



Living Lab Hoppet

8 May 2019 | Gothenburg, Sweden

Organizers:



INNOVATUM



#LivingLabGbg



The event is also a part of Testbed Gothenburg – testing the future together

Testbed Gothenburg is an initiative encompassing the entire city: trade and industry, public contributors, academia, research institutes and science parks, and was initiated by the City of Gothenburg through Business Region Göteborg, RISE, Chalmers University of Technology and Gothenburg University. In Testbed Gothenburg we are working together on a whole new level, enabling us to accelerate development, build knowledge, and take advantage of the region's innovative power. We're testing the future together. #testbedgothenburg



Welcome to Gothenburg!

Business Region Göteborg, Innovatum and Sustainability Hub are delighted to welcome you all to Gothenburg and the Living Lab-event for Hoppet – a fossilfree preschool pilot project!

Northern Connections is an Interreg co-financed project in the North Sea region with partners from 21 clusters, cities, regions and knowledge institutions. The goal of the project is to strengthen the degree of business development in renewable and environmental technology through transnational cooperation between cities, regions and clusters. In May 2019 Gothenburg is on the agenda!

All partners in the Northern Connections project have the task of establishing a living lab in their region. The challenge owner of the living lab is managing a project under development with modern and high sustainability standards that contribute positively to smart cities and urban development where technologies, innovations and services of the future are being used. The project's most important delivery is to develop methods to make the living lab available to renewable technology suppliers from the entire project's geographic area.

This means that renewable technology suppliers gain access to living labs across Northern Europe. Giving them opportunities to establish themselves in new markets and get new contacts.

Gothenburg, the second largest city in Sweden, is undertaking its greatest development in modern history and will grow by nearly a third by 2035 and it is one of the fastest growing regions in Europe.

The City of Gothenburg wants to serve as a role model and show the world that it is possible to live a good life without contributing to negative climate impacts and by that changing the conditions for our future generations. The long-term goal for the City of Gothenburg is to reduce its consumption-based greenhouse gas emissions with 75% by the year 2050. To achieve high environmental goals, close collaboration both national and international is the key.

The City of Gothenburg aims to be a part of how cities can unlock the potential for innovation across borders and we are very glad to have you here today.

On behalf of my colleagues at Innovatum and Sustainable Business Hub I wish you a warm welcome to Gothenburg!

Maria Strömberg
Director Clusters & Innovation, Business Region Göteborg



Program

Program May 8th

8:30

Mingle and registration

9:00—11:45

Gothenburg – a sustainable city open to the world

Gothenburg – a role model in collaborating for a sustainable future and a growing city with great potential for suppliers of sustainable materials

The City of Gothenburg wants to serve as a role model and show the world that it is possible to live a good life without contributing to negative climate impacts and by that changing the conditions for our future generations. Gothenburg is expanding, and it's one of the fastest growing regions in Europe. The long-term goal for the City of Gothenburg is to reduce its consumption-based greenhouse gas emissions with 75% by the year 2050. To achieve high environmental goals, close collaboration both national and international is the key.

Maria Strömberg, Business Region Göteborg | Andreas Göthberg, Business Region Göteborg

→ **Short Product Pitches**

Hoppet – Sweden's first fossil-free pre-school that will set the standard for future urban development

Hoppet – the first project in line to reach the standards for future urban development in the city. Hoppet is actively looking for ground-breaking actors and entrepreneurs that are willing to join this cutting-edge project that will set the standard for future urban development in the city.

Anders Hall, Local administration, City of Gothenburg | Maria Perzon, Bengt Dahlgren

Market driven tools for climate declarations Byggsektorns Miljöberäkningsverktyg and Environmental Product Declarations

Anders Ejertsson, IVL Swedish Environmental Research Institute

→ **Short Product Pitches**

Sustainable urban developers are looking for suppliers for upcoming projects

In the spring of 2017 the region's population passed the 1 million mark, and by 2030 the region will have around 1.2 million residents. This requires major investments from the region's many urban developers. Learn about current and future development projects where sustainable products and services are requested.

Maria Ådahl, Landvetter Södra | Amanda von Matern, Landvetter Södra | Eva Rydén Dalman, Municipality of Lund | Paula de Hollanda, Castellum



It takes courage to reduce greenhouse gases from the construction sector

“We must reverse the emission trend of carbon dioxide, but the construction sector cannot handle it alone - political determination is also needed!”. Hear more about the Roadmap for a fossil-free building sector – an initiative by companies in the construction and material sector to halve emissions by 2030.

Birgitta Govén, Sveriges Byggindustrier

11:45—13:00 Lunch, mingle, exhibition

13.00—15.45 Boosting possibilities for market impact — together we'll make the impossible possible

What is happening in our neighbouring countries?

Finding fossil-free solutions to reduce climate impact isn't just important in Sweden and Gothenburg. It's on the agenda for our neighbouring countries as well.

Peter Munk, Municipality of Aalborg | Kristin Anderssen, Municipality of Oslo

→ Short Product Pitches

The global trends in sustainable driven transitions

We give you an update on the latest trends in sustainable driven transition. During this session, we explore how green investments not only have positive effects on the climate and human health but also on a growth perspective.

Svante Axelsson, Fossilfritt Sverige

What are the possibilities of re-use in future construction projects?

Re-use could make a difference when aiming to become fossil-free and climate neutral. Learn about smart ways to make used things come to use again.

How do reuse of interior building products and furniture affect parameters as costs, climate impact and waste amounts?

Carina Loh Lindholm, IVL Swedish Environmental Research Institute

Re-use from a property owners perspective — New digital applications and work processes

Anton Franker & Fredrika Levén, Chalmersfastigheter

Secrets for successful sustainability work

Amanda Borneke, CS Riv & Håltagning

→ Short Product Pitches

15.45—17.30 Mingle, food and talks

Please make us visible on social media:

#LivingLabGbg #testbedgothenburg @NorthseaConnect @NorthSeaRegion @INTERREGTweets



Activity Schedule

2-MINUTES ON-STAGE PITCH		ONE TO ONE MEETINGS WITH PROJECT MANAGEMENT HOPPET	
		ROOM 1	ROOM 2
09:30–09:50	Kenoteq, Fischer Lighting, Altered, DAW		
10:40–11:00	ISSOL, Allbäck Linoljefärg, Forbo, Læsø Zostera, Ekolution	10:45–11:00 ØkoTømrer	KALK
		11:10–11:30 Juteborg	Altered
13:40–14:00	Kebony, Tarkett, ØkoTømrer, Hunton Fiber, Hemp in a Box	13.00 - 13.30 Hunton Fiber	ISSOL
		13.35 - 14.05 Læsø Zostera	Climate Recovery
		14.30 - 14.50 Fischer Lighting	DAW
15.30 - 15.50	Plockhugget, Green Furniture, Juteborg	14.55 - 15.15 Kenoteq	Kebony
		15.20 - 15.40 Ramirent	Allbäck Linoljefärg
		15.45 - 16.05 Hemp in a Box	
		16.10 - 16.50 Hampaprodukter, Ekolution, House of Hemp, Nordiska Hampakompaniet	



WORKSHOP – IDENTIFYING POTENTIAL COLLABORATION

11.15 - 11.45 DAW, Allbäck Linoljefärg, KALK, Kenoteq, ØkoTømrer, Plockhugget, Kebony, ISSOL

A

13.00 -13.30 Tarkett, Forbo, Green Furniture, Fischer Lighting, Altered, Climate Recovery, Juteborg

B

14.30 - 15.00 Hampaprodukter, House of Hemp, Ekolution, Læsø Zostera, Fiber Hunton, Hemp in a Box, Nordiska Hampakompaniet

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NEED ASSISTANCE?

Please contact the front desk at the entrance or please ask anyone with the badge "ASK ME"



Organizers



**BUSINESS REGION
GÖTEBORG**

Business Region Göteborg

We work to create favourable conditions for trade and industry throughout the entire region by offering knowledge, contacts and arenas for collaboration. Business Region Göteborg is responsible for business development in the City of Gothenburg and represents thirteen municipalities in the region.

We create sustainable growth by actively working for cluster and industry development in the Gothenburg region. We do this by identifying strengths, bringing together people from companies, academia and the public sector in valuable networks and by initiating industry collaboration to produce commercially viable innovations.

Innovatum

Innovatum is one of northern Europe's strongest development centers. Here we work with broadening and strengthening the business community in Western Sweden, arousing children's curiosity for technology and creative industry. We are a place for smart people with smart ideas you can say. And the world's best place for the best company of the future.

With us at Innovatum you can access a professional platform for regional, national and international development projects. In a creative and permissive environment for newly started companies with a whole house full of new knowledge and production equipment.

INNOVATUM



**Sustainable
Business Hub**

Sustainable Business Hub

Sustainable Business Hub is a Triple Helix cluster for sustainability and cleantech. The members are clean tech companies, public sector with regional and local authorities, utilities and universities and research institutes. Our mission is to promote innovation and business development in value chains that lead to a sustainable society. We offer members a platform where innovation, development and business for sustainable solutions are implemented.



Hoppet – a fossilfree pre-school setting the standards



The City of Gothenburg plans to invest €600 million in new schools and housing projects, all of which must meet strict sustainability criteria. The local administration of the City of Gothenburg, one of Sweden's largest managers of public premises, is both project owner and developer of the Gothenburg living lab challenger owner Hoppet.

The Hoppet preschool is a pilot project for these future developments, and will be built with fossil-free materials and processes. This cutting-edge project will set the standard for future urban development in the city and will open up a thriving market for sustainable suppliers.

In order to succeed with an innovation project such as Hoppet, it is necessary to be open minded for new forms of cooperation. The project needs to bring together suppliers of material and systems, product developers, researchers, innovators and a lot of other skills. Hoppet are therefore looking for people, companies and organizations who have knowledge and an open and optimistic approach to the challenges ahead.

Thank you for accepting the challenges!



Northern Connections

Northern Connections is a partnership of 21 clusters, cities, regions and knowledge institutions working together to create innovation connections between enterprises and clusters in the energy sector.

The joint challenge is to test the use of domestic innovation support measures transnationally and address barriers to competition which exist between clusters and regions. Innovation support is mainly applied within narrow geographies where calls to action are not visible transnationally and cities and clusters lack capacity to involve SMEs broadly.

Our objective is to get more enterprises to participate in transnational innovation collaboration via strengthening transnational cluster and city/region cooperation.

Main output is building capacity and transnational relations of sustainable energy clusters to provide demand-led innovation support. This creates the foundation for involving more SMEs in innovation. Develop broader political backing using Northern Connections to create coherence between political ambitions and cluster potential for innovation support.

Our approach is to provide a bridge between private and public sector on transnational innovation support. This will be achieved through improving/aligning innovation support measures by creating incentives for transnational SME innovation partnerships to collaborate and establish a critical mass of innovation activity on a transnational basis. We will pilot joint transnational innovation support measures aimed at broadening opportunities for SMEs from different North

Sea Region areas to participate in regional innovation activities, which ultimately will strengthen their ability to take part in global markets and create new value chains.

Northern Connections activities pushing innovation

Expanding our knowledge base

We will support the knowledge transfer between the cities and regions, the clusters and academia. Regional innovation strategies (RIS3) focus on the strengths of a region – they seldom take into account the synergies with neighbouring regions and the potential of transnational cooperation.

Therefore, we will expand our knowledge on how RIS3 can support internationalisation and how clusters can use this. These findings will provide valuable input to the capacity building on political and strategic level.

We also intend to dig deeper into how clusters support SME internationalization and innovation participation. This will provide a basis for cluster capacity building.

Innovation opportunities for SME's

Through our Living Labs we set practices on involving SMEs in solving energy challenges of cities and regions. A sustainable energy Living Lab is a real demonstration project with actual industry investments, technologies and experts - it is not merely a demonstration project, that is static and limited to its existing partners.





The Living Labs provide, to SMEs, access to an early phase of developing a pool of solutions towards public and private sector challenges. The challenges are made accessible through open-solution pitches and carried out throughout the North-Sea region. Creating a true market place where public and private sector challenge owners can see what the market can offer.

Clusters plays a key role

We have identified, developed and tested tools to improve SME's innovation skills. Clusters use the toolbox to adapt their services to meet the needs of enterprises.

The toolbox is a guide to understanding and carrying out interregional innovation activities for SMEs around innovation support measures already tied into regional value and innovation chains. A model for interregional cluster cooperation, where SMEs can profit from innovation and business opportunities across regions. It will contribute added value to initiatives like Enterprise Europe Network and European Cluster of Excellence Initiative.

Cities and regions - the challenge owners

By bringing together regions, cities and clusters, we discuss our role and identify tools that we can use to support SME innovation across borders. We wish to stimulate the international competitiveness of our SMEs in our region by extending innovation collaboration between clusters, regions and cities across borders.

We will develop and test new practices for building an international dimension into regional smart specialisation strategies, with a particular focus on living labs and how a coordinated effort from clusters and cities play a key role in this.

Building political and strategic capacity

By bringing together regions, cities and clusters, we can create the basis for discussing how smart specialisation strategies can be optimised to support SME innovation across borders. Our aim is to stimulate the international competitiveness of the region and extend the innovation collaboration between clusters, regions and cities. Policy is a governing agenda at any level promoting growth decisions, which support resource allocation.



Gothenburg is expanding and the city is densifying. An estimated EUR 100 billion will be invested in property developments and infrastructure in the years 2016-2035. The opportunities for investors and actors in urban development and construction are tremendous.

Photo: Per Pixel Pettersson



What is a Living Lab?

A Living Lab is a research concept. A living lab is a user-centred, open-innovation ecosystem, operating in a territorial context, integrating concurrent research and innovation processes within a public-private-people partnership. The concept is based on a systematic user co-creation approach integrating research and innovation processes. These are integrated through the co-creation, exploration, experimentation and evaluation of innovative ideas, scenarios, concepts and related technological artefacts in real life use cases. Such use cases involve user communities, not only as observed subjects but also as a source of creation. This approach allows all involved stakeholders to concurrently consider both the global performance of a product or service and its potential adoption by users.

How it works?

The living lab process, which integrates both user-centred research and open innovation, is based on a maturity spiral concurrently involving a multidisciplinary team in the following four main activities:

- **Co-creation:** bring together technology push and application pull (i.e. crowd-sourcing, crowd casting) into a diversity of views, constraints and knowledge sharing that sustains the ideation of new scenarios, concepts and related artefacts.
- **Exploration:** engage all stakeholders, especially user communities, at the earlier stage of the co-creation process for discovering emerging scenarios, usages and behaviours through live scenarios in real or virtual environments.
- **Experimentation:** implement the proper level of technological artefacts to experience live scenarios with a large number of users while collecting data which will be analysed in their context during the evaluation activity.
- **Evaluation:** assess new ideas and innovative concepts as well as related technological artefacts in real life situations through various dimensions such as socio-ergonomic, socio-cognitive and socio-economic aspects; make observations on the potentiality of a viral adoption of new concepts and related technological artefacts through a confrontation with users' value model



Company Profiles

🗨️ Allbäck Linoljeprodukter AB

Allbäck Linoljeprodukter manufacture environmentally friendly linseed products of renewable raw materials for the world market.

Hundred-year European, well-documented knowledge from the Second World War, combined with new production technology, has made it possible to develop a whole new generation of linseed products for both old and new buildings. These meet all modern requirements in terms of environment, durability, technical characteristics and economics.

Contact: Mikael Bengtsson | mikael@allbackpaint.com | www.linoljeprodukter.se

🗨️ ISSOL

ISSOL develops and manufactures smart glazing, capturing renewable solar energy to produce “green” power. We are able to add architectural features to photovoltaic technology and replace traditional building materials with ISSOL’s energy positive glazing, often referred to as Building Integrated PhotoVoltaic (BIPV).

ISSOL’s products belong to the fast growing, smart glazing category. Our laminated glass performs essential architectural functions: mechanical, sealing, insulation, sun protection or aesthetics. ISSOL’s energy positive glazing are available in many sizes, forms and colors, just like traditional glass made building materials, but equipped with high efficiency solar cells. Special emphasis during eco design of the project enables labelling of ISSOL energy positive glazing as CO2 neutral.

Our technology and design is tailored to the building project specifications and can be applied as:

- Glazed roofs, skylights and canopies
- Tiles
- Façades glazing and curtain walls.

Our team brings together capabilities required for designing energy positive buildings and know-how from photovoltaic energy and glazing transformation. Next of the supply of energy positive glazing our engineering office provides support services to architects and engineering

Contact: Xavier Flasse | xflasse@issol.eu | www.issol.eue

Ramirent

As Sweden’s largest rental company, sustainability is high on Ramirents agenda. We currently offer battery-powered or electric options in several parts of our Product Catalogue:

- Electric mini excavators, electric compact loaders, electric dumpers (2019), electric compressors, hybrid lifts. Most of the machines can be operated on alternative fuels.



- Battery-operated vibrator plates, cutting machines and trowels.
- The market's most energy-efficient modules
- Climate-positive electricity & heating solutions

Ramirent's temporary factory:

- Workplace planning, early stage design with, among other things, 3D & 4D as a tool. Early deciding on correct methods and process choices gives the opportunity to influence logistics, security and efficiency in the project. Experience shows 10% less waste and 5 % improved cost efficiency.

Contact: Isak Gillgren | isak.gillgren@ramirent.se | www.ramirent.se

One Reality AB

One Reality specialises in Digital Visualisation which is a part of the overall Digitalization space. The digital worlds and content is accessible through different hardware setups like VR, AR and ordinary laptop/tablets.

One Reality is working with several partners in the construction, real estate and city planning sector to visualize complex situations, designs, and setups and making them accessible and easy to understand. Recently we have worked with our partner Ramirent to visualize the Twin Construction site (Twinsite). The arena/stage can be used by different partners that needs to visualize and explain their specific product, component, offering in a context. These digital environments can also be used as "stages" for training and education.

Contact: Mats Eliasson | mats.eliasson@onereality.se | www.onereality.com

Fischer Lighting

Fischer Lighting is a sustainable business in rapid development, launching a unique circular concept. We see no reason to discard perfectly functional lighting fixtures, if they can be renewed and turned into something even better.

Fischer Lighting has a successful business model for upgrading existing lamps in existing buildings. In this way, CO2 levels are significantly reduced. An LCA showed a 42% CO2 reduction compared to buying new LED fixtures. This is why we produce modular LED solutions built on existing fixtures, but offering all of the functionality, lighting quality and energy saving technology expected from state-of-the-art LED.

We create solutions with a better quality of light, lower energy consumption and reduced environmental footprint.

LED solutions from Fischer Lighting frequently lead to fewer disruptions in the installation phase, as it will not be necessary to rebuild or restructure ceilings. Our solutions can be taken apart, eliminating the need to discard the lamp or fixture in connection with future upgrades. For new constructions, we are in the process of designing and implementing a new business model. We are currently running our first test project for the City of Copenhagen. The project



“Sydhavnens Genbrugscenter” is a new building designed by the famous architects from BIG. The City is supplying us with old lighting fixtures from schools and other buildings in the city, which are being demolished or renovated. Instead of ending up as waste, we upgrade these fixtures so they become as new LED fixtures. We also design them for disassembly, so we can recirculate them in the future.

Contact: Lars Elmvang | l@fischer-lighting.com | www.fischer-lighting.com

☞ DAW Nordic AB

DAW Nordic belongs to the German group DAW. Since 1895 DAW has developed, produced and sold innovative coating systems. As an independent family company in its fifth generation, we have continued to grow to become the third largest manufacturer of building paints in Europe and for decades we have been the market leader in Germany, Austria and Turkey.

Through their material properties, our sustainable products should enhance the health and well-being of people and provide environmental and climate protection. We have faced these challenges at an early stage and have become a forerunner for the whole industrial branch.

For living and working in a clean, healthy and sustainably designed environment we offer a wide range of emission-minimised and solvent-free paints, enamels, primers and other innovative coatings.

Two examples of products are Indeko Geo and Lasyr:

- In our interior wall paint Indeko Geo, fossil resources such as crude oil and natural gas are replaced by renewable resources without making any concessions in terms of quality.
- In our exterior lasur, Lasyr, the fossil oil has been replaced by oil made from camelina.

Contact: Sara Axelsson, | sara.axelsson@dawnordic.se | www.caparol.se | www.caparolfarg.se | www.daw.de/en/

☞ Læsø Zostera

Læsø Zostera develop and distribute insulation made out of seagrass. The company is run by Gunnar and Kirsten. Kirsten comes from the island of Læsø, where the passion for seagrass comes from - the island is known for their historical seagrass roofs that lasts for up to 300 years.

Seagrass is an extremely durable bio material, which we found so fascinating that we had to explore its potentials to become a modern building material. We provide seagrass insulation in batts and as loose blow-in insulation. The insulation batts have obtained a Cradle to Cradle certification on a GOLD-level as the first insulation material in the world.

The seagrass is collected along the coast by local farmers when the leaves have fallen off the plant. By collecting the seagrass we remove nutrients from the sea and store CO₂. Scientists have found that seagrass stores CO₂ eight times better than wood.



Seagrass contains minerals that serves as fire retardant, which means that we do not need to add any chemicals in the production.

Contact: Kirsten Lynge | kirsten@zostera.dk | www.zostera.dk

ØkoTømmer.dk

ØkoTømmer is a company with an ambition of delivering modern, untraditional solutions for sustainable building. We believe that low technological solutions can contain high technological quality, contributing to a more sustainable world.

Burnt wood is a sustainable alternative to pressure-impregnated wood. It is a way of impregnate which has been used all the way back to the Vikings and refined within the Japanese building culture.

When the top surface of the wood is charred, the sugars in the wood are burnt at the same time. This way the harmful microorganisms haven't anything to live by. The wood itself protects the surface and makes it very weatherproof and beautiful to look at.

We produce customized facade elements from recycled wood.

Contact: Anders Mølgaard | kontakt@burntwood.dk | www.BurntWood.dk

CS Riv & Håltagning AB

CS Riv & Håltagning AB is Sweden's first demolition company to take on the challenge to become fossil fuel free til 2030. Our machine fleet is 1/3 electric and over half of it is environmentally adjusted (e.g. bio hydraulic oils, manufacture year less than 5 years, EURO 6 engines etc.).

Smaller machines have HVO fuel (fossil free) and bigger machines, where HVO is not a considerable option, have had at least two environmental adjustments. The most common ones are environmental diesel (class 1) and a bio function on the engine that reduces the emissions 10-20% depending on the machine type.

We are right now accepted to demolish at the highest environmental ranking sites in Sweden, called Västlänken. Which we are very proud of!

We are also one of the first demolition company's to have a reuse-facility, Brattöns Återbruk. So everything that is whole and clean from our demolitions, we can sell at our store in Ringön, Göteborg

Contact: Amanda Borneke | amanda@csriv.se | www.csriv.se



Nature Impact A/S

Nature Impact produces modular solutions for green roofs. We focus on delivering products that can help handle challenges that has arisen due to climate change while creating habitats for our endangered insects. Through our production technology we can create unique customer-specific products that meet the special wishes of the customer, since we manufacture ourselves at our nursery in Poland. We use strategic collaborations with gardeners and roofers through local distributors in Denmark, Sweden, Poland, Germany, Belgium and France.

The Nature Impact® Roof is a system solution for sedum roofs that provides drain, growth medium and plants in a single system.

Our unique system solution prevents stagnant water from collecting on the roof – we prioritize rapid discharge of excess water to the sewage system.

Benefits of the Green Roof:

- By installing a green roof over a waterproof membrane, you extend the roof life significantly.
- A green roof can restrain or capture approximately half of the annual rainfall, thereby reducing the cost of cleaning and handling the drain from the roof. Instead, the plants use the water to grow with and thereby produce oxygen, which creates a better climate
- A green roof insulates the building, thereby containing the heat in winter and keeping the building cold in summer.
- The aesthetics of a Green Roof has a positive impact on health since it acts as a stress reliever, contributes to faster healing and thereby reducing the drug consumption of sick individuals.
- The plants, on a green roof, bind dust particles from the air and thus help to reduce the number of harmful particles that end up in our lungs.
- As the plants on a green roof grow, they bind CO₂ and thus reduce the amount of CO₂ in our atmosphere.

Contact: Jesper Staal | jst@natureimpact.com | www.natureimpact.com

Juteborg Sweden AB

Juteborg Sweden AB is an innovative, entrepreneurial and development company focusing on Jute Fibre, mostly hightech-based products, and innovative design and services with focus of combining the industries of:

- Automotive & Transportation
- Construction & interior
- Textile & Fashion
- Packaging

2019 Juteborg starts volume production of JutePP, a jutefiber reinforced granule for mould injection in Bangladesh. 2020 we will start production of JuteFlex, a prefab non woven felt of jute and polymer and undirected laminate of Jute and another polymer for strong and lightweight applications. Juteborg is also in the research of the most sustainable particle board in the world - JutePart, probably 30% lighter than the wooden.



100% jutefibers is applicable for insulation of buildings as well as automotive and e.g. refrigerators. Juteborg has also made samples that are applicable for furnitures, floors, and interiors. Juteborg has exchanged glassfiber into jutefiber in an electric three-wheeler vehicle JuteBee, together with Clean Motion.

Juteborg act also as companies development partner in order to identify where jute would be of best use in their portfolio.

Contact: Christina Östergren | christina.ostergren@juteborg.se | www.juteborg.se

Plockhugget AB

Plockhugget AB provides many services, ranging from Close to nature silviculture management to brokerage of lumber and sawn products from continuous, ecological forestry sites.

Predominantly, the ecological forest management model that Plockhugget apply on all its business eliminates that the forest is exploited to such a degree that it ceases to function as the diverse ecosystem it must be to provide all the necessary biological niches its inhabitants require.

Also, by maintaining a reasonably closed canopy and a high standing volume, the forest can sustainably continue to be a carbon sink, extracting CO₂ from the atmosphere.

Furthermore, the Plockhugget business model relies upon (and therefore encourage) local businesses to handle and refine the timber, so as to minimize transport and related emissions. Hence the Plockhugget business model function as a catalyst for a local, circular economy.

Contact: Erik Kullgren | plockhugget@gmail.com | www.plockhugget.se

Hampaprodukter Sverige Ekonomisk förening

Hampaprodukter i Grästorps can provide hemp fiber for isolation of roofs, floors and walls. We also offer hempcrete, which is made up of the core from the hemp plant, mixed with lime and water.

Hempcrete can be used for construction and isolation of walls. Hemp has many advantages, both for the environment and as building technology. For example, it regulates the level of humidity and heat in the indoor environment, providing a very pleasant living experience. Hemp is in many ways a sustainable product for construction work. It is grown without use of pesticides, and no chemicals are needed in the processing of it. Hemp is also a very efficient carbon sink. Hemp insulation lacks dangerous fibres that irritates the skin or get stuck in the respiratory system when building or living in the house; a big improvement compared to mineral wool for example. Mineral wool also requires a lot more energy to produce.

Contact: Roger Olofsson | hamparoger@gmail.com | johan@hallenisse.se | hampaprodukter.se/wp/



Hemp in a Box

Hemp in a Box is a manufacturer of prefabricated timberframe walls, insulated with hempcrete or strawflakes.

The hempcrete we produce, is a by-product of the hempfibre industry. We use the rest of the stem called hempshives. We mix this with lime and use this as an insulation material that not only insulates but also regulates the climate inside, like temperature and moisture, without the use of electricity. The other benefit of the product is that it stocks CO₂ in the hemp and also in the lime as it is hydrated lime that uses CO₂ in the hardening process.

The strawflakes is also a product we provide with CO₂ use below zero because it is a byproduct of the harvest of wheat. We mill this straw and add a fire retardant on natural bases so it can be used in passive houses.

Contact: Mathieu Hendrickx | mathieu@hempinabox.be | www.hempinabox.be/

KALK

KALK is the world's first C2C certified supplier of lime products. We want to contribute to changing and developing the "throw away culture" that the current construction industry is undergoing. All our products have a Cradle to Cradle certificate.

Our product VITRUV Lime mortar MC 1,5 is designed for new constructions

Very pliable properties in use, as:

- Good elasticity
- Great tensile strengths
- High porosity gives a diffusion open masonry, a good indoor climate and a favourable effect on heat insulation
- Free of cement and other additives
- Suitable for recycling: both mortar and bricks

Our product REN Interior/REN exterior paint

- Is free of dangerous volatile organic compounds (VOCs) and formaldehyde emissions and ideal for anyone allergic to chemicals
- The paint contains no phthalates, no biocides/fungicides, no heavy metals and no microplastics

Contact: Kaare Holmström | kaare@kalk.se | www.kalk.se

Kebony Sverige AB

Kebony is a supplier of wood based solutions, treated with the Kebony technology, for a variety of applications including decking and cladding.

Developed in Norway, the Kebony technology is a patented, environmentally friendly process, which enhances the properties of sustainable softwoods with a bio-based liquid. As a result the wood's cell structure is permanently modified to adopt premium characteristic.



Keconomy is beautiful wood recommended by leading architects. It is sustainable, durable and requires no maintenance beyond normal cleaning.

Contact: David Thorp | dt@keconomy.com | www.keconomy.com

Hunton Fiber AB

Hunton Fiber produce and sell environmentally-friendly and energy efficient building solutions based on wood and wood fiber.

With both the production and head office in Norway, we are proud to sell our Norwegian made products mainly for the Swedish, Norwegian, Finnish and Danish market.

Our goal is to influence builders to make the right choice to build sustainable, and in the most environmental way as possible - within heat energy and for sustainable construction.

Hunton Nativo® Wood Fiber Insulation:

With the brand new open factory in Skjerve, Norway, we will from 2019 produce Norwegian made Wood Fiber Insulation. Wood Fiber Insulation has a high heat storage capacity, binds CO₂ and is fire retardant.

Hunton Windproof™:

The market's leading wind barrier for external use on new buildings and renovations, protecting homes from moisture, drafts and cold.

Manufactured in Norway for tough Nordic climate, made out of wood chip that would otherwise go to waste.

Hunton Silencio sound absorption board:

Hunton Silencio is a wood fiber product for parquet / laminate underlays, that is excellent insulation against footfall and room sound.

Hunton LVL and Light beam:

Wooden beams for a simple construction and thicker walls that minimizes thermal bridging.

Contact: Joakim Elander | joakim.elander@hunton.se | www.hunton.se

Altered Company

Altered uses proprietary technologies to develop products that drastically reduces the use of water and energy without sacrificing user experience, functionality or design.

Water have a massive carbon footprint with energy used to pump, clean, transport and heat the water. Altered's first product on market was the Altered:Nozzle, reducing water and energy use with 98%. Our retro-fit products are installed in less than a minute and follow a global standard. Small simple solutions with huge global impact.

Currently we have retro-fit nozzles for multiple segments on the market that reduce the water and energy use with 98% without losing functionality. We are now extending our technology



to extreme water and energy saving showers that reduce the water and energy use with 85%. We are also developing a point of use filter solution in order to give clean water to everyone.

As a way to speed up development and increase market development we have partnerships with IKEA, Unilever, Stanford University, Nordic Choice Hotels and others.

Contact: Urban Dalhov | urban@alteredcompany.com | www.alteredcompany.com

Climate Recovery

Climate Recovery is a sustainable ventilation company from Kalmar.

Climate Recovery has developed a unique sustainable ventilation solution made out of recycled glass material for both ventilation and insulation. This 2-in-1 solution has many advantages over traditional insulated circular Spiro duct.

Some of the advantages:

- Pre-insulated (The insulation contract disappears)
 - Sound attenuation (approx. 6dBA / meter)
 - Semi flexible which makes it easier to install
 - Can handle larger airflows
 - Can withstand lower installation height
 - Less than half the weight (Better working conditions)
 - Transported in flat packages reducing transport emissions
- About 80% lower CO2 emissions compared to the traditional insulated sheet duct

Contact: Jarl Bengtson | jarl.bengtson@climaterecovery.com | www.climaterecovery.com

Tarkett

Tarkett has been manufacturing floors in Sweden since 1886 and today markets floor and wall materials for both home and design and functional solutions for public environmental purposes. Tarkett is one of the largest floor manufacturers in the world. The product portfolio includes wood, plastic, laminate, linoleum and textile floors.

Tarkett works long-term with sustainability according to the Doing Good Together. Since 2011, the company applies the principles of Cradle to Cradle® to create floor solutions that have a positive impact on people's indoor environment and on our planet.

Examples of sustainable floor solutions are:

- Textile floor tiles with yarn made from 100% recycled polyamid and backing with fillers from recovered chalk from Dutch waterplants.
- LVT tile based on recycled PVB (from ELV-windshields) and PLA (corn starch based biodynamic polymer).
- A collection program for installation waste from vinyl floors (375 tons 2018 in the Nordics) has been initiated along with a revolutionary Swedish invention to clean old vinyl floors from adhesive and concrete.



- Vinyl floors with bio-based alternatives to fossil-based plasticisers.
- Parquet with wear layer made from recycled oak.

Contact: Dag Duberg | dag.duberg@tarkett.com | www.tarkett.com

Ekolution

Ekolution delivers sustainable building materials with a focus on reduced CO2 emissions. We are today focused on delivering insulation and sound boards for all parts of the construction.

All of Ekolution's products are hemp based. We are using one of the most effective natural fiber to create insulation materials. We are focused on two main products, and a third acoustic product. The two main products are Hemp/lime insulation that come as a pre-fabricated wall construction and a Hemp fiber insulation that comes as normal insulation boards.

The acoustic board is under development and will be ready for the market during Q2 2019. This fiber insulation is to replace normal acoustic sealing.

Contact: Henrik Jacobsson | henrik@ekolution.se | www.ekolution.se

Repur AB

Repur AB produces building products made from insulation from recycled refrigerators.

One of the Products is Repur Markskiva, a board for ground insulation made from 99% recycled PUR material with an approximate 80% saving in climate footprint compared to similar products made from virgin material, and there is a recycling guarantee for the products after demolition of a building, further prolonging the life of the materials.

The other product is Repur Cement, a light weight concrete that apart from cement contains recycled PUR which also gives savings in climate footprint.

By delivering by rail, when possible, carbon footprint can be reduced additionally.

Contact: Mats Tarring | mats@repur.se | www.repur.se

House of Hemp AB

House of Hemp is the distributor for the certified Tradical® Lime Binder and Building Grade Hemp Hurd (shiv) from Chanvribat® for Sweden. Tradical® Hempcrete is the only fully certified hempcrete product in Sweden, as far as we know.

Tradical® Hempcrete is a unique, highly sustainable construction product for the creation of insulating walls as well as insulation layers for roofs and floors. Hempcrete is a blend of specially prepared hemp shiv and a special lime-based binder. Together these products form a bio-composite building material that can be used both for the creation of buildings that have excellent thermal and acoustic properties as well as creating a healthy living and working environment.



Additionally, Hempcrete has the ability to make an impact on the future of sustainable building. Helping to reverse the damaging effects of greenhouse gases, Tradical® Hempcrete locks up approximately 110kg of CO₂ per m² of the wall and provides one of the best value materials for low impact, sustainable and commercially viable construction.

Produced mainly from renewable sources, Tradical® Hempcrete is mixed on site for fast track construction and delivers high levels of insulation, air-tightness, and vapor permeability.

Contact: Peter Holmdahl | peter.holmdahl@houseofhemp.se | www.houseofhemp.se

Kenotek

Kenotek makes construction bricks from demolition waste, offering a truly circular economy process within the sector.

Kenotek will work with the construction industry and waste handlers to deliver innovative, sustainable building materials, such as the first product, the K-Briq - made from waste. We will require start-up capital upon launch in order to fully develop manufacturing capacity and deliver the K-Briq to market.

Contact: Samuel Chapman | s.chapman@kenotek.com | www.kenotek.com

Forbo

Forbo is an International flooring producer that started to produce floors in Sweden in 1896, today a Swiss based company. The world's largest producer of Linoleum flooring but with a wide portfolio to be able to cover most of our customers needs.

We have worked with LCA since 1990's as a way to measure and control our emissions and environmental impact. We started with 3rd party controlled EPD's 2011 and we are now on our 2nd generation EPD with a target to have all our own produced products environmental impact verified with EPD. We have worked hard with our Marmoleum product (linoleum) to reduce its impact by changing raw material to less harmful ingredients for the environment and changing the energy and other external sources in production so now we can say that we have a carbon neutral floor from Cradle to Gate (A1-A3).

Further on we work with our supplier to reduce the impact from transport, installation and maintenance processes. The material is produced by mainly natural resources linseed oil, resin, wood flour, limestone, jute. On top we have a thin layer of lacquer which is the only fossil-based material in the product (less than 1%). This is only to reduce other impact as maintenance (less energy and chemicals used), to get the floor more water resistance and prolong the long lifetime of the floor. Linoleum is not a new product but our Marmoleum is continuously improved, since it is carbon neutral in its production it has potential to meet future demands in construction industry like circularity and fossil free products.

Contact: Jonas Rothén | jonas.rothen@forbo.com | www.forbo-flooring.se



Green Furniture Concept

Green Furniture Concept makes sustainable architectural furniture for public interiors. Shaping places that last, a lasting sustainable message to visitors.

We have a circular business model, with 15 year warranty and a buyback system within that period. Timeless design and natural materials that age with dignity.

Flexibly winding, seamless benches and soft acoustic lamps from Green Furniture can be found in places like Stockholm Central Station, Nice Airport and Topanga Mall (LA), but also in Schools and healthcare waiting areas all over Sweden

‘Seamless’ means room for more people when needed. Benches from Green Furniture seat 30-50% more people than conventional public seating on a given surface.

‘Flexibly Winding’ means benches that can take any creative formation, follow the building and lead the flow of people.

‘Sustainable’ means a story of Lowtox, natural and cycled materials – visible and functional CSR.

Contact: Johan Berhin | jb@greenfc.com | www.greenfc.com

Nock Massiva Trähus

Nock Massiva Trähus build prefabricated sustainable apartments (to apartment buildings) in massive wood (CLT) out of our own factory in Älvängen, 30 km outside of Gothenburg.

Nock Massiva Trähus build in sustainable material (CLT/massive wood) with as small carbon footprint as possible. Since we prefabricate in our factory we minimize transports to, and disturbance at, building sites. Also, the material we use, massive wood, actually binds carbon in the building.

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Partners





*Vision of the future dock area in central Gothenburg.
Produced by Tomorrow.*

Northern Connections is a partnership of 21 clusters, cities, regions and knowledge institutions, and where we work together to create innovation connections between our enterprises and clusters in the energy sector. The aim is to increase the innovation potential across borders. In the project we look into how we involve enterprises from different countries in our living labs - and we develop tools for our clusters so they can provide the right support for the enterprises.

Organizers:



INNOVATUM



Financiers:

