Cluster in Germany and Korea
- Similarities and Differences -

Summary

Gerd Meier zu Köcker, Liane Garnatz, Helmut Kergel,

VDI|VDE|IT

VDI/VDE Innovation + Technik GmbH
Steinplatz 1
10623 Berlin

www.vdivde-it.de

Introduction

Germany and Korea have much in common: politically, they share the experience of partition; economically, they both have a strong orientation towards export and are faced with a constant pressure to innovate in order to sustain growth and highly-paid employment. Korea is the third most important market in Asia for German firms. In terms of gross domestic product (GDP), Korea is the world's thirteenth-largest economy. Among the EU Member States, Germany has remained Korea's most important trade partner by far. The Korean economy is a world leader when it comes to products such as ships, LCD displays, memory chips, steel and automobiles. Korea has initiated state-funded research and development (R&D) projects in many high-technology fields, such as biotechnology and nanotechnology, in order to prepare the economy for the future. For German companies, Korea is rising in importance both as a trade partner and as a platform for accessing the Asian market.

Background and objectives of the studies

As early as 1986, Germany and Korea concluded an agreement on co-operation in the areas of science, technology and innovation. The German side is represented by the German Federal Ministry of Education and Research (BMBF); the Korean partners are the Ministry of Education, Science and Technology (MEST) and the Ministry of Knowledge Economy (MKE). Regular bilateral consultations are held to agree on the political principles of co-operation and to discuss specific measures. Between 2006 and 2008, the BMBF supported a research marketing initiative in which Korea was the target country. The aim was to help German researchers and research establishments to initiate and prepare bilateral R&D collaborations and projects. This programme was extended in 2008 to include the initiation of bilateral collaborations between innovation networks in both countries.

Now, the question of how the benefits of this co-operation can be optimized for Germany is becoming increasingly important. This approach puts more emphasis on R&D collaborations between German and Korean companies as well as on regional networks, also known as clusters. Two studies have been carried out to support the BMBF's strategic considerations in this area.

One of the aims is to analyse the main success factors and barriers for collaborations between German and Korean companies in order to identify the areas in which there is a need for action on the part of the BMBF and improve the conditions for R&D collaborations. The primary target group of the online survey carried out in 2009 were research-oriented companies with less than 1000 employees from different industries with experience in co-operating with Korean and/or other Asian partners or with an interest in such co-operation activities. Of the approximately 5000 companies contacted, 600 participated actively, around 400 companies are already cooperating with Korea or other Asian countries or are interested in such a cooperation.

The aim of the second study is to analyse the similarities and differences between German and Korean clusters to be able to use these instruments more effectively for the initiation of bilateral collaborations.

Korea as a co-operation partner for German SMEs

In total, around 200 SMEs report that they have existing business contacts with Korea. Figure 1 shows that these contacts vary significantly in quality. According to the results of the survey, small (fewer than 50 employees) and very large (more than 1000 employees) companies appear to be more successful at co-operating with Korean and Asian partners in a way that has a positive impact on business development. This is not unexpected in the case of large companies, but it is surprising in the case of very small enterprises. The field in which the collaborations primarily take place (e.g. R&D, production, sales) does not appear to have a significant impact; the trends shown in Figure 1 are similar across the board.
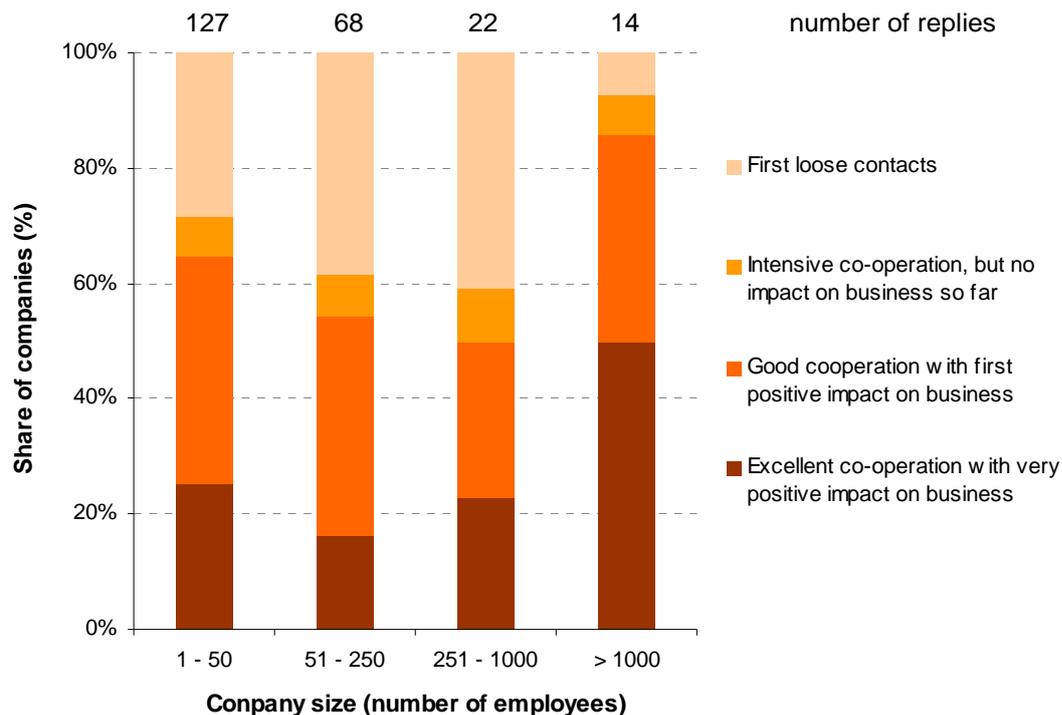

Figure 1: Effects of co-operation with Korean partners on business activities to date; categorized according to company size (sample: 231 companies with cooperating with Korea)

Success factors and barriers to co-operation with Korean partners

The studies present very interesting information regarding the main success factors and barriers to co-operation with Korean or other Asian companies. The assessments – on a scale from "very important" to "not important" – were weighted and normalized to the highest resulting value (Figure 2).

Companies that *already engage in co-operation* consider the performance and quality of the product(s) and technologies to be the main success factor. However, the following factors were also mentioned very frequently:

- Stable personnel pool within the bilateral collaboration
- Availability of a network in Korea and sufficient access to it
- Dedicated strategy available and implemented
- Sufficient time set aside and sufficient financial resources available
- Very good market knowledge at the beginning of the collaboration

Companies that are so far only *interested in co-operation* with Korean partners consider the same success factors to be important. Only the aspect of public funding is seen as significantly more important by this group. This is not surprising, as there are no really suitable direct funding measures for the support of international collaborations specifically for smaller companies.
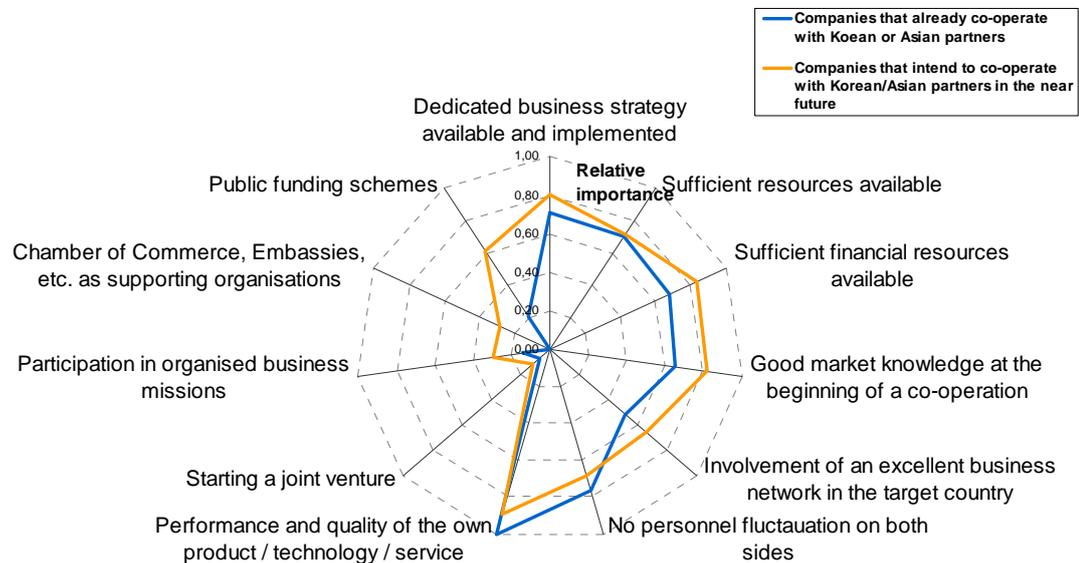
Figure 2**:** Success factors for co-operation with Korean/Asian partners

What are the barriers to co-operation with Asian partners? Among the companies *already engaging in co-operation*, the following aspects are seen as the most important (Figure 3):

- Amount of time needed to maintain co-operation
- Language barriers
- Problems with the protection of intellectual property
- Lack of an own network

Companies only *interested in co-operation* consider the following barriers to be the most important:

- Lack of access to Korean networks
- Insufficient market knowledge
- Amount of time needed to maintain co-operation
- High costs

All in all, the statements are similar, although companies already engaging in co-operation name significantly fewer barriers and see these barriers as less disadvantageous. This suggests that barriers to co-operation may be seen as more serious than they really are. It is also interesting that both groups mention a lack of access to networks as an important barrier to the initiation of collaborations.
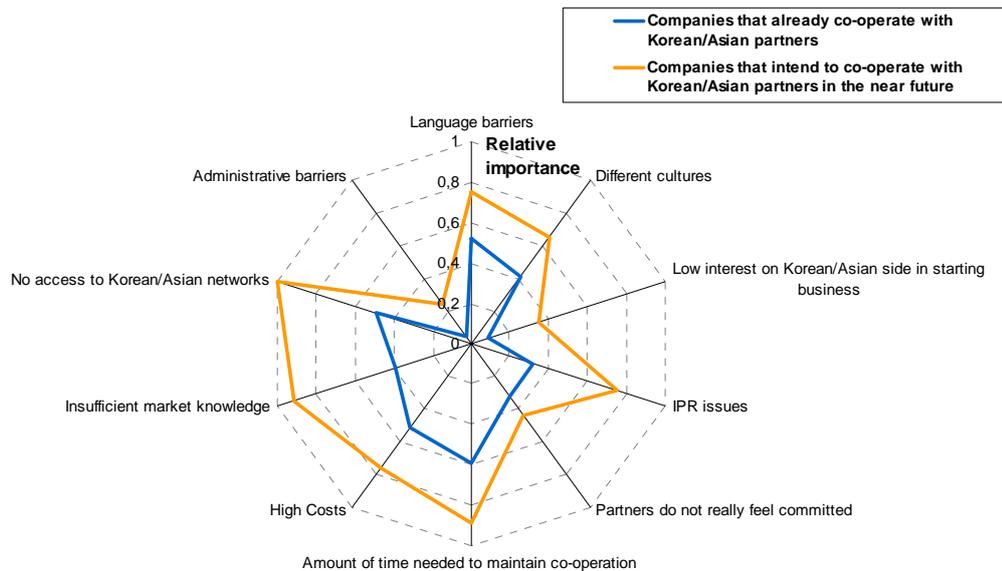
Figure 3: Barriers to co-operation with Korean/Asian partners

Korea's cluster landscape today

Today, Korea has 661 industrial complexes, of which 35 are so-called national industrial complexes, 262 are local industrial complexes, 4 are urban high-tech complexes and 360 are agricultural production complexes. Together, they account for almost 55 % of Korea's total production output and 42 % of all human resources employed in manufacturing.[1]

12 of these industrial complexes have been designated as "innovation clusters" since 2005 and have been assigned a step-by-step plan to ensure that this label soon becomes grounded in reality. No specific indicators according to which these 12 industrial complexes were chosen are known. The following industrial complexes were chosen in the first round: Gunsan, Gwangju, Banwol-Sihwa, Wonju, Gumi, Ulsan, Changwon. In the second selection round, Namdong, Ochang, Sungsu, Noksan and Daebul were added to the list, as shown in Figure 4.

However, the labelling of these 12 industrial complexes as "innovation clusters" was largely a political act, as they bear little relation to the European understanding of clusters and networks. Although they have an agglomeration of commercial stakeholders, mostly companies, the other characteristics of interacting clusters and networks are, for the most part, nonexistent. Key aspects are missing, such as a technological focus (most of the innovation clusters operate in several different industries and fields of technology), collaborative technology development between companies (without public funding) and joint R&D activities (this currently only takes place at the lowest level for mini-clusters). However, the industrial agglomerations in the industry complexes and the R&D infrastructure form an excellent basis for so-called mini-clusters.

At a level below the 12 industrial complexes labelled as "innovation clusters", there are 60 complexes defined as "mini-clusters", which in many areas are similar to networks and clusters in Europe. The number 60 is based on the different technological and industry-specific focuses covered by the 12 innovation clusters. Each innovation cluster consists of three to five mini-clusters, each with a reasonably specific technological focus.

---

[1] KICOX, „Outlook of Industrial Complexes in Korea", 2009 (KICOX = Korea Industrial Complex Corp.)
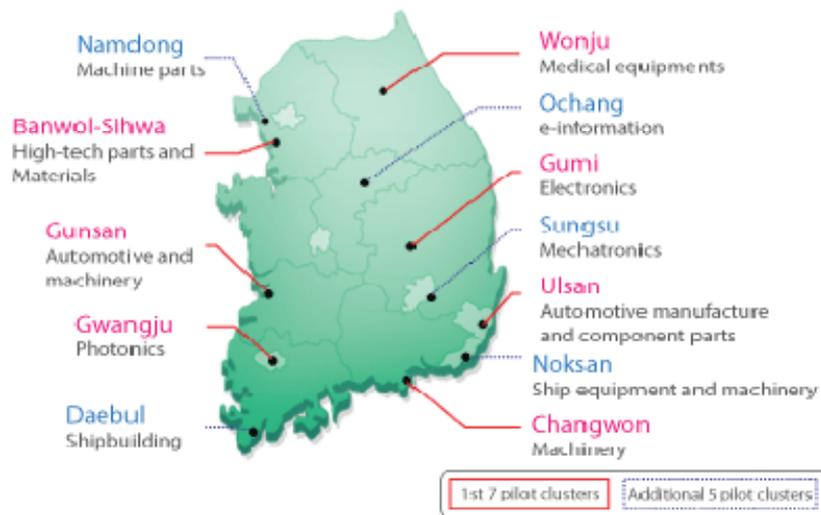
Figure 4: Overview of the industrial complexes labelled as innovation clusters (source: KICOX)

All stakeholders based in the industrial complexes are considered members of the clusters. Their number varies between 50 and 500. However, there is no formal membership, and the networking costs are borne exclusively by the Korean state. In some cases, small fees have to be paid for special services, particularly the use of facilities (cleanrooms, microanalysis, etc) (see Figure 5).
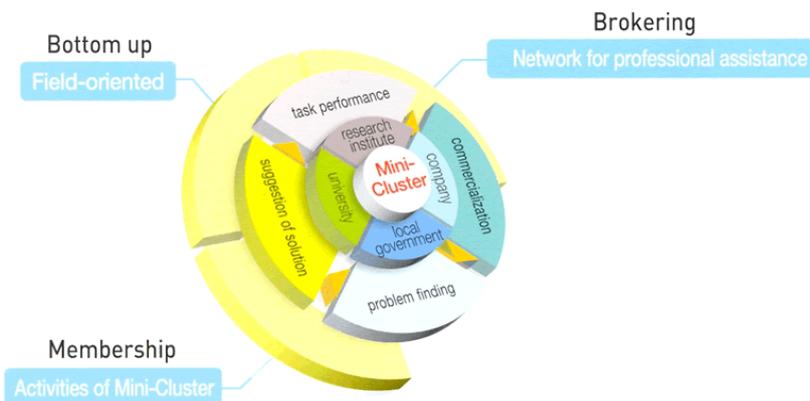

Figure 5: Structure and tasks of the so-called mini-clusters (source: KICOX)

A so-called cluster business development agency is at the centre of each cluster. These institutions can be compared to regional business development agencies in Germany and Europe. In Korea, they either have their own financial resources or have excellent access to funding. Thanks to their visible position, they can bring together stakeholders from science and industry and organize R&D capacities at research centres. In many cases, the R&D capacities belong to the cluster business development agencies themselves – for example, the agencies can act as operators of technology parks and thus support the stakeholders of the mini-clusters. In this way, the business development agencies play the leading role in the networking activities of each mini-cluster. The network coordinators are usually either employed directly by the Korea Industrial Complex Corporation (KICOX) or the business development agency receives funds from KICOX for the coordination of the mini-clusters.

Germany's cluster landscape today

There is an increasing number of regional networks and clusters existing in Germany. This is mainly a result of Germany's industrial diversity combined with public cluster funding activities, which take place on two levels, the federal level (mainly provided by the Federal Ministry of Economics and Technology, BMWi, and the Federal Ministry for Research and Education, BMBF), and the state (*Länder*) level. As a consequence, Germany has a dual system of cluster funding. Figure 6 presents some of the most relevant cluster initiatives in Germany in the recent past (at federal as well as at state level), which resulted in many successful clusters.
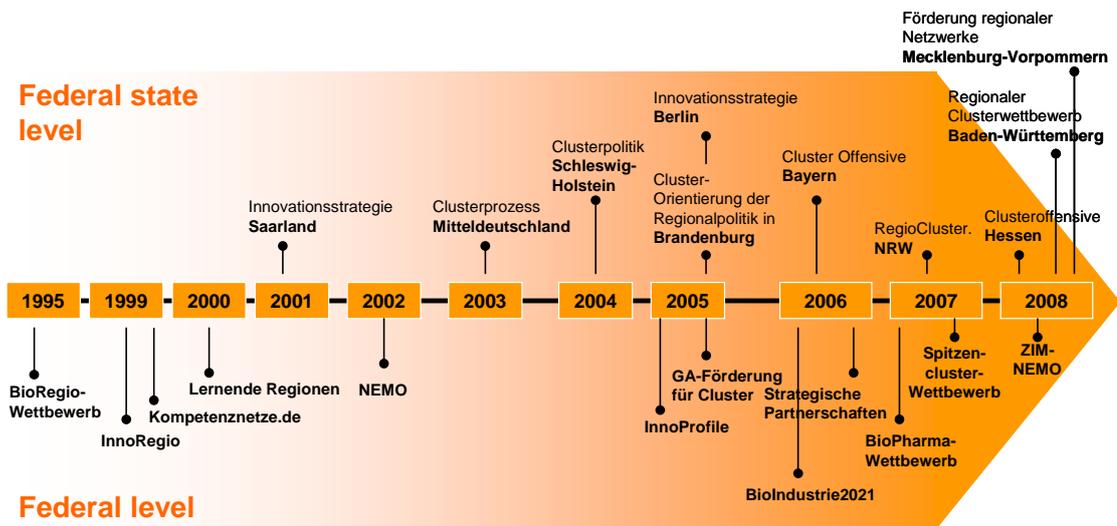

Figure 6: History of selected German cluster initiatives at state and at federal level (not a complete list)

In general, cluster support programmes at state level mainly focus on financing the emergence of clusters and cluster management, whereas at federal level, the most competitive clusters receive further support. For example, dedicated R&D funds are provided for the most innovative clusters under the BMBF's Leading-Edge Cluster Competition. So far 10 clusters have been selected and labelled as leading-edge clusters. The other important cluster initiative is Kompetenznetze Deutschland of BMWi, which can be seen as the league of the most competitive clusters in Germany. This measure focuses more on supporting cluster management by offering specific services.

Nevertheless, about one third of the most competitive clusters in Germany are real bottom-up clusters that never received significant public funding. These clusters operate very independently from policy-makers and focus strongly on the demands of the commercial members. Their main asset is to provide innovative, tailor-made services for their members. The cluster management is financed by membership fees or by services which have to be paid by the members.

The average public funding rate of matured clusters in Germany is about 40 %; 60 % is earned on a private basis. The main objectives of most clusters in Germany is to initiate collaborative technology development, carry out mutual networking, pool regional competences, learn form each other, conduct training and education activities and generate international business.

Clusters in Germany and Korea – a comparative summary

As a result of state control, the structure, objectives and working methods of all 60 mini-clusters in Korea are very similar. In Germany, on the other hand, there is greater variance. Simplifying slightly, one can distinguish two key types of clusters, so-called bottom-up clusters (industry-driven, no significant political control) and so-called top-down clusters (generally initiated and controlled by politics). Clusters of both types can be very successful [2]. Table 1 compares the most important characteristics of the main cluster types in Germany to those of Korean mini-clusters. It shows that there are similarities in many areas, but differences in others.

	German clusters (bottom-up)	German clusters (top-down)	Korean mini-clusters
Establish-ment background	• Usually developed organically, initiated by different stakeholders	• Usually initiated by politics or business development agencies	• Initiated by central government through 5-year plans
Motivation	• Alliance for mutual benefit as a result of long-standing knowledge on the part of the industry partners	• Usually a result of regional development policy or innovation policy • Strong role of politics	• Motivated by innovation policy • Politics plays an extremely strong role • Support and free access to R&D infrastructure for SMEs
Cluster management	• Usually SMEs or institutions commissioned by the members • Usually an active member of the cluster	• Often external management (project management agency, business development agency) • Commissioned or selected by political initiators	• Cluster development agencies responsible for management • Personnel provided or financed by KICOX • Acts according to political parameters
Character-istics of co-operation	• SME-driven (peer-to-peer) • Application-oriented • High added value for the members • Numerous members, decentralized co-operation • Wide range of different subject areas	• Varies strongly, sometimes good co-operation between stakeholders, even between SMEs competing horizontally with each other • In other cases, little co-operation between the stakeholders if there is too much political control and not enough added value for co-operation	• Low level of co-operation between the companies • Problem-based co-operation of SMEs with R&D institutions, initiated by cluster development agencies, motivated by funding • Short-term • Generally no co-operation between the mini-clusters
Co-operation commitment	• High level of commitment through written agreements and membership fees • Clear benefits increase commitment • Generally long-lasting memberships	• Varies strongly depending on the network management and the added value achieved through co-operation • High level of commitment in successful clusters	• Generally low commitment • Co-operation only occurs when there is a technological problem • Purely project-oriented with R&D institution and coordinator
Subject areas	• Application- and problem-driven • Technological and non-technological (e.g. initial and further training, etc.) • Defined by SMEs	• Often defined by cluster management or political initiators (usually at the beginning) • Otherwise, all partners can play an equal role in defining subject areas	• Narrow spectrum of support, R&D and export funding • Purely problem-oriented with a high technological focus • Individually defined by cluster management or SMEs, depending on the problem
Projects/ activities	• Application- and problem-oriented projects/activities • Emerge from problems that arise in day-to-day activities • Joint activities usually not publicly funded • Low dependence on the public sector	• Very diverse • Both R&D-oriented and application-oriented • Often strongly dependent on the availability of regional funding • High dependence on public funding	• Usually R&D-oriented (application-relevant) • Often strongly dependent on the availability of regional funding and R&D infrastructure • Very high dependence on public funding
Sustainability	• Long-term character	• Dependent on public funding	• Very dependent on public funding and politics

Table 1: Comparison of typical characteristics of German and Korean clusters

_____

[2] Meier zu Köcker, Clusters in Germany, 2008, www.iit-berlin.de/veröffentlichungen