

# Project partners

 Natural Environment Research Council (NERC), UK	 TNO Netherlands Organisation for Applied Scientific Research (TNO), NL
 University of Birmingham (UoB), UK	 Rijksinstituut voor Volksgezondheid en Milieu, Ministerie van Volksgezondheid, Welzijn en Sport (RIVM), NL
 Acondicionamiento Tarrasense (LEITAT), ES	 Eidgenössische Anstalt für Wasserversorgung, Abwasserreinigung und Gewässerschutz (EAWAG), CH
 Institut für Energie- und Umwelttechnik e.V. (IUTA), DE	 Malvern Instruments Limited (MIL), UK
 Swedish University of Agricultural Sciences (SLU), SE	 Perkin Elmer (PE), SE & CAN
 University of Vienna (UNIVIE), AT	 University of Plymouth (UoP), UK
 Wageningen University (WU), NL	 University of Ljubljana (UNI-Lj), SLV
 Oxford University (UOXF.DJ), UK	 VU University Amsterdam (VU-Vumc), NL
 European Virtual Institute For Integrated Risk Management (EU-VRI), DE	 University of Aveiro (UAVR), PT
 HEMPEL, ES	 Stichting Dienst Landbouwkundig Onderzoek (RIKILT), NL
 Promethean Particles (PP), UK	 Universita Ca' Foscari di Venezia (UniVE), IT
 FCC Construcción S.A. (FCCCO), ES	 Pensoft Publishers Ltd (PENSOFT), BG
 AMEPOX (AXME), PL	 SYMLOG France (SYMLOG), FR
 Inotex (ITEX), CZ	 GBP consulting (GBP), UK
 Applied Nanoparticles (AppNano), ES	<b>Non European Collaborative Partners with own funding</b>
 Eidgenössische Materialprüfungs- und Forschungsanstalt (EMPA), CH	 McGill University, Montreal, (McGill), CAN
 Technical University of Liberec (TUL), CZ	 Commonwealth Scientific and Industrial Research Organisation (CSIRO), AUS
 Institut National de l'Environnement Industriel et des Risques (INERIS), FR	 Duke University (DUKE), USA
 Environmental, technical and scientific services (ETSS), CH	 Carnegie Mellon University (CMU), USA
 Gothenburg University (UGOT), SE	 University of Kentucky (UK), USA
	 Montreal University (MU), CAN
	 University of South Australia (UniSA), AUS

Design by PENSOFT



## Consortium

42 partners (incl. 4 Swiss partners and 7 Non European Collaborative Partners), 11 work packages, 17 countries



## Budget

11,3 M€ – EC contribution: 10 M€



## Duration

Sept. 2015 – Aug. 2019



## Website

[www.nanofase.eu](http://www.nanofase.eu)



## Project coordinator

Dr. Claus Svendsen, NERC, Wallingford, UK.  
Email: [nanofase@ceh.ac.uk](mailto:nanofase@ceh.ac.uk)  
Tel: +44 (0)1491 692676



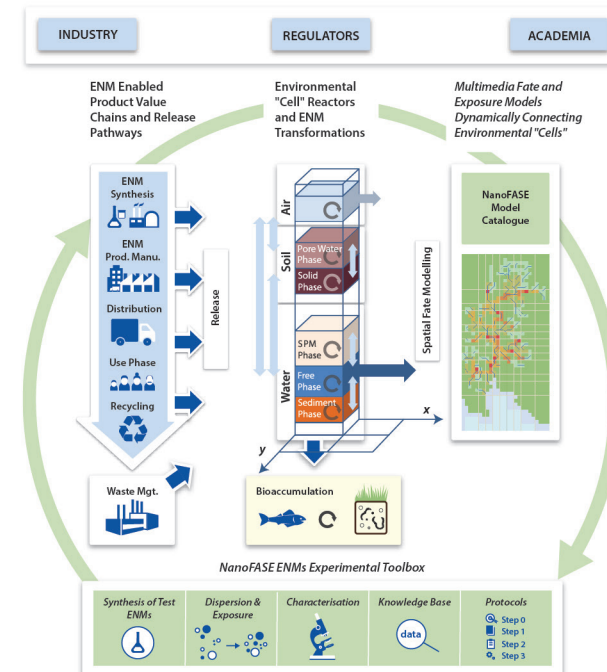
## Research work packages

- WP1 Exposure Assessment Framework for Engineered Nano Materials (ENMs)
- WP2 Multimedia modelling of fate and biouptake
- WP3 ENM supply, characterisation & transformation
- WP4 ENM releases from nano-enabled products
- WP5 Fate of ENM in managed waste facilities
- WP6 Effect of ENM form on environmental fate in air
- WP7 Effect of ENM form on environmental fate in soils
- WP8 Environmental behaviour of ENM in waters and sediments
- WP9 Biota uptake of ENMs

## Stakeholder engagement WP

- WP10 Dissemination and exploitation

# Nanomaterial Fate and Speciation in the Environment



This project receives funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 646002.



## Background

Progress is needed in the prediction of environmental distribution, concentration and form (speciation) of nanomaterials, to allow early assessment of potential environmental and human exposure and risks, to facilitate safe product design and to include these aspects in nano regulation.

NanoFASE is a progression of the FP7 project NanoFATE. It is part of the EU NanoSafety Cluster initiative ([www.nanosafetycluster.eu](http://www.nanosafetycluster.eu)) which works at maximising the synergies between the EU research projects addressing all aspects of nanosafety including toxicology, ecotoxicology, exposure assessment, mechanisms of interaction, risk assessment and standardisation.

## General aim

The overarching objective of NanoFASE is to deliver an integrated **Exposure Assessment Framework** (protocols, models, parameter values, guidance...) that:

- Allows all stakeholders to assess the environmental fate of nano releases from industrial nano-enabled products,
- Is acceptable in regulatory registrations and can be integrated into the EUSES model for REACH assessment,
- Allows industry a cost-effective product-to-market process, and
- Delivers the understanding at all levels to support dialogue with public and consumers.

NanoFASE has developed a set of novel concepts and approaches to underpin the Exposure Assessment Framework and strongly link research, exploitation and dissemination. These are presented online in our Clickable Framework.

## NanoFASE is

- Enabling form-specific release modelling, by development of detailed understanding of i) product-type and product-use based release forms; and ii) release pathways of engineered nanomaterials (ENMs) across ENM-enabled product chains.
- Optimising current, routine clean media methods for ENM characterisation to deliver repeatable and reproducible results in environmentally relevant complex matrices.
- Developing a catalogue of process-informed compartment models, to describe the transformation across time of distributions and populations of ENM forms entering all key waste management or environmental compartments.
- Working closely with research, industry and policy stakeholders to develop a fate and exposure assessment framework comprising validated standard operating procedures (SOPs), product value chain and waste management release modules, parameterised transformation algorithms and multimedia fate/exposure models, along with guidance for stakeholder use.
- Ensuring that the method and model developments have the widest and highest possible impact, by working with relevant communities (ECHA, OECD...) to enable uptake of NanoFASE methods and protocols into standards, into existing exposure prediction tools, and into mainstream chemical assessment tools, policy and regulation (e.g. EUSES & REACH, Industrial Emissions Directive, Waste Framework Directive).

## NanoFASE publications

The NanoFASE project results are published in peer reviewed journals. To access these and other documents visit the **Library** in our project website.

## Main outcomes

- A fit-for-purpose, road-tested and future-proofed Exposure Assessment Framework for ENMs, comprising models, experimental methods, standardised operating procedures and detection/quantification in environmental media.
- A state-of-the-art, flexible and future-proofed model for higher-tier fate assessment: the NanoFASE water-soil-organism (WSO) dynamic multimedia model.
- A fully operationalised version of the existing screening model SimpleBox4Nano, incorporating the latest algorithms and parameterisations of ENM transformation processes developed inside and outside NanoFASE.
- Functional Fate Groups: a novel, practical and future-proofed approach to grouping ENMs for fate assessment purposes.
- Methods, parameter values and model catalogues supporting the derivation of individual process models, describing transformation and transport processes in waste streams, air, soil and water/ sediment and uptake and accumulation in biota.
- A publicly available web-based Clickable Framework where NanoFASE outputs are brought together around a graphical access point. The Clickable Framework will remain live on [www.NanoFASE.eu](http://www.NanoFASE.eu) after the end of the project.

## Open for collaboration

The NanoFASE project and its individual partners welcome collaborations and offer several ways of engaging: research visits, joint workshops on specific science topics, application of the NanoFASE water-soil-organism (WSO) model....

Contact us at [nanofase@ceh.ac.uk](mailto:nanofase@ceh.ac.uk) to discuss