Science and Technology-Driven Regional Innovation in Japan (Industry-University-Government Collaboration)

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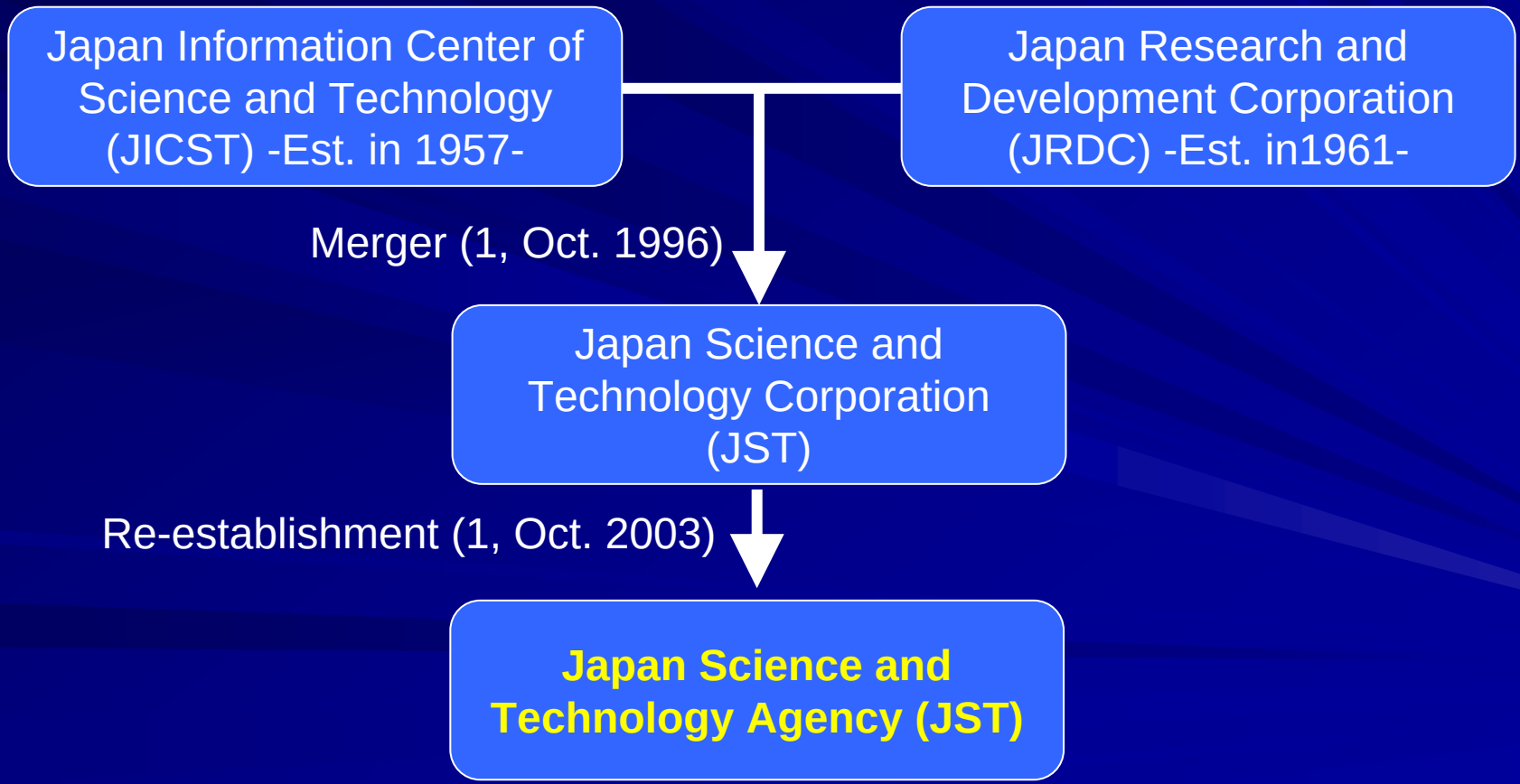
I. What's JST?

Missions

- Creation of Advanced Technology
- Promotion of Business through Advanced Technologies
- Promotion of S&T Information Dissemination
- Researchers' Exchange and Research Support
- Promotion of Public Understanding of S&T

I. What's JST

History



II. Outline of the regional S&T policy in Japan

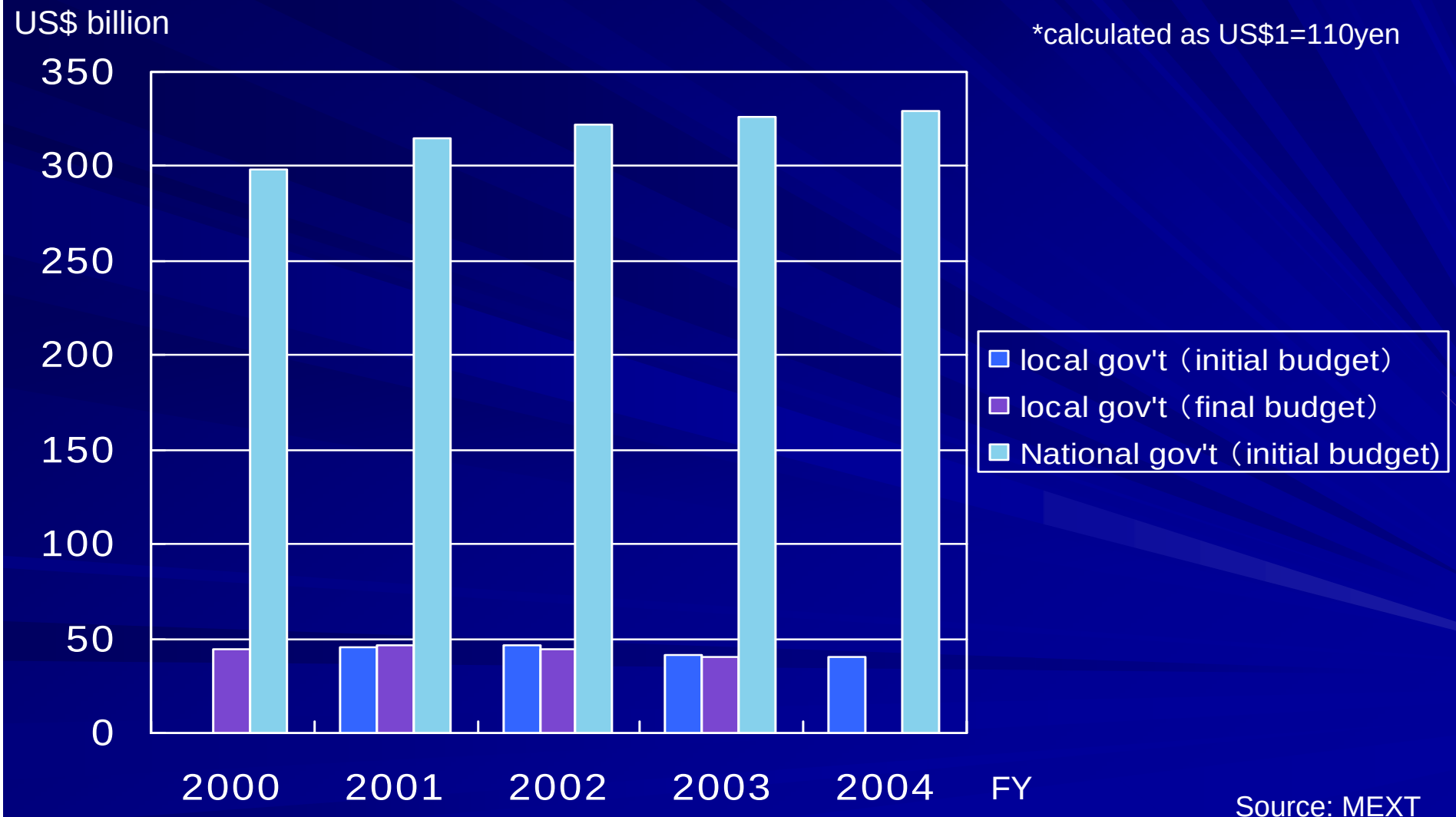
II. Outline of the regional S&T policy in Japan

Milestones of the regional S&T policy

- October, 1995
  The Science and Technology Basic Law was established
- March, 2001
  The Second Science and Technology Basic Plan was established
  - Creation of the “Knowledge Clusters”
  - Smooth execution of the Regional S&T Promotion Policy

II. Outline of the regional S&T policy in Japan

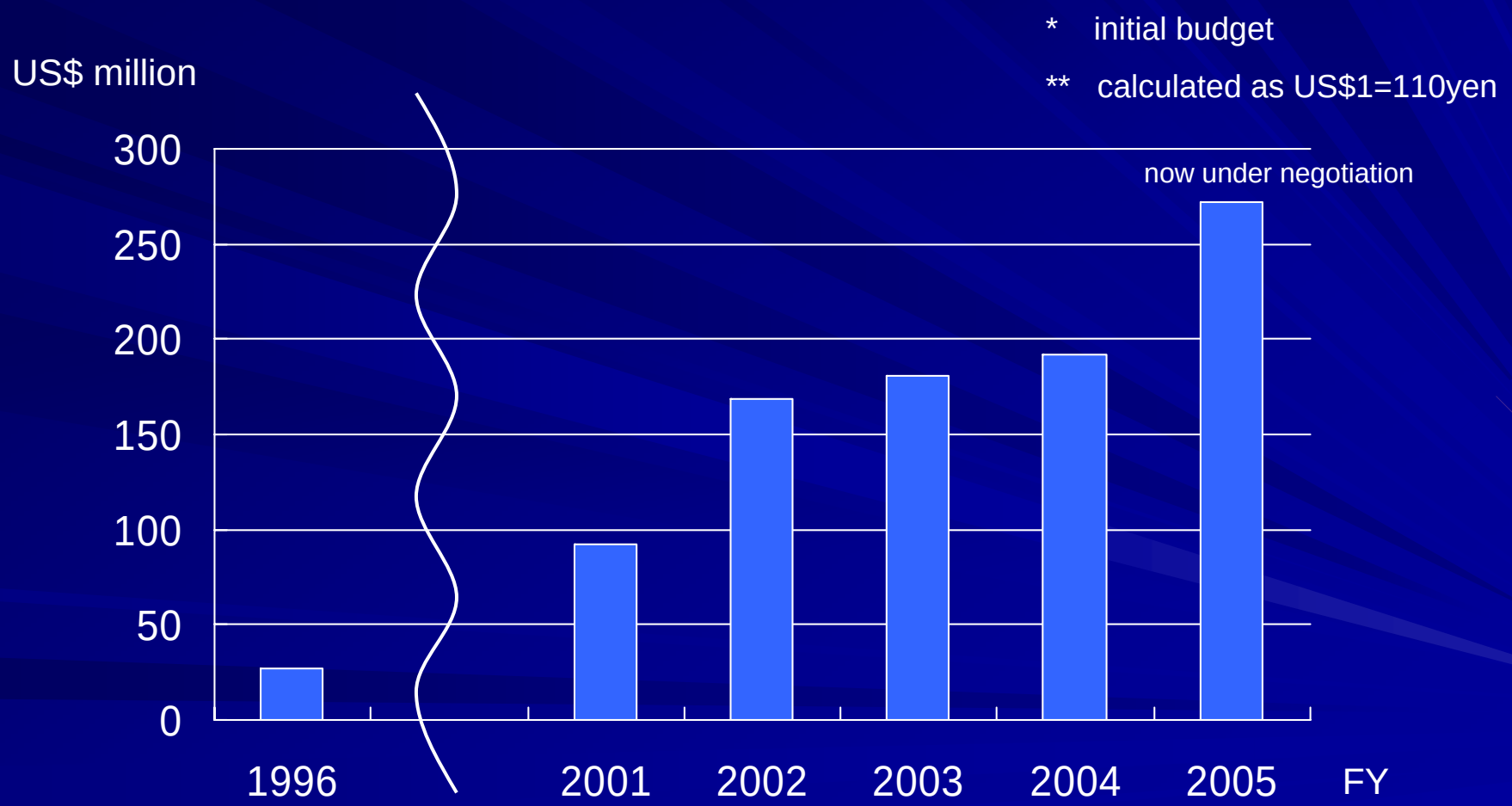
The S&T budget（National / local governments）



Source: MEXT

I. Outline of the regional S&T policy in Japan

The budget growth for the regional S&T



Source: MEXT

III. Programs of the regional S&T promotion

i. Knowledge Cluster Initiative (CLUSTER)
ii. Industrial Cluster Project
iii. City AREA Program
iv. Collaboration of Regional Entities for the Advancement of Technological Excellence (CREATE)
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vi. Science and Technology Incubation Program in Advanced Regions

i. Knowledge Cluster Initiative

Launched by MEXT (Ministry of Education, Culture, Sports, Science and Technology) in FY 2002

i. Knowledge Cluster Initiative

Overview

- **Purposes**
  - Create knowledge-concentrated region for technical innovation, where universities play a central role of knowledge creation in collaboration with R&D firms in the region
- **Budget**

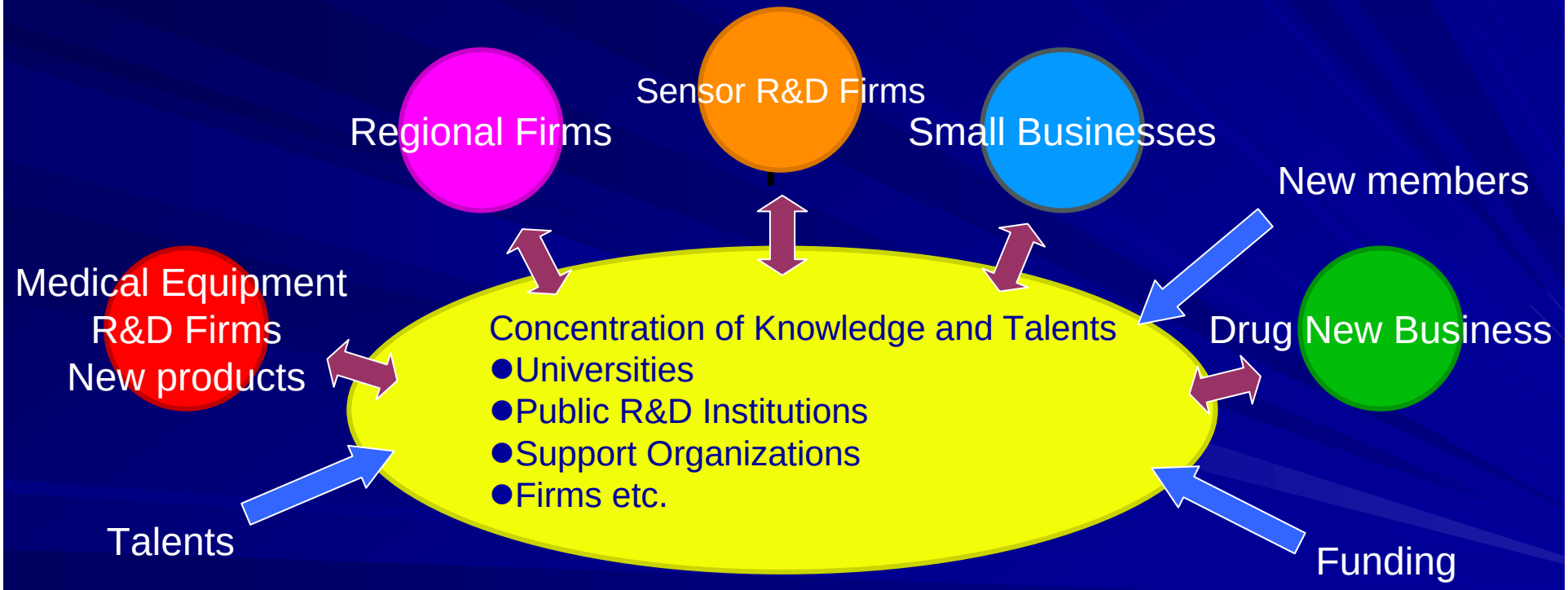
  * calculated as US$1=110yen
  - FY2004: US$ 81.8million
  - US$ 4.5million / cluster (5-year project)
- **Activities**
  - Set up a “Knowledge Cluster Headquarters” in each region
  - Place S&T coordinators and patent attorneys
  - Produce seeds through Industry-University-Government collaboration research for industrialization
  - Develop research, and apply for patents for research results
  - Hold forums on research results

i. Knowledge Cluster Initiative

Scheme

- Concentrate on a specific field of technology
- Stimulate competition and cooperation
- Promote concentration effects

-Example of a bio cluster-



Infrastructures
- ●Telecommunications
- ●Business Incubations etc.

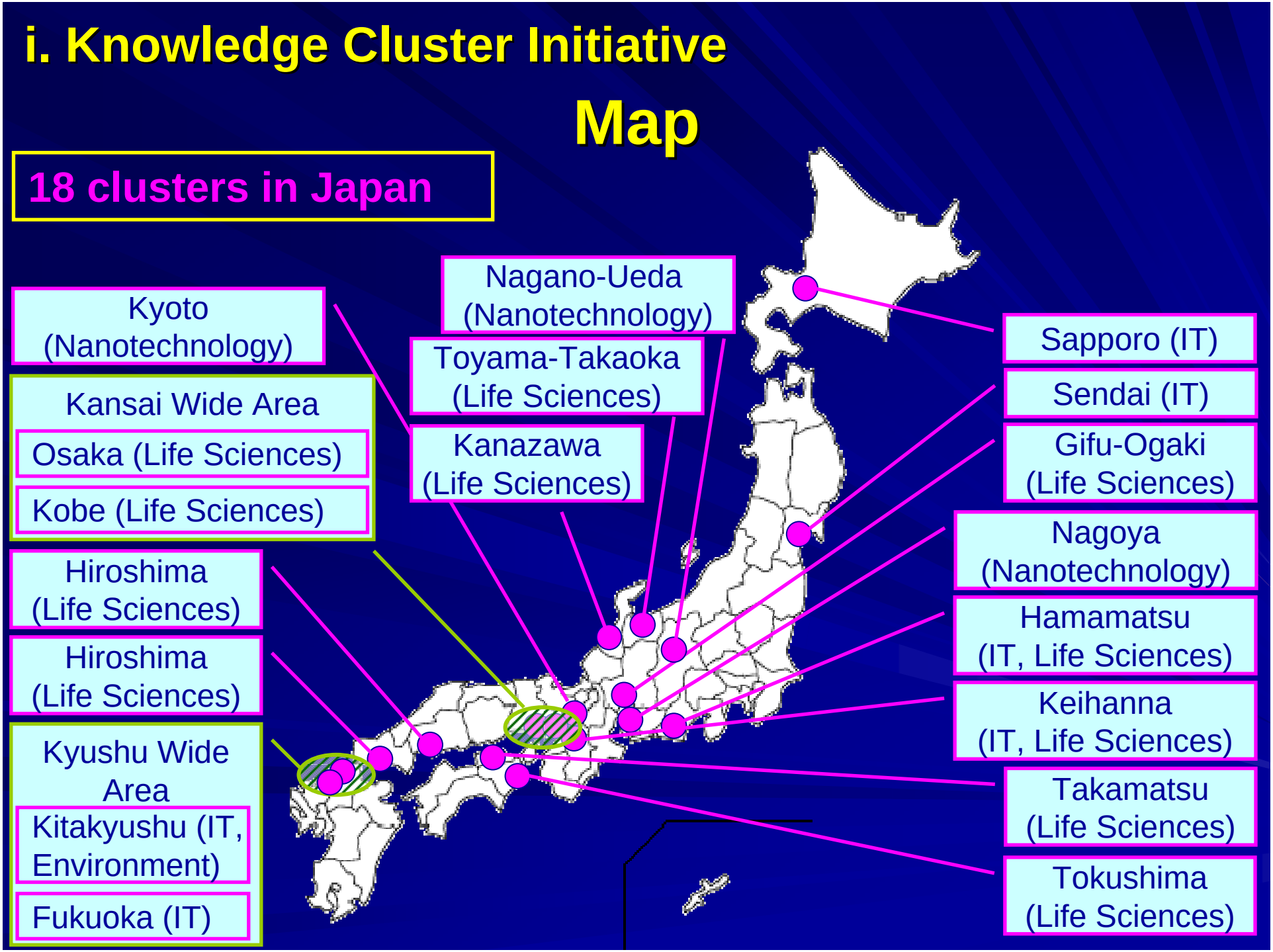
Suppliers
- ●Raw Materials etc.

Distribution Channels
- ●Product Sales Support etc.

i. Knowledge Cluster Initiative

Map

18 clusters in Japan



i. Knowledge Cluster Initiative

The image of IT Carrozzeria (Sapporo)

Embedded | IT workshops | Design workshops | Usability | merged together

Human-centered manufacturing business
Concept for marketing manufacturing IT workshop

Sapporo IT Carrozzeria Development Process (Establishment of IT Rapid Prototyping System)

Developing Concept

↓

Designing embedded & design workshops and usability

↓

Developing shape design for Software & Hardware

↓

Prototype process Structure Designs Design formation

↓

IT Devices Development

Designing UI Behaviors

Shape Design Rendering System

Rapid Color Design Check

Developing IT Devices through use of Lifestyle and Market Needs

●**Developing Ubiquitous Computers**

Development of ubiquitous computer platform (including wireless platform)

●**Developing Movable Computers**

Development of platform autonomous manufacturing support to movable object

Source: MEXT

ii. Industrial Cluster Project

Launched by METI (Ministry of Economy, Trade and Industry) in FY 2001

ii. Industrial Cluster Project

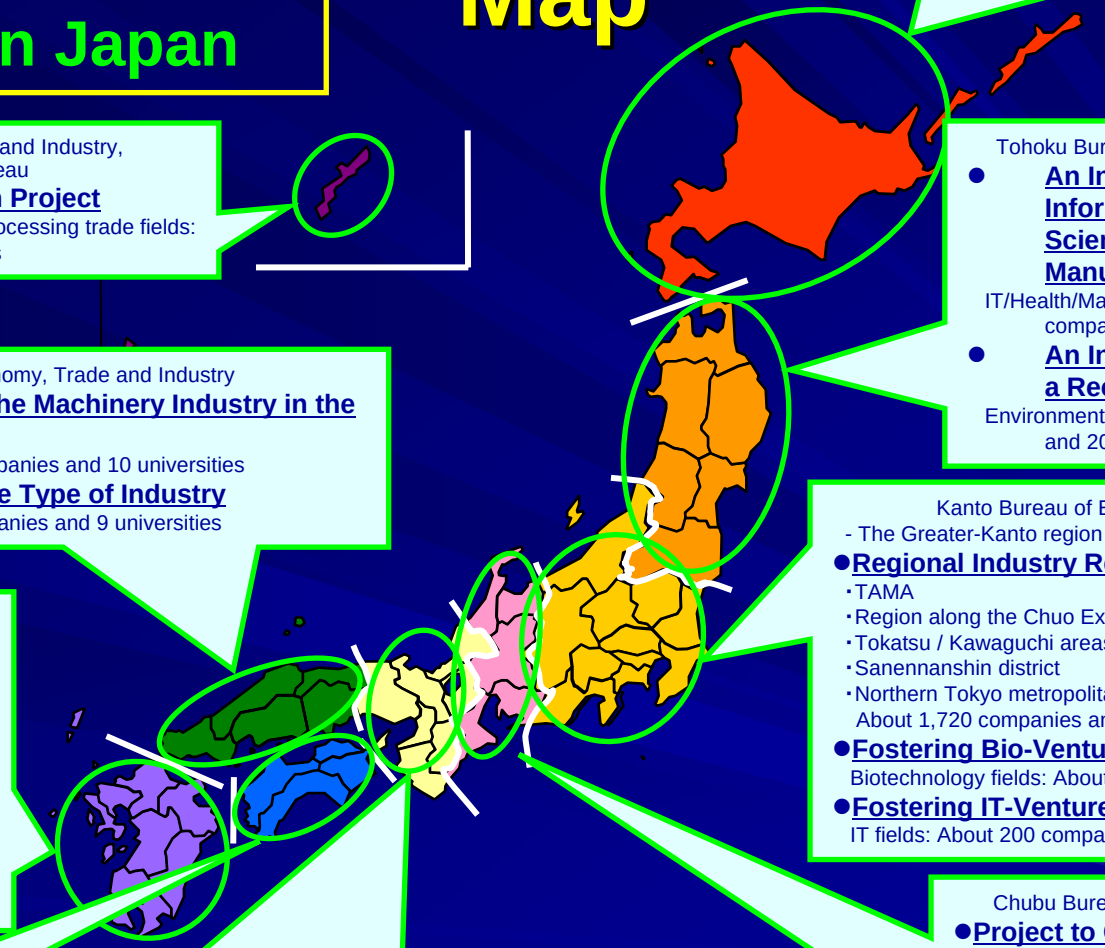
Overview

- **Purposes**
  - Foster innovative environment through formation of network among players with different technologies in industrial agglomeration
- **Budget**

  * calculated as US$1=110yen
  - FY 2004: US$ 445 million
    (All the relative schemes available but not solely earmarked for the Industrial Cluster Project)
- **Activities**
  - Support for close Industry-University-Government collaboration in regions
  - Support for development of technologies by taking advantage of regional characteristics
  - Enhancement of business incubator function
  - Support for the cultivation of the market in cooperation with trading firm
  - Cooperation with the financial sector

ii. Industrial Cluster Project Map

19 projects in Japan



Hokkaido Bureau of Economy, Trade and Industry

- **Hokkaido Super Cluster Promotion Project**
  Biotechnology / IT fields: About 300 companies and 16 universities

Tohoku Bureau of Economy, Trade and Industry

- **An Industry Promotion Project for Information Technology, Life Science and Cutting-edge Manufacturing**
  IT/Health/Manufacturing fields: About 230 companies and 21 universities
- **An Industry Promotion Project for a Recycling-oriented Society**
  Environmental/Energy fields: About 280 companies and 20 universities

Kanto Bureau of Economy, Trade and Industry
- The Greater-Kanto region Industrial Cluster Promotion Network -

- **Regional Industry Revitalization Project**
  - TAMA
  - Region along the Chuo Expressway
  - Tokatsu / Kawaguchi areas
  - Sanennanshin district
  - Northern Tokyo metropolitan area Manufacturing fields: About 1,720 companies and 56 universities
- **Fostering Bio-Ventures**
  Biotechnology fields: About 210 companies and 13 universities
- **Fostering IT-Ventures**
  IT fields: About 200 companies

Chubu Bureau of Economy, Trade and Industry

- **Project to Create Manufacturing Industry in Tokai Region**
  Manufacturing fields: About 650 companies and 29 universities
- **Tokai Bio Factory Project**
  Biotechnology fields: About 30 companies and 34 universities
- **Project to Create Manufacturing Industry in Hokuriku Region**
  Manufacturing fields: About 140 companies and 12 universities

Kansai Bureau of Economy, Trade and Industry

- **Bio Five-Star Company & Tissue Engineering Project**
  Bio-related fields: About 220 companies and 36 universities
- **Active Manufacturing Industry Support Project**
  Manufacturing fields: About 460 companies and 26 universities
- **Kansai Information Technology Cluster Promotion Project**
  IT fields: About 300 companies and 12 universities
- **Kansai Energy & Environment Cluster Promotion Project**
  Energy fields: About 110 companies and 23 universities

Chugoku Bureau of Economy, Trade and Industry

- **Project to Newly Generate the Machinery Industry in the Chugoku Region**
  Manufacturing fields: About 110 companies and 10 universities
- **Project to Form a Circulative Type of Industry**
  Environmental fields: About 90 companies and 9 universities

Kyushu Bureau of Economy, Trade and Industry

- **Kyushu Recycle and Environmental Industry Plaza (K-RIP)**
  Environmental fields: About 200 companies and 18 universities
- **Kyushu Silicon Cluster Project**
  Semiconductor fields: About 150 companies and 23 universities

Shikoku Bureau of Economy, Trade and Industry

- **Shikoku Techno Bridge Plan**
  Health and welfare / Environmental fields: About 290 companies and 5 universities

Department of Economy, Trade and Industry, Okinawa General Bureau

- **Okinawa Industry Promotion Project**
  Information / health / environmental / processing trade fields: About 150 companies and 2 universities

Source: METI

ii. Industrial Cluster Project

Cooperation with the Knowledge Cluster Initiative

1. Set up committee for regional cluster promotion
2. Encourage cooperation within regional entities
3. Promote joint conferences to announce project results

ii. Industrial Cluster Project
List of the tie-ups between MEXT and METI

Knowledge luster Initiative	Related Regional METI Bureaus	Committee	Joint Conference to Announce Project Results (Actual record for FY2003)
Sapporo	METI Hokkaido	Hokkaido IT Cluster Promotion Committee	March 2004
Sendai	METI Tohoku	Tohoku Region Cluster Promotion	March 2004
Nagano / Ueda	METI Kanto	Nanotech Forum Nagano	September 2003
Hamamatsu		Hamamatsu Cluster Promotion Committee	March 2004
Nagoya	METI Chubu	Committee of Cluster Promotion in Tokai Region	February 2004
Toyama / Takaoka		Committee of Cluster Promotion in Hokuriku Region	February 2004
Kyoto	METI Kansai	Kinki Region Cluster Promotion Committee	February 2004
Kansai Science City			
Saito (Northern Part of Osaka Pref.)		Kansai Wide Area Cluster Combined Headquarters Committee (Combining both Osaka and Kobe)	March 2004
Kobe			
Hiroshima	METI Chugoku	Chugoku Region Industry-Academia-Government Collaboration Committee	February 2004
Takamatsu	METI Shikoku	Rare Sugar Project Strategy Committee	February 2004
Tokushima		Tokushima Cluster Promotion Committee	
Fukuoka	METI Kyushu	Kyushu Wide Area Cluster Combined Headquarters Committee (Combining both Fukuoka and Kitakyushu)	May 2003
Kitakyushu Science and Research Park			

iii. City AREA Program

Launched by MEXT (Ministry of Education, Culture, Sports, Science and Technology) in FY 2002

iii. City AREA Program

Overview

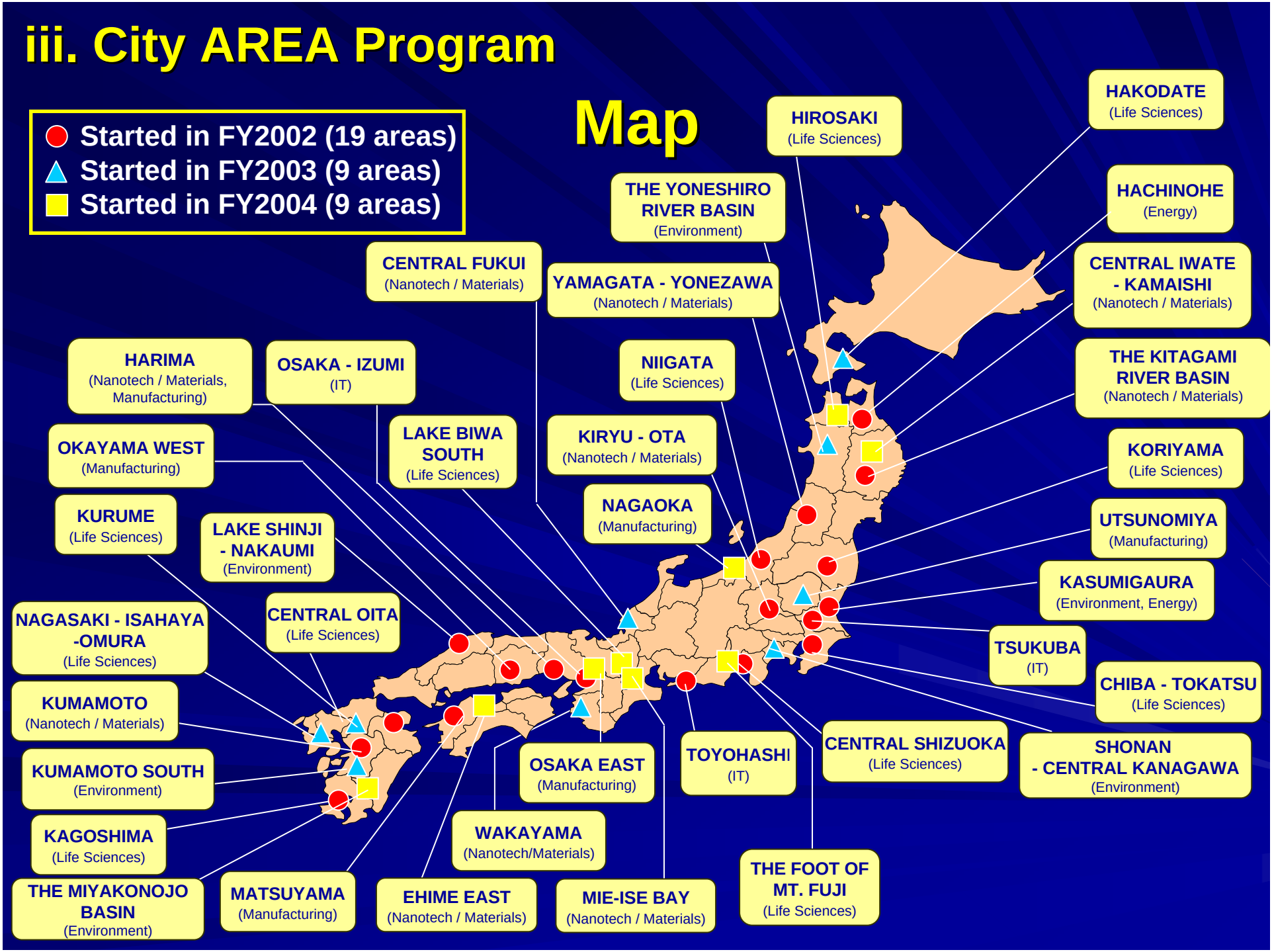
- **Purposes**
  - Produce new technological seeds by execution of Industry-University-Government collaboration centering on universities in city areas
  - Force new businesses and regional Industries with R&D strategies on the initiative of the local governments and regional characteristics
- **Budget**

  * calculated as US$1=110yen
  - FY 2004: US$ 30.9 million
  - US$ 0.9million / area (3-year project)
- **Activities**
  - Reinforce specific field of technology
  - Support for the core institutions settled by the prefectures or ordinance-designated city, execute various promotions matching for the sectors of the each city area

iii. City AREA Program

Map

- Started in FY2002 (19 areas)
- Started in FY2003 (9 areas)
- Started in FY2004 (9 areas)



iv. Collaboration of Regional Entities for the Advancement of Technological Excellence (CREATE)

Launched by JST (Japan Science and Technology Agency) in FY 1999

iv. Collaboration of Regional Entities for the Advancement of Technological Excellence (CREATE)

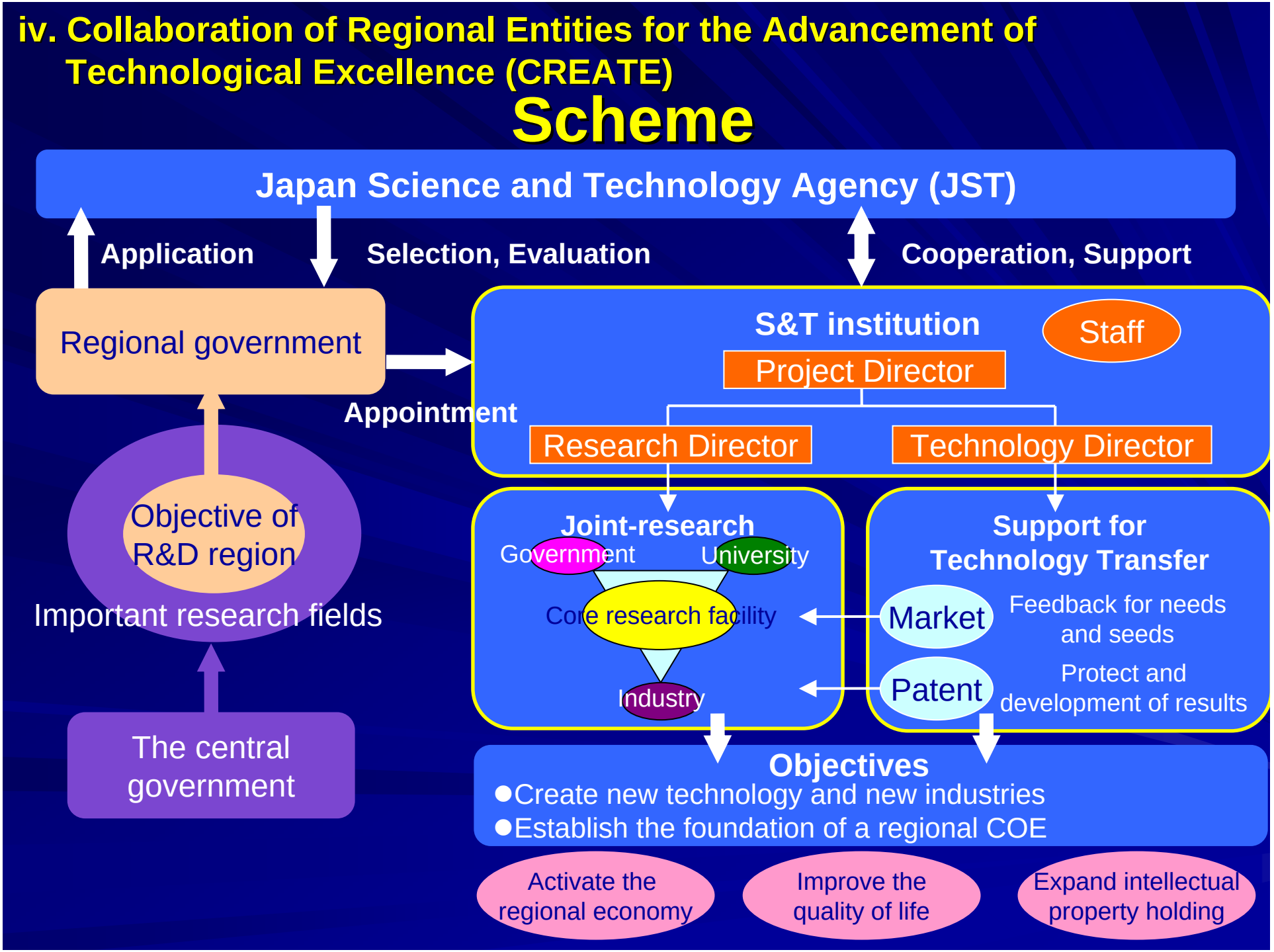
Overview

- **Purposes**
  - Establish and reinforce the S&T foundation that creates new technologies and industries in research fields with the first priority
  - Establish the foundation of a regional COE through joint-research by stimulating regional potential in universities, research institutes, and R&D oriented private firms
- **Budget**

  * calculated as US$1=110yen
  - FY 2004: US$ 44.7 million
  - US$ 2.2million / area (5-year project)
- **Activities**
  - Concentrate on important research field identified by the central government
  - Ask the role of a back office for S&T institution in the region, which facilitate researches and commercialization
  - Appoint Project Director, Research Director, Technology Facilitator etc.
  - Support for the joint-research system established by core research facilities, which consist of universities, research institutes, and R&D oriented corporations in prefectures or ordinance-designated cities

iv. Collaboration of Regional Entities for the Advancement of Technological Excellence (CREATE)

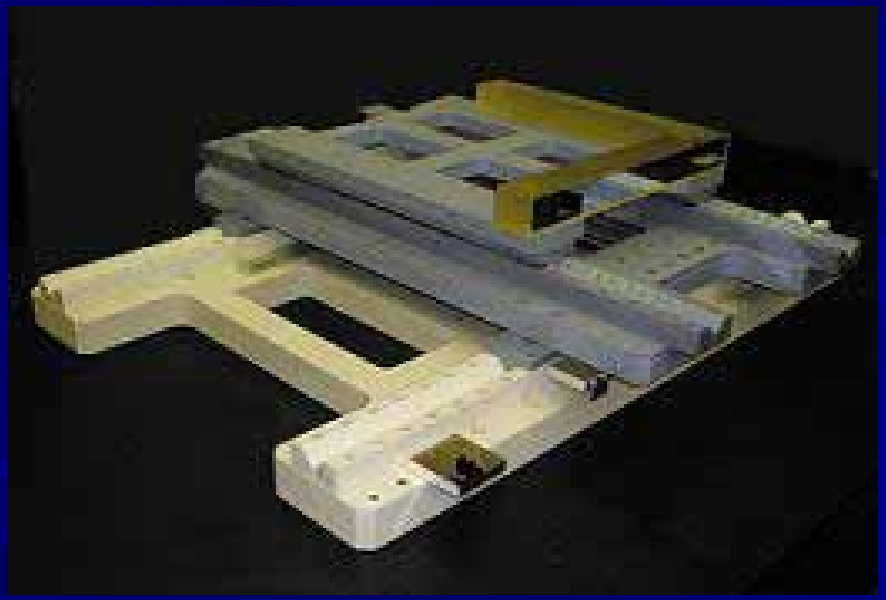
Scheme



iv. Collaboration of Regional Entities for the Advancement of Technological Excellence (CREATE)

Examples of research results (1)

- **Kumamoto Pref. (Started in FY1999)**
  Theme:
  Advanced Magnetic Storage and Medical Applications



Super precision high-speed stage

- **Fukui Pref. (Started in FY1999)**
  Theme:
  High-Brightness Laser Material Processing

Laser metal modeling hybrid machining unit

iv. Collaboration of Regional Entities for the Advancement of Technological Excellence (CREATE)

Examples of research results(2)

- **Hiroshima Pref. (Started in FY1999)**
  Theme: Tissue Regeneration

Hair follicle regeneration by the transplantation of cultured hair papilla cells

- **Yamagata Pref. (Started in FY1999)**
  Theme: Genetic Engineering and Sensing Technology for Advanced Biomaterials

3-D microscope tomographic measurement system prototyped

v. Regional Science Promotion Program (RSP)

Launched by JST (Japan Science and Technology Agency) in FY 2000

Overview

- **Purposes**
  - Build a regionally strong basis for science and technology
  - Put technological seeds obtained from academic research to practical use
- **Budget**

  * calculated as US$1=110yen
  - FY 2004: US$ 4.7 million
  - US$ 0.6million / area (5-year project)
- **Activities**
  - Appoint S&T coordinators in the regional government
  - S&T coordinators
    - Review research results and technological seeds in universities
    - Evaluate practicability of such results and seeds, and promote further necessary research and study by small funding
    - Transfer these results to other technological innovation programs etc.

v. Regional Science Promotion Program (RSP)

Scheme

* calculated as US$1=110yen

MEXT

Guidance

JST

Application | Selection, Evaluation | Cooperation, Support

Regional government

Appointment

Coordinating base (Secretariat)

1. Training and securing of talented researchers
2. Utilization of research and development activities
3. Coordinating and exchange
4. Dissemination of results
5. Others, unique regional functions

Type I; Network Creation

- Coordinator: 1 people
- US$ 0.4 millions / year (4-years)
- ●Collaboration of Industry-University-Government-region networks
- ●Find out talented researchers

Type II; Cultivation of Promising Research

- Coordinator: 4 people
- US$ 0.4 millions / year (4-years)
- ●Transfer results and seeds to practical use

Feasibility study

Development research study

Government

University

S&T coordinator

Industry

Technological seeds

Market needs

Transfer

Objectives

- ●Create new technologies and new industries
- ●Build a regionally-based strong foundation for S&T

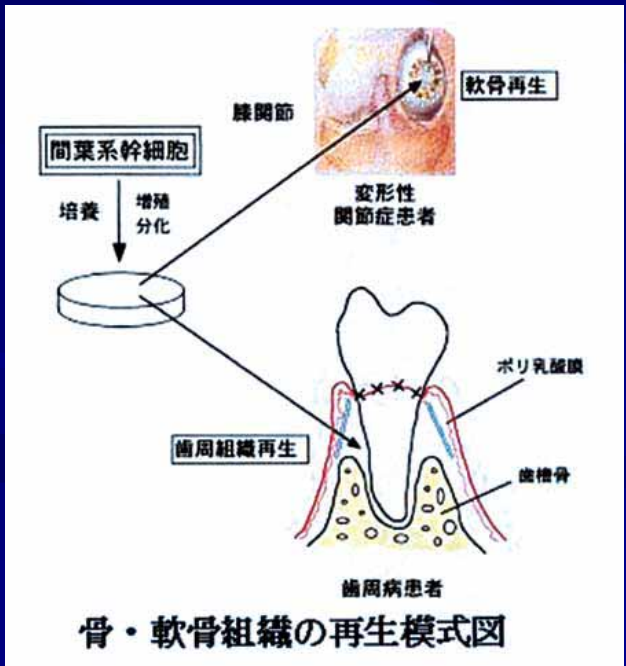
Activate the regional economy

Improve the quality of life

Expand Intellectual property Holding

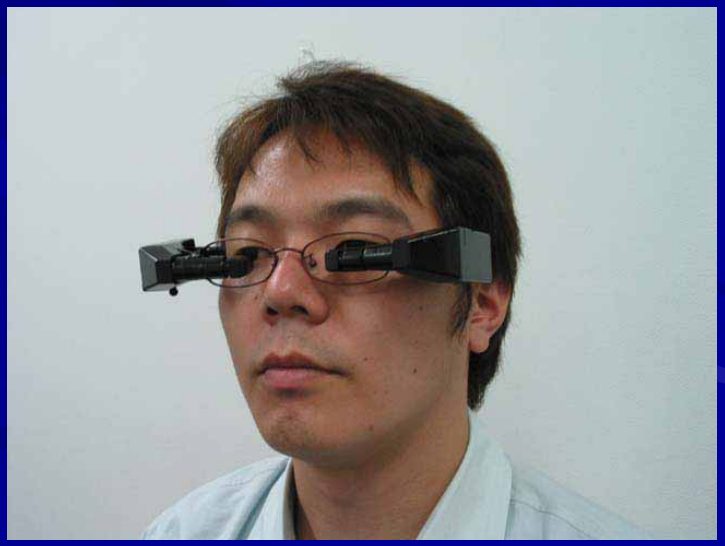
Examples of developed results

- **Hiroshima Pref. (Started in FY1999)**
  - Theme: Regenerative medicine for bone and cartilage diseases
  - Technological seeds: Prof. Yukio KATO (Hiroshima University)
  - Research facility: Hiroshima University



骨・軟骨組織の再生模式図

- **Osaka Pref. (Started in FY1999)**
  - Theme: Community system in low vision persons by high performance retina projection laser display
  - Technological seeds: Prof. Eiji SHIMIZU (Takarazuka University of Art of Design)
  - Research facility: Osaka City University


Head mount type electronic glasses

vi. Science and Technology Incubation Program in Advanced Regions

Launched by JST (Japan Science and Technology Agency) in FY 2001

vi. Science and Technology Incubation Program in Advanced Regions

Overview

- **Purposes**
  - Promote the regional Industry-University-Government collaboration based on creative research at universities
  - Revitalize regional economy and create new business
- **Budget**

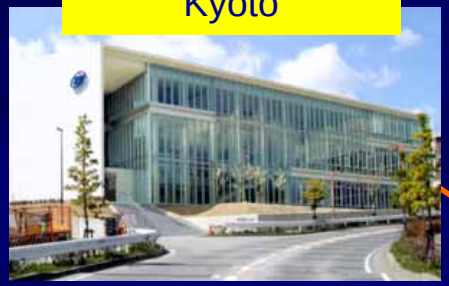
  * calculated as US$1=110yen
  - FY 2004: US$ 29.8 million
  - US$ 3.7 million / region
- **Facilities**
  - 8 Innovation Plazas in Japan
- **Activities**
  - Appoint S&T coordinators in Innovation Plazas
  - Coordinate S&T activities in each region
  - Promote joint research among the regional industry, Universities and the government for practical use
  - Exchange information through Plaza activities (research meetings, lectures etc.)

vi. Science and Technology Incubation Program in Advanced Regions

Map

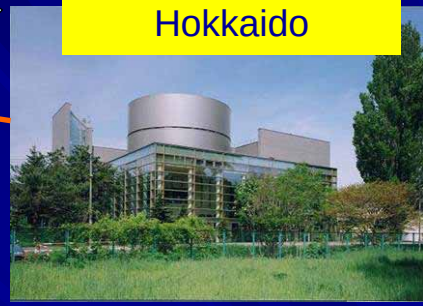
8 Innovation Plazas in Japan

Innovation Plaza Kyoto



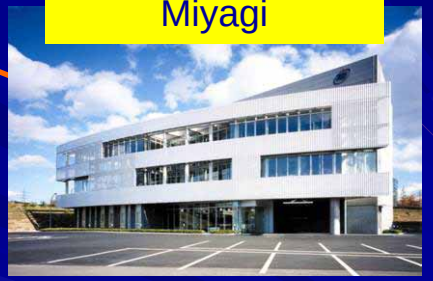
Innovation Plaza Ishikawa

Innovation Plaza Hokkaido



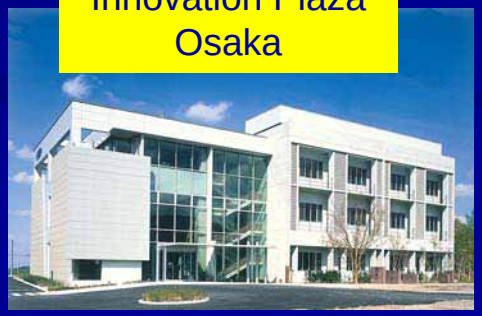
Innovation Plaza Hiroshima

Innovation Plaza Miyagi

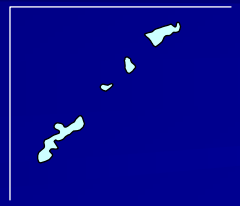


Innovation Plaza Fukuoka

Innovation Plaza Osaka



Innovation Plaza Tokai



vi. Science and Technology Incubation Program in Advanced Region

Scheme

Innovation Plaza

Promote the regional Industry-University-Government collaboration

- Review research results and technological seeds, and evaluates practicability of research results and seeds by the S&T coordinator
- Manage forums and workshops on research results

Make use of creative research results at universities in regions

- Support researches for commercialization in Industry-University-Government collaboration

JST Researcher (Government)

University

Research for commercialization

Joint research companies (Industry)

Transfer research results to other technological innovation programs

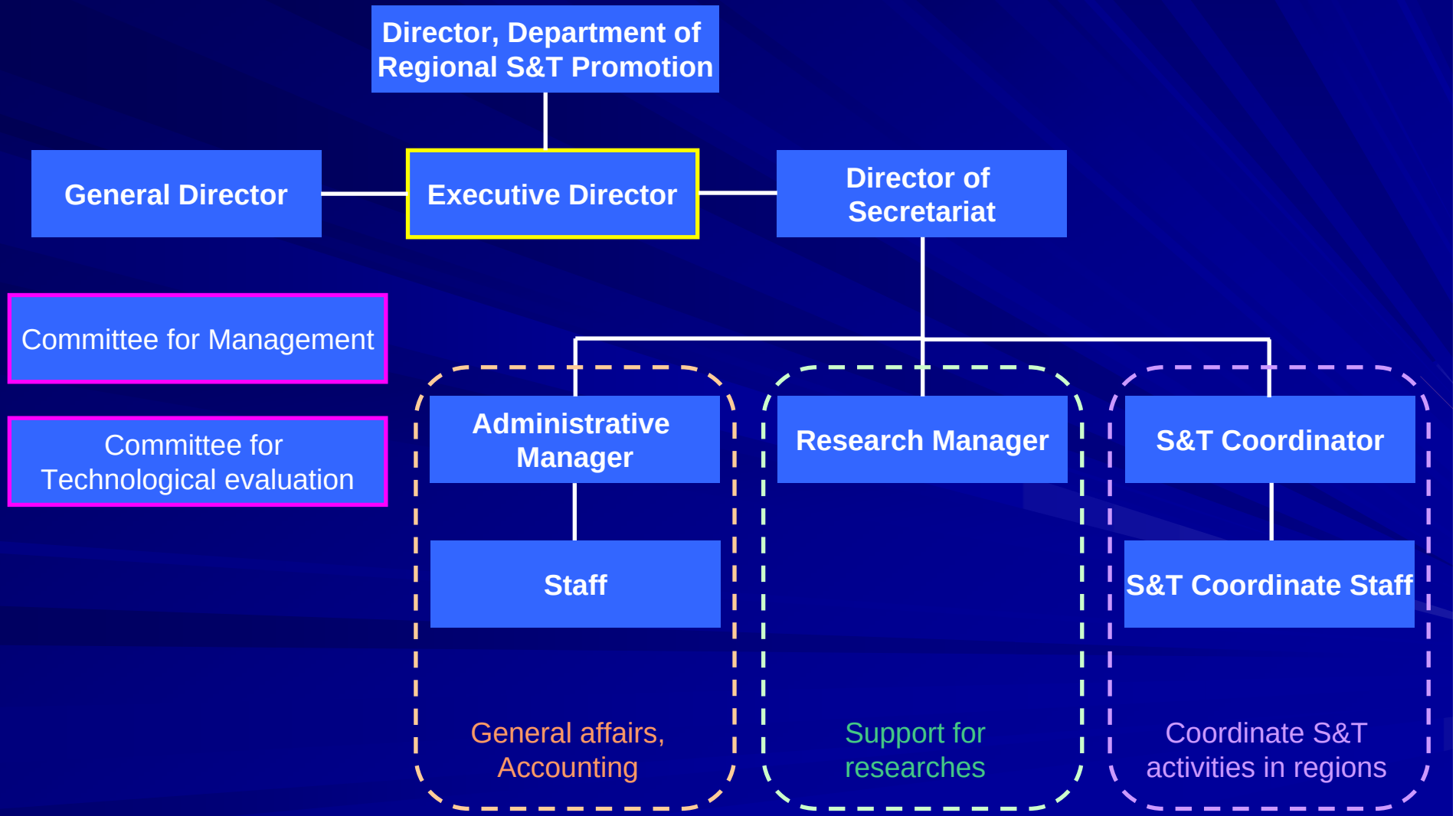
Promote Practical use

Activate the regional economy

Create new industries

vi. Science and Technology Incubation Program in Advanced Region

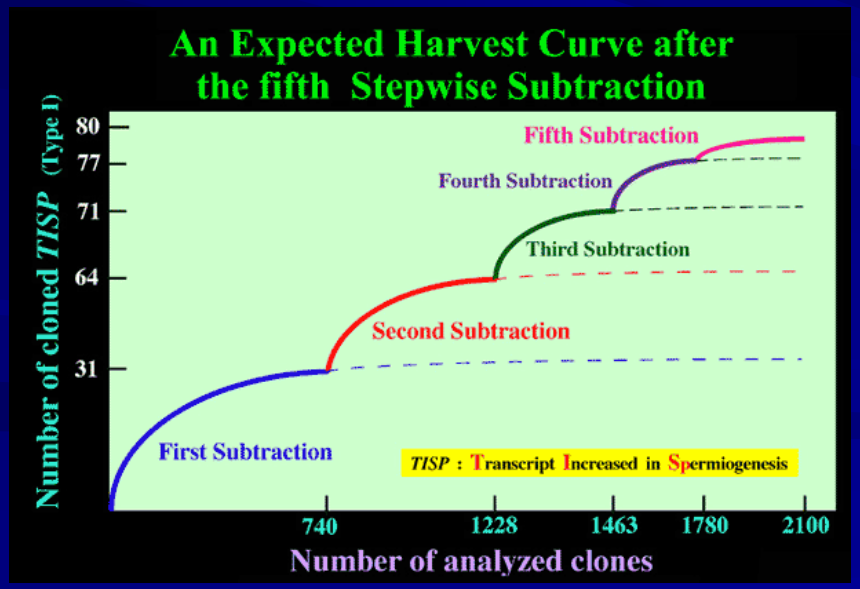
Organization of Innovation Plaza



vi. Science and Technology Incubation Program in Advanced Region

Example of developed product

- **Innovation Plaza Osaka**
  - Theme: Commercialization of a new tissue-specific cDNA microarrays for detection of diseases using blood sample (started in FY2001)
  - Research director: Prof. Hiroshi NOJIMA (Osaka university)
  - JST researcher: Hiroaki ONDA
  - Joint research companies: TAKARA BIO INC., Gene Design Inc

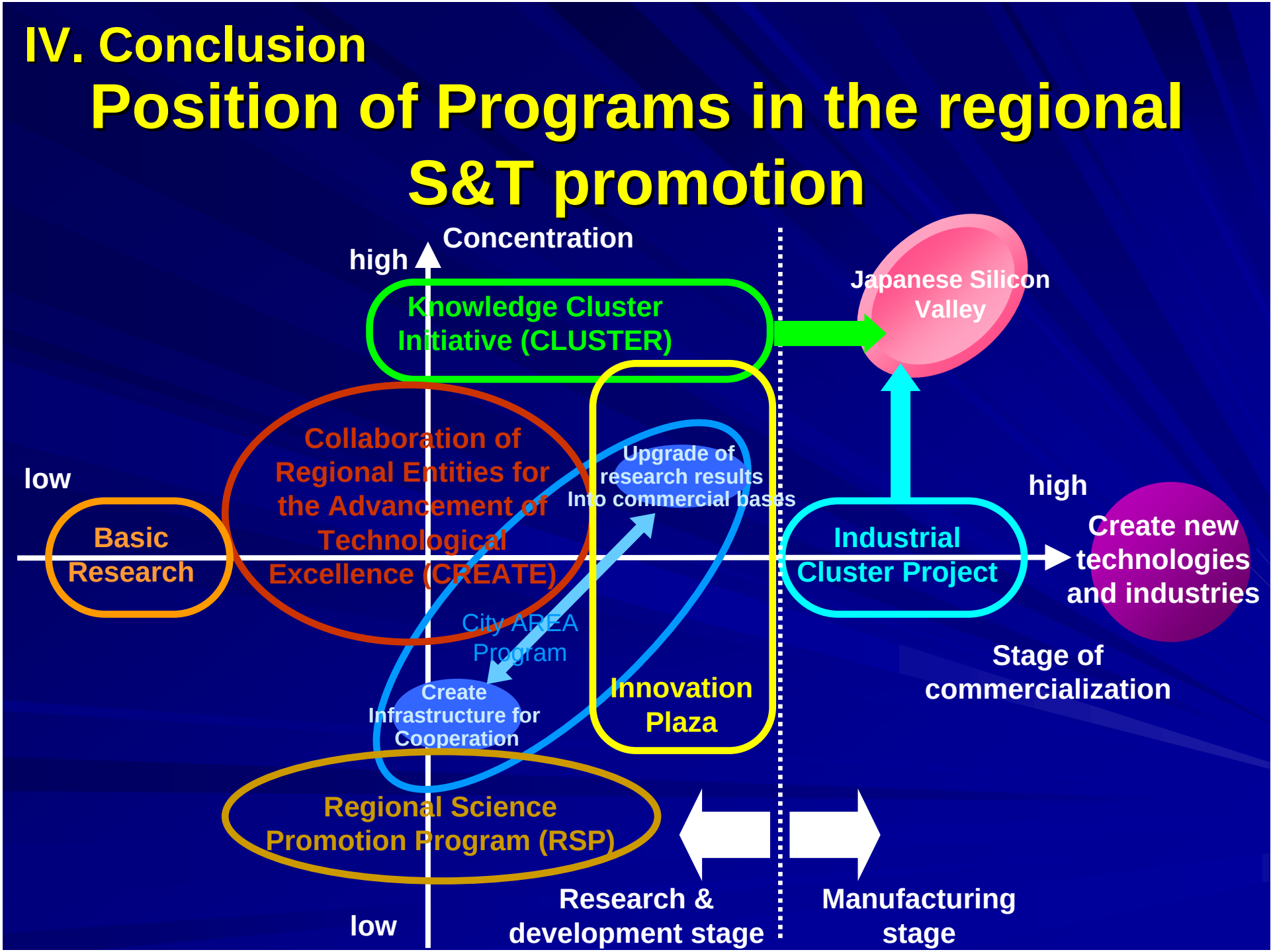


IntelliGene® PD Human PREB CHIP
sold by TAKARA BIO INC.

IV. Conclusion

IV. Conclusion

Position of Programs in the regional S&T promotion



Conclusions

- Simultaneously many kinds of program with each characteristic
- Soft linkage among each program
- University - Major player as a knowledge source
- Coordinator - Fundamental and key player
- RSP – Most basic and practical program

Thank you so much for your attention!