon
Reduction



Green Open Factory

New Low Carbon Products Development



Ultra High Pressure Concrete (UHPC)

1. High strength and strong weather resistance
2. Most suitable for structures and exterior decoration

Carbon Curing

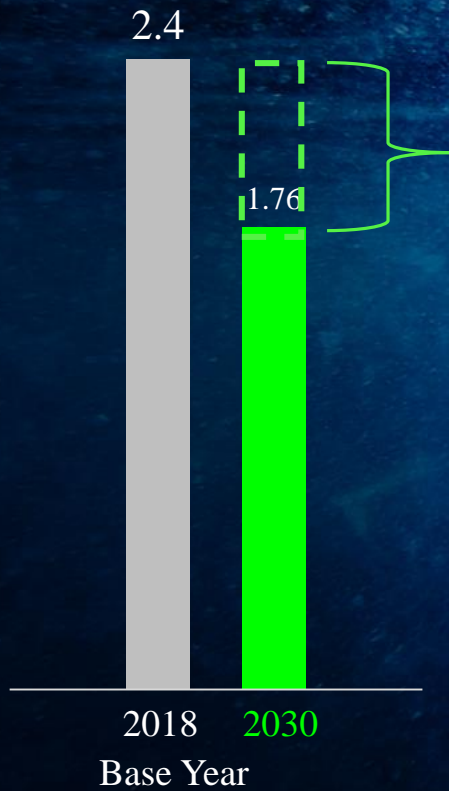
Using CO₂ curing in RMC:

1. Enhance RMC pressure strength
2. **Lock-in and store CO₂** (every unit of RMC can absorb **1.5%~2.0% CO₂**)

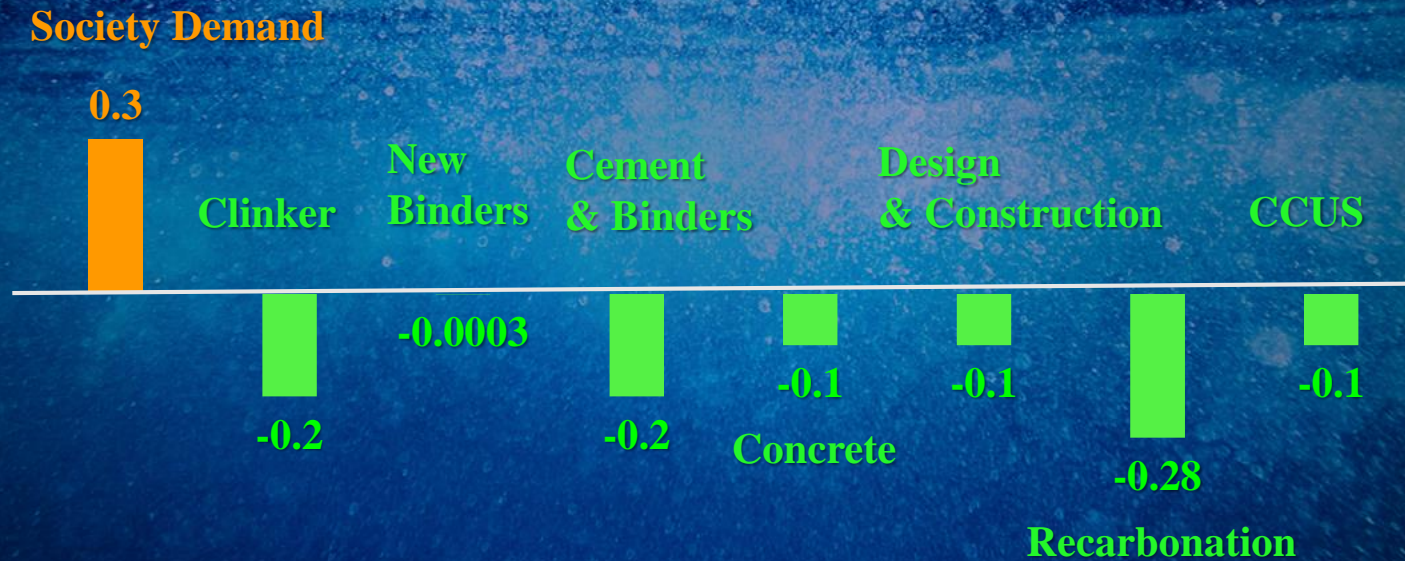
TCC Carbon Neutral RMC Plan, Stage I (2018 vs. 2030)



CO₂ Emissions
(Mt CO₂)



2030 Carbon Reduction Plan



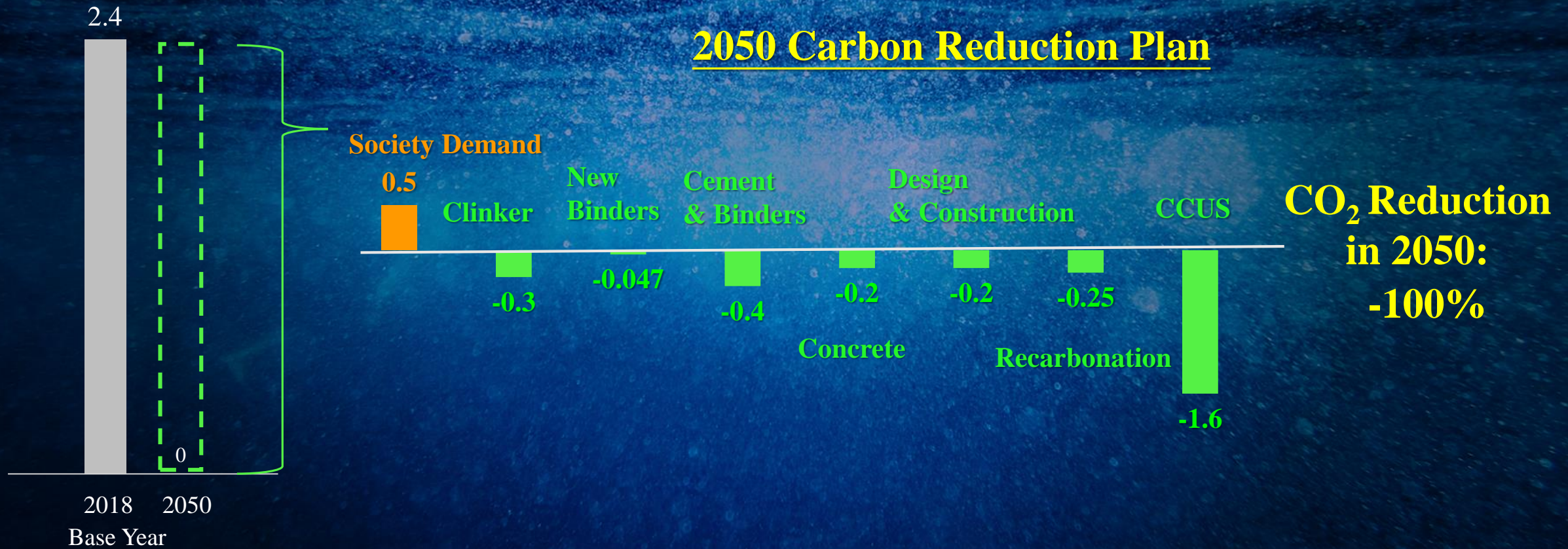
CO₂ Reduction
in 2030:
640,000 Tons

TCC Carbon Neutral RMC Plan, Stage II (2018 vs. 2050)



CO₂ Emissions
(Mt CO₂)

2050 Carbon Reduction Plan



Government Advised 4 CO₂ Reduction Phases



1st Phase: Companies need to know their carbon footprint and have carbon labels on products.



2nd Phase: Clear quota allowance differentiation by industry.



3rd Phase: Carbon fee and carbon tax need to comply with international standards.



4th Phase: Use carbon trade to reward low carbon emitters.

Carbon Trade vs. Carbon Fee/Tax Comparison Assumptions



General Assumption

- Market demand remains unchanged
- Product price remains unchanged
- Carbon reduction efforts: Company A > Company B > Company C

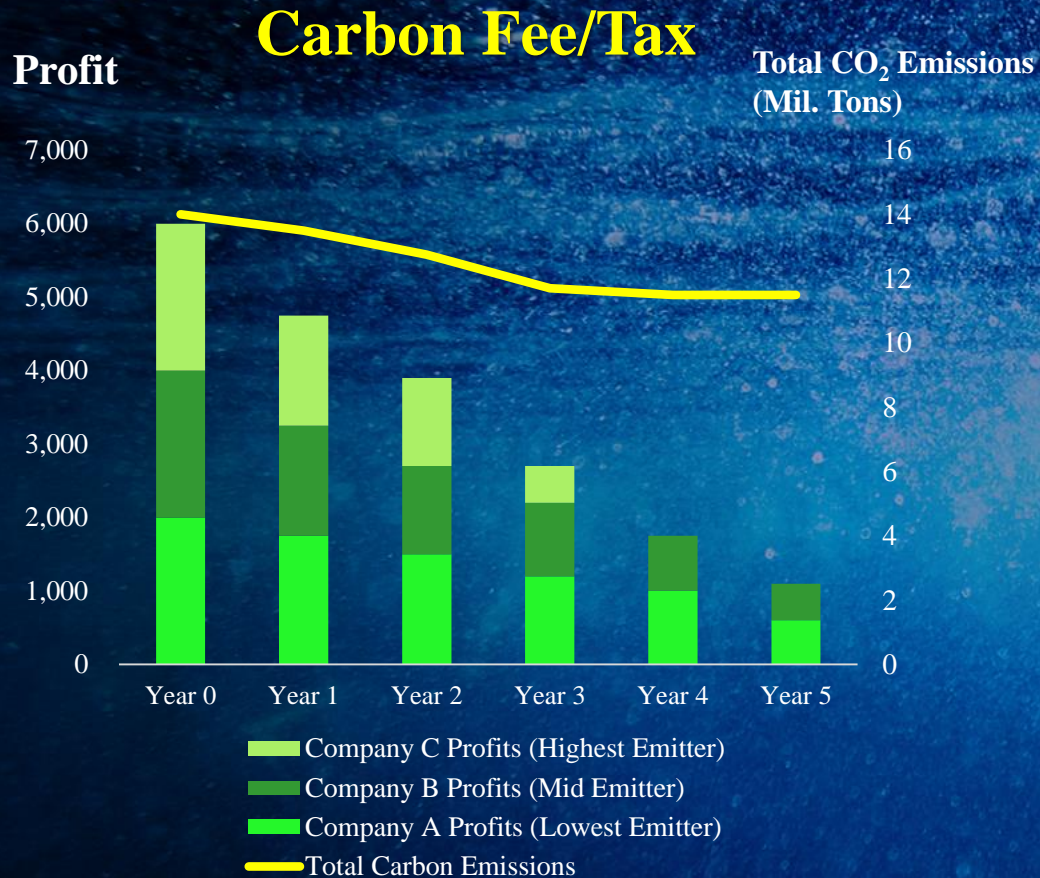
Carbon Fee/Tax Assumption

- Fee or tax rate increases annually

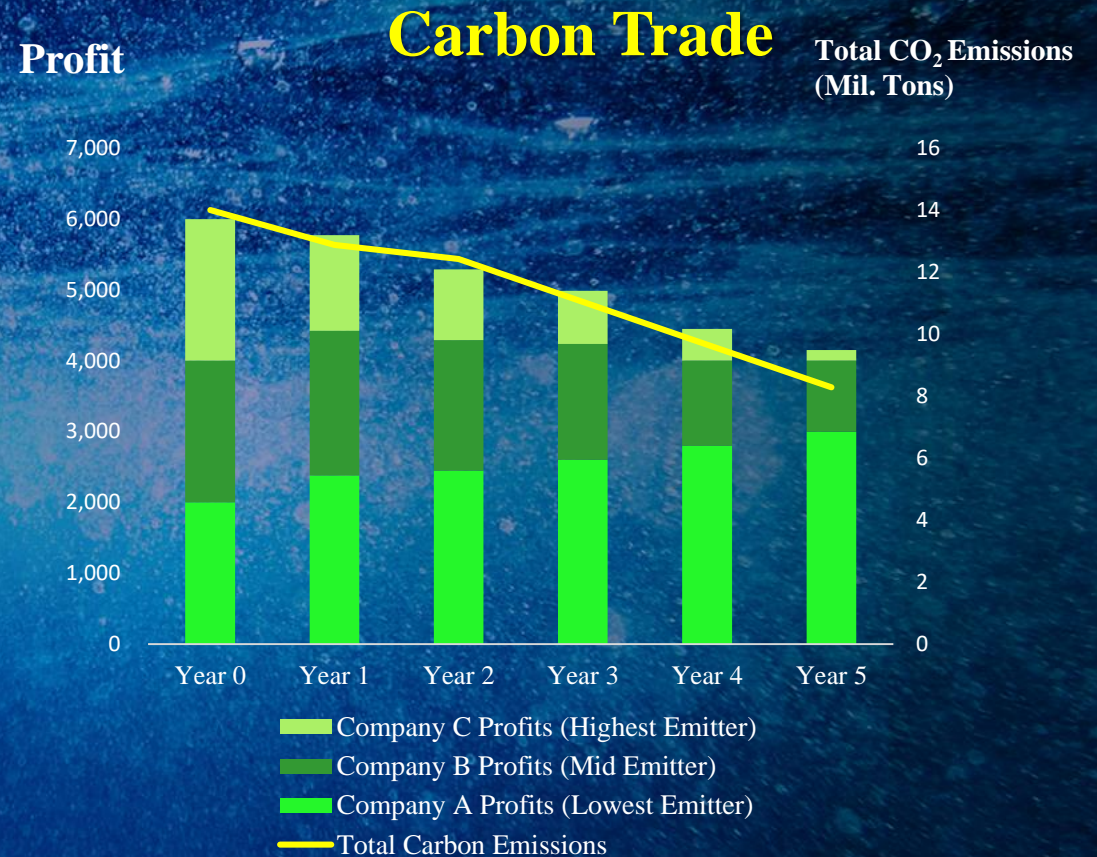
Carbon Trade Assumption

- Total carbon emissions allowed decreases annually
- Carbon trade price increases annually
- Companies comply with total carbon emissions allowed by reducing production or trade carbon allowances

Carbon Trade Rewards Low CO₂ Emitters



1. Same fee or tax rate punishes low emitters
2. Limited effects on total CO₂ emissions

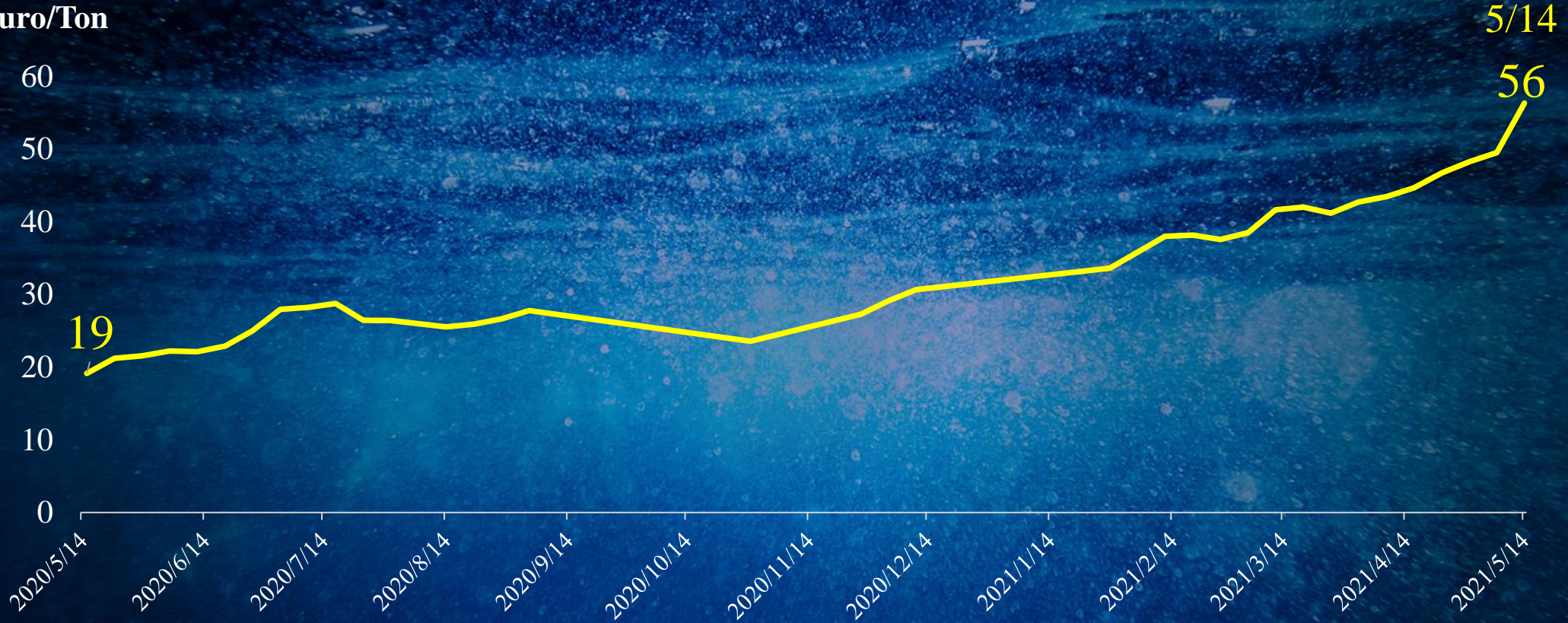


1. Market mechanism rewards low emitters
2. Effectively lowers total CO₂ emissions

EU ETS Spot Price



Euro/Ton



**Taking EU ETS as an example,
Mainland China carbon trade price expected to increase in the future as well.**

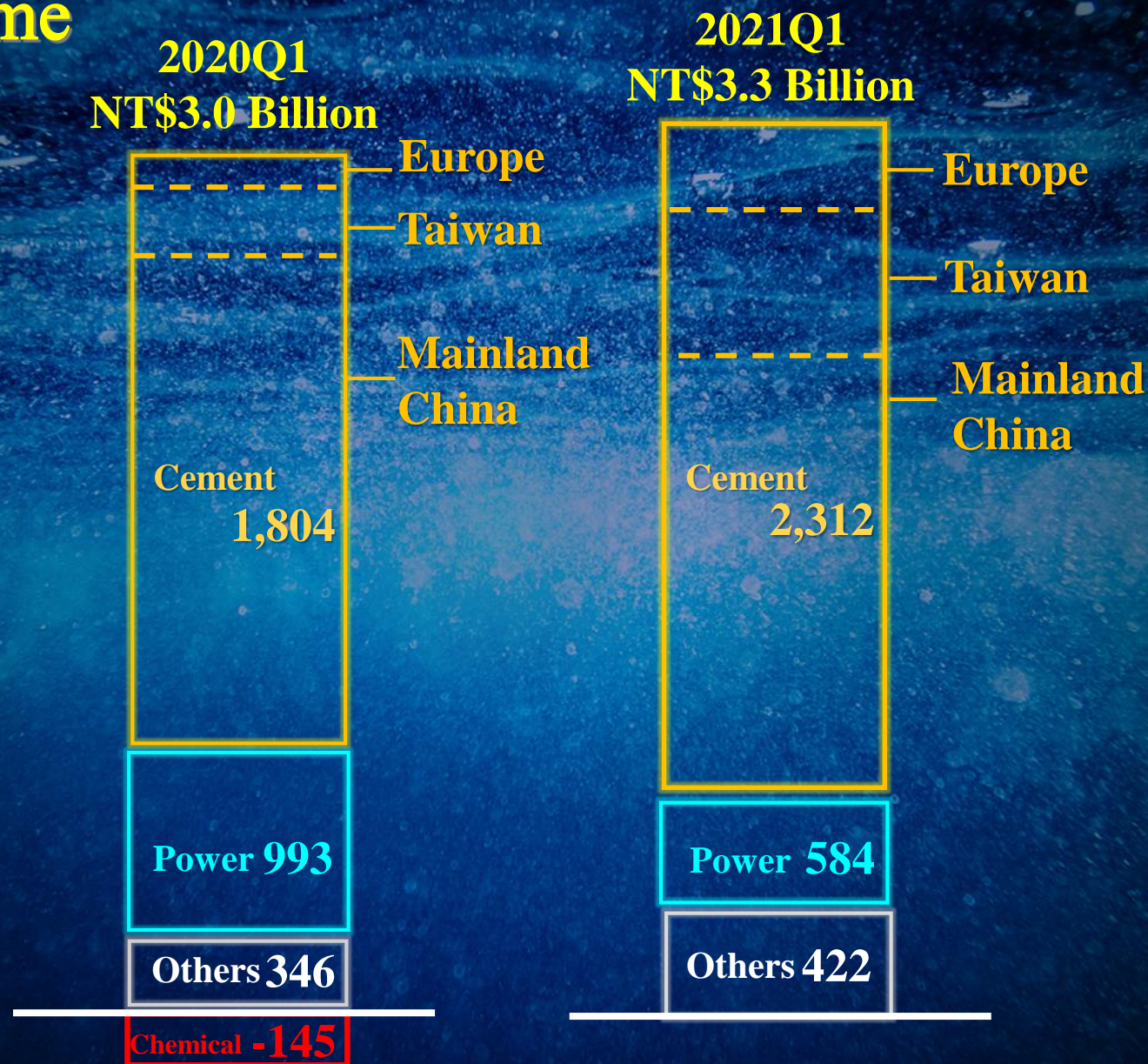




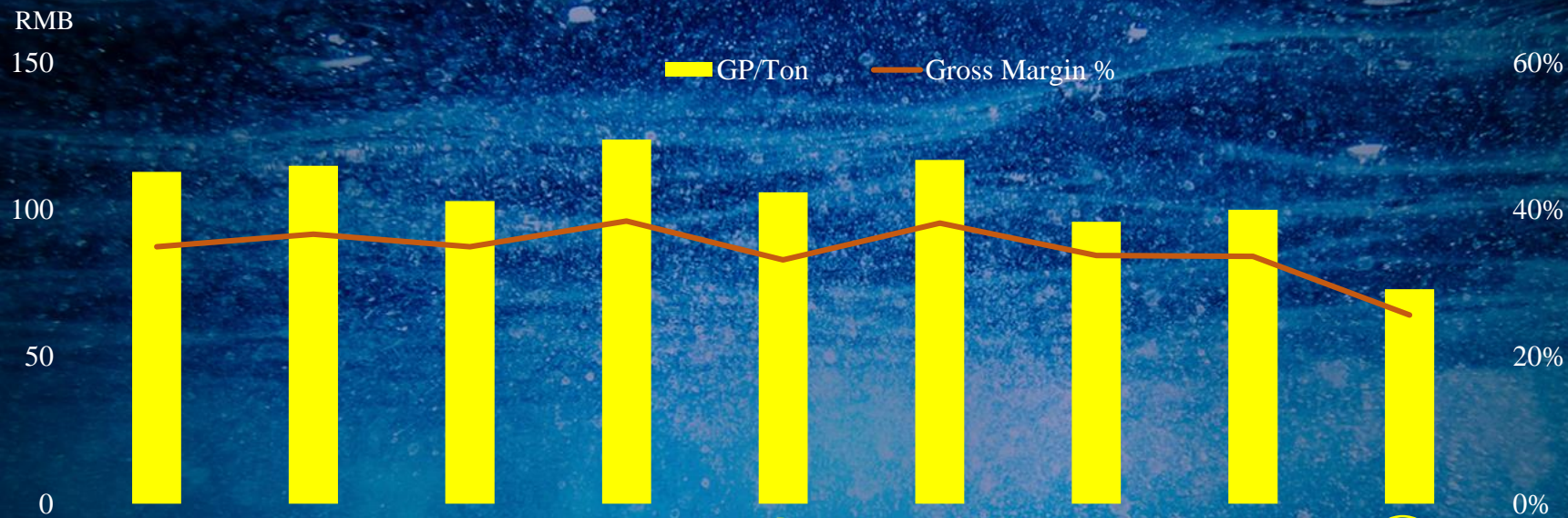
Finance

Group Net Income

Unit: NTD Million



Mainland China Cement



**Cement price
increase began in
April**

	19Q1	19Q2	19Q3	19Q4	20Q1	20Q2	20Q3	20Q4	21Q1
Sales Volume (Mil. Ton)	10.6	15.0	15.0	16.9	7.7	16	15	17	11.3
Revenue (RMB Mil.)	3,419	4,673	4,418	5,441	2,437	4,890	4,363	5,015	3,225
GP/Ton	113	115	103	124	106	117	96	100	66
Operating Profit (RMB Mil.)	893	1,332	1,075	1,642	541	1,444	1,122	1,243	436
Gross Margin %	35.0%	36.7%	35.0%	38.5%	33.2%	38.2%	33.8%	33.7%	23.2%

全国水泥价格指数 (CEMPI)

更新时间: 2021-05-11 星期二

159.03 ▲

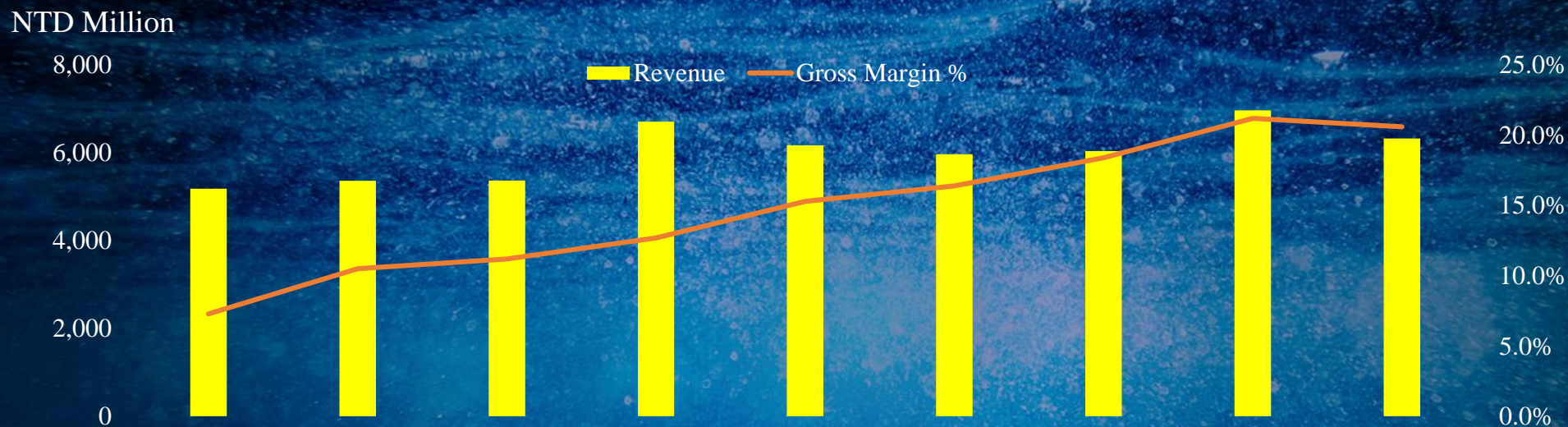
去年同期 147.51

同比涨跌 **+11.52 (+7.81%)**

指数基数: 2009年=100点

Operating Profit = (Revenue – COGS – Operating Expense)

Taiwan Cement and RMC



	19Q1	19Q2	19Q3	19Q4	20Q1	20Q2	20Q3	20Q4	21Q1
Revenue	5,186	5,363	5,368	6,708	6,174	5,971	6,039	6,969	6,622
Gross Margin %	7.3%	10.5%	11.2%	12.7%	15.3%	16.4%	18.4%	21.2%	21.5%

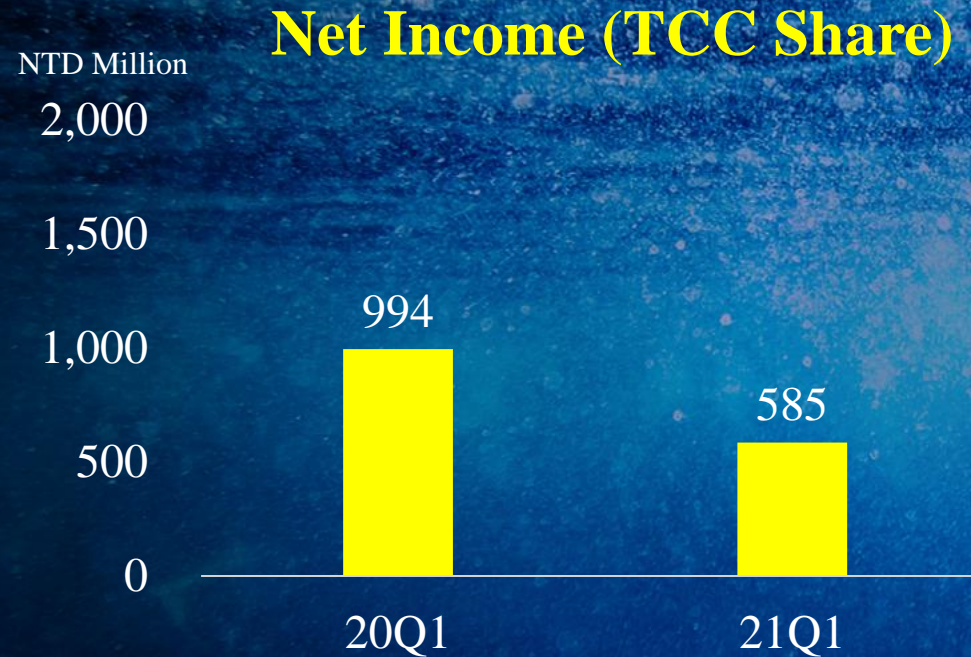
Gross Margin % = Gross Margin/Revenue

Note : Due to different sales unit, no profit per unit provided



Account: client
Password: 123456

Hoping Power



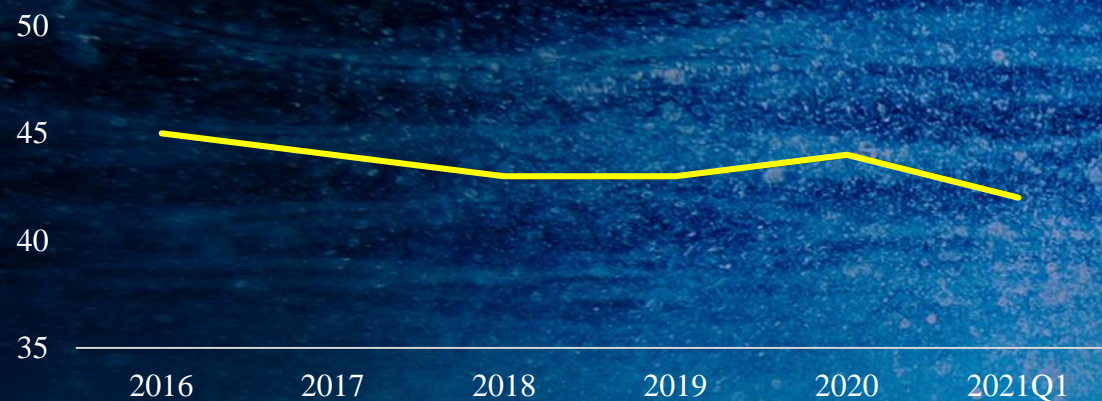
21Q1 net income decreased due to:

- 1. Scheduled 12 more days of annual maintenance to enhance power generation efficiency and safety.**
- 2. Australia and Indonesia experienced severe flood causing coal price to see short-term increase.**

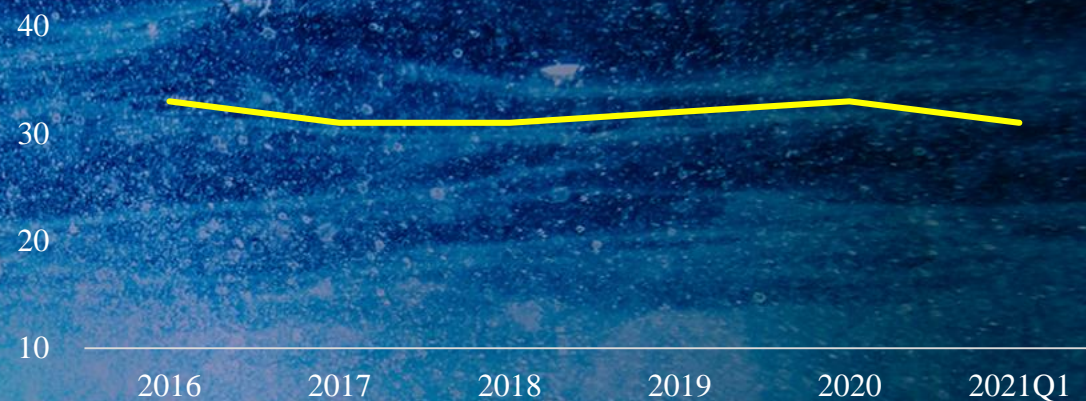
Financial Ratio



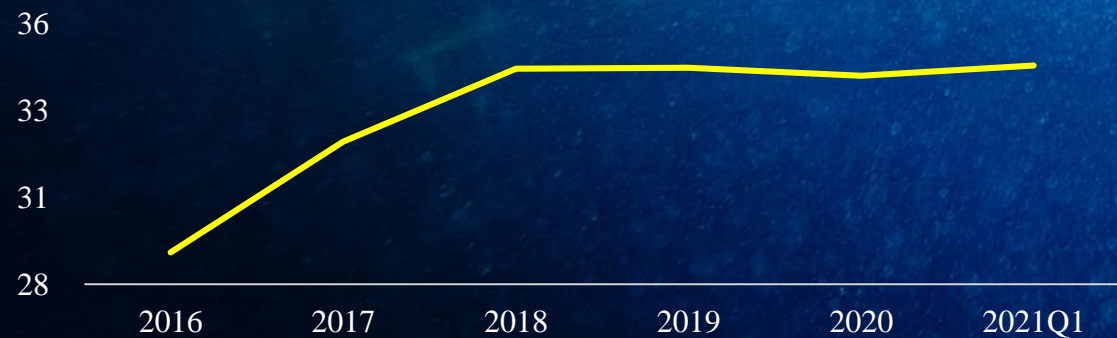
Debt Ratio (%)



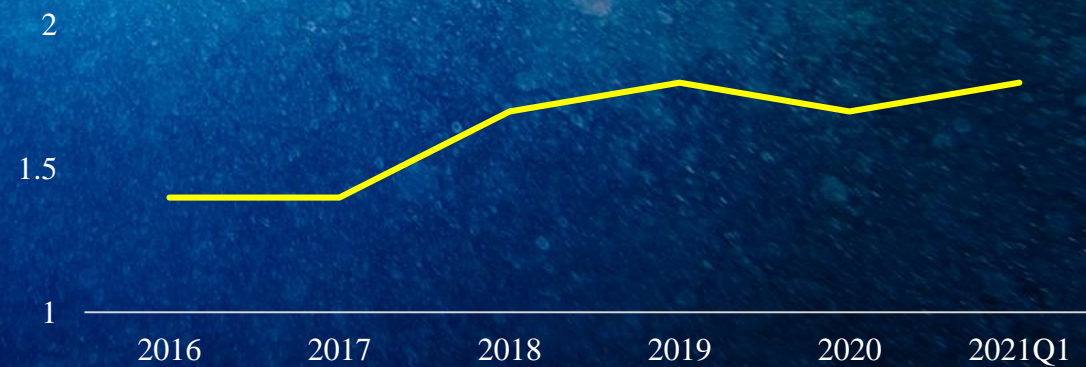
Interest-Bearing Debt Ratio (%)



Book Value per Share (NTD)



Current Ratio





ESG

2020 ESG

▼ 6%

CO₂ Emissions Density
(Cementious Material)
(Base Year=2016)

79.88MW

2021 Renewable Energy
Installation Capacity (Accu.)

100%

Water Recycling

1.025 Mil. Ton

Waste Treatment Volume

23.05%

Reused Cement/Ton

▲ 60.64%

Waste Heat
Recovery Efficiency
(Compared to 2018)

NO_x
(PPM)

Government
Standard:350

▼ 43%

TCC:200

SO_x
(PPM)

Government
Standard:300

▼ 98.5%

TCC:4.4

TSP
(mg/m³)

Government
Standard:25

▼ 88%

TCC:3

Dioxin
(ng - ETQ/Nm³)

Government
Standard:0.5

▼ 99%

TCC:0.005

2020 ESG



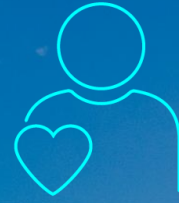
▼ **30.17%**

Employee Turnover Rate



0

Occupational Deaths in 2020



▲ **38%**

Hiring of Disability

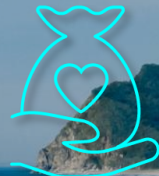


3.54

TCC DAKA
Social Return on Investment (SROI)



▲ **Near 200%**
of Company Contribution Ratio in Employee Stock Trust for Employees Aged above 60



▲ **46%**

Maternity Allowance Apply Rate



100%

Retirees Qualify for Three Insurance Coverages (Medical, Accident, and Life)

2021 Board Member Nominees and Core Strengths



▼ 21%

**Board Seats
(Reduce to 15 from 19)**



60%

**Female Independent
Directors**



1/3

**Board Seats are
Independent Directors**




Diverse

Backgrounds

**M&A, Risk Management,
Legal and Accounting**

ESG Achievements

- CDP Climate Change Leadership Grade: A-
- Supplier Engagement Rating (SER) Leadership Grade: A
- MSCI ESG Score: BB
- Sustainalytics: ESG Top-Rated Company among Global Building Material Peers
- FTSE4Good TIP Taiwan ESG Index Constituent Company
- BUSINESS FOR NATURE Member
- 2021 S&P Global Yearbook Member



The Sustainability Yearbook 2021
Tackling parity, plastics and petroleum - reflecting on values, anticipating risks and identifying opportunities

S&P Global ROBEKO

Sustainability leaders 2021	
● S&P Global Gold Class	
The Siam Cement Public Company Limited	Thailand
● S&P Global Silver Class	
Cementos Argos S.A.	Colombia
Grupo Argos S.A.	Colombia
● S&P Global Bronze Class	
Ambuja Cements Limited	India
CRH plc	Ireland
Sustainability Yearbook Members	
Cementos Pacasmayo S.A.A*	Peru
CEMEX, S.A.B. de C.V.	Mexico
HeidelbergCement AG	Germany
LafargeHolcim Ltd	Switzerland
Taiwan Cement Corp.	Taiwan

* S&P Global Industry Mover



ESG
INDUSTRY
TOP RATED





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