



Phosphorus Recovery Technology in Japan

-A Vision at Sewerage Works-

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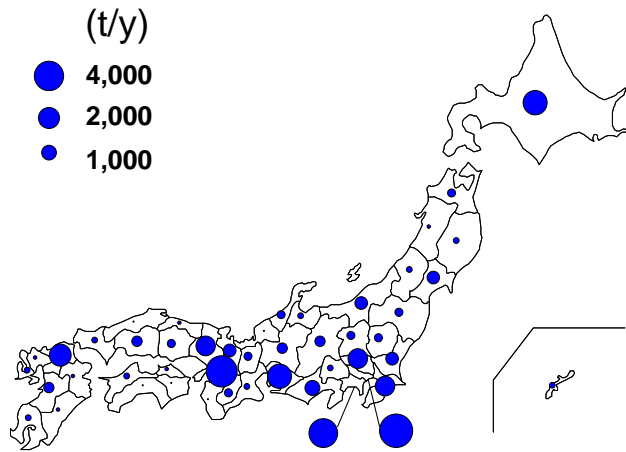
A photograph of a beach at sunset or sunrise. The sun is low on the horizon, creating a bright, shimmering reflection on the wet sand. The waves are breaking on the shore, with white foam visible. The sky is a mix of orange, yellow, and blue.

2011 Workshops

Outline of presentation

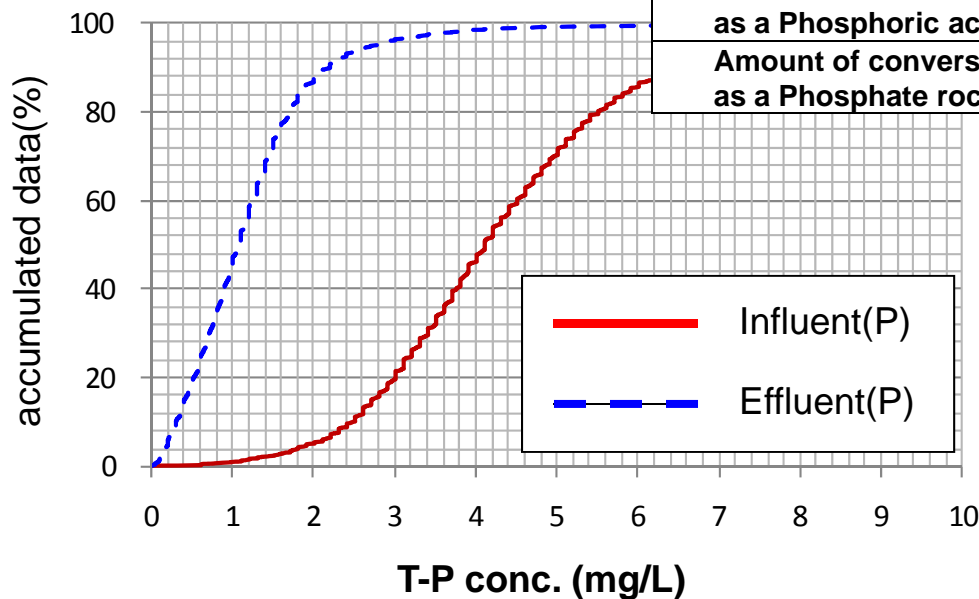
1. Phosphorus Resources in Sewage Treatment in Japan
2. Studies on High Quality Phosphorus Resources Technology of Incinerator Ash
3. Future Vision of Wastewater Treatment Plant which we have been aiming

Phosphorus is concentrated in wastewater treatment plant.



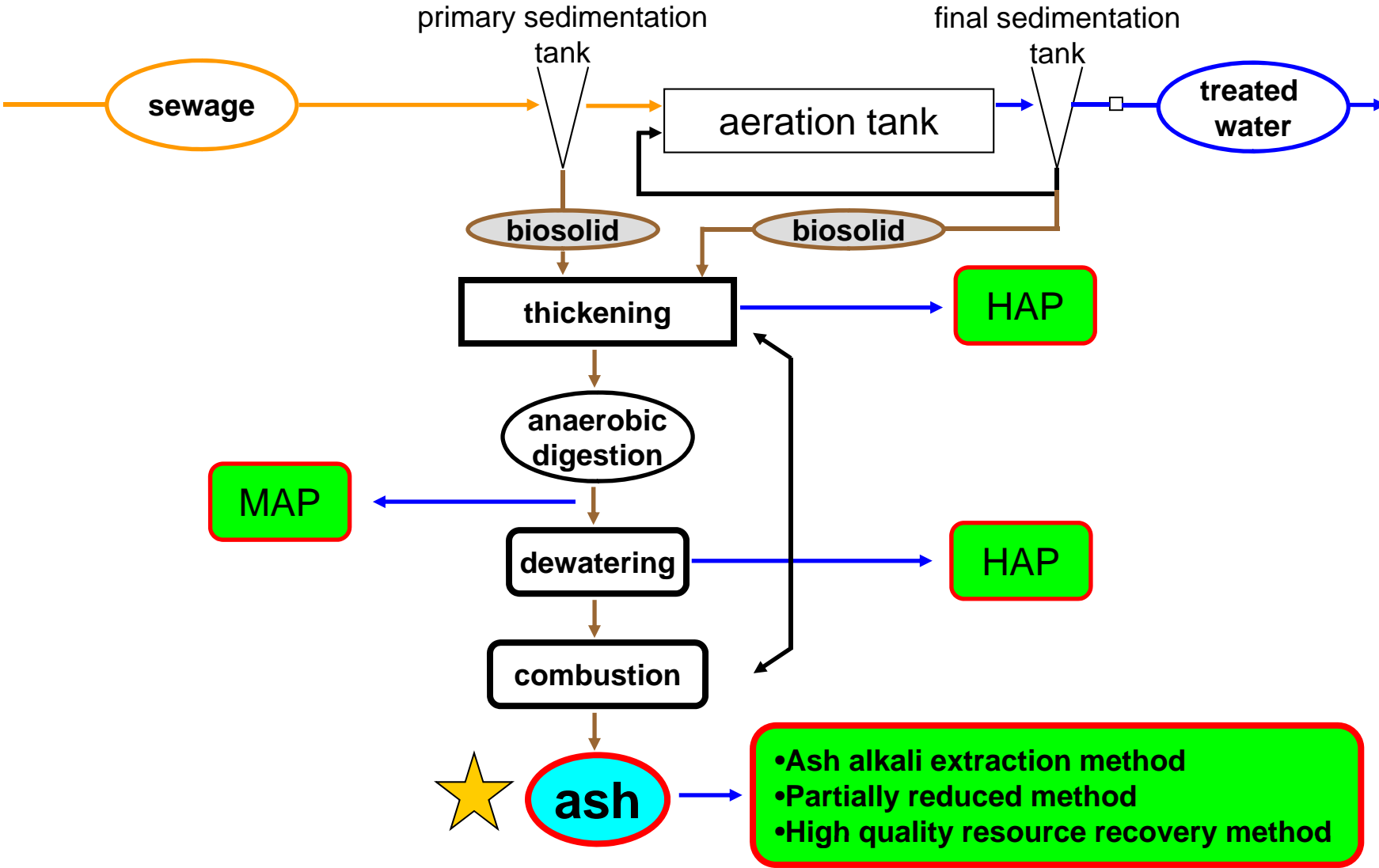
Influent waste water (m ³ /y)	14 billion
P conc. of influent (mg/L)	4.1
P conc. of effluent (mg/L)	1.1

	in Sewage	in Biosolid
Amount of P (t-P/y)	57,100	41,900
Amount of conversion as a Phosphoric acid (t-P ₂ O ₅ /y)	130,900	96,100
Amount of conversion as a Phosphate rock (t-P rock/y)	436,000	320,000

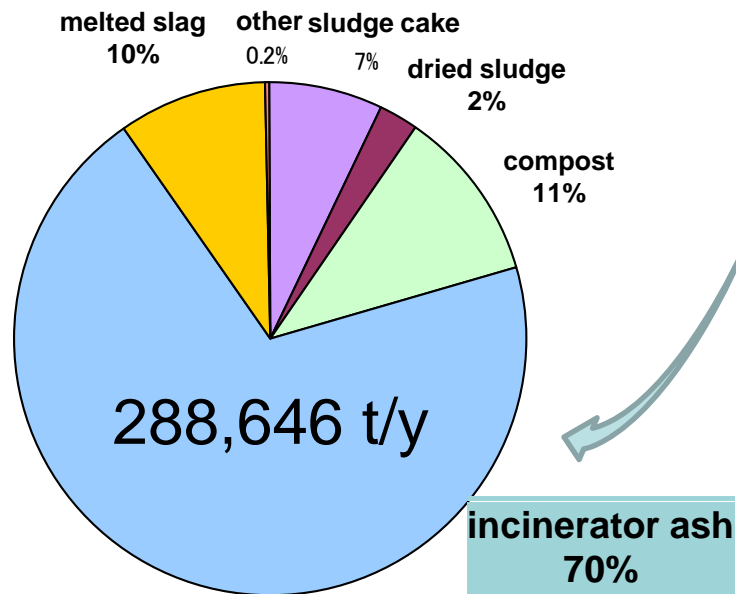
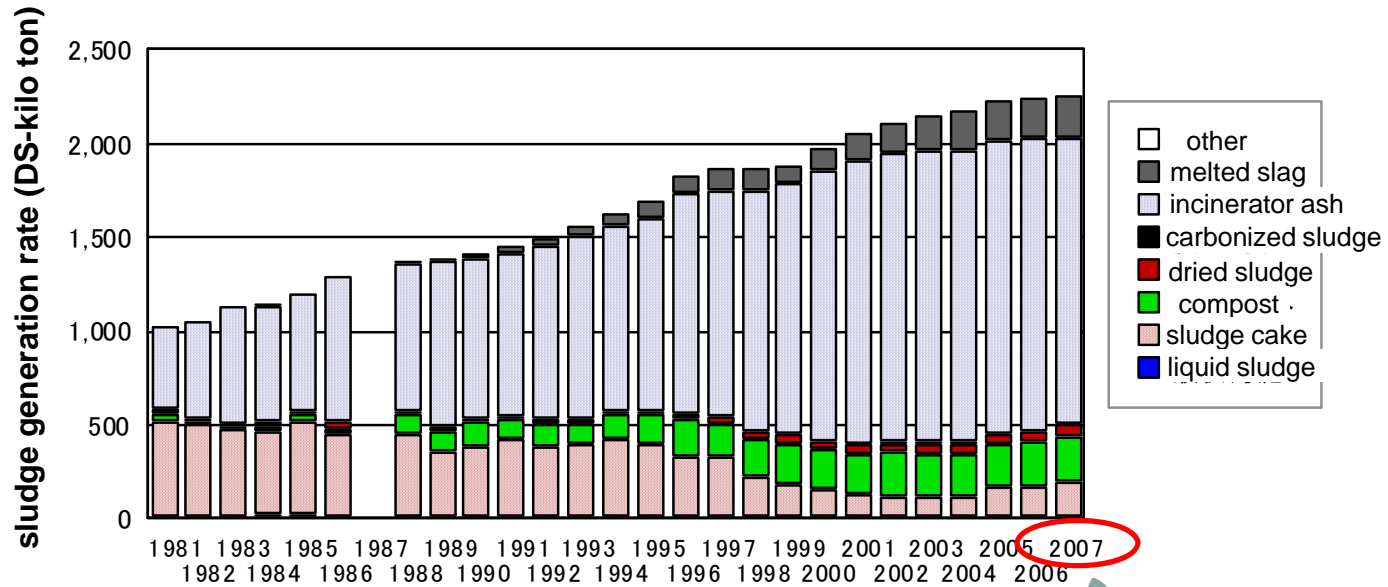


statistical results
in 2007

Expectation of Phosphorus Resources in Sewage Treatment



Amount of Phosphorus Resources according to Sludge form



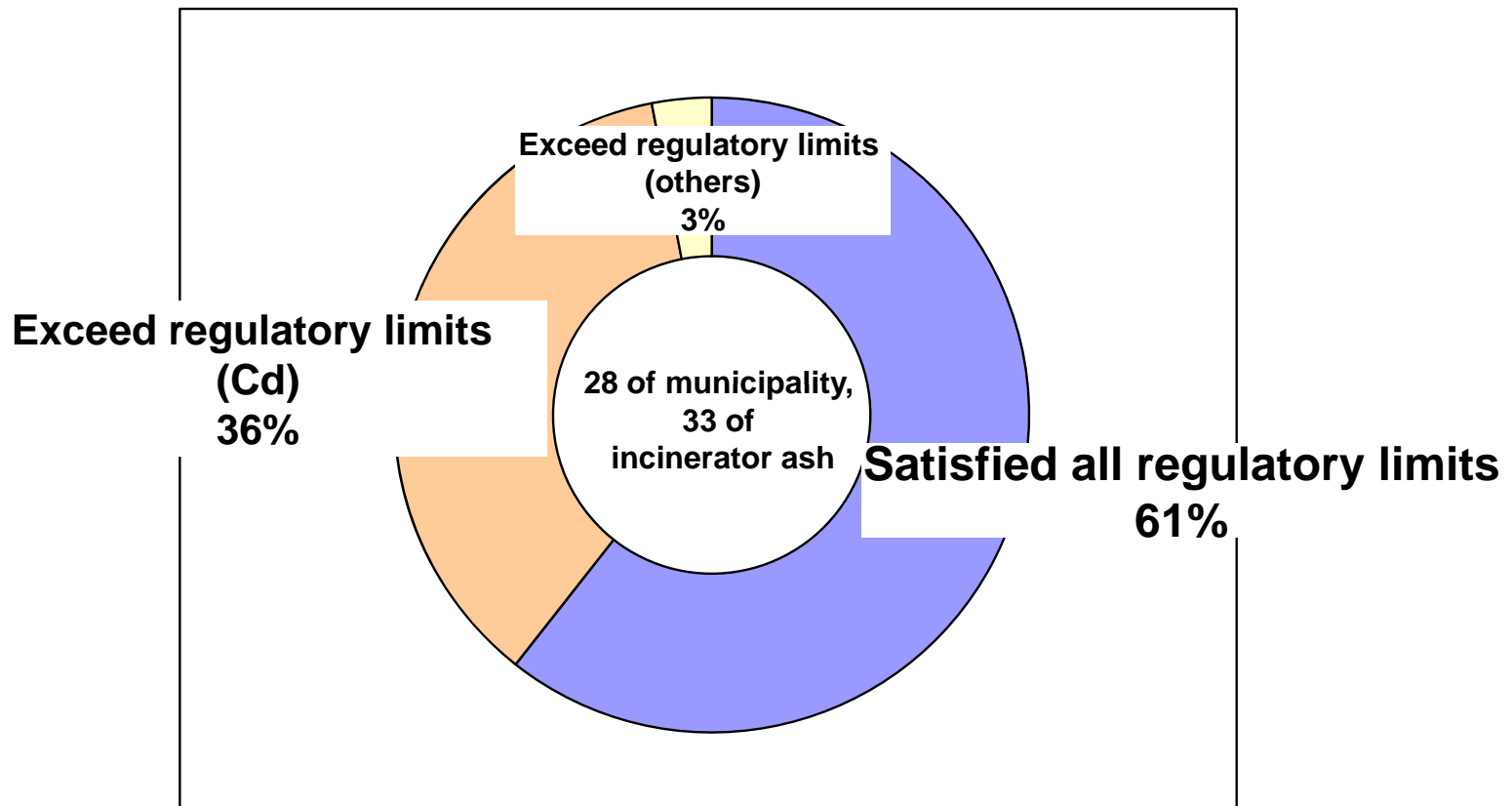
Comparison with Phosphate rock of Element of Incinerator Ash

		Incinerator ash	Phosphate rock
		288,646 t/y (production in 2007)	695,079 t/y (amount of import in 2007)
P ₂ O ₅	%	24-35	32-38
CaO	%	10-14	48-53
Al ₂ O ₃	%	10-14	0.2-0.8
Fe ₂ O ₃	%	2-27	0.2-0.7
MgO	%	2-6	0.2-1.0
SiO ₂	%	24-33	2-11
As	mg/kg	2-10	2-20
Cd	mg/kg	1-11	0.1-15
Hg	mg/kg	0.01-2	0.01-1
Pb	mg/kg	40-310	1-15
Zn	mg/kg	2000-5000	10-300

Amount of Heavy Metals in Incinerator Ash

**Table. Acceptable value of heavy metals in sewage sludge fertilizer
(Fertilizer Control Act, Japan) (mg/kg)**

As	Cd	Hg	Ni	Cr	Pb
50	5	2	300	500	100

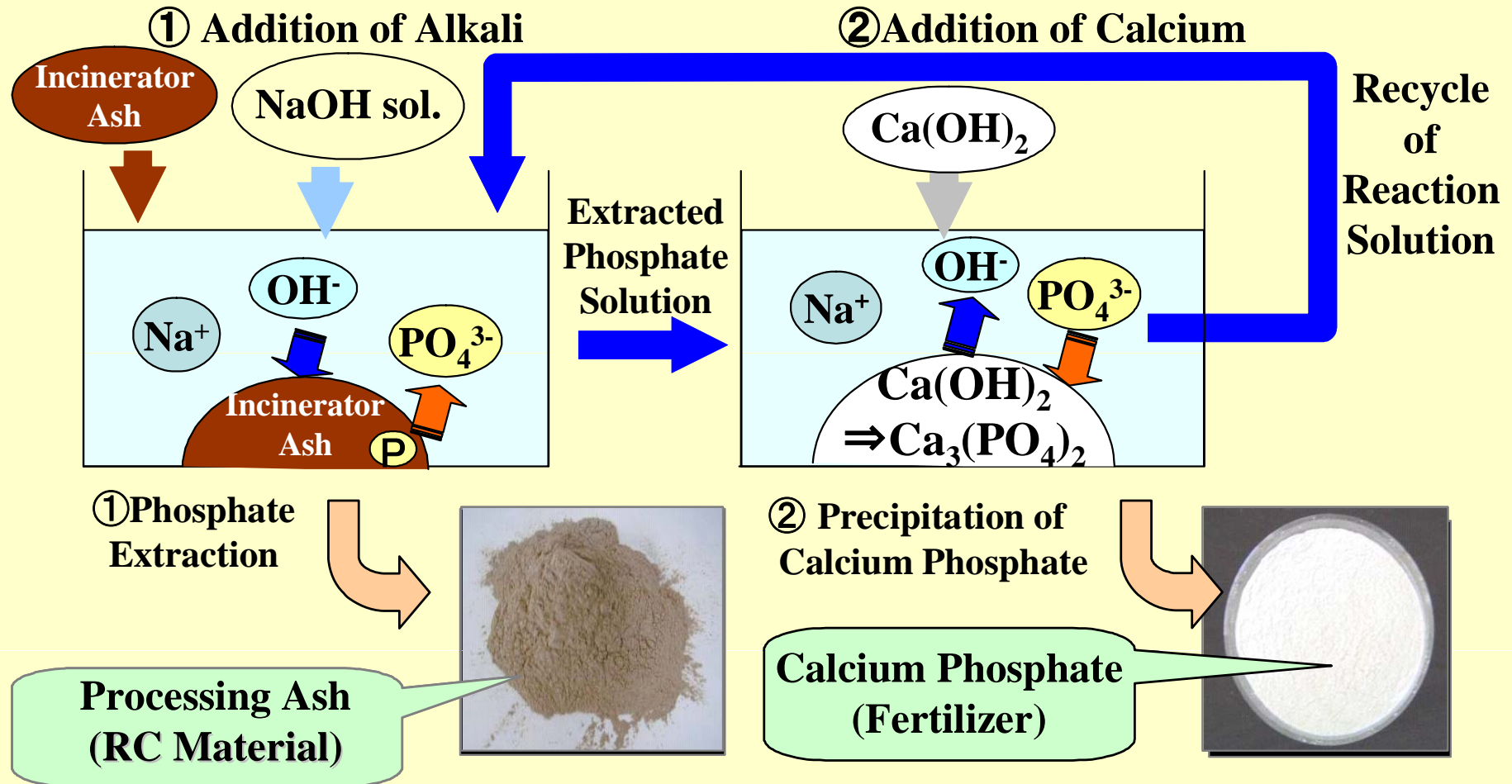


Phosphorus Recovery Plant in Gifu prefecture, Japan



Ash alkali extraction method from Incinerator Ash

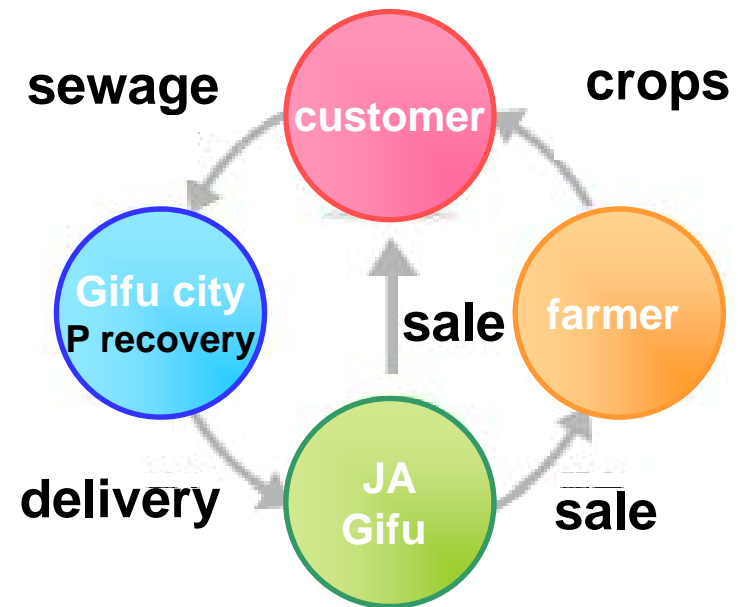
<Flow scheme of Phosphate recovery>



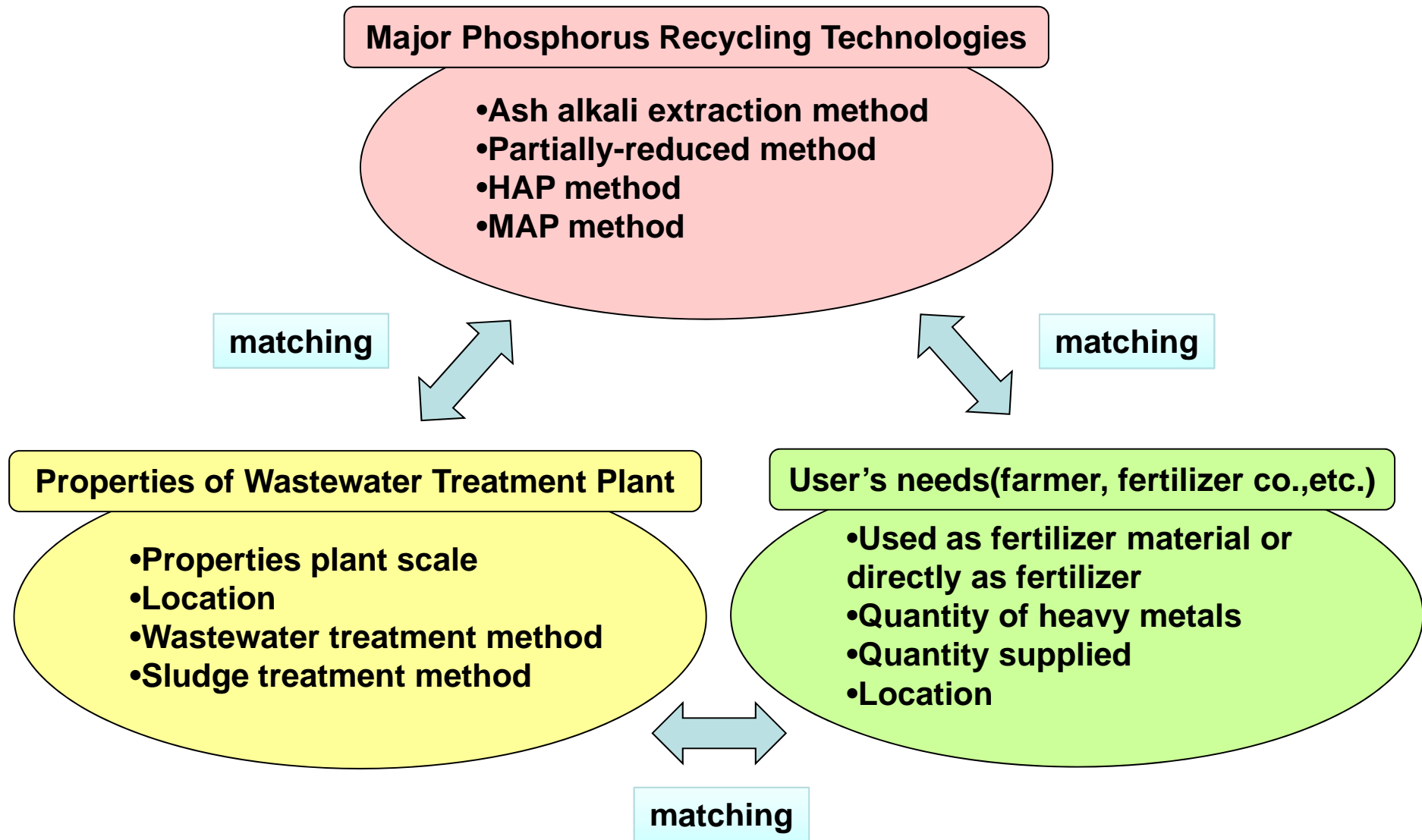
Phosphate Recovery Case with local production for local consumption (Gifu prefecture, Japan)



Gifu no Daichi
(acid soluble phosphate fertilizer)



Handbook on Phosphorus Recycling in WWT(2010.3)

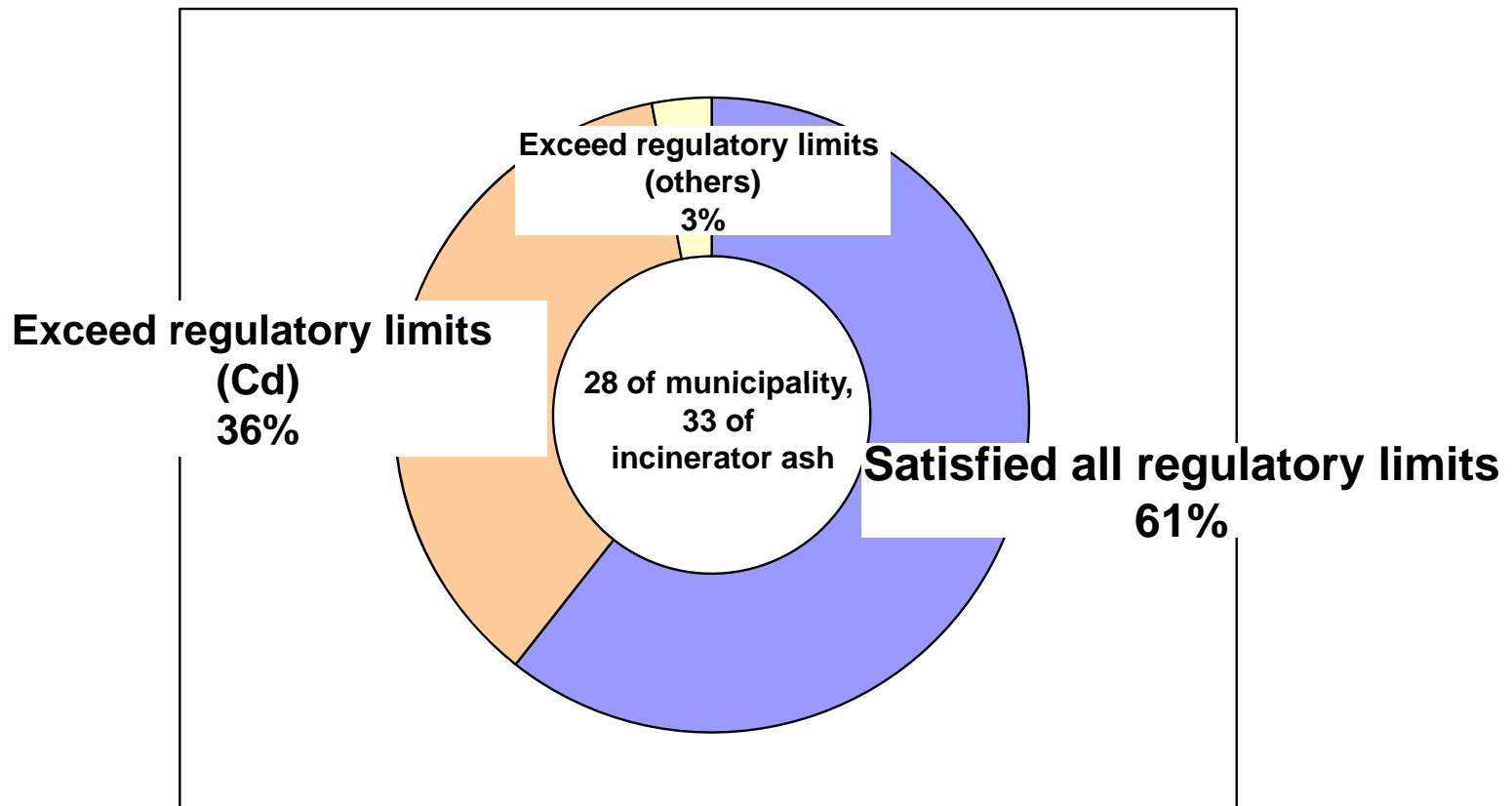


*Studies on High Quality Phosphorus Resources Technology
of Incinerator Ash*

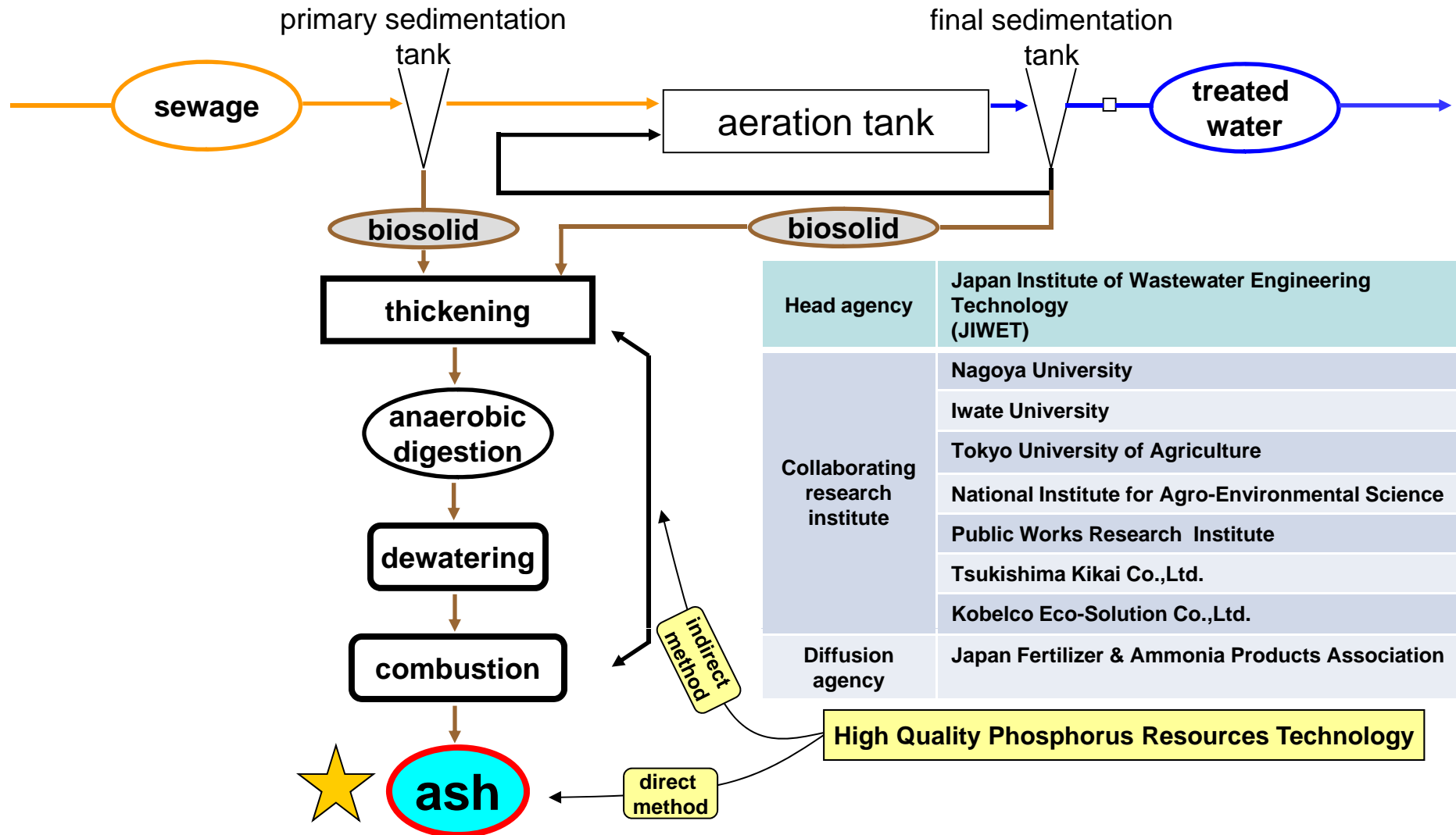
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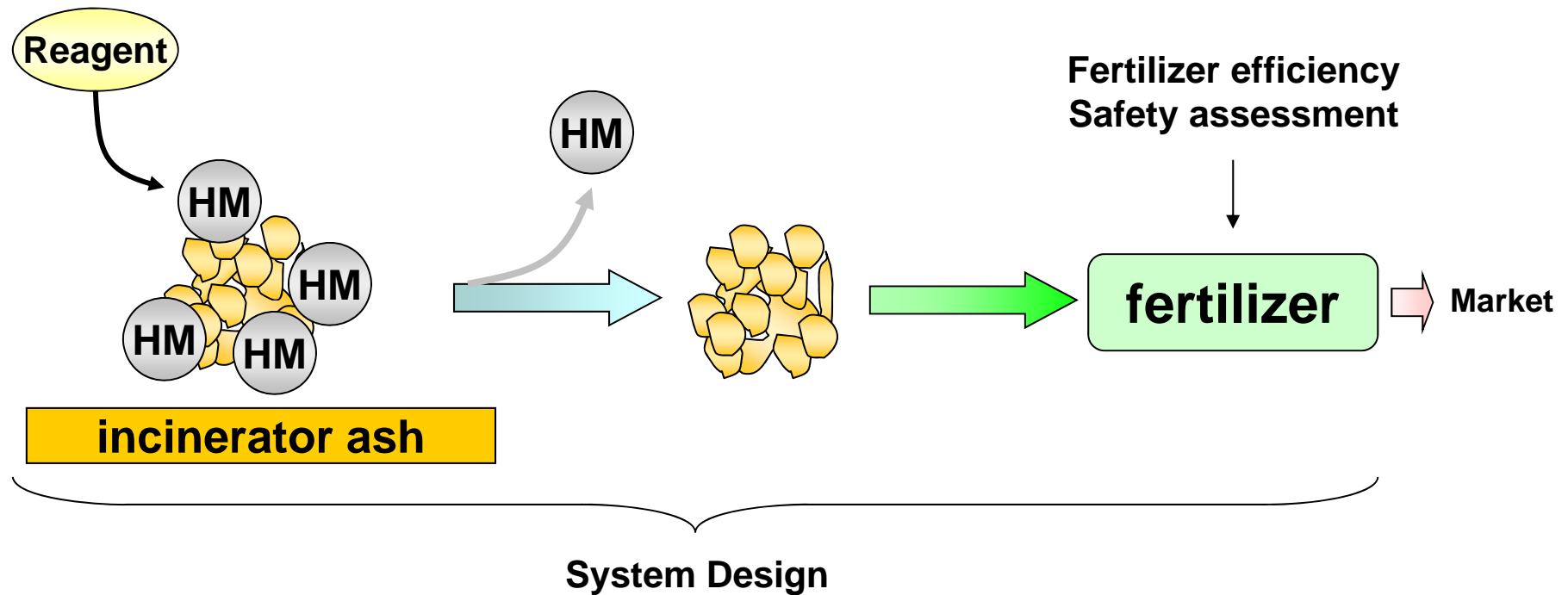


Studies on High Quality Phosphorus Resources Technology of Incinerator Ash



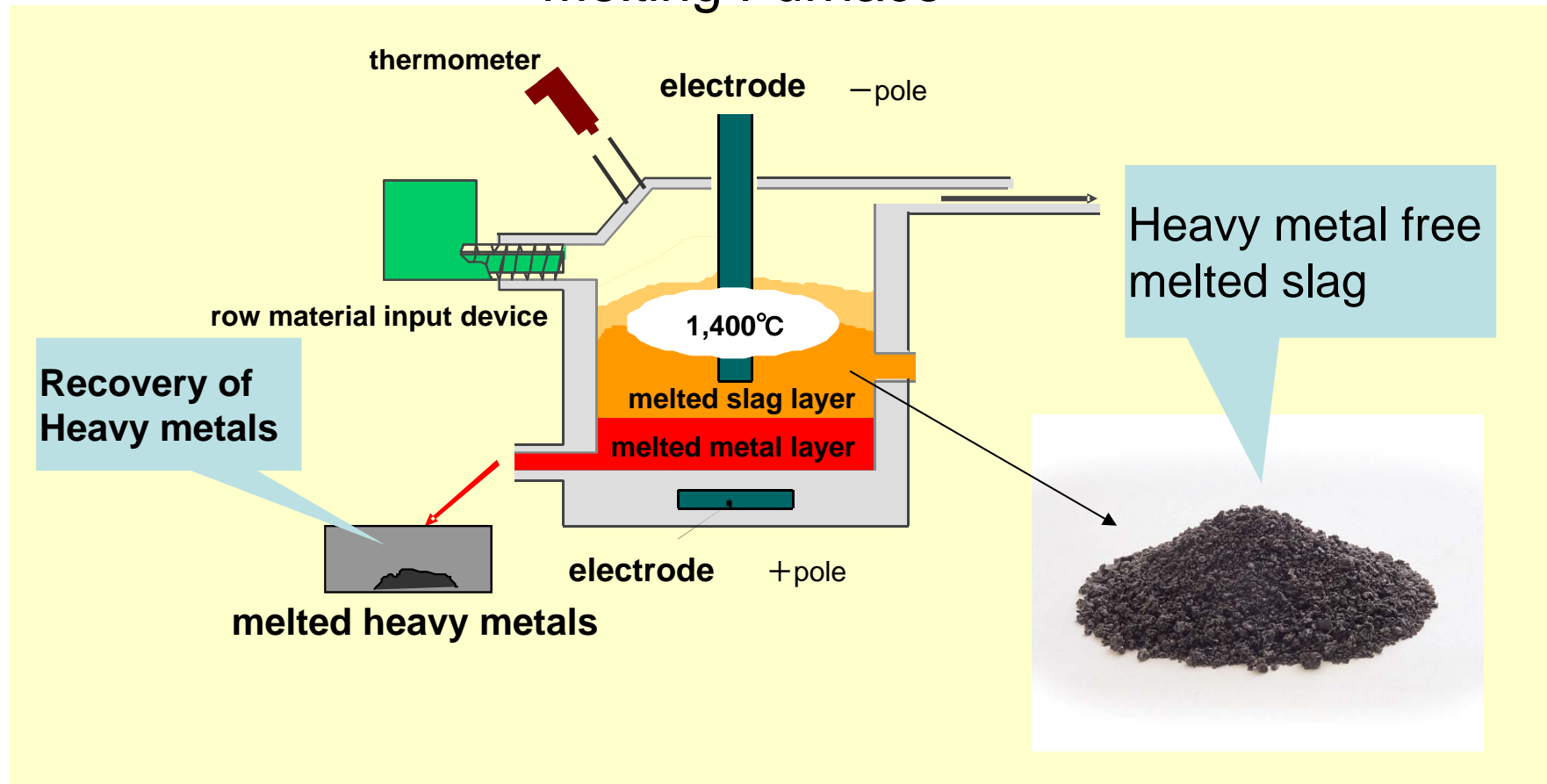
Studies on High Quality Phosphorus Resources Technology of Incinerator Ash

Divorcing method of Heavy Metals by volatilizing reaction or wet reaction

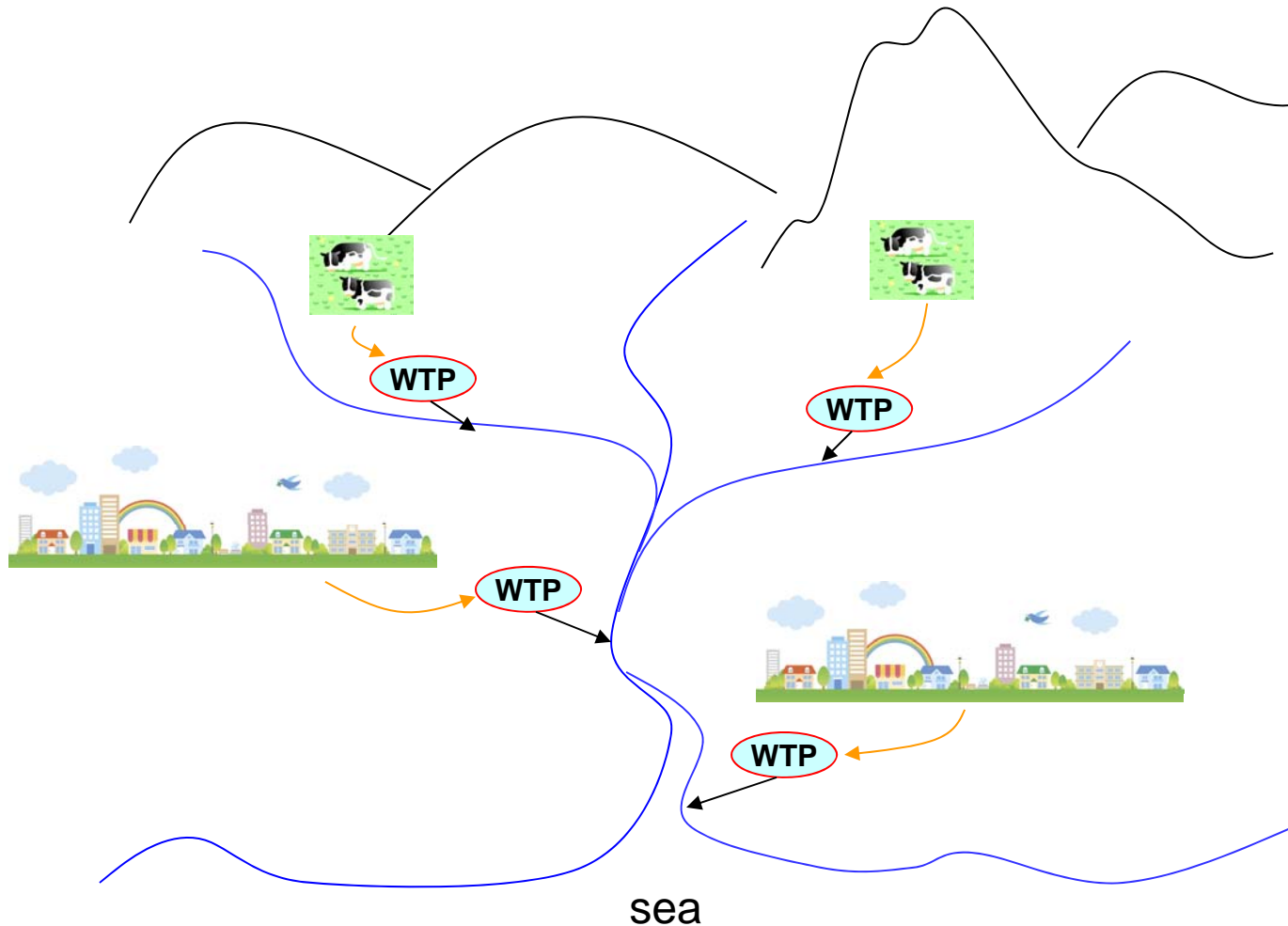


Melting method of Incinerator Ash

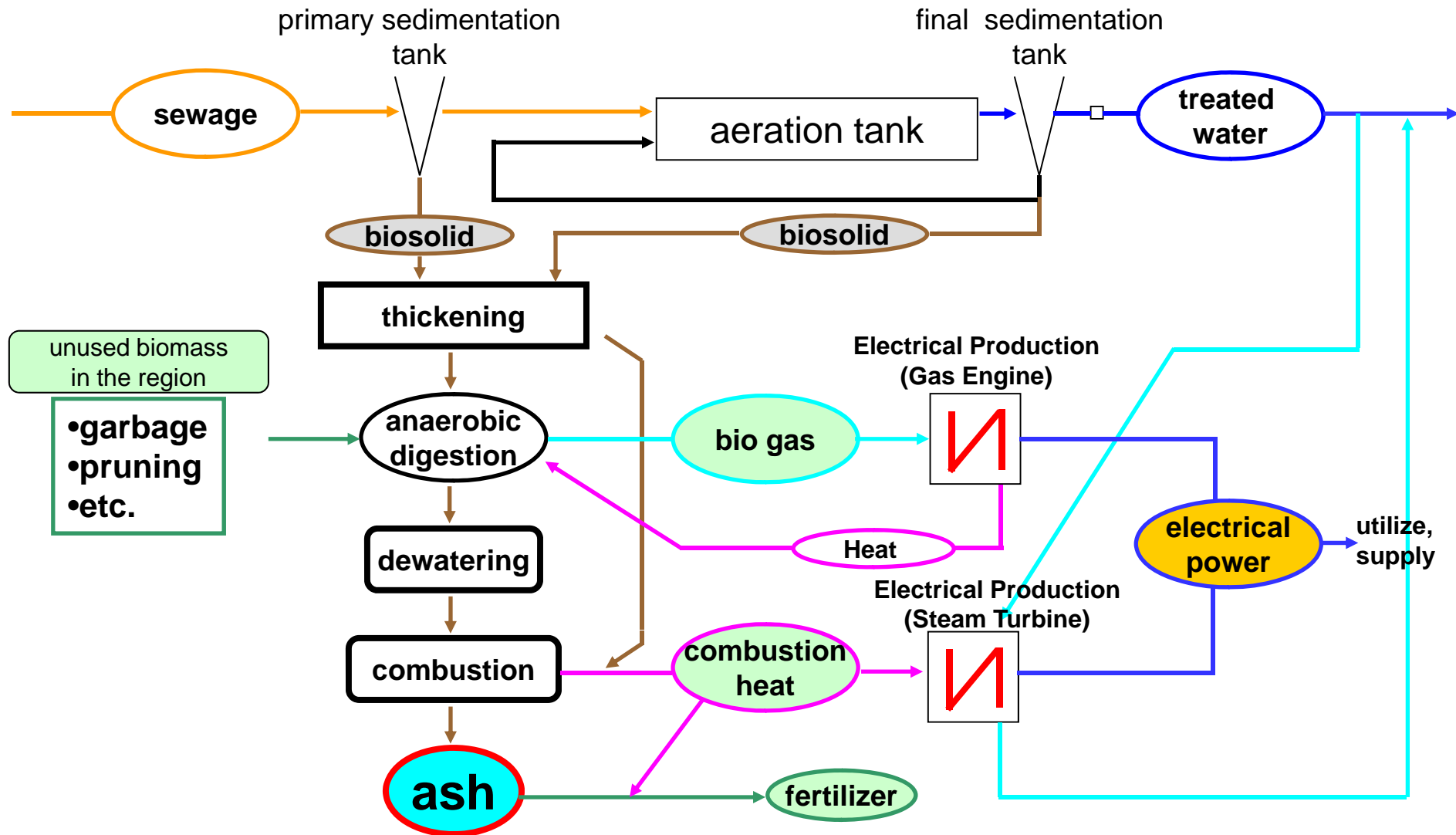
<Melting Furnace>



Future vision of Wastewater Treatment Plant which we have been aiming.



The Scheme of WTP as a Resources Base



Thank you very much for listening!

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