

# Japanese experience of fostering regional innovative activities through the "Industrial Cluster Program"

December 3<sup>rd</sup> 2008  
EU-Japan Regional Cluster Forum

YUJI HOSOYA  
Senior Analyst for Regional Policy  
Ministry of Economy, Trade and Industry



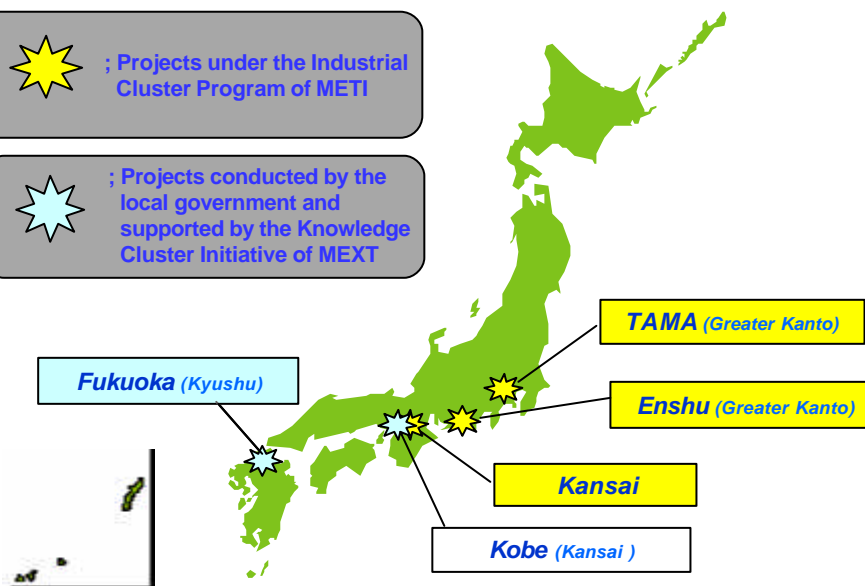
## Cluster related projects to be introduced in this presentation



; Projects under the Industrial Cluster Program of METI



; Projects conducted by the local government and supported by the Knowledge Cluster Initiative of MEXT



## Background of the birth of the industrial cluster policy

(Changes in regional economic development methodology)

### Industrial decentralization and development of regional core cities (1970s to mid-1990s)

- Dispersing industrial agglomerations of the megalopolis to the regional core cities for the purpose of promoting balanced regional growth  
The typical example is so called "Technopolis" program started from 1983.



### Prevention of hollowing-out and support for development of new growing sectors (since mid-1990s)

- Revitalizing existing industrial agglomerations (mainly Marshall type)
- Organizing comprehensive support systems for creating new businesses (Organizing one-stop support system for creating new businesses, enhancing incubation functions including building of facilities)



### Support for development of regional economy and competitive industries through continuous innovations utilizing regional resources (since 2001)

### **Industrial cluster policy**

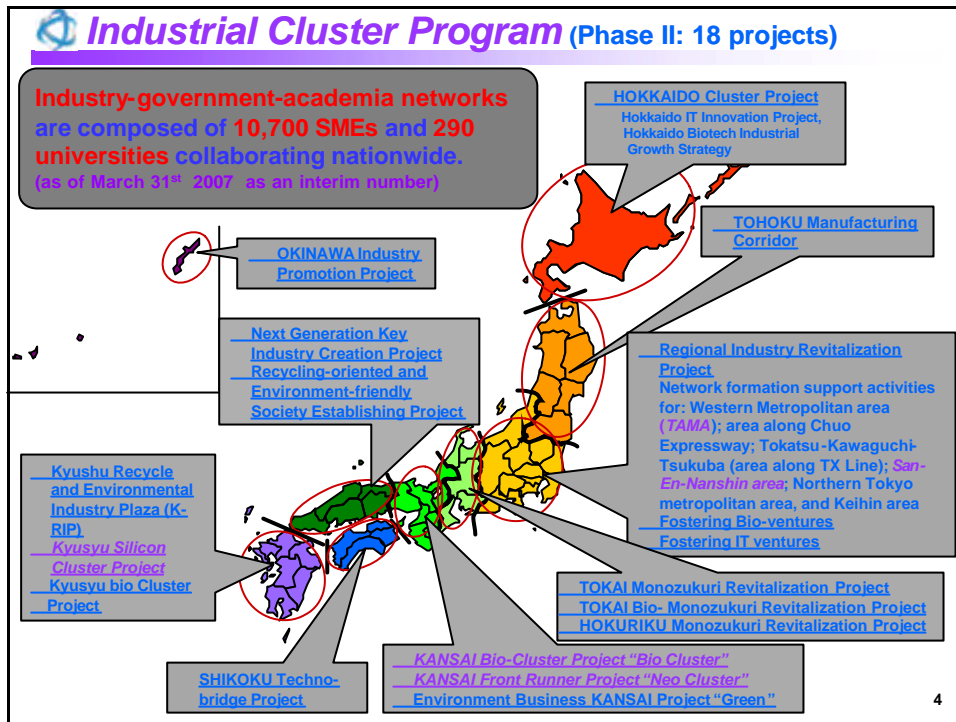
Promoting industrial clusters which accelerate innovation and facilitate world-viable new businesses to be created one after another

2

## Industrial cluster policy of the Japanese Government

	Ministry	Basic objectives	Policy tools	Start year	Number of project/region	Budget
Industrial Cluster Program	Ministry of Economy, Trade and Industry (METI)	Forming industrial clusters that facilitate innovation and the creation of world-viable new businesses to be created	Support for forming industry-government-academia networks in regions through a subsidy for a private promotional organization Supporting regional technology development activities through subsidies Enhancing business incubator functions by building facilities and supporting various activities	Phase 1 2001 Phase 2 2006	Phase 1: 19 projects Phase 2: 18 projects	FY 2008 : Industrial cluster project ¥ 1.14 bn.  Joint research and development projects from industry-university collaborations ¥ 6.32 bn.
Regional S&T Promotion Programs 1) Knowledge Cluster Initiative 2) City Area Program	Ministry of Education, Culture, Sports, Science and Technology (MEXT)	Forming regional clusters aiming at creating persistent innovation through close networking among industry-government-academia	Conducting and funding industry-academia-government joint research in which universities or other public institutions take core part for the purpose of forming regional clusters under local initiatives	1)1st stage 2002 2nd stage 2007 2) 2002	1)1st stage: End 15 regions, Active 3 regions 2nd stage: Active 9 regions 2)End 50 areas, Active 30 areas	1)FY 2008 : ¥ 9.1 bn. (For each region, ¥ 0.5 bn. to 0.8 bn. /year, over 5-year period) 2)FY 2008 : ¥ 4.6 bn. (For each area, ¥ 0.1 bn to 0.2 bn. / year, over 3-year period)

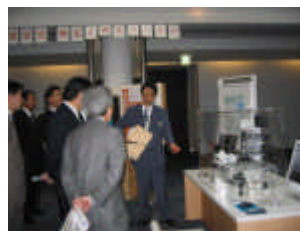
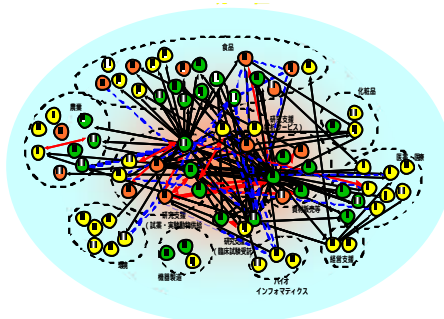
3



## Overview of the Industrial Cluster Program activities

### (1) Creation of industry-government-academia networks in regions

- Organizing industry-government-academia networks connecting **10,700 SMEs** and **290 universities** (including technical colleges) across the country  
(The numbers are estimated as of the end of March 2007. )



Matching event for bio-industry start-ups from university

## Overview of the Industrial Cluster Program activities

### (2) Project formation of technology development with regional partners by making use of government subsidizing measures

- Deploying technology developing projects by regional industry-academia collaboration (the Regional Research and Development Projects provided by METI)
  - Approximately 300 projects out of completed 1,130 projects have been successful in practical application.
- 80 out of 170 projects approved under the New Collaboration Business Support Project (cross-industrial collaborations supported by the Small and Medium Enterprise Agency, METI) are implemented by enterprises participating in the industrial Cluster Program.



Intelligent automated cell culturing facility



Compact vibration measuring system using diode laser

6

## Overview of the Industrial Cluster Program activities

### (3) Enhancement of incubation functions for new businesses, by not only building of facilities but also providing counsel by experts

- Across the country, there are more than 300 incubation facilities (most of these are supported by public entities) including those located on campus for enhancing technology transfer from universities.
- More than 400 incubation managers are permanently stationed at incubation facilities for assisting tenants.



On the Hokkaido University campus, Shionogi & Co., Ltd. opened a "Shionogi Pharma-Innovation Center (drug discovery joint research facility)," the first commercial research facility established on the premises of a national university in May 2008.

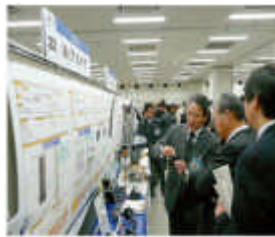
In addition, the SMRJ (SME supporting and regional developing organization of METI) is currently building the "Hokkaido University Business Spring (Hokkaido University's incubation facility)."

7

## Overview of the Industrial Cluster Program activities

### (4) Support for pioneering sales channels through cooperation with experts and trading firms etc.

- Organizing product exhibitions and matching events for providing opportunity to give a presentation of the products.
- Providing marketing support by professional coordinators and trading firms.
- Developing overseas market channels and international exchanges supported by Japan External Trade Organization (JETRO)



The exhibition of motor parts made by SMEs located in the Chugoku region was held at the head office of Toyota Motor Co. The Chugoku region, where is the home ground of Mazda Motor Co., is far from Toyota City.

Even thirteen of Toyota's top corporate officers, including President Watanabe, made an appearance, offering great praise to the high level of the technology in the region.

8

## Overview of the Industrial Cluster Program activities

### (5) Cooperation with financial institutions

- Industrial Cluster Financial Support Conferences set up in 11 blocks across Japan (Total 447 banks participated and total 69 meetings have been held.)
  - Holding industrial cluster support meetings and events for business plan presentation.
  - Bridge financing, low-interest financing, etc. through business alliance
  - Establishing regional venture funds



All Japan meeting of financial institutions supporting the Industrial Cluster Program



Business matching event held by Seibu Shinkin Bank and the TAMA Association

9

## Overview of Industrial Cluster Program activities

### (6) Human resource support

- Organizing internship programs for undergraduate and graduate students
  - ex. 1: Visit to factories and laboratories of not only top semiconductor makers but also SMEs for introducing entire cycle of semiconductor fabrication.
  - ex. 2: Internship program for students in a science and engineering course to have a short stay in SMEs which feel difficulty to employ new recruit for R&D.



IKKAN: Program visiting industrial sites of Kyushu (Silicon Island) for university students in a science and engineering course. They can know the entire cycle of semiconductor industry.

10

### Dynamic relations between industry-lifecycle and region according to Audretsch et al (2008)

	Product lifecycle: conventional explanation	Industry lifecycle by Audretsch et al. (2008)	Regions corresponding to industry lifecycle	Main players in production of goods and innovation	Types of innovation	Knowledge spillover	Products
Phase	Introduction	First entrepreneurial phase	Urban agglomerations	SMEs	Product innovation	Inter-industry knowledge spillovers (Jacobs externalities)	Brand-new products
Phase	Growth	First routinization phase	Industrial agglomerations	Large firms	Product & process innovation within top-performing incumbents	Less knowledge spillovers	Standardized products
Phase	Maturity	Second entrepreneurial phase	Industrial districts* & Urban peripheries	SMEs	Product innovation	Intra-industry knowledge spillover (MAR externalities)	Niche products supplied by complement incumbents
Phase	Decline	Second routinization phase	Peripheries	-	-	-	-

\* Rather specialized regions located in more peripheral areas, often near industrial agglomerations

Audretsch, Falck, Feldman and Heblich (2008), "The Lifecycle of Regions"

11

### Typology of the "Industrial Cluster Program" targets

Target	Phase of Audretsch et al. (2008)	Industry / Products	Technology	Type of business	Present status
Type 1	Phase (Embryos of new cluster in the metropolitan areas)	New industries (bio, ICT etc.)	Most advanced	Start-ups	Spin-off from large enterprise
					Spin-off from university
Type 2	Phase (Hidden champions located in the industrial areas)	New products in the broad range related to machinery, materials and metal processing	Advanced	Second-time Start-ups (New entrants to different markets from where their present businesses belong)	Subcontracting firms of still competitive industries (automobile, high-end electronics etc.)
					Independent niche-top business

Tentative classification by the author

12

### The Kobe Medical Industry Development Project

Project under the strong initiative of Dr. Imura (former President of Kyoto University) and the Special Headquarter for the Earthquake Restoration of Kobe City

#### Target areas

- Medical device
- Clinical research and trials
- Regenerative medicine

#### Policy tools



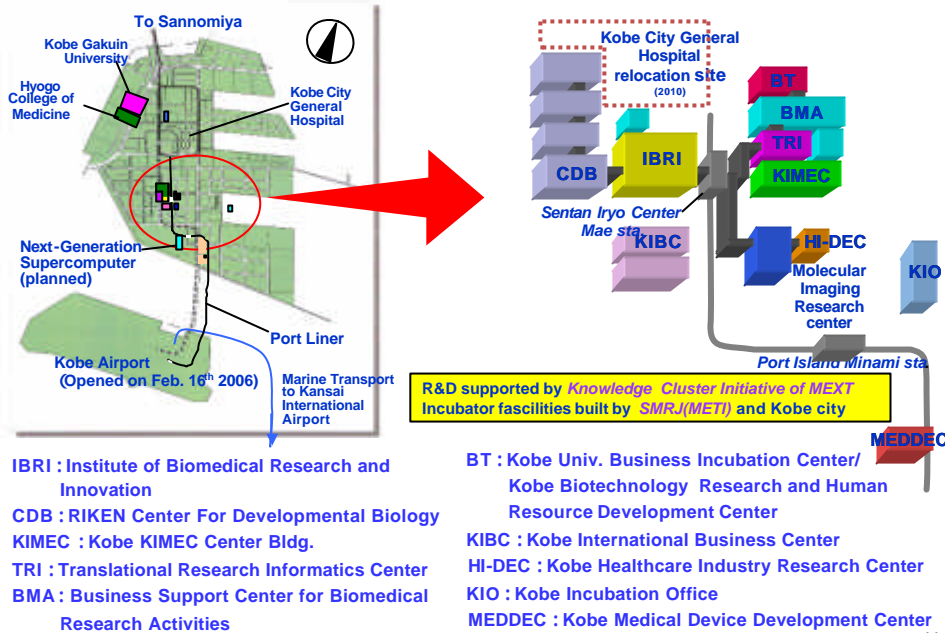
#### Objectives

- Create employment and revitalize local economy damaged by the "Hanshin -Awaji" Great Earthquake Disaster in 1995
- Provide advanced medical services and welfare for Kobe citizens
- Contribute to improvement of medical technologies in Asian countries



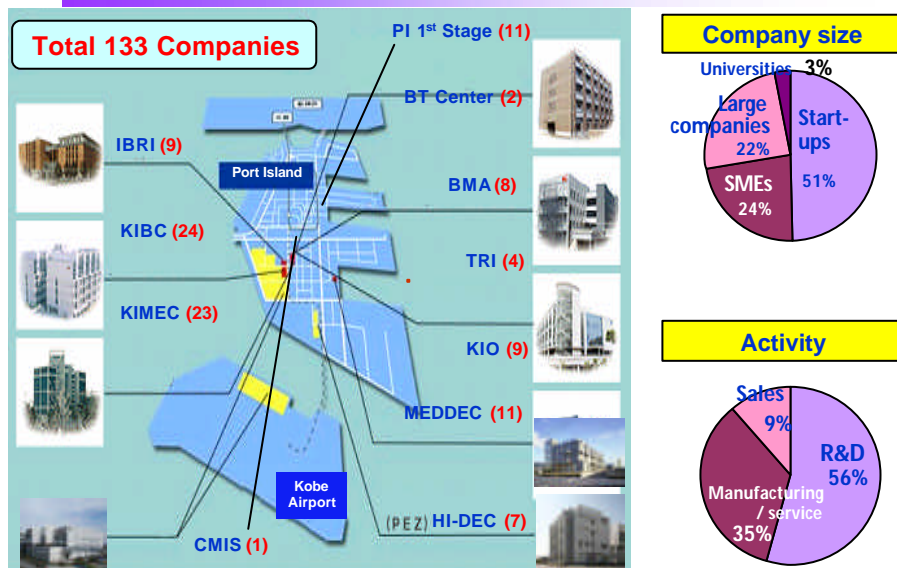
13

## Core facilities of the Kobe Medical Industry Development Project



14

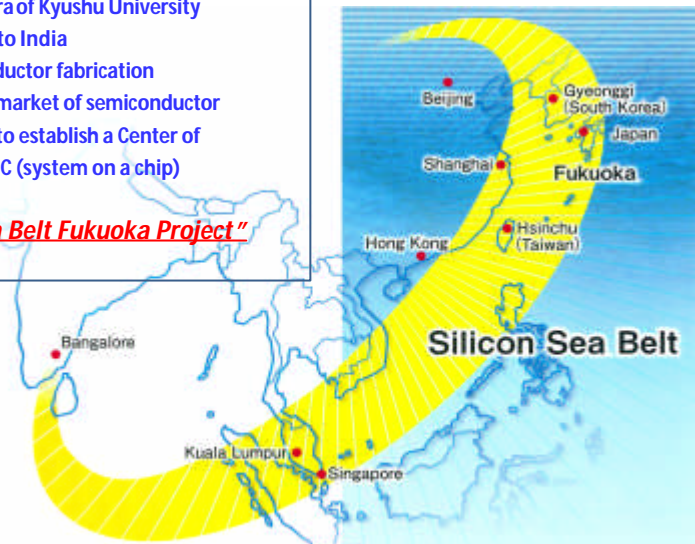
## Companies newly invited to Kobe City by the Kobe Medical Industry Development Project



15

## Silicon Sea Belt

- Named by Prof. Yasuura of Kyushu University
- Wide area from Japan to India
- The center of semiconductor fabrication
- Also the world largest market of semiconductor
- Fukuoka is addressing to establish a Center of Excellence (COE) for SoC (system on a chip) design in this area
- that is ***“Silicon Sea Belt Fukuoka Project”***



16

## Silicon Sea Belt Fukuoka Project

- Started in 2000***  
Mainly initiated by Fukuoka Prefecture (Governor Asou) and Kyushu University (Prof. Yasuura)
- Motivation***  
Kyushu was named *“Silicon Island”* in 1970s for the agglomeration of large semiconductor assembly plants. But being threatened by catch-upping Asian countries, Kyushu should change its role in the Silicon Sea Belt countries.
- Vision***  
Keeping the leadership in SoC design  
Bridging between system design and fabrication technology
- Strategy***
  - 1) **Aiming COE of new SoC design technologies**  
- Through the most advanced R&D activities supported by the *Knowledge Cluster Initiative* of MEXT
  - 2) **Accumulating human resources**  
- Training design engineers at the System LSI College (about 1,000/year)
  - 3) **Agglomerating enterprises related to SoC design and verification**  
- 156 enterprises (129 start-ups or SMEs, 27 large companies since 2000 to 2008)

17

## **“Regional Industry Revitalization Project” by the Kanto Bureau of METI**

•“Regional Industry Revitalization Project” by the Kanto Bureau of METI is one of the 18 projects under the Industrial Cluster Program .

• Targets of this project are manufacturing industry SMEs, mainly “**Product-developing SMEs**” which have designing capabilities, their original products in their sales and wish to create new products. Another type of the target is “**Parts-processing SMEs,**” which have not only highly skills but also will to utilize their skills for new business chances.

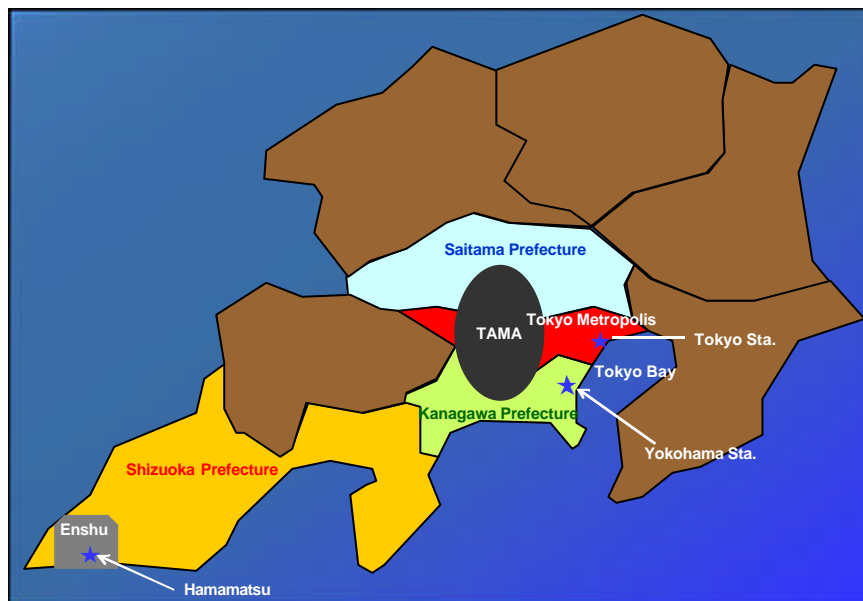
• The Kanto Bureau of METI designated 6 incumbent agglomeration areas where target SMEs were densely located.

•“TAMA ”and “Enshu region” are the representative areas of these 6 from the view points as below;

- 1) In Tama, “**Product-developing SMEs**” are highly agglomerated. On the other hand, Enshu region is still lively area for its automobile industry and there are many subcontracting SMEs.
- 2) In these two areas, there are **well-developed industry-government-academia networks** for regional innovation and various activities which are very creative and can be the model for other regions under the strong initiatives of local players (**good combination of top-down policy and bottom-up initiatives**).

18

## **The locations of TAMA and Enshu**



19

## History of TAMA area and TAMA Project

•TAMA is a suburban area of the Greater Tokyo Metropolitan Area. It takes about one hour to go by train from the Tokyo Station to Hachioji, the central city of TAMA area.

•Because of land price soar, land scarcity and regulation for expanding factory space, many "Product-developing SMEs" as well as large electric and electronic companies moved from the center of Tokyo or the bay area between Tokyo and Yokohama since the later half of 1960s to 1980s. In the same period, a lot of universities abandoned expanding their old campuses located in the center of Tokyo and established new ones in TAMA area for the similar reason as companies.

• At present, the value of manufactured product shipment accounted about ¥ 19 trillion in 2006 and there are 38 universities that have departments of science and technology. There are also more than 100 R&D divisions of large companies.

•However, until recently "Product-developing SMEs" in TAMA area did not develop tight and close relationships each other. There was no active interaction between SMEs and universities.

•The Kanto Bureau of MITI identified the characteristics of TAMA (the concentration of "Product-developing SMEs" etc.) in the report (1997) based on the joint study with Tokyo Metropolis, Saitama Prefecture and Kanagawa Prefecture.

•The Kanto Bureau of MITI proposed establishing an organization to intermediate university-industry and inter-firm linkages. In 1998, the TAMA Industrial Vitalization Council was established as a voluntary non-profit organization with 328 members including 193 firms.

•In 2001, the Council was reorganized as an incorporate body: "TAMA Industrial Vitalization Association Inc." TAMA is the abbreviation of "Technology Advanced Metropolitan Area" and also the name of the geographic area.



20

## History of Hamamatsu and San-En-Nanshin Project

•Hamamatsu, the central city of the Enshu region, is the center of typical industrial agglomeration. Before WW II, manufacturing industries, such as loom and musical instruments, flourished. SUZUKI, automobile company, started as a loom manufacturer. YAMAHA, famous for piano, was born in Hamamatsu. HONDA started its business as a motorcycle company in Hamamatsu after WW II.

•There had been many independent "Product-developing SMEs" till 1970s. But in 1980s, according to the growth of automobile industry, many SMEs strengthen the character as a subcontracting firm of the specific large company.

•SMEs in Hamamatsu have been positive for mutual cooperation historically. Right after WW II, many SMEs took part in voluntary financial mutual aid systems because financial institutions were not fully developed. In these environments, cross-industrial collaborations (joint product-development activities among the member SMEs) have been very active in this area. In 1980s, MITI launched so called Technopolis policy and Hamamatsu was designated for one of the 26 regions. Hamamatsu mainly focused its Technopolis activities in the field of cross-industrial collaborations among SME members.

•In the early 1990s, the growth of manufacturing industry stagnated because of overseas production expansion and slow domestic demand growth. In 1994 the Committee of Countermeasures against Hollowing-out made an proposal for fostering next generation industries. In its report, optoelectronic industry was strongly recommended to be focused on.

•At present, Enshu region has a plan to develop "Hamamatsu Optronics Cluster" through R&D supported by the Knowledge Cluster Initiative of MEXT.

•Also the Hamamatsu Branch of the San-En-Nanshin Vitalization Promotion Council has eagerly engaged in the new type cross-industrial collaborations through the 4 workshops involving large companies and academia under the Industrial Cluster Program of METI.

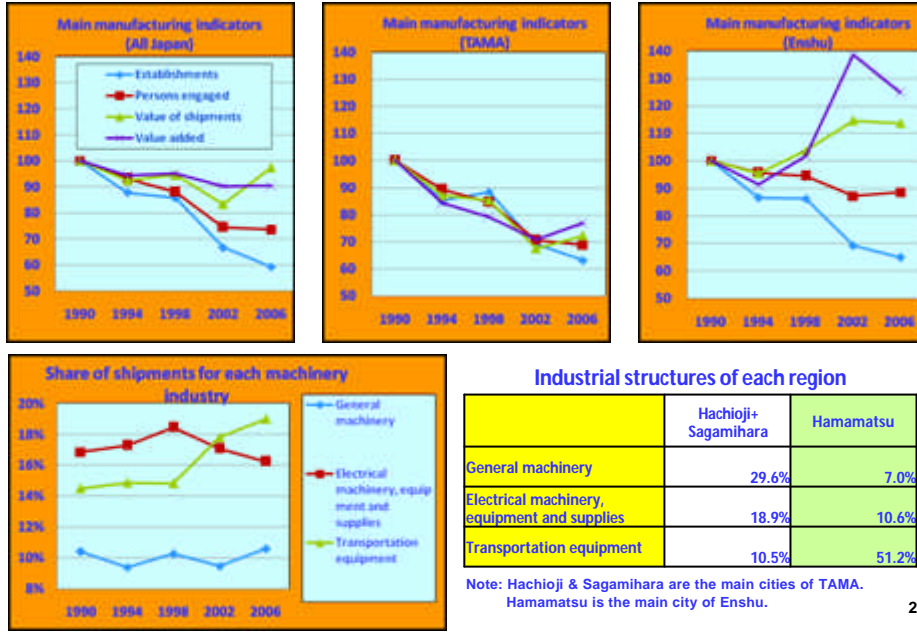
\* San-En-Nanshin is the name of greater region including En(Enshu).

\*\* The value of manufactured product shipment of Enshu region accounted about ¥ 6.4 trillion in 2006.

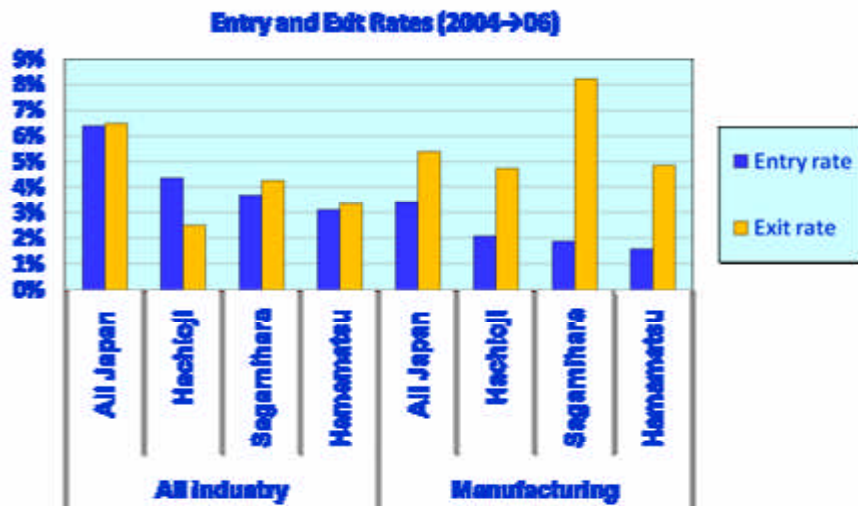


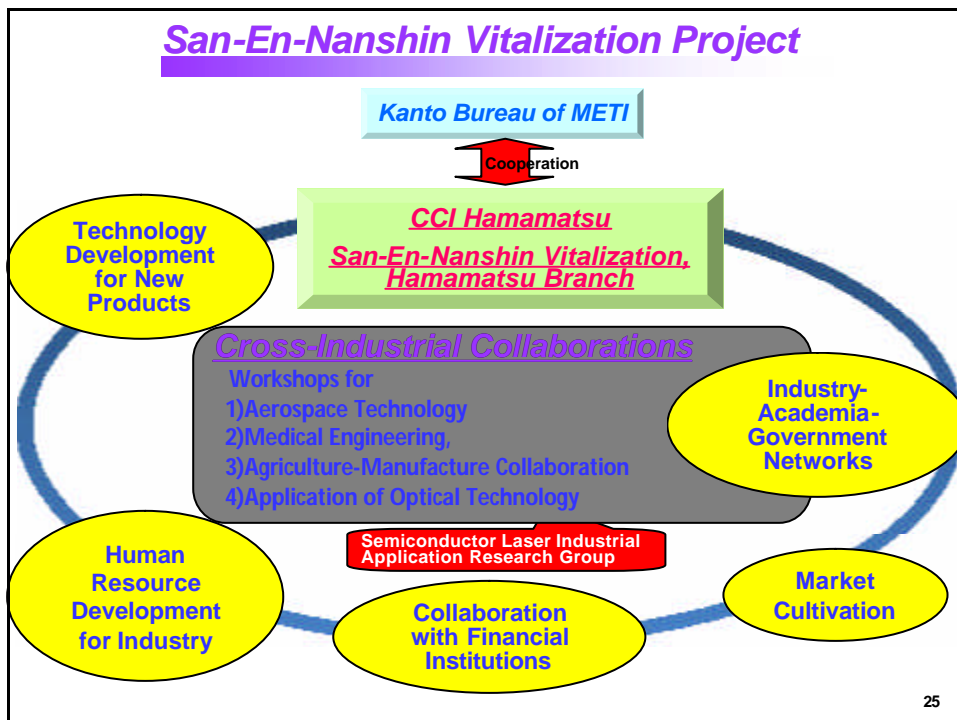
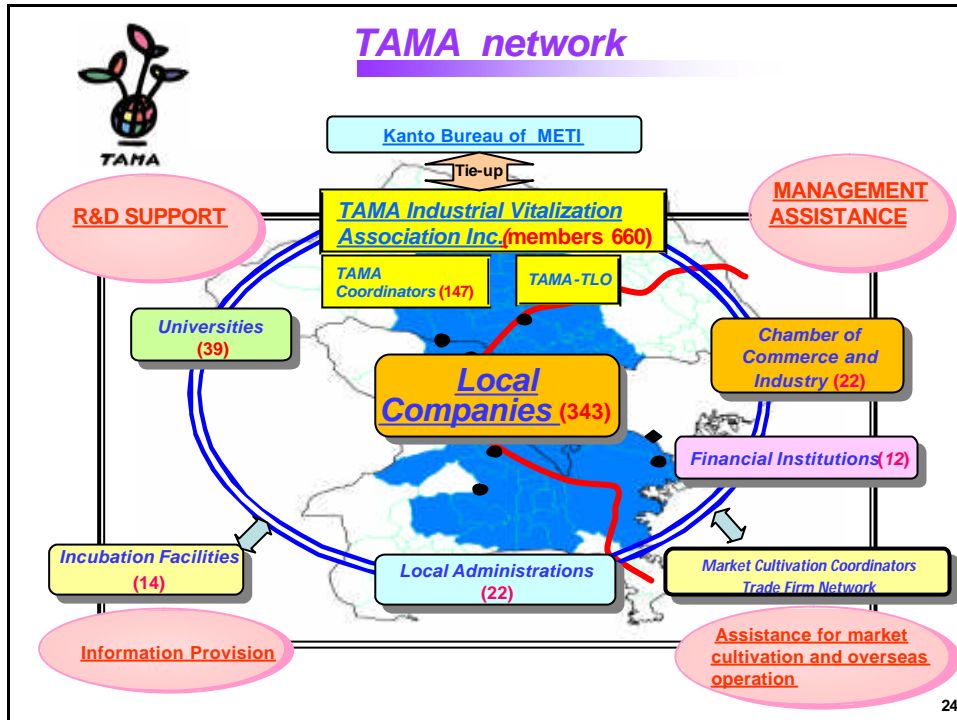
21

**Present circumstances of TAMA and Enshu as an agglomeration**



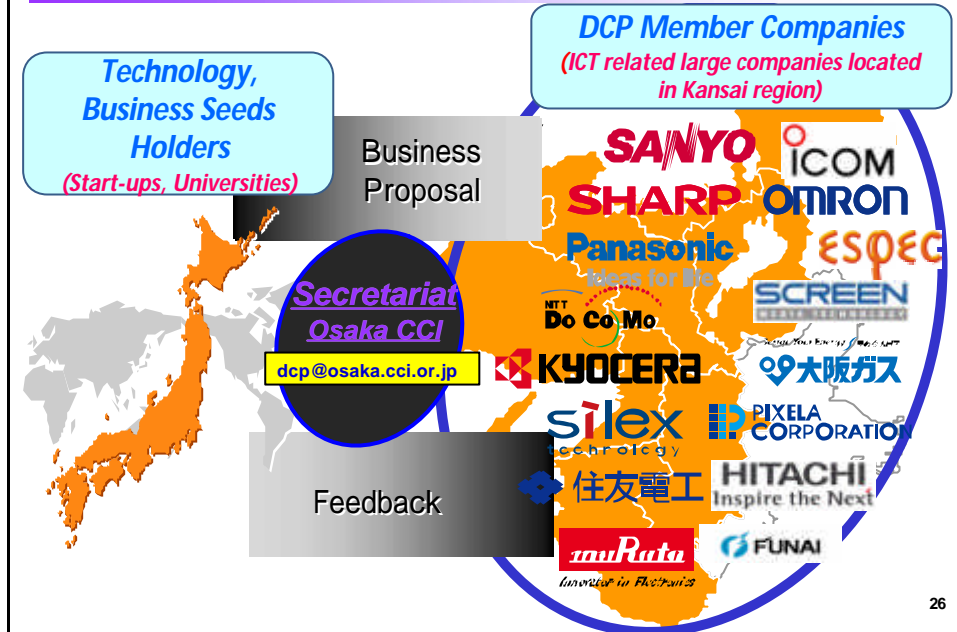
**Present circumstances of TAMA and Enshu as an agglomeration**





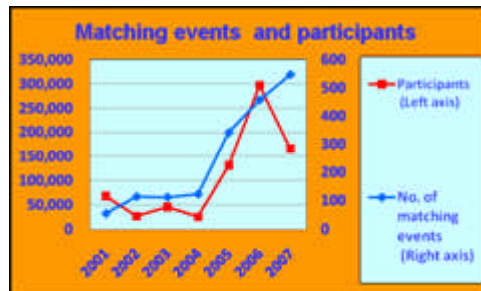
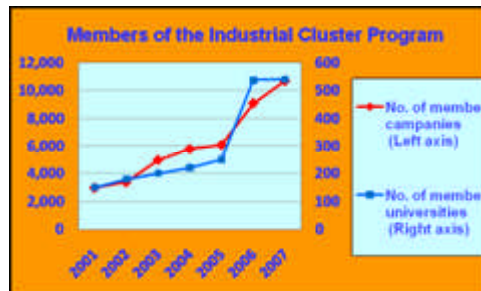
## DCP (Digital Concept Partners)

:Unique matching system between start-ups and large companies



26

## Utilization of the Industrial Cluster Program



27

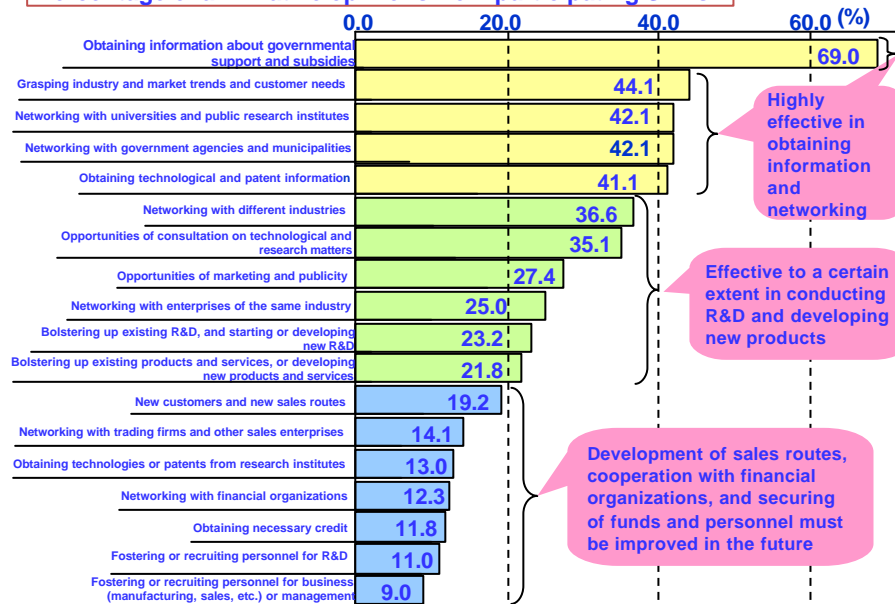
## Performance of participating SMEs



28

## Monitoring survey as of January 2005 (by METI)

### Percentage of affirmative opinions from participating SMEs



29

### Three target terms of the Industrial Cluster Program

Term I (2001-2005)

Industrial cluster launch period



Term II (2006-2010)

Industrial cluster development period



Term III (2011-2020)

Industrial cluster autonomous growth period

30

### Important issues to be solved toward the next term of the Industrial Cluster Program

#### 1. Two types of "JIRITSU"

- JIRITSU (自立) = "**independent**"  
= not too much depending on the financial support from the government
- JIRITSU (自律) = "**autonomous**"  
= creating some sort of chain reactions for innovation from the industry-government-academia networks established by the Industrial Cluster Program

#### 2. Increasing the productivity of product innovation and expanding the markets for such new products

#### 3. Establishing a sort of "policy identity" of the Industrial Cluster Program

- Thorough utilizing PDCA cycle, also review of evaluating criteria to be necessary
- Strategic focusing of targets (type of SMEs, activities, regions etc.)

31

## References

- Audretsch, D., O. Falck, M. Feldman and S. Heblich (2008), "The Lifecycle of Regions," CEPR Discussion Paper No. 6757.
- Kodama, Toshihiro (2002), "Industry-Academic and Inter-corporate Collaboration in TAMA (Technology Advanced Metropolitan Area)", RIETI Discussion Paper Series 02-E-014.
- Kodama, Toshihiro (2008), "The Role of Intermediation and Absorptive Capacity in Facilitating University-Industry Linkages – An Empirical Study of TAMA in Japan," Research Policy 37 (1224-1240).
- Kobe City, "The Kobe Medical Industry Development Project," <http://www.city.kobe.jp/cityoffice/06/015/iryo/index.html> (English contents inside).
- METI, "Industrial Cluster Program," <http://www.cluster.gr.jp/index.html> (English contents inside).
- MEXT, "Knowledge Cluster Initiative," [http://www.mext.go.jp/a\\_menu/kagaku/chiiiki/cluster/index.htm](http://www.mext.go.jp/a_menu/kagaku/chiiiki/cluster/index.htm) (English content inside).
- TAMA Association: [http://www.teamweb.ne.jp/TAMA/index\\_v3\\_e.html](http://www.teamweb.ne.jp/TAMA/index_v3_e.html).
- Venohr, B. K. Mayer (2007), "The German Miracle Keeps Running: How Germany's Hidden Champions Stay Ahead in the Global Economy," Working Paper 30, FHW Berlin.