

# Innovation & Future Visioning

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## **Assignment A: Own vision – Who am I in 2050?**

'Who will I be in 2050, where will I be and what will I be doing, what will be happening around me?'

### **Who will I be in 2050?**

By the year 2050 I will be a few years away from the legal retirement age, I will be 61 years old by that time. But my age alone will not be the defining characteristic of who I am, what my principles are and how I express myself will be more interesting to look at. What roles will I have in life? Both socially and professional? And what type of person will I be?

### **Where will I be in 2050?**

To answer this question a better definition should be given of what 'where' means to me, is it a physical place or more of a mental state I will be at? For sure the first is important to envision, because the physical setting will be defining the boundaries of possibilities I will have. The latter on the other hand relates to a more moral state where I am pleased with where I am at that moment in time.

### **What will I be doing in 2050?**

Under the 'what' umbrella fall a lot of different activities, from my day-to-day routine in my professional career to my leisure activities which will have overlap my social life.

### **What will be happening around me in 2050?**

The last part of the visioning of my future revolves around what happens outside of myself, but also influences my life. This can be specified into spheres on different scales. What will the people in my personal sphere be doing? What is the state of the environment, in the broadest sense, that I will be living in? And what will happen on a global scale for example?

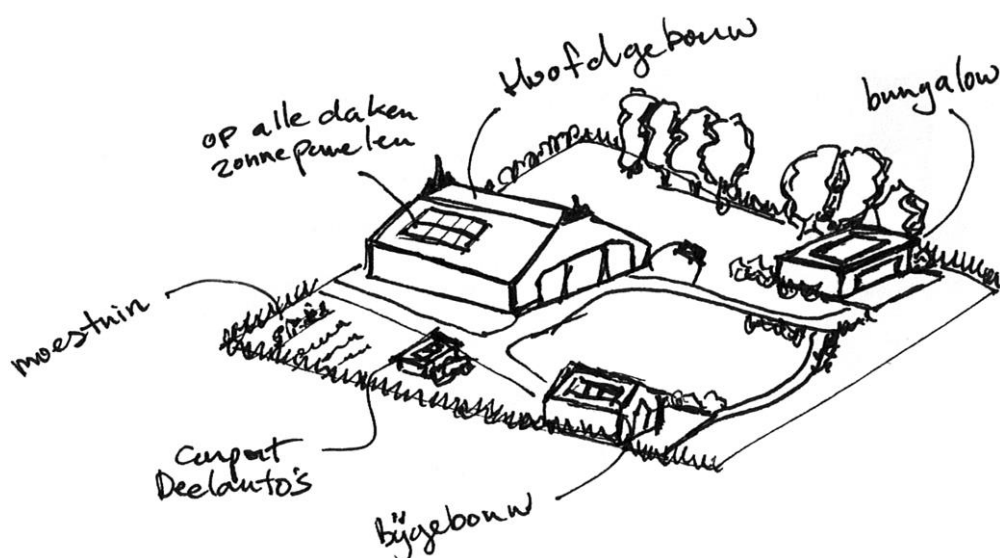
All the above mentioned questions will be interconnected to each other, as there can be made a causal relation between them. As a thought experiment I tried to envision a detailed typical day in my life, in the year 2050, which gives insight into a probable scenario of how my life might unfold. It is extrapolated from the person I am at this moment in time.

## Personal Scenario: "Just a regular weekday"

I will be waking up next to my partner by the break of dawn, as I appreciate the early hours of the day. When my house, in the rural area in the vicinity of Groningen, is slowly being warmed up by the watery sun which tries to break through the clouds and still misty air. As she likes to stay in bed for a little while longer. After a short meditative yoga session, which helps with loosening and warming up my body and mind, I will take a shower and put on some formal clothing since I will be having a meeting with a client later in the day. I will brew up a can of coffee and prepare a light breakfast for myself. I have had a vegetarian breakfast for over thirty years, so a few slices of bread with cheese and an apple will suffice in my energy needs for the next hours. I'll put on an old vinyl in the meantime to break the silence a bit. My partner walks in and we'll talk about our planning for the day, and divide some tasks for the household, she tells me that I have to pick up groceries when I'm in town.

By this time it's around eight in the morning, and I head off to the office. It's a small walk, because I am a co-owner of a consultancy firm specialized in spatial design and urban development, which I've started a few years after I graduated and it is located on the property I share with some close friends.

The central building, a typical Oldambster farmhouse, has been renovated in the late 20's. The front part, the former living quarters of the farm, serves as a home for friends who raised two beautiful children there. They left their home a few years ago to move to the city of Groningen where they study. My partner and I, live in a smaller bungalow house which we've built next to the south-eastern border of the plot to have some privacy, we do not have children on our own, but we've had the joy of being a part of the upbringing of the children of our beloved friends. A second country house is located on the south-western part of the property, a renovated smaller shed, which is the home for my business companion and his family.



The old barn at the back of the farmhouse functions as our office, an open space where the both of us have our desks, with some additional desks for interns which we coach on a regular basis. A built-in modelling workshop, which I also use for renovating furniture pieces from the 20<sup>th</sup> century, is located near the northern façade of the barn. Right next to it, is the atelier of the partner of my business companion. There are two extra spaces in the barn, one is used as conference room, and other as a play room the children when they were younger. The attic of the barn has some guest-rooms for family and friends, which often visit to escape their urban city life, but also for colleagues who stay over for a few days to work on various projects.

Today though I start off with turning on my computer, I have a look at my inbox and respond to some emails which I've received already. I take a short look at the news feeds I am subscribed to, just the basics to get a general sense of what is going on locally, domestically and globally. As all days of the week, it does not comfort me to hear and see that world hunger, poverty and violence are still business as usual.

My colleague walks in, and we briefly discuss some projects we're both working on. He shows some new virtual reality visualisations, I show some diagrams with received feedback from customers. Normally we take more time, but today we both have a busy schedule due to deadlines. As we see each other on a daily basis, our communication is good so it won't matter for our workflow.

Around 1 pm I head off to the business meeting in the city with clients who want to develop a life-lasting community home for four families. I use the small electric company car, which is an addition to the bigger family hydrogen vehicle we share with the three families for longer trips and vacations. The trip takes about half an hour, and we meet up at a coffee bar near the edge of Groningen.

The meeting last for about an hour and seems fruitful. The four families really thought it through and have a clear vision, the financial side is even covered already. Not often do I see so much preparation by customers in projects like these, I don't complain in the slightest since the process runs smooth like this.

On my way back I get the requested groceries from the supermarket, and I head back to home. As always around this time of the day, I experience severe traffic jams, no difference with 20 years ago.

In the evening we enjoy a lovely vegan noodle soup with fresh vegetables and tofu, together with the two other couples. We sit outside, philosophise about the world and our lives. Life is good and I enjoy it.

## Assignment B: Overview of potential trends and dilemmas

This part of the report contains research in regard to trends which will affect urban planning and design in the future, as these are the starting point for scenario planning. These trends are categorized through the STEEP method. The categories are *social*, *technical*, *economic*, *environmental*, and *political*. Some of the trends will have overlap with different categories, as they can be placed in multiple categories. The trends are put in perspective for different scales where possible, starting with the global and national, and ending with the local scale.

### Social trends



#### Population growth

Over the next few decades the population of the world is expected to grow gradually up to around 10 billion people in the year 2050. A rapid increase can be noticed from the industrial revolution onwards, as life expectancy grew due to better healthcare and rise of economic prosperity. Currently, the continents of Asia and Africa have the highest population growth, which will cause for a steady incline until the end of the 21<sup>st</sup> century (see Figure 1).

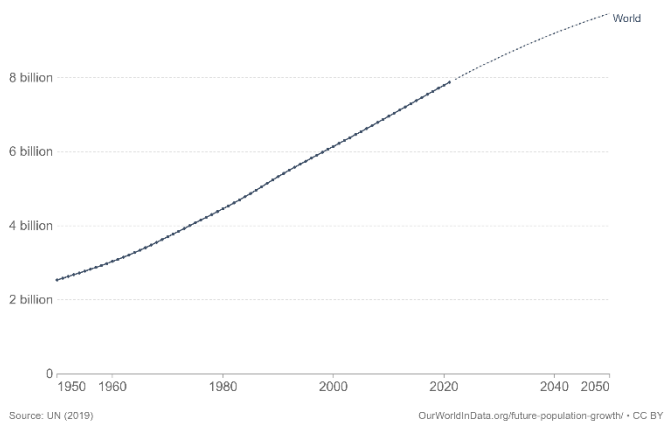


Figure 1 Population projection of the world, 1950-2050

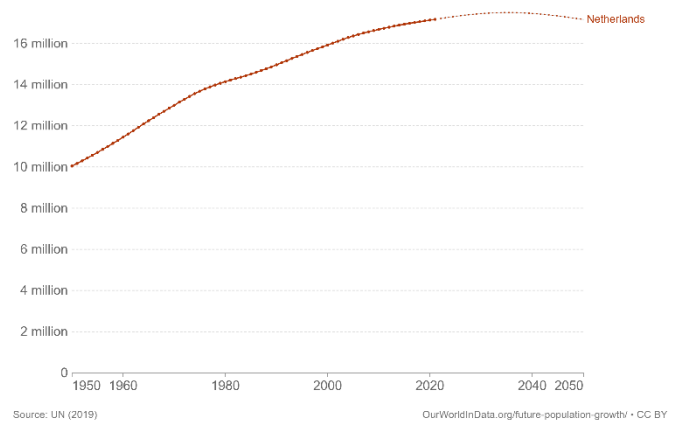


Figure 2 Population projection of the Netherlands, 1950-2050

The Netherlands will reach its peak around the year 2040 with around 19 million inhabitants (Centraal Bureau voor de Statistiek, 2022b), after which a decline in population can be expected (see Figure 2). The main cause for this is the age distribution, the Netherlands has a rather high amount of elderly (65 years or older) and low amount of children compared to the global trend (see Figure 3 and 4). This is caused by a low fertility rate in the Netherlands (Roser, 2013a).

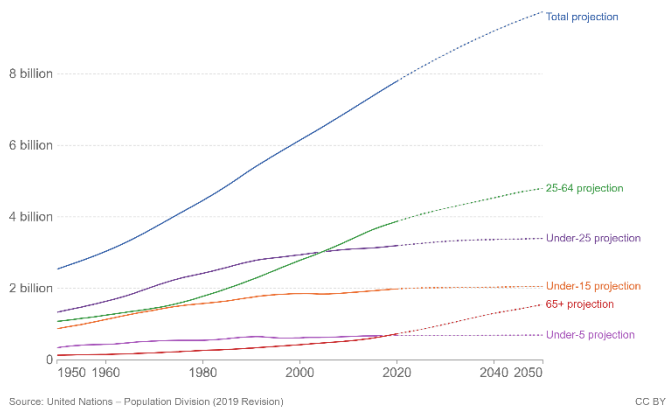


Figure 3 Population by age of the world, 1950-2050

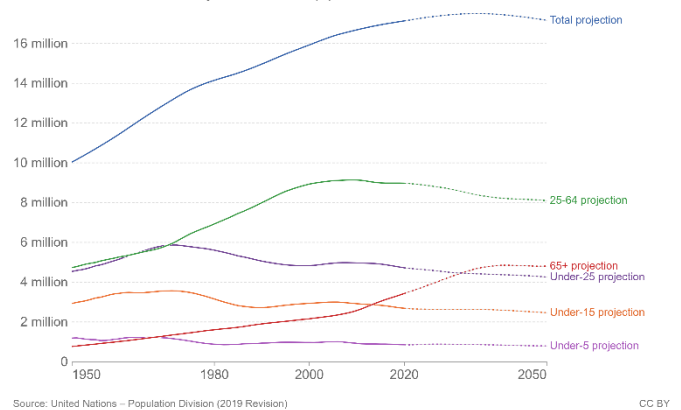


Figure 4 Population by age of the Netherlands, 1950-2050

For the Oosterhoogebrug area the same expectation can be made for both population growth, since student cities will increase in population size (Planbureau voor de Leefomgeving & Centraal Bureau voor de Statistiek, 2019), and age distribution, as there already is a large number of elderly people in the neighbourhood (Alle Cijfers, 2022a).



## Urbanization

The second social trend relates to the previous one, because the population also has to live at a certain place. A trend which can be seen, across all the different scales, is that people tend to move towards cities and other highly urbanized areas. Especially in developed countries, with a high GDP, the population lives in these urban areas. According to Ritchie & Roser (2018) the living standards are higher, because the access to electricity, sanitation, drinking water, and clean fuels for cooking and heating is higher. The figures below (5 and 6) show the historical development of urbanization and the prediction up until 2050.

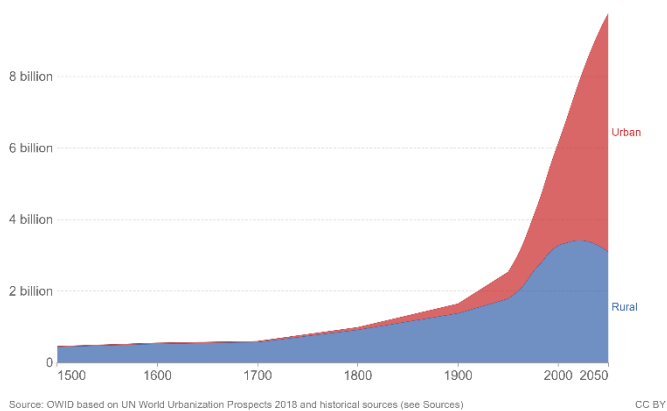


Figure 5 Urban and rural population in the world, 1500-2050

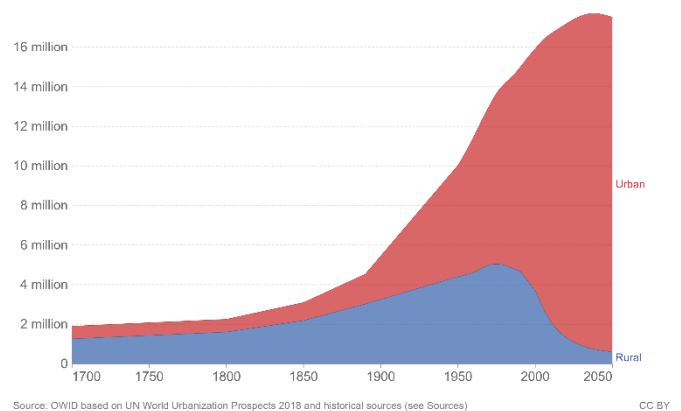


Figure 6 Urban and rural population in the Netherlands, 1700-2050

When zoomed in on the Netherlands, and in specific the city of Groningen, this trend can be expected as well. Due to depopulation within the rural area in vicinity of the city of Groningen a rise of 12% in population growth is expected by the year 2050 (see Figure 7). As such, national and local governments have a serious task in regard to spatial development for these urban areas according to Evers et al. (2021), either by creating compact, poly-centric, or diffuse urban areas. In the northern part of the Netherlands this development is already taking place through the cooperation of the provinces of Groningen and Drenthe, and multiple municipalities within in the Groningen-Assen region on subject as housing, mobility, economy, and spatial quality (Regio Groningen Assen, 2021).

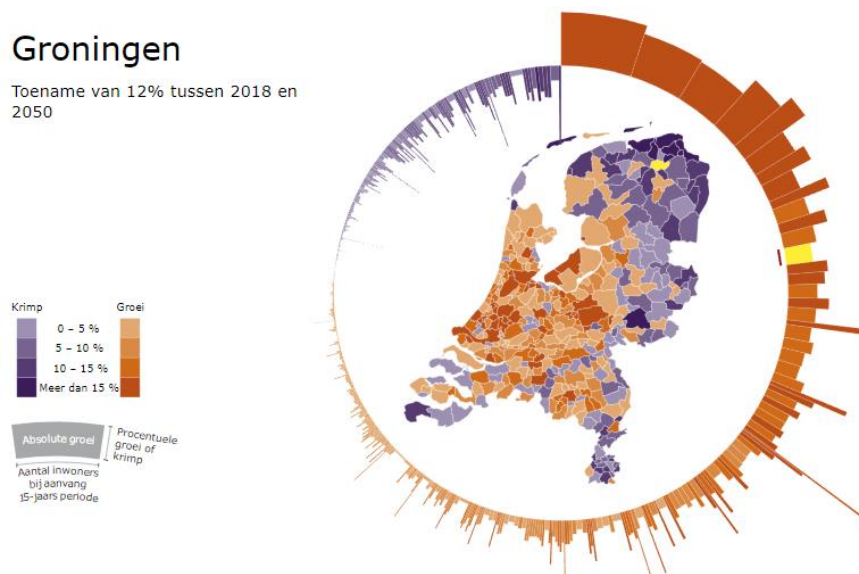


Figure 7 Populating and depopulating areas in the Netherlands, 2018-2050



## Inequality

In a classical sense inequality among people is related to social stratification theory (Wilterdink & van Heerikhuizen, 2012) and can be divided into three categories; power, wealth, and status. Which are interconnected to each other in different ways. The most common indicator of inequality is income, as a part of wealth.

In the two figures below (8 and 9) the differences in GDP (Gross Domestic Product) per capita can be seen. Most regions are close to the global GDP, with the exception of Western regions (which have a above average GDP), South and South-East Asia and Sub-Sahara Africa (which have a below average GDP). Over the course of the last decades an increase of GDP can be seen in all regions, the income gap between different regions did not decrease. Figure 9 reflects differences between Western countries, the average income of the Dutch citizen is high compared with neighbouring countries.



Although these figures give insight into the level of economic equality, they do not tell anything about social equality such as gender-, ethnic-, religious and racial equality, human rights, or level of education (United Nations, n.d.). Since the focus of this research lies at the local scale, these issues will not be discussed in detail.

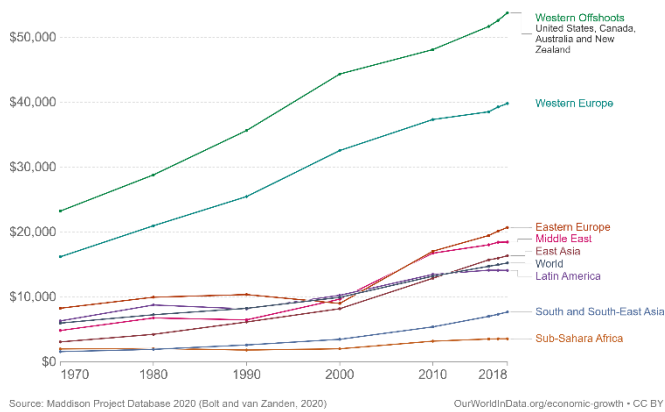


Figure 8 GDP per capita per region in the world, 1970-2018

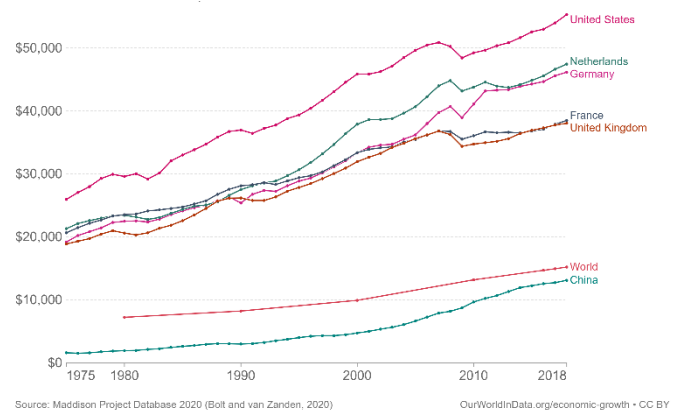


Figure 9 GDP per capita per country, 1975-2018

On a national, and local scale, the aforementioned sub-categories, and in specific the level of education, are more useful to look at. Because these can limit the possibilities someone has in daily life. The level of education, according to Gielen et al. (2021), has impact on the future income and life expectancy of people. The level of education in the Oosterhoogebrug neighbourhood is slightly higher than the average of the Netherlands (see Figure 10). The average annual income per inhabitant in the neighbourhood is around €3.000,- higher than the average of the province of Groningen, but this still € 400,- lower when compared to the average income of Dutch citizens (Alle Cijfers, 2022a, 2022b).

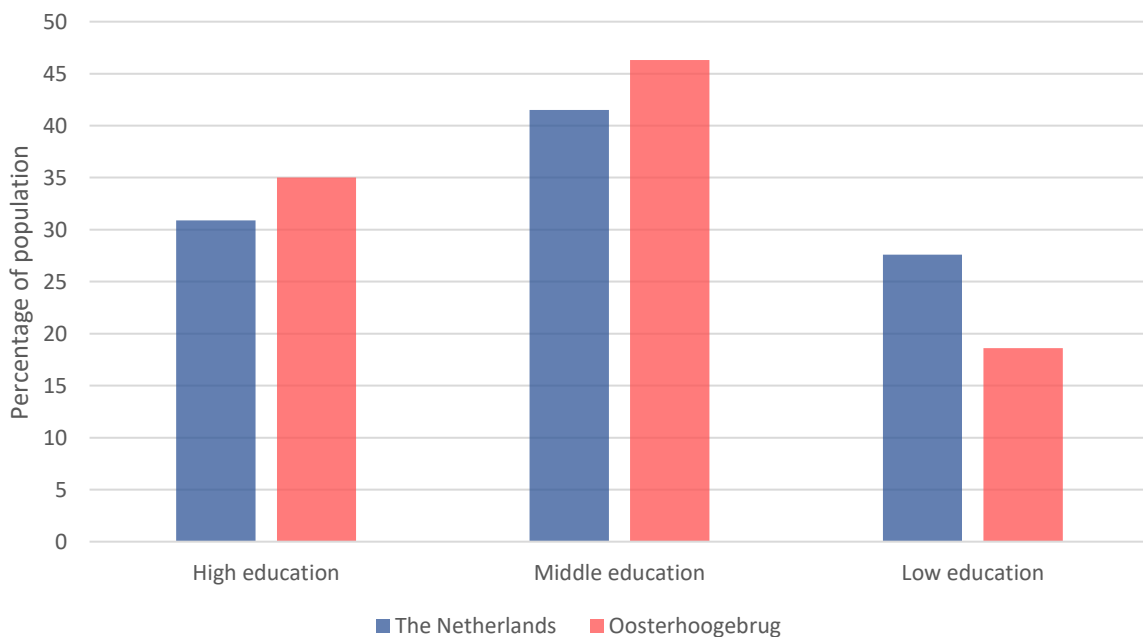


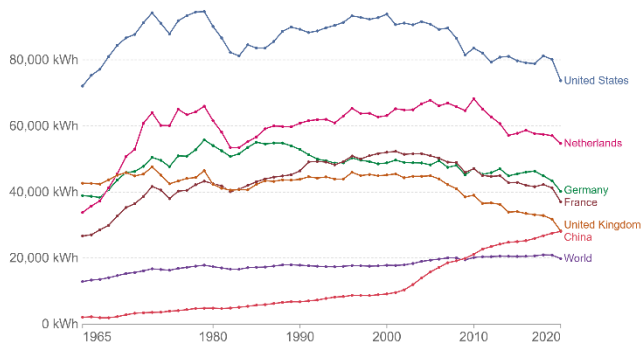
Figure 10 Comparison of educational level between the Netherlands and Oosterhoogebrug neighbourhood

## Technical trends



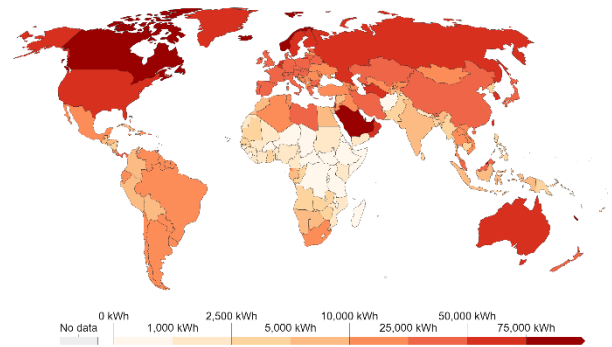
### Energy usage

The last two decades, the energy usage in the broadest sense has been declining in developed Western countries all over the world (see Figure 11), although far above the average global energy use per capita. In part due to awareness of the negative impact of energy production, but mainly due to energy efficiency of machines and appliances combined with insulation of the built environment. Compared with surrounding countries, the Netherlands uses a higher amount of energy per person (see Figure 11 and 12). The declining energy usage for households, can be seen at the local scale of the Oosterhoogebrug as well (see Figure 13).



Source: Our World in Data based on BP & Shift Data Portal  
 Note: Energy refers to primary energy – the energy input before the transformation to forms of energy for end-use (such as electricity or petrol for transport).  
 OurWorldInData.org/energy • CC BY

Figure 11 Energy use per person, 1965-2020



Source: Our World in Data based on BP & Shift Data Portal  
 Note: Energy refers to primary energy – the energy input before the transformation to forms of energy for end-use (such as electricity or petrol for transport).  
 OurWorldInData.org/energy • CC BY

Figure 12 Energy use per person, 2020

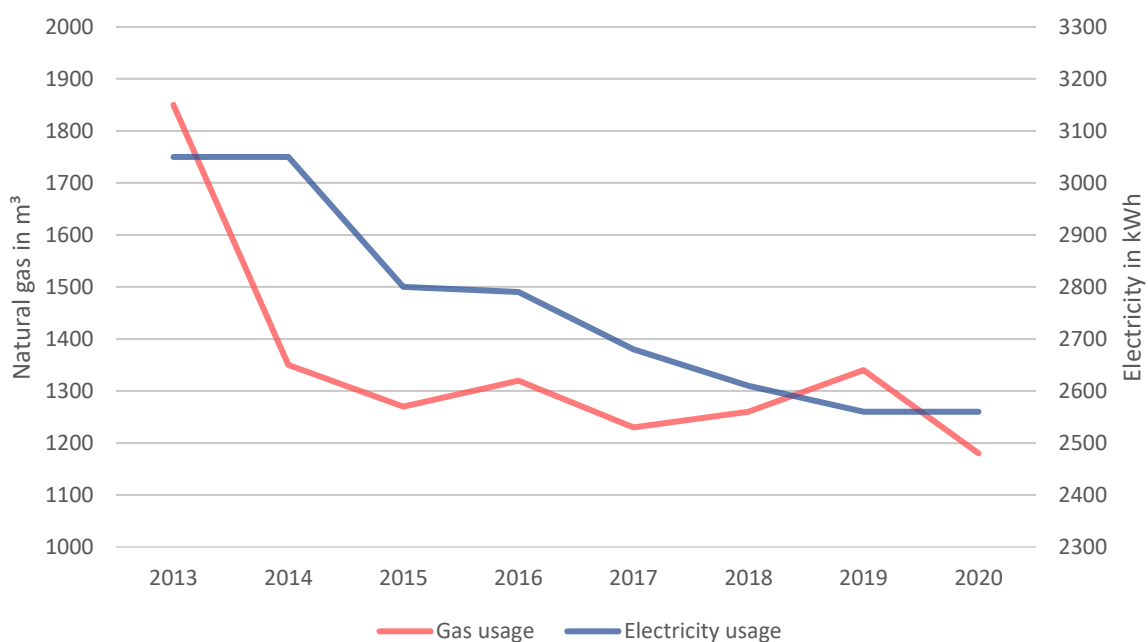


Figure 13 Average energy usage of households in the Oosterhoogebrug, 2013-2020



## Innovation

The city of Groningen, and the broader region of the Northern Netherlands, will have a crucial role in technological advancements due to the presence of the Rijksuniversiteit Groningen, the Hanzehogeschool Groningen, and multiple research institutes for different academic fields.

The region as a whole markets itself as the Hydrogen Valley of the Netherlands, and through profound cooperation of academia, businesses and governments a lot of technical innovation is made in regard to zero-emission technologies which are useable for different applications. On the medical side there are partnerships with the UMCG and various medical laboratories to conduct research which will benefit the overall health of people, either by prevention, surgery, or medication. The above mentioned fields for innovation are examples of specialities right now.

The larger region functions as a living laboratory where innovations can be tested and inhabitants will benefit from this in an early stage of development. In the meanwhile, these inhabitants also contribute to the innovation as they are necessary due to the demand for qualified personnel on all different educational levels. Therefore, educational institutes like the Noorderpoort and Alfa College, which are specialized in practical education, are required as well.



## 4<sup>th</sup> Industrial Revolution

The third technological trend has to do with the development of various technological innovations in IT which will have impact on the way we live, either online or offline. The 4<sup>th</sup> industrial revolution revolves around a combination of different technologies which will disrupt life as we know it. Artificial Intelligence (AI), Virtual Reality (VR), Augmented Reality (AR), genetic technology, the internet of things (IoT), smart sensors, automation, and robotics are just a few technologies which fall under this trend (Schwab, 2017).

As all of the afore mentioned technologies are still in development, a clear pattern of change cannot be set. Although it is clear that it will happen. As most rely on access to internet and computational power, these two factors are examined.

Figure 14 and 15 both show the share of world population which has had access to internet within the last three months, especially the last figure shows resemblance with figure 12, regarding energy use per person, so there might be a correlation between these two individual factors.

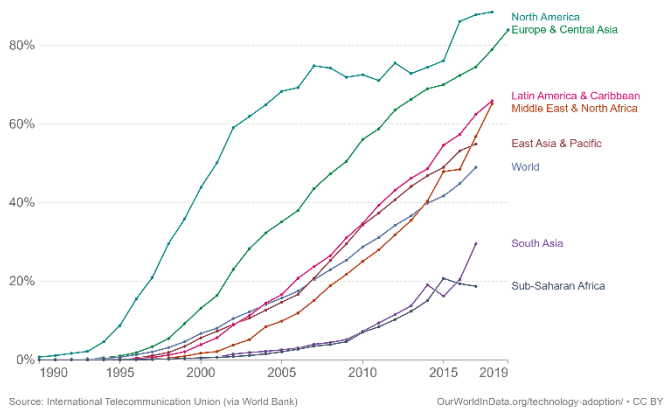


Figure 14 Share of population using internet, 1990-2019

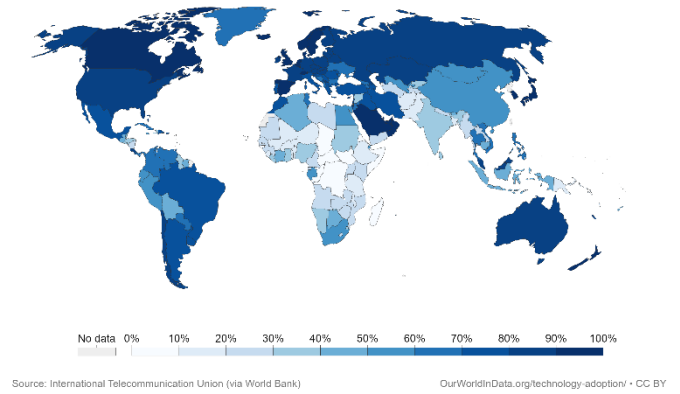


Figure 15 Share of population using internet, 2019

Computational power is not specific to a physical place, but must be seen as technological progress. According to Moore (2006) the amount of transistors in an integrated circuits, such as computer processors, doubles every two years (see Figure 16). Developments like these are necessary to make technologies as Artificial Intelligence as human-like as possible.

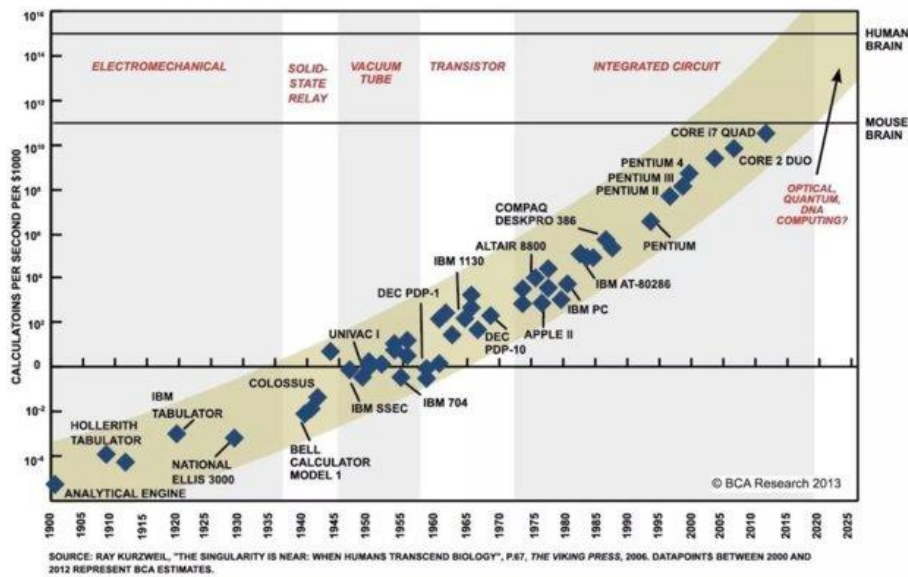


Figure 16 The exponential progress of computing power from 1900 to 2013

## Economic trends



### Economic growth

The first trend within the economic category of the STEEP method is touched upon in the social trend of *inequality*. Economic growth is often depicted as GDP (see Figure 8 and 9), either for the country as a whole or per capita. Both aforementioned figures show an increase of GDP, thus economic growth is increasing.

Although there are other factors which influence economic growth, the most important factor is inflation. As this affects how expensive goods and services are for consumers. In both of the earlier mentioned figures, the GDP has been corrected to take inflation into account. Inflation in the Netherlands is given in the consumerpriceindex (CPI), and with a singular exception the CPI has been positive over the last 55 years (see Figure 17). Recent studies show that especially the energy prices have contributed to recent inflation (Centraal Bureau voor de Statistiek, 2022a), as of February 2020 this even more the case due to the war in Ukraine.

### Consumentenprijsindex (CPI)

% verandering t.o.v. een jaar eerder

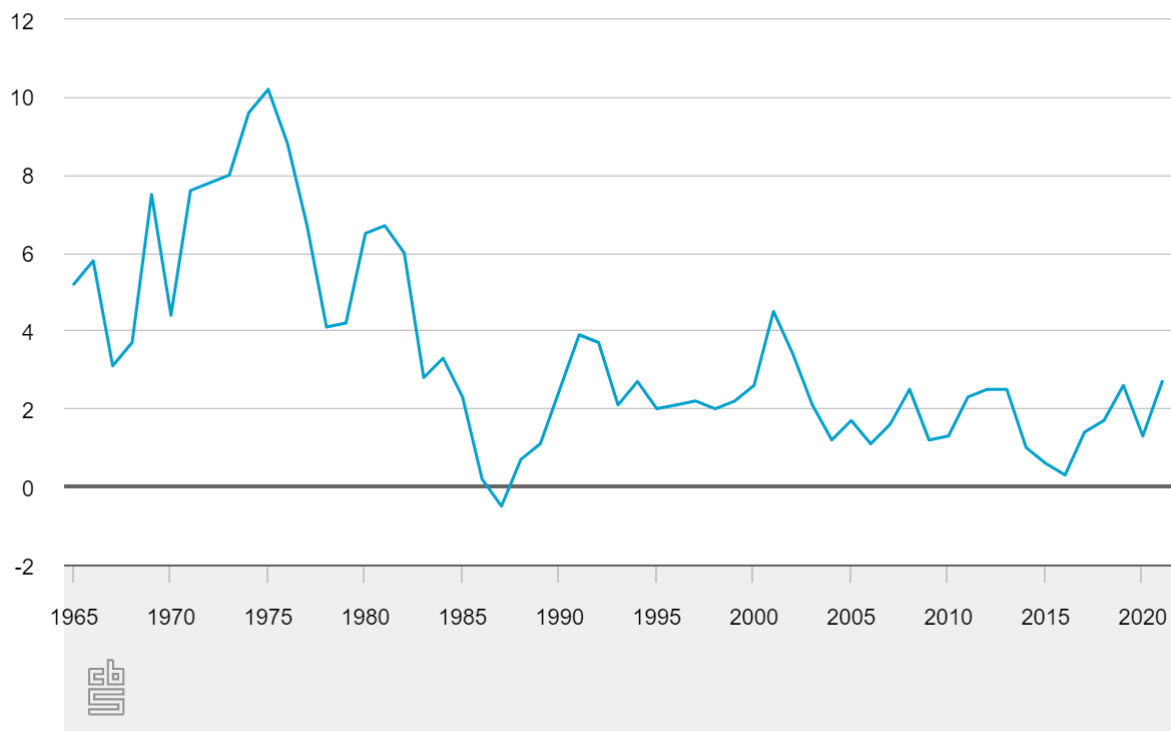


Figure 17 The consumer price index in the Netherlands, 1965-2021



## Import and export dependency

Another factor which unexpected interventions, like the Covid-19 pandemic and the war in Ukraine, showed is the import and export dependency of companies within different countries over the world. Over the last few years multiple goods have been hard to come by. Raw materials like crude oil, natural gas, coal, and harvested crops (i.e. wheat, barley, and maize), but also assembled technological goods like microchips, motor vehicles, and respirators.

Although this does not give direct problems for the Dutch economy, due to the availability of multiple suppliers (Centraal Bureau voor de Statistiek, 2021), it will impact the price of these specific goods for the end-consumer.



## Employment rate

The final economic trend concerns job employment, as the contribution of the population is necessary for both the world economy and Dutch economy. Over the last eight years, with the exception of the Covid-19 pandemic, the employment rate in the Netherlands has risen by nearly 8% (see Figure 18) and the unemployment rate of the available workforce has declined from around 8% to 3,2% over the same time period (see Figure 19). Which indicates that there has been a growing demand on the labour market, which is reflected in the difficulties companies have right now to find suitable employees.



Figure 18 Employment rate in the Netherlands, 2012-2022

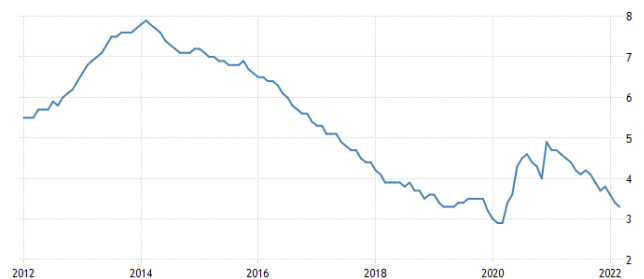


Figure 19 Unemployment rate in the Netherlands, 2012-2022

The municipality of Groningen predicts that there will be an increase of 28.000 jobs on the labour market in the region by the year 2040, which will impact the Oosterhoogebrug neighbourhood in both the economic as spatial sense (Gemeente Groningen, 2021).

## Environmental trends



### Climate change

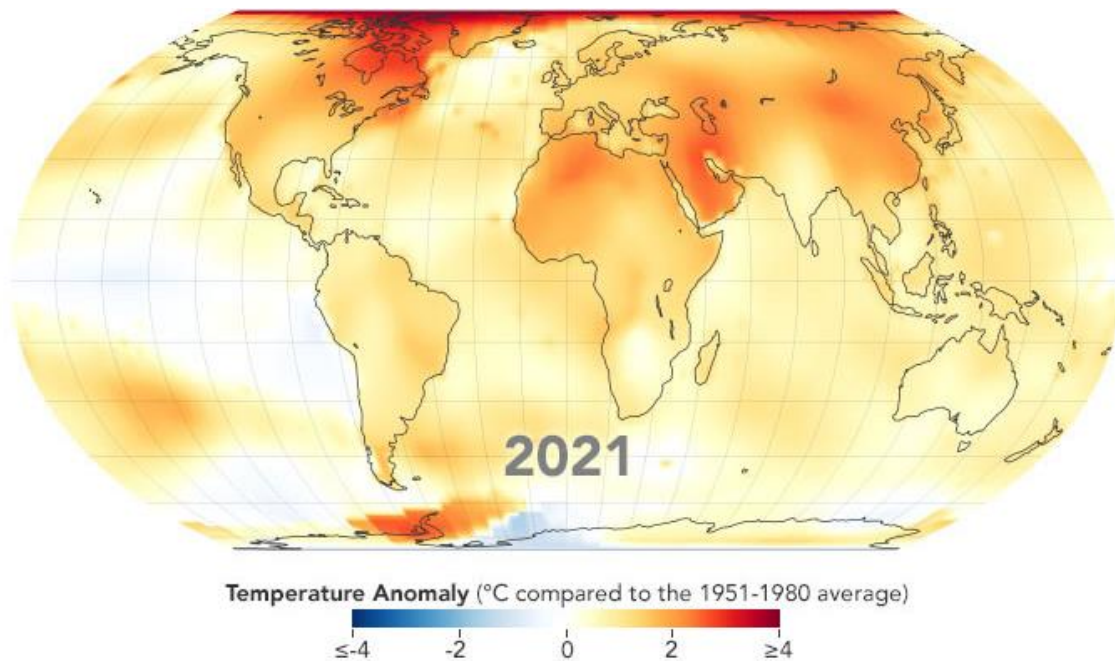


Figure 20 Temperature anomaly in °C in the year 2021 compared to the 1951-1980 average

The first environmental trend which will be discussed is the most obvious and impactful, the rise of global temperature due to greenhouse gas emissions which is the cause for climate change (NASA Earth Observatory, n.d.). The map of the world as seen in the figure above shows hotspots all over the world, some regions have seen in an increase of merely one degree Celsius, and others are already over the tipping point of two degrees Celsius (i.e. the Arctic region).

This trend already has devastating consequences for humanity as their environment becomes uninhabitable. Weather conditions become more extreme; flooding's and landslides due to heavy rain, poor harvests and lack of fresh drinking water for humans and animals due to extreme droughts. Combined with the rise of sea levels, due to melting ice caps in both the Arctic and Antarctic region, which endangers coastal areas all over the world.

On the local scale of the Oosterhoogebrug mainly the extremities of weather conditions, and the consequences of those, should be taken into account. Heat stress and droughts, but also heavy rainfall and possible flooding's of streets and houses.

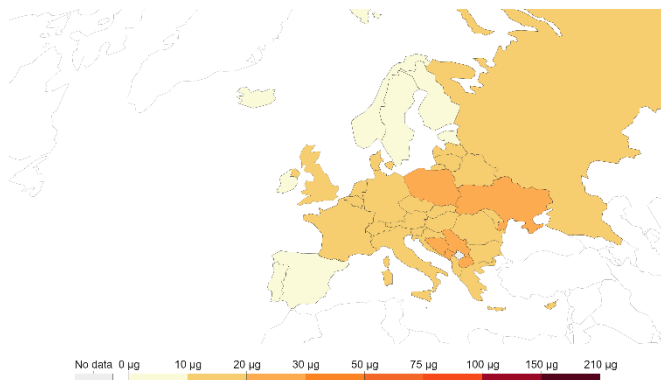
With current policies in place, this rise should be halted at a certain point. Dependent on how willing humanity is to shift to carbon neutrality.



## Pollution

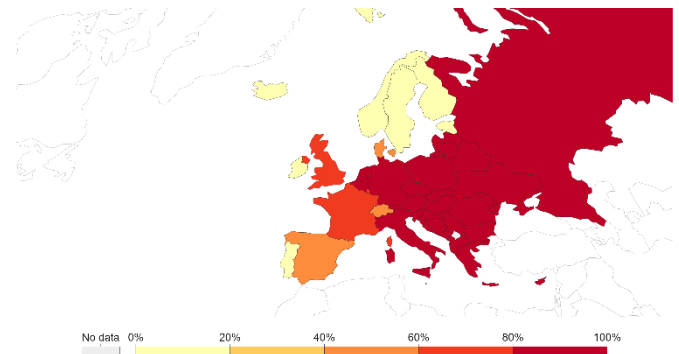
This trend seamlessly adds to the previous trend of *climate change*: pollution of air, water, and land caused by human activities. As mentioned above air pollution is in part the emission of greenhouse gases into the atmosphere. But there are more pollutants which form severe health risks for humans and animals (i.e. particulate matter, nitrogen oxides (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), and volatile organic compounds), and plant life (i.e. ammonia) (Ritchie & Roser, 2019b).

Figure 21 and 22 show that most of the European population, even in high-income countries, is exposed to a harmful dose of fine particulate matter. When zooming out to the global scale, it becomes even worse (with the exception of the U.S., Canada, Australia, and New-Zealand).



Source: Brauer et al. (2017) via World Bank  
OurWorldInData.org/air-pollution/ - CC BY

Figure 21 Average exposure to air pollution with fine particulate matter (PM<sub>2.5</sub> in µg/m<sup>3</sup>) of population, 2017



Source: Brauer et al. (2017) via World Bank  
OurWorldInData.org/outdoor-air-pollution - CC BY

Figure 22 Share of population exposed to air pollution levels above WHO guidelines (10 µg/m<sup>3</sup> per year), 2017

Part of the pollutants in the air end up in the soil, and eventually in the ground- and surface water. But also due to agricultural and industrial practices the soil and different bodies of water get polluted. Most of the aforementioned pollutants are not visible to the human eye, but garbage waste too often ends up in the environment as well. Land, rivers, lakes, and oceans are littered with (micro)plastics which harm eco-systems and are hazardous to all lifeforms.

With upcoming trends, such as *circular economy*, and strict environmental policies in place, all sorts of pollution are combatted. Thus, a gradual decline can be expected.





## Biodiversity

The last environmental trend follows the aforementioned trend once again, as already mentioned, biodiversity is under enormous pressure due to human activities. According to the European Environment Agency (2020) urban sprawl, agriculture, forestry and pollution are the main causes for a declining biodiversity. Although there are other causes to mention; invasive species which threaten populations, diseases, transportation industry, and energy production (i.e. wind-turbines).

Currently, although efforts are made, the conservation status of species and habitats at the broader European level is lacking (see figures 23 and 24), and both trends have been declining over the last years (European Environment Agency, 2020).

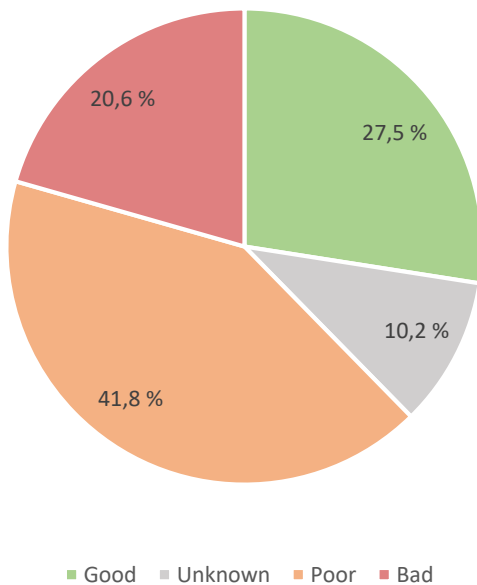


Figure 23 Conservation status of species at EU level, 2013-2018

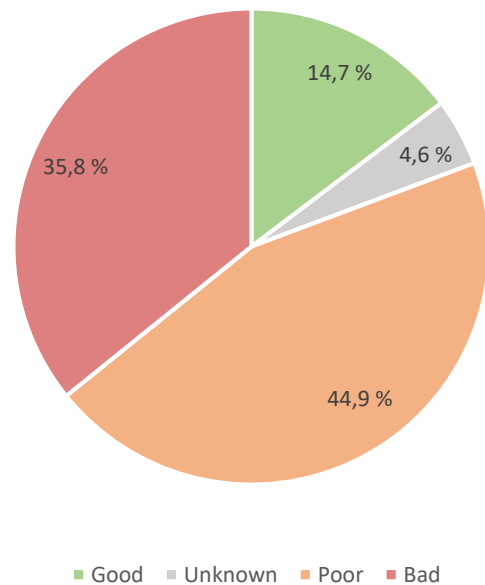


Figure 24 Conservation status of habitats at EU level, 2013-2018

## Political trends



### Polarization

The political trend of polarization can be seen on all scales, from global to local. As geo-political tensions between nation states (i.e. U.S. vs. China), and economic and military alliances (i.e. NATO vs. Russia), are common subject which are reported on news networks and in newspapers.

On national scale polarization through populism can be seen in politics as well. As figure 25 shows, throughout history there have been anti-political-establishment parties in multiple nation states within Western Europe, including the Netherlands (Casal Bértoa & Rama, 2021). Even more interesting is the presence of radical parties on both ends of the spectrum, on the left the Socialistische Partij (SP) and on the right the Partij Voor de Vrijheid and Forum voor Democratie (FvD). The extensive list of different parties within Dutch Parliament even add to the presence of a polarized political field at this moment, and the recent Covid-19 pandemic showed the polarized views within society.

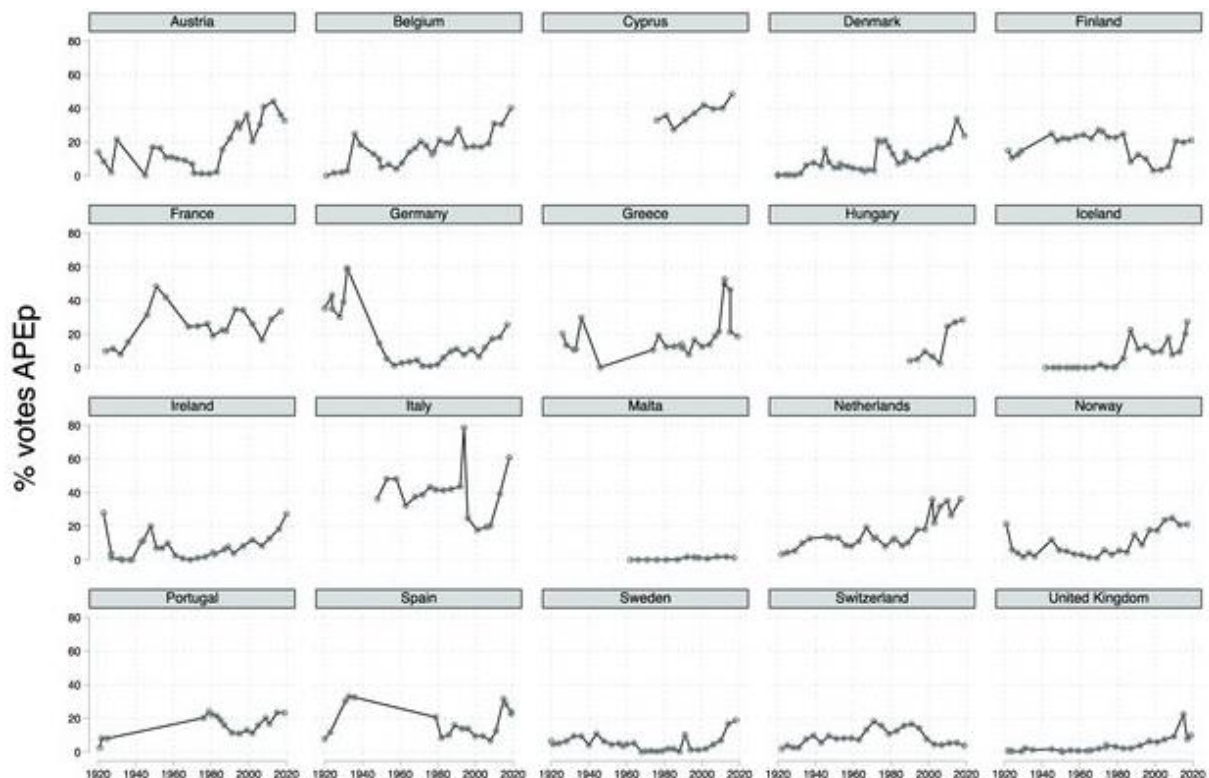


Figure 25 Percentage of votes for anti-political-establishment parties in Western Europe, 1920-2020



## Environmental protection legislation

Over the last few years legislation regarding environmental protection has been on the political agenda, on both the international scale as the national scale. Mainly focussed at combatting global climate change, as mentioned before, but also at preservation of biodiversity and decreasing pollution in general. Beginning with intentions which were formulated in the Paris Agreement (United Nations, 2015) to reduce the global temperature, the current European Green Deal (European Commission, 2019) offers specific guidelines which EU member states have to adhere to, and which will help to develop a sustainable society.

The ongoing specification of how to get to the end goal will only increase over the next few decades, international commitments and laws will have more impact.



## Trust in government institutions

The last trend which will be discussed is the trust in government institutions, focussed on the Dutch government and put in a broader perspective. The last few years, the Dutch government made crucial errors in governance. The childcare allowance affair by the Dutch tax authority and the earthquake damage settlements for the homes of thousands of citizens in the province of Groningen are two major examples of this. But also the Covid-19 measures affected the trust in the national government. As figure 26 shows, the trust in the government as a whole, and institutions like parliament and civil services is just below 50%. The government has to regain trust of the population to function properly again.

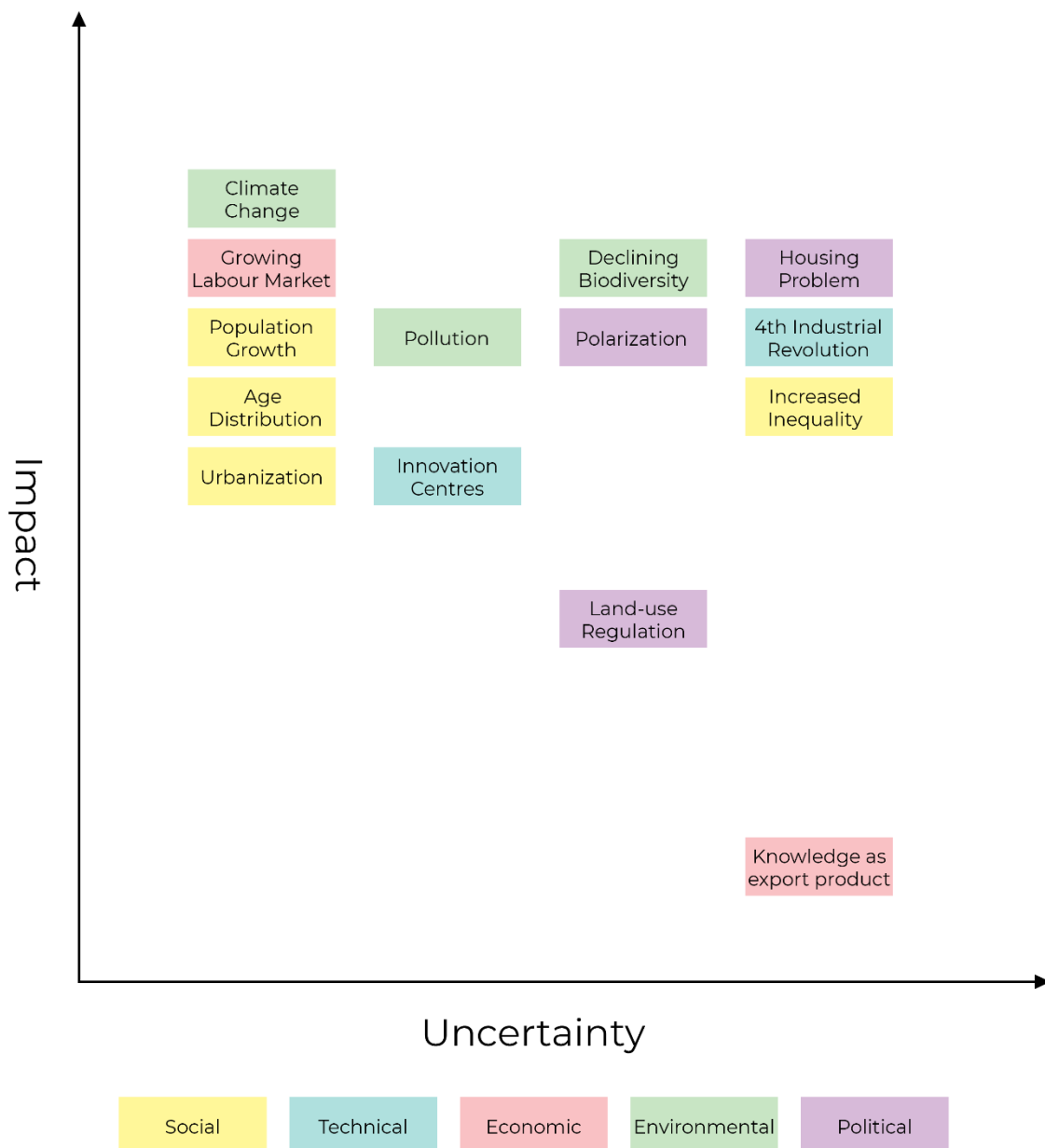


Figure 26 Trust in government, the civil service, the parliament and the police, 2018

## Assignment C: Impact diagram and explanation

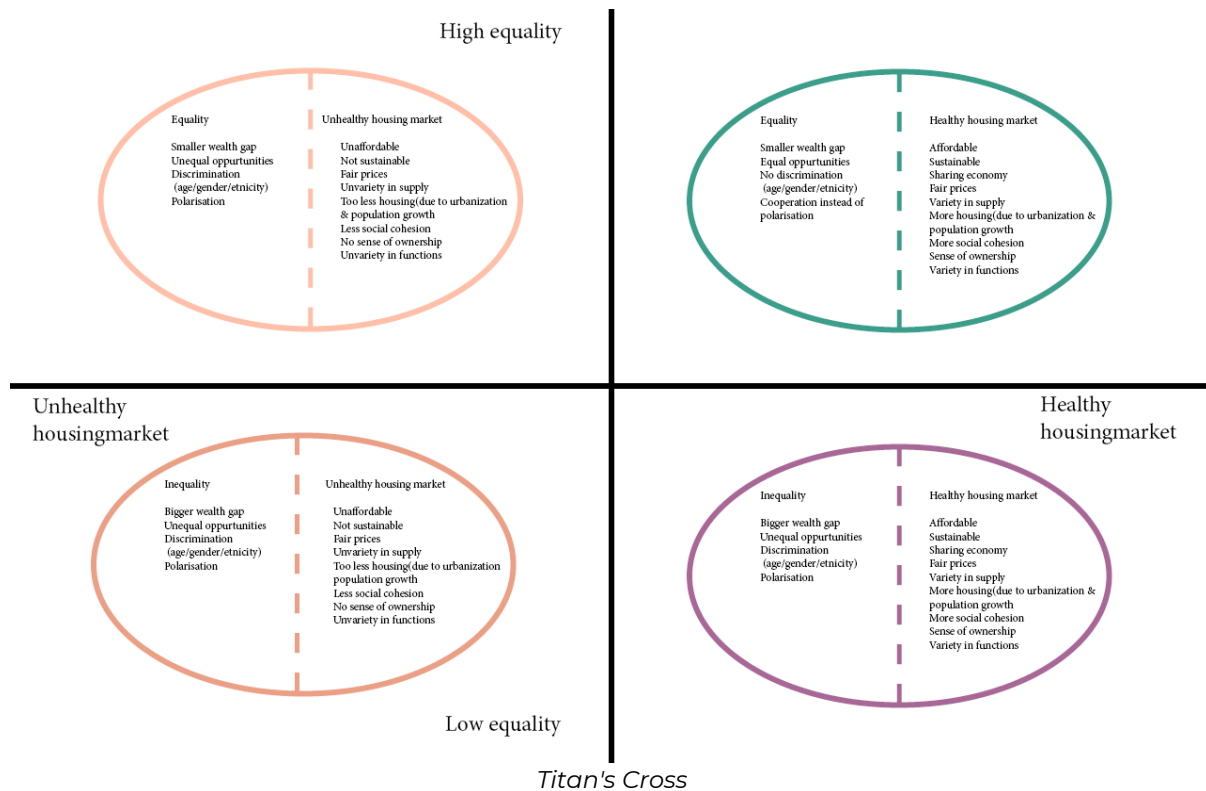
In this part of the report the researched potential trends, as described in *Assignment B*, which are applicable to the Oosterhoogebrug neighbourhood have been put in an impact diagram, which can be seen in figure below. These trends are structured by the impact they have on the neighbourhood, and by the uncertainty of the given trend. *Climate Change*, for example, is a rather impactful and predictable trend. The *4<sup>th</sup> Industrial Revolution* will have a high impact, but has a high uncertainty (mainly due to technological advancements which are unpredictable).

### IMPACT DIAGRAM



## Assignment D: Individual scenario

After discussing the trends and impact diagram as a group, two drivers have been chosen to use as extremities within the scenarios. The first being the *Housing Market*, either healthy or unhealthy. And the second being *Equality*, either as high or low (inequality). This resulted in a preliminary Titan's Cross which can be seen in the figure below.



The focus quadrant of the scenario as described in this report, is in the bottom-right corner. Where there is a *Healthy Housing Market* and *Low Equality*. As a first step, the two drivers of change have been specified in more detail.

A *Healthy Housing Market* is possible if four criteria are met: sustainable housing, enough housing for the population, variety in the housing supply, and affordability of housing.

*Inequality* has been specified in terms of social stratification: wealth and age gap between people, level of education, and is linked with discrimination of certain groups within society (i.e. poor vs. rich, native Dutch vs. immigrants, home owners vs. social rent).

The diagram on the next page shows how different trends, as researched in *Assignment B*, have impact on these two drivers.

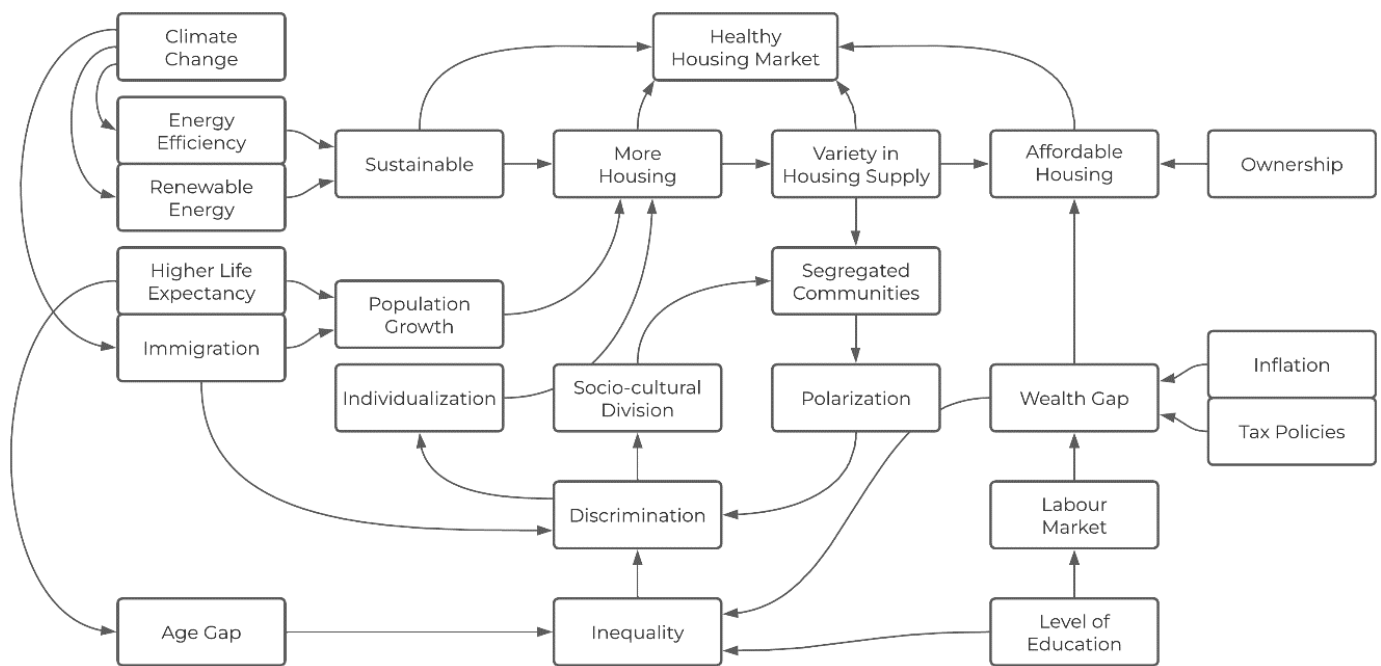


Diagram for Scenario: Peaking Polarization & Extreme Exclusion

The next step within this assignment revolved around the creation of an appealing scenario, where the path up until the year 2040 is described in a unique way. For this, a narrative is written from the perspective of a resident of the Oosterhoogebrug neighbourhood, who reflects on how things have changed over the last decades after walking to his home doing his groceries in the centre of the neighbourhood.

### Peaking Polarization and Extreme Exclusion

Once again people are having discussions at the supermarket about politics, almost to a degree that a fight breaks out, luckily the security guard steps in on time and the peace returns for a small time. But sooner or later, it will happen since polarization is peaking.

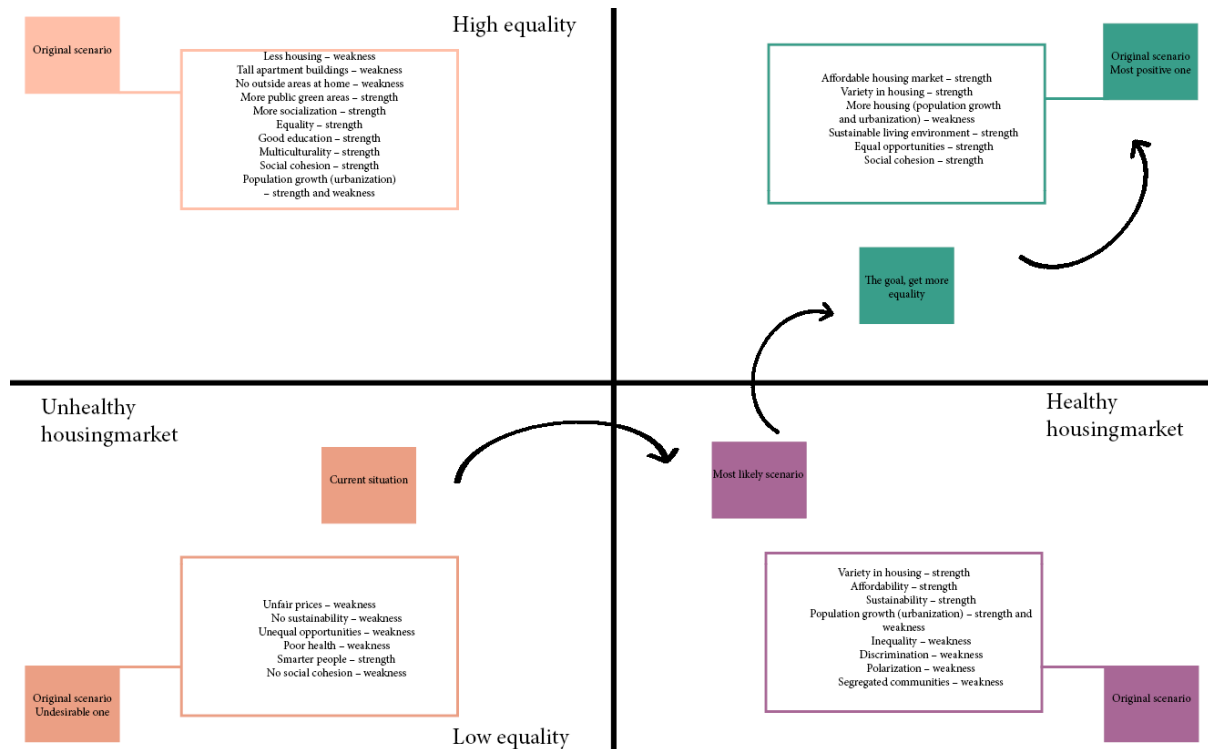
For a long time now the population of the city of Groningen is rising due to domestic and foreign immigration. Domestic immigration due to the trend of urbanization, which already started in the first industrial revolution and which continued into current times of the fourth industrial revolution. Foreign immigration has been around for at least as long, but it really took off since the mid 20's due to geo-political tensions regarding impending climate change. Whole parts of the world became uninhabitable due to droughts, floodings, and rising sea levels. Nation states around the world all signed the Paris Agreement, but with time running out they've started with scapegoating each other and the big polluters of the world, agriculture and fossil fuel industries.

These global tensions trickled down to the level of the neighbourhood as well. People from different classes blame each other for their personal misfortune, discrimination of other social classes is common. Although there is a wide variety of housing types to accommodate the different social classes they are all clustered in segregated communities. Newcomers or residents from other communities are met with disgust, as if the other is a pariah. People lost the connection with each other, and think they can react as if they are posting hateful messages anonymously on some internet message board. Why can't we just work together? We are all given the opportunity to make something of our lives, proper education and plenty of jobs within the region.

Why would I even care about the world around me? I have my own life, my own house, a decent income, and friends to who I can relate. The problem is not the other, maybe I should change as well to better the world.

## Assignment E: Group Scenario

We all wrote down the keywords from every scenario. Down here the most important key words are shown together with the strengths and weaknesses of the different scenarios. The first scenario is the most undesirable scenario. The best situation is to avoid this scenario.



After presenting the keywords from our individual scenarios we discussed which scenario was most likely to happen. As a group, we agreed quickly to which scenario is most feasible to happen in the year 2040. The figure above shows the process of this discussion. In the following paragraphs a summary is given regarding the current position of the neighbourhood within the diagram, the most and least desirable scenarios, the most likely scenario, and the scenario which we will work towards during *Application and Evaluation*.

### Current position of the neighbourhood

The current situation of the neighbourhood is somewhere in the middle of the bottom left quadrant.

The social cohesion as it has been in the past is decreasing, the feeling of the *old village* is disappearing. Outsiders from other neighbourhoods or villages are moving into the neighbourhood, which causes social tension since these people hold different values. The housing situation also is not healthy as there are no affordable homes on the market for people who are native to the neighbourhood and want to move back. There is a certain level of variety between the different types of houses now, but if these houses have the most suitable residents is questionable, as family homes are occupied by pensioned couples for example. A more positive development in the neighbourhood is the increased sustainability, in specific the installation of pv-panels on the roofs of social



housing by the housing corporation. This benefits the residents as well, because they produce electricity themselves which results in lower energy bills.

### **The most desirable scenario**

The most desirable scenario, in the top right quadrant, consists of a healthy housing market and high equality among inhabitants.

As seen in the diagram above, houses in the Oosterhoogebrug can be found in a wide variety of different housing types to accommodate different housing needs.

Housing for families and for people who live on their own, both young and old. But also, for different social classes within the neighbourhood. The price range and luxury of the houses differs, which results in affordable housing for all inhabitants. This also means that the costs for sustainable improvements will be easier to spread among the residents.

The public space is also developed with a clear vision, to bring people together in an inviting and sustainable environment which is accessible to all. Walking paths, benches, and plenty of safe playgrounds for children. There are also many spots where people can enjoy the company of each other, either during meetings of the different leisure associations or whilst getting the daily groceries. People look out for another; they give and receive help to each other. No one is left outside of the community, as all inhabitants are given equal opportunities to participate and develop themselves. All above mentioned examples strengthen the social cohesion in the Oosterhoogebrug.

Although this scenario seems lovely, there are also shortcomings to it. On the realistic side it might be difficult to accomplish the ideal of equality among people. As differences, in this scenario for example income and level of education, translate in different positions of power within the community. Furthermore, the increase in urban density as a result of population growth can be a threat to the *village* feeling which is present at this moment.

### **The most undesirable scenario**

The most undesirable scenario for Oosterhoogebrug is the one in the bottom left-hand corner. This scenario has only one strong point and that is that the unfair prices (as a result of an unhealthy housing market) will lead to only people with a high income coming to live in the neighbourhood. As a result, the average level of education is expected to rise. Unfortunately, all the other consequences, which have already been mentioned, are rather negative.

Of course, no one would like to see this happen, as the name "the most undesirable scenario" suggests. Therefore, it is important to ask ourselves how we can prevent this scenario from happening.

In the first place, social cohesion and the sense of ownership within the neighbourhood must be improved. There are several solutions for this, such as creating a new community centre. The current community centre is mainly aimed at bringing older people together (through choirs and card-playing clubs), so there are opportunities to improve this. For example, by focussing on bringing together residents from different ages and cultural backgrounds.

Another negative consequence of this scenario is a poorer health of the residents due to less investment in sustainable measures, including combating, for example, heat stress. This could be solved by, for example, making subsidies available for residents to take climate-adaptive measures and by implementing these measures in public spaces.

### **The most likely scenario**

While the most desirable scenario represents a utopian situation, the most likely scenario represents a more realistic situation. In this scenario not all the categories represent an opportunity, some of them are also a threat to the well-being of the neighbourhood.

To achieve a healthy housing market, variety in housing supply will be a priority, as well as fair and affordable price regulation. However, this can also become a threat, because the more housing that becomes available, the more people will move into the neighbourhood, so the population level will increase, leading to urbanisation and gentrification.

This increase in population can be an opportunity for the neighbourhood in terms of social diversity, but also a threat. The loss of village feeling and social segregation due to the arrival of new people in the neighbourhood can already be perceived. So, if the population continues to grow, this situation may lead to a lack of social cohesion.

The construction of new housing to increase the housing supply can become an opportunity to invest in sustainability in the neighbourhood.

But this scenario still does not represent an idyllic situation, just the most likely one, as equality of opportunity remains a threat to the neighbourhood. The increase in housing can attract people from different social classes, and with it an increase in the wealth gap.

### **Goal to work towards to**

Since the most desirable and positive scenario is not a realistic scenario to aim at, we agreed that the goal would be slightly lower on both driving forces. The goal scenario is still an improvement compared with the most likely scenario and the current situation. As it can be seen in the scenario diagram, it is in the middle of the top right quadrant.

With this goal scenario as an aim for our development plans, it also prevents the neighbourhood to get into the undesirable scenario. At this time, as described before, the neighbourhood is not in the best shape, but this is not a bad starting position, as this gives a multitude of opportunities. Of which an enumeration is given below.

- Healthy housing market
- More housing (can also be seen as a threat)
- Variety in housing
- Affordability
- Sustainability
- Community feeling
- Social cohesion
- Equal opportunities

At this moment the housing prices are sky high. This is not an ideal situation for the neighbourhood, but the housing market could be improved. There is not enough housing in the neighbourhood, due to the urbanization. This development is also hitting the area of Oosterhoogebrug, which is getting closer to the city centre each year. The city is expanding and, consequently, the neighbourhood is becoming more urbanised.

A second housing tower of the Eemstoren is an example of this situation. Its construction, as well as the previous construction of the Tasmantoren, is attracting more and more people with higher incomes, thereby increasing the wealth gap. The exact future of the neighbourhood is difficult to predict, but there are many opportunities for the neighbourhood to improve.

Some of the opportunities to achieve a higher level of equality in the neighbourhood are a healthy housing market, variety in housing, affordability or sustainability. All these categories could contribute to improve the community feeling, a higher level of social cohesion and more equality in opportunities.

While the construction of more housing could represent an opportunity as well as a threat, as previously explained in the most likely scenario.

Then finally an advice needs to be made for the different scenarios. As the current situation of the neighbourhood there are many opportunities that really need to be used to increase the positive things from the area. The first step for a better developed neighbourhood is to receive the better scenario that is most likely to happen in the future. The next step is to get a closer community that can be a more cooperative community and that the level of social cohesion will be higher. The opportunities for the neighbourhood are more difficult to predict for the future. It would be the best situation that the scenario is becoming really positive with the higher equality.

### **Criteria and research question for this scenario**

In order to achieve the objective of getting from the current situation to the scenario situation explained above, a few requirements must be defined. These requirements will be the same as those used to analyse the different scenarios, the most desirable, the most undesirable and the most likely one:

- Variety in housing
- Affordability/fair prices
- Sustainability
- Community feeling (social cohesion)
- Sense of ownership
- Equal opportunities

The above options represent possible opportunities for improvement in the neighbourhood. When all these criteria are met, the objectives set out to arrive at our scenario are fulfilled. So, these six working objectives will be the starting point on which to work and create an even better neighbourhood.

Positive things are difficult to achieve, therefore, some criteria that constitute a threat and an opportunity must also be considered.

Population growth and increasing urbanisation can be seen as both positive and negative. On the one hand, this population growth is forcing the neighbourhood to provide more housing. The current situation in the neighbourhood does not have enough housing to accommodate more people, but there is space in the neighbourhood for new housing to be built.

In addition, population growth will also affect the old village feeling in the neighbourhood, causing more segregation and less social cohesion. The village feeling is difficult to recover, but not social cohesion and a greater sense of community. This can be achieved by enhancing social cohesion through social activities or by improving the design of public areas.

On the other hand, since the term equality encompasses different approaches, the work will focus on achieving a greater degree of social equality, but not economic equality.

Considering all the points of the criteria mentioned above, the research question on which we will focus our work in the following module of *Application and Evaluation* is:

*How can a healthy housing market improve the social cohesion in the Oosterhoogebrug in the year 2040?*

### **The impact of an intervention**

This part of the scenario planning concerns a probable and unforeseen intervention that is the cause for certain problems which may arise in the neighbourhood. There are many things that can disrupt society, on a large scale but also on a smaller scale. Events which happen far out of one's own reach, either being expected or unexpected, can also have a negative impact on the Oosterhoogebrug area.

The recent covid-19 pandemic, for example, had impact on all different levels and people's daily life was affected by this quite heavily. The war in Ukraine also impacts the way people live, as the higher energy prices led to economic inflation. How negative this conflict might be, it also brings opportunities, we developed a different view on our dependence of other countries for raw materials and this can boost the carbon-free economy.

Our unforeseen event is on a local scale, to be precise in eastern part of the neighbourhood. Between the older terraced housing and the newer semi-detached housing, there is an area with above-ground electricity lines. As such, housing development is not allowed. The open area is developed for nature and leisure activities, right underneath the electricity lines there is a playground for children. What happened is the following.

During a scorching hot sunny day in the summer of 2038 around 5 pm, a lot of children were playing at the playground. Other people were home after a long day of work and taking refuge from the heat in their cooled homes.

Out of nowhere the electricity lines fell and caused a gigantic fire, starting in the playground. The fire spread quickly through the dried-out grass and bushes, that are in and around the playground, because of global climate change. The effects of the eastern wind caused the fire to spread to the residential area. The wildfire surrounded the homes of the residents at a rapid pace and many houses were set on fire by this. People were stuck in their homes, waiting for the emergency services to arrive. Elderly people couldn't get from the first floor to downstairs to leave their homes on time.

As a result of this unfortunate event, a total of 27 people, of which 12 were children, died. Either by the direct consequences of the fire or by the toxic smoke which suffocated them. Many residents were wounded very badly and had to be treated in the hospital for their injuries.

The tragic event was reported on national television and caused much attention to the neighbourhood, and the city of Groningen. In a negative way. Politicians and people around the Netherlands were struck by surprise and showed compassion with the victims and the relatives. Countrywide a moment of national mourning took place on the day of the memorial service.

The disaster was a national wake up call for safer use of electricity lines and how they should be integrated in the public space and urban areas, as a result the high-voltage electricity lines were put underground as is common with other utilities. Furthermore, landscape management had to be reviewed as well. Drought of nature and urbanised areas is not specific for the Oosterhoogebrug neighbourhood but is common in the whole of the Netherlands. This disaster obviously cannot happen again.

After an emotional period of mourning the residents were closer together, because they shared a collective trauma. Some people lost their children or other relatives and friends, because of this. It brought the people more together and they are remembering the victims for the rest of their lives. The tragedy caused for unity in the neighbourhood, and social cohesion increased. The residents are still licking their wounds but find comfort in each other's company.

A special monument will be placed, in the former area of the playground where it all started, in remembrance of the people who didn't survive this tragedy and especially for the children. The land surrounding it will be redeveloped by the local government.

# Reflection

## Feedback on results

Most of the feedback my group members and myself gave to each other was during various coaching sessions we've had during the module. Either by questioning each other during presentations about articles related to scenario planning, or by giving tips how to make individual scenarios more appealing.

These discussions gave insight into the thought process of group members. How do they link different trends with each other in a diagrammatic way? Did they make it internally consistent? But mainly, do I understand what they argue? I've taken a critical stance towards them, so they could develop a more coherent scenario. I think this comes natural to me, it's in my personality to question the world around me and to help others improving themselves.

The received feedback (see the Feedback Form in the Appendix) was rather positive, as the intended scenario seemed plausible to my group. I've tried to write an appealing story which was internally consistent and linked to the research I've done during *Assignment B*. This definitely gave confidence. Other group members asked me to help them out with their diagrams, as I've visually showed and verbally explained how everything is connected.

## Learning process

During the first class the question was raised "who has experience with scenario planning?", after which we had to stand in a line and position ourselves accordingly. As I've had a recent experience with scenario planning in my previous minor of *Sustainable Energy Professional*, at the International Business School of the Hanzehogeschool Groningen, I stood on the far end of the line.

But practice makes perfect as they say, and this is exactly how I started with this module. Gain more experience in scenario planning with a specific focus on my future field of work, spatial development, instead of looking at the possible impact on the energy market. Although many factors and trends which have been researched, in *Assignment B*, show similarities with scenario planning in other fields. As such, I've seen it as a valuable process. Mainly because the context relates more to my future career.

Researching possible trends, and discussing these later on, has been a large part of the module as this was an individual assignment. Which I understand, but for the creation of future visions it might have taken too much time.

The creative process on the other hand, where all group members had to envision their own future life and the assigned quadrant used for *Assignment D*, was rather small. I think this was not intended, but the creation of the flowchart for the specific quadrants had more emphasis. Although I see the benefits as well,

because the diagram gave a better insight into the internal consistency of the scenario I worked on. It also is a visual support for your reasoning and written scenario, which I've found very useful to take with me for the rest of my study and future career as I've struggled with making both *Assignment A & D* appealing to my group members.

I think that we discussed the different trends, scenarios and resulting impact on the Oosterhoogebrug neighbourhood to a high extent within our group. Which I've seen as a positive experience, as we all were informed about the each other's work.

As mentioned during the final presentation, I see some problems with using the STEEP method. As there is an alternative, the PESTEL method. The latter has an added category, *Legal*. In my opinion there is a difference between political trends and legal documents by which government organization and citizens are bound to. Although it might be a minor nuance, it should be given special attention.

For possible future scenario planning activities I will encounter, I would like to focus more on the visual representation of the scenarios. Look into different ways to make it more appealing to a broader public instead of peers. This also touches upon my career choices as I got a better understanding of my own future.

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## Appendix A – Peer Feedback form

*Are the contents of the scenario consistent?* Yes, it focusses on the same issues.

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*Is the scenario in line with the chosen quadrant?* Yes, it corresponds with the chosen quadrant.

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*Have the 'certain' trends been included in the scenario? What were the mentioned certain trends?* Some of them, like climate change, population growth and polarization.

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*Has the scenario been written from the perspective of the future (in 2040)?* Yes, the scenario describes a possible reality in 2040.

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*Does it look back from the year 2040 (back-casting)?* Yes, it does.

---

*Is the scenario plausible? That is, is the scenario supported by facts and predictions?* Yes, it could be plausible because it is consistent with some of the trends analysed.

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*Does the scenario presented arouse your interest?* Yes, I think the way the story describes a day in that scenario is interesting.

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*Has the scenario been presented in an engaging and creative way?* Yes, starting the story with a conflict situation is attractive.

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*Questions and / or comments:*

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- It still misses visual representations.
- It's good to put detail into the story, but maybe too much.
- Sometimes the story seems like a novel and sometimes like a more technical text.
- Making it shorter would help to focus more attention on what is important.

## Appendix B – Assessment Form

Group: 2  
Name student: Rik Bodewes

Learning outcome	Description	Step	Product	Criteria/indicator	Mark
I&FV.1: Students will be able to demonstrate their knowledge and understanding of trends, social developments and/or spatial factors acquired by carrying out research from different lines of investigation.	- When devising scenarios and making the associated choices, students can demonstrate that they have knowledge and understanding of the potential impact of trends, social developments and/or spatial factors. This knowledge and understanding has been acquired by reflecting on the future and understanding the trends and driving forces.	STEP 6 Individual 15%	{assignment (B)}:  Overview of potential trends and dilemmas	<ul style="list-style-type: none"> <li>o Overview of Trends and Developments</li> <li>o Research incl. resources / justification</li> <li>o Global / national/ local scale</li> <li>o Using STEEP</li> <li>o Nature of change in the trends</li> </ul>	8
		STEP 7 Individual 10%	{assignment (C)}:  Impact diagram (photo) and explanation	Impact diagram: <ul style="list-style-type: none"> <li>o 2 axes: impact versus uncertainty</li> <li>o Trends / driving forces + pattern of change</li> <li>o Related to overview of trends {assignment (B)}</li> </ul> Explanation: <ul style="list-style-type: none"> <li>o Incl. choices and thoughts</li> <li>o Clear</li> <li>o Logical</li> </ul>	7
		STEP 8+9+10 Group	Part of {assignment (E)}:  - Choice of driving forces - Scenario template - Key words per square in scenario template	<ul style="list-style-type: none"> <li>o Explanation of choice driving forces</li> <li>o Two independent and extreme d.f.'s (high impact + high uncertainty)</li> <li>o Focus Oosterhoogebrug area</li> <li>o Key words related to square scenario template</li> </ul>	pass

I&FV.2: Students will be able to associate through broadening, connecting and restructuring to cultivate new insights, to apply knowledge and skills, to justify choices and viewpoints and to demonstrate the outcome in a creative/unorthodox way.	<ul style="list-style-type: none"> <li>- Can apply knowledge and understanding in a creative or unorthodox way in the descriptions of the scenarios.</li> <li>- Students can use their knowledge and skills to defend and justify choices and viewpoints.</li> </ul>	STEP 4 + 5 Individual	{assignment (A)}: Own vision – Who am I in 2040?	<ul style="list-style-type: none"> <li>o Who, where, what doing, what happens around you</li> <li>o Arouse interest</li> <li>o Details</li> <li>o Research / sources</li> </ul>	pass
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Learning outcome	Description	Step	Product	Criteria/indicator	Mark
		STEP 10 + 11A + 11B  Individual  25%	{assignment (D)}:  Improved scenario (together with concept scenario and Flow Chart)	<ul style="list-style-type: none"> <li>○ Used feedback from peers</li> <li>○ Arouse interest / appealing</li> <li>○ Creative way</li> <li>○ Focus on Oosterhoogebrug area</li> <li>○ Consistent and in line with quadrant (keywords)</li> <li>○ Plausible (facts + prediction)</li> <li>○ Including <i>certain</i> trends (research)</li> <li>○ Justification</li> <li>○ Written from future (back from 2040)</li> <li>○ Written as if you are in 2040</li> <li>○ Named the scenario</li> </ul>	7
I&FV.3: Students can, based on research outcomes from different lines of investigation, evaluate the different scenarios.	- Can identify the strengths and weaknesses of different scenarios and can justify the desirability of scenarios and to give advice on scenarios.	STEP 12 Group 25%	{assignment (E)}:  - Explanation of scenario choice - Description how to get from current situation to scenario-situation  - Advice group scenario	<p>Explanation of scenario choice:</p> <ul style="list-style-type: none"> <li>○ Strength + weaknesses of different scenarios</li> <li>○ Justify desirability</li> <li>○ Used knowledge and skills to justify advice on scenarios</li> <li>○ Explained how to get there</li> </ul> <p>Group scenario:</p> <ul style="list-style-type: none"> <li>○ Well-based choices, in line with explanation of scenario choice</li> <li>○ Arouse interest / appealing</li> <li>○ Creative way</li> <li>○ Focus on Oosterhoogebrug area</li> <li>○ Plausible (facts + prediction)</li> <li>○ Including <i>certain</i> trends (research)</li> <li>○ Justification</li> <li>○ Written from future (back from 2040)</li> <li>○ Written as if you are in 2040</li> <li>○ Named the scenario</li> </ul>	8
			- Impact of intervention - research question and criteria for A&E	<ul style="list-style-type: none"> <li>○ Impact of intervention</li> <li>○ Research question, frame work, criteria, requirements for A&amp;E</li> </ul>	pass

Learning outcome	Description	Step	Product	Criteria/indicator	Mark
I&FV.4: Students can reflect on self-learning, the process followed and deliver reflective peer feedback.	- Students are open to the views of others and can give and receive feedback.	Reflection Individual 15%	Reflection: Feedback on results (5%)	<ul style="list-style-type: none"> <li>o Peer feedback (given and received)</li> <li>o Learned from others</li> <li>o Effect of feedback on own results</li> </ul>	7,5
	- Students can formulate personal learning objectives for the future based on the reflection on the scenarios.		Reflection: Learning process (10%)	<ul style="list-style-type: none"> <li>o Related to content (articles, videos etc), how can this module contribute to your future activities?</li> <li>o Did your perspective change?</li> <li>o What went well?</li> <li>o What could be improved?</li> <li>o Learning point for future</li> </ul>	8
I&FV.5: Students are able to demonstrate appropriate communication in an engaging and creative way.	- Can communicate the scenarios to an audience in an engaging and creative way.	Presentation and constructive cooperation Individual	- Presentation - Constructive contribution	<ul style="list-style-type: none"> <li>o Student presented on engaging and creative way</li> <li>o Student actively contributed and took his/her responsibility in the different STEPS.</li> </ul>	8,5
I&FV.6: Students are able to demonstrate constructive cooperation with group members and other participants/actors.	- Students can contribute to, take (partial) responsibility and has an active attitude regarding the results (and deliver it collaboratively and by consensus).	10%			