人と情報とテクノロジーのソリューションで
リサイクルビジネスの適正化・安定化・高度化をお約束します

Trace & Recycle

12th Asia-Pacific Eco-Business Forum in Kawasaki

Green Innovation from Kawasaki City

-From a Perspective of Recycling Business-

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Green Innovation from Kawasaki City

-from a Perspective of Recycling Business

1. What is recycling business?
2. Requisite for the business as a social infrastructure
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1. What is recycling business?

Recycling business = Waste management (public sector) + Fuels production business (private sector)

Recycling business is a compound industry of "Waste management" and "Fuels production business". "Waste management" is a kind of public service of sanitization, "fuels production" is a private business to return the recycled resources to arterial industry. In Japan, with the more than 20 years' system development and socioeconomic evolution, currently the proportion of private business becomes the majority rather than public service, that generally it could be said the private sector has become the leading role.

2. Requisite for the business as a social infrastructure

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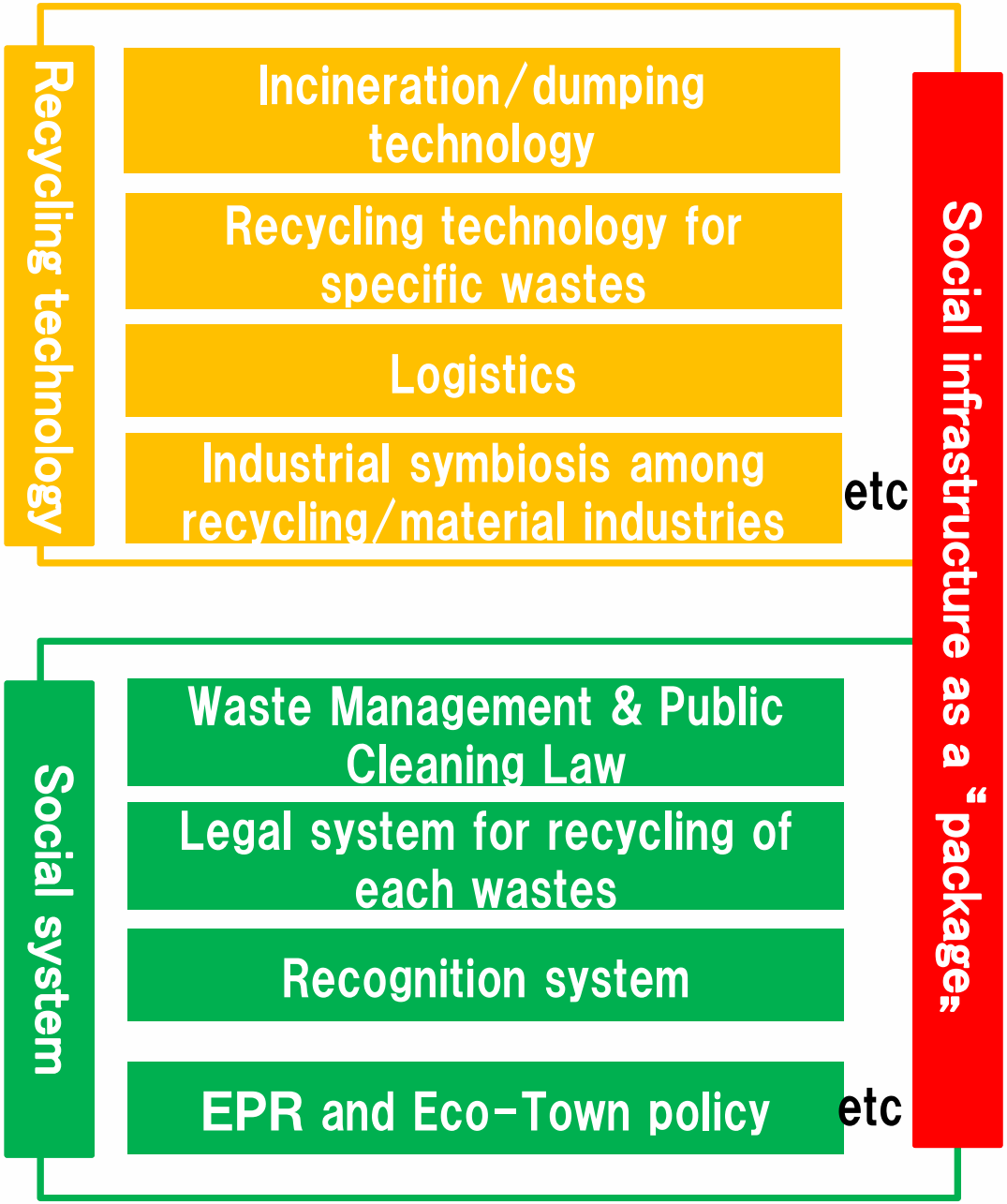
○In the field of recycling business, only having the patents required technology cannot gain the market.

○With the market changes (e.g. PET bottle popularization), the needs of techniques will appear where social system and policies are adjustable.

○In the market, recycling business would not be sustainable if it only stands on the subsidies.

○Oppositely, the business will not function without economically feasible technical support, even though the policy system is developed.

⇒Recycling business can function as a social infrastructure through packaging the technologies and social system.



3. Cases of Eco-Cities for promoting the business

Urban planning approach	*Comprehensive Planning*	*Incrementalism*
City management from a perspective of recycling		
Success cases (Domestic Eco Towns)	Kitakyushu Eco-Town	Kawasaki Eco Town
Success cases (International EIPs)	•Eco industrial park in China (Tenjin, Dalian etc.)	•Kalundborg in Denmark •Ulsan eco industrial park etc.
Superiority	◇Treatment technologies of various wastes as resources ◇Quality improvement by trade among regional facilities ◇Regional branding	◇Stability of procurement and distribution of wastes ◇Low cost and environmental impact on logistics ◇Excess energy exchange
City management strategy	Recycling complex model	Smart community model
Future target	◆Mainly developing countries •Newly planned industrial parks in coastal area and suburbs	◆Developing/developed countries •Existing industrial areas with integrated redevelopment plan of energy and water saving

4. Superiority of Kawasaki City for the business

Requisite for recycling business

Conditions of prominent Eco Towns

- Grounded administrative capabilities
- Industrial infrastructure including material industries
- Enough accumulated population

＋

Superiority of Kawasaki City

Kawasaki's notable feature

Coordinating Functioning of coordinators

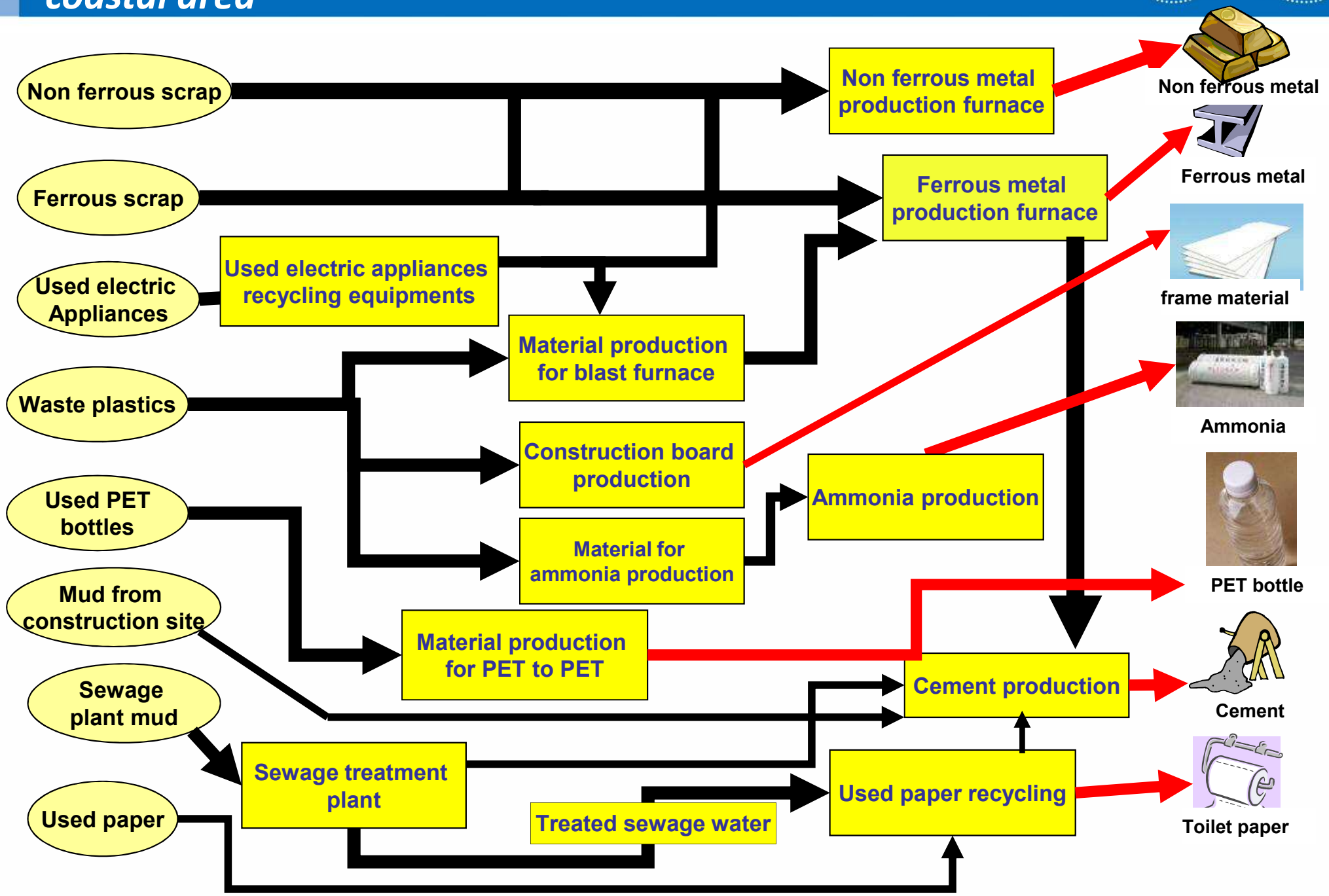
LCIE NPO法人 産業・環境創造リエゾンセンター

CCかわさき"エコ暮らし" 推進プラットフォーム

Accumulation of eco-businesses

Supports for advancing overseas

5. Current collaboration among companies on the coastal area

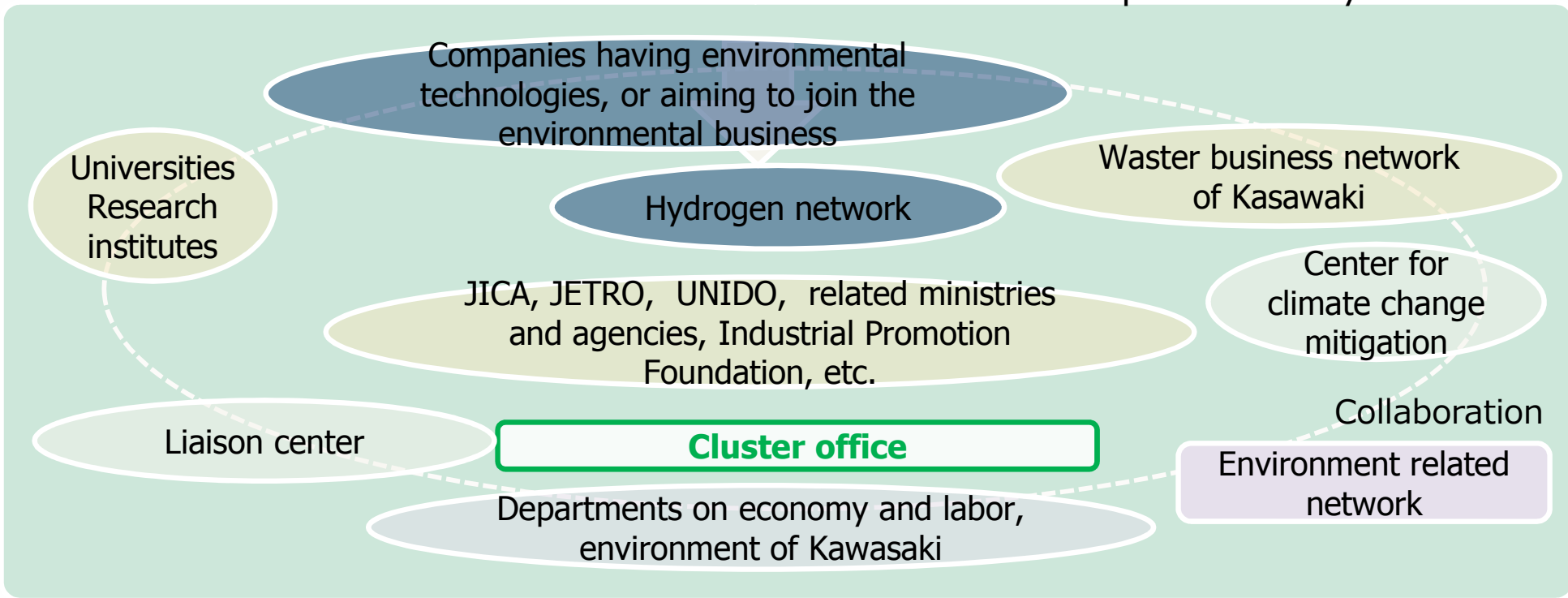


Policy of Green Innovation in Kawasaki (2014)

4 pillars

1. Revitalization of environmental technologies and industries
2. Mechanism for environmental awareness using advanced technologies
3. Urban planning using environmental technologies by multi-agent cooperation
4. Promotion of international contribution by environmental technologies

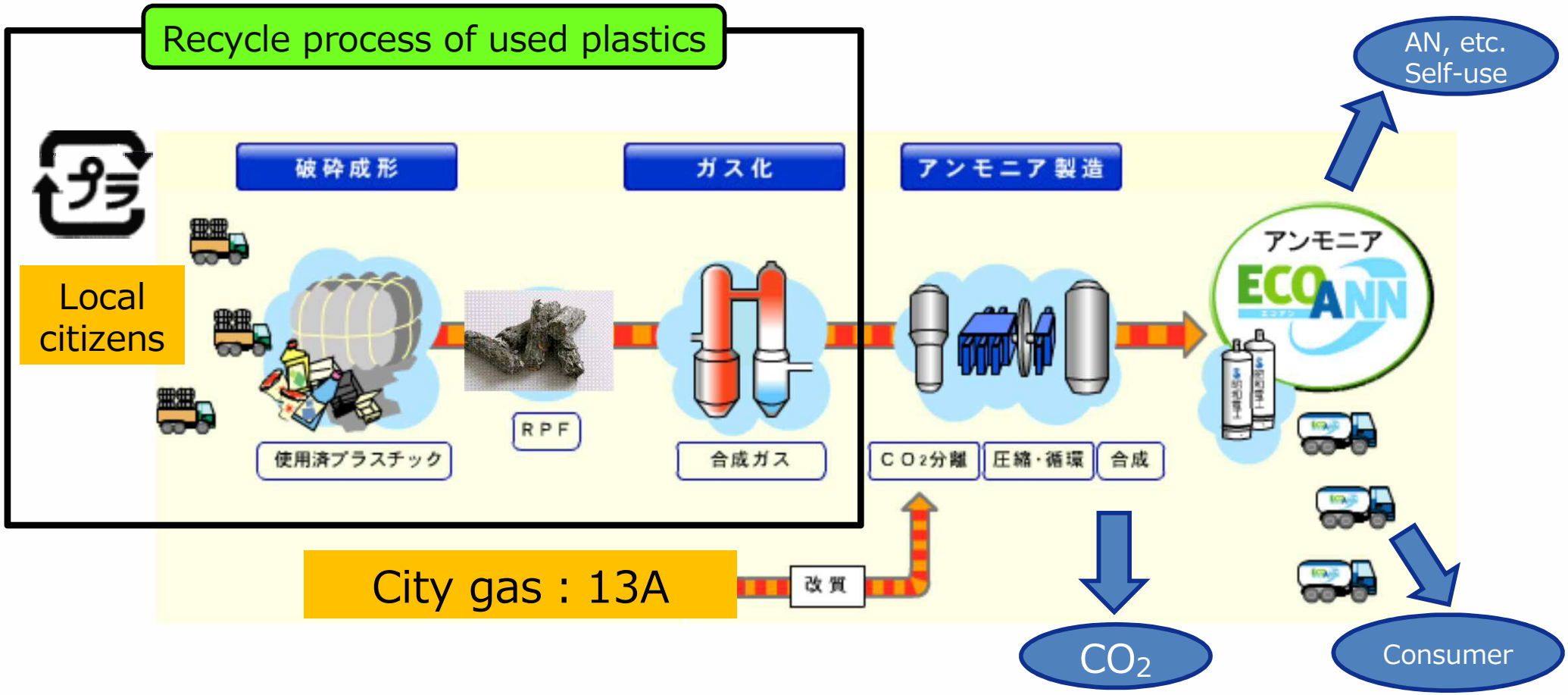
Construction of promotion system:



7. Current situation of recycling waste plastics by Showa Denko

Extract hydrogen from waste plastics and utilize as raw material for Ammonia

Based on the Containers and Packaging Recycling Law, recycle and utilize the waste plastics by gasification method.



Gas products of Showa Denko
(Liquefied CO_2, dry ice)

MOU of promoting a low carbon hydrogen city between Kawasaki city government and Showa Denko

On 28th July in 2015, MOU were concluded.
Kawasaki city government and Showa Denko aims to developing a low carbon hydrogen society with low environmental burden by utilizing hydrogen production system from waste plastics.

Win-win relationship

SHOWA DENKO 昭和電工株式会社

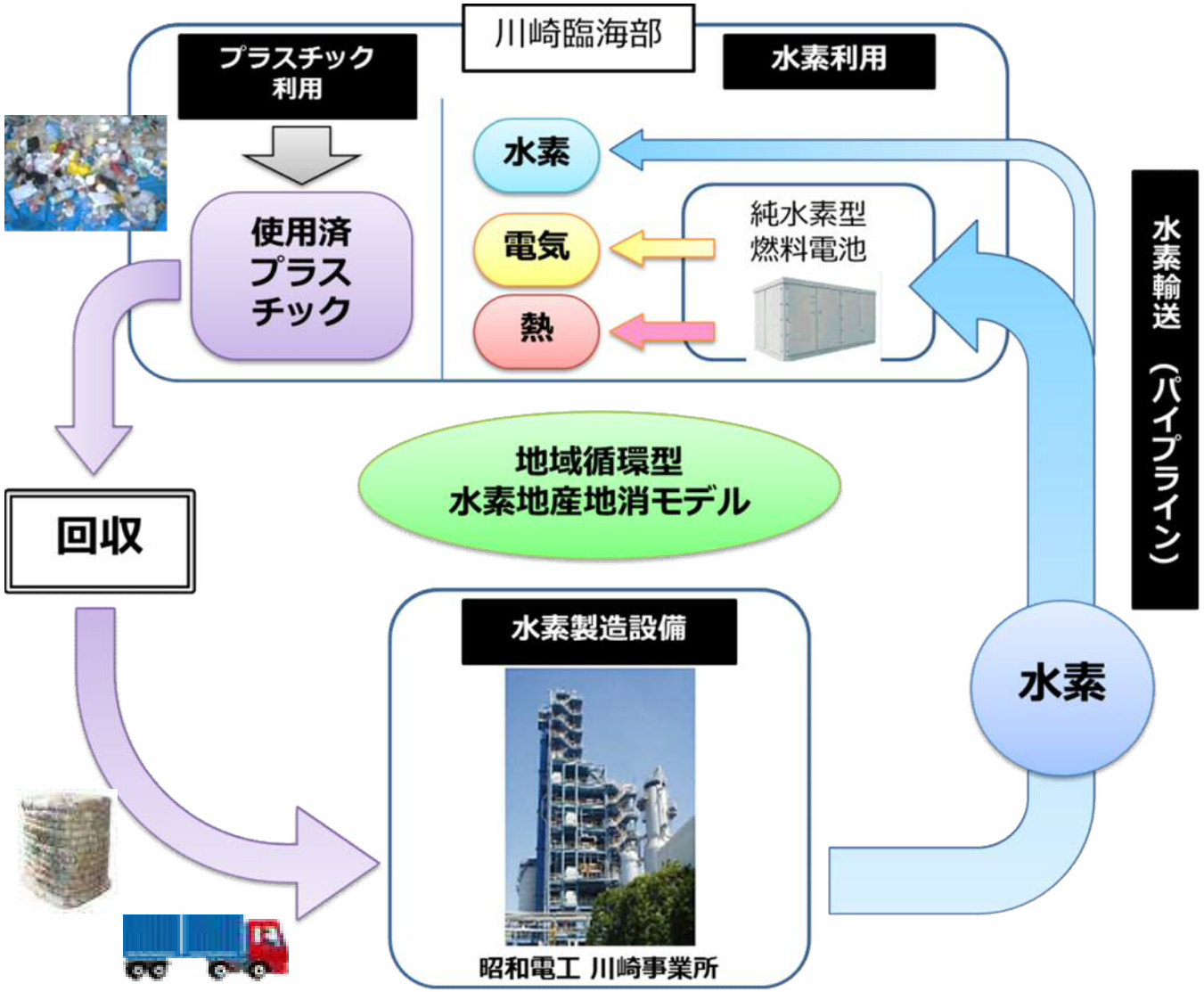
＜Objectives＞
1)Utilization of existed infrastructure, knowledge and experience
2) Substantiates experiment and trial to commercialization of low carbon hydrogen from waste plastic, resulting in contributing to establishment of a low carbon society

Collaboration

川崎市 KAWASAKI CITY

＜Objectives＞
Based on “Kawasaki Hydrogen Project”, Kawasaki city government has promoted “future eco city development”

Planned low-carbon hydrogen supply chain in Kawasaki coastal area



Contents

【Produce】

・Efficient production of hydrogen by remodeling PSA equipment and introducing membrane separation equipment.

【Transport】

・Hydrogen supply by pipelines

・Comparison on CO_2 emission with other transport method.

【Utilize】

・Quality identification of the hydrogen available for fuel cells and other purposes.

【Overall】

・Evaluation on the overall CO_2 emission reduction effect of the whole supply chain

Extend the successful cases of the “Kawasaki Initiated Green Innovation” to other domestic cities and the world