



Aluminum lightens the world

アルミでかなえる、軽やかな世界

Technology Supporting Business Sustainability

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UACJ Corporation



UACJ Group Intellectual Capital: Supporting the Achievement of its Group Philosophy



Our Purpose

Contribute to society by using raw materials to manufacture products that enhance prosperity and sustainability.

Our Vision

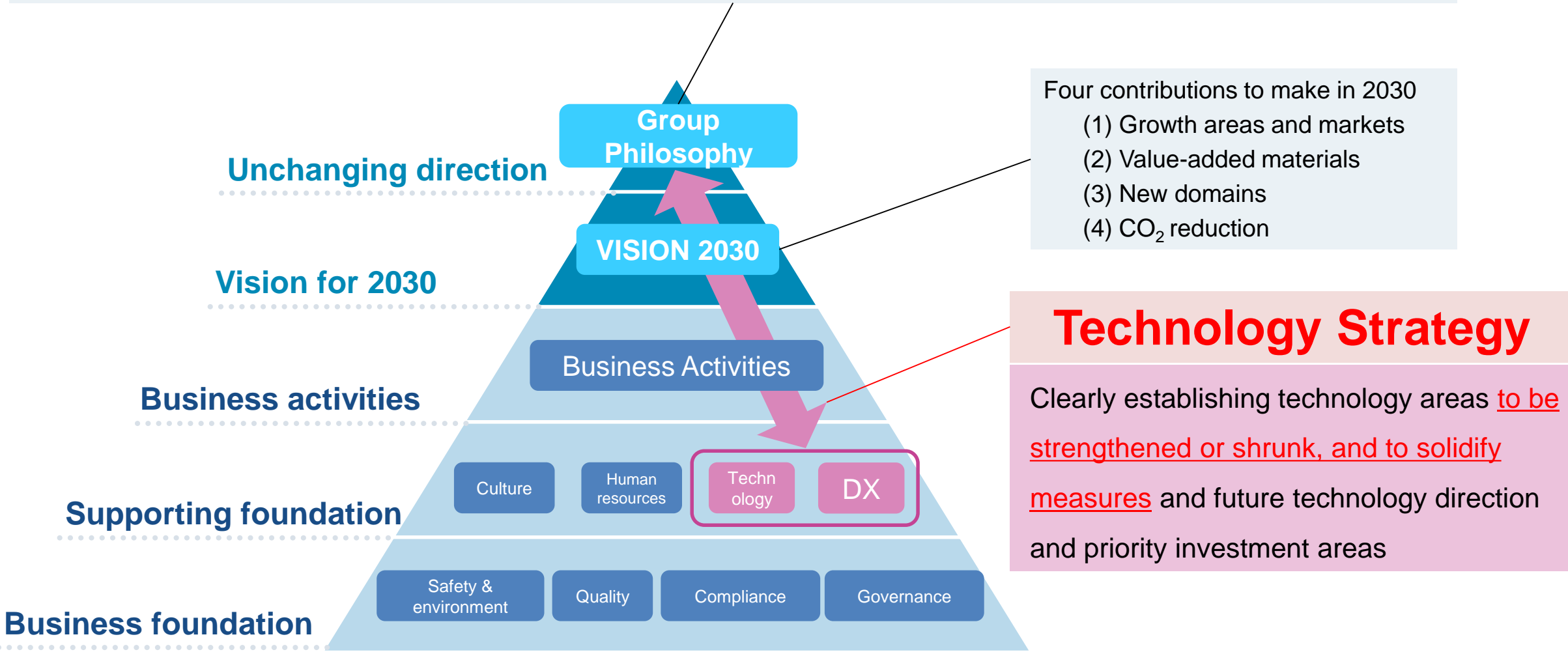
Aluminum is our passion. It inspires our work in building a better world and a healthier environment.

Our Values

- ▶ Respect and understand your associates.
- ▶ Embrace honesty and foresight.
- ▶ Be curious and challenging.

Leveraging UACJ Group Technologies to Support the Achievement of its Group Philosophy

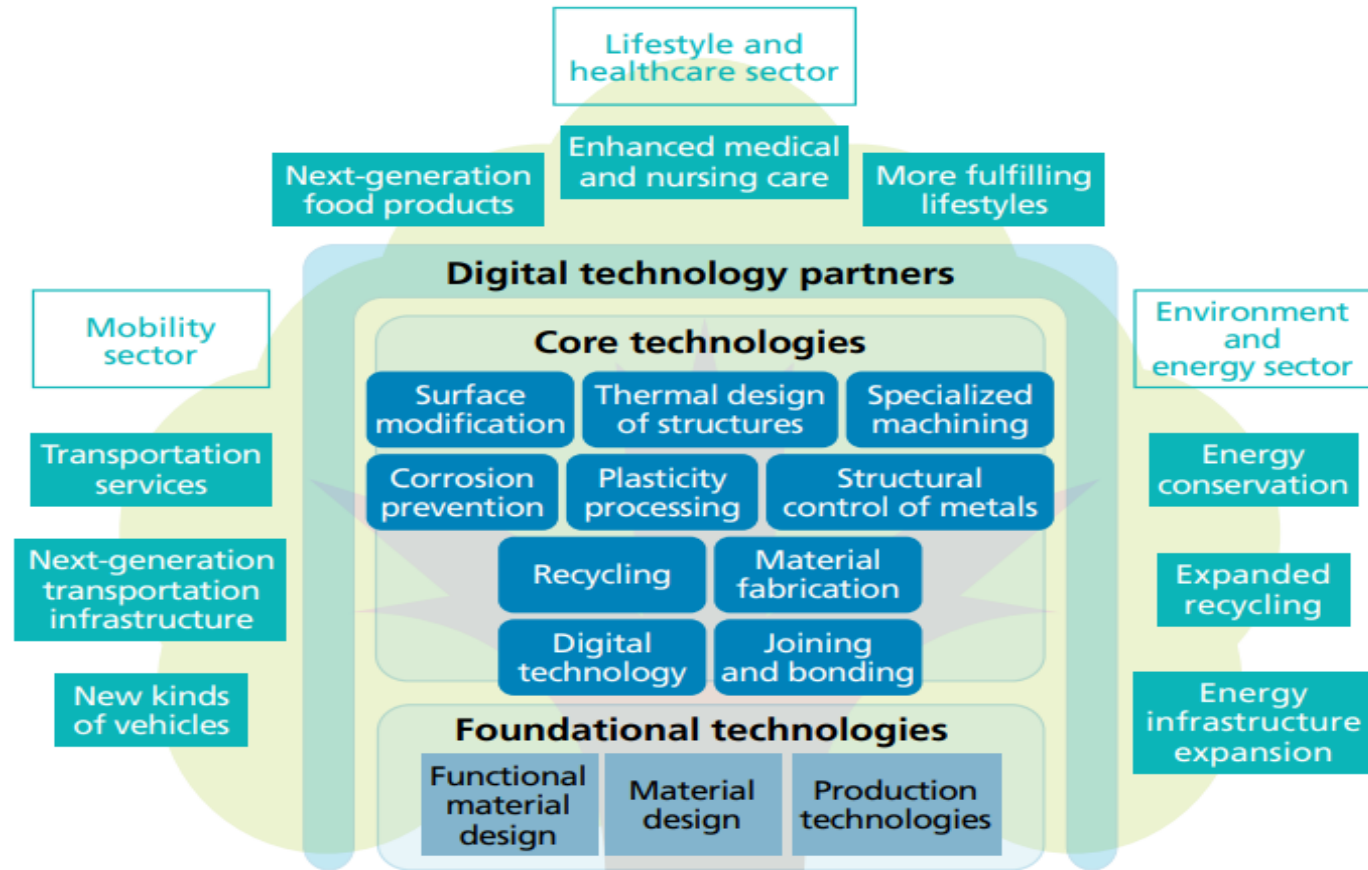
Our Purpose: Contribute to society by using raw materials to manufacture products that enhance prosperity and sustainability
Our Vision: Aluminum is our passion. It inspires our work in building a better world and a healthier environment.



Four contributions to make in 2030
(1) Growth areas and markets
(2) Value-added materials
(3) New domains
(4) CO₂ reduction

Technology Strategy
Clearly establishing technology areas to be strengthened or shrunk, and to solidify measures and future technology direction and priority investment areas

Direction of the UACJ Group's Technology Development



Benefits of aluminum

- Light weight
- Strong
- Resists corrosion
- Unaffected by magnetism
- Good electrical conductivity
- Good heat transmission
- Strong resistance to low temperatures
- Non-toxic
- Reflects light and heat
- Excellent surface processibility
- Easy to cast
- Easy to process
- Easy to combine
- Useful for vacuum applications
- Easy to recycle

15 Qualities of Aluminum

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Aluminum has excellent deformability and can be processed into various shapes. It can be easily made into thin, paper-like foils and extrusion materials of complex shapes. It can be molded at high speed for items like beverage cans, and performing precision surface finishing for products is relatively easy. Aluminum also has exceptional machinability and can be used for tools, such as molds, as well as machine components.

Excellent surface processibility



Various types of surface finishing are possible, such as anodic oxide coating treatment (alumite treatment). Surfaces can be hardened, and corrosion resistance can be increased. During processing, a variety of colors can be applied to aluminum through means such as natural coloring and electrolytic coloring, making it suitable as a material in fields where design aesthetics are strongly required, including building exteriors, packaging materials, and IT equipment. Functions can also be easily added by coating.

The UACJ Group's R&D Strengths

1 Extensive product development

Engaged in a wide range of research and development activities related to aluminum, from basic research on material design, analysis, and production processes to the development of products and utilization technologies.

2 Integrated development from research to mass production

Established R&D centers close to business locations capable of immediately supporting our six businesses

3 125 years of accumulated development technology

Annual publication of Technical Reports presenting research results

4 Attentive response to customer needs

Established an R&D structure that adapts flexibly to changing times

5 Japan's largest and highest-level aluminum research network

Broad network of 200 researchers and dozens of degree holders, comparable to Western peers

UACJ's Technology Strategy

1

Focus on technology that can contribute to recycling, energy saving, CO2 reduction, and DX, with the aim of realizing of a circular economy.

2

Dual pursuit:

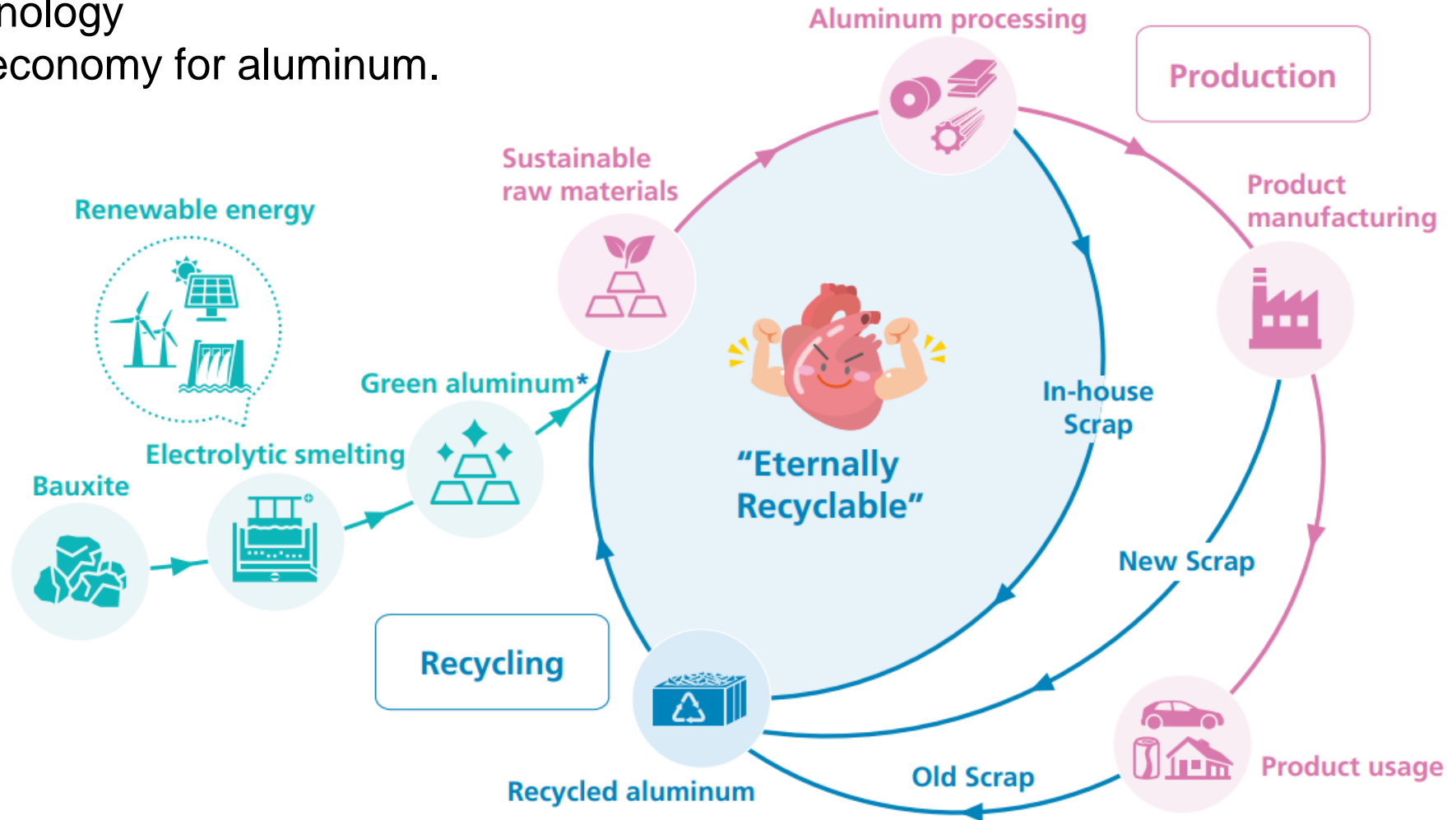
- Deep dive into existing technology
- Development of new technology

3

Clearly establishing areas to be strengthened or shrunk (Fundamental technology/production and facility technology/product development)

The World the UACJ Group Aims to Realize Through Technology

We will promote aluminum alternatives and evolve our recycling technology to lead a circular economy for aluminum.



Environmentally Friendly Aluminum Can Development with Toyo Seikan : Progress

Next-Generation Beverage Can Lid with Reduced Environmental Impact (released December 4, 2023)



(excerpt of release)

Developed **EcoEnd**, a beverage can lid that reduces greenhouse gas ("GHG") emissions generated in the manufacturing process by approximately 40%, in collaboration with Toyo Seikan, Ltd.

Compared to current beverage can lids, EcoEnd reduces GHG emissions by approximately 13,000 tons*1 per billion cans. In addition, **if all current beverage can lids sold by Toyo Seikan in Japan were replaced with EcoEnd, GHG emissions would be reduced by approximately 140,000 tons*2 per year.**

It has been customary to use a large amount of new metal for beverage can lids in order to ensure a certain level of quality, such as workability and strength of the material. By combining UACJ's material manufacturing technology and Toyo Seikan's lid molding technology, **we have developed a next-generation lid that can provide the same quality and performance as existing lids even when the amount of new metal used is reduced.**

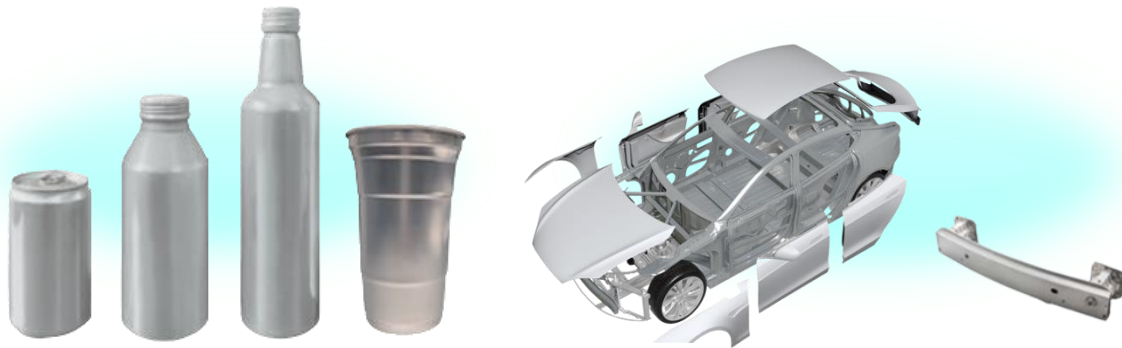
Release(Japanese only) <https://www.uacj.co.jp/release/20231204.htm>

*1 Toyo Seikan research

*2 Calculated based on GHG reductions per "EcoEnd" and Toyo Seikan's FY2019 manufacturing results of lids for SOT (stay-on tab) cans with current specifications.

R&D Themes and Development Examples

Contribution to value-added materials



100% recycled cans

Development of low-CO₂ recycled aluminum materials within automotive materials

Joint development of environmentally friendly aluminum cans

Deployment of UACJ SMART

Development of upgrade recycling technology

Reduction of CO₂ emissions through use of new fuels

Participated in the University of Tokyo's Advanced LCA Social Cooperation Course

Contribution to new business

Example: Rare reagent instruction notification foil



Remote and real-time notification of product opening by simply affixing it to the product

Integration with digital technology

“Mizu-Yojin” (Flood barrier)

Opening detection foil, notification foil

“Mizu-no-Kakehashi” (Water Bridge) water stockpile aid system

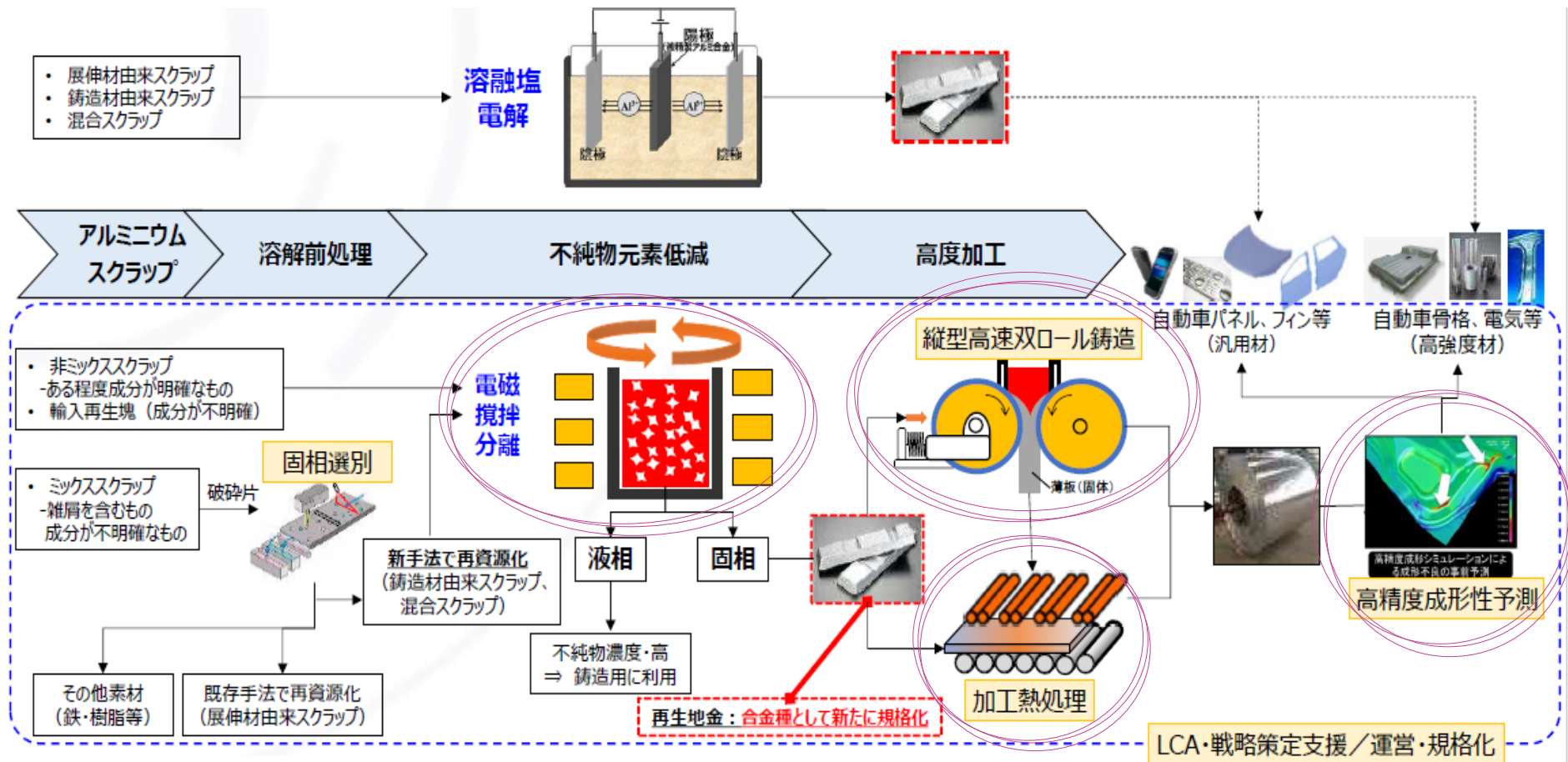
Development of a new aluminum alloy for use in 3D printers for next-generation rocket fuel tanks.

Participated in **Aichi Prefecture's project for startup ecosystem collaboration**

Participation in National Projects and Development of UACJ Technology

Aiming to reduce environmental impact in a recycling-oriented society

Participated in the Advanced Resource Recycling System for Aluminum Materials project.



Making Aluminum More Widely Adopted



Sumida Hokusai Museum exterior



100% recycled shelf boards at MUJI Shinjuku Yasukuni-Dori



Ossuary altar



Vehicle number plate material

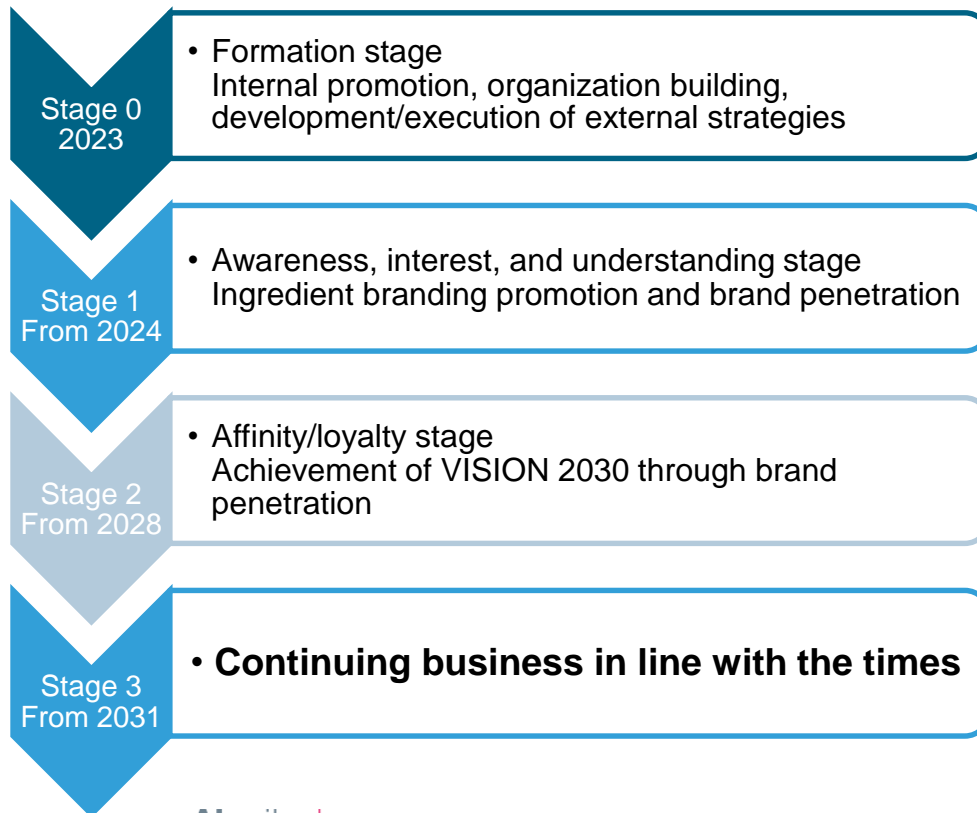


UACJ R&D Center exterior and eaves

Making Aluminum More Widely Adopted — Launch of Ingredient Branding Activities

We have launched ingredient branding activities to promote awareness of opportunities for aluminum use and to pursue its future potential.

Gradually develop consumer awareness of brands and draw a road map that ensures they will be recognized as essential



Launch of new brand **ALmitas⁺**

Ingredient branding activities for adding value to aluminum through enhanced materials commenced in September 2023.

Goal of promoting **ALmitas⁺**

Increase visibility of aluminum among competing materials



Promote finished products and aluminum to expand business possibilities in new fields and domains.

Expand business domains toward the achievement of UACJ VISION 2030

ALmitas⁺ This brand name combines the word “aluminum” with the Japanese word *tasu*, which here means to add fun and excitement, and the word *mitasu*, which here means the fulfillment of happiness.

For the Further Spread of Aluminum

ALmitas⁺

A UACJ product brand embodying its value-added aluminum

By informing a great deal of people, including end consumers, about the functionality and value of aluminum, we will grow the opportunities for people to choose aluminum products and expand demand for it



Used for aluminum poles in one-pole tents by Arkitent*1, an outdoor brand



Triple K

Used in sprocket material by go-cart parts “Triple K”²

*1 Arkitent: A collaborative brand between TARPtoTARP and United Arrows' outdoor label, koti BEAUTY&YOUTH

*2 Triple K: <http://triple-k.info/>

*3 Triple K: <https://katoss.co.jp/>

Toward Broader Use of Aluminum: Strengthening Human Capital

Developing the next generation of metal materials professionals who will help build a better world

Target

Fostering the next generation of professional R&D personnel to realize our corporate philosophy

Issues

- Uncovering interest of the younger generation in aluminum R&D
- Cultivating personnel involved in the development of advanced technologies

Collaboration with universities

- University of Tokyo Social Collaboration Course: "Creation of Next Generation Lightweight Alloys" Targeting Creation of Next Generation Lightweight Aluminum Alloys and Cultivation of Professional Human Resources
- Hokkaido University Industry Creation Course: Practical Course on Next-Generation Innovations in Aluminum

Proactive publication of research results

- Publication of UACJ Technical Reports

Industry–government cooperation

- Participation in national projects
- Collaboration with the National Institute of Advanced Industrial Science and Technology (AIST)

Intra-Group researcher exchange

- Recruitment of Thai researchers
- Residencies at the North America R&D center

Increasing awareness

- Participation in events, including opportunities to interact with startup companies
- Exhibited at Nikkei Education Challenge and the Earth Class One-Day Environmental School



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