

# Nakagawa Report

~ Toward a Sustainable and Competitive  
Industrial Structure ~  
**(Summary)**

May, 2004

Ministry of Economy, Trade & Industry  
(METI)

# Main Points of the Nakagawa Report

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## Aims

- ❖ Recovery of the Japanese economy has gradually come into view, as a “virtuous cycle” of demand and innovation has been created in such areas as digital consumer electronics (including flat panel display television sets), while corporations have gone forward with structural reform efforts and become more positive with regard to new investment. In order to solidify this trend toward recovery, it is necessary to dynamically reform Japan’s industrial structure, by reviving its strong manufacturing base and developing service industries which create employment. This report aims to define industrial policy to create and accelerate the virtuous cycle, based on this vision for the country’s future industrial structure.
- ❖ Japan does not have as much technological advantage in manufacturing as is often thought, even taking into account digital consumer electronics and fuel cells. Traditional advantages found in the people and culture of Japan have less impact when they come to be taken for granted. Now is the time to reconfirm Japan’s strengths, and take appropriate measures.

## Analytical Method

- ❖ This report is based mainly on analysis of actual conditions—rather than of statistics—which are currently present in the workplace, as well as studies of the strengths and problems recognized by people engaged in business activities and regional revitalization. (METI staff made more than 100 business trips, visiting some 300 companies and other institutions, and interviewing over 700 people.)

## Fundamental Concepts

- ❖ It is important to make the transition from recent policies focused on the promotion of restructuring—such as the retirement of excess capacity—to policies that encourage dynamic positive investment, including not only capital investment, but also investment in human resources and intellectual property. In this context, we intend to:
  - *Establish technologies and industries which will ensure a leading position for Japan in world markets for the next 20-30 years, by coordinating cutting-edge technologies—for example, nanotechnology, IT, and biotechnology—with traditional Japanese technologies, techniques, and craftsmanship. To this end, we will place a priority on investment in human resources and R&D.*
  - *Fully utilize already-developed technologies, and emphasize their preservation.*
- ❖ Market-oriented industrial policy should promote “a common future outlook or vision, and integration of measures and objectives” among relevant stakeholders, including industry, government, educational institutions, and local communities. Therefore, we will:
  - *Facilitate and promote integration of measures and objectives in all aspects: between industry and government; between industries (either between upstream and downstream industries, or between upstream industries); between governments (either between ministries, or between central and local governments.)*

# The Three Perspectives and the Three Pillars

## Issue 1: How to ensure global competitiveness?

(Issues)

- ❖ Intense global competition
- ❖ Growth of Asian rivals

(Advantages and opportunities)

- ❖ Japan as a land of “concentration of advanced component and material industries” in Asia
- ❖ Power of integration or *Suri-awase* function of the manufacturing industry
- ❖ Expansion of Asian markets
- ❖ Ability to export culture to the world through contents industry

The three pillars of the comprehensive policy approach

**Cutting-edge industry areas with strong global competitiveness**

## Issue 2: How to respond to the demands of society?

(Issues)

- ❖ Declining birthrate and aging population (fiscal deficit/public burden)
- ❖ Environmental and waste issues
- ❖ Safety issues

(Advantages and opportunities)

- ❖ Expansion of the senior market
- ❖ Advanced energy conservation and environmental technology
- ❖ Expanded utilization of IT

**Industry areas that meet market needs arising from changes to society (service industries, etc.)**

## Issue 3: How to end regional economic stagnation?

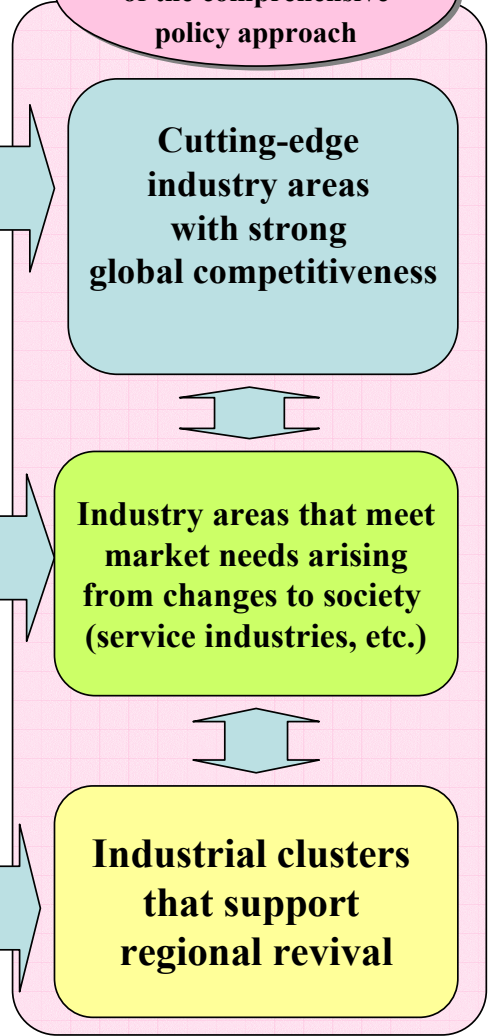
(Issues)

- ❖ Declining population
- ❖ Declining birthrate and aging population
- ❖ Decline in number of public works projects

(Advantages and opportunities)

- ❖ Resources and networks unique to regions and regional communities
- ❖ Advanced technical research and manufacturing industries

**Industrial clusters that support regional revival**



## Cutting-edge Industry Areas

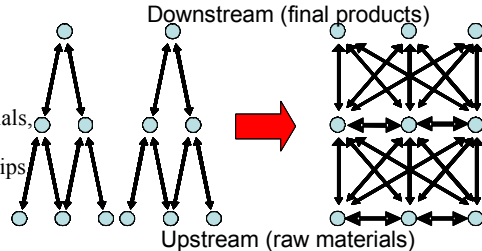
### (1) Current Situation

#### ❖ Japan, a land of “concentration of advanced component and material industries,” a nucleus of Asian digital manufacturing

- A unique industrial complex or a “concentration of advanced component and material industries” is formed in Japan, which provides strong base for Asian manufacturing.
- Quick and advanced “integration” of technology elements (e.g., precision processing and composition of special materials) is possible at the manufacturing worksite, which is essential to manufacturing and continuous innovation.

#### ❖ Development of meshed business relationships

- In the recession during the 1990s, intense competition in each stage – downstream (final products), midstream (components and processes materials) and upstream (raw materials) - led to a major change on the formerly simple serial subcontracting structure. Business relationships became multi-dimensional and developed into a so-called “mesh structure”.
- In recent years there has been new type of cooperation among midstream companies and among upstream companies.
- While the competitiveness of downstream products declined, upstream and midstream manufacturers of processed materials, components and equipment have expanded their business relationships with overseas manufacturers in South Korea, Taiwan, etc.



#### ❖ An “integration chain”, a basis for continuous innovation

- As technology matures and mass production systems become established, the modularization and subdivision of processes proceed, while the innovation for the next new products requires integration or “suri-awase” of various technologies or skills.
- The “chain of integration” in Japan enables one innovation from another. Such a chain is possible only when there is a thick concentration of advanced component and material industries. It explains why Japanese companies can respond skillfully to new markets.
- On the other hand the inevitable modularization requires companies to build the most suitable global production system in a short period of time. It is essential to prepare for economic partnership agreements (EPA), etc.

### (2) Advantages

- ❖ Diligent efforts and tenacity by the manufacturing sector to address technological challenges
- ❖ Entrepreneurial spirit and skill which uses crises and changes as a springboard for new challenges
- ❖ Close-knit communication, speed, and meticulousness
- ❖ Environment in which importance is placed on trust in long-term business relationships
- ❖ Existence of a domestic consumer market which demands high-quality products

### (3) Issues

- ❖ Establishment of an intellectual property strategy and prevention of unintentional technology drain
- ❖ Ensuring profitability, establishment of quality brands
- ❖ Lack of speedy decision-making
- ❖ Overcoming of the adverse effect of the long-term employment and personnel system
- ❖ Collusion and moral hazard due to long-term relationships
- ❖ Strengthening of industry-academia cooperation
- ❖ Promotion of new business start-ups
- ❖ Rebuilding of international marketing strategy

## New industry areas to meet the expanding market needs

### (1) Current Situation

#### ❖ Meeting the needs of seniors is a key aspect of the service industries for individuals

- There are some companies that recognize the rapid aging of society as a business opportunity and are switching to a marketing strategy centered on the senior generation, that with the most free time and disposable income
- There are some business models in which vigorous seniors work energetically and with motivation in the service sector as supporters of NPOs, etc.

#### ❖ Creation of new markets through responding to constraints imposed by environmental and natural resource issues

- Environmental and energy constraints, such as global warming, the waste problem, and the handling of hazardous chemicals, are in one sense creating new environmental markets such as energy-saving products and services, and development and provision of environmentally friendly products. International competitiveness of Japanese manufacturing and services in this field can be strengthened.

#### ❖ Service industries for businesses which are currently going through a major stage of development

- Services for businesses, which receive commissions to do some of the work of companies, are currently undergoing major developments, as companies turn more to outsourcing as a result of business reconstruction
- A emerging trend is to separate or make independent back-office departments to form new subsidiaries providing services to businesses

### (2) Advantages

#### ❖ The rapid aging of society in developed countries

- Already 40% of the total population is over 50 years old. In 20 years this figure is expected to reach nearly 50%.

- If industry in Japan can develop and establish a new business model to meet the needs of seniors, as a world frontrunner, it may be able to obtain a large competitive advantage in world markets where the aging of society will occur later than in Japan.

#### ❖ The existence of domestic customers who demand a high level of product and service quality

- Existence of domestic customers who demand a high level of product and service quality can improve the quality of services and make the service providers more competitive, while the review of regulations and customary practice reinvigorates competition.

#### ❖ The possibility of exporting Japan's business model and services utilizing IT to the growing Asian market

- If a competitive business model can be established, there will be an increased potential for the export of services to a growing Asian market facing an aging society, and for the export of services utilizing IT.

### (3) Issues

#### ❖ Improving the quality of hospitality

- It is necessary to review the regulations, systems, and customary practices that are an impediment to business innovation in the service sector and pursue improved quality in the hospitality industry. It is necessary to develop and disseminate ex post evaluation systems that can replace ex ante regulations.

#### ❖ Ensuring high quality human resources

- It is necessary to improve the quality of human resources by phasing in the formatting / standardization / systematization of service technology (create "service engineering").

## Industrial clusters for regional revitalization

### (1) Current situation

- ❖ **New businesses beginning to grow in the regions, sign of clusters formation**
  - Overall, the decline of the regional economies is continuing and in some regions the local towns are losing their vigor
  - On the other hand, attractive new regional businesses are in progress in some areas where local governments, universities, and NPOs gather together to support them, forming distinctive clusters.
- ❖ **Growth of “regional brand” activities**
  - Cooperation within local communities to develop brand strength of outstanding local technologies and product is gaining momentum
  - The existence of brands is creating a virtuous cycle by boosting demand for products in regions, attracting excellent businesses, human resources and investment, and increasing regional strength.
- ❖ **Formation of a horizontal trust network based on the local community and expansion of cooperative efforts based on the network**
  - In order to promote new businesses and regional brands, horizontal coordination networks are being built within regions. Specific forms of cooperation are being carried out, such as sharing of knowledge and human networks, joint receipt of orders, amalgamation of technology and sales outlets, standardization of product quality and production methods, and the linking between revitalization of local towns and the promotion of new businesses.
- ❖ **Universities that are expanding their contribution to the creation of new industries**
  - Cooperation with universities is very important for revitalizing regions
  - Universities are taking advantage of the opportunity presented by the development of an industry-academia cooperation system and the corporatization of universities to take a more positive step towards cooperation with industry and local governments.

### (2) The secret of success

- ❖ **Enhancing transparent and credible networks**
  - “Transparent and credible networks” are necessary to bring in new participants, knowledge, and ideas based on relationships of trust between individuals. When building such networks, the role of the coordinators is extremely important.
- ❖ **Having a comprehensive regional strategy built on the distinctive industrial structure, traditions, and culture of regions**
- ❖ **Developing new products and services and building regional brands through cooperative efforts based on local communities**

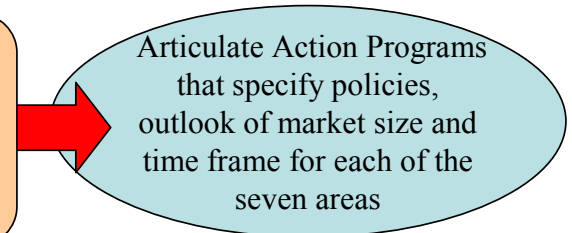
### (3) Issues

- ❖ **Precise understanding of the resources in regions**
  - There is insufficient knowledge regarding the value of technology accumulation by small and medium-sized enterprises, university education and research functions, traditional handicrafts, local foodstuffs, old towns, etc.
- ❖ **Building a horizontal network**
  - In many regions the former vertically divided structure (subcontracted business relationships, etc.) remains entrenched. It is necessary to build a horizontal network.
- ❖ **Enhancing industry-academia cooperation**
  - Industry is not sufficiently utilizing the research achievements of outstanding regional universities, in particular in fields related to biotechnology and medical care.

# Seven Promising Industry Areas and Four Regional Clusters 6

[Criteria for seven industry areas]

- a) Areas with significant importance for the future the Japanese economy
- b) Areas with strong domestic need that will contribute to the demand-led growth of the economy
- c) Areas that have a broad base, from final products to raw materials, from large corporations to medium-and small-sized enterprises, and from large urban cities to regions, and that can take advantage of the strengths of Japan's industrial concentration
- d) Areas where the market mechanism alone cannot ensure the development, a comprehensive policy package is necessary with joint efforts by public and private sector



## [Cutting-edge industry areas]

### Fuel Cells

- Expected large markets for use in automobiles and in the home
- Key for environmental policy
- Challenges in durability and cost for commercialization

### Digital Consumer Electronics

- Integration industry where Japan has strength
- Creation of advanced technology and market
- Challenges in vertical coordination, technical development, human resources and intellectual property protection

### Robots

- The need for robots to assist or take place of people such as support for nursing care, disaster relief and security guards and other operations people cannot perform
- Japan's strength in technology
- Challenges in market creation, technical development and regulations

### Content

- Expected significant growth, along with digital consumer electronics
- Expansion of Japan's contents industry has influence on the culture and market of the world
- Challenges in distribution, human resources, fund procurement, etc.

## [New industry areas to meet expanding market needs]

### Health and welfare devices and services

- Establishment of a healthy long-lived society
- Social participation of the elderly
- Welfare with minimal financial burden
- International expansion of health industry
- Challenges in regulatory reform, IT, bio-technology, etc.

### Environment and energy devices and services

- Recovery of clean water, air and soil
- Development of devices and services with advanced environmental and energy technology
- Challenges in regulations, technical development, information disclosure, etc.

### Business support services

- Separation and outsourcing of non-core operations due to business reorganization
- Expansion of new services utilizing IT
- Expected creation of employment
- Challenges in human resource development, quality and productivity

## [Industrial clusters for regional revitalization]

### Advanced high-tech industry

- Creation of regional system (industrial cluster)
- Promotion of technical transfer from universities
- Challenges in horizontal networking, industry-academia cooperation, integration of tradition and cutting-edge technology, and human resources development

### Development of new businesses in the manufacturing industry

- Latent potential of the region's manufacturing tradition and culture
- World-class "concentration of advanced component and material industries"
- Challenges in horizontal networking, product development, cultivation of the market and fund procurement

### Innovation in regional service industries

- Development of business with high added-value through unique appeals in tourism / visiting industry and health service industry, etc.
- Challenges in brand building and promotion of coordination with outside enterprises

### High value-added food industry

- Provision of safe and secure food and market cultivation
- Challenges in traceability, quality management, brand building, analysis of efficacy, technical development and industry-academia cooperation

**Innovative technology (nano-tech, bio-tech, IT, environment) and Japan's Tradition (craftsmanship, techniques)**

# Fuel Cells

## (1) Future Outlook

Market size in 2010 (outlook) » in 2020 (outlook)

Fuel-cell-powered cars:	50,000 units	5 million units
Fixed fuel cells:	2.2 million kW	10 million kW
Market size:	approx. 1 trillion yen	approx. 8 trillion yen

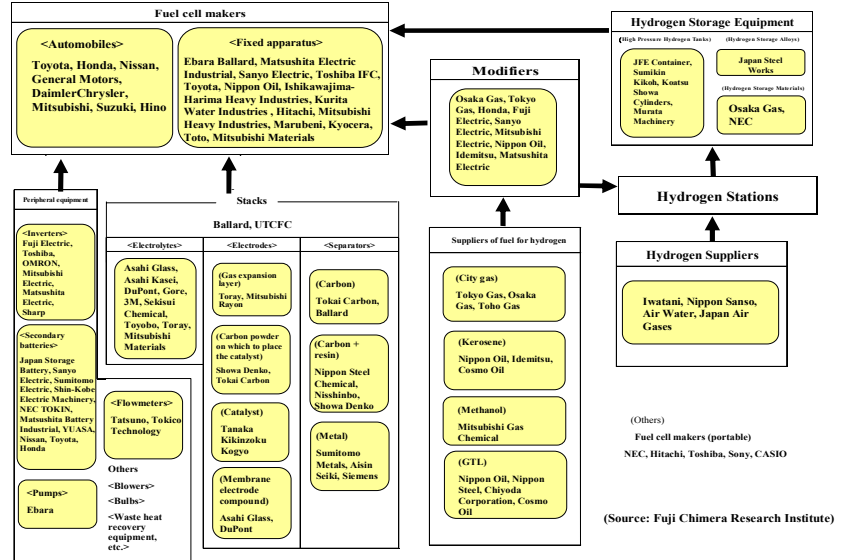
\*Portable fuel cells are expected to be introduced in addition to the above.

- ❖ Fuel cells are expected to gain a considerable market size given their characteristics of high efficiency, minimal noise and no emission of air pollutants or CO<sub>2</sub>. It is thought that they will have sufficient impact to transform the global automobile market, which marks annual sales of 50 million units in the future.
- ❖ Intense international competition for development of fuel cells is taking place within a broad range of industries including world-class automobile, home appliance and energy companies engaging in efforts for its practical application. Raw materials and parts industries such as chemicals and energy which support the above-mentioned companies are also engaging in these efforts.
- ❖ However, the cost is extremely high at this point and durability has not reached a sufficient level. For early commercialization of fuel cells, therefore, it is necessary to overcome such challenges as cost and durability through development of peripheral equipment from cutting-edge areas as well as appropriate integration conducted between upstream and downstream industries.

## (3) Action Program

- ❖ Formulation of new scenarios so that all companies concerned at each stage of development of fuel cells - body, material or parts - can work together for development and introduction of fuel cells.
- ❖ Further enhancement of technical development, from basic research to development of peripheral equipment.
- ❖ Acceleration of introduction of fuel cells, including hydrogen stations, towards early commercialization.
- ❖ Implementation of deregulation necessary for commercialization of fuel cells.
- ❖ Establishment of a framework for international cooperation on fuel cells.

## Industrial Structure and Examples of Companies Involved in Fuel Cells



## (2) Current Situation and Challenges

❖ Currently at the stage of limited automobile manufacturers starting sales of fuel-cell-powered cars and there are companies that have announced sales of fixed fuel cells to begin after this fiscal year.



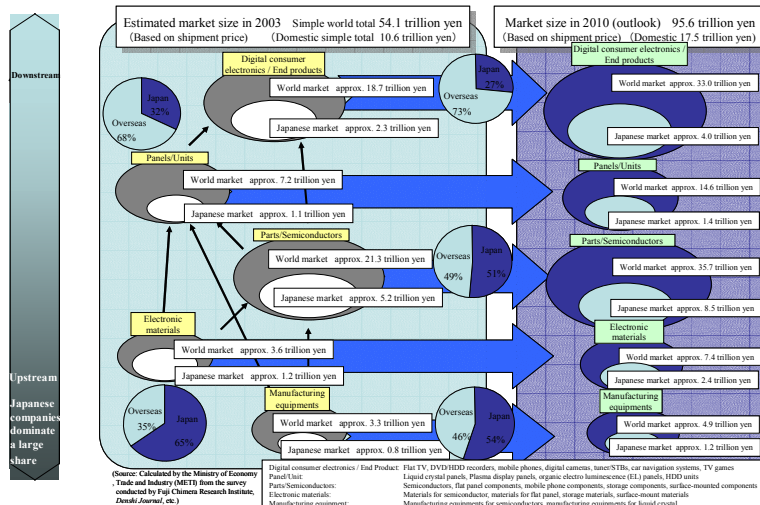
# Digital Consumer Electronics

## (1) Future Outlook

Market size in 2003 » in 2010 (outlook)

World: approx. 54 trillion yen      approx. 96 trillion yen  
 Japan: approx. 10 trillion yen      approx. 18 trillion yen

(Total sum derived from the simple calculation of adding together end products, panels/units, parts/semiconductors, electronic materials and manufacturing equipment markets.)

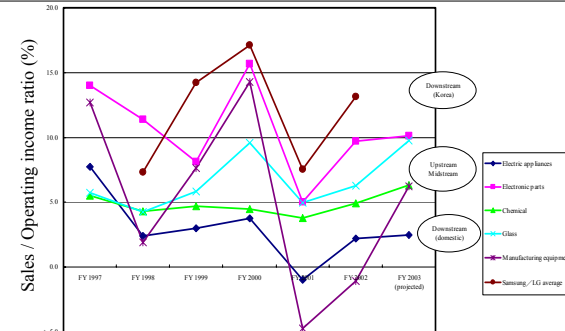


## (2) Current Situation and Challenges

- ❖ Related industries ranging from upstream (raw materials industry) to downstream (end products industry) spread all over Japan. New products and markets are continuously being created through careful “integration.”
- ❖ In particular, there is high global competitiveness among midstream (parts industry) and upstream industries which led to the formulation of a “concentration of advanced component and material industries.”
- ❖ The end products industry in East Asia has rapidly caught up through drastic and prompt investment decision-making while taking advantage of the merits of Japan’s “concentration of advanced component and material industries.” Further, they have developed high profit ratio operations.

## Comparison of Japan and Korea on trends in operating profit margins of industries related to digital consumer electronics

- There is a clear trend of upstream (materials, etc.) and midstream (parts, etc.) industries enjoying higher operating profit margins than downstream industries (electronic appliances).
- Nevertheless, the Korean major electronic appliance industries mark even higher operating profit margins.



Source: Survey conducted by Fuji Chimera Research Institute (commissioned by the Ministry of Economy, Trade and Industry (METI))

On a consolidated basis. Companies included in the calculation are as follows:  
 •Electric appliances: Hitachi, Toshiba, Sony, Panasonic, NEC, Fujitsu, Mitsubishi Electric, Sharp  
 •Electronic parts: Kyocera, Murata Manufacturing Co., TDK, Alps Electric Co., Rohm, Nitto Denka, Nide Corporation  
 •Chemicals: Mitsui Chemicals, Sekisui Chemical, JSR, Dai Nippon Printing Co. (DNP), Toppan Printing Co., Showa Denko, Nateco Co.  
 •Glass: Asahi Glass Co., Nippon Electric Glass, Nippon Sheet Glass, Central Glass Co.  
 •Manufacturing equipment: Tokyo Electron, ACCRETECH-Tokyo Seimitsu, Yokogawa Electric, Dainippon Screen Mfg. Co., Advantest, Shibuya Kogyo Co., SPS Electronics Co.

## (3) Action Program

- ❖ Development of common business scenarios (roadmap) of future digital CE to maintain and enhance vertical collaboration among upstream, midstream and downstream industries
- ❖ Classification of standardization issues and strengthening of activities in international standardization fora
- ❖ Development of highly skilled human resources who will take charge of development of built-in software and vertical integration
- ❖ Encouragement of business reorganization and restructuring to improve profitability and to accelerate decision making

## (1) Future Outlook

Market size in 2003 » in 2010 (outlook)  
 Market size: approx. 500 billion yen      approx. 1.8 trillion yen

Market size in 2025 (outlook)      approx. 6.2 trillion yen

## (2) Current Situation and Challenges

- ❖ Industrial factory robots account for the majority of the current market. With regard to non-industrial robots, a limited number have been commercialized for home entertainment robots. However, they account for only a minimal share. Robots other than these are at demonstration or experimental phase and, in most cases, specific market launch dates have not been decided.
- ❖ The current situation lacks a comfortable match of cost, function and technology, and also lacks a clear image for initial practical application.

Example of robots at the demonstration stage



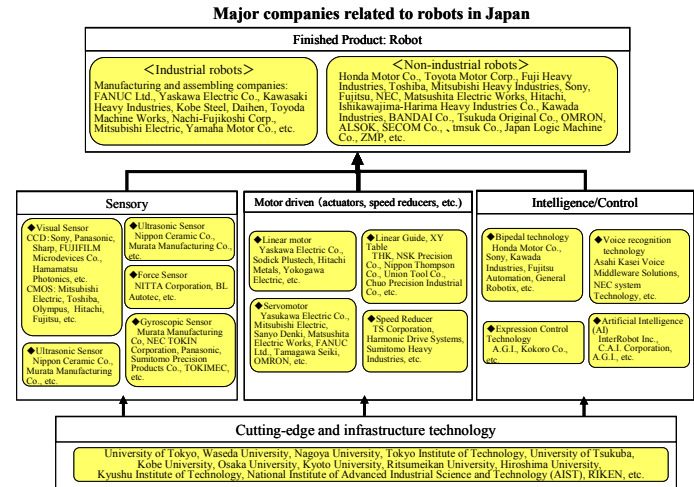
tmsuk: Enryu



Toyota: Partner Robot

- ❖ Robots requires a broad range of technology including a actuator unit, sensing technology, information processing (artificial intelligence) technology, and software technology, as well as technology to integrate all these into a single system. Japan is one of the leading groups in the world along with the US and Europe, with main focus placed on bipedal technology.

- ❖ In addition, the parts industry and precision machining industry have spread widely in Japan that can manufacture parts and materials used as components in robots. This makes Japanese robotics companies to take advantage of the strength of its industrial concentration.



## (3) Action Program

- ❖ Encouragement of development for initial practical application by advanced users through, for example, model programs in the medical care and disaster relief fields where demands can be led by public sector.
- ❖ Development of basic elemental technology and common infrastructure technology
- ❖ Development of a consensus on social acceptance of robotics safety, treatment under the Product Liability Law and various insurance systems, etc.

## (1) Future Outlook

Market size in 2001» in 2010(outlook)  
 Contents industry: approx. 11 trillion yen  
 (of which domestic market size of digital content)  
 approx. 1.9 trillion yen  
 Size of overseas export and licensing:  
 approx. 0.3 trillion yen

approx. 15 trillion yen  
 approx. 6.3 trillion yen  
 approx. 1.5 trillion yen

## (2) Current Situation and Challenges

❖ The world content market amounts to approximately \$824.1 billion. Its projected growth rate for 2006 is 6.5%. It is growing at a faster rate than the world GDP.

The World Market for the Contents Business in 2002 (Unit: billion dollars)

Media	World	United States	Japan
Movies	67.7	39.2	1.3 (170.9 billion yen)
Videos	-	-	3.2 (415.1 billion yen)
TV programs	107.3	37.0	23.1 (2,997.8 trillion yen)
TV distribution services	151.9	68.1	2.2 (292.4 billion yen)
Recorded music	38.4	14.3	4.6 (602.9 billion yen)
Karaoke	-	-	7.0 (908.5 billion yen)
Internet advertising and access fees	40.2	19.9	3.9 (509.1 billion yen)
Magazines	83.7	35.8	11.0 (1,426.1 trillion yen)
Books	85.3	30.1	7.5 (970.6 billion yen)
Newspapers	155.2	59.6	19.5 (2,534.3 trillion yen)
Radio and outdoor advertising	47.8	24.5	(250.5 billion yen)
Theme parks, amusement parks	17.8	9.6	3.6 (473.0 billion yen)
Video games	28.8	6.4	3.2 (413.1 billion yen)
Arcade games	-	-	4.3 (560.0 billion yen)
Total	824.1	344.5	96.3 (12,524.6 trillion yen)

(based on "Hyougen no Business" by Yasuki Hamano)

❖ Of all the animation programs broadcast on television around the world, 60% are made in Japan. "Zatoichi" directed by Takeshi Kitano won the Silver Lion at the Venice Film Festival and "Spirited Away" (Sen to Chihiro no Kamikakushi) directed by Hayao Miyazaki won the Academy Award in the United States.

❖ Content in itself is an intellectual property, so the contents industry has a major economic spill-over effect in comparison to other industries.

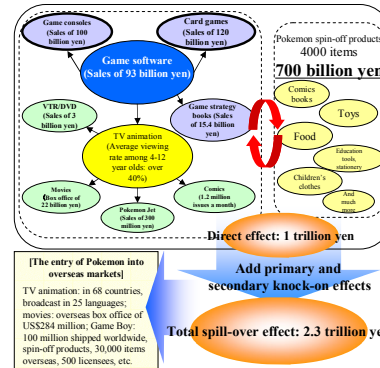
## Character Popularity Ranking

1	Crayon Shin-chan	74
2	Songoku	73
3	Doraemon	68
4	Detective Conan	57
5	Chibi Maruko-chan	53
6	Snoopy	49
7	Donald Duck	43
8	Mickey Mouse	39
8	Garfield	39
10	Sakuragi Hanamichi	37

The survey covered 1,000 men and women over 20 years of age residing in one of three Chinese cities (Beijing, Shanghai, Guangzhou)

Dec. 2001, Cyber Brains

## The economic spill-over effect of the popular Pocket Monster game



- ❖ In addition, content has various impacts such as improved understanding of culture and of the value of "Japan" as a brand which greatly contributes to Japan's international profile.
- ❖ There seems to be a tendency for the producers of these contents to rely on the distributors for fund procurement and marketing.
- ❖ The contents industry is currently structured in such a way that distributors are credited with the majority of added value and the producers who actually create the value of the content do not necessarily receive a return worth of their achievements.

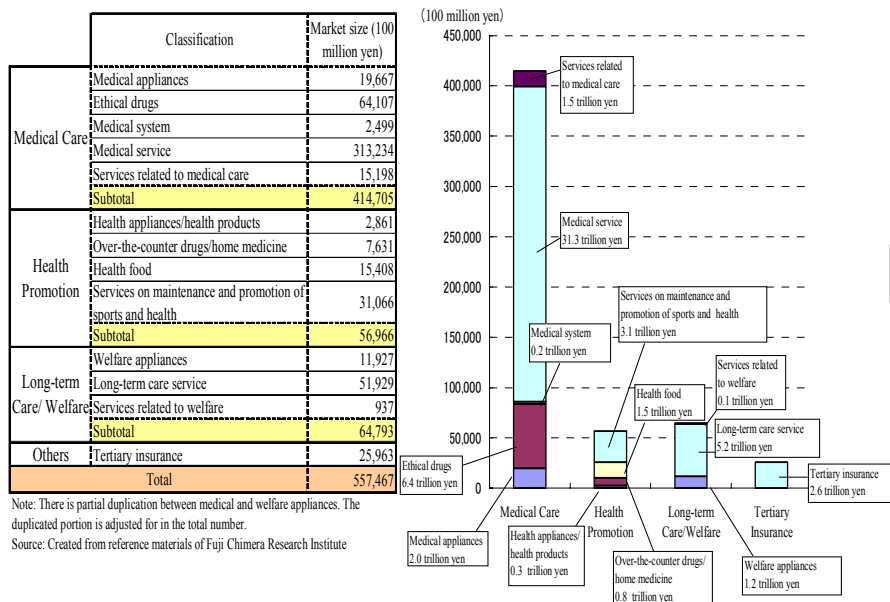
## (3) Action Program

- ❖ Encouragement of new market development through facilitating the international expansion of the content industry.
- ❖ Facilitation of dissemination of digital cinema.
- ❖ Establishment of a fair trade environment between the distributors and the producers.
- ❖ Facilitation of fund procurement for producers

## (1) Future Outlook

Market size and employment scale in 2002 » in 2010 (outlook)

Market size: approx. 56 trillion yen      approx. 75 trillion yen  
 Employment scale: approx. 5.51 million      approx. 7.5 million



## (2) Current Situation and Challenges

❖ The issue of highest interest and concern for the people is health. Further, given that Japan will experience the most rapidly aging population among developed countries in the near future, health-related industries are expected to expand through a significant increase in social security receipts and commercialization of medical care utilizing biotechnology.

- ❖ The employment creation to cover the demand of 10 billion yen is 1,022 persons in medical care, and 1,785 persons in nursing care, whereas it is 994 persons in public project. There are high expectations for the health and welfare industry to lead regional revitalization.
- ❖ New era of medical care and nursing care based on biotechnology.
- ❖ The current situation is that Japan had a late start in the introduction of advanced diagnostics when compared to Europe and the US and relies almost completely on imports for cutting-edge therapeutic apparatuses. As for welfare devices, there has been an increase in the need for user-friendly products and services that can be used by everyone, including the middle-aged and elderly.
- ❖ With regard to the resources of experts in the medical care and nursing care area, in which a labor shortage is expected in the future, the challenge is to secure labor power across borders.

## (3) Action Program

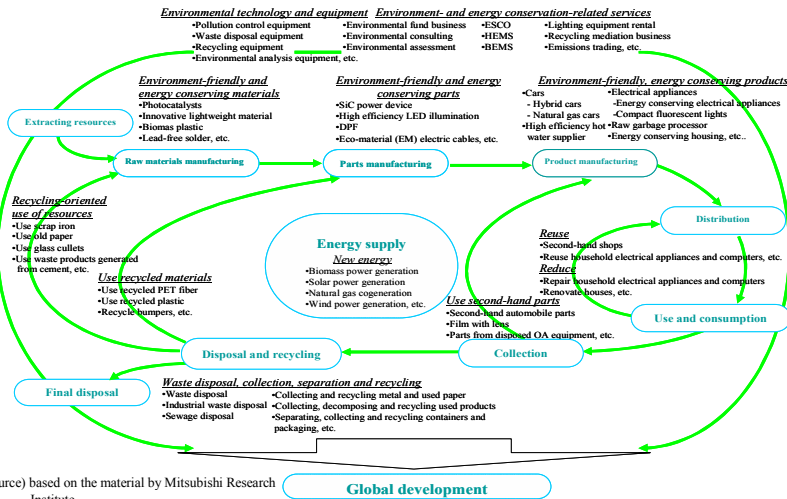
- ❖ Encouragement of health service industry development to meet the various health needs of the people with the aim of realizing a “country with healthy senior citizens.”
  - From the perspective of a) individual choice, b) positive health care with a sound basis and c) focus on prevention, encouraging comprehensive development of the health service industry through cooperation with a broad range of related industries.
- ❖ Steady implementation of the “e-Japan Priority Policy Program” such as promotion of electronic medical charts.
- ❖ Realization and dissemination of tailor-made and preventive medical care as well as regenerative medical techniques utilizing biotechnology.
- ❖ Development and dissemination of medical care and welfare devices utilizing Japan’s advanced manufacturing technology.
- ❖ Consideration of acceptance of overseas experts in the area of medical care and nursing care.

# Environment and Energy Devices and Services

## (1) Future Outlook

Market size and employment scale in 2001 » in 2010 (outlook)

Market size: approx. 52 trillion yen      approx. 78 trillion yen  
 Employment scale: approx. 1.44 million      approx. 1.91 million



❖ In order to realize the expansion of the environment/energy market, it is necessary to accelerate technological development, develop social systems and infrastructure and enhance global business development.



Recycling glass bottles



Solar power generation (TEPCO Fuji Service Center, Shizuoka Prefecture)

Wind power station (Tomamae Green Hill Wind Park, Tomamae-cho, Hokkaido)

## (2) Current Situation and Challenges

- ❖ Japan is facing with both environmental constraints, including global warming, waste management/recycling issues and resource/energy constraints. Such constraints are expanding globally as well. It can be said that such constraints sometimes create new markets, and companies that have responded to these constraints appropriately will acquire significant competitiveness.
- ❖ The environment/energy markets are not limited to recycling, environmental preservation, energy conservation and new energy devices. It should be expanded to the entire supply chain, including raw materials manufacturing, parts manufacturing and distribution. By responding to the needs of customers and consumers, further expansion of environment/energy market will be achieved.

## (3) Action Program

- ❖ Acceleration of technological innovation that will be the key to the breakthrough for environment and energy constraints
- ❖ Creation and expansion of the environment/energy markets through improving rules, disclosure of information, government procurement, etc.
- ❖ Promotion of global business development and market expansion

## (1) Future Outlook

Market size and employment scale in 2002 » in 2010 (outlook)

Market size: approx. 76 trillion yen      approx. 107 trillion yen  
 Employment scale: approx. 6.27 million      approx. 7.5 million

Business services	Amount of domestic production (trillion yen)	Number of persons employed (10,000 persons)
	2000	
<b>Advertising and survey and information services</b>	24.1	
Advertising	9.1	
Survey and information services	14.9	
<b>Equipment rental and leasing services</b>	12.7	
Equipment rental and leasing (except automotive rentals)	11.0	
Automotive rentals	1.6	
<b>Automobile and equipment repair</b>	12.8	
Automobile repair	6.7	
Equipment repair	6.1	
<b>Other business services</b>	26.7	
Building services	4.2	
Legal, financial and accounting services	2.7	
Engineering and architectural services	4.1	
Personnel supply services	1.6	
Other business services	14.0	
<b>Total</b>	<b>76.2</b>	

## (2) Current Situation and Challenges

❖ Business support services broadly encompass areas involving corporate activity. The market size has greatly expanded from 53 trillion yen in 1990 to 76 trillion yen in 2000. In the US, employment expansion has been remarkable in information services, legal, financial and accounting, services and temporary staffing services, and further growth in the future is anticipated in Japan.

❖ Background of market expansion:

- The use of external business support services has become an influential management method, as these services possess special skills and increased scale merits and have realized low costs. In particular, the use of IT-based business support services has become more active.

- Some non-core operations have been separated and made independent to form subsidiaries, which have become self-sufficient, profitable outsourcing service companies.

❖ Growth constraints should be overcome in business support services, such as human resources development, regulations and systems towards full utilization of the business support service and acceleration of market expansion.

## (3) Action Program

❖ Promotion of human resources development through establishing skill standards by occupation for business support services.

❖ Infrastructure development for business support services

- Facilitate outsourcing using information services

- Development of specialized services such as legal, financial and accounting services

- Activate the design business

❖ Creation of new markets through promotion of outsourcing by the public sector

# Industrial Clusters for Regional Revitalization

## Growth of new advanced industries (Biotechnologies, medical care, IT industries, etc.)

### <Source of competitiveness>

- ❖ Environment that enables fast development of new businesses founded on independent technologies.
- ❖ Transfer of new technologies and knowledge from universities, securing expert human resources necessary for business, swift establishment of partnerships among companies, timely supply of risk money, etc.
- ❖ Concentration of universities and research institutions that act as seedbed for new businesses, of relevant industries, and of experts in business support.

### <Barriers to growth>

- ❖ Delays in the establishment of the infrastructure for industry-academia collaboration
- ❖ Weakness of horizontal partnership networks
- ❖ Insufficient development of entrepreneurs and new businesses with regard to the supply of risk money and expert human resources.

## Development of new businesses in the manufacturing industry

### <Source of competitiveness>

- ❖ Existence of solid independent manufacturing technologies and capacity (e.g., special material synthetic products, nanoprocessing technologies, etc.)
- ❖ Linking of technologies, human resources and sales routes through flexible partnerships among companies
- ❖ Introduction of new technologies and development of entrepreneurs through partnerships with universities

### <Barriers to development of new businesses>

- ❖ Dependence on traditional fixed subcontractor relationship
- ❖ Difficulties in development of sales routes for new products and procurement of funds
- ❖ Low levels of recognition by potential clients from other regions

## Innovation in regional service industries (Tourism industry / health industry, etc.)

### <Source of competitiveness>

- ❖ Development of industries with added value and establishment of region-specific brands through innovative ideas and business models
- ❖ With regard to tourism/visitor industries, revitalization of local town through cooperation with tourist facilities, hotels, traffic facilities, shopping areas, and universities
- ❖ With regard to health industries, cooperation among medical care institutions, universities, local governments, health food industries and volunteers

### <Barriers to innovation>

- ❖ Insufficient awareness of regional sources such as traditions, culture, festivals, etc.
- ❖ Insufficient coordination of concepts and cooperation with local communities
- ❖ Insufficient awareness towards establishment of local brands

## High value-added food industry

### <Source of competitiveness>

- ❖ Establishment of local brands and development of brands in regions with high consumption
- ❖ Establishment of distribution systems that ensure high quality and safety (traceability)
- ❖ Cooperation among local tourism industries, health industries, and revitalization of local towns

### <Barriers to establishment of high added value>

- ❖ Lack of established local brands, infringement of brands
- ❖ Lack of contact with universities that possess biotechnologies
- ❖ Insufficient know-how and funds for development of business overseas

## <Common keys to success>

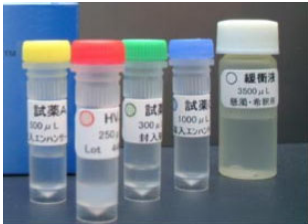
- Enhancement of transparent and credible networks
- Establishment of comprehensive approach for regional revitalization founded on distinctive industrial structures, tradition and culture
- Development of new products and services and creation of local brands through cooperation based on "innovative local communities"

**Growth of new advanced industries**

**<Policy orientation>**

- ❖ Create a business environment that facilitates swift development of new globally competitive businesses.

This includes creation of industrial clusters, enhancement of the systems for technology transfer from universities and industry-academia collaboration, formation of horizontal trust networks, fusion of traditional and advanced technologies, development of human resources such as industry-academia collaboration coordinators, expert engineers, and management of technology (MOT) resources.



**Bio-venture that originates from Osaka University**  
Development of a technology for mass production of vectors for gene therapy that was developed by a group of then associate professors at the Faculty of Medicine at Osaka University

**Development of new businesses in the manufacturing industry**

**<Policy orientation>**

- ❖ Create an environment that facilitates dynamic development of businesses in new areas, while taking advantage of technologies and know-how accumulated by local manufacturers and of regional traditions and culture.

This includes formation of horizontal trust networks, development of products that utilize innovative technologies, development of sales routes, fund procurement, dissemination of local brands, and assistance to the development of human resources essential for manufacturing.



**Industry-academia collaboration at the Tokatsu Technoplaza [Chiba Prefecture, Kashiwa City]**  
Numerous research and exchange meetings for industry-academia collaboration are held at the Tokatsu Technoplaza right outside the Kashiwa Campus of the University of Tokyo.

**Innovation in regional service industries [Tourism industry / health industry, etc]**

**<Policy orientation>**

- ❖ Create local communities that facilitate the dynamic establishment of businesses that have high added value. Also, utilize and disseminate regional attractions (business clusters, culture, traditions, scenery, etc.) as “regional brands.”

This includes formation of trust networks within communities, promotion of industrial tourism, enhancement of systems for acceptance of foreign tourists, and early development of model-type businesses in cooperation with local communities.



**The streets of Hida-Takayama preserve the spirit of the Edo Period**  
Hida-Takayama is bustling with tourists, thanks to the efforts to preserve and reconstruct the streets in their original look from the Edo Period, as well as the morning market, festivals and the numerous foreign tourists attracted by the improved provision of information in several languages.

**High value-added food industry**

**<Policy orientation>**

- ❖ Create an environment that facilitates the dynamic development of new products that utilize regional ingredients, and are perceived as safe and healthy by customers. Cooperation of local communities is important.

This includes creation of local brands that draw attention to the attractiveness of food products, securing of traceability (keeping track of production and physical distribution record), identifying of ingredients and functions in cooperation with universities, etc., development of overseas markets, and creation of high added value through adoption of new technologies.



**“Momo-ichigo” strawberries [Tokushima Prefecture, Sanagouchi Village]**  
Big, sweet high-class strawberries jointly developed and grown by the local community and the market



**Silicon Sea Belt Fukuoka**  
Silicon Sea Belt Fukuoka has established a “System LSI College” for the development of highly specialized engineers for system LSI.



**Higashiosaka Brand**  
Innovative goggles that maintain clear visibility. The goggles have been certified by the agency for promotion of the Higashiosaka Brand and have been issued the symbolic mark (in the upper right of the picture)



**Otaru Canal Area**  
Development of tourism where visitors can experience the atmosphere through glass and music-box crafts. Improvement of notifications in foreign languages (in Chinese on the picture)



**Irodori [Tokushima Prefecture, Kamikatsu Town]**  
People of the town have managed to create a business that conveys the spirit of each season by decorating the food with wild flowers and leaves.



# Priority Policies

## I: Priority policies regarding the seven promising industry areas

### 1. Fuel cells

- ❖ Accelerate research and development based on new development and introduction scenarios
- ❖ Accelerate introduction of fuel cells, including hydrogen stations, towards early commercialization
- ❖ Implement deregulation necessary for the commercialization of fuel cells
- ❖ Establish a framework for international cooperation

### 2. Digital consumer electronics

- ❖ Enhance vertical collaboration among upstream, midstream and downstream industries through common business scenarios. Encourage research and development
- ❖ Classify standardization issues and strengthen activities in international standardization fora
- ❖ Develop highly skilled human resources who will take charge of development of built-in software
- ❖ Encourage business reorganization and restructuring

### 3. Robots

- ❖ Develop initial practical application by advanced users including government and public needs
- ❖ Develop basic elemental technology and common infrastructure technology
- ❖ Develop a consensus on social acceptance of robotic safety, treatment under the Product Liability Law, and various insurance systems, etc.

### 4. Content

- ❖ Encourage new market development through facilitating the international expansion of the contents industry
- ❖ Facilitate the dissemination of digital cinema
- ❖ Establish a fair trade environment between the distributors and the producers
- ❖ Facilitate fund procurement for producers

### 5. Health and welfare devices and services

- ❖ Encourage health service industry development with the aim of realizing a "country with healthy senior citizens"
- ❖ Informatize medical care through promotion of electronic medical charts and other efforts based on the "e-Japan Priority Policy Program"
- ❖ Realize and disseminate tailor-made and preventive medical care as well as regenerative medical techniques utilizing biotechnology
- ❖ Develop and disseminate medical care and welfare devices utilizing Japan's advanced manufacturing technology

### 6. Environment and energy devices and services

- ❖ Accelerate technological innovation that will be the key to the breakthrough for the environment and energy constraints
- ❖ Create and expand markets through improvement of rules, disclosure of information, government procurements, etc.
- ❖ Promote global business development and market expansion

### 7. Business support services

- ❖ Promote human resources development through establishing skill standards by occupation
- ❖ Create new markets through the promotion of outsourcing by the public sector

## II: Priority policies for regional revitalization

### ❖ Enhance transparent and credible networks

- Support activities implemented by coordinators and develop specialized human resources

### ❖ Strengthen regional industry-academia-government collaboration

- Establish a system for technology transfer from universities, create hubs for development of entrepreneurs in cooperation with universities, support technological development through industry-academia-government collaboration, promote merge of traditions with advanced technologies

### ❖ Create and promote local brands

- Unveil regional attractions and disseminate information in the field of tourism/visitor industries, reinforce preservation of local brands, establish a traceability system that employs electronic tags, etc., support development of overseas markets for food products, etc.

## III: Cross-sectional priority policies

### 1. Development of industrial human resources

- ❖ Strengthen core human resources in manufacturing worksites who can maintain the competitiveness of manufacturing industries. Towards this end, support industry-academia collaboration and utilization of experienced human resources and enhance the commendation system
- ❖ Support development of human resources in the service industries, IT, and MOT (Management of Technology)
- ❖ Promote investment in human resources within companies
- ❖ Promote career education at schools (hands-on experience in manufacturing, etc.)
- ❖ Support the adoption of grass-root e-learning systems and regional development of human resources through assistance to regionally devised programs
- ❖ Enhance human resource development for managers of small and medium-sized enterprises (SMEs)
- ❖ Promote employment of women, elderly and foreign experts

### 2. Intellectual property policies

- ❖ Provide patent information expeditiously to enhance the efficiency of R&D activities
- ❖ Promote international cooperation towards a global patent system
- ❖ Promote intellectual property policies that support regional revitalization
- ❖ Eliminate the "intellectual property divide"
- ❖ Develop intellectual property policies that promote "competition based upon individuality"
- ❖ Facilitate active utilization of intellectual property by companies

### 3. Strengthening of protection of trade secrets and prevention of unintended outflow of technologies

- ❖ Strengthen control of trade secrets in universities and research institutes and measures to prevent unintended outflow of technologies
- ❖ Strengthen control of trade secrets in corporations and measures to prevent unintended outflow of technology

### 4. Establishment of brands and strategic utilization of design

- ❖ Strengthen protection of intellectual property rights related to design
- ❖ Improve systems for support of establishment of local brands
- ❖ Support planning and development of design
- ❖ Implement international PR activities to establish Japanese brands

**5. Improvement of market rules**

- ❖ Improve market rules that will promote competition
- ❖ Popularize an alternative dispute resolution (ADR) system

**6. Standardization**

- ❖ Promote international standardization activities related to technologies originated in Japan with the objective of creating and expanding global markets
- ❖ Promote sound dissemination of new products through development of standards meeting new social needs
- ❖ Promote utilization of a new JIS mark system

**7. Research and development (R&D)**

- ❖ Encourage promising industry areas based on the outlook for the future market. Also, further strengthen integrated approach, namely “the Research and Development Program” which promotes the R&D policy and related policies such as regulatory reform and standardization
- ❖ Support new challenges by SMEs and maintain and reinforce the strengths of the “concentration of advanced component and material industries” in Japan
- ❖ Advance the reform of innovation system through further strengthening of industry-academia collaboration and providing assistance for the growth of R&D-related business start-ups

**8. Business start-ups and development of new businesses by SMEs**

- ❖ Promote establishment of new partnerships among SMEs and establishment of brands, and support development of high added value
- ❖ Enhance assistance related to new business and facilitate funds procurement for entrepreneurs engaged in business start-ups and new businesses
- ❖ Implement thorough review and establish an integrated user-friendly system, with regard to the Law on Supporting Business Innovation in Small and Medium Enterprises, the Law for Facilitating the Creation of New Business and the Law on Creating Small and Medium Enterprises
- ❖ Promote formation of entrepreneurial communities engaged in regional grass-root activities in closer cooperation with private sector supporters such as investment funds and NPOs

**9. Strengthening industrial finance functions**

- ❖ Establish a new finance system that evaluates business feasibility
- ❖ Promote autonomous circulation of funds among companies
- ❖ Promote larger supply of risk money

**10. Restructuring of businesses and industrial revitalization**

- ❖ Encourage restructuring of businesses and industries with the objective of efficient allocation of management resource
- ❖ Review corporate structure system to provide variety of options available for company structures and to accelerate and facilitate flexible corporate restructuring
- ❖ Clarify the “Safe Harbor” rule under the regulations for company mergers of the Anti-trust Law

**11. Strategic trade policies including realization of East Asia-wide economic partnership agreements (EPA)**

- ❖ Promote East Asia-wide EPA
- ❖ In the WTO New Round negotiations, promote multilateral trade liberalization and improvement of trade rules
- ❖ With regard to unfair trade policies and measures implemented by foreign governments, implement various measures such as WTO dispute resolution procedures and appropriate improvement and application of domestic rules
- ❖ Introduce successful and outstanding foreign management methods, technologies and human resources through promotion of foreign direct investment toward Japan

**12. Informatization**

- ❖ Promote the establishment of common IT infrastructure across companies and industries by utilizing electronic tags and other information technologies
- ❖ Promote further improvement in credibility and security with regard to IT
- ❖ Promote informatization in advanced fields
- ❖ Support innovations of management that utilizes IT
- ❖ Develop and support communities which operate across companies to spread creative IT technology seeds

**13. Regulatory reform**

- ❖ Implement prompt and steady regulatory reform that will contribute to the maximum activation of the private sector

**14. Securing of stable supply of materials and natural resources**

- ❖ Strengthen efforts to respond to sudden market changes and to secure a stable long-term supply, with regard to materials and natural resources that are essential to Japan’s industrial activities

# Long-term Outlook for Industrial Structure (1)

## (1) Growth of seven promising industries and related industries

- The seven promising industries will go beyond expanding the market of each single sector, with the benefits spilling over into a wide range of supporting industries, and the synergies between them will promote growth in Japanese industry and higher added value.

Spill-over effect of market expansion in the seven industry sectors

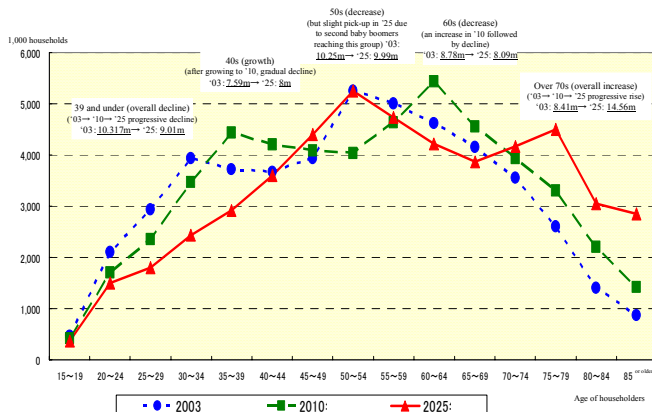
	Market size in seven sectors	Market growth in the seven sectors will have spill-over effect in other industries	Total
Now	207.1		207.1
2010	296.8	27.1	323.9

\*Inter-industry analysis estimate (trillion yen)

- It is estimated that the spill-over effect of market expansion in the seven sectors will be worth around 300 trillion yen by 2010. This is the equivalent of some 30% of domestic production in 2010 and is equivalent to the scale of the manufacturing sector in the current Japanese economy.

## (2) Changes in consumption structure due to falling birthrate and aging population

Future trends for no. of households per age group due to declining childbirth rates and aging population



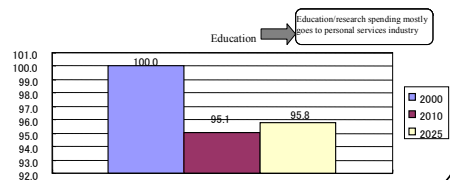
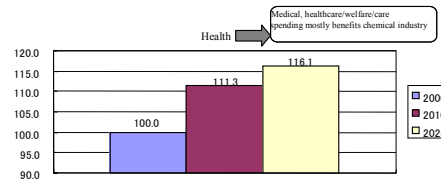
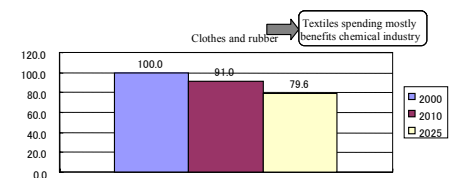
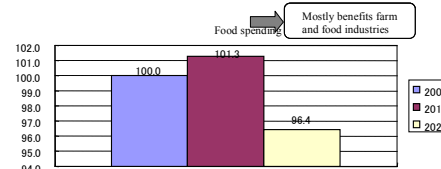
Note: Household distribution projections courtesy of "Future Estimates of Japanese Household Numbers (National Estimate)" by the Institute of Population and Social Security Research.

- Population and household structures will change significantly as a result of lower birthrates and the aging of the population. Specifically, the baby boom and the baby boom junior generations represent two demographic peaks. Aging will accelerate towards 2010 when the baby boomers reach retirement age, and a decrease in the number of children will become obvious as the baby boom junior generation grows older towards 2025.

- Consumer trends differ by life stage, which differ by era as well. The future outlook for consumer structure, taking into account the effect of changes in population and household structure as mentioned and changes in consumer trends according to life stage, is estimated as follows:

### Representative examples

- Food spending:** the baby boomers reach their early 50s in 2000 and the baby boom juniors in 2025, the age at which nutrition-related expenditure relative to income is lowest. Therefore, spending on food will grow from 2000 to 2010 and fall back from 2010 to 2025.
- Clothes spending:** will drop as the population of young people aged 24 and under, the main consumers of this sector, declines.
- Healthcare spending:** will rise as the population in the over-60 age bracket, the main consumers, increases.
- Education spending:** will drop as the baby boomers' period of child-raising ends over 2000-2010, but from 2010-2025, it will rise again as the baby boom juniors enter their child-raising phase.



# Long-term Outlook for Industrial Structure (2)

## (3) Development of economic integration in East Asia

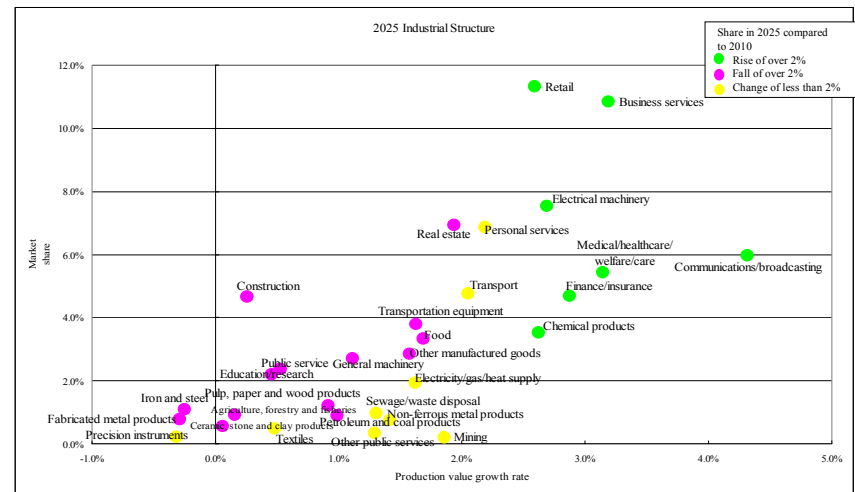
- As EPAs free the movement of goods, people, services and capital throughout the region, they are expected to bring about a more advanced industrial structure through changes in market prices stemming from lower tariffs, improved industrial productivity and production output of each industry depending on its competitiveness.
- One estimate of the benefits of EPAs between Japan, South Korea, Mexico and ASEAN based on advanced research\* analysis is for a upturn in GDP of around 0.5% by 2010.

\*Kenichi Kawasaki, "The WTO and the Formation of a Free-trade Zone in Asia," *Japan's Trade Policy and the WTO*

## (4) Future outlook for industrial structure

- Following is an outlook of future industrial structure in the case where seven promising industries grow as forecasted with steady implementation of the action program, taking into account changes in the consumption structure due to aging population and the declining birth rate and the effect of EPAs, etc.

- Manufacturing industry will continue to form the basis of the Japanese economy due to growth in advanced industries (electronics, transport equipment) and materials industries (chemical products). **Manufacturing industries that stay ahead of global competition can definitely be maintained at a certain level.**
- The service industry will grow significantly, particularly in business support services, personal services, medical care, health care and nursing care services. **It will provide employment opportunities.**
- Energy-intensive industries (steel; chemical products; ceramics and earthenware; pulp, paper and wood products): overall growth rates will be lower than the overall industrial average as **the industry structure becomes environmentally harmonious**, embracing environmental regulations and energy constraints.



	2000		2010		Average annual growth rate (production value)	2025		Average annual growth rate (production value)
	Production value	Market share	Production value	Market share		Production value	Market share	
Agriculture, forestry and fisheries	15,719	1.6%	14,301	1.2%	-0.9%	14,653	0.9%	0.2%
Mining	1,654	0.2%	2,283	0.2%	3.3%	3,009	0.2%	1.9%
Food	37,614	3.9%	40,940	3.5%	0.9%	52,611	3.3%	1.7%
Textiles	8,136	0.8%	6,985	0.6%	-1.5%	7,506	0.5%	0.5%
Pulp, paper and wood products	15,654	1.6%	16,510	1.4%	0.5%	18,930	1.2%	0.9%
Chemical products	28,061	2.9%	37,726	3.3%	3.0%	55,620	3.5%	2.6%
Petroleum and coal products	11,504	1.2%	12,195	1.1%	0.6%	14,141	0.9%	1.0%
Ceramic, stone and clay products	9,052	0.9%	8,563	0.7%	-0.6%	8,643	0.5%	0.1%
Iron and steel	17,897	1.8%	17,829	1.5%	0.0%	17,167	1.1%	-0.3%
Non-ferrous metal products	6,813	0.7%	9,432	0.8%	3.3%	11,647	0.7%	1.4%
Fabricated metal products	12,688	1.3%	12,923	1.1%	0.2%	12,373	0.8%	-0.3%
General machinery	28,807	3.0%	36,196	3.1%	2.3%	42,736	2.7%	1.1%
Electrical machinery	56,825	5.9%	79,906	6.9%	3.5%	118,978	7.5%	2.7%
Transportation equipment	43,167	4.5%	46,889	4.0%	0.8%	59,764	3.8%	1.6%
Precision instruments	3,788	0.4%	3,598	0.3%	-0.5%	3,431	0.2%	-0.3%
Other manufactured goods	32,668	3.2%	35,546	3.1%	0.8%	44,926	2.8%	1.6%
Construction	78,727	8.1%	71,023	6.1%	-1.0%	73,849	4.7%	0.3%
Electricity/gas/heat supply	20,221	2.1%	23,860	2.1%	1.7%	30,383	1.9%	1.6%
Sewage/waste disposal	7,077	0.9%	12,650	1.1%	6.0%	15,372	1.0%	1.3%
Retail	98,809	10.2%	121,908	10.5%	2.1%	178,903	11.3%	2.6%
Finance/insurance	38,166	3.9%	48,474	4.2%	2.4%	74,128	4.7%	2.9%
Real estate	64,737	6.7%	82,084	7.1%	2.4%	109,453	6.9%	1.9%
Transport	47,160	4.8%	55,424	4.8%	1.6%	75,156	4.8%	2.1%
Communications/broadcasting	27,781	3.4%	50,018	4.3%	6.1%	94,290	6.0%	4.3%
Public service	35,691	3.7%	34,435	3.0%	-0.4%	37,258	2.4%	0.5%
Education/research	34,011	3.5%	32,586	2.8%	-0.4%	34,874	2.2%	0.5%
Medical/healthcare/social security/care	36,243	3.8%	53,965	4.7%	4.1%	85,818	5.4%	3.1%
Other public services	4,172	0.4%	4,436	0.4%	0.6%	5,378	0.3%	1.3%
Business services	77,445	8.0%	107,020	9.2%	3.3%	171,454	10.8%	3.2%
Personal services	63,566	6.6%	78,282	6.8%	2.1%	108,283	6.9%	2.2%
Total production categories	963,850	100.0%	1,157,988	100.0%	1.9%	1,580,732	100.0%	2.1%