

Circular

The innovation agenda of East Netherlands











East Netherlands is committed to a circular economy with value retention of what has already been made for as long as possible and as little waste as possible

Our motivation

Modern materials, such as plastics, textiles, composites and rubbers, have become part of our society. Looking at this physical flow of materials, our current economy is largely a linear one. We extract more and more raw materials, manufacture and use products, and discard them as waste. This consumer society has a number of drawbacks.

Primary raw material extraction and the dumping or incineration of waste cause emissions into the air, soil and water. This has a negative impact on the climate, biodiversity and health. In addition, a linear economy makes us dependent on scarce raw materials from less stable or reliable countries, which entails strategic risks. Finally, we miss out on economic value because we do not (sufflciently) use valuable materials or product components or because we do not use products and materials efflciently.

More and more companies are looking for ways to combine sustainability and profitability. By focusing on a more circular economy, fewer primary raw materials are needed and we create less waste. This contributes to a better environment, less dependency on scarce raw materials and to new earning models and economic opportunities. The East Netherlands is therefore committed to a circular economy with the longest possible value retention for what has already been produced, and the smallest possible amount of waste.

We do this by redesigning and reusing products, components and raw materials and drastically

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East Netherlands Innovation Agenda

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reducing the use of natural resources. Innovative solutions are needed to curb the depletion of earth's natural resources. Investing in innovation, maintenance and new earning models is crucial for a sustainable recovery of our economy and for moving towards an economy in which all the smart and cleanly produced goods remain in use for as long as possible.

This Strategic Innovation Investment Agenda (SIIA) shows what the East Netherlands has to offer. The SIIA was created in close cooperation between the provinces of Gelderland and Overijssel, the development company Oost NL and the regional economic network, Th!nkEast Netherlands and the Economic Boards.

We want to invest particularly in a sustainable circular economy and we are looking for partners to do so. In this document, we show where our focuses lie. Then, together with you, we would like to discuss which programmes contribute most to economic growth and a sustainable future.

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The strength of East Netherlands

The strength of East Netherlands in the circular transition lies explicitly in 'doing'. We have a strong and versatile business community that works closely with internationally knowledge institutions in the region. This results in innovation. It also means that our manufacturing industry is already looking forward and growing towards an economy based on circularity in raw materials and end products. These matters require a long-term approach and patience.

The East Netherlands is a place where companies, knowledge institutes and students develop and experiment together in abundance. Because of the short lines between the triple helix partners, the lead time from lab scale to pilot production or user test is short in our region. For many companies, especially SMEs and start-ups, this is a prerequisite for innovation. That is the strength of East Netherlands.

The Netherlands has positioned itself as a global

leader in issues relating to the circular economy, such as at the COP meeting, within the G20 and the World Circular Economy Forum. The Netherlands is also actively involved in the development of international standards for monitoring and measuring the circular economy and, together with France, is the driving force behind the European Plastic Pact.

international standards for monitoring and measuring the circular economy and, together with France, is the driving force behind the European Plastic Pact.

However, a negative trend regarding the circular economy is taking place worldwide. Reasons include the high rate of primary raw material use, which does not go hand in hand with an increase in reuse. More new raw materials are used for production processes than are reused. Furthermore, there is a lack of endof-life processing and recycling, products are not yet designed in a sufficiently circular way and more and more materials are used to keep up with urbanisation - with all its infrastructural consequences.

In the East Netherlands, we are making a significant contribution to the Dutch circular transition ambition. We are directly involved in the national circular transition agendas for a number of raw material flows. For plastics, textiles and infrastructure, we are even an agenda-setter and driver, and we think directly about the required national policy. Within the manufacturing agenda, companies from

SDG's

The circular transition is in itself a social challenge that is in line with the mission-driven innovation policy and (in)directly links up with the Sustainable Development Goals (SDGs). The developments in this investment agenda mainly have a positive effect on clean water and sanitation (6), fair economic growth (8), industry, innovation and infrastructure (9), sustainable cities (11), responsible consumption and production (12), climate (13) and partnership to achieve the goals (17).



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National and European objectives

East Netherlands are directly represented with concrete projects and pilots for the combination of smart industry applications with responsible use of materials.

In 2018, the Dutch national and regional governments signed the National Raw Materials Agreement, which sets the ambition of being fully circular by 2050. To achieve this, we are working together on innovations throughout the chain. This has implications for all sectors.

With the Clean & Circular investment agenda, we are contributing to the energy and climate transition via the track of reuse and waste reduction. This is one of the four themes in the national missionoriented innovation policy. Within this investment agenda, we also give substance to the objectives for CO₂ reduction as included in the sustainability programmes on a provincial, national and global scale.

In the East Netherlands, we are making a significant contribution to the Dutch circular transition ambition

Our focal points

In the circular transition, the manufacturing industry, plastics, textiles, construction & infra and agrofood in this region offer an excellent opportunity to create social impact and value. For example, by using virgin (less newly produced) raw materials.

Strong manufacturing

Smart, circular strategies and measures in the manufacturing industry in the East Netherlands lead to significant savings in raw materials, but also to additional added value of €666 million per year (6% extra) and a reduction in CO2 emissions of 483 thousand tonnes per year (10% less). The manufacturing industry in East Netherlands has the potential to create this smart, circular added value. In figures, that could be €490 million per year, which is 74% of the potential in the total manufacturing industry.

Continued focus on Circular Plastics manufacturing

East Netherlands plays an important role in closing the (national) plastics and textile cycles. This is due to its extensive rubber, textile and plastic processing industry and its cooperating knowledge institutions. Four thousand people are employed in this sector in East Netherlands, producing around 13% of the national total of plastics. Annually, this is about 265 kilotons.

The East Netherlands is a major national and international exporter of high-quality semi-finished products. In the past decades, the plastics processing industry has proven to be an important innovator. It is unique that every link of a circular plastic chain is present in the region: from collectors and recyclers, to converters and end producers.

Technical, social and economic innovations are still needed to reduce the use of raw materials faster and with more impact. This requires public-private partnerships to look for opportunities to implement these innovations in their own value chain and crosssectorally.

Development of circular textiles

Textiles and East Netherlands are inextricably linked. Although much production moved away with the rise of cotton, the knowledge has remained at knowledge institutions such as Saxion, Artez, the University of Twente and Wageningen University & Research (WUR). Important textile manufacturers such as Ten Cate, Interface and Auping are still active in the region. Precisely because textiles have a large footprint, this offers opportunities for East Netherlands in the transition to circular textiles.

The knowledge and capacity in the field of mechanical and chemical recycling is present in East Netherlands and is developing rapidly. In addition, East Netherlands has the knowledge for the development of new, less environmentally damaging raw materials - and the know-how to apply this in the design of new textile products.

Making construction & infra circular

East Netherlands has an excellent position in the construction industry. The University of Twente, Saxion and various leading construction companies are proving this in Pioneering, in which over 200 construction companies are linking innovation in building processes and products to new forms of circular housing. The construction sector is perhaps the largest producer of waste and residual materials. In addition, construction is an important link in our economy. Without construction, there would be no infrastructure, homes or buildings.

The construction industry is facing a number of major challenges. There is a shortage of suitable housing, there is a surplus of nitrogen emissions, all buildings in the Netherlands must be off gas and all existing homes must be made sustainable. The circular transition comes on top of this, but at the same time offers an opportunity to accelerate these challenges. Digitalisation and robotisation are indispensable in this process.

Strong Agro-Food sector

The agro-food sector is represented strongly in East Netherlands. So strong that this sector has its own strategic innovation investment agenda. This also includes the circular plans for the agro-food sector. We refer to the Strategic Innovation Investment Agenda Smart & Sustainable Food Production.

Circulair in the picture

Eastern Netherlands offers many good circular leaders and inspiring examples.

Below we show a few companies, field labs, knowledge and educational institutions that are strongly committed to circularity. A selection has been made of appealing organizations. This one is far from exhaustive.

Manufacturing

1. Remeha (Apeldoorn)

- 2. Van Raam (Varsseveld)
- 3. Kaak (Terborg)
- 4. Hygear (Arnhem)
- 5. Nijhuis (Doetinchem)
- 6. Aebi Schmidt (Holten)
- 8. Van de Brink Staalbouw (Nijverdal)
- 9. Despray (Almelo)
- 10. Cloudgarden (Zwolle)

Plastics

- 1. Van Werven (Oldebroek)
- 2. Wellman Recycling (Spijk)
- 3. Filigrade (Twello)
- 4. Morssinkhof (Lichtenvoorde)
- 5. Ubbink (Doesburg)
- 6. RPP Kunststoffen (Nieuwleusen)
- 7. Berdal (Almelo)
- 8. Wavin (Hardenberg)
- 9. Veolio Polymers (Vroomshoop)
- 10. Dijkstra Plastics (Haaksbergen)
- 10. Coulisse (Enter)

Circular The innovation agenda of East Netherlands

1. Universiteit Twente (Enschede)

- 2. Saxion Hogeschool (Enschede)
- 3. Windesheim Hogeschool (Zwolle)
- 4. Wageningen Universiteit (Wageningen)
- 5. Radboud Universiteit (Nijmegen)

Textiles

3. DAR (Nijmegen)

6. Auping (Deventer)

8. Saxcell (Losser)

- 7. Alkondor (Hengelo)



Knowledge & Education

- 6. Hogeschool Arnhem Nijmegen (Nijmegen)

Construction

- 1. Leadax (Wapenveld)
- 2. Lagemaat (Heerde)
- 3. Bosch Beton (Barneveld)
- 4. De Hamer (Nijmegen)
- 5. Save Plastics (Arnhem)
- 6. De Groot Vroomshoop (Vroomshoop)
- 7. WEBO (Rijssen)
- 8. ReintenInfra (Oldenzaal)
- 9. Profextru (Hardenberg)
- 10. Schagen Infra (Hasselt)

1. Interface (Scherpenzeel) 2. Circulus Berkel (Apeldoorn)

4. Gispen (Culemborg) 5. NXT Cotton Solutions (Wageningen)

7. Frankenhuis (Haaksbergen)

9. Enschede Textielstad (Enschede)

How is our region contributing to the circular transition?

With our spearheads for a circular economy, East Netherlands proves to have a strong offering to tackle the social challenges in the field of sustainability and to develop new, circular concepts for industrial production. How we do this is explained below for plastics and construction.

Plastic

There are many circular plastics initiatives in East Netherlands, including:

- The Dutch Circular Polymer Valley originated in the Zwolle region from a collaboration between parties such as DSM, Wavin, Windesheim University of Applied Sciences, MBO Deltion College, the University of Twente and the Polymer Science Park. The partnership unlocks and develops knowledge about circular plastics, thermosets and elastomers for the wider industry. Regional authorities use their purchasing power and act as launching customers for the application of circular plastic
 products in the public space;
- Dijkstra Plastics, Van Wijhe verf and Veolia Polymers together developed a paint bucket of 100% post- consumer plastic. Through the national CE accelerator house, they are looking at how this bucket can be the standard for all paint brands; and
- Filigrade has developed a 'watermark' that makes it easy to sort food-grade plastic packaging from waste streams. This makes it possible to recycle them into new food-grade products.

Textile

The East Netherlands forms a National Dutch Circular Textiles Valley. This region has two public-private partnerships in the field of circular textiles, namely:

- Gelderland Innovators for Sustainable Textiles (GIST) in the Arnhem-Nijmegen region: GIST stimulates designers, scientists, entrepreneurs and governments to make circular textiles. In research and innovation projects, they develop new biobased materials and new value chains. Together they pave the way to a circular and sustainable society;
- TexPlus Foundation in Twente: a collaboration between six frontrunners in Overijssel, in which the entire chain of circular textiles is represented: from collection to processing and the manufacturing of end products. The objective of the TexPlus Foundation is to connect the chain from collection to reuse by stimulating the reuse of textile products and to recycle non-reusable textile products to the highest possible quality with innovative techniques. The market is actively involved in the development and application of recycled textile materials.

Saxcell

This start-up and spin-off of Saxion University of Applied Sciences processes old used cotton into high-quality new fibres suitable for new textiles with by using chemical recycling.

Auping

Auping creates the first fully recyclable mattress in the Netherlands, which can also be leased. All of the mattress' materials are reused again and again for a new mattress. In this way, the Deventer-based bed and mattress manufacturer closes the loop and contributes to a world where nothing is wasted.

Interface

The carpet manufacturer uses waste, such as old fishing nets and car window film, as raw materials. Fishermen in the Philippines collect discarded fishing nets, which serve as raw materials for carpet tiles. The project reduces ocean pollution and improves the living conditions of the local community.

Construction

Pioneering Foundation

The Pioneering Foundation is the platform for innovators in construction. Sharing and developing knowledge for parties in Overijssel and Gelderse is central. In this way, new methods lead to a strong market position for the East Netherlands construction sector. With over 240 participants, the Pioneering Foundation contributes to social issues by implementing various innovation programmes and activities, including circular construction.

Circular Construction

From Nijmegen, the Knowledge Centre Circular Construction acts as an extra booster for bio-based circular construction in the region. In addition, many municipalities are affiliated with Cirkelstad. Cirkelstad is the platform for frontrunners in the circular and inclusive construction sector.

Indu-zero

The Indu-Zero project is a European (Interreg) project aimed at the industrialisation of the preservation of existing dwellings.

CoP circular living labs

In 2019 and 2020, a total of 26 circular living labs started in the East of the Netherlands. These communities of practice (CoPs) aim to learn from each other and to connect and solve questions.

Fieldlab Circular

In the cross-border Fieldlab Circulair, pilot projects on circular construction and design have been started. Experiments with measuring methods for circularity are being carried out, and a number of material passports are being set up with open data, for everyone to use.



Circular entrepreneurship

Three business parks in Achterhoek are taking steps towards the new circular future-proof economy. It is not only sustainable, but also more efficient and offers new earning and business models. The project stems from the Cooperating Industrial Circles Achterhoek (SIKA) and the University of Applied Sciences Arnhem and Nijmegen (HAN).

De Woonplaats

Housing corporation De Woonplaats manages seven sustainable and fully circular houses in Stroink in Enschede. These have not only been made sustainable, but also circular.

Residential deal Arnhem Nijmegen

Until 2025, 20,000 homes will be built in the region, 25% of which will be circular.

CIRCLES

CIRCLES is the digital and physical meeting place for everyone in East Netherlands who wants to contribute to the transition to a circular economy. A variety of organisations from East Netherlands are affiliated with the CIRCLES network. Partners include governments, knowledge institutions, trade associations, entrepreneurial organisations, and nature and environmental organisations. Together, we have an enormous amount of knowledge and experience, which we make available to third parties to accelerate the circular transition.



East Netherlands Innovation Agenda

The East Netherlands has a strong and versatile business community that works closely with internationally recognised knowledge institutions in the region. This has led to a highly innovative manufacturing industry, a progressive international plastics export sector, a nationally recognised construction sector and the foundation for a circular textile sector. To accelerate the transition from waste to recycling and work towards a circular economy, we have drawn up a strategic innovation agenda. This agenda shows how we in the East Netherlands are working towards an economy without waste. We focus on the themes: transition of the smart (manufacturing) industry, circular polymers, circular textiles and construction & infrastructure.

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Transition smart (manufacturing) industry

The transition of the manufacturing industry affects a number of aspects. We see that many companies are still insuffciently aware of the necessity of the circular transition. This may be awareness of the use of conflict materials (slavery), (political) scarcity of raw materials, CO2 pricing or taxing. Companies also seek insight into the opportunities that circular business offers them. Furthermore, companies themselves and in cooperation with their chain partners need help in the transition. This applies both to the application of other business models and to other production processes. Finally, the buildings in which production takes place offer circular opportunities.

This requires large investments, with many uncertainties. For example, what is the right moment to invest in a new technology? The availability of extra funds for these investments helps companies to take action more quickly. Below are some examples of ideas for projects and programmes that can help move towards a circular society.

Circular Economy and Smart Industry (CESI)

With smart industry towards a circular economy (CESI). The aim is to accelerate the circular manufacturing industry through digitalisation. We do this by flnding frontrunners, cooperating in the chain, setting up a knowledge network and supervising chain cooperation. The annual potential of added value of the circular manufacturing industry in the high-tech equipment cluster has been calculated at € 1.8 billion per year (6% extra).

The annual potential for CO2 reduction is 98 thousand tonnes (9% less). About 60% of the manufacturing industry in the Netherlands is located in Gelderland, Overijssel, Noord-Brabant and Zuid-Holland. The circular economy in the high-tech equipment sector could therefore generate €1 billion of annual added value in these four provinces alone.^[1]



[1] Source of flgures in this memorandum: Rietveld, E., Takoya, J., Hauck, M., (2020) Vingerafdruk methode voor bepalen circulaire potentie. Database MS Excel.

By guiding these companies in the transition through a special hub in the East Netherlands, we realise this potential. This will be further developed in fleld labs, such as the fleld lab Circular Innovations in the Manufacturing Industry, where companies can pose questions about circularity to students and researchers.

Clean circular factories

Manufacturing companies that want to make their production processes clean and circular often feel held back by the lock-in of the linear economy and use raw materials and products only once. They now earn money from an inexhaustible source of raw materials to use. Circular initiatives often detract from this.

By supporting transitions in business processes, we accelerate companies towards a clean circular economy. We invest in ten to twenty additional factories. This concerns both the process and the buildings in which the processes take place.

Concrete projects are planned for all these aspects the transition programme for manufacturing industry, Transition Hub High-Tech Equipment and clean smart factories. These add up to an initial investment requirement of several tens of millions.

Circular polymers

Although we are recycling plastics more and more, large-scale application of recycled plastics still requires a greater effort.

Recycling plastics

In East Netherlands, we are committed to using more plastic recyclate in products and developing demanddriven standards for recyclate (standard grades) that are comparable to the current grades in virgin plastics. The standardisation of recyclate simplifles the application of recyclate in product development. Much knowledge development is still needed for the high-quality application of plastic recyclate in products and various production processes. Besides research, also equipment is needed, such as:

- large-scale hot wax facilities for polypropylene and polyethylene recyclate;
- production machines to produce recyclate virgin laminates for food grade packaging and watermarking installations for food grade plastics. Plastics are then safe to use as food packaging;
- · development of marker technology for accurate sorting of, for example, food grade packaging;
- knowledge development of fllm to fllm recycling.

Where mechanical recycling is not possible, chemical or physical recycling of plastics is needed. We build on existing developments and projects, such as the upscaling of pyrolysis facilities and the realisation of large- scale demo plants for the chemical recycling of extended polystyrene and polyester.



Recycling Thermoset plastics: composites and elastomers

Composites

Composites are lightweight and very strong, and therefore crucial for the energy transition in the form of wind turbine blades, among other things.

Windesheim University of Applied Sciences is an international leader in the recycling of thermoset composite materials.

Besides flne-tuning production techniques, we also want to realise these production techniques with and at companies in order to scale them up. The next steps are:

- research into upscaling production techniques;
- testing the longevity of products; and
- · realisation of large-scale production capacity of recycled composite products.

Rubbers

Rubbers are crucial to the economy, as is the application of (car) tyres. Rubber recycling is technologically less developed than composite recycling. A major challenge is the so-called devulcanisation. Devulcanisation is the breaking of the bonds (sulphur bonds) between the elastomers of rubber, as they were formed through vulcanisation.

Composite is very strong and yet very light rubber. These good properties of composite and rubbers make recycling a challenge. Research is being conducted within East Netherlands into how these materials can be recycled. We would like to continue this research. Where possible, we scale up through pilots and develop this further into new production facilities, including:

- · applied research into rubber recycling;
- · developing demonstration plants;
- · realisation of large-scale production and recycling facilities.

Together, these development projects and implementation projects of thermosets add up to an investment requirement of several tens of millions.



Biobased raw materials

With WUR, the East Netherlands has a top position in the fleld of biobased materials as raw materials for plastics. This involves the development of bio-reflning technologies for the sustainable use and high-quality application of ingredients from biomass. The WUR focuses on the development of renewable materials such as bioplastics, thermosets and agro-flbre-based products and materials.

In East Netherlands, we are building a large-scale programme to facilitate collaboration between knowledge institutes, educational institutes and companies for innovations in the bio-components sector. The required investment is several millions. This will be used for research into demonstration facilities for (production) processes and large-scale production facilities.

Good examples of biobased raw materials are:

- the bicycle tyre made of rubber from dandelion juice, by WUR and Apollo Vredesteijn;
- the reusable drinking bottle from BEO bottle made of plastic from sugar cane;
- · OV Designs: plastic material made from coffee residue:
- · clothing made of bamboo;
- paper from roadside grass, tomato and pepper stalks.



Legend project scope



1-10m



10-25m



20-100m



	>1

Circulair textiles

The most important links of the circular textile chain are present in the East Netherlands: from design (design for recycling, design with recycled content), via application and development of new (bio-based) flbres, to sorting of discarded textiles, mechanical processing to mechanical, and chemical recycling for new flbres and products.

Although major steps have already been taken, large investments, far exceeding 100 million, are still necessary to achieve serious system changes. This is made up of the following components or projects:

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- a region-wide collection system for the processing of different types of textiles;
- an application of sensors to properly sort content/composition. The need to know the content of textiles, materials and flnishes is growing as chemical recycling increases. The aim is to research various sensor techniques and to apply them in sorting facilities;
- the organisation of data management and monitoring throughout the chain. Where does textile come from? Where does it go? What percentages of recycled flbres are applied? These questions are important to prove that recycled textiles have been used. We then adapt production machines (such as knitting, weaving, spinning) to make digitisation and data management possible;
- the arrival of large(r) scale facilities for mechanical and especially chemical recycling of textiles. Think of the polyester recycling and upscaling of the Saxcel company;

• the application of more bio-based flbres in modern textiles, in addition to textile recycling. The application of these fibres, such as flax and hemp, requires further research. We also want to stimulate the development of other circular textile design concepts.

Bouw en Infra

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Energy transition is currently the most urgent challenge in the construction industry. For example, all houses must be off gas and we must make many existing houses more sustainable. On top of that, there is the circular transition. The Overijssel and Gelderse policy documents on housing state how circularity is used to build more houses in order to eliminate shortages. In this way, we as governments are inviting the market to come up with innovative and scalable circular concepts.

As a major consumer of raw materials such as asphalt and cement, the civil engineering sector also faces a major circular challenge. In cooperation with Bouwcirculair, parties in the East Netherlands are also working to close the asphalt and concrete chains. As major clients, governments are taking their responsibility in the implementation of material passports and the development of new standards for the circular procurement of infrastructure projects.

They also regularly act as launching customers for circular products and technologies from companies in the region. In this way, we ensure the combination of innovation and scalability that is necessary for the transition.



Due to good experiences in existing projects, we see opportunities for various scaling-up projects, such as:

- realisation of the factory of the Indu-Zero concept;
- development and realisation of 5000 circular houses in the Arnhem-Nijmegen region (launching customer); scale up the pilot of seven Stroink circular homes to at least 700;
- setting up a fund for implementing circularity in scaling up the sustainability of existing homes;
- setting up a raw materials roundabout in the East Netherlands, linked to demolition and construction agendas;
- scaling up of the circular building fleld lab.

Sleuteltechnologieën

Digitalisation and AI are key technologies for the proper implementation and monitoring of materials and products in their life cycle. And for realising circular business models focused on service, refurbishment and repair. This is evident from the CESI study into the crossover of smart and circular, conducted by the provinces of Gelderland and Overijssel among 38 manufacturing companies.

In addition, sensors are increasingly important in a circular economy residual streams for timely maintenance and for identifying content and for sorting with increasing accuracy into mono-materials.



For example, the INTERREG project Di-Plast, in which Oost NL is a partner, is developing ICT tools to accelerate and facilitate the application of recyclate for the industry.

In all of the above investment projects, digitalisation, sensoring and AI play such a crucial role that they are integrated into the projects.

Photonics is a new emerging sector with many opportunities. From the East Netherlands we are working on a circular roadmap for photonics. Its realisation requires investments of tens of millions.



An economy without waste

The transition to a circular economy requires a different way of working and therefore different competencies. In East Netherlands, we are working towards an inclusive, agile knowledge and skills to take on these challenges.

East Netherlands is committed to a circular economy with value retention of what has already been made for as long as possible and as little waste as possible

Je rijdt nu op een weg van gerecycled plastic

















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Human Capital

Companies play an important role in driving and realising the circular economy. Larger companies in particular can achieve an enormous acceleration towards a fully circular economy if they convert their linear business activities and processes into circular ones.

The implementation of circularity is complex and has an impact on all business processes and the chain. In order to make the transition to a circular economy, the work processes within the entire business operations must change. Employees in various departments will have to be able to apply circular knowledge, tools, forms of cooperation and work processes. In short: the transition to a circular economy requires a different working method and therefore different skills and competences.

Projects and clusters that focus on circular economy in East Netherlands take place from Green PAC, the open innovation centre for (green) plastics, flbres and composites. Here, young talents are trained in everything related to circularity. Within Green PAC, applied research is also carried out, knowledge is developed and (accelerated) innovations are realised through a unique cooperation between universities of applied sciences, universities and companies in the plastics industry. The open innovation facility Polymer SciencePark develops projects with a focus on circular (plastics go circular) and smart (plastics get smart) plastics.

In East Netherlands, we are working towards an inclusive, agile and future-oriented labour market. The provincial goal is to have sufficient skilled professionals for the important transition assignments and a flexible labour market in the longer term. Examples are Overijssel-Gelders craftsmanship, attracting and retaining highly educated talent, and the Technology Pact. Regional focus is on job security through lifelong development, agility and resilience of the entire workforce. This is for all inhabitants of the region. Approaches include (customised) training through regional training funds, career advice and career guidance.

If you would like to contribute, please contact info@thinkeast.nl

The transition to a circular economy requires a different working method and therefore different skills and competences



8 RHK ambassadeurs	Regio Stedendriehoek Apeldoorn • Deventer • Zutphen	kennispoort regio zwolle	RCT Gelderland	Foodvalley Bupping the Fature of Food Together
Fruit Delta Rivierenland	GROENE METROPOOL REGIO NUMEGEN	van hall larenstein university of applied sciences	HealthValley NETHERLANDS	HAN_UNIVERSITY OF APPLIED SCIENCES
kiemt	Novel T	Radboudumc	Radboud Universiteit	hogeschool Windesheim
• Foodvalley	koninklijke etaalunie	REGIO ZWOLLE	UNIVERSITY OF APPLIED SCIENCES	BOOST robotics
Fibinomic Board Hoto	THE ECONOMIC BOARD Pgi Artimi Virgen	Twente Board	EBRZ Economic Board Regio Zwolle	FME RE RECHNOLOGY
UNIVERSITY OF TWENTE.	VNONCW MIDDEN	UNVERSITY & RESEARCH	CONNECTR energy innovation	
<u>≡ provincie</u> Gelderland	provincie Verijssel	oost nl		

