

Social Consensus and Regulatory Issues in applying Nanoproducts in Korea

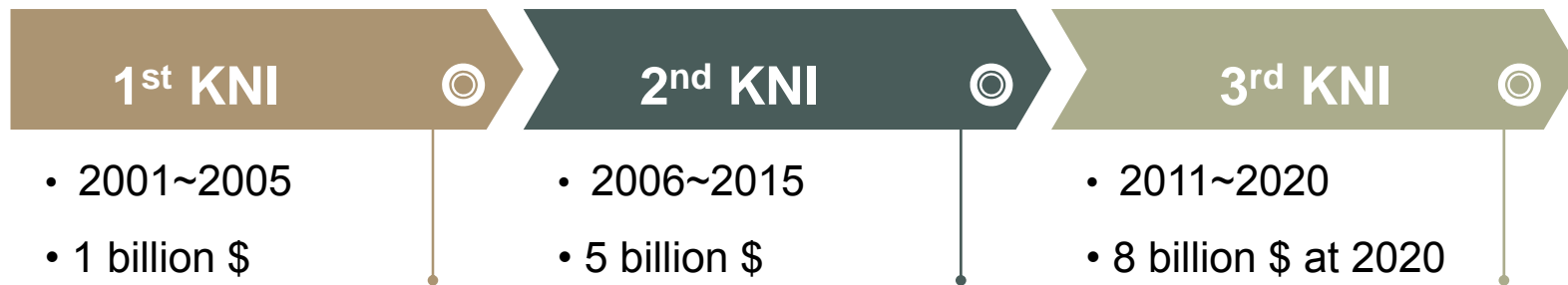
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Nanotechnology Strategy in Korea

❖ Korea Nanotechnology Initiative



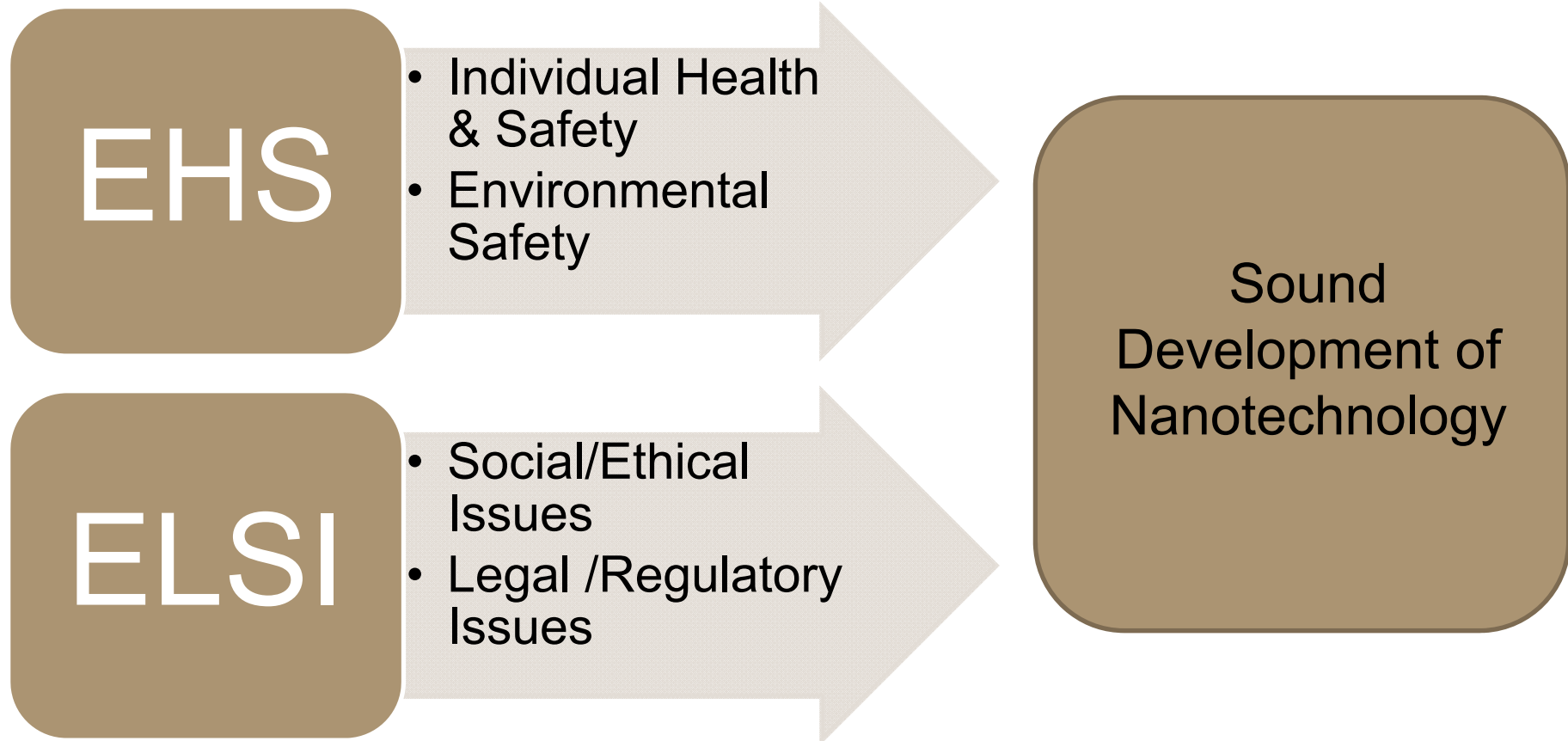
• Goal of KNI

- Secure technology competitiveness to join global leading class NT nations, based on effective R&D program, well-constructed infrastructures, and competent manpower
- Develop NT-related new technologies and products

• EHS & ELSI activities

- From 2nd KNI, emphasize on societal and ethical responsibilities of NT
- Increase the budget of EHS researches and activities from 3% in 2009 to 8% in 2020

EHS/ELSI for NT



NanoEHS Activities in Korea : Regulation

- 2002. “Nanotechnology Development Promotion Act”
 - to contribute to the innovation of scientific technology and the development of the national economy by pursuing systematic support and development of nanotechnology by laying down the foundation for research of nanotechnology
- 2005. RFID Privacy Protection Guideline (by Ministry of Information and Communications)
 - to protect the privacy of individuals potentially affected by an RFID system and promote a safe environment for RFID use.
- 2007. Guideline for safety evaluation of medical devices using nano-material (by KFDA)
- 2009. Guidance to safe handling of manufactured nano-materials in workplace/laboratory (by Korean Agency for Technology and Standards)

NanoEHS Activities in Korea : Regulation

- 2011. General Safety Plan for the Promotion of Nano-Fusion (by Ministry of Knowledge Economy)
 - To establish the Safety Standard for Nanoproducs
 - To establish the Safety Evaluation and Management System
 - To establish the International Safety Accreditation System for Nanoproducs
- 2011. Guideline for safe management of nanoproducs(Korean Standard)(by Ministry of Knowledge Economy)
 - to protect the privacy of individuals potentially affected by an RFID system and promote a safe environment for RFID use.
- 2011. Guideline for labeling cosmetics including nanomaterials (by KFDA)
- 2012. Guideline for safety evaluation of foods including nanomaterials
- 2013. Act for Registration and Evaluation of Chemicals is stipulated(enacted from 2015) (by Ministry of Environment)

NanoEHS Activities in Korea : Research

- 2005 & 2006. Nanotechnology Assessment (by KISTEP)
- 2008. A study of establishing the standard of nanomaterials to secure safe handling and societal implication (by Center for Nanostructured Materials Technology)
- 2009. Fundamental study for establishment of safety evaluation center of manufactured nanomaterials (by KFDA)
- 2010. Development of nano-materials safety and characterization Techniques (by KRISS)
- 2010. Evaluation technology for environmental exposure and effects of nanomaterials (by Ministry of Environment)
- 2011. Study for risk assessment strategy and technical development for the future preparation according to new risk such as exposure of nanomaterials (by KFDA)
- 2013. Improvement of management system for the safety of chemicals (by Ministry of Environment)

Overview of EHS Regulation in Korea

5 strategy	Stage 1 (2011-2013)	Stage 2 (2014-2017)	Stage 3 (2018-2020)
1. Laying fundamentals for the Management	<ul style="list-style-type: none"> ● establishing nanomaterials inventory(Ministry of Environment) 	<ul style="list-style-type: none"> ● registration of nanomaterials and nanoproducts ● safety standard for maximum exposure 	<ul style="list-style-type: none"> ● tracking management of nanomaterials and nanoproducts ● blocking of market entrance of harmful products
2. Developing safety evaluation standard	<ul style="list-style-type: none"> ● establishing database of nanomaterials ● standardization of analysis and evaluation procedure for nanotoxicity 	<ul style="list-style-type: none"> ● Material Safety Database System(MSDS) ● standardization of analysis and evaluation procedure for nanotoxicity 	
3. Setting up of accreditation system	<ul style="list-style-type: none"> ● conceptualization of “nano-safe workplace” ● Setting up Safety Center for Nanoproducts 	<ul style="list-style-type: none"> ● introducing factory accreditation system ● running SCNP 	<ul style="list-style-type: none"> ● technical standard of permissible exposure level ● safety accreditation of nanoproducts
4. Market promotion and product accreditation	<ul style="list-style-type: none"> ● Quality Certification Mark for nanoproducts 	<ul style="list-style-type: none"> ● preferential system for quality certified nanoproducts in public sector 	<ul style="list-style-type: none"> ● supporting market surveillance activity
5. Improving regulatory system	<ul style="list-style-type: none"> ● stipulating 「Guideline for Safe Management of Nanoproducts」 ● amendment of 「NDPA」 	<ul style="list-style-type: none"> ● expanding Korean Standard into International Standard 	<ul style="list-style-type: none"> ● amendment of 「Act of Quality Management of Industrial Products」

NanoELSI Activities in Korea : Research

- 2007. Early development of policy and public understanding of nanotechnology in Korea (by Lee EK)
- 2009. A survey of international research trends on ELSI issues in nanotechnology (by Lee)
- 2010. A study on the Ethical, Legal, and Social Implications of Nanotechnology (by Kwon)
- 2010. Ethical issues in nanomaterials technology and relevant policy recommendations (by Lee et. al)
- 2011~ Nanobiotechnology and nanomedicine responsible for human and society: interdisciplinary approach to the “risk“ (by Kwon)

Attitudes of Koreans to NT(2011 survey by Kwon)

- 91% male and 88% female citizens know the word “nanotechnology” and 25% male and 13% female could explain what it is.
- 53% male and 68% female concern the uncertain risk of NT.
- 60% male and 46% female agree with the advancement of technology in spite of the uncertain risk.
- 48% male and 31% female think that the science should develop although it bring about irreversible harmful effect on human health or the environment.(20% male and 36% female think it should stop!)
- 48% male and 61% female think that the precautionary principle should be applied to NT.
- Besides the safety, the injustice(nanodivide) and privacy infringement are considered as possible risk relevant to NT

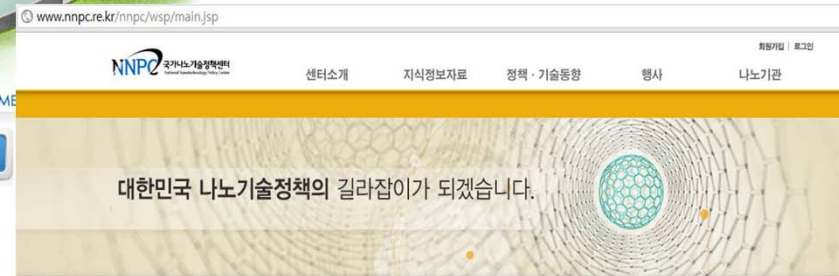
NanoELSI Activities in Korea : Public Engagement & Activities

- 2010. Planning Cell for “The sustainable development of nanotechnology” (by Korea U. in 5th STS academy)
 - For 4 days, 40 people and 6 experts participated
 - Lecture, small group discussion & debating, role playing and writing final report
- 2010. An experience of Korean consumer’s monitoring on nanoproducts (by Kim)
 - For 1 month, 22 housewives, monitoring 167 nanoproducts
 - Lecture orientation, compiling monitoring sheet, meeting and discussion
- Several surveys about public perception toward nanotechnology
 - Perception highly and positive attitude toward NT, less concerns for potential risk except potential harm to health or environment

Projects in Korea



nanofriends
Inform public about
EHS and ELSI issues,
including NT



NNPC
Introduce international and
domestic research trends
and policies about NT

행사

2012년 3월

일	월	화	수	목	금	토
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4	5	6	7	8	9	10
11	12	13	14	15	16	17
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25	26	27	28	29	30	31

- From theory to practice - development, training and enabling nanosafety and health research
- BioNanoMed 2012

나노윤리

주간포커스 2011.12.19 [나노위클리]

- 교육과학기술부, 2011 프론티어 연구성과 대전 개최

공지사항 2011.10.11

- 나노기술 연구 안전 지침 수립을 위한 공개토론회(안)

대학원

- 한국기초과학지원연구원

연구분야 : 나노소재, 나노공정 측정 장비

대학원

- [프랑스] Grenoble에 세계적인 연구단지 조성을 위한 GIANT 프로젝트 승인...

대학원

- 프랑스 고등교육연구부 장관 Laurent Wauquiez는 지난 10월5일 CEAR에 의해 운영되는 마이크로, 나노기술 분야 European center of excel...

2012.03.01 (정확동향)

대학원

- 나노포토닉스 연구실

Projects in Korea



NANO KOREA

NT festival in South Korea for commercialization and technology transfer.

Composed two parts; exhibition and symposium



Touch to Science on Friday
Lectures for the public, from elementary school students to adults
Focused on science and technology
Some of them dealt with NT

Projects in Korea



<http://www.sciencetimes.co.kr/article.do?atidx=0000055491>

NanoTruck

Circulate 17 schools located in provinces with high-tech equipment truck.

Offer a chance to the students for experience and lecture about NT



http://www.nnpc.re.kr/nnpc/wsp/trend/trendView.jsp?status=policy&tr_seqno=6141

STS Academy

Panel for the sustainable development of NT for 4 days.

Consumer's monitoring on NT products

22 housewives monitored 167 nanoproducts for daily life
After the monitoring, they recommended the government and nano companies to ensure the safety and to provide enough information about the products

NanoELSI Activities in Korea : Feature

❖ Budget

- Compared that of R&D or industrialization, the budget of ELSI researches and activities has taken too trivial portion.
 - 0.1~0.2% of entire NT related budget (by Kwon, 2010)

❖ Concerns

- Compared those for EHS, concerns for ELSI have been too weak.
 - Focused on safety (especially toxicity of NT material) and promotion to the public
 - Overlooked achieving social consensus and deliberating social or ethical changes raised from NT
 - Not exist a integrated system for researches or activities

NanoELSI Activities in Korea : Context

1. Immaturity of Deliberative Democracy

- ❖ Transit too rapidly made from traditional to democratic society
- ❖ Conflicts of values, customs, and social roles, ..and so on
- Government
 - Traditional elitism and Paternalism not allowing participation of public
 - Authoritative and military regime for several decades: 1st priority has been given to economic growth, then EHS and ELSI is the last one
- Citizen
 - Very limited participation in expressing opinion on politics and election, not ethics and science related issues
 - Poor interest/ understanding on basic science and ethics : Perceived as areas those are managed/should be managed by limited expert/professors etc. »

NanoELSI Activities in Korea : Context

2. Insufficient understanding by Science Societies

- ❖ Challenged and expected as means for material well-being and visible output only
- Lack of consideration on good society
 - With the decline of Neo-Confucianism since industrialization, no meaningful consideration has been given to the societal health ; No criteria exist for judgment on ethics regarding science at the moment
- Too much emphasis on the short-term and visible output for materialistic well-being
 - To cope with the expectation and challenge on the visible output in limited time, ethics has not been placed as priority for research (e.g. Scandal of Dr Hwang) . »

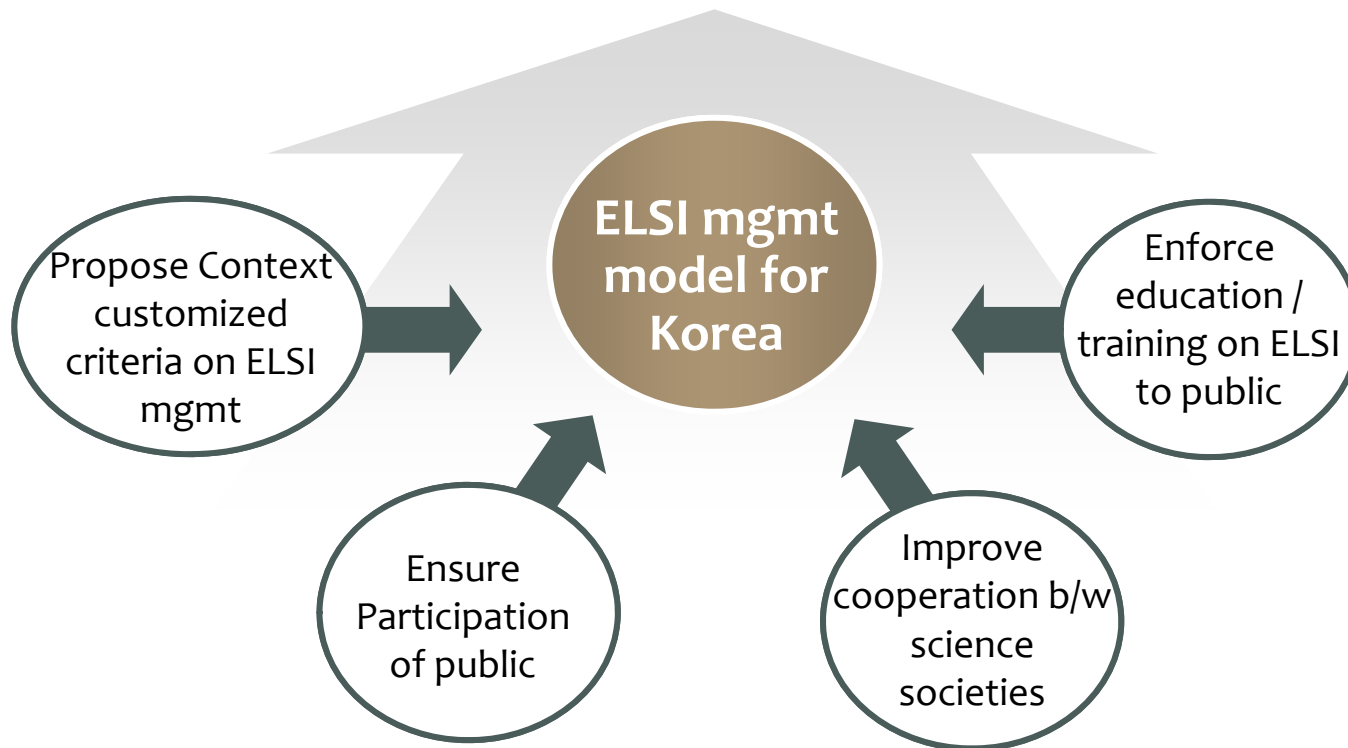
NanoELSI Activities in Korea : Context

3. Lack of Multidisciplinary Approach

- ❖ Two Culture: Chinese Wall between the social science/ humanities and natural sciences, even in social science and humanities
- Lack of partnership and cooperation
 - Coupled with the issues on project ownership, fair evaluation on contribution and financing etc, no proper practice for communication and coordination in place as well as lack of trust and respect on other academic fields.
- Poor understanding of ELSI
 - Even in the societies on Nanotechnology, EHS is more emphasized; little participation of expert from humanities and social sciences

Future Perspectives...

New methodology for ELSI management on non-industrialized countries



Thank You!