Image source: Freepik

European Union
European Regional Development Fund

REGION BLEKINGE

A Guide to Innovation Testbeds

A primer of best practices for developing a thriving regional innovation ecosystem of test sites and expanded test capacity, featuring lessons and case studies from the Swedish region of Blekinge

Contents

If clusters bring groups together, then *testbeds* are the environments where new concepts and products are tested. Testbeds provide important innovation infrastructure. This report explains why testbeds matter and offers lessons for other regions seeking to grow their own innovative capacity using testbeds as a lever. Based on analysis conducted in the southern Swedish region of Blekinge, this report features case studies alongside best practices, metrics, and funding sources that support testbed work – plus provides two self-service scorecards to use when either planning a new testbed or assessing the health of an existing testbed.

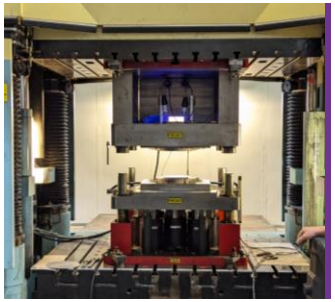

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Image sources from left to right: Tamara Carleton, NKT, SVT/Cajsa Bengtsson, BTH VPSL Lab

This report is useful for multiple groups:

- **Regional business leaders and startup teams** curious to understand more about testbeds or setting up a local test site.
- **Public sector authorities and city managers** who want to support regional economic development using testbeds as one part of a greater innovation ecosystem, aligned with national and international insights.
- **Local regulators** seeking to explore opportunities for getting involved in testbed development and growth in their own region.
- **Academics and researchers** who want initial input for studying or setting up regional testbeds and living labs.
- **Everyone interested** in understanding the value of real-world testbeds and how they fit within a regional innovation ecosystem and landscape.

Image source: Freepik

About this image:
At the Fire Lab at Roxtec, an employee tests cable and pipe seals at high temperatures.

About testbeds

Image source: Roxtec

Image source: Freepik

> “Such testing environments are critical for research and innovation in certain areas, such as autonomous driving, and help accelerate adoption of new digital technologies.”
>
> – OECD

What is a testbed?

OECD

Where new technology developments can be tested in controlled but near to real-world conditions.

Testbeds can be either physical sites or virtual simulations, which Sweden's innovation agency classifies into three levels

Sweden's national innovation agency definition of a testbed

According to Vinnova, a testbed is:

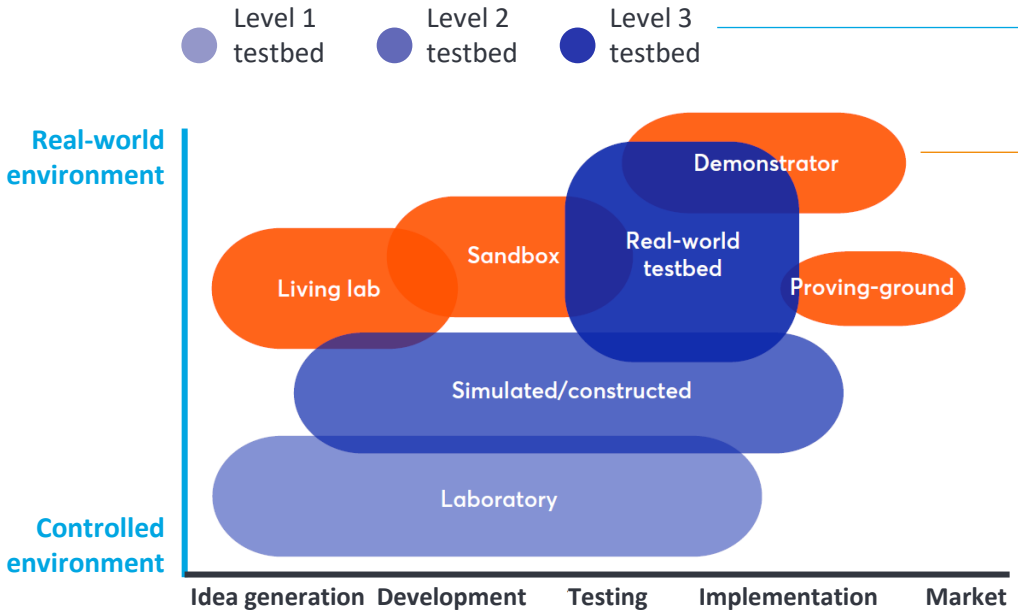
"A physical or virtual environment in which companies, academia and other organisations can collaborate in the development, testing and introduction of new products, services, processes or organisational solutions in selected areas."

The agency defines three levels of testbeds as follows:

- **Level 1: laboratories**
- **Level 2: simulated or constructed environments**
- **Level 3: real-world environments used for testing innovation**

Source: Vinnova, https://www.vinnova.se/en/m/testbed-sweden/

More realistic testbeds can be described with different names such as *living labs*, *sandboxes*, or *demonstrators*



Nesta, a British foundation for innovation, has placed Vinnova's three testbed levels along a vertical axis, describing a spectrum of environments from controlled to real-world environments.

In addition, Nesta uses the color orange to highlight other types of testbeds that more closely mimic real-world conditions, highlighting terms such as:

- **Living Labs** – more realistic test sites, such as a shared house, where citizens, researchers, and city officials can co-develop and test new technologies or services onsite, learning from everyday use.
- **Sandboxes** – controlled environments, often digital and/or regulatory, where groups experiment with new policy ideas or product concepts, during early development without full-scale consequences.
- **Demonstrators** – often small-scale pilots or showcase projects that illustrate how a new solution could work in practice, providing concrete evidence before wider market or commercial rollout.

Image source: Nesta, *Testing innovation in the real world: Real-world testbeds* report, 2019

How testbeds relate to Technology Readiness Levels (TRLs)

Technology Readiness Levels (TRLs) identify the maturity of a particular technology. The standard TRL scale ranges from 1 to 9, with 1 being the least mature and 9 being the most mature. TRLs can offer a helpful checklist or assessment tool to understand activities across a technology's development cycle.

NASA originally developed the TRL scale in the 1970s, and TRLs are now widely used across various industries from aerospace to manufacturing. The European Commission adapted the TRL scale for its programs, adding a TRL 0 to describe an unproven (untested) concept as shown in the illustration here.

Teams can use testbeds to examine how a new or unproven technology functions at a particular TRL level before full deployment. For example, at TRL 5, a technology is tested in a relevant environment, which could be a testbed designed to mimic the operational conditions the technology is expected to face once introduced to its relevant market.

Image source: European Commission

Testbeds exist globally and across Europe – here are two examples from the automotive and quantum computing fields

Image source: RISE

AstaZero

Physical testbed

Managed by the Research Institutes of Sweden (RISE), AstaZero is the world's first full-scale test environment for future road safety in all kinds of traffic and traffic situations. The site includes the world's longest indoor test track and a closed rural road loop of nearly six kilometers. This testbed is strategically placed in the center of the Western Sweden automotive cluster.

https://astazero.ri.se

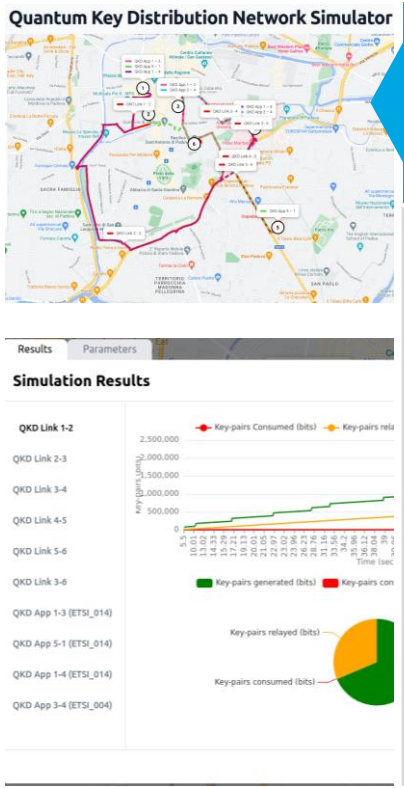


Image source: OPENQKD

OPENQKD

Virtual testbed

OPENQKD stands for the Open European Quantum Key Distribution Testbed. Involving 38 partners from 13 EU nations, this Horizon 2020 project was funded for three years with a €15 million budget. One goal was to create several open testbeds and a virtual simulator in quantum communication infrastructure. Another goal was to lay the foundation for a pan-European quantum network.

https://openqkd.eu

NATO DIANA test centres

As another example, the NATO DIANA organisation is affiliated with 180+ test centres across NATO nations. These centres are part of government programmes (defence and non-defence), universities, and large corporations. These test centres are dedicated to TEVV (Testing, Evaluation, Verification and Validation) activities needed to perfect their technologies.

https://www.diana.nato.int/test-centres.html

Image source: NATO DIANA

Sweden launched Testbed Sweden as a national effort to build test and demonstration capacity across the country

In 2018, Sweden launched a national effort called **Testbed Sweden** (Testbäddar Sverige in Swedish) with the aim to make the nation an internationally attractive test market.

As announced in local media, Sweden's national innovation agency Vinnova stated it would invest SEK 100 million per year for a total of one billion over 10 years to support test and demonstration activities for Swedish businesses. Vinnova also promoted an online list of Swedish testbeds categorized by activity area, such as health, digitalization, and smart cities.

One funded project in this initiative was an inventory of Swedish testbeds with international potential and ambitions. This project was led by the Research Institutes of Sweden (RISE).

Image source: Vinnova

RI. SE Research Institutes of Sweden

"The test bed is a vital part of the innovation ecosystem, enabling the efficient development and market introduction of new products, processes and services. The term test bed covers everything from equipment and prototype machines to policy labs and virtual and investigative environments, together with the associated expertise for continuous development. This is where competences, industries, problem owners and users come together to develop the innovations of tomorrow.

– RISE

The Testbed Gothenburg initiative offers lessons to other regions

Gothenburg (Göteborg in Swedish) is the second largest city in Sweden and the fifth largest city within the Nordic region with a population of 1.1 million inhabitants.

The Gothenburg municipality led a three-year project (2016–2018) to develop its city as a "test arena", funded by the European Regional Development Fund and the Swedish Agency for Economic and Regional Growth (Tillväxtverket).

As a test arena, the vision was to position Gothenburg as open to the world, where "business, the public sector, academia and civil society could develop the solutions of the future together" – such as in areas of social mixed living, sustainable lifestyles, and smart traffic. Target users were small and medium-sized enterprises (SMEs) to help them to develop new products and services in sustainable urban development.

The city launched a follow-on project (2018–2021) called Testbed Gothenburg (Testbädd Göteborg) in partnership with Business Region Göteborg, RISE (Research Institutes of Sweden), Chalmers University of Technology, and Gothenburg University. Run by Business Region Göteborg with local science parks, this project's aim was to take the city's urban development boom to a whole new level of cooperation. One activity was to organize a local testbed forum twice annually; another activity was to build a database of the 60+ testbeds in Gothenburg and 100+ testbeds in the county. A major concern was continued project funding.

See project highlights here ▸

HSB Living Lab is a 10-year project focused on sustainable housing that functions as a living laboratory and home for researchers and students.

Image source: HSB Living Lab

Image source: Sharing City Göteborg

Sharing City Göteborg developed a testbed to explore the sharing economy in cities, part of a national program called Sharing Cities Sweden (2018–2021).

"It is important to connect the testbed managers so that they feel they have the same interest." – Eva Kowaki, Johanneberg Science Park

Image source: LinkedIn

About this image:
The Blekinge region has over 100 nature reserves and is a UNESCO biosphere reserve due to its abundant biodiversity.

Blekinge context

Image source: Visit Blekinge

Welcome to Blekinge in Sweden

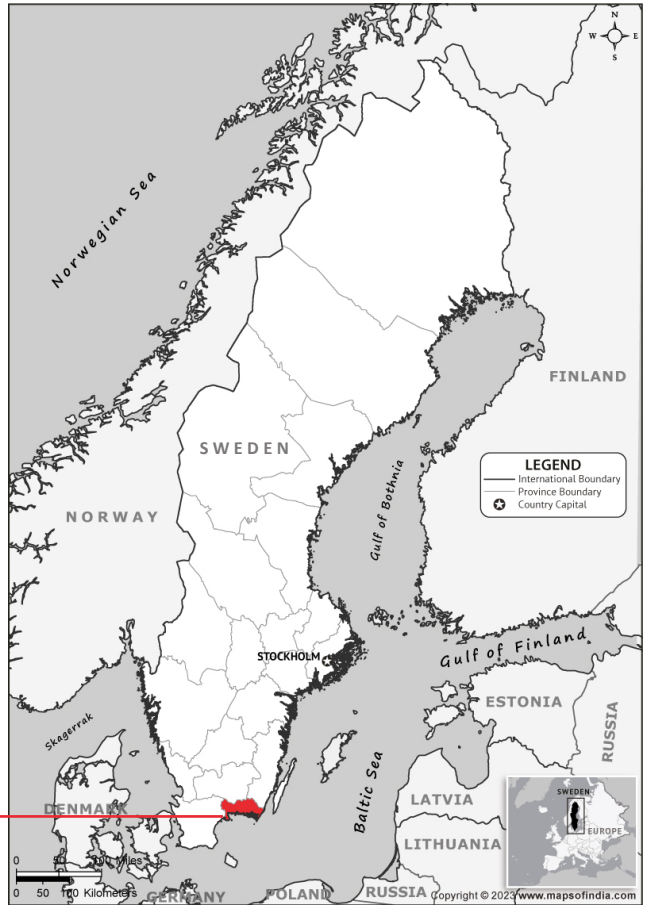
- Total population: approx. 158,000 people
- Regional land size: 2,941 km^2
- Regional Domestic Product (GRDP):
  SEK 460,000 per capita, 4% increase in 2018
  – second highest growth rate in Sweden
- Capital expenditure on R&D projects:
  SEK 2.9 million in all sectors in 2023
  – third highest invested of Swedish regions

Source: Statistics Sweden

The region of Blekinge in located in southern Sweden, bordering the Baltic Sea. The region is the smallest on the Swedish mainland. There are 1,650 islands in the Blekinge archipelago, which exhibits an unusually high biodiversity for its size. The region has five major cities, and the largest city is Karlskrona, which is a UNESCO World Heritage site.

Global companies with regional offices here include Volvo Cars, Ericsson, NKT, and Tetra Pak. Major companies head-quartered in Blekinge include SAAB Kockums, Tarkett, Dynapak, and Roxtec.

Industrial strengths are in submarine building, metal stamping and forming, and food pumping technologies. The world's first telecoms cluster was created in Karlskrona. The Swedish Navy and Coast Guard are based in Karlskrona, and the Swedish Air Force is located in Ronneby.



What is unique to Blekinge as a demo region

A small region serves as an ideal testbed because its compact size enables quicker, more controlled experiments before broader scaling.

In 2024, the Blekinge region in Sweden was recognized as a **Regional Innovation Valley**, a distinction from the European Commission granted to only 151 out of 1,166 regions in Europe.

Blekinge offers several unique assets related to testbed work, such as:

- **Scandinavia's largest rock festival**: Sweden Rock has 30+ years of history organizing a large public event, including testing transit options and modern toilets for crowd use.
- **Largest wildlife reserve**: Blekinge features the largest wildlife reserve in Scandinavia called Eriksberg Nature Reserve, which has been testing water filtration techniques using blue mussels and other experiments.
- **World's largest factory for subsea cables**: Since 1891, NKT has pioneered the power cable industry. While Denmark-based, NKT is building the world's largest factory for high-voltage subsea cables in Blekinge.
- **Digital media production**: Opened in late 2024, Karlskrona features the #1 largest digital production screen and studio space in Sweden, #2 in Scandinavia, and #5 in Europe.
- **Recycled textiles**: Södra operates a specialty mill and R&D site in Blekinge, producing OnceMore® as a sustainable material blended from dissolved wood pulp and textile waste.

Image sources: Visit Blekinge, Eriksberg Hotel & Nature Reserve, Sweden Rock, BTH Virtual Production Studio Lab, Södra

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REGION BLEKINGE

The S3 Kickstart projects aim to build innovation capacity in the Blekinge region of Sweden

Region Blekinge aims to promote sustainable development throughout Blekinge. This government body oversees resident health care services, the public transport system, and education, among other areas.

After the success of the first Kickstart project, the region has continued the Smart Specialization Strategy (S3) initiative with the Kickstart 2 project. The goal of Kickstart 2 is to strengthen Blekinge's research and innovation capacity by promoting collaboration between academia, clusters, and science parks and increasing support for local industry and companies.

The Kickstart 2 project has two tracks. One track has focused on developing Blekinge's system of testbeds so that they can form dynamic sites for local innovation development. The other track has addressed the green transformation of industry, which is described in a separate project report.

The Kickstart 2 project addresses three specialization areas for the region:

1. **Smart industry**: molding (forming) technology and marine technology
2. **Technology**: digitization and smarter societies
3. **Missions**: a focus on society's challenges based on mission-oriented innovation policy

The project's ambition is to increase cross-connections between these three specializations to develop new areas of innovation for Blekinge.

Region Blekinge is the project owner, and partners are Blekinge Institute of Technology, NetPort Science Park, and the Techtank industrial cluster. Financed by the European Regional Development Fund and Region Blekinge, the Kickstart 2 project runs from 2023-09-01 through 2026-08-31.

The first S3 Kickstart project identified 7 regional bottlenecks in the Blekinge region, many of which are shared by other EU regions

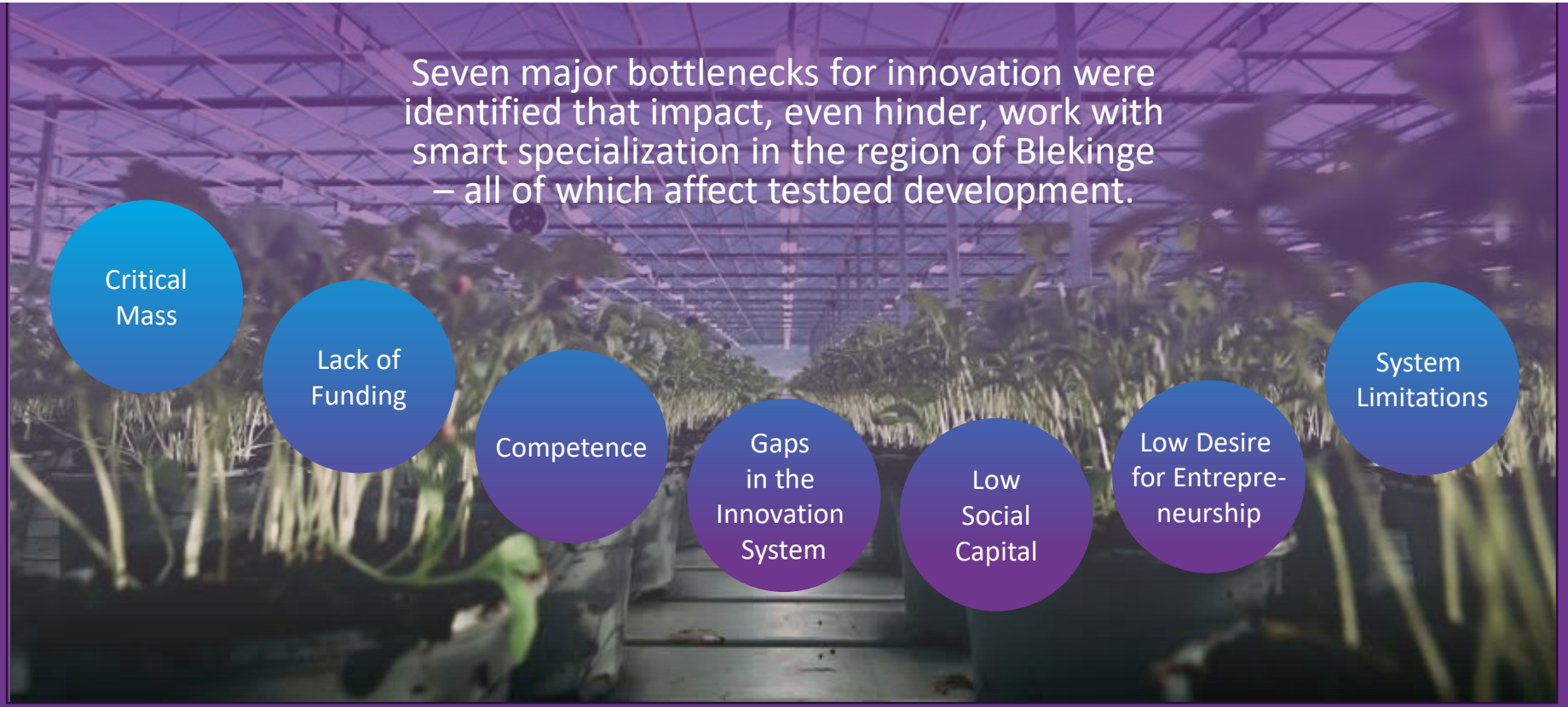


Image sources: Orbit One AB

During the first Kickstart project, two pre-studies assessed the testbed capacity of the Blekinge region

Local testbeds pre-study
2022

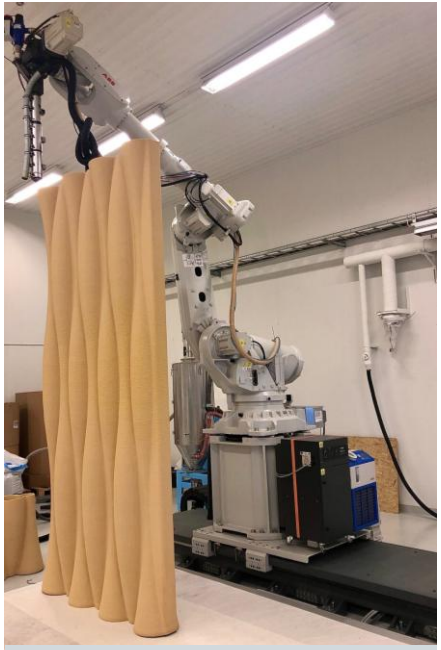
- A 2022 pre-study investigated the maturity of 8 publicly accessible testbeds and 10 privately owned testbeds as a representative data sample of the Blekinge region, further informed by 29 stakeholder interviews.
- Four other groups in Sweden have examined the state of testbeds, led respectively by RISE, Swedish Incubators & Science Parks, and two regions (Gothenburg, Skåne). Almost two-thirds of Swedish testbeds are managed by RISE. Also, most Swedish testbeds have had low usage historically, especially by small businesses.
- This pre-study proposed multiple ideas to improve testbed capacity in Blekinge.

Source: Region Blekinge, *Innovation Testbeds and Opportunities for Blekinge* report, 2022

Demo region pre-study
2023

- In a 2023 pre-study, a series of workshops invited participants from different Blekinge sectors and city governments in the spirit of "mission-driven innovation." Many participants wished to see this collaborative model adopted for other regional planning.
- Workshop participants felt that Blekinge must create and confidently own its definition of a "demo region". Being a demo region requires the willingness to "dare to try" – to demo means to experiment!
- Participants felt youth should be engaged more in regional plans, especially their views on local culture and jobs. A shared concern was the region's declining population.

Source: Region Blekinge, *Blekinge as a Demo Region* report, 2023



About this image: SCULPTUR works with designers worldwide to test and 3D-print sustainable furniture and other structures.

Image source: SCULPTUR

In the S3 Kickstart 2 project, the testbed track set two goals: address SME testbed use and the regional image

Image source: Tamara Carleton

About this image: Heating and cooling solutions provider Cetetherm has a test site for energy R&D.

TESTBED TRACK: GOAL #1	TESTBED TRACK: GOAL #2
Increase the use of existing testbeds with a special focus on local small- and medium-sized enterprises (SMEs)	**Develop the image of Blekinge, nationally and internationally, as interesting for testing and development**
Deliverables include: → Analysis of local SME needs and obstacles → Detailed review of several local testbeds → Proposal for SME financial support → Proposal and iteration of "testbed as a service"	*Deliverables include:* → A regional testbed forum → Action plan, marketing plan, and launch event for Blekinge as a "demo region in 2030" → Best practices for testbeds of the future

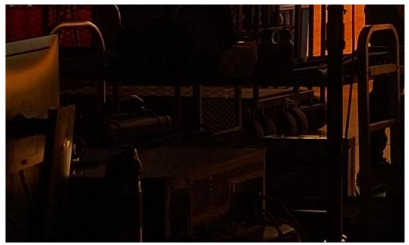
SPOK Blekinge provides an online directory of local materials and production experts, further supporting regional development and R&D testing capacity

SPOK is an online platform for Swedish production that aims to collect and spread knowledge about local manufacturing possibilities from crafts to industry. By fostering collaboration between manufacturers, practitioners, and creators, SPOK supports the development of local production throughout Sweden, and by extension, to produce more local and sustainable consumption. www.s-p-o-k.se

In the spring of 2021, SPOK Blekinge was launched and became part of the Swedish network and digital platform. SPOK Blekinge is run by Region Blekinge in collaboration with Techtank, Form/Design Center, and SPOK Sweden. The goal is to strengthen the companies and the Blekinge region by stimulating the development of local production of art and design in old and new materials, as well as to contribute to interesting collaborations between manufacturers and creators.

Image source: Region Blekinge

About this image:
In 2021, eight local artists in Blekinge used SPOK resources to take a new idea to finished art product.



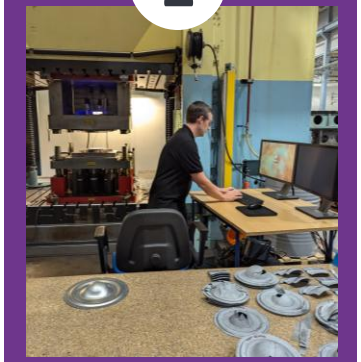
About this image:
The Virtual Production Studio Lab develops digital environments for movies, video gaming, and other uses.

Case studies & pilots

Image source: Blekinge Institute of Technology
Virtual Production Studio Lab

Five testbeds in Blekinge were investigated more deeply as case studies to identify lessons for supporting regional growth

1



RISE's Stamping & Forming Center of Excellence

A facility in Olofström for forming metal and testing multi-material industrial solutions (2016–current)

2

Energilabbet

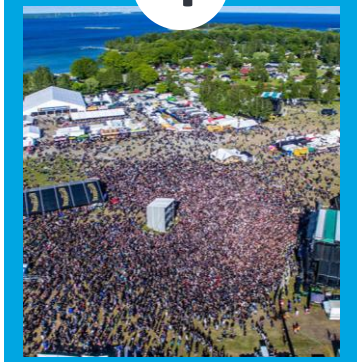
A lab space in Karlskrona dedicated to test new concepts in energy storage and climate tech (2021–2023)

3

CLUK (Centrum för livsmedelsutveckling i Karlshamn)

A shared test kitchen in Karlshamn specializing in small-scale food production and new pumpable products (2009–2023)

4



Sweden Rock

A 4-day summer music festival with five stages based near Sölvesborg as a major public event (1992–current)

5

Virtual Production Studio Lab (VPSL)

A digital media production facility featuring a large customizable LED wall in the city of Karlskrona (2024–current)

Image sources (left to right): Tamara Carleton, Energilabbet, CLUK Facebook group page, Sweden Rock, Sweden Rock

About RISE's Stamping & Forming Center of Excellence

PROFILE	DETAILS
Dates	2016–current (became part of RISE in 2018)
Location	Olofström, Sweden
Objective	Provide a test facility for forming metal and multi-material solutions attached to a composite structure; includes sheet metal forming, tensile strength tests, and simulations
Business model	Membership fee – member benefits include joining the center network, an annual conference, and magazine published quarterly
Access	Public, daily use during business hours
Notes	Previously owned by Volvo Cars
URL	https://www.ri.se/en/what-we-do/test-demo/stamping-and-forming-center-olofstrom

Image sources: RISE, Tamara Carleton

A SWOT analysis was done from a regional perspective, which may not reflect the opinions of the organization.

REGIONAL STRENGTHS

- **Deep expertise**: The staff has years of material testing (e.g., in steel, aluminum, titanium) for the auto industry.
- **National network**: It is part of 100+ test sites at RISE.
- **Local partners**: Its history with Techtank is a major asset.

REGIONAL WEAKNESSES

- **Split priorities**: Staff attention is split between this location in Blekinge and two related RISE test sites outside Blekinge: Mölndal (additive manufacturing) and Jönköping (casting).
- **RISE first**: The staff is not incentivized on regional growth.

REGIONAL OPPORTUNITIES

- **Branded hub**: Blekinge could brand and expand a regional ecosystem on forming technologies with local companies.
- **Swedish corridor**: RISE could connect local expertise (e.g., NovoCast) with mega casting work in western Sweden.

REGIONAL THREATS

- **Customer risk**: The local revenue relies mainly on one big company, which overly impacts this site's future fate.
- **Unclear politics**: Local railroad plans affect members' access to and potential growth of this test site.

Timeline for RISE Stamping & Forming Center of Excellence

RISE took over this facility in 2018, focused on sheet metal research and related testing services. The lab is run in partnership with Techtank.

Daniel Wiklund, RISE head of unit

2011: RISE works with Volvo Cars on sheet metal forming projects at a test site owned by Volvo Cars.

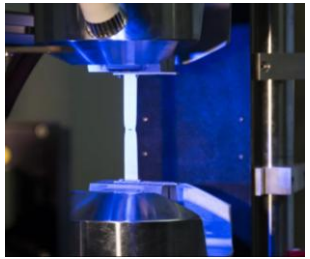
2016: Industry research consortium Swerea established the subsidiary of Swerea IVF at Olofström.

2018: RISE acquires Swearea IVF and owns the site.

1991: RISE forms a Sheet Metal Forum with several Swedish companies.

2015: The first industry conference is organized with Techtank as a local cluster partner.

2017: RISE launches the LIGHTest project to test new light-weight materials for manufacturing.



2023: RISE expands the LIGHTest project to help Swedish SMEs advance their use of lightweight materials.

Image sources: BTH PDRL, RISE, Techtank

About Energilabbet

PROFILE	DETAILS
Dates	2021–2023
Location	Karlskrona, Sweden [closed]
Objective	Explore and test new product concepts in energy storage and climate technologies
Business model	Planned for client fees and project grants, such as from the Swedish Energy Agency (Energimyndigheten)
Access	Planned mixed use (public, private)
Notes	One testbed founder continued a proof-of-concept in energy hardware as the basis for an energy startup called Voltic AB
URL	www.energilabbet.cc [inactive]

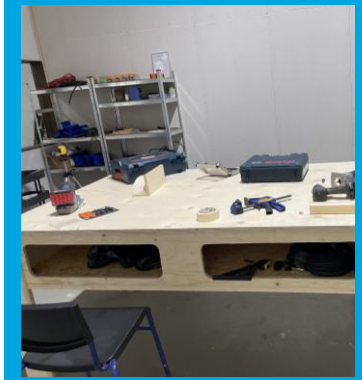


Image sources: RISE, Tamara Carleton

A SWOT analysis was done from a regional perspective, which may not reflect the opinions of the organization:

REGIONAL STRENGTHS

- **Bold vision**: The cofounders are “free spirits” who imagined co-creating a public testbed for energy innovation.
- **Rich content**: The lab drew from earlier consulting work and original gaming content that added to lab assets.

REGIONAL WEAKNESSES

- **Limited financing**: The lab budget relied on public grants, reducing the lab’s scalability and long-term stability.
- **Few partners**: The team relied on a small set of partners and delayed recruiting new partners to diversify the lab network.

REGIONAL OPPORTUNITIES

- **Market demand**: There is strong EU interest for testbeds that engage energy stakeholders and businesses.
- **Future relaunch**: The region could relaunch the lab with big partners like Affärsverken, Fortum, or Svenska Kraftnät.

REGIONAL THREATS

- **Low interest**: The regional business community may not be fully ready to participate in this type of early testbed.
- **Financial skills**: Testbed teams require fundraising skills and knowledge of funding sources locally and nationally.

Timeline for Energilabbet

Sebastian Sjöberg started 10X Labs with a local university professor in 2014. Fredrik Andrén joined in 2015, and they incorporated as 10X Arena in 2019. They combined their skills in ethnography and social anthropology with a passion to change the energy market through Energilabbet.

Fredrik Andrén, co-founder

Sebastian Sjöberg, co-founder

2014: 10x Labs is founded as a consultancy to bring exponential thinking to industry.

2019: 10X Arena is incorporated as a B-corporation, and client work focuses on renewable energy solutions.

2021: A warehouse is rented and Energilabbet is established; the team submits funding applications to the Swedish energy agency.

2022 spring: The team partners with Affärsverken, Region Blekinge, and other groups to explore a new funding grant.

2022 fall: The grant application is rejected, and their progress with partners stalls.

2023: They close the Energilabbet facility, and Andrén spins out an energy grid idea as Voltic.se with other colleagues.

2024: 10X Arena is shut down officially as a company.

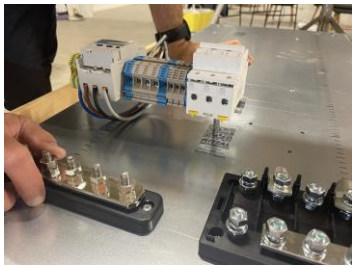


Image sources: Fredrik Andrén, Sebastian Sjöberg

About CLUK (Centrum för livsmedelsutveckling i Karlshamn)

PROFILE	DETAILS
Dates	2009–2023
Location	Karlshamn, Sweden [closed]
Objective	Support a growing cluster of small companies to test and develop new food products, specializing in pumpable products (e.g., beverages, ice cream) and small-scale production
Business model	Temporarily managed by Netport as a membership fee model in early 2020s
Access	Originally member based, then acquired by Green Dairy for internal R&D use
Notes	Funded initially by EU's Regional Development Fund, Region Skåne, Region Blekinge, and the County Administrative Board of Blekinge
URL	https://www.facebook.com/clukikarlshamn [inactive]

Image sources: Tamara Carleton

A SWOT analysis was done from a regional perspective, which may not reflect the opinions of the organization:

REGIONAL STRENGTHS

- **Strategic site**: Its location in a major industrial building offers easy access to food-oriented resources and skills.
- **Major partners**: Its history of public sector backing from the city and the Swedish Economic Agency is a big asset.

REGIONAL WEAKNESSES

- **Private access:** Acquisition by a local company changed the mission from a public food cluster to private R&D lab.
- **Uneven support**: Changing management and priorities at the local science park slowed CLUK's outreach efforts.

REGIONAL OPPORTUNITIES

- **Market growth**: The group's experience positions it well in the growing EU+ market of eco-friendly food methods.
- **Cross-regional synergy**: An alignment with the Skåne food cluster nearby could expand the test network and impact.

REGIONAL THREATS

- **Missing cluster focus**: Regional leaders (and politicians) have not fully recognized the potential of a food cluster.
- **Lack of financial support**: A relaunch of the CLUK brand and mission is possible – though requires new funding.

Timeline for CLUK

CLUK operated as a pilot plant and shared kitchen for nearly a decade, partly managed by NetPort Science Park. Then its largest customer Green Dairy acquired their equipment for internal R&D purposes and closed CLUK as a public site in 2023.

Marc Ljungström, seed investor

Cissi Lingerud, manager

2008: Marc Ljungström and Lennart Lindahl (from Ideon Agro Food) start the idea.

2009: CLUK is funded as a project (2009–2011) using Karlshamn Dairy's old premises.

2011. Funding is extended for "CLUK 2" (2011–2014) and supported with a business developer.

2014: NetPort Science Park in Karlshamn takes over CLUK branding with municipal and regional support.

2023: Green Dairy closes CLUK as a public test site.

2010: Food chemist Cissi Lingerud organizes equipment rental services and training courses for small business owners.

2013: CLUK starts outreach to local schools to share research results and engage young talent.

2020: Lingerud splits her time between CLUK and Green Dairy.

Image sources: Nyforetagar Ronneby Centre, CLUK

About Sweden Rock

PROFILE	DETAILS
Dates	1992–current
Location	Sölvesborg, Sweden
Objective	Celebrate classic rock music and other genres as a safe, fun, four-day festival
Business model	Ticket sales, sponsorships, merchandising, and local vendor partnerships
Access	Open to guests with paid tickets and special concert passes during the festival season
Notes	Known for top-tier production standards and environmental initiatives, regularly tests public event support services
URL	https://www.swedenrock.com

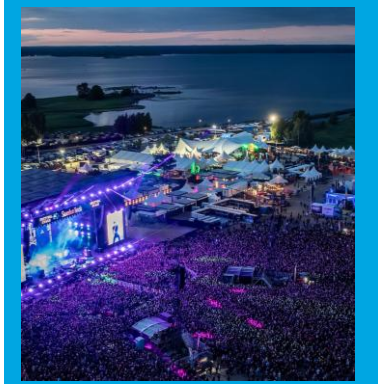


Image sources: Sweden Rock

A SWOT analysis was done from a regional perspective, which may not reflect the opinions of the organization:

REGIONAL STRENGTHS

- **Strong brand**: Sweden Rock is a trusted cultural platform with high community loyalty and robust visitor numbers.
- **Innovative mindset**: The operations staff has a history of experimenting and co-developing with their vendors.

REGIONAL WEAKNESSES

- **Location constraint**: The current site location in Blekinge creates a physical constraint with limited scalability.
- **Summer timing**: The festival relies on the summer season period, restricting possible year-round R&D and user tests.

REGIONAL OPPORTUNITIES

- **Testbed offer**: Sweden Rock could become a medium-sized testbed site and platform for bigger event organizers.
- **Diversification**: The staff could expand its collaborations to test other areas in immersive entertainment solutions.

REGIONAL THREATS

- **Reliable access**: The festival faces limited transportation options for a rapid influx of out-of-town visitors each year.
- **Backup plans**: The region lacks contingency plans for crowd control, terrorist risks, and changing music tastes.

Timeline for Sweden Rock

Sweden Rock has sold out for multiple years, capped at 50,000 concertgoers daily. The music festival also serves as a real-world testbed for testing event support services and public sustainability practices from food to energy to sanitation in high-density environments.

Ingolf Persson, founder

Pelle Åberg, head of production

1992: The festival is launched as “Sommar-festivalen” in Olofström, building on earlier local rock and blues festivals from the 1980s.

1993: The festival moves to Karlshamn, renamed as the Karlshamn Rock Festival.

1999: The festival is rebranded as Sweden Rock, focusing more on hard rock bands.

2009: Sweden Rock is Sweden’s largest music festival with a record 35,200 visitors.

2011: The festival changes owners and partners with *Sweden Rock Magazine*.

2016: Jets Group tests vacuum-flushing toilets, soon saving 2 million liters of water over 4 days.

2018: The festival begins inviting tech companies for immersive event experiences.

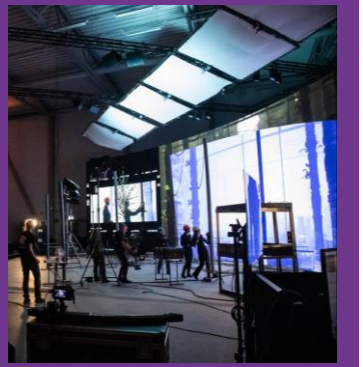
2020-2021: The festival is cancelled due to the global COVID pandemic.

2023: The festival works with Hybricon to power a stage’s energy needs using a truck battery. The vision is to use local cars linked to the energy grid.

Image sources: Sweden Rock, Jets Vacuum

About the Virtual Production Studio Lab (VPSL)

PROFILE	DETAILS
Dates	2024--current
Location	Karlskrona, Sweden
Objective	Provide a large-scale, virtual production environment for public and corporate use
Business model	Research project grants, city to manage production licensing fees and event rental services
Access	Open to academic researchers as a free demo site by request and industry on a pay-per-use basis
Notes	The test site began as a research project (2022–2024) called the Virtual Production Studio Lab; funded by Blekinge Institute of Technology, Region Blekinge, and Karlskrona Kommun
URL	https://www.vpsl.se



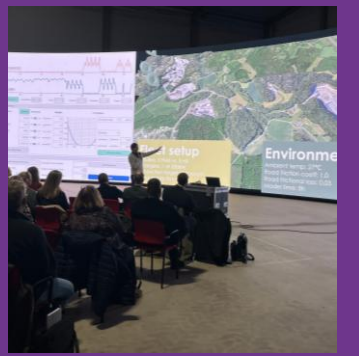


Image sources: iStudios Visuals, Tobias Larsson

A SWOT analysis was done from a regional perspective, which may not reflect the opinions of the organization:

REGIONAL STRENGTHS

- **Cutting-edge tech**: The site is built with advanced LED screens and powerful NVIDIA computing machines.
- **Multi purpose**: The space capabilities can support film-making, simulation research, and gaming development.

REGIONAL WEAKNESSES

- **Costly infrastructure**: Substantial funding is needed to maintain and upgrade the tech, plus afford electricity use.
- **Mismatched ownership**: The local municipality lacks the site facility skills and network to run a digital media studio.

REGIONAL OPPORTUNITIES

- **Unique location**: The staff can attract more European filmmakers and businesses seeking a large screen nearby.
- **Diverse use**: The setup can be used for other uses of digital simulations, including defense, medical, and training.

REGIONAL THREATS

- **Slow branding**: The city needs to aggressively brand the new facility and establish a clear market presence.
- **Unstable funding**: The city's budget for this test site may be overly impacted by national and global economics.

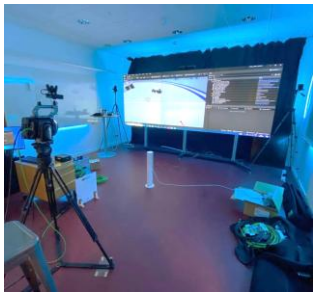
Timeline for VPSL

Professor Tobias Larsson at Blekinge Institute of Technology (BTH) began the Virtual Production Studio Lab (VPSL) as a 3-year research project with support from the city of Karlskrona. The city took ownership of the space in early 2025 but then ended its financing by late 2025.

Tobias Larsson, research director

Ryan Ruvald, research manager

2022: Larsson pitches the region and local municipality to fund a testbed to support digital twin research.



2023: The project team builds an initial sandbox environment on campus to test production flow and tech requirements.

2024 spring: The team temporarily rents a large warehouse off campus to test a partial installation.

2024 summer: A third site is installed at a former padel building near campus, requiring some light demolition and customization.

2024 fall: The space is launched and branded as Karlskrona Blue Port Studios during an annual film event.

2025 fall: VPSL installation ends onsite, and the next iteration of VPSLx is moved to BTH campus.

Image sources: Tobias Larsson

Nesta's four challenges for SME engagement offers a checklist to evaluate the case studies – that scored low for SMEs overall

Nesta, UK's innovation agency for social good, outlined four testbed challenges for small and medium-sized enterprises (SMEs) in a 2019 report entitled *Testing Innovation in the Real World: Real-World Testbeds*. Our project team rephrased the four challenges as questions and applied them to evaluate the depth of challenges facing SMEs in the Blekinge region. The scoring was interpreted from the perspective of the target customers of each testbed, drawing from the case study analysis. For example, RISE's Stamping and Forming Center scored low (◔) on lacking knowledge because most users would already have a strong awareness of available test services due to RISE's national reputation, the center's history in the region, and ongoing interactions with companies in the local industrial cluster.

Challenge for small and medium-sized enterprises (SMEs)		RISE Stamping	Energi-labbet	CLUK	Sweden Rock	VPSL
	Is the testbed too costly for participation?	◑	◔	◔	◑	◑
	Is knowledge lacking about real-world testbed opportunities for relevant SMEs, or doubt in the worthiness of the testbed participation?	◔	◕	◑	◔	◕
	Are SMEs treated as the primary target group?	◑	◔	●	◔	◔
	Is there a fear of exposing SME products or processes?	◔	○	◔	◔	◔

LEGEND: ○ none ◔ low ◑ partial ◕ often ● always

Interviews with 13 local business managers and other stakeholders in Blekinge offered more insight into Nesta's list of SME challenges

Too costly for participation?

The overall belief was lost time versus money, as such:

"I don't have time to wait for project funding… so I just have to do it for our customers and clients. There is no money for an R&D department or extra testing [at our company]."

Yet the obstacle wasn't all about testbed cost for SMEs:

"Living in Karlskrona [Blekinge] is cheaper to be honest. You can get paid more working remotely for a Stockholm-based company but live in Karlskrona."

A lack of testbed knowledge?

Locals agreed that testbed awareness is low, as such:

"Many companies [in the Blekinge region] are unaware that testbeds exist, and that funding exists."

"You can't say a company is interested in this testbed, but a *specific person* must be interested in this [testbed]."

Missed as the primary target?

The SME definition was seen as more complex in reality:

"We have 18 staff… yet we treat our subcontractors like part of our company, so we are actually close to 200 people overall."

Many SMEs felt overlooked and misunderstood:

"What benefit is in it for us [as a SME]? We have never seen a benefit from regional projects like this… It is better that we spend our time marketing to potential customers."

Fear of exposing products or processes?

Interviewees raised little concern for losing any competitive advantage or intellectual property.

Our report team surmised that IP concerns might be a potential later obstacle for these SMEs – after they became more actively involved in testbeds with other partners and groups.

Source of SME challenges: Nesta, 2019, *Testing Innovation in the Real World: Real-World Testbeds* report

NOTE: See list of interview candidates in the appendix

What if Blekinge is positioned as a demo region and testbed for industrial forming technologies? Two pilot forums were organized to explore this idea with local SME input.

About this image: RISE's Stamping & Forming Center shows a test sample of stamped metal defects.

Image source: Tamara Carleton

Forming technologies can be applied to a wide range of materials, including metal (e.g., stamping, bending), plastics (e.g., thermoforming, injection molding), rubber (e.g., compression molding, extrusion), and ceramics (e.g., pressing, casting) that achieve a desired shape and function.

Multiple companies and groups in Blekinge have experience with forming technologies, especially for industrial applications like metal car doors. During the regional S3 Kickstart project, several managers expressed an interest in exploring possible shared needs and opportunities in forming technologies.

The first forum was held in spring 2024. The goal was to see if a critical mass of participants living and/or working in Blekinge would engage across industry, academia, and public sectors. There was enough interest to organize a second forum in fall 2024. The goal was to expand on the spring discussion, share knowledge (through two invited talks), and consider possible actions to expand the local ecosystem.

Two main insights were made. First, Techtank, an industrial cluster in Blekinge focused on regional development, realized this topic could fit a future conference theme. Second, local researchers were inspired to pursue a grant to start a local consortium.

A 2025 NATO research workshop served as a major testbed forum for regional stakeholders with global partners

> "With its historical roots in the marine field, Karlskrona is the perfect place to have these discussions." – Henric Johnson, Vice-Chancellor, Blekinge Institute of Technology

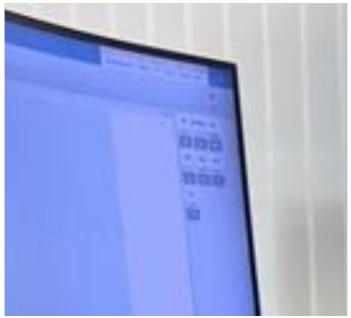
Image source: Blekinge Institute of Technology

In 2024, Blekinge Institute of Technology (BTH) joined a NATO-funded interdisciplinary research project called HEIST, which stands for Hybrid Space-Submarine Architecture Ensuring Infosec of Telecommunications. The 2.5-year project (2024–2026) is funded by NATO's Science for Peace and Security program. The BTH team has provided project expertise in marine engineering, plus potential testbed connections, for the HEIST project in partnership with the Marine Technology Center of Sweden (MTC) based in the Blekinge region. Moreover, Sweden has recommended MTC run one of two test centers in Sweden as part of the growing NATO DIANA testbed network.

BTH organized a large workshop in early 2025 to explore the NATO HEIST project as a testbed opportunity and identify potential partners to help support project outcomes. Participants came from multiple Europe nations and the United States in military, public sector, academia, industry, and small business areas.

As a regional testbed forum, this workshop has led to multiple benefits. Notably, the HEIST involvement has elevated the reputation of the region and particularly BTH and MTC as Swedish partners at a global level. Another result is that BTH has prioritized *critical infrastructure* as a key research focus for faculty and deepened the partnership with MTC.

Image source: Tamara Carleton



About this image:
The K3H Testlabbet Karlskrona measures and validates requirements for different sports training and athletic fitness.

Best practices & scorecards

Image source: Testlabbet Karlskrona

We invited several influential individuals with a personal connection to Blekinge to share their thoughts about developing the region's testbed capacity and image. One repeated point was invitations to serve on local corporate and advisory boards as bridges back to Blekinge.

Views from the Blekinge "diaspora" reveal key themes for spurring testbed potential and regional connection

Image source: E-hälsomyndigheten

Gunilla Nordlöf *was born and raised in Blekinge. Now based in Stockholm, she has served in public leadership roles for Sweden's Ministry of Finance, Ministry of Enterprise and Innovation, and the Swedish Agency for Economic and Regional Growth.*

"First of all, make an effort to find us and then stay in touch. I was invited a few summers back to mingle by the county governor, but then the invitations stopped coming, so I suppose the aim was not to stay in touch.

Also, [promote] job opportunities, and many of us would probably be interested in board work.

I believe Blekinge Institute of Technology has potential too."

– Gunilla Nordlöf, Director General, Swedish eHealth Agency (E-hälsomyndigheten)

Image source: LinkedIn

Sigvald Harryson *runs a management consultancy with offices in Malmö, Sweden, and Zurich, Switzerland. He has been a university professor at three universities in Sweden and Denmark. He keeps a summer home in Blekinge.*

"Invite us to inspiring events and let us share ideas on how to make the region more connected. Invite us to join boards. Or engage us as advisors for high-profile PhD projects.

[Companies based regionally such as] NKT, SAAB Kockums, and Roxtec give hope for growth. Inviting these leaders to 'shine on stage' while sharing experience on what it takes to grow in a region not associated with growth will be good."

– Sigvald Harryson, Founder and CEO, iKNOW-WHO

Image source: LinkedIn

Telma Gomes *is originally from Brazil and lived in Sweden for nine years where she earned a masters degree in Strategic Leadership towards Sustainability at the Blekinge Institute of Technology. She then moved to Portugal for family reasons.*

"Newsletters sharing news and projects from Blekinge are a good way to keep people connected and engaged with what is happening within the region.

Blekinge is known as the heart of Sweden's naval defense, hosting the Swedish Navy's headquarters with a strong cluster of defense-related companies, including Saab Kockums. I recommend positioning Karlskrona as Europe's hub for naval cybersecurity, green shipping, and underwater tech like Portugal's Blue Tech Cluster.

Or for sustainable development testbeds, offer Karlskrona's archipelago as a living lab for sustainable maritime tech like Copenhagen's energy islands."

– Telma Gomes, marketing manager, CMI Interser

Image source: LinkedIn

Damian Rovira *grew up in Sweden with immigrant parents. He studied software engineering at Blekinge Institute of Technology but dropped out of the 5-year program due to financial difficulties. In the past year, he launched a startup with two other students and moved to Stockholm to work.*

"In my opinion, Blekinge should offer a workspace or hangout spot. A hub like that should be available to people wanting to create or build stuff, to meet people with similar interests, and to connect with people outside of Blekinge – like me in this case.

I plan on visiting Karlskrona [in Blekinge] every few months, due to my co-founders and friends currently living there and for other events that seem interesting."

The nature and the closeness to the ocean stands out to me. The city of Karlskrona has immense growth potential. The city just needs to master the tools it already has instead of trying to allocate new ones."

– Damian Rovira, co-founder, Alva AI

Groups can rely on three top practices when planning a new testbed

How should a group set up a new testbed, or how can a city manager best support a local business with its setup of a testbed? Recommended setup practices may be split into two parts: strategic and operational.

(Note these practices are separate from the actual testing and evaluation – or TEVV – procedures occurring within the testbed itself.)

Testbed Strategic Viability

Considerations of strategic viability address testbed purpose, market need, stakeholder buy-in, possible regulatory and risk considerations, and impact. Two lessons are frequently mentioned from other groups in this regard.

1. Confirm market need with users

Studies have shown that many testbeds are underused and struggle past initial seed funding. One best practice during the prep stage is to conduct some form of market analysis for a possible new testbed. This analysis is often supported by a survey or interviews with representative users. In the startup space, this check is often called *product-market fit*. By doing this check, a group can gauge whether a new testbed meets a real need and can sustain demand beyond 1-2 funded projects. If the need is not strong, then a temporary lab site may be a smarter option than a full operation.

2. Test the testbed concept via a pilot

A second recommended practice is to organize a fast pilot as a pre-test of the testbed itself. In a pilot, the organizing group can refine early setup requirements and stakeholders gain proof of market traction. Moreover, this pilot may be set up a series of hypotheses that are tested – from service pricing to physical space configuration to even board engagement – which helps to embed a testing mindset into group practices from the planning start.

For example, one hypothesis could be:

H1: Locating our testbed pilot off campus will produce lower participation rates from researchers and higher participation rates with target corporate customers due to ease of access.

Testbed Operational Scalability

Considerations in operational scalability address testbed staffing, site selection, equipment needs, safety procedures, user/community outreach, and budgeting. These considerations are important to set up a testbed with a solid position from launch.

3. Mix financial and functional staff expertise

A best practice is to have at least one team member who understands project management, especially financing matters, and another team member who has direct experience with the testbed content and tools. This combination will reinforce the early focus needed on financial stability alongside crucial content knowledge.
In some testbed launches, the teams relied mainly on business development skills. While this staffing focus can generate strong partner interest, these teams will miss critical expertise needed to do the testbed work and chase vital funding – both essential aspects when setting up a solid foundation to run a testbed long term.

Image source: Framtiden Bruk

About this image: Framtiden Bruk is a small goat farm in Blekinge that uses its workspace as a test kitchen during winter.

Why use a testbed scorecard

Based on leading practices and our analysis, we developed two testbed scorecards for groups to use as a self-service tool when they seek to either (a) plan the viability of a new testbed or (b) assess the health of an established testbed.

By completing a scorecard together, groups gain a structured snapshot across a range of testbed considerations. The ensuing discussion helps to enhance group communication, improve accountability, and increase awareness of the interplay of the different factors contributing to overall testbed performance.

About this image: Plant Protein Production AB in Jämjö has spent 2+ years developing a viable plant-based protein produced locally in Sweden at their new factory site.

Image source: Plant Protein Production AB

A. Scorecard for testbed planning

B. Scorecard for testbed health

How to use each scorecard

Score each statement separately on a 5-point scale as follows:
1 = Strongly Disagree, 2 = Disagree,
3 = Neutral, 4 = Agree, 5 = Strongly Agree

Calculate the average score for all items.

An overall average ≥ 4.0 indicates the testbed is ready to move forward; lower scores highlight areas that need additional work before proceeding.

A. Scorecard for testbed planning

Discuss and rate each statement on a 5-point scale, then calculate the total average score.

SCORING: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Testbed Strategic Viability	SCORE
1. **Clear purpose**: We have a well-defined objective and timeline for the new testbed, to which we all agree.	
2. **Market need**: We have confirmed demonstrable demand from the target users of our testbed services (and its equipment) in the short term and long term.	
3. **Stakeholder buy-in**: Key stakeholders (e.g., city officials, partners, suppliers, community groups, etc.) have openly endorsed the need for this testbed and are willing to support key activities through funding or other ways.	
4. **Regulatory readiness**: All necessary permits, safety certifications, and other approvals have been identified and are attainable for the testbed.	
5. **Risk mitigation**: A list of key risks with mitigation steps has been discussed and can be documented as a plan.	
6. **Financial case**: We have identified expected economic benefits (e.g., regional growth, jobs, revenue) and other local impact measures that outweigh projected costs.	

Testbed Operational Scalability	SCORE
7. **Suitable site**: The location – physical or virtual – of this testbed provides adequate space, user access, and overall fit for our purpose, while meeting zoning requirements.	
8. **Qualified staffing**: We have confirmed the launch team and related personnel with the necessary expertise and skills to start testbed operations and execute.	
9. **Community outreach**: We agree on whom should be informed and involved, including a top 10+ target user list.	
10. **Data & monitoring:** We have agreed to a process and metrics for tracking early testbed progress and outcomes.	
11. **Safety protocols**: All necessary safety procedures, special equipment handling, and emergency mechanisms are defined, approved, and communicated/posted.	
12. **Budget control**: We have identified costs and vendors for all equipment, tools, and services for early operations.	
TESTBED PLANNING – TOTAL SCORE AVERAGE:	

B. Scorecard for testbed health

Discuss and rate each statement on a 5-point scale, then calculate the total average score.

SCORING: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Testbed Strategic Viability	SCORE
1. **Clear purpose**: The testbed currently operates against a clear objective and schedule that all parties still agree on.	
2. **Market need**: There is ongoing demand from our target users, plus potential new markets, for the testbed services (and its equipment) in the short term and long term.	
3. **Stakeholder buy-in**: Key stakeholders (e.g., city officials, partners, suppliers, community groups, etc.) continue to endorse and provide ongoing support of key activities through funding or other ways.	
4. **Regulatory readiness**: All necessary permits, safety certifications, and other approvals are up-to-date and actively maintained for the testbed.	
5. **Risk mitigation**: The board and management regularly review and mitigate key risks for the testbed.	
6. **Financial case**: Economic benefits (e.g., regional growth, jobs, revenue) and other impact measures still exceed testbed operating costs and capital expenditures.	

Testbed Operational Scalability	SCORE
7. **Suitable site**: The location – physical or virtual – of this testbed still meets the space, accessibility, zoning, and functional requirements for the testbed's intended use.	
8. **Qualified staffing**: Testbed staff still have the necessary expertise and skills to run the testbed with sufficient bandwidth, and there is a plan to address future skill gaps.	
9. **Community outreach**: We still agree on who should be informed and involved, and community awareness is high.	
10. **Data & monitoring:** The metrics and monitoring processes on testbed outcomes are relevant and active.	
11. **Safety protocols**: Staff are updated and trained on all necessary safety procedures, special equipment handling, and emergency mechanisms related to the testbed.	
12. **Budget control**: All testbed costs, vendor contracts, and procurement records are accurate and tracked.	
TESTBED HEALTH – TOTAL SCORE AVERAGE:	

Cities and regions can take various strategies to build their image as being attractive in testing and development work, while addressing common barriers in regional growth

- Support companies to design recruiting packages with a spouse job offer to boost family appeal.
- Create a thematic alliance of 3+ sister testbeds to cross-market to an industry or solution space.

- Offer grants, subsidies, or other incentives to companies that run major pilots or sponsor demo events at local testbeds.

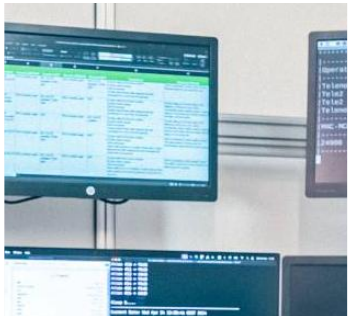
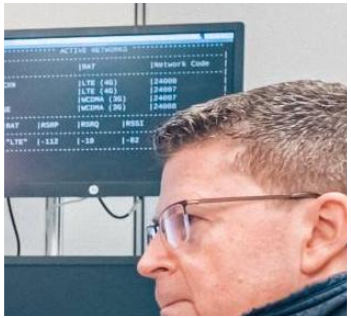
- Provide training grants to help local managers keep their R&D skills current.
- Organize field trips and co-sponsor projects for students to learn about local testbeds and increase their usage.

- Host regular demo days and open house events at testbeds to engage the public and entice investors.
- Assign a dedicated manager to grow the testbed network.

- Organize networking forums at different testbeds that mix across roles, ages, sectors, and backgrounds to help diversify the R&D community.

- Create innovation challenges that reward cross-sector collaboration or youth involvement.
- Lower perceived barriers to access by offering SMEs a “testbed passport” to a set of local public testbeds.

- Promote relevant success stories from local testbeds, possibly with video tours, to companies on the the target list for regional growth.

About this image:
The Telenor IoT Test Lab runs a site that mimics the networks of all four Nordic Telenor operators from a single location.

Financial support

Image source: Telenor

Various local funders aim to support innovation capacity, but a large gap exists specific to testbed work

In Sweden, teams have different funding sources available to help them test new product concepts, gain new R&D skills, or expand test facilities. These funding sources are a mix of grants and loans, sometimes referred to as vouchers, financial checks, or subsidies. However, this financing did not specifically target testbed activities and more generally supported innovation.

For the Blekinge region in Sweden, our project research found that most small businesses (SMEs) have very low awareness of funding sources available to them, especially from local sources. SMEs often did not know where to look for information.

An additional limitation exists for group who are not yet fluent in Swedish, such as international graduate students studying at the local university keen to explore commercial applications for a lab idea. This language barrier caused many to drop or postpone any testbed activities that were unrelated to their studies – a lost opportunity for the region.

Image source: Framtiden Bruk

Image source: Framtiden Bruk

Public sources for funding testbed activities in Blekinge rely mainly on three groups: Almi, Blue Science Park, and Region Blekinge

Multiple groups provide public financing for SMEs and teams based in Blekinge that can be used toward testbed activities.

A major local funder is Region Blekinge, which has the primary responsibility to fund regional growth throughout the region. Qualifying applicants are SMEs with fewer than 250 employees and a turnover of less than EUR 50 million and/or a balance sheet total less than EUR 43 million. Grants from Region Blekinge typically support 50-75% of actual costs.

The summary shown here offers one data snapshot, so we encourage readers to recheck latest updates and specific application requirements.

Funder/Source	Program Name	Team Eligibility	Funding Amount	Website
Almi	Verification Fund (loan)	Startup phase or new product developmental phase	Variable, up to SEK 300,000; above requires 50% co-financing	https://www.almi.se/lan-finansiering/verifieringsmedel/
Blue Science Park	Development Sprints – consultancy support	A SME based in Blekinge, Skåne, or Kronoberg	Consultancy value of SEK 750,000 for up to six months	https://www.bluesciencepark.se/vara-tjanster/test-utveckling/
Region Blekinge	Business Micro Grant	Business based in Blekinge less than 3 years, to be used for equipment or related	SEK 20,000-60,000 (at 50% of approved costs)	https://regionblekinge.se/regional-utveckling/finansiering-foretagsstod-och-projekt/foretagsstod.html
	Trade Show Participation	Business based in Blekinge to support for first-time participation in a trade show	SEK 10,000-150,000 (at 50% of approved costs)	
	Support for Consultancy Services	Business based in Blekinge, to be used to hire an external consultant, such as for new product development	SEK 10,000-150,000 (at 50% of approved costs)	

Other (semi-)private groups in Blekinge can fund testbed activities through business loans or small verification funds

A major private funder in Blekinge is the Blekinge Business Incubator (BBI), which has partnered with other nearby regions in some financing programs, namely Kick Capital and Kronanlanet. To qualify for funding, a local team pursuing testbed activities must already be admitted to BBI – creating an extra obstacle for building local capacity.

A funder on a smaller scale is the Blekinge Institute of Technology (BTH), which is focused on an academic community of researchers, staff, and students – often in partnership with BBI.

The summary shown here offers one data snapshot, so readers are encouraged to recheck latest updates and specific application criteria.

Funder/Source	Program Name	Team Eligibility	Funding Amount	Website
Blekinge Business Incubator (BBI)	SISP Innovation cheques	SME based in Sweden or a Swedish branch of a foreign company	Up to SEK 100,000 or SEK 400,000 for infrastructure	https://www.sisp.se/en/project/innovation-cheques/
	Kick Capital	Startups admitted to Blekinge Business Incubator, Kalmar Science Park, or Företagsfabriken (Kronoberg)	SEK 300,000-500,000 as a convertible loan	https://kickcapital.se
	Krigskassa Blekinge	Startups admitted to Blekinge Business Incubator	Variable	–
Blekinge Institute of Technology (BTH)	Idea verification funds	Researchers, staff and students at Blekinge Institute of Technology	Up to SEK 20,000	https://www.bth.se/om-bth/samarbeta-med-bth/innovation-office/#h-Vistottardinaideer
	Leapfrogs scholarship	Students at Blekinge Institute of Technology, Lund University, and Kristianstad University keen to turn a project idea into a business	SEK 40,000 summer scholarship	https://www.leapfrogs.lu.se

…continued on the next page

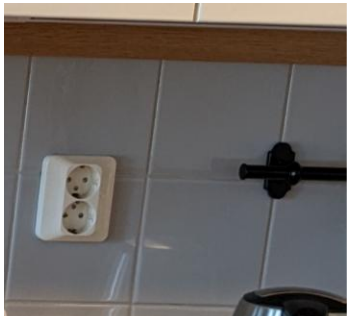
Some funding sources have limited time periods, requiring SMEs to be extra vigilant in monitoring possible testbed financing

Funder/Source	Program Name	Team Eligibility	Funding Amount	Website
Länsförsäk-ringar Blekinge	Community Engagement	Business operating in Blekinge	Variable	https://www.lansforsakringar.se/blekinge/privat/om-oss/hallbarhet--forskning/samhallsengagemang/lansforsakringar-gor-det-mojligt/
Sparbank-sstiftelsen Kronan	Kronan loan (Kronanlanet)	Business linked either to Blekinge Business Incubator, Företagsfabriken i Kronoberg, Kalmar Science Park, or HHIAB-Högskolan (Halmstad)	SEK 100,000-250,000 loan, maturity up to 48 months	https://sparbankssti ftelsenkronan.se/Kronanlanet

Several local financing programs run for a short time and are not continued due to limited project funds. This creates an uneven financial situation for local SMEs.

For example, PreInk was a joint project between Blekinge Business Incubator, Minc in Malmö, and Ideon Innovation in Lund aiming to support pre-incubator teams with new ideas. Funded by Region Blekinge and the Norwegian Agency for Growth, PreInk ran 2020 to 2023.

Another funding example is the Innovations Check Syd program, which was supported by Vinnova. This program ran 2022 to 2024, providing innovation vouchers to local SMEs to develop their ideas further.



About this image:
VISBO is a city apartment managed by Karlskrona municipality where seniors can view and test products for daily life.

Testbed metrics & resources

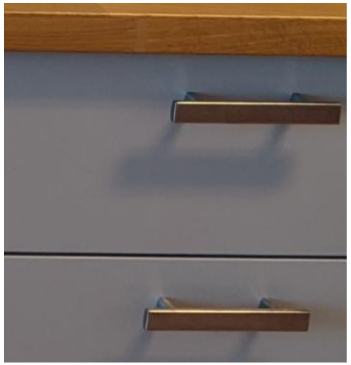


Image source: Tamara Carleton

How can a regional team measure the growth potential and testbed maturity of its region?

By using metrics of **foreign direct investment**, a planning team can broaden their perspective and see the region's potential from an "outside-in" viewpoint than the common internal viewpoint. This data may also be used to compare the region to other similarly sized regions to identify which areas stand out or could be better addressed.

A common approach to regional development is to adopt the usual benchmarks comparing a region against similar regions within the same country. However, this approach takes an inward view, often increasing the likelihood of narrow comparisons and reinforcing similar practices from regions nearby.

A different approach based on a best practice is to consider regional growth from the viewpoint of foreign investors, which shifts the analysis to an "outside-in" outlook. Foreign investors use a wide array of statistics to assess financial viability and growth potential. By considering these statistics, city managers and regional decision makers can expand how they see and measure local growth. In addition, regional teams can increase their awareness of which factors attract foreign investors alongside national and local support. This understanding can help regional teams to gradually diversify their region's economic base, attract more global talent for local industries, and boost resilience during economic downturns.

Multiple groups report on foreign direct investment (FDI) statistics, including the United Nations, OECD, and the World Bank for their member countries and beyond. We have used data from fDi Intelligence, a division of *The Financial Times*, to take a systematic review of Blekinge as a representative small region.

Foreign direct investment (FDI) relies on a range of metrics to assess a region's potential

ECONOMIC POTENTIAL

- Population
- Population growth rate
- Unemployment rate (%)
- Inflation
- GDP (PPP current Int'l $)
- GDP per capita (PPP Current Int'l $)
- GDP forecast (average annual growth rate - %)
- GDP average annual growth rate – (%)
- Outward FDI
- Outward FDI per 100,000 people
- Inward FDI
- Inward FDI per 100,000 people
- Nominal growth of inward FDI projects per 100,000 people
- Inward FDI in R&D and DDT per 100,000 people
- Inward FDI in advanced manufacturing per 100,000 people
- Number of mega projects by CapEx (over $100m) per 100,000 people
- Number of mega projects by jobs (over 1,000 people) per 100,000 people
- Capital expenditure on R&D projects
- Number of patents in 10 years
- Number of patents per 100,000 people in 10 years

HUMAN CAPITAL & LIFESTYLE

- Labour force participation rate, total (% of total population ages 15+) (modelled ILO estimate)
- Secondary educational attainment
- Tertiary educational attainment
- Education expenditure (% of GNI)
- Number of students
- Number of students per 100,000 people
- Number of universities
- Number of universities per 100,000 people
- Number of IB schools
- Number of top 1500 universities
- Skillset of graduates
- Life expectancy
- Social Progress Index
- Human Development Index
- Number of physicians per 100,000 people
- Ease of finding skilled employees

COST EFFECTIVENESS

- Average annual salary ($) for a semi-skilled worker
- Average annual salary ($) for a skilled worker
- Annual rent for prime Grade A office space ($ per m²)
- Annual rent for prime Grade A industrial space ($ per m²)
- 4*/5* hotel in city centre ($ per night)
- Minimum wage ($)
- Cost of establishing a business (absolute value using GNI)
- Cost of registering a property (absolute value using GNI)
- Cost of construction permits (absolute value using GNI)
- Cost of establishing an electricity connection (absolute value using GNI)
- Petrol prices ($)
- Cost of electricity ($ per kwH)
- Corporation tax rate (%)
- VAT/common indirect tax rate (%)
- Total tax rate (% of profit)

CONNECTIVITY

- Download speed (mb/s)
- ICT Development Index
- Number of airports within 80 km of the city
- Number of international destinations served
- Distance to nearest international airport (km)
- Number of ports within 100km (medium)
- Number of ports within 100km (large)
- Number of ports within 100km (very large)
- Number of ports within 100 km (medium+)
- Logistics performance index
- Network Readiness Index
- Environmental Performance Index
- Quality of overall infrastructure
- Quality of roads
- Quality of railroad infrastructure
- Companies in the transportation sector per 100,000 people

BUSINESS FRIENDLINESS

- Total number of companies within the manufacturing sector
- Total number of companies within the hi-tech service sector
- Total number of companies within the knowledge-based sector
- Proportion of companies within the hi-tech manufacturing sector
- Proportion of companies within the hi-tech service sector
- Proportion of companies within the knowledge-based sector
- Total number of companies within the hi-tech manufacturing sector (per 100,000 people)
- Total number of companies within the hi-tech service sector (per 100,000 people)
- Total number of companies within the knowledge-based sector (per 100,000 people)
- Number of jobs created by all inward FDI in last 5 years
- Number of jobs created by all inward FDI per 100,000 people in last 5 years
- Number of expansion / colocation projects per 100,000 people
- Fragile States Index
- Number of top 1000 World Banks
- Corporation tax rate (%)
- Days taken to start a business
- Ease of Doing Business index
- Index of Economic Freedom
- Corruption Perceptions Index
- Country risk score
- Firing costs ($)
- Credit rating

Source: fDi Intelligence (*The Financial Times*)

Blekinge stakeholders are improving how the region tracks its own FDI metrics to assess regional economic potential

FDI: Economic Potential

- **Population**
- **Population growth rate**
- **Unemployment rate (%)**
- **Inflation**
- **GDP (PPP current Int'l $)**
- **GDP per capita (PPP Current Int'l $)**
- GDP forecast (average annual growth rate - %)
- **GDP average annual growth rate – (%)**
- Outward FDI
- Outward FDI per 100,000 people
- Inward FDI
- Inward FDI per 100,000 people
- Nominal growth of inward FDI projects per 100,000 people
- Inward FDI in R&D and DDT per 100,000 people
- Inward FDI in advanced manufacturing per 100,000 people
- **Number of mega projects by CapEx (over $100m) per 100,000 people**
- **Number of mega projects by jobs (over 1,000 people) per 100,000 people**
- **Capital expenditure on R&D projects**
- **Number of patents in 10 years**
- **Number of patents per 100,000 people in 10 years**

Source: fDi Intelligence (*The Financial Times*)

Economic Potential metrics currently tracked by Region Blekinge

Note: these metrics are for the region only, unless stated differently, and kept in SEK due to changing currency rates

- Population: 157,223 (2024)
- Population growth rate: approx. 0.5% (2024)
- Unemployment rate (%): 7.0% versus 6.8% nationally (2025)*
- Inflation: 2.3% nationally (2025)**
- Gross Regional Domestic Product (GRDP) (Purchasing Power Parity current Int'l $): SEK 72.9M (2023)
- GDP per capita: SEK 460K (2023)
- GDP average annual growth rate: SEK 0.85 for private sector (2000-2023 fixed prices)
- Number of mega projects by CapEx (over $100m) per 100,000 people: 1
- Number of mega projects by jobs (over 1,000 people) per 100,000 people: 0
- Capital expenditure on R&D projects: SEK 2.9M all sectors, SEK 2.6M private sector (2023) – approx. 4% as the third highest R&D intensity of Swedish regions
- Number of patents in 10 years: 172 applications (2015-2024)
- Number of patents per 100,000 people in 10 years: 10.8 patents average (2015-2024)

Source: Statistics Sweden (SCB) * Swedish Public Service (Arbetsförmedlingen) ** KPIF

FDI metrics for Blekinge in Human Capital & Lifestyle

FDI: Human Capital & Lifestyle

- **Labour force participation rate, total (% of total population ages 15+) (modelled ILO estimate)**
- **Secondary educational attainment**
- **Tertiary educational attainment**
- Education expenditure (% of GNI)
- Number of students
- Number of students per 100,000 people
- **Number of universities**
- **Number of universities per 100,000 people**
- **Number of IB schools**
- **Number of top 1500 universities**
- **Skillset of graduates**
- **Life expectancy**
- Social Progress Index
- Human Development Index
- **Number of physicians per 100,000 people**
- Ease of finding skilled employees

Source: fDi Intelligence (*The Financial Times*)

Human Capital & Lifestyle metrics currently tracked by Region Blekinge

Note: these metrics are for the region only, unless stated differently, and kept in SEK due to changing currency rates

- Labour force participation rate, total: 85.6% for ages 20-65 (versus 85.2% nationally)
- Secondary educational attainment: 90% for equivalent gymnasium levels (versus 90% nationally)
- Tertiary educational attainment: 42% for university and higher vocational programs (versus 47% nationally)
- Number of universities: 1
- Number of universities per 100,000 people: 1
- Number of IB (International Baccalaureate) schools: 2
- Number of top 1500 universities: 0
- Skillset of graduates: software engineering, computer science, nursing, sustainability leadership, digital business, other*
- Life expectancy: 81.9 years for men and 84.7 years for women
- Number of physicians per 100,000 people: 563 physicians working in region, 579 physicians with medical degrees (total #)

Not in FDI list…

- Percentage of entrepreneurs among all employed people: 9% (2022)*

Source: Statistics Sweden (SCB) * Företagarna (2024 report)

FDI metrics for Blekinge in Cost Effectiveness

FDI: Cost Effectiveness

- **Average annual salary ($) for a semi-skilled worker**
- **Average annual salary ($) for a skilled worker**
- **Annual rent for prime Grade A office space ($ per m²)**
- Annual rent for prime Grade A industrial space ($ per m²)
- **4*/5* hotel in city centre ($ per night)**
- **Minimum wage ($)**
- **Cost of establishing a business (absolute value using GNI)**
- **Cost of registering a property (absolute value using GNI)**
- Cost of construction permits (absolute value using GNI)
- Cost of establishing an electricity connection (absolute value using GNI)
- **Petrol prices ($)**
- **Cost of electricity ($ per kwH)**
- **Corporation tax rate (%)**
- **VAT/common indirect tax rate (%)**
- **Total tax rate (% of profit)**

Source: fDi Intelligence (*The Financial Times*)

Cost Effectiveness metrics currently tracked by Region Blekinge

Note: these metrics are for the region only, unless stated differently, and kept in SEK due to changing currency rates

- Average annual salary ($): SEK 381,900 total earned income for all workers (2024, ages 20-64, versus SEK 410,200 nationally)
- 4*/5* hotel in city centre ($ per night): USD $145/night**
- Minimum wage ($): not applicable in Sweden
- Cost of establishing a business: SEK 2,500 bank fee with minimum SEK 25,000 account balance
- Cost of registering a property: 1.5-2.0% of total cost of residential property deed
- Petrol prices ($): approx. SEK 15-16/liter
- Cost of electricity ($ per kwH): SEK 71.8 per kwH (2025 partial)***
- Corporation tax rate (%): 20.6% nationally
- VAT/common indirect tax rate (%): 25% nationally
- Total tax rate (% of profit): 20.6% nationally

Source: Statistics Sweden (SCB) * Företagarna (2024 report) ** Hotels.com 2025 sampling *** Nord Pool

FDI metrics for Blekinge in Connectivity

FDI: Connectivity

- **Download speed (mb/s)**
- ICT Development Index
- **Number of airports within 80 km of the city**
- **Number of international destinations served**
- **Distance to nearest international airport (km)**
- **Number of ports within 100km (medium)**
- **Number of ports within 100km (large)**
- **Number of ports within 100km (very large)**
- **Number of ports within 100 km (medium+)**
- Logistics performance index
- Network Readiness Index
- Environmental Performance Index
- **Quality of overall infrastructure**
- **Quality of roads**
- **Quality of railroad infrastructure**
- Companies in the transportation sector per 100,000 people

Source: fDi Intelligence (*The Financial Times*)

Connectivity metrics currently tracked by Region Blekinge

Note: these metrics are for the region only, unless stated differently, and kept in SEK due to changing currency rates

- Download speed (mb/s): 100 Mbit/s, 85% business access*
- Number of airports within 80 km of the city: 1 regional (RNB)
- Number of international destinations served: 0
- Distance to nearest international airport (km): 297 km / 3h8m train to CPH
- Number of ports within 100km (medium): 1 (Karlshamn) – high quality, deepest port in southern Sweden
- Number of ports within 100km (large): 0
- Number of ports within 100km (very large): 0
- Number of ports within 100 km (medium+): 1 (Karlshamn)
- Quality of overall infrastructure: moderate
- Quality of roads: moderate
- Quality of railroad infrastructure: moderate with decreasing government investment
- Companies in the transportation sector per 100,000 people: 179 total work sites with active employees (out of 332 work sites) in the “transport & storage” sector

Source: Statistics Sweden (SCB) * Företagarna (2024 report)

FDI metrics for Blekinge in Business Friendliness

FDI: Business Friendliness

- **Total number of companies within the manufacturing sector**
- Total number of companies within the hi-tech service sector
- Total number of companies within the knowledge-based sector
- Proportion of companies within the hi-tech manufacturing sector
- Proportion of companies within the hi-tech service sector
- Proportion of companies within the knowledge-based sector
- Total number of companies within the hi-tech manufacturing sector (per 100,000 people)
- Total number of companies within the hi-tech service sector (per 100,000 people)
- Total number of companies within the knowledge-based sector (per 100,000 people)
- Number of jobs created by all inward FDI in last 5 years
- Number of jobs created by all inward FDI per 100,000 people in last 5 years
- Number of expansion / colocation projects per 100,000 people
- Fragile States Index
- **Number of top 1000 World Banks**
- **Corporation tax rate (%)**
- Days taken to start a business
- Ease of Doing Business index
- Index of Economic Freedom
- Corruption Perceptions Index
- **Country risk score**
- Firing costs ($)
- **Credit rating**

Note: these metrics are for the region only, unless stated differently, and kept in SEK due to changing currency rates

Source: fDi Intelligence (*The Financial Times*)

Business Friendliness metrics currently tracked by Region Blekinge

- Companies in mfg. sector: 302 work sites with 1+ employee
- Companies in hi-tech service: 000
- Companies in knowledge-based sector: 000
- Proportion of companies in hi-tech mfg.: 00%
- Proportion of companies in hi-tech service: 00%
- Proportion of companies in knowledge-based sector: 00%
- Number of top 1,000 World Banks: 0
- Corporation tax rate (%): 20.6% nationally**
- Country risk score: AA1***
- Credit rating: 99/100****

Source: Statistics Sweden (SCB) ** Företagarna (2024 report) *** Allianz ****World Bank

Several additional metrics can measure Blekinge as a demo region with a thriving system of test environments on an ongoing basis

Test environments – or testbeds – play a vital role in demonstrating a region's commitment to innovation and its capacity to support cutting-edge research and development. Testbeds provide a controlled setting for businesses and researchers to experiment with new ideas, technologies, and processes across different groups in academia, industry, and government.

In addition to the standard metrics for foreign direct investment (FDI), a more specific set of metrics can track testbed activity as part of building a regional innovation ecosystem. We recommend several metrics in this report, and a task in the regional action plan is to begin a system for tracking these metrics more regularly.

Overall, thriving and unique testbeds can help enhance a region's reputation as a hub for investment and attract further FDI by signaling a proactive approach to economic growth and technological advancement.

FDI category	Specific testbed metrics – our recommendation
Economic potential	• Testbed operational use (% used of active work hours) • Number of job openings created due to regional testbeds and incubators in last three years
Human capital & lifestyle	• Number of students and junior employees (<30 years old) involved directly with testbed projects per year • Number of people who have moved to Blekinge due to testbed opportunities in last three years • Total number of testbed training programs held per year • Average participation rate for testbed training programs
Cost effectiveness	• Average return on investment (profit/cost) for testbed operations
Connectivity	• Total number of new testbed partnerships and ongoing partnerships with organizations outside the region per year • Quality of testbed equipment & tools (low/medium/high)
Business friendliness	• Total number of testbeds in top industrial sectors • Engagement level of regional investment community in testbed programs and spinouts (low/medium/high)

About this image:
At its test center in Mjällby, Sweden, TitanX runs specialized wind tunnels that test heat transfer and durability.

Image source: TitanX

Appendix

Acknowledgements

This report is the outcome of collaboration with the organizations involved in the Smart Specialization Strategy (S3) Kickstart 2 project: Blekinge Institute of Technology, NetPort Science Park, Region Blekinge, and TechTank.

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Report author: Tamara Carleton

Publication date: January 2026

Further reading about testbeds

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Sweden

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Blekinge Kickstart 2 project: Interview list

#	SME	Interview Category	Organization	Person
1	**Yes**	Sustainability	Circular energy Sweden AB	Stan Weyns
2	**Yes**	Sustainability	Foodtankers	Tomas Pettersson
3	**Yes**	Innovation ability / potential	Kreativum Science Center	Jonas Knutsson
4	**Yes**	Sustainability	Livegreen	Alina Minkova
5	**Yes**	Sustainability	Predire Test Center	Henrik Rundgren
6	**Yes**	Sustainability	Södra Cell Mörrum	Stefan Sandberg
7	**Yes**	Sustainability	Teko-Tryck	Johanna Olofsson
8		Broad industry	Almi	Helena Gottfridsson
9		Broad industry	Handelskammaren (South Swedish Chamber of Industry & Commerce)	Johan Eckland
10		Broad industry	Svenskt Näringsliv (Confederation of Swedish Enterprise)	Sara Dahlberg
11		Innovation ability / potential	Visit Blekinge	Lotta Johansson
12		Women & those born abroad	Klarna (formerly Outpost24)	Kamal Guramkonda
13		Women & those born abroad	Indian Organization in Blekinge	Gurudutt Velpula

A Guide to Innovation Testbeds

European Union
European Regional
Development Fund

REGION
BLEKINGE