Confidential

BASC

Battery Association for Supply Chain

Working Report

【Digital Scheme to Support Battery Supply Chain】

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Contents Review Team & System Concept Team
Supervision / Issuance : BASC Secretariat

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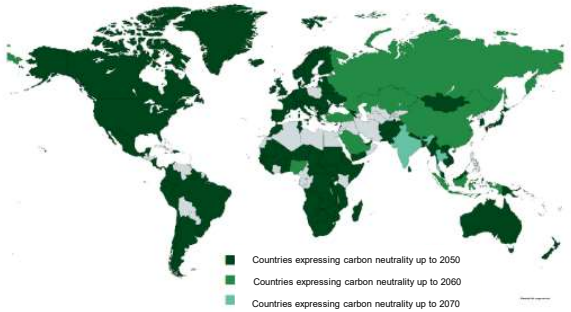
Contents

1.1 Environmental awareness

Countries have announced carbon neutrality to reach the 1.5 ℃ target of the Paris Agreement by 2050.

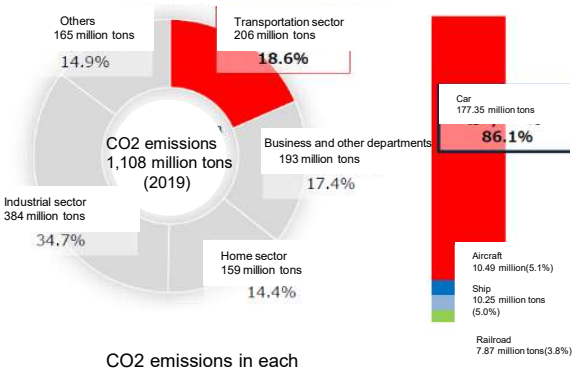
- Countries and areas, including Japan, have announced **aiming for carbon neutrality by 2025**.
- **The transportation sector accounts for 18.6% of carbon dioxide emissions** in Japan and the prompt action requires decarbonization.

<Countries and areas announcing carbon neutrality>



1) The map is referred to ①Countries which participated in Climate Ambition Alliance ②CN expressing countries by 2050.
①https://climateaction.unfccc.int/views/cooperative-initiative-details.html?id=95
②https://unfccc.int/process/the-paris-agreement/long-term-strategies

<CO2 emissions in Japan>



CO2 emissions in each sector(Japan

CO2 emissions in the transport sector(JPN)

CO2 emissions in Japan: 1,108 million tons

Transportation:18.6%　　Automotive related:16.0%

- Source: Website from Ministry of Land, Infrastructure, Transport and Tourism

【 CN statement status of each country 】

	JPN	EU	UK	USA	CHN
2020	↓	↓	↓	↓	↓
2030	46% decrease from 2013, challenge to 50%	55% less than in 1990	68% less than in 1990	‘50~52% less than in 2005	Convert CO2 emissions to decrease by 2030
2040	↓	↓	↓	↓	↓
2050	**Carbon neutral** (legislation)	**Carbon neutral** (Long-term strategy)	**Carbon neutral** (legislation)	**Carbon neutral** (Pledge)	↓
2060					**Carbon neutral** (United Nations speech)

Source: Ministry of Economy, Trade and Industry, Energy Agency, etc.

1.2 Regulatory trends

Country	Item	Trends
EU	Small car CO2 regulation	• Under the CO2 regulation for small vehicles (currently TtW regulation), considering whether to formulate and introduce a CO2 emission evaluation method in the life cycle.(Concluded by the EU Commission by 2023)
	Battery regulation plan (Dec. 2020 Proposal)	• Draft of battery-related regulations in the life cycle. Currently, under deliberation in the EU for finalization • The following carbon footprint requirements will be introduced for EV batteries※1 over 2kWh. 【Draft Battery Regulations Carbon Footprint Requirements】 Carbon footprint at the life cycle stage (raw material mining / processing, battery manufacturing, transportation, disposal / recycling)(CO2 kg) ＜Obligations＞ ➢ July, 2024：Information provision ➢ January, 2026：Performance classification and the display ➢ January, 2027：Fit to threshold • The carbon footprint is calculated by the EU Commission, Product Environment Footprint rules, etc.
	【Carbon border adjustment tax ※2 (Jul.14th, 2020Proposal)】	• Apply to imports of steel, iron, cement, fertilizer, aluminum and electricity • Require paying the carbon price equivalent to the CO2 emissions at the time of manufacturing the target product. (Purchase CBAM certificate)
China	Passenger car LCA regulation	• Consider the introduction of LCA rules for passenger cars(information disclosure (2023) and standard value conformity (2026) • In information disclosure, evaluate CO2 at the stage of raw material mining / material production, finished vehicle manufacturing, and vehicle use
USA	Car fuel consumption・GHG regulation	• No discussion on introducing LCA at this time
JAPAN	Passenger car fuel consumption regulation	• Propose from MLIT about the formulation of a global automobile LCA evaluation method at UN WP29 • Set up WG at UN WP29 from Jan. 2022, and discussions on LCA evaluation methods are expected to begin

※1: Under discussion to expand application to all batteries such as collection and recycling, DD, performance requirements, etc.
※2: Not an automobile LCA regulation, but a system related to import tariffs, just for a reference

1.2 Overview of regulations and rules in Europe

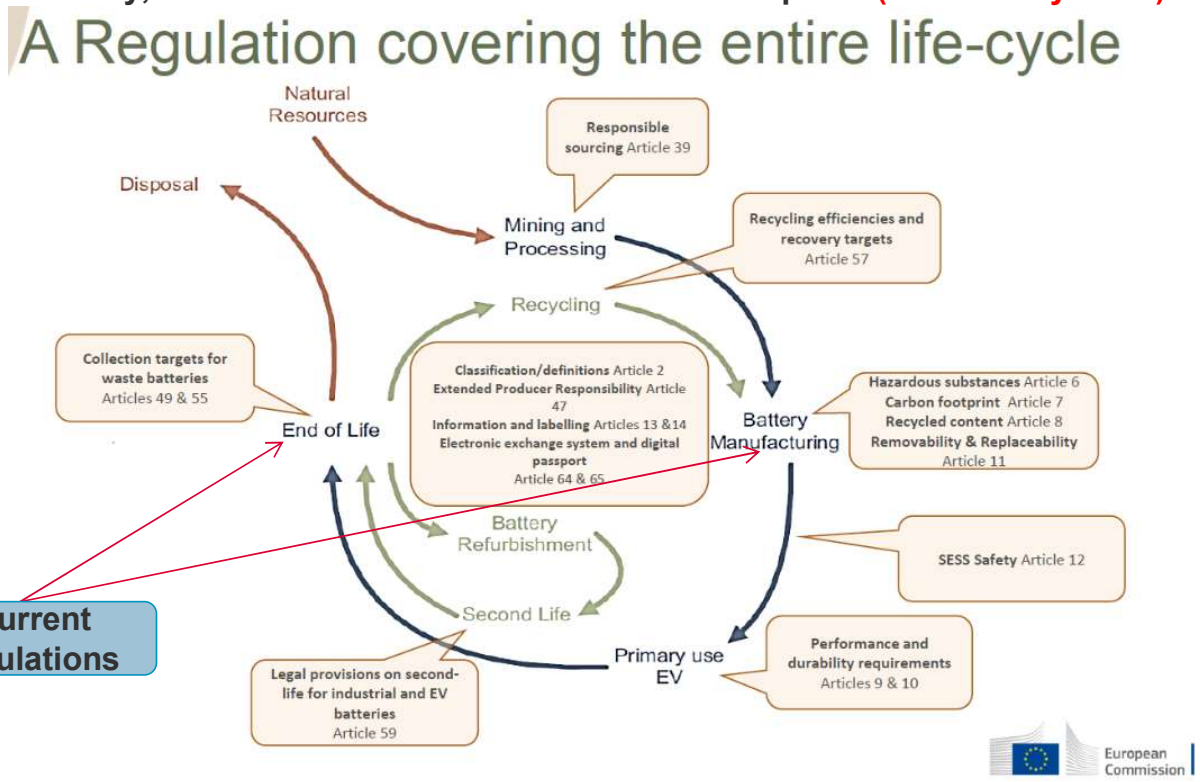
Regulations are being tightened, especially battery regulations affecting the battery business.

	Regulations	year	overview	remarks
Policy	**EU Green Deal**	2019	• Set targets for "climate neutrality" (effectively zero emissions) by 2050 and 55% reduction in greenhouse gases by 2030 • A compilation of action plans such as a review of related regulations.	• Jan. 2020:The European Commission announced the **"European Green Deal Investment Plan"** • Mar. 2020: **Circular Economy Action Plan** • Jun. 2021: **European Climate Law** passed. Legislation of 55% reduction target for 2030
Basic policy	**Fit for 55**	2021	• A policy package that embodies the European Green Deal • It has 12 basic policies such as national goals and expansion of renewable energy. Two points directly related to automobiles are as follows: ① **Revise of the Alternative Fuel Infrastructure Directive** ：Changing the conventional "command" aimed at greatly expanding the alternative fuel charging / supply station network to "rules" enable us to set binding targets for infrastructure development. ② **Revise of rules regarding CO2 emission standards for passenger cars and light commercial vehicles (vans)** ： Strengthen emission standards	• Included regulations on **the Carbon Border Adjustment Mechanism (CBAM)** as future possible impacts • Mechanism for charging for specific imported products with high emissions • Current object: cement, iron / steel, aluminum, fertilizer, and electricity • The U.S. announced countermeasures during the Trump administration, but no move under the Biden administration
Individual policy	**Battery rules**	2020	• Large-scale revision of battery regulations as **the first "circular action plan"** • It covers all types of batteries and defines the entire life cycle from product design to production process, reuse and recycling. Jul. 2024：Mandatory to declare CO2 emissions on LCA basis Jan. 2026：Display of performance class to facilitate the identification of large and small CO2 emissions throughout the life cycle Jul. 2027：Introduction of carbon footprint upper limit for the entire life cycle	• Details decided by delegated legislation by the European Commission • The manufacturer's responsibility will be seemingly added on the premise of recycling. The following correspondence will be also done: Jan. 2027: Disclose reused raw material use Jan. 2030: Introduce the lowest value for each reused raw material

1.3 European Battery Regulations

Current rules: Enacted in 2006. Main regulations include environmentally hazardous substances (mercury, cadmium, etc.) and recycling requirements.

Proposal to revise this rule to cover the entire battery life cycle to strengthen the European economy (manufacturing of high-quality batteries, market for recycled materials, etc.), promote the circulating economy, and reduce environmental and social impacts (new battery rules)



Source: European Commission, etc.

1.3 Objects to new battery regulations

➢ **All batteries**

Article 2 Classification of batteries

In the **Directive**, three types based on use: portable, automotive and industrial

In the **Regulation, four types**: portable, automotive, industrial and EV

- **portable battery**

  → sealed, weighs below 5 kg

- **automotive battery**

  → starter, lighting or ignition power

- **industrial battery**

  → designed for industrial uses

- **electric vehicle battery**

  → designed to provide traction to EVs

European Commission

EV batteries that were treated as industrial batteries under the current regulations are regulated as EV batteries under the New Battery Directive.⇒ Industrial and xEV batteries are required to have particularly strict requirements and management as specific batteries.

Source: European Commission, etc.

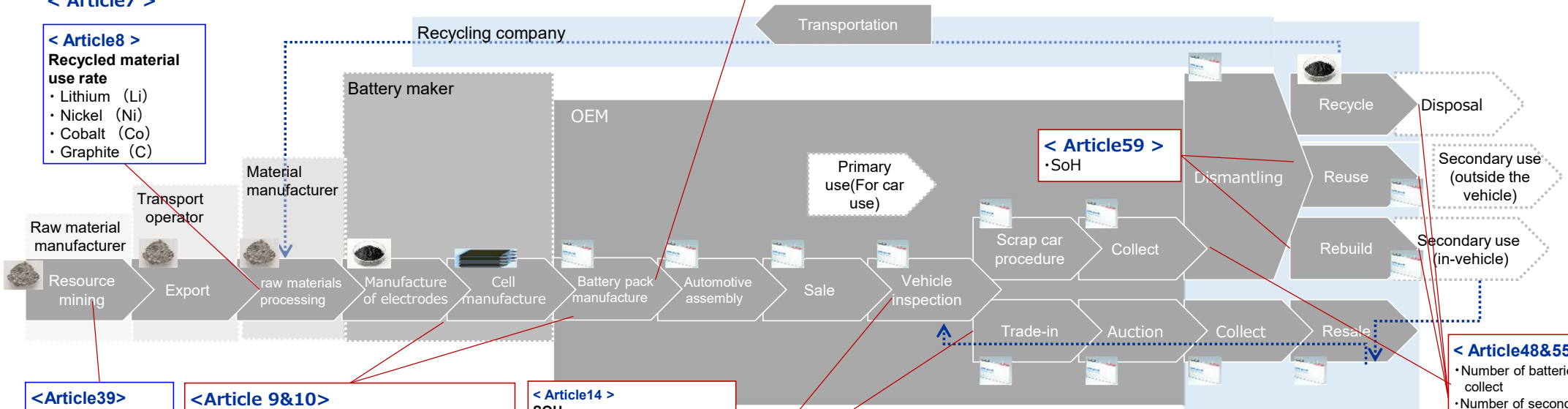
1.3 European Battery Regulations Disclosure Request Data

<Article65>Electronic exchange system(Input Required)
- Battery manufacturer
- Battery model
- Model description (concisely & identifiable, incl. launch date)
- Location and date of battery configuration incl important raw materials
- CFP info, responsible procurement info, recycled resource info shown in relevant action units
- Rated capacity (Ah)
- Minimum, nominal, and maximum voltage, temperature range if relevant
- Limited to original power capacity (in watts), temperature range if related
- Expected battery life represented by cycle, its test conditions
- Capacity threshold at the time of exhaustion (EV only)
- Temperature range that can withstand when not in use, its test conditions
- Commercial warranty period to which the calendar life applies
- Round-trip energy efficiency at initial and LC 50%
- Initial battery cell and pack resistance
- C rate of cycle life test

< Article13 >
Label requirements
- Manufacturer, trademark
- Battery model
- Model identifier
- Date of manufacture/launch
- Chemical composition
- Hazardous substance (Hg,Cd,Pb)
- Important raw materials

< Article7 >

< Article8 >
Recycled material use rate
- Lithium (Li)
- Nickel (Ni)
- Cobalt (Co)
- Graphite (C)



<Article39>
due diligence
- Lithium (Li)
- Nickel (Ni)
- Cobalt (Co)
- Natural graphite (Gr)

<Article 9&10>
Performance and durability
- Rated capacity (Ah) and capacity fade (%)
- Output (W) and Output Fade (%)
- Internal resistance (Ω) and increase in internal resistance (%)
- Prospective life indicator from energy & capacity

< Article14 >
SOH
1. Remaining capacity
2. Capacity reduction rate
3. Residual output & output reduction rate
4. Charge and discharge efficiency
5. Cooling requirements
6. Change in self-discharge rate
7. Resistance & electrochemical impedance

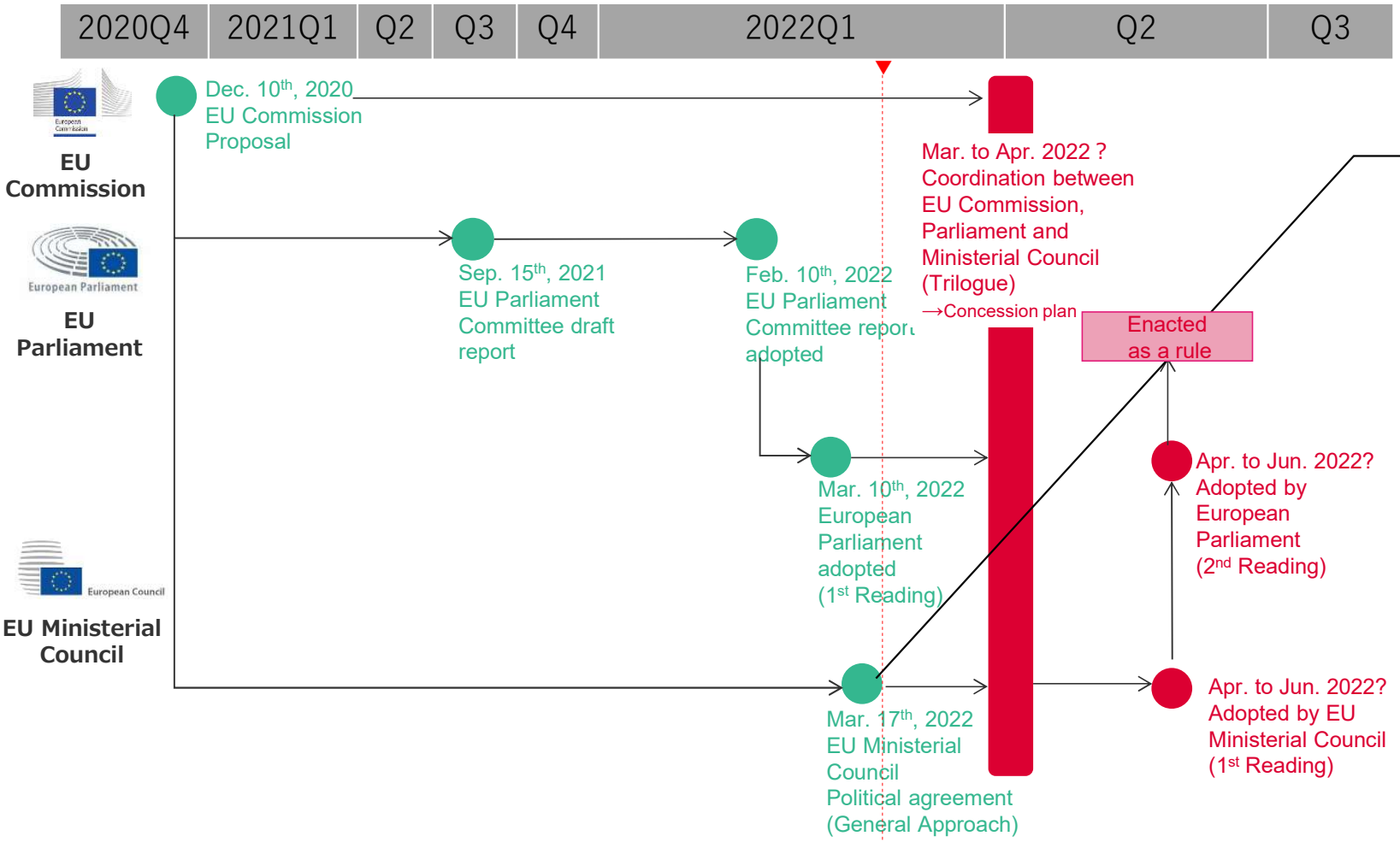
<Article65>
Electronic exchange system (data accessible by licensed business operator + EU committee)
- Detailed composition of positive / negative electrode and electrolyte material
- Source info for configuration / replacement parts
- Battery dismantling info (exploded view, flow, tools, safety)
- Safety measure

(Data accessible only to certification body & monitoring authority)
- Conformity certification test report

< Article48&55 >
- Number of batteries collect
- Number of secondary uses
- Detoxification treatment
- Recycling record

Complying with the new European battery regulations urgently requires creating a domestic system and guidelines.

1.3 European Battery Regulations Examination Status



【Main resolutions @3/17】

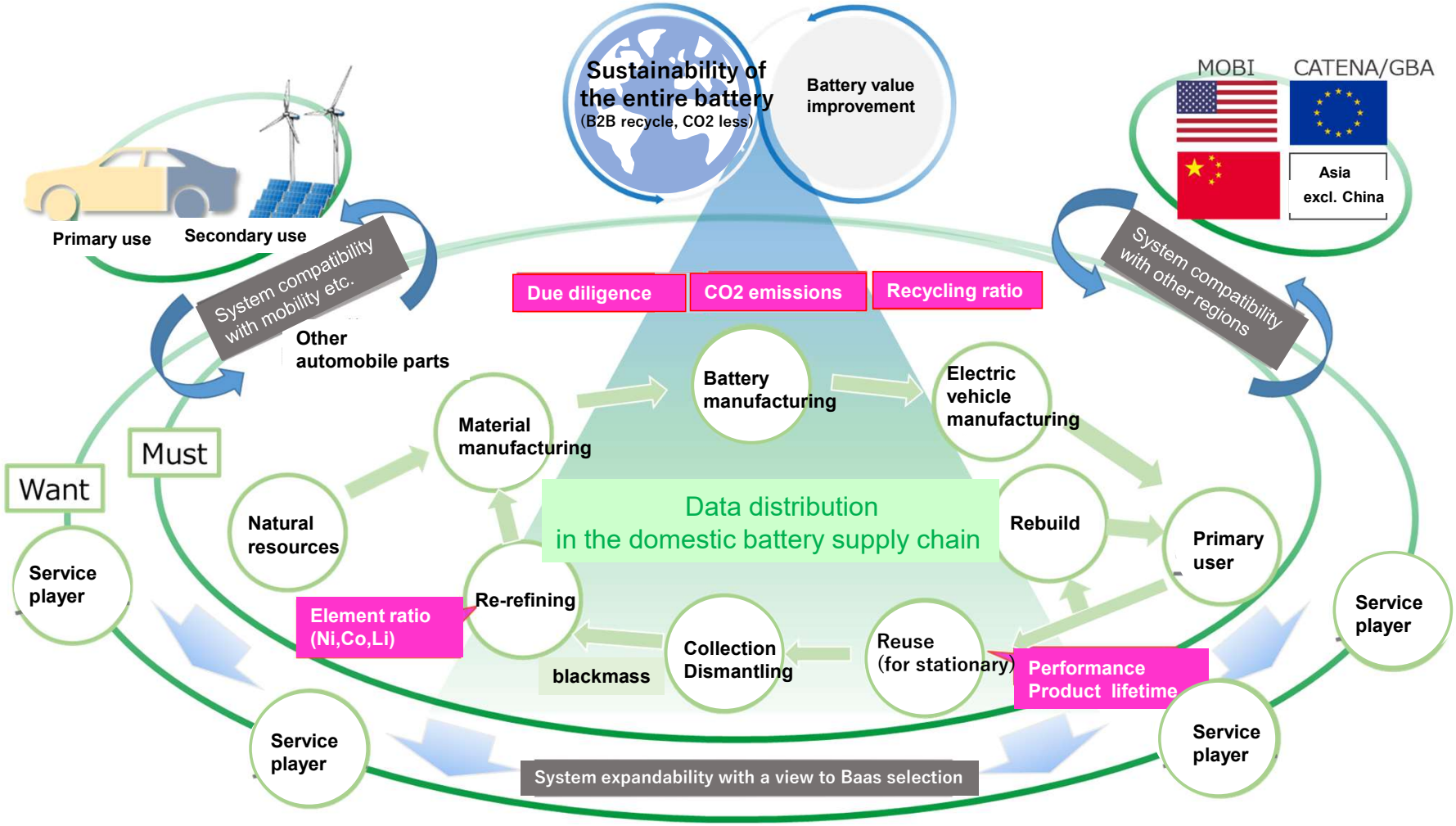
① Carbon Footprint (CFP) Requirements
- For all xEV batteries **(2kWh limit removed)**
- **6 months ahead** of enforcement
  CFP reporting obligation : '24/1
  Class performance classification : '25/6
  Threshold management : '27/1

②SOH Requirements
- For all xEV batteries **(2kWh limit removed)**
- Added for light vehicle LMT batteries

③ Electronic info exchange system /Batt Pass
- For all xEV batteries **(2kWh limit removed)**
  (Batt Pass 2kWh limit remaining?)
- Added for light vehicle LMT batteries
- Review of application time : '26/6

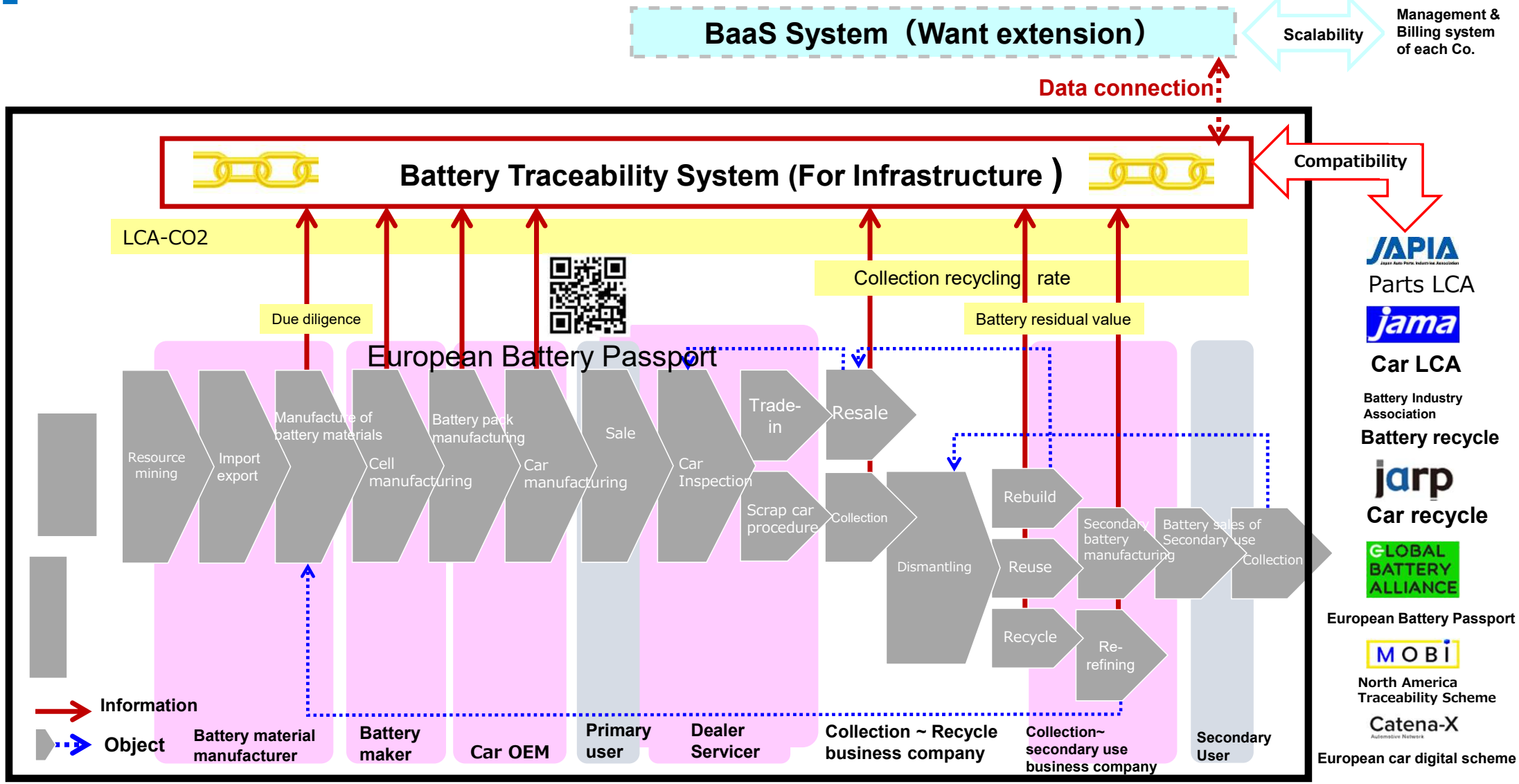
The European New Battery Regulations are considering expanding the scope of application and advancing the start time.

2. Construction of BASC Battery Digital Scheme

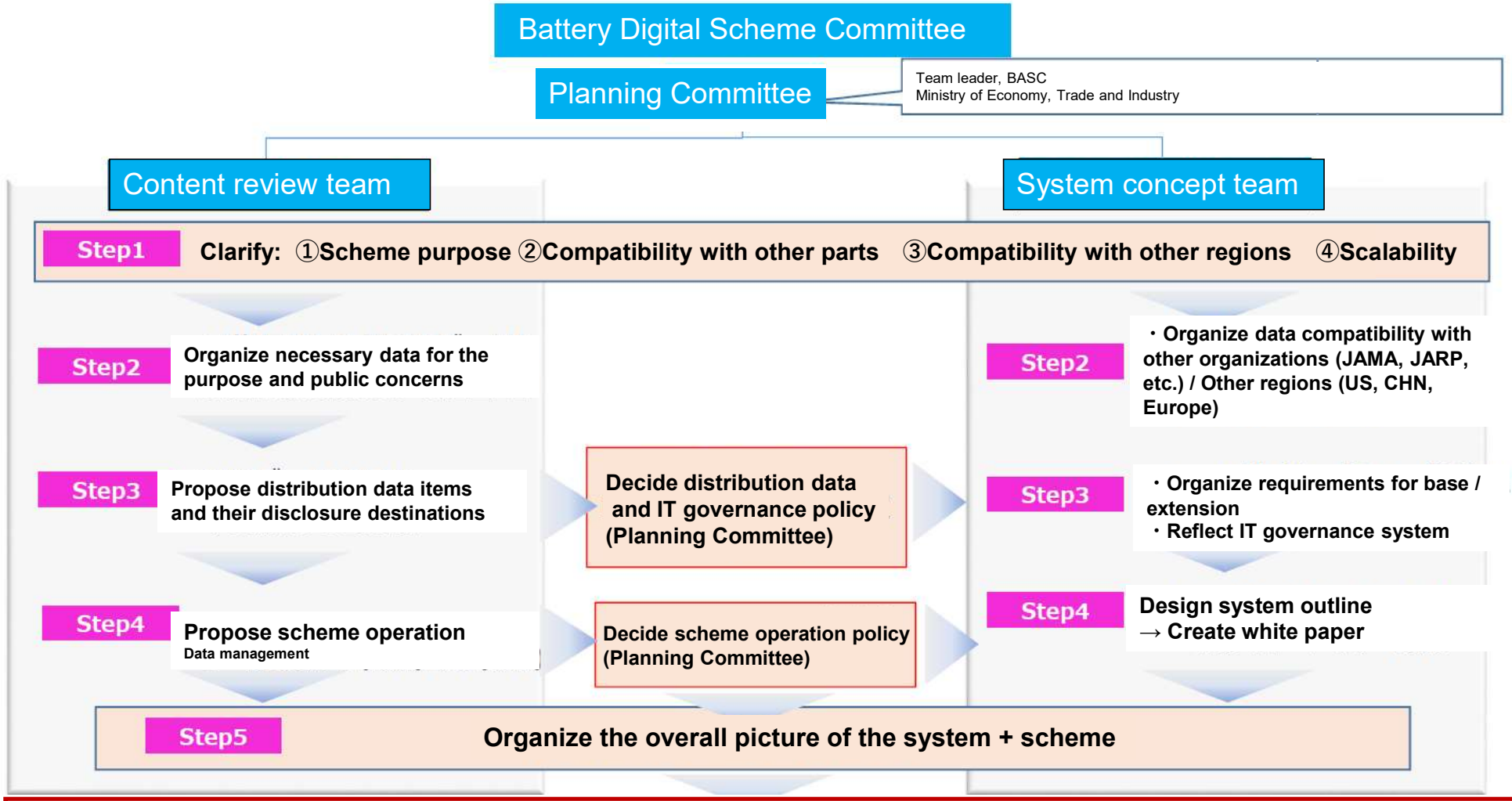


Distributing data within the domestic battery supply chain requires traceability systems and operational rules.

2.1 Image of the entire BASC battery traceability system

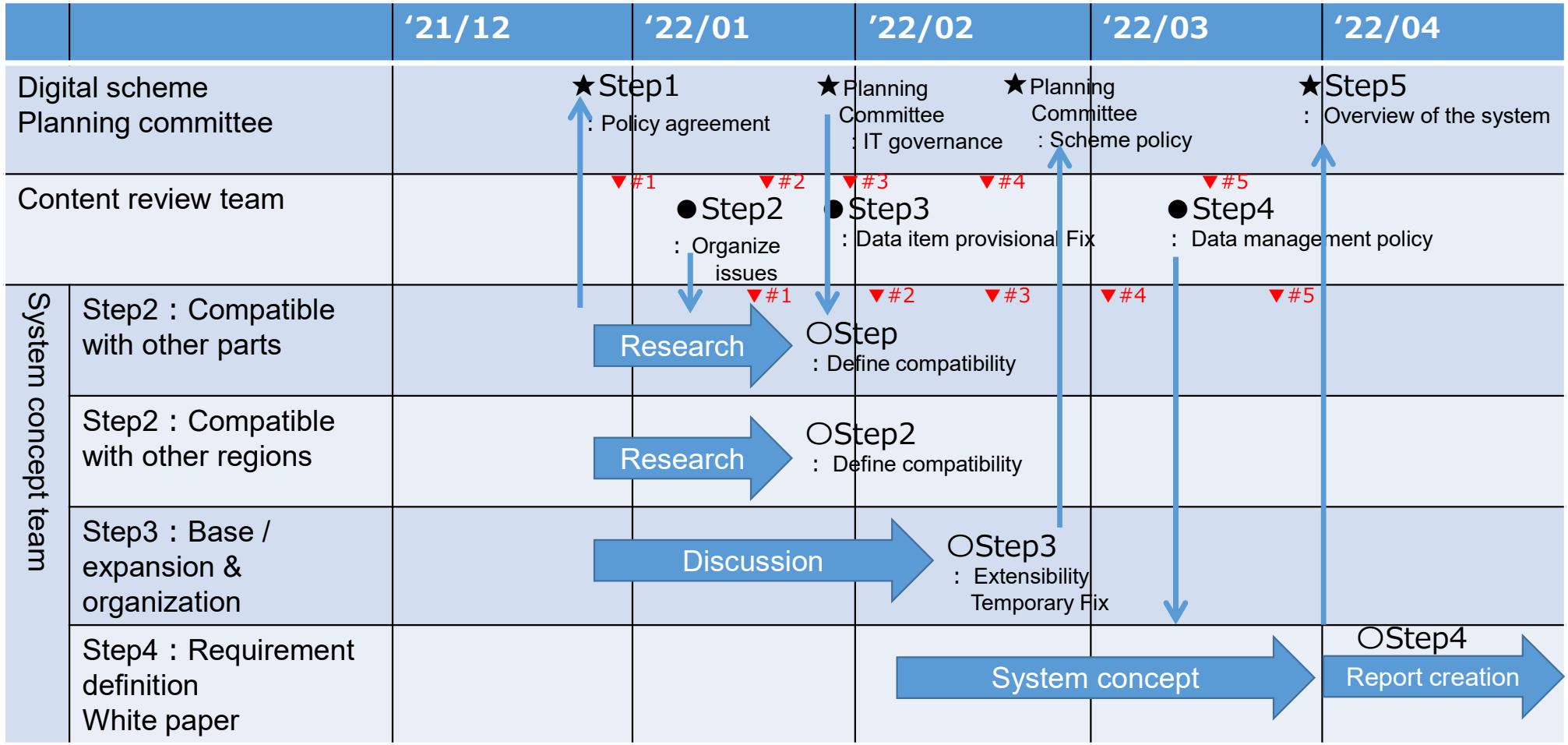


2.2 BASC Digital Scheme Preparatory Committee System & Examination Steps



Embody the system and the operation scheme through demonstration in 2022

2.2 BASC Digital scheme study & plan



3.1 Issues to achieve battery traceability

Institutions / policies, management and strategy, and technology have issues. Achieving effective battery traceability seems to be difficult simply by advancing individual efforts.

Issues and comparison with Europe

Institution/Policy

- Insufficient mechanism to guarantee security / data reliability
- Efforts for global data distribution management and rights protection

【 European situation 】
- Promote climate change-related issues as a major European agenda in terms of both institutional and investment promotion
- Clarify the legal status of digital data authenticity and certification

Understanding of the importance of efforts

- Consider DX only as a means of on-site improvement / lack of understanding and investment
- Most of management that stays in a wait-and-see / passive response

【 European situation 】
- Strongly recognized that climate change initiatives are linked to investor behavior

Data sharing & strategy linkage

- Lack of consideration & identification of competitive area that become standard as a reference for the range to be shared and non-competitive areas
- No or slow strategy execution plan to anticipate industrial restructuring

【 European situation 】
- Climate change action & strategies are an indispensable initiative, and considered that the entire SCM (business partners) needs to collaborate
- Recognized that sharing socially important information is needed

Platform setting and promotion system

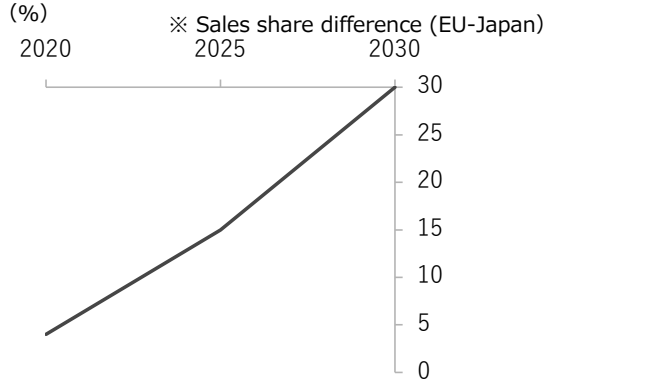
- Systematize and maintain the digital data
- No foundation for data sharing during companies

【 European situation 】
- Work on examination of digital data PF focusing on Gaia-X / Catena-X
- Core leaders in building infrastructure include IDS, SAP, Siemens, etc.

The gap between Europe and Japan will widen.

- The EU is advancing a systematic and strategic policy mix based on the key agenda (European Green Deal).
- EV spread represents "battery SCM driver".
  ⇒ The difference in spread is likely to further widen the gap between Japan and Europe.

EV: Difference in spread of rate between EU and Japan (forecast)



The share gap will increase about 7 times in the next 10 years.
Considering the market size (about twice in Europe), it will expand 14 times on a unit basis.

Source：RR, BCG analysis

3.2 Toward Building Battery Traceability: Suggestions and Recommendations

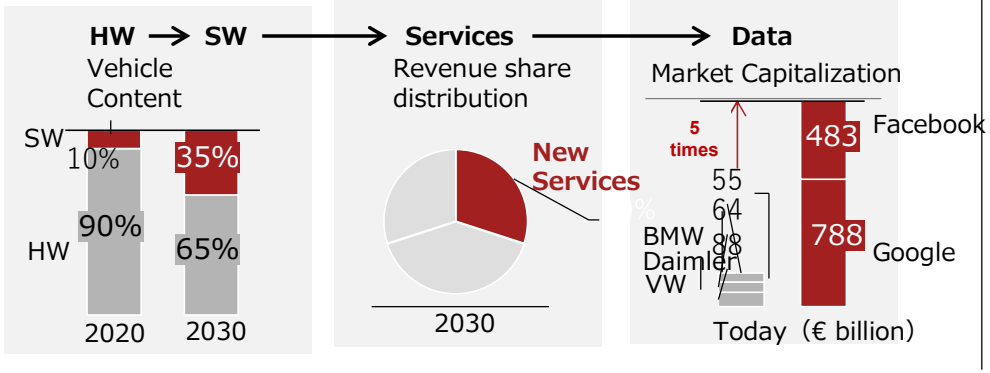
Building battery traceability in Japan consists of four success factors based on the EU situation.

1 Policy importance and effective institutional design / essential support

- Legalize as an important EU agenda
  - EU battery regulations
- Set data requirements (authenticity / traceability) and clarify legal framework
  - eIDSA
- Give effectiveness through strong budget measures
  - Budgeted Battery SCM as "Important Project for European Common Interest (IPCEI)"
- Activate cross-company & organizational initiatives
  - Battery Passport

2 Data from "sharing mechanism" to "competitiveness scenario"

Gaia-X background：「Powershift to Data」 → Creating economic value with data
Gaining value through data sovereignty



3 No effective without platform consolidation and cooperation

Data infrastructure coordination and division of roles have been clearly set from the beginning

- Catena-X
- Gaia-X

Mechanism of SCM data exchange in the automobile industry
Mechanism of cross-industry and common data sharing

Optimize the resource allocation in promotion
⇒ Participants can consolidate their skills and operations according to the purpose to be demonstrated.

4 Set legal compliance and minimum rules/Importance of flexible foundation for trading

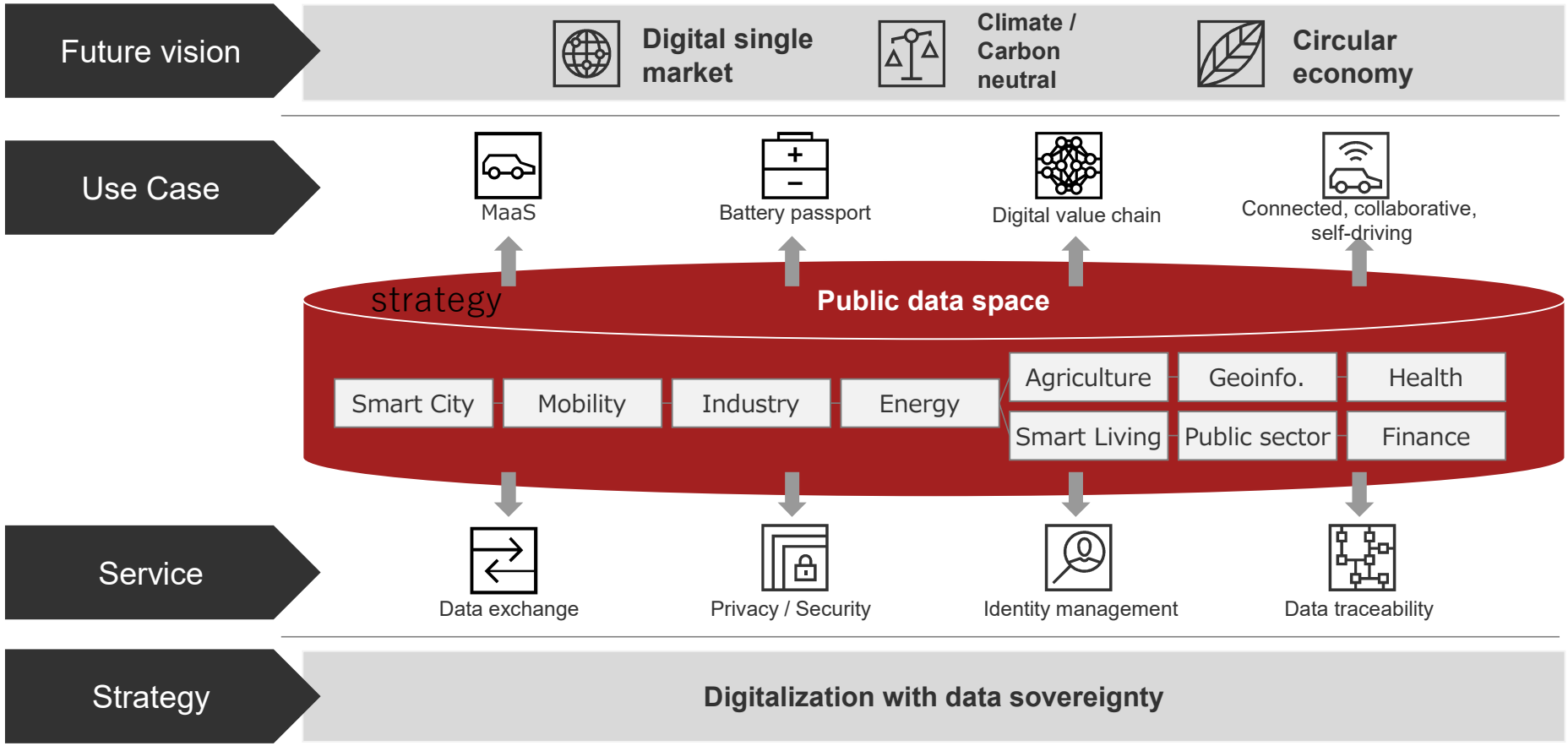
EU efforts	meaning
Rules such as access authority are set for the standard connector, but the metadata and data format depend on the user's agreement. （Mapping is also one service）	Respond to diverse business models and transaction scalability
Set Blockchain as one of the services Respond to needs of user entity (e.g. Battery Passport)	Maximize the benefits of technological evolution (e.g. Compute-to-Data/Ocean Protocol)

Improvement of the incentive to participate in the data infrastructure and increase of the network effect are promising.

Source : Gaia-X etc.

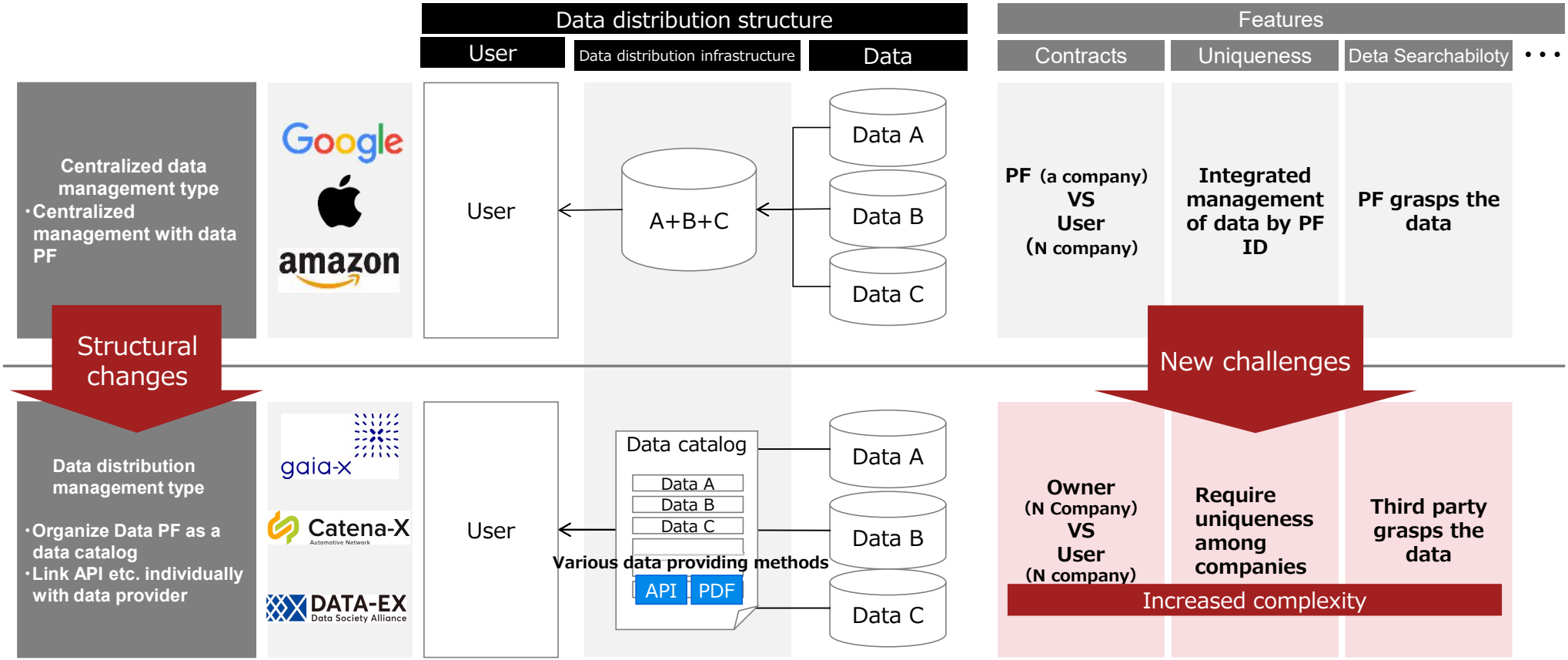
3.3 Trends toward ensuring product traceability

Ensuring product traceability is an important theme to achieve a sustainable society, and the public data space (data exchange PF) where various data can be exchanged between companies is important.



3.3 PF structural changes in data use

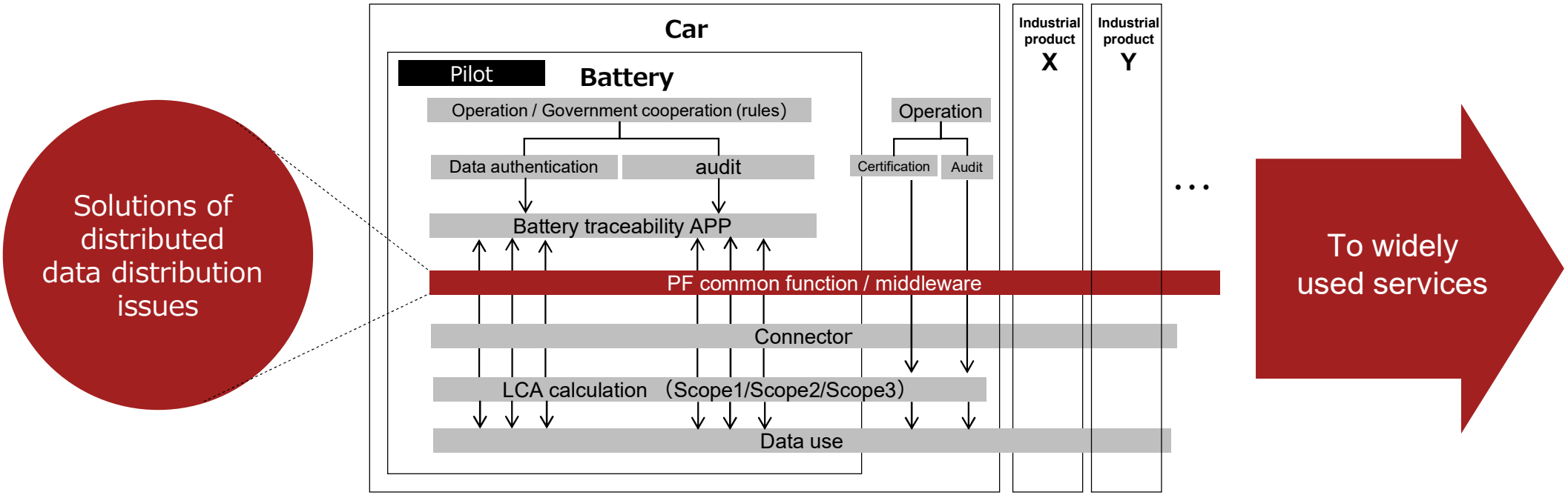
Achieving data use among companies requires paying attention to structural changes in data PF and new issues.



Source: Gaia-X etc.

3.3 Common PF functions for the era of distributed data distribution

PF common functions / middleware with an eye on the era of distributed data distribution are hopefully going to be widely used services.



4.1 System compatibility / Survey target

		Products					Target items				Storage Battery Sustainer Study Group	Storage battery digital scheme study
		Battery	Other parts	Car	Recycle	Other except car	CO2	DD	Loading material	CE		
EU	GBA Batt. Passport	○		○	○		○	○				
	CATENA-X		○	○								
	GAIA-X					○				IDS		
NA	MOBI			○		○						
CHN	GB/T32960	○	○	○	○							
JPN	JARP (self-reconciliation)	○	○		○		○					
	JARC(car recycle)		○	○	○							
	BAJ(Battery Industry Association)	○									○	
	JAPIA (Ministry union)		○				○		△ (IMDS)		○	
	JAMA(Automotive association)			○			○T2W				○	○
	JEITA(Institute of Electronics) G×D					○	○Scorp3					○
	DATA-EX (Data Society Alliance)					○				IDS		

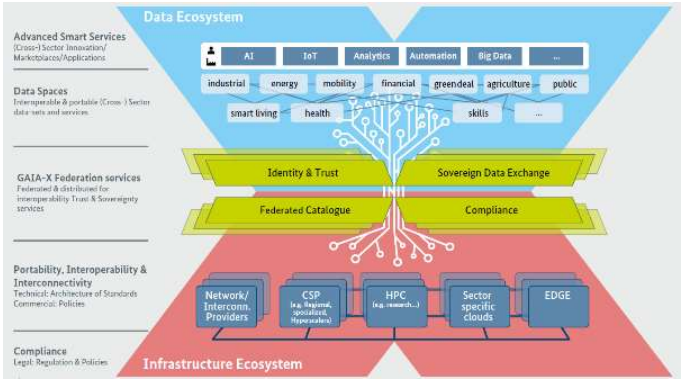
Survey item			
	・System vendor information (certification mechanism from regulatory agencies in each country) ・Data format, acquisition, communication and management (server) ・Data exchange, security policy and trade secret technology ・PF configuration and IF specifications (system compatibility with other systems and regions) ・System use fee and billing form ・Operation and maintenance SLA level etc.	Ministry of Land, Infrastructure, Transport and Tourism Ministry of the Environment	IPA -DADC IVI -CIOF IAJ -BRP RRI -SWG8

4.2 European data exchange platform concept

Europe is promoting to build a data exchange platform within and across industries.

Gaia-X

A platform for managing confidential and important data



■ Foundation/background

- Jun. 2020: Both German and French governments announced their establishment. It started by a total of 22 companies(11 German companies and 11 French companies).
- Nov. 2020: US and Chinese companies participated. From Japan, NTT Com and Fujitsu participated, and it became 350 companies.
- Mar. 2021: 195 new members, mainly European companies participated. Growing to 550 companies

■ Main purpose

- Build a data infrastructure that integrates various communication infrastructures, cloud facilities, industrial / personal data, and digital platforms that exist in Europe
- Establish a digital sovereignty(the biggest goal). Aim to develop a technological environment in which Europe itself can manage data stored, processed, and utilized without depending on companies outside Europe

■ Future development roadmap

- The approach to implementation has not been agreed, and the EU has many wait-and-see companies. On the other hand, companies that have acquired German industrial standards and cannot comply with "Gaia-X" may have difficulty in doing business with European companies and data distribution.
- Maintenance In the demonstration experiment in which NTT Com participated, "Distribution of power consumption data for calculating CO2 emissions during manufacturing" is dealt with.
- Pilot project with Catena-X also will start.

Catena-X

German companies involved in the automobile industry participate from upstream to downstream

■ Foundation/background

- Mar. 2021: BMW and Daimler announced establishment
- Apr. 2021: VW became a founding member
- Aug. 2021- : Plan to create use cases and connect with Gaia-X (European integrated digital data infrastructure)

■ Main purpose

- Standardizing information and data exchange enable the following matter to achieve.
  - (1) Strengthen the competitiveness of the automobile industry
  - (2) Improve the efficiency of inter-company cooperation
- (3) Aim to accelerate inter-company processes
  - (4) Achieve the sustainable CO2 emission reduction etc.

■ Future development roadmap

2021	2022	2023–
Development of network environment to become Data Ecosystem	Network of 1,000 companies Standard data PF in the automobile industry	Development for overseas / other industry Aiming for an incubation space for new business creation

Source : Gaia-X、Catena-X etc.

4.2 European data infrastructure structure and division of roles

Gaia-X represents a data infrastructure, and it consists of Product Passport, which prepares authentication data according to various regulations and standards, and Catena-X as a standard data distribution platform for the automobile industry.

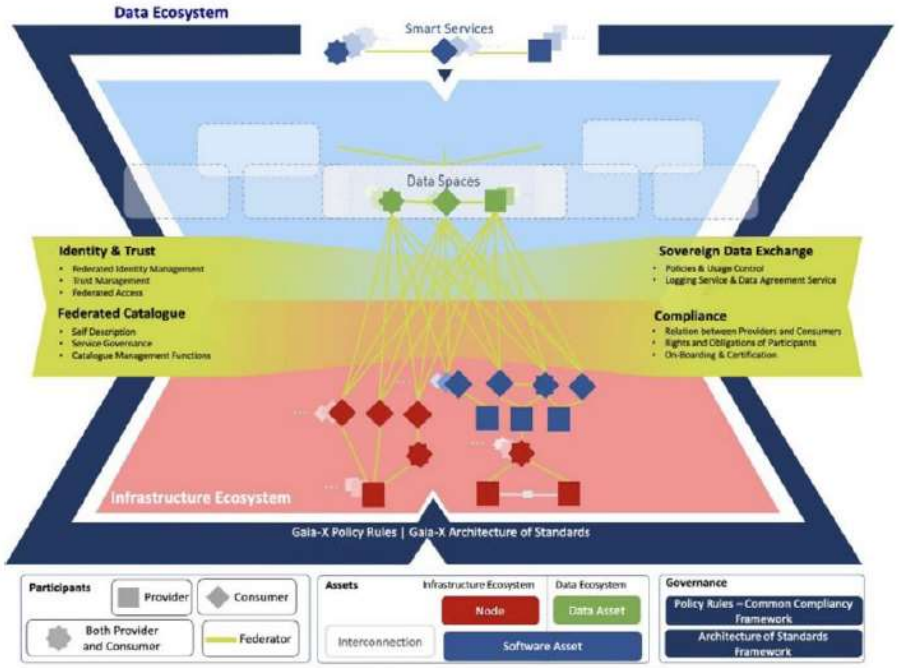
	Purpose	Organization	Industry	Level
Gaia-X	Work together for secure and transparent data exchange and digital trust Build a data infrastructure	Members with policy support from German and French industry and the scientific community	10 sectors such as energy, finance, medical care, mobility, SMEs, public, etc.	Hubs from 15 countries collaborate in the European Union and work on an international network
Product Passport	Achieve information exchanges that can be interoperated throughout the product life cycle by using digital twins	Industry mainly implements technical implementation in accordance with public laws and regulations	Value chain influenced by eco-design directives and multiple related policies such as energy and economy	National and international efforts to technically implement the new European Commission policy framework
Data Space	Create an ecosystem for new data-driven joint ventures that enable sustainable production	Bring together the power of industry groups and cooperate with government and financing	Various industries and areas related to policies about data governance and infrastructure	National and international use case and project based on national and European financing related to European regulations
Catena-X	Create standardized data and information flows across the automotive value chain / network	Have supports from industry and scientific members and policy	10 use cases covering different aspects of value creation by collaboration	A project that attracts national attention in Europe

Source : Sautter, B. Shaping Digital Ecosystems for Sustainable Production: Assessing the Policy Impact of the 2030 Vision for Industries 4.0. Sustainability 2021

4.2 Information sharing ① Gaia-X & IDS connector

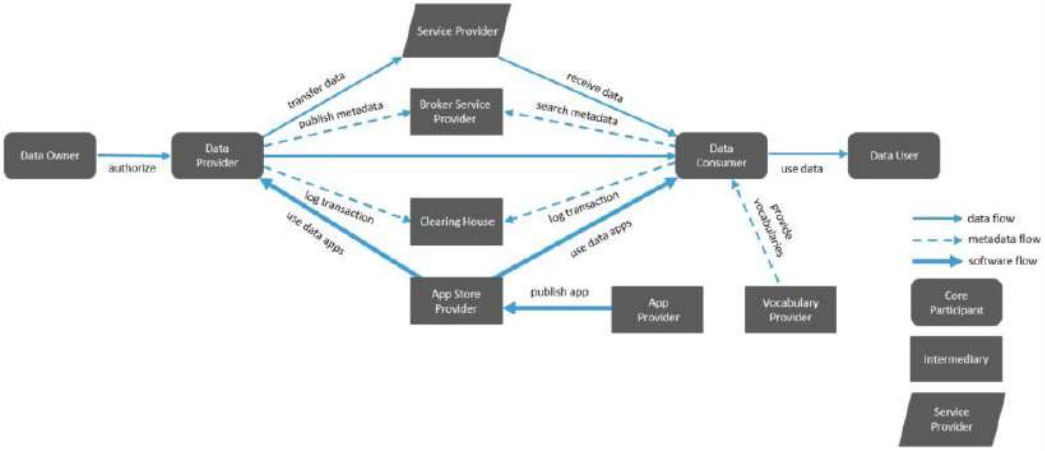
Gaia-X

A federated open data infrastructure based on European values regarding data and cloud sovereignty



International Data Spaces (IDS)

Distributed network of Data Endpoints allowing secure exchange of data and guaranteeing Data Sovereignty.



・Gaia-X mediates data distribution across multiple companies and industries with Federation Services.
・IDS provides a mechanism to control data transmission / reception / use between data providers and users by [IDS connector].

Source : Gaia-X、IDS etc.

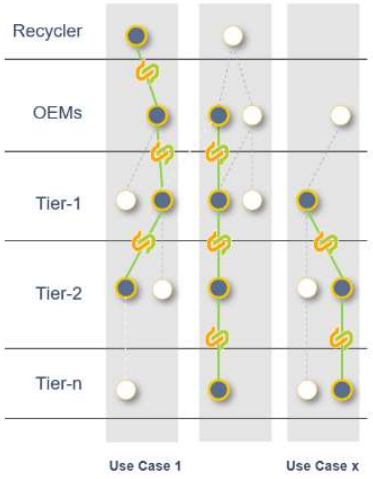
4.2 Information sharing ② Catena-X (Catena Automotive Network)

Set 10 initial use cases and start working on it

TP 2.0 Use Case Integration

- **TP 2.1 Traceability** of Hardware und Software components (・ Supply Chain Law)
- **TP 2.2. Sustainability** (・ Proof CO_2 footprint, compliance with social standards)
- **TP 2.10 Circular Economy** (・ CO_2 footprint minimization)
- **TP 2.3 Quality Mgt.** (・ Real time & collaborative quality management)
- **TP 2.4 Demand and Capacity Mgt..** (・ Security of supply)
- **TP 2.5 Business Partner** (・ Business Partner Service)
- **TP 2.9 Data and model-centric development and operations support** (・ Digital Twin)
- TP 2.6 Modular Production
- TP 2.7 Manufacturing as a Service
- TP 2.8 Real-time control and simulation

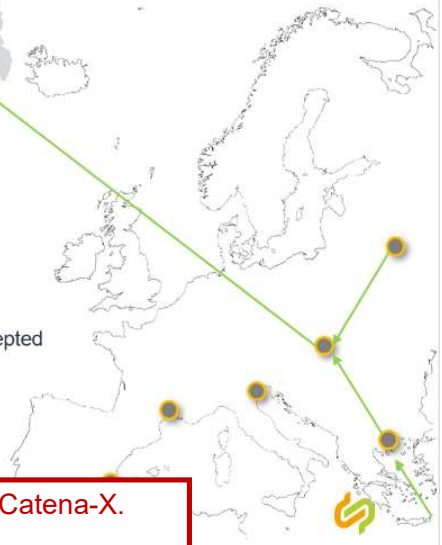
Data linkage in 3-4 layers



Mission critical to success:

- Orchestrated connection rel. partners of a chain in a time window
- Connection time / Partner: 2-4 Mo.
- Access to network (knowledge)

Source：Catena-X etc.

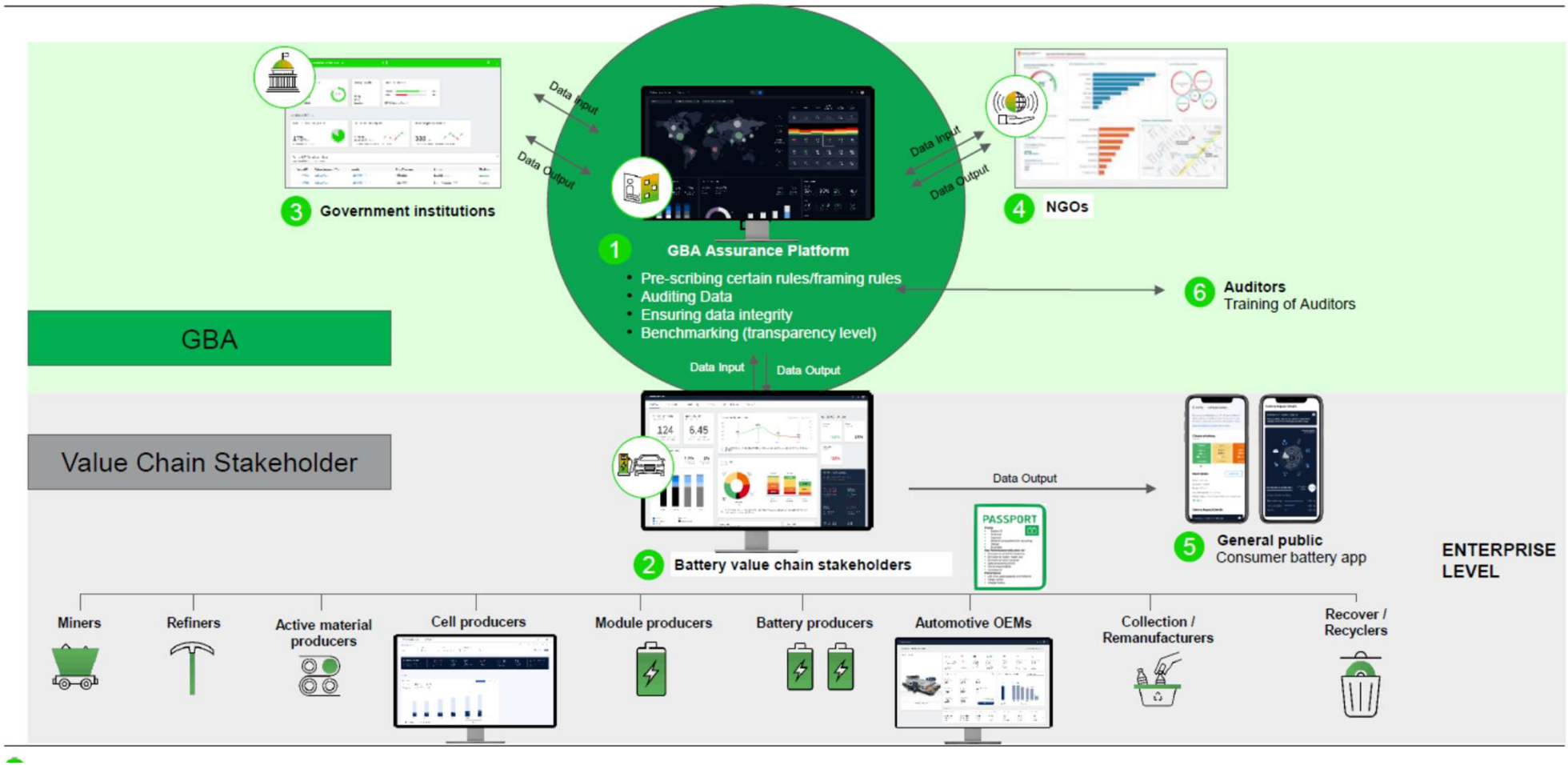


Approach:

- **Two-track activation of partners**
  (a) Top-Down + (b) central transfer mgt. (lateral flanking) Use of accepted and local industry 4.0 structures
- **Germany**: Adaptation of accepted (local) Industry 4.0 structures
- **Europe+:** BMWi / GAIA-X as access to further markets

・Each OEM has started a trial of data linkage using quality traceability as an example, and complianced company's data linkage mechanism to Catena-X.
・First, build a system in Germany and expand it to the base Hub in other regions (France, etc.)

4.2 Information sharing ③ GBA (Global Battery Alliance)



It makes it compatible not only with government agencies and NGOs, but also with supply chain companies' own systems and open house apps.
⇒Mechanism to authenticate to the tool vendor as [Battery Passport] from GBA

Source : GBA etc.

4.2 ③ Data that needs to be disclosed with Battery Passport

Battery Passport will seemingly collect and manage information from the perspectives of human rights and corporate ethics, in addition to the information required by the revised battery regulations.

□ : It shows data which can be requested to disclosure, in addition to the battery rule revision proposal.

Assumed scope of Battery Passport

Illustrative

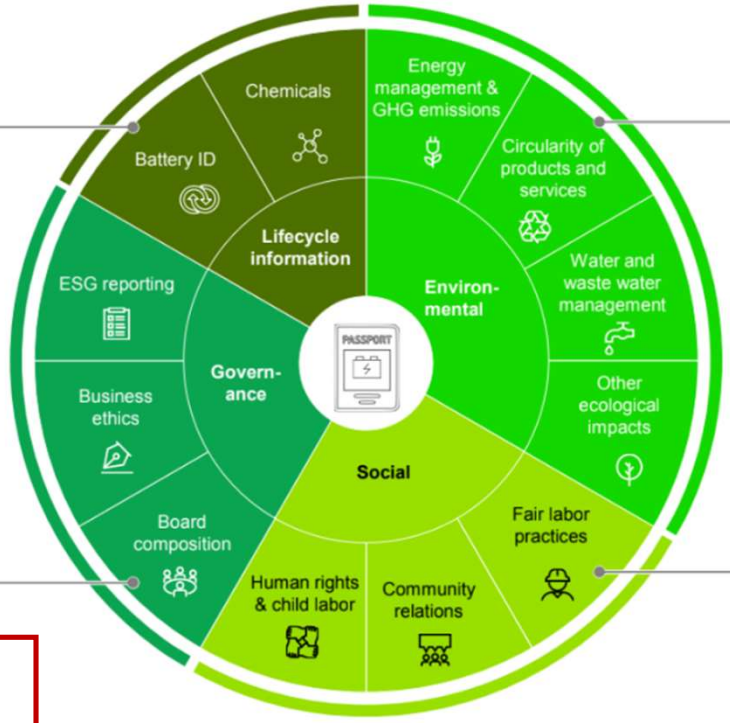
Lifecycle information

Battery traceability and identity with a focus on the cell and pack level; disclose limited battery data such as battery chemistry, and recycled content as well as dynamic data e.g., battery health, safety and lifecycle

Governance

Demonstration of business ethics, extensive and transparent ESG reporting

- Clarification of management system
- compliance
- Efforts for a sustainable society



Environmental

Disclosure of GHG footprint and general ecological impact

- Amount of industrial water used and water treatment method after use
- Local permit for industrial waste disposal
- Transportation method of hazardous material
- Responsibility of Extended Producer

Social

Proof of compliance with human rights, fair labor practices, and community relations

- Proof of non-forced / child labor
- Proof of fair transaction in accordance with the law
- Contribution to the local community

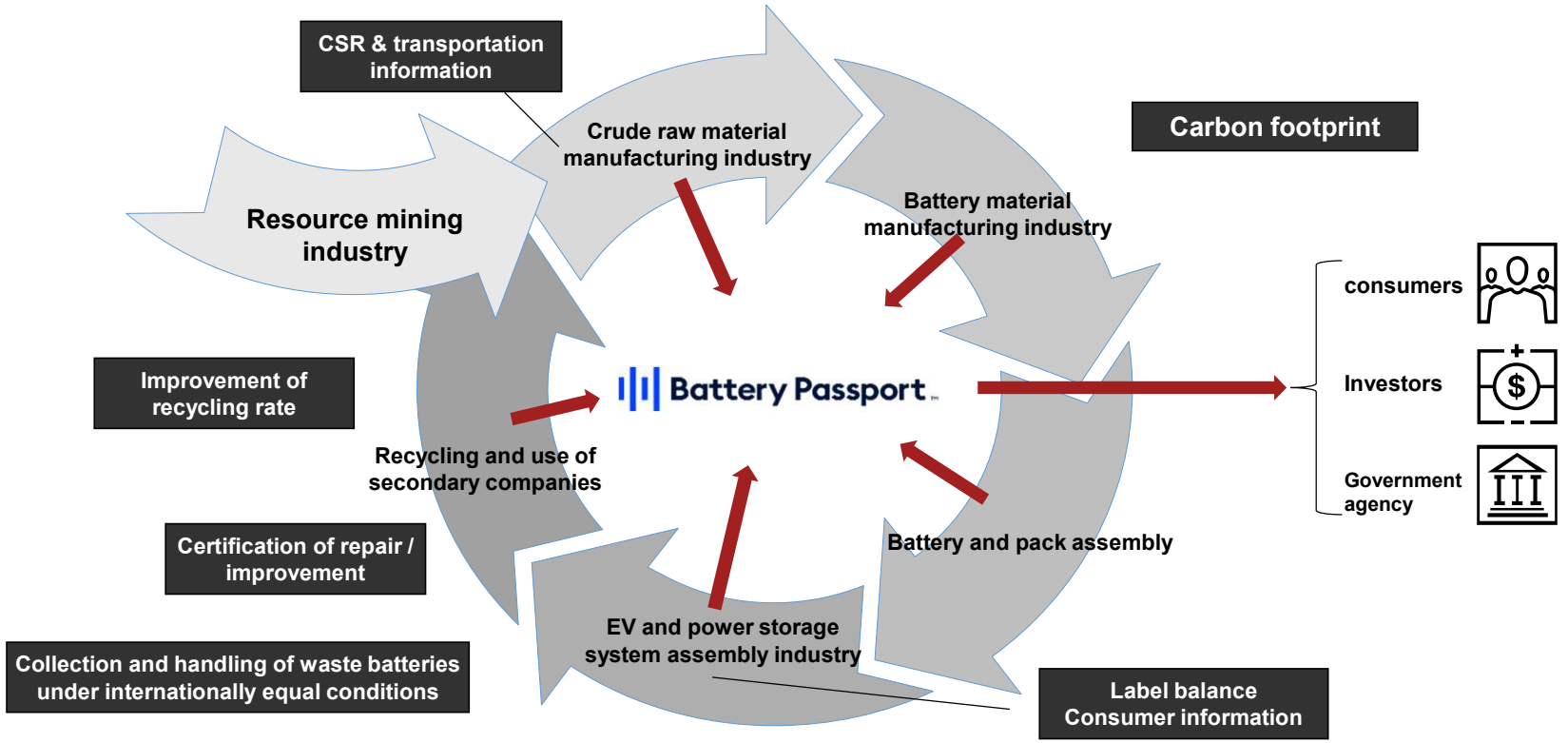
Source : GBA etc.

4.2 ③ Information flow centered on the Battery Passport

: Information flow
: Items to monitor

Battery Passport collects information to ensure the sustainability of the battery supply chain and provides information to the people who need it

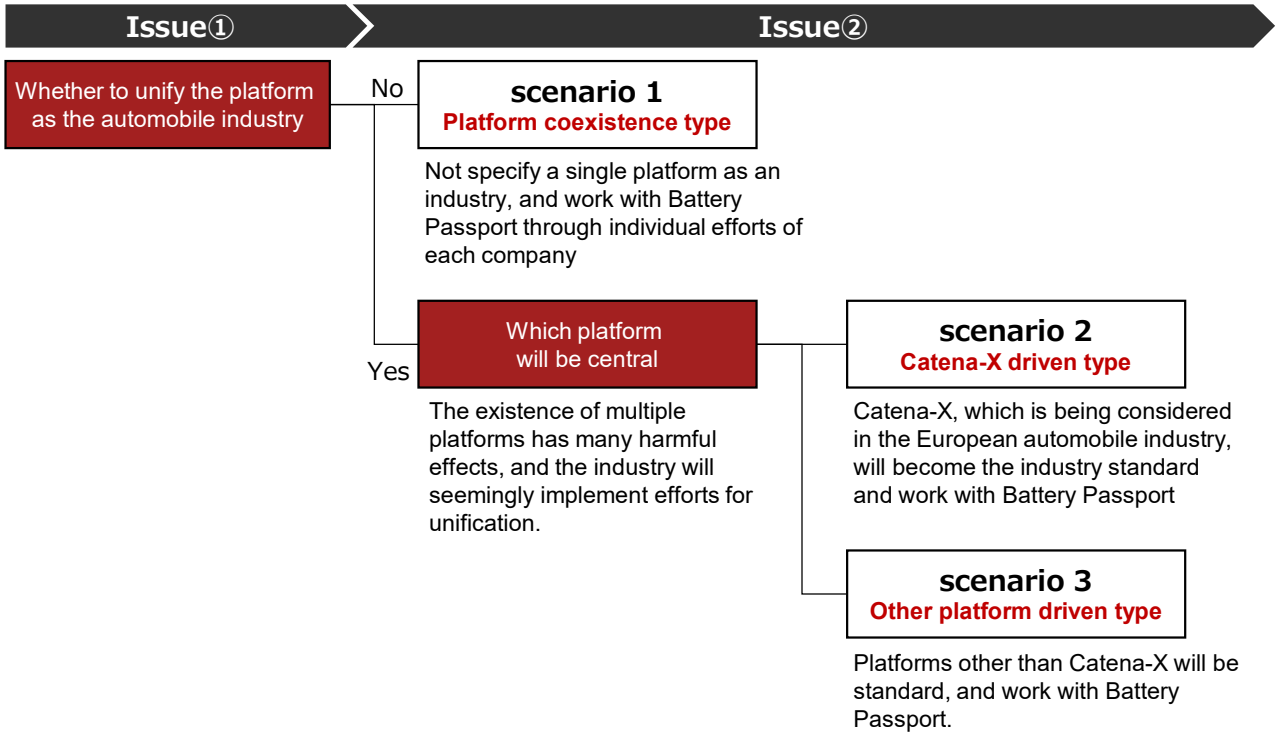
Information flow centered on Battery Passport



Source : GBA etc.

4.3 Initiative policy for building battery traceability scheme of Japanese version

At this stage, the automobile industry has multiple platforms that can achieve Battery Passport, and the competition between platforms will seemingly occur.



Possible issues before each scenario is achieved

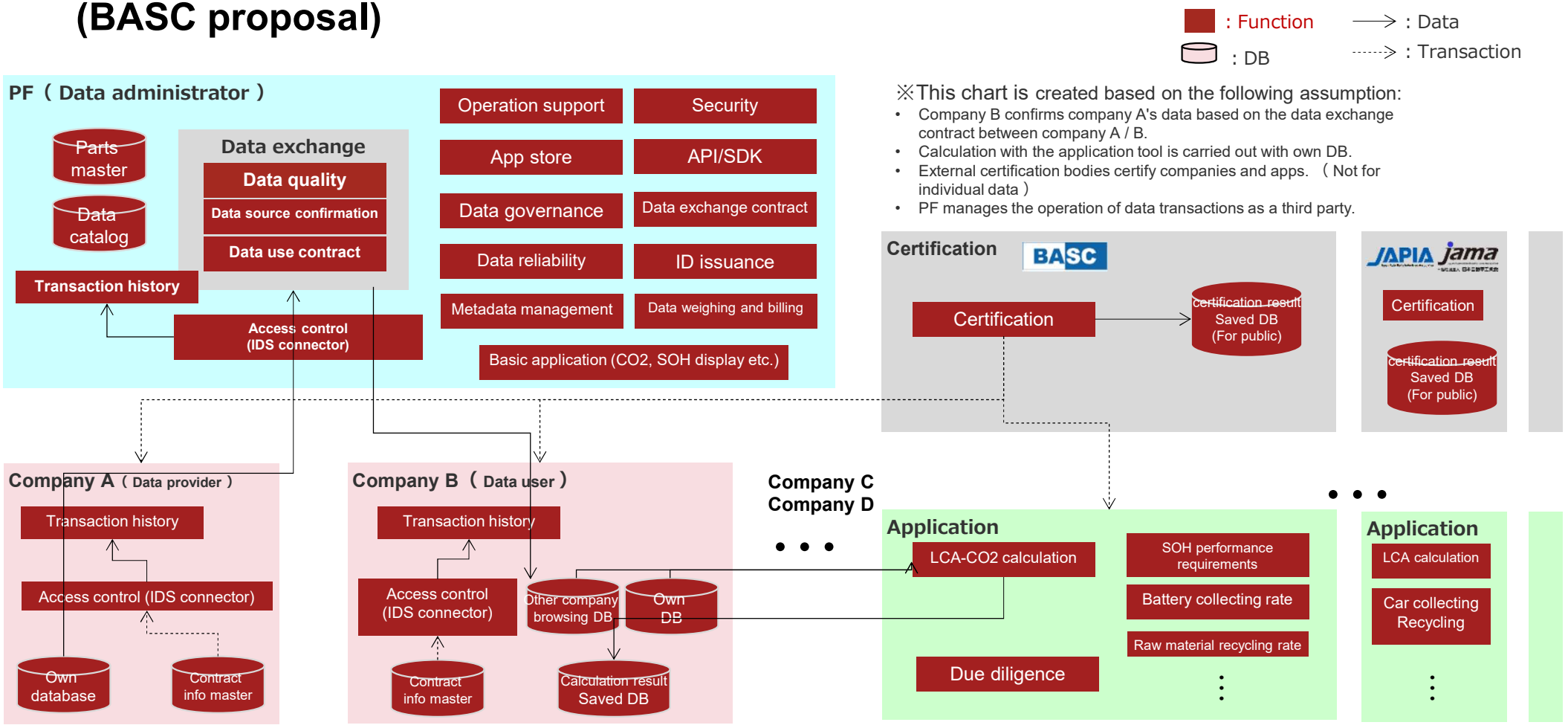
- **Is it optimal that the existence of multiple platforms for the industry as a whole?**
- What are the requirements for connecting each platform and Battery Passport?

- **How can Catena-X be expanded to regions other than Europe?**
- Will companies currently considering platforms other than Catena-X suffer any disadvantages?

- **How can we propose another platform for Europe**, which mainly considers Catena-X?
- Will companies considering other than the platforms used in this scenario suffer any disadvantages?

BASC plans a Japanese-style digital scheme configuration and functions in consideration of flexibility / expandability on the premise of the European Catena-X assumption system.

5. Japanese battery digital scheme configuration and function layout (BASC proposal)

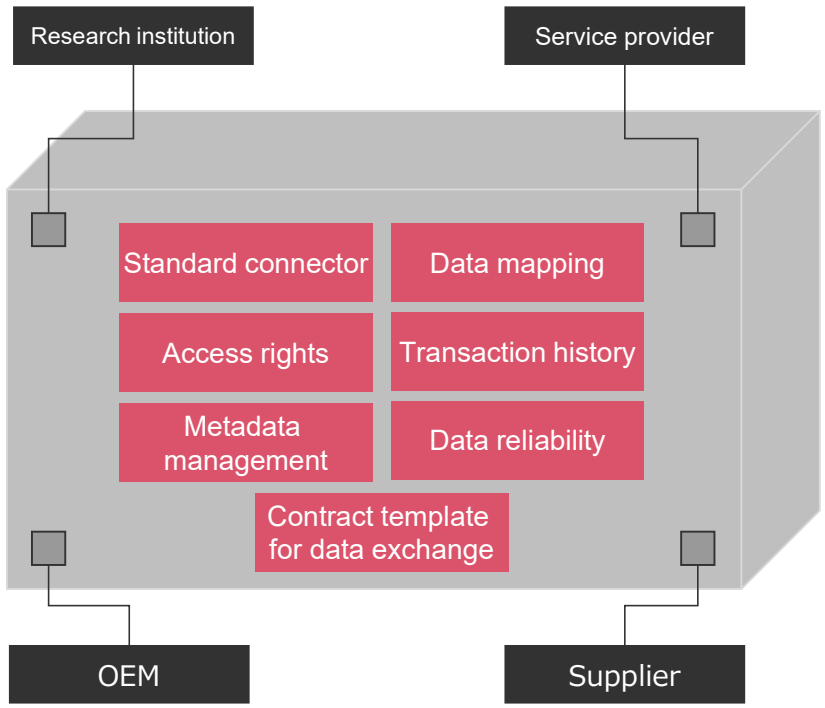


Formulating and managing data item guidelines and IT governance require formulation management in Japan while considering compatibility with the European assumed system.

5.1 Basic requirements for data exchange platform

The following seven matters are required as the main functions of the data exchange platform.

Platform conceptual diagram



Main function

1 Standard connector	Connection method for participating companies to access the data exchange platform
2 Access rights	Authority management method for data holders to freely set the data disclosure range
3 Metadata management	How to display and manage data attributes for data exchange
4 Data mapping	Function to associate content pointing to the same thing between databases
5 Transaction history	Acquire the history of data exchange, clarify the data user, and take measures when a problem occurs.
6 Data reliability	Framework of proving certification to ensure non-tampering certification / authenticity of data
7 Contract template for data exchange	Necessary contract template for arranging data exchange range, usage, etc. between companies

Source：Strategy＆etc.

❶ Standard connector – (e.g.) IDS

Standard connector function	Select the connect permission from the following: 1. Allow only access requests from specific connectors 2. Allow only access requests from connectors with specific attributes 3. Allow only access requests from connectors that meet specific security profile requirements

Requirements for IDS (excerpt)

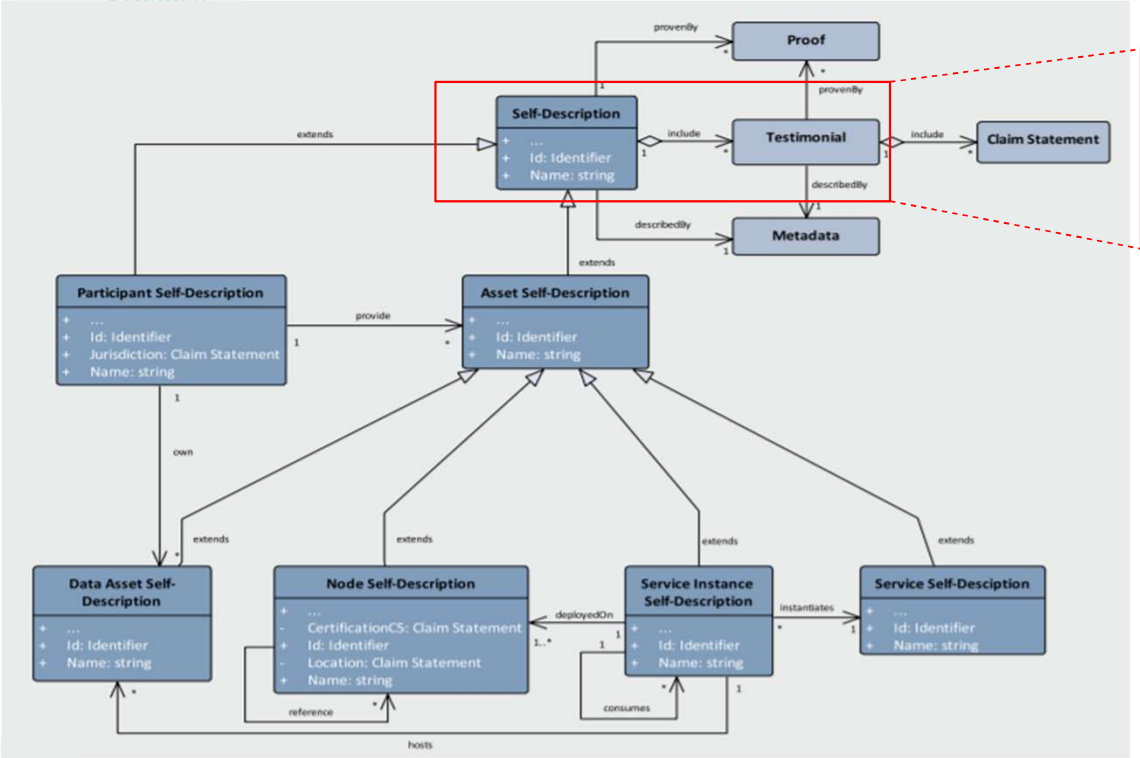
Reliability	■ IDS participants can participate in the business ecosystem after being evaluated and certified respectively.
Security data sovereignty	■ IDS components comply with the most advanced security measures. ■ Data owners can attach use restriction information to data before it is transferred. ■ To use the data, it is necessary to follow the policy specified by the data owner.
Data storage	■ It adopts a decentralized concept of data storage without a central data storage function ■ Data remains physically in the hands of the data owner until data transfer.
interoperability	■ IDS connectors have variations and can be provided by various vendors. ■ It can communicate with other connectors in the IDS ecosystem.
Advantages of distributed model	■ Easy to ensure scalability against changes in business relationships and changes in the number of parties involved ■ Easy to allocate optimal (necessary and sufficient) operating costs, since the scope of data responsibility can be clearly and limited

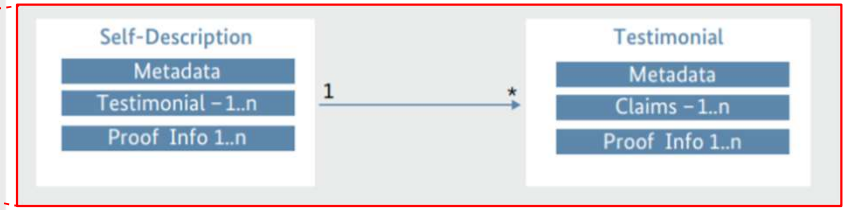
Source : IDS etc.

❷ Access rights (e.g.) Gaia-X

According to various assets (nodes, services, service instances and data) in Gaia-X, each ID and disclosure range of participants are managed by self-description (Self-Description).

Top-level Self-Description schema





- Node：
  Computing and storage resources. Node is defined by authentication level and geographic location
- Service：
  A cloud service provided by Gaia-X. IaaS (Infrastructure as a Service), PaaS (Platform as a Service), SaaS (Software as a Service), FaaS (Functions a Service), etc. are all included.
- Service instance ：
  Service (instance) actually provided by the node
- Data assets ：
  Define data assets for datasets that can be used with services on Gaia-X and set including availability (not disclosed).

Source：Gaia-X etc.

❸ Metadata correspondence standard (e.g.) Gaia-X

Gaia-X complies with globally determined data and metadata standards and will not use original rules.

Data format

Json-LD	• Lightweight Linked Data format • Easy to read and write • Provide a way to help interoperate JSON data on a web scale • Ideal data format for programming environments, REST web services, and unstructured databases such as Apache CouchDB and MongoDB

Data metadata standard

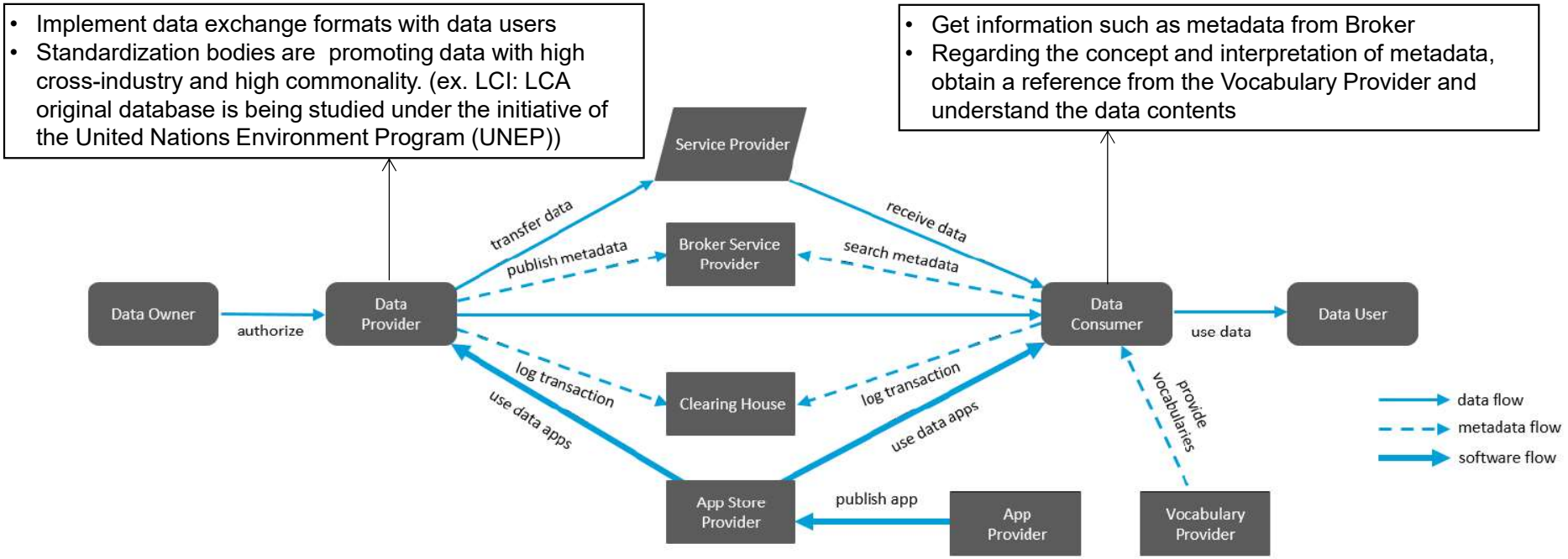
DCAT*	• Play a role of RDF vocabulary designed to promote interoperability between data catalogs published on the Web • Enable publishers to easily consume and aggregate metadata from multiple catalogs • Enable us to describe data sets and data services in catalogs using standard models and vocabulary • Improve discoverability of datasets and data services

* In addition to DCAT, RDF, OWL, VoID standard support will also be provided.

Source : IDS etc.

❹ Data mapping (e.g.) IDS

In IDS, data mapping is defined between data providers and users, and the data can be grasped by referring to metadata information and standard vocabulary. International organizations are standardizing common data such as LCI.



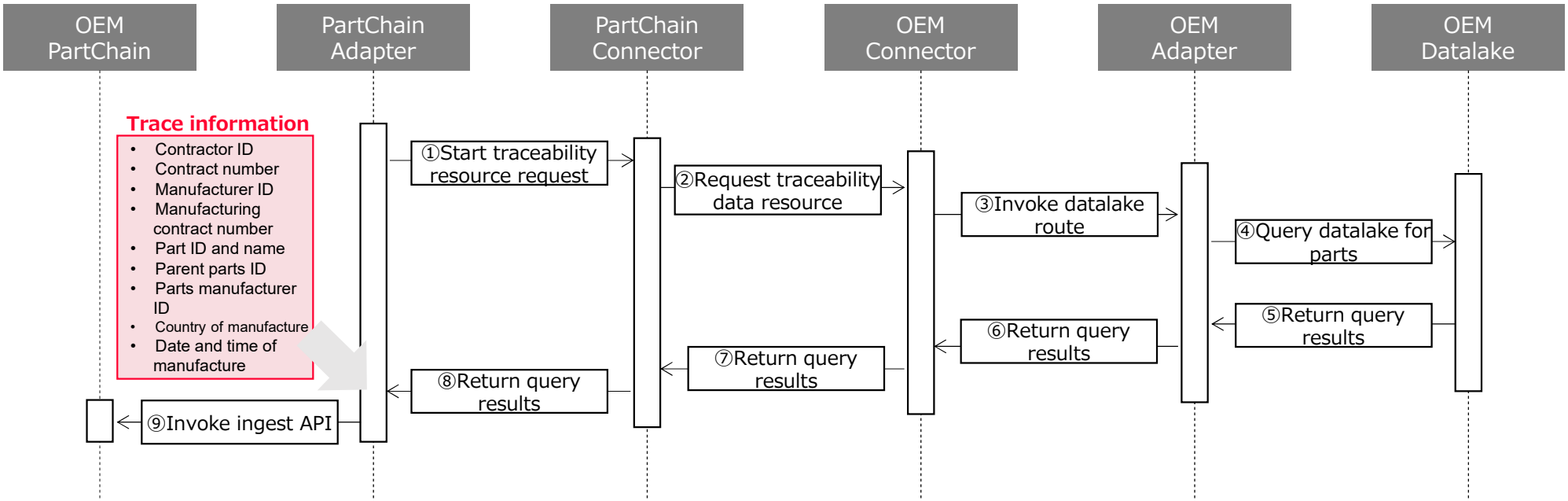
Source : IDS etc.

❺ Transaction history (e.g.) Tractus-X

In terms of ensuring traceability, in Gaia-X a specific method or technique is not specified, but in Tractus-X, traceability data is accumulated within individual participants, and acquisition requests are made as needed.

Gaia-X Policy	Gaia-X enables common methods for authenticating and approving technology, but does not enforce specific implementations. The trace information is linked to the smart contract and determined

Tractus-X Data Ingest



Source : Eclipse Tractus-X etc.

❻ Data reliability (e.g.) Gaia-X, GBA

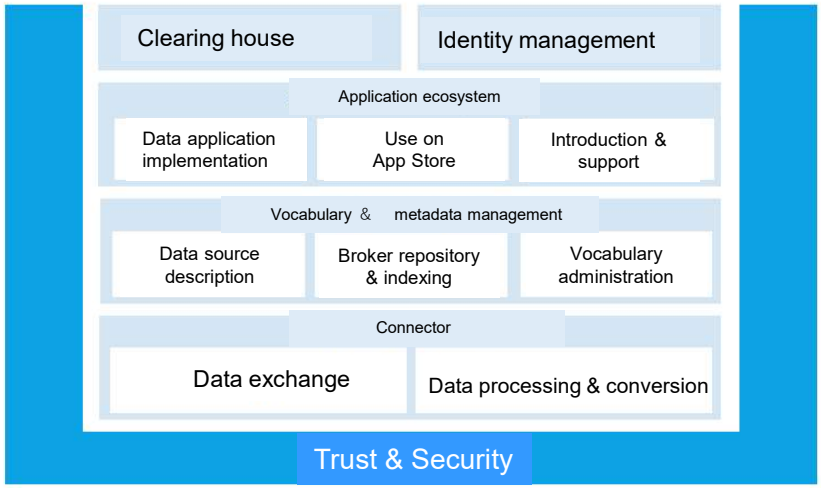
Guarantee of data reliability and non-tampering is proceeding with examination from both aspects of contract (third party authentication and IDS rule compliance) and technology (confidentiality + ID) development

Contractual requirements for Gaia-X

Mandatory certification by a third party

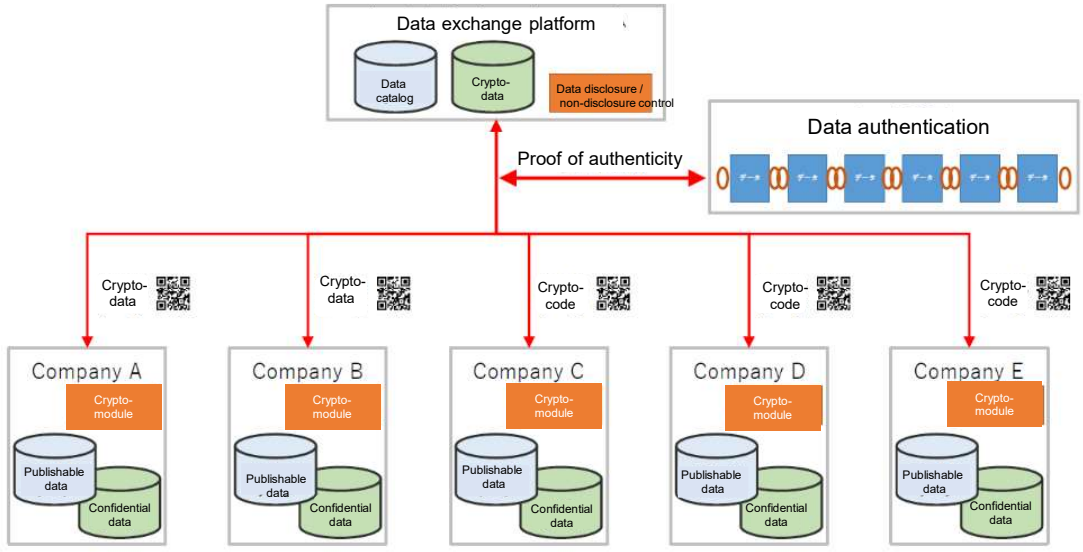
- Conduct regular internal audits of each implementation
- Certify cloud security certification by a third party
- Third-party certification obligations for regular control of compliance with data protection requirements

All participants must follow IDS rules.



Status of GBA technology development

Verification of the practicality and operability of the mechanism by issuing IDs and concealing data is underway.



Source : Gaia-x Policy rules etc.

❼ Contract template for data exchange (e.g.) Catena-X

In Catena-X, the contract details are decided between the parties involved in individual transactions. （different from the contract of platform use）
At major OEMs, the template of procurement contracts has been released, and transactions of small and medium-sized enterprises are being promoted.

Examples of contract items

- Purchase Orders
- Delivery Times and Delay
- Packaging, Transport
- Transfer of Risk
- Notice of Defects
- Invoicing and Payment
- Customs, Conformity, Origin and Export Control and Supply Chain Security
- Quality
- Warranty
- Liability and Damage Compensation
- Labelling of Goods; Advertising
- Tooling
- Spare Parts
- Intellectual Property Rights and Copyrights
- Electronic Data Interchange
- Information Security
- Confidentiality
- Insurance
- Environment
- Social Responsibility
- General Provisions
- Governing Law; Place of Venue and Jurisdiction

Note: In the European automobile industry, complying with Automotive SPICE and CMMI related to software and data is in common, and contracts such as joint development (Corporative Research & Development) are seemingly signed in addition to procurement contracts.

Source : Catena-X etc.

5.2 Basic requirements for app functions

LCA-CO2

Considering the confidential information of each company (material composition, manufacturing method, supplier, etc.), calculate LCA-CO2 in the supply chain, connect the calculated data, and disclose the data to the specified disclosure destination according to the PF request

due diligence

In addition to considering confidential information (raw material suppliers, etc.), respond to risks such as environmental and human rights of conflict minerals and illegal labor, and disclose the data to designated disclosure destinations in accordance with PF requirements.

SOH performance requirements

Calculate and display battery performance (including safety) of appropriate items according to the reuse application / request, and disclose the data to the specified disclosure destination according to the PF request

Battery recovery / raw material recycling rate

Manage traceability data between primary user (car owner) / secondary user (reuse user) -recovery / recycling company [battery recovery rate] and recycling company-battery raw material manufacturer [raw material recycling rate] in battery SC, and publish the data to the specified disclosure destination according to the PF request

5.2 Battery data items expected for application functions and utilization (e.g.)

	Material manufacturer	Cell maker	Car OEM	Car user	Reuse user	Data utilization image	Data use image
LCA-CO2							
Battery CO2-g/kWh		☑					Add value to the Wh unit price as a clean battery
Battery CO2-g/kWh		☑					Used for judgment office work of green finance (realization of office work efficiency) and for evaluation of business partners at financial institutions
LCA information: Basic database(Third Party Databases)	☑	☑				☑	Used for calculating GHG emissions using the basic unit of each country / region according to the purpose
LCA information: Basic information(Unique information)	☑	☑				☑	Used for calculating GHG emissions using the basic unit measured by each company
LCA information: Activity data(electricity certificate, electricity bill details, etc.)	☑	☑				☑	Used as evidence of utilities used in each process
Due diligence							
Manufacturing process information	☑	☑	☑				Reflecting traceability information such as human rights at the time of mining and treatment of contaminated water in price negotiations enhances the competitiveness of battery SC in Japan. It can be used in the future as evidence for overseas remittances.
Collection and recycling							
Residual value at the time of recycling		☑	☑		☑		
Co, Ni, Li content g						☑	Reflect the recycled material content in the transaction price
Percentage of materials used and LiB manufacturing process		☑					The performance of LiB can be changed depending on the ratio of rare earths and the manufacturing process.
LiB Demolition Contractor Information						☑	It is required from the viewpoint of ensuring the expertise of dismantling companies and the safety of reused LiB.
SOH～Reuse							
Battery remaining capacity Ah / remaining life year		☑	☑		☑		Reflected in the value at the time of rebuild / reuse
Resistance increase rate (condition example: 1C-1C, 100cyc)		☑					Used when calculating the transaction price of batteries
Capacity reduction rate (condition example: 1C-1C, 100cyc)		☑					Used when calculating the transaction price of batteries
Resistance (once a year)			☑	☑	☑		Used when calculating the transaction price of batteries
Electric capacity (once a year)			☑	☑	☑		Used when calculating the transaction price of batteries
What is the unit for negotiating assumptions (cells, modules, packs, etc.)						☑	
If deterioration diagnosis can be performed on a module-by-module basis, the diagnostic data						☑	
If it is reuse LiB, what is it used for?					☑	☑	Used as a guide for charge / discharge time and working voltage ⇒BattPass has manufacturer information but no user information. Apparently, user information and use status create extended value
Where is EV used?				☑		☑	In order to understand the environment in which the vehicle equipped with LiB was used (temperature, etc.)
Number of charge, discharge and quick charge				☑		☑	If it is recorded in BMS, is it possible to collect the data? ⇒At present, some data that can be obtained from automobile OBD records both the number of charges and discharges and the number of quick charges.
1st life cycle history and deterioration information (cell / module unit)			☑	☑		☑	Necessary for estimating the residual value of reuse. Assumed Argo is an individual company differentiation area as an application function.
Storage condition after the end of 1st life (temperature, period and SOC)						☑	↑
Repair history, SOH variation tolerance during repacking		☑	☑			☑	↑

5.2 Battery data items expected for application functions and utilization (e.g.)

	Material manufacturer	Cell maker	Car OEM	Car user	Reuse user	Data utilization image	Data use image
Others							
Amount of each material (positive electrode ○Kg, separator ○m2, etc.) and part number	☑	☑					Electronic approval of buying and selling of the entire supply chain (eliminate the trouble of procurement from sales at the time of buying and selling)
Selling price for each material	☑	☑					Electronic approval of buying and selling of the entire supply chain (eliminate the trouble of procurement from sales at the time of buying and selling)
Patent code that may conflict when reused	☑	☑					Eliminate the trouble of searching for patents of the re-user by showing patents that may conflict with each other at the time of reuse
Data controlling the disclosure range and particle size of company information	☑	☑				☑	First, it will be equipped with a function to publish in a general range and particle size, and the options will be increased as needed.
Model name of the vehicle installing LiB				☑		☑	
Product information (delivery company, purchasing company, amount of money, etc.)	☑	☑	☑	☑	☑	☑	Contribute to labor saving by integrating with payment (cooperation with accounting system and bank host) and development of financial solutions using commercial distribution. On the other hand, the case of pay-as-you-go includes an operational bottleneck because there is no one-to-one correspondence between the amount and the commercial distribution. it can be possible to consider linking traceability information with payment using ISO20022 or ZEDI.
Use information of storage battery		☑	☑	☑	☑		①Use in the data business by converting charging information and location information into big data is expected. ②Use in the subsidy system and green finance by visualizing the electricity stored in the battery is expected.
Manufacturing process information	☑	☑	☑			☑	Contribute to strengthen the competitiveness of battery SCs in Japan by reflecting traceability information such as consideration of human rights at the time of mining and treatment of contaminated water in price negotiations. Possibly, it can be used in the future as evidence for overseas remittances.
Component information such as cooling equipment, insulation monitoring, high voltage bus, etc.			☑			☑	Not to limit reuse applications, disclose information on safe use and parts reuse
Reason for end of 1st life, date, failure, abnormality flag, etc.						☑	↑
Safety limit information (upper voltage limit, safety function restrictions)			☑			☑	↑
Origin of occurrence (scrapped car, warranty replacement, accident, etc. Reason for replacement)			☑	☑		☑	↑
Visual confirmation result at the time of delivery (water and liquid leakage, heat generation, cell expansion)						☑	↑
Recommended connector shape			☑			☑	↑
Various safety test data, UL1974 transportation regulation conformity certification data, etc.			☑			☑	↑

6.1 Business (BaaS) deployment potential for battery data

Acquiring and exchanging battery data are creating new business, and a business seem to be proceeded that battery data will be widely shared.

Raw materials → Manufacturing → Utilization → recycling

Business opportunities within the automotive life cycle

- **Ethical procurement**
  Advance the introduction of data reliability technology (non-tampering/proof of authenticity) to understand procurement sources
- **Attracting manufacturing bases**
  European battery manufacturers locate factories in Scandinavia where CO2 emissions are lower. Manufacturing CO2 emissions data will be possibly used in battery evaluations in the future .
- **Evaluation**
  Vehicle use service that measures the battery status at the dealer in a short time
- **Charging / Lifetime Warranty**
  Always upload battery status to the cloud and adopt the best charging method for individual vehicles
  Aim to reduce maintenance costs for commercial EVs
- **Financial Services**
  Promote battery leasing and battery subscription through understanding battery status
- **Mobility**
  BaaS service that can be used for electric motorcycles and small EVs
- **Secondary use**
  Select an appropriate secondary use method based on battery SoH data and provide it to the manufacturer
- **Resource recycling**
  Simplify resource recycling based on battery configuration resource data
- **Used Car Price Forecast**
  Improve the accuracy of used car price forecasts based on battery SoH data
  Perform online assessments and promote online used car distribution

Business opportunities outside the automotive life cycle

- **Energy management**
  Obtain remaining battery charges from batteries and provide power system operators with a place to charge surplus power generation through an aggregator
- **Re-energy of local governments**
  Introduce batteries that have deteriorated and can't be used for secondary mobility to the local government together with solar power generation equipment and use them as a storage battery

Create new businesses by considering businesses that were not previously involved in the life cycle of automobiles as stakeholders

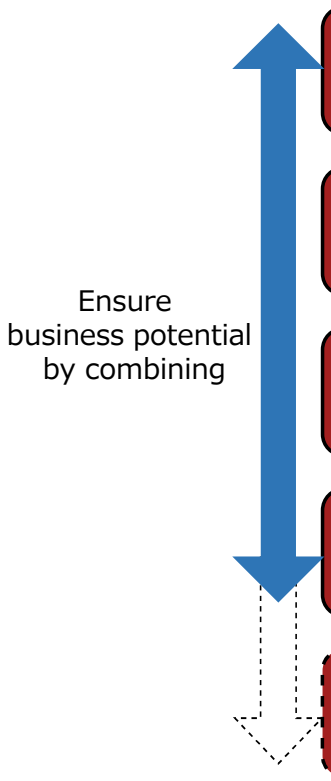
The use-recycling phase includes many new business efforts that are directly linked to improving battery value.

Source: Response, etc.

6.1 Monetization of data platforms (e.g. smart cities)

Data platforms themselves will seemingly provide data analysis and other value-added services in order to monetize the data.

Example of monetization model



	Service Overview	Example of collection method
A. Levy Model	Residents and visitors provide information that contributes to safety and security to companies in the target area, and beneficiaries bear the burden fairly so that free rides will not occur.	• Taxes and community dues • Amazon Prime • Collected as tenant and utility fees
B. Cost reduction/ incremental revenue Reduction Model	Provide information that contributes to improving service value and operational efficiency to businesses operating in the target area, and collect as part of sales increase or cost reduction	• ESCO business model • Cross-selling operating expenses and profit allocation • Credit card model
C. Service and data provision PF Model	Establish a PF that can provide one-stop services and advertisements to residents and visitors, and provide B2C service providers with efficient marketing and new business opportunities, etc., while also collecting use fees from users Provide services that involve facilities with software, etc.	• Platform model for Facebook, Google, etc. • Aggregator business • Mercari and Yahoo auctions
D. To other areas (data PF) Information provision model	Provide information that contributes to improving service value and operational efficiency based on the data collected in the target area for service providers in the area concerned, and receive compensation for data PF operators in the adjacent and surrounding areas	• Data Solutions for Yahoo! • Information Bank • Designated Credit Information Agency (CIC)
X. Data PF horizontal deployment / operation know-how provision model	Earn use and advisory fees by providing horizontal deployment of data PF and operational advice to neighboring municipalities and data PF operators in cities with similar environments to the target district	• Teikoku Databank • Consulting

6.1 Monetization of data platforms (e.g. CN/CE)

In advanced cities in each country, they are working on carbon neutrality, but ensuring traceability includes many measures that will be more effective, and a data collection mechanism is essential.

01 Demand reduction through energy efficiency

- **Renovation of commercial, residential and municipal buildings**
  Building envelope and interior improvements, better HVAC systems, energy efficient lighting and equipment, efficient heating and cooling systems
- **Building energy codes, data reporting and disclosure**
  Building benchmarking, audits, energy performance ratings, codes, and certifications
- **Building Automation and Intelligent Platforms**
  Monitoring and reporting of energy use (lighting sensors, smart thermostats, etc.), AI/ML-powered applications to quickly warn of energy waste and loss

02 Shift to clean and renewable energy sources

- **Introduction of Building-scale clean energy**
  Things that generate electricity on the spot, such as rooftop solar power generation and rooftop wind power generation
- **Introduction of regional clean energy**
  Clean energy-based heating and cooling network, microgrid, on-site storage
- **Fuel conversion program** (Building or district scale), conversion of municipal power company

03 Switch to mass transit and zero-emission transportation

- **Bus Rapid Transit Systems**
  Public transportation infrastructure, fuel conversion to low-carbon energy
- **Travel demand management**
  Car sharing, congestion charging zone, bike/walking lanes
- **low-emission vehicle**
  Citywide deployment of electric vehicles, hydrogen-fueled vehicles, renewable diesel and other biofuels, and charging stations

04 Improved waste management

- **Food waste reduction program**
  Improve freezing storage systems and handling of fresh food to reduce waste and divert excess food to other uses
- **Waste separation, recycling and reuse**
  Disposal of organic waste, composting, anaerobic digestion, reuse of home appliances
- **Landfill Gas Recovery**
  Use the recovered gas as a low-carbon energy source for power generation and heating

Source: Public materials of each local government, etc.

6.2 Domestic related organization activities that expect PF/interface collaboration

■ The supply chain LCA-CO2 visualization and inter-company data exchange PF that connects them as traceability data have already been examined by several organizations in Japan and overseas. Through exchanging information with these organizations, we are considering cooperation for realization. The domestic and international activities are as follows:

corporate name	Related Activities	Summary	Involvement and interest
● DSA（Data Society Alliance）	DATA-EX	• Work as "DATA-EX", which is a platform that aims to cooperate with existing initiatives for data collaboration and federal data collaboration across corporate sectors • Correlate strongly with the European GAIA-X about the conception and data linkage mechanism	➢ Create big concepts and rules for data linkage ➢ Use IDS connector for inter-regional and inter-disciplinary data linkage
● IPA（Information-technology Promotion Agency）	DADC	• Examinate the architecture that enables distribution and utilization of data between fields • Shape "third-party mediation type data distribution ecosystem with Trust"	➢ As a use case scenario for data exchange demonstration through data providers/demanders/third parties
● IVI（Industrial Value Chain Initiative）	CIOF	• Examinate for building a data trading environment with free CO2 emissions from each company. • Demonstrate experiment using the data distribution infrastructure of CIOF (Open Collaboration Framework between Companies)	➢ Develop CIOF, a data transfer system with NEDO budget Call for test demonstration use cases
● RRI（Robot Revolution & Industrial IoT Initiative）	WG1/SWG 8	• Define rules and functional requirements required for decarbonization and resource recycling. • Global Data Distribution Management Infrastructure Prototype Verification Experiment (GAIA-X connection trial, etc.)	➢ Conduct tests mainly for data connection with GAIA-X and other European countries. Coordinate with Europe Format and other details. ➢ Conduct global data connectivity tests with overseas initiatives
● JEITA（Japan Electronics and Information Technology Industries Association）	G×D Consortium	• Consider "methodologies for emissions data calculation and exchange" and "open networks for confidential and secure exchange of emissions data based on interoperability of technology solutions" to enable primary data exchange of emissions between supply chains	➢ CFP-based calculation methods and techniques for exchanging data ➢ Exchange opinions on a regular basis
● SEMI（Semiconductor Equipment and Materials International）	Traceability Global Technical Committee Blockchain TF	• Under consideration of semiconductor traceability standards by blockchain as a countermeasure against counterfeit semiconductor devices	➢ Traceability system as a countermeasure against counterfeit semiconductors. Consider expansion to CO2 in the future. ➢ Exchange opinions separately with the JEITA Semiconductor Subcommittee.
● JAMA（ Japan Automobile Manufacturers Association, Inc.）	LCA Review Group	• Restart the LCA Study Group to study T2W CO2 emissions centered on WP29.	➢ Participate in the "Sustainability Study Group for Storage Batteries" from the standpoint of battery users
● JAPIA（Japan Auto Parts Industries Association）	LCA Subcommittee IT Response Subcommittee	• Establish LCA-CO2 calculation method for parts • Start the study to connect SC for cars in cooperation with JAMA.	➢ Participate in the "Sustainability Study Group for Storage Batteries" from the standpoint of battery users
● JARP（Japan Auto Recycling Partnership）	LiB Collection Transaction System	• Construct and operate a LiB collection transaction system as a result of system examination by a national professional, (NTT DATA)	➢ Connect the LiB collection transaction system in operation with the SC upstream to visualize the collection rate and recycling rate

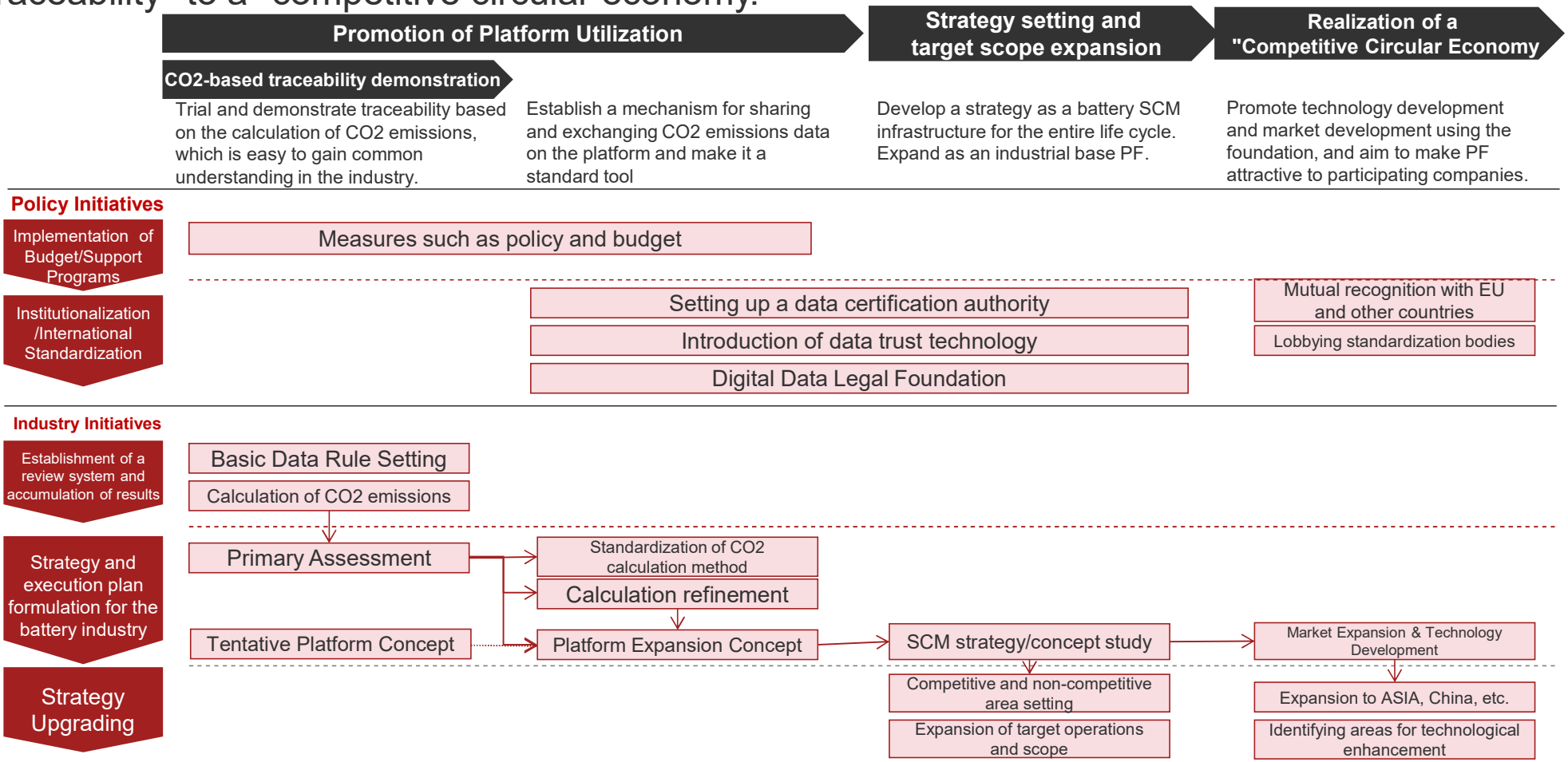
6.2 Information sharing of existing tools/efforts introduced by each company

■ Among the companies participating in the WG, they have already provided CO2 visualization tools for the supply chain and technologies necessary for data linkage, so we introduced the tools and technologies from each company. In addition, some of the tools of companies other than the members are included in the recommendation of WG members.

Company name / organization	Referral Tools and Technology	URLs
Asahi Kasei Corp.	• Plastics resource recycling project "BluePlastics"	• https://www.plastictraceability.com/
NTT DATA Corp.	• JARP "LiB collection and collection system"	• https://www.lib-jarp.org/
	• GHG emission calculation visualization service	• https://www.nttdata.com/jp/ja/news/release/2022/011400/
NTT Communications Corp.	• Gaia-X compatible "IDS connector"	• https://www.ntt.com/about-us/press-releases/news/article/2021/0408.html
IBM Japan, Ltd.	• Mineral resource traceability platform "RSBN"	• https://www.ibm.com/products/supply-chain-intelligence-suite/blockchain-transparent-supply
	• Product traceability system for OEM "XCEED"	• https://www.ibm.com/case-studies/renault/
MUFG Bank, Ltd.	• Information bank service "Dprime"	• https://www.tr.mufg.jp/dprime/
	• GHG emission calculation / visualization cloud service "zeroboard"	• https://zeroboard.jp/solution/
	• Re-energy fund "Z Energy"	• http://www.zet.energy/index.html
Sumitomo Mitsui Banking Corporation	• GHG emission visualization and calculation cloud service "Sustana"	• https://www.smbc.co.jp/news/pdf/j20211122_01.pdf
DSA（Data Society Alliance）	DATA-EX	• https://data-society-alliance.org/data-ex/
IPA（Information-technology Promotion Agency）	DADC	• https://www.ipa.go.jp/dadc/index.html
IVI（Industrial Value Chain Initiative）	CIOF	• https://iv-i.org/wp-content/uploads/2021/10/CIOF_2021-Autumn.pdf
RRI（Robot Revolution & Industrial IoT Initiative）	WG1/SWG 8	• https://www.jmfrri.gr.jp/document/library/1668.html
JEITA（Japan Electronics and Information Technology Industries Association）	G × D Consortium	• https://www.gxdc.jp/

7.1 Scenario to expand battery digital scheme

The basic approach is to link policy and industry initiatives and to develop from "CO2-driven traceability" to a "competitive circular economy.



Source: Ministry of Economy, Trade and Industry, Cabinet Office data, etc.

7.1 System operation scheme (draft)

Step4 **Proposal of scheme operation**
Data management /

・Question ① Who is the preferred body for system operation and data management?
Answer: It is preferable to have the data guidelines and IT governance managed by a supervising ministry (METI, MOE, DGI, etc.), but if this is difficult, an industry organization such as BASC or BAJ (initially a battery-related organization, but eventually an organization that can integrate the parts/automotive/recycling industry) should be established. Operation can be outsourced to the organization, but the Ministry should be responsible for supervision.

・ Question ② Reason for answering Question ①
Answer: Fairness / neutrality / transparency and confidentiality are important. It is not possible for an individual companies to handle, but an industry associations seems to be appropriate.
An incorporated association that is monitored by the supervising ministries and agencies would be better.

・ Question ③ If the private sector manages the data, how will the administrative costs be extracted?
Answer: ・50/50 split between the organization (membership fees for participating companies) and the data users
・Only for data users (fixed membership fee + pay-as-you-go system)
・50/50 split between government budget support and organizations (membership fees for participating companies)
[It would be difficult without incentives for participating companies]

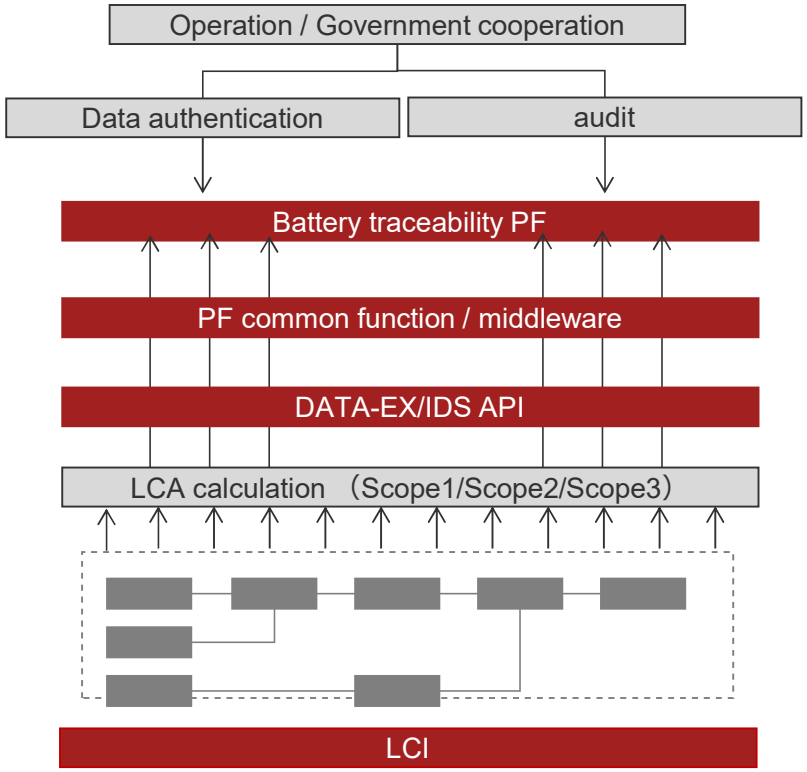
・ Question ④ What kind of scheme, if any, could be considered for incentives to the data registration side?
Answer: **Establishing rules is first,** and then post the environmental contributions of participating companies on the organization's website (e.g., RE100)
Subsidies, tax incentives, and preferential purchasing from registered companies (e.g., business matching)
Partial return of use fees from data users.

・Question ⑤ What other schemes of other organizations can be helpful?
Answer: Low emission certification system of the Ministry of Land, Infrastructure, Transport and Tourism, information bank operation scheme of financial institutions, etc.

7.2 Operation system for battery traceability scheme (draft)

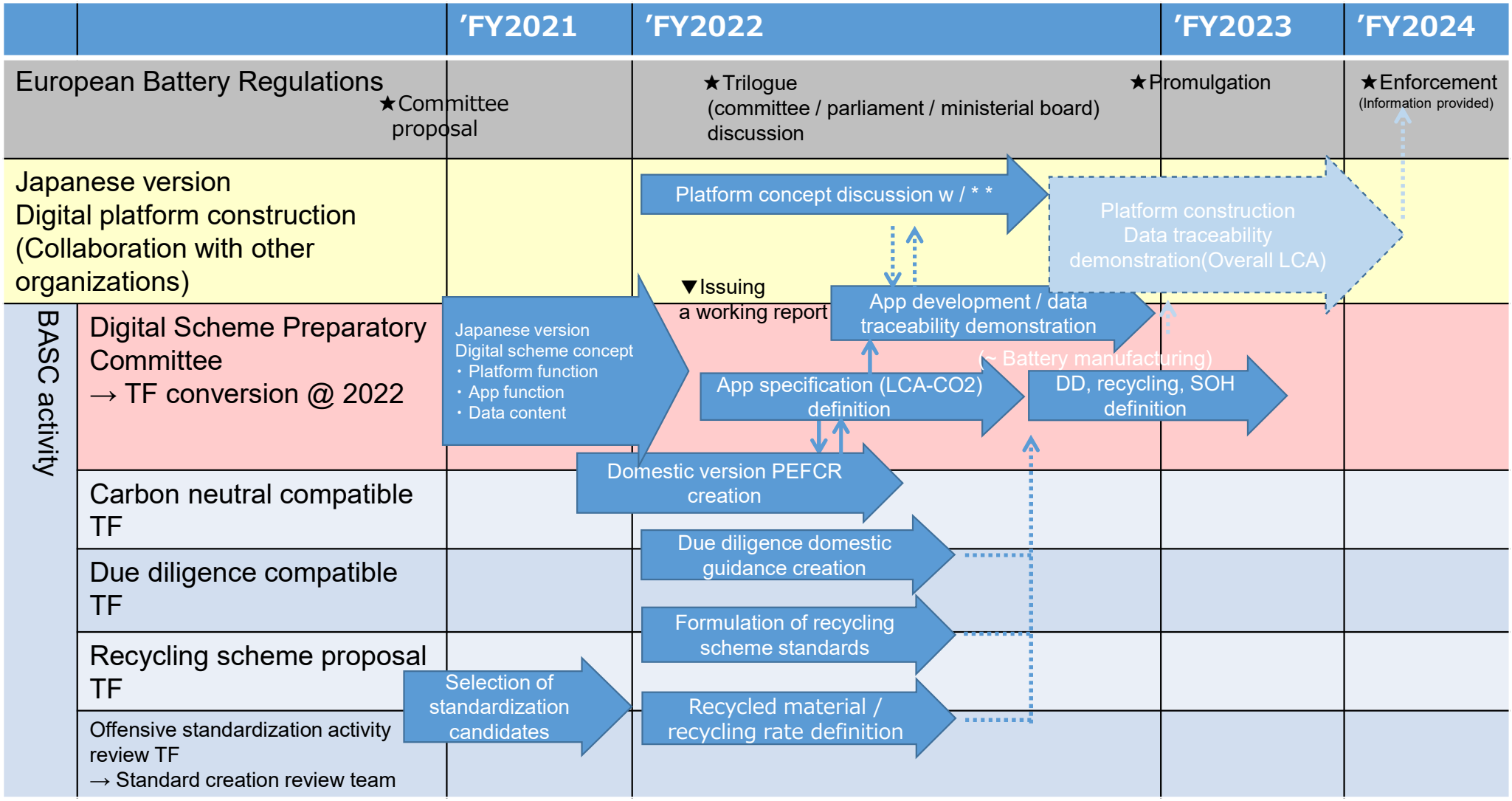
BASC is promoting operational aspects in cooperation with JAPIA / JAMA / JAPR, etc. The data infrastructure uses the system side while complying with DATA-EX and DADC.

Required organizational functions			Implementing entity (assumption)
Overall operation		• Formulation and operation of the overall policy of battery traceability (initially assuming LCA) • Cooperate with the Ministry of Economy, Trade and Industry (proposals for lobbying rules)	BASC ~ new organization
Certification / audit		• Implement data authentication / audit as a trust service • Data items and particle size (as initial stage, evaluating information calculation logic and management procedures, etc. and certifying the suitability)	・JIPDEC / GMO, etc. ・BASC / BAJ, etc.
Data infrastructure operation organization	Service operation	• Implement traceability data management, etc. • Provide services & applications such as traceability visualization	Sier / service provider that provides PF according to the guidelines of organizations such as BASC
	Providing common functions	• Provide important functions & middleware that are commonly used • Access rights, transaction management, app management Data reliability (non-tampering / ID issuance), etc.	
Compatibility connector		• Manage data exchange APIs within the industry with a view to connecting with Gaia-X	DSA/IPA
Presentation and Management of calculation guidelines		• Contribute to standardization of shared data by formulating and recommending industry guidelines for LCA calculation	JAMA/JAPIA
Participating companies		• Provide relevant LCA and traceability related data	**Gradually expanding from BASC participating companies**
Providing original data		• A vendor that provides LCI data. GaBi / Ecoinvent etc.	(Selected for each company)



Source: Cabinet Office, JAPIA etc.

8. Future development: FY2022 BASC digital scheme TF activity (draft)



8. Conclusion

Battery Association for Supply Chain(BASC) is committed to discuss regulations / rules compliance policies for strengthening regulations and promoting efforts toward a global decarbonized society. Also, we have set up TF / WG for each issue theme and are working on it as a place to promote activities for strengthening the competitiveness of the entire battery supply chain and building a system.

In this report, the "Digital Scheme Preparatory Committee," which is one of the BASC activities, uses digital technology for data traceability of the entire global supply chain and new rule making centered on Europe, clarifies the necessity and the vision in order to build a data exchange platform (data distribution platform) of the entire supply chain, and proposes issues, countermeasures and the [Japanese version battery digital scheme concept] as BASC for achieving it.

It is difficult for a single company alone to achieve the traceability and the data exchange throughout the battery supply chain and that cannot be achieved without the cooperation of all companies and organizations participating in the supply chain. We sincerely hope that many people read this report and look forward to your support, active cooperation, and participation in BASC activities.

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Battery Association for Supply Chain