



솔루스 첨단소재
Solus Advanced Materials

Global No. 1 Material Solutions Partner

Solus Advanced Materials



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 - Battery Foil
 - Copper Foil
 - Electro-Materials
 - Bio



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Chapter 1.

Prologue

01. Company Overview

02. History

03. Mission

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05. Site Locations

06. Management Excellence

01. Company Overview

Future-oriented high growth portfolio on Battery foil, Copper foil, Electro-materials, & Bio business secured

Company Introduction

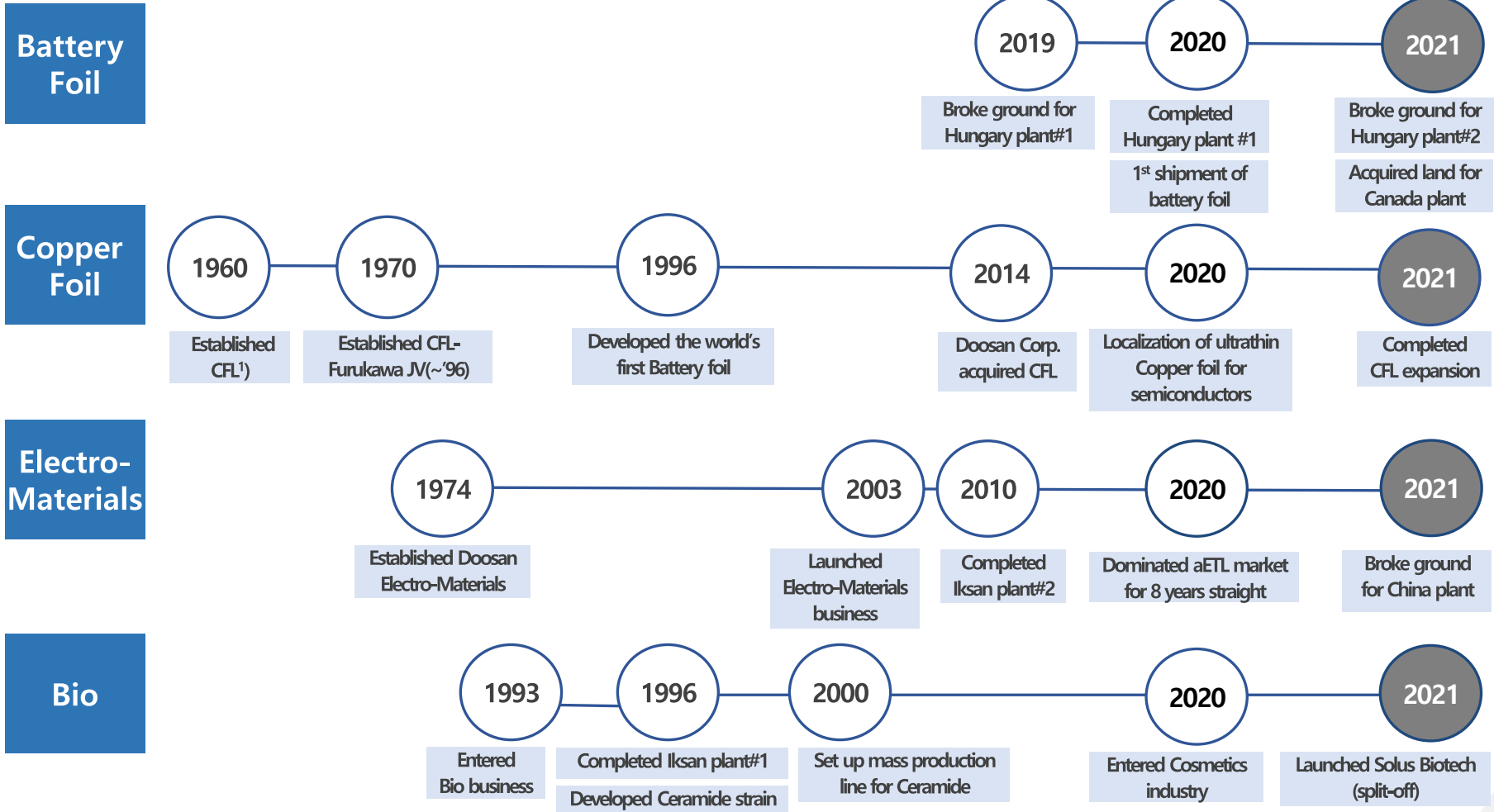
<u>Company Name</u>	Solus Advanced Materials Co., Ltd.
<u>CEO</u>	Daeje Chin & Kwangpyuk Suh
<u>Established</u>	2019.10.01
<u>Listed</u>	2019.10.18(KOSPI)
<u>Total Assets</u>	USD 982M (As of end of Mar '22)
<u>Employees</u>	1,104 (As of end of Mar '22)
<u>Sales</u>	USD 322M (As of end of Dec '21)
<u>Based</u>	627 Seodong-ro, Iksan-si, Jeollabuk-do
- <u>Battery Foil</u>	Hungary, Canada (R&D/Production/Sales)
- <u>Copper Foil</u>	Luxembourg (R&D/Production/Sales)
- <u>Electro Materials, Bio</u>	Yongin (R&D/Sales), Iksan (Production), China (Production/Sales)

Business Introduction

Battery Foil Division	Battery Foil	Core material for EV batteries	
	Copper Foil	Core material for 5G communications and electronic circuit boards	
Advanced Materials Division	Electro-Materials	Core material for OLED display on electronic devices	
	Bio	Natural ingredient for cosmeceutical, pharmaceutical and nutraceutical	

02. History

Business expansion and growth into global no.1 material company with over 60 years of experience



1) Battery foil-related core technology belongs to Circuit Foil Luxembourg(CFL)

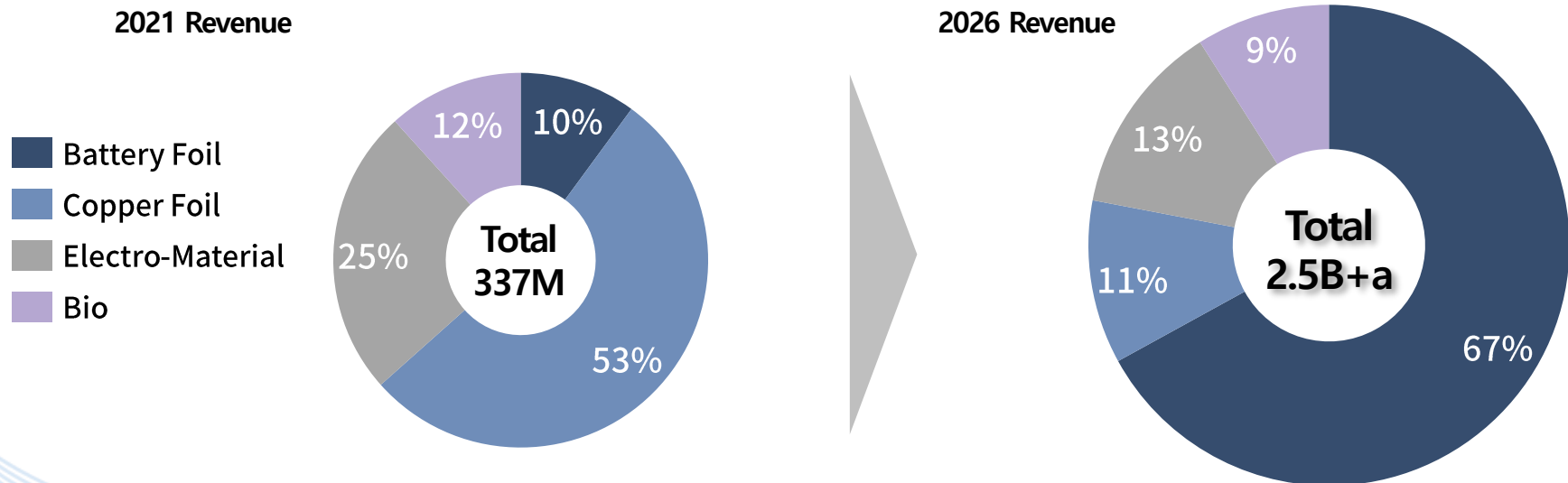
03. Mission

CREATE THE VALUE, CHANGE THE FUTURE

Based on cutting-edge technology that creates customer-value, we connect 'Advanced Materials' and 'Innovative Solutions' to humanity for a better future

GLOBAL NO. 1 MATERIAL SOLUTIONS PARTNER

Takeoff as a global leading company in advanced materials with the aim of USD 2.5B revenue by 2026



04. Company Governance

Multi-national business consisting of domestic and international corporations to secure global market



1) CFT(Circuit Foil Trading Inc.) / CFAPZH(Circuit Foil Asia Pacific Zhangjiagang) / CFAPHK(Circuit Foil Asia Pacific Hong Kong)

2) Solus Advanced Materials (Changshu) Co., Ltd

05. Site Locations

Manufacture & Sales Battery Foil/Copper Foil/Electro-Materials/Bio 7 Countries Around the World



S. Korea (Electro-Materials & Bio)



Luxembourg (Copper Foil)



Hungary (Battery Foil)



Canada (Battery Foil)

06. Management Excellence

Management composed of top industry professionals with over 40 years of experience



Mr. Daeje Chin

- CEO, Solus Advanced Materials
- CEO, SkyLake Investment
- Endowed-chair Professor, KAIST
- Former Korean Minister of Information and Communication
- Former CEO, Samsung Electronics, Digital Media Group
- Former CEO, Samsung Electronics, LSI Group



Mr. Kwangpyuk Suh

- CEO, Solus Advanced Materials
- Former CEO, Polypia
- Former CEO, Tapex
- Former President of Technology Strategy Center, SK Hynix
- Former CEO, Core Logic Inc.
- Former CEO, Samsung Electronics, ASIC/Foundry Group



솔루스 첨단소재
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Chapter 2.

Core Competency

01. Business Highlights

02. Business Overview

- **Battery Foil**
- **Copper Foil**
- **Electro-Materials**
- **Bio**

Business Highlights

Future growth business portfolio

Unique position in market

Ready to take off as global leader

Battery Foil

Battery foil demand in Europe expected to grow 7 times in 2026 with EV market expansion

World's first battery foil producer with Europe's one and only battery foil plant

Step-by-step plant expansion securing a production capacity of 117,000 tons by 2026

Copper Foil

High-end copper foil demand expected to grow 1.5 times in 2026 with the next generation 5G bloom

No.1 market share in high-end copper foil material within 5G field

Establish long-term supply system of high value product based on dominant technology

Electro-Materials

OLED electro-materials expected to grow 1.9 times in 2026 with increasing OLED application in Mobile/TV

Dominant aETL¹⁾ market position with OLED core material patents

Business portfolio expansion through organic material business, in addition to encapsulation film²⁾ and QD market entry

Bio

Bio-material market expected to grow 1.6 times in 2026 with increasing demand of natural ingredients

No.2 in global market share as Korea's one and only natural Ceramide manufacturer

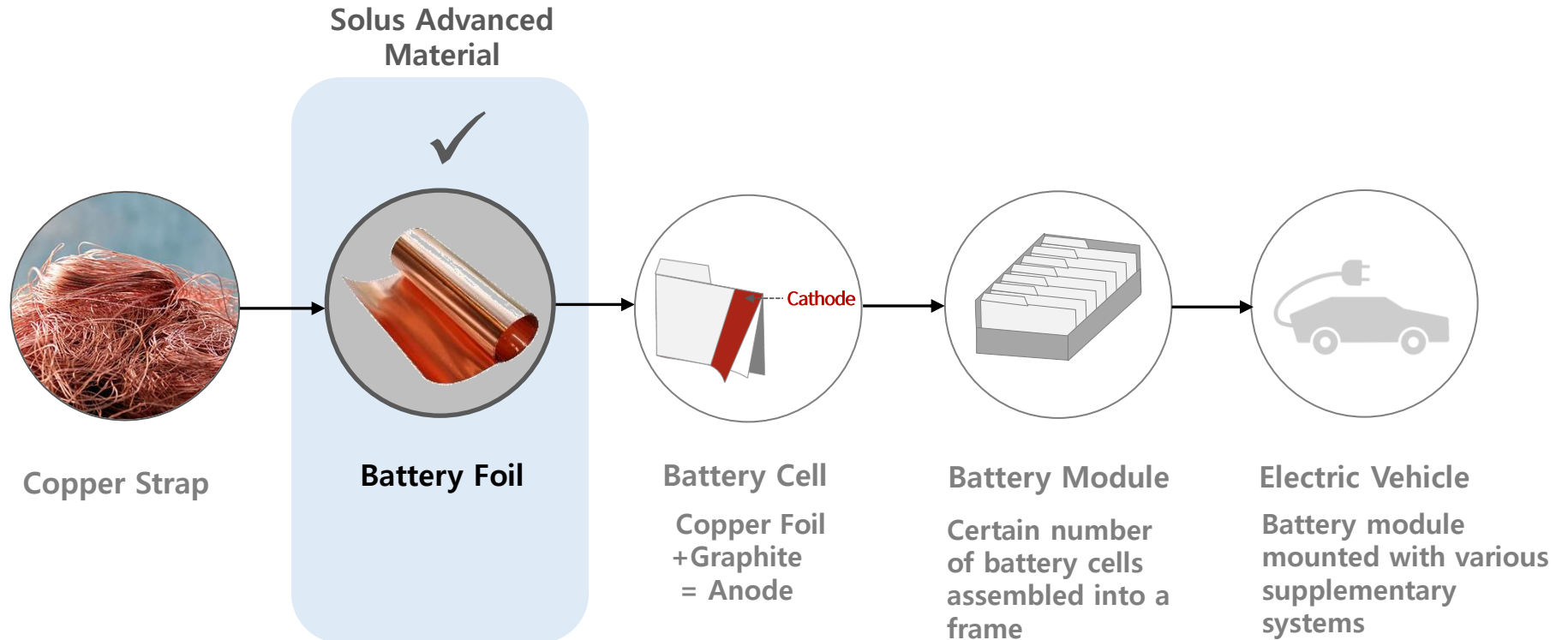
Material value chain expansion through product diversification and by securing demand of major customers

1) Additional Electron Transport Layer (aETL): ETL which improves Blue layer efficiency by 30%

2) Encapsulation Film: Located above the OLED panel cathode, it blocks the penetration of oxygen or fluid that may damage the luminous material of the organic OLED

Battery Foil Business Overview

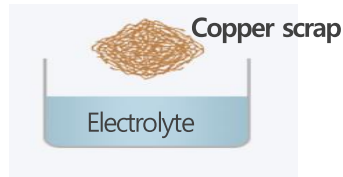
Battery foil(a type of copper foil) is a core material that forms the EV battery anode



Battery Foil Manufacture Process

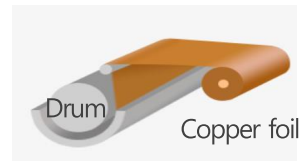
4 Steps for Completion: Dissolving → Plating → Slitting → Inspection and Shipping

Dissolving



Prepare electrolyte for plating by dissolving the raw material in electrolyte solution

Plating



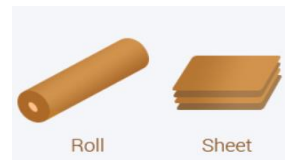
Produce copper foil by plating Cu ion on drum in electrolyte solution

Slitting & Sheeting



Slit in width direction according to customer demand size

Inspection & Shipping

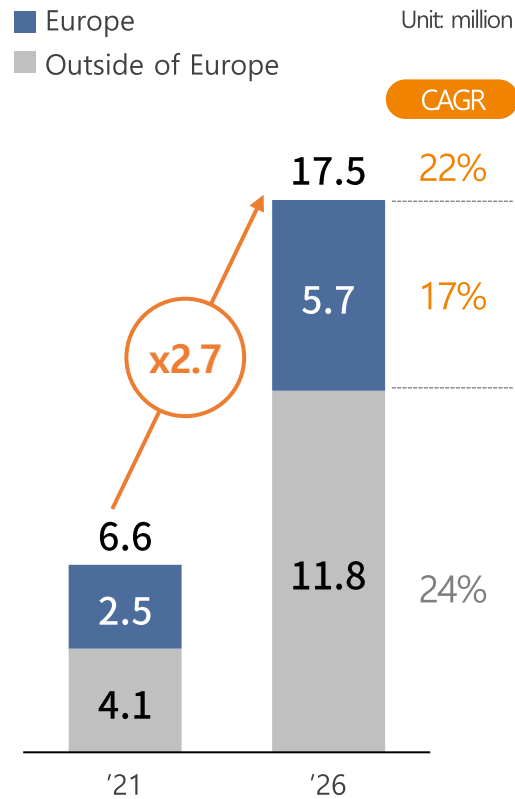


Pack and ship after strict quality inspection

Future Growth Business Portfolio

Battery foil demand in Europe expected to surge 7 times in 2026 according to EV market expansion

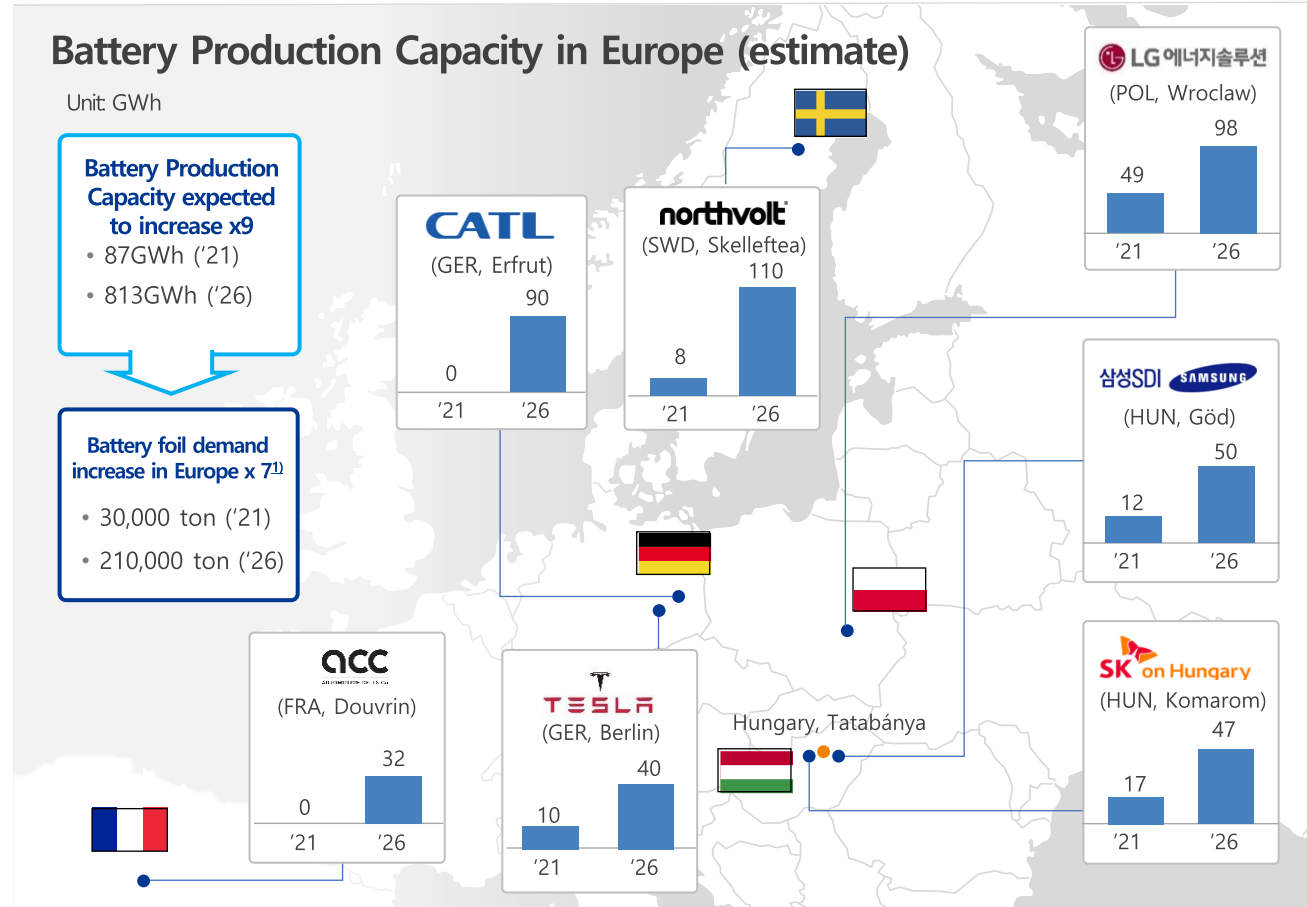
Global EV Market Outlook



Source: SNE Research (BEV+PHEV Standards)

Battery Production Capacity in Europe (estimate)

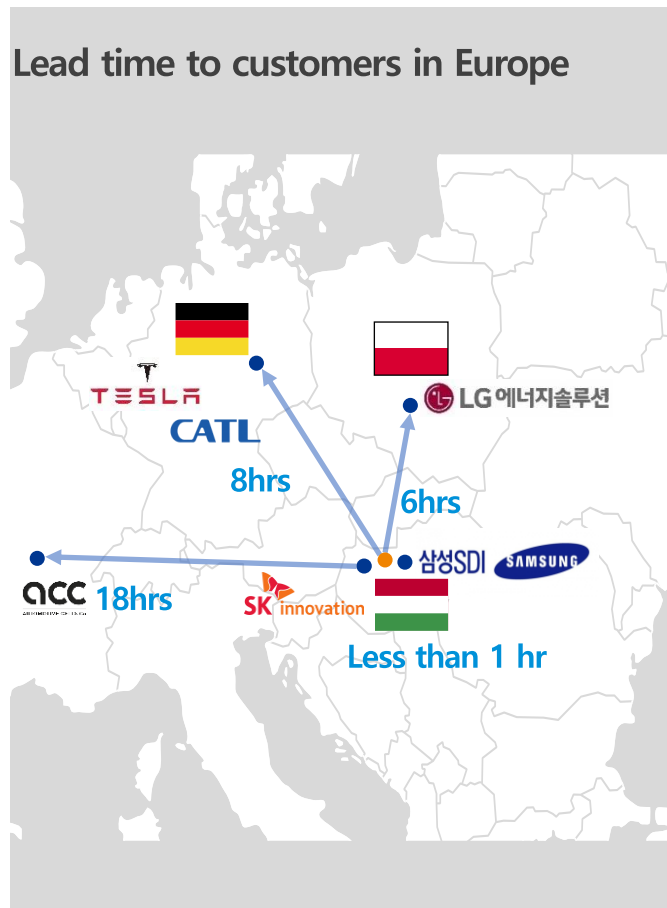
Unit: GWh



1) Amount of Battery Foil per 1GWh: 408tons/GWh ('21) → 330tons/GWh ('26), Top-Tier customer Standards

Unique Position in Market – Europe

Establish unparalleled position in market with Europe's one and only battery foil plant



Locational Advantage

Competitive edge in lead time

- Same-day shipping available for major customers
- Competitors need 5-7 weeks of lead time
 - Potential quality risks such as oxidization, deformation could be caused at long-distance shipping

Customer-focused support

- Real time technical support from local resident personnel
- Customer specific production line for certain volume order to be built

Customer Diversification

Secure Top-tier Customer

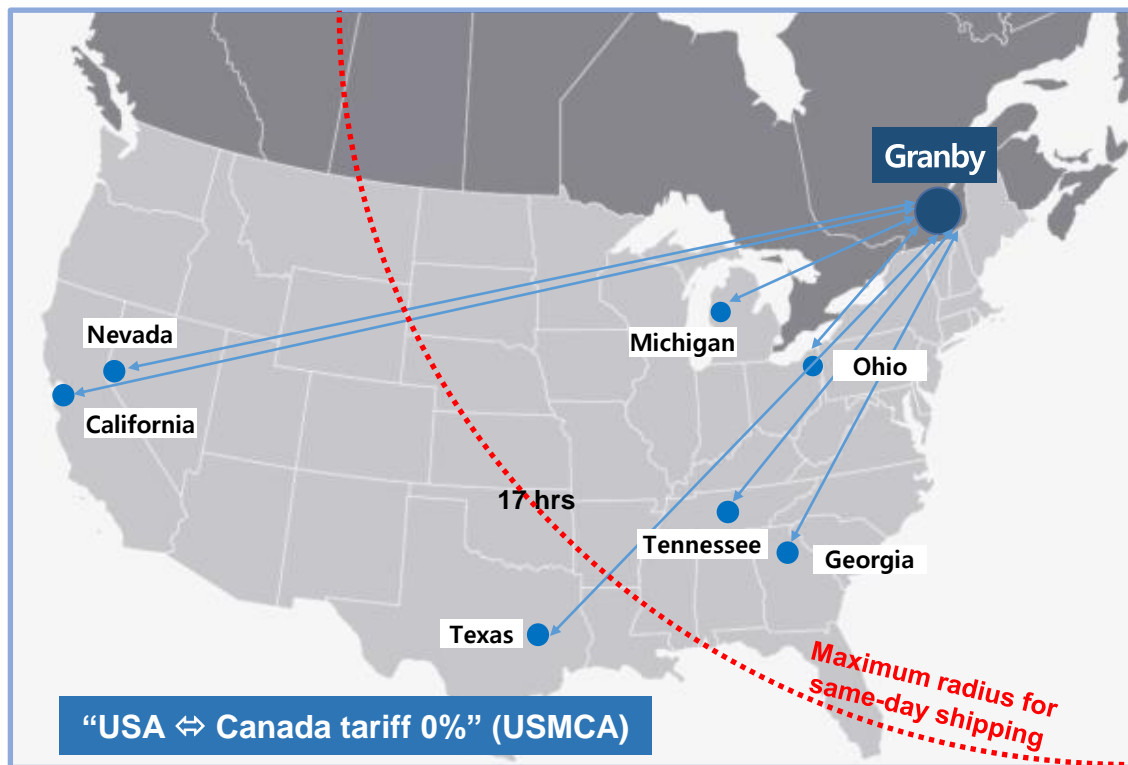
- Mid- to long-term supply contract with global top-tier battery manufacturer signed ('20)
- Mid- to long-term supply contract with global automaker signed

Supply contract with major customers in progress

Unique Position in Market – North America

Build Solus' first North America-based battery foil plant to dominate fast-growing EV market – secure real time support for major customers

Plant location and distance to customers in North America (hours)



Korea's first battery foil plant in North America

- Competitive edge in lead time
- Real time support and customer intimacy strategy available

Secure major customer

- Customer acquisition complete
 - Expected to make additional long-term supply agreement with existing customers
 - Increase in local demand at existing/new plants in North America under USMCA¹⁾

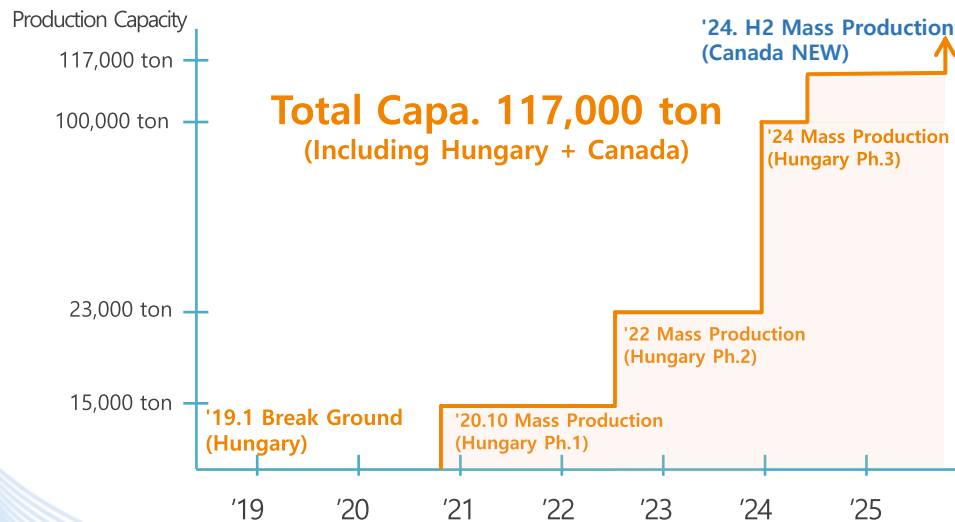
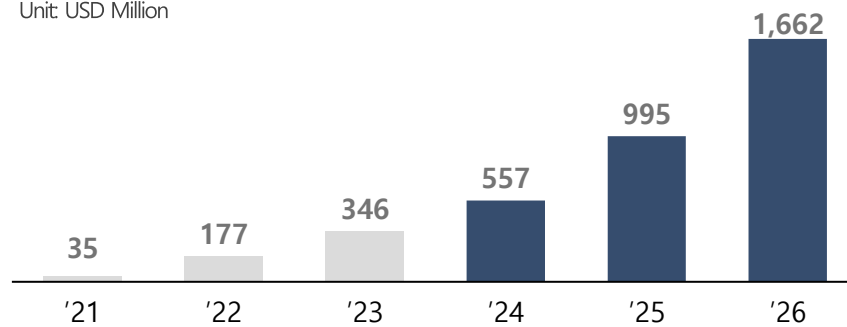
1) USMCA, US-Mexico-Canada Agreement: Effective from July 2020, tariff-free benefit is given only when 75% or more major vehicle materials/parts are acquired locally

Ready to Take Off as Global Leader

Revenue outlook of USD 1.7B in '26 with step by step capa. increase and new plant establishment in North America to respond to battery demand

Battery Foil Revenue Outlook

Unit USD Million



Growth-Acceleration Strategy

Proactive step by step capa. increase to meet battery customer demands in Europe & North America

- Europe (Hungary)

- Capa expansion in progress aiming to reach 100,000 ton by '26 [Phase 1(15,000 ton) / Phase 2(23,000 ton), Phase3(62,000 ton)]

- North America (Canada)

- Planning to build a plant in Quebec Canada for preemptive entry to North America market
- Mass production will start in the H2 of '24 [Phase1 (17,000 ton)]

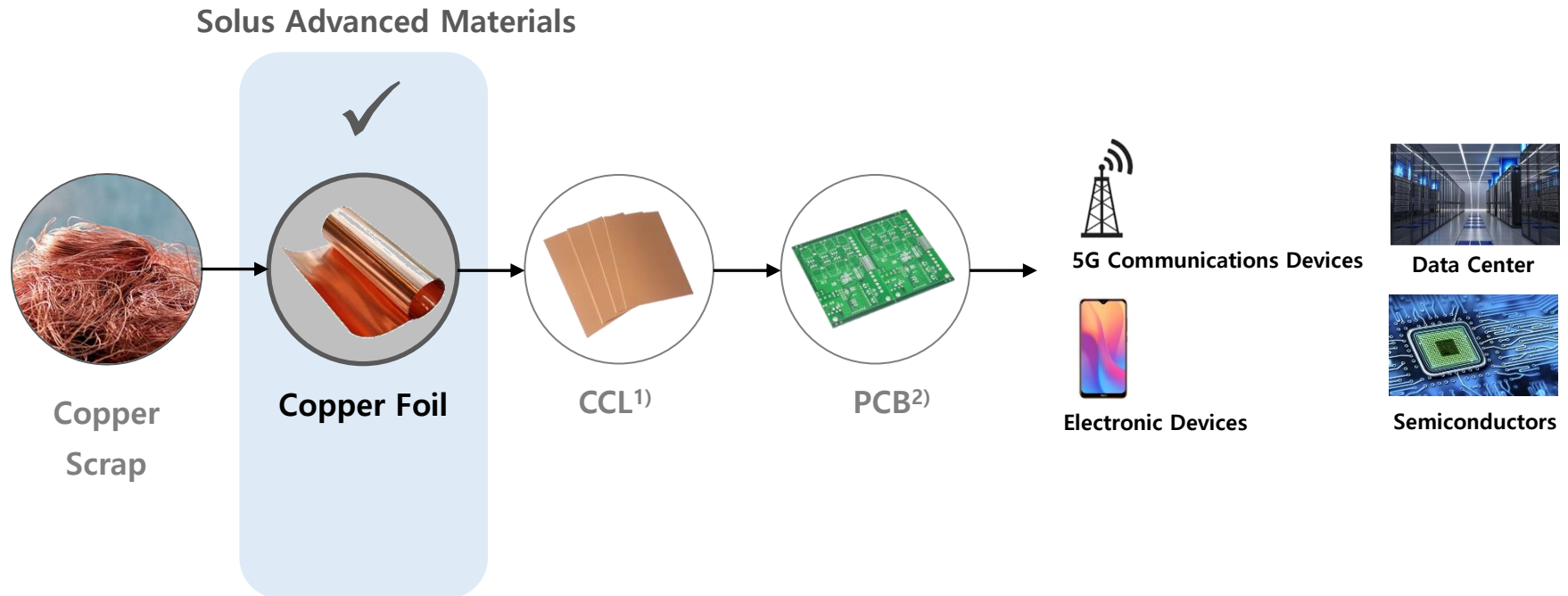


Secure stable supplies by long term supply agreement with major customers

Two-track supply to Europe & North America planned for existing customers

Copper Foil Business Overview

Copper foil is a cathodic electrolytic material used for high-end applications such as 5G communications devices and semiconductors

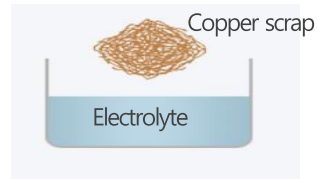


- 1) CCL: Copper Clad Laminate
- 2) PCB: Printed Circuit Board

Copper Foil Manufacture Process

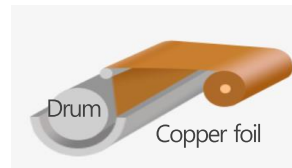
5 Steps for Completion: Dissolving → Plating → Surface Treatment → Slitting → Inspection & Shipping

Dissolving



Prepare electrolyte for plating by dissolving the raw material in electrolyte solution

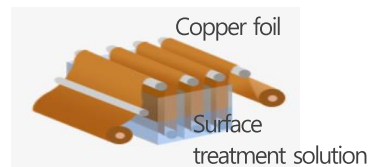
Plating



Produce copper foil by plating Cu ion on drum in electrolyte solution

Surface Treatment

(Additional process compared to Battery Foil)



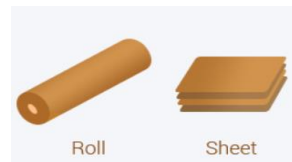
Add copper foil to surface treatment solution to improve copper foil functionality and prevent oxidation

Slitting



Slit in width direction according to customer demand size

Inspection & Shipping



Pack and ship after strict quality inspection

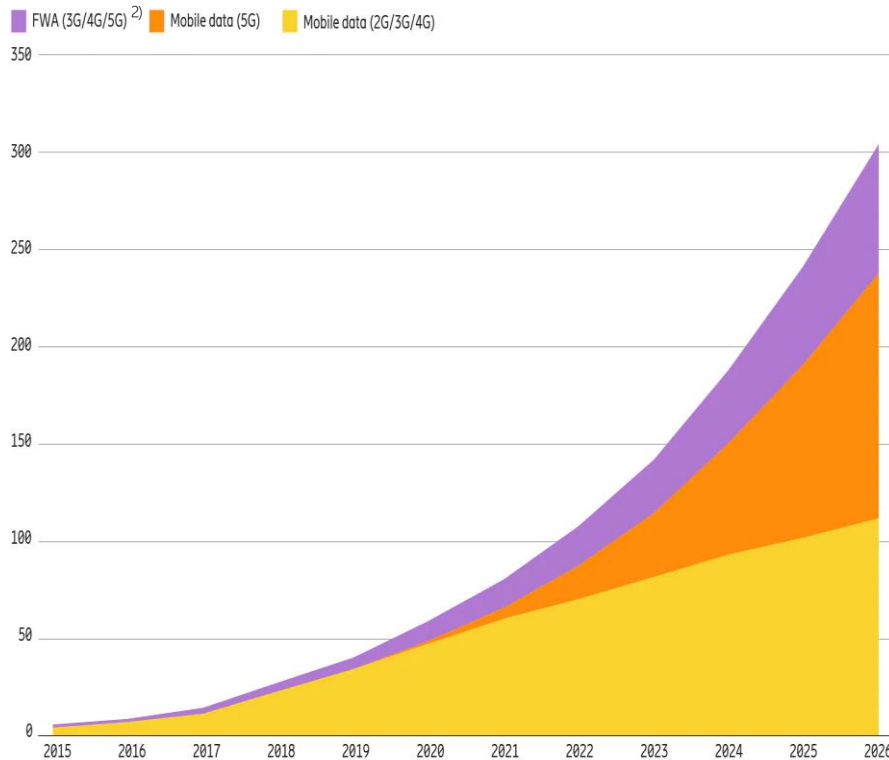
Copper Foil Market Growth

Steep increase in high-end copper foil demand with explosive growth in wireless infrastructure

Global Mobile Data Traffic

Unit: Exabyte¹⁾ per month

Source: Ericsson Mobility Report, Prismark



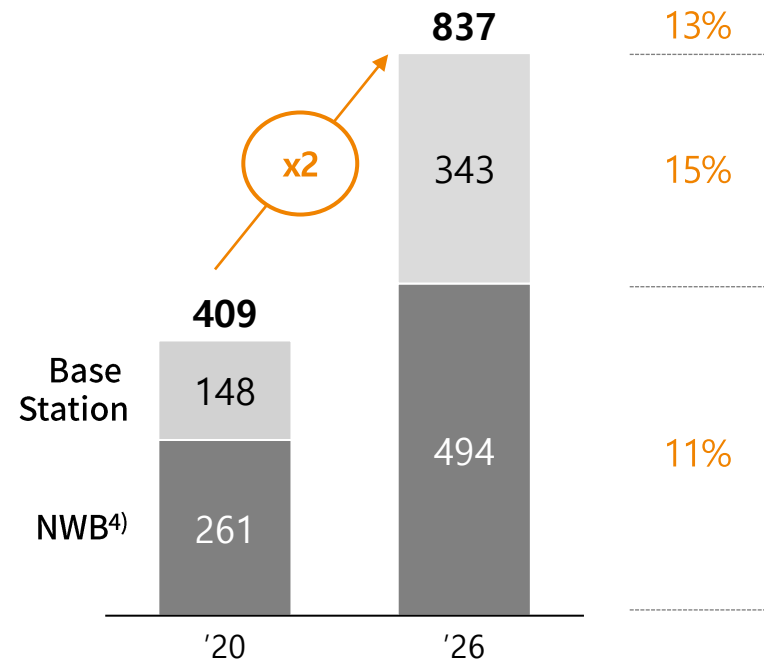
1) 1,000,000 Terabytes = 1,000 Petabytes = 1 Exabyte

2) FWA(Fixed Wireless Access): Wireless communication technology that provides high speed internet service via wireless connection of fixed customer device to base station, the network connection point.

5G CCL³⁾ Demand Forecast

Demand for high-end copper foil CCL expected to increase x2

Unit: USD Million



3) CCL(Copper Clad Laminate): Major application of copper foil in PCB material

4) NWB(Network Board): Router, switch, server etc.

Unique Position in Market

Global No.1 high-end copper foil manufacturer with 60 years of R&D and mass production experience

No.1 in
High-end
Copper Foil
Material



M/S No.1 (53%)¹⁾ in high-end copper foil used for 5G

- Low Loss Copper foil
- High Frequency Copper foil
- 5G Low Loss Copper foil, Ultrathin Copper foil for Semiconductor Package

1) As of '21

60 years of
Knowhow
Accumulated

- 1959 Establishment of Circuit Foil Corporation Bordentown Inc. (New Jersey, US)
- 1960 Establishment of CFL (Luxembourg)
- 1970 Establishment of CFL-Furukawa JV
- 2014 Doosan Corp. acquired CFL
- 2021 3,000ton expansion of CFL Copper Foil (Capa. Total 15,000 ton)

60 years+ experience in R&D and mass production enable us to secure leading technology of copper foil & stable supply of products

- Established in 1959 with 60 years of know-how accumulated
- Developed & mass-produced world's first battery foil
- Secured mass production technology of ultrathin copper foil (less than 2um) for semiconductors

Ready to Take Off as Global Leader

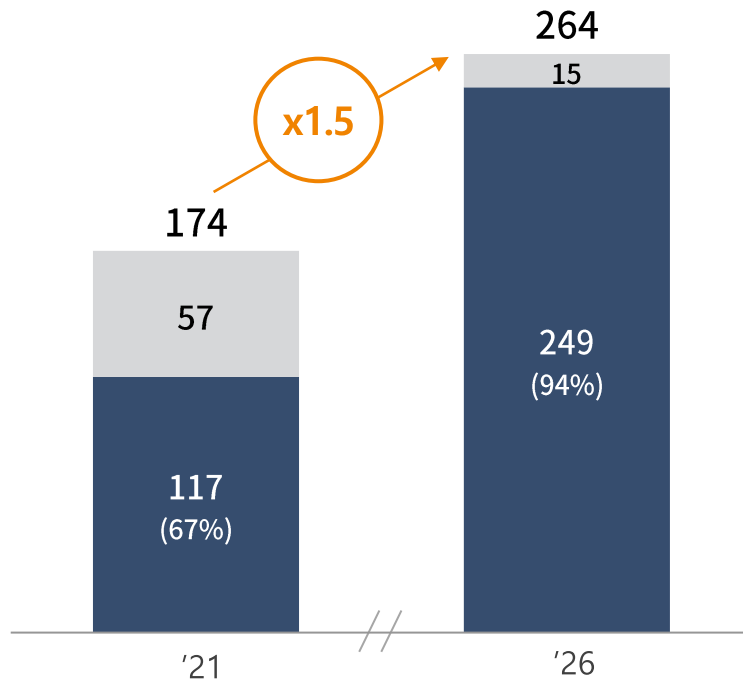
Sales outlook exceeding USD 253M in 2026 with high-end/high-margin product portfolio increase

Copper Foil Revenue Outlook

■ High-end (%)

■ Standard

Unit: USD Million



Growth-Acceleration Strategy

Increase high-margin products for 5G

- Low-loss, low-roughness copper foil
- High-frequency copper foil



Leading the market with the development of ultrathin copper foil (less than 2um) mass production technology for semiconductors

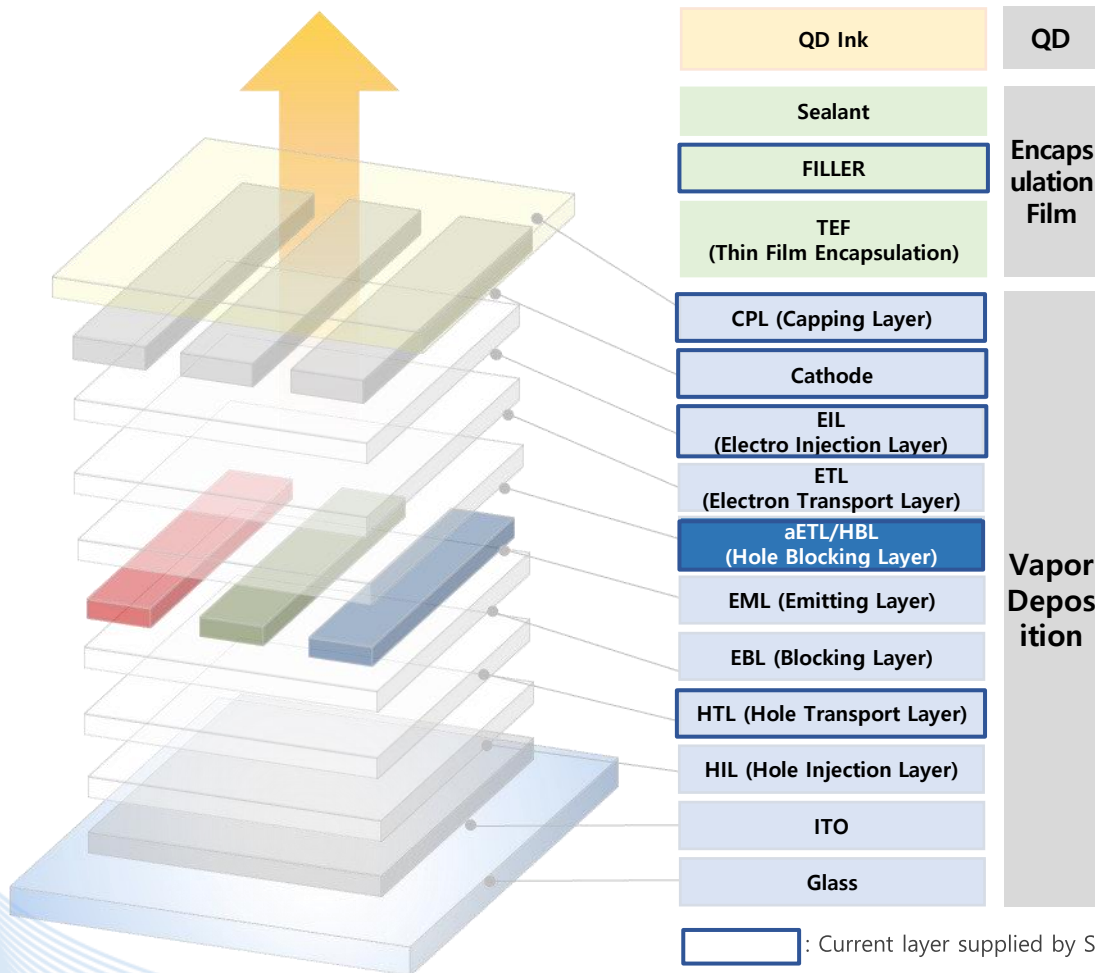
- Customer approval in 2021
- Mass production begins in 2022



Electro-Materials Business Overview

Manufacture key OLED materials to supply to major global panel makers

Solus Advanced Materials Business Field seen through OLED Layer Structure



Core Development Field: EML

- High efficiency, long-lived green phosphorescence P/N host
- Long lifetime deuterated fluorescence blue host
- High T1 blue phosphorescence host

Core Business Field: aETL/HBL (Hole Blocking Layer)

- Core technical element to maximize OLED luminescence efficiency
- 30% increase in blue brightness and vivid color realization
- Increase lifespan of OLED panel

Business Portfolio Expansion

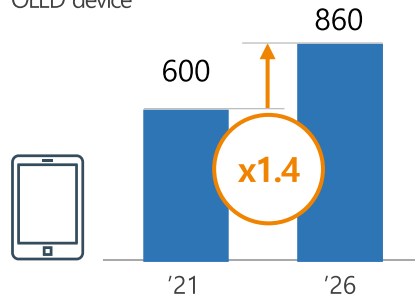
- Enter OLED organic material and encapsulation market for business portfolio expansion
- Develop QD Ink, a core technology for next generation display, to secure future growth engine

Future Growth Business Portfolio

OLED material demand expected to grow 1.8 times with increasing adoption of OLED display

Mobile

Unit: Million OLED device

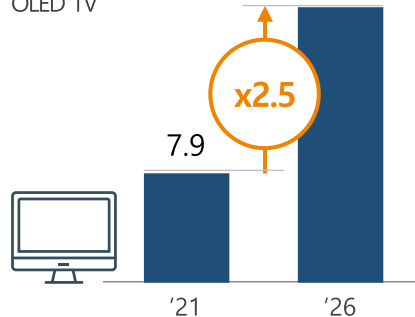


Major smartphone manufacturers

Prospect for increase in OLED display adoption

TV

Unit: Million OLED TV



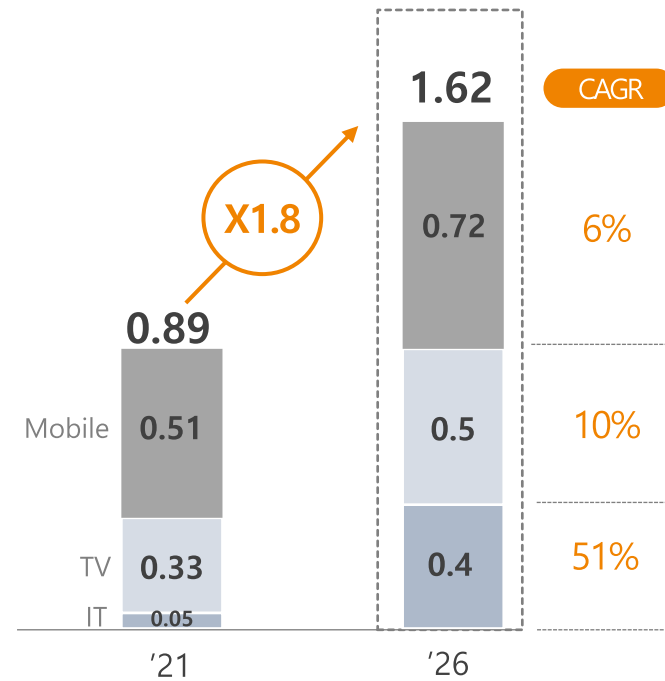
Major TV manufacturers

Prospect for increase in OLED TV mass production

Source: IDC, Omdia

OLED Materials Market Forecast

Unit: USD Trillion



Unique Position in the Market

Holding core IP for functional material & major panel maker references

Holding
Core IP

Holding core IP for OLED blue functional material (aETL) ¹⁾

- Enhance electric power efficiency of blue by 30%, which has high power consumption, and improve brightness
- Core IP: Application(December 2013), Registration(July 2016)

aETL was awarded the Minister prize by Ministry of Trade, Industry and Energy at the Korea Technology Awards in 2015

No.1 market share in aETL products within global organic material market

Major panel
maker
references

Holding product supply record to global TOP panel makers and joint products being developed



- Continuous supply of OLED materials for mobiles
- Enter mass production of OLED TV organic material & encapsulation



- Continuous supply of partial OLED materials for mobiles since 2017
- Joint development of high-end materials for mobiles

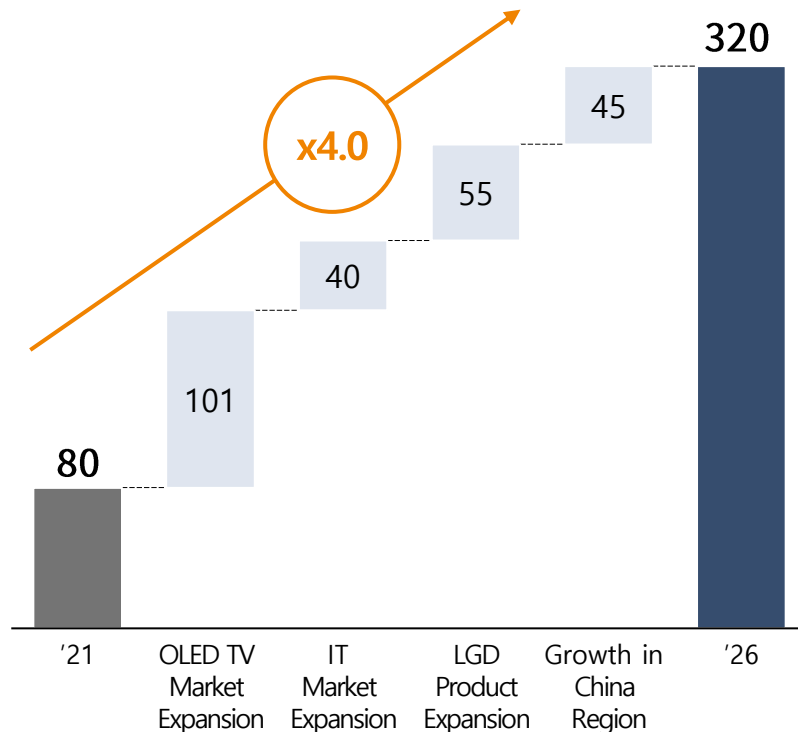
1) KR 2013-0157627

Ready to Take Off as Global Leader

Revenue outlook of USD 320M in 2026 with OLED product/customer diversification & increase in supply for international panel makers

Electro-Materials Revenue Outlook

Unit: USD Million



Growth-Acceleration Strategy

Increase product supply for OLED TV

Increase product supply of existing luminous materials and non-luminous materials

Increase product supply for IT

Market growth and product supply increase with increase in OLED adoption in laptop and tablet markets

Increase new material supply for LGD

Expand product range supply for TV/Mobile

Joint product development with global panel maker (in China Region) and increase supply through customer-focused support

Future Growth Business Portfolio

Bio market expected to grow 1.7 times with increasing customer needs for natural ingredients

Cosmeceutical Natural moisturizer (Ceramide) ¹⁾	With the advancement of functional derma cosmetics containing ceramide, prospects for growth in technology development and applied field
Pharmaceutical Phospholipids (PL) ²⁾	Prospects for continuous growth as essential ingredient in lipid emulsion infusion market for the aging society and patients with nutritional imbalance
Pharmaceutical/ Cosmeceutical Natural emulsifier (PC) ³⁾	With a growing trend in adult disease, prospects for high growth in PC markets, which is effective in improving liver function (fat decomposition)
Nutraceutical Natural ingredients for cognitive function enhancement (PS) ⁴⁾	With an aging population trend, prospects for high growth in PS market, which is effective in enhancing cognitive function

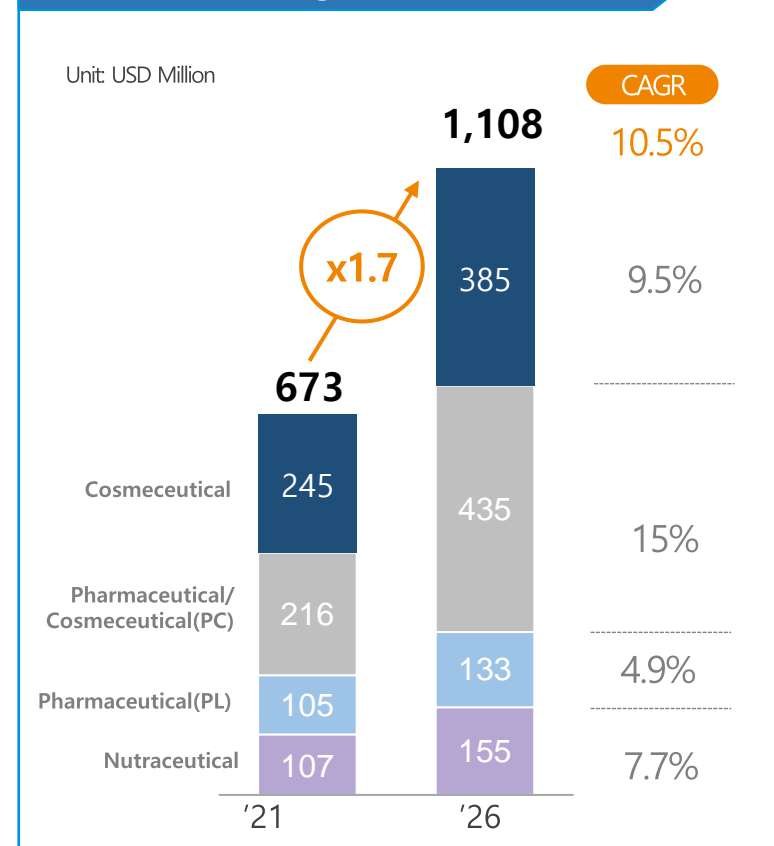
1) Ceramide: Bio-material used in cosmeceuticals for skin moisture and anti-inflammation

2) Phospholipids: Complex fluid that plays an important role in forming the cell membrane

3) Phosphatidylcholine: Typical phospholipid (rich in the brain/neurotransmitter/egg yolk lecithin)

4) Phosphatidylserine: A kind of phospholipid (rich in the brain/neurotransmitter/soybeans)

Bio-Material Target Market Forecast



Source: Persistence Market Research, Credence Research, Kalorama Information, QY Research, Us, Future Market Insight

Unique Position in Market

Manufacture materials for cosmeceuticals, pharmaceuticals and nutraceuticals, based on original technology for natural bio ingredient production

**Korea's
one and only
maker**

Korea's one and only natural Ceramide manufacturer, M/S 95%

- The world's second company with natural Ceramide manufacturing technology
- Main supplier of natural ceramide to major domestic and foreign customers

**Various
material
production
technology**

Possesses bio-material production technology for various natural ingredients, such as egg yolk lecithin, yeast, soybeans, plants and milk etc.



Cosmeceutical

Pharmaceutical

Nutraceutical

- Yeast-based natural cosmeceutical material (Ceramide)
- Egg yolk lecithin based high purity phospholipid material
- Natural emulsifier: Awarded as Global top-class product by the Ministry of Knowledge Economy ('08)
- PS : Certification by the Ministry of Food and Drug Safety in Korea ('06)
- US FDA recognition for effectiveness in preventing Dementia ('10)

**Cosmetics
Brand**

Derma heritage cosmetics brand, 'MY SKIN SOLUS' (Launched in Oct. '20)

- Development and application of advanced individual Ceramide (CERAPYome™)
- Securing lineup per skin concerns such as CERAPYome™, CITOPYome™ & EGOSTIC™, etc. and continuous portfolio enhancement

**MY
SKIN
SOLUS**

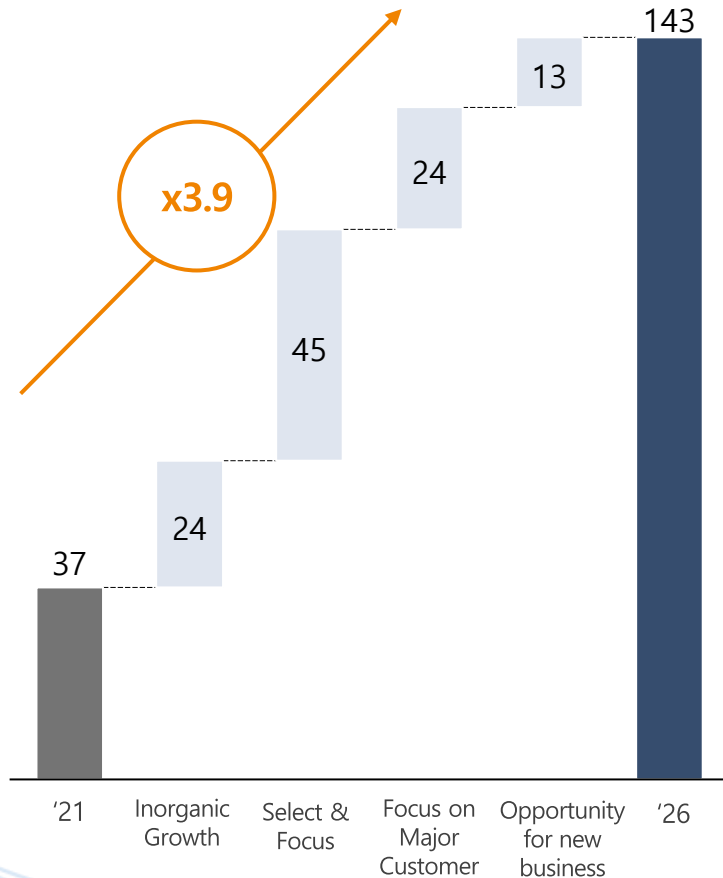


Ready to Take Off as Global Leader

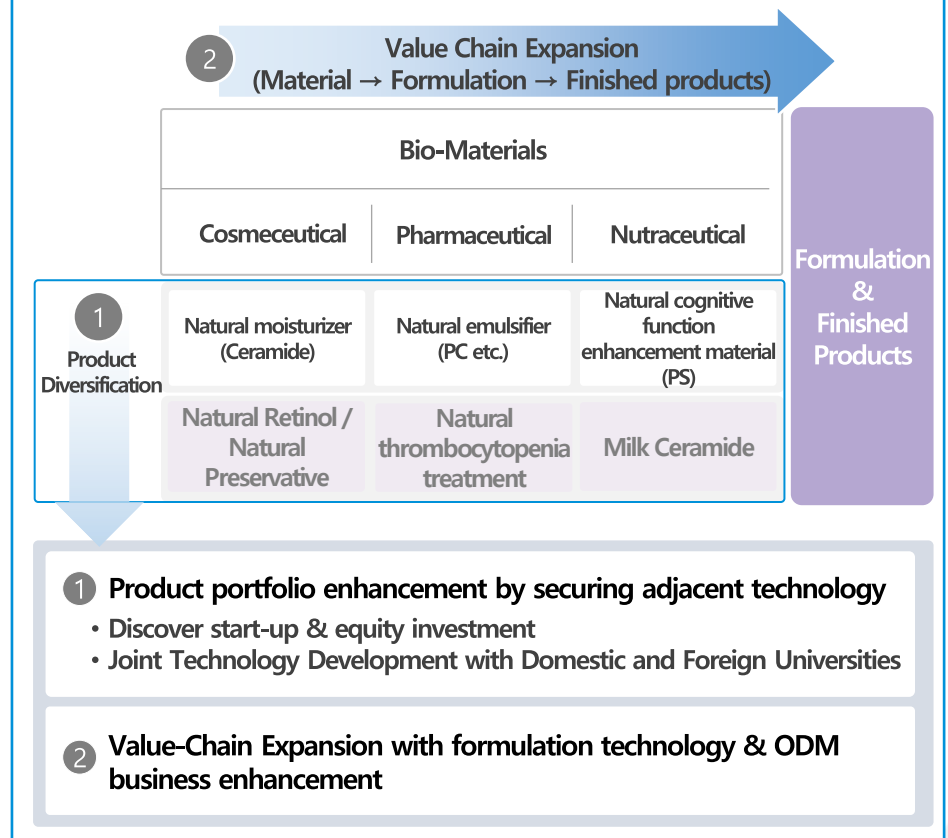
Revenue outlook of USD 143M in 2026 expected with business expansion through product diversification & value chain expansion

Bio Revenue Outlook

Unit: USD Million



Growth-Acceleration Strategy





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THANK YOU