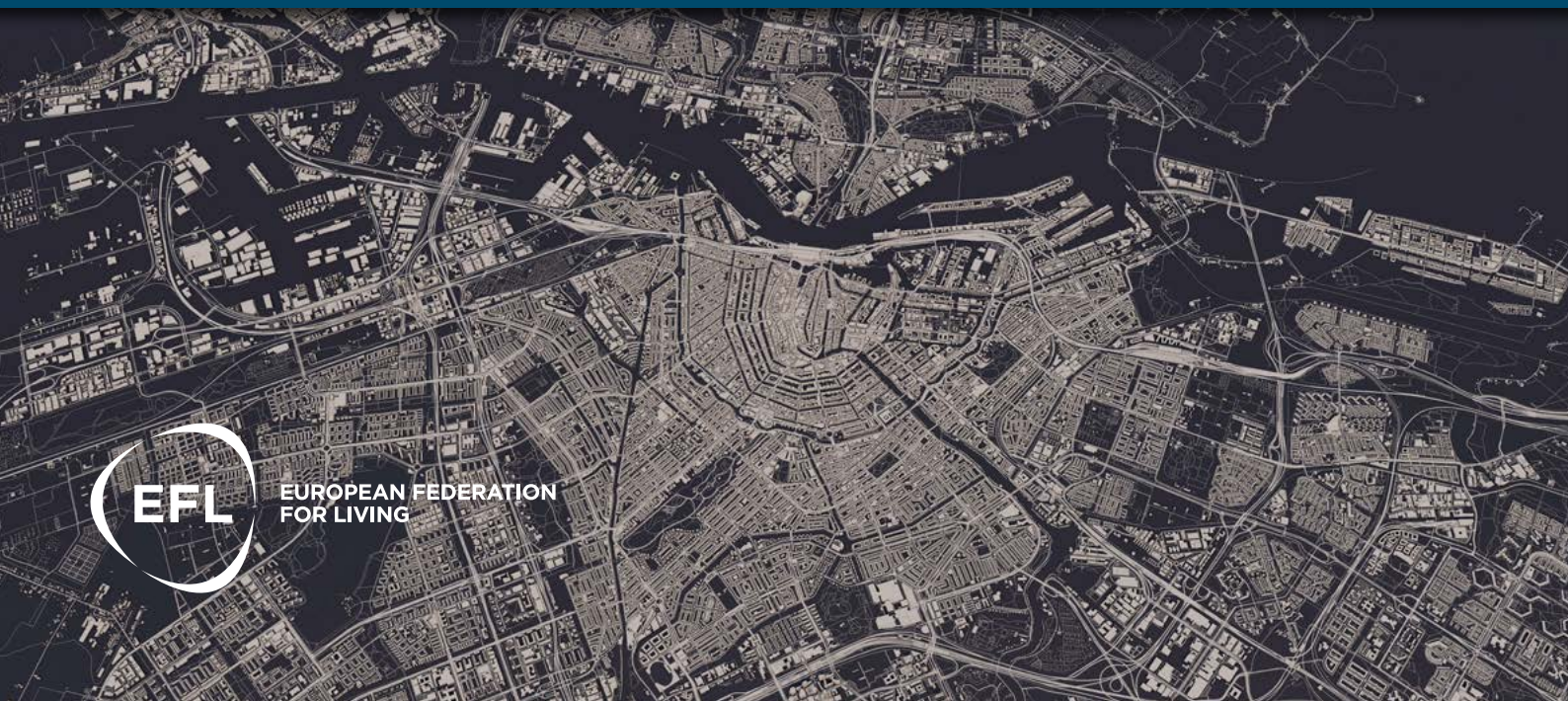




BROCHURE TOPIC GROUP CONSTRUCTION

SEPTEMBER 2021



EUROPEAN FEDERATION
FOR LIVING



TABLE OF CONTENT

FOREWORD OF ERIC DANESSE	3
INTRODUCTION AND OVERVIEW	4
FIRST DAY 'CIRCULARITY IN THE CONSTRUCTION BUSINESS'	5
PROF. DR. VINCENT GRUIS	5
CONCLUSIONS	6
CHARM	7
PRESENTATIONS MEMBERS TG CONSTRUCTION	8
GREEN DEAL	9
CONCLUSIONS	9
VISITED PROJECTS	10
PATCH22	10
TOP-UP	11
CIRCL	12
CONCLUSIONS	14
SECOND DAY 'CIRCULARITY IN THE CONSTRUCTION BUSINESS'	14
THOMAS RAU	14
CONCLUSIONS	15
WORKSHOP, CONCLUSIONS AND LESSONS LEARNED	16
REFLECTIONS AND MAIN CONCLUSIONS	17
USED SOURCES	18



FOREWORD OF ERIC DANESSE

On the 23rd and 24th of September 2021, the members of the Topic Group Construction gathered for a two day event in Amsterdam, the Netherlands. The theme of the event was ‘Circularity in the Construction Business’.

Because of this challenging topic, more EFL members and even some non-members joined the occasion. Social housing organisation Eigen Haard was a perfect host and provided a great programme. The programme consisted of two outstanding speakers, project visits, a workshop and presentations of our members themed around circularity in the construction business.

During these two days, a total of 30 persons joined the meeting (in person or online), representing the following organisations: TU Delft, Habitare Plus, Gewobag, Vilogia, L&Q Group, Zonnige Kempen, Inter-Vilvoordse, Eigen Haard, Chill Services, Drees & Sommer, and Paris Habitat. We would like to thank Gerbrand van Rootselaar of Eigen Haard especially for his perfect organisation and hosting skills.

This report on the meeting in Amsterdam reflects the speakers during the days, and the different projects that we have visited. You will also find sections in which we clarify what we have learned and concluded.

QUOTES

“The Topic Group Construction has become a key part of EFL, and more and more people want to join this group. Our main goal is completely linked to the core values of EFL, which are: exchange knowledge and sharing best practices. The meetings take place throughout Europe. We have had meetings in France, Germany and the Netherlands, where we visited several projects on-site and discussed about various topics. The theme of the meeting in Amsterdam was ‘circularity in the construction sector’. Dutch organisations are well advanced and we have had two wonderful days and learned a lot.”

Eric Danesse, Topic Group Leader

A major strength of the EFL Topic Groups is that the members share their experiences and best practices on a specific topic. In Europe, we deal with many of the same topics, such as: circularity and sustainability. Most of time the national or local context is different, and involved parties differ or act in another way we are used to. By sharing the context and the experiences, we get a close insight in projects and approaches, which could be adapted to be successful in the context others are facing and dealing with.

Joost Nieuwenhuijzen, managing director EFL

INTRODUCTION AND OVERVIEW

On the first day, eminent prof. dr. Vincent Gruis of TU Delft, expert in circularity in the built environment, was our keynote speaker. TU Delft is also the lead partner of Interreg NWE funded project CHARM. This project is about developing circular strategies in the built environment, reducing waste and upcycling used materials. Vincent Gruis presented on the basics of circularity and circular housing and showed us various examples and circular approaches. Then, members of the Topic Group showed the national state of play and highlighted some circular pilot projects in the Netherlands, Belgium, Germany, the United Kingdom and France. We visited Patch 22, Top-Up, and Circl, and got guided tours and detailed information on the construction of the buildings and the circular measures, which has been taken.

On the second day, prominent architect Thomas Rau was our keynote speaker. His presentation on treating (raw) materials in the light of performance, using a circular mindset, and with the knowledge of limited availability was spot on. We then spoke about how to make our organisations (more) aware of the need of becoming

sustainable and circular. We can make a massive impact, taking into account that the organisations we represent and work for are large and/or frontrunner in the national social housing sector. The results of this workshop, with the new insights and experiences of the inspirational meeting, were being exchanged among each other and discussed.



FIRST DAY

‘CIRCULARITY IN THE CONSTRUCTION BUSINESS’

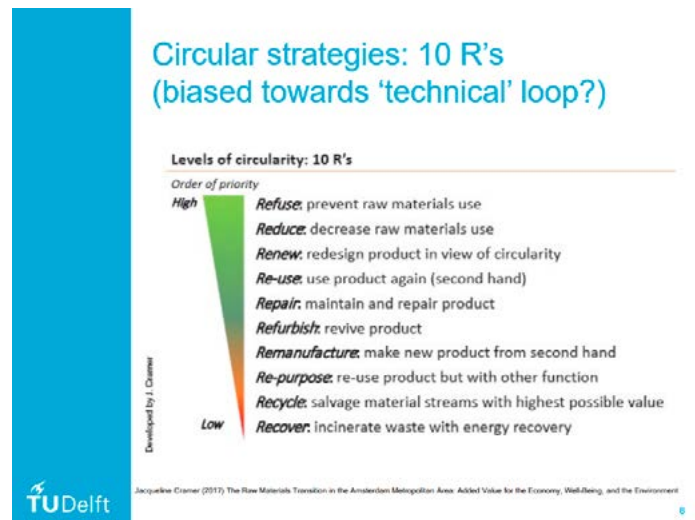
Prof. dr. Vincent Gruis, working at the University of Delft, did the kick-off of the day. His presentation introduced the topic of the two-day meeting of the Topic Group Construction and was a perfect start for our Topic Group meeting on circularity in the construction business.

Prof. dr. Vincent Gruis

Vincent Gruis is Professor of Housing Management - Department of Management in the Built Environment, and Chair of Department of Management in the Built Environment. Prof. dr. Vincent Gruis is doing research on organisational strategies in housing management and he is engaged in the question of how property managers and developers can adapt their stock and activities to societal challenges. Renovation and management of the existing housing stock is an essential part of the building task. There are significant challenges for corporations, developers, investors and governments.

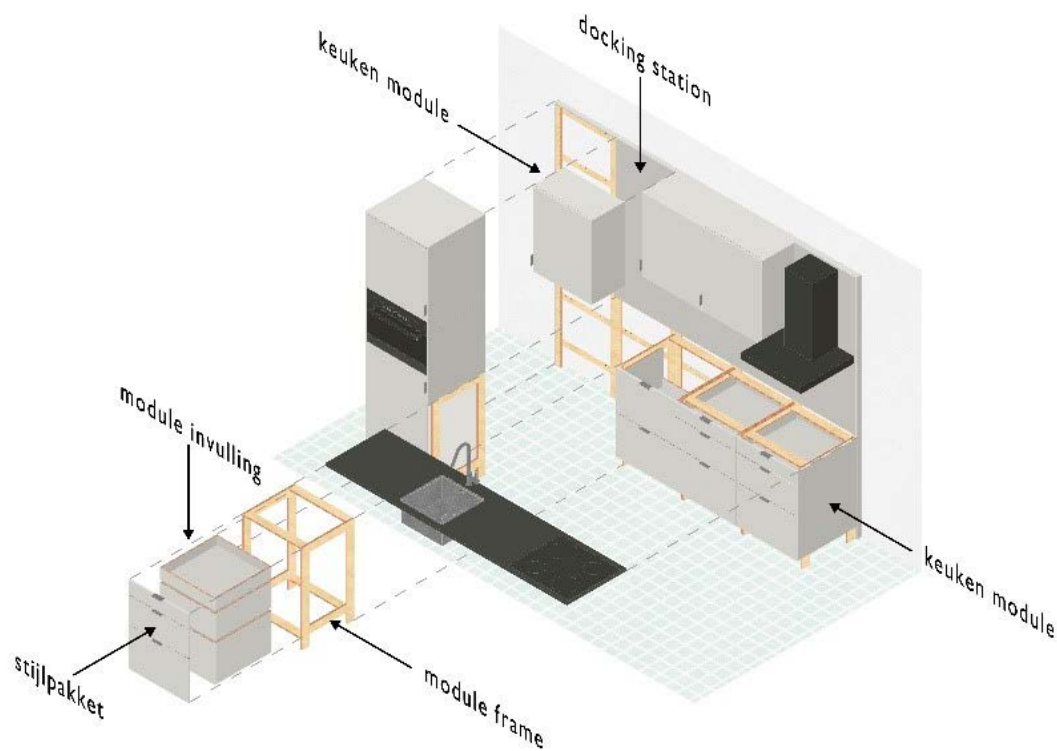


Vincent Gruis has worked since 1996 at the Faculty of Architecture and the Built Environment, where he graduated in 2001 with a thesis entitled 'Financial-economic fundamentals for housing associations'. He has participated in various faculty committees, including the core group of Architecture Curriculum Renewal (CURVE). He is involved in the Interreg NWE funded project CHARM, which stands for Circular Housing Assets Renovation & Management. Vincent also speaks regularly at conferences and symposia and has published extensively in national and international magazines.



The urgency and awareness are important key elements in starting the transition. This will take approximately about and at least ten years. During his presentation, Vincent Gruis mentioned and referred to many examples of circularity, such as: LoCal (Low Carbon Living), the circular kitchen, SuperLocal. In his presentation, he also mentioned a couples of methods, such as: the life cycle analysis and 10 R-model. These methods can be used as a tool to reach a more sustainable organisation. A major factor in our current society are the economical drivers. Because we use the same way to value materials, even if they are used circularly, the business case has to be positive. An advantage of the rising material costs is that it will push us further into the direction of a circular economy. We didn't reach the tipping point yet but we are heading for it.

The circular kitchen. The idea is to construct kitchens from modules with easily replaceable parts. So, after 20 years, instead of buying a whole new kitchen, you can simply buy or lease a new style package. The functional components only need replacing after 40 years and the frame on which everything is installed lasts a lifetime – up to 80 years.



In a way it is quite sad, that scarcity pushes us towards a circular mindset, and not common sense. However, it makes room to new products. Even out of – what we now consider as – waste, such as: the upcycling of used coffee beans into fertilizer. Other challenges expose themselves. No waste home, for example, throws up the challenge on the electric system. The use of timber based materials for the electric system is possible but at this point not allowed by regulation because of fire and acoustic issues. Technically seen, we can now engineer fire safe wooden buildings which are comfortable and perform acoustically very well. These houses are a smart combination of biobased materials composed by modern industrial methods.

The main point is, the topic should be on the companies agenda. We have to put pilot projects on circularity even

more prominent onto the company roadmap. Learning from these projects (also in a broader context by learning from each other's projects), the best practices and experiences should be included in the supply chain. We also need new or adjusted regulations to set another standard (and/or target, depending on how you see it). Plus: people need to be made aware of these new standards. Evidence show us that this awareness takes time: about ten years. Just how we had to adjust our mindset to e.g. electrical cars. The example of electrical cars shows us as well that the need of digital technologies is high to reach a circular building sector and economy. So far, most pilot projects are prototypes. This is why they are still (too) expensive. Once we standardize, costs would be reduced dramatically. We have to consider real estate as materials instead of projects because the uniqueness of the projects makes them more expensive.

CONCLUSIONS

The building sector has a huge impact on the amount of raw materials we use to build houses. Our responsibility is therefore also huge. We must think about energy efficiency and construction efficiency (meaning use less raw materials and limit waste to a maximum) to reduce carbon emissions. Both in the usage phase and in the construction phase. It's also a matter of mindset and wanting to make the transition possible. It is important to have a vision on the desired outcomes. Make them concrete and start with small steps, regarding the approach of Eigen Haard and Zonnige Kempen for example.

CHARM

Interreg NWE funded project CHARM is about making the social housing sector more circular. One of the objectives is to demonstrate and learn from innovative approaches for housing renovation and asset management that prevent downcycling of materials. However, the main project objective of CHARM is to optimise the (re)use of material and natural resources. The project wants to secure adoption of these approaches within the four housing organisation partners, which are: GreenSquareAccord, Paris Habitat, Woonbedrijf and Zonnige Kempen, as well as to accelerate the adoption of these approaches throughout the social housing industry. Lead partner is Delft University of Technology.

ABOUT INTERREG NWE FUNDED PROJECT CHARM

Besides TU Delft, Zonnige Kempen, Paris Habitat and EFL are involved in project CHARM. Information about the project and reports on all events can be found on the website of CHARM. The website contains more information on sustainability and circularity. In the online library you will find: articles, newsletters, websites, factsheets, readings, and webinars upon the subject(s). The project is funded by Interreg NWE and supported by the Dutch Province of North Holland.



The four social housing organisations have interesting approaches, using new insights and mindset. GreenSquareAccord is building houses where the plastics almost have been banned out and are replaced by environmental friendly materials. This means alternatives are being used when it comes to fitting the kitchens, bathrooms and windows, as well as reducing the amount of plastic used in building materials. The houses are being built by GreenSquareAccord's offsite manufacturing facility LoCaL Homes, which uses the latest modern methods of construction to manufacture high quality, super energy efficient houses.

Zonnige Kempen has moved into its circular renovated office last summer. It's possible to make a virtual tour through the circular office. Meanwhile, the renovation process is being explained from A to Z. You can also take an online walk through the building yourself. The French magazine D'architectures dedicated an article on the office. Paris Habitat is dealing with many renovations in a density of habitants in the metropole Paris. They are working on a Material Exchange Platform (MEP). This platform is used to store and reuse building materials. It's also possible to add a price to the materials, so other interested parties can buy them. This platform prevents downcycling. In a linear economy, materials were not used again in the case of demolishing. In a circular economy, materials are being used over and over again.

Woonbedrijf is developing modular build, circular houses. The circular houses will be based on the principles of Redesign, Re-use, and Re-cycle. The future tenants are involved in the process, which gives the development a true co-making character. The housing organisation used technology and VR glasses in the phase of the designing process of the houses. For example, together with the future tenants, they discussed about the lay-out and the right location of the bathrooms in their houses.



PRESENTATIONS MEMBERS TG CONSTRUCTION

The presentations showed us clearly that circularity is becoming an important topic on the political agenda in Belgium, France, Germany and the Netherlands. That is not a surprise. The European Union has given a strong signal with the Green Deal (see next paragraph). Having said that, it takes time to set the agenda items into concrete actions. Almost every economy is built upon the principles of linear use of raw materials, meaning we see materials as of no value after use. So, we throw them away or use them as a rest product and reduce them to – more or the less – an inferior product. And as a result of that, we have designed our processes and manufacturing around that. It will cost time, money and effort to change this linear way of thinking and doing into a circular way of thinking and doing.



BELGIUM

Belgium is already on its way to build a more sustainable society through circular

economy. The federal government and the three autonomous regions (Brussels-Capital, Wallonia and Flanders) are all aligned in this effort. One of the aims of the circular economy model is zero waste, where all materials are kept in circulation. In 2016, Belgium ranked as number two in the European Union in recycling waste; almost 77 per cent of total waste in Belgium was recycled. Nevertheless, Belgium has set itself higher targets. By 2050, the Flanders region wants to have a circular economy where nothing is wasted. In Wallonia, the organic waste will be separated from raw household waste throughout the region by the end of 2025. Other measures include the strengthening of the network of repair cafés and encouraging leasing of material goods rather than buying them.



THE NETHERLANDS

The Dutch government is working with industry, civil-society organisations,

knowledge institutions and other authorities to achieve a sustainable economy for the future. In this circular economy, there will be no more waste, as resources will be reused again and again. The government-wide Circular Economy programme sets out what we will need to do to achieve a circular Dutch economy by 2050. The Government-wide programme for a circular economy, entitled 'A Circular Economy in the Netherlands by 2050', was presented to the House of Representatives in September 2016. The programme sets out what the Dutch need to do in order to utilise our raw materials, products, and services in more efficient and smarter ways, thus enabling the country to realise the ambition to be circular by 2050.



FRANCE

France is shaping a system-wide transition towards a circular economy

with an ambitious law to tackle the environmental and social issues, that comes with waste and pollution. In 2020, France adopted its comprehensive 'anti-waste law'. The law aims to eliminate waste and pollution from the design stage and transform the system of production, distribution, and consumption from a linear to a circular economic model. It encourages businesses across various sectors, municipalities, and citizens to eliminate waste and adopt more circular practices. The law has introduced a large number of measures, some of which are a world first, to shape the transition to a circular economy.



GERMANY

The Circular Economy Initiative

Deutschland (CEID) was founded in 2019

on behalf of the Federal Ministry of Education and Research to promote Germany's transformation into a circular economy (CE) through a multi-stakeholder approach. It aims to develop a joint target vision + concrete plan on how to foster this transformation. CEID also stimulates practical implementation in the form of collaborative projects. It brings together economic, scientific and societal stakeholders. In sum, the insights from the initiative serve as a basis for deriving policy recommendations and options which are summarized in a Circular Economy Roadmap for Germany.



UNITED KINGDOM

The United Kingdom is committed to moving towards a more circular economy which will see us keeping resources in use as long as possible, extracting maximum value from them, minimizing waste and promoting resource efficiency. The Circular Economy Package (CEP) introduces a revised legislative

framework, identifying steps for the reduction of waste and establishing an ambitious and credible long-term path for waste management and recycling. The Resources and Waste Strategy (RWS) for England forms part of the UK government's commitment in the 25 Year Environment Plan for England to leave the environment in a better state than we inherited it.

GREEN DEAL

The EU states that climate change and environmental degradation are an existential threat to Europe and the world. To overcome these challenges, the European Green Deal will transform the EU into a modern, resource-efficient and competitive economy, ensuring:

- no net emissions of greenhouse gases by 2050
- economic growth decoupled from resource use
- no person and no place left behind

The European Green Deal is, so says the EU, also our lifeline out of the COVID-19 pandemic. One third of the € 1.8 trillion investments from the NextGenerationEU Recovery Plan, and the EU's seven-year budget will finance the European Green Deal. The European Commission adopted a set of proposals



to make the EU's climate, energy, transport and taxation policies fit for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

CONCLUSIONS

The need to change our mindset, including the way we need to operate and use raw materials in the near future, has been landed in our countries. The member presentations showed us – briefly and clear – the current state of the countries on the topic. Having said that, we need to act as a whole as well to create momentum to make the transition possible.

This transition into a sustainable and circular society will take decades because it needs time to set the goals and change the way we co-operate internally and in the social housing sector as a whole. We cannot do it by ourselves. Legislation will help the sector to focus on national level and to give clear handles. It is up to us to start making steps. We all have the opportunity to put this on the agenda and move it on into working procedures and think outside the linear box.

Besides time, we need examples, commitment and elbowroom to work jointly on effective tools and methods. Because the future is uncertain, and new solutions are almost countless, our organisations need to act carefully with our (financial) resources as well. Pilot projects, such as presented today by our peers, are very valuable to find our way in the transition from a linear to a circular building sector. Share these practices and experiences in a broader network, so we can learn to the fullest from each other.

VISITED PROJECTS

Three projects were being visited. Two were located in the north part of Amsterdam: Patch22 and Top-Up. The third one, Circl, lies in a posh business district in the south of Amsterdam, nearby the airport Schiphol.

Patch22 in Amsterdam North

Patch22 is a 30m tall high-rise in wood, and was one of the successful plans in the 'Buiksloterham Sustainability Tender' in 2009. The initiators, the architect Tom Frantzen and building-manager Claus Oussoren, founded Lemniskade Projects to achieve independently what they had never been able to manage when working on commissions for their previous clients: an outsized wooden building with a great

degree of flexibility, striking architecture and a high level of sustainability, not because that was what was required but because that is what ought to be done.

Patch22 is located in a redevelopment area in Amsterdam north, where a lot of industry will remain in the area.

Therefore, Patch22 is equipped with noise insulating single sheet glass facades covering the balconies on the north side. To protect the south side balconies from the always present south western winds the same sliding glass panel system is installed on the south side as well.

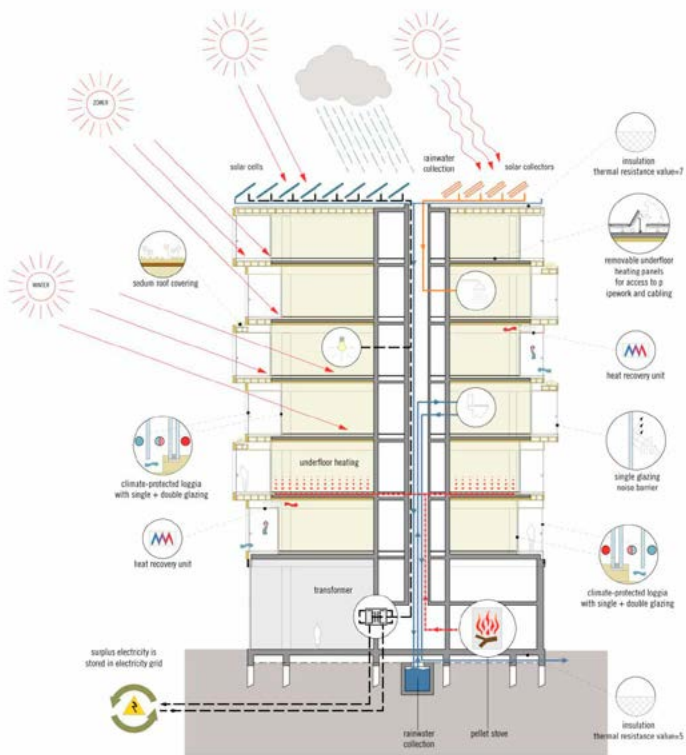
Innovations

The project incorporates numerous innovations in the technology used and application of technical rules, all aimed at achieving the desired flexibility without having to make compromises. Examples include the hollow floors and removable top floor, the lack of shafts in the apartments — achieved by having the piping and cabling taken horizontally to central shafts in the core — and agreements for a fixed ground lease with flexible positioning of the functions within the building. Another remarkable point is that this building was designed both for housing and for offices, which makes it even more circular. If the need for housing becomes less strong in this zone, the transformation into tertiary building is easy because all its design considered the two constraints. For example, it includes at the same time the specifications of the two fire regulations, which are different between housing and the tertiary sector. But the most unusual feature is the use of wood as the main structure for the 30m-tall building. Moreover, the wood has largely been left visible, making this a key factor in the ambience of the apartments and the exterior.

Sustainability

In Patch22, 'sustainability' is achieved through energy efficiency, the use of renewable materials and great flexibility in the floor plan layout options.





Tom Frantzen

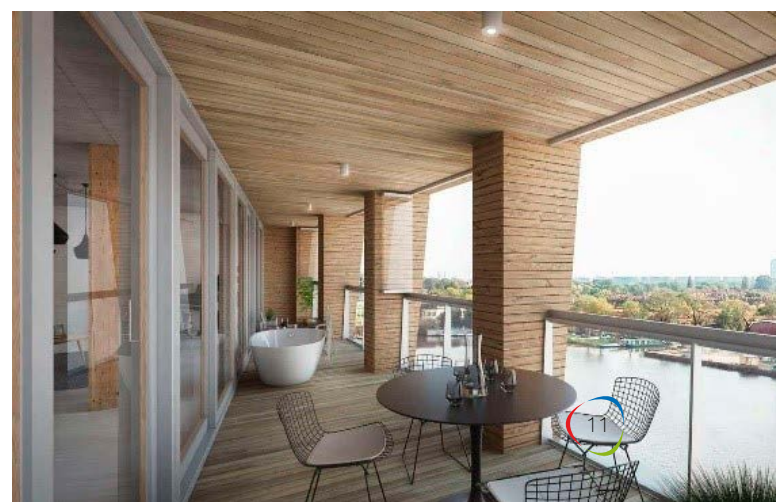
Architect ir. Tom Frantzen himself was our guide. During the exciting tour, he provided us with insights and gave us an incredible amount of information on the building process and the location of the two buildings in Amsterdam North. In 2016, Patch22 has won a WAN Award in the category 'Residential Awards'. The global WAN Awards acknowledge and celebrate excellent architecture. The awards recognise the outstanding works of innovative, visionary and imaginative architects worldwide.

Top-Up in Amsterdam North

Like Patch 22, Top-Up is located in the circular habitat of the area, called 'Buiksloterham' in the north of Amsterdam. Within this building, the reusability of products and raw materials is maximized and value destruction is minimized. The building can be taken apart in 100 or 200 years and all raw materials, such as: wood, concrete and aluminium, can be reused. By using triple glazing, solar panels, heat-accumulating loggias and reuse of rainwater for toilet flushing, the use of energy and drinking water is kept as small as possible.

Re-use of materials

At the end of its life cycle, Top-Up can be largely dismantled and the raw materials (such as: wood, glass, aluminium and concrete) can be used for a new building. The original concrete construction of the ground floor is the only part that cannot be dismantled. But consider this is the reused concrete construction of the former concrete cable reel of the former construction, which is still on site and used for constructing the building. That's why the name of the building is called 'Top-Up'.



SOME EXAMPLES OF CIRCULARITY IN TOP-UP

To limit the consumption of drinking water, Top-Up has a so called 'grey water system'. The toilets are flushed with rainwater. The installations are made on the basis of renewable energy. These installations are easier to understand and operate by the residents. Technology should not be a burden, is the philosophy. The space must remain freely divisible for current and future residents.

Flexible and made to last

The Top-Up building is made to be fully transformable. The walls between the different apartments are not load-bearing. The lofts can therefore grow and shrink. Due to the free height of 3 meters, the building can eventually be transformed into other functions, such as: an office, school or hotel. And then, if wanted, back to an apartment building. The flexibility of the construction also reflected in the budget. Some buyers want and can do a lot themselves. Others work together with a contractor, installer and (interior) architect during the entire realisation. This has led to apartments that are the same in structure, but unique in use.

Circl in Amsterdam South

Circl is a circular platform in Amsterdam South where the necessary forces from society, business and finance come together for a sustainable world. Here, we got a tour and got in insight in the circular principles using recycled and re-used materials. It all began with the dream of a Dutch bank, called: ABN AMRO. Their dream consisted of contributing to a sustainable world in which nothing we make, buy or use goes to waste. A new cycle of production and consumption, for a new economy: a circular economy where all raw materials can be re-used. You can spend as long as you like talking about sustainability, or you can just get down and do it. We've started the move towards a sustainable world by concentrating on ourselves.

MAIN PRINCIPLES OF CIRCULARITY

Reduce use only that which you strictly need. Do not waste raw materials unnecessarily simply to make something look more beautiful, or because that is the cheapest solution.

Reuse use as many already available or used materials and raw materials. **Recycle** if you do produce any waste, ensure that it is recycled and that as little as possible of its value is lost.



Circular principles, recycled and re-used materials, new concepts

At Circl, they believe in the circular economy and above all that we can only achieve it together by creating new forms of partnerships. The Circl pavilion is built entirely based on circular principles using recycled and re-usable materials. It's a living lab where they experiment with innovative solutions to meet the challenges of the future, an accessible platform, designed to facilitate unexpected encounters.



Circl is a building constructed entirely on circular principles, where even the insulation is made of fibres taken from 16,000 pairs of old jeans donated by the bank's employees. With an elevator that remains the property of the manufacturer and is leased on a use-only basis. What you need to learn to do, you learn by doing. Circl hopes that everyone will use the new knowledge and experience they have gained through the circular construction of the building. That's why they don't refer to what they've done at Circl as 'copyright' but rather as 'right to copy'. That's why they also offer tours on a regular basis. To inspire and spread the word. The principles were clear: minimal use of raw materials, as energy neutral as possible, everything designed to be disassembled later. Everyone was challenged to think outside the box. Wood was used instead of concrete. On the roof of the building there are 260 solar panels. Together with the university TU Delft, the parties came up with several remarkable systems, including the pavilion's system of horizontal and vertical geothermal heat exchangers that helps to reduce 'normal' energy usage. The vertical ones comprise a series of nine boreholes, some 80 metres deep, and use geothermal energy to heat and cool the building. Many features were dropped on the inside of the building, in

accordance with the 'reduce' principle. There are, for example, no fitted ceilings and the pipes and cable ducts have not been concealed. It was quite a journey but it has been done and established!



Product as a service

Besides these circular principles, the elevator is – as said – not purchased and owned by Circl. However, it is being paid for its use. To ensure that people use the elevator as little as possible, it is also placed at one end of the building! The manufacturer is and will be the owner of the equipment. Even the piece of floorage, on which the elevator is being built on is owned by the manufacturer. The concept is known as 'product as a service' and has been used by Thomas Rau in various situations for several assignments.

PRODUCT AS A SERVICE (PaaS)

Product as a service is a business model that provides a service in areas that were traditionally sold as products. A service model provides ongoing interaction with customers including support. Services may also offer the ability to exchange a product on a regular basis for a different or new model. The producer gets a regular income stream as services may include monthly subscription fees or usage-based charges. Customers may be attracted to service models due to flexibility, enhanced support, lower upfront costs and reduces risks.

Conclusions

These great examples gave us insights in what is already possible. The projects Top-Up and Patch 22 contain a 'can-do-it mentality'. The constructions of these projects are made to last for up to a hundred years and longer. The apartments within are like boxes that can be replaced within time. They can also be removed, so the construction can be made ready for another type of living, or even a hotel or for business use. Just like the former warehouses in the historic centre of Amsterdam have nowadays been transformed into houses and shops.

Circl showed us an entrepreneurial example of a large bank, which sector often is not driven by sustainability. If they can do it, then a sector which is based on social entrepreneurship can do it as well. It showed us another mindset on ownership. It showed that an owner doesn't need to possess all materials and appliances, such as an elevator. Sometimes, we only need to have the service to elevate the people within a building. And bringing them back on the first ground safely as well of course. This could also be integrated within our buildings, without doing compromises on the wanted (or needed) comfort and service level.

SECOND DAY

'CIRCULARITY IN THE CONSTRUCTION BUSINESS'

The first day of the two-day event was inspirational with the great introduction of prof. dr. Vincent Gruis, the discussions and the on-site visits of some great building projects based on sustainability and circular pillars. The second day started with the impressive talk of architect Thomas Rau.

Thomas Rau

Thomas Rau is being led by what will be needed in the future. This attitude is what he considers to be the only way for us to escape the tragic fate of one day having exhausted all resources that are needed for humanity to survive.



The one-dimensional foundation on which our linear economy was built has benefited us greatly—but it is now threatening to undermine all its successes. At a time when we are becoming more and more dependent on the resources within the closed system that is our planet, we are also increasingly jeopardising the availability of those resources.

His vision on circularity: material matters

In 2015, Thomas was invited to talk about his vision during an episode of the Dutch television series 'VPRO Tegenlicht'. Thomas and Sabine considered it a good opportunity to look back on the insights gained over the preceding decade—and to summarise those insights to form a coherent philosophy. And so it came to pass; the broadcast

became a raving success—it was one of the series' best viewed episodes ever and, later, it was voted that season's favourite episode.

ABOUT THOMAS RAU

Born in Germany, Thomas Rau initially studies pedagogy in Bonn, but continues his study career at the Aachen University of Technology (architecture) and at the Bonn Academy of Art. In 1990, he moves to Amsterdam (the Netherlands), where he works for various architectural firms. Two years later, he founds RAU, an architectural firm that uses environmentally friendly materials as much as possible. In 2008, Thomas Rau certifies himself as a 'cradle-to-cradle' architect and in 2010 he founds Turntoo.

Encouraged by the interest in their philosophy, Thomas and Sabine decided to also present it in a more traditional way: they wrote a book, entitled Material Matters. Main subject of the book is the theorem of there being alternatives to our ways of consumption and production. The pair takes the reader on an intellectual expedition, along the history of planned ageing, via the fundamental finiteness of the Earth's closed system, to our anthropocentric thinking which continues to severely limit our

perspective. Along the way, the book reveals the contours of a novel system; an economic model in which consumers are users rather than owners, one in which materials are awarded rights—and waste has become a thing of the past.

Conclusions

The powerful – and from time to time even emotional – presentation of Thomas Rau have had an impact on all of us. Rau sure knows how to bring a message to the people using a mix of figures and facts. The way he thinks about how we could use materials in a loop, is refreshing and in a way so logical. On the other hand, we know the world is not circularly programmed, but our economies are based on single use and short-term profitability.

Rau's story has led to a kind of mirror and view or insight, which is: we are in charge of the things we have created. So, if we want to change the situation we have ended up in, we have the power to change and undo that as well. It will not be easy, but we still have time and – without any doubt – the capabilities to do so.

At the beginning of his presentation, Thomas Rau already strikes us by saying that 'when optimizing is not enough, change is also not enough'. At this point, mankind has gone too far, and we must repair the relation between nature and us. We must transform to become innovative, and not the contrary.

If optimization do not reach the goal, then one tends to manipulate. The production of VW electric cars e.g., by 2030 will require 130,000 tons of cobalt. Considering that world

production of cobalt does not exceed 123,000 tons! Another example: the Phoebus cartel was composed by Philips, Osram and decided in 1924 that the life of the lightbulbs should not exceed 1.000 hours. If we keep on acting like this, then the Paris accords are like the story of an alcoholic who promises to stop drinking in 2030. We act the same way. The value creation chain is still a value destruction chain (almost everything goes to waste) and we say we are going to change it within a couple of years. Instead, we must act now. That is way Thomas Rau has added an extra goal to the 17 Sustainable Development Goals. The 17 Sustainable Development Goals (SDGs) agreed upon by all 193 United Nations Member States aim to end poverty, ensure prosperity, and protect the planet. This 18th goal is: attitude and humanity. It adds up the other goals which show us what to do and what not why.

Circularity is designing a new system. We human beings are the guests on this planet and not the hosts of the earth. The earth is thereby a closed system. Our needs are temporary, but the consequences are permanent. Even real estate is temporary compared to the lifetime of the planet. So, we must avoid waste. Materials are limited on our planet and waste is material without identity. We have to change our mindset and start treating natural materials with respect. Madaster is a way to do so. Madaster gives material its own passport and therefore an identity.

Another interesting example of changing our mindset and view on services. Schiphol Airport has a guarantee from Philips that the lighting they are using will consume 32% less energy and that in 15 years only 2,5 lightbulbs will be replaced. It is 'lighting as a service'. Just as renting a washing machine. A breakdown or another technical disorder will always be the responsibility of the producer instead of the user. Then, it will be for the benefit of the producer when the machine will function as long as possible without any problem. The value of the machine after its technological life span is also for the benefit of the producer.

Just as real estate. In fact, you can look at real estate as follows: real estate is a huge depot of valuable materials. The building of the Triodos bank, for example, has got this starting point. The building is made of wood, has around 165.000 screws and is totally demountable. It produces more energy than it needs and has been designed as a material depot. In this way, building constructions are well organised material mines.



WORKSHOP, CONCLUSIONS AND LESSONS LEARNED

We ended the event with a workshop. All participants took half an hour to discuss the information we've had got during the days, and asked ourselves the question: how can we put the item of circularity on the organisation's agenda and make an (extra) step towards a more sustainable and circular world? The impact of our linear behaviour is so immense and destructive in the long run, that we have to cut it into smaller parts to keep it understandable. It starts with another mindset and view at how we want to use raw materials. Let's start by putting the topic on the organisational agenda. And we all have the possibility to do this, concerning our roles and responsibilities in our organisations.

We have also seen that it is possible if we want to make a change. The projects in Amsterdam showed us buildings based on circular pillars. These (construction) pioneers prove that it is possible. They have put the money where their mouth is.

The lessons learned are as follows. We must think big but act small. To make the transition possible, we must do it step by step, and together. The concept of 'product as a service' is therefore a very interesting concept. Let's keep a close eye on this type of service. Partnership is by all means the key factor towards a circular economy. A single landlord or social housing organisation will not be able to deal with the subject of

circularity alone. It must be part of a broader partnership.

Having said that, it is difficult to change the mindset of all tenants, construction companies and finance department(s). The boards of our companies must take the lead to make a proper start. There are already a lot of designers and architects take have and use circular view but is seems to be difficult, as social housing organisation Zonnige Kempen showed us, to find construction companies that understands and handle the challenges of circularity.

Another lesson learned: the Madaster concept presented by Thomas Rau can easily be implemented in BIM models. BIM stands for Building Information Modelling.



REFLECTIONS AND MAIN CONCLUSIONS

It was for sure an event to remember, and to learn from. Besides the speakers and the projects we have visited, the participants were a great inspiration and unmissable for the fruitful discussions and insights. Besides that, our members (and other participants) are the glue of the Topic Group, and highly needed for sharing their knowledge and experiences.



It's clear that a change of our economy and society starts with our own mindset. How do we look at (raw) materials and in which way do we use them. Is that the proper way? And if not, how are we going to change this and hook on our colleagues and organisations? We can start this discussion ourselves because we are a part of the organisation. Think big, act small. There are several ways to put the topic on the organisational agenda. Be creative.

The various projects in Amsterdam have shown us that it is possible. Concepts, such as 'product as a service' and the will to perform more circularly, including the right mindset in the

whole organisation, are some ingredients to make it happen. As social housing organisations, it's within our power to build constructions in which the (raw) materials can last longer than we use them now. In a circular way. Materials keep value once used. We need to make that value visible economically as well. It's already visible in real life because these building simply exist.

We want to thank everybody for joining and participating. We hope to see you next time in good health and spirit!

*Eric Danesse – leader of Topic Group Construction
Joost Nieuwenhuijzen*



USED SOURCES

CHARM: <https://www.nweurope.eu/projects/project-search/charm-circular-housing-asset-renovation-management/>

CIRCL <https://circl.nl/>

EFL <https://ef-l.eu/>

EUROPEAN UNION: GREEN DEAL: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en and https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal/delivering-european-green-deal_en

PATCH22 <https://patch22.nl/>

THOMAS RAU <http://thomasrau.eu/en/>

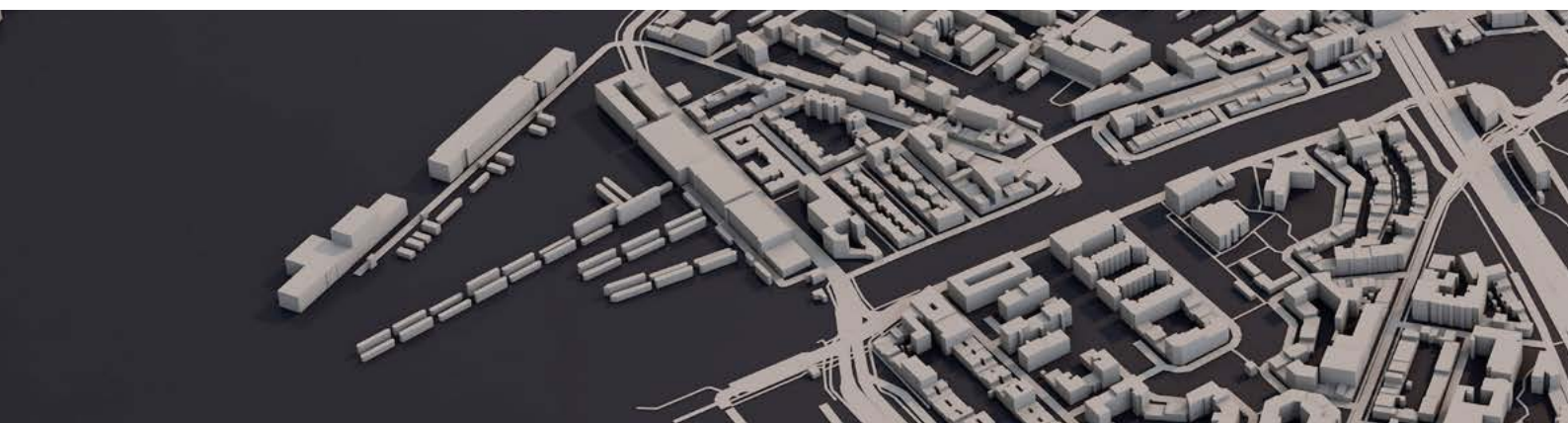
TOP-UP <https://www.top-up.amsterdam/gebouw-top-up/>

TU DELFT <https://www.tudelft.nl/en/architecture-and-the-built-environment>



Pictures made by Eric Danesse, Gaëlle Thibaut and Peter Hoogeweg

Text by Peter Hoogeweg (EFL), Gaëlle Thibaut and Eric Danesse (Vilogia)





EUROPEAN FEDERATION
FOR LIVING

CONTACT INFO

European Federation for Living

Official Postal address / P.O. Box 67065 / NL-1060 JB Amsterdam

E: info@ef-l.eu / W: www.ef-l.eu

