TECHATHON '22

INFORMATION FOR PARTICIPANTS

THE CHALLENGE
REDEVELOPMENT OF
THE HOEFKWARTIER
DISTRICT IN
AMERSFOORT

10 NOVEMBER 2022

www.startmetconnect.nl/techathon
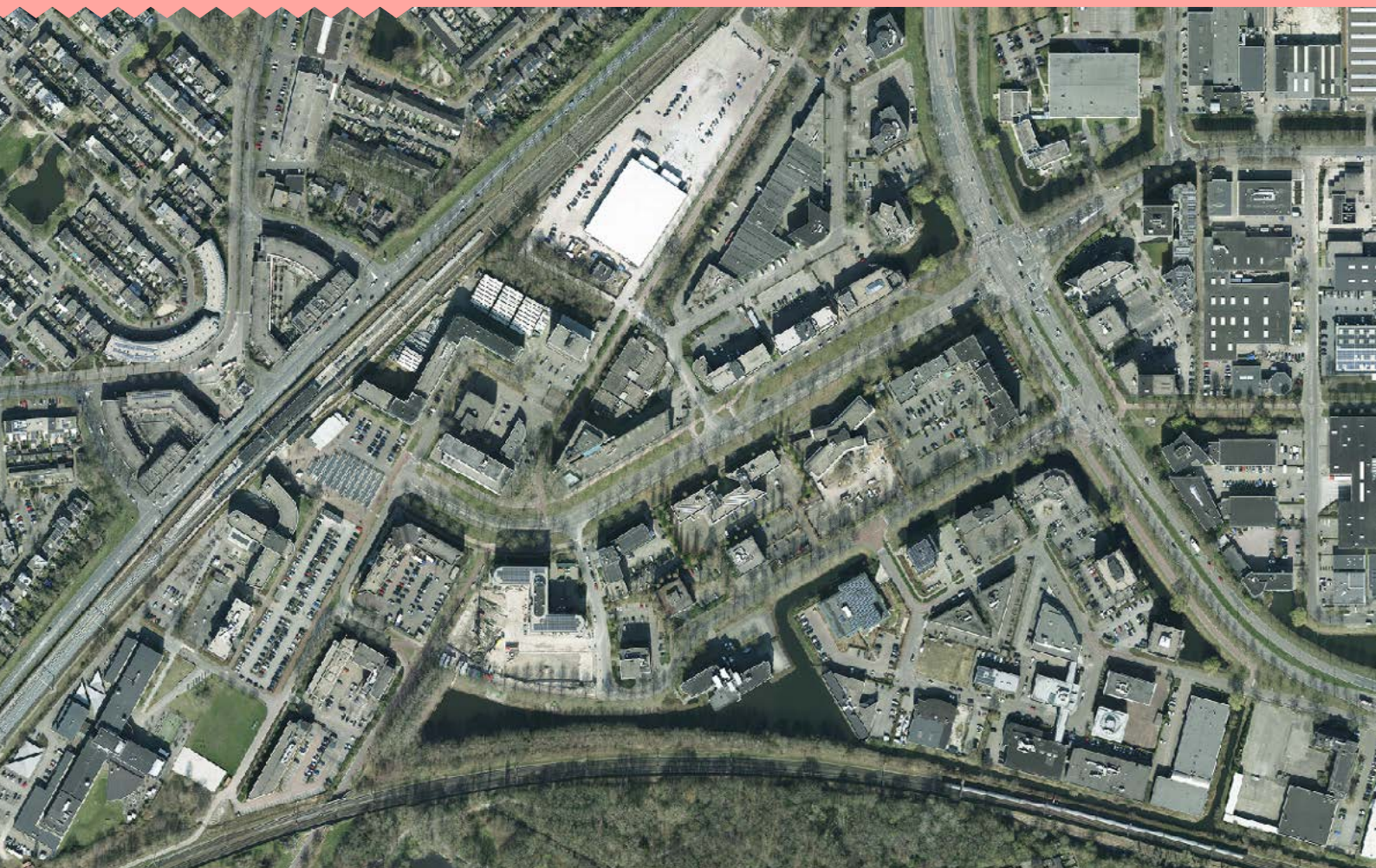
56 PARTICIPANTS
7 TEAMS
8 HOURS
1 CHALLENGE

CONTENTS

Make room for the Techathon '22!

In our densely populated country, space is inherently scarce. Living. Working. Recreation. Travel. All these have to share a limited number of square miles. In addition, when an area is designed or redesigned, there are rules that have to be taken into account; lots and lots of rules, dealing with aspects such as climate adaptation, circularity, energy, nature and safety. In the engineering sector's third Techathon, we're going to rack our brains about space.

Hoefkwartier is a district in Amersfoort mainly comprising offices, many of which are vacant. The Municipality of Amersfoort wants to turn the district into an attractive environment for various groups in society, with space to live, work and learn. It's up to you and your team to redesign and transform it into the new dynamic Hoefkwartier city district.
For the transformation, you'll have to exploit new business models concerning demolition, reuse, mobility and energy. This is important to encourage property owners to make investments of lasting value. The goal is to increase the value of the district with the plan drawn up by you and your team-mates. This requires both technical knowledge and a healthy dose of imagination, because everything starts with a vision of the future of people in a street, in a neighbourhood, or in a city.

Can you make a sound and feasible plan with the necessary innovation and wow factor? Then you could be part of the team that wins the Techathon Award '22. Let yourself be inspired by the results of Techathon '21 and '19, as well as the future outlook documents CONNECT2025, CONNECT2030 and SCENARIO2040.

The Techathon is all about education and business working side by side. In previous years, this has led to some excellent results, and this year we expect more of the same. I wish you the best of luck on Thursday 10 November.

See you in Amersfoort!

Doekle Terpstra
Chair of Techniek Nederland

Best participant in the Techathon

Welcome to Amersfoort! Welcome to Hoefkwartier, a new Amersfoort urban district under development!

In Hoefkwartier, you will shortly find yourself surrounded by greenery, get your coffee around the corner, eat your lunch on a terrace or the grass, and be within 10 minutes of the city centre by cycle and walking distance from Schothorst train station. Over the next 10 years, Hoefkwartier will change from a commercial area with many offices and educational institutions into a residential, work and learning district with an urban vibe. Up to 4,000 homes will be built in new and renovated buildings, while 5,000 jobs and the educational institutions will be retained. The plans envisage lots of flats in medium and high-rise buildings and a variety of townhouses. The area will soon offer a home to a wide range of people from different backgrounds; young and old, singles, sharers and families. It will become a neighbourhood where everyone can live, work, learn and spend their free time in ways that suits them. That is what we want, both now and in the future.

Hoefkwartier is one of our growth districts. Amersfoort is expanding due to the developments in Hoefkwartier and elsewhere in the city. The number of inhabitants is expected to increase from the current 160,000 to 180,000 in 2040. We're building housing and repurposing buildings into homes where people, animals and nature are of key importance. The growth in jobs on offer and facilities for sports, education, culture and care will accompany this expansion. At the same time, we will continue to cherish our historic city centre and the beautiful surroundings with such a variety of landscapes, which make our city so attractive for many people to live and work in.

With all these developments, we're planning two generations ahead, so that everyone can continue to live in our city both now and in the future. That includes Hoefkwartier. So, what does it all mean? How do we make sure that our plans will still be relevant for Hoefkwartier throughout the 21st century and beyond? It's great that you've accepted the challenge of sharing your thoughts with us about what a Hoefkwartier of the future should look like! Our questions about this area are tied to all the challenges we're facing in the future. They range from the housing issue to the energy transition and the movement to a circular economy. The design of our districts and buildings must take these challenges into account.

We desperately need all vocational higher-education and university students to help solve these future challenges. It's essential that the questions posed are tackled from a wide range of perspectives, where different types of expertise and insights are bundled. Getting everyone to put their minds to the task at hand is beneficial here. Work together, think creatively, and, above all, look at the world with an open, inquisitive mind. I'm convinced that this will help you devise innovative ideas for solving contemporary problems and move us forward as a city and as a society.

Think, dream, and act! Good luck today, and in the future that awaits you!

Astrid Janssen
Alderperson for Housing and the Energy Transition, Municipality of Amersfoort

INTRODUCTION

This booklet provides you with some background information about the Techathon '22 in advance, so you can prepare well. A good end result requires awareness of the background to the question posed and an understanding of the local context and situation. For this reason, please read this booklet carefully in the weeks leading up to the Techathon. It's also a good idea to do some preliminary research and collect information. For example, look online, and talk to colleagues, teachers or other people about the subject and the question posed for this Techathon. It's also highly recommended that you get acquainted with the other members of your team, and maybe divide tasks right away! Above all: think outside the box! The question posed is indeed broad, but it certainly leaves room to think outside existing or prescribed frameworks. And remember; there are various assessment criteria that we consider in order to arrive at a final assessment, and for good reasons!

You don't have to start thinking about solutions or creating designs just yet, because that is the purpose of the Techathon day itself. We believe that this is when you'll devise the best solutions by brainstorming, consulting, drawing, calculating and so on with your team. You can use the information in this booklet, and during the day, people from the Municipality of Amersfoort and the engineering sector will be on hand to answer your questions. Even so, as previously mentioned; you can and should start preparing now!

One more thing about the composition of the teams: we deliberately opted for teams with a mix of HBO and MBO students (so from vocational colleges and universities) and high potential employees from companies. This means different levels of expertise and experience will be represented in all teams. Moreover, it means each team has a direct line to a company, university of applied sciences and vocational college. This can be quite useful during the day itself, for example for bouncing ideas off experts at the 'underlying' organisations. In any case, it's always good to meet new people and learn from each other! Experience has shown that a team consisting of people from different fields of study approaches a subject from a broader perspective. So, don't limit your team to technology or architecture, but think about areas such as logistics, communications/marketing, behavioural sciences, digitalisation, or others that you think are useful. You are, of course, always ultimately responsible for the composition of your team.

Note: You will receive a hardcopy version of this information booklet on 10 November, so you don't have to print it!

1. TECHATHON '22

1.1 The purpose of this Techathon

This Techathon is a direct result of the future outlook agendas for the Netherlands and the engineering sector: CONNECT2025 (February 2018), SCENARIO2040 (February 2020) and CONNECT2030 (September 2022).

CONNECT2025 is the joint future agenda of the engineering sector. It describes how the sector wants to help prepare the Netherlands for the major changes coming its way. The agenda was drawn up based on the realisation that the engineering sector plays a key role in keeping the Netherlands prosperous and healthy. More info: **www.startmetconnect.nl/connect2025**.

SCENARIO2040 is a study designed to give the sector and its partners a more long-term perspective. What will happen in the future? What role will the engineering sector play in this? And also: think about the choices you make today because they will be decisive for your position in 2040! For more, see **www.startmetconnect.nl/scenario2040**.

CONNECT2030 was published in September 2022. It is not intended to replace, succeed or elaborate on CONNECT2025; it is a stand-alone medium-term outlook, but with a timeframe that extends beyond 2025. For more, see **www.startmetconnect.nl/connect2030**.

The first Techathons organised by Techniek Nederland and its partners in 2019 and 2021 connected seamlessly with CONNECT2025 and SCENARIO2040. During Techathon '22, you will also rely on these future outlook agendas, along with CONNECT2030. After all, the theme of this Techathon is very much in line with the major social developments in which the engineering sector is playing a crucial role. The approach chosen (teams comprised of companies and students) also reflects how crucial it is for business and education to work together on finding solutions to the major challenges we're facing. Basically, the Techathon is exactly what CONNECT2025, SCENARIO2040 and CONNECT2030 represent!

1.2 Organisation of the Techathon

Techniek Nederland is responsible for organising the event, in partnership with other centres of expertise in the engineering sector (Wij Techniek, ISSO and TVVL) and the Municipality of Amersfoort.

1.2.1 About the engineering sector:

The engineering sector is uniquely positioned to apply technical advances in practice and therefore make them socially relevant. Important sector organisations include:

- Techniek Nederland is the business association for technical service providers, installation companies and the technical retail sector. Techniek Nederland represents more than 6,300 companies and is a significant factor as one of the largest employers' organisations in the Netherlands.
See **www.technieknederland.nl**.
- Wij Techniek is the engineering sector's development fund. Wij Techniek encourages and supports all professionals in this sector to develop their talent and knowledge to the full and to use it for a future-proof living environment. See **www.wij-techniek.nl**.
- ISSO shares knowledge with professionals. Professionals turn to ISSO for reliable know-how for their projects or issues. They want to progress, learn more and solve problems because better buildings are built on better know-how. See **www.isso.nl**.
- TVVL is the number one independent platform for high-quality knowledge development in installation technology in the built environment. TVVL takes a solution-orientated approach to the technical challenges of the future. See **www.tvvl.nl**.

1.2.2 About the Municipality of Amersfoort

Amersfoort is a medium-sized municipality with approximately 157,000 inhabitants. The municipality carries out tasks that have a direct impact on the city's residents. This covers a broad range of tasks: the municipality accommodates schools, makes zoning plans for the urban area and makes sure household waste is collected. One of the municipality's key tasks is fleshing out the details of area development, such as how much space should be reserved for business, housing and nature. As Amersfoort grows, the way this scarce space is used is becoming ever more important. Many people need housing, both permanent and temporary (refugees).

At the same time, the municipality must also make sure developments in the city are sustainable. By 2050, the municipality plans to be free from natural gas, generate sustainable electricity on a large scale and consume much less energy. The municipality is also responsible for ensuring new buildings are sustainable, including circular construction principles and materials use. In Amersfoort, all these sustainability challenges are classified under 4 pillars: the energy transition, the circular economy, sustainable mobility, and climate adaptation and greening. Together with colleagues from other departments, care is taken to ensure that area development projects use sustainable models. All these challenges come into play in the development or repurposing of a district or neighbourhood. **Hoefkwartier** is a good example, which is why it's the star of Techathon '22.

1.3 Groenbalans

Organising the Techathon will result in the emission of 15 tonnes of CO_2. These emissions are being offset with a donation to the Kariba National Park Forest Conservation project in Zimbabwe. The aims of this project are to prevent deforestation, improve the quality of the forest and teach the population to provide for their livelihoods in an eco-friendly and sustainable way, while maintaining their own traditional lifestyle. This project will boost employment, education and health, and help conserve flora and fauna.

Groenbalans is taking care of the donation to this project. This independent, specialist consultancy provides advice on sustainable energy, energy savings and CO_2 compensation. The result is a carbon-free enterprise.

HOEFKWARTIER

2. THE HOEFKWARTIER DISTRICT IN AMERSFOORT

The Hoefkwartier district is at the centre of Techathon '22. This area mainly comprises offices and educational buildings, but vacancy rates are high. It's an attractive location, but some of the existing building stock is outdated and not up to current standards. It's not easy to adapt this building stock, because it was designed for specific functions and lacks flexibility. The supply (the current building stock) no longer matches the demand.

The municipality and real estate parties hope to integrally transform Hoefkwartier, which was built in the late 1980s, into a lively and pleasant city district where people can live and work. The ambitious task is therefore to create a future-proof district for 3,500 residential units with space for housing, education and offices.

2.1 Ambitions & considerations

The ambition for the Hoefkwartier district:
Hoefkwartier will become a lively part of the city. We want it to offer a broad mix of work functions. Besides offices and business premises, there is also space for healthcare, education, culture and other facilities. Mixing functions creates more variation and space for housing.

There are high and very varied expectations regarding the transformation of the district. Residents want to be able to live, work and move around comfortably and safely. The municipality has aspirations to disconnect this district from natural gas. Real estate parties want their properties to increase in value, to be easy to rent out and to be designed in a way that requires little maintenance.

The zone to the south of Hoefkwartier between the Liendert and Rustenburg districts was never built on because it was formerly used as a drinking water catchment area. Water extraction ended in 2003.

The Water Extraction Area Green Management Plan has helped turn this green belt into an attractive nature reserve with a variety of flora and fauna. The arrival of approximately 3,500 residential units could put enormous pressure on the vulnerable nature reserve. The water company is concerned about the future of the former water catchment area, the sewage system and the effects of climate change. It is interested in how this district can contribute to water robustness.

The distribution network operator says that the electricity grid has reached its local limits.

After the redevelopment, Hoefkwartier will be used for different purposes and mobility patterns will change. This will affect car use and parking. To prevent traffic problems and safeguard the quality of life, space for 'free' parking will soon disappear, and shared cars, bicycles, minibuses and public transport will be made available. How are we going to implement these mobility concepts, and what will it deliver at the end of the day?

The Techathon is therefore about making an integrated plan for the future in which all these aspects and many others are interwoven.

2.2 A future-agile district

The district will not be transformed just once, but must also be able to adapt to economic or social developments in the future, and respond to the demand for new functions or services. We call this 'future agility'. Designing buildings and homes
 without limiting them to a single function allows them to be used for other demographic target groups and activities/purposes (living, working, recreation) if necessary. By consistently applying this principle, the value and range of purposes for which this area can be used will only increase.

CONNECT2030 **(www.startmetconnect.nl/connect2030)** describes various relevant developments, innovations and examples of solutions that have an impact on the transformation of this area.

2.3 Feasibility during the transformation phase

Another factor to be considered is that the district must be thoroughly transformed in the next 5 years. How are we going to organise this in a practical way, and with whom, without the district becoming clogged with construction traffic? Inaccessible for commuters who still work there, and a headache for residents heading in the other direction? How do we limit noise and traffic nuisance? How do we mini-mise the number of vehicle movements needed for a transformation, and in what order do we carry out the work?

2.4 Development vision

The Municipality of Amersfoort has formulated its development vision for large-scale area transformations in the structural vision document De Hoef West (old working name). These principles are as follows:

1. We are a diverse city. We encourage social diversity to strengthen the urban character;
2. We are a sustainable city. In 2030, we'll be a carbon-neutral city and use cradle-to-cradle principles;
3. We want to create value. A new development adds value (physical, spatial, social and economic) to the city, so no loss of value elsewhere;
4. We adopt a local perspective that takes into account the local context. We're building on existing qualities, and new developments must be integrated accordingly; Flexible, sustainable, and in line with a need, but without causing hindrance, competition or conflict with locals.

The development vision for Hoefkwartier was subsequently embedded in the Development Framework (2019):

FIJNMAZIG, VERBONDEN EN BENUTTEN
Benutten van bestaande kwaliteiten, verbonden met de omgeving en toevoegen van fijnmazig doorwaadbaar netwerk

SLIM VERKEERS- EN MOBILITEITSSYSTEEM
Ruim baan voor fiets en voetganger, mobiliteit als dienst (MaaS) en een optimaal functionerend en aantrekkelijk OV-knooppunt.

LEVENDIG, GROEN EN COMPACT
Levendige, groene openbare ruimte en compacte 'Hoefse' architectuur.

GEMENGD EN INCLUSIEF
Een gemengde stadswijk waarin gewoond, gewerkt, geleerd en gerecreëerd wordt; een wijk voor iedereen.

DUURZAAM EN GEZOND
CO2-neutrale, circulaire, klimaatadaptieve en gezonde leefomgeving.

3. THE QUESTION POSED AND IMPORTANT DEVELOPMENTS

The Municipality of Amersfoort and the regional parties are convinced that combining the various tasks, challenges and ambitions described in Chapter 2 of this booklet is an opportunity to add value. They would like to be challenged by the Techathon '22 participants to look for innovative solutions based on ambitions.

3.1 The question posed

Techathon '22 poses the following question:

How can the Municipality of Amersfoort transform the Hoefkwartier district from an office area with a fairly functional layout to an area with a pleasant residential and living environment that meets 21st-century needs?

3.1.1 Considerations related to the question posed

1. Repurposing buildings and improving some connections is not enough.
2. A broad view of the transformation in which multiple challenges are combined, tackled and solved requires new innovative ideas, collaboration and solutions.
3. If combined solutions for various area challenges and implementation are carried out in a logical sequence, the chances of realisation are increased.

3.1.2 Programmatic challenges that have to be resolved

1. Approximately 3,500 residential units (a blend of housing types: flats for the elderly, starter homes, spacious flats for families and owner-occupied homes, with at least 35% social housing in the area as a whole; this is not necessary at individual building level).
2. Repurposing commercial buildings for residential use is permitted everywhere; take into account future changes in the functions of buildings.
3. Educational and work facilities (schools, learning workplaces); approximately 5,000 workplaces are needed.
4. The campus environment (SOMT) offers opportunities for a mixed programme of education, housing and business.
5. There are opportunities to connect public green spaces and other areas around the former water extraction area.
6. The district must discourage car use: fewer parking spaces (50% less than the parking standard) and deployment of mobility-as-a-service (shared transport).
7. Very limited retail trade in the plinth of buildings (up to 10% of GFA, with max of 250 m²).
8. No heavy industry.

3.2 Developments relevant to the challenge

In addition to the known challenges in the area, there are other tasks that must be tackled at the same time and embedded in the plan you elaborate for Techathon '22. These are ambitions that are linked to European or national plans, guidelines or obligations, and that will impact the details of your proposals. It concerns the following:

1. Climate adaptation
2. Circularity
3. Energy
4. Mobility & Transport
5. Spatial Quality & Liveability
6. Joint Value Preservation & Development
7. Digitalisation

3.2.1 Climate adaptation

The redevelopment of the Hoefkwartier must take into account and find solutions for various extreme situations that can occur as a result of climate change. This concerns various aspects, such as drought, which has consequences for nature and the groundwater level. It can cause problems such as subsidence and damage to the structures of buildings and roads. Other things to consider are flooding due to heavy showers which overload the drainage system, of extreme heat that can seriously affect the quality of life in buildings and in public spaces, and lastly flood risks from specific water bodies.

The hotter summers result in an increased risk of heat stress. To prevent homes getting too hot, an additional requirement has been added to the NZEB ('Nearly zero-emission building', BENG in Dutch): TOjuli (Temperature Exceeded in July). TOjuli is an indicator for reducing the risk of heat stress. Since 1 January 2021, an environmental permit may only be granted if the TOjuli value does not exceed 1.20. The TOjuli is derived from the Energy Performance Calculation according to the NTA 8800 (NZEB).

3.2.2 Circularity

Hoefkwartier forms the heart of the circular and area-orientated transformation of the Municipality of Amersfoort. Two of the three most important circular principles will be pursued as much as possible; circular construction and renovation as the new normal, and closed product cycles in the region.

The sophisticated sequence of tasks means donor projects in Hoefkwartier can serve to kickstart the circular ambitions. Smart choices are required to encourage maximum reuse, and products will be refurbished, adapted or reused without leaving the transformation area.

Existing buildings will be reused and/or transformed as much as possible through urban mining, and dismantled according to circular guidelines. New buildings will be designed in a circular and conceptual manner that allows them to be dismantled and rebuilt. We will keep the MPG (Environmental Performance of Buildings - 'Milieu Prestatie Van Gebouwen') standard as low as possible. All building materials will be zero-emission and it will have to be possible to separate all materials in any subsequent demolition or renovation.

Commercial developers are often initially opposed to a more extensive disassembly or demolition process, but they may be persuaded otherwise if it's better for the environment and no more expensive. Those commercial developers who do try this often become enthused, or more enthused, about a more circular approach to demolition because fewer valuable products are thrown away. Some developers are even studying if they can reuse building products to be sold in their own projects (as a basis for circular design & construction). Reuse in the same place is particularly beneficial, both for the environment (less transport) and for expenditure (no storage, sales or purchasing costs).

The Material passport concept could be considered, as it specifies how a structure is put together and means it's easier to take apart again. A format for Amersfoort is currently being worked on that will register materials used in construction. In this Tech-athon challenge, we're looking for a practical form of information storage that is future-proof and makes future reuse possible.

It's useful to be aware that Amersfoort has had a re-cycling centre for building materials since 2015 and a 'Retourboulevard' (for upcycling). The Municipality of Amersfoort does not intend to establish a circular hub in the Hoefkwartier, but it's perfectly logical that market parties might set this up before the transfor-mation period.
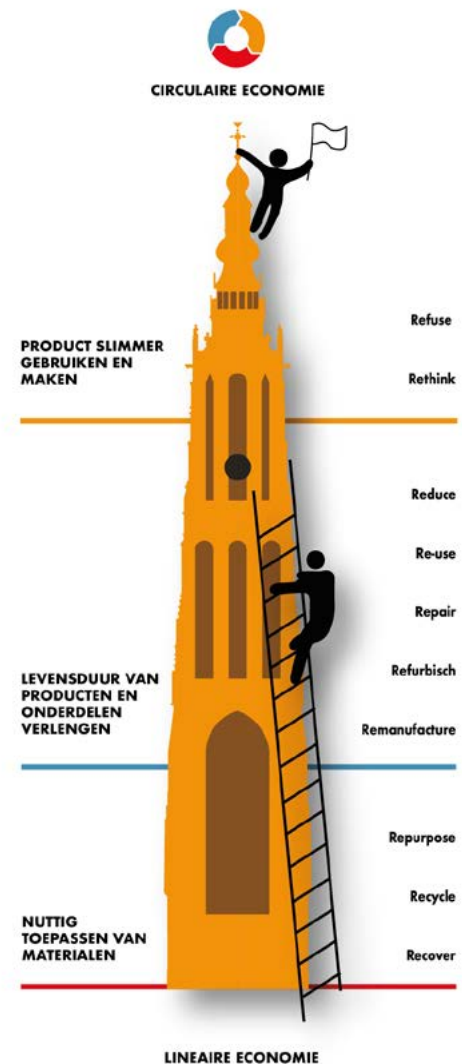
Figure 1 The Municipality of Amersfoort's circularity ambition & strategy.

CIRCULAIRE ECONOMIE

PRODUCT SLIMMER GEBRUIKEN EN MAKEN

LEVENSDUUR VAN PRODUCTEN EN ONDERDELEN VERLENGEN

NUTTIG TOEPASSEN VAN MATERIALEN

Refuse

Rethink

Reduce

Re-use

Repair

Refurbisch

Remanufacture

Repurpose

Recycle

Recover

LINEAIRE ECONOMIE

The Municipality of Amersfoort wants materials with a low environmental impact to be used, and applies the following principles in this respect:

- Promote the use of biobased material such as wood, hemp, flax and straw. This applies to new construction, but also to repurposed buildings and extensions to existing buildings. With light, circular materials, current buildings can be extended, for example.
- Use materials with the lowest possible MPG score.
- Use secondary material as much as possible. Preferably expressed as a share of the total weight or percentage of building materials used.
- Guarantee a long service life through, for example, return or reuse guarantees with no get-out clauses.
- Sustainable concrete. In the Concrete Agreement signed by Amersfoort, it was agreed that eventually 100% of released concrete would be used for high-quality applications; replacing at least 5% of the total volume of aggregates with concrete waste and retaining 100% of the concrete in the chain.
- Industrialised conceptual construction reduces transport and use of materials. This speeds up production, optimises the quality of homes and minimises waste and residues during production.
- Investigate options for pre-fabrication and on-site assembly.
- Circular demolition. The municipality has drawn up a Circular Demolition Guideline for developers who are redeveloping buildings and areas where existing buildings are used as 'donor buildings' for new construction.
- Use local donor materials as much as possible.
- Use clean, lightweight construction equipment.
- Use circular construction tools to measure performance such as BREEAM, WELL and GPR.
- Dismantability index: Amersfoort encourages the use of a 'Dismantability index' that encourages the use of objects that can be dismantled in buildings, so that the object can retain its function and is suitable for high-quality reuse.
- The municipality encourages the use of certified wood from sustainable sources in all projects.

3.2.3   Energy

Energy management objectives have been included for the transformation of Hoefkwartier. The intention is that Hoefkwartier is redeveloped into a fossil-free area; no more fossil energy sources will be used. Heating and electricity needs will have to be resolved differently.

The goal is energy-neutrality inside the Hoefkwartier area on an annual basis. This means that the annual balance sheet is at least zero and preferably positive. In view of the desired blend of functions and the available potential for collective generation, storage, conversion and consumption, this challenge require further elaboration. Answering 'How can upgrading the grid be avoided by saving energy and adopting smart solutions between generators and consumers?' requires a creative approach.

Thanks to the new Dutch Energy Act, collectives can generate, sell and respond to flexibility demands themselves when energy supply and demand are unbalanced.
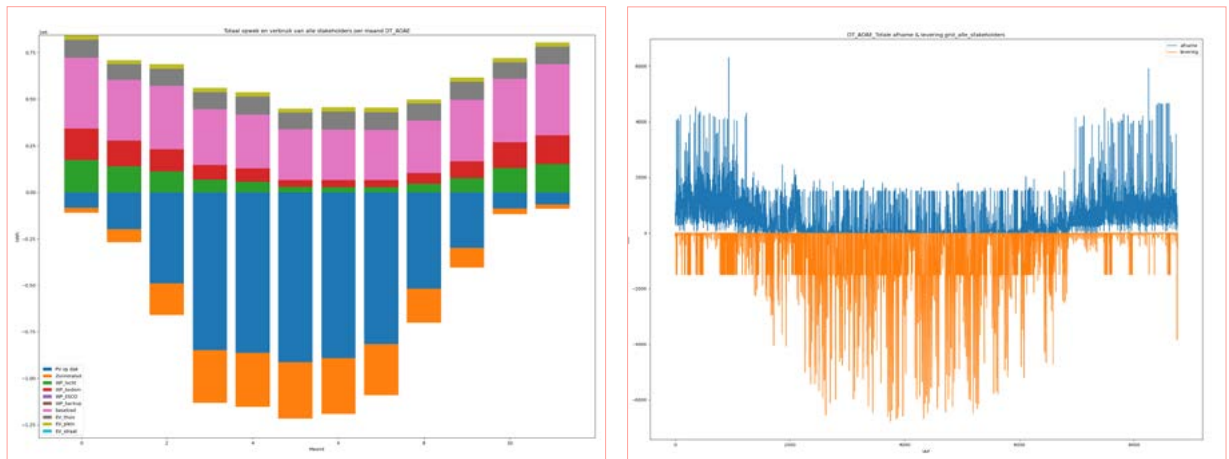

Figure 2 Example of a local energy system for a residential area designed to zero-emission building (ENG) standards and that is net-zero on an annual basis, but requires continuous coordination due to a combination of different generation, storage and consumption profiles (TNO, 2021).

Requirements for buildings in the Hoefkwartier are determined by the NZEB. Since January 2021, the energy performance of new buildings is determined by:

1. **NZEB-1:** the maximum energy requirement in kWh per m² of usable surface area per year.
   NZEB-1 requirement: Energy requirement is 10% stricter than the legal minimum for residential construction.

2. **NZEB-2:** the maximum primary fossil energy consumption, also in kWh per m² of usable surface area per year. This is the sum of primary fossil energy consumption for heating, cooling, hot water and fans. Primary fossil energy can be seen as the energy content of the fuel in the power station. Primary fossil energy consumption also takes into account losses, auxiliary energy and efficiency of the system; this is not the case with the energy requirement.
   NZEB-2 requirement: Primary fossil energy consumption 0 kWh/m².

3. **NZEB-3:** the minimum percentage of renewable energy (at building level). Each project is asked to generate a percentage of sustainable energy locally (NZEB 3). In this respect, both direct generation, such as via solar panels or collectors, as well as the use of heat from something like a heat network, the soil or the air via a heat pump, are counted. The share of renewable energy is determined by dividing the amount of renewable energy by the total of renewable energy and primary fossil energy consumption.
   NZEB-3 requirement: Percentage of renewable energy ≥ 100%.

For additional information, see the Covenant on Sustainable Housing of the Province of Utrecht in Attachment 2 and on the site **https://toekomstbestendigbouwen.nl/#convenanten**.

3.2.3.1 Electricity
Hoefkwartier contains one substation belonging to distribution network operator Stedin for the entire current commercial area. Maximum capacity is expected to be reached in 2027 based on the known catchment area of this substation. There is no room for local expansion.

In the Regional Energy Strategy, (1.0) Hoefkwartier was designated as an area with great potential for large-scale solar energy generation on roofs and car parks. The distribution network operator has said that it wants to work intensively with market parties on implementing local innovation and flex solutions in the coming years to limit the impact of the energy transition on the grid.

3.2.3.2   Heat

The Heat Transition Vision drawn up by the Municipality of Amersfoort (September/October 2021) foresees that Hoefkwartier will switch to a CO_2-neutral alternative to natural gas. As an alternative to directly saving energy, heat can be obtained from sustainable energy sources such as the ground, surface water (5th generation heat networks) or electricity generated sustainably by the wind or sun. Hoefkwartier offers an ideal opportunity for linking various systems that can be developed collectively, such as Heat-Cold storage.

The potential for using open and closed geothermal energy systems to meet heating and cooling demands based on the future sources has been mapped out for Hoefkwartier. The sources can sufficiently meet the demand, but their locations do require integration and cooperation between different local stakeholders, as can be seen on the map in Figure 3. Usage rules have been drawn up for this. Duurzaam Opwekken Amersfoort BV and Tullip Energy have launched a study into geothermal energy in the Municipality of Amersfoort. It is unclear whether these sources will become available quickly enough, or what their capacity might be. Duurzaam Opwekken Amersfoort is also working on setting up a heat network from the Hoef Oost industrial area to the city (Sustainable Energy Installation).
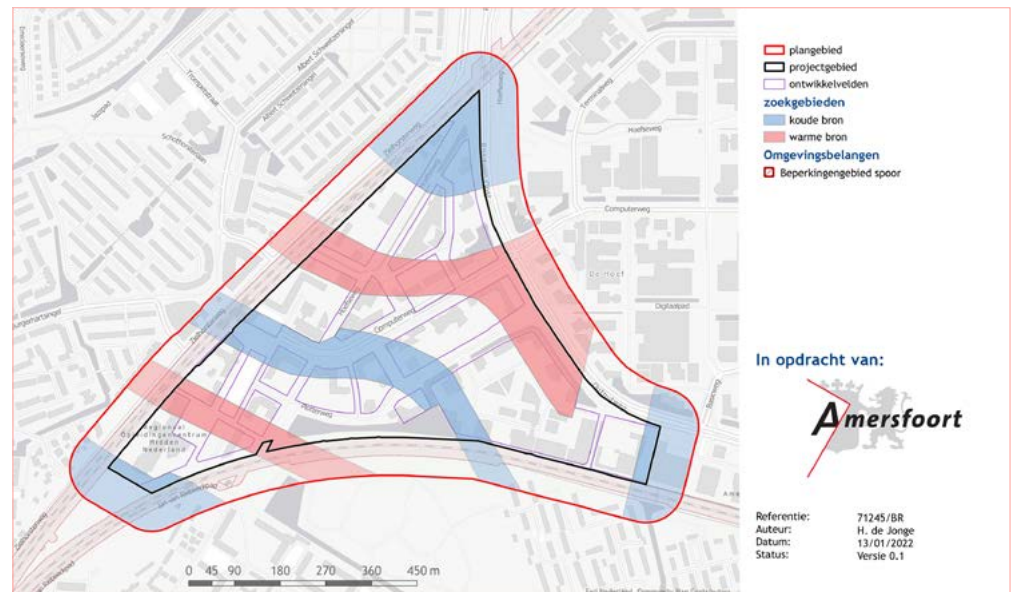

Figure 3 Map of the soil energy system (de Hoef soil energy plan, April 2022, IF technology BV).

Another heat source is small-scale solar thermal (linking PVT hybrid panels to a heat network or storage). Solar thermal systems can be installed collectively or individually.

3.2.4 Mobility & Transport

The possibilities of new mobility systems based on various fossil-free/zero-emission solutions place demands on the local infrastructure. Parking needs and patterns, charging stations, charging areas and advances in bidirectional charging provide opportunities for interaction in the energy system and space for new opportunities and solutions. It's assumed that excess energy can be stored in mobility systems and consumed in a controlled manner

Since March 2020, it has been mandatory across the Netherlands for residential buildings with more than 10 parking spaces on the same site to lay pipeline infrastructure (empty pipes) for each parking space so that new charging points can be installed. This rule applies to new residential buildings and existing residential buildings that undergo major renovation. Opportunities for linking sustainable mobility and energy generation can be created by generating solar energy in parking spaces. It should be noted here that the current planning envisages a limited role for generation via parking spaces as cars will be discouraged in Hoefkwartier.

Companies and services in this area will benefit from interesting developments in 'last-mile' delivery services and logistics hubs, with the aim of offering emission-free logistics services and the smart bundling of goods flows.

Transport by rail may be disregarded. It must be borne in mind that movements of all construction traffic required for the transformation must be limited to a minimum and be zero-emission as much as possible (in connection with particulates and nitrogen).

The Municipality of Amersfoort will not provide sub-concepts for mobility but does want to facilitate this. Parking requirement (in the numbers of spaces) can be further limited by introducing mobility-as-a-service.

3.2.5 Spatial Quality & Liveability

The idea is to transform Hoefkwartier into an attractive environment for diverse target groups that use the facilities and public space. Access to Hoefkwartier for people and animals will be maintained or improved. The needs of the different target groups will vary according to the times of the day. A broad mix of infrastructure is required for this. There are opportunities here for integration with other goals that play a role in this area, such as water storage or climate robustness.

It's important that the infrastructure stimulates residents and visitors to be active and interact socially and that street furniture design creates a safe space and prevents criminal behaviour. The ways in which public green spaces are designed can play a role in preventing people, animals and buildings suffering heat stress and limit the 'heat-island' effect.

Nature requirements:
- Lighting plan designed to allow nature to function undisturbed
- Green roofs and gardens with many native plants and minimal paved surfaces, built-in flower boxes on the balcony and insect hotels.
- Natural fencing with sufficient shelter for ground animals, e.g. a hedge with at least three different shrubs.
- Facilities for bats, nesting facilities for birds, habitats and wintering places for amphibians, biotope for aquatic insects.

3.2.6 Joint Value Preservation & Development

In essence, the transformation of Hoefkwartier must offer stakeholders long-term value. The municipality has announced that it will participate once, but is asking existing property owners and users to contribute; after all, they too will benefit from this transformation. Due to the diverse target groups in this area, such as businesses, public services (education, welfare, care), corporations, commercial real estate parties, tenants and buyers of homes, there is a need for collaboration and for this collaboration to be organised. The challenge is to take all these stakeholders into account and get them on board at the right moment so that the area transformation is successful.

Opportunities will be created for new business models related to demolition, reuse, mobility and energy, so property owners will be encouraged to make future-proof investments. Spatial quality will also be the subject of investments; another area which offers stakeholders a new perspective and ways of earning money. Circular propositions promote value retention and the district is expected to increase in value as a result of the transformation.

There are several ways to organise these processes. Examples include role-playing games, serious games and other possibilities to uncover individual and collective interests in an area transformation. On the basis of this, the steps necessary to formulate joint technical and other solutions and to think about the sequence of the work can be taken.

3.2.7 Digitalisation

Timely coordination is important between all active parties in Hoefkwartier. The challenge is to develop a plan from a joint starting point and inventory, in which different stakeholders and disciplines can coordinate, plan and direct matters with each other. Examples include reusing components or materials, jointly developing energy concepts and coordinating construction work to prevent nuisance.
Based on the joint inventory, sub-projects will be defined and separated from the main project and then elaborated, optimised and implemented by the stakeholders separately in their chains.

After commissioning, the use, management and maintenance stage begins, possibly followed by demolition. Questions that play a role here: what are the possibilities for digitally recording as much information as possible during development, then using and enriching it and transferring it to building and infrastructure management systems?

4. RESULTS, ASSESSMENT CRITERIA, JURY AND PRIZE

4.1 Results

During the Techathon, you'll work on a plan for Hoefkwartier. At the end of the day, each team will hand in a 3-pager with a description of the solution and present it to the jury and the other teams. The jury will base its verdict on the 3-pager and the pitch.

4.1.1 The pitch

A brief (three-minute) presentation. You and your team can decide how you want to present your solution, so choose a way with which you can be as convincing as possible in three minutes, and don't forget the substantiations:

- How does this project help solve the various challenges in Hoefkwartier and Amersfoort?
- What opportunities lie in or around this area and thus given extra attention?
- What are the major challenges in this area and thus given extra attention?
- How can you potentially tackle these major challenges (in outline)?
- What dilemmas does this entail, and what choices do you make?
- How are integral considerations made between the challenges?

The presentation should strike a healthy balance between the result and the steps needed to get there. After the pitch, the jury can ask 1 or 2 questions.

4.1.2 The 3-pager

In addition, you and your team submit a 3-pager with a description of the team's solution in more detail. Each team will receive a form for this (the same form for everyone, see Attachment 1). See Attachment 3 for inspiration; it contains more information about drawing up a sustainability vision.

You can add visual material to your plan (drawings, sketches, conceptual layout, etc.) and show this during the pitch. You can attach up to two pieces of visual material to the 3-pager.

4.2 Assessment criteria

What kind of submission will get us excited? The assignment is deliberately designed to bring many different issues together that can all be solved. This offers both opportunities and limitations.

To determine how 'good' a solution is, we look at the **result** as the **first criterion**. In this Techathon, we'll be looking closely at the criteria laid down in the Covenant on Sustainable Housing of the Province of Utrecht which covers Amersfoort. See Attachment 2 for this, and the site **https://toekomstbestendigbouwen.nl/#convenanten**.

The covenant deals with the following topics:
- Energy
- Circularity
- Sustainable mobility
- Climate adaptation
- Nature inclusiveness and biodiversity
- Healthy living environment

We expect the chosen solutions to at least meet the bronze requirement (see Attachment 2) and that they distinguish themselves by aiming to score higher on various sub-topics. It's important to indicate how you intend to achieve these requirements, so make a plausible case for how your solution responds to what was requested for the topic. Look particularly closely at the links between the various topics and how these are integrated.

The **second criterion** used for the assessment of the entry is the **action plan for transforming the area**. This action plan is necessary to assess the feasibility of the plan and how you intend to tackle any practical problems encountered. The action plan explains your ideas about how daily life will be able to continue during transformation of the area and answers the following questions, among others:
- In what order and with what steps will the plan be implemented? How do we get all the stakeholders on board?
- How do we combine practical interventions with minimum nuisance for employees, residents and visitors?
- What quantity of materials, raw materials and energy will have to be supplied to and removed from Hoefkwartier (from outside the district) and how much can be reused, stored, generated and distributed without leaving the redevelopment area?
- How can changes to the assignment (other functions/target groups) caused by social developments be incorporated into the process and the result?
- How are the costs and benefits of the transformation distributed among stakeholders? How do we accrue value in this area, and how do we distribute it among stakeholders (both now and in the long-term)?

The **third and final assessment criterion** is **the potential to roll-out the solution in other areas**. The solution sought has to respond to the question posed, but can also be used in other areas facing the same type of issues. What learned lessons can we take away and use more often for other assignments?

4.3 Composition of the jury

The jury includes the following:
- Teun Bokhoven, chair of TKI Urban Energy and board member of TKI Bouw & Techniek
- Saskia Hesselink, senior policy officer for the energy transition in the built environment at the Netherlands Ministry of the Interior and Kingdom Relations
- Astrid Janssen, Alderperson for Housing and the Energy Transition at the Municipality of Amersfoort
- Remco van der Linden, Director of Technology & Market at Techniek Nederland

4.4 What can you win??

Everyone who participates in the Techathon will enjoy a unique experience. Companies and students will get to know each other and boost their profiles. But there can only be one winner! Besides eternal fame and glory, the winning team will win a considerable cash prize and other items related to the subject.

5. PROGRAMME

5.1 Techathon '22 programme

The programme on Thursday, 10 November 2022 is as follows:

From 7:30 am	Arrival and reception
8:30 – 9:00 am	Official opening: • Jacques van der Krogt, chair of Techniek Nederland's Innovation Committee • Doekle Terpstra, chair of Techniek Nederland • Lucas Bolsius, Mayor of the Municipality of Amersfoort
9:00 am – 12:00 pm	Teams work on the issue
12:00 – 1:00 pm	Lunch, in team rooms
1:00 – 3:30 pm	Teams work on the issue
3:45 pm	Teams submit their 3-pager with the description of the solution by 3:45 pm at the latest
3:45 – 4:45 pm	Teams prepare for the pitch
4:30 pm	Teams submit their presentation/visual material for the pitch no later than 4:30 pm
5:00 – 6:00 pm	Presentation of the ideas - pitches from all participating teams
6:00 – 6:30 pm	Drinks and jury deliberation
6:30 – 7:00 pm	Announcement of the winning team and closing speech by Erik van Engelen, General Director of Techniek Nederland and Astrid Janssen, Alderperson at the Municipality of Amersfoort
7:00 – 8:00 pm	Buffet

5.2 **Notes about the programme**

During the Techathon, we will of course take into account any Covid-19 measures applicable at the time. We're now well aware how suddenly Covid-19 can turn things on their heads, so we'll have to act quickly if the situation changes. Keep an eye on your inbox in the run-up to 10 November. We'll let you know if there are any changes to the day's programme.

5.2.1 Arrival and reception

You are welcome at Playground 33 from 7:30 am, where there will, of course, be coffee waiting for you. You can get settled in your assigned team room with the rest of your team to get know each other better and go through the strategy for the day. Make sure to register at the entrance no later than 8:15 am because the official programme will start at 8:30 am sharp!

Please note: we'll ask you to complete a 'declaration of use of images' during registration. This grants the organisers permission to use photo and film material that is taken during the day and might feature you. The photographer, vlogger and filmmaker will be recording images throughout the day, including when you're working in your team room

5.2.2 Official opening

The opening will start at exactly 8:30 am in the central area of Playground 33.

5.2.3 Teams get to work on the challenge

After the opening, you'll really get down to some hard work with your team! You can work on your solution undisturbed in your team room. Each team room will have a work table, a whiteboard or flipchart, and a beamer or large screen on which you can work together. Wi-Fi will be available.

Please note: the team rooms can't be locked, so don't leave any valuables behind if the whole team leaves the room.

5.2.4 Lunch and snacks

Food and drinks will be provided during the day. Snacks will be delivered to the team rooms during the morning and afternoon. Lunch will be ready at 12 noon. If you want, you can make it a working lunch in the team room!

5.2.5 Teams submit 3-pager and pitch material

Someone from your team should send the 3-pager (in Word, Windows) with the elaboration of your solution to the organisers no later than 3:45 pm (email to **info@startmetconnect.nl**). Up to two pieces of visual material may be attached (send in PDF format).

The jury will use the 3-pagers to prepare for the assessment of the solutions. You then still have time to complete your presentation (such as a PowerPoint presentation, but please note! Do not use a black background and letters that are too small, the ratio must be 16:9). Hand it in on a **USB stick** by 4:30 pm at the latest to the organisers in the 'nerve centre', because presentations start at 5:00 pm. You can also submit it earlier, of course!

All teams are therefore expected to assemble at 5:00 pm in the central area of Playground 33.

5.2.6 Presentations

At 5:00 pm, each team will have 3 minutes to present their solution one by one to the jury. One or at most two team members may make the presentation on a stage set up for that purpose. There will be a microphone available and a screen for your presentation. After the presentation, the jury may ask one or two questions per team.

All teams will be present in the room so all participants and the jury can see the pitches, but also by a larger audience, as we'll be streaming this part of the Techathon live. That means others interested in the event, perhaps from your company or school, people who work in the sector or family and friends, can watch events unfold live. Livestream: **www.tnl.nu/techastream22**

Please note: the pitches, videos and the forms with a description of the solution will be made available to Techniek Nederland, which reserves the right to publish the videos, 3-pagers and any attachments. The background material (sketches and drawings, elaborations in Excel, etc.) belong to the team or company behind it and will not be shared.

5.2.7 Drinks, buffet and announcement of the winning team

After the presentations, the jury will withdraw for deliberation. At the same time, drinks will be served in the central area of Playground 33.

At around 6:30 pm, the jury chair will announce the winner of Techathon '22! The day will be closed by Erik van Engelen, general director of Techniek Nederland, Astrid Janssen, alderperson for the Municipality of Amersfoort and Jacques van der Krogt, chair of the Techniek Nederland Innovation Committee.

Afterwards, a buffet will be available for all those present.

6. PRACTICAL INFORMATION ABOUT THE DAY

6.1 How can you prepare?

Read the information in this booklet carefully in the weeks before the Techathon. You are, of course, free to do some research so you thoroughly understand the question posed and the situation. In fact, it's highly recommended because the competition is fierce! You can also consider getting to know your team members in person or remotely before the Techathon so that you can make a flying start on the day itself. Maybe something for which your team captain can take the initiative?!

You can, of course, have a look around Hoefkwartier, the district at the centre of this Techathon. However, to give everyone an idea of the district and the challenge, we have also produced a vlog. Let our vlogger Joshua guide you around the area, together with Jesper from the Municipality of Amersfoort! Link to the vlog: **www.tnl.nu/tech22opdracht**

Below is a list of some websites that could help you in your preparations:
- **www.startmetconnect.nl/techathon**
- **www.startmetconnect.nl/connect2030**
- **www.startmetconnect.nl/connect2025**
- **www.startmetconnect.nl/scenario2040**
- **www.technieknederland.nl/circulair**
- **www.klimaatakkoord.nl**
- **www.circulairebouweconomie.nl**
- **www.hollandcircularhotspot.nl**
- **https://hoefkwartier.nl**
- **www.amersfoort.nl/parkeernormen**
- **https://www.rvo.nl/onderwerpen/wetten-en-regels-gebouwen/milieuprestatie-gebouwen-mpg**
- **https://app.pdok.nl/viewer/**
- **https://www.rvo.nl/onderwerpen/wetten-en-regels-gebouwen/epbd-iii/laadinfrastructu-ur-elektrisch-vervoer**
- **www.digigo.nu**

6.2 What you'll need during the day itself

Don't forget to bring:
- A charged mobile phone and charger plug.
- A laptop (Wi-Fi is available, password can be found in the relevant room).

And naturally, all the other things you still think you'll need for the substantive work and the pitch!

6.3 Presence and accessibility of the organisers

The organisers will be present all day. A 'nerve centre' will be set up in the central area of Playground 33, where the organisers can be found during the Techathon. Contact them with any practical questions and queries about the programme. You can also send an email to info@startmetconnect.nl.

6.4 Assistance with content

The Municipality of Amersfoort is 'the client/contracting authority' in this Techathon, so there will be people from the municipality present all day. You can turn to them with questions about the district and assignment, for example. There will also be experts from the engineering sector on hand
who can answer your technical questions. You can also find them via the nerve centre in the central area.

6.5 Location

Playground 33
Disketteweg 1
3821 AR Amersfoort

Playground 33 is easy to reach by public transport. Amersfoort Schothorst station is a
2-minute walk from Playground 33.

If you come by car, you can park in the car park at the front of ROC Midden Nederland (set navigation to Disketteweg 1).

6.6 Overview of participating teams

The following teams are participating in Techathon '22:

- Team 1: Antea – Avans University of Applied Sciences – Curio Breda
- Team 2: Croonwolterendros – The Hague University of Applied Sciences - MBO Rijnland
- Team 3: Dura Vermeer – Arnhem Nijmegen University of Applied Sciences – ROC Rijn IJssel
- Team 4: Equans – Rotterdam University of Applied Sciences – Koning Willem I College
- Team 5: Kuijpers – University of Applied Sciences Utrecht – King Willem I College
- Team 6: Movares – University of Applied Sciences Utrecht – ROC Central Netherlands
- Team 7: Spie – tbd – King Willem I College

ATTACHMENT 1

Form for the solution description (3-pager)

The jury assesses each team's solution on the basis of this 3-pager and the pitch. The 3-pager must contain the elements below. Obviously, it must be no more than three pages long, so pay attention to the maximum number of words per part (this will be checked)! Do not include any tables, graphs or illustrations in the 3-pager, attach them to your pitch.

Name and number of your team ('Company | University of Applied Sciences | MBO'):

Title of solution/presentation:

Summary
Use up to 150 words to describe the solution proposed by your team. If necessary, outline the timeline of your proposed measures.

The result
Use up to 400 words to describe to what extent the solution offered is in line with the Covenant on Sustainable Housing of the Province of Utrecht and meets the bronze requirement. Indicate how the requirements will be met, and in doing so, make a plausible case for how your solution responds to what was requested. Don't forget to look at the links between the various topics and how these are integrated!

Action plan for the area transformation
Use up to 400 words to describe your action plan using the information in the booklet. Remember that normal daily life will have to continue undisturbed while the plan is executed.

The potential to roll-out the solution in other areas
Use up to 400 words to describe the frameworks, conditions, principles and working methods that could be used repeatedly for upscaling.

Other information
Use up to 150 words to add any other information

Attachments

You can choose to add visual material (tables, graphs, illustrations, drawing, sketch, conceptual layout, etc) to the 3-pager as an attachment. Visual material (max. 2 attachments in PDF format) are not taken into account in the number of words of the 3-pager.

Attachment 1:

Attachment 2:

Contact person

Who can be contacted about the proposed solution after the Techathon?

Name:

Company/college/university:

Email:

Phone:

On the day itself, you will receive this form in a digital format that can be filled in.

ATTACHMENT 2

Assessment criteria

Assessment criteria for the Covenant on Sustainable Housing of the Province of Utrecht

Onderwerp	Indicator	Wettelijk	Brons [20]	Zilver [20]	Goud [20]
Energie	**BENG 1**: maximale energiebehoefte voor verwarming en koeling (in kWh/m2/jaar)	Grondgebonden: ≤55 Gestapeld: ≤65	Grondgebonden: ≤55 Gestapeld: ≤65	Grondgebonden: ≤52,5 Gestapeld: ≤61,8	Grondgebonden: ≤50 Gestapeld: ≤58,5
	BENG 3: minimaal aandeel hernieuwbare energie (in %)	Grondgebonden: ≥50 Gestapeld: ≥40	Grondgebonden: ≥100 Gestapeld: ≥80	Grondgebonden: NoM Gestapeld: ≥80	Grondgebonden: ≥ 125 Gestapeld: ≥100

Onderwerp	Indicator	Wettelijk	Brons [12/13]	Zilver [12/13]	Goud [12/13]
Circulair	**MPG-score**: versimpelde weergave LCA. Schaduwkosten in €/m2 BVO/jaar	0,8 (2021) 0,5 (2030)	0,75	0,50	0,20
	Massapercentage (%) van grondstoffen is non-virgin	Indirect in MPG	≥30	≥45	≥55

Onderwerp	Indicator	Wettelijk	Brons	Zilver	Goud
Duurzame mobiliteit	Parkeernorm (plaats/woning) in relatie tot afstand tot OV-knooppunt.	-	90% van parkeernorm per woning	75% van parkeernorm per woning	60% van parkeernorm per woning
	Laadpaalnorm (laadpaal/elektrische auto)	-	Publieke laadinfrastructuur groeit mee met de vraag. Alle inwoners zonder eigen parkeerplaats kunnen een openbare laadpaal aanvragen. Iedere nieuwbouwwoning met een oprit heeft loze leidingen voor het aanleggen van een laadpunt.	Publieke laadinfrastructuur groeit mee met de vraag en aanvullend worden er strategische laadlocaties ingericht. Alle inwoners zonder eigen parkeerplaats kunnen een openbare laadpaalaanvragen. Iedere nieuwbouwwoning met een oprit heeft loze leidingen voor het aanleggen van een laadpunt.	Publieke laadinfrastructuur groeit mee met de vraag en in iedere wijk zijn strategische laadlocaties ingericht. Alle inwoners zonder eigen parkeerplaats kunnen een openbare laadpaal aanvragen. Iedere nieuwbouwwoning met een oprit heeft loze leidingen voor het aanleggen van een laadpunt.

			Brons [15]	Zilver [15]	Goud [15]
	Loop- en fietsroutes	-	Realiseer toegankelijke, aantrekkelijke, logische, vindbare, veilige en comfortabele loop- en fietsroutes van en naar scholen, OV-haltes, winkelcentra en – indien van toepassing – parkeervoorzieningen op afstand [16].		Realiseer toegankelijke, aantrekkelijke, logische, vindbare, veilige en comfortabele loop- en fietsroutes van en naar alle belangrijke bestemmingen in het gebied [16].
	Deelmobiliteit	-	Stimuleer ontwikkelaars deelmobiliteits-concepten aan te bieden	Er dient een deelmobiliteitsconcept aangeboden te worden voor 25% van de bewoners.	Er dient een deelmobiliteitsconcept aangeboden te worden voor 40% van de bewoners.

Onderwerp	Thema	Indicator	Brons [15]	Zilver [15]	Goud [15]
Klimaatadaptatie	Wateroverlast	a) Waterberging privaatterrein b) Natuurlijke afwatering c) Waterdiepte d) Waterneutraal	Hevige neerslag (1/100 jaar, 70 mm in een uur) zorgt niet voor schade in en aan gebouwen, infrastructuur en voorzieningen.	Hevige neerslag (1/100 jaar, 70 mm in een uur) zorgt niet voor schade in en aan gebouwen, infrastructuur en voorzieningen.	Hevige neerslag (1/100 jaar, 70 mm in een uur) zorgt niet voor schade in en aan gebouwen, infrastructuur en voorzieningen.
			Bij hevige neerslag (1/250 jaar, 90 mm in een uur) blijven vitale en kwetsbare infrastructuur en voorzieningen functioneren en bereikbaar.	Bij hevige neerslag (1/250 jaar, 90 mm in een uur) blijven vitale en kwetsbare infrastructuur en voorzieningen functioneren en bereikbaar.	Bij hevige neerslag (1/250 jaar, 90 mm in een uur) blijven vitale en kwetsbare infrastructuur en voorzieningen functioneren en bereikbaar.
	Droogte	a) Droogtebestendige inrichting b) Bodemdaling c) Vitale en kwetsbare functies	Bij langdurige droogte (potentieel maximaal neerslagtekort 300 mm, eens per 10 jaar) wordt schade aan bebouwing, wegen, groen en vitale en kwetsbare functies voorkomen.	Bij langdurige droogte (potentieel maximaal neerslagtekort 300 mm, eens per 10 jaar) wordt schade aan bebouwing, wegen, groen en vitale en kwetsbare functies voorkomen.	Bij langdurige droogte (potentieel maximaal neerslagtekort 300 mm, eens per 10 jaar) wordt schade aan bebouwing, wegen, groen en vitale en kwetsbare functies voorkomen.
	Hitte	a) Schaduw b) Koele plekken c) Horizontale en verticale oppervlakten d) Vitale en kwetsbare functies e) Binnentemperatuur	Tijdens hitte biedt de gebouwde omgeving een gezonde en aantrekkelijke leefomgeving.	Tijdens hitte biedt de gebouwde omgeving een gezonde en aantrekkelijke leefomgeving.	Tijdens hitte biedt de gebouwde omgeving een gezonde en aantrekkelijke leefomgeving.

	Overstromings-risico	a) Schade voorkomen b) Schadebeperking c) Schuilen en evacueren	Afhankelijk van de plaatselijke overstromingskans en optredende waterdiepte wordt ingezet op het voorkomen van schade, het beperken van schade of het voorkomen van slachtoffers. Voor vitale en kwetsbare functies gelden aanvullende eisen. Welke eisen van toepassing zijn op het plangebied is dus afhankelijk van de overstromingskans en diepte. Wat de overstromingskans per waterdiepte is, is te vinden in de klimaateffectatlas.	Afhankelijk van de plaatselijke overstromingskans en optredende waterdiepte wordt ingezet op het voorkomen van schade, het beperken van schade of het voorkomen van slachtoffers. Voor vitale en kwetsbare functies gelden aanvullende eisen. Welke eisen van toepassing zijn op het plangebied is dus afhankelijk van de overstromingskans en diepte. Wat de overstromingskans per waterdiepte is, is te vinden in de klimaateffectatlas.	Afhankelijk van de plaatselijke overstromingskans en optredende waterdiepte wordt ingezet op het voorkomen van schade, het beperken van schade of het voorkomen van slachtoffers. Voor vitale en kwetsbare functies gelden aanvullende eisen. Welke eisen van toepassing zijn op het plangebied is dus afhankelijk van de overstromingskans en diepte. Wat de overstromingskans per waterdiepte is, is te vinden in de klimaateffectatlas.

Onderwerp	Subdoel	Indicator	Brons [15]	Zilver [15]	Goud [15]
Natuurinclusiviteit en biodiversiteit	Hoogwaardige habitats	De soortencategorie zijn verdeeld in vijf hoofdgroepen: – Gebouw bewonend – Boom bewonend – Aan struweel gebonden – Aan bloemrijk grasland gebonden – Aan water en oevers gebonden	**Kleinschalig project:** Hoogwaardige habitat voor ten minste gebouw bewonende soorten **Middelgroot project:** Bovenop eis voor kleinschalig project ook hoogwaardige habitat voor een andere soortencategorie **Grootschalig project:** Hoogwaardige habitat voor ten minste 3 soorten categorieën.	**Kleinschalig project:** Bovenop de eis voor brons minstens een hoogwaardige habitat voor 1 andere soort. **Middelgroot project:** Bovenop de eis voor brons minstens een hoogwaardige habitat voor 1 andere soort. **Grootschalig project:** Bovenop de eis voor brons minstens een hoogwaardige habitat voor 1 andere soort.	**Kleinschalig project:** Bovenop de eis voor zilver minstens een hoogwaardige habitat voor 1 andere soort. **Middelgroot project:** Bovenop de eis voor zilver minstens een hoogwaardige habitat voor 1 andere soort. **Grootschalig project:** Bovenop de eis voor zilver minstens een hoogwaardige habitat voor 1 andere soort.
	Groen-blauwe structu-ren		Het horizontale en verticale oppervlak wordt in samenhang met de groenblauwe structuren in de bredere omgeving ingericht (met minimaal 30 % biodivers en hoogwaardig groen op buurtniveau, boomkroonoppervlak telt mee)	Het horizontale en verticale oppervlak wordt in samenhang met de groenblauwe structuren in de bredere omgeving ingericht (met minimaal 40 % groen op buurtniveau, boomkroonoppervlak telt mee)	Het horizontale en verticale oppervlak wordt in samenhang met de groenblauwe structuren in de bredere omgeving ingericht (met minimaal 50 % groen op buurtniveau, boomkroonoppervlak telt mee)

Onderwerp	Subdoel	Indicator	Wettelijk	Brons	Zilver	Goud
Gezonde leefomgeving	Toxiciteit in materialen verminderen [12]	% van de toegepaste materialen is vrij van giftige stoffen van de 'Banned list of Chemical C2C Certified CM Product Standard V3.0'.	-	90	95	100
	Temperatuurover-stijging in de woning tegengaan [20]	TOjuli	1,2	1,2	1,2	1,2

Kostenindicaties

Hieronder zijn de indicatieve meerkosten voor een woning van circa 60m2 per onderwerp weergegeven. Bij deze meerkosten is nog geen rekening gehouden met de baten en/of subsidies die van toepassing zijn per thema en juist kosten kunnen drukken. Peildatum 1 februari 2022.

Onderwerp	Indicator	Brons	Zilver	Goud
Energie	BENG 1	-	€2.000	€2.330
	BENG 3	€600	€1.190	€1.585
Circulair	MPG	€13 per m2 bvo incl. bijk.k. (25%), excl. btw	€25 per m2 bvo incl. bijk.k. (25%), excl. btw	€60 per m2 bvo incl. bijk.k. (25%), excl. btw
Duurzame mobiliteit	Laadpaalnorm	€1.500	€1.500	€1.500
Klimaatadaptatie	Geheel pakket	€1250-€2500 per woning (excl. kosten openbare ruimte), OF €90.000-€310.000 per hectare (totale kosten incl. vastgoed).	€1250-€2500 per woning (excl. kosten openbare ruimte), OF €90.000-€310.000 per hectare (totale kosten incl. vastgoed).	€1250-€2500 per woning (excl. kosten openbare ruimte), OF €90.000-€310.000 per hectare (totale kosten incl. vastgoed).

ATTACHMENT 3

Sustainability vision

Why does the municipality request a sustainability vision at the start of a project?

Analysing the area at an early stage reveals opportunities and challenges in terms of sustainability which can then be taken into account. This is part of the architect's or urban planning department's analysis. Practice shows that the sooner sustainability considerations are included in the process and design, the simpler, better and cheaper the end result. For this reason, it's important to discuss matters such as energy concept, sustainable forms of mobility and the prevention of heat stress at an early stage.

Who draws up the sustainability vision?

The initiator (land owner) is responsible for drawing up the sustainability vision. For small developments, the landowner or developer draws up the sustainability vision alone, but for large area developments with multiple functions and land owners, the sustainability vision is drawn up together with other stakeholders.

How do you draw up a sustainability vision?

A sustainability vision begins with an analysis of the opportunities and challenges of the area, for example, a SWOT analysis. Investigate the functions of the area and how they can reinforce each other.

- Is it an area with lots of woodland that offers opportunities for enhancing greenery and biodiversity?
- Is the location close to water, can this water be used as an energy source, and are there possibilities for a collective energy system?
- Then determine a basic level for each ambition, and for which ambitions extra efforts will be made.

Various tools can help decide ambitions, such as an online ambition session, an infrastructure strategy appraiser ('Omgevingswijzer') or multi-criteria analysis. For topics that can't be easily quantified or made SMART, these formats can help when considering trade-offs and priorities.

Which instrument is best suited to a project depends, among other things, on the project size, the area, the land owner, and the developer's experience. The ultimate decision always lies with the author of the sustainability vision, but the municipality likes to share its thoughts.

What is included in a sustainability vision?

The initiator determines how the sustainability vision is drawn up. The municipality doesn't impose any requirements, as long as it answers the question: how do the developments in the area contribute to the sustainability challenges faced by Amersfoort? The four sustainability pillars can be used as a basis, but the municipality does appreciate being surprised by innovative solutions.

Example of the contents of a sustainability vision:

1. Introduction (short description of the area)

2. Energy transition
   - Opportunities in the area created by the energy transition
   - Challenges in the area created by the energy transition

3. Circular economy and circular construction
   - Opportunities in the area created by the circular economy and circular construction
   - Challenges in the area created by the circular economy and circular construction

4. Climate resilience and greenery
   - Opportunities in the area created by climate resilience and greenery
   - Challenges in the area created by climate resilience and greenery

5. Sustainable mobility and air quality
   - Opportunities in the area created by sustainable mobility and air quality
   - Challenges in the area created by sustainable mobility and air quality

6. Conclusion and next steps

ATTACHMENT 4

Techathon '22 is CO_2-neutral because all emissions will be fully compensated.

groenbalans

Certificaat CO2-Compensatie

Groenbalans verklaart dat het evenement

Techathon 2022

georganiseerd door
Techniek Nederland, Wij Techniek, ISSO en TVVL
en gemeente Amersfoort
volledig CO2-neutraal is.

De CO2-footprint van 15 ton wordt gecompenseerd door
een investering van 15 CO2-rechten
in het bosbehoud en biodiversiteit project
Kariba National Park in Zimbabwe.

Meer informatie over deze rechten en de daaraan verbonden
emissiereducties en duurzame (energie) projecten is te vinden op
www.groenbalans.nl

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