National Institute of Advanced Industrial Science and Technology
AIST

AEA 2008: Evaluation Policy and Evaluation Practice
Nov. 7, 2008 @Denver, Colorado

Effectiveness of Evaluation from the Perspective of Outcomes on Research Units and Research-supportive and Administrative Departments in AIST

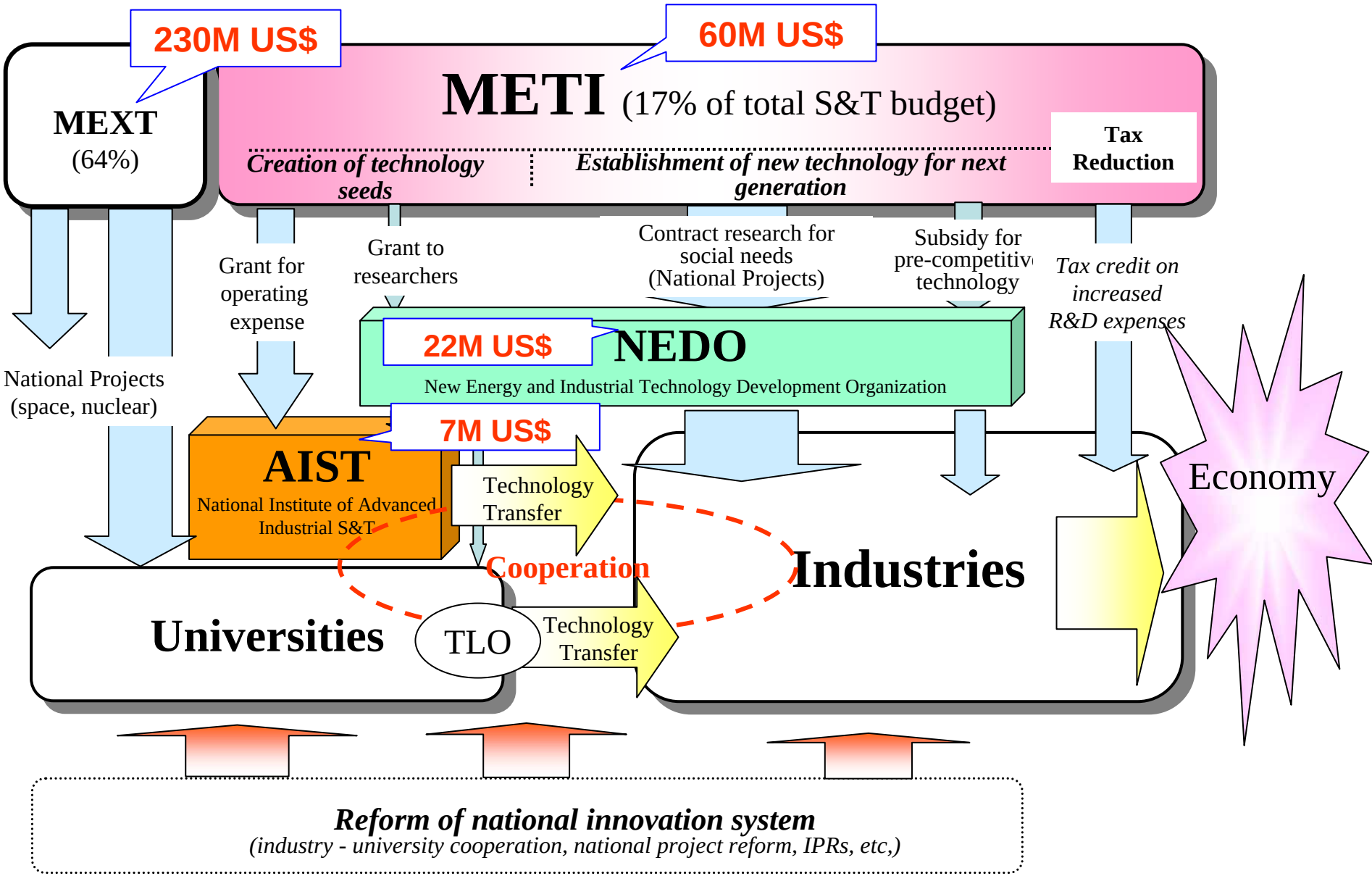
Chair: Osamu Nakamura
Presenters: Osamu Nakamura & Tomoko Mano
Discussant: Katsuhisa Kudo

National Institute of Advanced Industrial Science and Technology
AIST

Abstract

With the introduction of an evaluation system from the perspective of outcomes, research units in AIST have come to have a clear scenario of research and development toward outcomes by showing roadmaps with clear goals, milestones and benchmarks.
The leaders of research units have good communication with members to discuss their strategies to induce innovations. The evaluation system has been encouraging research units to have strategic management in their research activities.
On the other hand, the evaluation of research-supportive and administrative departments has been leading a variety of advancement of their services with promoting changes in the consciousness of members. They have been challenging to have long-term approaches in order to collaborate with other departments to support the activities of research units for innovation.
In this session, some good examples of research units and research-supportive and administrative departments through the evaluation system in AIST will be introduced.

AIST's Role in S&T Administration



Strategy Structure of AIST

Basic principles: Social development through enhancing industrial technologies

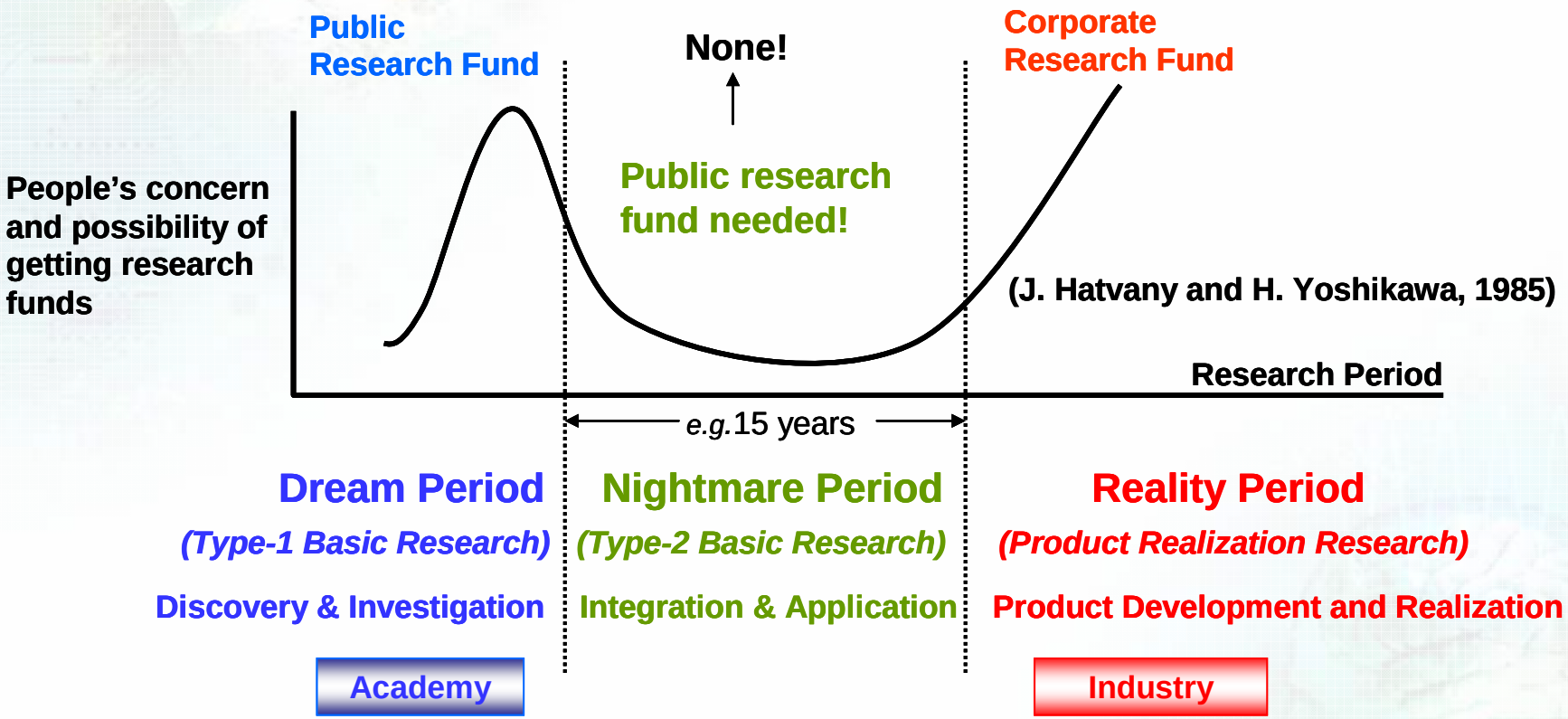
Missions:
- Contribution to a sustainable society
- Contribution to industrial competitiveness
- Contribution to local industrial development
- Contribution to Industrial technology policies

Future visions*

＊Future visions：
1. High quality life with good health and longevity
2. Intelligent, safe, and secure life supported by advanced information services
3. High industrial competitiveness and reduction of environmental load realized by new materials, parts, and manufacturing technology
4. Wealthy and comfortable life by overcoming environment and energy issues
5. Advanced industrial infrastructure developed by novel measurement technologies and evaluation systems
6. Construction of intellectual infrastructure through understanding of the earth
7. Dissemination of physical and chemical metrological standards

“Full Research” at AIST

Carrying on Type-1 and 2 research **concurrently and coherently**



AIST new schemes for innovation promotion

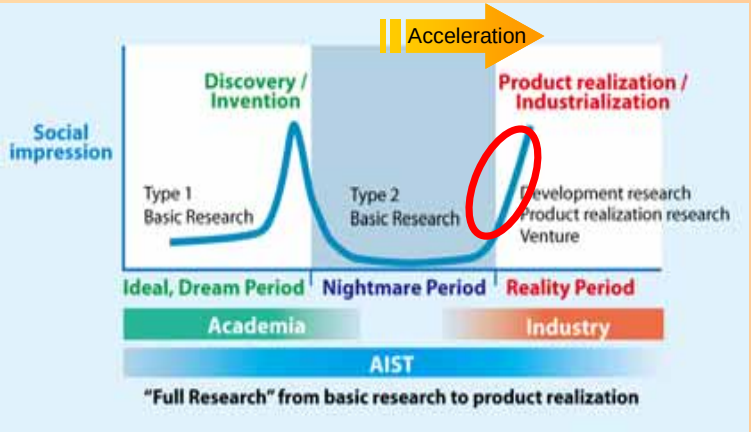
Focused points for innovation promotion

(1) Creation of innovation current in the society towards achieving sustainable society

(2) Integrated publicity of “full research” products

(3) Grasp on the needs of society

(4) Strategic allocation of research resources for practicing “full research"



Innovation promotion is thrusted by the leadership of AIST management board.

Strengthening organizational structure

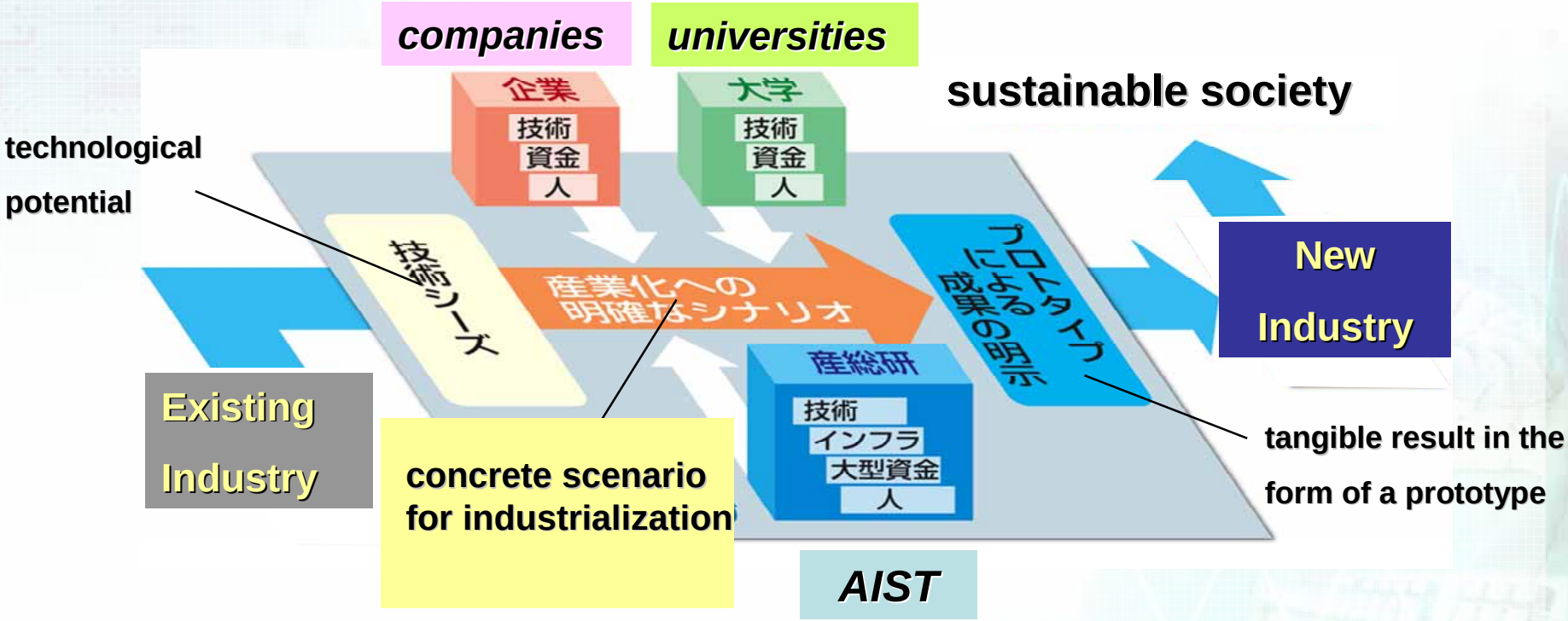
(1) Appointment of three vice-presidents in charge of innovation promotion (“Innovation promotion core” in the AIST management board)

(2) Appointment of “Innovation Architect"

(3) Establishment of "Research and Innovation Promotion Office"

Industrial Transformation Research Initiative

- Providing a new mechanism for collaboration among industry, academia and government
- Sharing a concrete scenario for new industries
- Developing a prototype with an enhanced budget for a limited term (2 or 3 years)

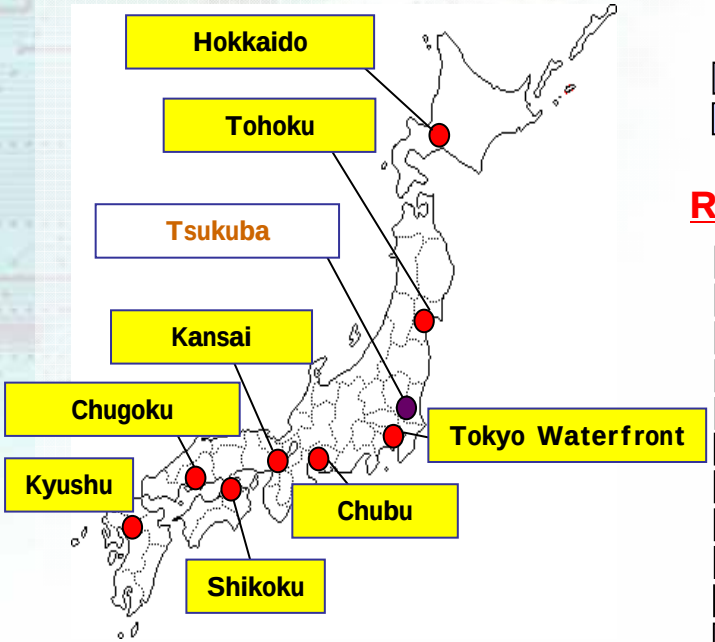


National Institute of Advanced Industrial Science and Technology
AIST

Organization of AIST

October 2008

Research Bases



Research Units

- Research Centers (23)
- Research Institutes (22)
- Research Initiatives (5)
- Research Core / Center for Intellectual Infrastructure

President

Senior Vice-President
Vice-President

- Compliance HQs
- *Evaluation Dept*

Research Promotion

- AIST Fellow
- Innovation Architect
- Res Coordinator
- Res & Innov. Promotion Office
- Chief Inf. Officer
- EAI2 Project Res & Dev Office
- Tsukuba Adv Comp Center (TACC)
- Intl Patent Organism Depositary
- AIST Innov Center for Start-ups
- Center for Service Research
- Geo-information Center
- Metrology Management Center

The Management for System Support

- Planning HQs
- General Administration HQs
- Safety & Environ Protection Dept
- Superintendent
- Public Relations Dept
- Gender Equality Office
- Collaboration Promotion Dept
- Intellectual Property Dept
- International Affairs Dept
- General Administration Dept
- Human Resources Dept
- Financial Affairs Dept
- Research Facilities Dept

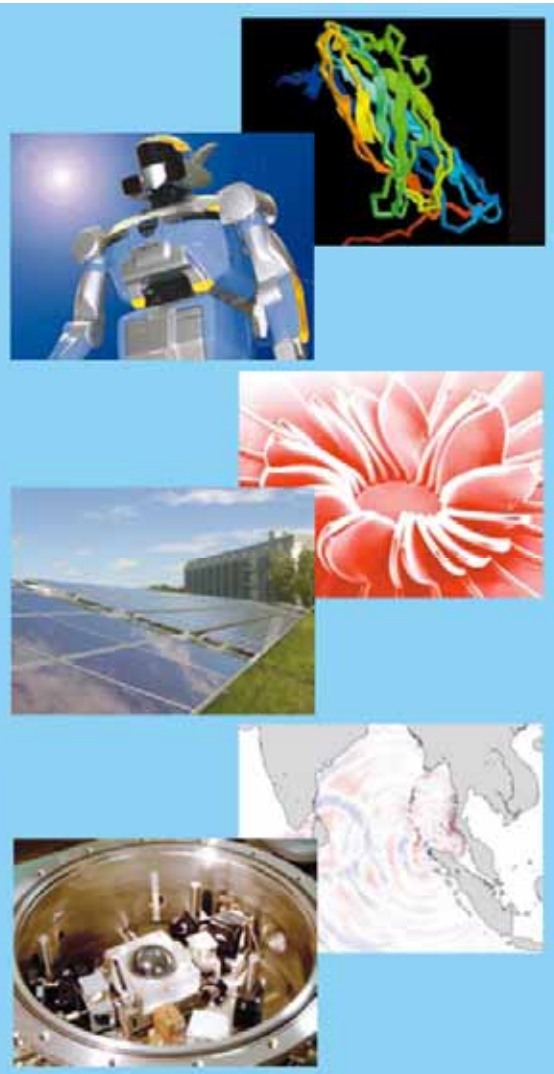
- Auditor
- AIST Advisory Board
- Honorary Fellow
- Emeritus Advisor
- Emeritus Councilor

Researchers: 2,408
Administrative Staffs: 695
Total Employees: 3,103
April 2008

National Institute of Advanced Industrial Science and Technology
AIST

Research Fields in AIST

Future visions	Research fields
(1) High quality life with good health and longevity	Life Science and Technology
(2) Intelligent, safe, and secure life supported by advanced information services	Information Technology
(3) High industrial competitiveness and reduction of environmental load realized by new materials, parts, and manufacturing technology	Nanotechnology, Materials, and Manufacturing
(4) Wealthy and comfortable life by overcoming environment and energy issues	Environment and Energy
(5) Advanced industrial infrastructure developed by novel measurement technologies and evaluation systems	Geological Survey and Applied Geoscience
(6) Construction of intellectual infrastructure through understanding of the earth	Metrology and Measurement Technology
(7) Dissemination of physical and chemical metrological standards	



National Institute of Advanced Industrial Science and Technology
AIST

AEA 2008: Evaluation Policy and Evaluation Practice
Nov. 7, 2008 @Denver, Colorado

Effects of Evaluation from the Perspective of Outcomes on Research Units in AIST

Osamu Nakamura*, Shinichi Ito, Kunio Matsuzaki, Hironori Adachi, Tetsuo Kado, and Syuichi Oka

National Institute of Advanced Industrial Science and Technology
AIST

Strategy Structure of AIST

Basic principles: Social development through enhancing industrial technologies

Missions:
- Contribution to a sustainable society
- Contribution to industrial competitiveness
- Contribution to local industrial development
- Contribution to Industrial technology policies

Future visions*

Strategy of Research Fields

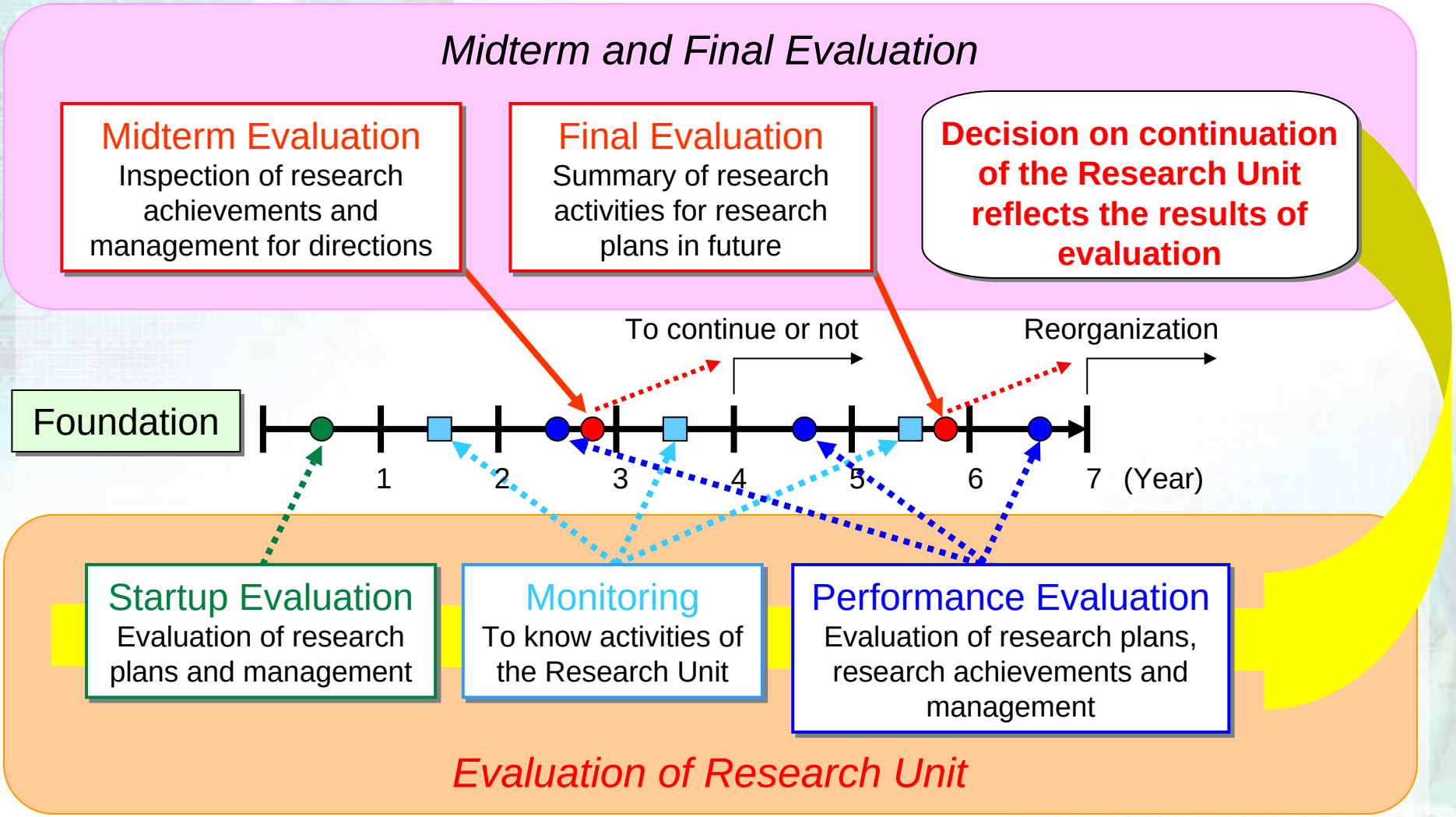
Strategy of Research Units

Research Subjects

Evaluation of Research Units

＊Future visions：
1. High quality life with good health and longevity
2. Intelligent, safe, and secure life supported by advanced information services
3. High industrial competitiveness and reduction of environmental load realized by new materials, parts, and manufacturing technology
4. Wealthy and comfortable life by overcoming environment and energy issues
5. Advanced industrial infrastructure developed by novel measurement technologies and evaluation systems
6. Construction of intellectual infrastructure through understanding of the earth
7. Dissemination of physical and chemical metrological standards

Evaluation of Research Units



Evaluation of Research Units

- Purposes of evaluation
  1) Activation and efficient management of Research Units
  2) Reference to the top management of AIST
  3) Accountability to the Japanese Nation

- Viewpoint of evaluation

1st Mid-Term (FY2001-2004)

Evaluation based on Outputs and global level of research

→

2nd Mid-Term (FY2005-2009)

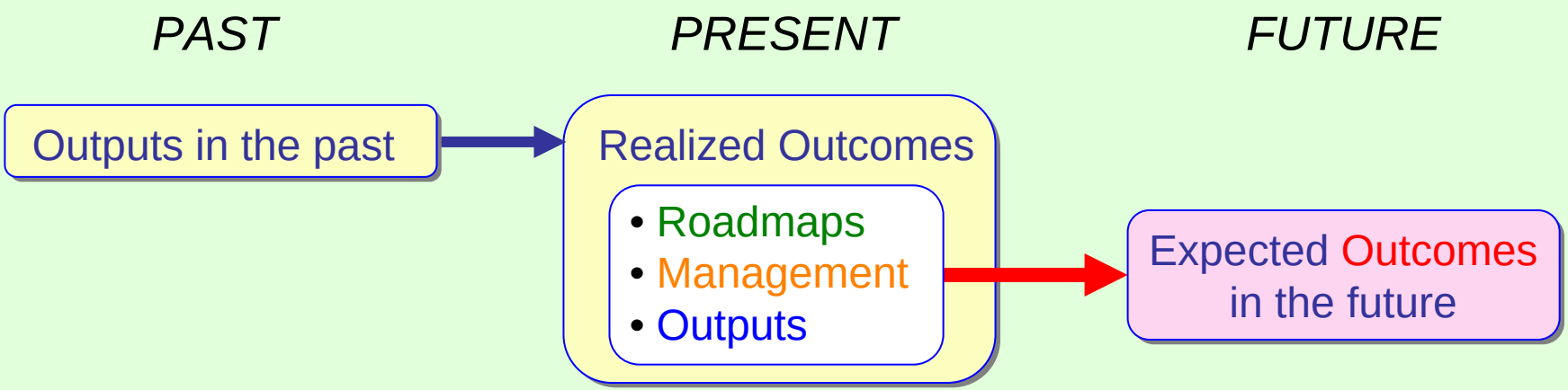
Evaluation from the viewpoint of Outcome

Evaluation System in AIST

From the Perspective of Outcomes

☆ Subjects of evaluation

- Evaluation of Roadmaps toward Outcomes
- Evaluation of Outputs toward Outcomes
- Evaluation of Management toward Outcomes



National Institute of Advanced Industrial Science and Technology AIST

Evaluation Indexes

- Evaluation of Roadmaps

  Outcomes, milestones, technical elements, benchmarks

- Evaluation of Outputs

  Papers, patents, standards, academic activities, press releases, prizes, prototypical products, *etc.*

- Evaluation of Management

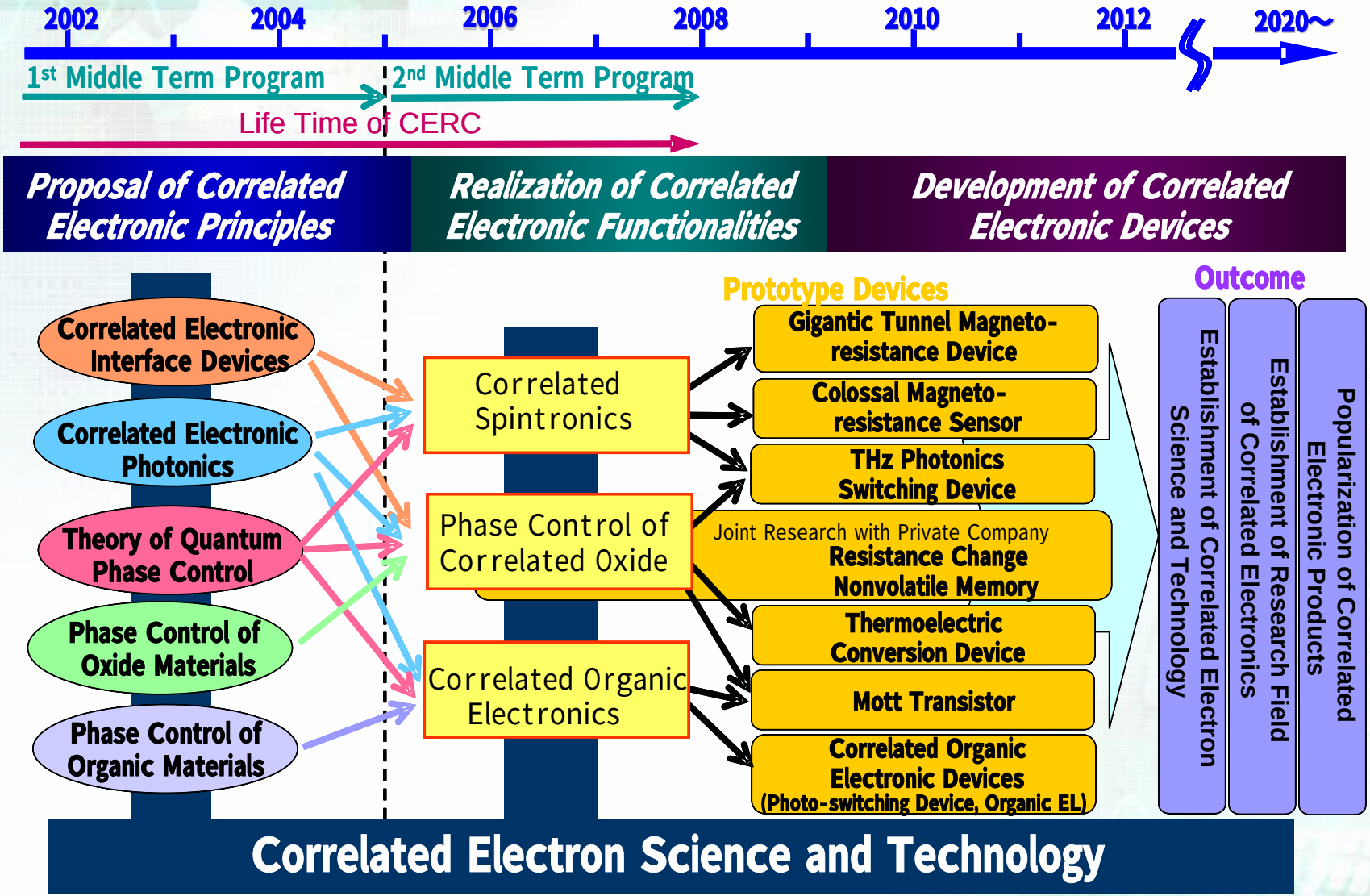
  1) Research strategy

  "Full Research", innovations, human resource development

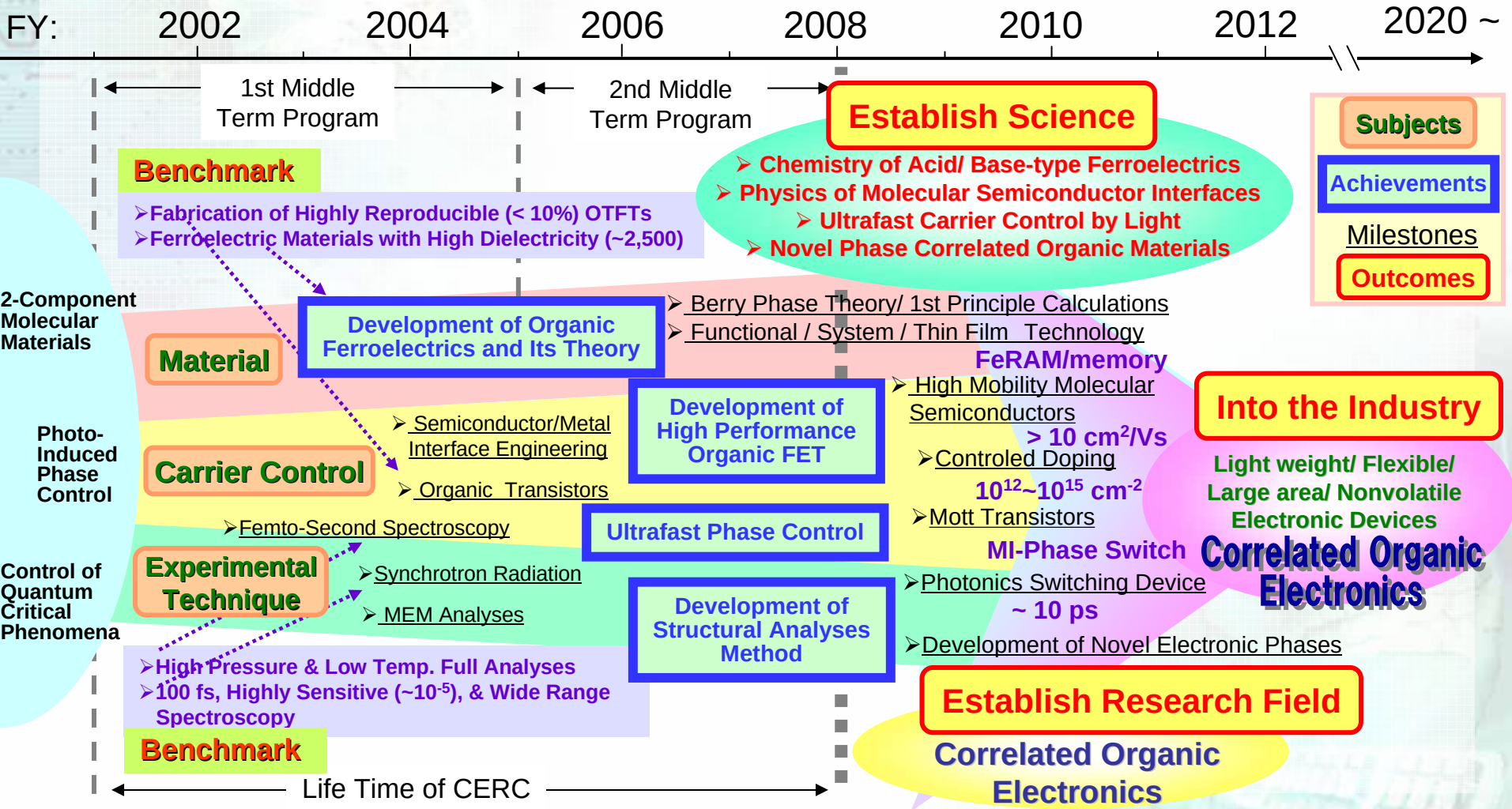
  2) Other management

  Overall management, budget management, risk management

Correlated Electron Research Center: Overall Roadmap

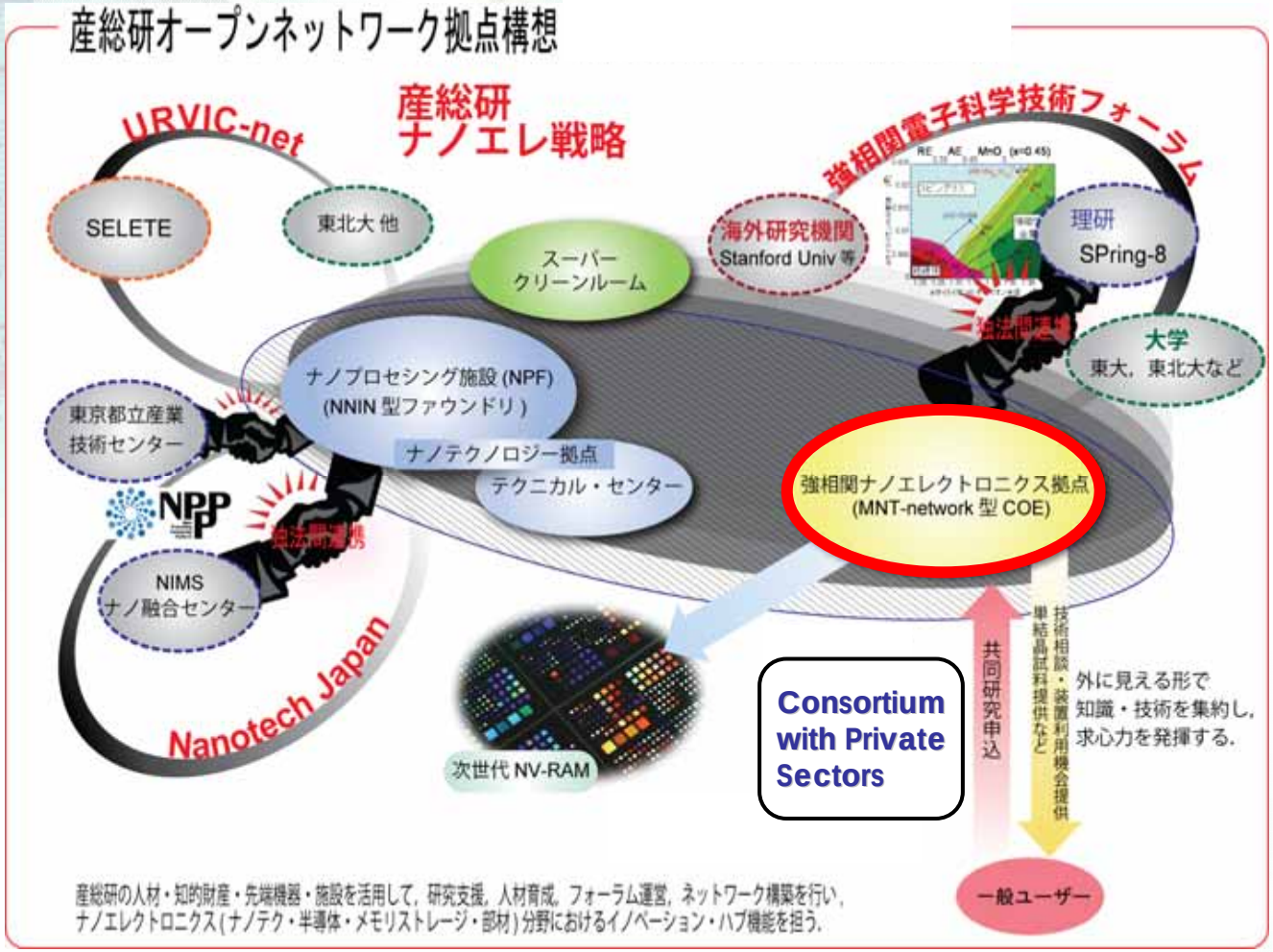


Roadmap for Correlated Organic Electronics



Platform formation of Nano-electronics strategy

Concept of AIST Open Network Platform



URVIC-net: University, Research Institute, Venture company, Industry Consortium Network

NPPP: Nano Processing Partnership Platform

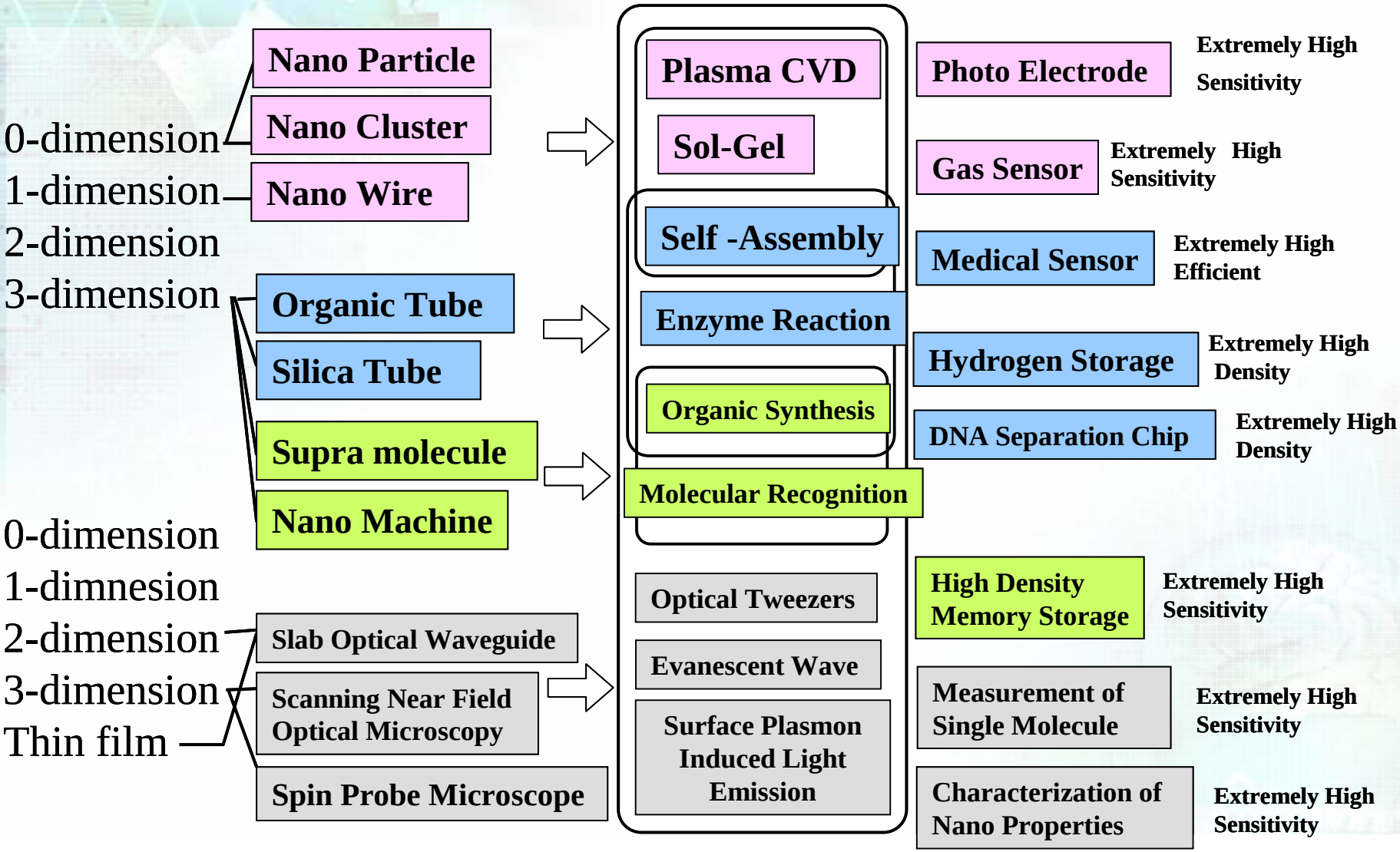
SELETE: Semiconductor Leading Edge Technology

NV-RAM: Non-volatile-Random Access Memory

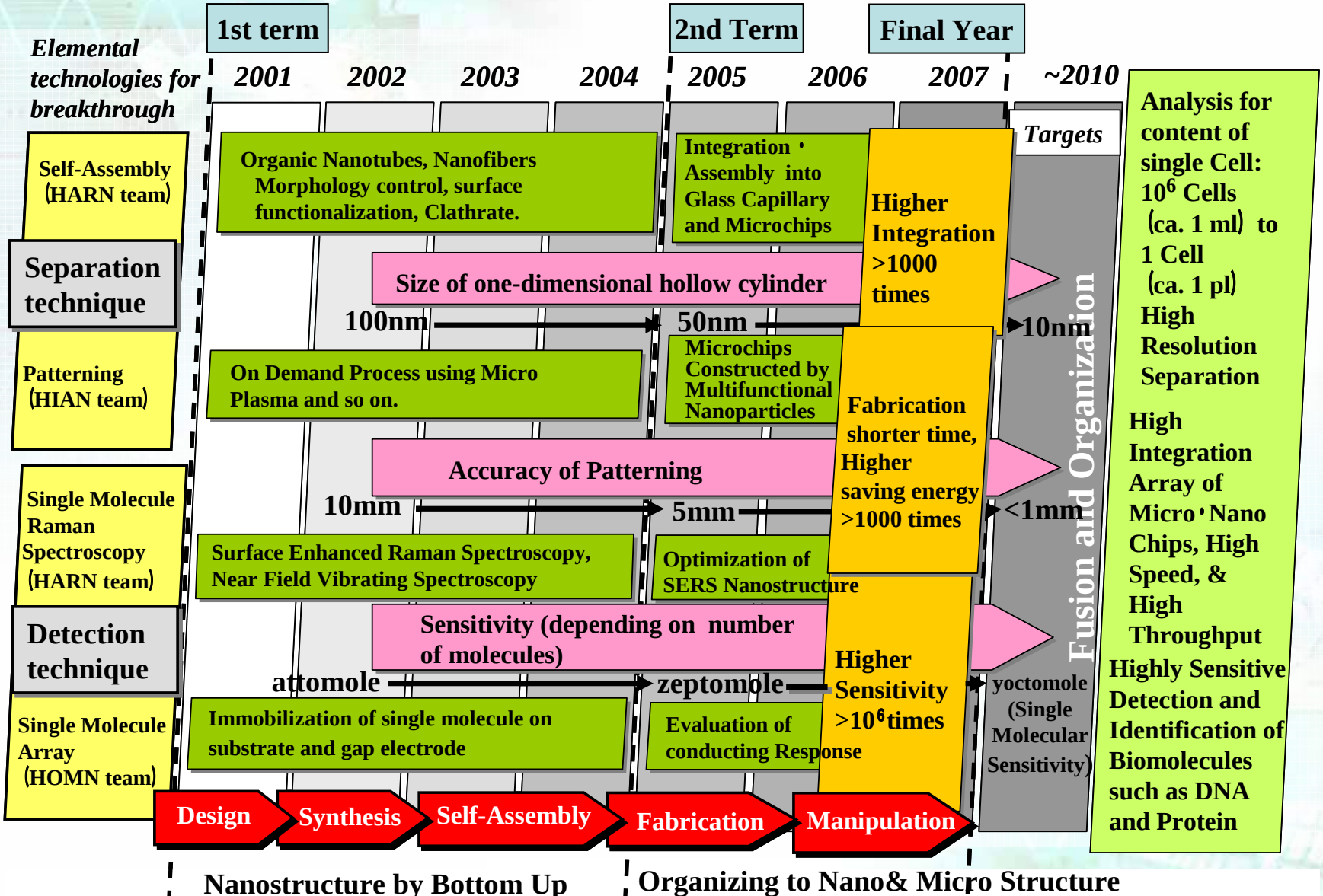
National Institute of Advanced Industrial Science and Technology
AIST

Elemental Technologies of NARC

NARC: Nanoarchitectonics Research Center



Roadmap of Elemental Technologies in NARC



Example of output of NARC

Image of Development of Highly Integrated Nano Chip

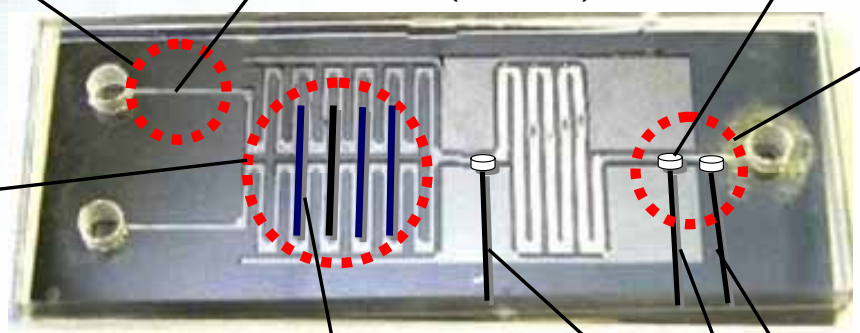
Self-Assembly Technology
to fabricate a channel structure with 100 μm
by integration of channels with 10 nm

Integration (> 10^3 times)

Molecular Scale Device

Nano Channel

By Competence Centre for Microactuators (CCMicro)



Single Molecule detection technology, Single Molecule Array technology
to detect target materials, analyze and identify

Detection with a sensitivity (> 10^6 times)

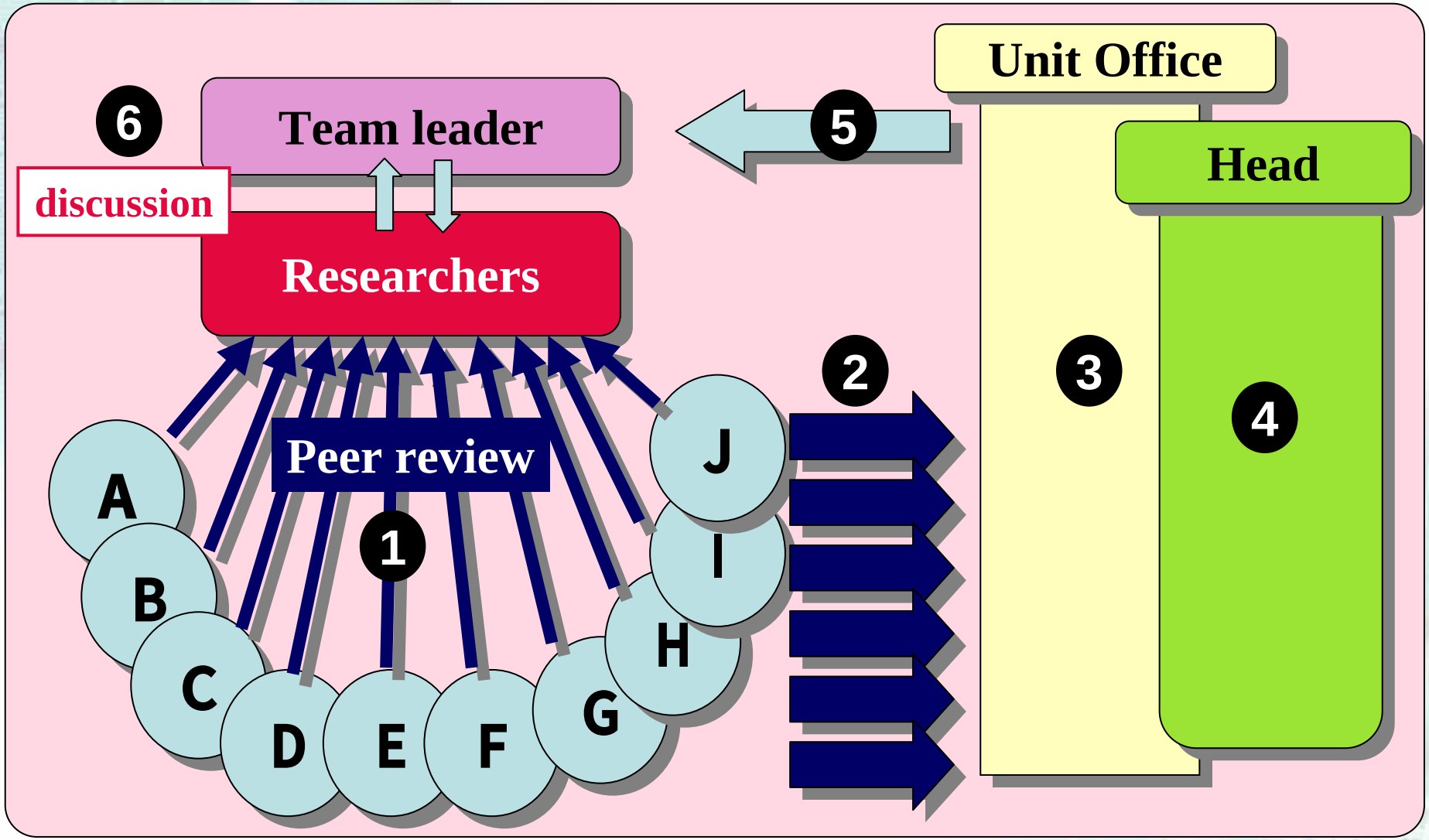
Micro-heater

Micro-sensor (temperature, pressure, flow)

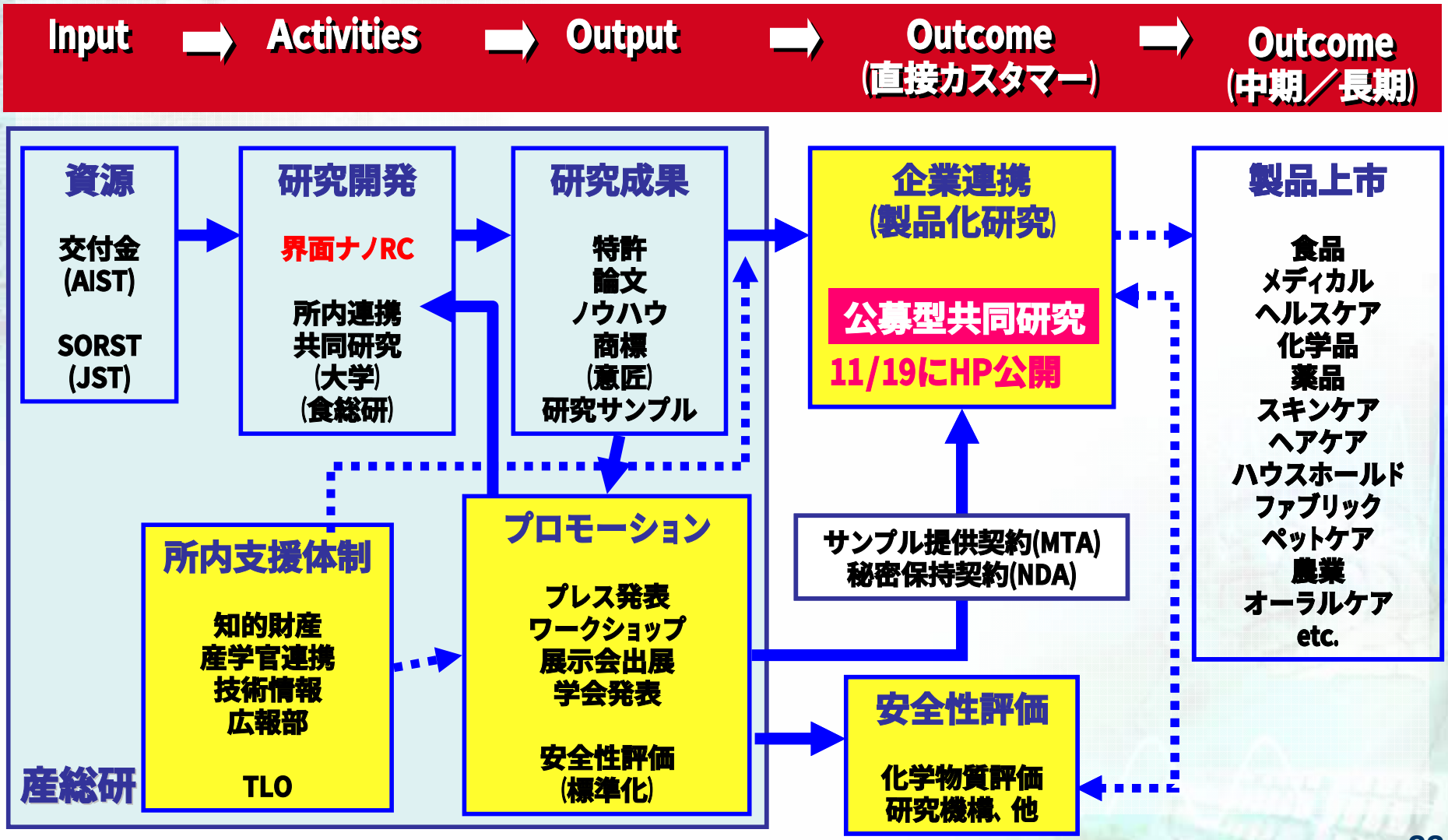
Pattern Forming Technology
to fabricate micro heater and micro sensor with ease and no waste, and in short time

Saving energy (> 10^6 times)

Communication in NARC



Logic model preparation for development of organic nano-tube



National Institute of Advanced Industrial Science and Technology AIST

Comments of Unit Directors

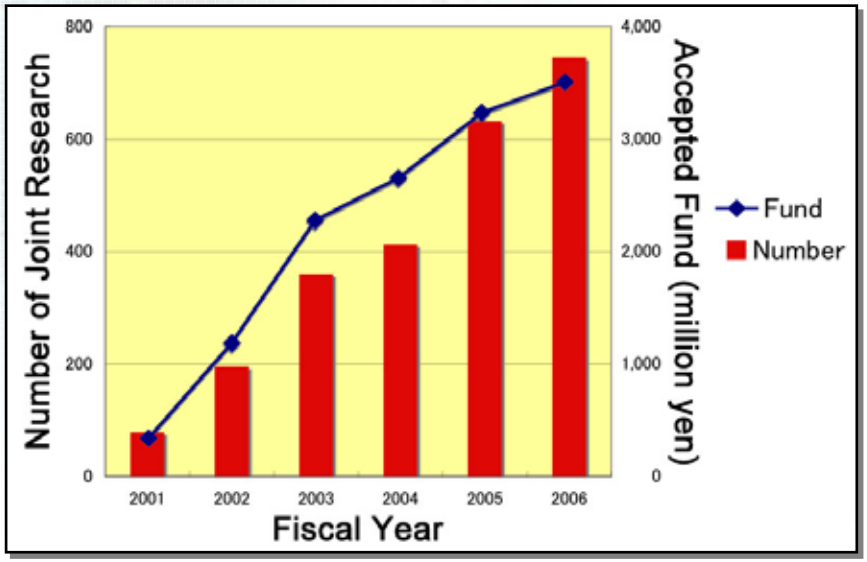
- The director of NARC noted that the evaluation system encouraged them to have a clear scenario from the perspective of outcomes, and comments by the evaluation committee have directed them to organize a strategic R&D plan with clear goals, applying technology elements in NARC. He organized a self-evaluation scheme inside of NARC, in which members critique other member's researches in an effort to create clear, mutual communication among members.

- The director of CERC noted that an evaluation system oriented toward outcomes might become the model in other research institutes. At first, they felt it difficult to prepare the roadmap because CERC had been performing Type I Basic Research. But, the flexible concept of outcomes provided by AIST's Evaluation Department gave them with an appropriate logical framework.

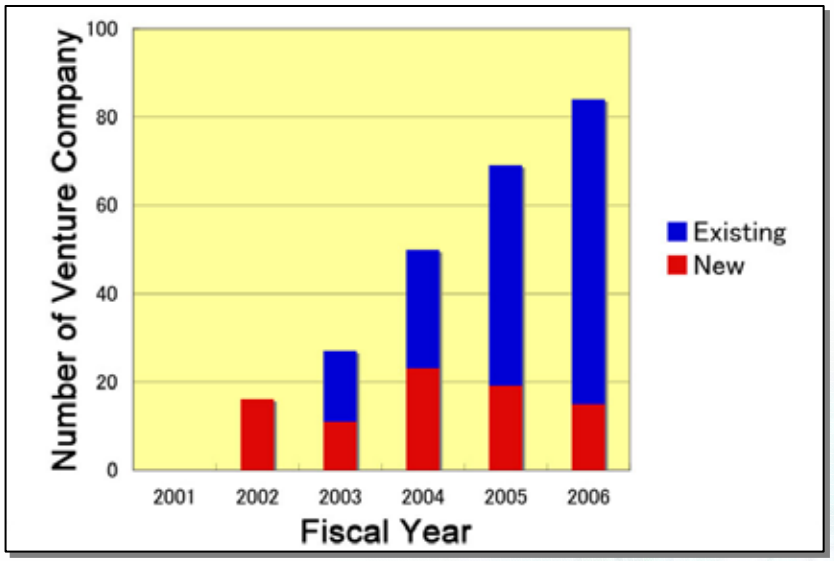
Performance of AIST

National Institute of Advanced Industrial Science and Technology
AIST

★ Joint Researches



★ Venture Companies



- Both number of joint research and accepted fund increased by ~10 times in 5 years.
- Number of venture company constantly increased.

National Institute of Advanced Industrial Science and Technology
AIST

Strategy Structure of AIST

Basic principles: Social development through enhancing industrial technologies

Missions:
- Contribution to a sustainable society
- Contribution to industrial competitiveness
- Contribution to local industrial development
- Contribution to Industrial technology policies

Future visions*

Strategy of Research Fields

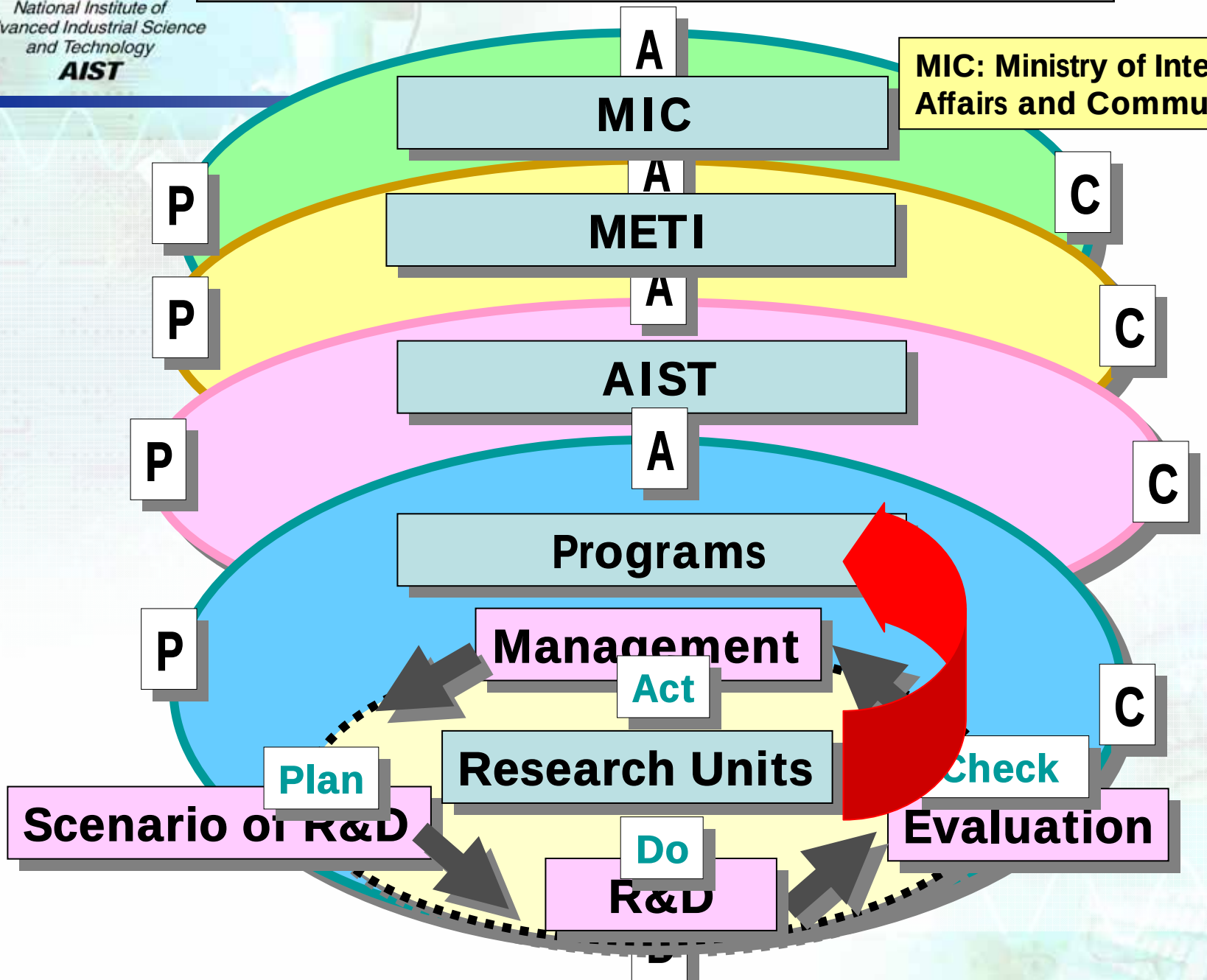
Strategy of Research Units

Research Subjects

Evaluation of Research Units

＊Future visions：
1. High quality life with good health and longevity
2. Intelligent, safe, and secure life supported by advanced information services
3. High industrial competitiveness and reduction of environmental load realized by new materials, parts, and manufacturing technology
4. Wealthy and comfortable life by overcoming environment and energy issues
5. Advanced industrial infrastructure developed by novel measurement technologies and evaluation systems
6. Construction of intellectual infrastructure through understanding of the earth
7. Dissemination of physical and chemical metrological standards

Spiral of R&D Evaluation



MIC: Ministry of Internal Affairs and Communications

Notes:

- Evaluation is for ***Encouraging with Love***.
- Evaluation is for ***Communication***.
- Evaluation is for ***Strategy***.
- Evaluation is for ***Creation***.
- Evaluation is to be ***fed back***.
- Evaluation ***reflects the Future***.
- Evaluation is like a ***Compass for Voyage***.

"Revised Evaluation System to Reflect the Future" (O. Nakamura, AIST, 2005)

Notes:

- Evaluation is for ***Program***.
- Evaluation is for ***AIST***.
- Evaluation is for ***Innovation***.
- Evaluation is for ***Socioeconomy***.
- Evaluation ***reflects the Future***.
- Evaluation is *the* ***Compass for Voyage***.

"Re-revised Evaluation System for Innovation" (2008, O. Nakamura, AIST)