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Partners in Development

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CLUSTER DEVELOPMENT IN NRW AND SCOTLAND

	Nordrhein-Westfalen	Scotland
Cluster Definition	<ul style="list-style-type: none"> ▪ Cluster as an industrial agglomeration. ▪ Cluster as a technological competence field. ▪ Geographical and technological definition. 	<ul style="list-style-type: none"> ▪ Cluster as an economic development process. ▪ Limited importance of geographic boundary.
Cluster Analysis	<ul style="list-style-type: none"> ▪ Porterian concepts and/or technological perspective. ▪ Few explicit methodologies. 	<ul style="list-style-type: none"> ▪ Porterian concepts as a starting point. ▪ Strong emphasis on community (shared values/mental models, basis for sharing trust). ▪ Mapping of industries, firms and stakeholders.
Cluster Policy	<ul style="list-style-type: none"> ▪ Top down. ▪ Cluster-specific approach. ▪ Confusing for regional actors. ▪ Defined around technological competence fields, not from the market along the value chain. ▪ Access to state funds suspected to be an issue. 	<ul style="list-style-type: none"> ▪ Top-down. ▪ Cluster-specific, cluster-informed hybrid approach. ▪ Light touch, facilitative role. ▪ Market and business driven. ▪ Access to state funds not a primary issue.
Measurement and evaluation	<ul style="list-style-type: none"> ▪ Resistance to evaluation. 	<ul style="list-style-type: none"> ▪ Experimenting with balanced scorecard. ▪ Evaluation infrequent but used to modify approach and shape policy when available.

Introduction

Comparing the approach to clusters in the two regions has not been a straightforward exercise. The widely differing political structures, population and business densities, cultural attitudes and general approaches to economic development meant that we could not compare like with like, as was the initial intention. However, upon realising this fact, we changed the nature of this study. Rather than examining which approach is best, we looked for complementarity and comparison.

In particular, NRW, due to its political structures, must pursue a policy-led approach. It lacks experience of a single organisationally focussed, pragmatic approach to strategy and development. Conversely, Scotland has a recognised strength in its strategic approach to cluster development yet has no policy. Furthermore, Scotland does not see the need for explicit policy development in this area.

The conclusions and recommendations that follow therefore focus on the areas where practices from one region will enhance, rather than replace, current practices in the other.

Approach to Cluster Development – Nordrhein-Westfalen

There has been a policy of cluster development in NRW (Nordrhein-Westfalen) since the beginning of industrialisation. In the Ruhr area the development of the Montanindustrie⁷ was supported by the state in such a way which is comparable to our current idea of cluster development, although this phrase was never used. A typical example from the 1980s is the media industry in Cologne; one of the region's major success stories. This growth began after the Second World War with the foundation of the Westdeutscher Rundfunk.⁸ Today, it employs 50000 people.

However this development was organic. One was not conscious of this new approach for regional structural policy. As such, it remained an issue for a few experts who discussed in small, closed circles the possibility of a broader application. One of the main target areas for this application was in the Ruhr which has above average unemployment.

The late start of this approach is explained, in the main, by the fact that a new economic perspective for the Ruhr area was unclear for a long time. No clear successor was identifiable for the declining Montanindustrie. Thus the structural policy in NRW was aimed at modernising the infrastructure, to build universities, promote technology transfer, improve the education/skills/training of the population and to redevelop brownfield sites.

Today less than 15% of the region's workforce is employed by the Montanindustrie Cluster, but only in the last few years did it become clear what was the main industrial activity of the other 85% of the 2m workforce. Today, the Ruhr area is gaining a

⁷ Rough translation would mean 'mountain industry'; it includes coal mining and also the related steel and heavy metal industries.

⁸ West German Radio.

higher profile. Twelve main industries have developed which include information industries, logistics, water, mining supplies, microelectronics, medical technologies, chemicals, tourism, new materials, design, heavy engineering and energy.

Since the beginning of the 1990s, there have been systematic attempts to establish the cluster approach in structural policy but only recently has it become a political topic. It has been only in the recent months that the approach has been gaining respect by all involved parties/participants.

All attempts at implementing this approach remained the result of a compromise between the state government and regional activists. This was due to the fact that, due to NRW's structural policy, an implementation of new approaches cannot take place without involvement of regional bodies. The state government is dependent on the co-operation of these bodies. If they had attempted to implement this approach with political pressure or had attempted to use sophisticated methods of evaluation, then the interest in this type of structural policy would not have grown.

In 2000 it became necessary to change paradigms in the regional structural policy in NRW. This was the consequence of the newly created Objective 2 programmes for the years between 2000 and 2006. Additionally, the International Construction Exhibition⁹ – IBA - had ended. The Ministry of economics has used this opportunity to give more profile to the cluster approach. As a result, a partnership called 'Wachstums - und Beschäftigungspakt Ruhr' will be created this year between the local authorities and organisations in the Ruhr area, solely to pursue this approach with greater vigour and to focus on the 12 named areas.

This is one area, where a noticeable difference to Scotland can be identified. In the Ruhr area alone, there are 52 local authorities which all carry out economic development. Apart from that, there are chambers of commerce and industry, guilds, industry associations, trade unions and institutions from science and research. A particular problem is the behaviour of companies who see themselves exclusively as competitors and have little inclination to co-operate with cluster initiatives. In these circumstances it will take some time to make this approach acceptable.

In the meantime, the state government is trying to widen the approach to the whole of the NRW. There have already been first successes.

Cluster Analysis and Evaluation

Traditional studies in NRW suffer from the fact that they do not pay enough attention to the demand-side of markets or the competition from other regions. When there was a question of following the results of the analysis or the creation of a broad political coalition, then the state government tended to pursue the latter option. However, should the support for the approach grow in the future, then the analytical tools for the evaluation of single initiatives will be able to play a more important role than until

⁹ IBA – High profile, state-led series of projects that regenerated former industrial, contaminated and brownfield sites into a series of leisure and tourism developments, e.g. Emscher Park and Landschaftspark.

now. However, in the current climate it is more important to influence the participants to act in the first place.

Cluster Definition

The cluster definition is broadly equivalent to the Scottish idea: “it is a group of industries and organisations linked by a common goal or practice.” However, as a result of the huge number of interests which have to be carried out by the state government and the variety of participating bodies, no strict concept of a cluster development policy can be pursued. Also, there are differing ideas of what the practical aspects of a cluster are. Quite often it is just the co-operation of the companies in one sector. It is only in the following phase that local authorities and organisations join the initiative and it is only during the very last stage that suppliers and customers join. In the first instance the agreement is restricted to pursue a common interest.

Another difference lies in the idea of the state’s role in the two countries. As the state is in greater demand in Germany than in Scotland, it means that bodies who participate in an initiative are more likely to be state institutions and as such are subject to the different political interests.

As a result, there are only very limited possibilities to delegate some activities to agencies or other non-state bodies. As such, it is the employees of the ministries who are tasked with the moderation of processes and to mediate. Third parties tend to be rejected for those roles. This is accompanied by an increasing reluctance to pay for those services. As a result, the state suffers from scarce personnel and the number of people who could take over these functions is very limited.

The regional situation plays a more important role in NRW than in Scotland. One reason for this is the size of NRW: with 18m inhabitants and close to 600,000 companies it is inevitable that there are many clusters which have developed in a long drawn out process according to different historical circumstances. The local authorities and their economic development departments are often owners/managers of specific infrastructure which are important for the individual clusters - such as technology centres in NRW - and, as such, they play a very important role. As a result, there is a requirement to define which local authorities should be involved in the issue and which are perhaps more peripheral i.e. stakeholder management – identification, recruitment, reward, etc..

If we take the 12 cluster examples for the Ruhr area the relevant initiatives are at a very differing stage of development. In the logistics cluster there is a state project/initiative which focuses on two geographical areas, one in the eastern Ruhr area the other one in the western Ruhr area. In the medical technology cluster, the organisation of cluster activities is only beginning. Business start-ups and university institutions are expected to take part, a consensus within some local authorities is now complete and the establishment of the cluster can begin. In the case of information technology, which is mainly concentrated in the eastern Ruhr area around Dortmund, there are more than 600 companies which are slowly growing together in an initiative which is led by the local authority.

An example which exists since 1997 is the ChemSite initiative of the chemical industry in the northern Ruhr area. Here, eight companies, Gelsenkirchen University, the regional development agency and several local authorities have come together to support the development of the chemical industry in this area. This mainly happens in two ways. On the one hand there are attempts to improve the rate of new firm formation in this sector. There have been approximately 15 start-ups employing approximately 100 people. A second strand of activity is inward investment promotion. In this area the companies together with the regional development agency try to attract investors, mainly from the USA. The competition from Rotterdam and Antwerp is enormous which meant that in the last few years several big investments of up to €1 bn were lost. The situation is slowly improving after appropriate industrial sites could be provided and the pipeline infrastructure is also being improved with state assistance.

The ChemSite initiative shows several elements of the cluster approach:

- All participants have a clear idea of the advantages.
- Companies, Associations, Research Organisations, local authorities and state government work together very closely.
- There is a joint strategy. Currently this is in the process of being discussed and re-orientated.
- The situation in the products markets and the relationship to competitor regions were analysed and evaluated in great detail at the beginning.

So far it has not been possible to include the supply chain and customer base into this process which means that the initiative has, as yet, remained an industry-specific initiative instead of broadening out to a cluster initiative as it could do. Work is currently taking place to improve this.

Summary

The cluster approach has been in existence in NRW for a long time however until very recently it received hardly any political attention. This has changed now. The state of the development of existing initiatives differs widely as does their self-awareness. As a result, all variations of clusters are in existence in NRW. The main characteristics are as follows:

- Fragmentation: In NRW there are a number of bodies who take part in structural policy. This makes the implementation of an approach very difficult and also makes it impossible to implement a common approach. However, the advantage is that once an approach has been implemented it is widely accepted.
- Policy driven: In NRW it is very difficult to completely delegate responsibilities to a separate or devolved agency. As a result, the demands for state action are higher. The disadvantage of this is that the usage of resources is politically motivated. The advantage is that once a decision has been taken there is a much higher chance of it being implemented.

- Not time limited: The demands that people have of the state make it difficult to pull back from initiatives after a pre-determined time-frame.
- Analysis and Evaluation: In NRW analysis and evaluation are not as important as in Scotland. This is the result of the current state of developments. Prior to that, the approach has to gain wider interest. Afterwards, those two factors will gain in weight.

Approach to Cluster Development – Scotland

For the purpose of this comparison, we have restricted our study to cluster initiatives in lowland Scotland – specifically the area covered by the Scottish Enterprise Network. The reason for limiting the study to one region (the remaining part of Scotland, covering 13% of the population, has Highlands & Islands Enterprise as its lead economic development agency) is to focus on the changes that cluster development has catalysed within the organisation itself (in terms of policy-making, its role, its approach to intervention and its structure) as well as in the market.

Cluster Definition

The Scottish Enterprise Network originally defined clusters as a noun - *‘a group of industries and organisations linked by a common goal or practice’*.

Worthy of note here is the lack of a geographic element. By default, Scotland assumes its clusters are national models. Regional concentrations are usually referred to as ‘growth nodes’ within the overall cluster. It is left to the cluster participants to define their own geographic boundaries (if any).

Latterly, the Scottish Enterprise Network has changed to using the term ‘cluster’ has as a *verb* – an economic development process – to describe their approach to a particular range of interventions.

Cluster Initiatives

Currently there are eight active, explicit cluster initiatives in which the Scottish Enterprise Network is involved. These were identified as part of a research exercise by Michael Porter’s Monitor Group in 1993. Divided into three ‘waves’ each cluster was selected, ultimately, for its growth potential and long-term sustainability. These are:

- Biotechnology - <http://www.biotech-scotland.org/>
- Creative Industries - <http://www.creativesotland.com/>
- Forest Industries - <http://www.forestryscotland.com/>
- Food and Drink - <http://www.scottishfoodanddrink.com/>
- Optoelectronics - <http://www.microelectronics.org.uk/>
- Semiconductors - <http://www.semiconductors.org.uk/>
- Energy (previously Oil and Gas) - <http://www.se-energy.co.uk/>
- Tourism-<http://www.scotexchange.net/business/business-se-clustersnewtourism.htm>

There are many other implicit cluster initiatives in Scotland. In recent months, Scottish Enterprise has begun to drop the term ‘cluster’ as the process it refers to is adopted throughout the organisation; there is no longer a need to distinguish the cluster approach as something different. Examples of recent implicit initiatives are:

- Financial Services
- Chemicals
- Textiles
- Aerospace
- eLearning

Figure 3 below shows the first wave of cluster initiatives and the characteristics of each cluster. Whilst the diversity in each cluster’s company base, in the gestation of the cluster and in the overall approach can clearly be seen, it was possible to apply a common framework to all.

Figure 1

Scottish Enterprise Network First Wave Cluster Initiatives

Cluster Characteristics	Biotechnology	Semiconductors	Food & Drink
Origin of Industrial Base	Organic	Transplant	Organic
Geographic Scope	Dispersed	Localised	Dispersed
Number/size and importance of firms	Sparse	Sparse	Dense
Breadth & Depth	Broad Shallow	Narrow Shallow	Broad Deep
Innovative Capacity	High innovation	Low innovation	Low innovation
Cluster Governance	All ring, No core (Research-led)	All core, No ring (MNE-led)	All ring, No core (SME-led)
Coordinating Mechanisms	Public-Private (BioAlliance)	SE	SE (initially), then industry
Overall State of Cluster Development	Latent	Policy-driven	Mature

Brown, R Cluster Dynamics Paper (1999), *Scottish Enterprise Network*.

The initial approach that Scottish Enterprise took was to build upon previously successful sectoral initiatives, which were largely state-led and interventionist. The main example here is the semi-conductor cluster.

Locate in Scotland (LiS)¹⁰ were highly successful in leveraging state and EU funds to attract manufacturing and assembly work from major multi-national enterprises (such as Motorola and National Semiconductor) to the central belt of Scotland, generating high numbers of medium to low value jobs in high unemployment areas. Recognising the cyclic nature of the semi-conductor industry (which, in recent months has seen the long-expected migration of assembly jobs from Scotland to Eastern Europe), LiS also put significant efforts into attracting high-value R&D to Scotland. This would strengthen linkages in the local value chain, making any decisions to decant operations from Scotland less attractive

Project Alba was conceived as a joint initiative between government, local agencies and academia. A high-tech campus was constructed, almost on a speculative basis, with a view to attracting overseas companies such as Cadence – thereby bringing high-value, knowledge-intensive jobs to the area. LiS based their locational marketing efforts around the bespoke facility, the quality of life in Scotland and the excellent academic track record of Scottish universities and graduates.

The lack of influence of local managers, when the key decision makers are outside the cluster locus, was recognised from the previous sectoral initiatives. To relocate an assembly plant to a region with a lower wage structure is a relatively simple exercise. To move an entire value chain, however, is much harder; the risk of severe and sudden job loss is therefore reduced. As we are now witnessing, this has provided a dampening effect on the employment cycle in Scotland.

The first wave of cluster initiatives highlighted the fragmentation that existed between national policy makers and local delivery organisations (such as Local Enterprise Companies, Enterprise Trusts, Chambers of Commerce and Local Authorities). In many ways, Project Alba ‘broke the mould’ of agencies acting in isolation, and other initiatives, such as the Food & Drink cluster, really began to embed this approach.

Food & Drink was an existing, mature cluster. The cluster team began by mapping the cluster; the core and related industries and the linkages between actors. This provided i) an overall framework for the industry to allow any interventions to be targeted much more effectively and ii) a context for local delivery organisations to work with the actors at micro-level. In other words, *clustering* became the practice of setting a meso-economic framework to direct micro-economic promotion and intervention with groups of firms, rather than individually.

In the case of the Food & Drink cluster, the interventions lay, in the main, around value-chain integration (including skills development and logistics). Various Local Enterprise Companies were then actively encouraged by the core (national) team to lead on these interventions, building on existing local relationships and skills and leveraging these at national level. The core (national) team provided a single framework and took a co-ordinating role. An example of this is the CAMIC project within the Food & Drink cluster - Scottish Enterprise Grampian, a LEC in the north-

¹⁰ LiS is the joint Scottish Enterprise / Scottish Executive inward investment agency. It works within a framework set by the Department of Trade and Industry (DTI) to attract foreign direct investment to Scotland. LiS is now renamed Scottish Development International.

east of Scotland, leads the market intelligence efforts for the industry in Scotland as a whole.

The Scottish Enterprise Network is only allowed to intervene in markets to resolve market failures.¹¹ This means that there are almost no examples of direct support or grant schemes within the Network's portfolio of services. The vast majority are indirect;¹² they attempt to bring markets into balance or address systemic failures. As an NGO (Non-Governmental Organisation) Scottish Enterprise is also in a position to inform policy development at national level, should this be required.

Cluster Analysis

Scotland recognises clusters according to the following typology shown in recent research on cluster initiatives in several European countries (Raines 2000, 28 f):

1. Value-chain clusters, delimited by a network of supply linkages;
2. Competence-based clusters, based on the technological expertise in a region;
3. Functionality-based clusters, cutting across industry boundaries along issues such as knowledge and knowledge management.

Although the eight (explicit) Scottish clusters were originally identified using Porter's Diamond (see fig 2), learning from the first wave of cluster initiatives was quickly factored into the process. These additional criteria are:

- Job and wealth creation;
- Growth prospects in the Industry - UK and internationally;
- The competitive environment - UK and internationally;
- Geographical dimensions of the cluster in Scotland;
- Status of cluster (emerging, mature, disconnected, declining, etc);
- Scotland's capability to shape the industry development (including the impact of regulation, market leadership elsewhere);
- Cluster fit with few Network strategy (and government policy);
- Current (and potential) Network involvement / connections with the cluster;
- Scottish Enterprise Network's capacity for involvement / influence / making a difference.

Each of the above were ranked as to whether the area was Very / Moderately / Not suitable as a priority cluster initiative. This focus on macro-economic growth, network connections, goal alignment and influencing capabilities (of Scottish Enterprise) made selection more effective. Scottish Enterprise had to be convinced that they were the

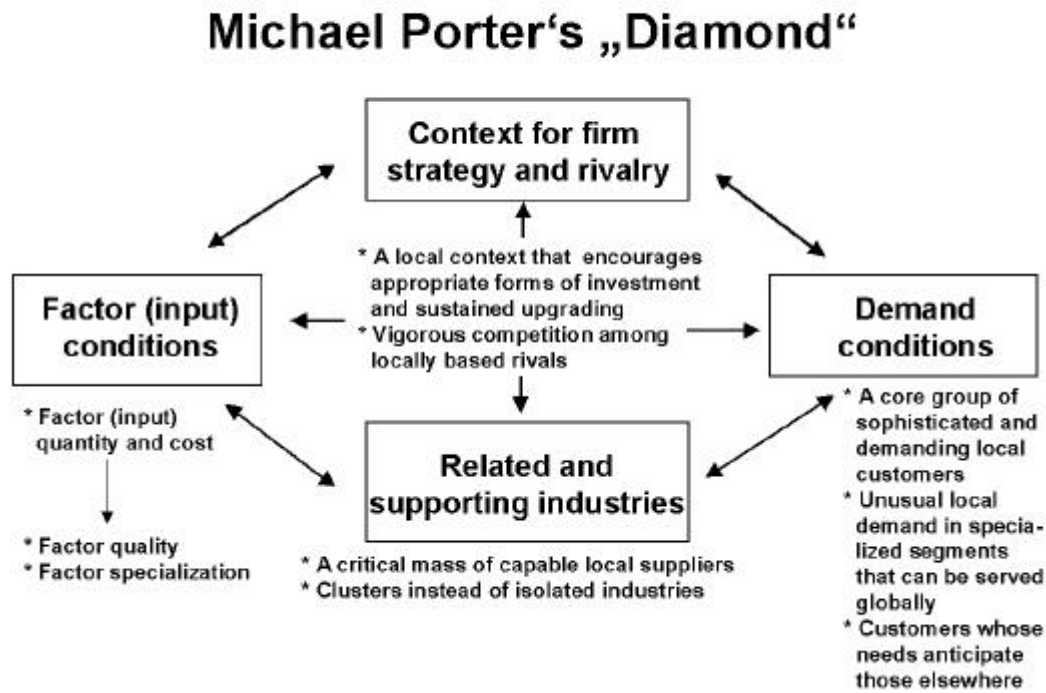
¹¹ The Scottish Enterprise Network was established under the Enterprise and New Towns (Scotland) Act 1990. Under the terms of the act, the Network is only allowed to intervene in markets where a market failure can be identified, i.e. an imbalance between supply and demand, caused by one or more factor conditions.

¹² For example, if a lack of skilled workers is identified as the root cause of poor quality or inefficient production, Scottish Enterprise may fund the development and promotion of training courses with local training organisations rather than give training grants directly to the industry.

right agency to be involved in developing the cluster and, if so, what their role should be.

Figure 2

Porter's Diamond



Source - Porter, M. (1990) *The Competitive Advantage of Nations*, Free Press, New York.

Cluster Management

Scottish Enterprise's modus operandi is now well formed. New cluster initiatives, whilst developed top-down, follow extensive consultation with the actors in the marketplace. One of the more recent illustrative examples is Creative Industries – a functional / value-chain hybrid cluster.

Creative Industries unites a number of traditionally disparate sectors via a common function – design capability. These sectors – architecture, games software, arts & culture, multimedia, advertising, publishing, TV & radio, music and film – are now sharing design expertise through a process we call co-creation. One of the best examples is the use of architectural design within games software. To make the gaming experience as real as possible and to future-proof the experience for some years, the latest architectural techniques and features are incorporated into the game.

The cluster process is time-boxed; the dedicated team that is charged with each cluster action plan is given three years to consult, plan, intervene and exit, ensuring that funding mechanisms and industry-led bodies are in place to continue any further action

needed. In Creative Industries, the formation of key industry groups, such as Scottish Screen and the Scottish Games Alliance is fundamental for the continued growth and co-creation within these industries once public-sector involvement ceases.

Scottish Enterprise uses the term ‘community’ in much of its references to the actors within each cluster. This term is used because actors with similar value systems are sought to build the core of the cluster. By aligning actors with similar attitudinal and mental models, trust can be established more quickly and this mitigates the internal rivalries and reduces transaction costs. It is more important that actors are linked attitudinally than technically; these links are stronger than a transient set of links based around current technologies.

This reflects the ‘light touch’ approach to cluster management; indeed, the word ‘management’ is not used either – Scottish Enterprise sees its role as one of *facilitation*, not management. Before initiating a cluster development programme, Scottish Enterprise evaluates the probability of the cluster community reaching critical mass and the community’s willingness to take charge of its own destiny.

Scottish Enterprise never seeks to own a community; indeed, such an arrangement would preclude a successful outcome and Scottish Enterprise would reject any initiative that required it to take such a role. It is only one constituent member of the cluster community, albeit a prominent one in the early stages of some clusters development. Critical to the long term sustainability of each cluster, or of regional competitive advantage, is a sense of ownership and leadership within the market itself. This low-key approach makes intervention and exit much easier and helps to change the dependency culture.

Similarly, the light touch approach and facilitation role, combined with the meso-economic framework, allows local economic promotion organisations (such as LECs, Chambers of Commerce and Local Authorities) the maximum flexibility in delivering interventions at micro level whilst ensuring that overall goal alignment is maintained. In other words interventions are not, typically, centrally-driven directives; the top-down framework harnesses bottom-up activities. This mitigates against the tensions always present between local and national agendas, although by no means eradicates them. This is illustrated by the emergence of Interactive Tayside – a local cluster initiative in one region of Scotland. Tayside has one of the growth nodes for Creative Industries (mainly based around games software) and some local agencies see this node as a distinctive (and perhaps even separate) cluster from the national one. Market forces, and the ability to reach critical mass, will either prove this distinction right or wrong over time.

Cluster Evaluation and Measurement

When trying to measure and quantify the impact of cluster initiatives, Scottish Enterprise has used a large number of methodologies and economic indicators; from standard measures such as jobs created/safeguarded, increase in exports to (where applicable) newer measures such as number of businesses adopting e-commerce and number of new networks created. The measures will vary depending on the nature of

intervention/activity within the cluster, e.g. inward investment for semi-conductors, commercialisation for biotechnology and value-chain integration for food & drink.

There is a consensus, however, that this does not explain the full picture. A blend of macro-economic performance measures (for the cluster as a whole) and micro-economic measures (to establish the success of individual interventions or projects within the cluster) is needed.

In an attempt to address both areas, a version of the ‘Balanced Scorecard’ approach (Kaplan and Norton, 1994) is now being tested. This should simplify and reduce the number of measures and targets whilst producing the desired blend of internal and external market indicators. It also provides enough flexibility to accommodate cluster-specific measures at micro-level whilst maintaining enough consistency to compare clusters at meso or macro-level.

As can be seen below, this includes some ‘softer’ measures as well as more traditional ones. Each Critical Success Factor (CSF) shown has 1-3 associated Key Performance Indicators (KPI) that can be easily measured to show whether the CSFs are present.

Figure 3

Balanced Scorecard for Cluster Evaluation

Critical Success Factors

<p><u>Economic/Financial</u></p> <ul style="list-style-type: none"> ● Levels of Investment ● Company Performance ● Market performance – Global, UK ● Employment Levels / No. Companies 	<p><u>Knowledge</u></p> <ul style="list-style-type: none"> ● R&D and Innovation ● International Awareness/recognition ● Integration of academia & business
<p><u>Skills</u></p> <ul style="list-style-type: none"> ● Appropriate skill levels & structure ● Improved value per employee ● Continuous learning & development 	<p><u>Cluster Process</u></p> <ul style="list-style-type: none"> ● Local Connections & Networks ● Appropriate Infrastructure ● International Connectivity ● Industry Leadership

MacCallum, N (2001), *Knowledge Management, Scottish Enterprise Network*.

Evaluation has, in recent years, begun to be embraced within Scottish Enterprise and Local Enterprise Companies as valuable aid to organisational learning. In general, evaluation is still carried out by external consultancies (to ensure objectivity) but it is relatively infrequent and lacks consistency in some areas. The establishment of a Knowledge Management directorate and KM practitioners within the Network has put the use of evaluation into context – it is a key knowledge asset to be used and leveraged. Practices are being standardised to improve consistency and the feedback

loop is becoming much tighter; learning points and best practice are actively being sought by the rest of the organisation, keen to avoid any issues or pitfalls of the past.

Summary

Whilst it is still too early to say whether the Scottish approach to cluster development has been successful (according to Porter (1998), numerous case studies suggest that clusters require a decade or more to develop depth and real competitive advantage), there are initial signs of moderate success in most of the Scottish cluster areas (Sim and Pollock, 2001).

The key characteristics of the Scottish approach are summarised as follows:

- **Market-led:**¹³ Where possible, the cluster is market led. The Scottish Enterprise Network tends to reject the lead role.
- **Facilitation:** It is a light touch approach, less interventionist than previous sectoral initiatives.
- **Co-ordination:** The cluster map provides a meso-economic framework that allows local agencies to target interventions more effectively and complimentary to the national goals.
- **Time-boxed:** From the outset, members of the cluster ‘community’ are aware that the Scottish Enterprise Network will exit after 3 years.
- **Adaptive:** Extensive use is made of research and evaluation evidence to adapt and improve the approach relevant to each cluster, its market and its growth potential.
- **A-political:** Great effort is put into mapping and managing stakeholder relationships to ensure that win-win scenarios are present for other organisations (public, private and third sectors) to ensure goal alignment.
- **Indirect Support:** Cluster funds are not paid directly to SMEs within the cluster; they are used to address market failures by stimulating the supply or demand side of the market, as appropriate. Cluster initiatives do not have any kind of open (slush) fund at their disposal.

Comparisons - Cluster Definition

A widely accepted issue that inhibits comparison of the concepts of clusters is that the term means different things to different people. One of the reasons for this is the fact that there is no ratified or *de facto* standard framework for examining clusters. Feser (1998) notes there is no cluster theory *per se*, but a broad range of theories and ideas that constitute cluster logic. Held claims that this approach can be harmful (Held,

¹³ The term ‘market-led’ is a shorthand way of expressing that the cluster could be either consumer-led, industry-led or policy-led depending on the prevailing market conditions and the nature of the imbalance between supply and demand.

1996, p.249) as it can have negative policy ramifications: ‘sadly, in the rush by various governments to employ clusters, some fundamental issues have been slighted, including appropriate research methods and even the definition of the cluster itself.’

This can be seen from the undernoted examples of different definitions used when examining clusters¹⁴.

‘Concentrations of interconnected companies and institutions in a particular field.’
(Porter 1998).

‘A concentration of competing, collaborating and interdependent companies and institutions which are connected by a system of market and non-market links.’
(UK DTI 1998).

‘Buyer-supplier relationships, or common technologies, common buyers or distribution channels, or common labour pools.’
(Enright 1997).

Although these definitions have much in common, not everyone views clusters the same way. The differences in the Scottish and German definitions have already been discussed in this paper; in Nordrhein-Westfalen it is an academic *term* used to describe industrial agglomerations, for Scotland it is a *process* of economic development to promote local business competitiveness.

Comparisons - Cluster Analysis

Much of the recent, global interest in clusters was influenced by the work of Michael Porter (Competitive Advantage of Nations, 1990). According to one study examining cluster initiatives across Europe, however, the majority of cluster programmes were not preceded by an in-depth regional analysis comparable with Porter's cluster mapping process (Lagendijk, 1999a). Moreover, Lagendijk claims that the widely accepted Porterian concepts of clusters have been interpreted very differently across regions, being translated into practical initiatives according to the specific needs of local and regional economies. This has been backed up by other cluster researchers (Raines and Asche, 2000).

In keeping with the findings of Bergman and Feser (1999), Scotland uses Porterian theory as a starting point, or a catalyst, to undertake cluster development and does not rigidly apply the theoretical framework as the only tool. From a policy perspective, the Scottish approach towards clusters is flexible in accommodating varying industrial, institutional, political and market conditions.

The Scottish approach is also more flexible in setting the geographic boundaries of individual clusters; these are determined by the market forces and infrastructure

¹⁴ Adding confusion to this is the fact that related terms, such as industrial districts, value chains, innovation systems, competence fields and business networks, are sometimes used interchangeably with the term clusters.

characteristics inherent in each cluster. This is in contrast to the Nordrhein-Westfalen approach where policy-driven spatial dimensions are applied.

In summary, the Nordrhein-Westfalen approach is very much policy and technology-driven (e.g. chemicals and textiles) rather than the Scottish approach of fostering and facilitating market-led initiatives (e.g. biotechnology, creative industries, food & drink).

Comparisons - Cluster Policy

According to Feser (1998), there are broadly two different types of cluster policies; i) those that focus specifically on identified clusters called '*cluster-specific strategies*' and ii) the improved implementation of individual development initiatives, called '*cluster-informed strategies*'. From our comparison between the Nordrhein-Westfalen and Scottish approaches, Nordrhein-Westfalen clearly sets cluster-specific strategies whilst Scotland uses a hybrid of the two.

In Scotland, the top-down (usually national) element of the strategy is cluster-specific, involving cluster mapping and strategic analysis of both global and local market growth potential. The action plan is then converted into a cluster-informed strategy, developed bottom-up in consultation with industry actors and stakeholders, to allow local agencies to harness the competitive forces and improve the effectiveness of local interventions. This builds a clear relationship between meso-level and micro-level economic promotion, ensuring overall goal alignment for economic agencies and industry alike.

Comparisons - Measurement and Evaluation

Although numerous methods are used to analyse and measure the viability and impact of clusters, the lack of unified theory means that there is no universally accepted method of cluster assessment and measurement either (Held, 1996). Different countries and regions tend to define clusters in a variety of ad-hoc ways, using a wide variety of analysis techniques, success criteria and measures.

Evaluation techniques from which clusters can be identified include industry-based input-output relationships, shift-share analysis, location quotients, industry growth forecasts and case studies. Each must be applied in context. The variety of different cluster evaluation techniques also owes much to the different practices and skills which are deployed by various economic development bodies and consultancies working in this growing field.

Having assessed many of these, Scotland is trying an approach based on Kaplan and Norton's Balanced Scorecard to capitalise on the strengths of individual methodologies and measures within a single framework. Nordrhein-Westfalen, still to implement a full, regional framework, has much to choose from and, as mentioned, with no clear 'best practice' winner.

Some cultural resistance to measurement and evaluation is still apparent in NRW; it may be seen as an overhead and a potential threat to funding if targets are not being

met and, if so, avoidance could be expected. In recent years, Scottish Enterprise has begun to overcome some of this resistance and avoidance by treating the information gathered as a knowledge asset and making it available to aid organisational learning. By placing equal value on learning and leveraging knowledge assets as on achievement of economic targets, the stigma of failure has been partly removed and actors are starting to be more open with information. Moreover, the values of knowledge-sharing and openness are characterised and rewarded through (mandatory) staff performance contracts.

Within economic development bodies, there is a balance to be struck between efficiency and effectiveness. In NRW, staff structures and departmental remits are optimised towards administration and large-scale implementation. In Scottish Enterprise, they are geared towards adaptability to market conditions. This reflects the direction from which lead responsibility is expected; state *vs* industry. Both regions can learn from the others approach in this respect, as the Scottish approach is more opportunistic and market-sensitive whilst the ministry in NRW has implemented projects on a scale and at a speed not seen in Scotland. We see complementary strengths across both regions.

Conclusions

Given the lack of unified theory, interpreted definitions and the variations in national (and regional) legislation and policy, no one can claim to have the definitive approach to cluster development.

Insofar as Scotland has tackled some of the constraints that continue to hamper development efforts in NRW, however, there may be some opportunities to transfer knowledge and experiences and attempt to implement them. Taking each issue in turn:

Definition – widening the definition of a cluster to involve the full value-chain around the core industry would help to dissipate internal rivalry within the company base and increase the range of market opportunities. Consideration of functional clusters (such as the design function inherent in Scotland’s Creative Industries cluster) and value-chain clusters (such as the Scottish Food & Drink cluster) would allow NRW to take a more market-led approach. Consideration could also be give to relaxing the geographic limitations to tackle the exclusion issue.

Implementation – we used the phrase “*setting a meso-economic framework to direct micro-economic promotion and intervention*” above to describe the philosophy behind the Scottish Enterprise cluster approach. This approach, including the widening of the cluster definition, could be examined from the NRW perspective to allow for a possible consideration of using indirect support mechanisms and addressing key aspects of market failure; rather than direct payment of funds or grants to SMEs within the cluster. This could provide the greater evidence of additionality and displacement effects being increasingly sought by the EU with regard to Structural Fund and State Aid policies.

Evaluation – a consistent approach must be taken towards evaluation and processes put in place to allow the findings/lessons to change policy and practice as quickly as

possible. NRW may have access to any of the Scottish Enterprise Network's knowledge management practices and techniques to identify transferable components. Similarly, Scottish Enterprise would be keen to learn from NRW regarding the effectiveness of any techniques tested.

Co-ordination - whilst NRW does not have the advantage of a single body tasked with the full range of economic development responsibilities (in the way that Scotland has Scottish Enterprise and Highlands & Islands Enterprise), establishment of a meso-economic framework is possible. The other Ministries have a key role to play in this ensuring greater probability of success.

As a vehicle to transfer any relevant knowledge or experiences between Scotland and NRW, we would propose further joint working. Consideration could be given to joint cluster initiatives. As highlighted in the following chapter on Sustainable Development, Environmental Industries could be one such area. One practical possibility would be a cluster initiative based around renewable energies.

NRW's cluster-specific approach, implementation abilities and clear focus on operational effectiveness are attributes that Scotland could do well to emulate for certain types of intervention. The fact that the NRW employs more than 6 times the number of people in environmental industries as Scotland (for a region 3 times the total population) shows that far greater progress has been made in these areas.

Scotland has a strong research base but has yet to commercialise much of this activity. There may also significant cultural barriers towards development of environmental industries; they do not seem to be valued in the same way as in NRW. We would therefore propose exploring technology and skills transfer opportunities between the regions that would assist Scotland in achieving its target of 18% of energy being provided from re-useable sources by 2010. The framework for achieving this would be based upon the Scottish Enterprise Network's cluster process, giving the Ministry of Economic Affairs and local companies in NRW first-hand experience of this approach.

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