

**Nanosmile website on nanosafety  
Training, Education and Public dialogue issues**

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The nanoparticles are finding new industrial applications every day in fields as various as electronics, biomedicine, pharmaceuticals, cosmetology, chemical catalysis, new materials, and others. We are about to witness the advent of a new era in the industrial history of nanoparticles. New types of nanoparticles that up to now were under laboratory development are on the brink of mass-production. Economists are now speaking about the dawn of a new industry for the 21<sup>st</sup> century that could rank with the automobile and microelectronics industries in terms of turnover.

Nevertheless, this new industry will only be dynamically developed if two critical conditions are met. First, the safety issues have to be settled for the entire life cycle of the nano products: from fabrication to the end of life through usage. Second but not least, nanotechnologies have to be accepted by the public at large.

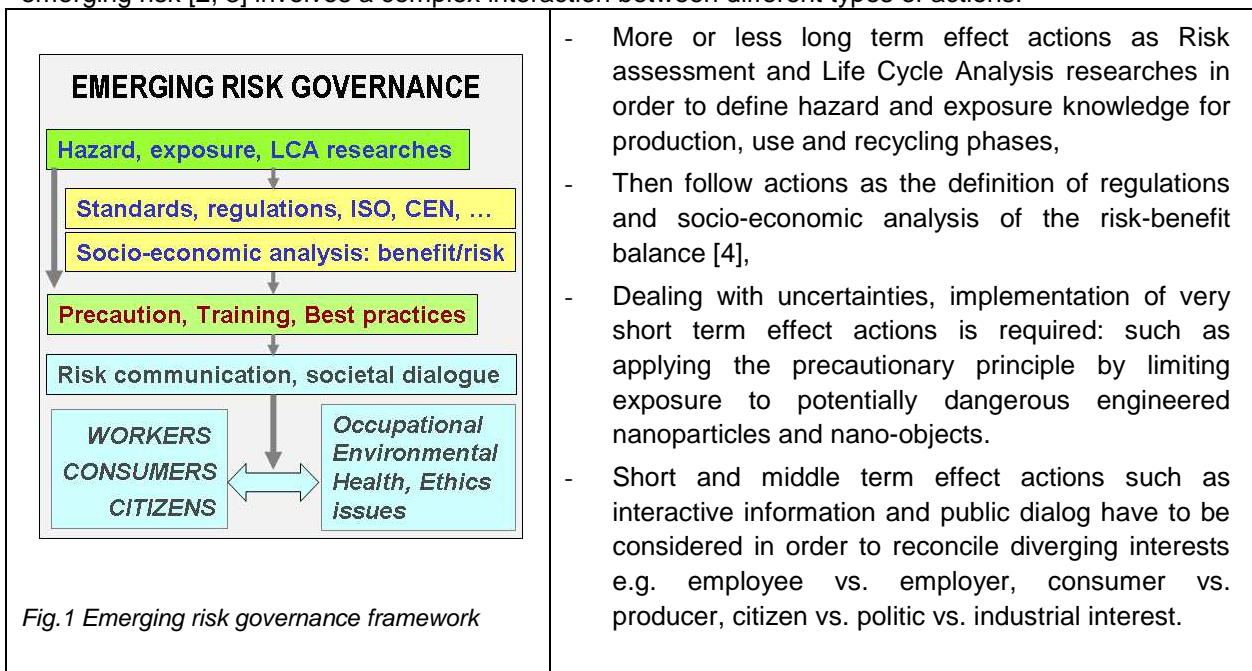
Hence, important work, both scientific and technical has to be performed to reduce so far as we can the risks induced for humans as well as for the environment by the fabrication and use of nanomaterials. This requires on one hand an evaluation of the hazards of nanoparticles (nanotoxicology, thermal behaviour), and on the other hand, techniques that bring exposure under control. In parallel to this technical work, there is a need for accompanying educational and communication actions.

First, in order to maintain the exposure levels in workshops and laboratories As Low As Reasonably Achievable (ALARA), it is of prime importance to educate the future potentially exposed workers and their associated management.

Second, it is necessary to fuel the societal debate, and inform the public at large about the potential risks, but also the potential advantages, of the nanomaterials.

The way that risk issues are addressed has dramatically evolved over the past twenty years. Regarding regulated risks such as emerging risks [1], scientists and engineers nowadays are required to consult the Society before deciding on a risk management strategy.

During years they produced innovations without consulting the Society, whereas today responsible innovation should take the public concern into account. As indicated on Fig. 1, governance of an emerging risk [2, 3] involves a complex interaction between different types of actions:



Consequently, in 2006, in addition to the technical work performed at the CEA in the frame of the European project NanoSafe2, the authors designed an interactive website structured on three levels of knowledge:

- **DISCOVER** for consumers, NGOs and the general public in order to facilitate the nanomaterials potential risks understanding and contribute to public dialogue.
- **EXPLORE** for students, scientists and everyone who wants to know more.
- **KNOW HOW** for scientists and industrials and people who want to check the precaution supposed to be taken.



Fig.2 Nanosmile concept <http://www.nanosmile.org>

*This website, initially implemented as an e-learning support available internally at the CEA, has been gradually opened to the public at large and updated in the frame of EU FP7 iNTeg-Risk, NanEX [5], NanoHOUSE [6] and NanoCode [7].*

This communication will succinctly present:

- The emerging risk governance context
- What can we expect from Risk Communication Science? [7], [8], [9], [10], [11]
- Nanosmile design, implementation, feedback and perspectives
- The methodological and the didactical options chosen to set up the NanoSmile website should finally discussed.

## References

- [1] As defined by EU-OSHA (2005), OECD (2003), ETPIS (2007)
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- [3] FP7 iNTegRisk Project <http://www.integrisk.eu-vri.eu/>
- [4] ECHA Guidance Fact Sheet [http://guidance.echa.europa.eu/index\\_fr.htm](http://guidance.echa.europa.eu/index_fr.htm)
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- [9] Chris.Tourney, Nature Nanotechnology, Vol 4, (March 2009)
- [10] Mateo Bonazzi, European Commission, Communicating nanotechnology, (March 2010)
- [11] David Berube, White paper, communicating risk in the 21st century, NNCO, (Feb 2010)

## Figures

- [1] Emerging risk governance framework
- [2] Nanosmile concept