EEDF

13th Japan-German Energy and Environment Forum

Circular economy for climate change countermeasures

DAY2 session5 January 26th

Digital strategy for Circular Economy launched by SIP and case study of Harita Metal

SIP Sub-Program Director
Makoto Harita (Harita Metal Co.,Ltd.)

SiP 戦略的イノベーション創造プログラム
Cross-ministerial Strategic Innovation Promotion Program

ERCA 独立行政法人 環境再生保全機構
Environmental Restoration and Conservation Agency

Mr. Makoto Harita

Makoto Harita serves as Sub-Program Director for development of New Circular Economy System for 3rd SIP. Currently, he is a member of the ISO TC323 Circular Economy domestic committee, and TC323 international expert, and a member of the METI Circular Economy vision committee (2019-2020). At Circular Partners, which was established by the METI in December 2023, he was appointed as a member of the information distribution platform construction working group.

He also serves as the president of Harita Metal Co.,Ltd., a recycling company. Harita Metal processes many kind of used products including automobiles and home appliances and industrial waste, In addition, a value chain has been formed by a consortium of many companies to circulate various materials such as plastic, glass, metal, and rare metals.

The world is filled with challenges.

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EEDF Session 5

Digitalization and **IT solutions** are key to the success of a circular economy

The path to a successful digital strategy

Digitization ⇨ Digitalization ⇨ DX

The path to a successful digital strategy

Digitization ⇨ Digitalization ⇨ DX

analog → digital　Digital→Improved productivity　transformation

The path to a successful digital strategy

Digitization ⇨ **Digitalization** ⇨ DX

analog → digital　Digital→Improved productivity　transformation

The path to a successful digital strategy

Digitization ⇨	Digitalization ⇨	**DX**
analog → digital	Digital→Improved productivity	transformation

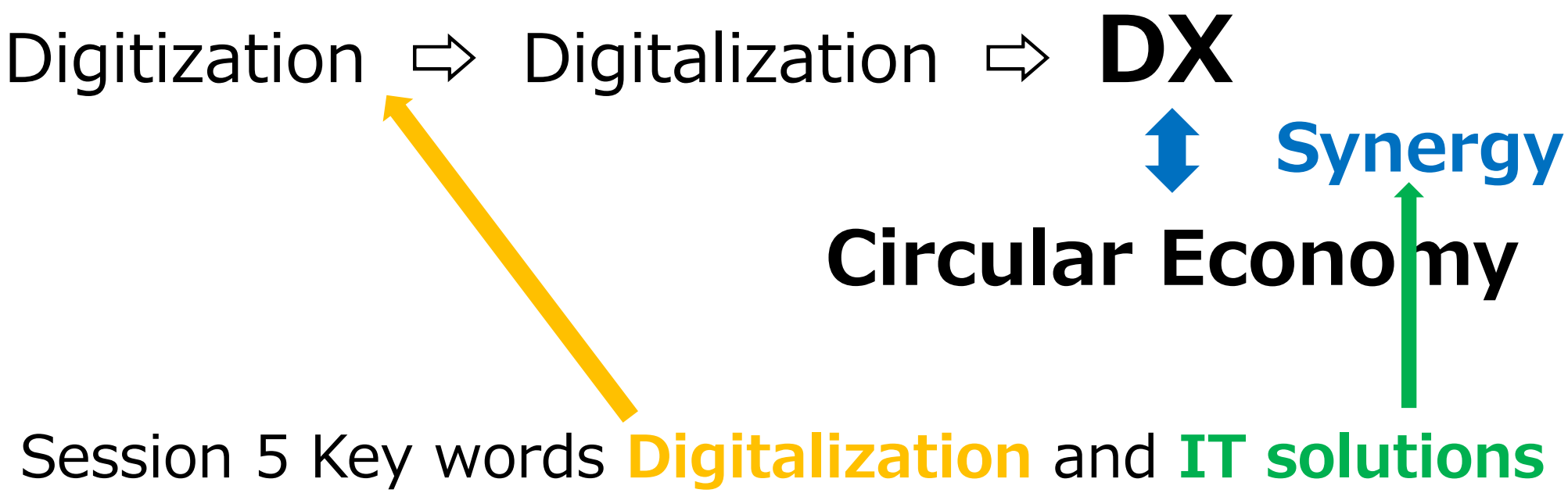
The path to a successful digital strategy.

Digitization ⇨ Digitalization ⇨ **DX**

Synergy

Circular Economy

The path to a successful digital strategy.



SIP

Cross-ministerial **S**trategic **I**nnovation Promotion **P**rogram

What is SIP?

What is SIP?　SIP is a national project established by the Cabinet Office's Council for Science, Technology and Innovation as a control tower to realize science, technology and innovation through management that transcends the boundaries of ministries and traditional fields.

We will tackle 14 world-leading social issues that are truly important to the people and that can contribute to the revitalization of the Japanese economy.

We promote industry-academia-government collaboration centered on 14 program directors (PDs) who strongly lead each issue, and promote R&D from basic research to practical application and commercialization, in other words, all the way to the exit.

We will strongly promote scientific and technological innovation, which is the driving force behind economic growth and dramatically changes society.

3rd SIP Assignment list

Assignment list

1. Building a sustainable food chain that provides abundant food
2. Building an integrated healthcare system
3. Building an inclusive community platform
4. Building a platform that realizes learning and working styles in the post-corona era
5. Building a maritime security platform
6. Building a smart energy management system
7. **Building a circular economy system**
8. Building a smart disaster prevention network
9. Building a smart infrastructure management system
10. Building a smart mobility platform
11. Developing basic technologies and rules for expanding human collaborative robotics
12. Developing basic technologies and rules for expanding the virtual economy
13. Promoting the application of advanced quantum technology platforms to social issues
14. Building a material commercialization innovation/nurturing ecosystem

SIP PD, Sub-PD member

PD

The University of Tokyo
Kohzo Ito

Invented tough polymer materials, established university venture, and served as PM of ImPACT /Moonshot and president of Society of Polymer Science. World authority in field of polymers.

Sub-PD (concurrently serves as PM)

Tohoku University
Tomonaga Okabe

Specializes in mechanical modeling of polymers and composite materials. In 2022, awarded title of Research Professor by Tohoku University. Only Japanese EC member of international Society for Composite Materials.

Sub-PD

University of Tokyo
Kaori Karasawa

Specializes in social psychology and social cognition. Served as president of Japanese Group Dynamics Association and Japanese Society of Social Psychology. Received Publication Award of 2018 Japanese Society of Social Psychology.

Sub-PD

Kyoto University
Masaki Takaoka

Researchs technology and system development in waste treatment and recycling field. Serves as vice president of Japan Society of Material Cycles and Waste Management. Expert in this field.

Sub-PD

The University of Tokyo
Yasushi Umeda

Specializes in life cycle engineering, eco-design, and circular economy. Expert in ISO TC323, international standard for CE. Serves as board member of Institute of Life Cycle Assesment, Japan

Sub-PD

Bridgestone Co., Ltd.
Hideki Komatsu

Served as managing executive officer in basic research, product development, and new business development departments. During meanwhile, planned and promoted collaborations with many companies, academia and ventures globally.

Sub-PD

Harita Metal Co., Ltd.
Makoto Harita

Comprehensive recycling company that handles intermediate waste treatment, end-of-life vehicles and home appliances, *etc*. Serves as member of ISO TC323, METI CE Domestic Review Committee, Small Home Appliance WG., and Circular Economy Vision Study Group (2019-2020).

3rd SIP Assignment list

Assignment

Building a circular economy system

Sub-Assignment

Sub-Assignment A :
Visualization of circular market and business
Digitalization and commonization to support CE expansion

Sub-Assignment B :
Promotion of expanding resource
circulation with cooperating CE industries

Sub-Assignment C :
Establishment of platform for improving
circulation and visualization

Assignment and istitution regarding SIP circular economy system

Sub-Assignment A : Visualization of circular market and business Digitalization and commonization to support CE expansion		Institution	
A1	Etablishiment of digital infrastructure contributing to expand circular market	NEC	Toray Industries
A2	Organizing and standardizing information rules necessary for establishing digital infrastructure	Nomura Research Institute	Asahi Kasei
		Mitsubishi Research Institute	
		Kyoto University	Kyushu University, Osaka University, Hokkaido University
A3	Development and visualization of natural capital assessment tools	National Institute for Environmental Studies	Tohoku University , NTT DATA Institute of Management Consulting
		Institute of Advanced Industrial Science and Technology	Kobe University

Sub-Assignment B : Promotion of expanding resource circulation with cooprating CE industries		Institution	
B1	Development of system for sorting and supplying high quality recycled materials from waste plastics	Mitsubishi Electric	
		Toyama Kankyo Seibi	
		Seiko Epson	
		Tohoku University	Kyoto University, Takenaka, Kobelco Eco-Solutions
B2	Establishment of system for sorting and supplying collected plastics in cooperation with municipalities	Amita Holdings	Toray Industries

Sub-Assignment C : Establishment of platform for improving circulation and visualization		Institute	
C1	Establishment of platform for improving circulation and visualization	National Institute for Materials Science	Teijin
		Tohoku University	Yamagata University , Kyoto University, Gunma University, The University of Tokyo

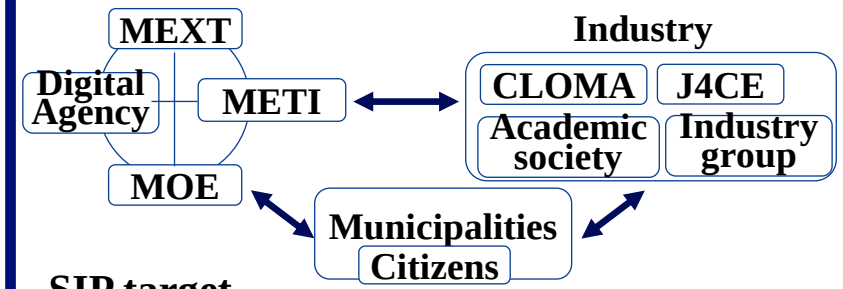
Development of New Circular Economy System

- Applying PLA-NET, highly qualitying recycled materials (Data-bank + MI) , and compliance with EU and TNDF regulations develops advanced circular economy system for plastic.
- Expanding recycled plastic usage solves domestic plastic waste issue, furthermore improves competitiveness of exported products overseas.
- Collaboration with projects of related ministries ensures early social implementation.
- "Circulation Science" as comprehensive knowledge encompassing polymer science, recycling technology, data science, social science, humanities, *etc* are propmoted to the world.

SIP initiatives

Three collaborations

① Ministries, Agencies ② Industry, Academia, Government ③ Municipalities/Citizens



SIP target

- Development of sharing system (PLA-NET)
- Optimization of rules (quality criterion for recycled materials)
- International standardization (ISO/TC323, CFP, TNFD, Digital promotion guidelines, *etc*)

Highly qualify recycled Materials (Data_Bank+MI)

Realization of CE system

Material development

Digital traceability

Separate collection system

Sorting & recycling technology

Digitalization

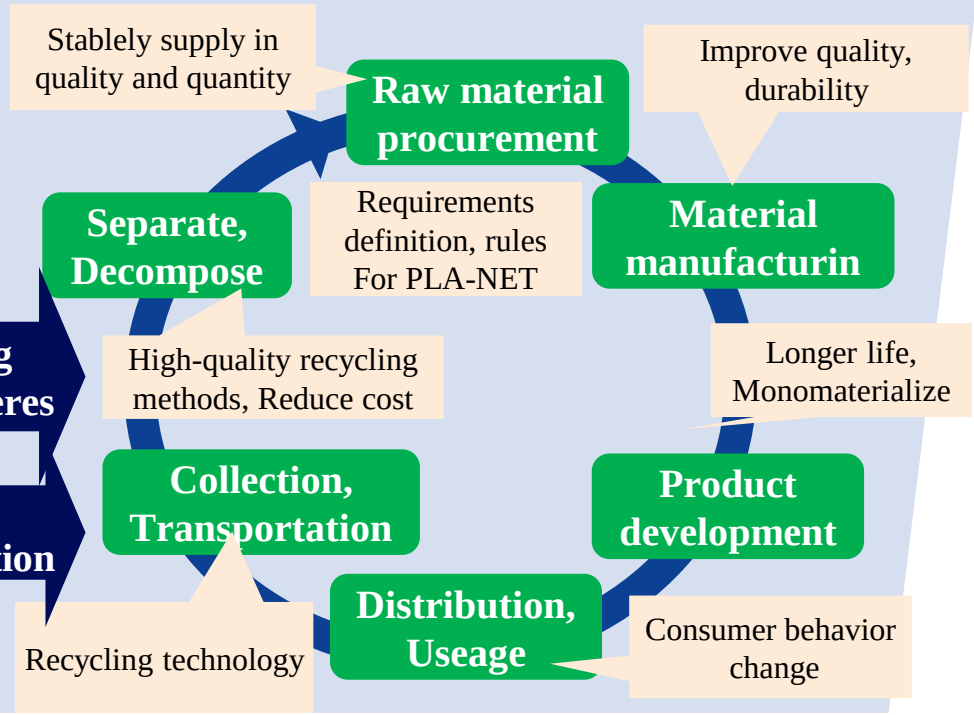
Plastic Information Platform

Cooperation among recyclers, manfuctureres

Improvement of circulation, visualization

Challenges for CE realization

Early social implementation by SIP results



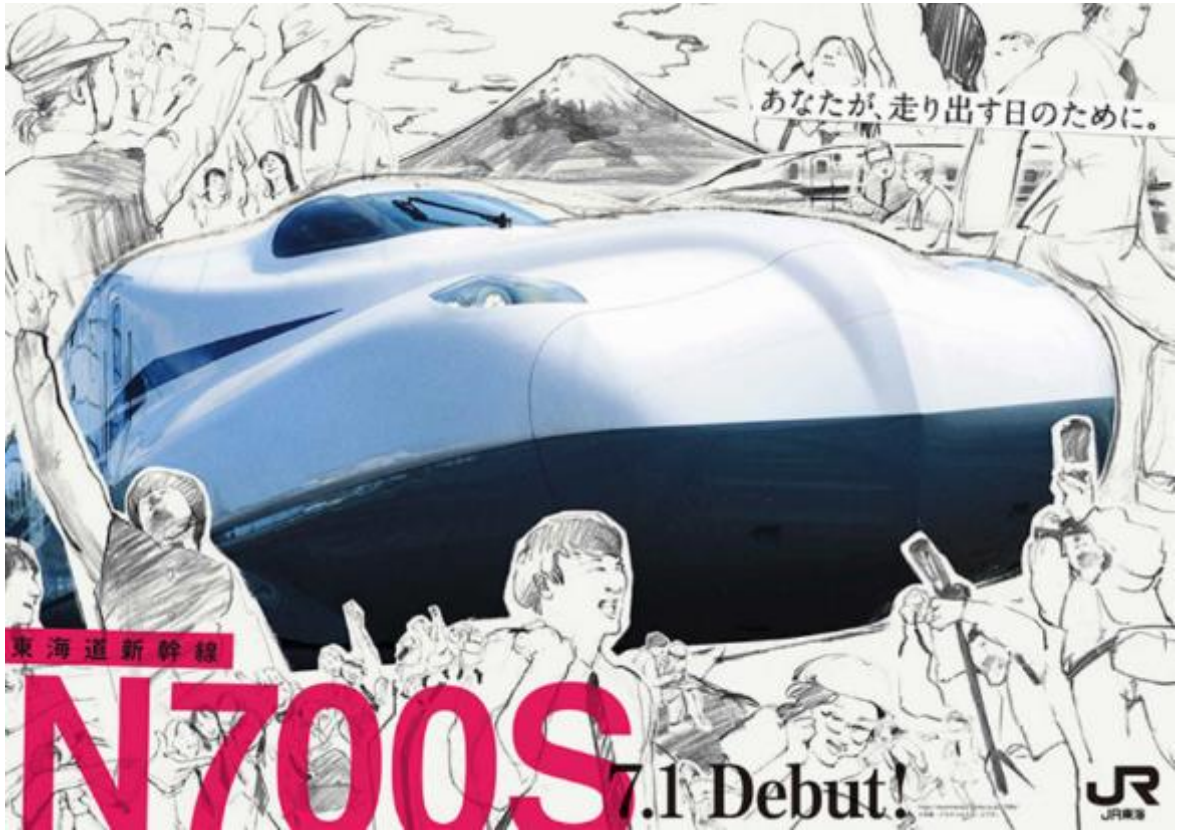
Complify with European regulations

NEDO New Energy and Industrial Technology Development Organization

Demonstration Project for
Introducing an Energy-Saving Resource Circulation System in Asia

「System of horizontal Closed-loop recycling of aluminum for train vehicle」

Run from April 2016 to March 2019



World's first horizontal aluminum recycling realized on high-speed railway

①廃棄車両から素材を抽出

②構体素材を溶解

③ビレット（元素材）を精製

④ビレットを押出成型

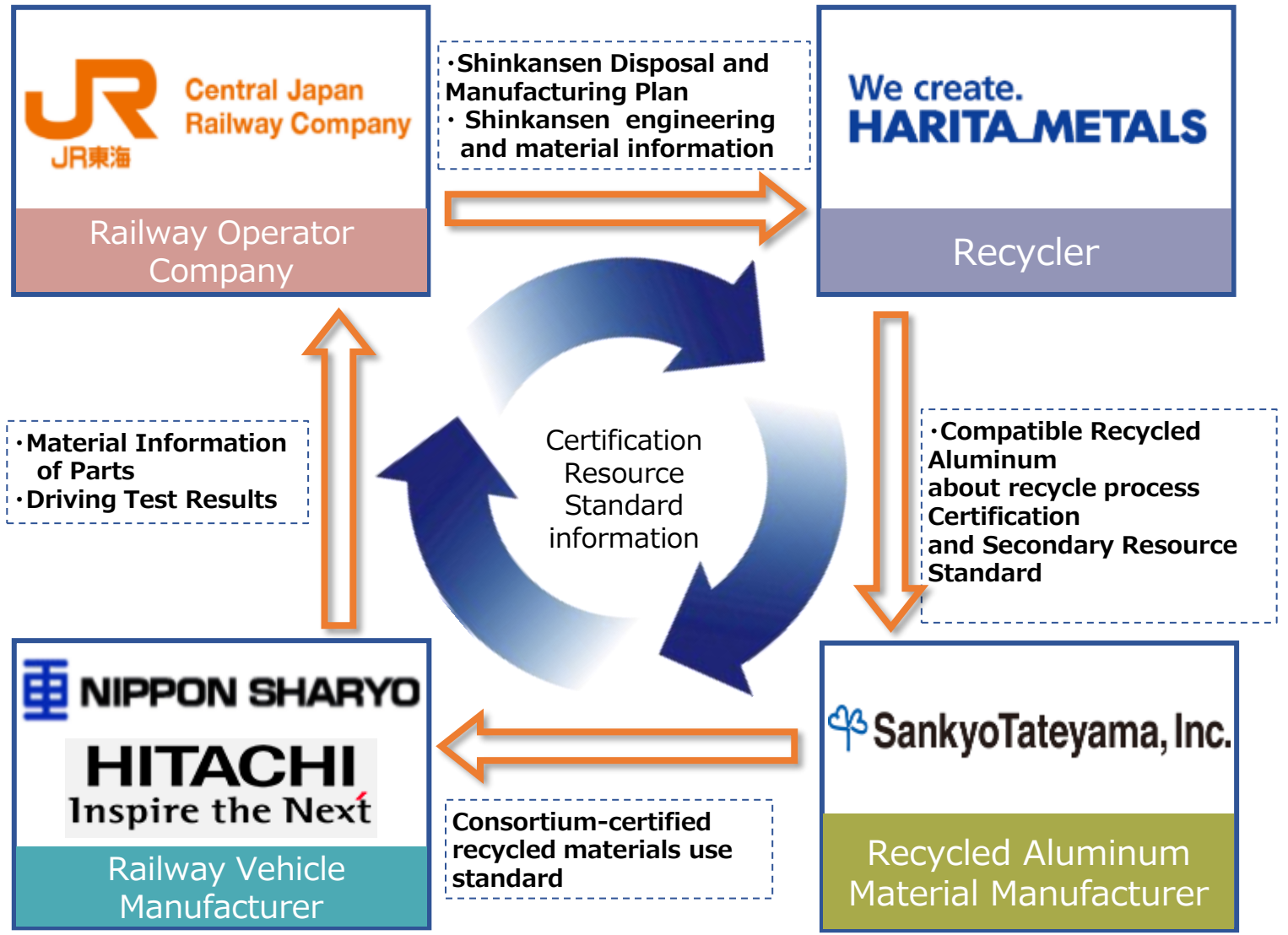
荷棚下パネル　荷棚

循環利用された内装部品

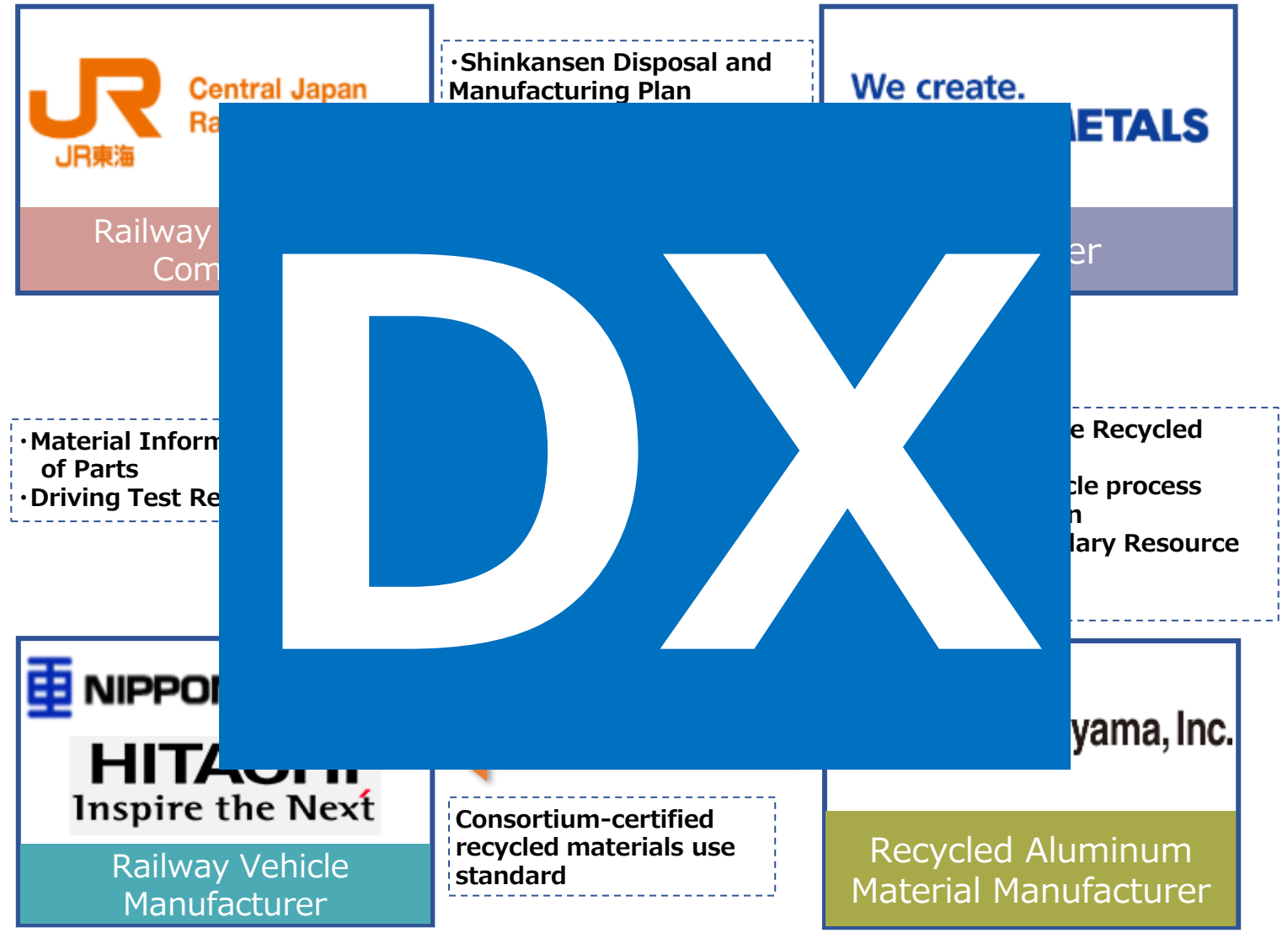
"Horizontal Recycling Promotion Committee of Aluminum Vehicles" Member Company

Railway operator company	Tokyo metro, JR tokai, JR east
Railway vehicle manufacturers	Kawasaki, Nippon syaryo, Hitachi, Kinki syaryo
Recycler	Haritametals, NikkeiMCAluminium
Aluminum vehicle material manufacturer	UACJ, Kobesteel, Nippon light metal, Resonac, MA Aluminum, Sankyo Tateyama
Car manufacturer (observer)	TOYOTA, HONDA, NISSAN

Systematic Framework of Horizontal Aluminum Recycle About Shinkansen



Systematic Framework of Horizontal Aluminum Recycle About Shinkansen



ASR

“Automobile Shredder Residue”

ASR

“Automobile Shredder Residue”

Difficult to treat waste

Plastic recycling

RDF（solid fuel）

Succeeded in developing technology to convert into useful resources

Prime Minister Kishida's site visit to Harita Metal Co.,Ltd.
August 10, 2023

Prime Minister Kishida receiving an explanation of automobile plastic recycling process from ASR

Prime Minister Kishida's site visit to Harita Metal Co., Ltd.

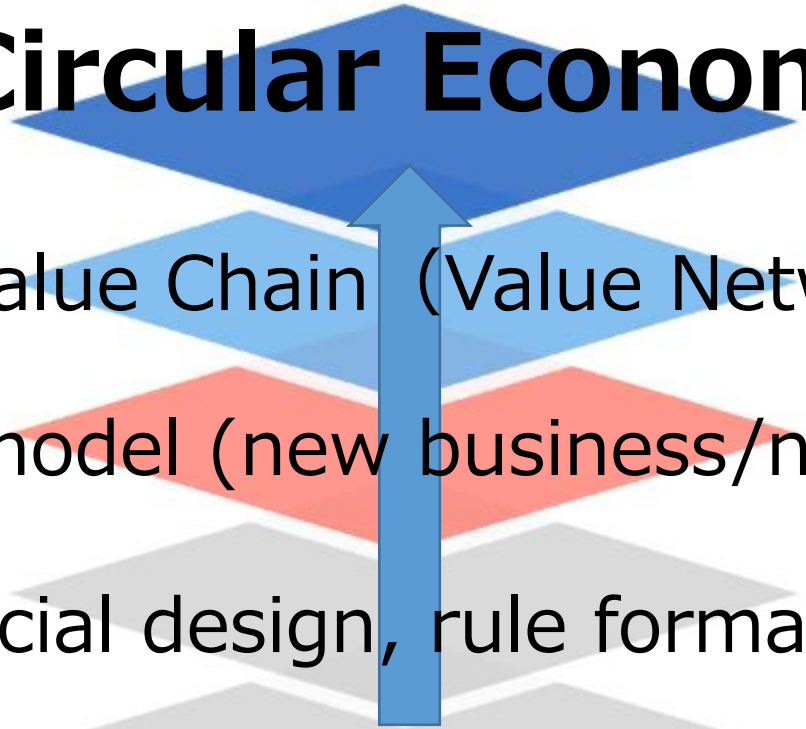
Prime Minister Fumio Kishida (Remarks on August 10, 2023)

Regarding the so-called ''circular economy'', we observed advanced efforts to recycle the aluminum used in Shinkansen into high-quality parts and reuse them in Shinkansen, as well as a site where young female employees are active.

''Community-based resource circulation initiatives'' that utilize advanced technology are truly an area in which Japan has strengths. I felt that the circular economy perspective is important from the perspective of regional revitalization.

In September, the Ministry of Economy, Trade and Industry and the Ministry of the Environment will launch the "Industry-Government-Academia Partnership on Circular Economy" to accelerate efforts centered on local regions.

Circular Economy



New Value Chain (Value Network)

Business model (new business/new service)

Social systems (social design, rule formation, regulations, *etc*.)

Digital technology

We will innovate society through
circular economy and digital technology.

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let‘s start Session 5 !

Thank you for your attention.