Introduction to the regional cluster ecosystem – Input Paper for NRW

Dr Jan-Philipp Kramer

Team Leader ‘Data & Policy‘, ECCP / Prognos AG
Economic profile of North Rhine-Westphalia

General trends in the regional economy:

- Largest regional economy in Germany, with a GDP of €739 billion in 2021 (representing roughly 20% of Germany's total GDP) and the second-largest exporter among federal states
- North Rhine-Westphalia’s GDP per capita boasts around €37,100 (PPS) (above EU and slightly below national average)
- Demonstrated robustness, rebounding after the COVID-19 pandemic, bolstered by effective government intervention

Sectoral composition:

- Predominantly service-oriented (ca. 40% of total employment), however maintains a relatively strong industrial presence with roughly 19% workforce in the industrial sector, exceeding the EU27 average
- Six regionally relevant sectoral nodes, with a majority of these nodes pertaining to manufacture, indicating a distinct advantage and competency in manufacturing-related activities
- Overall, NRW boasts a diverse economy, which is also reflected in the region’s cluster landscape & its S3 priority areas

Employment shares across the Industrial Ecosystems

Source: ECCP (2023), own elaboration based on Eurostat.
North Rhine-Westphalia’s regional innovation & competitiveness performance

**Relative strengths**
1. Product and business process innovators (relative to EU)
2. International scientific co-publication and public-private co-publications (relative to EU)
3. Employment innovative enterprises (relative to EU)

**Areas for improvement**
1. Sales of innovative products (relative to EU)
2. R&D expenditures in the public and business sector as well as innovation expenditures
3. PCT patent applications

**Regional Competitiveness Index 2022**
- North Rhine-Westphalia's five administrative districts all exhibit an overall average score falls above the EU average, indicating relatively high regional competitiveness
- The regions of Cologne and Düsseldorf stand out for their relatively high performance across all sub-indexes

Note that the scores have been computed using the population-weighted average of the respective NUTS-2 regions
Cluster ecosystem* in NRW: Locations, sectors and structures

Cluster Organisations

- 32 Cluster Organisations (CO) from NRW: 27 state-level clusters (Landescluster), 12 ECCP-registered COs
- Cover 10 out of 14 EU Industrial Ecosystems
- Top 3: Digital, Energy-Intensive Industries, Mobility-Transport-Automotive/Electronics
- NRW.innovativ acts as an orchestration platform for the ecosystem

Structure of clusters

- Relatively large COs with commonly over 100 cluster members: 50% have 150 or more members (EU: <25%)
- Cluster organisations have significantly higher numbers of staff than on EU average.
- Collaborative Areas: Technology scouting; partnering for projects; digitalisation; resource efficiency and circular economy

Source: ECCP (2023). Own elaboration based on https://reporting.clustercollaboration.eu/all; last access 09.10.2023. *registered on the ECCP
Clusters and regional economic competitiveness

Cluster organisations are positively correlated with a range of economic competitiveness indicators:

<table>
<thead>
<tr>
<th>Business environment</th>
<th>Firm behaviour</th>
<th>Intermediate performance indicators</th>
<th>Outcome indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public R&amp;D expenditure</td>
<td>Business R&amp;D expenditure</td>
<td>Apparent labour productivity</td>
<td>GDP per Capita</td>
</tr>
<tr>
<td>Human resources in science &amp; technology</td>
<td>Employed ICT specialists</td>
<td>PCT patents per Capita</td>
<td>Employment in technology &amp; knowledge intensive sectors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ICT patents</td>
<td>Share of ICT in GVA</td>
</tr>
</tbody>
</table>

However: The presence of regional industrial agglomerations is also linked with higher air pollution.

Source: ECCP (2022) Summary Report on Cluster Policy in the EU

++ Positive correlation  +++ Weak positive correlation
## European Commission programmes for collaborative projects among clusters & their members

### 2014-2020 funding period

<table>
<thead>
<tr>
<th>INNOSUP-1</th>
<th>ESCP-4i</th>
<th>ESCP-4x</th>
<th>ESCP-S3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INNOVATION</strong></td>
<td><strong>INTERNATIONAL</strong></td>
<td><strong>EXCELLENCE</strong></td>
<td><strong>SMART SPECIALISATION</strong></td>
</tr>
<tr>
<td>• Horizon 2020 initiative</td>
<td>• COSME initiative</td>
<td>• COSME initiative</td>
<td>• COSME initiative</td>
</tr>
<tr>
<td>• Development of new-crosssectoral industrial value chains across the EU</td>
<td>• Development and implementation of joint internationalisation strategies to support SME internationalisation</td>
<td>• Boost the cross-cluster networking and learning within the EU and development of cluster management excellence</td>
<td>• Boost cluster cooperation in specific thematic areas in the field of regional smart specialisation strategies</td>
</tr>
</tbody>
</table>

### 2021-2027 funding period

<table>
<thead>
<tr>
<th>Euroclusters</th>
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<tbody>
<tr>
<td>• Single Market Programme</td>
</tr>
<tr>
<td>• Support the implementation of the EC industrial strategy through cross-sectoral, interdisciplinary and trans-European cluster initiatives</td>
</tr>
</tbody>
</table>

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2014-2020 funding period

2021-2027 funding period
NRW clusters in interregional cluster partnerships

Overview of the selected projects

- **VIDA**
  - Value-added Innovation in food chains (INNOSUP-1)

- **CONNSENSYS**
  - Connecting smart sensor systems for the food industry (ESCP-S3)

- **HIGHFIVE**
  - Enhancing digital and Green growth in the Food processing industry via interregional innovation investments (I3)

- **FoodPackLab – Phase 1** (ESCP-4i)

**Projects and Thematic Foci**

- **4 project participations** in EU cluster & interregional innovation programmes
- **Projects involved European cluster partners** from 13 different countries
- **Thematic foci:**
  - Food processing
  - Food packaging
  - Sensor technologies & connectivity
Crossborder cluster collaboration for innovation within INTERREG

Source: ECCP (2023) based on information from keep.eu data hub.
Priorities of the NRW S3 2021-2027 & survey results

**Priority areas of North-Rhine Westphalia**
1. Innovative Materials & Intelligent Production
2. Connected Mobility & Logistics
3. Environmental & Circular Economy
4. Energy & Innovative Construction
5. Innovative medicine, health & life science
6. Culture, Media & Creative Industries, Innovative Services
7. Key Technologies of the Future & ICT

**Contribution of competencies of NRW cluster organisations to the priority areas**

- **Innovative Materials & Intelligent Production**
  - Very high contribution: 5
  - High contribution: 3
  - Some contribution: 3
  - Low contribution: 1
  - Very low contribution: 1
  - n=15

- **Environmental & Circular Economy**
  - Very high contribution: 3
  - High contribution: 2
  - Some contribution: 6
  - Low contribution: 1
  - Very low contribution: 1
  - n=15

- **Connected Mobility & Logistics**
  - Very high contribution: 2
  - High contribution: 4
  - Some contribution: 2
  - Low contribution: 2
  - Very low contribution: 1
  - n=15

- **Culture, Media & Creative Industries, Innovative Services**
  - Very high contribution: 1
  - High contribution: 3
  - Some contribution: 3
  - Low contribution: 1
  - Very low contribution: 1
  - n=15

- **Innovative medicine, health & life science**
  - Very high contribution: 1
  - High contribution: 4
  - Some contribution: 3
  - Low contribution: 3
  - Very low contribution: 1
  - n=15

- **Energy & Innovative Construction**
  - Very high contribution: 1
  - High contribution: 4
  - Some contribution: 4
  - Low contribution: 2
  - Very low contribution: 1
  - n=15

Source: ECCP (2023) own elaboration based on the Regional Innovation Strategy 2021-2027 of North Rhine-Westphalia
Final Remarks

**NRW economy** boasts a diverse industrial ecosystem, while the state’s **innovation landscape** shows strengths in its institutional composition and R&D activities.

**NRW cluster organisations** link traditionally strong sectors in manufacturing, heavy industry and chemicals with the cross-cutting green and digital transitions.

**Interregional cluster partnerships and cross-border collaboration** facilitate innovation and value chain transformation within the Single Market.

Smart specialisation in NRW covers 7 priority areas and is closely linked to NRW’s cluster ecosystem.

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**Role of cluster organisations in supporting transformation**

**Market Intelligence**
- Identifying opportunities in other industries
- Roadmapping
- White Papers
- Market-Check Tool

**Matchmaking**
- Finding partners in other industrial sectors
- Cross-sectoral Speed Dating
- Competence Mapping Tool
- Technology Round Tables

**Project Development**
- Translating market intelligence and matchmaking into cross-sectoral innovation
- Innovation Platforms
- Change Management Moderation
- Special Interest Groups

**Technology Transfer**
- Spreading capacity and knowledge
- Transfer Concept

**Innovation Vouchers**
- Channeling funding through a cluster organisation
- Meet & Greet Incentives
- Insight Incentives
- Collaboration Incentives

**Strategic Cross-cluster Collaboration**
- Networking across boundaries
- Facilitation of value chain transformation (twin transition), innovation and greater resilience

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