

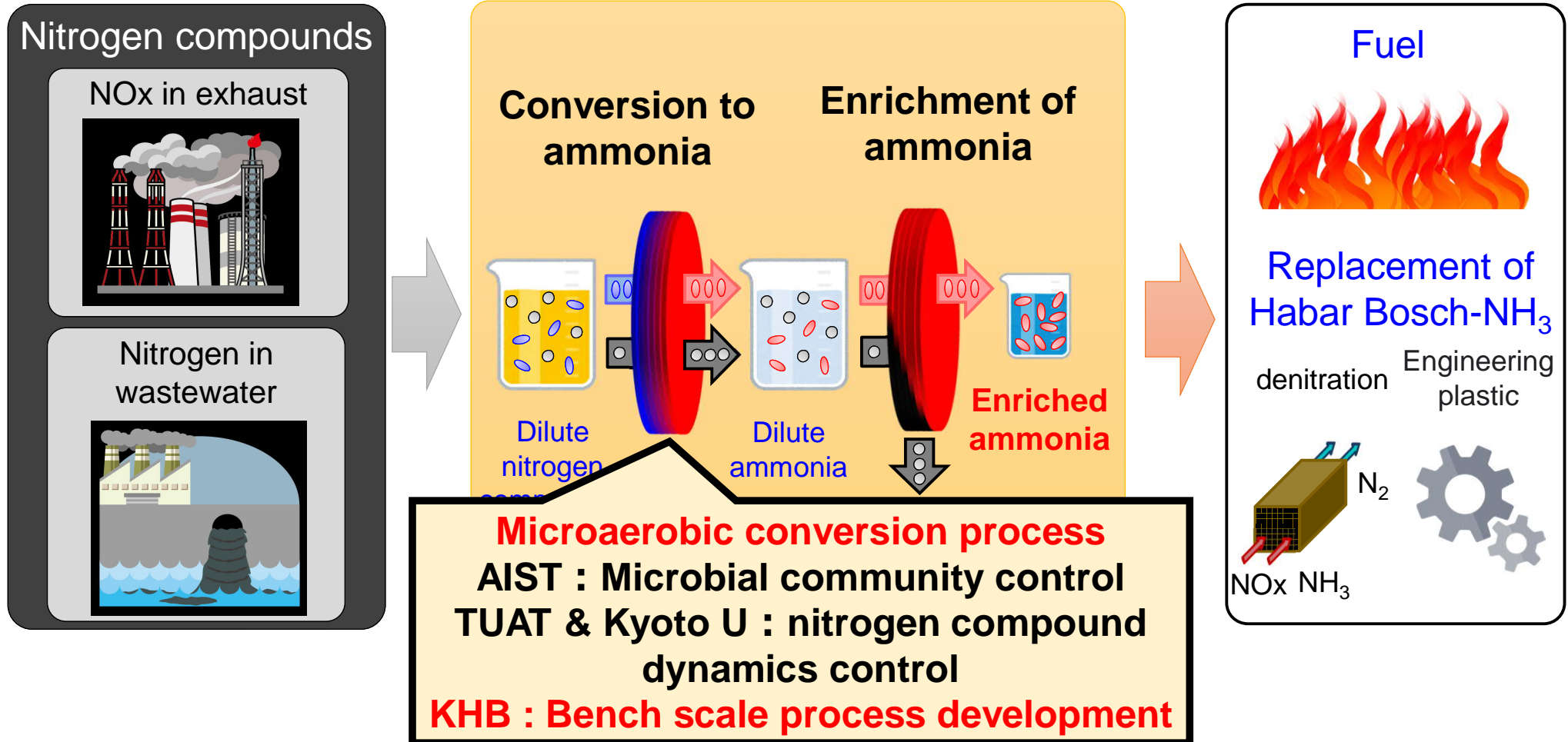
# Innovative Circular Technologies for Harmful Nitrogen Compounds/ To Solve Planetary Boundary Issues

Theme 2. Recycling nitrogen compounds in wastewater to ammonia resource  
Theme 2-1. R&D on microbial conversion of nitrogen compounds to ammonia

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Implementing organizations : National Institute of Advanced Industrial Science and Technology (AIST),  
The University of Tokyo, Waseda University,  
Tokyo University of Agriculture and Technology, Kobe University,  
Osaka University, Yamaguchi University, Kyowa Hakko Bio Co., Ltd.,  
ASTOM Corporation, Toyobo Co., Ltd., FUSO Corporation, Ube Industries, Ltd,

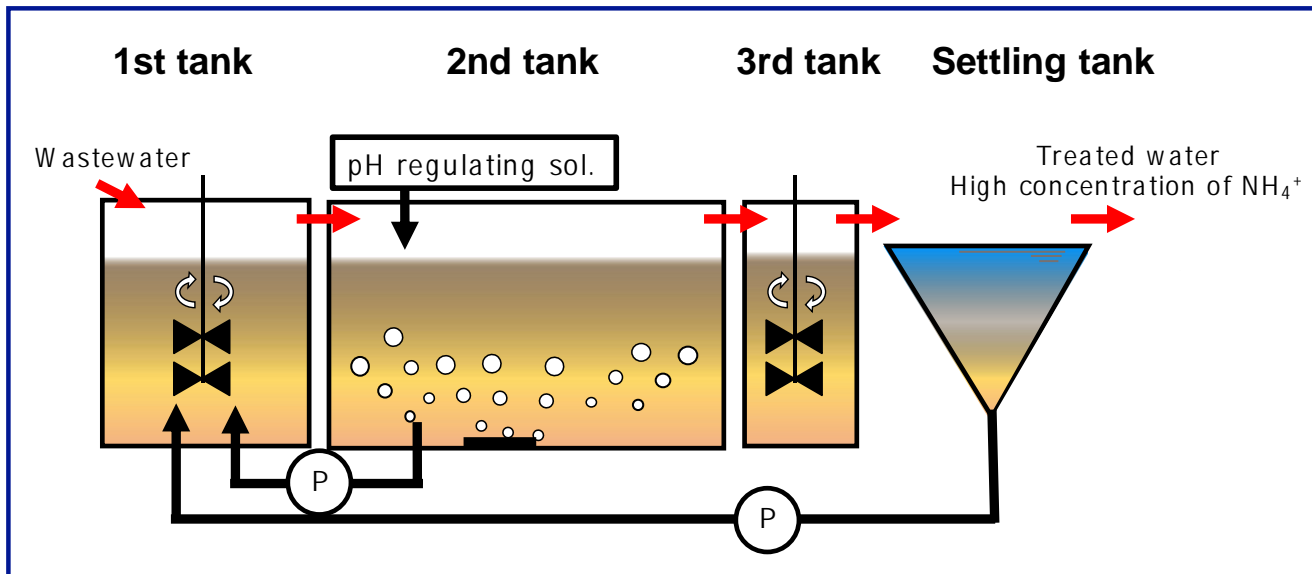


Target of Theme 2 for FY2029: Pilot-scale demonstration (5~15 m<sup>3</sup>/d) of recovery and condensation of ammonium from wastewater

Position of KHB: Construction, operation and maintenance of a bench-scale microaerobic conversion process

Target of KHB for FY2029: Construction and demonstration of a pilot-scale microaerobic conversion process for ammonium recovery using actual wastewater.

## Design of a lab-scale bioreactor

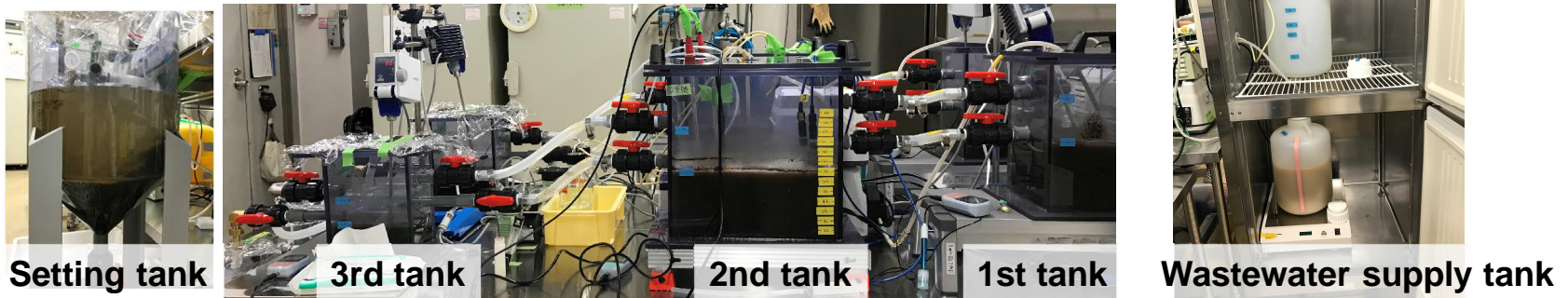


### Industrial wastewater as influent

(Composition of 10- to 20-fold concentrated industrial wastewater)

- NH<sub>4</sub>-N approx. 5,000 mg-N/L
- Total nitrogen (TN) approx. 7,000 mg-N/L
- Total organic carbon (TOC) approx. 12,000 mg-C/L
- pH approx. 1.5

### Lab-scale bioreactor constructed and operated in AIST

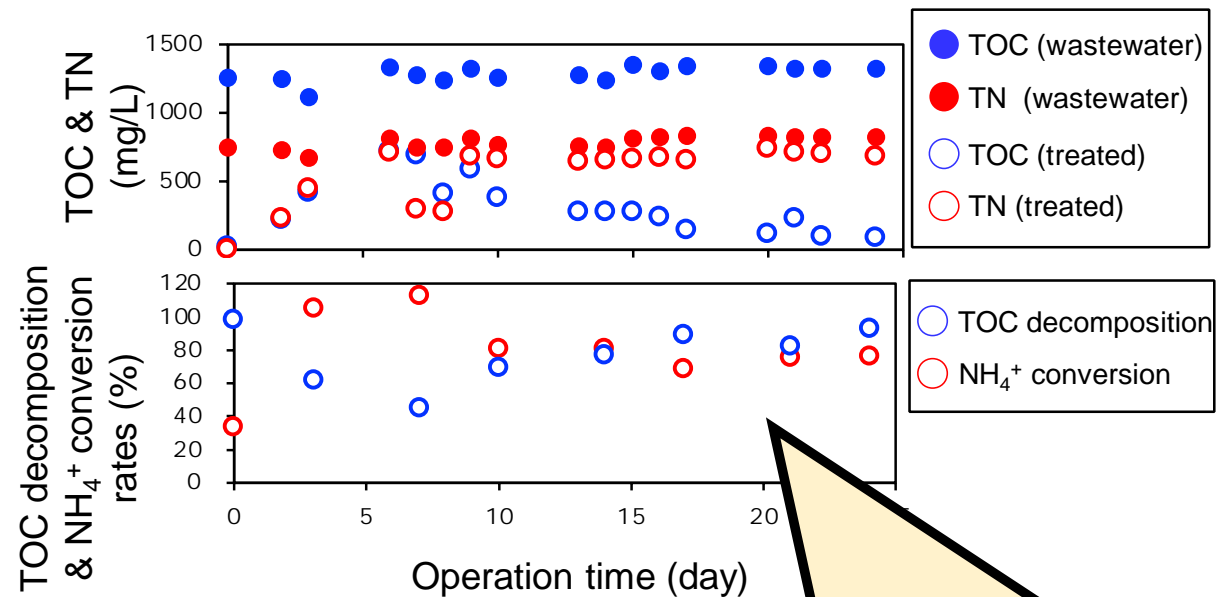
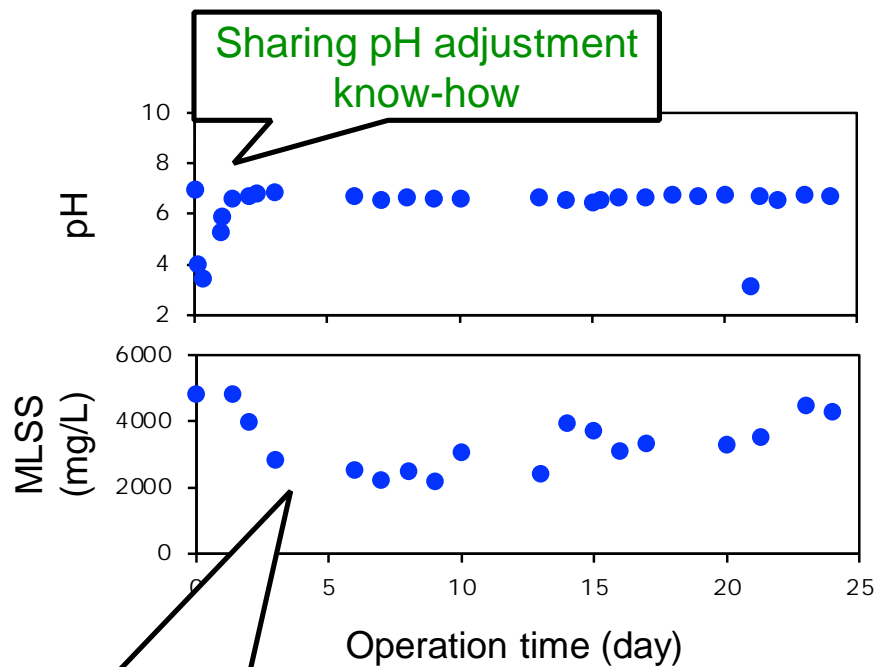


## R&D Items

- Construction, operation and maintenance of a bench-scale microaerobic conversion process
- ⇒ Sharing information to perform the design and stable operation of the process

- Sharing the knowledge and know-how on operation of the lab-scale process
- Obtaining information necessary for the bench-scale process test (collaboration with AIST)

## Operating parameters



**R&D to optimize operation conditions for stable organics decomposition and efficient conversion of N compounds to NH<sub>4</sub><sup>+</sup> using actual industrial wastewater**

## Position in the project

R&D of microaerobic conversion process from nitrogen compounds to  $\text{NH}_4^+$

## Target for FY2029

Construction and demonstration of a pilot-scale microaerobic conversion process for ammonium recovery using actual wastewater

## R&D items

Construction, operation and maintenance of a bench-scale microaerobic conversion process

## Achievement

- Sharing the knowledge and know-how on operation of the lab-scale process
- Obtaining information necessary for the bench-scale process test

