【Advanced Materials Business】 Advanced Materials Div.

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Executive Officer
General Manager of Advanced Materials Div.

SUMITOMO METAL MINING

Materials Business　Aiming the independence as a core business

Establish a strategic implementation structure for the battery materials business and sustainable growth for the advanced materials business

Materials Division

April 1, 2019

Battery Materials Division

- Quicken decision-making
- Promote company-wide battery materials strategy (nickel, cobalt)
- Strengthen the business management structure

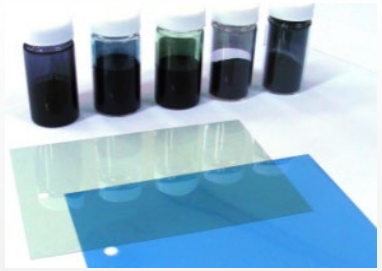
Advanced Materials Division

- **Maximize profitability of existing businesses**
- **Create new business, advance incubation**

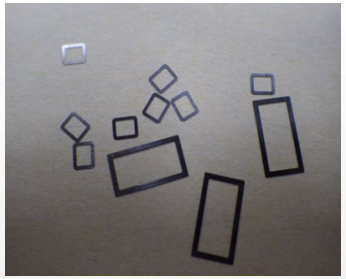
The three businesses supporting the Advanced Materials Division

Powder materials

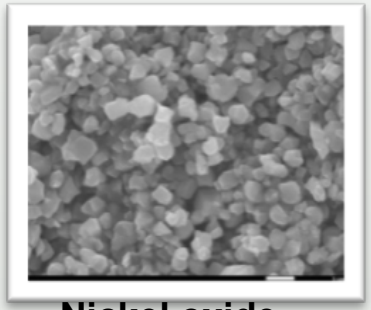
Thick film paste



Near-Infrared shielding material



Alloy preforms



Nickel oxide

Magnetic materials

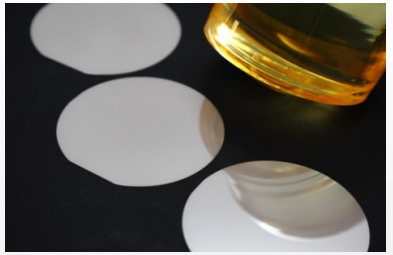
Metal targets

Copper / nickel powder

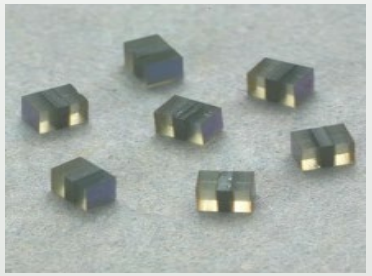
Thin-film material

Lubricant

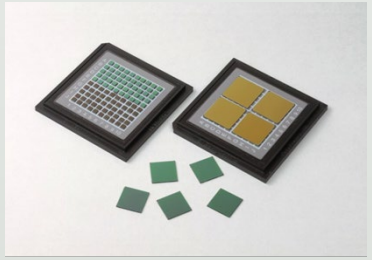
Crystal materials



Lithium tantalate
Lithium niobate

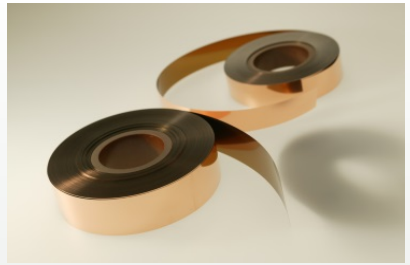


Optical isolator

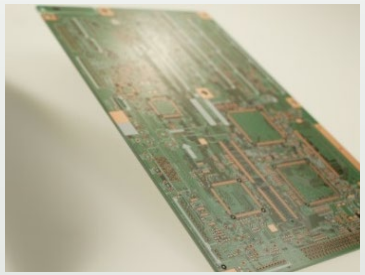


Faraday rotator

Package materials

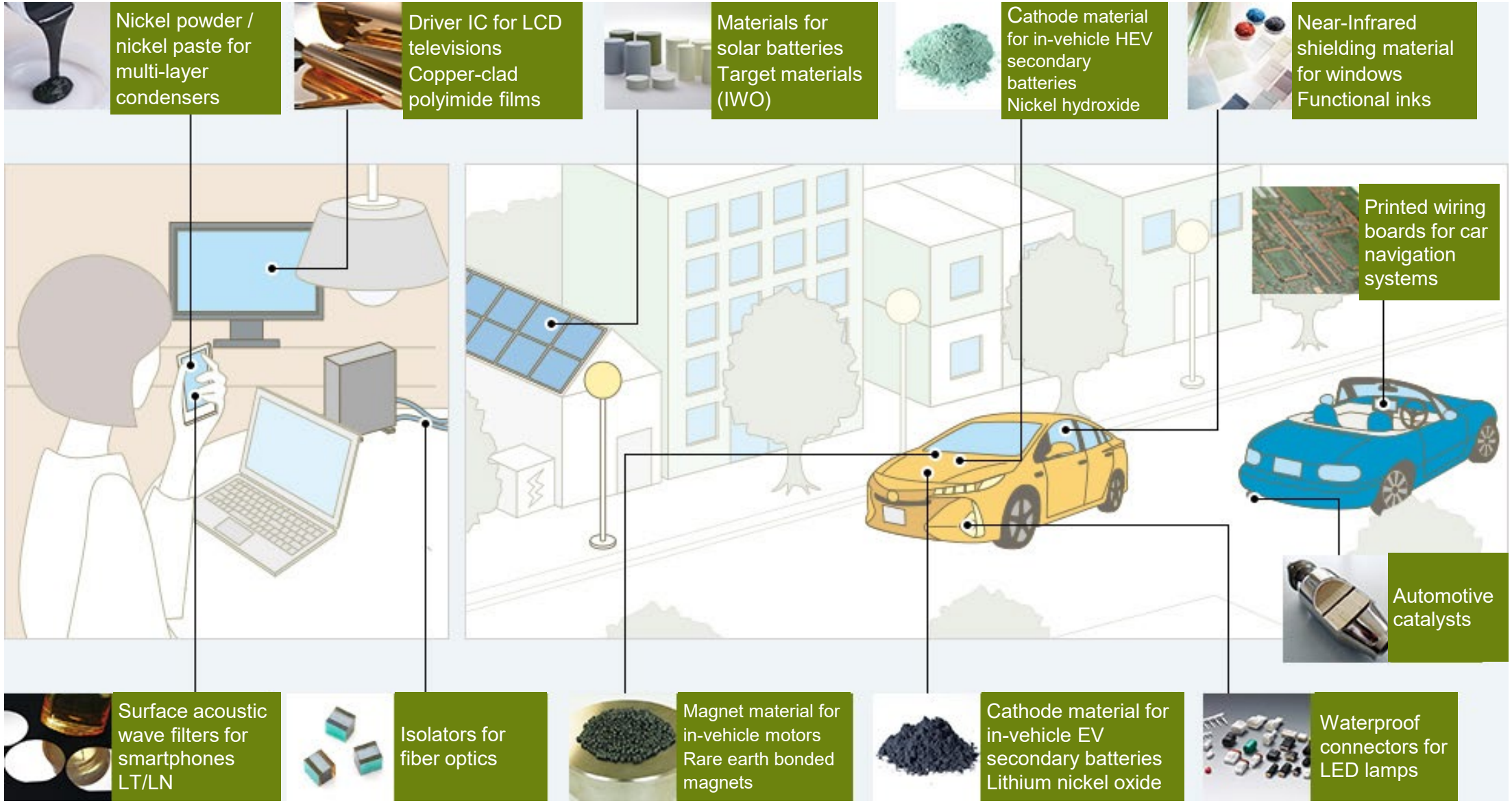


Copper-clad polyimide films

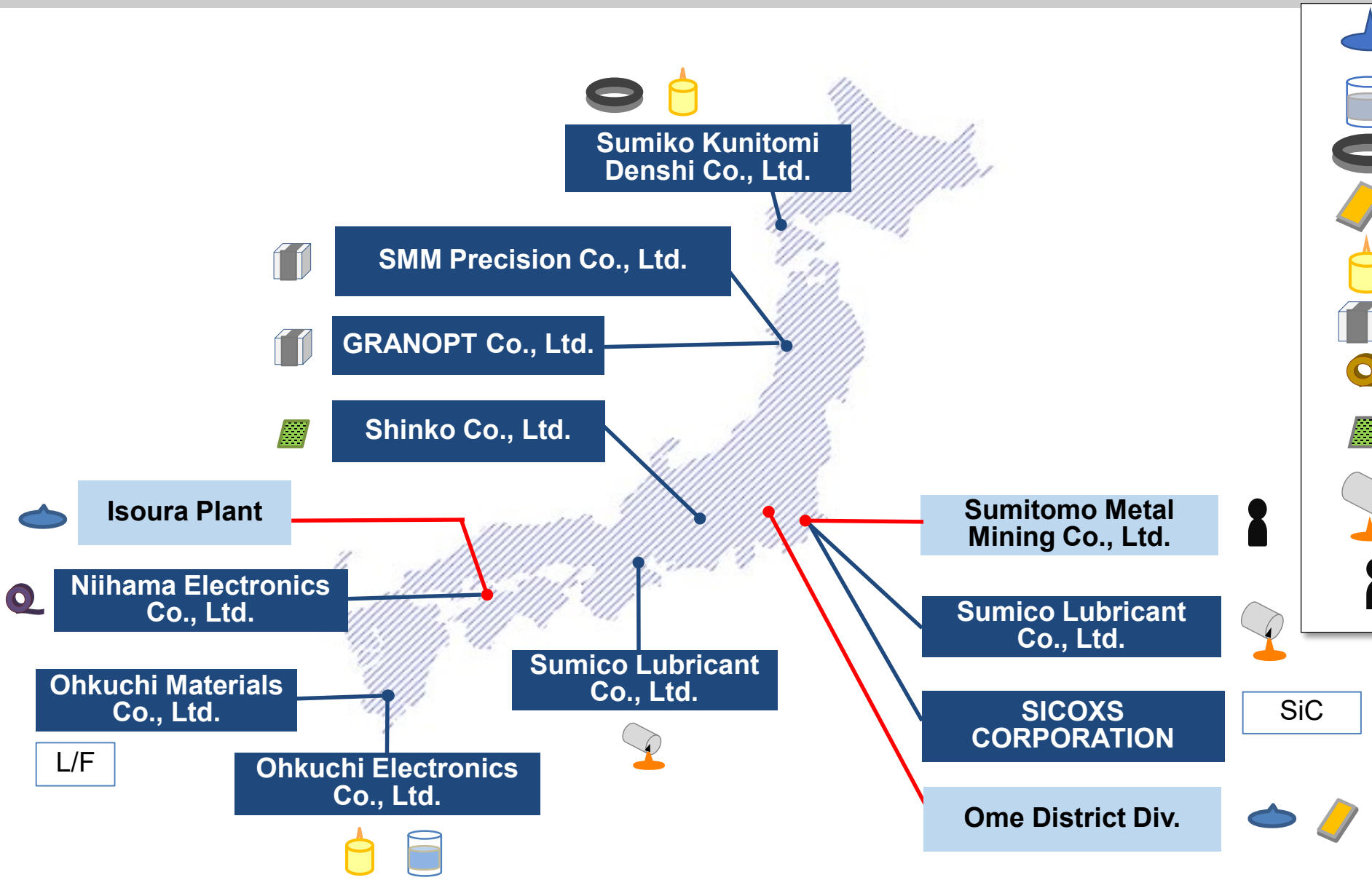


Printed wiring boards

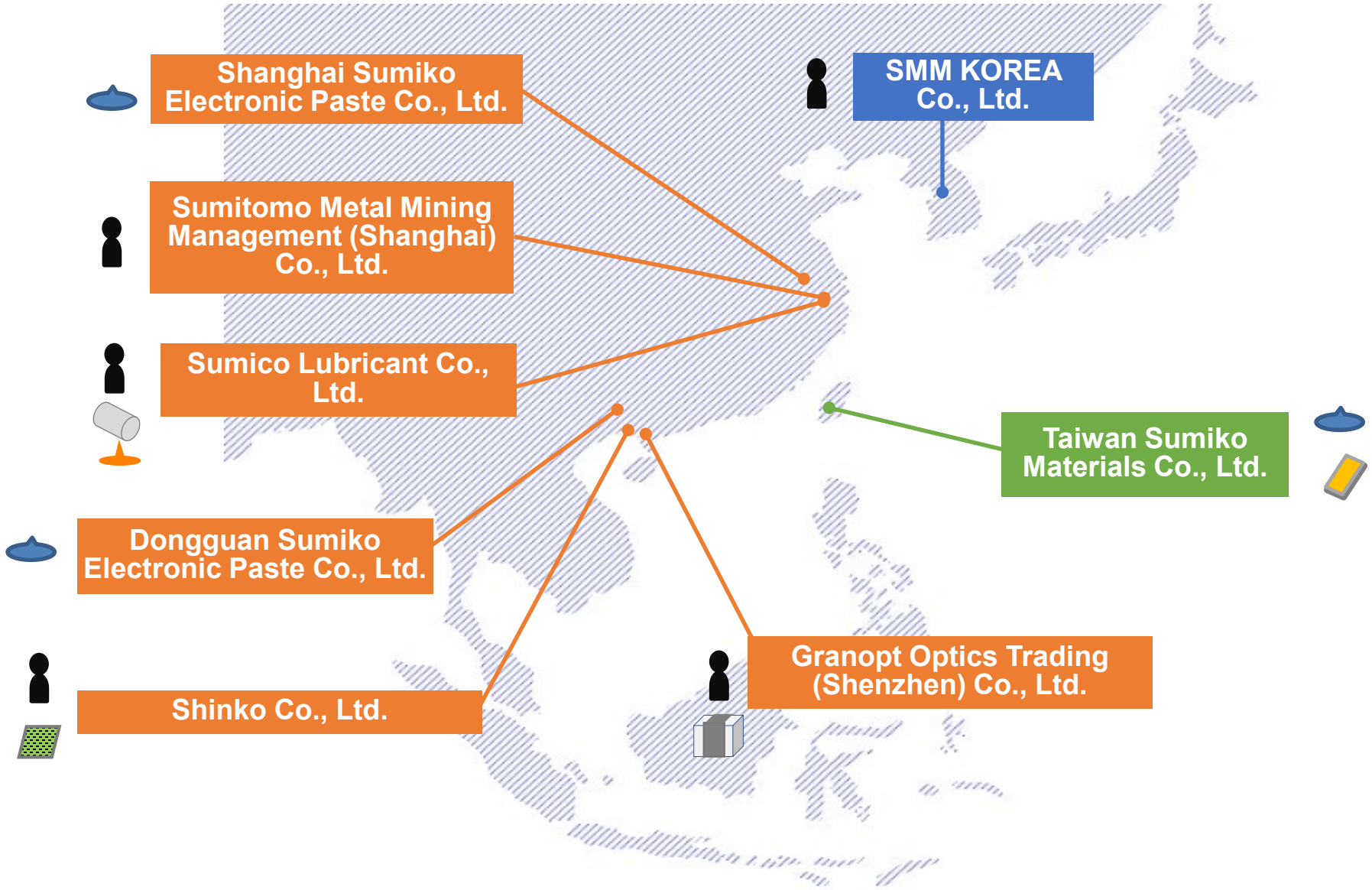
Advanced Materials Division products in daily life



Domestic bases



Overseas bases

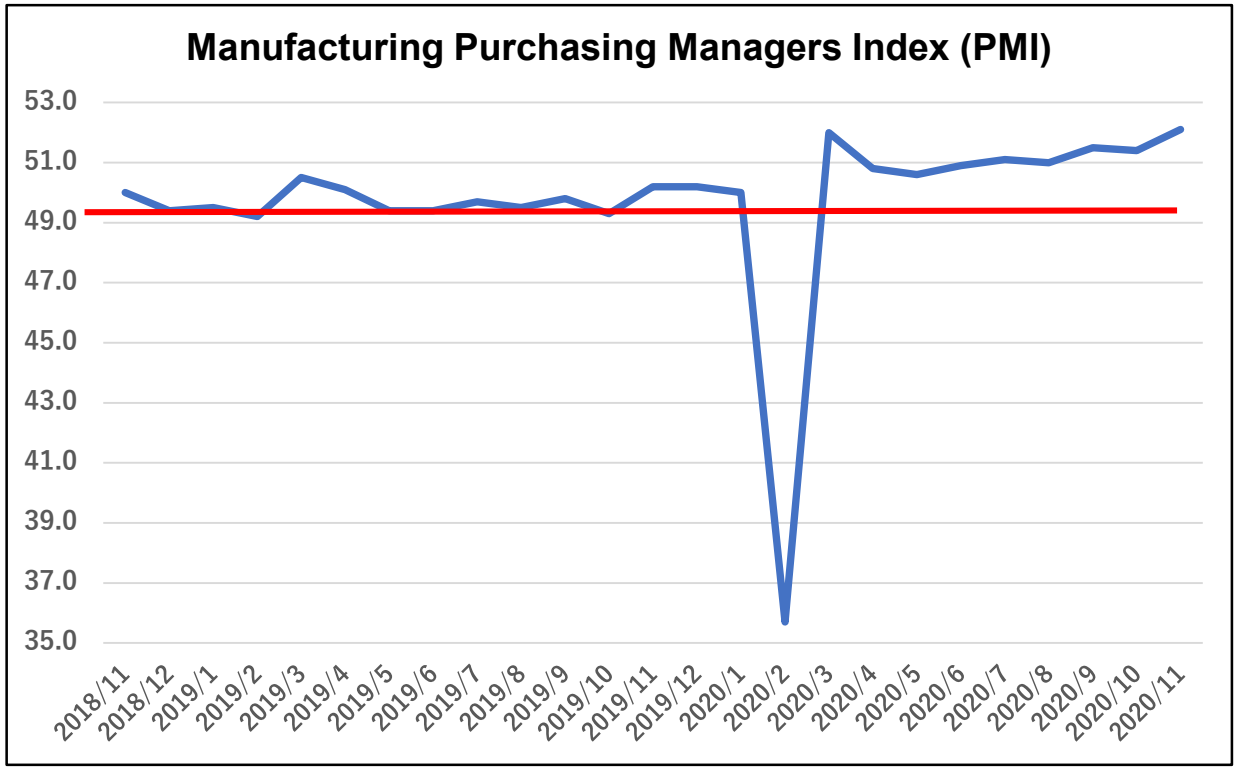


- Paste / nickel powder
- Near-infrared shielding ink / powder
- Rare earth magnetic materials
- Targets / vapor deposition materials
- LN / LT Crystals
- Fiber optic devices
- Copper-clad polyimide films
- Printed wiring boards
- Specialty lubricants
- Sale base

FY2020 Business Environment 1

Impact of COVID-19

- Chinese bases, which produce thick film paste, temporarily suspended operations after the Chinese New Year, however, they swiftly resumed and sales have recovered to the level that they were at before COVID-19. On the other hand, there are movements to increase inventory due to apprehensions about the coming third wave, and we are keeping an eye on movements early in the new year.
- In-vehicle and industrial machinery related market bottomed out in August and is gradually recovering. Year-on-year smartphone-related products saw a slump, but the 5G market is starting in earnest.
- The entire division has largely recovered to what it was before the pandemic, and shipments of most products are at a level where they will outstrip the previous fiscal year, which had an inventory adjustment.



FY2020 Business Environment 2

Overview by business

Powder materials	• **Sales to MLCC and resistors market was steady mainly for Chinese market, for computers and game systems through telework, and for 5G base stations.** • **Magnetic materials and ink materials for in-vehicle use bottomed out in summer and turned into recovery phase.**
Crystal materials	• **LTLN for smartphones recovered through the formalization of 5G.** • **Sales of faraday rotators and optical isolators for fiber optics are strong for data centers and 5G base stations.**
Package materials	• **Television LCD panel shipments are steady. Smartphone market has recovered and shipments of copper-clad polyimide films bottomed out in summer and recovering. There were movements in markets related to in-vehicle components, and additionally, the industrial machinery market and China's 5G portable terminal market improved.**

5G and advanced materials business

Societal changes

Digitalization of society

Telecommunications	Mobile	In-vehicle / Industrial machinery
Data centers 5G base stations	Smartphones PC / Game systems	Autonomous driving Robots

Material demand

High-density implementation

High reliability

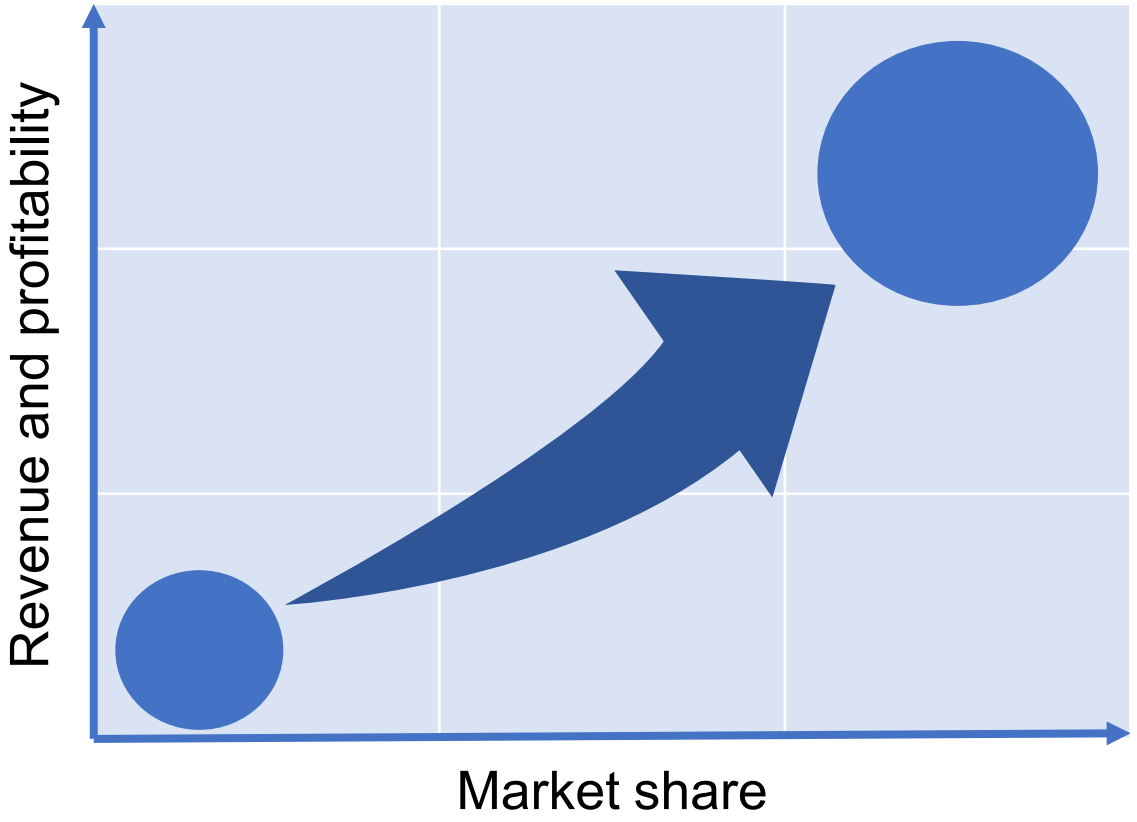
Miniaturization	High precision	Weight reduction	Composite	Heat countermeasures

Product development

Ni powder	Tape	LNLT	Paste	Magnetic materials	SiC

Digitalization of society is speeding up in a variety of fields through 5G.
Along with these changes in society, material needs are also changing.
We're dealing with these changes by developing products in anticipation of these changes alongside costomers.

Vision that advanced materials business is aiming to be

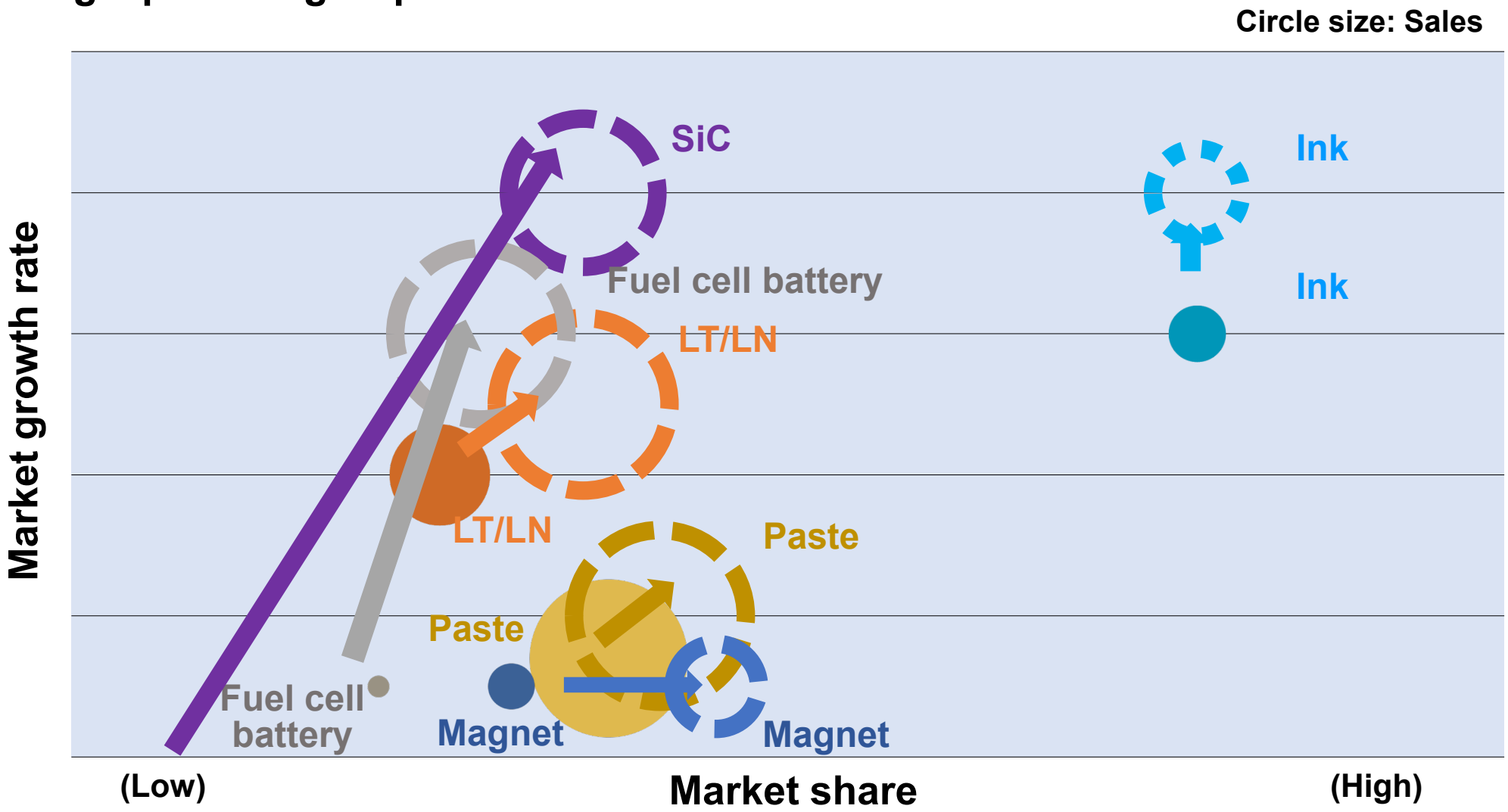


A top-runner in each product market;
keep improving technological ability of material to expected needs in any era; keep profitability and top-class market share.

In July, 2020, GRANOPT Co., Ltd. was selected for the "Global Niche Top Companies Selection 100" by the Ministry of Economy, Trade and Industry.

Business Strategy 1 Creating a business portfolio

Strategic product groups in the 2018 3-Year Business Plan



Business Strategy 1 Products expected growth

Continue to produce new products in the energy, environmental and telecommunications domain

Increase of electronic parts for * 5G, CASE

Paste for MLCC / resistors

LN/LT for SAW filters

*Connected, autonomous, shared, electric

Infrastructure establishment through the increase in information volume

Faraday rotator

Optical isolator

Power semiconductors for power conservation

SiC

Heat management through demand for power conservation

Near-infrared shielding ink

Increase of drive motors like those for power seats

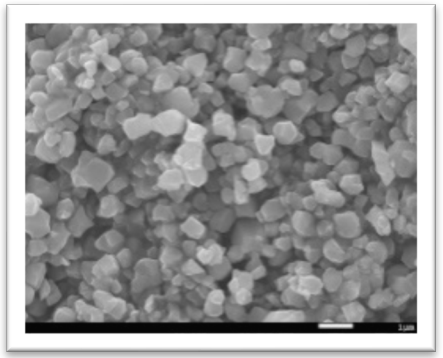
Magnetic materials

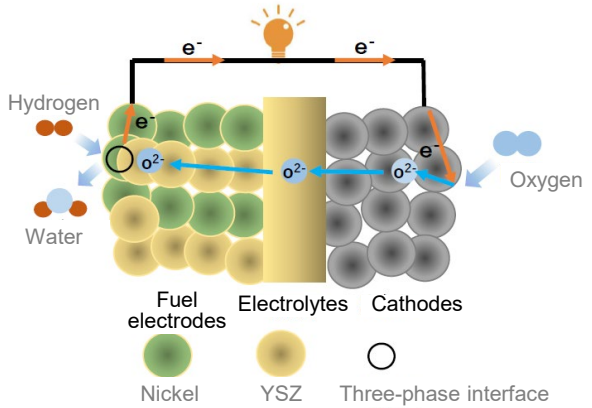
Rising demand for power conservation, clean energy

Nickel oxide
for fuel cell batteries

Examples of products expected growth

Nickel oxide



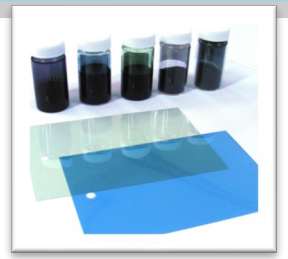


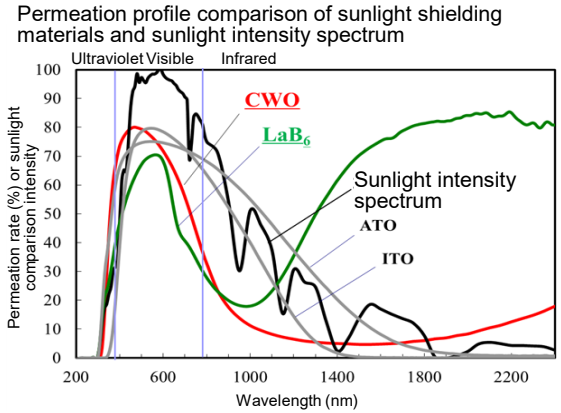
Nickel oxide is used in fuel electrodes

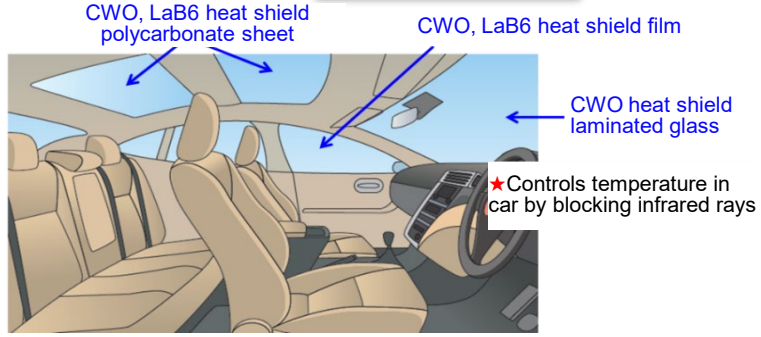
Utilizing their small size and high purity, they have recently been garnering attention for their use in fuel electrodes in solid oxide fuel cells (SOFC), in addition to multi-layer chip inductors.

With fully integrated production that starts from nickel mineral ore, we will realize stable supply and high-quality.

Near-infrared shielding ink







Cesium tungsten oxide (CWO) and lanthanum hexaboride (LaB_6), the near-infrared shielding materials we developed at SMM, are able to more effectively draw in the energy-rich light wavelengths (near-infrared rays) selectively in the 800 - 1,200nm range of sunlight.

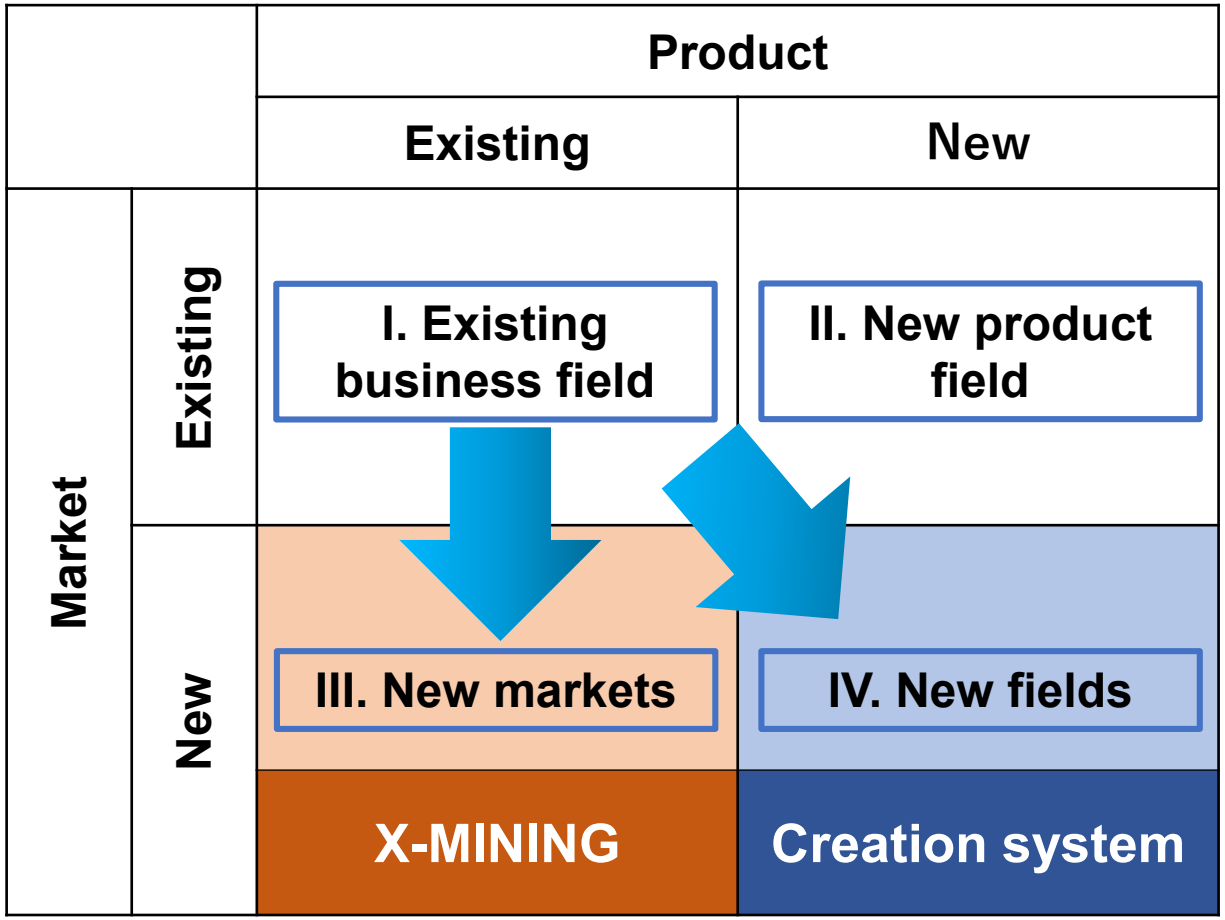
For example, if applied to materials for windows, they can retain brightness and effectively cut the near infrared ray energy, allowing for a great degree of control in keeping the temperature from rising in the room. They also have the ability to convert light into heat, control light and convert light into electricity.

Highly advanced materials that make contributions to resolving the social issues, as mentioned in our Vision for 2030

Business Strategy 2 Continuous creation of new business

X-MINING Expand market share and explore new markets (develop new applications) with our existing products and techniques as a base

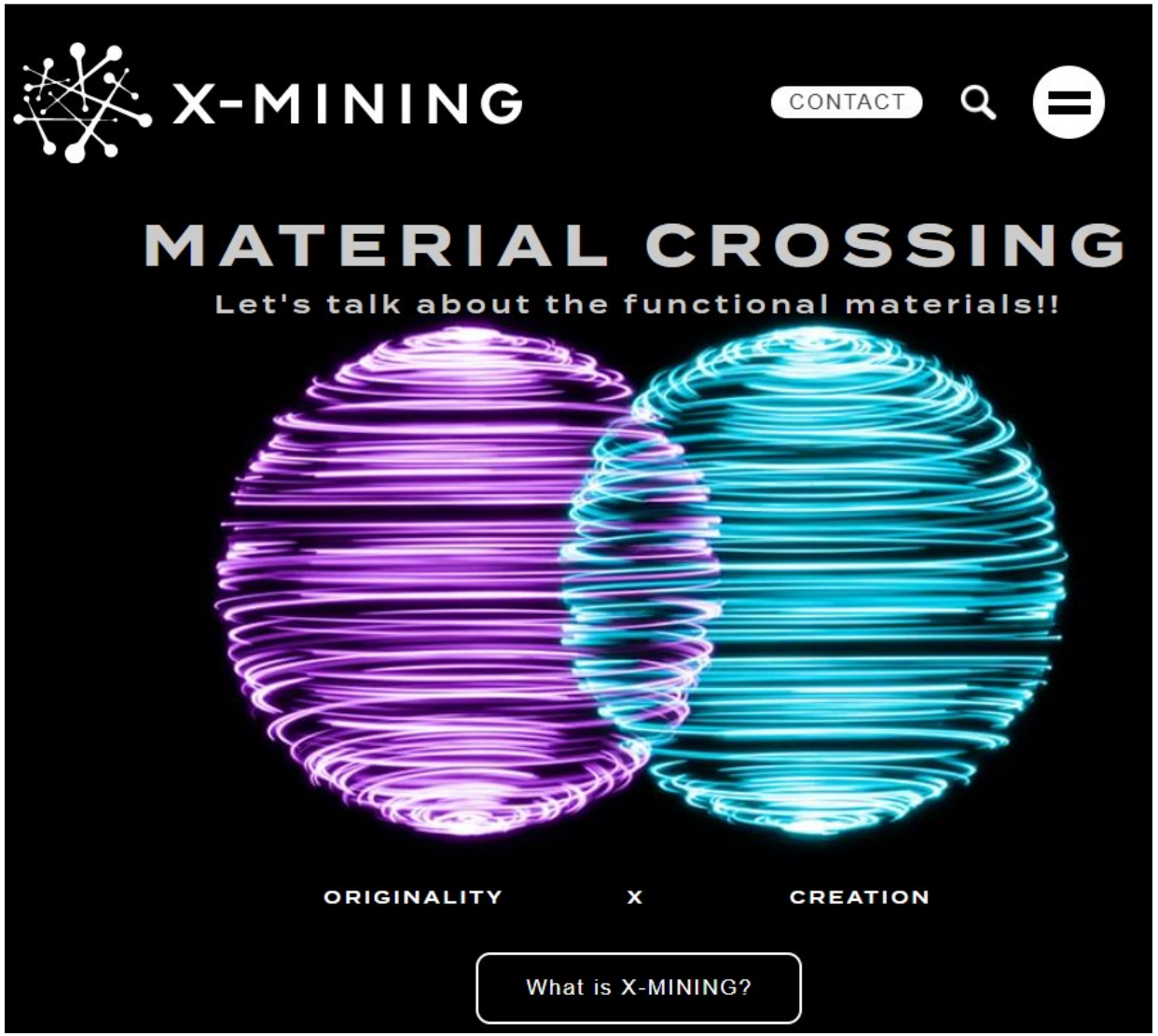
Creation system Exploring new fields, starting from **discerning the future (finding "seeds")** to **new product development**



As a mechanism to sustainably create new products, a new business creation system is being developed through cooperation with the Engineering Division, the Battery Materials Division and the Advanced Materials Division, to cover the process spanning from new product research to commercialization proposal.

On October 20, we had the grand opening of the product information site for our powder materials business, "X-mining." "X-mining" is a marketing system based in open innovation and cooperative creation that includes cooperative business and mergers in new fields and different industries so that we can break into new fields that have business opportunities for existing products.

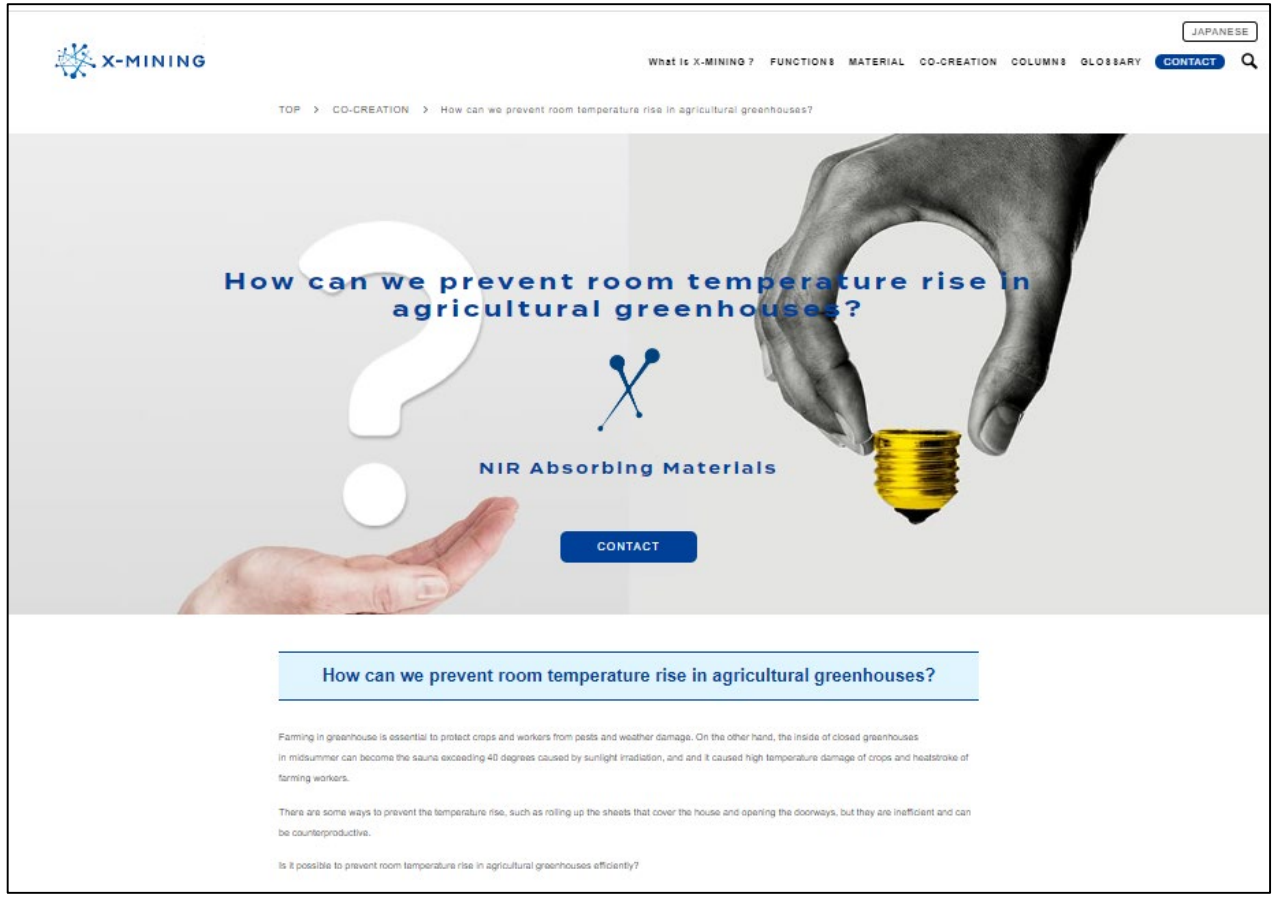
X-MINING (Cross Mining)



Information communication website for powder materials business products
X-MINING (Cross-Mining)
Grand opening on October 20

Aimed at a new form of co-creation,
using SMM's materials and ideas
from a wide variety of people,
from researchers imagining
the future of the environment,
energy and telecommunications,
to marketers.

X-MINING(Cross Mining)



Introduction of Functions and Co-Creation sections

How to make window and roofing materials that only cut out heat rays while maintaining light.

Prevent_X_Near-Infrared Absorbing Materials

Resin glass such as polycarbonate is used for the window and roofing materials of high-speed railways, aircraft, sunrooms, etc. It is light, strong, high transparency and safety, but the sunlight causes high temperature inside in summer.

What is a material to keep the comfortable room without impairing the characteristics of resin glass?

environment Temperature Architecture Heat-ray

How to keep the comfortable room temperature with large glass window.

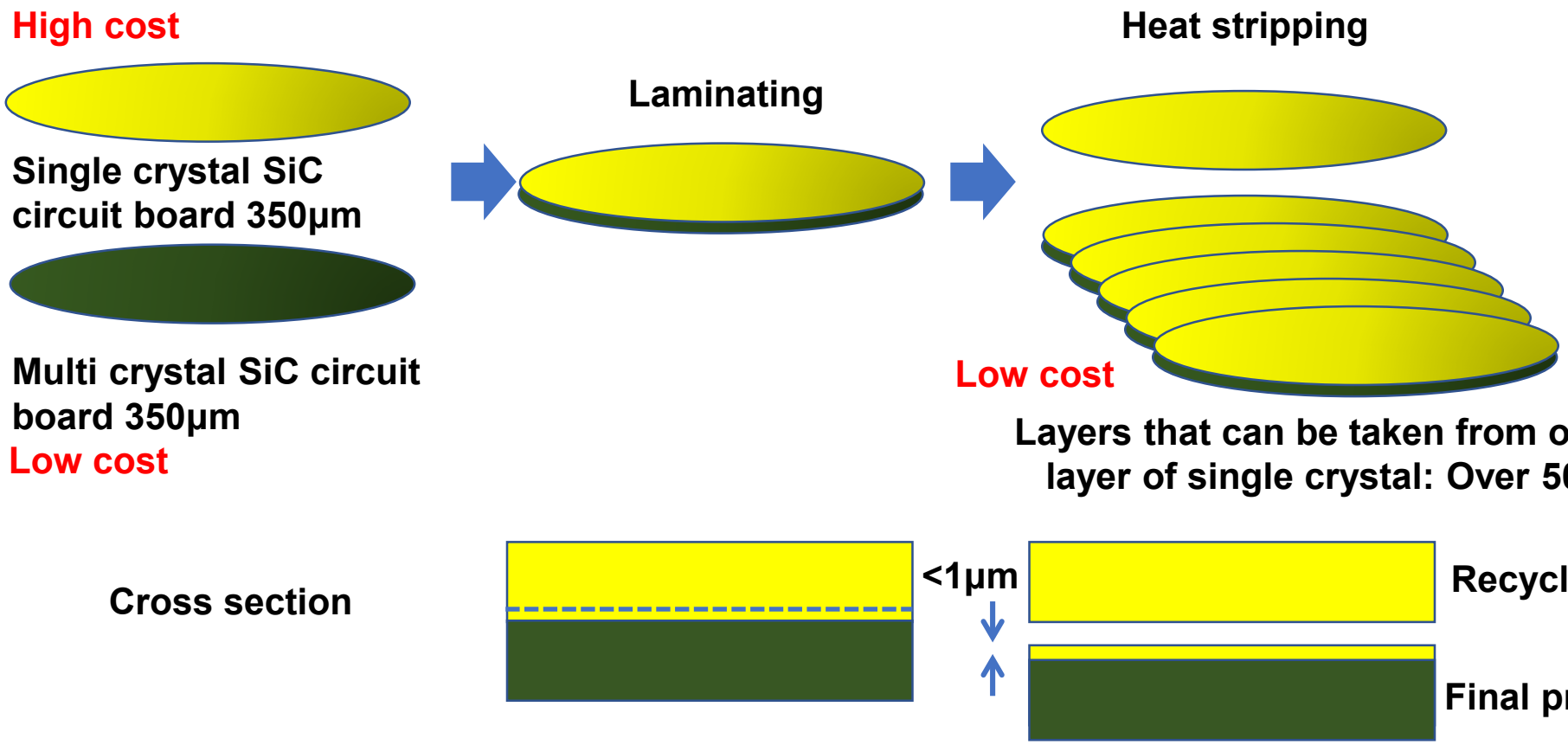
Prevent_X_Near-Infrared Absorbing Materials

Buildings with large windows not only provide a bright open-feeling space, but also excel in attracting customers and preventing crime. However, large windows have the problem that the room temperature tends to rise especially in midsummer.

How to saving the energy with open-feeling space?

environment Temperature Architecture Heat-ray

Through the adherence of a high-quality single-crystal film on top of a low-cost support circuit board, quality of the SiC single crystal does not deteriorate and manufacturing cost is reduced



Progress of the 2018 3-Year Business Plan 1. Development of laminated SiC circuit board

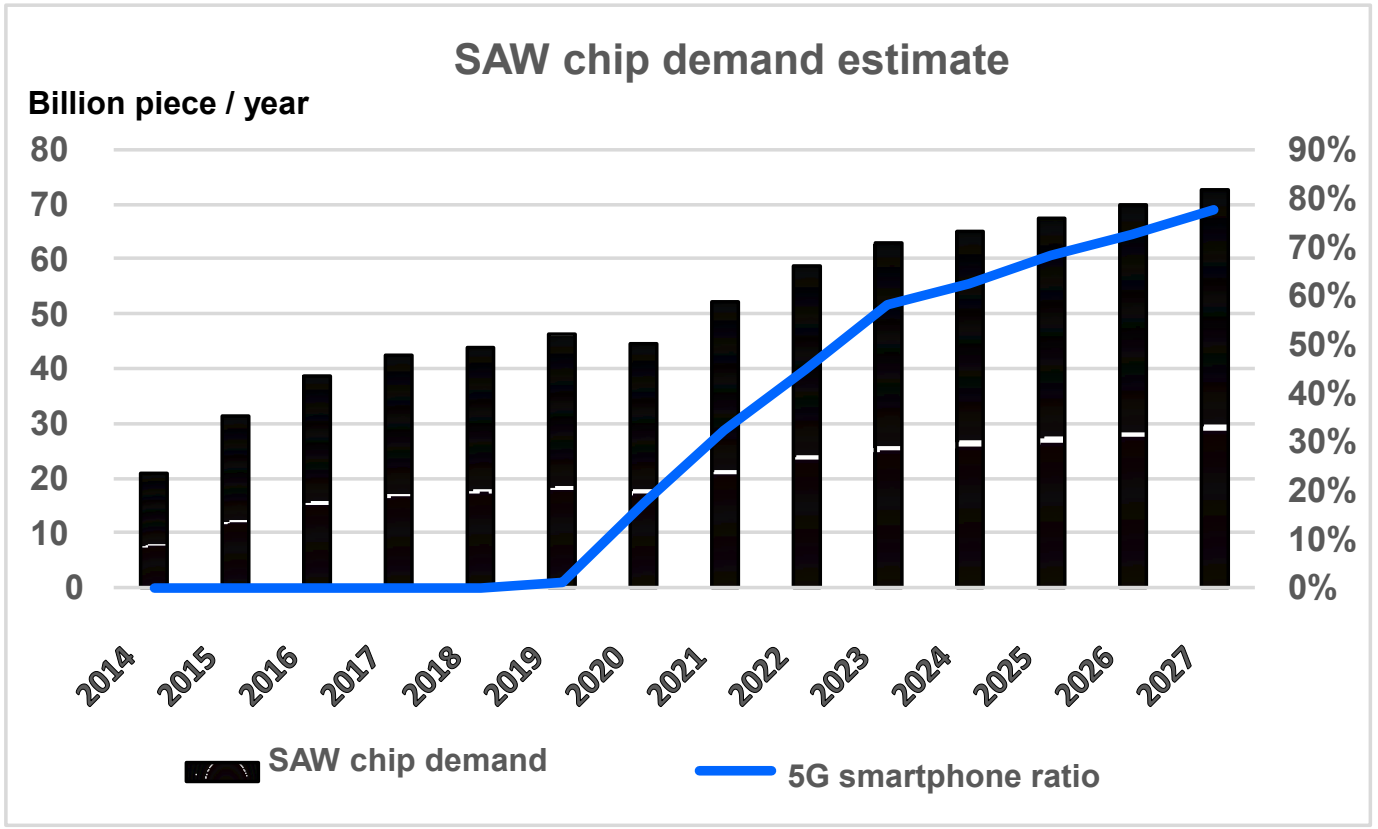
Current	Sample work
2021	Consumer market release (Market size for 6 inch conversion approx. 200kp/year)
Around 2025	In-vehicle market release (Market size for 6 inch conversion, expected over 600kp/year)

Progress of the 2018 3-Year Business Plan 2. Crystal materials LT/LN

Crystal materials lithium tantalate/lithium niobate (LT/LN)

Smartphone sales will continue to gradually recover

Additionally, increases in demand for surface acoustic wave chips continue as IoT continues to promulgate



Note

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Therefore, we ask that you refrain from making any investment decisions based on these materials alone. The Company cannot be held responsible in any way for any losses that may occur as a result of the use of these materials.

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