Working Party on Nanotechnology

UPDATE ON THE WORKING PARTY ON NANOTECHNOLOGY AND EXTENSION OF THE WPN MANDATE

Istanbul, 21-22 October 2008

Delegates will find attached an update on the activities of the Working Party on Nanotechnology. A more elaborate discussion of the WPN work will be undertaken under item 9 of the draft agenda.

The mandate of the Working Party on Nanotechnology will expire on 31 December 2008. The CSTP is therefore invited to extend the mandate of the WPN for one year, until 31 December 2009, aligning the WPN mandate with that of the other CSTP working parties and the CSTP itself. Considering the need to discuss the CSTP mandate in 2009, the Secretariat suggests leaving the current WPN mandate unchanged at this time.

Delegates are invited to:
- take note of the update on the WPN work;
- extend the mandate of the WPN until 31 December 2009.

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Background

*Nanotechnology*

1. “Nanotechnology is the collective term for a range of technologies, techniques and processes involving the manipulation of matter at the molecular (groups of atoms) level, systems that typically possess at least one physical dimension in the range 1-100 nanometres. Such systems may possess entirely new physical and chemical characteristics, resulting in properties that are neither well described by those of a single molecule of the substance, nor by those of the bulk material”.¹ Some size-dependent phenomena, and related techniques, may lead to radical innovations while others provide new opportunities to sustain the incremental trend toward miniaturization in many industries, *e.g.* electronics (see DSTI/STP(2008)19).

*The Working Party on Nanotechnology*

2. In light of the socio-economic promises of nanotechnology, the R&D investments in the field and major impacts foreseen, the CSTP established the Working Party on Nanotechnology (WPN) at its meeting of 26-27 March 2007, as a mechanism to assist in the development of well-informed, responsible, balanced, coordinated and broad-based policies that take into account environmental, health, safety and ethical considerations. The OECD Working Party on Nanotechnology seeks to offer a global forum for facilitating discussions and analysis of nanotechnology developments. Its mission is to “advise upon emerging policy issues of science, technology and innovation related to the responsible development of nanotechnology, to elaborate and implement a programme of work with the aim of promoting international co-operation that facilitates research, development and responsible commercialization of nanotechnology in member countries and certain non-member countries”.

3. Most OECD countries participate in the work of the WPN, as do a number of CSTP Observers (notably Israel, Russia and South Africa). Involvement of other non-member countries is being actively solicited, in alignment with the CSTP’s Outreach Strategy (see DSTI/STP(2005)18).

4. The current WPN mandate (see Annex) expires on 31 December 2008. For the 2009-2010 work programme of the CSTP, further work is planned on nanotechnology (see DSTI/STP(2008)9/REV1), providing member countries continue to support the work. To permit this work to be undertaken, the CSTP is invited to extend the WPN mandate until 31 December 2009, aligning the WPN mandate with the CSTP’s own mandate. Considering the need to discuss the CSTP mandate in 2009, the Secretariat suggests leaving the WPN mandate unchanged at this time.

¹ This definition is based on ongoing work by the International Standards Organisation (ISO) Technical Committee 229.
Activities of the Working Party

5. Since the first WPN meeting in May 2007, six projects have been subject of WPN work, though with varying start dates and progress to date:

- Indicators and Statistics (A)
- Impacts on Companies and the Business Environment (B)
- International Research Collaboration (C)
- Outreach and Public Engagement (D)
- Policy Dialogue (E)
- Global Challenges: Water (F)

6. The remainder of this section provides an update on these activities and the work still to be completed. In addition, paper DSTI/STP(2008)19 reports preliminary findings on “Fostering a Business Environment for the Responsible Development of Nanotechnology”.

Indicators and Statistics (Project A)

7. This project aims to:

- provide an overview of nanotechnology trends based on available comparable indicators and statistics;
- identify and address policy makers’ needs for additional indicators and statistics; and
- establish a framework for the development and collection of those new indicators and statistics.

8. The first activity involves an overview of market forecasts, research and development, patents and innovation statistics and indicators. This was presented to WPN delegates at their third meeting in April 2008 (see DSTI/STP/NANO(2008)3) and enabled a discussion of policy makers needs.

9. The third activity involves work of a Task Force to develop a framework for nanotechnology indicators and statistics (see DSTI/STP/NANO(2008)2). The Task Force is chaired by Canada (chair) and also involves France, the United States, Russia, BIAC, and ISO. The draft framework was presented to the NESTI meeting in June.

10. For the December 2008 WPN meeting, Project A will have the following outputs: a completed overview of nanotechnology trends (Nanotechnology: an overview); and a revised draft of the framework for comment. The work on the framework is scheduled to continue into 2009.

Impacts on Companies and Business Environments (Project B)

11. This project is examining the impacts of nanotechnology on firms and the broader business environment for nanotechnology to identify possible new challenges for the business community. It complements the WPN work on statistics and indicators.

12. The project consists of:

- Business case studies based on interviews with company representatives. Over 40 case studies have now been completed in 17 countries in sectors including pharmaceuticals and health, electronics, machinery and engineering. An additional 4-6 case studies are being considered.
• Literature review and overview of recent studies (see DSTI/STP/NANO(2008)5 for a preliminary draft).
• Policy questionnaire examining the approaches used in different countries to support the responsible development of nanotechnology.
• Workshops in April and October 2008.

13. The key question for this project, formulated at the April workshop, is: Do the conditions best suited to supporting the responsible development, application, and commercialization of nanotechnology by business differ from those for other areas of economic activity and does this require new policy approaches? If so, how, and what type of new approaches? The April workshop also provided an opportunity for presentations by companies and initial case studies (from Finland, Korea and Canada), which were used to refine the case study process.

14. A workshop in Helsinki on 6th and 7th October 2008 discussed the preliminary findings from the literature review and case studies. Issues being raised by companies include:
• The complexity of R&D related to nanotechnology.
• Difficulties in scaling up laboratory research to prototype and industrial scale.
• Challenges in recruiting human resources with specialized as well as generalist knowledge.
• Concerns about environmental, health and safety issues and public perception.

15. The project is considering policy options to address these issues. The main output for the December 2008 WPN meeting will be a report on this project (Nanotechnology Business: Evidence, Impacts and Policy Implications).

**International Research Collaboration (Project C)**

16. This project is addressing the issue of research collaboration in the field of nanotechnology. In April 2008, the WPN agreed that the first stage would be a gathering of web links from members of the WPN, links to portals, networks and research institutes engaged in facilitating or undertaking research collaborations. A short template was designed to gather information and circulated to delegates in June 2008. Responses were received from 21 countries and the European Commission by September 2008. Discussions are underway regarding the best method for dissemination of this information (e.g. WPN electronic discussion group, WPN homepage). Expected outputs for the December 2008 WPN meeting include a progress report on the project.

**Outreach and Public Engagement (Project D)**

17. This work aims to promote the exchange of experience in outreach and public engagement. Two questionnaires were circulated to delegates in 2008, one for policy makers and the other for practitioners in outreach and public engagement. A workshop was held back-to-back with the April WPN meeting and a second one is scheduled. A one-day conference (30th October, open to external people) and a one-day workshop (31st October, WPN delegates and invited contributors only) will take place in Delft in the Netherlands, organized jointly with the Dutch delegation and with assistance from the UK delegation. A related site visit is scheduled for October 29th. The purpose of the conference is to exchange good practice on outreach and public engagement with ten countries making presentations. The workshop will provide an opportunity for discussion of preliminary results from the analysis of the questionnaires, consolidation of the messages from the workshop and goal setting for the remainder of the project.
18. The expected outputs for the December 2008 WPN meeting are a report on the project to date and an outline for further work (if any).

**Policy Dialogue (Project E)**

19. The project on policy dialogue aims to develop an overall synthesis of the WPN work relying on a policy questionnaire and other material to highlight policy responses and challenges across countries, combined with workshops dedicated to specific policy themes. Twenty four country responses to the policy questionnaire were received. This information is being analysed for trends across countries (see DSTI/STP/NANO(2008)8 for some preliminary findings). A workshop has been proposed but delayed to 2009.

20. Expected outputs for the December 2008 WPN meeting include a report on the project (The Development of Nanotechnology Policies in OECD countries) and a proposal for the workshop.

**Global Challenges: Water (Project F)**

21. This project is focusing on the potential contribution of nanotechnology to the global challenge of clean water and the barriers that will need to be addressed. Both developed and developing countries are experiencing, to varying degrees, water stress and this is projected to escalate if action is not taken to address it. This project looks at how technology may play its part in addressing the issue.

22. A review paper was presented to WPN in April 2008 (DSTI/STP/NANO(2008)9), based on a short literature review and interviews with a small number of experts. The project since then has involved additional work in the areas of:

   - general mapping of the technologies, policies and challenges related to nanotechnology and water;
   - policy aspects of the industrial use and development of nanotechnology for water, including commercialisation, intellectual property and research-industry collaboration;
   - increasing awareness of nanotechnology in the water communities and water in the nanotechnology communities (business, research, society); and
   - the impacts which can be achieved by cooperation between developed and less developed countries on water in the developing world through the harnessing of nanotechnology.

23. In addition to the ongoing review of literature a series of mini-case studies were undertaken through telephone interviews with companies, researchers and other stakeholders. These informed the discussion paper which was prepared by the Secretariat for the one-day Water Workshop at the conference Nanotechnology Northern Europe in Copenhagen on September 25th 2008.

24. The project is being co-ordinated with other OECD activities (OECD Horizontal Water Programme, WPN, WPMN, Environment, Agriculture) and some seed funding for the project was provided by the OECD Secretary General.

25. Expected outputs for the December 2008 WPN meeting is a final report (Nanotechnology and the global challenge of access to clean water – Opportunities, barriers and policy responses). This will be presented for decision as to how the project should progress in 2009. The WPN work on water will also contribute to the OECD Horizontal Water Programme.
Collaboration and outreach

26. The CSTP WPN cooperates with a wide range of partners, within and outside the OECD:

- The OECD Working Party on Manufactured Nanomaterials (WPMN) of the Chemicals Committee (established 2006). The objective of the WPMN is to promote international co-operation in human health and environmental safety related aspects of manufactured nanomaterials, in order to assist in the development of rigorous safety evaluation of nanomaterials.

- Other OECD CSTP groups, specifically NESTI (for the work on statistics and indicators); TIP and WPB (for work on business environments and water); and the Global Science Forum (for its work on international scientific collaboration and public dialogue);

- It is also working with the OECD Environment and Trade and Agriculture Directorates (for the work on water).

- WPN currently cooperates with the International Standards Organisation, notably in work on measurement.

- The Business Advisory Council to the OECD also participates in several projects.

Work programme for 2009-2010

27. The work programme 2009-2010 identifies six reports and four policy roundtables on the responsible development of nanotechnology to be undertaken, as follows:

- Statistical framework for nanotechnology (continuing the work with NESTI to improve the quality of statistics and indicators related to nanotechnology);

- Monitoring and benchmarking report on nanotechnology developments (to help share information on policy developments related to nanotechnology across countries, including the compilation of new indicators);

- Policy report on addressing challenges in the business environment specific to nanotechnology (continuing the work on the business environment for nanotechnology started in 2007-2008 and focusing on policy challenges in the business environment that are specific to nanotechnology);

- Two policy reports on fostering nanotechnology to address global challenges (continuing the focus of the WPN on the contribution that nanotechnology can make to addressing global challenges. Work will continue on water, but will also start addressing other global challenges where nanotechnology can make a contribution, notably energy and climate change);

- Report on fostering international scientific cooperation in nanotechnology (continuing the work in 2007-2008 on international scientific cooperation in nanotechnology); and

- Four policy roundtables and reports on key policy issues related to nanotechnology (e.g. convergence) (to help the WPN to address emerging policy issues on a timely basis).

28. The purpose of the work is to improve understanding of the development of nanotechnology; develop best practices to develop and commercialise nanotechnology in a responsible manner; enhance international co-operation in and co-ordination of policies towards nanotechnology; and develop indicators to track the development of nanotechnology. Parts of the work will feed into the OECD Innovation Strategy (IS, see SG/INNOV(2008)2). The work will primarily feed into the IS work on markets and
governance for innovation, but should also be relevant to the IS work on innovation for global challenges, the IS work on the changing nature of innovation, and the IS work on human capital (as human capital is currently considered an important barrier by nanotechnology firms).

**Funding of the WPN**

29. The CSTP work on nanotechnology has thus far been primarily financed through voluntary contributions from almost 15 countries. Some Part I resources were allocated to the work in 2007 and 2008, which primarily covered management and oversight of the work and some work on statistics (e.g. work on patent statistics).

30. The CSTP did not give a sufficiently high priority to the WPN work to enable the allocation of significant Part 1 resources to the work. Commitments are therefore being sought from member countries to support the work in 2009 and 2010. A number of countries have already indicated their willingness to continue their support for the work in 2009-2010.
Annex: Mandate of the CSTP Working Party on Nanotechnology


Confirmation by the Executive Committee registered in the Summary Record of its 778th session [CE/M(2007)6, Item 52 and CE(2007)5]


1. The Working Party on Nanotechnology is a subsidiary body of the Committee for Scientific and Technological Policy. For the purposes of this document, the term “nanotechnology” encompasses nanoscale science, engineering, and technology. Moreover, it refers to the use of nanotechnology in various applications and sectors. The Working Party has the following terms of reference

2. The Working Party will advise upon emerging policy issues of science, technology and innovation related to the responsible development of nanotechnology. It will elaborate and implement a programme of work, with the aim of promoting international co-operation that facilitates research, development, and responsible commercialisation of nanotechnology in member countries and certain non-member economies.

3. Its work will focus on the following areas:
   - Identifying opportunities and impediments for realising the economic, environmental and social benefits of nanotechnology;
   - Fostering science, research and capacity building in support of advanced nanoscience and nanotechnology research and development;
   - Encouraging an appropriate environment for commercialisation, technology transfer and innovation related to nanotechnology;
   - Fostering approaches to formal and informal education related to nanoscience and nanotechnology;
   - Facilitating the development of internationally comparable statistics and indicators that can track research, development and commercialisation of nanotechnology;
   - Assessing and taking account of public perceptions related to advances in nanotechnology and its convergence with other technologies, taking account of legal, social and ethical issues;
   - Assessing methods for communication with the public related to advances in nanotechnology and its convergence with other technologies;
   - Fostering a collaborative exchange on policy developments related to nanotechnology among member countries and certain non-member economies.

4. The Working Party will advise the CSTP on priorities among the above issues which need to be addressed in the short, medium and long term within the context of the CSTP Programme of Work.
5. In carrying out the work, the Working Party will take a proactive approach in regard to co-operation and will recommend the best means of undertaking the various projects, for example, through a lead country approach or through small task groups or workshops. Where appropriate, the Working Party may also refer issues to other CSTP bodies for their views.

6. The Working Party will report to the Committee for Scientific and Technological Policy (CSTP), and will keep other Committees or their subsidiary bodies informed on the progress of work relating to their interests. It will also seek to work co-operatively with such bodies, notably the Working Party on Manufactured Nanomaterials of the Chemicals Committee, where such work is deemed mutually beneficial and complementary. Working Parties may seek inputs from one another and/or take forward work falling within their respective terms of reference that originate in the other body. The OECD’s Internal Co-ordination Group for Biotechnology will be consulted and informed about the activities of the Working Party, with a view to avoiding duplication and in order to promote synergy and joint activities.

7. The Working Party will co-ordinate its work with that of other relevant intergovernmental organisations (e.g. UNESCO) and standardisation organisations (e.g. ISO), with the aim of avoiding duplication and ensuring complementarity with their activities. It will recognise and take cognisance of the important role and work of non-governmental organisations in this area.

8. When and where appropriate, and having identified appropriate activities, the Working Party shall seek through various forms of outreach activities to make known and extend the influence and impact of OECD work on nanotechnology beyond member countries, and in so far as practicable take this wider context into account in the preparation and execution of its work.

9. The Working Party values openness and transparency in its activities. Accordingly, the participation of stakeholders will be decided by the Working Party, in line with the policy of the CSTP.

10. The Working Party will elect a Chair and Vice-Chairs for a period of one year.

    The terms of reference of the Working Party on Nanotechnology will take effect on 26 March 2007 and will remain in force until 31 December 2008 unless the CSTP decides otherwise.”