

# Japan Nanotechnology Strategy Update 2005 - Part One

*-Summary on Japan 3<sup>rd</sup> S & T Basic Plan and*

*METI Nanotechnology Policy Committee Report*

2005 has been a transitional year for various countries in their S & T Planning. Malaysia is in its last year of 8<sup>th</sup> Malaysia Plan, China is in its last year of the 10<sup>th</sup> Five-Year Plan, Thailand is preparing its 10th National Economic and Social Development Master Plan starting 2007, Australia started its National Nanotechnology Initiative planning and Japan is in its last year of the 2<sup>nd</sup> Science and Technology Basic Plan and launching its 3<sup>rd</sup> S & T Basic Plan starting 2006.

Japanese government released the Key Policy for the 3<sup>rd</sup> Science and Technology Basic Plan April this year emphasizing on 5 main strategies for the next 5 years Science and Technology of the country. The 5 top strategic areas are the following:

1. Human Resource Strategy (including creating diversified and integrated education program, encouraging women in S & T, utilizing the senior's expertise, and importing excellent foreign scientists to Japan and etc.)
2. Fundamental Research Strategy (targeting at diversified and world-class of fundamental research areas and technology seeds, ensure allocation of the competitive funding for fundamental research at universities and strengthening infrastructures)
3. Innovation Strategy (focus on 4 priority areas including Biotech, Environmental Technology, Nanotechnology and Information Technology and their fusion areas to create economic and social values through innovations; ensure the commercialization of the original research results, build regional innovation systems and strengthen industry-government-academic cooperation)
4. Basic Core Technology Strategy (develop national characteristic core nanotechnology to ensure long term and sustainable development in areas of integrated global scale earth observation and monitoring systems, space transport systems; petaflop supercomputer, ultra high-speed protein factory and others)
5. International Strategy (Promoting international activities including establishing attractive research environment, importing foreign excellent human resource, strengthening information dissemination and taking leadership for establishing East Asia Community )

Nanotechnology continues to be one of the national priorities in Japan and stronger emphasis on the support more interdisciplinary and fusion of different areas in science and technology R & D. Both fundamental research and strategic applied R & D are stressed. The Ministry of Economy, Trade and Industry takes the key responsibility for supporting the commercialization of Nanotechnology. METI and its affiliated R & D management organization the New Energy and Industrial Technology Development Organization (NEDO) have conducted a number of surveys the past few years on the analysis Japan nanotechnology industries strength and status of development, market opportunities, road mapping and other related issues. Since the beginning of 2005, METI put together a nanotechnology strategy report based on the recommendation of 3 special

committees (with majority of representatives from industries and METI affiliated R & D organizations). The 3 committees are:

1. Nanotechnology Policy Research Committee consists of members from Japanese industry (including NTT, Hitachi, Fujitsu, Toray, Shimazu, Innovation Engine, Showa Denko), National Laboratory (NIMS, AIST) and Universities (Tokyo Institute of Technology, Kyoto University, Institute of Technologists) chaired by Dr Teruo Kishi (President of NIMS) and co-chaired Dr Michiharu Nakamura (Executive VP of Hitachi)
2. Basic Policy Working Group consists of members from Japanese industries (including Olympus, Mitsubishi Corporation, NEC, Osaka Gas, Fujikura, Cluster Technology, Optware), government organization and National labs (NEDO, Chuobu Economic Association, AIST) and university (University of Tokyo, Toyama University), chaired by Dr Hiroshi Yokoyama (Director of Nanotechnology Research Institute of AIST)
3. Societal Impact Working Group consists of members from Japanese industries (including Toto, Japan Cosmetics Industry Association, Central Research Institute of Electric Power Industry, Frontier Carbon, Hosokawa Micron ), government organization and National labs (AIST, Chemicals Evaluation Research Institute) and university (Tokyo University of Science), chaired by Dr Junko Nakanishi (Director of Chemicals Risk Management Research Center of AIST).

The Nanotechnology Policy Research Committee, Nanotech Basic Policy Working Group and the Nanotech Societal Impact Working Group had held 3 monthly meetings during Jan.-March 2005 separately and formulated the following National Nanotechnology Strategy paper summarized as the following:

#### Grand Challenges

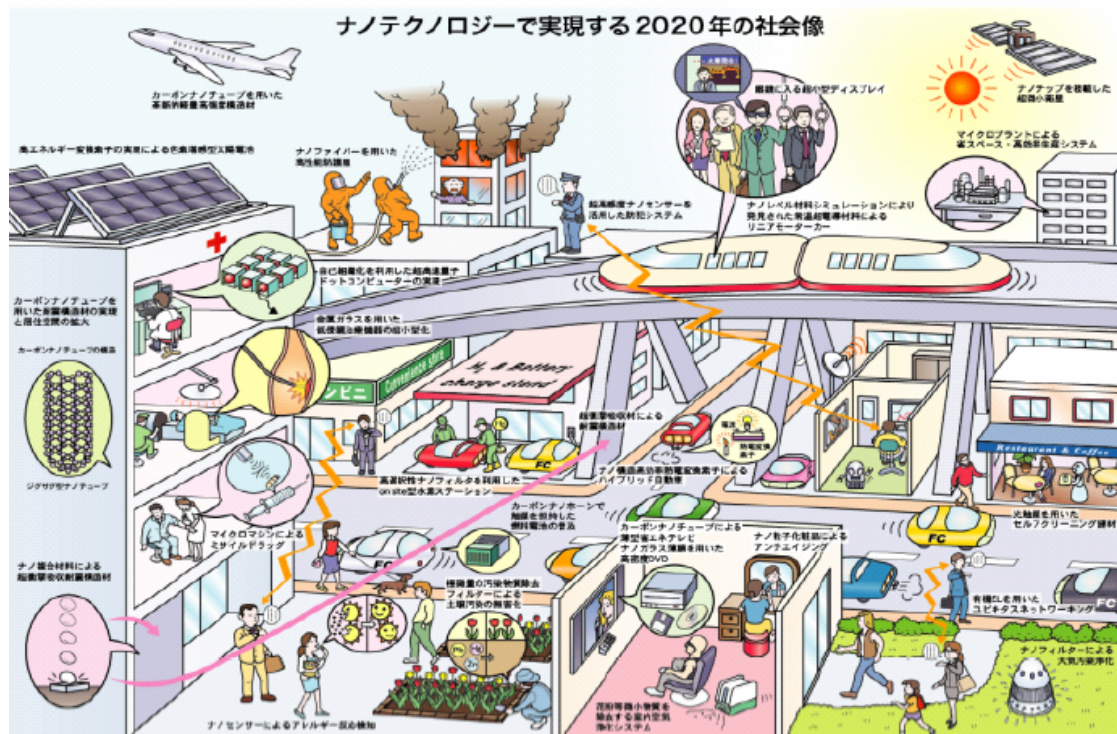
1. From Atomic and Molecular Level, Nanotechnology Enriches Quality of Life (through ultra light and ultra strong miniaturized, wearable, high sensitivity and high precision devices such as card size portable TV Phone and wearable ultra small medical devices.
2. Nanotechnology can create a safe and secure society –high sensitivity, high selectivity, and miniaturized testing and monitoring system (nano sensors, nano filters), high strength, and ultra light structure materials (nano fiber and nanocomposites for sports clothing, uniforms for fireman, aerospace materials, building materials etc), nano satellites and micro chips for trace-ability systems managing/monitoring goods flow and water boundaries.
3. Nanotechnology Sustainable Development in the Society through optimizing/reducing energy consumption (high memory capacity, low power products including high density storage devices using nanostructures with photon and spin properties, CNT FED, nano solar cells, nano photo catalyst, and nano rare metal catalyst.

4. From the Atomic and Molecular Level Optimized Manufacturing - micro-reactor for environmental monitoring, self-assembly and self-organized production, micro-processing technology including nano-imprint and nano-lithography for mass precision manufacturing.

To achieve the above mentioned grand challenges, seven strategies are outlined:

1. Strengthening Solution/Open Resource Management
2. Establishing environment for Societal Impact and standardization issues (ensuring safety and others)
3. Market Creation RoadMapping
4. Coordination in Creating Projects for solving social problems.
5. Building Systems/Mechanism for facilitating Transition from Basic Technology to commercial application.
6. Technology/Human Resource Spin-off Strategy
7. Matching the University Research and Industry & Society Needs

For details of content of the report, please contact us.



Japanese Expectation of the Nanotechnology Society in 2020

Source:

1. METI report on Nanotechnology Policy Committee Report –Recipe for Realizing Value Creation Using Nanotechnology (4 National Goals and 7 Strategic Measures) 31<sup>st</sup> of March 2005
2. Key Policy in the 3<sup>rd</sup> Science and Technology Basic Plan April 8<sup>th</sup> 2005

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