



Special Feature – The Nippon Kayaku Group's Global Efforts to Improve Environmental Preservation Technologies for Water Treatment



Today, companies have to take the lead in finding solutions to environmental issues and social issues in order to realize a sustainable society. With operations in 12 countries and regions around the world, the Nippon Kayaku Group implemented the Clean Eco Technology (CET) Project at business sites in Japan and at Wuxi Advanced Kayaku Chemical Co., Ltd. (WAC), a Group company in China, with the aim to establish safe, stable and eco-friendly wastewater treatment

The 14th goal of the UN's Sustainable Development Goals (SDGs) covers the preservation of oceans, seas and marine resources. The CET Project, which also considers biodiversity conservation, has been a long-term initiative spanning five and a half years since 2012 responding to the needs of society.

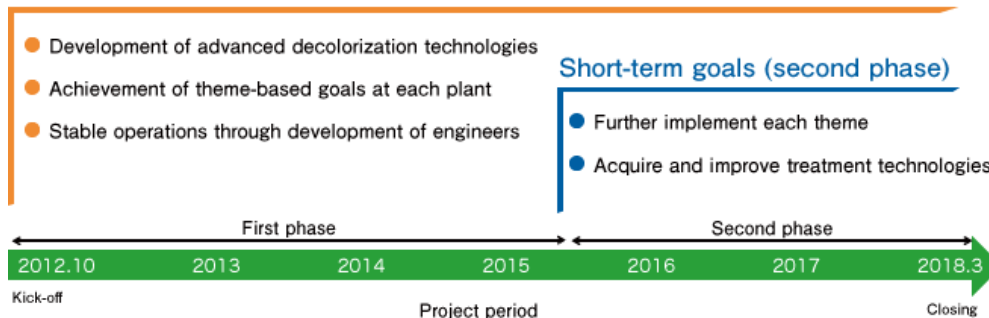
Background to Project Establishment and Goals

Plants of the Nippon Kayaku Group handling resins, colorants and dyes face the unique issue of wastewater treatment. This includes high salinity wastewater that is difficult to treat biologically and high COD colored wastewater produced during the colorant manufacturing process. Overcoming these issues not only reduces environmental impacts, but also is important from the standpoint of sustainability, including engagement with local communities.

Launched in October 2012, the CET Project was separated into two phases based on its medium- to long-term goals. The first phase was 2012 to 2016 and the second phase was 2016 to 2018. To put into practice number nine of the Mid-term CSR Action Plan ("Improve environmental preservation technologies for water treatment"), we deployed effective management. The project worked on initiatives at business sites in Japan and at WAC, citing as a target, the common goals of reducing COD emissions through improved wastewater treatment technologies, development of future engineers, cost reductions, and leveling of technologies between business sites.

Goals of the Project

Medium- to long-term goals (at time of project establishment)



Participating Business Sites/Departments and Main Achievements

Participating business sites/departments

Japan

Fukuyama Plant (Nippon Kayaku Fukuyama), Asa Plant, Tokyo Plant (Nippon Kayaku Tokyo), Takasaki Plant, Himeji Plant, Kashima Plant, Tokyo Business District, R&D Planning Division, Functional Chemicals R&D Laboratories, Pharmaceuticals Research Laboratories, Agrochemicals Laboratories, Technical Administration & Engineering Division

Group companies

Wuxi Advanced Kayaku Chemical Co., Ltd., POLATECHNO CO., LTD., Asa Plant of Kayaku Akzo Corporation

Main achievements

Achievements

- COD emissions reduced by approx. **50** % (compared to 2007)
- Nitrogen emissions reduced by approx. **43** % (compared to 2011)
- Phosphate emissions reduced by approx. **29** % (compared to 2011)

(Results in Japan)

WAC (China)

Theme

Reduce COD emissions through introduction of new wastewater treatment facilities

Achievement

Reduced COD*emissions by approx. **28** % (compared to 2013)

*COD: Chemical Oxygen Demand. An indication of the amount of oxygen needed to oxidize a subject compounds in water.

Tokyo Plant

Theme

Examine optimization of existing wastewater treatment process

Achievement

Reduced raw materials costs by changing nutrients and changing operating conditions (8 million yen/year)

Fukuyama Plant

Theme

Improve decolorization using high performance coagulants

Achievement

Reduced water usage by approx. **33** % (compared to 2011)

Asa Plant

Theme

1-Develop high salinity epoxy wastewater treatment technology
2-Establish technology for removal of molybdenum from catalyst wastewater

Achievement

Achievement: Established a technology for epoxy wastewater treatment (3 other patents pending)

Engineer Development, Industry–Academia Partnerships, Earning Trust

In addition to the achievements of the CET Project above, there were three separate initiatives.

(1) Initiatives to develop engineers involved study sessions, working groups and networking sessions at all business sites (total of approximately 20 times over a five-year period) for skill building. A project database was also set up to centrally manage information and disseminate information to all business sites, which enabled timely sharing of information. As a result, we were able to raise greater awareness among researchers about wastewater and enable manufacturing design with an eye on wastewater treatment from the research phase.

(2) In terms of industry-academia partnerships, a technology sharing session was held in which information was exchanged and presentation of cases was made on the Nippon Kayaku Group's core wastewater technology for the "decolorization of colored wastewater." In addition, joint research was conducted with universities with the aim of developing new wastewater treatment technologies.

(3) Towards building an external network, we accommodated requests from business partners for engineer training and requests from universities for site visits in an effort to earn trust by actively sharing technologies with outsiders.

■ Making Improvements with Ceaseless Efforts and Utilizing Achievements for the Future

Roughly five and a half years have passed since the project kicked off in 2012. In addition to engineer development, which was an important long-term goal of the CET Project, we have developed a network of wastewater personnel across business sites and one externally, while establishing actual technologies, which have resulted in visible improvements, including new facility proposals and the quick realization of cost savings. Furthermore, we were able to evaluate treatment technologies and build up know-how for optimization. In 2018, the project achievements were featured in a book called "The Nippon Kayaku Group's Wastewater Treatment Technologies," which is now being used to reinforce our wastewater treatment technology base for the future and pass down these technologies. Looking ahead, we will now deploy the PDCA cycle as part of technical assistance for each plant and environmental preservation activities.

These activities were also recognized with an Outstanding Award at the 2018 Responsible Care Award organized by the Japan Chemical Industry Association.

The Nippon Kayaku Group stands committed to being an eco-friendly company—one that designs eco-friendly products based on an understanding of treating wastewater with advanced wastewater technologies and sound knowledge and one that uses innovations to improve existing processes.



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