Master Thesis

Life in the greenhouse gas emitting society and climate change mitigation solutions

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Acknowledgements

It is surprising that I refer to just one book written by Peter-Paul Verbeek, my first supervisor, but it is perhaps fitting that it is *De Daadkracht der Dingen.* Back when I was still working on my Bachelor in Mechanical Engineering, and while I made my very first steps in philosophy in the minor, I put this book on my birthday wish list. After receiving it from my parents and reading it during the summer holidays, I decided that Philosophy of Technology is much more interesting than Calculus and Fluid Dynamics, so as soon as I could, I made the jump to the PSTS Master programme.

From before the very first course of the programme to this thesis, I have experienced Peter-Paul as an excellent philosopher, teacher, guide, and inspirator. Despite his busy schedule, he always managed to squeeze in a meeting, even if it had to be by phone late at night. By the time I got confident enough that I might actually finish this master and started wondering what to do next, he promptly provided me with a fruitful lead for a PhD position. I am certain that much more of Peter-Paul than just his first book has found its way into this thesis. So my first word of gratitude goes out to Peter-Paul, for introducing me to Philosophy of Technology, making the journey so far so pleasurable, and offering the leads for the next step.

I have picked my supervisors appropriately, because the second, Adam Briggle, is clearly the second-most influential person on my journey, as he hosted my 5-week stay at UNT in Denton, TX. I experienced this short but very interesting and inspiring stay abroad as perhaps the pivotal moment in the programme, and I am sure it would not have happened without Adam. In Texas I did not just learn about the experiential gap, environmental ethics, and different ways for approaching Borgmann, but also about bicycle activism, Thanksgiving, and the amazing women Adam shares his life with. So I would like to thank Adam for having made possible this unforgettable experience.

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I The problem of climate change

Introduction

When I recently booked a flight to Dallas, Texas, I noticed the web page for KLM's CO2zero programme ("CO2 Calculator", n.d.), aimed at offsetting the carbon dioxide emissions of air travel. Because it is currently impossible to use carbon neutral fuels in jet engines, the programme guarantees to save an equivalent amount of emissions elsewhere: for example by building wind turbines, planting forests, or capturing methane from landfills. I was required to fill in my departure and destination cities, and the page returned some data on my emissions: a return flight of 16.504 km consumes 596 litres of fuel per person. The 1.490 kg of carbon dioxide emissions can be offset for €12,66.

I found these figures fascinating. By simply sitting in a noisy, moving environment for a day, I am able to burn 596 litres of fuel, enough to heat my apartment for almost a year. This feels like a huge amount, and it is amazing how easily I can consume this amount of energy. However, taking the distance into consideration, a different perspective develops: at 27 km per litre, air travel appears to be as efficient as the best performing cars. Add the advantages in speed and the ability to travel in a straight line (and indeed, the ability to cross the Atlantic), and it appears we should choose the aeroplane over the car any time.

These are two different ways of looking at the consumption of resources. The latter is the traditional way of approaching the problem in a technical way. By focussing on efficiency and comparing different solutions with each other in a given context, the best solution, or lowest consumption for a given task, emerges. In this thesis, I argue that something important is ignored by this way of reasoning, and the former approach of looking into the ease at which energy is consumed is essential if we are to reduce our consumption.

With my flight to Dallas, I am burning 596 litres of jet fuel at a ticket price of €809. Were I to use the same amount of gasoline for my car in the Netherlands right now, I would pay around €1000 for the fuel alone[1]. That would be without the purchase and maintenance of the vehicle, a qualified driver, and friendly in-flight attendants.

The reason for this discrepancy is that car fuel is heavily taxed in the Netherlands in order to reduce its use, whereas jet fuel is not. It would make sense to tax air travel in a way similar to road travel if we are to reduce energy consumption. But so far, taxing of jet fuel has proven to be very difficult to achieve, due to the international character of the business. If the Netherlands would impose taxes, but other countries do not, airlines simply fill up their tanks elsewhere. Not every country supports fuel taxes, for example because they want to keep air travel accessible to the less wealthy. Furthermore, it is argued that heavy taxes would hurt the economy, and therefore the quality of life for all of us.

Another interesting bit of information is the cost of compensation: €12,66. That is less than the price of a good

[1] Assuming a gasoline price of €1,65. Gasoline is not the same as jet fuel, but its caloric value is similar at around 45 MJ/kg, so this comparison is valid.

meal on an airport, and about 1,5% of the ticket price of €809. How can this be so little, and why is it not simply included in the ticket price (or at least made easier to pay) if it is such a good thing to do?

There are a few ways to approach these questions. First, it is cheap partly because it is not yet widespread. Currently, there are many easy ways to prevent emissions, for example by burning available biomass to heat buildings, rather than composting it. When this 'low hanging fruit' has been taken care of, further reductions become more difficult and therefore more expensive. Second, it is debatable how effective carbon compensation is: I am still burning 596 litres of fossil fuel that are not returning to their original sediment layer any time soon, and scientists do not know the exact effects of emitting carbon dioxide this high in the atmosphere, and how to account for the vapour trails that are formed in the wake of a jet aircraft. Making me feel like I am saving the planet for a few euro's might have the effect that I will choose to travel more often, resulting in more emissions, rather than less.

A range of presumptions were made in the description of the example above: climate change is a phenomenon we should do something about, we can do that by reducing the emissions of carbon dioxide, and it is no easy task to do so. In this chapter, I will argue that these presumptions are indeed permitted. First, the main concepts of climate science are introduced, after which I will describe two frameworks in which the problem of climate change is currently approached. My problem statement follows from the inadequate understanding of technology in those frameworks.

1.1 The planetary climate

Without greenhouse gases, life on earth could not exist. The planetary atmosphere works as a blanket which holds heat, increasing the average and nightly temperatures, while protecting us from extremely bright sunlight during the day. This is called the greenhouse effect, which works roughly as follows. A certain amount of solar energy reaches the earth. Part of this energy is reflected by the atmosphere or the earth's surface, and bounces right back into space. Another part is absorbed by the atmosphere, increasing the temperature of the air, and the rest is absorbed by the land and ocean surface. Like the air, the temperature of these surfaces rises because of this. All matter emits an amount of radiation relative to its temperature, so the earth's surface and atmosphere emit part of their absorbed energy in the form of long wave radiation. Part of the surface radiation leaves the atmosphere, and part is radiated back to the surface by the reflective surface of clouds and the atmosphere itself (see fig. 1). (IPCC 2007a)

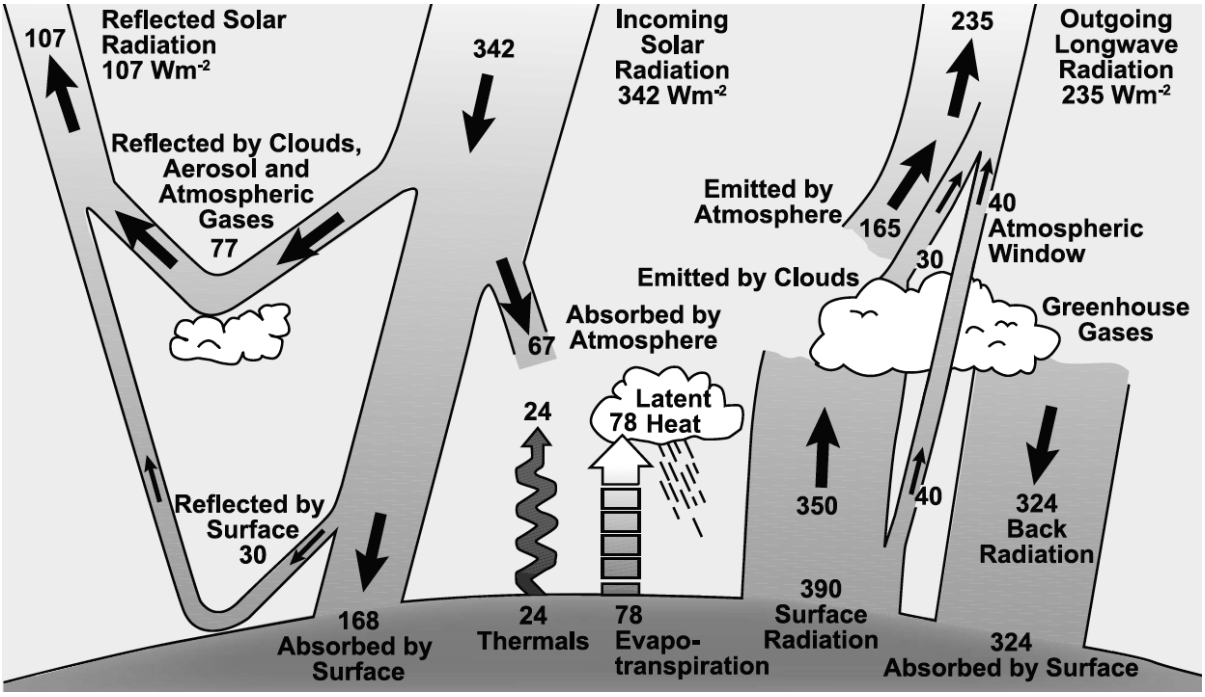

Figure 1: the Earth's energy budget (Kiehl & Trenberth 1997)

If the incoming and outgoing energy flows are in balance, the temperature of the earth's surface and the atmosphere remain constant. But when the conditions of the system change, the energy flow becomes off balance, the amount of stored energy changes, and the temperature drops or rises. With this temperature change, a new balance in the system is found, for example because a higher temperature results in a slightly higher surface radiation which balances out increased incoming solar radiation. There are many parameters which may throw the system off balance, for example the type and amount of formed clouds, the albedo (or 'reflectiveness') of the gases in the atmosphere and the surface, and the amount of incoming sunlight. This is why it is difficult to calculate the effects of air travel: a variety of parameters is influenced by the emission of various gases and particles in the upper atmosphere. If a change in parameters causes an increase in mean temperature, we say the greenhouse effect has increased. A broad range of phenomena like ocean currents, land distribution, mountain ranges, tides, and seasons influence the distribution of heat and weather around the globe, resulting in the weather in a specific location (Burroughs 2007).

Imbalances in this system are recognisable as changes in the weather: increasing temperatures cause an increase in evaporation of water, which leads to the formation of clouds which reflect sunlight and therefore cool the surface, and so on. This leads us to the relation between weather and climate. The climate is the weather at a certain location averaged over a certain amount of years. While this irons out all the small wrinkles of particular days, it does not mean climates are stable. Behind the day-to-day chaos of the weather and the changing of the seasons, there is some long term change to be recognised, for example a shift towards higher temperatures because of increased back radiation of greenhouse gases when their concentration in the atmosphere rises.

1.1.1 Climate change

The climate has fluctuated since the dawn of time: there have been several 'ice ages' during which large amounts of land were covered in ice and the sea level dropped because water was 'stored' in ice sheets, and warm periods in which the ice sheet retreated and the sea level rose. Natural causes for climate change include fluctuations in the earth's orbit around the sun, solar activity, and volcano eruptions. During the last few millennia in which humanity flourished, the climate has been relatively stable. However, a large majority of leading scientists are all but certain this stable period is coming to an end, and we are due to face considerable changes in the climate within the next few hundred years (IPCC 2007a).

Before we move on to a more detailed description of what scientists know, we might ask ourselves why we should care about climate change; it is a natural phenomenon after all. There are two main reasons for this. First, unlike historical climate change, the current changes are most likely anthropogenic. This means humans have caused it, so we may have a moral obligation to do something about it, if it has detrimental effects on life on earth. The fact that natural disasters create harm, does not allow us to create harm as well. And second, because human civilisation has developed in the current climate, a change in this climate threatens our civilisation. Agricultural traditions are threatened by changes in temperature and precipitation patterns, possibly leading to widespread famines, and an increase in 'extreme weather events' is likely to occur, leading to more natural disasters. Temperature rise leads to the melting of glaciers and other land-based ice masses, resulting in a rise in sea level. This could make densely populated coastal areas around the world uninhabitable. Next to these two reasons appealing to the public at large, environmentalists note for example the possible extinction of vulnerable species, which are not able to migrate along with the changing climate, like mountaintop species, coral reefs, and other lifeforms depending on local geography or ecosystems (Parmesan 2006). All in all, if the scientists are right in their predictions, we have good reason to be very worried.

So how certain are the scientists about their predictions? To answer this question, we need to look into the practices of climate science. Before making any predictions, scientists try to reconstruct the historic climate situation. They can draw from direct measurements from the last century or so, and can go much further back in time by examining historical records and using 'proxy measurements': trapped air bubbles and pollen content in ancient layers of ice, ocean sediment, and caves contain useful data to reconstruct fluctuations in temperature, precipitation, and greenhouse gas concentrations. Scientists also do lab and field experiments to find for example radiative properties of gases and clouds, and use this in combination with the historical data to reconstruct the climate over a vast time period. Climate scientists emphasise this is a very complex problem: “The first thing to get straight is that there is nothing simple about how the climate changes” (Burroughs 2007, p. 1).

Still, there is quite a lot they *do* know, for example that carbon dioxide, methane, and nitrous oxide are radiative gases, so an increased concentration of these gases leads to an increase in the greenhouse effect, and therefore an increase in mean temperatures. They also know that indeed, the concentration of these gases is increasing, and that human activities are by far the most likely cause for these increases: human emissions dwarf natural causes on the global level. For example in the case of carbon dioxide, the increase in observed concentrations accounts for just 55% of human-emitted CO_2 since the industrial revolution – the rest has been taken up by plants and

the oceans (IPCC 2007a). However, there is uncertainty regarding the 'climate sensitivity', the extent to which the increased concentrations of these gases result in an increase in temperature. It is expected this sensitivity is somewhere between 2 and 4.5°C for a doubling in greenhouse gas concentrations. And although scientists are rather confident in predicting climate change on the continental scale, regional and local predictions are much more uncertain, so global estimates cannot be translated directly towards local situations.

Further uncertainties lie in the existence and location of 'tipping points': tresholds after which a sudden shift occurs. Examples of tipping points are the halting or reversal of ocean currents which radically alter the distribution of heat around the globe, and the melting of frozen bogs in arctic regions which would emit large amounts of methane, creating a positive feedback effect. Such events are very difficult to predict, and therefore hard to implement in climate models. (Burroughs 2007)

Because the climate is influenced by the concentrations of greenhouse gases, rather than emissions directly, the effects of our behaviour only become apparent after many years. In order to stabilise concentrations, emissions must be reduced to the speed at which greenhouse gases are removed from the atmosphere by natural processes. Carbon dioxide for example, is taken up by plants and the ocean. With increasing deforestation, the 'carbon sink' of forests decreases, so the critical emission level drops even further. Although there is some uncertainty about the exact timing, the general consensus is that the sooner a neutral emission level is reached, the lower the stable concentration of greenhouse gases will be. If we hope the peak will remain around twice the 'pre-industrial' levels (which corresponds to 2 to 4.5°C temperature rise), it is estimated that a neutral emission level needs to be reached before the year 2050.

1.1.2 IPCC

In order to offer some clarification in the chaotic literature and debates on climate change, the United Nations erected the Intergovernmental Panel on Climate Change (IPCC). This panel is a scientific body assessing the work of climate scientists worldwide. It does not do research itself, but aims at providing the world with a balanced and rigorous overview of climate science, as a reference for scientists, policy makers, and the public at large. So far it has produced four 'assessment reports', the latest being released in 2007, combining the work of three 'working groups'. The first working group deals with the scientific knowledge on climate change, the second on predicted and measured social, economical, and natural impacts of climate change, and the third on possible mitigation options.

Despite working according to scientific reviewing standards, there has been some controversy around the Fourth Assessment Report (IPCC 2007a), concerning errors in data, compromising emails between scientists, and a minority voice of scientists who claim the general conclusions of IPCC are incorrect. However, impartial assessment of these controversies resulted in the conclusion that the IPCC works according to the scientific standard, and that despite the data errors, the main conclusions of this report remain legitimate (Ravindranath 2010). This is no guarantee the IPCC is correct; it is good to remember science is no democracy, so the majority might in fact be wrong. Also, even the majority accepts the uncertainties in the available knowledge, which some people might interpret as a good reason to postpone any action. Still, there is no use waiting for full

certainty on this matter; in all likeliness anthropogenic climate change is indeed a real and pressing problem, and we do not have the luxury to wait for certainty which may never come, because of the irreversible damage that could have already occurred by then.

Because this thesis does not rely on (or wishes to add to) the cutting edge of climate science, but on the rather well-accepted general conclusions of it, the scientific uncertainties will be accepted for what they are from here on. It will be assumed that human activities are causing climate change or will cause it in the future, and that non-interference will lead to unacceptable consequences.

1.1.3 Climate change mitigation

It is exactly this assumption which has spawned a myriad of climate change mitigation proposals. Scientists, technologists, and politicians alike have looked at the 'facts' of climate change – we are emitting greenhouse gases and aerosols with these and these activities, so we need to discourage people to partake in those activities, or find non-emitting alternatives. The IPCC working group 3, dealing with mitigation options, organises the options by sector: energy supply, transport, buildings, industry, agriculture, forestry, waste management, and sustainable development. For each of these sectors, they estimate how much emissions could be reduced by efficiency improvements, technological developments, and policies like a cap-and-trade system for emission permits or 'carbon taxes'. (IPCC 2007b)

These explorations are rather technical in nature: For example regarding energy supply, it is dryly noted that "global energy demand continues to grow" (IPCC 2007b, p. 43), so the report deals with the spectrum of technologies at our disposal, their potential in energy production and greenhouse gas mitigation, and the hurdles that still exist before this potential can be realised. For example in the case of wind power, a proper way to store its energy is necessary if it is to produce a large share of our electricity. No political choices are made by the IPCC, its task is merely to inform the political discussions with scientific and technological data.

A growth in energy demand, both in developing countries and the affluent west, is accepted as a given in these studies. This is not surprising: practically every graph available shows increasing energy use per capita over time, increasing population, increasing GDP and increasing energy consumption with an increase in GDP (Darmstadter & Fri 1992, Herring 2006). Only the energy density, or energy used per dollar GDP, decreases with increasing GDP. However, this effect is apparently not strong enough to put our growing hunger for energy to a halt. The question arising here, is why our energy demand keeps rising, but this question is not currently dealt with in the literature and the IPCC debate.

Another technical approach is articulated in *Sustainable Energy – without the hot air* (MacKay 2009). In this book, MacKay argues that the current discussion regarding consumption and emissions is unnecessarily troubled because of a bad choice of units. Claiming a new wind farm provides electricity for 5,000 households does not provide any insight in its significance for the world. Therefore, MacKay suggests we should look at the emissions per person. Only then it becomes clear how our emissions are distributed, so we can see where the big savings are (stop flying), and what does not add much (unplugging our telephone chargers).

MacKay then proceeds with showing that with a smart application of novel and proven technologies, a little mentality change, and some dedication, it is indeed possible to make the transition towards a climate neutral society. He also shows how much of Britain's surface area needs to be used for these novel technologies, and what technological problems are still to be tackled. In his calculations, MacKay does not assume energy demand continues to grow, like the IPCC does, he takes today's consumption as a baseline. By increasing efficiency and some other measures, we can reduce this consumption without radically altering our lifestyles (except perhaps shifting to public transport).

When reading these technical approaches, a certain optimism is evident: when the uncertainties are hidden in assumptions and the problem is clearly delineated, we seem to have the tools to tackle it. This view is nothing new: 'technological fixes' have been around at least since the Romans, who built enormous aqueducts when the cities grew too large and too dirty to drink from the rivers they were built around. The term 'technological fix' was coined by Alvin Weinberg in 1966, in an essay called *Can Technology replace Social Engineering?* (Weinberg 1966). The problem of 'social engineers', according to Weinberg, is that a social problem is difficult to solve: it is a social problem because many individuals are doing something wrong, and it is difficult to make them all behave in a better way. Therefore, Weinberg suggests, we should use technology so the behaviour is not problematic any more. Rather than discouraging poor people from having many children (who are born into poverty), we just install intrauterine devices which prevent pregnancy. Rather than telling Californians to use less water, we should build nuclear desalination installations to meet the demand. Although reality is typically much more complex than the technologist assumes (nuclear energy turned out to be a lot less perfect than assumed in the sixties), it is this optimism that still resonates in many proposed solutions to climate change.

1.2 Philosophical and ethical discourse

There is, however, more to climate change than a technical puzzle, as is reflected in the philosophical and ethical discussions on the topic. I will here give a concise overview of the issues addressed in this discourse.

1.2.1 A perfect moral storm

Climate change can be understood as an exceptionally complex case of a *tragedy of the commons*, a term first coined by Garrett Hardin (1968). The classical example of this effect is of a pasture shared by several shepherds, and these shepherds intend to maximise their income. The rational action for them is to add more sheep, even if this results in overgrazing and eventual exhaustion of the grounds. After all, the short-term benefit of adding another sheep – more wool and meat for this specific shepherd – is obvious, while the long-term harm – a little increased grass consumption per added sheep – much less so. To make it even worse, it works the other way around as well: a single 'environmentally conscious' shepherd will not have much influence on the overgrazing problem, while his income does decrease significantly if he decides to tend a smaller herd. In the case of climate change, the shepherds are all inhabitants of the earth, and the pasture is the global atmosphere. Because greenhouse gases are emitted in practically all aspects of modern life, every single action can be understood as

putting another sheep in the pasture. The personal benefit of these actions is clear: heating up the house, travelling to a holiday destination; but the marginal effects of these actions are small, distant, and apparently insignificant. If all people use their own perspective and compare the personal benefits of consumption with the global downsides of it, they will not take any action towards decreasing their consumption.

How to solve this problem? The traditional tragedy of the commons is solved by "mutual coercion, mutually agreed upon" (Hardin 1968, p. 1245). The shepherds erect a governing body which makes sure every shepherd abides by the rules – when knowing the rest behaves properly, the shepherds do not need to be afraid they lose income by abstaining from adding more sheep themselves. But there are significant difficulties if we are to use this solution in the case of climate change. Stephen Gardiner (2006, 2010) therefore describes this problem as a 'perfect moral storm', in which three separate moral problems converge and result in a situation in which we are "extremely vulnerable to moral corruption" (Gardiner 2006, p. 397).

The first of these problems is the fact that we are dealing with a *global* commons. If local or national environmental issues are reasonably dealt with, international issues are much more difficult. There is currently no effective 'world government' able to enforce 'mutual coercion, mutually agreed upon', and because effects of climate change vary from place to place, not all national governments are interested in effective but expensive routes towards mitigation. Developing countries argue that although they are likely to be the first to feel climate change impacts, they cannot afford slowing down their economic development (and therefore their greenhouse gas emissions). Furthermore, developing countries note that it is the developed West that caused the problem, as the West has been emitting greenhouse gases for centuries. Therefore, they should carry the heaviest burden. The pasture is not shared by a tribe of equal shepherds, but by shepherds from many tribes, rich and poor, and with different cultures.

The second and more severe problem Gardiner notices is the fact climate change is an intergenerational problem. Some scientists claim the carbon dioxide emitted now will remain in the atmosphere for thousands of years (Archer, 2005). The current generation has the power to act, but feels little urge, as it will not experience most of the consequences of its actions anyway. Later generations have no power to act now, but will suffer the consequences of this generation's behaviour. The problem can thus be understood as a tragedy of the commons where each generation is an actor. From the point of view of one generation, the preferable outcome is not to act, but from the point of view of all generations, the preferable outcome is when each generation restricts its pollution. With one exception: for the current generation, there is nothing in the collective deal, as it will not experience most of the consequences anyway. For all later generations, the collective deal is attractive precisely until it is their turn to act, so the problem iterates. While it would be theoretically possible to come to 'mutual coercion, mutually agreed upon' in a global commons, in the intergenerational case it is impossible.

The third problem according to Gardiner is the lack of theoretical frameworks at our disposal. Although philosphers are working on it, there is currently little practical guidance regarding scientific uncertainty, long-term future planning, and environmental ethics, for example. Combined with the first two storms, Gardiner holds we are very susceptible to moral corruption: we might focus on uncertainties to delay any decisions, pay selective attention to research on the 'safe' side of the spectrum, etc. The main point here is that even if we have the technical abilities to mitigate climate change, there are many other reasons why we might fail to take action.

1.2.2 Justice

Beyond the tragedy of the commons of rational, self-interested actors, a common topic regarding climate change is justice: climate change mitigation needs to be fair and equitable. According to Jeremy Baskin (2009), this is important because climate change demands a truly global solution: everyone should cooperate. Therefore, the mighty West needs the poor South[2] to cooperate, but the South will not accept any solution that is deemed unjust. The main issues here are the (historical and contemporary) responsibility of the developed world for the lion's share of emissions, the right to develop for poor people and nations, the dissimilar financial and technical capacity to deploy non-polluting technologies, and the increasing risk of international conflict and instability if appropriate action is not undertaken.

Baskin evaluates four policy approaches on their contribution to global justice: equal cuts for all, 'converge and contract' to equal per capita emissions, a greenhouse gas development rights framework, and geo-engineering. Equal cuts for all is understood as unjust because it leads to a relative status quo: if everyone cuts their emissions with 70%, the biggest polluters now will remain large polluters, while the poor have to cut their already tiny emissions to a level at which it could very well be impossible to survive. The converge and contract approach resolves these problems by aiming for an equal emission level for everyone at some point in the future. This means the largest polluters have to cut their emissions most, and only the poorest nations are able to increase their emissions slightly. Still, this is problematic because the West has access to more advanced technologies that allow for higher standards of living with the same emission levels, so it would be unfair, Baskin argues, to not let developing countries develop towards a similar technological level. On the other hand, an infrastructure of highways and airports that imply high-emission lifestyles in the West make the necessary large emission cuts very difficult to achieve. A step even further in this direction is the greenhouse gas development rights framework, which holds that everyone should be able to develop to a similar level of affluence before paying for mitigation efforts. The result of such a framework would be that the developed West would pay for further development of poor nations, leading to an even heavier burden on the West. The final approach, geo-engineering, is as yet shrouded in uncertainties, but Baskin holds that it might get real if we fail to take appropriate action any time soon. Geo-engineering is the practice of directly intervening in the climate, for example by increasing the planetary albedo by injecting aerosols in the stratosphere. Baskin warns for the potential of such practices: they can be undertaken unilaterally, but their effects are most likely not positive for everyone, further increasing tensions and possible conflicts.

So Baskin points out that although difficult to obtain, justice is an essential part of a successful climate change mitigation approach. But using many of the same arguments, other scholars are lead in the opposite direction. In *Climate Change Justice*, Posner and Weisbach (2010) argue that exactly because everybody needs to cooperate to mitigate climate change, we should not confuse climate change with other pressing global problems. It might

[2] The 'West' is used in this thesis as synonymous for the affluent, Western nations, and the 'South' for poor, developing nations. I am aware that this simplifies the situation severely: within poor nations like India, an affluent jet-set appears to be exempted from taking responsibility, and the Arab oil states and quickly industrialising nations like China do not neatly fit into either West or South.

be true that wealth needs to be redistributed, but climate change mitigation negotiations should not be 'hijacked' for such topics, or everybody goes home empty handed.

Instead, we should be pragmatic. Because a global climate treaty is most likely developed by an assembly of nation states, these nation states should be understood as the main actors in the negotiations. The main objective of the nation state is to protect the interests of its inhabitants, so these states will not subject to a treaty which is perceived as detrimental to the interests of a nation. Therefore, the main feature of a climate treaty is that it satisfies the principle of *international paretianism*: all parties must believe they are better off with the treaty than without it, so a treaty is only feasible when its costs are smaller than its benefits, for all participating actors.

With this feasibility constraint in mind, Posner and Weisbach unpack all appeals to justice, responsibility, historical emissions, fairness, and equality as naïve and impossible. If the United States insist their inhabitants are entitled to a large share of greenhouse gas emissions, developing nations (who are most likely to be negatively affected by climate change in the near future) better not bargain too hard, but accept a treaty that is acceptable to the United States as well. What is left is the cynical reality of power politics in which everyone can block the process to buy time and make the problem more pressing, in the hope they get a better deal in the end.

The contrast between Baskin on the one hand, and Posner and Weisbach on the other regarding climate justice is exemplary for the debate among diplomats working on a climate treaty. Seemingly irreconcilable demands and perspectives, combined with issues such as scientific uncertainty and highly dispersed sources of climate change, make it very difficult indeed to come to a treaty everyone can agree upon. It is therefore not surprising that all hopes are on the engineers, who often optimistically claim they have a whole portfolio of solutions ready. If they have a solution that makes everyone a winner, it seems we do not even need a treaty anymore.

This difference in confidence for a solution is striking, and can be clarified by understanding the difference in paradigm of the two groups. Engineers work on clearly deliniated technological problems (like how to improve a production process), ignoring the messy societal reality in which this technology is embedded, and the diplomats are immersed in this messy societal reality, approaching technology only as a 'black box of solutions'. Obviously, both these paradigms have their merits, and climate change could be understood both as a technological and a social problem. But what both approaches underestimate, is the intricate connection between the two paradigms.

1.3 Philosophy of Technology

Technologists like MacKay and the IPCC working group 3 understand technologies as tools, and better technologies will result in comparable tools without the greenhouse gas emissions. Politicians, economists and other climate treaty negotiators have a similarly neutral conception of technology. With the right incentive (carbon tax, cap-and-trade arrangements) in the right place, cleaner technologies will be developed and our

welfare will be maintained. The implicit conception of technology as a neutral tool is at odds with insights in philosophy of technology: the influence of technologies is far more complex. Without oil refineries, aeroplanes, and the bio-industry, humanity would not have been able to cause climate change in the first place. Without cheap and fast air travel, we would not feel the urge to travel from the Netherlands to Texas to attend a conference or go on holiday.

These facts are typically ignored when looking for climate change solutions, but I argue that taking seriously the complex relationship we have with our technologies is essential for the understanding of the problem, and ultimately, for finding effective and agreeable solutions to it.

Our ability to exhaust the commons of greenhouse gas absorption, combined with the impression that using more of this commons improves our lives, is a prerequisite for the development of a tragedy of the commons. Therefore, it is interesting to look into the rationale behind our greenhouse gas emitting activities. Why do we value our greenhouse gas emitting activities so high that we risk causing climate change with it? Are our lives clearly improving with increasing emissions? Technologies have their influence in both these aspects: they allow us to burn great quantities of fossil fuels, and promise us faster, more exciting lives. But how does this work in practice?

If technology is no neutral tool, how should we describe its relation to us? How did we become a greenhouse gas emitting society anyway? What can philosophy of technology tell us about how we arrange our lives in ways that emit so much greenhouse gas? Why does our energy demand keep rising, even though more efficient technologies are developed? And how can we use this knowledge to develop more effective solutions for mitigation?

These are the central questions in this thesis. More generally, my main question is: *how can insights from philosophy of technology help in developing more effective climate change mitigation solutions?*

In philosophy of technology, a variety of authors have worked on the problem how to describe the relations between humans and technology. For Martin Heidegger, modern technology is the result of a way of understanding the world as resources, to be used any way we deem appropriate (Verbeek 2000). Later, the focus shifted to specific artefacts, which could be understood as solidified politics or morality: a low-hanging overpass on the way to the beach could prevent buses containing poor African Americans from spoiling the fun of the white middle class (Winner, 1980); speed bumps near schools enforce the moral behaviour of slowing down our cars in the vicinity of children (Latour, 1992).

Despite the possible merits of these or other frameworks, I have not looked into them closely in relation to climate change. Instead, I have focused on the work of Albert Borgmann, because his work, more than that of other philosophers of technology, is balanced between the influences of technology on individuals and on society at large. This makes it interesting for the problem of climate change, because, as we have seen above, this problem emerges in the interplay between these three realms. As we will see shortly, Borgmann's concept of the *device paradigm* is exceptionally useful when it comes to understanding our greenhouse gas emitting habits, especially when combined with the *experiential gap* as developed by Adam Briggle and Carl Mitcham. The perspective developed in chapter two will be used as a foundation for shaping and assessing climate change

mitigation solutions in a way that does more justice to the effects of technology on our lives.

Central to this perspective is the importance of perception of our actions and choices. Chapter three builds on the insights developed in the previous chapter by turning to *Nudge*, a popular concept aimed at improving our choices by tweaking the contexts in which decisions are made. Although the authors of *Nudge* do not specifically focus on the role of technology in choice contexts, their approach appears to resonate with Borgmann's insight that our technological environment invites very specific behaviour. The merits and problems of this approach are explored in this chapter, as well as its connection with the framing of the problem of climate change in chapter two. This leads to an expansion of the range of 'nudges' for climate change mitigation into a powerful and versatile 'toolbox'.

But to use this toolbox properly, some rules are essential. Because people are 'nudged' towards a certain decision, this direction has to be the right one. In chapter four, it is argued that it is impossible to find this 'right' direction without a conception of the good life, and that therefore, a proper discussion on this matter is essential. The 'thick debate' on bioethics is introduced as a good example of such a discussion, and an initial exploration of the arguments likely to develop in discussions on polluting activities is made. Nudges, especially experiential gap reducing ones, can be used to induce this deliberation, as well as to turn the outcome of the deliberation into practice.

2 Technology and the greenhouse gas emitting society

Commercial air travel enables me to travel to Texas comfortably and burn hundreds of litres of fuel in the process. How does this enabling occur? Is it neutrally offering an option, or does it actually *invite* me to embark on an international trip? These are important questions if we are to take a closer look at the influence of technology on our greenhouse gas emitting activities. In this chapter, I will use Albert Borgmann's philosophy in order to develop the argument that indeed, technologies clearly invite greenhouse gas emitting behaviour. But to come to this conclusion, we must take a long detour through Borgmann's thinking, so we can appreciate the qualities of his perspective.

This chapter is set up as follows. In the first section, Borgmann's theory is summarised and criticised, focusing on the relevant topics in his first two books: *Technology and the Character of Contemporary Life* and *Crossing the Postmodern Divide*. After this firm basis, the problem of climate change is approached from a Borgmanian perspective in section 2.2. This is followed by a shift in focus towards the experience of individuals in greenhouse gas emitting activities, in section 2.3.

2.1 Albert Borgmann

2.1.1 Technology and the Character of Contemporary Life (TCCL)

Albert Borgmann opens *Technology and the Character of Contemporary Life* (Borgmann 1984, from now on 'TCCL') with the claim that the traditional focus on innovations and cutting-edge technologies is unsuitable for finding the most important influences technologies have on our lives. Instead, we should look at the "countless inconspicuous objects and procedures of daily life in a technological society" (TCCL, p. 3). Together, these objects and procedures form a pattern Borgmann calls the device paradigm: a way in which people living in modern societies perceive their world. Before we go into any details about what the device paradigm entails, we should take a step back and look into the goal of philosophy and the available routes to pursue that goal according to Borgmann.

The task of philosophy, according to Borgmann, is twofold: "to engage philosophy with issues that matter and to involve the public in a philosophical conversation about these matters" (Strong & Higgs, 2000, p. 21). The goal is thus to lay bare the structure or essence of these issues, so the public is able to become aware of them. But which issues matter? If we accept that the goal of life is to live a good life (whatever that exactly means, more on this later), then issues that matter are the issues that influence our ability to pursue such a life. Regardless of whether there is an absolute or permanent definition of the good life, over time the issues that influence this pursuit change: the political climate, the availability of sufficient food, or the threat of war make different issues more or less pressing at a given time and place. This means that any claim about which issues

matter is contextual, and that it is difficult or perhaps impossible to make absolute claims about any of these issues.

One 'issue that matters' that Borgmann has taken up in his philosophy is modern technology. In TCCL he argues that much of modern technology is detrimental to the good life for people living in modern societies. Borgmann notices an uncritical appropriation of technology by society, and therefore he tries to 'involve the public in a philosophical conversation' about it. In order to do so, Borgmann describes a pattern which he believes to be visible in the 'fabric of society' woven by countless technologies. It is Borgmann's hope to make this pattern visible to the public, which is then able to develop some critical relationship with modern technology. In the remainder of this section, I will summarise the main argument in TCCL.

To make the pattern of modern technology visible, Borgmann contrasts modern technologies with their 'pre-modern' counterparts. Modern technology is the kind of technology which developed roughly since the enlightenment, together with the scientific method, liberalism, and capitalism. The pre-modern situation Borgmann sketches is one in which people are grounded in their worldly situation: people live according to the rhythm of the days and the seasons, and are connected to their direct environment for the supply of food and fuel, friendship and protection. The technologies people use in such a society are mostly *things*, of which the hearth is the paradigmatic example. A hearth produces warmth, but only if people chop enough firewood before winter sets in, when the fire is carefully tended, and the family gathers around it to enjoy the heat. So next to providing heat, the hearth makes sure that people appreciate their surroundings for the fuel they provide, and the family gathers to tend the fire and talk to each other. The activities of chopping firewood and talking to each other on cold winter evenings are not just valuable because they result in heat, but also because they grow strong family ties and a certain reverence for ones surroundings. Things thus lead to practices or traditions which result in more than just the realisation of the direct function of the things.

The pattern that Borgmann recognises in modern technology, is that it tends to make the functions of things more readily available. Such technologies are called *devices*, their function is to provide us with *commodities*. The device-equivalent of the hearth is the central heating system, which makes heat a commodity, available instantly in the entire house through the flick of a switch. Devices are typically very effective in the production of commodities, and in the process of commodification, the practices that used to be needed to produce these commodities get lost. Because these practices were often valuable not just for the production of the commodity but also for other reasons, these 'side-effects' get lost too. In the case of the central heating system, people do not grow strong relations with their environment and family with the practice of enjoying heat. The device paradigm then, is a world view in which devices dominate the ways people experience and interact with the world.

The structure of devices is very different from the structure of things. Things are transparent: their functionality is obvious from the way they are shaped. Users are able to understand their functioning, and mend them if necessary. Devices, on the other hand, are opaque: they function as a black box and hide their machinery from sight. Means and ends are split up so that users are exposed only to the end, the commodity a device produces. If a new central heating system is installed based on different technologies than the old one, the user does not experience this, except perhaps when it turns out to be more or less effective in the production of the

commodity. The system itself remains a humming machine hidden away in a closet or the attic.

Devices thus reduce people's ability to interact and form relations with their environment in two separate ways. Firstly, they destroy practices connected to the use of things which were valuable for more than just the commodities produced, and secondly, they allow less interaction with the technologies themselves. Through these routes, Borgmann holds, modern technology has a disengaging and alienating effect on its users. Ultimately, the resulting world is one in which people become one-dimensional 'couch potatoes', mindlessly consuming commodities[3].

Peter-Paul Verbeek (2000) argues that this is a single-sided view of the effects of technologies on our lives: a technology like the telephone can connect people with distant friends and relatives, something impossible without telecommunication. Borgmann appears to focus only on impoverishing effects of technology, ignoring the enriching ones. Although Borgmann agrees that engaging technologies exist, his interest lies in the overall pattern that emerges in modern technologies, and he holds that disengaging technologies are much more ubiquitous than engaging ones (Borgmann, 2002). I will return to this debate in section 2.1.3.

These engaging technologies Borgmann calls instruments: technologies which allow people to connect with their environment. Telephones could be understood as instruments if they result in meaningful conversations with distant friends, musical instruments when they are used to make music, and freeze-dried food when it allows hikers to experience the wilderness they are camping in. They are different from commodity-producing devices in the sense they do not directly provide their user with the desired object, but rather allow the user to pursue it. A musical instrument does not provide one with music like a CD-player does, but with an instrument a musician is able to make music. So the problem with modern technology is not that it is impossible to use it for engaging activities, but rather that in the current society, engagement inhibiting technologies (like CD-players) are much more prolific than engagement inducing ones (like electric guitars).

For Borgmann, this is problematic, because he holds that engaging technologies are much better for us than disengaging ones. As is already suggested in calling a television viewer a 'couch potatoe', Borgmann holds that a disengaged life cannot be a good one: good lives are achieved through a physical engagement with ones environment. This is exactly what instruments allow (and even require), and devices do not. Although I do not hold this conception of the good life to be unproblematic, I will hold off any discussion regarding the substance of a good life and the procedure for finding it until chapter 4. For now, it suffices to note that Borgmann's critique on the notion of the good life implicit in devices (i.e. the consumption of commodities) could very well be appropriate.

Instruments are used for activities which are valuable in themselves, like making music. Borgmann calls these *focal activities*, and they are understood as the antidote to the device paradigm. Focal activities counter the alienation caused by devices by having a grounding and centering effect on one's life. Borgmann's favourite examples of focal activities are cross-country running and the culture of the table. The purpose of running for

[3] The society that results from the destruction of communal practices is further explored by Borgmann in *Crossing the Postmodern Divide*, dealt with in section 2.1.2. The lack of interaction with technologies is central in section 2.3, on the experiential gap.

Borgmann is the experience of the run. The interaction with the path and the awareness of the local light and atmosphere make a run an experience profoundly connected with the runner's surroundings. The culture of the table is a celebration of the tradition of a cuisine, of the nourishment and taste of ingredients, and of the presence of friends and relatives. Although people might enjoy different focal activities, Borgmann is confident that the experience they result in generally grounds and centres peoples lives. Being exposed to focal activities allows people to appreciate the difference in experiencing the world through them and devices. By stepping out of the device paradigm for the duration of the focal activity, its effects become visible where they used to be invisible, so people can make informed decisions about the appropriation of devices and instruments from then on.

But Borgmann's conviction that people would choose instruments and focal activities over devices seems to be rather uncommon in our culture. As Verbeek (2000) argues, devices have positive effects as well. Getting rid of chores does not appear to be a bad idea. Although Borgmann understands cutting wood before winter as an engaging task which sparks a reverence for the forest, it is also very hard work which costs a considerable amount of time which then cannot be spent on an activity someone might prefer. The efficiency that comes with a central heating system should result in more free time which can be used for activities one deems valuable. But instead of valuable activities, Borgmann notices people just spend more time in front of their television, even though empirical studies suggest that even the viewers themselves do not like watching television (TCCL p. 143). Devices do make life easier, but not necessarily better[4].

Next to the allegedly wrong use of the time saved, the very notion that time is saved when not having to cut wood anymore is only possible from the perspective of the device paradigm, because within this perspective labour is seen as 'mere means'. The thorough separation of means and ends makes us “exaggerate the liberating character of the transformation of work and thus cover up the concomitant cultural and social losses” (TCCL p. 119). Borgmann thus claims that in a pre-technological society, people did not see cutting wood as a mere means to stay warm in winter, but as an integral part of their lives. Another factor contributing to our disdain for labour such as cutting wood is tied to the fact we understand it as 'unskilled': the tools used are not as complex as modern devices, and our lengthy education is not aimed at such manual work. Implicitly we assume that complex devices are more difficult to operate than simple things, even though devices tend to not require any skill from their users, while a thing like an axe demands a certain amount of dexterity to use it.

To summarise, Borgmann brings two separate issues to the fore in TCCL. The first is the descriptive force of the device paradigm: it allows us to understand the structure of the influence of modern technology in society in a revealing way. The second is the normative conclusion Borgmann draws partly from empirical data and partly from the insights the device paradigm provides him with: that the influence of technology on the quality of contemporary life is dubious at best. Connecting these two issues, Borgmann concludes that we should develop a way to critically assess the effects of technologies in terms of the device paradigm before we appropriate them.

In section 2.1.3, I will deal with some critiques on Borgmann's work and discuss whether Borgmann offers an

[4] Borgmann does not deny the benefits of modern technology, for example regarding healthcare, but holds that the balance of positive and negative effects could very well be negative.

appropriate framework for the problem of climate change. But before I do so, I will expand the discussion to Borgmann's later work on the modern and postmodern society, because this will form a broader understanding of the society in which the device paradigm took shape and is embedded, and the kind of society Borgmann envisions as a way out of it.

2.1.2 Crossing the Postmodern Divide (CPD)

In Crossing the Postmodern Divide (Borgmann 1992, 'CPD' from now on), Borgmann shifts his focus from technology in contemporary society to the structure of this society in general. After discussing its history, starting with the enlightenment, he describes how the device paradigm fits in the 'modern project', and how this project revolves around a false end of consumption. The latest incarnation of this development, hypermodernism, is contrasted to 'postmodern realism', which Borgmann offers as a way out of the ever increasing efforts needed to satisfy demand in the modern system. Here I will give a detailed summary of the argument. What kind of society took shape in the reign of the device paradigm?

Modernism emerged after the demise of the Middle Ages. The medieval structure collapsed when new discoveries brought down the centuries-long reign of the church. New fundaments were found in the work of Bacon, Descartes, and Locke, "the designers of the modern project whose elements are the domination of nature, the primacy of method, and the sovereignty of the individual" (CPD, p. 5). Baconian domination of nature was put into practice most visibly with the construction of railroads through the formerly 'virgin' American west. The mindset that accompanies the domination of nature, Borgmann calls *aggressive realism*: a direct and continued attack on nature exemplified in dynamite and stripmining. To properly organise this attack, a new and universal way of doing business was necessary. The Cartesian "triumph of procedure over substance" (CPD, p. 24), which resulted in *methodical universalism*, was essential for the forming of large networks like the railway system. It lead to a standardisation and upscaling of many aspects of business: from local time to timezones, from family owned businesses to corporations, and from artisans to division of labour. The final pillar of the modern project is *individualism*, which Borgmann describes as follows:
"The individual is the author of the enterprise and the beneficiary of its fruits. The former of these two functions has been fixed in the American consciousness as rugged individualism; the latter leads a more surreptitious life in commodity consumption. I will call this second function commodious individualism" (CPD, p. 38).
Rugged individuals thus are the people who triumphed the elements and built railroads, whereas commodious individuals are the ones benefitting from the swift transportation the railroad delivers. This division of individualism into two different strains is essential for Borgmanns critique on modernism: it matches the device paradigm in its separation in means (rugged individuals) and ends (commodious individuals).

Borgmann notices that the balance between these types of individuality is slowly but surely shifting towards the commodious kind. "America may have been evolving more into a post*industrious* society than a postindustrial one" (John P. Robinson, as cited in CPD, p. 62). Production is slowing down, while consumption (on credit) increases, resulting in a net trade deficit in the United States. At the same time, people do not find pleasure in leisure: as mentioned above, television is rated negatively by its viewers. Work, on the contrary, is well regarded,

according to Borgmann because it is constructive and in touch with reality: working people are met with respect and regard. It becomes clear that the means and ends do not make much sense: if commodious consumption does not make us happy, but the means to this end do, then consumption is a false end, and work should be an end in itself. If this is the case, it should have far-reaching consequences for the organisation of work: rather than aimed at efficiency and maximising profit in order to be able to consume as much as possible afterwards, work might be organised in a way that makes it most fulfilling.

But the modernist approach is another one: *hypermodernism*. If commodities do not fulfill their users, the tendency is to technically improve them: make them more exciting, immersive, and 'realistic'. An example can be found in video games: for a new game to be successful, it has to include more life-like graphics than its predecessors[5]. Vibrating controllers extend the experience of explosions to the tactile realm, because just audio-visual impulses are not enough anymore. The environment brought forth this way is called *hyperreality*. The sophistication of the hyperreal experience is conveyed in its 'glamour'. A glamourous experience is one which is brilliant (affecting all senses), rich (action packed), and pliable (interactive).

Borgmann holds that this approach is futile. His critique on hyperreality rests on two claims: hyperreality is empty at its core, and spending time in hyperreality is detrimental for enjoyment in the 'real' world. To illustrate the first claim, Borgmann provides us with the example of coming across rare wildlife during ones workout. The natural experience is one in which a runner traverses a trail in the Rocky Mountains on a sunny winter day, and a mountain lion shows up catching a prey. For the runner, this might be a life-changing experience because all the elements seem to line up perfectly: it is a beautiful day, mountain lions rarely make themselves visible, and the runner happens to be at the right time and place. An experience like this connects the runner to their environment, making them grateful they experience it.

Now consider that same runner at a hypermodern gym, which mimicks the experience of seeing a mountain lion during a workout in the mountains on a beautiful winter day perfectly. Of course, this is not possible with the current state of technology, but for the sake of the argument, let us assume that it is possible to make the experience so life-like that there is no discernible difference with the original experience. At first, this appears to be a great idea: the experience can be had more often, by more people, and throughout the year, while having no detrimental effects on wildlife reserves. But although the experience appears to be the same, it is embedded in a very different world. Instead of solitarily driving through the snowy landscape to the trailhead on a sunny day, not knowing the events of the day, the hypermodern runner drives to the down-town gym, greets the employees, and selects the programme of the snowy trail featuring the mountain lion. If the runner ends up feeling connected to their environment, this environment is the computerised gym in which the runner is omnipotent, rather than the humblingly majestic Rocky Mountains. These experiences are undisputibly different, and Borgmann argues that the experience in the hypermodern gym is empty because it does not *engage* the runner with the world, but rather lets the runner summon it for their pleasure.

Hyperrealism appears to be some kind of 'happiness machine': a machine to which subjects can hook up so the machine provides them with ultimate pleasure (Crisp 2008). The concept of happiness machines is used to

[5] There are exceptions to this apparent rule: Farmville for example, a deceptively simple game played on the Facebook website, has been a huge succcess lately.

problematise hedonism: if a machine can provide it, happiness itself cannot be the object of desire; it must be the things which provide us with happiness that we should really be after. Similarly, it is not the fact we see a mountain lion which makes this a special experience, it is the fact that we see one while this is a rare event which does. But as long as hyperrealism is based in the 'real' world, the main difference with the happiness machine is that we cannot stay in forever: to enjoy hyperreal commodities we have to face the real world every now and then to work and maintain our bodies, and compared to the glamourous hyperreality, reality appears pale and stubborn. "The force and presence of reality seem to evaporate" (CPD, p. 51). Hyperreality thus provides pleasure not unlike heroin: highly addictively, and the time between 'shots' is increasingly unpleasant.

The growing irrelevance of rugged individualism and the distraction and emptiness that comes with commodious individualism turned out to be the side effects of the modern project, and if Borgmann is right in his assessment of hypermodernism and hyperreality, these do not provide solutions to those problems.

With the decline of modernism, a post-modern way of doing business is emerging; based on information processing, flexible specialisation, and informed cooperation, rather than aggressive realism, methodical universalism, and rugged individualism, respectively. The postmodern worker is the successor of the pre-modern artisan. But Borgmann understands the crisis to be deeper than so far has been considered: if the crucial distinction in modernism is the line between production and consumption, then post-modernism needs to deeply analyse and reshape that distinction. So far, post-modernism only recognises what has been destroyed by the modern project (community, culture), but it does not yet recognise that this happened because humans became consumers. 'Post-modern' solutions to problems are too often a plea to lower consumption so we can keep consuming 'sustainably', not attempting to change anything about the dichotomy between production and consumption itself. To develop a true solution, rather than new means for the same ends, we should become post-consumers. The answer for Borgmann lies in *postmodern realism*, which is understood as "to outgrow technology as a way of life and to put it in the service of reality, of the things that command our respect and grace our lives" (CPD, p. 82).

Here, a further difficulty emerges: it is rather difficult to become a 'post-consumer' in current society. One can choose to consume in a different fashion, but in a society geared towards 'commodious individuals', this does not result in any structural change. The reason for this lies in the hierarchy of choices in society. Borgmann distinguishes between fundamental and daily choices; the former bind us over a long time, the latter only for a moment. Take, for instance, the availability of cars. Whether or not to buy a car is a fundamental choice, which preformes the daily choice of cycling or driving to work. Once a car is purchased, it becomes a very tempting option to travel around – it is fast and convenient, marginal costs of a trip are low, and when the weather is not cooperating, the bicycle does not appear as enjoyable as it used to. Once a fundamental choice is made, daily choices are made in the context of the fundamental choice.

If daily choices are preformed by fundamental choices, it makes sense to focus on making the right fundamental choices in order to develop better habits. Although Borgmann leaves this mostly implicit, these fundamental choices are not made in a vacuum, either. They, too, are preformed, by what I call the *societal structure.* To remain with the example of the car, the choice to purchase a car is preformed by the availability of alternatives, like public transport or safe cycling routes. Without such alternatives in place, people are much more 'pushed'

towards the purchase of a car.

Consumers find themselves in a fixed environment in which choices have to be made, and these choices have only minimal influence on the environment. Borgmann's postmodern programme therefore focuses on expanding the role of people from mere consumers to members of a community. A good example is the current bicycle activism in Denton, TX. Here, a group of (aspiring) cyclists not only use their bicycle for transportation as often as they can (which would be the consumer action), but they also work on awareness through community bike rides, promote more bicycle-friendly infrastructure at the local gouvernment, and increase the feasibility for others to pick up cycling by offering a community bikeshop where routine maintainance is taught and second hand bikes and parts are available at low cost[6].

More generally, the way to realise a broader involvement in society according to Borgmann is to promote *focal realism*: the embrace of those pieces of reality which "gather our thoughts" (CPD, p. 119). These focal things and activities (like encountering a mountain lion or making music) offer a genuinely rewarding alternative for the devices of hyperreal entertainment, and thus have the power to counter the advance of hyperreality.[7]

To do this, Borgmann proposes a few rules. First, the postmodern project needs some theoretical basis. This is difficult, because to be comprehensive this theory must be universal, but it is supposed to result in particular solutions, rather than universal ones. Borgmann pleas for a language which uses some schematic account of modernism and postmodernism, intertwined with places and situations called by their proper names: "Enschede", rather than 'cities'. Second, community must be facilitated by designing living space so that it can flourish. City life cannot be designed and controlled, but "you can let it happen and contribute to it by allowing stores and residences, manufacturing and retailing, the utilitarian and the extravagant to coexist" (CPD, p. 131). Finally, the postmodern project must "take up the burden modernism has despaired of, the obligations of justice, as well as to counter the hypermodern spectre constructively" (CPD, p. 138). So we should offer a postmodern alternative to hypermodernism: festivals and places fit for communal celebration. Choices on what to build (roads, malls, stadiums) and organise (festivals, cultural activities) always have a moral aspect; they are never neutral. Therefore, when reshaping a downtown area, building rights should not go to the highest bidding chain store, but to projects which return the city space to its inhabitants. Only then the societal structure will incline people to make better fundamental and daily choices.

Borgmann pleas for a deictic discourse: pointing at what is valuable as a participant. He describes having a relaxed lunch in a park as a very real moment, with real, particular people in commanding presence. This is what we need more: "daily reality needs to be linked to the natural, raised to the festal, and extended to the poor" (CPD, p. 133). We might disagree on the value of relaxed lunches in parks, but if we do, we are already halfway there in articulating what we *do* find valuable: if not relaxed lunches, then what? Discussing provocative works of art in public space? Playing baseball in neighbourhood parks on Sundays? Perhaps we might come to

[6] See http://bikedenton.wordpress.com/ and http://qcbs.wordpress.com/.

[7] It must be noted that the bicycle activists mentioned above are not solely motivated by the ways riding a bike 'gathers our thoughts' better than driving a car might, although the community bike rides surely have a communal aspect to them (as the name implies), and the design of the bicycle clearly connects one better to their environment, the local weather, and fellow road users. Other motives include the environmental benefits of bikes over cars, as well as safety issues and the fairness of an infrastructure that enables people who cannot afford a car to get around.

the conclusion that we value the ability to purchase a yacht after retirement from a life of 60-hour work weeks, although that would be rather surprising. Regardless of the conclusion, any attempt to articulate what is of value enables one to reflect on its merits and deficits, most likely leading to better choices than when this is left implicit.

To summarise, Borgmann argues in CPD that modernism has brought us a lot of affluence, but in the end, the sole focus on economic growth and consumption does not lead to better lives. We need to restructure our activities and societal structure so that they invite us to connect to thought-gathering 'focal reality': this will promote the good life of engagement. So rather than economic growth, we should work on meaningful employment for everyone, and rather than chain stores providing us with the most affordable consumables, we should promote small scale, family-owned busineses which have a communal function as well as the function of providing people with commodities.

CPD offers the societal context in which TCCL is placed. Borgmann's plea for a shift from devices to things in TCCL is the move away from the device paradigm on the micro level. The shift from economic growth to meaningful employment for everyone is the same shift on the macro level. Borgmann argues that activities themselves are valuable, rather than the commodities or growth they produce.

2.1.3 Critique

Borgmann's claims have not been without critique. One of the most central critiques on his work revolves around its connection to empirical reality. As we have seen in the discussion on whether the device paradigm shows a single-sided view of the effects of technology in section 2.1.1, Borgmann holds that devices are much more prolific than instruments, and that therefore, the device paradigm is appropriate for describing the pattern of modern technology. This does not mean that devices are the only possible outcome of modern technology, and Borgmann indeed describes instruments as engaging technologies. Since his claim is based on the status of the actual world, rather than some theoretical propositions, it makes sense to look into the ways we can learn about this 'status'.

According to Borgmann, the type of philosophy he is interested in cannot be built up from abstract definitions; it must be grounded in the culture it is supposed to be saying something about. There are two main methods in which Borgmann grounds his critique: phenomenology, and the empirical social science approach[8]. The phenomenological approach, Husserl's famous move 'to the things themselves', to “look and see what is in fact the case” (Borgmann 2002, p. 116), is useful for three seperate aims. Firstly, to explore a topic, firm up intuitions, and to enable us to aks significant questions. Secondly, for describing how a particular technology should be used if it is to be supportive to the good life. And finally, to form a critique on certain practices or a particular culture. But phenomenological 'evidence' is of an anecdotal character and therefore never conclusive. If someone disagrees with others about what “is in fact the case”, something of a deadlock develops. Sometimes, empirical data can be used to back up (or counter) phenomenological claims: this is data which is supposed to

[8] A third approach, attributed to Veblen, is mentioned as well, but this seems to be somewhere in the middle ground between the two approaches mentioned.

be valid and reliable, so if it speaks in favour of an argument it is a strong support. But it is difficult for philosophers to use findings of social scientists, as these findings tend to be complex and often revised due to new research developments or changes in the phenomena researched, and it is always tricky to draw general conclusions from empirical findings. Furthermore, social scientists tend to pose different questions than philosophers, so philosophers can only use their data by approximation. (Borgmann, 2002)

An effect of basing a philosophical theory in empirical claims is thus that it cannot be proven or refuted. A theory can be supported by examples and empirical studies in order to make it more persuasive, but it is never conclusive. Borgmann understands and accepts this limitation, and points out that deductive arguments (based on abstract definitions) are no better: their conclusions are limited by the definitions one starts from. Only by starting at bold statements one can come to bold conclusions, but those assumptions can be negated by opponents. Philosophers thus need to make their claims persuasive, and cannot expect to ever write the last word about a topic. After all, these topics will develop over time; new developments will result in new insights.

In *Technology and the Good Life?* (Higgs, Light, and Strong, 2000), a variety of claims made in TCCL are disputed because empirical studies have progressed and no longer support Borgmann's original claims. In the final essay of the book, Borgmann replies to these critiques. For example the original claim that increased wealth results in decreased happiness, made in TCCL, now can not be made any more strong than claiming that above a certain level of wealth, happiness does not increase any further with increasing wealth (Borgmann 2000, p. 357). A similar nuancing was made regarding the 'engaging' use of the telephone:

> All this leaves us with the question whether … communication devices can be the instruments of a focal practice. We need to consider the concrete particulars. Certainly when parents on a weekend talk to their children, those are moments of pleasure and engagement. But notice the phenomenology of the occasion. Here are the parents, receiver between cocked head and raised shoulder, doing the dishes perhaps or sorting newspapers, listening now and exclaiming then. Is this what the richness of reality and the capacities of humans have come to? Is this what gives meaning and coherence to the life of the parents? To raise such questions is anything but a condemnation of what those parents do. But their activitiy is best described, it seems to me, as the beneficial use of a device that supports, but could not be at the center of, a life worth living. (Borgmann, 2000, p. 352)

Here we see that the technology of the telephone appears to be used in an engaging matter, but upon closer inspection it might not be so engaging after all. A reply can be made that Borgmann envisions the situation in an overly gloomy way and the parents might actually sit down and focus on the conversation while calling their children. Michelfelder (2000) indeed makes an argument along those lines, based on empirical research among female telephone users in a small American community. She recognised certain care-giving practices through phone calls, accomplishing important community relations. Borgmann might again reply that this could be a minor positive effect among larger negative effects, resulting in an endlessly regressing argument. A conclusion to be drawn from this could be that indeed, it is difficult to draw general conclusions from particular examples. Even if the telephone turns out to be used in an engaging fashion on some occasions, its net effect in a society remains an empirical problem. A strong quality of the device paradigm is that it makes this kind of question visible. It is a magnifying lens for the (dis)engaging effects of technologies.

Another point to be drawn from the example of the telephone is that Borgmann's vocabulary might be overly black-and-white. If we have to discuss at great length whether a certain technology is a device or a thing and come to the conclusion that it depends on how it is used, perhaps it is better to talk about the extent to which it

allows or even invites engagement. Returning to the fireplace and the central heating system; the coal-powered stove and electrical heater could be understood as various 'shades of grey' between the two extremes[9]. Similarly, we should not be under the impression that American infrastructure *demands* the use of cars – other modes of transportation are possible, just not really encouraged.

By framing technologies in terms of the device paradigm, certain features (like engagement) will be made more explicit, while others are somewhat disregarded. Depending on one's purposes, different features of a technology or practice are significant, so for a paradigm to be practical, it has to make the right features explicit. This leads to the question whether Borgmann's theory is practical to deal with global climate change.

2.2 Application – a Borgmanian perspective on climate change

To be clear, Borgmann's aims were never to counter climate change: his interests lie with the good life and what role technology can have for its achievement. He does however mention that he notices that 'prophets' of security, peace, equity, ecology, etc. are "connected by bonds of kinship" (TCCL, p. 240) and he finds allies in them when it comes to technological reform. "I find these [issues] difficult or impossible to understand as foundations for the good life; yet it would be sectarian to insist that people not only set out jointly in the right direction, but also share the final goal" (TCCL, p. 240). A concern for ecology, which global climate change is, is thus appreciated by Borgmann because it leads in the same direction as his plea for focal practices. It should be noted that since TCCL was written, climate sciences has come a long way, so Borgmann's conclusions might be very different today – he might argue that a stable climate is essential for the pursuit of a good life. But if he did not develop his framework with this kind of issue in mind, we must be extra careful to apply it to the problem at hand. So how useful is Borgmann's framework for dealing with climate change?

A Borgmanian perspective on climate change shows us that the problem is not merely technical, so it cannot be solved simply with smarter technologies. It is not the case that the technologies we are currently using simply fulfil our natural needs in a polluting fashion, so we just need to replace the technologies with carbon neutral ones. To the contrary, with the appropriation of devices an insatiable hunger for more convenient commodities emerged. While a cross-continental railroad journey of a few days was deemed 'swift' in the late 19th century, we now think air travel is the only feasible option for such distances. The traditional fireplace which gathered the family around it did not heat up the entire house like a central heating system does, resulting in much lower fuel demand than in the case of a central heating system. While good progress is being made in the efficiency of these heating systems and the insulation of buildings, we become so used to heated space that we install patio heaters to enjoy evenings outside without the need for dressing warmly, offsetting any efficiency improvement made in our buildings. It thus seems to be the case that a shift towards convenient modernist devices results in increased greenhouse gas emissions: making commodities more easily available involves a greater energy

[9] Indeed, the cover of Verbeek's *De daadkracht der dingen* (2000) features an electric heater which invites engagement as you have to tweak its elements and sit around it like a campfire, just without the hassle of cutting wood, fire hazard, and throwing out the ashes the next day. Hereby, it invites one to actively enjoy the heat, and indulge in a conversation with others who do. What is lost is any engagement with the fuel providing the heat – there is no memory of felling a tree months earlier if electricity, rather than wood, is burnt.

consumption. We have developed technologies which help and indeed invite us to effectively consume large amounts of resources: without commercial air travel it would be difficult to burn hundreds of litres of kerosine for a city-trip, and we probably would not feel the urge to go Christmas shopping on another continent. Our technological environment co-shapes both the way life is perceived and the structure of society.

It is ironic to notice that the apparent progress in the availability of commodities could very well be nothing more than 'apparent'. Ivan Illich (1974) calculated the time a typical American spends on or in their car: driving around, or working to pay for the car, fuel, and indirect costs like motorways, car-related accidents, etc. Adding all this time up, the 'real' speed of a car is just 5 mph, not much faster than walking. Yet, as we now see, this mode of transport has a significant impact on the global climate. This is just one case study, and it is unclear at what speed the Americans (or the Dutch, for that matter) are currently driving, but the point remains: focusing on one parameter (the velocity at which we are speeding on the highway, for example) hides all the effort going into optimising this single parameter.

Borgmann's normative assessment of the impoverishing effects of the device paradigm on our lives further problematises the polluting activities: if there is hardly anything positive coming out of the speeding up of society, its negative effects on the environment are even more difficult to justify, and the current focus on finding solutions which have the least consequences on the way we arrange our lives becomes awkward. Instead, it would make sense to look into solutions which combine an increased quality of life with decreased pollution.

The uncritical appropriation of devices could be understood as a blind trust in the convenience of the devices, while the supporting context behind them is lost out of sight. This is not suprising, as one of the defining features of a device is the 'black boxing' of its workings. I will return to this effect and its consequences in a more structured way in section 2.3 on the Experiential Gap.

Other topics in Borgmann's work are more ambiguous. His plea for localism for example initially appears to be of dubious use for dealing with a global problem. Indeed, our local framework of reference is understood as one of the reasons global problems are so difficult to deal with, as noted in section 1.2.1 on the tragedy of the commons. Technology promises to make the 'global picture' visible – sometimes literally: the 'Earthrise' and 'Blue Marble' photographs shot during Apollo missions revolutionised the conception of 'mother Earth'. Commercial space travel is promoted by initiators as being beneficial to the environment, because "practically everybody returning from space becomes an ambassador for the conservation of mother Earth"[10] (Droste, 2010, translation RJG). On a more human scale, people tend to donate more to charity when they can relate to a tragedy: the Dutch history of fighting against water probably had its influence on the exceptional national generosity after the South-east Asian tsunami on Boxing Day 2004. It thus seems to make more sense to assume a broader, more global perspective would be beneficial to people's awareness of climate change.

[10] Ben Droste, commander in chief of the Dutch Royal Air Force and initiator of Space Experience Curaçao (http://spaceexperiencecuracao.com/) emphasised this at Pauw & Witteman (17 nov 2010). He also stated their programme will be carbon neutral and they even aim to make 'autark' operation possible (so they generate their own energy). But no matter the good intentions and efforts for making this project environmentally responsible, shooting mass into space costs a lot of energy, energy not available for less decadent activities once it is used. Even if they succeed in reaching their own sustainability targets, I do not believe they really contribute to climate change mitigation in a particularly effective way.

But Borgmann's plea for localism should not be understood as a plea to close our eyes for the rest of the world, it is a plea for the appreciation of local customs and situatedness over a globalised culture. Knowledge of the earth and different customs in other cultures is beneficial, and perhaps essential, for the appreciation of the uniqueness of one's 'home'. Solutions to global problems can be developed within local frameworks. Energy efficient architecture for example leads to very different designs in Iceland than in Costa Rica. Still, it is debatable whether a trip to the edge of space out of fascination for nature makes sense in an environmental context: there is a lot of aggressive realism in attempting to escape gravity, and the view from space does not exactly invite engagement with the biodiversity of the rainforest, which is nothing more than a green blotch from space anyway.

Another important distinction in Borgmann's work is the one between the real and the hyperreal. While the hyperreal represents instantly available satisfaction which is empty at its core, real satisfaction is more difficult to obtain, and perhaps therefore, more satisfying in the long run. Borgmann warns us that too much time spent in hyperreal environments leads to a numbing of the senses, so the real feels ever more boring. In *The nature of reality and the reality of nature* (1995), Borgmann mentions the apparent environmental benefit of indoor ski experiences. If skiing can be done in a downtown mall in every city, people would not have to fly or drive into delicate mountain regions to get their fix. Theoretically, indoor skiing could result in less ski holiday related emissions, so the hyperreal might be seen as a solution to climate change problems: heavily emitting activities could be simulated so the actual activity would not be necessary anymore.

But so far it seems simulated experiences do not reduce the demand for 'the real thing', they might even encourage it. Travel documentaries make people plan their holidays, rather than decide to stay home and watch others in breathtaking scenery. Indoor skiing is seen as practice or preparation for a trip to Aspen, rather than an alternative to it. This effect is related to the 'jogging effect', as described by Debray (2004): now people do not have to walk anymore thanks to the car and public transport, one might expect them to start neglecting their legs, but they start jogging instead. Even though nearly every bit of the world is instantly available through Google Streetview, people keep travelling. If Borgmann's analysis is right that hyperreal experiences are ultimately void, this effect is unlikely to reduce in the future, because the hyperreal alternatives to activities are not considered as actual alternatives. On a more positive note, people's apparently stubborn continuation of travelling and skiing indicates they realise the hyperreal surrogate is no proper substitution, so perhaps they are on the right track concerning the good life as understood by Borgmann.

However, there is more to the real/hyperreal distinction than travel versus travel documentaries. Hyperreality is not just TV-shows and websites, but also 'placeless places', or locations that do not reflect the environment and local culture they are built in, like shopping malls. Airports, aeroplanes, sunny resorts, well-prepared skiing slopes, and party towns fit in this category as well. The summer holiday as reward after a year of hard work is a manifestation of the device paradigm: with hard work we produce the ability to consume two weeks in paradise. The affordable annual intercontinental holiday to a resort in Bali, or the skiing experience on prepared 'fun parks' and artificial snow-covered slopes, has a similar numbing effect to the appreciation of everyday reality as a perfectly glamourous hyperreal gym. The fact that these places advertise with 'snow warranty' or record-breaking annual sunshine hours emphasises that going here is no attempt to get in touch with the natural to induce a certain reverence for it, but rather to enjoy controllable or at least predictable aspects of it. Hence the

disappointment if the annual holiday turns out to coincide with rainy weather. Travelling can be very conducive to the good life, but if a hyperreal environment is all that the travellers are after, it is unlikely to actually enrich their lives. I will return to the value of travelling in chapter 4.

When evaluating polluting activities or technologies and their proposed alternatives, the concepts of the device paradigm and hyperreality are valuable tools to flesh out similarities and differences. Instead of (cleaner) solutions to natural needs, technological development towards more efficient production of commodities should be understood as manifestations of the insatiable drive of the device paradigm towards increased consumption. But most interestingly, Borgmann enables us to expand the problem to the value of our activities. If our greenhouse gas emitting activities are evolved from a perspective with a very narrow conception of the good life, the best solutions might not lie in the reduction of polluting characteristics of our technologies, but rather in the re-evaluation of where we are going.

2.3 The Experiential Gap

Next to Borgmann's insights about how to understand the effects of technologies on the quality of our lives, his work provides a fruitful basis for understanding how we behave regarding the use of resources. As argued above, devices inhibit engagement because their machinery is hidden to the user. The result is that the amount of resources used when consuming a commodity is often invisible to the user, which complicates any attempt at making people act more environmentally friendly. In this section, I will explore the concept of the 'experiential gap' in order to better understand the mechanics of this effect.

In *The Embedded and the Networked: Conceptualizing Experience in Technosociety* (Briggle & Mitcham 2009), Adam Briggle and Carl Mitcham claim that it is useful to understand modern society as a networked society, rather than an embedded one. In an embedded society, parts are subordinate to the whole, and the parts have a strong relation with the whole. Disembedding occurs when these strong part-whole relations get dissolved, resulting in an 'autonomisation' of the parts. These autonomous 'ex-parts' can become nodes in networks, where networks are understood as systems of relations or links between nodes. These relations are much weaker and more susceptible to change than the ones that form an embedded society.

To make this a little less abstract, we can imagine a self-sustaining community on an island without contact with the rest of the world. People living here are embedded in their society, and probably have a fixed task or role in this society. Local economy is tied to social relations, culture, schooling, etc. Then, on the mainland it is decided that a ferry service is initiated with the island. Suddenly, there is an influx of foreign people and artefacts on the island, and perhaps some of the islanders' products are valuable elsewhere. The local economy gets disembedded and forms a node in the network of global economy, resulting in disrupted social relations, culture, and schooling as well.

Briggle and Mitcham describe five types of disembedding, the most interesting of which for us (and them) is 'experiential disembedding'. This entails the phenomenon that in increasingly complex networks, the

experience of the effects of an action at a node becomes more distinct from the actual effects this action has on the network as a whole. The authors refer to this as the 'experiential gap'. To stay in the network idiom: “when individuals 'ping' the world with their actions, the return signals they receive are often distorted or muted.” (Briggle & Mitcham 2009, p. 11)

Although disembedding and networking are of all times, they occur in an unprecedented intensity in the modernising development of the western world. Since means and ends become seperated in Borgmann's device paradigm, people connect with commodities, while the machinery that produces them remains in the background. This makes it difficult or at least less than straight forward to see the 'larger picture' when consuming something. Modern production systems are only possible through a disembedded understanding of the world: resources are 'decontextualised' and reduced to their technical functionality, stripped from everything that could remind us of their origin[11]. The experiential gap is both a cause and an effect of increasingly large networks: the sense of autonomy and insignificance of one's choices makes it easy to take whatever one likes, and this taking enrolls a complex system of people and technology that makes sure you can get it.

At first glance, it seems Briggle and Mitcham offer a bit of a one-sided story. Technologies do not always have disembedding effects, and modernisation does not always result in larger networks and increased experiential gaps. When inhabitants of a small town in the Chilean desert switched from delivery of fresh water by truck to a fog catching system, the network for providing them with fresh water shrunk considerably (Cereceda, 1998). A technology like the skateboard can have an embedding effect among its users in a city: skateboarders become part of the whole of the skateboarding subculture and connect to their streets in new ways. This latter example suggests that the difference between disembedding technologies and embedding ones coincides with the difference between devices and things or instruments. Similar to when Borgmann claims the device paradigm matches the pattern of modern technology, the increasing experiential gap matches this pattern as well.

So, the concept of the experiential gap enhances our understanding of the effects of modern technology on our perception. In Borgmann's terms, devices inhibit engagement by increasing the experiential gap when consuming commodities. This gap, then, can be seen as one of the mechanisms through which the device paradigm increases its influence: if the use of devices makes it difficult to connect to other nodes in the network because return signals are muted or distorted, people will be decreasingly interested in these other nodes.

To see how this works in practice, we can look into the way electricity is typically consumed, as the electrical system fits the description of disembedding and networking like a glove. Electrical power enters my house silently and odourless. What I need to know about it to benefit from electricity, is simply that it makes all my appliances work. I do not need to know that electricity is generated somewhere from primary energy sources, and that these primary sources and the generation are sometimes very dirty and destructive to the environment. Since my energy bill is debited automatically, I do not even need to know that getting the electricity to my house costs anything, but if I do notice it is not for free, I notice it is not very expensive, either. When I am working on this thesis late at night, I am not experiencing any fossil fuel being burnt or squeezed out of Canadian tar sands, even though my slightly humming computer, the light in my room, and the refridgerator

[11] The food industry springs to mind, and the problems that some people have with eating things that 'look like animals', while they do enjoy an anonymous slab of meat.

in the kitchen are quietly fed by this enormous network that provides us with electricity. Compared to medieval monks writing on locally produced parchment by candle light, my writing activity is highly disembedded (as I do not know where the things I am using come from) and networked (as I am having effects in far-away places like Canada or Nigeria, as opposed to just the local parchmenter and chandler).

If the problem of climate change is that people tend to use too much of the finite earthly resources, it becomes clear that the experiential gap is of crucial importance if we are to change this: this gap moves resource consumption out of sight in daily practices. Therefore, we should look into ways in which the gap might be deproblematised. Briggle and Mitcham suggest two types of solutions: regulations and taxes on the one hand, and a more active citizenship on the other.

Regulations and taxes could 'patch' the mismatch between effect and perception by making polluting activities illegal or expensive. In economics, this practice is understood as internalising externalities. As we have noticed in section 1.2, it is difficult to do so: finding the right 'price' is hard due to intergenerational and scientific issues, and making a global agreement around it even moreso due to conflicts of interests and uncertainties which are difficult to translate into policy.

A more active citizenship would ask people to actively work on learning about the networks in which they are part. When turning on an electric appliance, one should try to keep in mind the powerplants and oil tankers crossing the globe. A problem with this approach is that it might entail an unrealistic demand for the consumer: one can never be totally certain about the network they are summoning, so this demand would paralyse people to the extent they cannot live properly.

Both these solutions are relatively external to the experiential gap itself. Taxing polluting activities does not close the gap, but rather shortcuts it by adding an artificial response to make up for the muted or distorted response people get from the network. When viewed that way, it becomes clear that the difficulties surrounding this method boil down to the difficulty of making an artificial response which adequately matches the proper network response. The plea for a more active citizenship can be understood as a plea to listen more carefully to the network. Although praiseworthy, if the network is emitting nothing but noise, listening more carefully does not help much. Both solutions take our networked situation for granted. Would it be possible to do something about experiential-gap-causing networks themselves?

The network metaphor used by Briggle and Mitcham invites a closer look into the structure of this network. If the experiential gap is caused by disembedding and networking parts of a whole, it is perhaps possible to 're-embed' these parts by changing the nature of the links between parts. The experiential gap is the difference between the effects of ones actions, and the perception or experience of these effects. So if ones perception would be enhanced, an opaque network can be made more transparent. If ones effects are reduced, an extensive network is made smaller. Both of these shifts would narrow or perhaps close the gap. Electricity consumption for example could be made more transparent by adding 'smart energy meters' which provide information on consumption patterns, and the network could be made smaller by producing electricity on a more local scale.

In Borgmann's terms, these measures resemble a shift from devices to instruments. Devices radically seperate

ends and means, and 'black box' the machinery. Attempts to make networks smaller and more transparent are attempts to decrease the seperation between ends and means, and attempts to open the black box. More than in the case of regulations or pleas for active citizenship, these shifts take the technical reality of our environment seriously.

The merit of the concept of the experiential gap, is that it illuminates the details of the practice of 'black boxing' that occurs in devices. With these details in sight, ways to make resource consumption more visible become apparent. This visibility is an important first step if people are expected to consciously deal with environmental issues like climate change: we have to realise our actions have unfavourable consequences before we can act upon this.

2.4 Conclusion

In this chapter, it has become clear that the understanding of technology as a neutral tool in climate change mitigation efforts is problematic. The work of Borgmann provides a powerful framework to understand the ways technologies shape our desires and the way we experience the world and our role in it.

The concept of the device paradigm reveals how modern technologies are often shaped so that they offer an easy way to provide users with certain commodities, while they hide the efforts necessary for these commodities in the 'black box' of their machinery. The result is that users of devices are encouraged to increase consumption, without questioning the influence of this consumption on either their quality of life, or their environmental footprint. Borgmann holds that this focus on consumption is misguided, as it does not improve the quality of life at all, but rather impoverishes it because the devices through which consumption takes place only allow the experience of a small part of the world. Therefore, he suggests a shift from devices to things or instruments, which allow for a more engaged and therefore more worthwhile experience.

In *Crossing the Postmodern Divide*, the 'device-like' shape of society as a whole is further explored and problematised. Because the gratification of consumption wears off quickly, new developments and infinite growth are essential to keep the dream of better lives through consumption going. Next to all the small devices around us, modern society is geared towards consumption as well. As a consumer, it is difficult to do anything about this: if our roads and traffic rules are tailored towards cars, it is difficult to use the bicycle, even if we would like to. Therefore, Borgmann argues for the participation of people as citizens, rather than just consumers, who are able to restructure society so that it invites us to connect to our environment in a different, more rewarding, and more sustainable way.

A closer look into the way the polluting nature of consumption is effectively hidden from our daily choices is offered by the concept of the 'experiential gap'. This 'gap' consists of the discrepancy between the effects of ones actions in the world, and the perception of these effects. Devices result in a large experiential gap, and if people are expected to consciously choose less polluting activities, this gap needs to be closed or narrowed.

In practical terms, this chapter leads to a number of suggestions for climate change mitigation efforts. It makes sense to look for technologies which encourage a decrease in consumption, for example by enabling engagement and focal activities, rather than the consumption of commodities, and by bridging the experiential gap. Moreover, it is important to keep in mind the societal structure influences the choices people make, so simply suggesting the use of another technology in the same context is not enough: the societal infrastructure must become susceptible to different technologies.

But how to go about putting these suggestions in practice? Is it even acceptable to purposefully steer people's behaviour? And if so, how should this be organised? In the next chapter, we will look into these questions with the work of Thaler & Sunstein.

3 Nudging away from Climate Change

There is nothing original about the idea that our environment influences our behaviour. The atmosphere at ones workplace can make or break productive working hours, and a box of chocolates on the table makes you eat more than you would like. Commercial businesses have used this phenomenon to their benefit for a long time; the candy racks at the supermarket check-out are a good example. More recently, voices are emerging pleading for a moral appropriation of this knowledge: how can we make people lead a better life through changes in their environment? Richard Thaler and Cass Sunstein's *Nudge* could be the most popular incarnation of this position. Would it be possible to draw from these ideas in order to counter climate change?

In this chapter, I will explore Thaler and Sunsteins theory, evaluate its theoretical and practical merits and problems, and look into how it might be used to counter climate change.

3.1 Libertarian Paternalism

In *Nudge* (2008), Thaler & Sunstein point out that when making decisions, people are influenced by their surroundings: the choices of people around them, the way a choice is formulated, etc. Also, people are often not happy with the choices they make: many smokers would like to quit, but fail; many people hit the snooze button on the alarm clock more often than they plan to the night before. These two points lead Thaler and Sunstein to the claim that influencing peoples behaviour on purpose by 'choice architecture' is both possible and desirable. They call this position *libertarian paternalism*: if we know what is best for someone, we are allowed to give a 'nudge' so they are more likely to take the right choice, but ultimately, the choice is theirs.

Padded with many examples, Thaler and Sunstein describe a range of phenomena which affect our choices. They point out that the typical subject of economic studies – Homo Economicus – is far from a realistic depiction of people in their daily lives. The difference between Homo Sapiens and Homo Economicus, or humans and econs, in Thaler and Sunstein's terms, is that econs always make well-reasoned, rational choices, while humans are often lead by subconscious mechanisms which ultimately result in less-than-perfect choices because we are 'tricked' into certain behaviour. This is understood to be due to two different 'thinking mechanisms': automatic and reflective thinking. We humans often make choices 'automatically', rather than reflectively, and use deceptive rules of thumb when we do not have enough information to properly make choices. We are also overly optimistic when it comes to planning the future, are 'loss averse' (we dislike losing more than we like gaining), and tend to get influenced by the way a question is framed. Econs on the other hand always use their reflective thinking mechanisms, taking time to deliberate, abstracting the problem at hand from its messy background, and not getting fooled by misleading rules of thumb.

Taking these effects seriously, one cannot but conclude that people are less autonomous in their choices than they might expect: they are steered by their environment. Thaler and Sunstein proceed their argument by claiming that now we know choices are steered in myriad ways, we should take action and channel the force of

these effects so people make the choice they themselves would consider best, all things considered. This use of steering mechanisms in order to make people make the right choices is called *nudging*. An example is the layout of food in cafetarias: people tend to end up consuming what they saw first, so assuming people like to eat wholesome food, a good nudge would be to display healthy food before the french fries and desserts.

The good thing about nudges, according to the authors, is that there is no coercion involved. People still make their own decision, they are just more likely to make the choice they really wanted to make in the first place. This makes nudging acceptable to libertarians, who feel passionately about freedom of choice. Indeed, Thaler and Sunstein do too, and this is exactly why they find the issue so important: now we know choices are not made autonomously, we need to make sure we use this knowledge to our benefit. If we do not, we can expect to be influenced in our choices in ways we might not approve of – something unacceptable for libertarians.

Since a choice has to be presented in some way, which way would be best? Thaler and Sunstein call the way choices are presented *choice architecture*. A neutral choice architecture is impossible, there is always some influence. This leaves two options: minimising the aims, one could choose to set up choices randomly; or one could try and make it most likely the best choice will be made. The cafetaria manager could have the food displayed in a completely random order, or intentionally have it displayed so people pick healthy food. Thaler and Sunstein's position is that it would be good to have choices framed so that people tend to make the right choice without having to think reflectively. “If people can rely on their Automatic Systems without getting into terrible trouble, their lives should be easier, better, and longer” (T&S 2008, p. 24). This intuitively makes enough sense: because the not-helping random option still does not offer neutrality, there is little reason to choose that option over the helping one.

Thaler and Sunstein offer some leads for 'choice architects' on when and how they should (and should not) nudge. Choice architects are all people who influence the way choices may be represented to others: policy makers, designers, store managers, and medical doctors, among others. They should adhere to 'the golden rule of libertarian paternalism': “offer nudges that are most likely to help and least likely to inflict harm” (T&S 2008, p.79). Nudges are appropriate in situations in which people have difficulties making the right decision: when they are tempted into choices they do not really want to make, and when they have difficulty recognising the consequences of the various options. Nudges should be transparent, so one should be able to realise they are being nudged, and the intentions of the 'nudger' should be clear. Nudges should also not limit choice, so for example making it difficult to opt out of a certain subscription in order to make people give up on trying is no proper nudge. Beyond this, a lot is allowed. Since surveys show that most people are in favour of organ donation, but many of them do not take the time to take the necessary steps to become one, the authors hold that it would be appropriate to make donation the default choice so people only need to act if they want to opt-out (T&S, p. 188). In this example, case-studies of pilot projects show promising results.

If applied properly, libertarian paternalism is argued to be a reasonable position which has the potential to function as a 'Third Way', bridging the gap between the American Democrat and Republican parties. Thaler and Sunstein hold that their lessons are useful in many situations and offer low-cost, highly effective solutions to various societal problems.

3.2 Critique

Before going into detail about the practical merits and problems of liberatian paternalism regarding climate change, it is important to take a close look at its theoretical qualities. I will do so in this section, based primarily on the work of Luc Bovens and Evan Selinger and Kyle Whyte.

3.2.1 Selinger and Whyte

Although they offer a fresh perspective on decision making and propose some guidelines on how to make use of this knowledge, Thaler and Sunstein's account remains mostly grounded in examples of smart usage of nudging, rather than any structural or theoretical framework. This leads Selinger and Whyte (2010) to point out four difficulties if nudges are to be actually put in practice. First, there is the problem of inference: how do we know that a nudge is offered according to the rules? "Thaler and Sunstein do not provide clear criteria for determining the minimal background conditions that need to be met in order for someone to be capable of claiming that they can offer a nudge based on appropriate considerations of the empirical studies" (Selinger & Whyte 2010, p. 471). Second, Selinger and Whyte hold that even if successful nudges exist, it remains to be seen whether it is possible to replicate these effects over time and in different cases - it is unclear whether nudging is "the sort of endeavor that can be cultivated as a competence or expertise" (Selinger & Whyte 2010, p. 471). Third, the authors see problems regarding where the new domain of choice architecture should be located. Since choice architecture is embedded in our environment, the domain collides with product design, law making, and other domains. It is unclear how nudging can be incorporated into the protocols and knowledge of those other domains. Fourth and finally, Selinger and Whyte fear that choice architects will project their own ideas on the 'nudgees' too often in cases where user preferences are not obvious.

These four objections are serious, but not fundamental. Selinger and Whyte note that currently, several aspects of choice architecture are unclear, and more research is necessary to take away these uncertainties. But the authors note a more fundamental problem: *semantic variance*. This concept refers to the fact that the same signal could mean different things to different people and in different contexts. The example Selinger and Whyte provide is that of an invitation to smoke a Cuban cigar. For Americans, this might mean an exciting and illegal experience, while for a Cuban expat it is an opportunity to get nostalgic about home, and for a European cigar-enthousiast it is simply smoking a good cigar. All signals are subject to semantic variance, but to different degrees.

Selinger and Whyte note that the examples in *Nudge* deceptively appear to be semantically invariable in their descriptions. An example mentioned various times in Nudge, is that upon etching flies in Amsterdam airport urinals, men's aim improved 80%. The etched fly functions as a nudge, because it suggests a target for the urinating man, which apparently helps him to stay concentrated on the activity. This seems harmless enough, but as a thought experiment, Selinger and Whyte suggest that a tribe might exist, members of which have such reverence for life that they would be offended by urinating on a depiction of a fly (Selinger & Whyte 2010, p. 475). Although this example appears to be somewhat extreme, the point is that it is very difficult to predict all

meanings that people will ascribe to a specific nudge.

Obviously, the effects of semantic variance are present in every choice context, not just contexts in which nudges are consciously implemented. As Thaler and Sunstein mention, there is no escaping choice architecture in general. So the point Selinger and Whyte bring up is not necessarily more problematic when it comes to intentional nudging compared to designing 'traditional' choice architecture (which unintentionally 'nudges' in a certain direction as well). The question is whether nudges have any influence on the semantic variance of a context. Some nudges, like the etched fly, add meanings to the context, so here semantic variance increases. Urinating now becomes urinating on something, or for example trying to aim more precisely because of the fly. In other cases, like the rearrangement of the cafetaria so people are more likely to pick wholesome food, this is less obvious: the new arrangement does not add any new elements to the context. In general, it seems that depending on the type of nudge, semantic variance could increase, but it does not necessarily do so.

Since nudges are attempts to steer people's behaviour, the nudgees' awareness that they are being nudged might influence their perception of the choice context. One might wonder what they are tricked into, or what the intentions of the nudger have been. Some people might be sensitive about the idea that they are treated as if they are not able to make their choices themselves, which could result in recalcitrant behaviour, reducing the effects of the nudge, or possibly even backfiring.

It is here useful to take a closer look at what exactly is a nudge. In the introduction of *Nudge*, the term is defined as "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economc incentives" (T&S, p. 6). This definition does not foreclose the possibility of 'accidental nudges', aspects of choice architecture which alter people's behaviour without being intended to have this effect. Yet, in their actual usage of the term, Thaler and Sunstein seem to call something a nudge only when there is some intention behind the behaviour altering aspects – they have to be put there on purpose.

The consequence of only focusing on intentional nudges, is that they seem manageable: we can see how they work, and what rules nudgers need to obey. But at the same time, this impression of controllability overshadows Thaler and Sunstein's insight that even without intentional nudges, there is no such thing as a neutral choice context. Their definition therefore does more justice to reality than their practical use: if we understand nudges as *any* aspect of choice contexts that alter people's behaviour, we come to appreciate the complex effects our technologies have on us as nudges as well. I will proceed by using 'nudge' in this broader sense.

A commercial urging you to buy a car by appealing to a sense of freedom and adventure, the physical layout of the city you live in, and a governmental program for bicycle commuting, all contain nudges: they all have the effect of changing people's behaviour. The commercial does so with the aim of selling more cars, the layout of the city unintentionally makes alternatives for the automobile more or less feasible, and the bike commuting program might be aimed at increasing people's health or reducing traffic jams. Although there is a moral difference between intentional and unintentional manipulation, we are nudged regardless of the existence and substance of the intentions behind nudges. This does not make questions about these intentions by the nudgee invalid or irrelevant, but it might make people realise their autonomy is not violated more with deliberate

nudges than with accidental ones.

Furthermore, this insight makes us realise that it is unfruitful to discuss who should be allowed to make nudges: everyone who influences choice architecture, either intentionally or unintentionally, creates nudges. Rather than acting as gate keepers, academics could be of more help if they looked into the mechanics of nudging, and offered some guidance regarding effects and best practices, so they direct the process in a desirable way, rather than try to stop the inevitable.

3.2.2 Bovens

In *The Ethics of* Nudge (2009), Luc Bovens points to different problems related to nudging. He wonders whether nudging would result in genuine preference changes, and the building of moral character. Since nudges play on unconscious, 'automatic' choice mechanisms, Bovens holds that choices made by the nudgee are not autonomous. The question then is whether people change their preferences because they rather like the outcome of their nudged choices, so they end up making the same choice autonomously, or they keep their old preferences and will return to their non-nudged behaviour after the nudge is removed. In terms of the cafetaria example: will people who are nudged into picking healthy food start to appreciate it, and look for it in other situations as well, or will they just keep picking whatever food they are shown first?

Related to this, Bovens points out that we should be careful with adding stimuli to choice architecture, because it is likely that ever increasing stimuli are needed to achieve the same results. People might become immune for subtle nudges like finding the healthy food first, so they would need other nudges (like pictures of obese people around fatty food) to keep them eating healthy food. Bovens calls this effect *infantilisation*, or reduced responsibility in behaviour. If people do not change their actual preferences after they are nudged a few times, this effect appears to be more likely to occur.

Bovens seems to compare nudged behaviour with pure, autonomous behaviour: his critique revolves around the point that people are 'tricked' into behaviour they would not entertain without nudges. This is problematic, because as Thaler and Sunstein rightly point out, the choice context will always influence peoples behaviour. The pure, autonomous choice is thus an ideal theory, rather than a realistic alternative to a deliberately nudging context. Instead, a more appropriate comparison would be a choice context into which not much thought has been put: a randomly organised cafetaria, or a treacherous curve in the road without extra cues to slow down. In this light, nudging deliberately does not seem so bad after all – a deliberate design of choice architecture leading to good choices is always preferable over a poorly thought-out design of architecture that might lead to good or bad choices.

Bovens' worry that the short-term benefits of nudges wear out quickly, only to result in less responsible moral agents, is reasonable, but his conclusion does not follow. Bovens holds that "[t]o warrant long-term success, we should let people make their own decisions while providing minimal aid" (Bovens 2009, p. 215), but he also mentions that it could be possible that people in fact change their preferences through nudges. If so, nudges might very well have the long-term effect that people make better choices, because they have been exposed to

the effects of a good choice by this nudge. Rather than minimising influences, the right aim for nudges would be to make people change their preferences for the better.

A final point that Bovens brings up is transparancy. Since nudges work on a subconscious level, they work best when the nudgee is not aware they are being nudged. On the other hand, to be 'libertarian', they have to be transparant, because people have the right to know the context in which they are making a choice. To illustrate these apparently contradictory requirements, he suggests to put the following note in the cafetaria:

> "Research shows that people are more prone to take food items displayed earlier rather than further down the line. Many of our customers are trying to lose weight but find it difficult to do so. To help them, we have arranged the snacks in the food line with healthier items displayed earlier so that they are more likely to choose those items" (Bovens 2009, p. 217)

While making the nudge transparent, the note would most likely reduce the effectiveness of this nudge considerably. But Bovens notes that such notes are not necessary: if it would be theoretically possible to recognise a nudge for what it is, the transparency requirement has been fulfilled. The fact that one could notice the food is arranged in a specific order makes such a nudge acceptable, while subliminal messages are not.

3.2.3 Revised rules for nudges

These critiques add several requirements to nudges, next to the ones that Thaler and Sunstein already suggested: nudges are appropriate in situations in which people have difficulty making the right decisions by themselves, and should not inhibit choice. With Selinger and Whyte, we could add that choice architects should be careful not to add semantic variance to a choice context, and with Bovens, that nudging should be aimed at preference change, rather than reduced responsibility for nudgees. These extra requirements might narrow the application of deliberate nudges, but they will also reduce unwanted consequences.

Next to these extra requirements, we have noticed that the focus on deliberate nudges by Thaler and Sunstein obscures the fact that many nudges are built into choice architecture unintentionally. While the extra requirements narrow the application of nudges, the existence of unintentional nudges expands the importance of knowledge about the role of these nudges. We might try to exercise restraint when it comes to deliberate nudges, but as long as choice contexts exist, nudges are inevitable. Therefore, knowledge about nudges is essential when it comes to understanding our behaviour in the world.

With this firm theoretical basis on which to build, it is time to turn to the problem of climate change. How do nudges influence our greenhouse gas emitting activities? How might we be able to nudge people away from these activities?

3.3 Nudge and climate change

Are deliberate nudges appropriate when it comes to climate change? Thaler and Sunstein suggest nudging is appropriate where it is "most likely to help and least likely to harm". This means nudging is allowed when it

makes it easier to make the right choice, while it would not trick people into choices they do not really want. Are people convinced it would be better to reduce their emissions, but fail to do so because making the right choice here is difficult? It seems that this is indeed the case: as we have seen in section 2.3 on the experiential gap, in the present technological environment, it is very difficult to realise the effects of ones actions in a global context. At the same time, people seem to agree that it would be good to mitigate climate change. Nudging people into climate-friendly behaviour is thus acceptable, because it would make it so much easier to make the right choice.

3.3.1 Unintentional nudges

Before we proceed towards the possible nudges in the right direction, it is good to take a closer look at the (unintentional) nudges that already influence our behaviour when it comes to greenhouse gas emitting activities. As we have seen in chapter 2, the device paradigm invites people to consume commodities. This can be understood as a structural nudge towards the increase of consumption. In the light of climate change, this should be understood as an unintentional nudge, as the idea behind consumption was never to increase pollution.

Zooming in on specific devices, the structure of these nudges becomes more clear. Implicitly and explicitly, we are nudged towards air travel. Public television shows like travel programmes, *Temptation Island,* and *Expeditie Robinson* chronicle exotic travel destinations, only accessible by flight, and the adventures to be had there. Television further celebrates flight in programmes like *Hello Goodbye* in which travellers are interviewed about their plans and adventures, and *Airport*, a 'reality soap' on the dynamic and exciting environment of international airports. Public money is being spent on infrastructure like airports, and as mentioned above, there is a fuel tax exemption for air transport, enhancing its competitive position compared to road and rail travel. So the choice context surrounding how to travel seems to be nudging towards flying, or at the least, there are elements in this context which nudge in this direction. Then there is the character of the technology itself. Although few people enjoy being crammed into a small space with many other people, flying is at least swift and hygienic. It is the most refined device we currently have for the commodity of transportation: a user is sent to their destination quickly and effectively, while the 'machinery', the technology of the aircraft, the network of air traffic control, the route, and fuel provided by the oil industry, are hidden out of sight. If the consequences of flying are more apparent due to nudges that close the experiential gap, people's experience of flying being convenient and unproblematic might very well change.

For other devices, similar structures emerge: we see that the convenience of the car nudges us towards its usage, away from bicycles and public transport. Any electric appliance we have nudges towards their usage – marginal costs are low if visible at all, and they constantly remind us of the commodity they are able to produce. When sitting in a living room with a large television, we tend to turn it on, just to see what it might offer us. When enjoying an evening outside and the cold of the night sets in, the patio heater next to you will remind you there is something you can do about the chill. Thanks to the experiential gap, these devices strongly emit signals inviting people to use them, while effectively hiding any negative consequences of this usage. If nudges away from these activities are to be effective, they have to neutralise these negative nudges before making any net positive effect. What are the opportunities for such nudges?

3.3.2 Thaler and Sunstein

Thaler and Sunstein offer some some ideas themselves: they spend a chapter of *Nudge* on 'saving the planet'. The main solution they offer, is making 'going green' more visible. If you see people around you making the shift to a less polluting lifestyle, you are more likely to do so yourself as well. Labeling pollution levels of technologies like cars, buildings, and electric appliances more visibly creates awareness, so people are nudged into getting the greener version. Green technologies should look green. The authors believe one of the reasons for the success of the Toyota Prius over other hybrid cars is that the Prius is only sold as a hybrid, whereas other cars like the Toyota Camry are sold with either a conventional engine or a hybrid engine. This makes the Prius more recognisable as a 'green' car, so people who want to show off their 'greenness' would prefer a Prius, and others around them will be influenced by the increasing amount of Priuses on the road, leading to an increased popularity of the model if people are indeed likely to choose what people around them choose. Next to economic success of the Prius for Toyota, the existence of pure hybrid designs leads to free advertisement of less polluting technology on the road: whenever we see a Prius, we are reminded hybrid technology is a viable option.

The section on 'ambitious environmental nudges' (T&S, p. 206) proceeds with a myriad of ideas to make electricity consumption visible: kill-a-watts, orbs glowing red or green dependent on current electricity usage, glowing power cords, and websites to compare electricity usage with peers. These ideas, Thaler and Sunstein hold, are excellent for creating awareness about ones energy use, and for 'conservationists' they offer a challenge of becoming the greenest of all. Finally, they hold that 'voluntary participation programmes' for companies are powerful gouvernment tools for making business more 'climate friendly': managers might lack the attention or expertise to figure out the possible benefits of energy savings, so a programme promoting efficient office appliances and lighting could help both businesses and the climate by pointing out the opportunities.

Some of these nudges are susceptible to the critiques of Bovens and Selinger and Whyte. Fuel-efficient cars are subject to semantic variance: people might understand their improved mileage as an invitation to drive further and more often. The gimmicky nature of glowing orbs and power cables makes Bovens' fear for short lived effects and ever 'louder' nudges reasonable[12]. This is not to say these ideas are not commendable, but they are certainly not unproblematic.

More generally, these nudges (even the 'ambitious' ones) seem a little weak. If all there is to climate change mitigation is labeling more efficient cars for what they are, playfully pointing at people's electricity consumption, and telling businesses how to save money by saving energy, then it seems odd that diplomats are fighting at climate conferences over who is to carry the biggest burden. If nudging is to be of any help, we would have to come up with better nudges than these. But before we proceed to better nudges, I would like to look into what is wrong with these ones.

[12] Thaler and Sunstein jokingly suggest the glowing orb should make annoying sounds above a certain treshold, "such as cuts from ABBA's Gold: greatest hits" (T&S p. 206). Joke aside, this is exactly the problem: if everything around you is flashing to tell you about energy consumption, all it takes is time until the flashing is not noticed anymore.

3.3.2 Nudging towards cleaner cars

It is interesting to notice Thaler and Sunstein's solution against polluting cars is *less polluting cars*. By requiring standardised fuel efficiency tags on new cars and making this more visible after sale as well, people are expected to take fuel efficiency into consideration when shopping for a car. Because the authors grew up in automobile-addicted America it might not be surprising they do not consider alternatives like public transport or bicycles, but it is disappointing. The IPCC expects a possible doubling of fuel efficiency for the most efficient vehicles in the upcoming years (IPCC 2007b, p. 50), so it is certainly worthwile to make people shift from their old gas huffers towards cleaner vehicles, but leaving the car for a bicycle would be even better, and it remains to be seen what the effects of cleaner cars are on their usage – as pointed out above, people might understand it as a permit to use it more often. The IPCC notes that currently in europe, 30% of car trips are for distances under 3km, and 50% for distances under 5km (IPCC 2007b, p. 51). It could be argued that many of these trips could have been done cycling, and with fuel costs even less of a concern with more efficient cars, this percentage might further increase.

Beyond the possibility of choosing to take the bicycle for a 3km trip every once in a while, Thaler and Sunstein's assumption that one needs a car is at the same time an understandable and problematic one. Indeed, having a car is often essential to get to work or travel to friends living in a small village, but at the same time it is very difficult to significantly reduce energy consumption when the default mode of transportation involves dragging along 1000kg of steel to move our 80kg bodies. I will return to this problem of infrastructural change in chapter 4.

3.3.3 Saving money and the planet at the same time

Thaler and Sunstein often emphasise the financial gain of saving energy. The voluntary participation programmes aimed at reducing energy consumption in business are popular mostly because of these financial gains, which creates a win-win situation. With or without these programmes, efficiency improvements have lead to considerable savings in energy costs over the years. Yet, we have not seen any net reduction in energy consumption in those years, on the contrary: energy consumption has been rising steadily for decades (Darmstadter & Fri 1992; Herring 2006). How can this be?

Thaler and Sunstein are not the only ones claiming this to be a perfect solution; new products are often marketed with this claim. Volkswagen advertises its 'BlueMotion' technology, a series of efficiency improving technologies in their cars, as being both clean and cheap: “BlueMotion Technologies represent the cleanest, most energy-efficient cars in our range. So when you see this logo you'll know we're talking about ways to cut your emissions and driving costs” (“Efficiency & BlueMotion Technologies”, n.d.). Similarly, Unilever claims that by inspiring consumers to do laundry in a more efficient fashion, both energy, CO2, and costs are reduced: “Every time a Unilever consumer does the laundry at a lower temperature or with a full load, the reductions in energy, CO2 and costs are cumulatively very large.” (“Sustainable Development Overview”, 2009). Saving money and saving the environment seem to go hand in hand, which makes efficiency improvements appear to be a feasible solution to mitigate climate change.

The beauty of this solution is that it seems to negate the tragedy of the commons: by aligning the interests of the individual with those of the commons, everybody can simply focus on their own interests, and everything will be well.

Unfortunately, the larger picture tells a different story. The saved money does not disappear, rather it is consumed in another fashion. Improved efficiency does not lead people to work less to keep the same level of affluence, the 'extra' money is used to increase their affluence. Companies that improve the efficiency of the production process are able to lower their prices, which increases sales and therefore production. Increased use due to larger efficiency is called the *rebound effect*. It consists of a direct rebound effect (an increased use of lighting with the rise of the energy saving lightbulb), indirect rebound effects (using other commodities with the saved money), and general equilibrium effects of the market as a whole (Herring 2006). Only direct rebound effects are well researched, and are believed to be around 20%. But as Herring summarizes, it is assumed that including indirect and general market aspects, the rebound effect could very well even out efficiency improvements.

Efficiency improving technologies are in reality thus either cutting emissions or saving money, and as long as saving money is the reason people use more efficient technologies, there will be no or little emissions cut thanks to these improvements of efficiency. So we are back at a tragedy of the commons: efficiency improving technologies would be beneficial for the commons only if consumers or businesses would refrain from using them to improve their own situation. The strength of efficiency improvement turns out to be its weakness as well.

3.3.4 Better nudges

Let us take a closer look at the nudges Thaler and Sunstein offer. First, there is the labeling of emission performance of technologies like cars and fridges. By making this aspect of the technologies more visible, people are nudged towards taking energy consumption into consideration, and therefore choose 'greener' than they would otherwise. This nudge presupposes that people understand reducing emissions as a positive thing: if they did not care about about the tag, it would have no effect. It is not entirily clear how certain Thaler and Sunstein are about this position; to seal the deal, the estimated annual fuel costs are printed on these labels as well – if you are not interested in the planet, then at least buy a Prius for your own good. As mentioned above, the rationale of 'voluntary participation programmes' is similarly problematic. Finally, there are the glowing orbs and power cables, making visible hidden electricity consumption, which next to perhaps the novelty aspect of their gadget-like appearance, are mostly aimed at awareness of electricity consumption – for whatever reason people find this interesting.

Although Thaler and Sunstein seem to carefully avoid the more complex situations when financial gain and emission reductions do not coincide (like when paying for offsetting emissions), they do implicitly suggest that 'saving the planet' is a worthwhile endeavour. Yet, their suggestions do not appear to be very effective. Would it be acceptable to develop some more radical nudges?

Recall from section 3.1 that nudges are appropriate when people have difficulty making the right choice, due to the complexity of the situation or a lack of information about it. Nudges should not constrain choice, so if people actually do prefer greenhouse gas emitting activities despite their negative consequences, they are allowed to pursue them – much like a person who would like to lose weight, but likes cupcakes even more. Would we like to counter climate change, but do we like our polluting activities even more? It is perhaps useful to stay with the cafetaria example here. Thaler and Sunstein's claim that most people would like to choose a healthy diet could very well be true. In a 'nudgeless' cafetaria, we might recognise two types of customers who fail to pick the healthy food options: people who mindlessly take the first thing that appeals to them, and people who enter the cafetaria with a big plate of french fries in their minds. The former type would be helped with the 'healthy food first'-nudge, but the second type not so much. Indeed, Thaler and Sunstein note that it is the former group that they are trying to help: the busy, absent-minded people who simply do not have the time to stand back and think the options through with every choice they make.

Now it makes sense to wonder which of the two types of people at the cafetaria resembles the greenhouse gas emitting person: are we mindlessly consuming, or do we simply love burning fossil fuels? As became clear in the discussion on Borgmann's work in section 2.1, it is reasonable to assume that to a large extent we are mindlessly consuming, which suggests that nudging towards more sustainable consumption is likely to be acceptable and fruitful. But let us focus on the other option, that we simply love burning fossil fuels. As people grown up in the era of air travel, we surely have grown to appreciate our ability to go on holiday anywhere in the world and enjoy distant cultures and landscapes. For some (or perhaps many) of us, giving up air travel might feel like a sacrifice we are not willing to make. Are we making this decision after long deliberation with all relevant information available, or are we just tricked into this idea by all the amazing photos in National Geographic magazine?

Another of Thaler and Sunstein's examples is helpful here. In an effort to get out of bed on time, notorious snoozers are helped by the nudges of a moving alarm clock. By the time it is time to wake up, this clock will drive off the bedside table and make annoying noises. By the time the owner has located and turned off the alarm, they will be out of bed, and awake enough to start their day. Thaler and Sunstein describe this alarm clock as an effective nudge which the 'planning evening self' administers on the 'sleepy morning self'. This description admits we are not always in the position to make important choices (like whether to get out of bed or not), and some versions of ourselves are allowed to 'rule' other versions.

They go one step further: in the case of pension plans, the 'self' that administers the nudges is a hypothetical contemplative self, one with a degree in economics and a more realistic idea about building up a pension than the big spender 'real' self may have. This hypothetical self nudges the 'real' self into saving habits they would never develop by themselves, no matter how much time they deliberated about it. Still, at the end of the day, the 'big spenders' are happy to save more for their pensions so they can keep spending like they are used to after retirement.

It could be argued that the problem of climate change is too complex to grasp for many of the people who would not like to give up air travel by themselves. Like the big spenders, they could use a hypothetical

contemplative self, specialised in climate science and risks, who would come to the conclusion that the benefits of air travel really do not weigh up against the risks of catastrophic climate change. The result would be that beyond simply making emissions more visible, actual air travel discouraging nudges are acceptable. In the next chapter, I will explore how likely such a position is, but I will here assume that it is indeed reasonable to say we should be nudged away from air travel.

How could we develop such stronger nudges? To effectively structure our options, it is interesting to frame our example of air travel in terms of the experiential gap. The problem, then, becomes that air travel allows the user to employ a polluting network without experiencing the negative effects. Four different routes were suggested in section 2.3 to mitigate this problem: to introduce external stimuli that mimick the effects on the network for the user; to ask of the user to listen carefully to the network; to alter the network so that it better communicates the global effects with the user; and to alter the network so the effects of the user are less negative. Each of these routes could lead to effective ways to nudge people away from air travel.

The most obvious external stimulus would be to introduce price incentives, like fuel taxes. These taxes are supposed to reflect the societal costs of excessive fuel use, rather than their economic costs. This way, formerly hidden effects in the network (like climate change), are communicated to the user. It is good to notice that when it comes to choosing the mode of transport for our holidays, we are currently being nudged *towards* air travel, rather than away from it, due to the fuel taxes for road transport. Compared to buses or cars, fuel costs for air travel appear to be discounted, making it as expensive to drive to Spain as to fly to Morocco, while the flight does consume more fuel. If we are choosing the best destination within our budget, it is not surprising flying grows in popularity.

To ask the user to carefully listen to the network presupposes a certain technical literacy regarding the effects of flying. As mentioned in chapter 2, the complex nature of modern technological networks makes this difficult. Yet, it would be reasonable to assume at least a part of the users of air travel are more or less aware of their contribution to climate change. To those people, an appeal to think their actions through could be effective. Imagine the following public service advertisement:

> The setting is at Amsterdam airport, some summer popsong gets you in a holiday mood. A variety of travellers is waiting or walking around, not carrying their typical luggage, but dragging along large liquid containers, filled with the fuel their trip will cost. A few are singled out, and their cost is displayed: Dallas, Texas: 596 litres. Caïro, Egypt: 212 litres. Auckland, New Zealand: 1390 litres. Being shown an overhead shot again, the viewer is asked: "Burning of fossil fuel causes climate change. Is your trip worth it?"

This way, we are made aware of the consequences of our actions not through some artificial price tag of a carbon tax, but with an appeal to our imaginations.

Altering the network in order to make it more transparent might be done in several ways, depending on what one understands as the 'network of air travel', and what changes are acceptable. A conservative approach might be to make the figures of fuel consumption more visible. Rather than hiding it in a special webpage, KLM could print the figure of 596 litres on the checkout page and the confirmation email when booking a flight. But arguably, this would be too late – the flight has already been booked.

Finally, to alter the network to reduce the negative effects of ones actions, there are several options imaginable. The most obvious option is to compensate for carbon emissions by generating carbon neutral energy elsewhere, like KLM aims to do with their CO2zero programme. To nudge people into using this more often, a checkbox could be added to the booking page, perhaps next to the cancellation insurance. Nudging more agressively, this box could be of the 'opt-out' kind, so the impression is raised it is normal to pay for this service. However, the semantic variance of this system might lead people to believe there is no environmental harm in flying at all, apart from the fact that scientists are not entirily certain about the merits of CO2 compensation.

More far-reaching would be to look into alternative networks for travelling, like trains, which are more energy efficient, and at least theoretically can be run on sustainably produced electricity. Tele-conferencing or choosing a less distant holiday destination could also be options in some cases.

As becomes clear, there is a broader range of nudges possible to mitigate climate change than Thaler and Sunstein suggest, at least if we accept that some sort of 'self' comes to the conclusion that many of our activities (like air travel) are not always worth the price of climate change. But note that these nudges are not really equivalent, they are nudging at different levels and with different consequences. Some, like making air travel more expensive so the cost is in line with other modes of transport, play on the simple tendency of people to pick the cheapest among equivalent options, so they just happen to choose more environmentally responsible along the way. Others, like the 'awareness advertisement' ask people to reflect on their actions more than they would otherwise. Thaler and Sunstein's suggestion of labeling the fuel consumption of vehicles fits somewhere between these routes: people might choose the fuel efficient car because it saves money in fuel costs, or because it saves fuel.

Nudges offering environmentally benign alternatives to air travel, like a proper rail network, work on a wholly different level. Unlike the nudges Thaler and Sunstein offer, which are cheap and easy to implement, these are expensive and have to be approved by the majority of society. This makes them appear much less attractive, but if we consider the fact that the current infrastructure nudges *towards* polluting transportation, it becomes clear that this route demands serious consideration if we are to really bend the choice architecture towards environmentally friendly nudges. If we focus on the individual deliberating their holiday options, we can think of ways to nudge this person away from polluting air travel, but this takes for granted the options this individual has, and the fact they feel like going on a holiday. This is unfruitful and needlessly limiting the scope of deliberate nudges: unintentional nudges are influencing people on different levels as well, so if we are to make a difference, these other levels (like the available infrastructure) must be taken into consideration.

But their apparent importance does not make these nudges less difficult to implement. Difficulties like semantic variance and infantilisation remain significant problems for specific nudges. The expensive and relatively permanent nature of infrastructure makes for a difficult field to experiment in, and it is all but impossible to opt out of the prefered mode of transportation. How can we adjust the nudging nature of our surroundings, without resorting to flat-out bans and restrictions? In the next chapter, these problems will be explored.

3.4 Conclusion

If chapter 2 offered a diagnosis of the problem at hand, this chapter lead to the first steps towards a solution. As we have seen, the ideas in Nudge offer many fruitful leads, but the book leaves open some boundaries and raises several questions and concerns. In this chapter, I have discussed these questions and concerns, and tried to expand the boundaries of the territory of nudging.

Thaler and Sunstein's central points are that every choice is influenced by the context in which it is made, and that choice contexts are never neutral. This leads them to the claim that deliberate nudging towards better choices is allowed or even obliged for anyone influencing choice contexts. After all, if people have influence anyway, it is better they put some effort into having a good influence than accidently having either a good or a bad influence.

Several philosophers have pointed out that this path should be tread on carefully: we must be careful not to increase the semantic variance of the situation, and be wary of the possibility of infantilisation. In other words, nudging in the right direction is not enough; it should be nudging in the right direction for everybody, and the nudge should not make the 'nudgée' less morally competent because they expect their environment to steer them in the right direction without paying attention. But these concerns should not make us abandon nudging. If anything, they emphasise the importance of putting effort into the design of choice contexts, and therefore the 'art' of nudging.

The second part of this chapter dealt with the question whether nudging is appropriate in the case of climate change. It was argued that this could very well be the case, as long as we accept that either we are mostly emitting greenhouse gases simply because our environment invites us to, rather than because it improves the quality of our lives; or that we can imagine some 'hypothetical self' who concludes that all things considered, our choice for consumption of commodities over the conservation of the climate is misconceived. If so, we can think of several nudges which not just nudge people away from polluting activities on the daily level, but also on the fundamental level of the structure of society. The latter is important, because in the current situation we can identify many nudges towards polluting consumption.

The main issue that still remains, is which nudges are right? If we need to reshape things like infrastructure and the way we organise our lives, the 'right' nudge cannot be expected to be found by solitarily thinking about what people might want. Instead, I will argue for public deliberation regarding the way in which we would like to be nudged in the next chapter.

4 Deliberation

In chapter 3, we learned that Thaler and Sunstein point out that no choice is ever presented in a neutral way, and that therefore, choice architects need to work on presenting them so that people are most likely to make the right choice. The 'right' choice, then, would be the choice people make if they had access to all necessary information, unlimited time for deliberation, and a clear mind. Because people do not typically have these three requisites, choice architects are allowed to nudge people in the right direction.

For some, this argument sounds like we should give up our autonomy, and let others (in this case, the choice architects) make our decisions, which goes against the good tradition of liberalism. Anticipating this response, and considering themselves good liberals, Thaler and Sunstein defend their position at great length. They point out that, although we must indeed be careful not to let others make our decisions, there is simply no other option than to present choices in *some* way, so it would be for the better if some thought goes into this presentation. No rules of liberalism have been violated, or at least not more so than in other choice contexts.

But this raises the question – if choice contexts are never neutral, how valid are the presuppositions of liberalism in practice anyway? To answer this question, it is good to first take a closer look at the concept of liberalism itself, and then look into how it maps onto the theory of *Nudge*.

4.1 Beyond liberalism

4.1.1 Nudge and liberalism

Liberalism is no clearly delineated ideology; there are many competing conceptions of what liberalism exactly entails. Still, these conceptions have a common denominator, which is the idea that autonomy of individuals is of utmost importance for any just policy: people should be "the authors or makers of their own lifes, rather than being subject to the will of others" (Swift 2006, p. 158). Debates revolve around what autonomy and individuals exactly are, which set of rules satisfies this principle best, and in which cases (if at all) the autonomy of individuals may be sacrificed for something else.

There is, for example, the debate about the obligations we have to our fellow citizens. Should the wealthiest pay redistributive taxes to diminish the poverty of the least well-off? Libertarians argue they should not: freedom is the liberty to use your belongings in any way you might choose. Other, more left-wing, liberals argue this is not the right way to understand freedom: freedom is the ability to choose your own life plan. If we are to secure this freedom, we must make sure everyone is able to afford whatever they need to develop themselves in life, like good nutrition and tuition, which might mean the least well-off need some 'subsidisation'. In this example, we might understand the libertarian position as one of *formal* equality (everyone has equal liberties), and the 'left-wing' liberal critique on this position is that this formal equality does not resolve the *substantive* inequality that

might come from being born into different social environments and with different abilities.

Both these positions are neutral towards conceptions of the good life: they allow people to choose their own path in life. This makes sense if we are to accept *value pluralism*, or the idea that different people have different ideas on what is important. While some may hold it is praiseworthy to excel in sports or playing an instrument, others may argue it is much more important to enjoy the game or the music one plays than being particularly good at it. Note that these two appear to go hand in hand: people tend to like what they are good at, or get better at things they enjoy. Still, the question remains what is of (most) final importance. As long as such questions are not answered adequately, it is better for the rules on which we base our society to be neutral on the matter.

Value pluralism does not necessarily mean that any conception of the good life is as good as any other. Without making any definite claims on the ranking of conceptions of the good life, we might be able to make some distinctions: a life devoted to playing violin might be better than the life of a drug addict, for example. *Perfectionist* (as opposed to neutralist) liberals hold that it is allowed to inspire people to choose for a valuable life rather than a useless one, as long as people are ultimately able to make the choice themselves.

This perfectionist liberal position seems to be close to the 'paternalism' in Thaler and Sunstein's libertarian paternalism: “a policy is 'paternalistic' if it tries to influence choices in a way that will make the choosers better off, *as judged by themselves*” (T&S, p. 5, italics in original). Who 'themselves' exactly are is illuminated in the next sentence: they are theoretical selves who “had paid full attention and possessed complete information, unlimited cognitive abilities, and complete self control” (T&S, p. 6). Such theoretical 'selves' might be understood as people who have a good idea about better and worse conceptions of the good life. The libertarian aspect of Thaler and Sunstein's doctrine “lies in the straightforward insistence that, in general, people should be free to do what they like” (T&S, p. 5). Within the liberal spectrum, their position could thus be summarised as favouring free choice over substantive equality, and accepting some conceptions of the good life as better than others. This is reflected in their emphasis on the ability to opting out of a nudge: if you are sure you want something different than the option nudged towards, it must be possible to make this alternative choice.

4.1.2 Liberalism in practice

So much for the theory. How does this theory match up with the practice of nudging, as described by Thaler and Sunstein? Recall the example of the cafetaria. Thaler and Sunstein argue that it is acceptable, and indeed advisable, to organise the food so that people tend to pick the healthy options, because most people would like to live according to a healthy lifestyle. Here, the authors implicitly assume a healthy lifestyle to be more contributing to the good life than a gluttonous one, backing up this position by statistical data on preferences. The interests of the glutton are assumed to be protected by not blocking any choices: the cupcakes are still available, just not at the start of the line any more.

Something interesting happens here. While Thaler and Sunstein suggest nudging should be done in the best direction judged by hypothetical perfect people, they settle simply with the majority vote. Most perfectionist

liberals would object to this position, because there is no guarantee the majority values the 'right' good life. More importantly, their doctrine would be hardly paternalistic if it were simply based on preferences of the majority – 'libertarian populism' might be a better term. Another explanation is that Thaler and Sunstein mention the statistical data on preferences in order to reassure the reader they are not proposing anything out of the ordinary: 'See, we're just saying what everyone really wants, but fails to achieve!'. A good 'pater' would always let their subjects know their suggestions are for the subjects' own good. The examples in *Nudge* appear to be relatively harmless: we all want people to be healthy and would like the planet to survive. But these issues are not always as easy as they seem: how much economic growth are we willing to give up for some uncertain reduction in the risks of catastrophic climate change, so which way should we nudge if a choice context is to be designed between a fast but polluting aeroplane and a slow but cleaner train? Like in other situations, there is no way to design this choice context without promoting one choice, and therefore, one conception of the good life, over another. How to make choices on this matter when there is no straight-forward answer?

Admittedly, not *all* nudges are inevitable; advertisement campaigns for example can be avoided. In such situations, Thaler and Sunstein suggest we should wonder whether nudging is likely to help, which is the case for "decisions that are difficult, complex, and infrequent, and when they have poor feedback and few opportunities for learning" (T&S, p. 247). If so, nudging is acceptable, and if not, we should refrain from nudging beyond the bare minimum. As became clear in chapter 1, climate change mitigation decisions check all these boxes, so we should indeed nudge more than the minimum. But even if we would settle for minimal nudging, it is impossible to refrain from making decisions on what would be the right choice, so some value judgement has to be made.

The importance of this point becomes clear when we take a closer look at choice contexts. Thaler and Sunstein note that every choice involves a choice context, but the choice contexts they consider are relatively small and simple: the layout of a cafetaria, the arrangement of pension plans. In chapter 3, it became clear that both specific technologies (like electrical appliances and aeroplanes) and the societal structure at large (like infrastructure and a 'travel culture') can be understood as choice contexts or elements thereof as well. This significantly expands the area in which we should be looking for the influence of nudges, and does more justice to the complexity of the problem at hand: how to mitigate climate change.

4.1.3 Implicit and explicit conceptions of the good life

In chapter 2, we learned from Borgmann that our societal structure, based on modernism and liberalism, has a very specific character: individuals are encouraged to consume any commodity they like, while the production of these commodities is kept out of sight as much as possible, thereby inhibiting more engaging activities. The societal structure is thus clearly geared towards consumption, without serious deliberation about the consequences of this consumption – after all, these effects are hidden. Any attempt to counterbalance this tendency towards consumption with small scale nudges towards preservation and consuming less is therefore faced with an enormous opposition. The gouvernment might encourage cycling with a public advertisement campaign, but if the situation on the road is unsafe because it is geared towards automobiles only, people will not consider cycling as a viable option. So next to the imperative to use knowledge for the best, we notice that

taking the societal structure into consideration is essential if we are to nudge people into climate change mitigating behaviour.

But this is no simple task. If the interests of the glutton were protected by still offering cupcakes in the cafetaria, it is not always possible to offer such flexibility when it comes to the societal structure. Consider, for example, the layout of cities. Public transport is most feasible in dense city centres: many people living close to each other make for short distances and high passenger densities. Suburban sprawl, on the other hand, makes automobiles as good as necessary to get around. The dominant mode of transportation is therefore already pre-formed in city planning: if a city council decides to develop a public transport friendly residential district, it will be impossible to create single family houses with large gardens for all. And even if choice is preserved, like in the case of the glutton who is still able to buy the cupcakes, people are made aware of the societal disapproval of their behaviour: by putting healthy food up front, the cafetaria management is sending the message that they (or the majority of their customers) value a healthy lifestyle over a gluttonous one. By spending money on a bus lane in a city centre, rather than more car lanes, the local gouvernment shows they value public transport more than they do private transportation.

This goes against the core principle of liberalism: if there is no such thing as a neutral environment in which choices can be made, how can someone be the 'author of their own life'? No matter the theoretical merits of this liberalist idea, it is impossible to remain neutral and leave questions regarding the good life truly open to the individual - either implicitly or explicitly, these choices have to be made by society, or perhaps by the sum of all individuals.

Albert Borgmann argues that if these matters are not addressed explicitly, an answer will take shape implicitly instead. He describes liberalism as a principle intended to promote “human development in its richest diversity” (Mill as cited in TCCL, p. 86), and for this diversity to flourish, it is necessary to allow people to develop in different directions, hence the neutrality of the governing rules of liberalism. But in practice, the hope that the openness of ends in politics results in a society of people living good lives appears to be in vain. Filling the gap that politics left open, technology developed into promoting a specific conception of the good life: consumerism. Rather than promoting human development in its richest diversity, it promoted the production of commodities in their 'richest diversity', but all ultimately promoting the shallow life of unengaged consumption. But because this happened implicitly, there has not been any deliberation about it: no evaluation of the grounding principles or the effects of this conception of the good life in society. Instead, the technological environment appears to be neutral at first sight, as we can choose any commodity we like.

This makes Borgmann problematise liberalism: by not addressing the question of the good life in public debate, it was implicitly addressed in the development of technology, ultimately leading to the device paradigm. While we are formally free to be the 'author of our lives', technology greatly influences the options we have and perceive in life. It suggests the best way by far to get anything is through convenient devices, and it becomes increasingly difficult to choose otherwise: although no-one is forced to take the highway to take in some scenery, a valley split in two by this highway does not allow for solitary hiking anymore.

Now it could of course be that this implicit answer happens to be exactly the right one. If consumerism indeed

leads to good lives without any negative consequences like environmental degradation, no-one would complain it was not organised deliberately. But consumerism is certainly not without negative consequences, and as argued above, it is unlikely it leads to very good lives. More fundamentally, Borgmann's analysis of the failure of liberalism emphasises the danger of an implicit development of the type of good life promoted by a society. By uncritically accepting the promise of technology (or any other means to the end of a good life, like religious dogmas, for example) for the interpretation of the good life, any form of discussion about this matter is regarded off-limits in the political discourse – technological development (or the church) will figure it out. This makes it impossible to discuss any grounding principles or effects of the doctrine in practice. Even without taking the history of liberalism into consideration, such blind faith on an important issue like the good life seems less than prudent.

Perfectionist liberalism could be understood as an attempt to introduce some guidance regarding better and worse conceptions of the good life in order to steer people in the right direction, but according to Borgmann, perfectionist liberalism in practice does not actually answer any question concerning the good life: it merely steers people in ways that leave open as many options as possible. It might push people towards education rather than playing videogames, because education allows them to pursue more satisfying careers than playing videogames does. Although commendable, this refinement of liberalism does not mend the fundamental flaw of letting technology fill in the dominant conception of the good life: people could very well end up getting themselves educated to work very hard on a job they dislike, only to be able to consume as many commidities as possible.

Perfectionist liberalism could be understood as grounded on a 'thin' description of the good life: it accepts that there are better and worse conceptions, and protects people from doing stupid things like unnecessarily reducing ones options, but leaves choices on what is of most importance to the individual. This kind of description is contrasted with 'thick' descriptions of the good life: descriptions that actually appeal to what is important, rather than leaving this open for everyone to figure out individually, or for technology to fill this in implicitly.

Albert Borgmann warns us for the effects of letting the question of the good life be answered implicitly, and offers an explicit, thick, conception of the good life instead. He very clearly announces that his conception of the good life is one of engagement with the world, and liberalism has lead to a society in which this is all but impossible to achieve. But Borgmann's critique of liberalism does not logically lead to his own conception of the good life. While he offers compelling arguments that the engaged life is indeed a good one (for example with anecdotes about 'centering' experiences like running into a mountain lion), he does not offer any kind of conclusive argument that this is the *only* kind of good life imaginable. Where Thaler and Sunstein assumed that a good life is simply what everyone really wants if they think deeply enough, Borgmann appears to confuse his (well-founded) conception of the good life with the only one possible. So ultimately, Borgmann shows the need for a strong conception of the good life, but does not offer a final answer to fulfill this need.

I take Borgmann's account as a first attempt to engage in a discourse on the good life, as a starting point for further deliberation. By drawing up a position, its problems and merits can be discussed, possibly leading to a more refined position. Borgmann's emphasis on physical engagement by cutting wood for example can be

problematised by pointing out the liberating effects of a less demanding supply of energy, like natural gas. If this liberation is used to focus more on focal activities than on mindless consumption, it would actually contribute to the quality of life.

If we are to accept that we need a conception of the good life to know which is the right way to nudge, and that there is no simple answer on what is a good life, we have no other option than to engage in a debate about the good life. For a debate and the legitimacy of its conclusions, it is important to get different voices heard. This way, it might be possible to find some common ground on which the perceived plurality of values is based, or at least find a direction in which to go which can be agreed upon by most or all groups. In the next section, we will explore how such a debate can take shape.

4.2 Discourse on the good life

How does discourse on the good life unfold? It is perhaps useful to look into other situations in which modern society has embraced a thick debate on the good life over the liberalist utopia of leaving it open for everyone to make these choices themselves. A good example is the debate around bioethics, as described by Adam Briggle (2009). After the introduction of this example, I will explore how applicable this model could be regarding energy consumption, and whether nudges can aid the debate, rather than just be the outcome of it.

4.2.1 A thick debate on bioethics

An example of discourse on the good life, in this case on bioethics, is described by Adam Briggle (2009). Briggle describes the methods of the US President's Council on Bioethics, as compared to its predecessors. This Council, formed by the Bush administration and chaired by Leon Kass, was to advice the President on the governance of biotechnology, "undertake fundamental inquiry into the human and moral significance" of developments in biotechnology, and "provide a forum for a national discussion of bioethics" (Briggle, 2009, p. 36). Where the predecessors of this Council came up with some simple guidelines to preserve a 'thin' moral basis for the conduction of research, the Council came up with a much 'thicker' approach. 'Traditional' commissions would come up with boundaries within which research was allowed to take place, but the Council reflected on much deeper problems concerning the results of such research in society at large. For example regarding the problem of regulating or prohibiting bio enhancers in sports, the Council explored why sportsmanship is admired in the first place.

What makes sports persons admirable is not so much throwing a spear a few meters further, but the dedication and excellence needed to achieve this. Bio enhancers might result in a lot of broken records, but also in the irrelevance of those records. The centre of sport events would shift from 'admirable persons' to the competition between enhancement labs. Arguably, this would reduce the Olympics to a trade show of the enhancement business. This is an entirily different argument and conclusion than would result from a 'thinner' approach to enhancers, which could for example result in the suggestion that enhancers should only be used if they are safe, and do not create an unfair advantage. This approach would not get to the core of what might be wrong with

enhancers in sports, and would thus not result in truly 'informed' policy choices.

The main achievement of such a commission would not be to come up with easily implementable laws and regulations, but to make 'fundamental inquiries', and inform public debate. As Briggle notes, “by listening in on the substantive conversation of the Council, one will get a better sense of what truly is desirable by becoming aware of the consequences of all the different lines of conduct open to him” (Briggle, 2009, p. 49). This is valuable both to policy makers and to anyone interested in figuring out how to live their lives.

4.2.2 A council on energy consumption

A council similar to the one on bioethics could be imagined to develop a substantial discussion on the ethics of energy consumption and other climate change inducing activities. A 'council on energy consumption' would explore the reasons why people might understand their (energy consuming) activities as worthwile, and inform the discussion on whether these reasons might be misconceived. By inviting a thick debate about this matter, the implicit focus on consumption in society is made explicit and being problematised. If the result of this deliberation is that we believe much of our energy consumption does not lead to anything valuable, this will increase the societal acceptance of a shift in nudges away from such consumption and towards mitigation of climate change.

In order to explore the possible arguments that might emerge in a 'fundamental inquiry' of energy consumption, I will once more return to the example of air travel. What makes people choose air travel? Depending on ones perspective, there are many answers to this question possible. If enhancers in sports are simply to improve the performance of the athlete, people might choose air travel in order to go on holiday or a business trip, to visit friends or family, or possibly for something critical, like a special medical treatment or to seek refuge from war. It would be unhelpful to group all these reasons together, so I would like to concentrate on tourism in this small case study.

So what makes tourists choose air travel? We have already found some reasons for the popularity of air travel: it is convenient, and relatively cheap because of the lack of fuel taxes. But this convenience and low price do not result in a smaller amount of effort, time, and money spent on the 'transit' part of the holiday, typically a more distant destination is chosen. If the Dutch go on holiday by car, France is the most popular destination, leading to roughly a day spent travelling. If they choose to fly, they might choose Turkey or Egypt instead. The much shorter actual flight time of 3-5 hours is mitigated by the transfer to the airport, the endless lines for check-in, security, and customs, and the transfer to the holiday destination, leading to again roughly a day spent in transit. We might thus conclude that for a typical holiday, the gain in convenience and cost in air travel is traded in for something of greater value: a more exotic destination.

What draws people to more distant destinations? One important reason could be the weather: in Turkey, there is a better chance of sunshine than in France or the Netherlands. If people see their holidays as ideally dreaming away on the beach with nothing on their minds, the choice for air travel would be the result of simply finding out which affordable destination has the highest chances of good weather. In this case, Borgmann's critique of

hypermodernism would be applicable. If people twenty years ago settled for France or the Dutch province of Zeeland and now feel their holidays will be better in Turkey, they are merely chasing the perfectly controllable environment. There is no ending to this quest, and no satisfaction of the desire for the perfect holiday. It is therefore doubtful whether the ability to travel further increases the perceived quality of a holiday: with the absolute increase in good weather, the relative standard of expectation goes up as well. In addition to this, it is worth pointing out that the idea of the holiday as a moment to relax and recover from a year of hard work is a manifestation of the device paradigm – would it be possible to organise work so it does not burn one out, even at the expense of not being able to afford a holiday?

Another reason might be the pursuit of adventure. Distant locations have attracted travellers since time immemorial, for reasons varying from the thrill of not knowing where one ends up at the end of the day, to getting to know ones own culture by contrasting it with another. People embracing these ideas would stay away from sterile resorts, and instead immerse themselves in Asian cities, the Amazon rain forest, and desolate mountainous regions. If one holds the exploration of the world adds to a good life, today's charted and explored world makes flying to the last bits of uncharted terrain necessary to enjoy this. But if one takes a closer look at the practice of most of these 'backpackers', their activities are better described as 'pseudo-exploration'; visiting scenic towns highlighted in the Lonely Planet travel guides, meeting and drinking with fellow backpackers and connecting with the locals who learnt to speak English in order to make a living from tourism. If the goal is to enjoy some fresh scenery and meet new people, Ireland (or the Wadden islands for that matter) could very well have as much to offer as New Zealand does.

For the 'true explorer' things might be different, and someone interested in Buddhism could plausibly argue that for them, a trip to a distant Asian monastery would indeed add significantly to their quality of life, but the point here is that it is likely that many people choosing a distant holiday destination do so without actually gaining anything significant. If this is indeed the case, it makes sense to nudge people away from air travel, rather than towards it as now is the case.

This exploration of the value of air travel for tourism is not intended to be conclusive or exhaustive, but merely to see whether an inquiry like this is likely to be fruitful. If done in a more rigorous manner, another outcome is quite possible, which only strengthens my point that it is important to make explicit the values behind our behaviour. Only then, we can make the nudges in our society match our beliefs. And, as Briggle (2009) suggests, an important task of a council on energy consumption is to inform the public: by 'listening in on the council', one is invited to deliberate on ones own behaviour: why did I feel like flying to Texas, anyway?[13]

Similar inquiries could be made regarding other polluting activities: the use of electrical appliances in and around the house, the value of living far away from ones job, the periodic updating of gadgets to the 'lastest and greatest' versions, the consumption of meat, etc.

[13] 'Asking the question is answering it' – Well, to be honest I'm having a hard time defending this trip to myself. Going to a conference is a legitimate and possibly necessary activity in academia, but I cannot say that I could not wait until I have something more significant to share than the paper I will be presenting. Visiting friends is a great additional benefit, but I have friends in the Netherlands I haven't seen since the previous time I was in Denton. But possibly as striking as the experience of my own moral dilemma is the utter acceptance of my choice by my environment: without exception I was encouraged to take this opportunity and stop worrying.

4.2.3 Nudging towards deliberation

So far, I have argued that nudges should be developed reflecting the outcome of some societal debate on what is actually valuable in life. This could be understood as an instrumental view of technology: a society (or politicians, or whoever controls the nudges) is able to deploy technology as a means to the end of promoting the good life (or remaining in power, or whatever other end). But this is not the entire story: next to hard-to-manage issues like semantic variance and the difficulty of predicting the effects of technologies in general, the societal debate cannot be seen seperately from the society filled with nudges.

Consider, for example, the television programmes revolving around air travel. Dutch public television features travel programmes, showing off the most the most exotic locations (and the fact they are within reach), docusoaps about the daily business of airports, and *Hello Goodbye,* a programme celebrating travel by interviewing travellers departing or arriving on Schiphol airport. These programmes could be understood as technological nudges towards air travel: 'flying is fun and interesting, and all these people do it too!' By visibly endorsing a technology like this, our society discourages any deliberation on the issue.

If we would come to the conclusion that indeed, flying is detrimental to the quality of life because it does not result in anything worthwhile, but does pollute significantly, a good analogy could be made with smoking tobacco. In the past few decades, the previously positively appreciated practice of smoking has been largely rejected due to its unhealthy effects. Nudges towards smoking, like advertisements and the glamourisation of smoking by movie stars, have been banned. Replacing flying with smoking in our television show nudges, we might imagine a docusoap about cigarette factories, and something like *Hello Goodbye* where smokers are interviewed about their experience – something distinctly awkward in our current society. We might feel the same about our flight-celebrating culture in a few decades from now: something exoting, of another era.

In the wake of the Icelandic vulcano eruption of 2010 which paralysed air travel in Europe for a few weeks, Alain de Botton (2010) described a future scenario without flying:

> "In a future world without aeroplanes, children would gather at the feet of old men, and hear extraordinary tales of a mythic time when vast and complicated machines the size of several houses used to take to the skies and fly high over the Himalayas and the Tasman Sea. The wise elders would explain that inside the aircraft, passengers, who had only paid the price of a few books for the privilege, would impatiently and ungratefully shut their window blinds to the views, would sit in silence next to strangers while watching films about love and friendship – and would complain that the food in miniature plastic beakers before them was not quite as tasty as the sort they could prepare in their own kitchens."

Botton proceeds in describing how travellers returned to doing things slowly, because ultimately, the time and effort of the journey leads to the transformations we seek in travelling (a claim ahead of the public deliberation I am arguing for). Airports will be turned into museums of a time gone past, where "one would be able to walk unhurriedly across the main runways and even give in to the temptation to sit cross-legged on their centrelines, a gesture with some of the same sublime thrill as touching a disconnected high-voltage electricity cable" (Botton, 2010). A foretaste of this experience can already be had in Berlin, where the Tempelhof airport has been turned into a city park recently. The runways are now inhabited by cyclists, inline skaters, joggers, and

cross-country skiers. Such experiences (or the thought of them, like when reading an article by De Botton) invite contemplation and deliberation about the qualities of flying.

A nudge like the public advertisement suggested in section 3.3.4, visualising the amount of fuel a trip costs, could draw more attention to the dirty side of air travel and open up the discussion about its value, possibly leading to more public support for structural nudges away from air travel. Not all nudges are deliberation inducing: in order to effectively ignite deliberation and discussion, a nudge has to appeal to ones consciousness by offering more information about the effects of ones actions. In other words, the experiential gap must be closed, rather than bypassed by making local and global interests coincide.

This seems to go against Thaler and Sunstein's goal of nudge as a tool to make the right decision when not paying full attention: we are asked to pay more attention, rather than less. But nudging to ask for deliberation regarding one issue goes hand in hand with building in fool-proof nudges later or elsewhere, because the deliberation inducing nudges result in a better idea of the right direction in which to nudge later on.

A welcome feature of deliberation inducing nudges, as opposed to 'unconscious behaviour steering nudges', is that their function is not to work in the dark, but to pose questions. Therefore, there is a much smaller chance of damage due to possible incompetence of nudgers: semantic variance might lead people to think about different problems than intended, but people will not be nudged into unwanted behaviour, or be insulted by inscribed values, except perhaps if they are so certain about their values that they find it insulting they are questioned at all. This makes deliberation inducing nudges less controversial to implement than other nudges.

4.2.4 A feedback loop

One might thus imagine a situation in which current greenhouse gas emitting practices are problematised: why are we doing this? What do they offer us, and which unwanted side-effects do these activities have? Such a discussion is inevitably influenced by the technologies that surround us – these have nudged us towards the current practices in the first place, and technologies can induce or inhibit deliberation about their effects. If some sort of (temporary) consensus is reached, we can feed the choices made into new technologies, large and small. If we come to the conclusion we should fly less, we might tax jet fuel or airline tickets, make television programmes about enjoying our holidays closer to home, and stop public funding of airports in favour of other modes of transport (in case we still find transport in general important). This new society with different nudges will inevitably result in new practices, most likely with different problems, and possibly still with some of the same problems. This new situation can be fed back into the deliberation loop, making incremental changes towards a better society.

I am not implying that this is an easy, unproblematic route to solve climate change – it requires a lot of effort to instigate public deliberation on a topic, let alone to end up with a consensus. Still, this route allows for moving beyond the deadlock of protection of accumulated affluence which dominates climate treaty negotiations, while it is not based on the optimism of engineers claiming everyone will be a winner if we just start using energy more efficiently. Instead, it is based on the (possibly optimistic) suggestion that lives might be better if we get rid of the addiction to fossil fuels and economic growth.

4.3 Conclusion

We started this journey wondering how insights from philosophy of technology might help in developing more effective climate change mitigation solutions. What kind of insights have I found, and how do they help?

Before constructing anything, one must prepare the ground to build on. So before going into *more* effective solutions, I looked into what could be wrong with the current practice. By making visible the ways technologies influence our behaviour through the work of Albert Borgmann, it became clear that the 'greenhouse gas emitting society' is no logical outcome of the quest for the good life, but rather a somewhat accidental outcome of letting technology fill in the way in which our lives are led. The concept of the device paradigm provided a powerful heuristic to understand the way in which 'pursuing a good life' was reduced to 'consuming commodities' in this society. From this was concluded that the conception of technology as a neutral tool in current climate change mitigation solutions is misguided – climate change is intrinsically tied to technologies exploiting fossil fuels, technologically induced wants like intercontinental holidays, and the structure of society that took shape under influence of these technologies.

Once this became clear, new ways to approach the problem opened up. If we know how devices create an 'experiential gap', effectively hiding the detrimental effects of one's actions, we can think of ways to bridge this gap and make it more likely people reflect on their effects in the world. Also, knowledge of the ways in which technologies induce certain behaviour leads to suggestions how to induce a different kind of behaviour.

These insights marked the start of a more 'positive' answer to the main question. Via the *Nudge* approach, which was revised and expanded, I offered suggestions on how to 'nudge' people towards different, more sustainable behaviour. Because people are implicitly 'nudged' on all levels between specific artefacts and the way society is organised, it is essential to take all these levels into consideration when hoping to considerably change people's behaviour for the better.

But this point led to the realisation that what is 'better' is rather difficult to find out. Especially in the case of things like infrastructure, which do not offer an easy way out and have significant implications for the ways people are able to live their lives, nudges should be designed carefully. This is no argument against nudging in general, as nudges are inevitable, but rather a plea to take it very seriously. Because defining 'better' is impossible without articulating some conception of the good life, I argued that a proper discussion on where we would like this society to move towards is inevitable.

Finally, I suggested that such deliberation could take shape in a similar manner as the discussion on bioethics does, appealing to substantive accounts on what we find valuable. The question we should ask ourselves when looking for solutions to climate change is not how to make our activities less polluting, but why we partake in these activities anyway. Only when we have figured this out, we can design our technological environment in a way that does justice to our values, and nudges in the right direction. If done properly, we have much more to gain than just a safe climate.

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