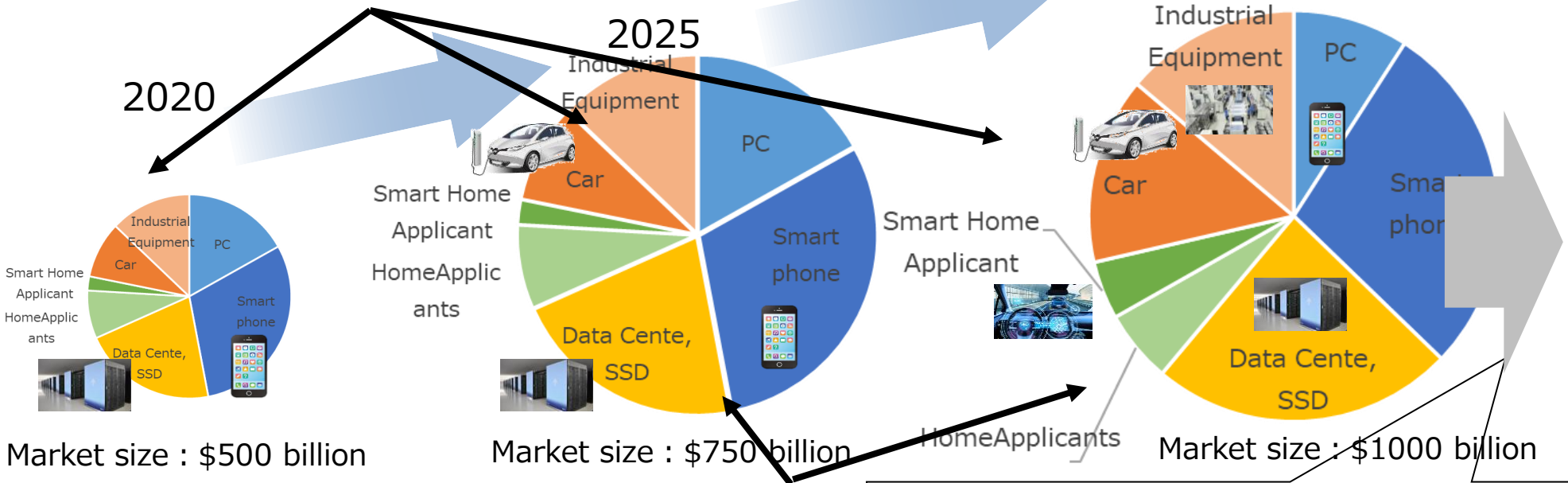
Basic strategies for revitalizing Japanese semiconductor industry

- Urgent enhancement of semiconductor production infrastructure for IoT（Step: 1）
- Next-generation semiconductor technology infrastructure through Japan and EU（Step: 2）
- Future technology infrastructure through global collaboration（Step: 3）

Step 1 : semiconductor production infrastructure for IoT
⇒ Urgent enhancement of production portfolio

(Reference) : prepared by METI, based on data from OMDIA

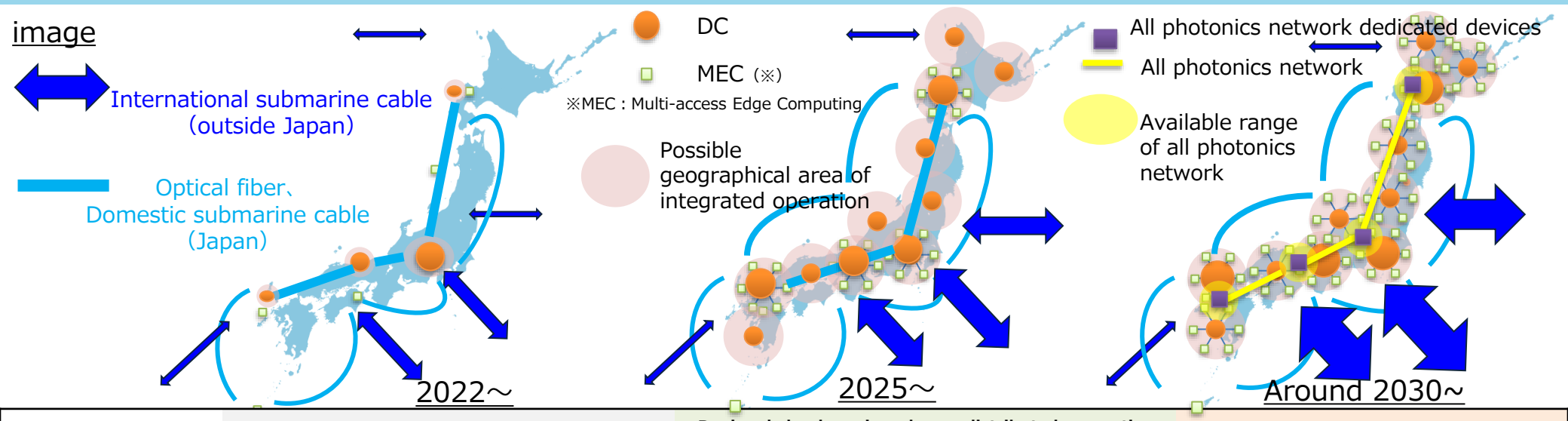


Step 2 : Next-generation technology
⇒Acquisition/securing Next-generation semiconductor technology through Japan and EU collaboration project

Step 3 : Future technology
⇒Implementation of future technologies such as photonics-electronics convergence through enhanced global collaboration

Image of “Building A New Digital Japan Roadmap”

- Technologies, infrastructures and industries that support data-driven society have developed dynamically.
- It is important to develop Japan’s infrastructure for information processing, telecommunication and power management in an integrated manner, considering global trends.
- Japan will secure the players of digital industrial infrastructures that support the economy, society and democracy, regardless of whether they are domestic or foreign capital.



	2022～	2025～	Around 2030～
Soft/Cloud/Data Collaboration Infrastructure	・Development of public cloud, hybrid could ・Change of Industrial on-premise to cloud base ・Expansion of IoT（Smart XX）	・Regional cloud services, hyper-distributed computing ・Advancement of Digital Twin ・Next generation super computing ・Establishment of IoT plat form ・Data collaboration infrastructures	・Implementation of quantum computing
Base infrastructures (DC, Network, Energy)	・Development of 5G and optical fiber ・Optimal location of Data Centers ・Suppressing operational cost ・Promotion of renewable energy procurement	・Post-5G, domestic submarine cable, satellite constellation ・Expansion of reginal green data centers ・Development of MEC ・Expansion of quantum cryptography communication and leased line ・Expansion of renewable energy and storage battery introduction	・Beyond5G ・All photonics network ・Full-scale implementation of MEC ・Using renewable energy as the main power resources, updating of gid control, mass introduction of storage batteries, demand response, V2G development
Basic technologies (semiconductors, storage batteries)	・Reinforcement of semiconductor bases ・Securing domestic production base for storage batteries ・R&D of photonics electronics convergence, hyper-distributed computing technologies and quantum computing technologies	・Development of next generation semiconductors （Beyond2nm, 3DIC, Green Power Semiconductor ） ・Implementation of next generation storage batteries (All-solid-state batteries)	・Implementation of future semiconductors (chips of photonics electronics convergence, quantum related devices)

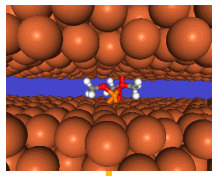
Image of next generation computing platform

Government level

Nation security

Natural disaster

Material R&D



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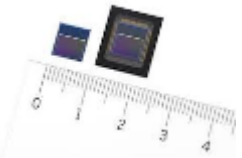
Low power semiconductors

Industry level

AI semiconductor



Sensor ×AI semiconductor

On-board

Autonomous vehicle

Smart factory

Robotics

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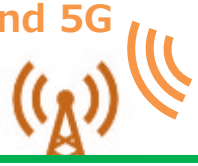
5G/Post 5G
Beyond 5G



【Computing Resource manager】
(Combining various computers and optimally controlling the computing infrastructure as a whole)

High speed semiconductors

Ultra high performance CPU

AI accelerator

Ultra-high-speed, high-capacity optical network

Quantum gate

Quantum annealing

【 Quantum :
optimization of combination 】

Supercomputer

AI computer

…

High performance computer

…

【 Classical : general use、AI、science technology, etc. 】

On-board

Green Digital Computing（image)

- With the significant increase in data processing, power consumption has also increased remarkably.
- Our goal is to achieve approximately 50% energy-saving by 2030 with technology development such as super distributed green computing, next generation edge computing, next generation green data center.