

# The Nitric Acid Climate Action Group (NACAG)

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## Paving the Way for the Sustainable Transformation of the Nitric Acid Sector

In an effort to boost climate action and incentivize the realization of low-cost emission reduction potentials, in 2015, the German Government has launched the Nitric Acid Climate Action Group (NACAG). NACAG's objective is to incentivize the installation and operation of effective nitrous oxide (N<sub>2</sub>O) abatement technology in every nitric acid production plant worldwide. In this way, NACAG aims to promote the climate-friendly transformation of the global nitric acid sector.

### Nitrous Oxide (N<sub>2</sub>O) Emissions

Nitrous oxide is a potent greenhouse gas (GHG) and ozone-depleting substance. Its global warming potential (GWP) is 273 times that of carbon dioxide (CO<sub>2</sub>). One of the primary sources of N<sub>2</sub>O emissions is the production of nitric acid and caprolactam. Nitric acid is predominantly used for manufacturing nitrogen-based fertilizers.

Caprolactam is crucial for producing Nylon 6 fibers and resins, essential in textiles, carpets, and industrial fibers. Its resins are used in automotive, electrical, electronic, and packaging sectors, with the automotive industry consuming over a third of the production.

In many cases, the N<sub>2</sub>O emissions are released unabatedly into the atmosphere. However, N<sub>2</sub>O emissions from nitric acid and caprolactam production can be reduced relatively easily and at a low cost compared to other greenhouse gas abatement options. Abatement costs range US\$1-3 t/CO<sub>2</sub> eq per ton of CO<sub>2</sub> eq, depending on the employed abatement technology and plants technical characteristics.



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### NACAG's offer

In 2023, NACAG expanded its scope to include caprolactam facilities due to similarities with nitric acid production and approaches to N<sub>2</sub>O abatement in these two sectors. To encourage the nitric acid and caprolactam sector to phase out its N<sub>2</sub>O emissions, NACAG offers technical, political and financial support to governments, business organizations and companies, considering this mitigation action. NACAG's technical support encompasses advisory services aimed at guiding the installation, operation, and upkeep of appropriate abatement technologies. Additionally, the initiative provides financial assistance for the procurement and installation of N<sub>2</sub>O abatement technology and monitoring equipment. The financial support is granted on the condition that countries commit to secure permanent emission reduction measures in the future and is reserved for ODA countries that have limited resources to procure emission reduction technology.

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## NACAG's technical support

NACAG offers comprehensive technical support at both the governmental and plant levels. The initiative assists governments by providing expert advice on the technical aspects of implementing abatement activities in the nitric acid and caprolactam sectors. This includes guidance on integrating these activities into national policies and climate change plans, Nationally Determined Contributions (NDCs), national emission trading schemes and other national policy instruments. Furthermore, NACAG helps governments establish the necessary national structures to ensure the effective and sustainable continuation of emission reduction measures.

At the plant level, NACAG's technical support encompasses advisory services and direct assistance with the physical implementation of abatement activities. This support includes feasibility and technical evaluations, as well as recommendations for appropriate abatement and monitoring technologies. To ensure that plant operators are equipped to meet future requirements, local personnel receives training on the operation of abatement technology and its associated monitoring and reporting activities.



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Its global approach ensures the creation of level-playing field over time for all stakeholders and thus reduces negative economic impacts and at the same time supports plant operators adapting to changing international market conditions such as implied by a possible carbon border adjustment mechanism.

All interested partners, including governments, plant operators and donors, are welcome to join this global action group and, in doing so, contribute to sustainable climate change mitigation.

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH hosts the Technical Support Unit of the NACAG. This project is funded by the International Climate Initiative (IKI) of the German Federal Ministry of Economy and Climate Protection (BMWK).

Currently, Mexico, Thailand, Georgia, Uzbekistan, Tunisia, Zimbabwe, Argentina, Peru, Jordan and Colombia signed the Statement of Undertaking (SoU) and through this committed to climate-friendly nitric acid production. In total 16 countries have officially joined the Action Group by signing the NACAG Declaration, expressing support to the idea and the goals of the initiative. 10 partner plants have signed a Grant Agreement with NACAG for the procurement and installation of N<sub>2</sub>O emissions abatement technology.



Global overview of nitric acid producing countries  
Number of nitric acid plants worldwide: approx. 500

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