Industrial Cluster Policies of the Korean Government in the 2000s: Retrospect and Prospect

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Menangiyn Plain
Nei Monggol Plateau
Da Hinggang Mts.
Qiqihar
Daqing
HARBIN
Yichan
Hegang
Jiamusi
Jixi
Mudanjiang
Jilin
Changchun
Liaoyuan
Vladivostok
Ch'ongjin
Hunjiang
Fushun
Benxi
SHENYANG
Fuxin
Beipiao
Jinzhou
Liaoyang
Anshan
Haicheng
Fengcheng
Dandong
NORTH KOREA
SEA OF JAPAN
Sapporo
Hokkaidō
Sendai
Kawasaki
TOKYO
Chiba
YOKOHAMA
NAGOYA
Hamamatsu
Honshū
Kyōto
OSAKA
Kōbe
Sakai
Hiroshima
Okayama
Shikoku
Kitakyūshū
Fukuoka
Kumamoto
Kyūshū
Kagoshima
Miyazaki
PACIFIC OCEAN
EAST CHINA SEA
YELLOW SEA
Korea Bay
Bo Hai
Gulf of Tianjin
Dalian
P'yŏngyang
SEOUL
Inch'ŏn
SOUTH KOREA
Taejŏn
Taegu
PUSAN
Kwangju
Cheju
Tangshan
TIANJIN
BEIJING
Langfang
Zhangjiakou
Datong
Shijiazhuang
Botou
Xinji
Handan
Anyang
Liaocheng
Xinxiang
Zhengzhou
Kaifeng
Pingyang
Dongying
ZIBO
Jinan
Tai'an
Qingdao
Rizhao
Qufu
Zaozhuang
Xuzhou
Bengbu
Huainan
NANJING
Hefei
Changzhou
Wuxi
Suzhou
Huzhou
Jiaxing
SHANGHAI
Nantong
Yangcheng
WUHAN

South Korea

Pop: 48 Million

GNP: $16,000

Land: 99,000Km^2

Economic and Industrial Growth

1945 : Liberated from Japan

1948 : New government

1950 – 1953: Korean War

1962 – 1996: Economic Development Plans

1972 – 2020: Comprehensive Land Development Plans

The Success

1960s

1970s

1980s

1990s

2000s

Resulting Problems

1. Widening Regional Gaps

- **between the Capital and the Rest**
- **between the East and West**
- **between Urban and Rural**
- **between old core and new areas within cities**

2. Widening Social and Economic Gaps

3. Environmental Pollution

4. The Lack of Social Infrastructure

Past Approaches to the Problems

Rural Development: New Community Movement

Growth Control in Seoul

Construction of Industrial Estates Mainly in the South

Coordinated Development by Spatial Planning: CNLDPs

Decentralization

New Approaches in the 2000s

Regional Innovation Policies

Industrial Cluster Strategies

New Administrative Capital

Innovative Cities and Enterprise Cities

RIS Programs by Ministries

Ministry in Change	Projects	Main Actors	Beneficiaries
Ministry of Commerce Industry & Engergy	Techno-Park Project	Universities Governments	Universities Local Governments
	Regional Technology Innovation Center(TIC)	Universities	SMEs outside of Seoul
	New Technology Business Incubator Center (TBI)	Universities (29)	University Professor, Engineer, Research Staffs
	Growth Engine for the Next Generation	Companies, Local Governments	Companies
	Pilot RIS Project	Universities, Research Institutes Companies	Universities, Companies
	Regional Research Center (RRC)	Universities	Universities, Companies

Source: Revised from Kwon and Hur (2000: 177).

RIS Programs by Ministries

Ministry in Change	Projects	Main Actors	Beneficiaries
Bureau of Small & Medium Enterprises	Business Incubator Assistance Project	Corporation of Promoting SMEs	Individuals
	Business Incubator Assistance Project	Corporation of Promoting SMEs Local Governments	Individuals
Ministry of Science & Technology	Science Research Center (SRC)	Universities(26)	University Professors and Students
	Engineering Research Center (ERC)	Universities (35)	University Professors and Students
	Center for High-Tech Commercialization	KAIST	University Professors and Students
	Center of New Technology Start-ups	KAIST	Individuals

Source: Revised from Kwon and Hur (2000: 177).

Daejeon: a Science City

Pop: 1.5 Million

Land: 537 Km^2

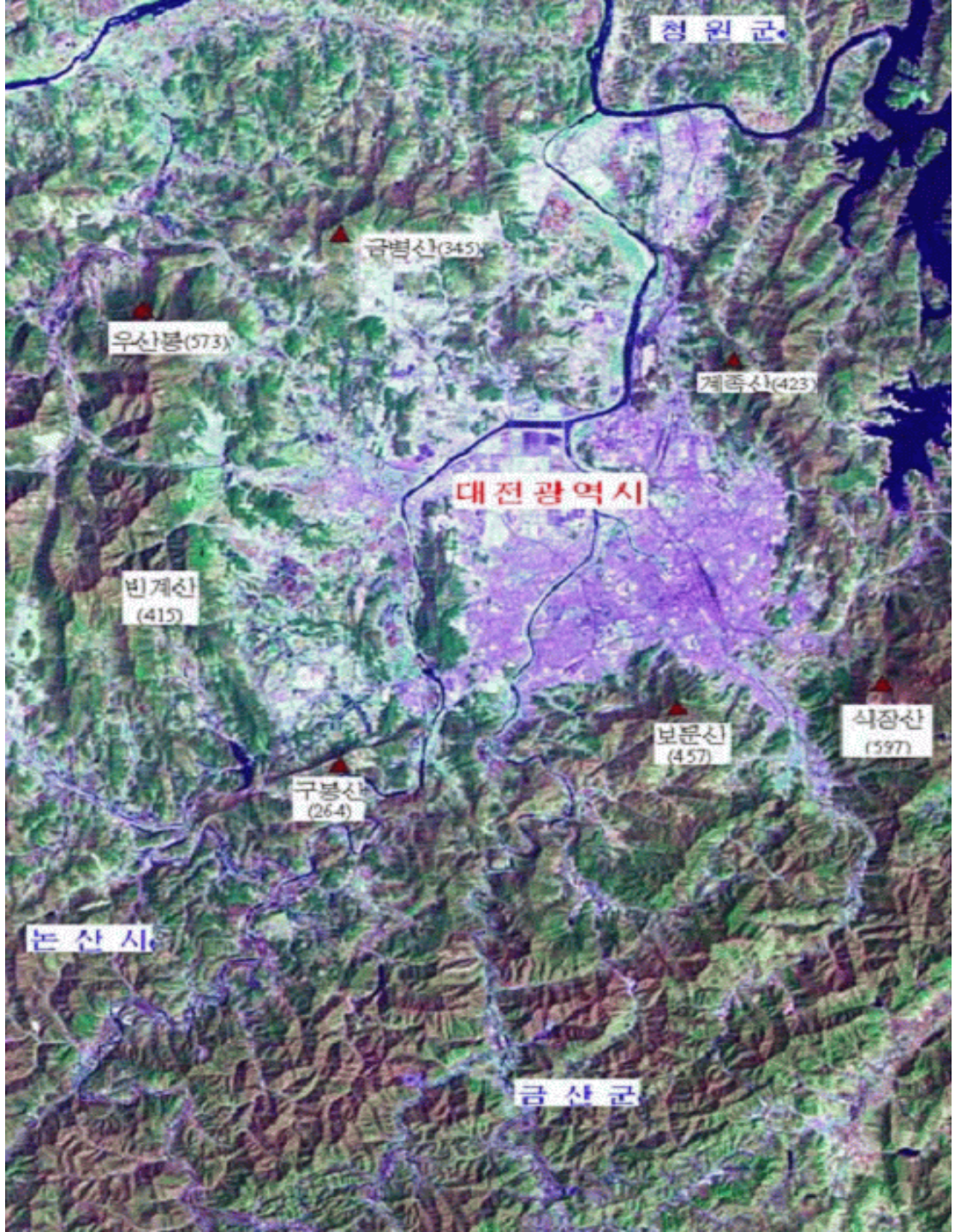
Characteristics:

- **Science City**
- **Transportation Hub**
- **Administrative Centre**
- **Educational Centre**
- **Regional Centre**

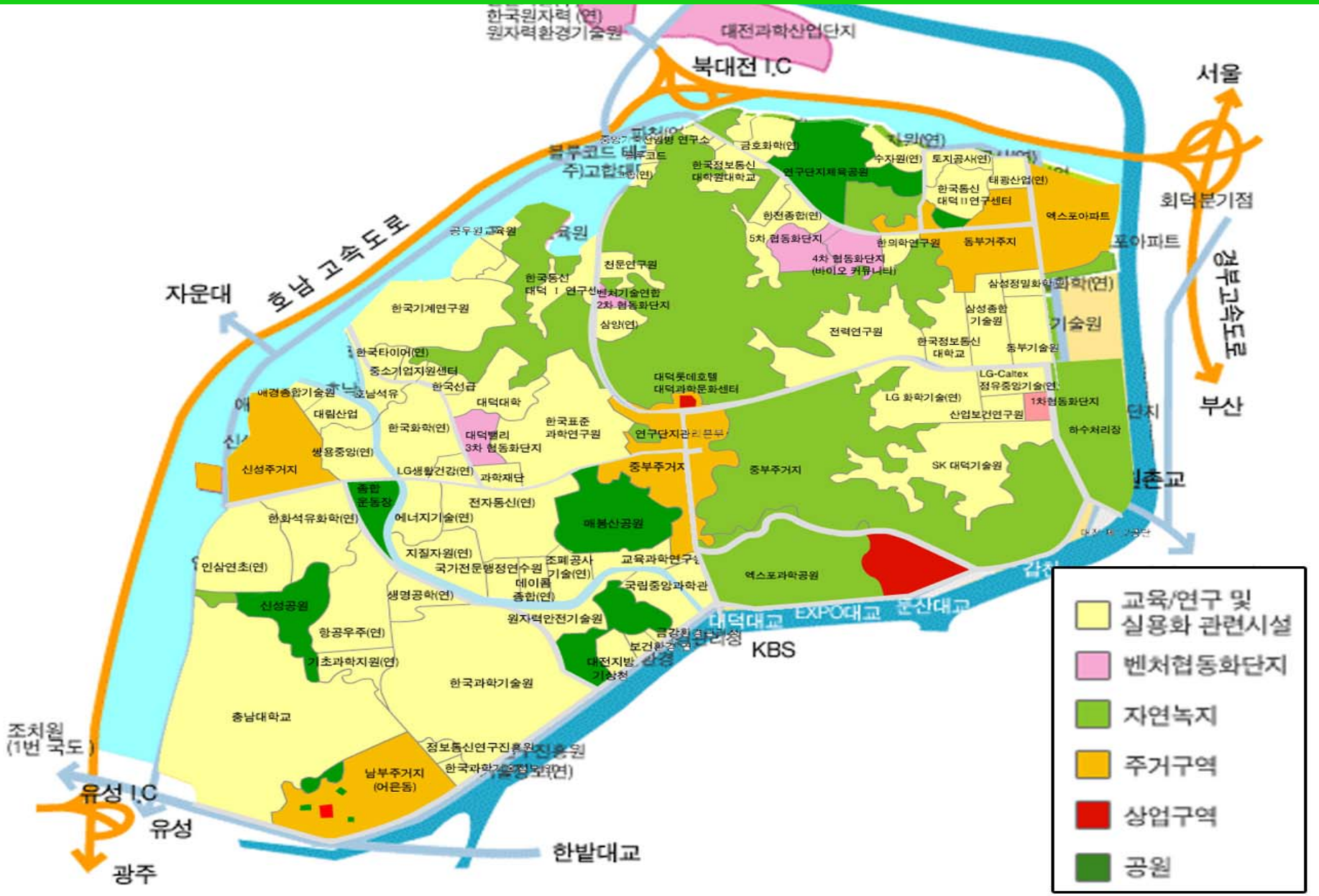
Modern Economy: Science & Administration

Traditional Economy: Leather, Textiles

History: 1905 Railway Station


청 원 군
금병산(345)
우산봉(573)
계족산(423)
대 전 광 역 시
빈계산
(415)
보문산
(457)
식장산
(597)
구봉산
(264)
논 산 시
금 산 군

Daeduck Science Town



Changes in the DST

Time	Major Activities
1973	Area Designated (24.7 Km2)
1974	Master Plan (Ministry of Science & Technology)
1974	Construction Started
1978	Location of Research Institutes Began
1983	Daejeon Was Expanded to Include DST
1992	Land Development Completed
2002	Renamed as “Daeduck Valley”
2004	Renamed as “Special R&D District”
2005	Area Expanded, Governing Structure Changed

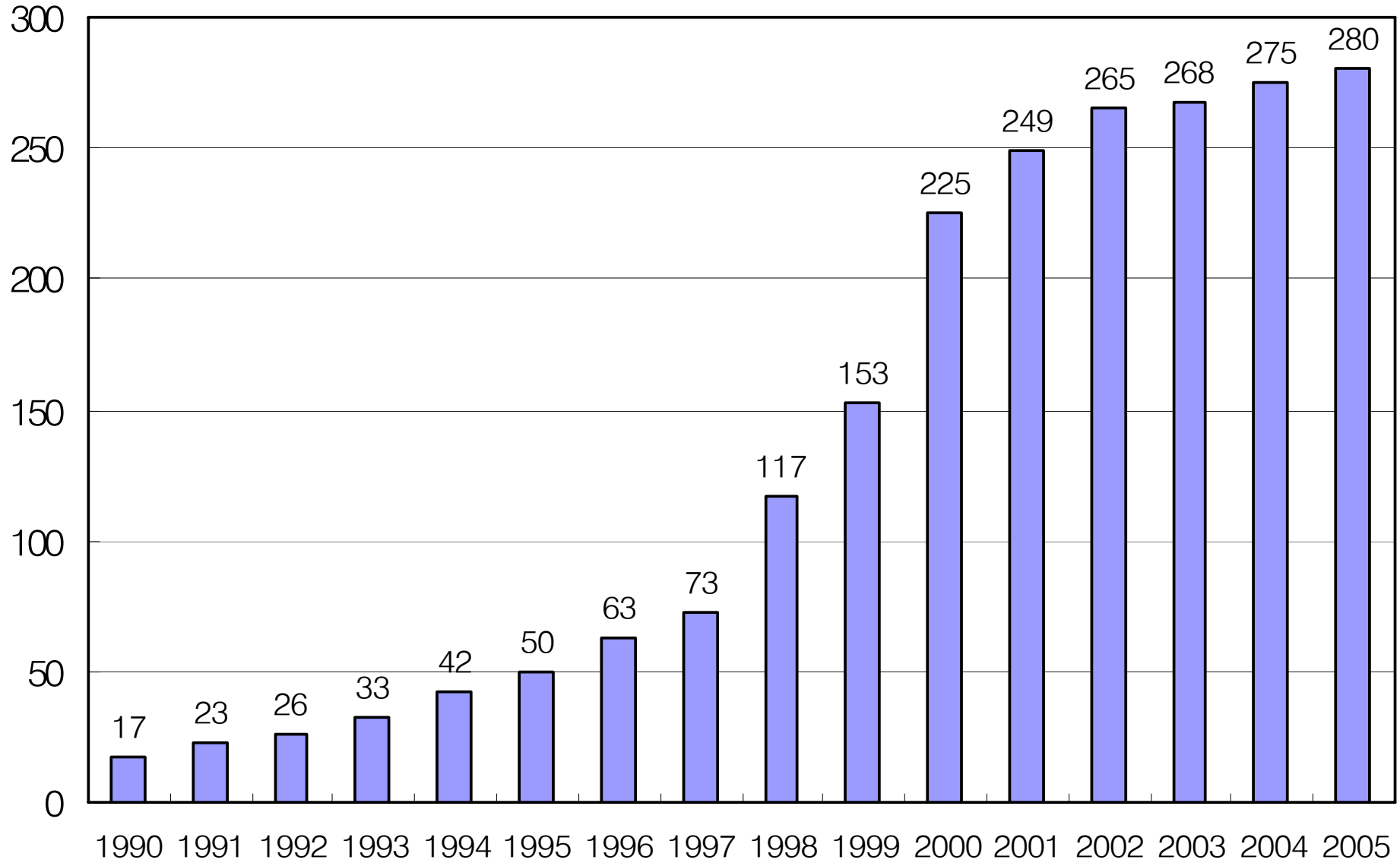
Growth in the DST

Year	1979	1985	1990	1997	2002	2005
Gvt. Institutions	0	0	3	7	9	12
Private Res. Ins.	0	0	0	0	7	6
Res. Institutions	8	11	27	49	54	64
- Gvt	5	8	19	16	17	20
- Private	3	3	8	25	26	33
- Semi-gvt	0	0	0	8	11	11
Universities	1	2	3	3	4	6
SMEs	0	0	na	na	111	152
Total	9	13	33	59	185	239

Growing Employees in the DSP

Year	1979	1985	1990	1997	2002	2005
Gvt Institions	0	0	244	420	426	726
Private Comp.	0	0	0	0	54	55
Res. Institutions	4,698	6,848	10,218	14,220	12,036	14171
- Gvt	3,879	6,129	6,920	7,473	6,277	7217
- Private	719	719	1,432	4,475	3,224	4399
- Semi-gvt	0	0	0	2,272	2,535	2555
Universities	1,146	1,257	2,084	2,423	2,385	2,707
SMEs	na	na	na	na	1,919	3097
Total	5744	8105	10,680	17,063	16,820	20756

Spin-offs form the ETRI



SOLAPACK

HANOOL
ROBOTICS
주)한울로보틱스

KIA

InBioNET
InBioNET

Commercial Biotechnology Innovator
Business Portfolio
Animal Healthcare Products
Bioenvironmental Products
Bioagricultural Products
Biopharmaceuticals
Pharmaceuticals
Biotechnology Network

Insect Biotech

ASTEL

XL PHOTONICS
IDIS

아이티

ASTEL

Problems of the DST

Unclear Role Definition

- **Public vs Private**
- **R vs D and B**

Limited Local Economic Impacts

- **Problems in Local Economic Structure**
- **Problems in its Governing Structure**

Lack of Internal Linkages

- **Poor Advanced Services in Daejeon**
- **Low Political Commitment & Poor Strategies**

Limited Resources

NURI: Concept

BK21 and NURI, Created by MEHRD

NURI focuses on forming industrial clusters

Aims to supply trained graduates and applied knowledge

Improves the quality of university education

Strengthens university-industry relationships

Creates mutual support between universities and industry

Plans investing 260 million dollars annually for 5 years

Constituted of 3 types: large-, medium-, and small-scale

In 2004, 111 projects have been selected

NURI: Evaluation

Daejeon hosts 11 NURI projects

According to the BK21-NURI Evaluation Committee

Initial success by downsizing the number of college students

- Improved ratio of teaching staffs versus students
- Increased No of intern & OJT students
- Increased No of special lectures by corporate managers at universities

No clear signs of creating new jobs and better trained people

RIS Pilot Program: Concept

Designed by MCIE

Aims to create start-up activities,

Aims to assist the existing firms by supplying R&D activities

Using universities and other research institutions

Aims to generate jobs by commercializing existing technologies

Assists networking activities among universities and businesses

Using commercializable technology

Provides each area with 2.5 million dollars per year for 3 years

In 2004, 39 projects were selected

RIS Pilot Program: Daejeon

Six proposals submitted

DRIA, KAIST, and HNU, CNU, etc.

Two were selected: merged one, and another

Merged one: material design, tech-transfer

Another: logistics cluster based on chemical tests

RIS Pilot Program: Evaluation

At the National Level

Too many programs with little diversity

Too much investment, leading confusion & budget waste

Unreasonable and rigid regulations: budget and accounting, Lack of Trusts

Poor coordination among agencies

Long communication channels

Delayed budget

Irrational selection process

RIS Pilot Program: Evaluation

At the local level:

Lack of coordination and cooperation

Lack of professional ethics:

Lack of technological competence

Poor coordination among project sub-teams

Daedeok Valley Innovative Cluster Management Plan

Conducted a Major Survey in the Late 2005

Designed the Program by DRIA Director

To Create Forums for Technology-intensive SMEs

To Share Information, Knowledge, and Technologies

Expected to Create Industrial Clusters

Constituted of 8 Clusters and 14 Mini-clusters

Held Meetings with Popular Supports in the early 2006

Not Active Any More Since then, because of Political Reason

Industrial Complexes in Korea

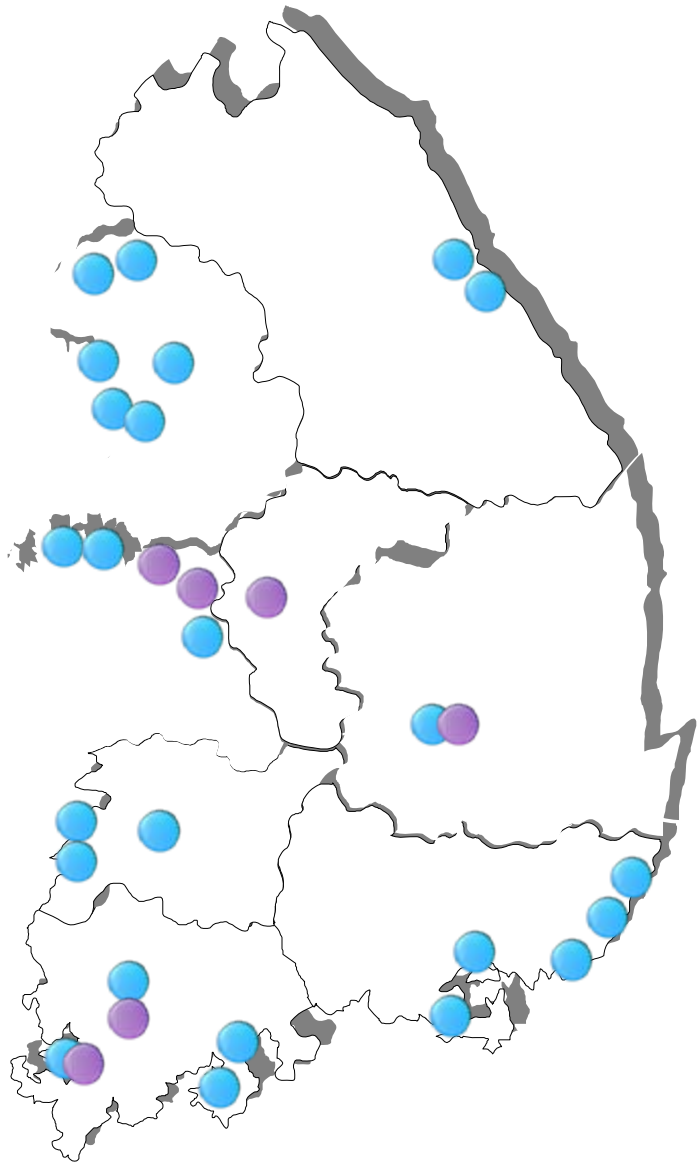
Operate 30 industrial complexes
- total size : 265,960,000 sq. meter

Host 26,768 companies

Employ 679,335 workers

Produce 280 billion dollars per year

Export 120 billion dollars per year



Innovative Cluster Strategy of KICOX

Strategy

	Industrial Complex	Innovative Cluster
Main Body	Company	Company+Univ+Re. Institute
Relationship	Vertical	Horizontal
Inducement	Physical Location	Using network
Competitiveness	Mass Production Eco	Technology Innovation

The Process

Jan. 2004: The Strategy was Designed

June 2004: Selected 7 pilot areas

Jan. 2005: Approved by MOCIE

Apr. 2005: Launched 7 Cluster Development Agency

(Budget US$ 30M)

Apr. 2006: Evaluated the 1st year's ('05.4~'06.3) performance

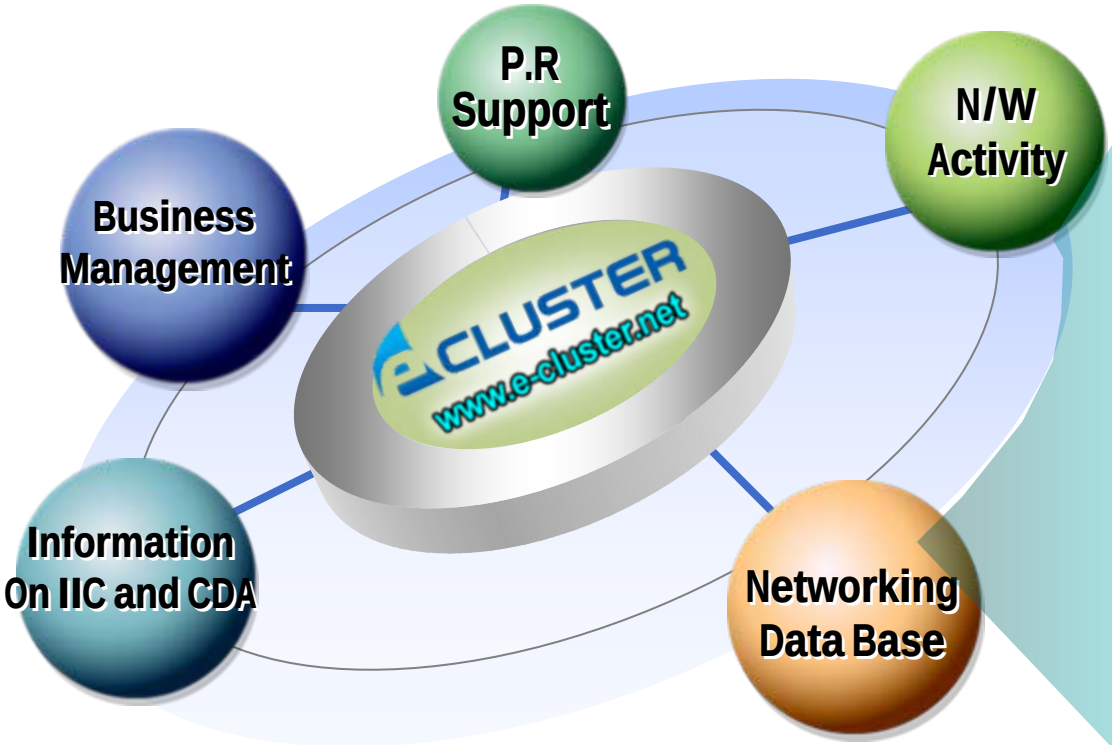
& Start the 2nd year project (Budget US$ 46M)

Seven Pilot Project Areas

7 Complexes

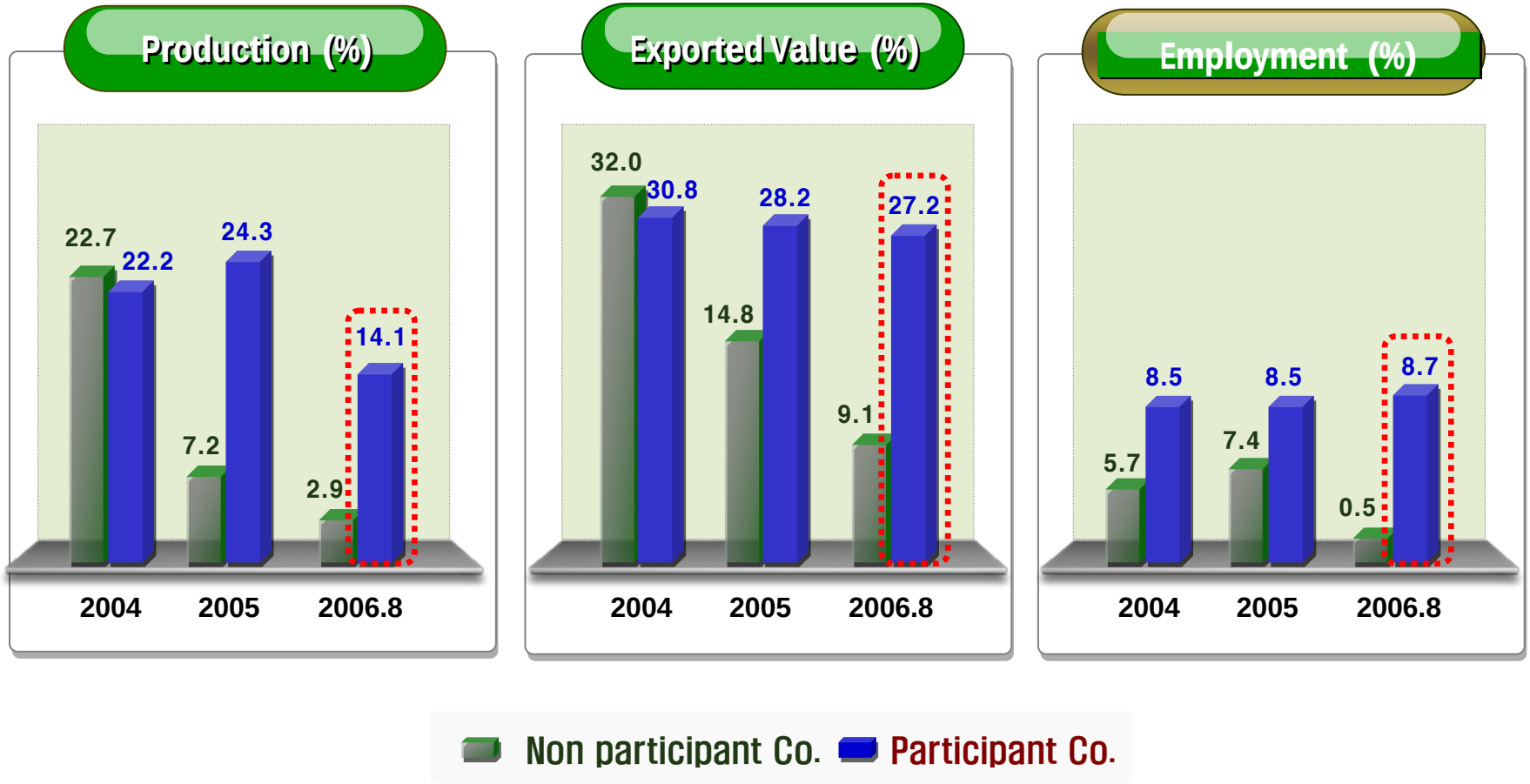
Complex Name	Strategic Industry	Development Vision
Changwon	Machinery	Advanced Machinery Global Cluster (strong presence of heavy industry already)
Gumi	Electronics	Advanced Digital & Electronic Cluster
Ulsan	Automobile	Global base of Advanced Automotive Component Supply
Banwal Sihwa	Components & Material	Global base of Advanced components & Material Supply
Gwangju	Optical Electronics	Global Cluster of Photonics Industry
Wonju	Medical device	The Core of Advanced Medical Device Industry
Gunsan	Automobile Machinery	Global Cluster of Auto & Machine parts Industry

Networking Scheme



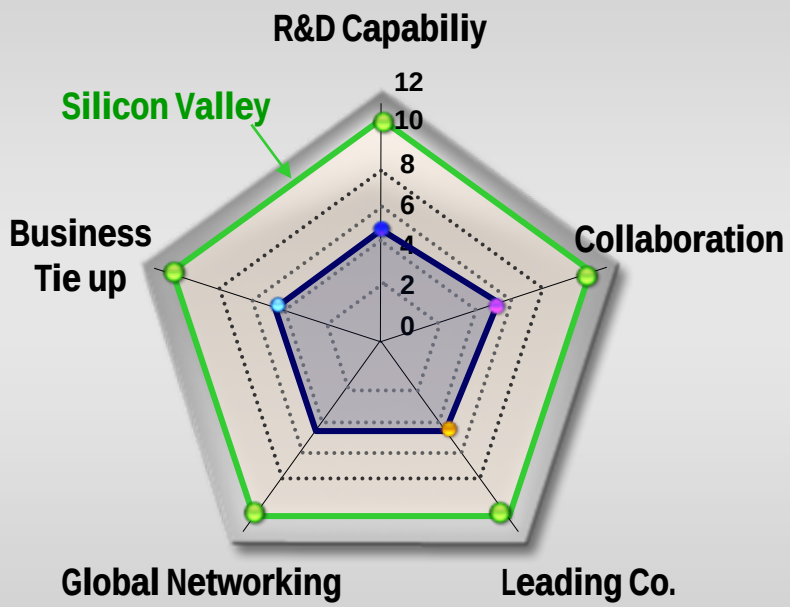
Networking DB	
No. Company	126,000
Product	43,000
University	384
Research Institute	488
Supporting Agency	361
Experts	13,000
Equipment	12,000
Patent, Papers	11,000
Technology	5,300

Outcomes of the Strategy

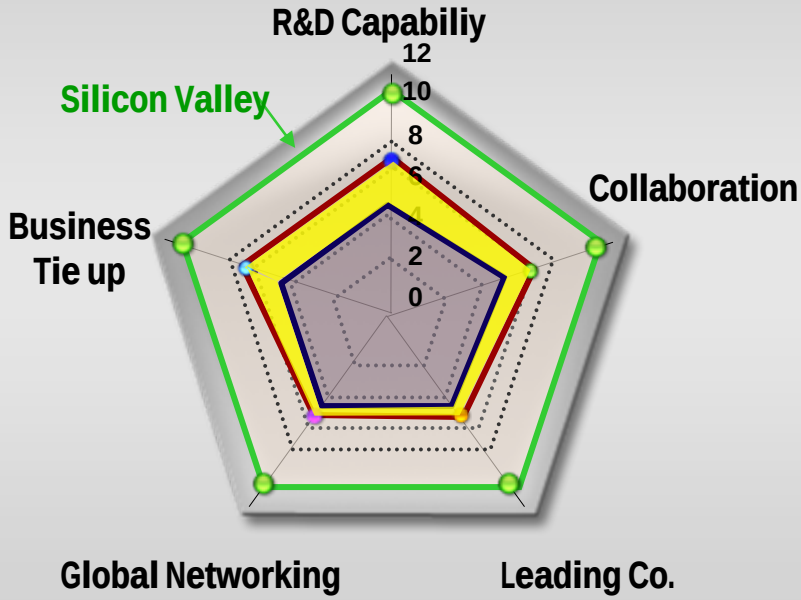


Changes in Innovative Capacity

Innovation Capability ('04.3)



Innovation Capability ('06.9)



Changes in Firm Relationships

Exchange information on policies and networking

Exchange know-how in technology commercialization

Cooperate with technology, commercial trade and inward investment

Participate and run entrepreneurship programs

Participation in related conferences and seminars

Conclusion:
The Industrial Cluster Strategy

Positive Side

- **Right choice to tackle the problems**
- **Succeeded in orienting concerns to applied R&D**

Negative Side

- **Too much focus on high-tech & manufacturing, i.e., BT, IT**
- **Considerable expenses for learning effects**

Alternative

- **Creative industry: culture and technology**
- **Need flexibility and diversity to create jobs**
- **Use local resources: cultural, material, and technological**
- **Focus on services as well**