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PARTNERING WITH VENTURE CAPITALISTS AND FINANCING THE DEVELOPMENT AND COMMERCIALIZATION OF INVENTIONS (SEED FINANCING, ANGEL FINANCING, VENTURE CAPITAL)

CURRENT SITUATION OF KOREAN PATENT TECHNOLOGY COMMERCIALIZATION

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I. CONCEPT OF PATENT TECHNOLOGY COMMERCIALIZATION

- 1. Patent technology commercialization is a process in which a company registers its invention as a patent and then transforms the licensed patent into a product. The term "commercialization," as it is used here, means not only a part of the patent technology development (innovation) process, but also a concept strategically set to overcome slow commercialization after the patents have been obtained.
- 2. There are other concepts of commercialization, which are similar to patent technology commercialization. One is development activity that is conducted to use scientific information or a research outcome. Another is the process of converting R&D development into a product with success in technical implementation or patent technologies that are introduced from outside. The other is capitalization that is defined as a process in which, in order to utilize the patent technology obtained, a company is incorporated, and the company then applies the patent to the test production, builds up an operation system, and sells its product. In this paper, commercialization is defined as the latter two concepts.

A. FLOW OF COMMERCIALIZATION POLICY

3. There are two policies that relate to the diffusion of patent technology commercialization; the first is the supply-led technology policy, and the second, based on "needs"-led policy. The former focuses on a commercialization spin-off deriving from public research and development distribution policy for unique technologies, and the latter concentrates on technology exhibition subsidy policy, which supports displays for practical use of technology in order to solve technological problems more easily, and technology subsidy policy for technology consultation and connection. The current trend around the world is changing towards supply-led technology policy from a needs-led policy.

II. DIFFICULTIES IN PATENT TECHNOLOGY COMMERCIALIZATION

A. PROBLEMS OF R&D AND ITS FIRST STEP

- 4. After deciding to initiate commercialization by using its patent technology, a company should analyze the driving forces, which have an impact on production activity and the development of the manufacturing process.
- 5. The Industrial Bank of Korea conducted a survey of small and medium-sized companies that specialize in integrated technology. The findings showed that the biggest problem was a shortage of funds for R&D, which accounted for 87.7 per cent, followed by scarcity of human resources for R&D, at 73.4 per cent and a lack of R&D facilities and equipment, at 39.6 per cent (see figure 1 below). This survey found that all of the three following important factors were lacking in business were: funds, human resources and facilities.

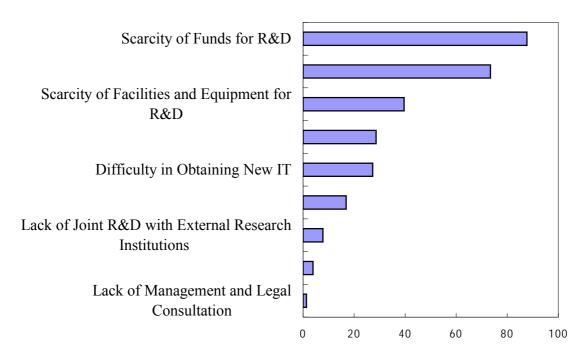


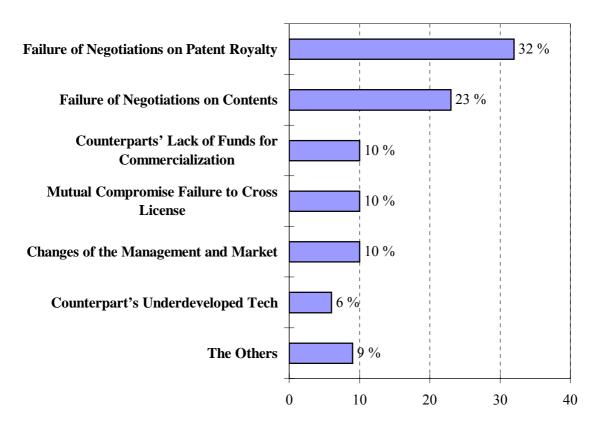
Figure 1: Negative R&D Factors

<u>Note</u>: *The sum of these percentages is not 100, since responses to the survey were given by multiple parties.

6. As shown in the figure above, the small and medium-sized companies (which manufactured products from their patent technologies that they thought could be profitable) felt that the scarcity of funds for R&D from the inception up to the manufacturing of products, human resources for R&D, and facilities and equipment for R&D, were the hardest obstacles to overcome.

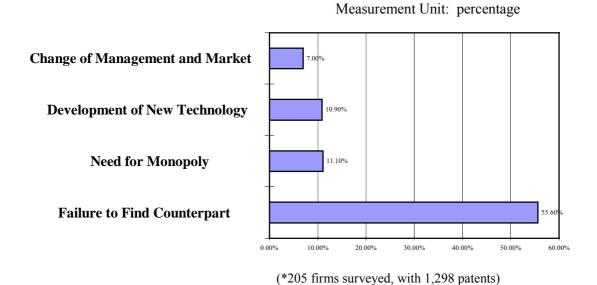
B. REASONS WHY PATENT TECHNOLOGY IS NOT PERMITTED FOR USE BY COUNTERPARTS

7. Reasons for not allowing counterparts to use patent technology in Korea are due to failure of negotiations on patent royalties and contents between suppliers and clients' accounts for a large number of reasons, 32 per cent and 23 per cent respectively followed by counterparts' lack of funds for commercialization, mutual compromise failure to cross license, changes in management and the market, and so on.



<u>Figure 2</u>: Reasons why patent technology is not permitted for use by counterparts

8. The response of firms in Korea seems to be similar to that of firms in Japan. According to a survey by TechnoMart Foundation, concerning the reasons why other firms are not allowed to use a firm's patent technology, firms in Japan intend to earn patent royalties through their counterparts' use of their patent technologies, but 55.6 per cent of them cannot find counterparts who need their technologies.



<u>Figure 3</u>: Reasons why Japanese patent technology is not permitted for use by Counterparts in Japan

III. WAYS OF AND COUNTER-MEASURES FOR PATENT TECHNOLOGY COMMERCIALIZATION

- 9. The original purpose of applying for an intellectual property right is to commercialize patent technology. A survey, aimed at scrutinizing the situation of patent technology commercialization in 1999, in Korea found that the rate of non-use of an intellectual property right had increased to 56.2 per cent, up from 76 per cent in 1997.
- 10. There are two ways to commercialize patent technology; one is that a patentee conducts his own business, and the other is that a patentee transfers his patent to another to commercialize it. If a patentee does his own business, he needs funds and the capacity to manage the business. Fortunately, the Korean Government set up a "Patent Commercialization Committee" within the Ministry of Commerce, Industry and Energy, to establish the one-stop service system for patent technology. As the Committee depends on an indirect fund and accounting, without its own independent supporting fund appropriated for patent technology, what is needed now is to develop the Committee into a stable and foreseeable "patent-related inclusive project" (see Attachment: 2002 supporting project).
- 11. Commercialization of patent technology transferred to another party needs an active technomart, which is in its early stages in Korea. Although it has grown to some extent, along with Internet technology, the technomart is going through a basic phase, such as using information on the Internet. It is therefore feasible to promote more briskly a technomart that connects funds and patent technology through a market mechanisms in which business deals relating to technology can be conducted more actively.
- 12. In addition, the biggest problem for a company starting a business with its technology is a lack of ability to bear financial costs and collateral to support the fund. In this case, using angel and venture capital to help start up a business can increase the probability of success.
- 13. Still, most venture capital companies are in favor of firms that have strong earning potential or a solid start-up foundation, and they invest their capital in these firms only to be eventually disappointed.
- 14. Even after their start-up firms can be in trouble, with their patent rights infringed. The longer the processing time from application to patent right registration after examination, the more likely are difficulties in commercializating patent rights and establishing new start-up businesses. To deal with these systematic problems, KIPO should find ways to shorten the processing time for patent applications.
- 15. What's more, in cases of the infringement of patent rights, an in-house discussion on increasing the jurisdiction of the patent court is required.
- 16. The fields of intellectual property management, which is beyond the capacity of small-sized companies, including the management of R&D, PM, or the Patent Map, which determines the infringement of a foreign patent and an intellectual property rights verification project, should be vitalized, and a corporate culture where firms would try to create their own independent patent department should be established.

17. Thus, can be concluded that when dynamic firms obtain comparative advantages in technology and make their economy more competitive, what counts is that more public awareness of the patent application, registration and commercialization is needed.

[Attachment follows]

2002 PATENT COMMERCIALIZATION COMMITTEE SUPPORT PROJECT

1. Patent Technology Business Support

(measurement unit: 100 million won)

	1	(measurement unit. 100	
Name of Support	<u>Subsidy</u>	Contents of Support	<u>Institution</u>
<u>Project</u>	<u>Volume</u>		for Application
			and Registration
IP-Mart	-	■Qualification for Applicants:	Korea Invention
(Internet Patent		- Technologies subject to the procedure of	Promotion
Tech Mart)		application or registration for patent, utility model,	Association
		design and trademark.	02-577-1077
		■ Contents:	(Extension 506)
		- Supporting patent technology business deal on the	
		Internet (free-of-charge): www.patentmart.co.kr.	
Patent Tech Mart		■ Qualification for Applicants:	Korea Invention
Simulation	5	- Technologies subject to the procedure of	Promotion
Production	(Subsidy)	application or registration for patent, utility model,	Association
Subsidy		design and trademark.	02-577-1077
		■ Contents:	(Extension 506)
		- Display and production support for simulation of	
		patent technology business deal promotion (free-of-	
		charge);	
		- Selection from IP-Mart registration technology.	
Patent Tech	-	■ Qualification for Applicants:	Korea Invention
Business Project		- Technologies subject to the procedure of	Promotion
(Patent Tech		application or registration for patent, utility model,	Association
Mart, Patent		design and trademark.	02-577-1077
Mart)		■ Contents:	(Extension 506)
		- Publication of patent technology mart and patent	
		mart for technology transfer, practical application	
		right permission, and joint investment.	
Foreign Tech	-	■ Qualification for Applicants:	Korea
Transfer Project		- Technologies subject to the procedure of	Information,
(IT-Mart)		application or registration for patent, utility model,	Science and
		design and trademark.	Technology
		■ Contents:	Institute
		- Export of excellent patent technology online	02-3299-6060
		(IT-Mart) and offline (Technomart):	
		www.technomart.org.	

2. Patent Technology Evaluation Support

		(incasurement unit. 10)	o minion won,
Name of Support	Subsidy	Contents of Support	Institution
Project	Amount		for Application
			and Registration
Industrial Property	2	■ Qualification for Applicants:	Korea Invention
Right Verification	(Subsidy)	- Technologies before and after the procedure of	Promotion
Project		application or registration for patent and utility	Association
_		model.	02-577-1077
		■ Contents:	(Extension 506)
		- Preliminary overall evaluation of the domestic and	
		foreign patent rights at the R&D stage	
		(Subsidy support up to 50%, with maximum amount	
		of 15 million won).	
		*Registration dates: on or before March 23, 2003.	
Patent Technology	10	■ Qualification for Applicants:	Korea Invention
Evaluation Support	(Subsidy)	- Technologies taken for patent registration or utility	Promotion
		model registration maintenance decision.	Association

Patent Technology Value Evaluation	-	 ■ Contents: Technology and commercialization evaluation fees of patent technology. (Subsidy support up to 90%, with maximum amount of 30 million won). ■ Qualification for Applicants: Technologies subject to the procedure of application or registration for patent or utility model. ■ Contents: Valuation of business deal, technology investment, cash finance, net present value? 	02-577-1077 (Extension 506) Korea Invention Promotion Association 02-577-1077 (Extension 501)
Technology Value Evaluation	-	 ■ Qualification for Applicants: - Technologies subject to the procedure of application or registration for patent or utility model. ■ Contents: - Guarantee support and evaluation of firms' technology already registered and applied for (Evaluation fee: 500,000 won, Guarantee fee: about 1% belonging to an individual firm). 	Korea Technology Credit Guarantee Fund 02-789-9308
Technical Guidance for Production Field Problem of Small and Medium Sized Firms	-	■ Qualification for Applicants: - Small and medium-sized firms with technologies subject to the procedure of application or registration for patent or utility model. ■ Contents: - Support of 80% of consultation expenses and short-term guidance to resolve the problem in the field for small and medium-sized manufacturing firms.	Small and Medium Business Administration 02-481-4460
Checking and Guidance Project	-	 ■ Qualification for Applicants: - Small and medium-sized firms with technologies subject to the procedure of application or registration for patent or utility model. ■ Contents: - Production field dispatch, evaluation, and consultation of domestic and foreign specialists to deal with managerial and technical problems of small and medium-sized firms (support of 40% of total expenses). 	Small Business Corporation 02-769-6695

3. Patent Commercialization Fund Support

(a) R&D and Property Right Process Support

		(measurement unit: 1	00 million won)
Name of Support	Subsidy	Contents of Support	Institution
Project	Amount		for Application
			and Registration
New Technology	40	■ Qualification for Applicants:	Korea Institute
Utilization Project as	(Contribution)	- An individual with technology subject to	of Industrial
part of	,	the procedure of application and registration	Technology
Industry Technology		for patent and utility model;	Evaluation and
Development Project		- An individual who registers a plant under	Planning
1 3		Article 16 of the Law on Industrial	02-8298-655
		Arrangement and Plant Establishment;	
		- An individual who has a research center	
		owned by the firm under the Technology	
		Development Promotion Law (Article 3 of 8,	
		Clause 1, Number 2);	
		-A venture firm under the Special Treatment	
		Law of Business Venture Promotion,	
		(Article 2, Clause 1);	
		-A small firm that can be treated as a	
		priority, supported and specially applied	
		under the Special Treatment Law for Small	
		Company Support.	
		■ Contents:	
		- First Step: About 50 million won, second	
		step: about 150 million won;	
		- First Step: 100% of overall R&D expenses,	
		Second: 75% of the overall R&D expenses;	
		- A contribution is given every year, divided	
		for each step, contribution of the second step	
		needs "continuation" decision from the first	
		step evaluation;	
		- Repayment of the government fund with	
		development success.	
Small and Medium-	20	■ Qualification for Applicants:	Korea Invention
Sized Firms	(Contribution)	- A small and medium-sized manufacturing	Promotion
Innovation	,	company which registers its plant under	Association
Development Project		Article 16 on the Law on Industrial	02-577-1077
		Arrangements and Plant Establishment.	(Extension 501)
		The following exceptions are recognized in	, , ,
		the case of small and medium-sized firms	
		with business registration certificates,	
		irrespective of whether they register their	
		plant:	
		1) Software (Standard Industry	
		Classification 7220, 7231 and 7240) and	
		Industry Design Service Business (Standard	
		Industry Classification 74329);	
		2) A small and medium-sized firm that has	
		its sub research center under the Law on	
		Technology Development Promotion;	
		3) A small and medium-sized firm that is	
		built in start-up centers or technology	
		promotion centers organized by Small	
		Business Corporation, university, State-	
		owned research institute, State-donated	
		research center or organization that is	
		recognized by the head of Small and	
		Medium-Sized Business Administration;	
		4) A small firm defined by the Law on	

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Beginning Product Support Project	10 (Subsidy)	Special Treatment for Support of Small Firms. Contents for Applicants: With the condition of technology development of small and medium-sized firms, support fund for technology development without collateral and interest, and repayment of a part of government support funds with technology development success; New product development technology that can be completed within one year. Government contributes funds of 75% of the overall development expenses, up to 100 million, with the remaining expenses belonging to the relevant firm. Qualification for Applicants: A student, an individual, with nationality and address in Korea, or an owner of a small and medium sized firm by the Law of Small and Medium Businesses, which have inventions (creations) as follows: Right registered under the domestic Patent Law and Utility Model Law (in the case of a technology registered, after application, as a utility model since July 1, 1999, technology evaluation file should be attached). Invention (creation) with the relevant right currently maintained since the beginning product is filed for production support. The owner of the initial product is excluded from registration. Contents: Under-privileged inventor, student: total expense amount is supported; Individual inventor: 90% of production expenses are supported;	Korea Invention Promotion Association 02-577-1077 (Extension 505)
		production expenses are supported; * With the maximum amount of 30 million won as production support.	
Foreign Application Fee Subsidy Project	4 (Subsidy)	■ Qualification for Applicants: - Technology subject to the procedure of application and registration for patent or utility model, in case of PCT application, technology, which comes into domestic phase. ■ Content:	Korea Invention Promotion Association 02-577-1077 (Extension 403)
		- Support of foreign application fee for excellent patent technology of an individual, or a small or medium-sized firm.	

(b) Start-up Capital Support

Name of Commant	A	Contents of Compart	
Name of Support	Amount	Contents of Support	Institution
Project			for
			Application
			and
			Registration
Technology	20	■ Qualification for Applicants:	Korea
Business Incubation	(Contribution)	- An individual with patent or utility model	Institute of
Project		subject to the procedure of registration and	Industry
		application;	Technology
		- A preliminary founder such as a special	Evaluation
		engineer, researcher, student, and professor	And Planning
		who can start up within one year, or a	02-8298-730
		technology intensive small and medium-	
		sized firm, which within one year of its start-	
		up, has been classified by the law with small	
		and medium-sized firm start-up support.	
		■ Contents:	
		- Capital support used to commercialize new	
		technology such as test product development	
		without collateral or interest;	
		- 50% of equal repayment with "successful"	
		decision.	
Small and Medium	200	■ Qualification for Applicants:	Small and
Venture Start-up	(Loan)	- An individual with patent or utility model	Medium-Sized
Capital	(====)	subject to the procedure of registration and	Business
o np - m-		application;	Association
		- A small and medium-sized firm which,	042-481-4408
		within three years of its start-up, has been	
		classified by the law with small and medium-	
		sized-firm start-up support (Article 3).	Korea
		Contents:	Technology
		- Working and equipment capital used for the	Credit
		early stage management of start-up and start-	Guarantee
		up;	Fund
		- Lending interest: annually 5.75% (floating	02-789-9308
		rate);	02-707-9300
		- Lending period.	
		Working period: within 5 years (including)	
		2 years of the period of deferment).	
		• Equipment capital: within 8 years	
		(including 3 years of the period of	
		deferment):	
		- Lending limit: a maximum amount of one	
		billion won (in case of working capital,	
		within 500 million).	

(c) Production and Equipment Capital Support

		(measurement unit. 10	
Name of Support	Amount	Contents of Support	Institution
Project			for
			Application
			and
			Registration
Patent subject		■ Qualification:	Korea
for		- A firm with technology under the procedure	Invention
Industry Technology		of registration and application for patent or	Promotion
Development Loans		utility model, which supports utilization of	Association
		the patent technology.	02-577-1077
		■ Contents:	(Extension
		- Support of development project of test	504)
		product of capital goods, development	
		project of high technology product, and new	
		technology distribution project;	
		- Lending rate: annually 5.42 % (floating	
		rate), with fee not included;	
		- Lending period: 8 years (3 years of the	
		deferment, 5 years of installment payment);	
		- Lending limit: a maximum amount of	
		5 billion won (80 % of the required capital).	
Development	200	■ Qualification for Applicants:	Small and
Technology	(Loan)	- A small and medium-sized firm with patent	Medium-Sized
Commercialization		utility model right whose registration has	Business
Capital		been completed since 1999.	Association
		■ Contents:	042-481-4377
		 Direct capital required for developed 	
		technology commercialization;	
		- Lending rate: annually 5.75 % (floating	Small
		rate);	Business
		- Lending period: 5 years (including 2 years	Corporation
		of the deferment);	02-769-6871
		- Lending limit: a maximum amount of	
		500 million won (working capital within	
		300 million won);	
		- Form of lending: pure credit loan.	

(d) <u>Design Development Capital Support</u>

(measurement unit: 100 million won)

Name of Support	Amount	Contents of Support	Institution
Project			for Application
			and Registration
Design Innovation	20	■ Qualification for Applicants:	Korea
Product	(Contribution)	- An individual with technology subject to	Institute of
Development		the procedure of registration and	Design
Project		application for patent, utility and design,	Promotion
		and classified as one of the following:	031-780-2084
		1. Firms and relevant organizations which	031-780-2092
		promote high value added through creative	(Extension 507)
		design development of product;	
		2. An individual who works in agriculture,	
		fisheries, animal husbandry and forestry,	Korea Invention
		and relevant organization.	Promotion
		*Limit and Rate of Support:	Association
		- Support Limit.	02-577-1077
		• Product design: one million won.	(Extension 507)
		Brand, character, package and visual	
		design: 30 million won:	
		- Support rate: within two thirds of	
		development expenses;	
		- Technology royalty collection.	
		• Small and medium-sized firms: 20 % of	
		supporting funds where successful;	
		• Conglomerate: 40 % of supporting funds where successful.	
Design Subject	10	■ Qualification for Applicants;	Korea
Among	(Loan)	- A firm that has a technology subject to the	Institute of
Industry Technology	(2041)	procedure of registration and application	Design
Development Loans		for patent, utility model and design, and	Promotion
I I I I I I I I I I I I I I I I I I I		which tries to develop a product with the	031-780-2094
		technology;	
		*It should finish the final rendering.	
		■ Contents:	
		- Lending rate: annually 5.42 % (floating	
		rate), with fee not included;	
		- Lending period: 8 years (3 years of the	
		deferment, 5 years of installment payment);	
		- Loan limit: a maximum amount of	
		5 billion (80 % of the required capital).	

(e) Guarantee & Authentication Support

Name of Support	Contents of Support	Institution
Project	Contents of Support	for Application
Troject		and Registration
Technology	■ Qualification for Applicants:	Korea
Preferential	- A firm that is defined as "Excellent" as a result of the patent	Technology
Treatment Guarantee	technology evaluation institute's examination	Credit Guarantee
	Contents;	Fund
	- Preferential treatment such as designation as preferential	02-789-9308
	treatment guarantee subject and review with technology first	
	of primary importance	
	(Guarantee fee: about 1 % belonging to the firm).	
Venture Special	■ Qualification for Applicants:	Korea
Guarantee	- Venture firms with patent technology.	Technology
	■ Contents:	Credit Guarantee
	- Support with the establishment of mutual recommendation	Fund
	connection support system between venture firms and	02-789-9308

	financial institutions (Guarantee fee: about 1 % belonging to the firm.	
Technology Evaluation Guarantee	 ■ Qualification for Applicants: An individual who has a technology subject to the procedure of registration and application for patent and utility model, and who intends to commercialize the technology (a preliminary founder). ■ Contents: 	Korea Technology Credit Guarantee Fund 02-789-9308
EM Authentication Support	■ Contents: - A system in which machinery, components and material, which have been developed three years previously, quality, performance, and manufacturing process are evaluated, excellent products are granted a warranty mark of quality, and the qualified products are given the support of advertising, marketing channels and funds.	Korea Agency for Technology and Standard 02-509-7273 Korea Invention Promotion Association 02-577-1077 (Extension 507)
NT Authentication Support	■ Contents: A system in which technology or products, which have been developed three years previously, quality, performance, and manufacturing process are evaluated, an excellent new technology and products are granted a warranty mark of quality, and the qualified products are given the support of advertising, marketing channels and funds.	Korea Agency for Technology and Standards 02-509-7273 Korea Invention Promotion Association 02-577-1077 (Extension 507)
GR Authentication Support	■ Contents: A GR mark is granted to excellent products after thorough testing, analysis, and evaluation of recycled products, which are developed and produced in Korea.	Korea Agency for Technology and Standard 02-509-7273 Korea Invention Promotion Association 02-577-1077 (Extension 507)

4. Other Support Activities:

(measurement unit: 100 million won)

	(measurement unit. 1	
Name of Support	Contents of Support	Institution
Project		for Application
		and Registration
Training Specialists	■ Education Program:	Korea Invention
in Commercialization	Training and Research Study;	Promotion
of	• Research on assessment of value of patent;	Association
Industry Property	Trade patent technology;	02-577-1077
	Patent conflict cases:	(Extension 803)
	- Courses for basic levels, intensiveness and specialists in	
	industrial property;	
	* 40~60% of the tuition will be refunded as this program is	
	subsidized by the Ministry of Labor.	
Recommendation of	■ Qualification for Applicants:	Korea Invention
Excellent Inventions	Recommendation is available for individual businessman or	Promotion
to be consumed	small and medium-sized companies who have completed	Association
preferentially	business registration.	02-577-1077
	■ Contents:	(Extension 505)
	Recommending excellent patent technology for government	
	or government investment institution to purchase	
	preferentially (free-of-charge).	
Participation in	■ Qualification for Applicants:	Korea Invention
Foreign Exhibition	Patent technology must have been registered or a patent or	Promotion
	utility applied.	Association
	■ Contents:	02-577-1077
	Funding booth fee, interpretation and translation fee, and	(Extension 702)
	catalog publication fee.	
	Funding is limited to exhibition in Switzerland, Germany,	
	America, etc.	
Support in case of	■ Contents:	Korea
Technological	Technological support is designed to help companies	Agency for
Difficulties	producing, researching developing and recycling products to	Technology and
	solve problems occurring at the production level, which is	Standards
	likely to improve the quality of recycling products due to	02-509-7273
	upgraded technology and development capability.	
Open Laboratory	■ Contents:	Korea
	Recycling Technology Development Center will set up an	Agency for
	open laboratory equipped with recycling Pilot manufacturer	Technology and
	such as site feeding twin screw compressor, Henschel mixer,	Standards
	and the laboratory will be open to any recycling	02-509-7273
	manufacturing company in order to support research and	
	development capacity. This center will also transfer and	
	provide education on special technology.	
Support of	■ Contents:	Korea
Technology	Providing a copy of research resources relating to national	Institute of
Information	and international science technology information.	Science and
		Technology
		02-3299-6233

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