

Country factsheet

Estonia



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1. Introduction and economic policy context



This document presents an overview of the cluster policy in Estonia. Given the importance to contextualise the cluster policies (and related) analysed in the factsheets, a comprehensive outlook of the country in socioeconomic terms can be consulted in the <u>European Semester Country Report for Estonia 2023.</u>

The European Semester is an instrument introduced to coordinate the EU Member States economic policies and

address the economic challenges faced by the EU. Its goals are "to ensure sound public finances, to prevent excessive macroeconomic imbalances in the EU, to support structural reforms to create more jobs and growth, and to boost investment". Thus, it focuses on the following areas: business environment; financial and fiscal stability; green economy; public administration; labour market and skills; and social protection and cohesion. Chapter 4.2 provides an overview on how Estonia's cluster policy could help to tackle the economic policy challenges identified in the European Semester country recommendations.

As a consequence of the COVID-19 pandemic, European as well as global economies have been subject to severe output losses. In response, policymakers at EU and national level have acted decisively and made very significant financial resources available to tackle the threat of a prolonged downturn. This was carried out through the Recovery and Resilience Facility, National recovery and resilience plans that have been drafted in each Member State to ensure a recovery that addresses the challenges identified in the European Semester. The Estonian National recovery and resilience plan is structured around six pillars: the digital transition of businesses, the green transition in enterprises, digital Estonia, sustainable energy and energy efficiency, sustainable transport, and healthcare and social protection. Estonian clusters are a key tool for the successful and quick implementation of the plan. In addition to the COVID-19 pandemic, the ongoing Russian military aggression against Ukraine has also taken its toll on EU companies and industrial ecosystems, highlighting the significance of policy efforts in supporting SMEs and clusters.

The <u>ERDF partnership agreement 2021-2027</u> between the EU and Estonia does not mention clusters or cluster-related issues. Support for the existing Estonian clusters is not evident in the Estonia's Operational Programme (OP) for <u>Cohesion Policy Funds 2021-2027</u> (EU investment 3,369 million EUR).

In the following, a succinct overview of the cluster policy in Estonia will be provided. The structure of this factsheet generally encompasses:

- 1) an overview of the industrial ecosystems and cluster landscape in Estonia
- 2) an overview of the national cluster policy,
- 3) an assessment of the state of Estonian cluster policy and its role in broader economic policy challenges mentioned in the European Semester Reports







2. Industrial ecosystems and cluster landscape

2.1 Employment in the 14 industrial ecosystems

As part of its Industrial Strategy (March 2020), the European Commission has identified 14 industrial ecosystems that encompass all players operating in a value chain. The classification of the 14 industrial ecosystems have been calculated by aggregating NACE 2 -digit activities, following the methodology established in the European Commission. This means that the data provided below can differ from other publications by the European Commission that do not consider the industrial ecosystem classification.

Figure 1 shows the share (in %) of employed persons in each industrial ecosystem in the country in comparison to the EU27. The industrial ecosystem that employs the most people in Estonia is Retail, accounting for approximately 16% of employment. Construction is the second largest ecosystem in terms of employment in Estonia. It is around 2% higher than the EU27, indicating its relative strength. Several other ecosystems show a high relative strength, including Energy Intensive Industries, Digital, Cultural and Creative Industries, and Textile. This strength is evident in the sectoral and ecosystem agglomerations that are regionally relevant in the country, as demonstrated in the section below.

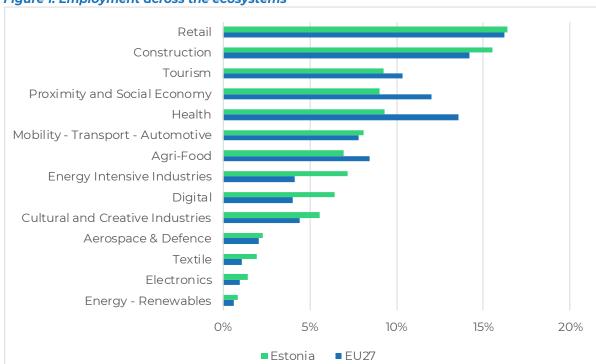


Figure 1: Employment across the ecosystems

Source: ECCP (2023), own elaboration based on data from Eurostat.



¹ see here for more information https://clustercollaboration.eu/in-focus/industrial-ecosystems (last access 23.01.2024).

² see European Commission (2022): Annual Single Market Report, SWD(2022).

2.2 Regional agglomerations

Economic activity is not equally distributed across regions in the EU but tends to agglomerate in certain places. In this context, an Agglomeration is defined as the concentration of a certain industry, sector or ecosystem in a certain geographical area. The following section provides an analysis of, first, the sectoral agglomerations and, second, the ecosystem agglomerations in the regions. Agglomerations are operationalised through the employment-based Location Quotients (LQ), measuring the relative specialisation of one region compared to the EU level, as well as the employment size.

If the LQ for a given activity-region combination is above 1.5, it is considered an agglomeration, and if the activity accounts for at least 1 % of total employment in the region, it is considered a regionally relevant agglomeration.³ The following tables shows the total number of relevant agglomerations in the country and identifies the top five most specialised. Table 1 focuses on the 88 NACE 2-digit activities or sectors, totalling 7 in the country, while Table 2 is based on the 14 ecosystems, which totals 4 in the country.⁴

Table 1: Number of relevant sectoral agglomerations and Top 5 agglomerations (NACE)

Region	# of agglom.	Agglomeration 1	Agglomeration 2	Agglomeration 3	Agglomeration 4	Agglomeration 5
EE: Estonia	7	C16 - Manuf. of wood products	C31 - Manuf. of furniture	C33 – Repair & installation of machinery & equipment	F42 - Civil engineering	F41 – Construction of buildings

Source: ECCP (2023), own elaboration based on data from Eurostat.

As mentioned at the beginning of this Chapter, the NACE 2-digit activities have been aggregated to the 14 EU industrial ecosystems following the methodology established by the European Commission. Table 2 provides an overview of the regional distribution of industrial ecosystem agglomerations. Overall, there are fewer numbers of ecosystem agglomerations compared to the regionally relevant sectoral agglomerations by NACE sectors⁵. This more concentrated agglomeration can at least partially be linked to the methodology of measurement of the 14 industrial ecosystems. The employment strength of Estonia in the industrial ecosystem Construction which emerges in Figure 1 is also reflected in a number of Top 5 regionally relevant sectoral agglomerations of the country (e.g., F41 – Construction of buildings and F42 – Civil engineering).

Table 2: Relevant ecosystem agglomerations

Region	# of ecosystem agglomerations	Agglomeration 1	Agglomeration 2	Agglomeration 3	Agglomeration 4
EE: Estonia	4	Textile	Energy-intensive industries	Digital	Electronics

Source: ECCP (2023), own elaboration based on data from Eurostat.

⁵ This is to be expected since aggregating - and therefore averaging - NACE 2-digit activities into larger industrial ecosystems dull the variability in the specialisation signals.



³ for more information on the methodology please see the methodology note: https://clustercollaboration.eu/infocus/policy-acceleration/country-factsheets-on-cluster-policies-and-programmes (last access 09.01.2023).

⁴ Please note that Estonia does not have any regional subdivisions at the NUTS1 or NUTS2 levels, hence the data in Chapter 2 apply to the entire country.



However, this is not reflected in the regionally relevant ecosystem agglomerations which can also potentially be linked to the methodology behind the measurement of the industrial ecosystems. Nonetheless, Estonia has regionally relevant ecosystem agglomerations in the industrial ecosystems Textile, Energy-Intensive Industries, Digital and Electronics which is also mirrored in the higher share (in %) of employment in Estonia in these industrial ecosystems compared to the EU27 (see Figure 1).

2.3 Cluster organisations & interregional cooperation

Cluster organisations in the country

There are 14 cluster organisations registered on the ECCP⁶ in the country. These cluster organisations are operating in the industrial ecosystems Construction (2 cluster organisations), Digital (3 cluster organisations), Aerospace & Defence (1 cluster organisation), Renewable Energy (1 cluster organisation), and Health (1 cluster organisation).⁷ This distribution of cluster organisations by industrial ecosystems corresponds with the distribution of the share (in %) of employment in Figure 1 as well as with relevant sectoral agglomerations (in Table 1 and Table 2) where an agglomeration in the F41 – Construction of Buildings corresponds with 2 cluster organisations in industrial ecosystems Construction, and an agglomeration in Digital ecosystem corresponds with 3 cluster organisations in the same ecosystem. The majority of member organisations of Estonian cluster organisations with profiles on the ECCP are composed of SMEs (88%, EU: 83%), followed by research organisations (6%, EU: 8%), and large enterprises (6%, EU: 9%).

Interregional cooperation

In the 2014-2020 funding period⁸, the European Cluster Partnerships and the INNOSUP-1 initiative have been launched by the European Commission to encourage clusters from Europe to intensify collaboration across regions and sectors. With a total of ten cluster cooperations Estonia participates in both the ESCP and INNOSUP. Four cluster organisations participated in the ESCP for Excellence, three in the ESCP for Going International and one in the ESCP for Smart Specialisation. Two Estonian cluster organisations participated in the INNOSUP-1 programme.

In the 2021-2027 funding period, the Single Market Programme supports clusters as part of the Joint Cluster Initiatives (Euroclusters) for Europe's recovery. From Estonia, one cluster organisations is part of the Eurocluster BioMan4R2, with partners from six countries (BE, DE, ES, FR, NL, PL). This Eurocluster covers the industrial Health ecosystem.⁹



⁶ ECCP (2023): Data for the analysis was extracted on 21/12/2023.

⁷ Not all cluster organisations on the ECCP provide this information.

⁸ Many of the programmes of the 2014-2020 funding period have been terminated by December 2023. However, the collaborative projects that were funded may continue to operate.

⁹ https://clustercollaboration.eu/euroclusters (last access 31.03.2023).

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National cluster policy, programmes and initiatives





3. National cluster policy, programmes and initiatives

In this section we provide an overview of the existing Estonian policies relevant for clusters on a national level.

The breakdown is presented in the form of a table, with the first column showcasing information on the aspects which constitute the policy (beginning with 'Policy Objectives', following with 'Policy Focus', etc.). The second column represents the case of an Estonian policies relevant for clusters.

Within the table the text presented in bold (black) depicts standardised categories across country factsheets (56 in total for 2023), which are applied for comparative purposes. This is followed by a complementary descriptive text to provide more insights about the cluster-relevant policy in Estonia.

Table 3: Overview of Estonian cluster policy

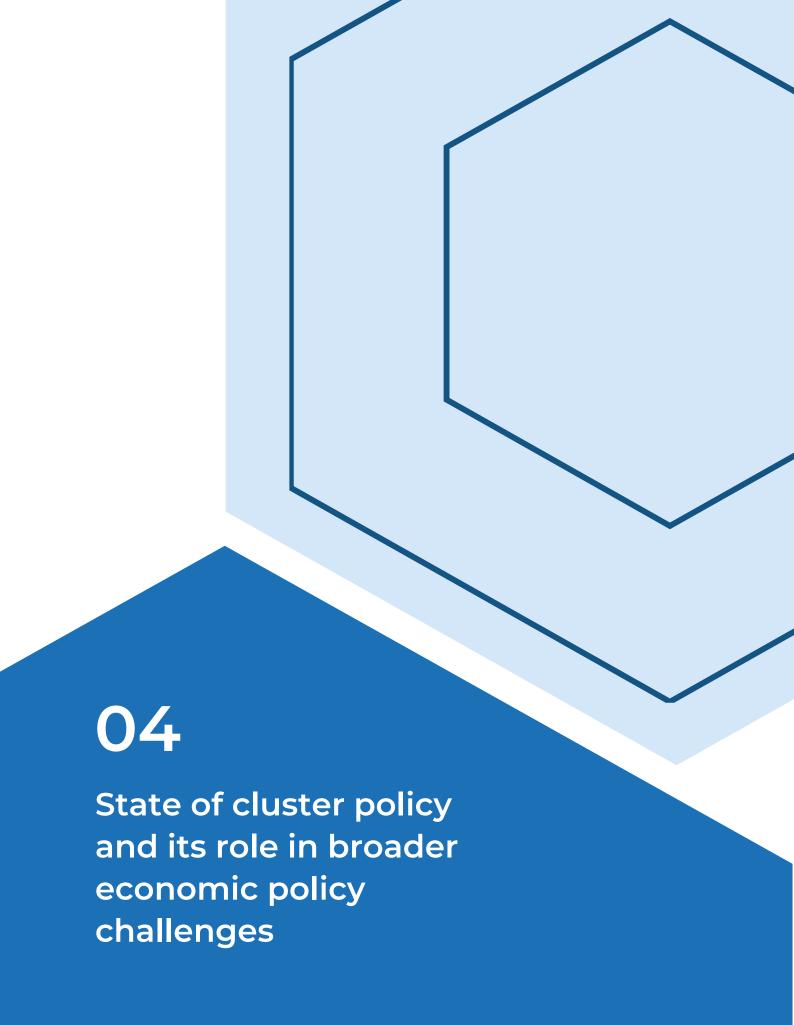
Policy type:	Broad Policy
Policy name:	Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035
POLICY OBJECTIVES	Strengthening cooperation between companies or industry and RTDI actors Increasing competitiveness and boosting scale up of SMEs Supporting internationalisation activities Fostering R&D activities, technology development and implementation Fostering innovation and strengthening innovation ecosystems Promoting entrepreneurship, start-ups and spin-offs Promoting resilience and sustainable economy and other solidarity-based initiatives
	Promoting employment and upgrading skills and competences The policy aims to foster innovation, R&D, and skills development, which indirectly promotes high-skilled employment. It outlines support for start-ups and SMEs to boost competitiveness and scale. It also mentions sustainable business models and international cooperation.
POLICY FOCUS	Cross-sectoral The main focus of the strategy is to increase productivity and added value by encouraging growth of private sector investments in R&D, addressing development needs formulated in Estonia's long-term development strategy 'Estonia 2035', and encouraging the use of innovative technological solutions resulting from research already funded by enterprises. The Strategy contributes to the achievement of the UN Sustainable Development Goals, as well as all five strategic objectives of Estonia's long-term development strategy 'Estonia 2035'.

Policy type:	Broad Policy
Policy name:	Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035
RESPONSIBLE AUTHORITIES	Provides funding
	In charge of implementation
T	Oversees the implementation
	Responsibility for the management, implementation, and reporting on the results of the Strategy is shared equally between the MoER and the MoEAC and other ministries within their respective areas of responsibility. The planning and implementation of national R&D activities are coordinated through the RDI Coordination Council.
BENEFICIARIES	Cluster Organisations
~ @	Large firms
	SMEs
•	Research organisations
	Academic institutions
	Start-ups
	The policy supports various cluster organisations in Estonia, such as ICT Cluster, Wooden Houses Cluster, Connected Health Cluster etc. These cluster organisations have a variety of members from SMEs, to start-ups and research associations. For example, the Connected Health Cluster members include start-ups, medtech, biotech and R&D partners.



Policy type:		Broad Policy
Policy name:		Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035
INSTRUMENTS	Financial	Funding collaboration initiatives Support to R&D projects, SMEs becoming cluster members, etc. Subsidies to hire personnel Supporting market entry (e.g. testing, proof-of concept, prototyping, demonstration projects) Financing networking events Financing start-ups
	Technical assistance	Support for hard skill development: knowledge transfer, intellectual property, entrepreneurship, export advice, market intelligence Support for networking and partnership building (at national and/or international level) Marketing activities: advertising, communication, events, fairs, and so on Infrastructure: coworking spaces, offices, incubation and accelerator spaces, research centres, technology parks etc.
	Explanation	The financial instruments discussed in the strategy include the use of national budget resources and structural funding to support innovative technological solutions and research activities. The non-financial instruments discussed in the strategy include the establishment of a strategic steering group consisting of representatives from various government departments.
HISTORY	Period	Limited period
	Ending year (for policies with limited period)	2035
	Starting year	2021
	Explanation	The policy is a part of Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035.

Policy type:		Broad Policy
Policy name:		Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035
BUDGET	Overall	3 361 million EUR
	Annual	-
	Source of funding	The source of funding for the research and development system in Estonia includes a budget forecast of 1% of GDP from 2021 onwards, as well as funding from other ministries for sectoral R&D activities. Additionally, EU structural funds are used to fund the activities of the strategy, and government-funded private R&D expenditure is maintained at least at the level reached in 2019.
POLICY EVALUATION	Availability	The Ministry of Education and Research, in cooperation with Statistics Estonia, will aggregate information on R&D activities and the use of funds. At least two interim evaluations are planned to assess the objectives and impact of the strategy. Additionally, there will be a performance report on the implementation of the strategy programs, which will provide an overview of the progress made.
X X	Results	
POLICY ALIGNMI	ENT WITH THE	Green economy
EU PRIO	RITIES	Digitalisation
\$		Resilience



4. State of cluster policy and its role in broader economic policy challenges

4.1 The state of cluster policy

This section presents an overview on the state of play of Estonian cluster policy in the form of a qualitative assessment across four categories of analysis – policy scope, continuity of cluster policies, evidence of performance, and the range of cluster support instruments. Please refer to the **Annex** for the detailed overview of the categories. The table below presents an overview of the **state of play Estonian cluster policy** for 2023.

Table 4: State of Play

Estonia	State of Play
	Absence of cluster policy
POLICY SCOPE	Broad policy
POLICI SCOPE	Sectoral policy
	National and/or regional cluster policy
	No cluster-specific policy available
	Cluster policy established recently
CONTINUITY	Cluster policy established between
	over 2 and 10 years
	Cluster policy established over 10 years
	ago
	No evaluation and / or monitoring available
	Existence of evaluations of past
EVIDENCE OF	policies
PERFORMANCE	Existence of monitoring or an ongoing
1 EM OMIZATOE	/ interim evaluation
	Existence of monitoring and ex-ante
	or ongoing / interim evaluation
	No instruments for cluster
	development
	Financial support for cluster
CLUSTER SUPPORT INSTRUMENTS	development in the broader and / or
	sectoral policy
	Financial or technical support for
	cluster development in dedicated cluster policy
	Financial and technical support for
	cluster development in dedicated
	cluster policy
	1 3

Source: ECCP (2023).

The text below provides a qualitative description of the state of the cluster policy in Estonia.

Policy scope

In Estonia clusters are indirectly supported under the Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035. The strategy focuses on fostering innovation, R&D, and skills development; it also supports start-ups and SMEs. Given the broad aims of the policy and the fact that cluster support is indirect, it is categorised as a broad policy.

Continuity

Cluster policy in Estonia is not extensive and is fairly new compared to its European counterparts. Up until 2008, there were no clear policies supporting clusters, however, there were programmes that supported collaboration amongst different stakeholders such as Competence Centre Programmes and Technology parks. The first national policy was the Pilot Programme for supporting cluster development, which was implemented in 2008. The policy ran from 2008 to 2013 with majority of the funding coming from European Regional Development Fund. In 2014, as part of the government's Entrepreneurship Growth Strategy 2014-2020, the Development Clusters Programme was implemented. Since 2021 cluster are indirectly supported under the Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035.

Evidence of performance

The Ministry of Education and Research, in cooperation with Statistics Estonia, will aggregate information on R&D activities and the use of funds. At least two interim evaluations are planned to assess the objectives and impact of the strategy. Additionally, there will be a performance report on the implementation of the strategy programs, which will provide an overview of the progress made.

Cluster support instruments

The financial instruments discussed in the strategy include the use of national budget resources and structural funding to support innovative technological solutions and research activities, for instance support to R&D projects, SMEs, or support for hard skill development: knowledge transfer, intellectual property, entrepreneurship, export advice, market intelligence.



4.2 Cluster policy's potential impact on challenges identified in the European Semester Report

Cluster policy can provide important support to broader economic policy efforts. This section shows first how Estonian cluster policy can play a role in tackling the challenges identified in the European Semester Report for the country. To this end, the European Semester 2023 country report for Estonia has been analysed across policy areas relevant to cluster policy. The results point to a series of issues where cluster policy can play an important role in tackling the country's economic challenges.

The table below also outlines how Estonian cluster organisations are already contributing to the challenges outlined in the European Semester Reports, despite having only a broad policy for supporting clusters. Developing a dedicated cluster policy could further strengthen and focus the activities of Estonian cluster organisations towards broader economic policy challenges.

Table 5: Contribution of Estonian cluster organisations to the challenges identified in the European Semester Report

Policy area	Challenges	Cluster activity
INNOVATION	 Challenges Low levels of investment in research and innovation by business sectors Slow adoption of some advanced technologies Need to increase public sector spending in R&I to create synergy with R&I undertaken in the public sector Need to train more specialists to increase engagement in R&I and advanced technologies 	Increasing investments in research and innovation (R&I) to improve economic performance and competitiveness can foster technology transfer between science and industry in the innovation ecosystem. The Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035 aims to upgrade the skills of research institutions and higher education institutions staff on knowledge transfer, including the development of a model for spinof entrepreneurship and sustainable market-based commercialisation of knowledge. Moreover, cluster organisations can play an important role to address the challenges regarding innovation. The central tasks of cluster organisations include supporting and promoting cooperation, networking and knowledge development and transfer between different innovation players, often in specific fields of technology and/or sectors. In this way, they act at the interface between business, science and politics and represent a large number of local companies, universities, non-university research institutions and other players in the innovation ecosystem. When supporting projects, which can result from the provision of information and the establishment of contacts, an important contribution is usually also made by clusters to technology transfer in the innovation
		ecosystem. ¹² In that regard, the various Estonian cluster organisations are strongly focusing on facilitating R&D projects. As illustrative examples, one can mention the Lung cancer patient journey development project of the

¹⁰ https://economy-finance.ec.europa.eu/document/download/952b166f-4973-48a7-a68e-d78ae6903218_en?filename=ET_SWD_2023_606_en.pdf(last access 02.05.2024).

¹¹ European Cluster Observatory (2014).

¹² Fioravanti; Stocker; Macau (2023).

Policy area	Challenges	Cluster activity
		Estonian HealthTech Cluster ¹³ which is implemented in partnership with the public and private sector. Another example can be found in the activities of the Estonian Defence and Security Industry Innovation Cluster ¹⁴ which follow the main objective of promoting innovation in the defence ecosystem and to develop new and highly competitive solutions for the export. Moreover, the literature points out that the presence of clusters is positively linked to higher expenditures for research and development both in the public and especially the private sector. ¹⁵
SKILLS	 Labour shortages remain high, particularly in export industries Need to reduce early school leaving and easing teacher shortages Lack of green skills needed for the green transition 	Regarding skill development , the Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035 aims to implement activities that support the training of professionals for (industrial) enterprises. There, cluster organisations also have the potential to offer a significant contribution. Research underlines the role of clusters in developing the skills of the workforce and attracting skilled workers to a region. Here, one can outline activities of the Estonian cluster Creative Estonia as an illustrative example. This cluster is conducting a project which addresses skill gaps for the green transition in the textile sector. More generally, as cluster organisations act as intermediaries between companies and research and educational institutions, they can also be seen as part of the training and educational infrastructure in the innovation ecosystem. In
GREEN TRANSITION	 Need to increase energy security while reducing energy intensity Need to continue to incentivise the deployment of renewable energy Improving municipal waste management Designing and implementing new 	In order to support the green transition of the country, the Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035 includes the focus area of smart and sustainable energy solutions, which will be prioritised in cooperation between the state, enterprises and research institutions. As facilitators of technology transfer, cluster organisations are assigned an important role in supporting the green transition. Clusters in Estonia are addressing the challenges and recommendations mentioned by the European Semester Report. As illustrative examples, one can mention the Estonian Recycling Competence Center/Green Economy Cluster ¹⁹ which focuses on increasing recycling,

 $^{^{13}\,\}underline{\text{https://connectedhealth.ee/lung-cancer-patient-journey-development-project/}\,(\text{last access 23.05.2024})$

¹⁴ https://defence.ee/cluster-and-members/ (last access 23.05.2024)
15 ECCP (2022).

¹⁶ Hsu, M.-S et al. (2014).

 $^{^{17}\,\}underline{\text{https://www.looveesti.ee/en/creative-estonia/projects/sit-sustainability-in-textile/}\,\text{(last access 23.05.2024)}$

 $^{^{18}}$ European Expert Group on Clusters (2020).

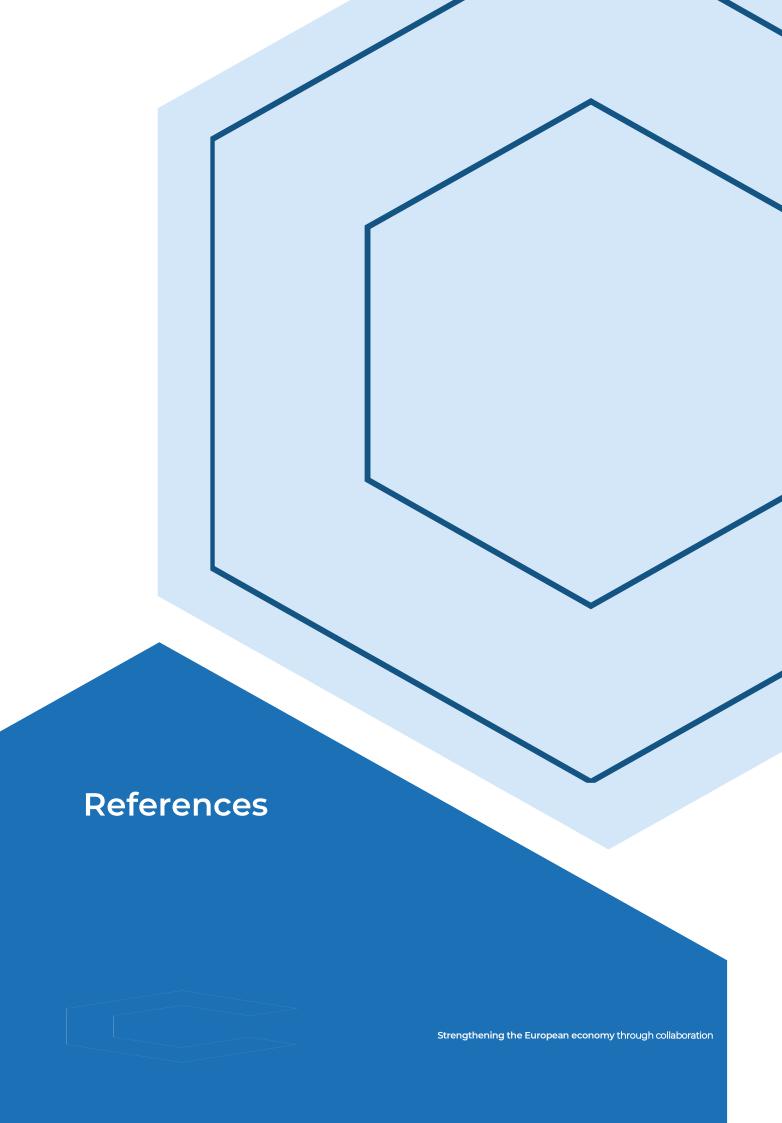
 $^{^{19}}$ see $\underline{\text{http://www.recycling.ee/jaatmete-taaskasutusklaster/}}$ and

https://profile.clustercollaboration.eu/profile/cluster-organisation/7e4a0546-d6fe-4b1f-8333-12eae24fbe32 (last access 23.05.2024)

Policy area	Challenges	Cluster activity
	measures to reach the 2030 climate targets for the sectors outside the Emissions Trading System	conducting several projects in that area and also provides trainings for waste management. Moreover, the GreenTech Cluster ²⁰ is focusing on fostering green technology solution and is thereby also supporting activities in the area of renewable energies.
	Strengthening the capacity of the land- use sector for carbon removals	Studies also show that clusters can play a vital role in the green transition of the economy ²¹ and it can be underlined that cluster organisations have a positive influence on the green transition, not least because they facilitate exchange between different actors, disseminate relevant knowledge and practices and deepen environmental awareness among stakeholders. ²²

Source: ECCP (2023).

https://www.tehnopol.ee/en/business-services/greentech-cluster/ (last access 23.05.2024)
 Lis, A. & Mackiewicz, M. (2023); ECCP (2021).
 Hatch et al. (2017).





References

ECCP (2021): Cluster driving the Green and Digital transition". Available online: https://clustercollaboration.eu/sites/default/files/document-store/Clusters%20driving%20the%20green%20and%20digital%20transitions%20event%20%20Input%20paper.pdf (last access 21.12.2023).

ECCP (2022): Summary report on cluster policies and programmes across Europe and priority third countries. Available online:

https://clustercollaboration.eu/sites/default/files/sites/default/files/editor/ECCP_Summary%20report %20cluster%20policies_2022_finalv2.pdf (last access 21.12.2023).

Enterprise Estonia (EAS). A cluster – why and for whom? <u>www.eas.ee/teenus/development-of-clusters/?lang=en</u> (last access 26.01.2023).

Eurofound. Future of manufacturing: Development of Clusters – Internationalisation policy measure (Estonia). https://euagenda.eu/upload/publications/untitled-191855-ea.pdf (last access 26.01.2023).

European Commission (2020). Estonian ICT Cluster paves the way for a smarter society. https://ec.europa.eu/regional_policy/en/projects/Estonia/estonian-ict-cluster-paves-the-way-for-a-smarter-society (last access 26.01.2023).

European Commission (2019). Peer Review of the Estonian R&I system. Final Report. https://www.hm.ee/sites/default/files/pr_estonia_-final_report_pdf (last access 26.01.2023).

European Expert Group on Clusters (2020): Recommendation Report. Available online https://clustercollaboration.eu/sites/default/files/news_attachment/European%20Expert%20Group%20On%20Clusters%20-%20Recommendation%20Report.pdf (last access 21.12.2023).

European Cluster Observatory (2014): Cluster Collaboration and Business Support Tools to Facilitate Entrepreneurship, Cross-sectoral Collaboration and Growth.

European Observatory for Clusters and Industrial Change (2019). Cluster Programmes in Europe and Beyond.

www.clustercollaboration.eu/sites/default/files/news_attachment/cluster_programmes_in_europe_a_nd_beyond_0.pdf (last access 26.01.2023).

Fioravanti, V.; Stocker, F.; Macau, F. (2023): Knowledge transfer in technological innovation clusters. Innovation & Management Review 20:1. Available online:

https://www.emerald.com/insight/content/doi/10.1108/INMR-12-2020-0176/full/html (last access 10.01.2024).

Hatch et al. (2017): The Role of Social Actors in Advancing a Green Transition: The case of Québec's Cleantech Cluster. In Journal of Innovation Economics & Management. Available online: https://www.cairn.info/revue-journal-of-innovation-economics-2017-3-page-63.htm (last access 21.12.2023).

Hsu, M.-S et al. (2014): "The impact of industrial clusters on human resource and firms performance", Journal of Modelling in Management, vol. 9 (2). Available online:

https://www.emerald.com/insight/content/doi/10.1108/JM2-11-2012-0038/full/html (last access 21.12.2023).

Jürgenson, A. (2007). Country Report: Estonia. Europe INNOVA Cluster Mapping Project. https://irp-cdn.multiscreensite.com/bcb8bbe3/files/uploaded/doc_890.pdf (last access 26.01.2023).

Lis, A. & Mackiewicz, M. (2023): The implementation of green transformation through clusters. Ecological Economics 209. Available online:

https://www.sciencedirect.com/science/article/abs/pii/S0921800923001052 (last access 18.01.2024).

Ministry of Education and Research & Ministry of Economis Affairs and Communications (2021). *Estonian Research and Development, Innovation and Entrepreneurship Strategy 2021-2035.* https://www.hm.ee/korgharidus-ja-teadus/teadus-ja-arendustegevus/taie-arengukava-2021-2035 (last access 04.10.2023).

Okuwhere, M. et al. (2022): The catalyst roles of clusters in the relationship between open innovation and Digitalisation: A systematic review and research agenda within SME context. Available online: https://pure.coventry.ac.uk/ws/portalfiles/portal/56311371/The_catalyst_roles_of_clusters_in_the_relationship_between_open_innovation_and_Digitalisation_A_systematic_review_and_research_agenda_within_SME_context_FinalPaperUpload_904_0623073209_Published_copy.pdf (last access 10.01.2024).

Tallinn City Enterprise Board. A cluster-why and for whom? www.tallinn.ee/eng/clustersinestonia/A-cluster-why-and-for-whom (last access 26.01.2023).

Tallinn City Enterprise Board. Estonia's first website that consolidates information about clusters. www.tallinn.ee/eng/business/Estonia-s-first-website-that-consolidates-information-about-clusters (last access 26.01.2023).

Annex

Table 6: Analytical framework for the state of cluster policy

Criterion	Description	Categorical variables
Policy scope	assessment whether the country has a dedicated cluster policy, or cluster creation and/or development is targeted through broader policies, e.g. foreign trade policies, labour and social policies or specific sectoral policies, e.g. industrial policy tourism policies, agriculture policies	absence of cluster policy existence of broader policies existence of specific sectoral policies existence of targeted cluster policies
Continuity of cluster policies	assessment of the duration and experience of the country in carrying out cluster policies. This criterion assesses only existence of targeted cluster policies and not broader policies or sectoral policies	absence of policies supporting cluster development cluster policy established recently (within the last 2 years) cluster policy established between over 2 and 10 years cluster policy established over 10 years ago
Evidence of performance	assessment whether there are evaluations of past and ongoing policies and a monitoring system in place. The existence of monitoring and evaluation mechanisms determines the degree of policy development in the country	no evaluation and / or monitoring available existence of evaluations of past policies, e.g. ex-ante existence of monitoring or an ongoing / interim evaluation existence of monitoring and exante or ongoing / interim evaluation
Cluster Support Instruments	assessment whether the policies provide any instruments to support the policy implementation, being these financial and/or technical support	no instruments for cluster development financial support for cluster development in the broader and / or sectoral policy financial or technical support for cluster development in dedicated cluster policy financial and technical support for cluster development in dedicated cluster policy

Source: ECCP (2023).