



Comment on the National Nanotechnology Initiative (NNI) draft Strategic Planⁱ

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The Institute for Agriculture and Trade Policy (IATP), a 501(c)(3) organization, is pleased to submit this comment. IATP participated in the NNI stakeholder workshop in June, including two breakout sessions on Environmental, Health and Safety (EHS) impacts.

The NNI should commit to implementing the Organizations for Economic Cooperation and Development (OECD) “Recommendation of the Council on the Safety Testing and Assessment of Manufactured Nanomaterials”.ⁱⁱ That commitment could be made in paragraph 4.2.3 (page 37). Because the United States helped negotiate the recommendation, it implicitly supports such provisions as “Recommends that [OECD] Members make safety data related to nanomaterials available to the public.” However, the Strategic Plan should make this commitment explicit for all NNI funded or co-funded research, not just because U.S. taxpayers have paid for that research, but because no world-class EHS impact research program can be developed without a commitment to making EHS available to the public for review and criticism. Because the NNI supports the development of nano-specific metrology, including the development of metrics for nano-toxicology, one might assume that such metrology would be in the service of making EHS data on nanomaterials comprehensible to the public. But an explicit commitment to support the OECD nanosafety Recommendation would remove any doubt about making such an assumption. NNI funded public engagement will be more robust and credible if safety data is readily accessible to the public.

The National Research Council assessment of the 2011 Strategic Plan urged NNI-funded agencies to research the effects of Engineered Nanoscale Materials (ENMs) on the gastrointestinal system.ⁱⁱⁱ From what we know of publicly reported research from the Food and Drug Administration (FDA) and the National Institute for Food and Agriculture (NIFA), few NNI investments are directed to gastro-intestinal studies.^{iv} The Strategic Plan should exemplify the “significant progress” claimed (lines 22–23, p. 35) to allay the NRC’s concerns. Given the number of commercialized food-related products claiming to incorporate ENMs (more than 300, according to a 2013 Center for Food Safety inventory), an NNI Signature Initiative or at least a FDA prioritization on gastro-intestinal research is urgently needed.

Although both the National Institute for Standards and Technology (NIST) and NIFA have funded laboratory research on the effects of ENMs on elements of the soil feeding chain,^v funding of field research should be an NNI EHS priority. There is growing scientific consensus that a large fraction of ENMs are entering natural environments, either via landfills or through the application of treated sewage (biosolids) to at least 70 million acres of U.S. agricultural land.^{vi} In view of this fertilization practice, field condition studies of the effects of ENMs on soil health should be a NNI EHS priority. Under the “Product End of Life Cycle” portion of the

Product Life Cycle Considerations illustration (p. 36), there should be a box for “Agricultural fields.”

We appreciate the frankness of the NNI to acknowledge the “few existing evaluation activities” (line 33, p. 37) for diverse stakeholder participation in the review and design of NNI-funded EHS research and outreach. Goal 4 (Support responsible development of nanotechnology) cannot be realized without a budgetary and programmatic expansion of such evaluation activities. IATP recommends that interagency events concerning biosolids and soil health, and concerning gastro-intestinal impacts of ENMs, be proposed in an addendum to the Strategic Plan of possible Goal 4 evaluation activities.

Regarding realization of Goal 4 of the Ethical, Legal and Social Implications objectives (ELSI), budget lines are concentrated largely in the National Science Foundation (NSF). Since the research of NNI-participating agencies has ELSI consequences, the Strategic Plan should recommend that each agency develop a plan to realize Goal 4.3 objectives and budget accordingly for it.

Finally, the Strategic Plan lacks an interagency mechanism for deciding when agency research programs should collaborate and how they may conflict, particularly with regard to Goal 4. The National Nanotechnology Advisory Panel (NNAP) should be requested to develop such a mechanism at the beginning of “Coordination and Assessment” (p. 54).

ⁱ This comment is a slightly expanded version of the one that IATP submitted in mid-December 2013 at the website of the National Nanotechnology Initiative. The maximum comment length allowed was 4,000 characters, including blank spaces. The draft cited in this comment is at http://www.nano.gov/sites/default/files/2014_nni_strategic_plan_-_draft_for_public_comment_locked.pdf To see all comments, go to <http://www.nano.gov/2014strategy>

ⁱⁱ Available at <http://acts.oecd.org>. (2013) 107. September 19, 2013.

ⁱⁱⁱ *A Research Strategy for Environmental Health and Safety Aspects of Engineered Nanomaterials*, National Research Council, January 2012, at 79. Available at http://www.nap.edu/download.php?record_id=13347

^{iv} For an overview of risk assessment of ENMs in food and feed in Europe, see the 2013 report of the European Food Safety Authority at <http://www.efsa.europa.eu/en/supporting/doc/531e.pdf>

^v E.g., research resulting in Christian O. Dimpka et al, “Biomodification and Bioremediation of Ag, Zn, and CuO Nanoparticles with Relevance to Plant Performance in Agriculture,” *Industrial Biotechnology*, December 2012, 8(6): 344-357, at 346. Available at <http://online.liebertpub.com/doi/full/10.1089/ind.2012.0028>

^{vi} E.g., Benjamin P. Colman et al “Low Concentrations of Silver Nanoparticles in Biosolids Cause Adverse Ecosystem Responses under Realistic Field Scenario,” *PLOS ONE*, February 2014, 8:2, e57189 at 4. <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0057189#pone.0057189-Robichaud1>.