IR DAY 2020

MinebeaMitsumi
Passion to Create Value through Difference

Analog Semiconductor Business

December 3, 2020

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1. What is analog semiconductor ?

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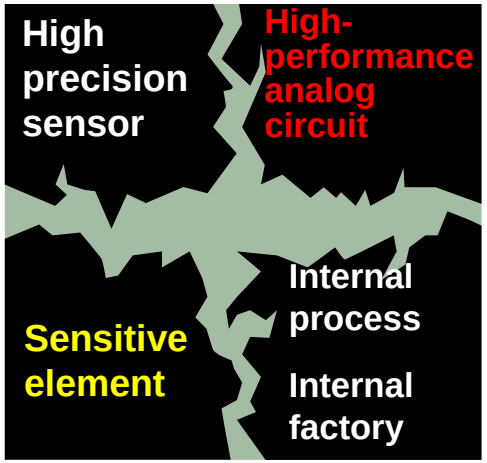
Analog semiconductor represents information as “lower” or “higher”, different from digital semiconductor that represents information with “0” or “1”.

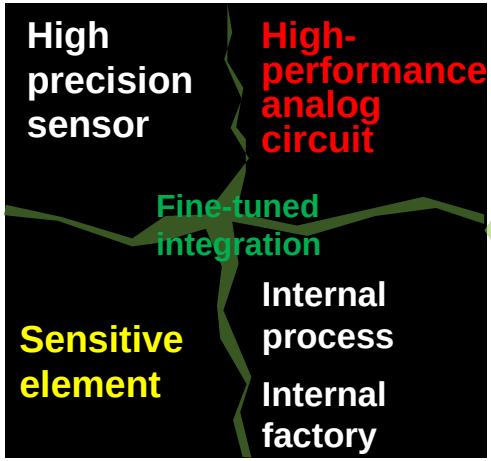
To process various complex signals correctly,



Expert skill
Minuteness Carefulness
On-site capability

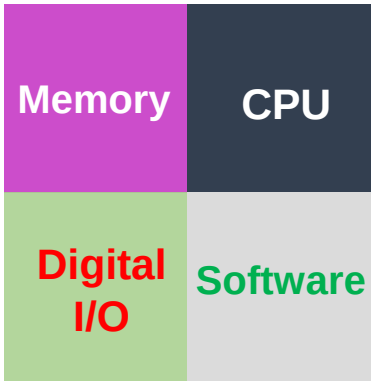
Analog semiconductor

Integral architecture



Digital semiconductor

Modular architecture



Remarkably high performance technology and exceptional manufacturing method are required.

Feature

1. **High barrier to entry**
2. **Hardly copied**
3. **Technique achieved only by IDM maker**

※ IDM : Integrated Device Manufacturer

Since we are now in the digital era in which differentiation is difficult, superior analog technology will change the era.

Analog semiconductor offers us the best opportunity to exhibit strength of Japan and to succeed at a world-class level.

1. Analog semiconductor produced by MinebeaMitsumi

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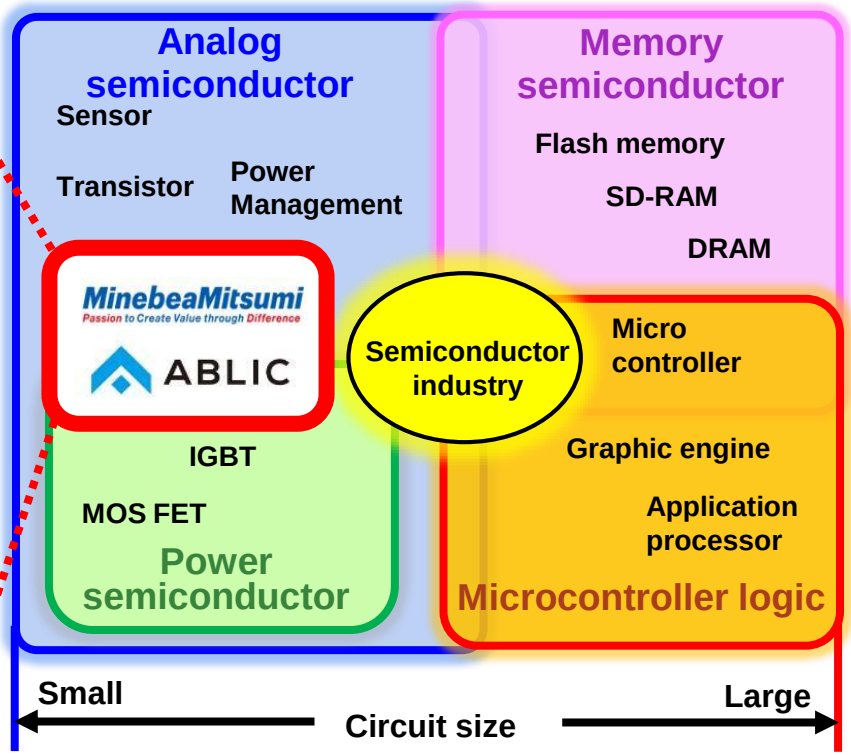
Apr. 2020 Business merger of MinebeaMitsumi, which has acquired unique technology through competition with other part makers, and ABLIC, which has developed original technology as a former watch maker

- Business merger has improved the capability to develop analog semiconductor! -

Strengthen of MinebeaMitsumi

1. Analog circuit technology taking full advantage of Li-ion battery characteristics
2. High quality manufacturing
   - Highly trusted by automotive makers
3. Sophisticated sensing technology
   - Sensor IC, ADC, MEMS technology
4. ECO & low power consumption technology
   - CLEAN Boost, IoT product
5. Acquisition of system know-how through INTEGRATION activities
   - Development of best IC and provision to other internal business



Combining and taking advantage of fine Japanese technologies expand solution supporting comfortable life!
This business makes full use of distinctive technology, aiming for increase in sales from 60 billion yen in FY20 to more than 100 billion yen.

1. Strength over competitors

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Develop products meeting customer needs. (Leading makers cannot do it.)

Leading analog semiconductor maker	Provide wide range of product lineup.	×	Sound out the market potential by introducing general-purpose product lineup.
MinebeaMitsumi	Specialize and intensify development resources in niche and growing fields.	×	Provide support and develop products meeting market / customer needs.

Focus on 8 business fields.

Business scale in 2025

	1	2	3	4	5	6	7	8
	Li-ion battery protection	Automotive power supply	Concurrent activity	MEMS Custom sensor	IGBT	Medical & high voltage	Magnetic sensor	CLEAN Boost
	★ 34 billion yen	★ 21 billion yen	4 billion yen	10 billion yen	13 billion yen	8 billion yen	★ 7 billion yen	★ 5 billion yen
	World's biggest share	High customer satisfaction !	Expansion of own business	Industry's top performance!	Full use of feature of our own factory	Improvement of ultrasonic diagnosis accuracy	Innovation of motor technology!	Innovation of IoT technology!

Basic management strategy: **Fully use core technologies to expand sales and revenue by focusing on niche and growing fields.**

Today, four fields with ★ mark will be explained.

2. Growth strategy by market
– Information & communications <Li-ion battery IC>

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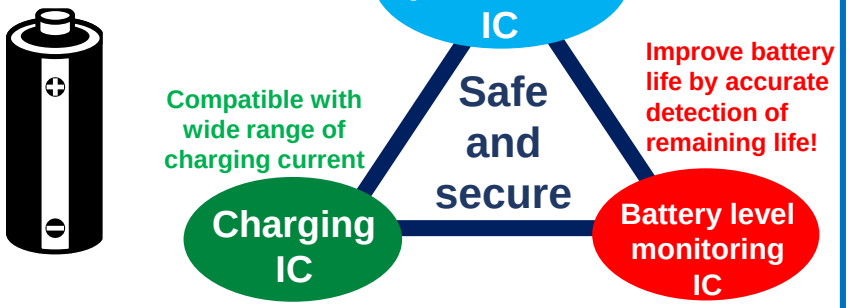
Intensify core technology along with technological evolution of earphones and quick charge for smartphones.

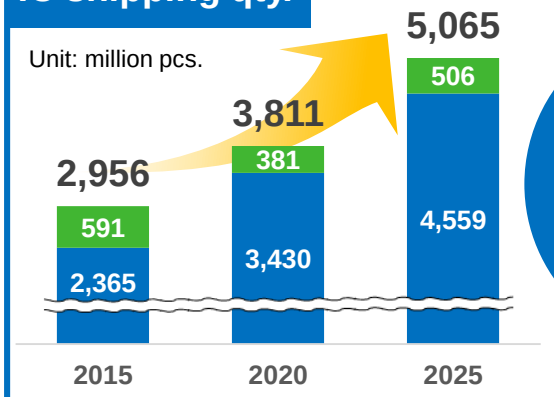
Product strategy

1. Advanced development of battery protection IC along with evolution of battery quick charging technology
2. Contribution to technological innovation for TSW and IoT devices by pursuing technologies for low current consumption and miniaturization

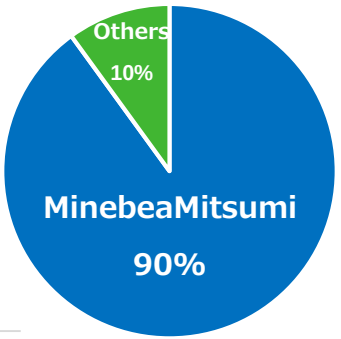
Products for Li-ion battery



IC shipping qty.

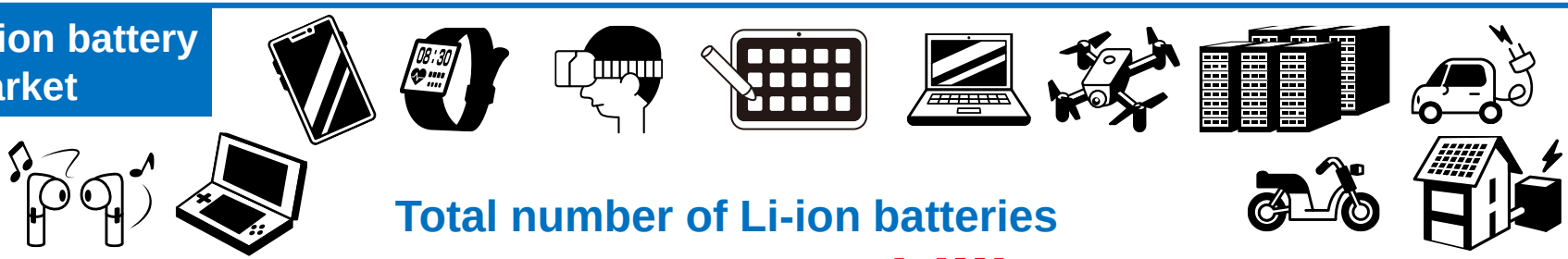


▲Shipping qty. of 1-cell protection IC (according to our research)



▲ Market share of 1-cell protection IC (according to our research)

Li-ion battery market

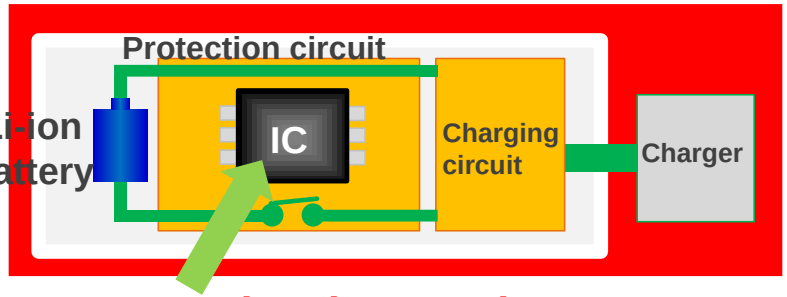


Total number of Li-ion batteries

8 billion cells in 2020 => **10.5 billion** cells in **2025**

Technology developed by MinebeaMitsumi reduces battery charging time by 20%, even using the same charger and at the same charging current!

Conventional technology



Conventional protection IC

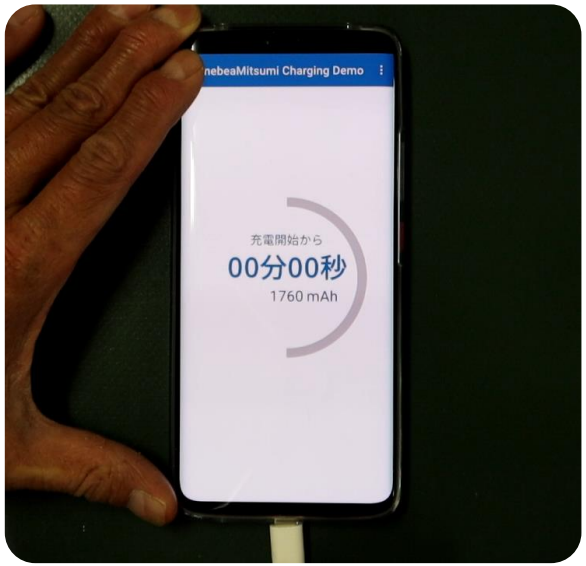
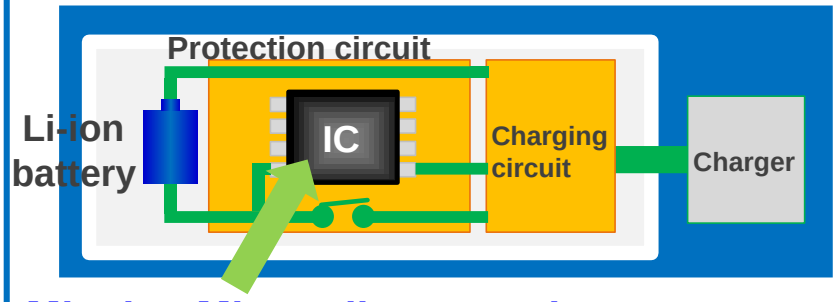


Image at 300X

Technology of MinebeaMitsumi



MinebeaMitsumi's protection IC

This accurately detects battery condition and charges batteries.

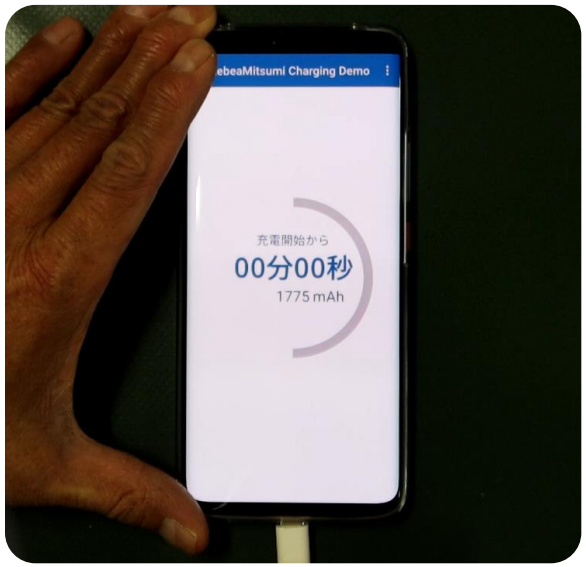


Image at 300X

2. Growth strategy by market

– Motor vehicle <Power supply IC, magnetic sensor IC>

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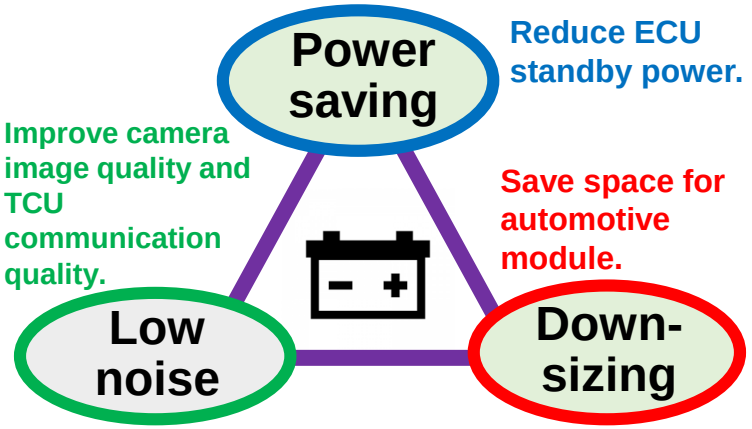
Expand high-value-added product lineup using our strength along with growth in automotive application market.

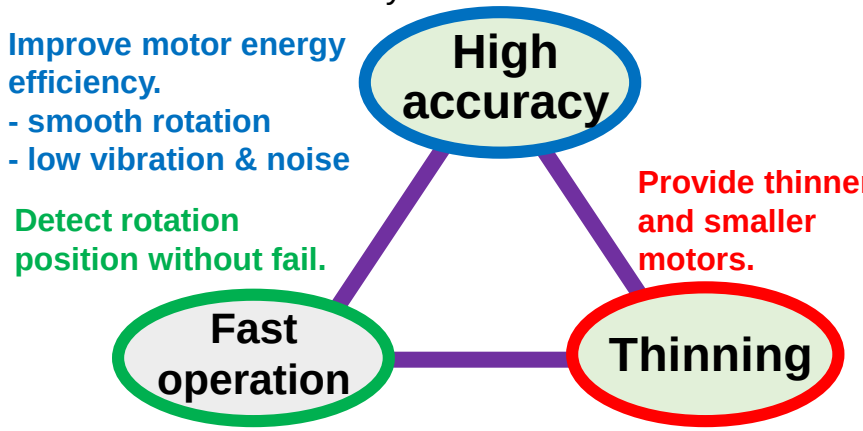
Strength of automotive power IC

Reset IC “starts a system safely!”
LDO/DC-DC converter does
“not shake power source!”



Strength of automotive magnetic sensor IC

“Revolutionize motors by accurate detection of rotation position!”
Won the “Semiconductor of the Year” Award held by the Electronic Device Industry News.



Strength of automotive IC

“High quality”

- **Technology acquired through nearly 30-year production experience**
  Consistent quality system from development to manufacturing for zero defect
  Received “Good quality” award from Company T
  Received “Best quality” award from Company P
  Designated as “Best supplier” for 4 years straight by Company D

Expand characterized product lineup based on the trust from customers earned through our high performance and high quality products.
Expand our sales along with evolution of automotive applications and increased number of parts.

2. Growth strategy by market

– Motor vehicle <Power supply IC, magnetic sensor IC>

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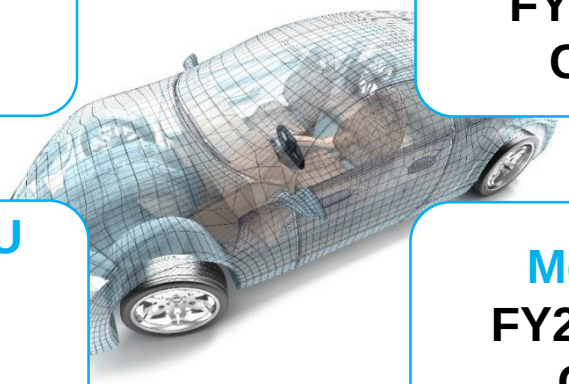
Applications using automotive power supply IC and magnetic sensor IC are increasing!

In-vehicle camera market
FY25 266Mpcs
CAGR 11%

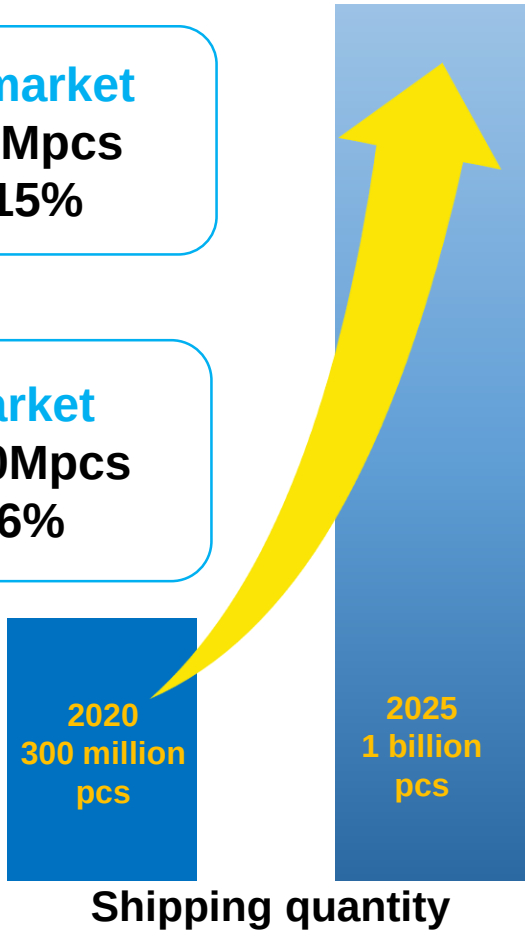
TCU/V2X market
FY25 108Mpcs
CAGR 15%



ADAS / autopilot ECU market
FY25 112Mpcs
CAGR 6%

Motor market
FY25 4000Mpcs
CAGR 6%

	Camera	ADAS/ECU	TCU/V2X	Motor
Automotive power supply IC	○	○	○	○
Magnetic sensor IC	-	-	-	○



Shipping quantity

Our power supply IC and magnetic sensor IC have already been used in many automotive applications.
The shipping quantity of these ICs is 300 million in 2020 and the target quantity is 1 billion in 2025.

What is CLEAN-Boost ® Technology?

* Received IEEE Award in 2019 for related technology.

Technology to accumulate and boost small amounts of energy (1 μW) up to 30,000 times (30 mW) to enable wireless transmission, using **ultra-low power consumption (SOI technology)** * SOI: Silicon on Insulator

Realize "battery-less" wireless sensor.

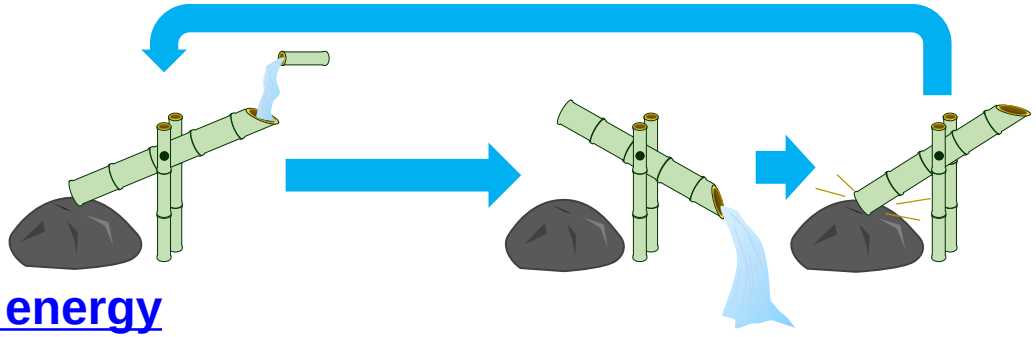
CLEAN-Boost® Technology

Store small amounts of energy and discharge it through wireless transmission.

Image

Accumulate small amounts of water and emit a sound like "Shishi-odoshi".

Accumulate natural force and earth force without leak to use them effectively.



Natural energy

temperature, Water droplet, light, vibration, etc.

Accumulate energy without leak.

Instantaneously discharge at the start of communication.

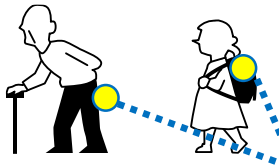
SDG s 7: Energy

Earth-friendly energy without use / replacement of batteries

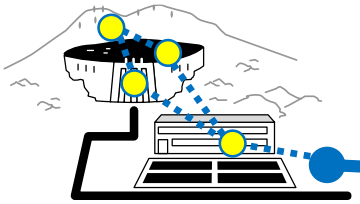
Application of battery-less sensing using CLEAN Boost ® Technology

Use of IoT in a wide range of fields including infrastructure, agriculture, and healthcare provides infinite possibilities.

Healthcare

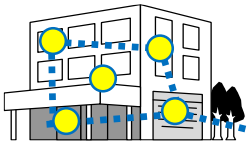


Body temperature, motion, location

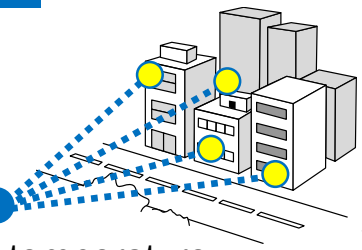


rainfall, water quality

Security

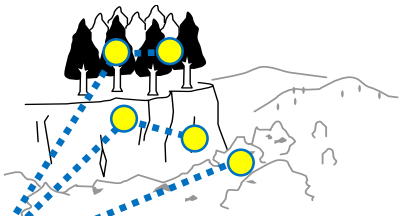


deformation, temperature, lightness, vibration

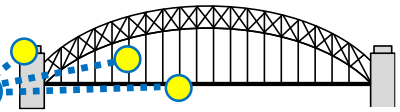


temperature, vibration, deformation

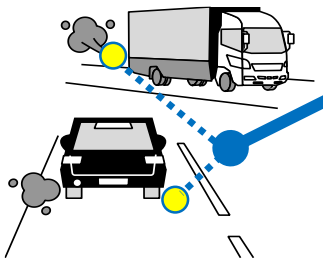
Disaster prevention



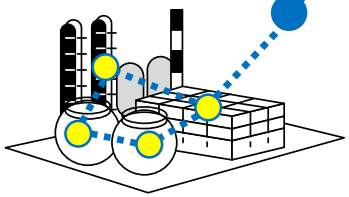
temperature, ground displacement



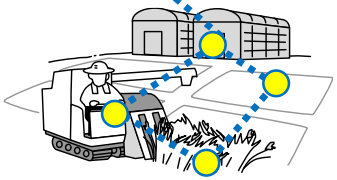
vibration



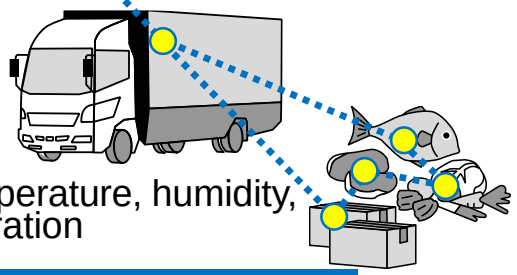
Sox, Nox, vibration



gas, deformation



growing condition, growing environment



temperature, humidity, vibration

Response to environmental risk

Production process (agricultural products, etc.)

Product using CLEAN-Boost® Technology: Battery-less water leak sensor

Wireless water leak sensor for IoT system

Early detection of water troubles of piping equipment, such as water leakage and rainwater intrusion!

- **No power supply!** **Generates power using leaked water** and wirelessly notifies water leakage.
- **Easy installation!** **Needs neither batteries nor installation construction** for power supply or communication wiring.
- **Energy saving!** Monitors water and rainwater leakage **without changing batteries**.
- **High sensitivity!** Detects 150 μL (**a few drops of water**) without fail.

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Video of leak test

3. Business policy　Sales and revenue target

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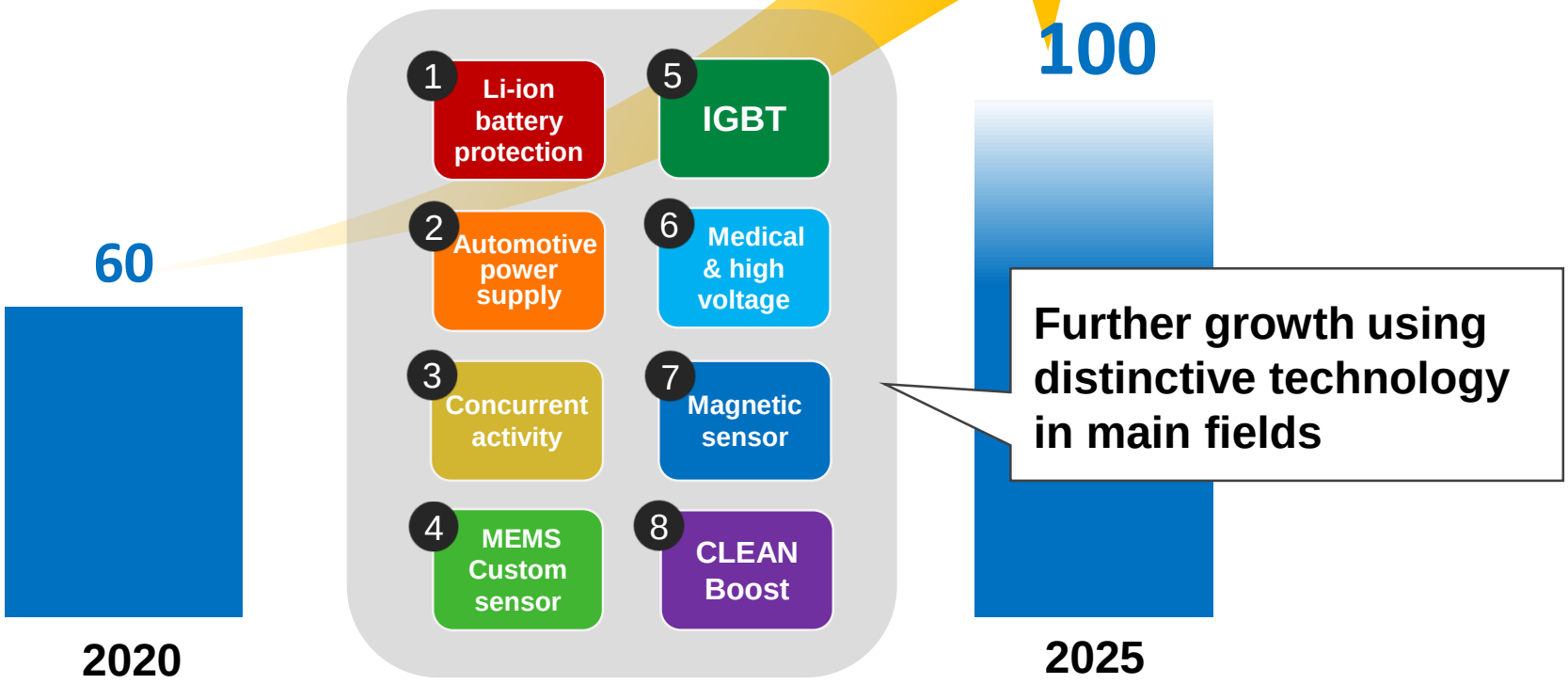
Fruition of Electro Mechanics Solutions®

Analog semiconductor business: Early achievement of 100 billion yen in sales

1 Use strength of distinctive semiconductor technology to expand niche and custom domains.

2 Promote concurrent activities in MinebeaMitsumi group.

Go Beyond 100



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Please note that actual performance may vary significantly from any particular projection due to various factors.

Factors affecting our actual performance include but are not limited to: (i) changes in economic conditions or demand trends related to MinebeaMitsumi's business operations; (ii) fluctuation of foreign exchange rates or interest rates; and (iii) our ability to continue R&D, manufacturing and marketing in a timely manner in the electronics business sector, where technological innovations are rapid and new products are launched continuously.

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