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# Energy, Logistics and Everyday Life

*Fossil Fuel Infrastructures, Energy Transition and  
Social Practices in and around Port of Rotterdam*

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## **Abstract**

The Port of Rotterdam is the core of fossil fuel industries in Europe and, therefore, an essential place and infrastructure to reconfigure if we are to mitigate climate change and achieve a proper energy transition. However, the Port is more than a logistics hub and a global supply chain, it is the next-door neighbor to the Island of Vorne-Putten, an area with a population of around 160000 people. This ethnographic research project investigates the relationship between the everyday life(worlds) of the citizens of Vorne-Putten (with a focus on the villages of Brielle and Pernis), in relation to the industrial actors and infrastructures an around the Port. The project uses theories from critical infrastructure anthropology and political ecology as it argues that the industrial actors in the Port are actively trying to create a separation between the fossil-fueled worlds of the industry, and the “greened” environment of the citizens on Vorne-Putten. Furthermore, through the lens of ethnographic participant observation and semi-structured interviews—the research illustrates some of the often invisible power ingrained in infrastructure space. The research describes different actors in the field site: local politicians, citizens, farmers, workers, and a manager from the Port. By analyzing and discussing these encounters and experiences, it tries to anchor energy struggles in local, materialized, and embodied experiences. From this focal point, the research carves out a potential for change and the creation of new energy imaginaries.

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# Contents

Abstract	2
<b>Introduction</b>	<b>6</b>
Background	6
Energy transition at the Port of Rotterdam	7
Research Questions	7
Methods	8
Chapter Overview	12
<b>1: The Village and the Refinery</b>	<b>14</b>
Arriving in Pernis	14
Oil tactics	18
Contested Knowledge	19
From Pernis to Shell	23
Memory of Another Refinery	25
Building a Wall — Separating Worlds	26
Hausknost and The Environmental State	28
Energy Transition or Accumulation?	31
Domestication and Infrastructuralization	33
Beyond Local Struggles	36
Chapter Conclusion	37
<b>2: The Farmer and the Port</b>	<b>38</b>
Cycling Through Fields	38
The roads and infrastructure history	39
Technology and the Farm	40
Automation at The Farm and the Port	44
Memory of the ECT terminal	45
The Windmill and the Oil Past	49
Pipelines and Path Dependencies	53
Local as Counter to Logistical Fossil Fueled Worlds	55
Environmental rumors	55
Chapter Conclusion	59
<b>3: A transition - The Modern Way</b>	<b>60</b>
World Port Center	60
The Transition Plans	63
Chapter Conclusion	68
<b>4: The Home and The Factory</b>	<b>70</b>
Gasless Nights	70
The Quality Inspector	72
The Factory	74
The Office and the Factory	77
The Power of Energy Objects	81
Thesis Conclusion	83
Bibliography	85

# List of illustrations

**Image 1.** Roy, Simon O. 2021. *View from Pernis Metro Station*. Photograph. Rotterdam, Netherlands. Page 14

**Image 2.** Verheul, Johannes J. 1994. *Gezicht op boerderij "De Bonte Koe" aan de Lange Bakkersoordschedijk te Pernis* (View of the farm "De Bonte Koe" on the Lange Bakkersoordschedijk in Pernis). Photopgraph of painting. Collectie J. Verheul. Beeldbank, Stadsarchief Rotterdam. Page 16.

**Image 3.** Roy, Simon O. 2018. *Visitor brochure at the Shell refinery*. Photograph. Fredericia, Denmark. Page 26.

**Image 4.** Roy, Simon O. 2021. *Front yard in Pernis*. Photograph. Rotterdam, Netherlands. Page 34.

**Image 5.** Roy, Simon O. 2021 *View from behind Daan's tractor*. Photograph. Voorne-Putten, Netherlands. Page 41.

**Image 6.** Roy, Simon O. 2021. *The interface of the RTK navigation system in Daan's tractor*. Photograph. Voorne-Putten, Netherlands. Page 43.

**Image 7.** Roy, Simon O. 2021. *Rusty metal storage boxes in front of the garage*. Photograph. Voorne-Putten, Netherlands. Page 58.

**Image 8.** Roy, Simon O. 2021. *Front of WPC and cruise ship reflected in lobby windows*. Photography collage. Rotterdam, Netherlands. Page 62.

**Image 9.** Roy, Simon O. 2021. *Still photo from video recording of Europoort in the morning*. Photopgraph. Europoort, Rotterdam, Netherlands. Page 75.

**Image 10.** Roy, Simon O. 2021. *Separate Worlds: Beachfront at Oostvoornse lake and a horizon of oil storage tanks, cranes and a coal power plant*. Photograph. Oostvoornse Meer, Netherlands. Page 84.

# Introduction

## Background

It's been 2 years since I was roaming the Port of Amsterdam on a bike, looking for semiotic clues in an infrastructure space that communicates in what seemed an alien language. Navigating between lines of storage tanks full of crude oil. Oil that floats inside massive steel tanks and on top of financial markets, as derivative speculators bet on the future price of fossil fuel energy. Through my fieldwork and writing in Amsterdam, I concluded that the infrastructure space is not part of public imaginary and that this exclusion creates an impasse for an energy transition—if the fossil fuel infrastructures are continuously made invisible, then energy questions are continuously depoliticized, giving room for big oil lobbyism, while marginalizing new ideas for sustainable energy futures. As I handed in my work and lingered on my arguments, I started to realize that my fieldwork in Amsterdam lacked a crucial perspective—the social fabric that binds, influences, and is impacted by infrastructure spaces such as industrial ports. Maybe this sociality that is crucial to the functioning of even the most abstract infrastructure spaces opens up a new understanding of obstacles and potentials for energy transition away from fossil fuels?

As I sit in my apartment in Oslo and read about the Port of Rotterdam's proposed energy transition, an anxious feeling lingers in my body. For my bachelor's fieldwork, I travelled to the area called Westpoort to record sounds and take pictures of oil storage tanks and a pipeline that penetrates the space below a nature preserve area called "Geuzenbos". In the midst of my recording process, a police helicopter hovered above me and stayed in place: I panicked and packed up my recording gear. As I cycled away from the spot with my heart racing, I started getting more afraid of doing fieldwork close to fossil fuel infrastructures because of the heightened security measures and the general feeling of being unwelcome. But ports like Amsterdam and Rotterdam are eerie spaces, abstract in their communication and scale, but inviting and fascinating for the same reasons. They are infrastructure puzzles, industrial organisms that grow and spread as their roads, shipping routes and railways reach into the land like veins in a body, sustaining the metabolisms of urban centers. Modern ports prefer to be seen as industrial and technological—but they are also socio-cultural and ecological, interwoven in the fabric of everyday life: ports not only provide goods, they also provide certain imaginaries while limiting others. That is why I decided to go back to the Port for my ethnographic fieldwork.

## Energy transition at the Port of Rotterdam

The Port of Rotterdam is the biggest port and industrial area in Europe. Here, more than a hundred million tons of cargo: liquid and dry bulk (oil, chemicals, coal, iron ore) and containers pass through annually<sup>1</sup>. The site is dominated by fossil fuel companies, refining, processing, and distributing petroleum products through global supply chains. Additionally, semi-automated container terminals ensure the constant movement of goods. There is a great chance, that most of the things you own, have traveled through these Port spaces at some point before you got them<sup>2</sup>. The Port is at once abstract and concrete—abstract because of the scale and the logistical and technical semiotics of the space, concrete because of the material impact of the enormous processes and metabolism that flow through and from its infrastructures. This research project sets out to concretize the Port (a bit), albeit as fragments, through local peoples' experiences and my ethnographic encounters and reflections.

## Research Questions

The relation between the Port and the Villages is at the core of my research as I pursue the following research question: How are dynamics between and inside the Port and Villages impacting the possibilities of energy transition in Rotterdam? How are the discourses and imaginaries of energy transition reflected through the lived experience of citizens on Voorne-Putten? How are fossil fuel actors in the Port and beyond actively separating the worlds of logistics and industry from the worlds of everyday life? What is the effect of this separation when it comes to developing new energy practices and imaginaries?

This project focuses on the experiences of actors in Villages on the island of Voorne-Putten and actors who work in or in relation to the Port of Rotterdam. In the thesis, I attempt to analyze the socio-material dynamics between the spaces of industry, farming, and everyday life. Through my ethnography, I operationalize and reflect on the concepts of world-making and infrastructure (Carse and Lewis 2017; Tsing 2009; Anand 2017) to

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<sup>1</sup> <https://www.portofrotterdam.com/en/pressroom/throughput-figures> (Accessed 16/05/22)

<sup>2</sup> <https://www.statista.com/statistics/1192002/gross-weight-seaborne-goods-european-union-ports-by-country/> (Accessed 16/05/09)

understand the power dynamics and the possibilities of change in and around the fossil-fueled logistical spaces of the Port. In my research, I conclude that the proposed energy transition is far from happening as the Port still relies on fossil fuel processes as one of its material and financial pillars. However, I see potential in new imaginaries and action sprouting from the Villages around the Port.

## **Methods**

The fieldwork for this project consisted of 2 months of ethnographic work and around a small town called Brielle, in the outskirts of Rotterdam (Netherlands) and close to the Port of Rotterdam.

### Infrastructure Ethnography

I was struggling through my first weeks of fieldwork in Brielle, a village on the island of Vorne-Putten in the Netherlands. I had arrived from Oslo, ready to meet with the main interlocutor that I had been in contact with for months before. She worked for a seafarers welfare office where she took care of the workers onboard vessels in the Port. She seemed to be the perfect person to give me access into the otherwise highly securitized logistical spaces of the Port of Rotterdam—but after weeks of canceled meetings and delayed phone calls, I had to start thinking about a plan B. Besides my plans of spending the coming months with her, I had a list of companies that I wanted to contact. I started sending out emails and got rejection after rejection. The Covid-19 pandemic had made the exclusive spaces at the Port even more restricted than before. I spent the first weeks, walking around town—taking with my host to the house where I rented my room. I found myself a bike which I used to transgress into the Port, cycling up to 50 km a day on an old rusty “Opa Fiets” (Old man’s bike). After a few days, I realized, that I was doing fieldwork already. I was collecting stories in the house, and I was doing (participant) observation around the Port: watching truckers, trains, ships, refineries, sports cyclists, pipelines, police helicopters, dunes, cranes, seagulls, and other actors in the cast that co-constitute the infrastructure spaces which stretches from Rotterdam City into the North Sea.

I started looking for new potential interlocutors who could help me understand the dynamics between the Port and its surroundings (and get me more involved in the participation). After a few weeks, I signed up for a “historical hike: A local event that invited people to hike 30 km through Brielle and other villages on Vorne-Putten (a big



island, next to Port of Rotterdam where most of my fieldwork took place). I arrived early in the morning to wander and the hike became my first real “ethnographic experience” during my fieldwork. I paired up with an older man and asked if it was okay for him to do the hike together. He was hesitant, perhaps because he could hear from my Dutch that I wasn't from the Netherlands.

However, he agreed to walk together, and after an hour of hiking, we switched to speaking English (most people in the field spoke fluent English). It turned out that he was a local vice-mayor who had worked in Rotterdam earlier and had studied in the US for a while. The situation immediately taught me the lesson that local interlocutors not necessarily are “local” as in confined to a specific place but often subjects who relate to a whole range of places. I told him about my research interests and we ended up hiking together for 6-7 hours, discussing some of the local citizens' reluctance to change (at the time they were debating the replacement of an old sculpture in town, something which had spurred a counter-demonstration from a group of citizens). I felt a rush of excitement when I arrived home from the experience and I started to write everything down. This was the start of what would become my fieldwork experience in the Netherlands.

My inspiration to follow (Port) infrastructure for my ethnography, came from works such as Nikhil Anand's *Hydraulic City* and Anna Tsing's *The Mushroom at the End of the World*. Both scholars let the object(s) of their study form the movements of their ethnographic fieldwork. For Anand, this means following the water infrastructures around Mumbai, and for Tsing, this means following the mushroom around the globe. But not only their ethnography and fieldwork are formed by the object(s) of study—their writing and thinking are molded and reformed by it too. In the introduction to her influential book, Anna Tsing writes:

*Following a mushroom, this book offers such true stories. Unlike most scholarly books, what follows is a riot of short chapters. I wanted them to be like the flushes of mushrooms that come up after a rain: an over-the-top bounty; a temptation to explore; and always too many. The chapters build an open-ended assemblage, not a logical machine; they gesture to the so-much-more out there. They tangle with and interrupt each other—mimicking the patchiness of the world I am trying to describe. (Tsing 2015)*

The Port of Rotterdam and the villages around it inspired me to pursue a similar type of patchy ethnography, one that would follow both people, cargo, and energy—as an “open-ended assemblage”. As I returned to Norway and started sorting out my data, I felt an

urge to carry on my exploration. The continuously unfolding stories I gathered from the people living around the Port, motivated me to stay open during my writing process as well. Therefore I researched the places I had visited, the people and companies I had been around, to take into account the historical developments of my field site—the past that had formed and accumulated into the moments I spent in Brielle (Voorne-Putten), Pernis, Port and City of Rotterdam. This meant investigating maps, online archives, companies' annual reports, and historical journals.

### Methods and tools

During my fieldwork, participant observation was a core method for gathering data through ethnographic experiences. I brought my notebook everywhere I went and jotted down notes, ideas, and drawings as I traversed the landscapes, villages, and infrastructures around the Port. Key to my participant observation was the tension between moving observation and static observation—how a place or space is perceived differs if you are statically observing, or if you are moving through it, waking, on a bike, in a bus, or on a train. My interest in the Ports metabolism and circulation meant that I would experiment with moving ethnography myself—inspired by the objects and infrastructures I was observing. I also used a camera to take photos and “freeze” the observations for later inspection and analysis. This proved helpful, especially for landscape and infrastructure observations: the more time I spent the more details I would find—understanding logistical worlds is a long process of deciphering and decoding semiotic space.

I participated in the household, cooking, washing, and doing the everyday things that the temporary workers had to do in the time they were “off” work. And I was lucky to join a few in their work practices, getting to harvest in a tractor and inspect monopiles in the Port. I also consider the meetings with politicians and managers as participant-observation, because meetings constitute a large part of their job.

For a lot of my meetings, I used semi-structured interviews. I planned those beforehand and adjusted to the people I would meet. I used this to get the most out of the (sometimes limited) time I had with my interlocutors. However (as I hope my ethnography will reveal) in all meetings I used participant observation as well. The semi-structured framework was always open for change, and often my conversations with interlocutors would organically go in new directions as we got to know each other. I consider this a crucial part of the qualitative nature of ethnographic methods, as this counters the issues with quantitative methods that superimpose a framework onto a

conversation and therefore “locks” the possible diversity of data before the meeting even starts.

My semi-structured interview and participant-observation with the Farmer I recorded on my phone as it was multiple days (and he felt comfortable with it). I later transcribed the recording and used it for my ethnographic writing. For the rest of the meetings, I took notes in a book that was less intruding on the conversation. I would transcribe the notes into coherent form immediately after to remember all the details. I reflect added and rewrote notes at night after returning from field meetings and or participant observations. I also did semi-structured phone interviews with companies and with a few of my interlocutors who had to leave the field (because of their temporary work contracts).

In my post-fieldwork analysis, I researched companies, actors, and archives online. I used “advanced google search tools” to find older articles and news (searching for specific dates and years). In addition, I used an online archive service<sup>3</sup> to retrieve annual reports that were no longer available on contemporary company sites. For my infrastructure observations, I augmented my fieldwork with the use of maps from Google Earth, Google Street View as well as a Dutch website that virtualizes old maps through time<sup>4</sup>. I used discourse analysis and visual analysis to discuss and write about the articles and company reports I found online.

### Limitations

Before and during fieldwork I tried to reflect on my subjective position—especially predetermined ideas about environmentalism, capitalism, and energy. However, my experience in the field was that I found it harder to get in contact with the people I “disagreed” with, because they worked in the highly securitized infrastructure spaces in the Port. I contacted several fossil fuel companies via phone and email only to receive rejections (or no answers at all). However, I still experienced plenty of disagreements throughout my fieldwork, and they were all productive, interesting, and possible the most learning full experiences

A general limitation in the field was the difficulty of accessing the Port. This was partially due to the general high security in these spaces. Unfortunately, during my time in the Netherlands, Covid-19 pandemic measures made it close to impossible to visit

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<sup>3</sup> [web.archive.org](http://web.archive.org) (Accessed 16/05/22)

<sup>4</sup> <https://www.topotijdreis.nl/> (accessed 16/05/22)

industrial sites—the government has imposed a limit on the number of people in spaces and I was of course the prioritized person to gain access to the industry. Another limitation to my fieldwork was my non-native Dutch language abilities. I used my Dutch language to get in contact and initiate conversation but I relied on a “switch” to English to gather elaborate data about my experiences. Lastly, important to note regards my limitations/opportunities during fieldwork are my (intersectional) privileged as a white, cisgender man. Industrial sites like the Port of Rotterdam are still male-dominated, and not a safe space for all people.

### Ethics in the field

Ethics are essential to ethnographic research. It was important to ensure the safety of the people I met as well as my own, as a researcher. I ensured that my interlocutors were confident with the topics and conversations of our meetings. I also ensured to get their permission to gather data from the interviews. All names in this thesis have been anonymized to further enhance the privacy of the people I meet in the field. None of my interlocutors were particularly sensitive subjects and my focus on energy transition did not put them in vulnerable positions. However, the infrastructure development creates contested situations and my different interlocutors have a vested interest in the progress in and around Port of Rotterdam, thus, I chose to anonymize them throughout my work.

Before going into the field, I reflected on the Covid-19 situation, and I decided to go despite the risks of getting sick. I tried to stay safe, and ensure my interlocutors' safety as best as possible during the time we spent together. But, this wasn't always fully achievable (for instance within the household). However, I and none of my interlocutors got sick during the months I spent in the Netherlands.

## **Chapter Overview**

In chapter (1) I discuss the relation between the village called Pernis and the Shell Refinery which is their “neighbor”. Through an interview with a local politician and ethnographic observations, I analyze the dynamics (and separations) between the places, the actors, and the environment. I describe the struggle against a gas exploration project underneath the Village and the power of technical discourse. Lastly, I investigate the plan of a “green wall” around the Shell refinery and link it to Daniel Hausknost's theories on “the glass ceiling of transformation” (2020).

In the following chapter (2), I move to the agricultural fields around Brielle (Voorne-Putten). Here, I encounter a fifth-generation farmer and his wife. Through my discussions

and observations with him and his wife, I describe how the history of the Port is interlinked with their family and farming history. I discuss the (relation between) labor and technology development in the Port and the Farm and link different practices through the progress of GPS systems. Afterward, I argue that the active separation between worlds and the anonymity of logistical space limits the potential for an energy transition in the area. In addition, I describe how fossil fuel path dependencies and oil pipelines obstruct new energy infrastructure development.

In the third chapter (3) I take a trip to the City of Rotterdam. Here I meet with a Port manager in the World Port Center. This chapter revolves around proposed energy transition and planning perspectives. I analyze the spatial politics of the place—while interpreting my discussion with the manager. Hereafter is an elaborate description of Carbon Capture and Storage technology which is a key infrastructure component in the energy plans in Rotterdam. Lastly, I criticize the disconnection between the offices and the Port and use that to reflect on the (im)materiality of the energy transition plans.

In the final chapter (4) I reflect on intimate energy relations in my fieldwork residence. Then I take a drive through the Port to visit a monopile (windmill) factory and describe the complex and messy (human and nonhuman) social practices that go into the production of mega-structures in the Port. Finally, I describe the importance (and potential) of re-materializing politics and how social practices are key to understanding what a real energy transition would require.

# 1: The Village and the Refinery

## Arriving in Pernis

I arrive at the Pernis metro station in Rotterdam. Mid-November, it's a cold day around noon and the station is quiet. The platform is a lifted concrete structure that on one side has a view of Pernis village and to the other side, through a glass and steel wall, overviews the A4 highway and Europe's biggest petroleum refinery and chemical site: Shell Pernis. The sky is covered by heavy grey clouds which blend with the nuances of smoke and steam coming from the industrial smokestacks that break the horizon into tall vertical lines. The metro line cuts through a dense urban landscape but the Pernis station is different, as the view is saturated with petrochemical infrastructure—right at the border of the residential area of the Pernis village. The refinery marks the fossil fuel pinnacle of



**Image 1.** Roy, Simon O. 2021. *View from Pernis Metro Station*. Photograph. Rotterdam, Netherlands

the ARA<sup>5</sup> region's oil infrastructure—a vast industrial area that stretches across borders, under cities, through the waters and deep under the North Sea (Hein 2018). The Pernis refinery, receiving its crude oil from pipelines as well as tankers from all over the world, is

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<sup>5</sup> The ARA region is a multi-port region/infrastructure which consist of the port of Amsterdam, Rotterdam & Antwerp—primarily known as the main petrochemical cluster in Europe.

at the heart of global logistics. The fossil fuel infrastructures are what make the shipping industry go round: next to fueling most of the diesel engines of the vessels (Smil 2013), oil & gas alone represents more than 29% of all global cargo—and if we add coal, the number rises above 40% (Sirimanne 2020)<sup>6</sup>. The site has been operative since the late 40s when it was rebuilt after the Germany destroyed most of the infrastructure during WWII—but crude oil refining has been central to the area since colonial times where in 1902 a plant was constructed to process oil from the Dutch colonies in Indonesia (Goey 2002). Many of the plants on site today are what actors in the oil industry call “brownfield” refineries, which means that it is an old plant, post peak production, that requires constant maintenance but is kept alive as long as it is profitable. In other words, the industrial facility marks a decaying oil infrastructure, where leak (prevention), accidents and pollution are intricate to its function—24 hours a day, 7 days a week, the refinery only stops in emergency situations or for routine checks.

As I walk down the main road of the village, it strikes me how what I envisioned through studying historical maps of Pernis is true to my feeling of being here—the village has been subsumed by the logistics and petrochemical industries. However, after a few turns, the industrial horizon is gone, and the place looks like any small sized Dutch town. Organized, clean, with symmetrical recreative areas and a mix of terraced houses and heterogeneous detached houses. This paradox is at the heart of my research: how do dirty, fossil fueled, industrial infrastructure spaces actively create lifeworlds that are blind or passive to their destruction? Given the proximity of the refinery, Pernis is intimately co-constituted by a history of fossil-fuel practices. The petroleum-scape is not something “out there” but right here, as it blows toxic fumes through the park, the main street, the gardens, and through the cracks and windows into every house. How are these (historical) processes negotiated by the citizens of Pernis?

Navigating with Google maps on my phone, I take a right turn where the screen tells me to, as I walk towards the new community house called “Bonte Koe” (Playful cow). The house is named after an old farm that was located in the same area of Pernis (fig 1)—a subtle hint to the countryside nostalgia that still permeates the area—in stark contrast to the proximity to industrial infrastructure space that now encircles the village. Despite the village being the neighbor of the biggest industrial port in Europe, socio-cultural references often point towards a different time, when the area was surrounded by fields

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<sup>6</sup> The percentages are calculated from the numbers of the 2018 UNCTAD review of maritime transport (Sirimanne 2020): coal 1263 MT (million tons), oil/gas/chemicals: 3194 MT, cargo total 11005 MT.

and agriculture and fishing was central to everyday life (Nienhuis 2008). This dynamic, or sometimes tension, between a nostalgic agricultural past and a modern, technological (industrialized) present and or future, is something that I continuously encounter in the area.



**Image 2.** Verheul, Johannes J. 1994. *Gezicht op boerderij "De Bonte Koe" aan de Lange Bakkersoordschedijk te Pernis* (View of the farm "De Bonte Koe " on the Lange Bakkersoordschedijk in Pernis). Photograph. Collectie J. Verheul. Beeldbank, Stadsarchief Rotterdam (copyright free).

I walk through a parking lot and cross a small bridge over one of the canals, and then I enter the “Bonte Koe” which stands at the edge of the Pernisserpark—a green recreative area for leisure activities as well as a border zone that shields the city from a landscape of logistics terminals in Eemhaven. The community house is quiet. Two older ladies are playing billiard in the otherwise empty room, as I take a seat to wait for Koen to arrive. The ambiance is somewhere between a café and a library, the seating arrangements invite you to sit, but not to stay for too long.



I found Koen, a local politician in Pernis, through an article he recently wrote, criticizing the NAM's (Nederlandse Aardolie Maatschappij)<sup>7</sup> plans to drill and open a gas field underneath the village of Pernis. In the article, published for the Dutch newspaper "AD" (Algemeen Dagblad), Koen describes his fears of something similar to the Beirut explosion in 2020 will happen in Pernis if NAM decides to extract gas from the field located underground of the village<sup>8</sup>. His argument is that the close proximity of the Shell Pernis refinery combined with high risks of earthquakes from gas drilling makes it a perilous process that should be stopped. NAM is well known in the Netherlands, especially for their gas fracking history in Groningen which raised public anger and critique due to the local earthquakes' damage to houses. However, working closely with the Dutch State as a partner that benefits from the extraction through sales and taxes<sup>9</sup>, public resistance has not always been enough to stop dangerous extraction plans (Voort et al. 2015).

Koen brings down two cups of coffee for us after a bit of smalltalk with one of the people working in the community house. We sit down at the table and I can tell from his slight hesitance that he is not used to having people reaching out about his local policy work like this. However, as we start talking about Pernis and his work he quickly opens up. After telling him about my research focus and interest in energy transition at the port of Rotterdam, I ask him about his relation to Shell and his ideas on the proposed energy transition at the port. His response surprises me as he immediately starts talking about how Shell is building a hydrogen plan in the Maasvlakte area. In optimistic words he explains how they are expanding their facilities to both hydrogen and biofuels and how they can use hydrogen internally in their processes<sup>10</sup>. Meanwhile, I feel an internal dissonance as I compare his words to the critical article he wrote—why is he trying to sell me these ideas? As I lift my coffee cup, I sense from Koen's look that he is searching for

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<sup>7</sup> Dutch Petroleum Company, the name is misleading as it is owned 50/50 by Shell and ExxonMobile.

<sup>8</sup> Logistics and offshoring's (like flag of convenience policies) influence on the explosions at the port of Beirut in 2020 has been succinctly described by scholar Laleh Khalili here: <https://www.theguardian.com/commentisfree/2020/aug/08/beirut-explosion-lawless-world-international-shipping-> (Accessed 12/09/22)

<sup>9</sup> The Dutch State earns money through NAM's partnership with EBN which is a national gas company fully owned by the state.

<sup>10</sup> Hydrogen is used to lower sulfur content in diesel fuel. Sulfur dioxide is regulated in fuels because of its negative environmental (and health related) effects: when combined with water and air it creates acid rain which can severely damage ecosystems. [www.epa.gov/acidrain/what-acid-rain](http://www.epa.gov/acidrain/what-acid-rain) Accessed 26/03/22

that common denominator in our conversation, as if he is trying to analyze what I stand for, before saying too much. Before I get to ask another question, Koen turns the conversation around, as he states: "The old installations at the refinery are the most polluting—therefore, the newer facilities are less bad for the immediate environment. Shell does two things to avoid complaints from the local communities [such as Pernis and Brielle]: they use filters in the smokestacks and they build the chimneys at the refinery extremely tall (more than 200 meters). This means that the pollution hits some 150 kilometers away." The irony of the statement causes him to laugh and I join—"so it just hits someone else further away, who might not be able to make the connection between the pollution and a specific industrial actor?" Koen nods and takes a sip of coffee.

## **Oil tactics**

It seems that the tall chimney is a way for Shell to distort the causal relations between polluter and pollution. By leaving it up for the wind to pick a place for their pollution to arrive they naturalize (and neutralize) the pollution by removing the ability for people to point out the polluter. Oil companies are master's of deception and doubt, also on a grand scale. Research have shown how they tried (and some still do) to distort causal relations between their action and consequences. Like denying or creating doubt about the relation between fossil fuel use and global warming. A few years ago, professors Geoffrey Supran and Naomi Oreskes took on ExxonMobil, the American multinational oil and gas conglomerate, and revealed how they had (internally) known about global warming's relation to fossil fuels since the 1970s but instead of changing their practices and sharing the knowledge, they chose for the opposite, creating doubt or oppositional narratives—contrary to what their internal scientists had argued—while expanding their business operations. In their impactful paper from 2017, Supran and Oreskes show how (historically) 80% of the internal documents in the company confirmed anthropogenic climate change—while only 12% of their public documents did. Instead, over 80% of the public documents were written to create doubt about the causal relation between fossil fuel use and climate change (Supran and Oreskes 2017). Recently, journalists and scholars have indicated a shift in fossil fuel corporations strategies. Continuous work on Exxon by Greenpeace's investigate journalism platform "unearthed" who arranged a false meeting with an Exxon manager, have exposed the company's shift in political strategy

from what Supran calls “denialism to delayism”<sup>11</sup>. The “delayism” means to slow down energy transition, through different political strategies that delay the phasing out of fossil fuels (Rajak 2020; Jean Buck 2021). These type of political strategies of denial or delay is also not foreign to Shell, who operated in similar ways to Exxon through the 80s<sup>12</sup>—and still, Shell is being accused for spending more money on advertising green technologies than actually investing in them<sup>13</sup>. As I converse with Koen, these stories lingers in the back of my head.

## Contested Knowledge

It quickly becomes apparent in our conversation how important the Pernis refinery is to the village. As a local politician, working for a party that subscribes to ideas of energy transition and a phase out of fossil fuels, Koen act as a mediator between local citizens and heavy industry, between everyday life and global extraction and production infrastructures. It’s a complicated position to be in, because as a mediator, Koen needs to translate and act between different worlds, navigating industrial terminology into relatable narratives for the local citizens to understand, discuss and act upon. Koen’s job is to bring information from the communication advisor (and sometimes board members) at the refinery and present it for a local group of politicians and for the public in Pernis. He meets up with people from Shell 1-2 times a month, so the communication is a continuously and intense process. The frequency of these meetings indicates that a lot is at stake, and the relation with the village is something that is constantly negotiated by both industrial actors, local politicians and the citizens they represent.

As we talk, I wonder how much of this negotiation is covert, how much of it happens through tactics of what critical architect Keller Easterling refers to as the difference between “declared intent” and “underlying disposition”. Her argument is that declared intentions often have a different, sometimes even opposite underlying disposition to what is stated (Easterling 2014). For example, if an oil company like Shell decides to over-communicate, or focus on specific topics, in order to steer away attention

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<sup>11</sup> <https://unearthed.greenpeace.org/2021/06/30/exxon-climate-change-undercover/> (Accessed 13/05/22).

<sup>12</sup> <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2018/sep/19/shell-and-exxons-secret-1980s-climate-change-warnings> (13/05/22)

<sup>13</sup> <https://www.theguardian.com/commentisfree/2019/jun/26/shell-not-green-saviour-death-machine-greenwash-oil-gas> (Accessed 13/05/22)

from something else<sup>14</sup>. Koen tells me that Shell works with local schools (in Pernis and other villages close by) with a focus on “looking towards the future”. These lessons work as a form of persuasion, or an early recruitment strategy. Here, the company will teach the kids about its advanced technologies (and the significance of and need for oil companies) in order to convince the 12-to-14 year olds to pursue a “technical” education when they turn 16. This is a strategy for Shell to ensure the reproduction of local labor, recruiting future plant managers, technicians and welders at an early age for their refineries and upcoming bio-fuel plants. The children are also invited to visit Shell’s “Children’s Council” where they learn about the company, technology, sustainability and the future. The council is for (even younger) children— between the age of 6-to-8<sup>15</sup>.

Shell’s recruitment also indicates a general issue that industrial actors at the port are facing: a serious labour shortage across all domains of work, an aging workforce at the port, and a lack of local labour supply (which is a nationwide issue of not enough “technically” educated students)<sup>16</sup>. This means that the companies are somewhat desperate to hire people—and at a good salary. This is one thing that Koen mentions: Shell has (historically) been an attractive workplace because of the salary, they pay well compared to the educational level they require—when things were less automated, and less precarious—dependent on contracted workers (a few decades ago), the plant employed on third of the citizens at Pernis. However, my argument is still that the recruitment of workers at such a young age not only ensures a supply of labour for Shell, but is just as much a political act of (con)forming energy imaginations in a classroom setting and in this way ensuring the support for a business-as-usual and fossil-fueled future.

Koen tells me that they do this a few times a year: “they let kids play with hydrogen cars and give small gifts to them”<sup>17</sup>. It seems strange to me, that a multinational oil and

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<sup>14</sup> Like investments in green advertisement (instead of infrastructures) as a way to delay public resistance to fossil fuel practices.

<sup>15</sup> <https://www.shell.nl/over-ons/shell-pernis-refinery/news-archive-pernis/archief/berichten-2021/kinderraad-shell-pernis-weer-enthousiast-van-start.html>

<sup>16</sup> Information on national labour market in 2020 in the Netherlands: “Most unfilled vacancies are for technical occupations” [https://ec.europa.eu/eures/public/living-and-working/labour-market-information/labour-market-information-netherlands\\_en](https://ec.europa.eu/eures/public/living-and-working/labour-market-information/labour-market-information-netherlands_en)

<sup>17</sup> Fossil fuel companies have been pushing “blue hydrogen” which is hydrogen produced from natural gas (mainly because it would entail a continuation of fossil fuel-based infrastructures). The promise is that the technology, combined with carbon capture and storage would be zero emission, but the process has proven to be high on green house gas emissions (including methane) and more costly than “green hydrogen” which is hydrogen produced from electrolysis of water using renewable energy. For a direct analysis and critique of blue hydrogen see: <https://onlinelibrary-wiley-com.ezproxy.uio.no/doi/pdfdirect/10.1002/ese3.956> (accessed 12/04/22)

gas company gets to “educate” children in public schools on the future of energy and transportation. However, this indicates one of many ways that Shell try to shape the public’s attitude long towards the company in this area, long-term. Koen is against these sponsored “educational” events, but at the same time not too worried about them—I wonder if he has become accustomed to the interlaced dynamics between corporate and public actors, so I choose to ask further questions about the relation between Shell and Pernis.

About the relation between the village and the refinery, Koen states that Pernis and Shell are “neighbors, but they are not friends”. He explains that Shell has as neighborhood council which meets with people from around the region once a year. The council is set out to enhance the communication between citizens and the company. “Shell is open, but you won’t hear about everything they do”, Koen argues—this type of selected openness brings me back to the idea of declared intent and underlying disposition. If Shell invites neighbors of the plant for annual talks, and pretends to be transparent about their workings at the port, that might serve as a way to avoid resistance to their practices—if people think they know, and that they feel heard, then they might hesitate to complain about pollution, or even an expansion of new facilities. However, as I don’t have access to these meetings, I won’t be able to analyze or comment on these practices.

Koen says, in a comment on Shell and Pernis, that: “Enemies don’t talk, friends only talk, but neighbors think, talk and feel together”. For Koen, the communication he has with Shell is crucial for the future of Pernis—he sees it as a duty to the community, but also as his way of participating in climate change policies, in other words, something larger than the local measures in the village. In many ways, he is the mediator who helps make Shell and Pernis neighbors, not only by proximity but via the communicative exchange that he as a local politician facilitates. However, this is just one part of the neighbor relation, the other parts involve continuous production of oil products, which the gas-heated village depend on for multiple metabolic services (like logistics and auto-mobility). Another exchange is the toxic fumes that blow from the chimneys—fumes that are an intrinsic part of flaring which is the burning of excess gasses in the refining process. Koen’s work is crucial to the mobilization of actors in the village and to the ongoing relations between Shell and the citizens of Pernis.

Communication with both Shell and NAM, however, proves to be a hard task. There are certain tropes that Koen continuously uses to describe his struggles in negotiating with

the companies. The tropes effectively describe the difficulty of engaging different worlds. He describes how an issue with the people at NAM (and the organization in general) is that: “they don’t live in Pernis, so they don’t have a feeling with the place. They go about with their technical terms but that doesn’t compare with what people feel like in a place”. In this way, it is easier for them to make decisions regarding their gas explorations, and at the same time downplay the risks connected to such operations. Furthermore, the technical language they use makes it hard for him to discuss anything with them—it is as if they speak two different languages. Koen’s argument about not having a “feeling” with a place is strong and I can tell that this is at the heart of his endeavors in Pernis: trying to make NAM (and Shell) understand Pernis as a place of feelings, of people and livelihoods, and not just a business case or code on a technical map of oil and gas reservoirs<sup>18</sup>.

However, this is also where he struggles the most, because the industrial actors thrive in their technicality. Logistical discourses purposefully avoid ideas of place as socio-cultural and ecological. Instead, they reduce places to calculative, operative spaces that can be infrastructuralized for the purpose of business expansion (in this case, increased energy production) (Wilson et al. 2017; Chua et al 2018). By dwelling in the technical, the companies actively erase potential obstacles in their decision-making—like citizens resisting gas drilling underneath their historical village, or ecosystems collapsing under pressure from extraction and pollution. It is not necessarily that they do not know how to use other discourses that may embrace the complexity of the places they operate—it is because they do not want to do so. The “logistical fantasy of seamless interoperability” (Rossiter 2016, 27) is what keeps the machinery running and the infrastructure expanding. Industrial actors like NAM cultivate the idea of technical discourses as apolitical exactly to achieve their political means for fossil-fuel expansion—they are not stuck in a technical world, but masters at moving between worlds, using different strategies and terminologies to persuade actors and eliminate resistance to their extractive endeavors.

To inform and at the same time confuse the local public, NAM delivered door-to-door folders about the gas field to all houses in Pernis. Describing the extraction process and potentials merely in technical terms and calculations—symbolically assuring the citizens that the exploration of a gas field underneath the village would not interfere with *their* world, using language to produce a clear divide between worlds that are (socio-

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<sup>18</sup> Fittingly, the gas field is shown in red but Pernis is not indicated on this oil and gas map from the Dutch Oil and Gas portal: [https://www.nlog.nl/sites/default/files/2022-04/oil\\_and\\_gas\\_jan\\_2022\\_final\\_1.pdf](https://www.nlog.nl/sites/default/files/2022-04/oil_and_gas_jan_2022_final_1.pdf) (Accessed 13/05/22)

materially) inseparable<sup>19</sup>. However, through the communication of a relatable and situated narrative about the extraction plans, in opposition to the technical one from NAM, Koen and other local politicians in Pernis managed to mobilize resistance within the community. Later, through their collective work, they gained the support of a progressive politician at Rotterdam municipality <sup>20</sup> and this led to a court case against NAM (and its fossil fuel co-owners). This means, that for now, the extraction plans and operations remain frozen until the court decision has been made<sup>21</sup>.

## From Pernis to Shell

I imagine how<sup>22</sup>, for his meetings with Shell, Koen drives from his house in Pernis to the technical headquarters of the company located in the “Botlek” area in the Port of Rotterdam<sup>23</sup>. The short drive is an accelerated journey across scale: starting from the narrow streets and old houses in Pernis, then driving towards the outside of the Pernisserpark that shields the city from a view of the logistical terminals in Waalhaven. Here the landscape starts to change as lines of houses are replaced with big grey blocks of logistics hubs that foreground a horizon of container stacks in different salt-water and sun faded shades of blue, brown, red & grey. On the right side of the road is a wall of trees, sowed in a perfectly straight line with same distance between them: a common sight in the Dutch landscape. To the left, across the water, stands the tall container cranes in a similar organized way, moving slowly and quietly through most hours a day. As the drive continues out of Pernis and onto the ring road, the last bit of residential ambience

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<sup>19</sup> My argument here is related to Koen’s comment on “technical versus feeling” – technical or logistical discourses are never just out-there, but always grounded in place and with a socio-material effect. In other words, if NAM decides to describe gas drilling as merely technical, they are actively leaving out “place” or what I translate to socio-cultural (and metabolic) significance for livelihoods and ecosystems in Pernis. In other words, logistical fantasies have socio-material consequences and significance that differ from what they communicate—and oftentimes this difference serves as a strategic choice to achieve certain goals.

<sup>20</sup> The Groen-links (Green-left) minister of energy transition (vice-mayor) of Rotterdam, Arno Bonte, supported the resistance in Pernis to the gas drilling: <https://vlaardingen.groenlinks.nl/nieuws/vragen-groenlinks-over-nieuwe-gasboringen-bij-pernis-een-onzalig-plan> (Accessed 04/04/22)

<sup>21</sup> Court case is ongoing and expected to end sometime in 2022.

<sup>22</sup> Having moved through the spaces myself, and revisited the route on google street view post-fieldwork. However, I was not able to make this journey with Koen.

<sup>23</sup> The villages around the port are all accessible by public transport, however if you want to get into the port, you generally need a car (or a good bicycle and willingness to cover vast distances).

disappears as a scenery of interlaced transport infrastructures emerge—railways for freight trains, roads for trucks and cars, hovering above each other and crisscrossing in strange ways. The logistical fantasy that thrives in macro perspectival representations has different, messy, and unpredictable realities on the ground. Under the surface, another layer of infrastructures: pipeline corridors and electric cables that ensures the energy supply to and from the port—some of them connecting the Port of Rotterdam to most of Europe via pipeline systems like the CEPS (Central Europe Pipeline System) and the RRP (Rotterdam Rhine Pipeline)<sup>24</sup>.

Half-ways, at a big intersection, he takes a right turn. The road signs are now predominantly area codes. The port is usually somewhere you go when you know where you are heading, therefore, the industrial areas are indicated with number codes and not necessarily names—this adds to the abstract ambience in the port as it purvey place that is technical and functional rather than socio-cultural, especially when compared to the often historically grounded street names in villages like Pernis. After the right turn, the road continues straight ahead, and after a few more minutes, the port and a line of Shell's oil storage tanks become visible. Massive steel cylinders white and rusty, with different types of roofs: some round, some flat, which indicates which types of petroleum product they store. The oil-tanks are semi-hiding behind massive dykes that are built to protect the surroundings from oil spills. Massive in size, but quietly blending with the grey nuances of asphalt and concrete which dominates the port. After around two kilometers of driving next to the oil tanks, Koen arrives at the entrance to the Shell facilities and the technical headquarters where he meets up with the representatives or the “neighbors” as he call them. The area of the refinery that borders Pernis is only accessible through these official entrances further inside the port—here extensive security facilities are setup to ensure only the right people are allowed enter to the fossil fuel facilities.

However, Koen only visits the administrative building known as “Centraal kantoor (central office) Shell Pernis,” build in post-war modernist style in 1957 and recently declared a protected monument by the municipality in Rotterdam<sup>25</sup>. The 9 story high office building also marks the permanence of (at the time still booming) fossil fuel industry at the Port of Rotterdam as it became the world biggest port just 5 years after the completion of the “Centraal kantoor” in 1962. This was a moment of a different kind of “energy transition”, namely from coal to oil as post-war Europe's thirst for petroleum grew

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<sup>24</sup> For more information about pipeline connections, see <https://www.portofrotterdam.com/en/logistics/connections/intermodal-transportation/pipeline-network> (accessed 06/04/22).

<sup>25</sup> <https://www.monumenten.nl/gemeentes/rotterdam> (Accessed 06/04/22)



exponentially (Boon 2012). Oil actors like Shell where expanding rapidly and the enormous office building at the Port of Rotterdam cemented the anticipation of a politico-infrastructure power which would only increase in the decades to come (Hein 2018; Mitchell 2013). For Koen, the monumental office, unlike most of the industrial port, is not unfamiliar as he spends much of his time in public offices in his practice as a local politician and his work in the economy department of the Dutch government. The familiarity might indicate a neighbor-relation through similar aesthetics and practices of administration and bureaucracy—but this familiarity could also be used as a way to persuade politicians to believe there is a common-ground from where negotiation takes place. However, through the windows of the central office one can see a contrasting landscape of pipelines, crude oil fumes, enormous gas burners hidden inside steel towers, metal staircases twisting and turning around objects, rectangular roads that lead everywhere and nowhere and omnipresent sounds similar to jet engines—in all, the metabolic, abstract, fossil fueled hinterland of urban life.

## **Memory of Another Refinery**

As I mentioned, I was not able (nor allowed) to join Koen in his meetings with Shell. But In 2018 I had a guided tour at a different Shell Refinery. This was an informal tour as I had gotten to know a manager at the plant who invited me as a “business-partner”. Here I experienced on first hand the perpetual glitch between the ICS (Industrial Control System) which monitors the refinery via computers and sensors, and the actual physical workings of the plant. The manager was in charge of maintaining operation and therefore to request repair of valves and pipes whenever needed. We went for a walk around the plant and it was leaking everywhere, the fumes and the liquids where mixing and spilling all around us as he several times stated “Oh, it’s probably not to healthy to stand here, let’s move on”. With a small digital camera he documented the leaks, which he then reported—the report would activate jobs for contracted workers to come and fix. I saw some of these workers around the plant and the working conditions seemed hazardous to say the least. The plant was also from the 60s like the main refinery in Pernis.



Image 3. Roy, Simon O. 2018. Visitor brochure at the Shell refinery.

Photograph. Fredericia, Denmark.

## Building a Wall – Separating Worlds

Through my ethnographic fieldwork, I want to argue that the spaces and types of environments we move in and engage with, have immense power over imagination and decision-making. Furthermore, architecture and infrastructure have a double historical significance: they tell us something about how the historical past has accumulated into a spatial configuration or moment, which continues to have social impact on the future (hence double as it produces history) (Soja 1989, 129; Harvey 2001; Mitchell 2013; Harvey 2016; Anand 2018)<sup>26</sup>. In other words, specific practices are often linked to specific places

<sup>26</sup> This argument is broad and therefore resonates with different contemporary theory, my work is mainly informed by critical infrastructure studies and the ethnographic work related to political ecology and energy humanities.

—Koen has to drive to Shell to have a meeting, he is not only engaging with the representatives there, but also with the milieu, the spatial disposition which has an impact on practices and imaginaries as he moves through. The abstract scale of the port infrastructures, the separation of spaces (which I call worlds to indicate the socio-material practices that go into creating and maintaining spaces), the office space(s) where Koen meets the Shell actors, the objects that surrounds them in the office when they discuss fossil-fuel futures and financial support for Pernis, the chimney-dense horizon and the endless lines of oil tanks, the fumes and the smell of the refining process and gas flaring, the contrast between Pernisser park and the logistical spaces behind it, all these things (and more) matters to the political processes, negotiations and decisions that take place between the citizens everyday life in the village and the industrial expansions at the Port. As Edward Soja writes in his influential book *Postmodern Geographies* from 1989, which is in discussion with Lefebvre and Foucault's theories on space and sociality and as a comment to earlier Marxian ideas on sociality and material:

*..spatial fragmentation as well as the appearance of spatial coherence and homogeneity are social products and often an integral part of the instrumentality of political power. They do not arise from material spatiality of the mode of production in some simple, deterministic fashion, nor do they reflect back on society, once established, with simplistic determinacy of another kind. But conceptions of representations of space in social thought cannot be understood as projections of modes of thinking hypothetically (or otherwise) independent of socio-material conditions no matter where or when they are found... (1990, 126).*

This point has been elaborated, negotiated and operationalized by many theorists since then, and multiple new trajectories of thinking social and space has evolved. However, here I just want to point at the core of the argument, that spatial (and material) conditions, in various ways, influence practices, thinking and imaginations—hence, it is important to pay close attention to environment across scale, from intimate to urban, local to global when conducting ethnography (Harvey et al. 2019).

Koen asks me if I want another cup of coffee, gesturing towards the machine behind the long desk that goes all the way across the community house. He swiftly moves behind it and retrieves two cups—he states that the coffee is free for him as he sits back down. Meanwhile, the two older ladies are packing up their stuff after their billiard game, talking

about the weather while putting on their jackets and face masks<sup>27</sup>. The community house is situated between the public swimming pool in the Pernisser park (they removed a bit of the forest when building the house). Through the windows I see a classic urban landscape in the Netherlands, consisting of: a canal with grass grown on the sides, neatly planted trees and bushes, a parking lot, a road and a bike path (all made with bricks<sup>28</sup>). What makes Pernis different from other Dutch villages is the logistical landscapes that fill the horizon. After talking about how Pernis used to depend on fishing, agriculture and local manufacturing, Koen turns back to the bio-fuel plant at the Shell facility: “They tore down a wall when they started preparing for the new bio-fuel plant. This means that the noise from the refinery has been worse lately. People have been complaining to DCMR<sup>29</sup>. Building the new factory makes a lot of noise as well.” I ask him about what Shell is doing about this and he continues: “they want to build a new wall around the plant, so they are asking the citizens in Pernis to decide what the wall should look like. The local council [which Koen is part of] will send out a survey to all house-holds, so people can decide if they want a wall with paintings on, a green wall [with plants or grass growing], a row of trees or a fourth thing”. I sense some bitter irony from Koen, but he sticks with the explanation just like he focuses on the practicality in his tasks as a local politician—he seems driven and hands-on when it comes to projects and ideas.

## **Hausknost and The Environmental State**

As I hear about building a new wall around the Shell refineries and asking the citizens of Pernis to participate in decision-making, I start thinking about an article by sociologist Daniel Hausknost on “the glass ceiling of transformation” that I read before traveling to the Netherlands. The arguments in the article intrigued me before going on fieldwork, but it was not before talking with Koen that the theory really started resonating with the field.

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<sup>27</sup> My fieldwork was conducted during the Covid-19 pandemic: facemasks were required in all public buildings (until seated) and during public transport in the Netherlands.

<sup>28</sup> The brick-full urban-scape of the Netherlands is, similar to the fossil fueled Port, another interesting object of study through the lens of political ecology: as the Dutch early on managed to convert the clay sediments of their waterways (the big rivers, Rhine and Maas) into a booming brick-industry which helped to build towns and roads. In other words, managing material-ecological conditions to infrastructuralize and urbanize the landscape. Again, this points to the important link between material conditions and sociality of space. [https://www.pbl.nl/sites/default/files/downloads/pbl-2020-decarbonisation-options-for-the-dutch-ceramic-industry\\_4544.pdf](https://www.pbl.nl/sites/default/files/downloads/pbl-2020-decarbonisation-options-for-the-dutch-ceramic-industry_4544.pdf) (Accessed 12/04/22).

<sup>29</sup> The environmental service organization that monitor and regulate industries in the Rijnmond region <https://www.dcmr.nl/> (accessed 12/04/22)

In the article, Hausknost theorizes the difficulty for states to truly commit to a transformation towards 'system' sustainability. He argues that the environmental state, a concept that include most countries in the Global North, has for decades improved and "greened" the 'lifeworlds' of its citizens: through a selective agenda of regulating industry, zoning practices as well as a general outsourcing of production. The result is that citizens in environmental states are able to "enjoy both, a relatively safe, healthy and clean environment as well as a lifestyle of high consumption, mobility and material abundance that proves to be spectacularly unsustainable." (Hausknost 2020, 17).

In his article, Hausknost shows how environmental states have successfully decoupled the sustainability of 'lifeworld' i.e. the immediate environment of citizens, with the sustainability of the system. The result is a lifeworld, out of touch (sensibly and politically) with its socio-metabolic relation to anthropogenic climate change & biodiversity loss. He uses the concept of a glass ceiling of transformation, because the "greened" (and unsustainable) lifeworld creates an invisible ceiling for the system transformation needed to mitigate climate change and stay within 'planetary boundaries'<sup>30</sup>. The ceiling he describes is a structural barrier for transformation—because the environmental state is part of an "unsustainable reproductive system" that produces "sustainable lifeworlds" from where the issues are not visible. In other words, cause and effect have been decoupled, and this decoupling is what preserve the legitimacy of the environmental state—through ensuring material abundance, individual transport, clean air and safe surroundings for its citizens, while shielding them from the negative outcomes of the socio-metabolism of their lifeworld<sup>31</sup>.

However, Hausknost's focus on the macro-perspective of transformation means that local dynamics and the general agency of citizens negating, demonstrating, imagining and working towards systemic sustainability is missing. And as Thomas Holland Eriksen argues in a praise for combing ethnography with historical, statistical and macro-sociological knowledge : "The macro and the micro, the universal and the particular must be seen as two sides of the same coin...Since human lives are lived in the concrete here and now, not as abstract generalisations, no account of globalisation is

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<sup>30</sup> Hausknost uses the planetary boundaries term from the influential Stockholm Resilience Center paper published in 2009: <https://www.ecologyandsociety.org/vol14/iss2/art32/> (Accessed 13/04/22). The nine boundaries are: Climate change, ocean acidification, stratospheric ozone, global nitrogen (N) and phosphorus (P) cycles, atmospheric aerosol loading, freshwater Use, land use change, biodiversity loss & chemical pollution.

<sup>31</sup> I use the term socio-metabolism to describe both material and energy flows needed to maintain the livelihoods in Pernis and beyond: this include the logistics and energy infrastructures at the Port such as the Shell refinery.

complete unless it is anchored in a local life-world – but understanding local life is also in itself inadequate, since the local reality in itself says little about the system of which it is a part.” (Eriksen 2016). In light of Eriksen’s ethnographic expansions, and my conversation with Koen, I see a different version of Hausknost argument: a more entangled and messy negotiation between lifeworld and system sustainability, playing out in a socio-historical and local context.

When Shell decides to ask the local citizens to participate in constructing a green wall around one of the biggest petrochemical refineries in Europe—they allow them to actively separate their lifeworld from the petrochemical industries that surrounds their village. It seems to me, to be a persuasive tactic from Shell, the illusion of choice—“what kind of green wall do you want, any idea is welcome!” What is of course missing is: do you want the continuous expansion of petrochemical industries right next to your village? Do you want a windmill or a solar park, or a bio-fuel plant? A green wall acts as a semiotic neutralizer, a physical as well as mental border between everyday life and fossil-fuel industry. It is an effective way of ensuring people that the technical world (of oil infrastructure) does not interfere with their world of everyday life (or what Koen would call “place”). In many ways, what is happening in Pernis is a microcosm of what Hausknost describes as global dynamics—outsourcing of production, improvement of lifeworlds in the environmental state at the cost of system sustainability and lifeworlds *elsewhere*.

I will argue, echoing a range of scholars in anthropology and beyond, that discursive (and spatial<sup>32</sup>) separation between worlds that are socio-materially inseparable happens across scale and that using ethnography to understand local contexts like in Pernis is crucial for analyzing the political power of infrastructure in general (Easterling 2014, Anand et al. 2018; Anand 2017). The proposed green wall around the Shell refinery and the house-hold delivered folder by NAM about the gas exploration under Pernis are both examples of how fossil fuel actors try to separate worlds: one is the logistical or technical world (in which they thrive and where business is booming), the other one is the world of everyday life, feelings, emotions, belonging, or “place”. If you can effectively separate these worlds, then it is easier to propose invasive industrial expansion plans like drilling for gas or refining crude oil in the backyard of a village and community.

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<sup>32</sup> For the relation between discursive and spatial I am influenced by the work of Michel De Certeau and his reading of Foucault, thinking the city as discursive space that can be negated or appropriated through citizens movements (as speech acts) (Certeau 1984).

## Energy Transition or Accumulation?

“A lot of people in the city don’t care about local politics” Koen states, explaining that this is where he sees his main purpose in Pernis, to activate young people and make them vote. Through his work in local sports organizations he has a following of young people in the village, he hopes that this generation will take the action that former generations failed at. Koen is feeling rather hopeless about the scandal-ridden political climate in the Netherlands, despite all the issues, VVD<sup>33</sup> keeps getting the most votes and as he says, their conservatism means they “don’t care much about the environment and generally prefer business-as-usual”. For Koen, local politics is an important place for environmental struggles, and the NAM situation just shows how mobilizing communities can prove essential for environmental politics. It is about countering industrial thinking: “get rich in the moment: change, adaption or [climate change] mitigation means postponing the getting-rich part”, this is the type of thinking that we need to counter, and for Koen a bottom-up approach through local politics is crucial. But mobilizing the people to galvanize an energy transition in line with community needs is hard: “The old generations have this sense of common living in Pernis, but individualization is prominent and community feeling is not what it used to be. It is difficult making people interested in things like energy transition, many think in short term [similar to industrial thinking] and focus on the next two years of their life—not the future of the planet”. The community house was built 4 years ago and has been an important part of revitalizing community feeling in Pernis, but there is still a long way to go, Koen argues. His dream is that some of the young people he works with through organizations in the village will eventually start a local Green-left party<sup>34</sup>. Right now there are no representatives for the green party in Pernis, instead the local politics are dominated by two parties, namely the center-left Christian Democratic party called CDA, and the right-wing conservative party called Livable Rotterdam<sup>35</sup>. The conservative party used to be stronger and Koen sees, in line with his own plans, a potential path towards more progressive environmental politics in the village.

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<sup>33</sup> Volkspartij voor Vrijheid en Democratie (People’s Party for Freedom and Democracy) <https://www.vvd.nl/> (Accessed 18/04/22)

<sup>34</sup> Groen-links (insert link!).

<sup>35</sup> “Leefbaar Rotterdam (insert link!)

I ask further about the energy transition in relation to how the city is already encircled by energy and logistics infrastructure—what does the future of Pernis look like? Koen states that the village can't grow more, because of how it has been encircled by industry, 5000 citizens is optimal, then there is space for everyone. Space is always a limiting factor in a country as dense as the Netherlands and therefore never left politically untouched. "The village is cut off by the ring road, the Shell refinery and the logistical terminals, and now NAM wants to drill underneath" I say, "only (I point up towards the sky), is left". Koen laughs: "yes, no airplanes....yet" whereafter he changes to a more serious tone: " I am all for energy transition—I have a hybrid car and solar panels on my roof. But it needs to be done right: the Rotterdam municipality wants to place wind turbines close to Pernis. So, we protested. The reason why was that Rotterdam wanted a 250 meters turbine—this would be visible from the whole town. 150 meters tall would be okay, because it would be hidden behind the Pernisserpark, but not a 250 meters one."

The story is just another indication of the many obstacles for an energy transition, moving away from fossil-fuel based energy means new infrastructures, technologies, objects, constructions, and potential huge windmills in the backyard and horizons of villages that are already drowning in the old ones. In this way, renewable energy infrastructure, like windmills or solar panels, creates new issues and tensions as they interfere with lifeworlds in new ways. Some scholars working on energy infrastructure refers to this as the NIMBY syndrome or phenomenon (Not In My Backyard)—which is when local groups oppose change because of proximity to their houses or communities (Batel 2020). However, the term is not always seen as an obstacle to energy transition. Anthropologist Scott Vandehey argues through his fieldwork on (local resistance to) power cables in Southern California that NIMBYism could potentially serve as a powerful tool for communities to become more self-sufficient in a time of energy scarcity by (re)focusing their protectionism to construction of community gardens, solar panels and rain catchment systems (Vandehey 2013). However, these practices are often symbolic actions compared to the extent of fossil fuel energy that urban lives depend on. There is a long way to go, for the current development to truly become a transition<sup>36</sup>.

So far, the energy transition is something more akin to what professor of anthropology, Gökçe Günel, calls an: "energy accumulation". In her latest work, she criticizes the energy transition narrative, adapted by companies and critical scholars alike,

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<sup>36</sup> The map of Netherland's TES (Total Energy Supply) tell the story, the energy supply relies on a steady foundation of oil, coal and natural gas.



because the energy landscape is still far from transitioning away from fossil-fuels, instead energy is accumulating with renewables as a surplus to a stable base of fossil fuels (Günel 2022). Port of Rotterdam seems to be a prime example of this, while windmills were set up around the port area in the last decade, the throughput of crude oil has been stable around 100 million tons per year since 1970<sup>37</sup>. The question then is, if the energy transition narrative at the Port means a transformation of the fossil fuel industry, or merely encircling and covering the oil landscape with windmills and green-walls—separating the symbolic green landscape of an environmental state with the fossil-fueled that powers it. Or are the growing environmental regulation and public opposition an indication of an actual transition in the years to come?

## **Domestication and Infrastructuralization**

The Netherlands is generally an infrastructuralized country, by this I mean that most space is artificially created with a specific purpose: waterways are for agricultural irrigation, hills are “polders”—man-made barriers to keep the drained water out and create land, parks are neat and scripted for leisure and recreative activity, tiny squares of land are “re-wilding” for biodiversity growth, roads, bike-paths, walk-ways, everything is organized down to small details. After staying in the Netherlands for a few years, this organized nature of the surroundings starts to influence how you think—mobility, imagination, how to get from a to b, but also how, where and in what scale you dream. A near friend of mine, a Dutch fiction writer told me recently: “I can’t write stories that take place in the Netherlands, the stringent arrangement of space makes it impossible to let my imagination run free. When I make up fictional worlds for my stories, I think of them as outside of the Netherlands”. Interestingly, it seems that this type of organizing space, is a popular cultural practice, something which you encounter in villages like Pernis.

On my way to the community house I walked past a neatly manicured front yard. The front yard, just a few square meters in size, was divided by low bushes that create two lines towards the entrance and a square which marked the space in front of the living room window. In the middle, a plant in a white square pot, arranged like a bouquet. The garden, despite its size, communicates a fantasy about order and organization, borders between spaces, separation of worlds. In the living room window was another object in

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<sup>37</sup> Sources for this number are: Boon (2012), Port of Rotterdam Annual Report 2005: <https://www.yumpu.com/en/document/read/33324382/annual-report-2005-port-of-rotterdam>, Port of Rotterdam Annual Report 2020: <https://www.portofrotterdam.com/sites/default/files/2021-06/Annual-report-highlights-Port-of-Rotterdam-2020.pdf>. Accessed 19/04/22

same style as the decorated pot, symbolizing coherence, a style, perhaps a theme? Just like most townhouses in the area, every address has a small space at their front door, which many choose to decorate as a private spot. Often the yard has a theme, or something that indicates *who* lives in the house—a cultural signifier which is intended to communicate in both directions. From the inside, a barrier that reflects, a soothing confirmation that things are the way the person wants it, you look out the window and you see something of *yourself*. From the other side, the front yard is a look into *who* the person wants to portray her or himself as.



**Image 4.** Roy, Simon O. 2021. *Front yard in Pernis*. Photograph. Rotterdam, Netherlands.

For me as an “outsider” to these front yard practices I find it a fascinating microcosm of the Netherlands in general, a country with a historical dependence and obsession with organizing space through drainage and reclamation of land for agricultural use, urban expansion and industrial space<sup>38</sup> (Hoeksema 2007). Through my months of

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<sup>38</sup> Land reclamation is still going on, and one of the most recent places is the Maasvlakte 2 area, at the edge of Port of Rotterdam—which is now a functional industrial space. <https://www.portofrotterdam.com/en/news-and-press-releases/maasvlakte-2-five-years-operation> (Accessed 20/04/22)

fieldwork I continuously wonder how this behavior of “domesticating” space, influence (and is influenced by) politics across scale. Maybe the individuals urge to domesticate space, decorate and arrange everything into something like a semiotic echo-chamber that separate the domestic world from what is going on *out there*. Is the local environment so domesticated that the citizens won’t see the systematic issues right outside their doorway? Or is it merely a deliberate escape from the struggles of everyday life and the pollution outside? The obsession with neatness strikes me as a contrast when it is in so close proximity to dirty industrial spaces at the Port. After a few hours of talking with Koen, I chose to present my thoughts to him.

“The house is sacred for the Dutch. Property and home are important for how Dutch live” Koen states. He experience this in his work in Pernis, especially when trying to mobilize people in situations like the NAM drilling. A lot of houses in the village are old, that makes them vulnerable to any outside impact, like earthquake from a gas drilling. Generally, the citizens don’t care much about what is going on at the Port, but “When the house crumbles [cracks in the wall], then people care. When it smells at the house, then people care. When the noise is at the house, then people care. Then they start complaining”. He tells me that this is one of the reasons why it is so hard to organize people, they only care to the border of their own property. He elaborates as he argues that from his perspective politics is more of less the terrain of 40-50 year olds who react to local issues and short term problems—instead we need to organize for the long term and across borders. But Koen sees a hope in the younger generations: “they look further and broader, and the digital world helps them understand issues beyond their own life”.

My thinking about domestication of space aligns with an interest in how people imagine and dream in different spaces—who gets to imagine an energy transition, where, and in what ways? Are the public invited into imagining energy futures at a grand scale like the Port of Rotterdam, or are they left to adapt individually? If industrial worlds and worlds of everyday life are actively separated, then citizens spatial and political imagination might be reduced to that of the domestic space—creating green bubbles in a world that is moving towards drastic climate change and ecosystem degradation. However, people’s focus on agency and care inside property lines, might be something for politicians like Koen to use for achieving results at a greater scale. Right now, environmental plans in the village includes greening the gardens by asking people to remove tiles and stones and grow more plants in their front yards, plant more trees at the water fronts, expanding the parks where possible and stimulate further regulation of

industrial noise and pollution around Pernis. If the citizens starts to demand a truly sustainable and (long term) livable environment, their political and spatial imagination will be forced to move beyond the borders of the house—implicating places like the Shell refineries. And because of the scale at the port, naturally the local effort has a global impact. These dynamics mark the power struggle of separating worlds and why actors like Shell are interested in maintaining an unproblematic neighbor-relation.

## **Beyond Local Struggles**

Conversely, in recent years, Netherlands has seen a growth in environmental groups and actions. In 2019, the Urgenda Foundation won a historical case against the Dutch government obligating the state to “urgently and significantly reduce emissions in line with its human rights obligations”<sup>39</sup>. The environmental group was the first in Europe to win such a court case—enforcing the states legal duty to mitigate climate change, to ensure a sustainable and livable environment for its citizens. In many ways, the Urgenda climate case tried to use the contradictions that Hausknost carves out in his article on the environmental state, but they tried to turn the glass ceiling into a springboard: if system sustainability is not achieved, then the environmental state loses its legitimacy. However, despite the initial juridical success of the Urgenda case, the environmentalists are still facing draw-backs. What looked like a huge win for sustainable transitions in the Netherlands has turned into a political protraction and since the re-opening of society after covid lock-downs, the Dutch State has continuously failed to meet the required 25% carbon emissions reduction demanded in the legal case<sup>40</sup>. After Urgenda, in 2021, another Dutch environmental group, Milieudefensie (Friends of the Earth Netherlands) led a similar legal case against Shell group, to reduce their net CO<sub>2</sub> emissions by 45% in 2030, and won<sup>41</sup>. The case was later appealed by Shell and the case is now set to continue into the coming years<sup>42</sup>.

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<sup>39</sup> <https://www.urgenda.nl/en/home-en/> (Accessed 20/04/22)

<sup>40</sup> <https://www.nu.nl/klimaat/6193855/jetten-onzeker-of-urgenda-klimaatdoel-komende-jaren-gehaald-wordt.html> (Accessed 20/04/22)

<sup>41</sup> <https://www.rechtspraak.nl/Organisatie-en-contact/Organisatie/Rechtbanken/Rechtbank-Den-Haag/Nieuws/Paginas/Royal-Dutch-Shell-must-reduce-CO2-emissions.aspx> (Accessed 21/04/22)

<sup>42</sup> <https://en.milieudefensie.nl/news/shell-is-appealing-the-climate-case> (Accessed 21/04/22)

Koen's work with mobilizing resistance to the NAM drilling, shows how important local action is when it comes to stopping expansion of fossil fuel infrastructures—the question is then, if these dynamics can change into an environmentalism that goes beyond the domestic borders. The villages around the Port of Rotterdam are interesting ethnographic field sites as Port and everyday life around it are constantly negotiated because of their entangled nature. Industrial actors actively separate worlds: leaving place out of the logistical and technical fantasies, while ensuring that the technical won't interfere with the lifeworlds, or place. They are, in collaboration with government and municipalities, building walls and green zones around the industrial facilities—creating a (physical) rift between everyday life and industries emissions and pollution. However, as the port expands while anthropogenic climate change is changing the (political) environment, the stable neighbor-relation between Pernis and Shell might start to crumble.

## **Chapter Conclusion**

Through my meeting with Koen and his work in Pernis I hope to have shown the complexity of the “neighbor” relation between Port and village. The Port and village needs each other—the oil industry creates highly paid jobs for local people and is in a constant need of technical labour. But at the same time, the Shell refinery and the logistical terminals creates pollution and noise (and carbon emissions)—which might interfere with the lifeworlds of the citizens in Pernis. For the fossil fuel actors at the Port, it is important to separate these worlds—ensuring that the local actors wont resist their extraction and processing. They do this by using a technical discourse about their practices, building physical walls and green zones (in collaboration with the government) and creating logistical spaces that are abstract and hard to understand for the public. They acknowledge that they cannot separate the worlds completely, so they negotiate with local politicians (like Koen), they educate the kids in school to form energy imaginaries for a (fossil fueled) future, and they support local organizations and sports clubs financially. However, the citizens of the village are not passive in this process— they rely (and negotiate) the affordances of fossil fuels to maintain their ways of life, keeps their houses warm (with gas), fuel their cars and the diesel engines of the global supply chain that bring cheap goods to the local store (Smil 2013; Lemanager 2014). The processes between Village and Refinery saturates the landscape—physically and politically, leaving little space for new energy infrastructure and imaginaries to sprout.

## 2: The Farmer and the Port

### Cycling Through Fields

Navigating the areas around the port by foot and on bicycle also means moving through agricultural landscapes. These dominate the Island of Voorne-Putten where both Brielle and Pernis is located. I had for a while been interested in the farming practices around the port, both the industrial ones as well as the local allotment gardens located just outside of the city border. My interest was in thinking with people who relate to the land through the soil, hearing how, if, they imagine energy transition and what they think of the port in general. I had discussed with the local politician in Brielle about windmills and some of the public resistance towards changing the landscape with rotating blades and tall white piles. However, it was a while after arriving in Brielle, one night, searching for interesting interlocutors on the local municipality's website, that I stumbled upon a Dutch farmer named Daan. He was part of a recorded municipal meeting at the Geemente just up the street from where I lived—eagerly, he discussed the regulation on windmills, why Brielle needed to adapt and build new renewable infrastructure and how he could take part in this. I immediately started searching for him and when I found the information I sent off an email. My experience during fieldwork was that people on the “environmental” side were much more interested in talking with me, than any kind of fossil fuel actors who never answered my emails.

A few weeks later, I was on my bike on the way to Daan and Ronja's farm a bit outside of the village of Brielle. It was a drizzly Thursday morning with cold wind coming in from the North Sea. The flat Dutch landscape is ideal for cycling except for the wind that finds no obstacles in its way. With cold hands on the handlebar I steer to the left to enter a muddy driveway. I continue cycling, navigating puddles and stones in the dirt, passing by a barn to the right and a classic Dutch farmhouse to the left before arriving at a big garage. Next to the garage is an enormous pile of sugar beets: resting, in a static moment, a monument of thousand hours of farm work<sup>43</sup>—waiting to be picked up for the next step in processing. The ground is wet, uneven and patched together from different materials: brick, asphalt, gravel, soil, mud. I park my bike as Daan walks out from the garage. He is

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<sup>43</sup> And thousands of liters of diesel fuel.

fixing something on a tractor to get the last things ready before we head into the field. When I contacted Daan, he told me that we could meet up, but that it was harvest time and the meeting had to be in his tractor where 1,5 meters distance was not possible<sup>44</sup>. He furthermore asked for my purpose of the meeting as he didn't like "any commercial stuff". I explained my research purposes and we agreed to meet.

Daan greets me with an elbow and a smile. He is wearing a blue overall suit and a beanie tucked far down over his ears. With a thick dutch accent he tells me to get into the tractor pointing towards the little step at the front door of the vehicle. I jump up the step, acting like this isn't my first time in a tractor. It is muddy inside the simple cabin and already pleasantly warm. Daan asks me to move my backpack a bit so his brake-pedal is free for him to use. The tractor bumps over the ground as we drive into the field. He is starting late today because of the rain, he tells me. He has been waiting patiently for the last hours for the rain to stop and the field to dry a bit. He cannot harvest when the ground is too wet because the soil gets clumped and this interrupts the rotary motions of the draper header on the tractor. He takes a right turn down across the field and explains to me that we are going to harvest the "winter wheat". The fields around lies bare—this area has already been harvested in the past days. Daan tells me that he spent the last week in the tractor before we met up today.

## **The roads and infrastructure history**

Through the window to the left, I see the "Dammeweg", part of the N57 highway that was build in the early 70s to connect the area with Europoort<sup>45</sup>. Interestingly, Daan, as a fifth-generation farmer on this land, embodies a long history of landscape changes—the environmental change he didn't experience himself, he learned through stories from the former generations that cultivated the land. Daan explains how the government bought the piece of land (by force as it was for the "common good") from his father and uncle in the middle of their fields to construct the highway. The road then effectively divided their land in two pieces of equal size while connecting a growing population of industrial workers in the villages to the rapidly expanding fossil fuel industry at Europoort. In the coming decades the port industries attracted the young men, who used to do hard

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<sup>44</sup> My fieldwork was done during a time of Covid-19 where 1,5 meters distance was recommend in most public spaces. However, Daan said he wouldn't mind doing the meeting in the tractor as long as I was feeling healthy.

<sup>45</sup> The new road is visible on this map from the start of 1970: <https://www.topotijdreis.nl/kaart/1973/@73578,435104,10> Accessed (30/04/22)

manual labor in the fields on Voorne-putten for farmers like Daan's father—with better pay for equal or lighter types of work. Emergent competition, therefore, drained the labour supply of vital young people from the surrounding villages. But, at the same time new and more “efficient” modes of less labour-intensive farming spread—ever-more reliant on the fossil fuels and fertilizers processed and transported through the industrial facilities at the port (Karel 2010).

This interchange and interdependence are symbolic for the fossil fuel expansions in the area—creating new types of path-dependencies as it grows: the industry promotes more roads, more roads means more cars, more cars means higher demand on gas and diesel and the system now works in a loop (Hein 2018). Most of the land, including the majority of Port of Rotterdam used to be agricultural—but with the industrial revolution and the expansion of port infrastructures, roads and new villages started to cut and dissect the squares of arable land and the surrounding polders, changing the landscape with a new infrastructural layer, one that envisioned a different and accelerated circulation of goods and people (Hein and van de Laar 2020).

## **Technology and the Farm**

For Daan, it was never certain that he would be the next generation farming on the same land as his family. In the 90s, after a few years of financial struggle, his father had tried to sell the entire farm and land. Daan was around 10 years old at the time, and his father was unsure if his son wanted to continue as the fifth generation on the land. Grain prices had been low for a while so the idea of selling the land became more and more attractive. The Dutch State wanted to buy the land, but had a limited budget for the purchase—so the farm continued, albeit with half the amount of land. Decades later, Daan and his cousin overtook the land and the two established farms on each side of the N57 highway. His father had told him at a young age that farming was not enough: “you can always do farming, first, you go study”. Daan's Father had experienced multiple crises, like the low grain prices, and new that farming in the Netherlands was no guarantee for a stable and safe life.

Daan listened to this advice so he took a technical education before returning to the farm—something which he is grateful for now. As we take a right turn and drive toward the field of winter wheat he states: “Many of my colleagues they have only seen the farm where they grow up, and nothing else. I've seen a lot. I mean, not in other



countries, but I've seen a lot of companies. And I have a lot of experience in other companies. I use that now for my own company. I can use that experience". As we continue to talk and harvest I feel how my presuppositions are dissolving with every little dig of the harrow into the soil behind us. Groups of seagulls are fighting for a feast of worms and insects as they come to the surface riding on fresh chunks of soil from underneath and around the roots of the winter wheat as we harvest. Their squeaking overpowers the noise of the tractor's diesel engine as we comfortably ride through the field, turning the green landscape brown by chewing the surface of the land with a big mechanical mouth. "When you have a lot of birds, it means that you have good soil—lots of worms and insects! But you don't want them to eat all the worms, we need some for the soil too!" Daan comments.



**Image 5.** Roy, Simon O. 2021. *View from behind Daan's tractor.* Photograph. Voorne-Putten, Netherlands.

He is not steering the tractor as much as he is controlling and observing the GPS system which uses live satellite updates to ensure a precise harvest in the field—lane by lane. The whole site is mapped out and the GPS system helps to make the harvest process more efficient. The precise satellite mapping of the location means that every lane is straight, and right on the edge of the previous one—in this way the harrow, which turns the soil, uses the complete width of its capacity. As we drive, a loud blipping noise interferes our conversation: "It is losing signal. The GPS. Oh, for a short time" Daan

says. “If it fails..well, we are almost dependent on the system. Almost every farm around here uses this system—and when it fails or the signal is lost most people go: oh no, oh no, what [to do] now, what [to do] now. Because, you can drive by yourself [control the tractor] but, you know, people are so used to the system driving for them now. And, you can do other things, you can look around, check email, especially in the evening it is nice, you don’t see anything, but you are always in the right lane. I like to text with my Neph[ew], he is harvesting right on the other side of the road at the same time, we send jokes and funny comments to each other”. I ask him for how long the harvest practice has been like this and he explains that he got the system in his tractor about six years ago. However, the first systems with accurate “RTK<sup>46</sup>” GPS systems have been around for at least 12 years, but at first they were too expensive for him to afford: “production goes up the price goes down” he states.

My experience at the farm continuously brings forward these entanglements between embodied, intergenerational knowledge and modern agriculture technology: Daan’s comments on the amounts of birds relating to the quality of the soil merge with the GPS system blipping, while his mechanical shovels in the back of the tractor are the latest technology in careful treatment of the soil (he doesn’t plow because it ruins the top soil). During one of our harvest sessions he tells me that he paid for a “3D scan” of his fields—a millimeter precise map would then show the quality of the soil: dryness, sandiness, pH, ground water and so on: “I already knew..the field map just confirmed what I already knew. It was what I expected—but I had no numbers. When I grew up my father always told me: The soil makes your success or not—the quality of the soil. And because our family was always here on the farm. We know each square meter of the soil, from generation to generation. So, I could tell them [the people scanning the field] exactly at what lines the soil was different. But I didn’t have the numbers [data and visualization] with it. Now I have, so I can grow the crops in the ways the numbers tell me—I use that.” He explains how the soil, closer to the river contains more clay, he knows by working with the soil by his own hands, from the intergenerational knowledge—but also by the noises of the machines. “When we hit soil with more clay, the machine starts going slower [making a low buzzing sound]”.

Before meeting Daan, I expected to encounter a “traditionalist” approach to farming here at the outskirts of Brielle. Hearing and reading the stories of him being fifth

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<sup>46</sup> Real-time kinematic positioning: a GPS system that works with land sensors and satellites to measure accurate positions. [https://gssc.esa.int/navipedia/index.php/Real\\_Time\\_Kinematics](https://gssc.esa.int/navipedia/index.php/Real_Time_Kinematics) (Accessed 01/05/22)

generation on the land, triggered certain ideas on nostalgic and romantic ways of doing things, a place where the past kept the present at bay. Quite on the contrary, Daan embraces how technological advances in machinery and sensing can help him and make for a better business-case and more efficient farming. The intergenerational knowledge is not gone, instead, it merges and mixes with the technological advancements: anecdotes & rules of thumbs infuse the interpretation of satellite maps, soil scans and automation. Technological advancement, like the RTK GPS system, doesn't replace his embodied relation to soil and crops, or to the equipment itself<sup>47</sup>, and digital sensing doesn't replace the physical and practice-based sensing of the fields. Instead, these are negotiated, cultivated and changed through (intergenerational and historical) practices. In many ways, continuous adaptation to changing socio-technical and material surroundings, seeking the opportunities that come seems to be a common narrative throughout his family's cultivation of this land, something which Daan is proud to be a part of.



**Image 6.** Roy, Simon O. 2021. *The interface of the RTK navigation system in Daan's tractor.*

Photograph. Voorne-Putten, Netherlands.

<sup>47</sup> The “digital” augmentation of his farming practices still consist of physical objects: wires, antennas, cables, chips, motherboards, made from rare earth minerals, copper, silicon and a range of other materials. In the tractor these objects are susceptible to weather change, mud, and they damage and break just like any mechanical equipment needed for the harvest.

## Automation at The Farm and the Port

A few decades before Daan's introduction to the RTK systems, Port of Rotterdam started expanding its logistical container terminals into the North Sea through the construction of "Maasvlakte": a man-made island for the industry (Notteboom et al. 2022). In many ways, Maasvlakte was the materialization of a logistical wet-dream that combines infrastructural expansion with the presumed emptiness of the sea and in this way avoided the resistance of land and communities. The "emptiness" of the sea as a place for global capitalism and the orchestration of hundreds-thousands of container and tanker ships serving the supply chains of the world is carefully depicted by Allan Sekula and Noël Burch in their influential film *The Forgotten Space*. The film shows how the shipping industry is incremental to the functioning of global capitalism but often invisible to public imagination—the active *forgetting* of space serves the interest of industries who exploit the labour (and ecology) across co-constructed supply chains that benefit from, and retains, global (and regional) inequality (Easterling 2014; Tsing 2009). In relation to my argument and in addition to the film I'm also influenced by Jeff Diamanti and Megan Hayes work on "intermodal aesthetics" which uses the container as a focal point to carve out the forgotten (oceanic) ecological perspectives in Sekula's work—adding ecological exploitation (marine bio-systems, noise pollution, salinization in port areas) to the film's focus on labour and capital. As they call out the political ecology of the ocean as a missing aspect of Sekula's film: "...the very ecology that lubricates intermodal mobility and absorbs its hidden costs"<sup>48</sup>. The expansion of the Rotterdam terminals into the "empty space" of the North Sea included a leap in the technological complexity for container terminals. In 1988 ECT and SeaLand (Maersk) sign a 25-year contract for a "first in the world" automated container concept. Five years later, in 1993, the new automated terminal is completed, dominated by AGVs (Automated Guided Vehicles) and ASCs (Automated Stacking Cranes)<sup>49</sup> a vast landscape of steel and concrete, millions of tons of goods in constant movement. "Automated" is, however, more a catchphrase than the reality of the space—the STS (ship-to-shore) cranes that offload the vessels needs operators. This involves intense labour, where the operator sits in a cockpit and has to focus through a little window in the floor for hours on end (Ham 2012). Truckers await on the other side of the

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<sup>48</sup> Without the water/oceanic ecosystems there would be no material foundation for the shipping industry <https://leviathan-cycle.com/essays/intermodal-aesthetics-the-dissolve-of-leviathan/> (Accessed 02/05/09)

<sup>49</sup> <https://www.ect.nl/en/about-us/over-50-years-milestones> (Accessed 02/09/22)

terminal, ready to bring the containers onto the road, and the post-industrial sound of “automated” is interrupted by the diesel engines<sup>50</sup> that drive the AGVs.

## Memory of the ECT terminal

In 2018 I co-planned a field trip with a former supervisor to the terminals at the Port of Rotterdam. Compared to the agricultural land around Brielle, this area (terminal) of the Port feels like pure abstraction: The scale, the sounds, the ambiance of the AGVs and ASCs constantly moving containers around. The piles of containers, that are awaiting for the next step in their intermodal transport are organized by algorithms and computing power in what is called a “chaotic storage”—this means that the system place the containers where there is space, and not in an “ordered” way (to the human mind). So, if something breaks down, or disappears, the port workers are dependent on the software system to help them. The architecture of the place is determined by automation, it is not space for the human body to navigate. Signs around the terminal tells the truckers to stay inside their trucks—to ensure a steady flow of containers no “external” objects to the system can move around in the area. As a spectator to the logistical dance of machines and containers the active (and enforced) separation between worlds has a strong affective impact: I had to resist my curiosity to enter the landscape to explore the nooks and corners of this architecture scripted for AGVs and not for me.

On the ECT website, a promotional video from ECT<sup>51</sup> called “50 Years prominent in the port” shows how a logistical imaginary discursively detaches itself from the socio-material and ecological conditions of space. The video starts with dramatic music dominated by ambient (midi) strings and percussive elements panning from left to right. A text rolls over the screen: “The container changed the World, ECT changed the World of the Container”. Meanwhile, the picture makes a quick zoom in from the globe to Port of Rotterdam—a classic visual trope that indicates how the company is a “global player”. The dramatic music builds up as the video cuts from satellite imagery to 3D maps, moving from an analogue world to a software world. The new image shows the port of Rotterdam as a flat

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<sup>50</sup> Soon to be replaced with “hybrid” diesel/electric AGVs <https://www.porttechnology.org/news/vdl-automated-vehicles-to-supply-77-agvs-to-hutchison-ports-ect-rotterdam/> (accessed 05/09/22).

<sup>51</sup> [https://www.youtube.com/watch?v=tC2VZkghZUw&t=79s&ab\\_channel=ECTRotterdam](https://www.youtube.com/watch?v=tC2VZkghZUw&t=79s&ab_channel=ECTRotterdam) (Accessed 03/05/22)

beige surface—empty: the ideal (and imagined) place for a logistics company to start building an automated landscape. A text pops up on the screen: “The First Container Terminal in Rotterdam” while a slider on the right side indicates the year 1967. On the bottom of the video there is a display of the amount of containers (TEU’s <sup>52</sup>) at the terminal. As the TEU indicator starts rising and the time scale changes, 3D cranes and containers are multiplying across the landscape. The fantasy of logistical software coming to life is evident—the containers and cranes are multiplying exponentially in a seemingly empty space, this is the dream of logistics software materializing with no socio-material or ecological resistance. Again, this indicates what Ned Rossiter calls the “fantasy of seamless interoperability” (Rossiter 2016, 27). The video moves from inside the Port of Rotterdam to the Europoort area on Maasvlakte. The timeline indicates the progress between 1984 and 1993 as cranes, containers and cargo ships are copy-pasted into the scene in an accelerating pace. As the video cuts to a macro-perspective of the port area, the multiplying of logistical objects keeps accelerating—hinting at the economies of scale (and compound growth) intrinsic to the development of Ports like Rotterdam (Notteboom et al 2022; Hildyard 2016; Harvey 2001). As the logistical landscape duplicates in the beige world, nothing else changes—the only development or change visible, are the objects relating to ECT’s progress. Their world presented, or the fantasy of logistical expansion, thrives in this type of discourse that makes invisible the socio-material and ecological world<sup>53</sup> while enhancing the smooth functioning of intermodal transport and automated machines. However, and as multiple scholars have argued already, logistical landscapes, like the ECT terminals at the Port of Rotterdam, have a severe socio-material and ecological impact that goes way beyond the borders of their industrial sites (Cowen 2014, Chua et al. 2018, Levinson 2006).

To remain focused on energy transition in relation to logistics technology, I want to return to the cockpit of Daan’s tractor—because, in many ways the surroundings of the Port, co-develop with the industrial changes in the Port. As I argued earlier about Shell, NAM and Pernis, despite the industrial managers wanting to separate technical worlds from socio-material lifeworlds of the villages—these places are always interconnected (or the separation is actively undone), socio-materially entangled through labour, air pollution, metabolic (energy) services, transport infrastructures, ecosystems and more. New

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<sup>52</sup> Twenty-foot equivalent unit (the standard container size used for measuring throughput at ports).

<sup>53</sup> Extraction, fossil fuels, labour, environment, all these categories are erased, made invisible, in these type of promotional videos.

technologies and logistical ways of coordinating space “spill out” in a constant exchange between Port and periphery. From the perspective of Daan’s tractor and its semi-automated harvesting system, the Port still seems strange and abstract—but the logistical technologies that serve the movement of containerized goods might not be that different from the RTK system that facilitate an efficient harvest of winter wheat, sugar beets and potatoes here in the outskirts of Brielle. My ethnographic encounters here, in the villages around the port, makes me question my binary critique of logistical (and fossil fueled) worlds—are there ways of recuperating what is often used as extractive and exploitative technologies to use them for a greater (socio-ecological) good? Do the expansion of logistical technologies like automation override the need for situated and practice-based knowledge?

Through ethnographic fieldwork with pilots training in container ship handling through a scale model, Ashley Carse argues that mechanization of labour in the shipping industry does not erase the need for the pilots “feel”<sup>54</sup>. Instead, the need for feel is different, as it is mediated and executed through mechanized systems. But in reality, the embodied, practice-based knowledge becomes increasingly important as the ships become bigger and more automated (Carse 2020). Carse’s argument resonates with Daan driving his tractor in the field. His embodied knowledge from intergenerational practices of farming is still defining for his engagement with the soil and his long-term plans for his farm. And furthermore, it seems that Daan can make a more efficient (and sustainable) harvest by automating part of the process, while saving time for himself—time he can use to focus on establishing new practices and imaginaries around food and soil relations at their farm. His, and Ronja’s vision of their farm place is to create more sustainable farming while inviting local citizens (and farmers) inside—they want to be transparent with their practices and open to discuss methods, techniques and progress.

During my time at the farm, Daan and Ronja were renovating their old barn (with help from carpenters). The barn was used for cattle until the 50s—hereafter it served as a place for potato storage. Throughout my time with Daan he refers to these plans and how he and Ronja want the people of Vorne-Putten to re-connect with farming practices—“most people have lost touch with this, food doesn’t grow in the supermarket. People sometimes say, we can live without farmers..I think they would have a problem very quickly!”. Daan’s comments on farming practices and relating to the crops, implicate or moves toward an entirely different world than the logistical discourses at the port—it is

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<sup>54</sup> Carse defines “feel” as “a learned attentiveness to dynamic environmental, technical, and social phenomena and the embodied knowledge of how to respond to dynamic conditions” (3)

about situating people in a socio-ecological context, materializing the local and create a better sense of place and belonging.

To a great degree, Daan is a local man. His heritage at the farm is a strong driver for his decisions. As we drive through his fields, it is easy to forget how close we are to the Port. The polders that surround the fields are there to keep water out, but they also create a border for one's gaze—limiting how far you can see and in this way creating a boundary around this agricultural land. I imagine the effect this has, when it comes to relating to the Port area. As I ask him about the relation to the Port Daan is quick to admit that he is not too aware of what is going on, for him, the Port is “out there,” it's on the other side of the water<sup>55</sup>. Moving towards the Brielse Meer I point to the right to a set of chimneys behind the trees and ask “do you know what company that is?” — “Is that Shell Pernis?” Daan answers promptly. “No, I think that is further away” I answer (After having just spend some days there<sup>56</sup>. I take out my phone and start looking on google maps: “It could be Vopak but they have no chimneys”, “Yes they are only tanks” Daan Replies. “So, I think it is Air Products or Lyondell<sup>57</sup>, maybe both” I state. Orienting oneself in and around the Port is confusing, even for the people, like Daan, who live close to it. And despite being the 5th generation on the land, it is interesting how he isn't familiar with the companies close by: in the horizon of where he works everyday<sup>58</sup>. However, the logistical landscape *wants* to be anonymous to citizens, the semiotics of the space is simply not decodable for the average consumer or citizen. Rather, the vast size of the space and the homogenous landscape of chimneys, pipelines and storage tanks, the technical (and

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<sup>55</sup> Between the farm and the Port, there is a lake, Brielse Meer, formerly it was Brielse “Maas” (river), but the river was closed with a dam/polder in 1950, just before the disastrous North Sea flood in 1953. As well as a canal (water way for the inland barges), between Daan's fields and the Port. The damming of Brielse Maas also had an incremental impact on the agricultural possibilities of Daan's family as it made reservoir of fresh water available, close to the farm.

<sup>56</sup> Shell Pernis is in the port area called “Vondelingenplaat” closer to the city of Rotterdam, the name owes its history to the old river formations in the area, before the water ways were infrastructuralized to suit the needs (and reduce flooding) of the Port and urban areas. Closer to Daan's fields is the area called “Botlek” which also refers to old water ways. Botlek and Vondelingsplaat was formed by the fossil fuel industry in the earliest growth era of the Port. The other area close to Daan is Europoort, which history goes back to the 1970s when a big agricultural area was repurposed into logistics terminals and refineries. After Europoort the Port started expanding “into the water” with Maasvlakte I and Maasvlakte II (Hein 2018, Boon 2012).

<sup>57</sup> Lyondell produces different chemical products: mainly for the plastics industry <https://www.lyondellbasell.com/en/botlek-site/> (accessed 04/05/22), Air Products produces a wide spectrum of gasses, from fuels to gasses for the medical industry. They are also a central actor in Port of Rotterdam's hydrogen energy transition plans. <https://www.airproducts.nl/?ga=2.86124319.644151017.1651665506-2019984252.1651665506> (Accessed 04/05/22).

<sup>58</sup> The area of the port close by only stems back 1 to 2 generations.



number-based) identifiers of areas, regions and sites, makes it almost impossible to locate specific companies and to figure out *what* exactly they do. Even when you stand right next to it, it feels like its “out there”.

When thinking about energy transition, the socio-cultural and semiotic separation between the everyday life (and farming practices) around the port, and the grand scale industrial, abstract processes of transporting and transforming containers and bulk cargo into commodified material and movements becomes an issue. I will argue that this separation is a central obstacle to accelerating the energy (and sustainability) transition. Because the port, with its 100 million ton crude oil yearly throughput, its coal fired power plants and the material footprint of the 14 million TEU's<sup>59</sup>, is one of the centers of global carbon emissions and the extractive endeavors that are currently pushing the planet towards severe warming and climate instability<sup>60</sup>—without changing the port, an energy transition cannot happen. In our talk about citizens not knowing about farming, and a general disconnect between the public and the port, Daan exclaims: “What you say is true, because, I thought about citizens who don't know about what I'm doing. But also, I don't know, what exactly the Lyondell is doing! It's the same... we are so close to each other. I would like to know what they are doing.” It makes me wonder what it would take for the industries at the port to work towards transparency with their practices, in the same way that Daan and Ronja are trying to make their farming hyper-visible to the public. But, back in my head lingers the unanswered emails and phone calls from industrial companies at the Port, the rejections and the anxiety connected to traversing the fossil fuel spaces such as the Shell refinery—they are intrinsically uninviting, not supposed to be seen by the greater public, noisy, smelly, imposing health hazards and other dangers.

## **The Windmill and the Oil Past**

After some time, I elaborate to Daan about my research focus on energy transition and how I wanted to meet up with him because of his proposal to setup windmills on his land. It seemed to me, that he already felt some resistance to the project—something which

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<sup>59</sup> These numbers are accessible both on the website and in the annual report <https://www.portofrotterdam.com/en/logistics/cargo/containers> (Accessed 04/05/22)

<sup>60</sup> The connection between fossil fuels and global warming goes without saying, but for more on the relation between fossil fuel infrastructures and their reserves in connection to staying below 2 degrees warming, see the latest IPCC report (Technical summary draft P. 90): [https://report.ipcc.ch/ar6wg3/pdf/IPCC\\_AR6\\_WGIII\\_FinalDraft\\_FullReport.pdf](https://report.ipcc.ch/ar6wg3/pdf/IPCC_AR6_WGIII_FinalDraft_FullReport.pdf) (Accessed 04/05/22).

another local politician had mentioned earlier during my fieldwork. How any kind of change can be difficult in a local context like Vorne-Putten, with limited amount of space and citizens who tend to be conservative about their immediate surroundings. To my surprise, Daan's ideas of energy transition and windmills date further back than I expected. In 1996, Daan's father proposed a plan to the local municipality to set up a 0,8 MW windmill from the Dutch producer "Lagerwey". This was a relatively large windmill for the time (about 70 meters high) so the government told him that it was "too big".

Daan tells me this story while laughing, pointing at a (newer) 150 meter high windmill at the edge of the Port. Ironically, about 10 years later, in 2007, people from the provincial government of South Holland came back to the farm with maps and plans for putting windmills up on their fields. Because they had already tried to put up a windmill they accepted the offer to work with the province and hoped that this would make it easier than last time when Daan's father proposed the idea. "A lot of circumstances made my decision to do something next to farming" he states. "Renewable energy is, one of the things, I'm open for it". After getting to know Daan, I realize just how influential his father's words, technical education, and the former generations constant adaptation to the surroundings have been to his opinions and interest in renewables and energy transition. But despite the plans and years of hard work, bureaucratic and political (such as the local municipal meeting where I found out about the farm in the first place), there are still no windmill standing in his field, nor in his nephew's field on the other side of N57. Daan's description of the process indicates just how difficult it has been:

*I told you that my father had a plan 25 years ago, and then nothing. And then the government [province] said, Okay, we have to do something about clean energy and they go searching for locations the windmills...So they came with a map. And they said: okay there will in the future be space for windmills at your ground, at your farm. First I thought.. yeah okay. This is another idea from someone [from the government]. I don't think they are coming that was my first reaction. My nephew, on the other side [of the road] he thought the same. Because they have made many plans already: for an amusement park, over there, there must come a [indoor] ski slope. They wanted to build it, but it was also too big. They have made many other plans. So we thought.. yeah, okay. Just another one. But then the Wethouder [vice mayor] said: No, we have to do something, because of the Paris Climate Accord. We have to do something, so I think..it's realistic, that the windmills are coming here. Then I called my nephew. And I said, we have to talk, because there is something going on. And we could lay back and let it happen. Or we can have an active role and try control it. In a way we are happy with. Because when we lie back—the big the big industry says, okay, we do it so and not another way, and you have nothing to say. So I contacted my neighbor and my nephew. And he said, Okay, I think it's a good idea that we both start to make a plan by ourselves. We contacted an*

engineering company, "Windunie" which is a Dutch company that do windmills planning. And we go to the local government to talk with the Wethouder. What do we want? - If they're coming, we want to do it by yourself. Okay, so we make a plan. And that started in 2018. beginning 2018 we started that process. What I just say about talking, writing a plan again talking, writing a plan. Now we are four years later. And there is nothing, only a plan, just a plan. Because we have to talk with neighbors, and we must participate—neighbors must participate in the plan. And the conditions, the Gemeente [municipality] says: "you have to do this, you have to do that" and now, we want to build. It's "moeizaam" [arduous], the processes is taking long as we are now four years only talking and writing papers [laughs].

*Simon: Do you think there's a lot of resistance to the project? Who would be against this?*

*Daan: Not yet, but people don't know yet, as it haven't been published in the newspapers. So people don't know yet. We are now talking with the government about it, planning the permits. You have to publish the news first, and then people can read it and say if they are against it. But that process is going on, we are now, with the gemeente [municipality] preparing the early permits. And I think, I hope, next summer, we can publish the permits and then we hear from all the people who are against it. Since spring, last year, we started with a natuuronderzoek [environmental permit research] for the birds in the area, if there is some species that are that have protection, that that takes a year to investigate. So we are waiting for the investigation to finish. And then we can publish the permits. And now we have to talk and plan with the Gemeente. How do you talk with your neighbors? And can they participate? It's all, the "little stuff" but It's important. But it's a lot of talking and talking and writing papers.*

Daan's frustration with the bureaucracy of planning is clear in this section, which, considering the timeline of his dad proposing the first windmill in 1996 is justified. It is also clear, that for Daan and his Nephew, taking control of the situation, or having agency in the energy transition is important—as he mentions, the big industry will take control if they are not resisted. It needs to be done in a way that benefits them and their farms. I think Daan's story helps to illustrate the complexity of an energy transition, where even small landscape changes (compared to the scale of the Port of Rotterdam) are intensely negotiated, planned, re-structured and renegotiated. Yet, the bureaucracy is not the only issue Daan is facing with his plans to take part in a renewable future: the fossil fueled past and present is limiting his options as it lingers in the form of oil pipelines underneath his potato fields.

*That's also—I am connected with the industry, this is the center of the pipeline! I have four pipelines in my field. Gas, two oil, and a water pipeline. We have to keep distance between the windmill and the pipelines. Because of failure with the windmill—in case a blade comes off and cuts into the*

*ground. They calculate if the blade can reach the pipeline. I think that is around 200 meters. There is one, one little spot here, where it is possible, and nowhere else. So, that's difficult. That's the other side of the story—we talk and we must do a lot of stuff, but if you look in the field, you see, we have this whole area which was subjected by the government. We have to do, in this area: windmills. And then you go, to look for the obstacles: there, there, there, there, there, there—all over the place. So, in this whole area, it's about 100 hectares, there are only two spots where it is really possible.*

So, the pipelines that penetrate underneath Daan's fields, make the windmill planning process even harder. As he explains, for safety reasons, the windmills needs to be at a certain distance from the pipelines. However, unlike the windmills, the pipelines were not infrastructure decisions of Daan or his father's: In the late 1950s, the government wanted to put a water and a gas pipeline through their field, and they (Daan's family) were forced to cooperate as it was for the "common good" and didn't receive any compensation. Later, in the 60s, the field was the chosen location for the RRP<sup>61</sup> (Rotterdam-Rhine Pipeline) after protests from the citizens of a nearby area who did not want the pipeline through their village. 10 years later, they added the RAPL<sup>62</sup> (Rotterdam-Antwerp Pipeline) —the logic was that they already had pipelines in their field, and, yet again no compensation was paid. As Daan argues: "That is a great pity, because some serious money flows through the oil pipelines. And the field is "locked" in that area, we are not allowed to build anything on top of them". However, he is acutely aware of the power of the oil actors (and the government) because of the size, both materially and financially: "..we are dealing with very large companies, and think we can't fight them. We accepted it, wether it isn't really fair".

The idea of constructing new pipelines next to the old ones, shows how infrastructural layers sometimes works to normalize energy politics—step by step, the fossil fuel infrastructures becomes a dominant spatial (and energetic) power in the landscape. In relation, it is not arbitrary that the pipeline constructions was paralleled by the development of the N57 road-system which divided their land in two—the expanded flow of oil worked in line with a new mobility regime, promoting cars, individual transport and logistics development. Carola Hein calls these developments for "path-dependencies": this is the political power ingrained in fossil fuel infrastructure—production and consumption of petroleum products in spatial and representational loops.

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<sup>61</sup> Originally a crude oil pipeline, later expanded and used for mixed petroleum products. Owned by Shell (56%), Ruhr Oel (22%) and BP (22%). <https://www.rrpweb.nl/en/> (Accessed 04/05/22)

<sup>62</sup> Crude oil pipeline. Biggest investors are: Marathon Oil, Petrochina, Axxon Mobil, Saudi Aramco, Total & Chevron. <https://antwerpenpijpleiding.nl/> (Accessed 04/05/22)

In an argument that resonates with my ethnographic experiences at Daan's farm she writes:

*The long life span of petroleum installations and the built environment creates path dependencies, making it particularly difficult for us to overcome oil dependency and promote new energy practices. To bring about new landscapes and imaginaries and to prepare for the redevelopment of former oil infrastructure, oil transportation, office districts, or gas stations, we need to first understand the extent of the spatial and represented petroleumscape and understand how corporate actors and cultural factors drive spatial development (Hein 2018).*

The example of the pipelines in Daan's field shows exactly how these fossil fuel path dependencies—physically and politically—prevent, or restrict the possibilities of new energy regimes to emerge (Wilson et al. 2017; Mitchell 2013; Hein 2018). Furthermore, the difference in the protracted processes around building, planning and permitting the construction of windmills compared to the enforced construction of the pipelines, indicates just how powerful fossil fuel actors have been in incorporating oil infrastructures into the material and political landscape. Being a spatial focal point of competing energy politics<sup>63</sup>, Daan feels stranded:

*One of the reason why citizens are against windmills, is the money or subsidies<sup>64</sup> that goes to the developers. But they don't realize the risk and investments of building them [windmills]. Specifically in my case, I think I have the right to something [subsidies], seen our history and issues with governments and the pipelines in the past. For more than 60 years now, we have to deal with things we didn't ask for and have a great negative influence on our future. So I think it's fair that I can earn something from the windmills. When telling our story to people, I think or hope they're understanding. I hope [this will cause] less resistance in the whole process. We will see in a couple of years.*

## **Pipelines and Path Dependencies**

The pipelines that restrict the renewable opportunities for Daan, are the materialization of another (historical) energy transition in Rotterdam—namely from a focus on coal to

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<sup>63</sup> My use of energy politics is informed by Dominic Boyer's concept of "Energopower" (Boyer 2014; 2019) and Timothy Mitchell's work *Carbon Democracy* which defined a new era for the study of political power through the lens of labour and energy infrastructure(s).

<sup>64</sup> There are different types of subsidies available for the construction of renewable energy infrastructure in the Netherlands but one of the most important is the SDE++ (Stimulerend Duurzame Energieproductie en Klimaattransitie—Stimulation of sustainable energy production and climate transition) which covers a wide range of "CO2 reducing techniques". Daan told me that without the subsidies, the project is not financially feasible (or profitable in the long run). <https://www.rvo.nl/subsidies-financiering/sde> (Accessed 05/09/22).

petroleum, a transition that fueled the expansion of Port in the late 50s onwards as it grew to become the biggest in the world in 1962<sup>65</sup>. After Second World War, unstable economics around the Rotterdam's main function as transit hub for coal to German regions meant that the Rotterdam City council tried to attract new (heavy) industries to the Port. The plan was effective, and because of the rise of oil demand in Europe at the time, many of the companies that arrived came from the oil and petrochemical sector. In the late 1960, the (multinational) oil companies' that now resided in the port, and the council collaborated to expand the port to facilitate the growing size of tanker vessels — this was the time that marked the construction of Europoort, and later Maasvlakte.

Furthermore, the expansion was paralleled with a (at the time risky) investment in extensive pipeline infrastructure to the economically important hinterlands of the Rhine region<sup>66</sup> (Boon 2012; Hein et al. 2020). These decisions proved fruitful (for the time being) and the spatial and political infrastructure of the Port became locked-in on a petroleum future. The petroleum landscape that was built in the 60s onwards not only created a dense fabric of oil infrastructures in the port, but extended its connections in all directions through intermodal logistics: roads, railways, pipelines, waterways, trucks, trains, tankers —all objects that would reinforce the energy politics of oil corporations (Hein 2018).

It is in the encounter and analysis of these infrastructures, and archives that tell a fragmented history of their planning and implementation, that the present struggle towards a real energy transition in and around the Port comes to life. The way the RRP pipeline physically limits Daan's opportunities for tapping into renewable future, shows one of the ways in which the materialization of 1960s energy politics obstructs possibilities of alternative energy futures.

I will argue that, telling these infrastructure stories and the local and specific struggles with supply chains, is important to understand and analyze the fossil fuel futures that are ingrained in almost any landscape but that are accumulated in industrial areas like the Port of Rotterdam. The fossil fuel infrastructures, spatial and political, hinders the possibility for energy transition<sup>67</sup> (Boyer 2016), but to understand these processes at a grand scale, we need to tune into the local, intimate and social negotiations, struggles and imaginaries—because it is impossible to understand the

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<sup>65</sup> A position which stood until early 2000s (based on cargo throughput): historical statistics on world ports throughput is available on [www.aapa-ports.org](http://www.aapa-ports.org) (accessed 05/09/22)

<sup>66</sup> Among them was the RRP pipeline that goes through the field of Daan's farm.

<sup>67</sup> Without a systemic change, we are left with “energy accumulation” —renewables layered on top of a stable or even growing foundation of fossil fuels (Günel 2022).

systemic issues, if they are not crystalized and assessed through the experiences of everyday life.

## **Local as Counter to Logistical Fossil Fueled Worlds**

Daan and Ronja's focus on teaching the (local) people about their practices to change ideas and around food and farming sets up a different imaginary than the fossil fueled and logistical imagery of the Port. Their plan is to tell a story about their land, the soil, and the practices and struggles that goes into growing food. In this way, they hope to educate and re-materialize the missing links between socio-material practices, ecology and consumption. Daan explains to me that

*In my father's time it was, we produce, we grow our crops here, and you don't have to know what we are doing—that is our business. That is turning around, we are going to turn it around, people want to know what is happening with the food and we go “come on, let's tell it”. Lots of colleagues with the farms around say: “I don't want to do that, I don't want a lot of people around my farm”. It's ok, it is their choice — but we chose to do it.*

The initial statement of “you don't have to know what we are doing—that is our business” echoes the fossil fuel actors at the Port, a statement which is built into the disposition of the industrial space: keeping people out, bordering the securitized industrial sites with walls, fences, and green zones and in this way separating the industrial (systemic) worlds from the lifeworlds that depend on their metabolic services (Hausknost 2020). Daan and Ronja's plan to tell a story about their practices is not going to change systemic sustainability, or the energy transition trajectory, but their strategy of re-materializing and reconnecting people to the soil and the land is compelling and might foster new imaginaries and new practices. Their proximity to the port might sprout renewed attention to the fossil fuel infrastructures that lure in the horizon, pollute the air and penetrate their field.

## **Environmental rumors**

Listening to Daan's (and his family's) story while participating in his work helped to reshape my fieldwork and to connect my observations and ideas with his and Ronja's locally anchored experiences and practices. From an outside perspective, before going into the field, energy transition seemed like a binary struggle—one thing needs to replace

the other, one group of people need to overcome another group of people and so on. However, when immersed in the midst of transition struggles, bureaucracy, various types of local resistance, former infrastructure decisions's power over new developments, messy negotiations and complex imaginaries, the big picture starts blurring. And just like my interlocutors environment and spatial disposition is essential for their imaginaries and decision-making—my own imaginary and analysis changes as I move through socio-material and semiotically dense landscapes: amalgamations of stories, technical discourses, infrastructure, social relations and ecologies twist and turn the theories and concepts I brought with me when I set off to go into the field.

With the stories I hear from Daan, there is a clear distinction between the ones about his own practices—and the ones about the Port or, “the other side” as he calls it. The stories about the farm are grounded and tangible, they are the product of intergenerational knowledge which is maintained through re-telling of stories. In contrast, the stories about the Port and the world “outside the farm” are often more ambiguous. In a conversation about pollution from the Port, he tells me that he doesn't really experience it because of the wind direction “usually comes from north west” and this means the pollution blows in the other direction—towards “Hoek van Holland” a town and residential area on the other side of the Port. But, four years ago, the neighbor farm had an issue with Exxon:

*The wind direction was the other way and pollution, the black air from the from the factory, dropped in the area here next towards that side [pointing] and all the crops have been finished, just shredded. They found some, some "species" in the crops roots from the exhaust, black smoke, like in the crops. Yeah, they found it on some crops and they take no risk. And Exxon paid a lot to the farmers and they destroyed all the crops they harvested and they put them in bio installation [bio-fuel factory], they destroyed and that was the last time something happened with pollution.. but, normally the wind direction is the other way.*

Daan's story leaves open what happens in the residential area called Hoek van Holland when “black air<sup>68</sup>” from the factory travels with the wind in that direction. The area is already known to suffer from coal dust traveling with the wind from the mountains of coal

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<sup>68</sup> The “black air” might have been petroleum coke, also known as “petcoke”, a (dry) product derived from oil refining, used for steel production and for coal power plants. The material can cause respiratory health issues when it pollutes the air: [https://www.atsdr.cdc.gov/HAC/pha/KCBXPetroleumCoke/KCBX\\_Petroleum%20Coke\\_HC\\_508.pdf](https://www.atsdr.cdc.gov/HAC/pha/KCBXPetroleumCoke/KCBX_Petroleum%20Coke_HC_508.pdf) (Accessed 08/05/22)



processed through the “dry bulk” terminals on the Maasvlakte part of the Port<sup>69</sup>. For the fossil fuel companies, rumors and stories like Daan’s, are destructive—especially when cause and effect is directly connects to a corporate company. Their practices are best when unnoticed, in the background, millions of tons of oil and petrochemicals processed and transported through intermodal infrastructures and on a cushion of logistical discourse of seamless (and clean) operability (Rossiter 2016)<sup>70</sup>. In a similar way, Koen’s story about the extra tall chimney at Shell Pernis that ensures the pollution lands *elsewhere*, in a location where cause and effect are distorted, where worlds are effectively separated—this is the ideal situation for the fossil fuel actors as they can continue status quo—business as usual, with no change in resistance or reluctance from the public. But something elemental like a change in wind direction can expose the entangled ecology of industry and everyday life. Rather than separate worlds, these are interwoven socio-material and ecological spaces: sometimes, the pollution and leakages are visible (like coal dust), sometimes they are odorless, unseen, unheard.

The weather is dry and cloudy with a bit of wind, as I grab my backpack and jump of the tractor. Outside the garage is different harvest equipment and some painted metal storage boxes for different materials that Daan needs for the farming. The colors are faded as all of them are covered in with thin layers of rust, it looks like they have been out here for a long time. Daan recognize that I’m looking at the things and goes: “yes.. things rust out here”. I don’t know why. Other people have said it before. Someone thought it was from salt in the air, coming from the ocean. But, I think I’m too far away from the ocean for it to be this bad. I sometimes wonder if it is from the port—maybe ammonia, in the air—something is making these things to rust very fast”.

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<sup>69</sup>Here a meeting from the DCMR (environmental governance in the region) about the issue <https://www.dcmr.nl/sites/default/files/2021-03/Stofhinder%20en%20luchtkwaliteit%20Hoek%20van%20Holland%20powerpoint.pdf> (accessed 08/05/22)

<sup>70</sup> Often these fossil fuel company websites (wether it’s infrastructure or refineries) include a page on “safety and environment” outdoing each other in just how clean and environmentally friendly they are. For example, the website for the Rotterdam Antwerpen Pipeline writes that: “Pipeline transport is a safe, environmentally conscious and sustainable form of transport” <https://antwerpenpijpleiding.nl/safety/> (Accessed 08/05/22).



**Image 7.** Roy, Simon O. 2021. *Rusty metal storage boxes in front of the garage.* Photograph. Voorne-  
Putten, Netherlands.

Daan's words echoes like an environmental rumor, stories that subtly indicate the intimate (ecological) relations between the Port and the villages around. The Port is omnipresent around here. However, it disappears into the background if you are not paying attention to the ways in which it communicates. Low frequency ambient sounds, blips, unrecognizable scents and smells in the air, vertical lines in the horizon, big white storage tanks hiding behind tree lines, the sound of a train from a distance merging with the accumulated white noise of a busy highway, thin layers of rust on metal boxes. Perhaps, Daan and Ronja's invitation for the public to experience the soil and their farming practices will be the first seed in growing an ecological perception and imaginary that is attentive and reactive to entanglements with the fossil fueled logistical worlds clustered on the other side of the water.

## Chapter Conclusion

In this chapter I have shown how the post war expansion of the Port influenced the island of Voorne-Putten through the focal point of the land in and around Daan's farm. The developmental history of the port is not separate from the agricultural history, instead change in labour and technology formed both sites but in different ways. The industrial sites at the Port provided new opportunities for the people doing manual labour in the farms. And, at the same time the fossil fuel developments changed the metabolism of farming, diesel tractors of increasingly bigger size replaced a majority of the manual labour (leading to a reduction in the need for people). Later on, navigation systems like RTK freed up more time for farmers like Daan to focus on other things (like opening the farm to the public). Daan's use of GPS systems is similar to the automated AGV's at the port—creating a virtual data layer which allows computers to navigate the spaces. But, Daan's use of automation merges with practices that are informed by intergenerational knowledge of soil and surroundings. Although there are similarities between the development of Port infrastructure and farming technologies, the spaces are still separate worlds. And despite Daan's (intergenerational) grounding at the outskirts of the Port, he still is (generally) unfamiliar with the companies and infrastructural practices on the other side of the water. The (produced) gap between the two worlds creates an issue when it comes to energy (and sustainability) transition—if the Port continues to remain a anonymous, separate world that continuously disappears through the abstract semiotics of logistical landscapes, then people like Daan and Ronja's imaginary of change will remain within the boundaries of their farm. A boundary which is constantly threatened by the Port's expansion. Lastly, the (infrastructural) entanglement between Port and farm creates an obstacle for energy transition as the oil pipelines restrict the opportunities for Daan to put up a windmill.

### 3: A transition - The Modern Way

#### World Port Center

I arrive in Rotterdam after a bit over one hour of public transport—the village I stay in for my fieldwork is close to the Port but not the City where the port authorities office is located. To get there, I take the local bus which takes me to the end station of the metro line. From here, I travel through several villages/sub-municipalities including Pernis, and hereafter, I finally arrive in the City. On a map, these places look close in proximity, but the scale of the Port distorts the impression of distances—and as soon as you leave the metropolitan area of the City, public transport options become scarce. If you want to visit the Port itself, you need your own car, or access to the (non-public) busses that are in place for workers at the Port. The commute takes me through a range of places, from the enclosed villages on Voorne-Putten to the industrial outskirts of the Port, before I arrive in the neighborhood, and peninsula, called “Kop van Zuid”: an old port area now converted into offices, hotels, restaurants. The peninsula also holds the City’s “cruise terminal” from where international cruise ships arrive and depart (and from where the historical Holland-America line used to take European migrants to the Americas). The area is dominated by post-industrial architecture and arriving there after staying in Brielle is a dizzying experience—steel, glass and concrete high riser buildings arranged on flat streets, so close to the water they feel like enormous ship masts swaying in the wind as I walk towards the “World Port Center” where my meeting is set.

The World Port Center (WPC) is the office building for the Port authorities, a modernist building designed in 2000 by the company of British architect Sir Norman Foster<sup>71</sup>. The high riser building, resembles the accommodation on a ship as it stands on the edge of the pier, with a curved front facing towards the waters of the “Nieuwe Maas”. On top of the building, is what looks like the bridge of the ship—a “panoramic conference center” with a view across the water—indicating the modernist vision or close-to topographic perception of the Port *authority*<sup>72</sup>. I imagine that from here, the managers can have their meetings and feel like captains that steer the Port towards new places.

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<sup>71</sup> <https://www.fosterandpartners.com/projects/world-port-centre/> (Accessed 09/05/22)

<sup>72</sup> The separation between City and Port as well as the sheer size of the industrial area extending into the North Sea, means that the Port is barely visible, even from this position. <https://www.worldportcenter.com/#gallery> (accessed 09/05/22)

The construction of the new offices correlated with years of steady growth at the Port: the late 90s brought by a steady increase in cargo and bulk throughput and a more than a double growth of income<sup>73</sup>. The belief in progress and industrial expansion was strong and as stated in a section of the annual report from 2000: “Need for more space. With the EuroMax Terminal and the chemicals complex of Lyondell/Bayer, the port is almost full. This once again show the urgency of land acquisition.” The Port management was looking to expand with a second Maasvlakte, a process which would end up being delayed by more than a decade by increasingly complex legal restrictions around planning (Gent 2014). Interestingly, the report also marks a time of negotiations around the Kyoto protocol<sup>74</sup> — a time where environmental regulation debates was gaining traction but also when oil lobbyists and industrial actors yet again re-invented their communications tactics to distract or disarm their opponents (Hauser 2022). Similarly, a nonsensical “environment and safety” statement about space and planning, from the Port Management in the 2000 report, sets the scene for a symbolic and rhetorical industrial environmentalism:

*Regarding (re-)structuring plans, a special method makes it possible to put environmental aspects on the table at an early stage and include them in plan formation. Consequently, these environmental aspects are accorded full importance in the weighing up of pros and cons. The result of this method is an integral environmental recommendation for a sustainable (re-)structuring of areas.<sup>75</sup>*

The phrasing seems almost comical, with its self-referring logic, but was nonetheless published as a part of the 2000s plan for the Port of Rotterdam. However, it seems, that through the last decades of climate cases and legal action around fossil fuels and carbon emissions in the Netherlands, environmental plans are forced to become more concrete. Self-referential corporate discourse is no longer enough to feed environmental groups and public citizens hungry for change.

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<sup>73</sup> From 82 million guilders in 1996 to 174 million guilders in 2000.

<sup>74</sup> [https://unfccc.int/kyoto\\_protocol](https://unfccc.int/kyoto_protocol) (Accessed 10/09/22)

<sup>75</sup> “Annual Report.” 2000. Rotterdam, Netherlands: Rotterdam Municipal Port Management. <https://web.archive.org/web/20120602043535/http://www.portofrotterdam.com/en/Port-authority/finance/annual-report/Pages/annual-report-archive.aspx>. (accessed 10/09/22)



**Image 8.** Roy, Simon O. 2021. *Front of WPC and cruise ship reflected in lobby windows.* Photography collage. Rotterdam, Netherlands.

I walk into the lobby of the building that is centered by a big (round) reception. In fact, the curved form that characterizes the front of the building outside is repeated throughout the interior, both as rounded furniture, texture on the walls, and as the logo of the WPC. The strict and sleek interior resonates with the emptiness of the space, two receptionists are answering phones and the café is only occupied by the barista, seemingly waiting for something to do. The lobby has a discreet smell of perfumes, as if a group of people was just here and now their scents linger in the air. The place feels like an entirely different world than my experiences of being in and around the Port—industrial fumes, plastic trash and engine noise is replaced with a clean and quiet environment, neatly scripted to impress visitors with its purifying aesthetics of exclusivity, control and organization. I order a coffee and find a spot where I can wait for my interlocutor to arrive. A group of businessmen walk through the lobby, they are hard to distinguish from each other in their matching suits. Shortly after, Geert arrives, a medium-tall white man dressed in informal business clothing. In his hands are a (closed) laptop and charger, which he puts down in front of him as we start our meeting.

## The Transition Plans

Port of Rotterdam has a “four pillar” plan for an energy transition: the first pillar is about “efficiency and infrastructure”<sup>76</sup>. The plan includes different projects that all are set out to improve or change the core infrastructure already place. One of the projects is called “Porthos” which is a Carbon Capture and Storage (CCS) project. The project is funded with around 100 million Euros from the European Commission<sup>77</sup> as well as 15-year “budget reservation” of 2.1 billion Euros from the Dutch Government’s SDE++ subsidy scheme<sup>78</sup> (the same scheme that Daan is hoping will accept and support his windmill plans in Voorne-Putten). The purpose of the project is to create a centralized pipeline through the Port. A range of (fossil fuel) companies then connect their process facilities to this pipeline, which leads compressed CO<sub>2</sub> into an empty gas field in the North Sea. To capture the CO<sub>2</sub> from the different process facilities, the companies needs to, separately, adapt their industrial plants with carbon capture technology<sup>79</sup>.

Geert explains to me that he sees the CCS development as a “temporary fix”—it is where you get the most value for money when it comes to immediate CO<sub>2</sub> reduction. He is unsure if it is needed in the future, but for now it is essential for the Port to meet its emissions reduction targets. When I ask more into the future of the project he tells me that there is a Dutch saying which goes: “Don’t govern over your grave” he adds, “Don’t tell new generations what to do, but let things in the future happen in the future!”. The statement echoes a specific type of practical “realism” that I’ve encountered throughout my fieldwork—an insistence that actions and statements are stemming from a practical place and has nothing to do with ideologies, belief-systems or the like. However, I will argue that every decision in relation to energy transition, sustainability and infrastructure change is a way to determine the future. At the juncture of energy and climate issues is the possibility of forming the socio-material (and atmospheric) conditions for future livelihoods—there is no present decision which is deprived from having effect in the future. In this way, the insistence on present practicalities becomes a just as much an ideological position as anything else. The argument aligns with my earlier discussion

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<sup>76</sup> <https://www.portofrotterdam.com/en/port-future/energy-transition/efficiency-and-infrastructure> (Accessed 09/05/22)

<sup>77</sup> [https://energy.ec.europa.eu/system/files/2020-10/list\\_of\\_all\\_projects\\_receiving\\_eu\\_support\\_under\\_the\\_2020\\_cef\\_call\\_0.pdf](https://energy.ec.europa.eu/system/files/2020-10/list_of_all_projects_receiving_eu_support_under_the_2020_cef_call_0.pdf) (Accessed 09/05/22)

<sup>78</sup> <https://www.porthosco2.nl/en/dutch-government-supports-porthos-customers-with-sde-subsidy-reservation/> (Accessed 09/05/22)

<sup>79</sup> <https://www.porthosco2.nl/en/> (Accessed 10/09/22)

about how technical discourses that ensure to be *purely* technical and therefor not able to interfere with socio-material and ecological worlds are inherently political in their disguise of power-relations.

Carbon, capture and storage technologies have long been criticized, especially in the social sciences and humanities, as being a strategic device for fossil fuel companies to “buy time”, to ensure and extend the reliance on the (monopolized) oil infrastructures in which their continuous capital accumulation relies on—instead of achieving real systemic change which would take for the fossil fuel industries to come to an end (Rajak 2020). The road for CCS technology to develop has already been long and despite the extensive process, only a few commercial scale industrial plants with carbon capture are in use today (Kern et al. 2016). In the summer of 2021, I worked with a group of professors and PhD students from TIK (Center for technology, innovation and culture) at Oslo University, on a project about CCS technology providers (Finstad et al 2021).

The project focused on the Norwegian history and future for carbon, capture, storage and utilization technology providers—but I worked to create a database of change, which included global actors in the CCUS sector. Working on the database made me realize how technological trajectories are complex, diverse and fragile. Because, the development of CCUS technologies is highly dependent on funding and collaborative clusters of research that bridge private companies and university departments. The process requires sociopolitical action (collaboration, persuasion, regulation) which is reliant on material conditions (funding, labor, location/space, resources). However, in the commercial representation of CCUS technologies, these trajectories are often silenced, this is done to promote the technology as a scalable, modular, but at the same time standardized product—making the process of adaptation seem easier than what it is. This way of de-contextualizing the technology from its socio-material conditions and in this way streamlining it ‘as a product’ speaks to both government’s negative CO<sub>2</sub> emission calculation(s) as well as industries profit-oriented approach to implementation of new technology<sup>80</sup>.

In the case of the Porthos project in Rotterdam, these tactics worked out as the actors involved were appointed with more than half of the Dutch annual budget for sustainable projects in 2021<sup>81</sup>. The Porthos website provides little information about what carbon capture is and how it works—but focuses the CO<sub>2</sub> pipeline and its different

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<sup>80</sup> This paragraph is a rephrasing and edit of my argument in the rapport I did at TIK.

<sup>81</sup> <https://www.reuters.com/world/europe/nearly-half-dutch-2020-green-subsidies-go-rotterdam-carbon-capture-project-2021-06-08/> (Accessed 10/09/22)



infrastructural functions. The actual process of capturing CO<sub>2</sub>, which the individual companies are set out to do, remains invisible on the project site. Moreover, the intriguing part of the grant decision by the Dutch government is that the Porthos project is a collaboration between fossil fuels actors: Air Liquide, Air products, Exxon and Shell<sup>82</sup> — companies that are the center of global carbon emissions, the issue that we are trying to find a solution for.

Different to other experiences in the field, I feel a rush to end the interview, we have a scheduled amount of time and I'm trying to get as much information as I can. I ask about how the Port will ensure that the companies are actually capturing the CO<sub>2</sub> from the industrial processes—if the Port will have people assigned to routine check-ups to ensure that the carbon capture is working out as planned. Geert seems slightly surprised by the question but states that they will measure the CO<sub>2</sub> via the centralized pipeline, in this way they can constantly keep in check if the companies are capturing the amounts that they say. The pipeline will be part of one of the many pipeline corridors that penetrate the port and in this way they won't have any issues when it comes to permissions or resistance from public or industrial actors. This practice resonates with the “layering” of pipelines in Daan's field—the first pipeline legitimizes the next, and so on. The danger of this type of industrial plan (and logistical fantasy) is that it sounds great on paper—streamlined, easy: a factory captures CO<sub>2</sub>, you connect the factory with a pipeline, the pipeline goes into an empty gas field, the CO<sub>2</sub> is stored underground.

However, carbon capture technology is still in early stages of commercialization (Kern et al. 2016). One of the reasons why CCS has proven so hard to integrate at a commercial scale is the corrosive effect of amine-solvents (which is the industry standard for CCS at the moment) when they mix with CO<sub>2</sub> gas as part of the capture process. Imagine inserting an extra chamber, made out of carbon steel, into a chimney. From the side you have a (chemical) amine-solvent in a steady flow. When the amine solvent gets warm, it starts to combine with the CO<sub>2</sub> gas—creating a new solution. This new solution is corrosive to the chamber itself, speeding up the degradation of the milieu as it is transported out of the chimney to be cooled down (to release the CO<sub>2</sub> into a separate system). The other issue is that the amine-solvents degrade by themselves as well—forcing the industrial actor to add a steady (and costly) supply of new amine-solvent into the capture process while the degraded amine-solvent becomes what is called “secondary pollution” (Ooi et al. 2020). The reason why I want to add this amount of

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<sup>82</sup> <https://www.porthosco2.nl/en/rotterdam-companies-and-porthos-sign-contracts-for-transport-and-storage-of-co2/> (accessed 10/05/22)

details to my description of carbon capture, is to illustrate the complexity, implications and issues of the material (environmental and ecological) entanglements and processes, that are so often left out, or streamlined, in fossil fuel companies communication to the public.

Shell, which is one of the actors in the Porthos project, have their own carbon capture technology called “Cansolv”<sup>83</sup>. The technology was implemented at a commercial scale project, for the first time, at a power station in Canada in 2014<sup>84</sup>. After the plant became operational with the new carbon capture technology in 2016 they experienced that the amine solvent degraded much faster than what Shell had promised them, making the project financially unsustainable<sup>85</sup>. A few years later in 2021, the company reported that the carbon capture process was reduced by over 40 percent (from the ideal 90 percent capture rate) because of issues with a compressor motor<sup>86</sup>. These examples indicate the socio-material complexity of carbon capture and how it will require constant monitoring and maintenance if the Port of Rotterdam and the Porthos project wants to achieve their environmental plans.

Besides Porthos, the Port is also planning a “hydrogen economy” — again in close collaboration with the fossil fuel companies that already use hydrogen during oil refining for desulfurization of petroleum products. The hydrogen economy will consist of blue hydrogen (using natural gas and carbon capture technology to create hydrogen) as well as green hydrogen (using renewable energy to split water into hydrogen via electrolysis)<sup>87</sup>. The hydrogen economy is the second pillar in the four pillar plan I mentioned earlier. The third pillar is produce bio-fuels in the Port, a process which is already happening: there are multiple bio-fuel plants at the Port and Shell are planning to build the biggest “sustainable aviation fuel” facility in Europe at their site close to Pernis<sup>88</sup>. And the fourth pillar is about making logistics and intermodal transport more sustainable.

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<sup>83</sup> <https://www.shell.com/business-customers/catalysts-technologies/licensed-technologies/emissions-standards/tail-gas-treatment-unit/cansolv-co2>

<sup>84</sup> [https://sequestration.mit.edu/tools/projects/boundary\\_dam.html](https://sequestration.mit.edu/tools/projects/boundary_dam.html) (accessed 10/05/22)

<sup>85</sup> <https://www.cbc.ca/news/canada/saskatchewan/saskpower-looking-for-help-to-fix-high-cost-boundary-dam-carbon-capture-flaw-1.4680993> (accessed 10/05/22)

<sup>86</sup> <https://www.eenews.net/articles/ccs-red-flag-worlds-sole-coal-project-hits-snag/> (accessed 10/05/22)

<sup>87</sup> <https://www.portofrotterdam.com/en/port-future/energy-transition/ongoing-projects/hydrogen-rotterdam> (Accessed 10/05/22)

<sup>88</sup> <https://www.portofrotterdam.com/en/news-and-press-releases/shell-to-build-one-of-europes-biggest-biofuels-facilities> (Accessed 10/05/22)

I travelled to Rotterdam to experience some of these projects during my fieldwork, but realized as I arrived, that many of them are in such early phases that they only exist as plans or proposals—making it impossible to do an ethnographic analysis of these future infrastructures in relation to energy transition.

During our meeting, I ask Geert about the challenges for the energy transition at the Port. He states that organizing the industrial actors, changing the infrastructures and maintaining a functioning “value chain” makes the transition hard. In this way, the transition is more complex than the technology itself. In his opinion, the technology is already mature enough for an energy transition to happen. But, the dynamics of organization and securing the return of investment for the corporate actors makes it hard to orchestrate for the Port authority. Geert goes on to explain the difference between the companies and the Port management: “If the companies lose all their money, they have to stop—it is different here at the Port office, we are paid by institutions to do our work”. His comment is a reminder to the way in which the Port functions as a landlord and manager (backed and controlled by the municipality and the government) generating an income from renting out sites to industrial actors, charging dues from the ships that enter the harbors, while orchestrating the general infrastructures that makes the Port accessible in the first place<sup>89</sup> (Notteboom et al. 2022).

For Geert, the agency lies in what he calls “public awareness” — for him, the policy plans of the Dutch government are not progressive enough, and he argues with an optimistic tone that the companies at the Port are ready for change, if just the policy-makers implement regulative policies “like the EU law about a percentage of bio-fuel in gasoline. The trick is to create a level playing field, so the income is secured for the big companies. The challenge right now is to change public awareness and take the Paris treaty and make it into actual policies”. Interestingly, when I tell him that my focal point is the communities living around the Port he quickly states they play no important part in the transition because they have no political decision power. “They are too small, too insignificant” whereafter he refers to the idea of “public awareness” again. During our interview, I start to get the impression that the story about a top-down approach in the Port authority which I’ve been warned about from interlocutors in the field, is not entirely made up. I will argue that, “public awareness” is crucial to the energy transition—but public awareness is anchored in specific local, socio-material worlds, and to understand

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<sup>89</sup> <https://www.portofrotterdam.com/en/about-port-authority> (accessed 10/05/22)

the dynamics of a national public awareness, one needs to analyze what is going on in a local context. Furthermore, the areas in close proximity to the port, can serve as indicators and knowledge for possible alternative energy futures, namely because they as a product of their location, have had to negotiate in various ways, a relation to the fossil fuel energy infrastructures that currently maintain and energize the social metabolism of urban lives.

But Geert is a progressive person in an old (conservative) institution, this is clear from our brief conversation. He tells me how the Paris Climate Agreement was an eye-opener to him—this was a moment when he realized that things really needed to change. However, he is working with “many actors that needs to collaborate and therefore changes takes time. But, just a few years ago, things were are lot more conservative within the Port Authority”. The internal change in “environmental politics” is something that makes him optimistic about the current transition plans.

But there are still many obstacles—he explains that many of the companies at the Port would perform better if there was less bureaucracy and generally, if the government reduced their restrictions for spatial planning. In an optimistic view, this pro-development argument holds the potential for rapid expansion for renewables, or other types of sustainable energy infrastructure, but, it also opens up for fossil fuel actors to operationalize loopholes in climate (and environmental) regulation and mitigation.

I leave the meeting, and the World Port Center, with an unsettled mind. Saturated with information about energy transition plans, but also dissatisfied with the situation. The experience of the light, pure and detached ambience of the lobby in contrast to the million tons of material processed through the Port every day<sup>90</sup>. The clear separation between the world of material extraction, processing and distribution orchestrated by the Port management and the purified corporate spaces here at Wilhelmina peer leaves me skeptical about the promises of progress—oozing from the architecture and corporate communication.

## **Chapter Conclusion**

In this, shorter, chapter I described the state of the energy transition at the Port of Rotterdam authority, from a planning perspective. Thereafter, I analyzed the historical

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<sup>90</sup> 2021 total throughput was 468,709 million tons <https://www.portofrotterdam.com/sites/default/files/2022-02/port-of-rotterdam-throughput-2021.pdf> (accessed 10/05/22)

discourses of the Port in relation to the spatial politics of the offices' architecture and location. I presented my interview with Geert—and compared the materiality of energy (transition) to the post-industrial ambiance in the lobby of the high-riser building. I used my previous research on CCS to carve out a critical perspective on the Porthos project and the fossil fuel actors involved in it. At last I indicated the potential changes within the organization of the Port with a subtle skepticism because of the continuous focus on Port development as growth of throughput.

So far, my ethnography has evolved around people who reside and belong to places close to the Port and Geert who work in the Port management. My focus has been on decoding the semiotics of space and the discourses, that effectively separate the industrial worlds of the port from the everyday-worlds around it. This chapter furthermore brought in a description of the separation between the messy industrial and the purified office—the high tower of communication, aesthetically and affectively detached from the material forces at play in the port. However, in the following, last chapter, I move back to the house in Brielle where I stayed during my fieldwork. Here, I discover a different group of people: contracted and temporary workers and managers. They stay at the Port temporarily but their work and practices have long term consequences for the (infrastructural) development of the space.

## 4: The Home and The Factory

### Gasless Nights

I wake up in a cold and clammy room in my fieldwork residence in Brielle. My clothes are damp and the air feels heavy to breathe. The night temperature must be lower than the other days. Half-asleep I start looking for blankets or towels in my room, just to get some extra cover and isolation for the rest of the night. In the morning, tired after a cold night, I ask the landlord if it is deliberate that the house gets so cold at night. He tells me that he set the (gas) heating to turn off automatically at night—otherwise, the heating costs are too high for him. I then persuaded him to turn it on, if not just a bit, during the night—explaining how my room with two outer walls becomes so cold I could not sleep.

During my fieldwork, gas (and electricity<sup>91</sup>) prices started rising exponentially in the Netherlands<sup>92</sup> (and in Europe in general). This led to rapidly increasing energy bills for my host who in turn started restricting consumption at the house. For me, it meant coming directly in contact with another part of energy transition: the relational aspect of energy prices and household consumption. The fluctuation of energy prices has a myriad of repercussions on the everyday life of different social groups—in my fieldwork house it was the topic of increased tension between the people renting rooms, and the host and his roommate. The fluctuation in prices materialized in a set of rules to change the habits in the household (host, roommate, me and different contracted workers temporarily staying in rooms). One of the rules was to limit the frequency of using the washing machine and drier—a once a week policy—which eventually created discussions and suspicion between host and tenants. On several occasions, tenants were blamed for overusing the machines (and not sticking to the rules)—the rising tension and energy prices followed each other as the weeks went by.

The way our everyday practices (and affects) in the household changed because of external dynamics in the (fossil fuel) energy market directs my attention to how energy matters across scale. However, without the fluctuation, the metabolism from energy infrastructures is still essential to the socio-cultural settings of the household, even as it operates in “the background” without creating tensions or disruptions. Infrastructure

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<sup>91</sup> [https://ember-climate.org/app/uploads/2022/02/Briefing\\_Dutch-Electricity-Prices.pdf](https://ember-climate.org/app/uploads/2022/02/Briefing_Dutch-Electricity-Prices.pdf) 60% of electricity came from gas—so the price fluctuation is interconnected (Accessed 12/05/22)

<sup>92</sup> <https://www.statista.com/statistics/1267202/weekly-dutch-ttf-gas-futures/> (Accessed 12/05/22)

decisions, technological change, and ecological (de)stabilization connects to the realm of everyday life and alters social practices around material settings (like appliances and heating)—but are also formed by specific practices (some more important than others). The socio-material and semiotic settings of the household is a place where most people come into contact with energy infrastructures—it is therefore also a place of interest in my pursuit for an “energy transition” around the Port of Rotterdam. In relation to energy reduction (as part of a transition), Harold Wilhite describes the connection between energy policies and social practices in a precise manner:

*The conceptual move that I am proposing—from viewing energy consumption as something performed by individuals and individual devices to something that is a result of the interaction between things, people, knowledge, and social contexts—has subtle but important implications for policies aimed at reducing energy consumption. From a practice-grounded perspective, individual consumers, their material worlds, and their sociocultural contexts are viewed as agentive. (Wilhite 2016, 67)*

In this quote, Wilhite argues that energy consumption evolves through practice and interaction within a social context. His argument indicates how a practice-oriented view (which aligns with an ethnographic perception), opens up for an understanding of individuals as part of “clusters of energy practices” that are not only informed by larger-scale infrastructures but also able to negotiate (and therefore have agency) material and political energy landscapes beyond their immediate surroundings.

Most of my interactions with the other people in the house evolved around energy use of different kinds: cooking (with gas), discussing when to wash clothes, having coffee etc—all dependent on the affordances of (fossil fuel) energy and electricity. We met in the kitchen and discussed everything from politics, recipes, home country cultures to energy transition and climate change. Some people stayed for only a day or two, others for weeks. Some I got to know, some kept for themselves. I spent a lot of time in the house in Brielle, especially in the first month of my fieldwork, as I was trying to get in contact with people relevant to my project and interests. It felt like the Port was *out there*, inaccessible and incomprehensible. What I needed was to get to know people who could take me *into* the port. Until now, I had spent most of my time in the villages around the port, with local people and politicians, Daan and Ronja (the farmers) and Geert at the port offices. My host was a local man, but like Daan, he had little (or nothing) to do with companies or people at the Port. I continuously sent out emails to companies (both fossil fuel companies and renewable companies) but none of them had an interest in a visit.

Rejection after rejection was wearing me down—Covid-19 policies<sup>93</sup> and the (general) extensive security measures at the Port made it impossible to establish contact to people inside the industrial facilities let alone gaining physical access to the sites.

## **The Quality Inspector**

One morning when I got down into the kitchen, a new and talkative lady (Elena) had just arrived in the house. She tells me that she drove all evening and night from southern Germany to get here. She had to be at the Port 03:00 to do a final inspection on a set of monopolies (the steel towers that go under water for off shore windmills). However, her company had changed plans in last minute, so now she was just waiting for new directions from them. We organically start a conversation and I tell her about how I ended up in the house and what my research plans is. She tells me about the cities she had lived in, all because of her work as inspector on windmill infrastructure. An interesting story into places interconnected because of their steel production facilities. She had stayed in small towns, close to where I grew up, places I never thought had visitors from outside Denmark. As I tell her about my focus on energy transition (in hope that she will explain about her work) she interferes and starts listing the difficulties with renewables: “If there is no wind then there’s no power—if there’s no sun, then there’s no power. Wind works well here up north, because at the West coast—there’s almost always wind. But in the South [of Europe] there are large periods without wind. Hydropower is ideal for the steady delivery of electrons—but hydropower needs big rivers and elevation difference, this is not so easy to find in the South either.” She goes on and states how much she hates when people are being “philosophical” about the energy transition, especially people like: “Greta Thunberg.” She tells me that she is tired so we plan to continue our talk the next day.

Conversations and meetings with interlocutors in the house are usual fragmented, people are busy while staying here and when they are not working at the port, they usually focus on getting lots of rest. For most of them, working hours a long and intense because the contracted work is for a restricted amount of time. Elena, works 20 days on 20 days off—and this type of setup seems common for the people I meet in the house. Some are only at the Port for a few days to attend specific problems or meetings—others, like Elena have a more structured on/off schedule for a period or a season.

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<sup>93</sup> As mentioned earlier, my fieldwork was conducted during high numbers of Covid-19 cases. The public authorities advised the industry to test their employees and restrict too many “foreign” visitors.



She is educated as a chemical engineer and now she works as a quality inspector —with experience in different steel factories she now works at a place where they do mega-structures like monopiles for offshore windmills. Right now, she is doing the inspection for a large windmill project that will be installed “offshore” in the North Sea. The monopiles are constructed at the Port of Rotterdam but the windmills are constructed elsewhere. In her job she deals with welders, painters, managers and other quality checkers as the monopiles are constructed, assembled, painted and transported into the sea.

This is not her first time in Brielle because she has been on the windmill project for a while now, however, the last time she was here, she lived in another place: a bar that doubles as accommodation for temporary port workers and “old Dutch men who have been kicked out by their wives”. Elena is a storyteller, and every time we meet downstairs, she explains to me about her experiences at her former accommodation in Brielle, she calls it “Junkie House”. A local pub-owner in Brielle has re-done the upstairs of a classic Dutch “bruin café<sup>94</sup>” to rent out rooms. Elena’s nickname for the place comes from the attitude of the guests, who spend a lot of time indulging in bar facilities downstairs. However, the opportunism of the pub owner relates to how the area generally lacks space. The local “Gemeente” (municipality) is currently planning to build new residential areas to accommodate people moving to Brielle (and people like Elena and me looking for temporary rooms). A local politician in town told me that the expansion of Brielle is complicated by the Port’s increasing need for space. As mentioned in earlier chapters, this constant negotiation with the Port and Rotterdam municipality seems intrinsic to the dynamics of spatial planning on Voorne-Putten.

The “Junkie House” indicates just how messy work cultures at and around the Port can be—industrial companies that communicate streamlined, hi-tech facilities, are dependent on workers like Elena, and her acquaintances (who still live on top of the bar). But a lack of accommodation (and for other workers a lack of support) means that they have to stay in precarious (and seemingly unsafe) conditions. Elena’s stories surprise me, because it indicates a community in the (small) town, that I didn’t know existed.

As our relation develops, I continue talking with Elena about her work to try and understand some of the practices that evolved around creating these infrastructure objects (monopiles) that are essential to an energy transition. After a while, I ask her if I

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<sup>94</sup> Brown café because of the color palette of the interior in these traditional Dutch bars. The term covers traditional/old cafés with dark/heavy furniture and Dutch singers on the stereo (like André Hazes).

can come with her and spend a day, observing and maybe participating in her work. We agree that I can go with her this coming weekend, and spend a day doing quality control with her at the factory in the Port.

## The Factory

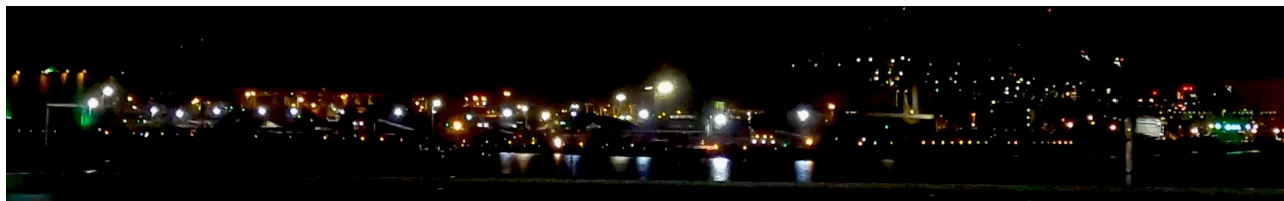
At 06:45 we leave the house in Brielle in Elena's Mazda. It is still dark outside as we cross the city boundary and take a right turn towards the outskirts of the Port. The car stereo is playing Christmas music, Elena tells me that she likes to listen to this every morning. The day before she had asked me if I could bring my camera and take a photo of the Europoort area (from the road to the left of the Brielse Meer (lake) when going towards the Port). If you cross this point on the bike (path) that goes parallel to the road, you will see a monument at the side of the road, with inscriptions stating that the Brielse Maas (river) was closed on the 3rd of June 1950 whereafter the water became the Brielse Meer. As mentioned earlier, the closure was important for farmers at the shores, like Daan, who now had a reservoir of freshwater next to his fields. But, furthermore, the area around the lake was made into a recreative "green zone" that now divides the village of Brielle from the Port. This green zone, like the proposed green wall around Shell, arguably works as a buffer zone that separates the logistical worlds from those of everyday life and leisure<sup>95</sup>.

I take my camera out and start recording as we cross the road and get a view of Europoort. This is the first time I get this view of the Port in the dark. For Elena, it looks like a Christmas tree—but to me, it looks like a city from far away. The logistical semiotics (and the scale) of the Port open up for a range of interpretations. The space is not scripted for the public like a commercial city center: the lights are not advertisement banners or signs directing towards food or leisure—and logos and company names are sparse. In addition, the scale of the place forces you to navigate it by car (creating another barrier between the subject and the industrial sites). These things combined, make the Port always feel like it's *out there*—incomprehensible. The issue is, that the fossil fuel actors thrive in the anonymity of infrastructure space. Infrastructures like the oil spaces and intermodal transport systems in the Port actively make worlds (Rossiter 2016,

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<sup>95</sup> For an elaboration of this specific point: During my fieldwork I did a visual investigation of this area and made a short film in a project for the honors degree (Green Certificate) in environmental humanities at University of Oslo. The film is accessible here: <https://youtu.be/C0mA7rmEqgU>

Larkin 2013<sup>96</sup>). As the Port reaches into the land and out into the sea, it creates and sustains (life)worlds with its supply chained and metabolic services (Arboleda 2020) and molds the socio-material landscapes in port cities, urban centers, and extractive hinterlands (Hein 2020). But as we drive past one of the centers of fossil-fueled infrastructure space, it disappears into the background, open for interpretation, anonymous in its abstract scales and logistical architecture.



**Image 9.** Roy, Simon O. 2021. *Still photo from video recording of Europoort in the morning*. Photograph. Europoort, Rotterdam, Netherlands.

In reality, the site we are passing is the BP refinery in Europoort<sup>97</sup>. With a processing capacity of 400000 barrels of crude oil per day<sup>98</sup>, the refinery is, along with Shell Pernis, the biggest in Europe (Hein and van de Laar 2020). In other words, the site is one of the central places in the accumulation of carbon emissions that is currently propelling the climate towards the instability of more than two degrees of warming. The lights, which might look like a Christmas tree or a city-view, are for the refinery (and other facilities) to be accessible for repairs and maintenance 24/7—because the site is non-stop processing crude oil.

The ideal situation for actors like BP is to be regarded as a function or a tool—and not a place or an agent. This is the slippery nature of infrastructure politics. If these abstract sites of fossil-fuel processing and distribution are seen as functions and not places (which is what logistical discourses want to persuade), then their political power

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<sup>96</sup>Larkin use a more subtle word, in terms of separation, than “world”. Instead he states that infrastructures generate the “ambient environment of everyday life” (328).

<sup>97</sup> <https://www.portofrotterdam.com/en/setting/industry-port/refining-and-chemicals/oil-refineries> (Accessed 14/05/22)

<sup>98</sup> To bring that in perspective: that’s more than 25 olympic swimming pools full of oil, every day (25 x 2,5 million liters = 400000 barrels).

remains invisible and their responsibility is downplayed<sup>99</sup>. This is because a function is always for *someone* or *somewhere* else, and in this way it removes the impact of the place (and corporation) itself. However, due to the contingency of ethnography and the restricted access to sites like BP, I will now move back into the car with Elena, towards the monopile factory in the Maasvlakte area of the Port.

As we drive into the factory site, Elena scan her company cart and the gate opens. A dense fog is laying low, hovering around the massive steel monopolies<sup>100</sup> that are neatly arranged on piles of sand and concrete that prevents them from rolling. Elena reverses the car into a parking lot (as advised on a sign). This is to ensure that everyone can leave quickly in case of any hazards on site (fire or other dangers). Inside the logistical landscape catastrophes or accidents are embodied in everyday safety gestures. We walk into her office which is inside a stack of construction site trailers. Interestingly, a lot of built space in the Port is similar to this—modular, temporary, easy to move and remove according to the needs of space for different projects. It is not only goods and cargo that circulates, the Port itself moves as well.

Elena brings me a coffee as we sit in her office space and waits for a notice from her colleagues. She tells me to put on safety shoes, hat, reflective jacket and glasses. From the generic office layout it's hard to see what Elena does—a computer, documents, the usual office supplies and a calendar on the wall. The simple layout and lack of personal items, indicates to me, how the place is for temporary personnel: there are few personal items around in the room, besides some specific snacks and coffee. Elena tells me that she shares this office with other people—when she is doing her 20 day shift, her name tag is put on the wall. When she leaves, the name tag is replaced with a new one. However, she does know some of her colleagues here, but it is rare they spend time together namely because of the work in shifts.

After a while, she receives a text message: a monopile is ready for her inspection. As a quality inspector, she performs the practices and duties of the “International Organizations for Standardization” (ISO). ISO is a “nongovernmental international organization” that develops standards and quality management systems<sup>101</sup>. ISO standards are *everywhere*: from the size of credit cards (so they all fit in the same

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<sup>99</sup> An example of this is how the petroleum product pipeline RRP (Rotter Rijn Pipeline) states on their website, that they are “CO2 neutral”. Because the content of the pipeline is not part of the equation. <https://www.rrpweb.nl/en/environmentally-friendly/> (Accessed 15/05/22)

<sup>100</sup> 75 meters long and more than 10 meters in diameter.

<sup>101</sup> <https://www.iso.org/about-us.html> (Accessed 15/09/22)

machines), to batteries, paper sizes, valve sizes at refineries, ISBN numbers on books and articles, sustainability measures etc<sup>102</sup> (Easterling 2014<sup>103</sup>).

ISO standards are spread across the Port and essential for the (global) logistical infrastructures too interoperate. For example, an ISO standard defines how containers should be coded, identified and marked<sup>104</sup>. In this way, ISO creates a framework for a (global) technical discourse that is essential for the expansion and sustaining of logistical spaces like the Port of Rotterdam. However, what I hope to show in the next part of the chapter is how, the streamlined standards and certificates of ISO are performed through a range of social practices and negotiations (human and nonhuman). The logistical world is never as stable and purified as it pretends to be.

## **The Office and the Factory**

We walk through a maze of ventilator systems set up on pallets outside one of the factory halls. The factory consists of many adjacent halls: all in a size that makes the scale hard to fathom. Each hall marks a specific step in the preparation of the monopiles (before they are sent out into the sea): the first layer of rust-protection, the second layer, then the paint, and so on.

It is the weekend so the place is rather empty (or at least that is what it feels like), but scattered objects around the industrial machines indicate the groups of people who work here: a t-shirt hanging on a valve on the wall, some old paint buckets in a corner, some plastic scraps laying around, a pair of gloves stuck underneath a pallet. In a technical environment like these halls, the objects that are scripted to the size of a human body stand out—these are the things that are naturally familiar to me. The first thing that I notice in the entrance hall, is a constant buzzing sound. This is from the (heavy) ventilation which is required when you paint such massive objects. Despite the ventilation, a smell of paint and metals mixes into something that immediately confuses my sense of place.

As we walk towards the painting hall, I nod to a few men that we pass, they are also wearing full safety gear: “‘..’ello”. At first, it seems that people are concentrated, or

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<sup>102</sup> <https://www.iso.org/popular-standards.html> (Accessed 15/05/22).

<sup>103</sup> For an elaboration on the power of ISO, and especially their management standards, I refer to the “Quality” chapter in Easterling’s book (2014, pp. 171-210).

<sup>104</sup> <https://www.iso.org/standard/83558.html> (Accessed 15/05/22)

simply just minding their own business, but Elena tells me that because of the work shifts and the dependence on contracted workers—most people don't know each other here. We walk into a hall and I see a monopile (it fills up the entire hall). It lies vertically on top of a set of metal wheels that are slowly rotating the whole steel tube—in this way, the workers can paint the monopile in a steady and controlled way. The orchestration of objects in this room is unimaginable (to me)—how they got the monopile onto that set of metal wheels, and how they made the monopile out of steel in the first place, all make for an abstract experience as I enter the space.

We walk up a scaffold where we greet two men. Elena jokes around with them right from the start, which seems to unarm the situation a bit. I shake hand with the one guy and Elena explains that I'm a student visiting today—but the words seem to disappear into the noisy surroundings. I follow Elena from the platform and into the monopile. The monopile is a long tube, made from smaller pieces of tube that are welded together. The tubes are created from bending steel plates into a circle.

As part of Elena's job, she needs to walk into the monopile to check if the weldings are done properly—because if there are issues with the welding, the monopile will start rusting out on the sea and eventually this could lead to a collapsing windmill. Just like any other infrastructure, the production of windmills needs to take into account the ecological resistance of nonhuman actors—in this case, how saltwater in collaboration with colonies of seaweed, mussels, and snails will corrode and decay any bare metal. As we cross from the platform into the rotating monopile, the (other) inspector says: "Please be careful, watch out for the holes". The rotation makes the work more dangerous, because of the holes for the power cables that go under the sea into a substation when the offshore windmill is set up. We walk into the pipe and my sense of direction is immediately disturbed. The light is different because it is coming from the two ends of the monopile like in a tunnel. Sounds morph as they bounce on the rotating walls. And lastly, the ground is constantly moving because of the rotation.

The rotation happens subtly—so you have to pay constant attention. Elena walks through the monopile (like a walk in the park) and looks at the welding in different places. The process is quick and we return to the platform. On the way down, Elena says something (which I didn't hear) and moves towards me: I take a reflexively step back and she immediately states: "never walk backward without looking!". This is the type of knowledge I lack but is supposed to be embodied through experience in moving around industrial sites with the dangers it entails.

Back in the office, Elena shows me pictures of corrosion and paint issues that she has taken (with her phone) during other inspections. These are macro-photos of flaky paint, rust dots, and scratches. The photos demonstrate the scales at play in the construction and arrangement of renewable infrastructure like offshore windmills—a few millimeters of rust can delay the whole project which is bound upon a constant movement of the production. If one monopile needs extra work, then the general process is slowed down. Every day, Elena gets a printed schedule from a colleague, with 1-to-20 tasks. The tasks are time scheduled so she knows where to be at what time.

However, when she meets up at work in the morning, she knows what to do, but she never knows what to expect because the quality checks are never the same. Working with Elena tells me how complicated and contingent the development of (renewable) infrastructure for an energy transition can be. The schedule serves as a draft document for the quality checks as well—after talking, negotiating, taking pictures, writing down (in technical terms) the state of paint, welding, etc, Elena transcribes the document into an Excel sheet so the main office can follow the production progress and the quality certificates. In this way, she translates the socio-material dynamics of the situated and embodied knowledge produced in the meetings between her, monopiles, paint, rust, other inspectors and industrial ambiance—into a subset of codes that fits into the framework of her company (and ISO). Thus, the streamlined technological discourse of ISO certificates is the *translation* of these experiences—it is not the ISO codes that detect the rust and paint bubbles, but Elena’s embodied knowledge and sensory apparatus.

Her phone blips—a new inspection is ready. Despite the schedule on the daily agenda, she never knows exactly when she will be “called in” for inspection. The welders, painters and other inspectors sends her a text, when the monopile is ready for a check. We walk into a second hall, here a monopile is being painted red. Elena explains how each layer has a different color to indicate how far in the process the painting is. As we arrive, the other inspector is gazing towards the ventilation system in the ceiling. He looks back at us “Listen!”. “Pip, pip”—the sound of a bird merges with the noise of the ventilation and a gas-driven truck in the background. “I think there’s a bird in here. I’ve been hearing it in the last couple of days but I can’t see it”. “Pip, pip”. “It’s just the ventilation” Elena says. “No, I’m quite sure it is a bird” goes the other inspector. I agree with him and they move on to the inspection process. Meanwhile, I keep staring towards the ventilation, trying to locate where the sound is coming from. But the sounds of the bird drowns in industrial ambiance: a misplaced sound in this environment or paint odor

and compressor machines. It messes with my senses. A place like these painting halls, are created to separate worlds—the organic, or ecological, is not allowed in here—because for the purified industrial world, it entails loss of control, rust, decay. However, as the bird in the ventilation (if it was a bird) shows, it is impossible to separate these worlds. Instead, it's a constant negotiation to “purify” the environment (Latour 1993).

After a minute or two, two workers tells Elena that they have issue with the blaster (the machine to sandblast the mill): “Come and check tomorrow”. The workers know that the monopile is not ready, and they try to “buy time” so they will not have to stress about the painting. I sense how Elena is used to these kind of negotiations as she proceeds to check underneath the monopile, ignoring the request from the workers. She moves around to detect any errors in the paint job and stops at one of the holes that are for underwater electric cables, She gets up on her toes to get a proper picture of it—I walk over to help her. She explains that the layer of paint is thin at the edge of the hole and ask me to take a picture as my reach is higher. At the edge of the hole are small bits of metal, left-overs from welding and blasting: a symbol of the fine mechanical labour that goes into producing mega-structures like offshore windmills. However, the rough edge is also the issue here—there is a lack of paint around it, making it a potential place for rust to emerge. We take a few pictures of the edge, whereafter we walk back to the office.

It seems that Elena's job entails these constant (and contrastive) switches between office and factory hall. The switches also means that she has to navigate different social context, from the welders, painters, the inspectors to her manager, all with a distinct vocabulary which they use to describe both tasks and objects. We discuss Elena's position at the company on the walks back and forth from office to factory halls. She jokes that she is the “dictator” and she likes this. As she explains to me that: “when she is right, she likes raising her voice and tell groups of men how to do things” a comment which indicates how she is one of few women in a male-dominated space. Her position as inspector gives her a lot of power, because the workers depend on her acceptance before their project is done—if she finds an error in the painting or welding, they have to do the work over again.

It is the same two other inspectors that we meet at every monopile check. They are working for another company, doing a different kind of quality check providing data which is essential to Elena's final acceptance as well. Underneath the monopile, inside a plastic-covered scaffolding, we meet the two men. One of them is pushing a long syringe into the layers of paint. In front of him lies a box with a range of measuring devices and what looks like medical gear. He checks the amount of salt in the layers of paint—again, as part



of preventing corrosion once the monopiles leave the factory.

Elena starts joking about the company policies around Covid-19 and an uncomfortable silence spreads among our group. After a minute of focusing on the syringe, the other inspector goes “I’m vaccinated, I think vaccination is a good thing”. Elena, who is against vaccination (something she told me early on in our meetings) laughs at him and they move on with a technical discussion about the salt-values in the paint. The sensibility of the needle in the paint is part of a spectrum of performances that assemble in and around the monopile as it nears completion. The awkward tension between vaccination ideologies, and the negotiation of when to do the inspection, shows how contingent (and affective) the practices around creating the monopiles are<sup>105</sup>.

## **The Power of Energy Objects**

In his influential work *Carbon Democracy*, Timothy Mitchell argues that the “birth of the economy, based upon oil, made possible a form of politics that was dematerialized and de-natured” (235). The presumed abundance of energy created a political climate that believed in limitless growth: the affordances of the fossil fuel energy meant that the politics became materialized and de-natured. However, a renewed attention to the limits of oil supply (Mitchell 2013) as well as a reorientation towards the climatic effects of fossil fuels forces the politics to re-materialize. Shortly before I went on fieldwork, The International Energy Agency published their “Roadmap for the Global Energy Sector” with their findings: no new oil or gas exploration and no new coal-fired power plants if we (the world) are to reach net-zero in 2050 and avoid the most catastrophic climate scenarios. The change in discourse from (what used to be) a conservative organization when it comes to energy politics—makes it seem like things are changing, but is it fast enough?

During ethnographic fieldwork In the factory with Elena, I got a glimpse of the materiality of an energy transition to come. Re-materializing politics around energy transition not only means understanding (and acting on) the limits to growth, and material and energy use. It also entails making visible the labor practices and sensibilities across scale which are essential to the construction of a new foundation of energy. Perceiving the materiality of the factory, and the myriad of human and non-human collaboration and resistance, like rust and planning issues, makes it clear how much work goes into creating renewable energy infrastructures (and how easy these megaprojects can come to

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<sup>105</sup> During the Covid-19 pandemic in the Netherlands and in Europe in general a rift erupted between vaccinated and people who was against vaccination.

a halt). Furthermore, the bird in the factory hall, indicates how there is no empty space, space is always shared with (or stolen from) something, or someone. The (industrial) effort to purify or separate space from ecology is part of dematerialization practices, something which needs to change as well if we are truly to realize sustainable, energy transitioned futures.

However, following Elena and her colleagues' practices around the monopiles inspired me to think about the potential of new energy practices. The monopile as an object that pulls a range of actors together (and in this way forces the materialization of its workings) can serve as an indicator of the potential of new energy objects and practices. Wilhite asks us to view energy consumption as interactions between “things, people, knowledge, and social contexts” (2016, 67), but what if this “energy consumer” becomes even more involved in the orchestration of energy objects, knowledge, and practices? What new socio-material potentials do new energy practices open up for? One thing is for sure, if we are to truly commit to an energy transition away from fossil fuels, then we need a public shift of attention (and imagination) towards the materiality and practices of creating this new infrastructural foundation. Elena’s perception and engagement with the monopiles might indicate the change in attention that is needed for this to happen.

## Thesis Conclusion

The relation between the Villages on Voorne-Putten and the Port of Rotterdam is a constant process. The places are interconnected through the metabolic services from the Port, labor movements across the boundaries (and green zones), local politicians like Koen who negotiate with industrial actors, port managers like Geert who influence spatial planning in and around the Port, Elena who works in the monopile factory, farmers, like Daan and Ronja who struggle with the oil pipelines that penetrate their fields.

Through my ethnographic fieldwork, I argue that the (planned) energy transition at the Port of Rotterdam is far from materializing. The financial backbone of the Port's operations still relies on an (unchanging) steady flow of fossil fuels. While my encounters with a range of actors in and around the Port indicate that change is on the way—I still found no evidence of a real energy transition anywhere. Instead, the transition looked more like Günel's concept of "energy accumulation" which means that renewable infrastructure accumulates as a surplus to the fossil fuels, not a replacement for them (Günel 2022). The spatial surplus creates issues along the dense borders of the Port because citizens resist the development of renewable infrastructure (like the windmill in Pernis). In other words, the fossil fuel infrastructures in and around the Port saturates both landscape and imaginaries, and this obstructs the possibilities of energy transition.

However, I saw the potential for new imaginaries (and action) to sprout on Voorneputten: Actors like Daan and Ronja, who try to re-materialize farming practices for the wider public—with the chemical factories lurking on the horizon. Koen wants to stimulate the local youth and make them more interested in environmental politics—right next to Shell Pernis. As well as Elena who is realistic about energy and the labor required to make a transition happen.

I hope that the boundary-making and separation of worlds—ingrained in the workings of logistical and fossil-fueled infrastructure space like the Port of Rotterdam, has been illustrated through my ethnographic observations and writing. Furthermore, I hope to have shown the complexity and messiness of the field—how the actors I encounter (and myself) are not isolated subjects, but living, moving, historical, and negotiating beings—moving through material-semiotic worlds that constantly form and change the perception and imaginary.

As the Port infrastructure keeps moving: the petroleum flows through the refineries and pipelines, the containers are distributed on the AGVs, the truckers drive onto the highway,

the vessels are mooring and the gas is flaring at the refineries. More than ever, there is a need for a rematerialized politics—one that brings into account the experiences of local lifeworlds and ecologies, and opens for collaboration across scale to imagine and create renewable futures.



**Image 10.** Roy, Simon O. 2021. *Separate Worlds: Beachfront at Oostvoornse lake and a horizon of oil storage tanks, cranes and a coal power plant.* Photograph. Oostvoornse Meer, Netherlands.

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