# caLIBRAte
nano risk governance

Compilation of suitable value chain case studies for demonstration of the caLIBRAte Nano Risk Governance Portal

Within caLIBRAte, value-chain case-studies were collected and generated with a twofold purpose: model performance testing and demonstration of the usability of the risk assessment (RA) models included in the caLIBRAte Nano Risk Governance Portal (NRGP).

Value-chain case-studies
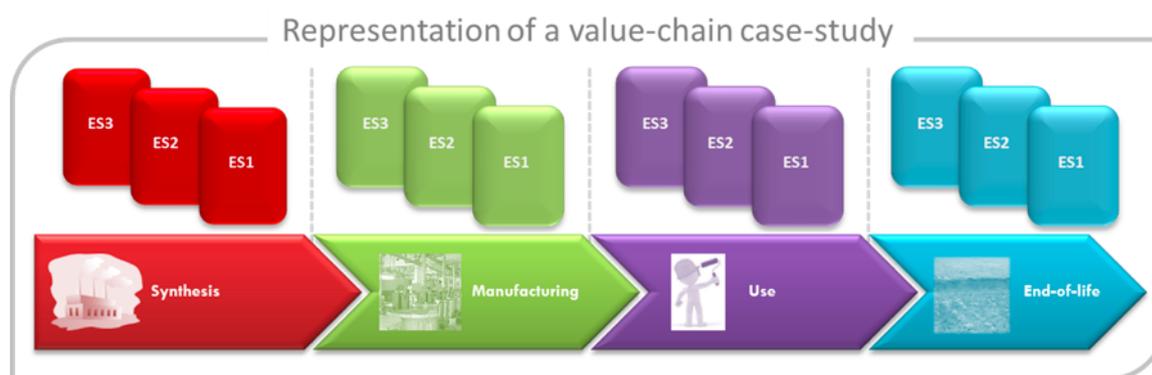
Simplified representation of a comprehensive value-chain case-study, having different relevant exposure scenarios (ES) along the different life cycle stages (LCS) of the nanomaterial/nano-enabled product (NM/NEP)

Value-chain case-studies contain data and contextual information allowing to describe the "story" of a nanomaterial (NM) and/or nano-enabled product (NEP) along its life cycle stages (LCS).

The case studies selected and/or generated for demonstration purposes included both an example of a comprehensive case study, attempting to cover as many critical exposure scenarios (ES) along the LCS as possible, and different examples that represent the type of ES and data set that a final-user of the caLIBRAte NRGP could possess.

The comprehensive case studies will demonstrate in a more extensive way the risk assessment (RA) models of the caLIBRAte NRGP, providing indication and data on how to run the different models according to their applicability to the specific exposure scenario and depending on the quality and quantity of data available.

The other case studies, representing more common ES and data gaps, will supply user-oriented indication. These case studies will provide not only information on models applicability and data needs, but will contain indications to improve the usability of the RA of the models from the final users by i) giving information on how to generate experimentally or find missing data, ii) indicating on how some data/parameter can be calculated and iii) suggesting the application of "good/sound" assumptions.

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Value chain case study provided for the demonstration of the NRGP

Four existing value chain case studies have been selected from the previous gap analysis and quality evaluation performed according to the input parameters requested by the RA models. Experimental efforts were focused on generating three new case studies through the product value chain by selecting scenarios of early stage to late R&D and product launch (NECOMADA and GELCLAD case study), and by generating a comprehensive case study involving a fully implemented industrial application of NMs (B&J case study). This last case study greatly contributed in generating relevant data covering primarily the workplace exposure plus also the release of NM and their related fate in the surrounding environment. The table below shows the data available and generated for the B&J case studies and their applicability to different models of the caLIBRAte NRGP.

B&J value-chain case study with data available in relevant ES along the different LCS of the NM/NEP.

B&J case study - TiO_2 in indoor paints				
LCS	**Synthesis**	**Manufacturing**	**Use**	**End of Life**
ES available	**ES1.1** Grinding TiO_2	**ES1.2** Pouring of TiO_2 powder **ES1.3** Incineration of empty TiO_2 bag **ES1.4** Waste water	**ES1.5** Indoor use of paint	**ES1.6** Landfilling of paint
Applicable RA models				
NanoSafer	• **NM:** size, shape, density, amount, solubility, SSA, dustiness, respirable OEL • **Process/activity:** production/use rate, time and frequency of tasks, emission rate • **Contextual info:** volume working room, air exchange rate, activity lev. in room	**ES1.2** • **NM:** size, shape, density, amount, solubility, SSA, dustiness, respirable OEL • **Process/activity:** production/use rate, time and frequency of tasks, emission rate • **Contextual info:** volume working room, air exchange rate, activity lev. in room	• **NM:** amount, size, shape of NM used in the 3 paint formulation • **Process/activity:** NM released from 3 paint formulation during simulated use condition	• **NM:** amount, size, shape of NM used in the 3 paint formulation • **Process/activity:** NM released from 3 paint formulations during simulated landfill disposal condition
Stoffenmanager nano				
GUIDEnano				
SUNDSS	• **Process/activity:** NM released from synthesis	**ES1.2** • **Process/activity:** NM released from manufacturing		

LEGENDA: Data available, Missing information

Summary

For demonstration purposes, existing and newly generated value chain case studies are provided as standard examples and inspiration for using the RA models included in the caLIBRAte NRGP, giving information on "which data are needed to run a certain RA model/tool" and "which RA models/tools it is possible to use considering the data available from a specific scenario".

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