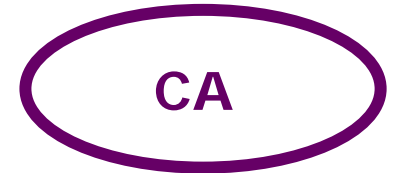


NMP4-CT-2005-013968

IMPART, an overview



**Improving the understanding of the
impact of
nanoparticles on human health and
the environment**

Karl Hoehener
Coordinator
TEMAS AG

Overview

Project objectives

To prevent knowledge of the health and environmental implications of nanoparticles from lagging behind the technological advances

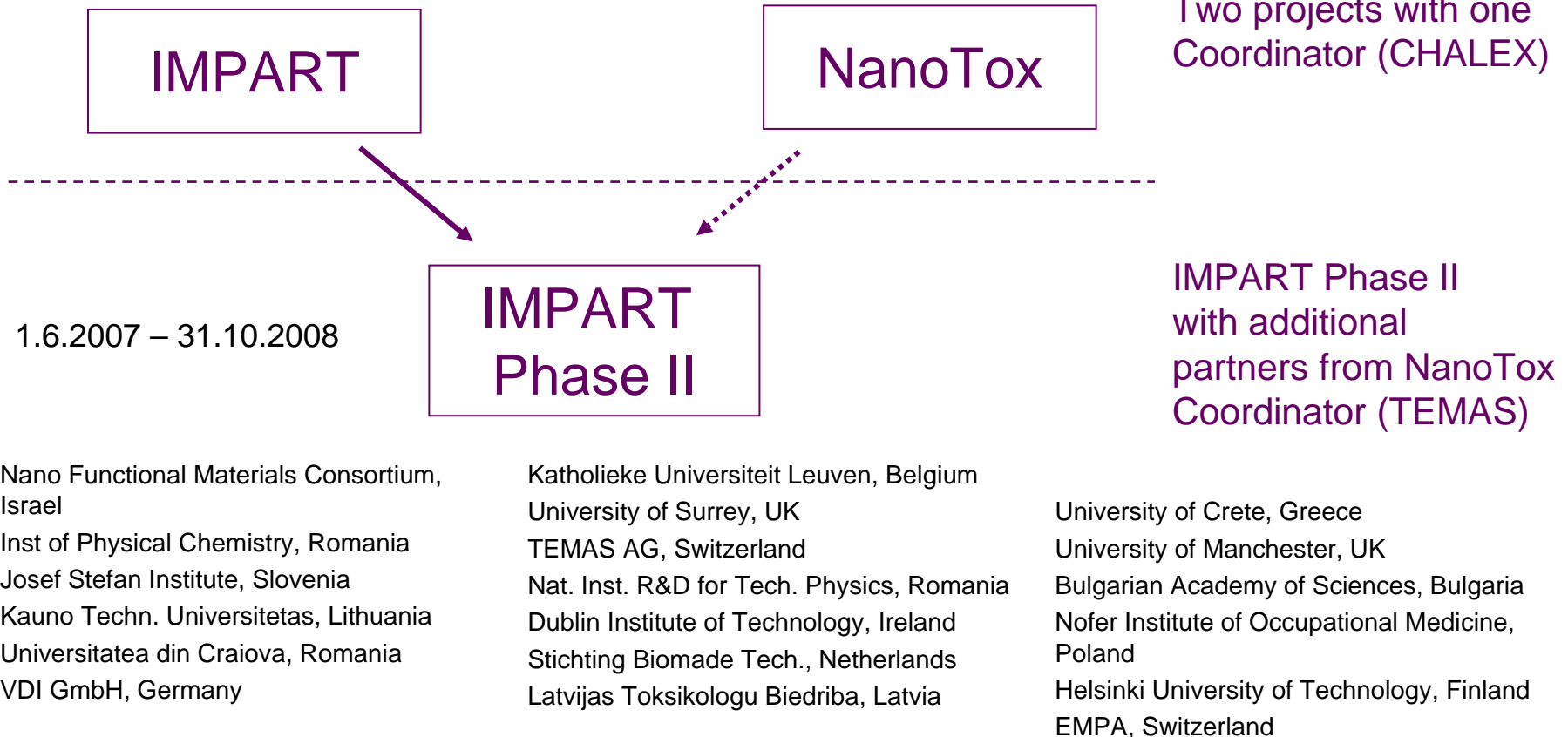
Specific challenges

To foster communication between different initiatives, streamlining resources and facilitating cooperation

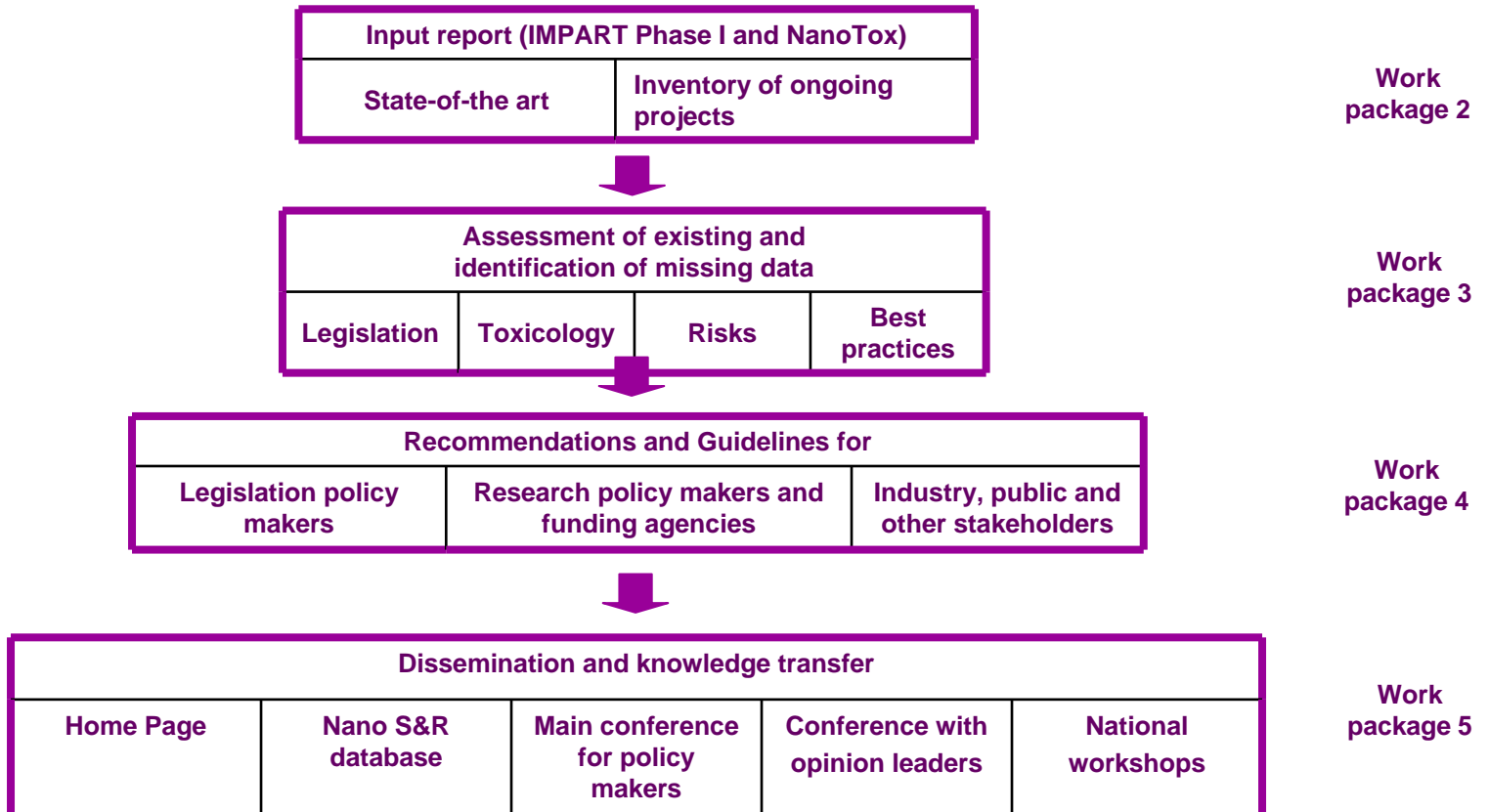
Expected impact

- ➔ Improvements in the understanding of the potential impact of nanoparticles on human health and the environment.
- ➔ Dissemination to, and recommendations for the respective stakeholder groups

IMPART, an unusual project



IMPART Phase II Workflow



Selection of Deliverables

(www.impart-nanotox.org)

Public report “the state-of-the-art” (input-report)
Inventory of all ongoing projects

May 2008

Database with easy access and structured

online

Recommendations for legislation policy makers

October 2008

Recommendations for research policy makers

October 2008

Guidance Booklet on safe handling of
nanoparticles

October 2008

Conferences, European and national work shops

June 2008

December 2008

First overview of identified knowledge gaps

- ◆ Role of impurities (e.g. residual metal catalyst particles in CNTs)
- ◆ Potential long-term toxicity, degradation and metabolism of nanoparticles
- ◆ Influence of different compositional variables on the reactivity and thermodynamic data (e.g. intrinsic defects, foreign atoms, non-stoichiometry in multi-component oxides)
- ◆ High quality data for thermochemistry of nanoparticles
- ◆ Differences between nano and bulk, considering quantum, surface, size, shape effects and agglomeration/deagglomeration
- ◆ Influence of other primary effects apart from oxidative stress (inflammation, lung disease, immune reactions ...)
- ◆ Validated test methods
- ◆ Reference materials

First overview of identified knowledge gaps

- ◆ Entering of nanomaterials into the body via different barriers (air/blood, nose/brain, skin/blood, intestine/blood)
- ◆ Displacement from one compartment to another
- ◆ Dose dependence on reactivity, biokinetics
- ◆ Interaction with cells and organelles, persistence
- ◆ (Bio-)markers for inflammation, oxidative stress, cell proliferation
- ◆ Environmental toxicity
- ◆ Environmental exposure/exposure routes
- ◆ Definition of environmental conditions (as compared to physiological conditions)
- ◆ Reproductive and immunotoxicity, mutagenicity, irritancy of nanomaterials

IMPART Data Base

In order to keep the IMPART data base as a valuable tool
after the end of the project,
we are looking for partners and collaborations!

Interested?

Contact: karl.hoehener@temas.ch

Innovation means seeing
what everybody sees and anticipating
what no one has anticipated



Thank you for your attention!

www.impart-nanotox.org



IMPART



NMP4-CT-2005-013968



Public report “the state-of-the-art” (input-report)

- ◆ Introduction
 1. Materials
 2. Materials to be monitored (Families defined)
- ◆ Health
 3. Are there impurities within the produced nanomaterial that might be responsible for toxicology?
- ◆ Exposure
 4. What is typical for “nano” and is different from bulk or other “Toxicology”.
Does “Nanotoxicology” differ from other/normal “Toxicology”?
- ◆ Environment
- ◆ Legislation

Public report “the state-of-the-art” (input-report)

◆ Introduction

◆ Health

◆ Exposure

◆ Environment

◆ Legislation

5. Is there a difference between “local” and “systemic” toxic effects?
6. How to express dosing: mass dose, surface area dose, ... (a combination of the two former) effect?
7. How good are the present protocols? Have we to apply new Tox-test? Do we need a new strategy?
8. Dissolution / precipitation of material within the biological system (organ specific)?
9. Cellular uptake and accumulation in “organelles” and “organs”?
10. How will we dose the materials for in vivo tests / in vitro tests?
11. What about long term studies at low (more realistic) concentrations?

Public report “the state-of-the-art” (input-report)

- ◆ Introduction
- ◆ Health
- ◆ Exposure
 - 12. Occupational exposure
 - 13. Exposure and detection in biological samples/fluids
- ◆ Environment
- ◆ Legislation

Public report “the state-of-the-art” (input-report)

- ◆ Introduction

- ◆ Health

- ◆ Exposure

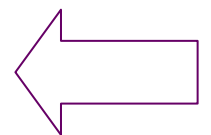
- ◆ Environment

- ◆ Legislation

14. Mobility and translocation of materials within the environment from one compartments to another?
15. Interference and binding of toxic compounds from the environment to nanomaterials?

Public report “the state-of-the-art” (input-report)

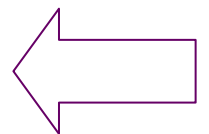
- ◆ Introduction
- ◆ Health
- ◆ Exposure
- ◆ Environment
- ◆ Legislation 16. Law and Regulation



Recommendations for legislation policy makers

Recommendations for research policy makers

- 1 Introduction
- 2 Commented overview of current knowledge
- 3 Assessment of existing data
- 4 Recommendations with regard to policy makers
 - 4.1 Summary of assessment and knowledge gaps detected
 - 4.2 Derived need for actions in the respective field
 - 4.3 Recommendations for immediate and long term measures
 - 4.3.1 Immediate measures
 - 4.3.2 Long term measures
- 5 Summary and outlook



Guidance Booklet on safe handling of nanoparticles

1 Introduction

1.1 Aim of this booklet

1.2 Nanotechnologies: Scope, applications, and risks

1.3 The IMPART project, goals and implementation

1.4 Current state of knowledge

1.5 Lessons learnt

2 Guiding notes for coping with nanotechnological uncertainties

2.1 General remarks and recommendations

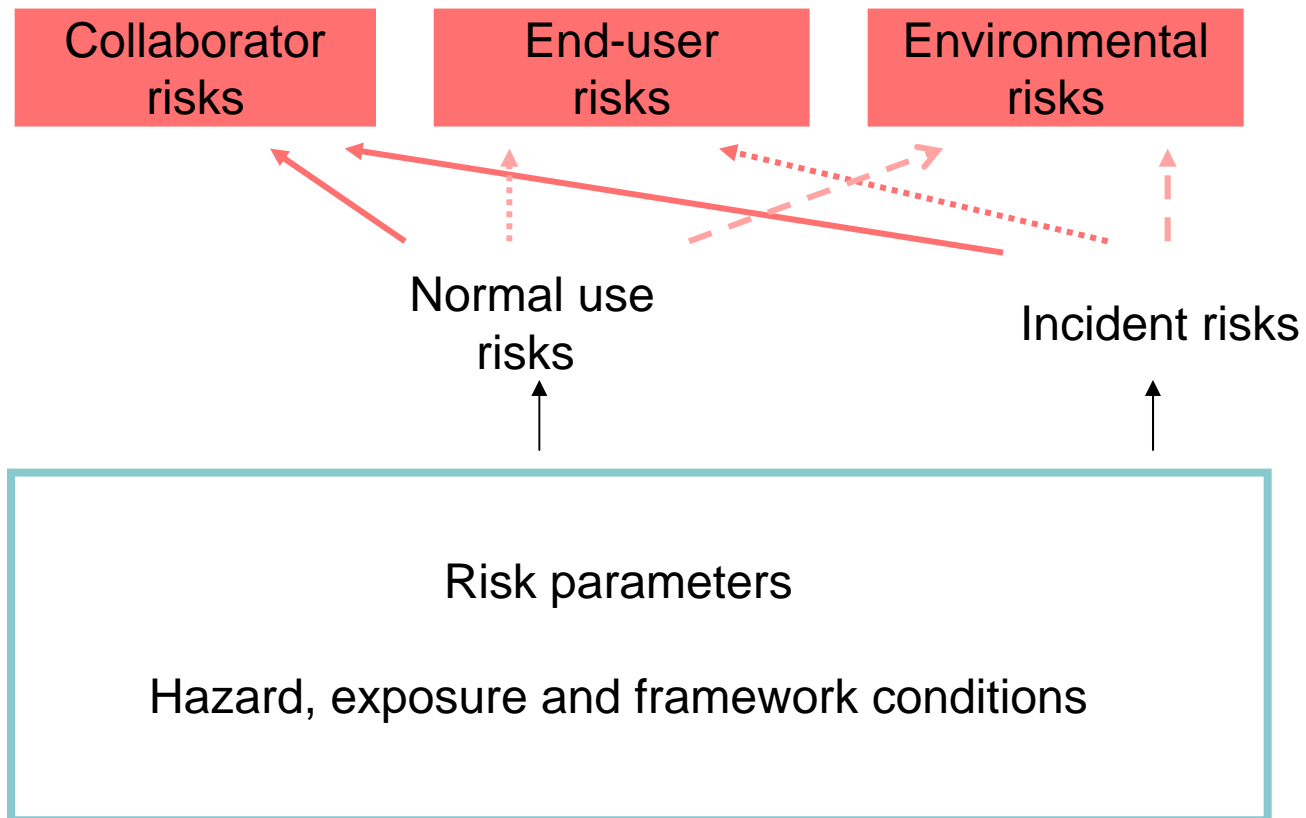
2.2 Safe handling of nanoparticles in different environments

2.3 Fostering research

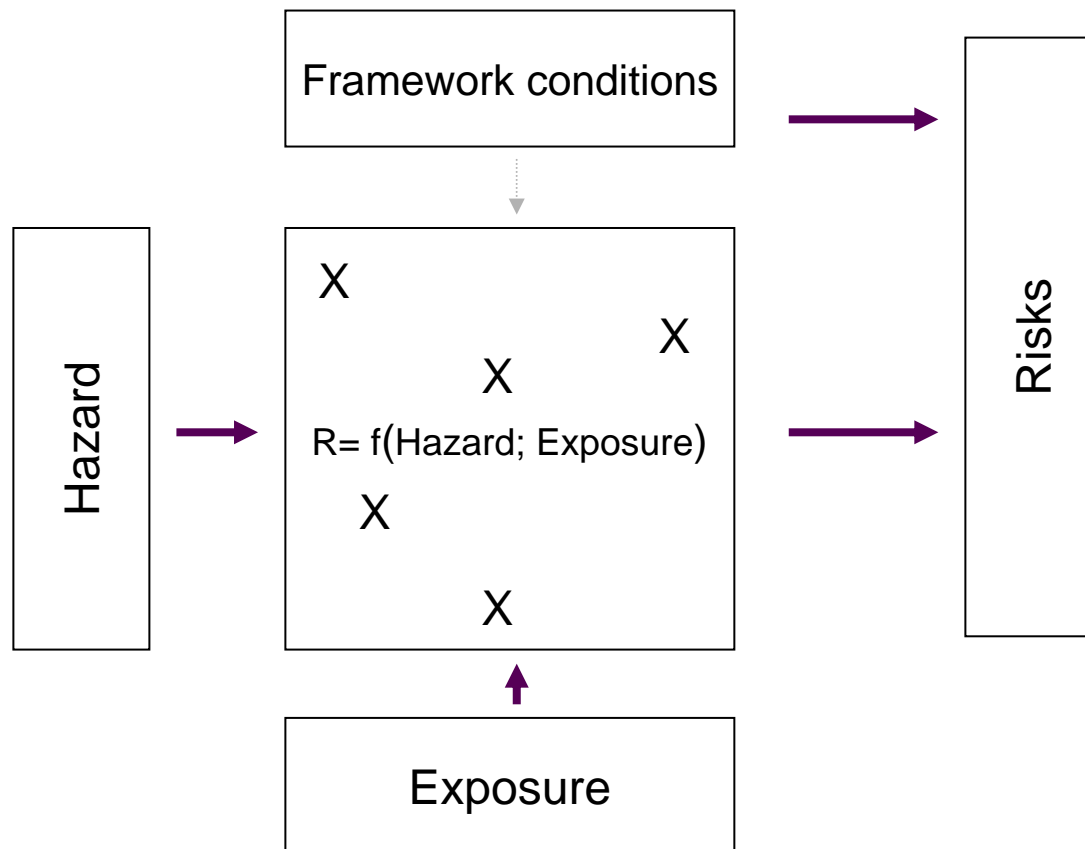
2.4 Communication strategies

3 Summary and outlook

Recommendation, an approach for self declaration



Basic information for the input needed for the self-declaration



Conferences, European and national scale

European scale: The IMPART main conference for
Policy Makers
Brussels, October 16, 2008.

National workshops: NanoEurope 16.-17. September, St. Gallen, CH
NanoSave 3. – 7. November, Leuven, BE
10th workshop on Nanoscience and Nanotechnology
Nov 2008, Sofia, BG
Nanosafety Symposium, 30. May 2008, Portoroz, SLO
"Risk of nanoparticles for health and environment" 16 of
October 2008 in Latvia

If you are organizing a conference 2008 in your country
IMPART is interested to participate

November, 2008 in Dresden, Germany
NanoTox, 11. September, Zurich

