Green or Greed?

The conflictuous relation between energy security and energy justice in the Dutch green hydrogen import ambitions from South(ern) Africa.

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Preface

Last year, I was introduced to the term environmental justice which opened up a field of knowledge, and the presentation by Noura Alkhalili on energy justice last October proved to be of great inspiration for the direction of my thesis. Therefore, I want to thank my supervisor Noura Alkhalili at the Radboud University for introducing me to this field, for guiding me through this research, while providing me with critical reflections and confidence. In addition, I want to thank Marcel Llavero Pasquina from the EJ Atlas at ICTA-UAB, for his thorough feedback, patience and reassurance he gave me throughout the process. They have motivated me to dig deeper and to be sharp while being reflective of my position and contribution to the field. Their knowledge and experience helped me greatly to improve the work.

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Abstract

The drive behind the Dutch green hydrogen import ambitions is motivated by the ecomodernist ideas of green growth, while aiming to provide energy security. Accelerated by REPowerEU the Netherlands aims to diversify energy supply to decrease dependencies, green hydrogen allows to do so by importing it from areas with high renewable energy generation capacities and cheap land; thus the global South. Therefore, the Netherlands has signed a range of Memorandums of Understanding (MoU) of which I highlight the export ambitions from the coastline of southwestern Africa in particular from the Hyphen project in Namibia, the Boegoebaai project and developments in Saldanha Bay in South Africa. Ambitious green hydrogen targets remain elusive due to the quick rise in popularity without there existing a market yet, presenting a chicken-or-egg-problem for investment. The Netherlands joined the German H2Global to overcome this issue through technological and economical solutions, where it benefits from German international relations, while Germany benefits from the Netherlands as an energy transfer hub of northwestern Europe. These solutions, however, could redefine the policy space for public service provision putting private capital, such as the fossil fuel sector, in control. Additionally, responsibility mechanisms largely prioritise European wellbeing while maintaining economic growth, while imports from southwestern Africa are justified by economical and technological solutions through sustainable development narratives. In reality, sustainable development risks becoming empty promises, while foreign influence extends in export locations. Failure of meaningful consultation, a neglect of public participation and a lack of transparency in processes lead to ecological distribution conflicts, where local communities fear loss of livelihoods through diminished access to resources, intensification of polluting industries, environmental degradation and social injustices. The promise of green hydrogen as a solution to the intersecting crises of employment, energy and climate in South Africa is dubious, disproportionately affecting

historically marginalised communities, in part shaped by Dutch colonial history in South Africa. Genuine justice in energy transitions requires a holistic account of justice, including concepts such as energy democracy and sovereignty, ensuring local control and equitable resource distribution. However, the Dutch expansion of green hydrogen frontiers, mirrors historical patterns of resource exploitation, increasing pressure on already vulnerable ecosystems. Meanwhile the Netherlands maintains its excessive consumption patterns unquestioned. Dutch involvement in green hydrogen projects in southwestern Africa reflects green colonialism.

Keywords: green colonialism, green hydrogen, environmental justice, ecomodernism, ecological distribution conflicts

List of abbreviations

EBN - Energie Beheer Nederland

EU - European Union

EZK - Ministerie van Economische Zaken en Klimaat (Ministry of Economic Affais and Climate)

GW - GigaWatt

MW - MegaWatt

NWP - Nationaal Waterstof Programma (National Hydrogen Programme)

PoR - Port of Rotterdam

PPP - Public Private Partnerships

RVO - Rijksdienst voor Ondernemend Nederland (Dutch Enterprise Agency)

SEZ - Special Economic Zones

GHG - greenhouse gases

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1. Introduction

Over the last years, green hydrogen has established itself as the newest low-carbon technology to mitigate the climate crisis. Other variations on hydrogen production are among others; blue hydrogen made from natural gas (grey hydrogen) or coal (brown or black hydrogen) by using CCS to capture the carbon emitted by hydrogen to store it (often) under the ground, or pink hydrogen made from nuclear power (Cheng and Lee, 2022). This newest form of hydrogen production utilises electricity produced by renewable energy sources to split water molecules into hydrogen and oxygen (IEA, 2023). Therefore, it is proposed as the solution to transit hard-to-abate sectors such as long-distance (industrial) transportation and heavy industries such as steel production (Bermudez et al, 2023). These applications currently demand less than 0.1% of hydrogen demand, yet the EU fully embraced the application of green hydrogen increasing demand to one-third of the global hydrogen demand (Bermudez et al, 2023).

The 2019 EU Green Deal aims to make the European Union (EU) carbon-neutral by 2050 through its net-zero strategy (European Commission, 2019; IRENA, 2022). This process accelerated due to the Russian invasion in Ukraine of 2022, exposing the EU's reliance on Russian oil and gas (Müller et. al., 2022). This acceleration, written down in REPowerEU, incentivised the diversification of energy supply while transitioning into green alternatives (Müller et. al., 2022). Green hydrogen proposed the perfect solution for the Dutch plans to phase out onshore gas extraction, while transitioning their gas infrastructure to green hydrogen infrastructure creating a possibility to position themselves as the green hydrogen corridor for northwestern Europe (NWP, 2021).

Green hydrogen provides the missing link in the green energy transition since it allows transportation over long distances by the use of ammonia and other energy carriers that are still under development (Bermudez et al, 2023). The Netherlands views this as an opportunity to import green hydrogen from South Africa (and Namibia) to the Port of Rotterdam (Becker et al, 2023). This import ambition translates to Dutch and European investments in green hydrogen production and export facilities along the southwestern coast of Africa, from a perspective that is supposedly 'mutually beneficial' (Becker et al, 2023, p. 3).

Although promises for a green transition often collide with the term 'just transition', in many of the policy papers, agreements and projects, there is a lack of description in these texts to what justice entails (Zografos and Robbins, 2020; Gupta et al, 2023; Vela Almeida et al, 2023). It risks the creation of green hydrogen facilities through financial structures and political mechanisms that overlook local demands and perspectives. Green hydrogen has both a vertical and horizontal reliance on resources and in distribution of power (Huber and McCarthy, 2017), potentially recreating patterns of unequal ecological exchange (Hickel et al, 2020).

1.1. Societal relevance

The Netherlands is amongst the largest carbon emitters per head in Europe where it follows Poland and is followed by Germany (EBN, 2023). Also, the Netherlands ranks amongst the highest globally in terms of energy demand per capita (Our world in Data, 2022). Now, green hydrogen will enable a so-called 'second gas revolution', reusing the fossil grid with green hydrogen (Gigler et al, 2021). However, since the Netherlands does not have the conditions to produce sufficient renewable energy for green hydrogen production itself, the country has found South Africa (among others) to be a suitable location to produce and import green hydrogen from.

The South African government aims to benefit from the global energy transition by collaborating with foreign companies and governments on the production of green hydrogen (Ramaphosa, 2023). Collaboration with the Netherlands, could help the green hydrogen strategy which is meant to solve multiple issues, including decreasing South Africa's GHG emissions, develop the economy through the attraction of (foreign) investments and by enhancing employment opportunities, in order to tackle South Africa's employment crisis and wealth gap (DSI, 2021; Ramaphosa, 2023). The Dutch government and stakeholders expressed their interest in South Africa for the transition to green hydrogen, due to the country's abundance of wind and solar hours, additional to the supposed availability of land, leadership in PGM output; including the platinum and iridium necessary for fuel cells and electrolysers, specific technical knowledge, existing port infrastructure and its necessity to change their current energy system (Becker et al, 2023). Already, the Netherlands contributed heavily to the South African green hydrogen fund, increasing the expenditure on export infrastructures that are enabled by a network of public subsidies, while this is also reinforced by the South African government and local stakeholders who aim to gain export revenues from these developments (Becker et al, 2023; Kalt et al, 2023). The European Investment Bank (EIB) contributes as well to the South African Just Energy Transition Investment Plan (JET-IP), which marks hydrogen as a national priority for 2023-2027 (Becker et al, 2023). The EIB set up the European Hydrogen Bank (EHB) to accelerate investment and to facilitate renewable hydrogen imports to the EU (Directorate-General for Energy, 2023), and 'other development banks aim to expand the global hydrogen market and develop South Africa into Europe's main power station' (Kalt et al, 2023; Vanaerschot, 2023).

South Africa's need to lower its GHG emissions is due to the primary supply of energy and electricity generation through coal (IEA, 2019; DSI, 2021). Therefore, South Africa ranks 7th globally in the production of coal (Carbon Brief, 2018; McSweeney and Timperley, 2018). Coal, also, is the reason that South Africa is the 14th largest emitter of greenhouse gases (GHG) through mainly carbon emissions (Carbon Brief, 2018; McSweeney and Timperley, 2018). Alongside the need for many of the power stations that need to be decommissioned soon due to old-age by 2050, South Africa is looking towards green hydrogen as a solution, in which renewable energy power generation will develop through private sector investments (DMRE, 2021; DSI, 2021; South African Government, 2022). Not only is green hydrogen promoted as the promise to tackle climate change, it is supposed to alliviate the country from the ongoing energy crisis, due to mismanagement at Eskom (the country's largest electricity producer), the energy regime is in need of drastic change (Kalt et al, 2023).

The issues at Eskom are remnants of apartheid which in turn came out of colonialism (the Economist, 2022), a history that started when Dutch settlers started a trading post called 'Cape the Good Hope' in the seventeenth century (Green, 2022). Although the green hydrogen developments are proposed from the perspective of a just energy transition, it remains a question whether the historically marginalised, who suffer most under Eskom's mismanagement, will be uplifted through these developments (the Economist, 2022). In theory, the energy transition could decrease inequality, yet the opposite seems to be happening because energy consumption remains unquestioned in the dominant global discourse on energy transitions (Schütze, 2024). As long as this discourse remains focussed on growth, a perpetuation of coloniality seems likely with green hydrogen as the solution for intersecting crises (Kalt, 2024).

This system of growth, particularly green growth, is executed through the privatisation of public energy systems and diminished state control under the guise of 'sustainable development' and 'climate protection' (Sweeney, 2023). Both EHB and EIB are criticised for greenwashing and lack of incorporating local communities (Hallowes and Munnik, 2022; Vanaerschot, 2023). Due to the administrative barriers experienced by decision-makers (Dejonghe, 2023; IEA, 2024), legislature is shortened or bypassed in order to speed up the construction of green hydrogen facilities, resulting in protests from local communities who were not consulted (Steenkamp, 2023; Kalt, 2024). Under the ideas of sustainable development, narratives of green growth justify the expansion of green energy frontiers, while local communities and environments bear the costs of the green extractivism and other dynamics that further entrench inequalities.

1.2. Scientific relevance

Claar (2022) asserts that the EU-African relations under the EU Green Deal (EGD) must be understood in the context of colonial history, revealing the presence of green colonialism within this dynamic. Energy, here, is seen as the mediator in the relation between people and their environments and is therefore an important lens to view neocolonialism (Tornel, 2022). In these neocolonial energy landscapes, experience and memory are connected to political histories and power dynamics in particular places, which emerge from attempts to control people and places by reinventing the meaning of these landscapes (Tornel, 2022). The dominance of capitalism has transformed, therefore, these landscapes into places regarded as 'wasted space' (Tornel, 2022), which justifies extractive businesses and/or the creation of renewable energy facilities in these spaces, while overlooking local demands. In the case of renewable energy, the system of green capitalism recreates the system of fossil capitalism, where these wasted spaces become are sacrificed for the energy transition. Or as Zografos and

Robbins (2020) call ‘Green Sacrifice Zones’, which occur in the case of ‘green extractivism’ or ‘green colonialism’.

Sovacool (2021, p. 13) argues that ‘low-carbon transitions and climate mitigation efforts can be viewed as power struggles and processes of exacerbating vulnerability’, where enclosure, exclusion, encroachment, and entrenchment of local populations across green technologies. Extractive violence occurs as an unfolding process, which could happen at different speeds and various forms through; dispossession, coercion and physiological and psychological harms associated with the pollution and degradation of socio-environmental systems which refers to slow violence (Le Billon and Middeldorp, 2021).

Scholars have identified that German involvement in the South African energy transition through green hydrogen adds to this pattern of unequal exchange (Müller et al, 2022; Kalt, 2024). In this thesis, I want to highlight the role of the Netherlands in green hydrogen developments in South Africa. First, because the Netherlands presents itself as a potential distribution hub for green hydrogen through the Port of Rotterdam, where already much of the imported energy is exported to Germany (EBN, 2023). Secondly, Schmidt (2015) notices how the role of the Dutch creation of colonial knowledge production has been highly impactful, yet rather obscured in history. It seems that the Netherlands gets away by remaining in the shadow of its surrounding countries such as Great Britain, Germany and France, while Dutch colonial history has contributed to being the world's most polluting countries (Evans and Viisainen, 2023). It could be for this reason that I miss any note on green colonialism in green hydrogen developments by Hamouchene and Sandwell (2023), while the Dutch ambitions could perform a continuation of the coloniality they began ±375 years ago.

Through the lens of political ecology and environmental justice, I aim to understand the connection between green hydrogen import/export from South Africa to the Netherlands. In this research, I argue that the dominant ideology of ecomodernism resulted in the situation where the Netherlands is working to combat climate change through technocratic and economic solutions, by expanding green energy installations and technologies of which green hydrogen is the most recent development. This is done through the theoretical frameworks of green colonialism, ecomodernism and environmental distribution conflicts, through which the green economy is used to mitigate climate change through financial structures and economic developments. I try to understand in what way this system overlooks the foundations of capitalism, that leads to a change in what Martínez-Alier (2009) calls the 'social metabolism of human economies, pushed by population and economic growth, the resulting ecological distribution conflicts among human groups'. So, instead of following the lines of sufficiency, the energy demand in the Netherlands is based on maintaining unsustainable, consumerist lifestyles and maintaining industries in the Netherlands and surrounding countries (particularly Germany), while expanding green energy frontiers through green hydrogen, thereby externalising the costs to human and non-human life in these places.

1.3. Problem statement

The research aims to deconstruct the Dutch view on the green hydrogen energy transition by understanding the underlying narratives from which this transition and import ambitions are motivated. My objective is to highlight the concerns and (potential) impacts green hydrogen developments can have along the southwestern coast of Africa. In close proximity, three projects are currently developed, in which the Netherlands aims to take part, of which one in Namibia, close to the South African border. Although my particular focus lies in the renewal of colonial relations of the Netherlands in South Africa, the Namibian project is further advanced

and highlights aspects necessary to understand the socio-economic impact of green hydrogen developments. The goal of this thesis is to provide analysis of the systems in which this green hydrogen export/import market is manifested by investigating the ideologies, institutions and infrastructures–three interacting perspectives from which an understanding of power distribution can be made. This will lead me to understand the dominant and overlooked narratives, the political and financial structures, and distribution of benefits and costs between the Netherlands and South Africa, so I can investigate the three subquestions, which will lead me to developing an answer on my main research question:

'To what extent do Dutch green hydrogen import ambitions
exercise green colonialism in South Africa?'

1. What is the drive behind the Dutch green hydrogen import ambitions?
2. What are the socio-environmental concerns and impacts of green hydrogen developments?
3. Do the promises of sustainable developmentalism reflect reality?

The research is structured as follows. In chapter 2, I discuss the theoretical framework, which I have divided into green colonialism; conflicts in the energy transition that is subdivided in ecological distribution conflicts, energy diplomacy, transition conflicts, and hydrogen justice; and the historical context of Dutch coloniality in South Africa. In chapter 3, I discuss the methodology, which is divided in research approach; data collection, subdivided in secondary data and Semi-structured interviews; I will continue to explain how I analyse the data; and I end with a twofold section on limitations and challenges, and positionality and reflexivity. In chapter 4, the discussion is divided in three sections as follows the sub questions to the research

question. First, I discuss the drive behind green hydrogen ambitions from the perspective of the Netherlands (and the EU), which is divided in explaining the motivations for import; followed by the achievability of these ambitions; the financial mechanisms that support ambitions; and lastly I elaborate on the mechanisms of responsibility. Second, I discuss the concerns and impacts of green hydrogen developments. Here, I start by explaining the Boegoebaai, Saldanha and Hyphen plans for green hydrogen, then I divide the socio-environmental concerns, and (potential) climate and health impacts in the sections on land, water and air. Third, I discuss the promises and realities of sustainable development, starting by a failure of meaningful consultation and a lack of public participation. I continue by explaining the unrealistic promises of economic development, which are divided in employment promises and energy distribution. I end with a conclusion, where I summarise my findings and suggest directions for further research.

2. Theoretical framework

The theoretical framework of this thesis contains an understanding and elaboration of green colonialism and conflicts in the energy transition through the framework of political ecology. In the first section, I identify the mechanisms that explain the occurrence of green colonialism, by highlighting certain aspects of this dynamic including the concepts of environmental orientalism, ecomodernism, green capitalism, green extractivism, sustainable developmentalism, the green economy and green energy frontiers. Continuously, I will explain the consequences of these dynamics, by highlighting the ecological distribution conflicts, conflicts in energy diplomacy and transition conflicts. Having done so, the historical context of the Netherlands in South Africa will be sketched in addition to the process of the construction of Dutch colonial narratives that, I argue, are still persistent in Dutch culture. Furthermore, I will dive into the meaning of justice, to understand what a just energy transition should entail. I will use this theoretical framework to understand the current dynamics in Dutch-South African green hydrogen import-export relations, from where I will identify why and how these relations are conflictual and unsustainable.

2.1. Green colonialism

Green colonialism refers to the deepening and/or extending of domination through colonial relations of plunder, dispossession and dehumanisation of marginalised groups, countries and peoples prioritising the need of one region over the other in the green renewable energy transition (Zografos and Robbins, 2020; Hamouchene, 2023). This is understood from the perspective of political ecology, a field of critical research that questions the relationship between politics, economics and nature which Robbins (2012, p. 13) describes to be understood from the idea that 'any tug on the strands of the global web of human–environment linkages reverberates throughout the system as a whole'. I argue in this thesis, that the narratives

of ecomodernism has led to green hydrogen to become such as 'tug', which puts pressures on this 'global web of human–environment linkages'

Political ecology can be understood from the following interacting perspectives, namely ideologies which are materialised in institutions, that in turn travel through ideological infrastructure (Loewenstein, 1953). The dominant narrative of capitalism degrades nature to the 'production conditions' of a place (Escobar, 1996), and views nature as a passive entity separate from humans, open to appropriation and commodification for the benefit of (a certain group of) people (Neumann, 2008; Dorn et al, 2022). These ideologies translate to the creation of institutions. Here, power is centralised and narratives reinforced, resulting in the control, valorisation and distribution of natural resources through infrastructure such as mines, pipelines and harbours (Escobar, 1996; Robbins, 2012; Dorn et al, 2022).

The concept of 'environmental orientalism', as explained by Hamouchene and Sandwell (2023, p. 9), is the dominant narrative underlying the process of the expansion of green energy frontiers. At the foundation of this concept lays 'orientalism', defined by Said (1978), this explains the dominance of Western ideologies on the non-Western regions where these are deliberately misinterpreted for the continuation of an essentialist narrative that serves colonial demands (Hamouchene and Sandwell, 2023). Orientalism justifies the othering of a place and peoples, invisibilising their cultures and practices for the sake of improvement and restoration as argued by the colonising power (Zografos and Andreucci, 2022; Hamouchene and Sandwell, 2023).

This environmental orientalist outlook connects to the concept of ecomodernism which describes the industrial economy from an environmentalist perspective (Martínez-Alier, 2021).

The ecomodernist decarbonisation of the global economy through technological innovation relies on the framework of green growth, that searches for so-called sustainable solutions while maintaining economic growth (Martínez-Alier, 2002; Dorn et al, 2022). However, this idea overlooks processes that lay at the foundation of growth. Martínez-Alier (2021, p. 1) explains that 'the industrial economy is entropic', in other words, the industrial economy always demands new supplies and materials from 'commodity frontiers' combined with the output of polluting waste. In regard to the green energy transition led from an ecomodernist perspective, Hickel and Kallis (2019, p. 480) argue that 'growth increases energy demand'. Thus, the green energy transition from an ecomodernist perspective keeps expanding commodity frontiers. In this context referred to as the green energy frontier, which debunks the idea of circularity through renewable energy, because it does not address the resources needed to create and maintain energy sources as well as that it does not address the industrial economy itself (Martínez-Alier, 2021).

Further critique of this environmental orientalist, ecomodernist narrative finds that in general energy remains too often described only in technical terms, overlooking the speciality of energy in the type of power it produces according to Huber and McCarthy (2017). Fossil fuels are energy-dense, which translates to the seemingly limited amount of space these resources initially take in. Extraction and distribution dramatically enlarge this space, allowing power to be reproduced between resource-owning states and multinational extractive capital (Huber and McCarthy, 2017). Fossil fuels are easy to transport over long distances, allowing for the 'vertical' power dynamics to be established. In other words, industrial capitalism is manifested in the 'vertical' reliance of resource extraction, distribution, wealth, pollution from 'down' to 'up'; from underground to above ground; from south to north (Huber and McCarthy, 2017).

Through this mechanism, capitalism creates social power through control over land, labour, resources, machines and money (Huber and McCarthy, 2017).

Green capitalism, according to Dunlap (2023, p. 42) presents a misleading mechanism that uses ideas and ideologies to continue the 'capitalist political economy and statist governance'. Hickel and Kallis (2019, p. 15) therefore argue that green growth is political. 'The assumption is that it is not politically acceptable to question economic growth and that no nation would voluntarily limit growth in the name of the climate or environment; therefore green growth must be true, since the alternative is disaster'. Maintaining this economic growth, results in mechanisms such as eco-taxes, emissions-permit-markets and other climate mitigation schemes, while technological innovation puts emphasis on 'sustainable development', 'ecological modernization' and 'wise use' of natural resources supported by materials- and energy-saving changes (Martínez-Alier, 2002; Dawson, 2010; Dunlap, 2023). Using these 'green' and 'sustainable' discourses, add to the strategies of justification of coloniality (Dunlap, 2023, p. 42). Through the idea of development, import countries argue that green energy projects are for the benefit of the export country and communities as well (Daggett, 2019, p. 11). From this line of thinking, ecomodernists critique arguments of environmentalists to deny 'the higher planes of civilisation and life, predicated on the availability of productive work for all citizens' as explained by Daggett (2019, p. 11). Meanwhile, the green economy acts as a means to 'stabilise environmental anxiety, unrest, and to intensify techno-capitalist development' (Dunlap, 2023, p. 40). Dunlap (2023, p. 42) describes it as a way to 'convince people that capitalism can resolve the socio-ecological crisis. Despite all evidence to the contrary'.

For the production of green energies, facilities need resource extraction in order to work, which Andreucci et al (2023, p. 8) describes as green extractivism, or 'minerals for so-called

low-carbon technologies such as renewables'. So-called 'export-led growth' justifies green extractivism (Andreucci and Kallis, 2017), because free trade strategies will supposedly lead to a scenario where all participants gain and everyone wins because each participant is able to set a range of standards to safeguard local priorities (such as the prevention of polluting industries or trading of rare resources) (Muradian and Martínez-Alier, 2001). It imagines power between states is distributed equally, however, overlooking historical developments and inequalities that resulted from the (previous) expansion of energy frontiers, alongside the continuous uneven distribution of resources. Eventually, these market-based solutions, as presented through eco-modernism, assume that resources are infinitely reusable and exclude the costs connected to the processing of these resources. These solutions often remain to represent the interests of the dominant fossil fuel sector and their shareholders, falling into green capitalism (Croeser, 2021; Yang and Yang, 2022)

Green hydrogen is the missing link that allows to reproduce the 'verticality' of the fossil system with renewable energy justified by a sustainable developmentalist narrative. Green hydrogen creates an energy carrier that allows renewable energy to be transported over long distances similarly to fossil fuels. Through a bioeconomy, as mentioned on the website of the EU, 'using renewable biological resources from land and sea, like crops, forests, fish, animals and microorganisms to produce food, materials and energy' will decarbonise the continent (European Commission, 2022). Yet, this ecomodernist bioeconomy promoting green growth neglects the circumstances and places in which these resources have to be produced (Dorn et al, 2022).

Renewable energy requires vast amounts of space, intensifying the 'horizontal' reliances mainly in rural areas that are thinly populated and where land is relatively cheap (Huber and

McCarthy, 2017). The extension of 'horizontal' reliances of green hydrogen result in the expansion of the green energy frontier by constructing wind and solar farms in places where land is most cheap (Huber and McCarthy, 2017). This happened while the 'vertical' reliances are deepened, increasing the pressure on (marginalised) peoples, places, ecologies and spaces, risking these geographies to be (further) sacrificed for the extraction, transportation, installation and operation of low-carbon energy transitions (Huber and McCarthy, 2017; Zografos and Robbins, 2020). Green hydrogen, thus, might further expand these 'green sacrifice zones' in ecologies, places and populations (Huber and McCarthy, 2017; Zografos and Robbins, 2020, p. 543).

The interconnectedness of the industrialised world is deepened through the energy market, yet simultaneously intensifying the b/orderly world which emphasises differences between peoples, ecologies and identities (van Houtum and Naerssen, 2002). Decarbonising the energy sector while mitigating the climate crisis results in struggles over power and processes of increasing vulnerability (Sovacool, 2021). This is due to the expanding green energy frontiers resulting in decarbonisation by dispossession. Through the ecomodernist outlook of capitalism, 'market elites effectively come to possess the assets of others', defined by Sovacool et al (2019, p. 7). Motivated by the competition of the capitalist market economy, assets such as labour, land, water and others are dispossessed in the race for profit and capital accumulation (Sovacool et al, 2019, p. 7). Sovacool et al (2019, p. 7), quote Harvey (2004, p. 66) by calling this the 'accumulation of dispossession', where 'centralisation of wealth and power in the hands of a few by dispossessing the public of their wealth or land'. These dynamics with relation to the energy transition can be described as green grabbing, where assets such as land or water are taken to support the green agenda (Dunlap and Fairhead, 2014; Hamouchene and Sandwell, 2023). Here, the green energy frontier is expanded and redrawn, exposing the coloniality of

these boundaries in the first place: to expose the lines of force that correspond to dominion and limits of control (Fanon, 1961; Daggett, 2019). The border, therefore, serves the one who installed them in the first place, or as Daggett (2019, p. 8) concludes, 'boundaries are inherently political'.

The ecological unequal exchange posits that industrial economies of the global North have gained their developed state by appropriating biophysical resources such as land, energy, materials and labour from the global South (Dorninger et al, 2021; Hickel et al, 2022). The wealth of the elite imposing the energy transition is located largely in the global North, yet not only, the Gulf States and China for instance are large producers and consumers of energy as well. By the instalment of green technologies in poorer nations for the securing of their energy demand, this elite continues to extract along the historic lines of imperialism on which unequal ecological exchange is built (Zografos and Robbins, 2020; Hickel et al, 2022). These dynamics and colonial rhetorics translate to the context of green hydrogen, where it is vocalised as the 'new frontier in the energy transition', the 'clean hydrogen frontier' or 'green hydrogen frontier' (Anner, 2021; Ball and Czado, 2022; Bolger, 2023). Under the guise of South Africa's 'large availability of land', the Netherlands sees opportunity for cheap production of renewable energy (Becker et al, 2023). This could overlook the fact that 'these territories are embedded in cultures and communities' (Hamouchene, 2023, p. 10), while also risking the reproduction of historic injustices.

2.2. Conflicts in the energy transition

The effects of this green energy transition manifests in the intensification of exploitation of resources leads to enclosure, exclusion, encroachment and entrenchment, while undermining the sovereignty of native and indigenous communities and ecologies (Zografos and Robbins, 2020; Sovacool, 2021). Meanwhile, it is impossible for all such nations to 'catch-up' on the state of development of richer countries (Zografos and Robbins, 2020; Dorninger et al, 2021; Sovacool, 2021; Hickel et al, 2022). These injustices occur as an unfolding process, which could happen at different speeds and various forms through; dispossession, coercion and physiological and psychological harms associated with the pollution and degradation of socio-environmental systems, relating to the concept of slow violence (Le Billon and Middeldorp, 2021).

2.2.1. Ecological distribution conflicts

Overexploitation of resources causes deterioration of quality (of for instance soil), and the consumption of renewable resources does not level the time it takes for resources to (re)grow (in case of wood, fish etc.) (Martínez-Alier et al, 2016, p. 731). Martínez-Alier et al (2009, p. 64-65) argues that expanding economies generate more waste, damage natural systems, undermine rights of future generations and cause unequal access to environmental resources. It results in a constantly expanding commodity- and/or extraction frontier to supply a growing demand (Martínez-Alier et al, 2016, p. 65). Daggett (2019, p. 7) argues that, therefore, energy has become one of the main sources of contestation in the political arena nowadays, since it is an important driver of capitalism through which various processes like work and waste can be measured and accounted for (Daggett, 2019). The change in what Martínez-Alier et al (2009, p. 64-65) call the 'social metabolism of industrial economies' (including the excessive production of carbon dioxide) gives rise to increasing numbers of conflicts, interfering with social conflicts related to race, class and gender. These 'ecological distribution conflicts', thus refer to the

environmental injustices in ecological economics, and can be identified as conflicts around extraction, transport and waste disposal, where local populations and ecologies bear the costs and resist developments along these supply chains (Martínez-Alier et al, 2016).

'Ecological distribution conflicts' were first highlighted by the environmental justice movement in the US and are translated to a global perspective by Martínez-Alier (2002, p. 12) in 'Environmentalism of the Poor'. This strand of environmentalism fits into the larger political ecology framework, which critically examines the power dynamics that influence access to natural resources and aims to reveal disparities and injustices in the distribution of costs and benefits within society (Robbins, 2012).

2.2.2. Energy diplomacy

In addition to ecological distribution conflicts that are intensified due to the ecomodernist energy transition, conflicts, too, arise along energy diplomacy. This refers to the practice of states and non-state actors of securing energy resources through foreign policy (Dejonghe, 2023). Here, energy dependency is regarded as a political issue that needs to safeguard national interests–following for instance the Russian invasion in Ukraine and the subsequent energy crisis–and is currently based on a geostrategic and market-based approach. The manipulation of infrastructure or change in energy prices for geopolitical reasons could be a result with the goal of hurting the largest offtakers/consumers (Dejonghe, 2023). These are largely located in the global North, which is highly dependent on energy import to maintain their energy intensive lifestyles. Besides, companies whose profits are at stake also suffer largely from an unstable energy supply. Meanwhile, energy demand is growing, increasing the energy dependence amongst consumers, leading to the securitization of energy policy to forecome future insecurities (Dunlap and Fairhead, 2014; Dejonghe, 2023). This response, in turn, can

give rise to new forms of authoritarian control, contributing to a broader trend towards right-wing politics on a global scale (Dawson, 2010; Dunlap and Fairhead, 2014; the Economist, 2024).

Similarly, global warming and the climate crisis are regarded as a threat multiplier, leading the security sector to take proactive measures to manage its so-called inevitable, direct impacts of intensifying conflicts in places where environmental degradation is most felt (Dunlap and Fairhead, 2014). This creates a self-fulling prophecy where the continuation and intensification of existing political and industrial economic relationships fail to address their own responsibility and thus exacerbate the changing of the climate (Dunlap and Fairhead, 2014). Yang and Yang (2022, p. 748) quote Marx by saying 'the abuse of nature by capital is no different from the exploitation of workers by capital'. The increase of right-wing politics exposes how the securitization of national interests such as energy go hand in hand with the dismissal of climate change as a non-problem which arguably pose a so-called threat from the 'real' issue: immigration (Malm and the Zetkine Collective, 2021). For example, the expenditure of the top global carbon-emitting countries–USA, China, India, EU and Russia– spent approximately 2,3 times as much on strengthening their borders than on climate finance (TNI, 2021; World Resources Institute, 2021). Referencing Zygmunt Bauman, Dawson (2010) argues that as the climate crisis intensifies, the contradictions of green capitalism will lead to more 'human waste'—individuals rendered surplus by the relentless progress of modernity.

2.2.3. Transition conflicts

Although promises for a green transition often collide with the term 'just transition', in many of the policy papers, agreements and projects, local ecosystems and populations are invisibilised,

and there is a lack of description in these texts to what justice entails (Zografos and Robbins, 2020; Gupta et al, 2023; Vela Almeida et al, 2023). Dunlap (2023, p. 44) argues that a 'transition' ignores the continuation of addition of generalised energy extraction, meanwhile opening the doorway to environmental-technological optimism and, consequently, market development in line with the rise of sustainable development'. Energy injustices are embedded in existing energy systems and energy policies (Tornel, 2023). Hamouchene and Sandwell (2023, p. 44-45) argues that 'a just transition may mean very different things in different places', therefore, defining the boundaries in which these conceptions of justice have been formed allows for redefining the concept into reconnecting life and thought in order to create a plural political ecology of knowledge (Escobar, 1996). By guidance of local populations themselves, it is important to recognize the contextual aspect of what justice entails, therefore speaking of justices instead of one justice (Hamouchene, 2023, p. 44-45). Schlossberg (2004, p. 535) puts this notion in the context of activism where they argue that 'the environmental justice movement demonstrates the power of a unity without uniformity as it illustrates environmental justice on so many dimensions simultaneously'.

Yet, the lack in conceptualising justice in the energy transition leads to changing dynamics that spark societal responses that translate to what Kalt (2024) calls 'transition conflicts'; struggles for dominance that arise in the realm of society-nature interactions due to the politicisation of ecological crises (Kalt, 2024). While similar to ecological distribution conflicts, transition conflicts focus on the transition from one system into another in which Kalt (2024) particularly focuses on the impacts of the green hydrogen transition. Temper et al (2020) proof that 'low carbon, renewable energy and mitigation projects are as conflictive as fossil fuel projects', and disproportionately affect rural and indigenous communities amongst other vulnerable groups. These socio-ecological changes are largely shaped by conflicts among groups with differing

interests, beliefs, and objectives, all operating within a framework of unequal power dynamics (Kalt, 2024). Driven by concerns over failure of social inclusivity and environmental damage in decarbonisation projects, these groups face repression and violence in many of their actions (Temper et al, 2020). Temper et al (2020) shed light on local communities efforts to reshape the energy systems by the demand for including 'localisation, democratic participation, shorter energy chains, anti-racism, climate-justice-focused governance, and Indigenous leadership' in energy transitions.

Within the environmental justice framework it is vital to let people speak their own voice (Martínez-Alier, 2002). This is emphasised by the Earth System Justice framework that argues from the perspective of the most marginalised and poorest people in order to refocus boundaries towards the reduction of harm and increased well-being of these groups, while reflecting on different types of justices (Gupta et al, 2023). Genuine just transformations, according to Gupta et al (2023, p. 638), challenge power politics that are often vested in ecomodernist principles. Radically reforming and redistributing the global system forces us to reimagine the dominant narratives into a future where a multitude of knowledge systems are recognised and respected, mostly from misrecognized or unrecognised groups (especially local and indigenous) (Gupta et al, 2023). Acknowledging that race, class, gender, sexuality, and other differences between humans shape different environmental justice struggles is of vital importance (Pellow, 2016). In this assessment, the non-human world is considered equal to the human world and their struggles need to be understood to paint an image of disproportionate unequal distribution of harm (Pellow, 2016; Hickel et al, 2022).

2.2.4. Hydrogen justice

According to Sovacool and Dworkin (2015) energy justice in the context of decision making needs to include: availability; affordability; due process; good governance; sustainability; intergenerational equity; and responsibility. Yet these principles remain very consumer-oriented. Related to environmental justice, other forms are explained as distributional justice which refers to the equal allocation of benefits and burdens, procedural justice emphasises the need for all stakeholders to participate and are taken seriously in decision-making processes and recognition justice demands that individuals and groups are represented respectfully, free from (physical) threats, insults, devaluation and degradation (McCauley et al, 2013). Temper (2019, p. 30) argues that it is important to inform environmental justice through a decolonial lens to not reproduce Western settler-coloniality, where they state that 'decolonization calls for an abolition of property relations as we know them and a renewal of our relationship with nature'. Furthermore, they argue that inherently in environmental justice is resistance against the politicisation of environments; justice should allow indigenous communities to live their own concepts of justice through 'practice, enactment and antagonistic politics that disrupt the economic and social logic and production of settler colonial power' (Temper, 2019, p. 28). Temper (2019, p. 30), thus, questions how to listen to struggles of those who suffer under settler-colonialism, to inform a more radical and emancipatory environmental justice.

In terms of energy, the concept of a genuine just transition includes concepts like energy democracy and energy sovereignty, where Hamouchene and Sandwell (2023, p. 45) discusses this situation as a place 'where people have access to, and control over, the resources they need to lead dignified lives, and have a political role in making decisions about how those resources are used and by whom'. In that regard, a just transition is not just about energy (Hamouchene, 2023 p. 45), but about the way people also relate to the concepts of work and waste (Martínez-Alier, 2021).

Müller et al (2022) define justice in the context of green hydrogen production, export/import and infrastructure facilities, where they question access, ownership and distribution over resources such as land, water, energy, as well as financial and political mechanisms. Using the classical environmental justice framework from Schlossberg (2004) hydrogen justice is defined by Müller et al (2022) through procedural, relational, recognitional, distributive, restorative and epistemic justice. Schlossberg (2004, p. 528) translates demands of global environmental justice movements as the 'equity in the distribution of environmental risk, recognition of the diversity of the participants and experiences in affected communities, and participation in the political processes which create and manage environmental policy'. Müller et al (2022, p. 5) apply this to hydrogen justice by stating that in 'a neoliberal global hydrogen market, import-focused hydrogen strategies in consuming countries and export-oriented hydrogen projects in producing countries increase the risk of hydrogen injustices as do high drought risks, high energy poverty, lack of renewable energy in the energy mix, lack of participation opportunities, and weak labour, social and environmental standards in producing countries'.

2.3. Historical context

Although many accounts state that South Africa's colonial history started when the Dutch arrived mid-seventeenth century in the Cape (Kuipers, 2014). Already ±150 years before, the Portuguese landed here as well, under Antonio de Saldanha who gave the name to what is now known as the Table Mountain, where he was protested away by the indigenous communities (Thael, 2010). In 1601, a Dutch sailor arrived in what he thought was the Cape, but it appeared to be the current-day Saldanha Bay (Laubscher, 2009). Expansion of colonial frontiers, however, happened in the Cape ±50 years later, due to the freshwater availability. This was when the Dutch East India Company (VOC), which later became known as the first

multinational in the world with the Dutch government as largest shareholder, established the trading post called 'Cape the Good Hope' (or the Cape) between Europe and the East Indies (Worden, 2007). The settlement was not intended to produce commodities for the Netherlands but to provide restocking for the ships, yet it expanded its frontiers through the establishment of farms to provide the settlement with food (Guelke, 1976; Green, 2022).

When Dutch settlers arrived, along the southwestern coastline the Khoi and San lived, yet these were far from monotone groups as history books tend to say (Mellet, 2020). The frontier expansion violently dispossessed and oppressed these communities, or forced them to work on the Dutch farms (Willebald and Juambeltz, 2016). The frontier grew as the settlement grew, when resources in the settlement became insufficient, more farmland was needed (Mellet, 2020; Green, 2022). The economic competition in the open market of the growing settlement, led to increased value of farms close to the Cape pushing poorer settlers to expand the edges at the frontier. At its peak, the Cape was estimated to be the size of Italy (Worden, 2007), or Great Britain with a population of 25,000 Europeans (Guelke, 1976). In this process, cheap labour on the settlers' farms came from the exploitation of the Khoi and San alongside the 20,000 imported slaves (Green, 2022). Although the Khoi and San resisted these developments heavily, fired by the land grabs and brutal treatment of settlers against their enslaved and indigenous labourers, the colonists proved too powerful to retrieve forces (Green, 2022).

After 150 years of the Dutch trading post in the Cape, the British took over control driving parts of the Dutch-speaking population called Boers (translates to farmers) inland where they established two independent republics (Bosgra, 2008). Under British rule, indigenous inhabitants remained forced to serve the colonising power (Bosgra, 2008), while racial segregation, unequal land distribution, and stark wealth disparities exacerbated in nineteenth-

century Cape and twentieth-century South Africa under eventually the Apartheid regime from 1948-1994 (Green, 2022).

At the same time as the British took over South Africa, the Dutch abandoned territorial overseas expansion as a whole and shifted to a trade-based model which enabled them to trade the 'image' of the world that translated to the idea that Europe did not only expand overseas, but created itself by this expansion (Schmidt, 2015). It explains that the Dutch government took a neutral stance in the change of power in South Africa, opposed to the Dutch public that sympathised with the Boers (Green, 2022). Made in graphic workshops, the Dutch promoted a pan-European, non-national, 'universal' and non-doctrinal worldview, dividing the world into imperial Europe and the exotic Other, thus creating both a European consumer and an exotic subject for consumption, promoting a sense of global sameness and subtly downplaying imperial rivalries (Schmidt, 2015). In maintaining these differences, European ideologies were supported by colonial experiences that influenced the idea of what it means to have a 'European identity', making Europeans feel distinct over non-Europeans (Schmidt, 2015). While much of the knowledge about colonies was developed in Europe across its various imperial centres (Schmidt, 2015). The Dutch, managed to synthesise a vast array of sources, creating both the 'gallery' of the world and its audience, thereby forming a knowledge that supported European imperial power which appeared neutral but had a distinctly European perspective (Schmidt, 2015). Directing the narrative while remaining seemingly backstage could explain the reason why Said (1978) overlooks the Dutch contribution in the forming of what Schmidt (2015, p. 16) calls 'colonial knowledge' in his conceptualisation of orientalism.

This narrative is visualised in the low-horizon in classical paintings according to Helmreich (2023), who explains that this Dutch iconography translates to the dominant idea in Dutch

culture, which is a(n) (imperial) perspective that encourages 'an expansive (imperial) navigational point of view'. The horizon symbolises the frontier to be discovered, and crossing it holds promises of improvement and growth according to this horizon-gaze (Helmreich, 2023). Wekker (2016) expands by pointing out that these past four hundred years of 'unacknowledged Dutch imperial rule' still dominate processes of meaning-making, 'including the making of the self, taking place in Dutch society'. This becomes clear in the policy advice commissioned by the Dutch ministry of Economic Affairs and Climate, that overlooks ±150 years of Dutch colonial settlement in the Cape (Worden, 2007), stating that 'the Netherlands has a long history of cooperation with South Africa, which has progressed from support during the anti-apartheid struggle and traditional development cooperation, to a partnership built on mutually beneficial economic cooperation, trade, and shared responsibility' (Becker et al, 2023, p. 14).

In this light, the horizon-gaze (Helmreich, 2023) of ecomodernism (Martínez-Alier, 2002) translates to the expansion of the green hydrogen frontier in South Africa, where Dutch ports aim to become a green hydrogen corridor between northwestern Europe and South Africa (Becker et al, 2023), and the west coast of South Africa risks, once again, unequal exchange of resources (Guelke, 1976; CBN 2, 2022; Hickel et al, 2022).

3. Methodology

This research is qualitative, based on semi-structured interviews with experts and stakeholders, and various secondary data, which I will further discuss below. Here, I will provide the research

design, the methods of data collection, the methods of data analysis, the limitations, challenges of the research design and I conclude with a section on positionality and reflexivity.

3.1 Research approach

A qualitative research approach acknowledges that each individual has a different view on their social reality. For this reason, this approach takes into account that there are 'multiple stories of lived experience' (Hesse-Biber, 2010, p. 455). Knowledge is situated, hence I aim to add to the knowledges that exists in a network of connections, instead of theorising the world (Haraway, 1988). This perspective refers to the political ecology framework that understands certain dynamics from a global network of human-environment relations (Robbins, 2012). Meaning-making happens through human actions, which influence and interact with the actions of a collective. This is called symbolic interactionism that opposes the idea of objectivity (Gupta, 2024). Objectivity, in that sense, denies meaning making of different entities and overlooks the variety that exists in a process as such creating a hierarchy based on one perspective (Haraway, 1988). Therefore, my research is conducted through the lens of epistemic justice, in which forms of knowledges are questioned and the reproduction of knowledge investigated (Gupta et al, 2023). Qualitative research allows to include what Denzin and Lincoln (2008, p. 11) call the 'epistemologies of critical race, queer, postcolonial, feminist and postmodern theories'. In this regard, objectivity does not exist and the researcher must be cautious not to perpetuate power and knowledge that align with ongoing political and economic structures that are dominant (Haraway, 1988; Denzin and Lincoln, 2008). Thus, at the foundation of qualitative research lies the assumption that reality is socially constructed and multiple (Hesse-Biber, 2010). This is also known as triangulation, where an attempt is made to gain a deeper understanding of a phenomenon (Denzin and Lincoln, 2008). When findings from different data sources align, it strengthens the confidence in the accuracy found in a phenomenon (Allen et al, 2016). This

thesis got shape while conducting the research, where it came to existence through a process of reflections and interactions (Gupta, 2024). In this regard, it is important to reflect on the position and the perspective of the researcher, on which I will explain more in section 3.4.

I make use of a critical paradigm that centres on examining issues of power, control and ideology, which exposes and liberates social injustices (Hesse-Biber, 2010; Gupta, 2024). There are multiple perspectives and methods to which enable me to do so (Denzin and Lincoln, 2008; Gupta, 2024), in which the adoption of a postmodern perspective helps me to create an understanding of the reproduction and privilege by elites, or as Hesse-Biber (2010, p. 455) calls them, 'those who occupy positions of power'. I use this perspective from a feminist approach that understands that all knowledge 'contains a perspective' as mentioned by Hesse-Biber (2010, p. 456). At the intersection of these perspectives, which connects to the constructivist perspective that emphasises the making of meaning, I aim to what Crenshaw (1991, p. 1296) calls 'a way of mediating the tension between assertions of multiple identity'. Intersectionality reflects on the representation of different identities a person embodies, in order to understand how this relates to a person's position in society (Crenshaw, 1991).

These perspectives, described in the above, are vital in understanding the workings of the unequal distribution of socio-environmental harm, and thus fit in the growing body of environmental justice studies. Research in this field is interdisciplinary, activist-scholar inspired and seeks connections between the academy and community, theory and practice, analysis and action (Pellow, 2016). This allows me to investigate these aforementioned green hydrogen developments, based both on primary and secondary data. My approach is influenced by the methodology developed by the Environmental Justice Atlas (EJ Atlas). The EJ Atlas visualises local socio-environmental conflicts and is a tool for research, which collectively exposes a global

dynamic of ecological distribution conflicts. Furthermore, it documents and catalogues these conflicts on an online, interactive platform which is coordinated and managed by a team of researchers and activists (Martínez-Alier, 2021; EJ Atlas, 2024). The EJ Atlas provides a space to exchange information and knowledge, to connect groups and issues, and increase visibility of environmental conflicts (EJ Atlas, 2024).

The already existing EJ Atlas cases helped me structure and analyse emerging conflicts in the realm of green hydrogen along the west coast of South Africa. By doing so, I found that the recurrence of certain conflicts around a multitude of (green) energy technologies and dynamics helped me to contextualise the quickly changing dynamics of global green hydrogen developments, and gave me the tools to create connections between the various scales in this research. However, I decided not to mention these cases outside of the southwestern coast of Africa since it risked raising confusion amongst readers. Nonetheless, using the methods of the EJ Atlas helped me identify the Hyphen green hydrogen export facility in Namibia, close to the South African border. This proved to be of importance to understand in what ways the Netherlands exercises their influence over green hydrogen projects in the region and how far they will go in obtaining energy security.

Connecting local struggles by identifying the similarities between different contexts, helps to map a network in which a phenomenon is exposed. However, it is important to prevent the generalisation of the concerns voiced and injustices experienced by different communities in these different contexts for the sake of building a theory. For this reason, this study is exploratory, where I explored the practices of meaning-making along different stakeholders and documents through a narrative research approach, allowing me to develop themes that enabled me to what Gupta (2024, p. 14) calls, "restoring' the story'.

3.2. Data Collection

Data collection in this qualitative study is based on a combination and an interaction between primary and secondary data. I will start with explaining how I collected my secondary data, in order to continue with how this influenced collecting the primary data for this research.

3.2.1. Secondary data

I gathered data by analysing the networks of power that describe the relational properties of an environment (Maya-Jariego et. al., 2016). Network analysis uses social interaction as a basis, where data by definition is contextualised (Maya-Jariego et. al., 2016). Usually used in the context of community-based research, I applied network analysis for understanding actions and positions of organisations on different scales, such as between the global and the local, but also in the different interpretations of nature-society relations. It enabled me to provide an integrated vision of the multiple levels and stakeholders within these processes and is useful for understanding the different dimensions of justice (Graham et al, 2017). Unravelling the networks in which power manifests has provided insights regarding those who are concerned or neglected in the process (Graham et al, 2017). I used this network analysis to find different organisations through which I identified potential interviewees. In the thesis, the network analysis becomes mainly visible through the different approaches and narratives interviewees have on these green hydrogen developments between the Netherlands and South Africa (and Namibia).

Understanding the different networks relevant for this research, resulted in an interaction that led me to gathering other relevant secondary data, such as notes from meaningful consultations, booklets, powerpoints and news articles. It helped to gain insights in how justice is framed and conceived through the work of multiple stakeholders (Graham et al, 2017). This data, I

retrieved from largely Dutch, South African and international governmental bodies, research institutes and think tanks, environmental justice organisations and other types of civil society organisations and non-governmental organisations, energy (related) company statements and documents, international and local journalist platforms and news outlets, and databases such as the Global Energy Monitor, the International Energy Agency (IEA) and the aforementioned EJ Atlas. Moreover, interviewees provided me with secondary data as well, such as relevant notes from events and meetings; presentation slides; booklets; and maps were shared, that these interviewees had gathered on developments in the energy landscape in South Africa, green hydrogen developments in South Africa and green hydrogen relations between the Netherlands and South Africa.

Lastly, secondary data was collected by attending events both online and in real life from January to May 2024. These events were as follows: 'Transformació Social' seminar by Observatori del Deute en la Globalització (ODG); the online conference on 'GH2: fueling just decarbonization or 'greening' extractivism?' by German and British research institutes; the webinar of CounterBalance called 'Reclaiming Europe's climate agenda: Towards a just transformation'; the 'Growth vs Climate' conference organised by ICTA-UAB; and lectures on green colonialism in the energy transition and the green hydrogen transition by amongst others Hamza Hamouchene and Max Ajl at ICTA-UAB. Attending events as such, has brought me to comprehend more tools on conducting research from the perspective of environmental justice and political ecology with relation to energy and the green energy transition. Some lectures even provided me with in-depth knowledge on green hydrogen developments in relation to green colonialism. Attending events as such, allowed me to ask questions and discuss with speakers and those interested and/or working in the field.

3.2.2. Semi-structured interviews

The aforementioned secondary data provided me with the necessary background information and contextualization of the field in order to select themes through which I conducted the semi-structured interviews with the thirteen experts and stakeholders. These semi-structured interviews enabled me to understand the individual perspectives which either drive or are affected by green hydrogen developments, and opened up the possibility to crosscheck the collected secondary data (Graham et al, 2017; Ruslin et al, 2022).

In the sampling of participants for semi-structured interviews, I applied the method of maximum variation and snowballing through which I found new interviewees (Miles and Huberman, 1994). I did so to include a broad range of perspectives in this thesis, who could provide me with either Dutch or South African variety of insights on green hydrogen developments. Important to note is that the inclusion of the Hyphen project in the thesis was a decision made after having conducted the interviews, hence the reason why I did not reach out to Namibian stakeholders.

According to Denzin and Lincoln (2008, p. 47) an 'interview is a negotiated text–a site where power, gender, race, and class intersect' therefore, the interview is not neutral but a situation where two people create the 'reality of the interview'. Therefore, I made specific questions that apply to the specific contexts of the interviewees. Also, I took this into account when reaching out to multiple stakeholders, yet I was challenged partially in my sampling efforts by being based in Barcelona during the process of conducting this research to learn from the EJ Atlas. It proved rather challenging to arrange interviews with a balanced amount of participants from either country and/or all the aimed perspectives. Of the thirteen interviewees, eleven are located in the Netherlands and two in South Africa. I will further expand on the challenges that

led to this disbalance in section 3.4. With the approval of the interviewees, each interview lasted about one hour and was recorded, which I thereafter transcribed and coded by using Atlas.ti. On this process, I will further elaborate in section 3.3.

Table 1: Overview of interviewees.

Ref.	Date	Located in	Name organisation	Name interviewee	role
i1	16 April 2024	NL	Wetenschappelijk Bureau GroenLinks.	Richard Wouters	Researcher for an independent think tank of a Dutch political party.
i2	17 April 2024	NL	NL Hydrogen	Interviewee 2	Expert in energy system design, analysis, and optimization of (smart) energy systems, with focus on hydrogen and sector coupling between energy and mobility. Program Coordinator for System & Infrastructure (Hydrogen, Sector Coupling, Energy Transition) at the hydrogen industry association that connects, strengthens, and represents the Dutch hydrogen sector. Members are active in the production, import, transportation, use, and storage of hydrogen, including related manufacturing industries.
i3	17 April 2024	NL	NWP / EZK	Interviewee 3	Senior policy officer at the Netherlands Ministry of Economic Affairs and program manager at the national hydrogen program.
i4	18 April 2024	NL	NWP / RVO	Leo Brouwer	Senior program advisor for energy and geothermal in urban environments for the national hydrogen program and the Netherlands Enterprise Agency.
i5	18 April 2024	SA	One Ocean Hub / University of Cape Town	Menka Vansant	Doctoral researcher focussing on ocean economy and just energy transitions at an international programme of research for sustainable development and the University of Cape Town. In their research, they focus on the impacts of mega-infrastructure development, including offshore oil and gas and green hydrogen, on small-scale fishers in the Northern Cape. Apply background as an economist, policymaker, and mining conflict researcher to environmental and social impact assessments, ocean economy development plans, just energy transition plans, and decarbonization and climate change goals.
i6	22 April 2024	NL	Dutch environmental organisation	Interviewee 6	Project manager (sustainable) energy at an independent environmental organisation in the Netherlands. They work on subjects as energy infrastructure, and green and blue hydrogen,

					through research, lobby, project management and relation management.
i7	22 April 2024	NL	EBN	Dennie Kleijweg	Business developer hydrogen for a public energy company in the Netherlands.
i8	24 April 2024	SA	H2Watch / Koek Sisters project / Greenconnection	Natalie Jane van Wyk	Activist, researcher, advocator, project manager at H2 Watch SA in Saldanha bay, South Africa.
i9	25 April 2024	NL	Fossielvrij NL	Leo van Kampenhout	Content specialist and campaigner, focussing on new fossil infrastructure with a focus on Dutch gas exploitation, LNG and future energy systems at an activist network and NGO in the Netherlands.
i10	25 April 2024	NL	EBN	Interviewee 10	Senior advisor strategy and strategic partnerships for a public energy company in the Netherlands.
i11	6 May 2024	NL	Port of Rotterdam	Marthe Fruytier	Business analyst new energy systems at the Port of Rotterdam.
i12	6 May 2024	NL	EBN	Annemarie Rullens	Senior advisor and program manager of social responsible entrepreneurship, stakeholder- and environmental management, participation and public support, strategic partnerships and focus on implementation of CSRD focusing on energy storage, geothermal energy, hydrogen, green gas, CCS and natural gas for a public energy company in the Netherlands.
i13	8 May 2024	NL	RVO	David Bolsman	Senior advisor on hydrogen policy support / independent consultant on strategic issues, change management, supply chain assurance, commercial performance. Policy advice for the Ministry of Economic Affairs and Climate.

Here, I will elaborate on Table 1, giving a short introduction of each of the interviewees. Richard Wouters [i1] is a researcher for an independent think tank called Wetenschappelijk Bureau GroenLinks, which is related to the GroenLinks political party. Their extensive experience in research and advising politicians has resulted in extensive knowledge on national governmental level and EU level.

Interviewee 2 [i2] is a program coordinator for system and infrastructure for NLHydrogen, and could provide me with insights on developments made by the energy (related) companies that drive the green hydrogen transition in the Netherlands. Members of this branch organisation include mainly fossil fuel companies such as Shell and GasUnie. Through this contact, I used the technique of snowballing to get in contact with Shell, Eneco and GasUnie, from whom I unfortunately did not receive a response or were unavailable.

Furthermore, by investigating the National Hydrogen Strategy (Nationaal Waterstof Programme, NWP) I selected multiple members who represent Dutch green hydrogen developments from different angles. I received responses from two members, which were interviewee 3 [i3] who is connected to the Ministry of Economic Affairs and Climate and enlightened me with the perspective of social responsibility and green hydrogen in the Dutch context, and Leo Brouwer [i4], who is connected to the Dutch Enterprise Agency (RVO) and worked on connecting public projects to green hydrogen from a more technical perspective. Through them both, I aimed to reach out to more internationally oriented policy officers, which proved to be a challenging effort due to the two green hydrogen related events that took place in April and May in Rotterdam; the World Hydrogen Summit and the World Energy Congress.

To continue, I got in contact with three members of Energie Beheer Nederland (EBN), which is a state-owned energy company which regulates all energy (related) projects in the Netherlands, or in which the Netherlands is involved in foreign countries. Here, I spoke to Dennie Kleijweg [i7] who is a business developer that could provide me with insights on the future of green hydrogen and the feasibility of the Dutch goals. They introduced me to two people within EBN who could provide me with additional perspectives.

The first, interviewee 10 [i10], is the senior advisor strategy and strategic partnerships, who had a deep understanding of how green hydrogen targets were set on a national and international

level, and deepened my understanding of the process in which strategic (international) partnerships are built and what the Netherlands looks for in these relations. They worked closely with H2Global as well.

The second, Annemarie Rullens [i12], provided me with insights of how Dutch energy projects take care of social and environmental responsibility from the perspective of EBN.

Furthermore, I got in contact with Marthe Fruytier [i11], who is a business analyst that focuses on green hydrogen in new energy strategies, employed by the Port of Rotterdam. Through them, I tried to get hold of their colleagues who were actively involved in partnerships with South Africa and Namibia, but they were unavailable to answer my questions.

Moreover, I spoke to David Bolsman [i13], who is a senior advisor on hydrogen policy support for the Dutch Enterprise Agency (RVO). Their information gave me a rich understanding of the practical aspects of the green hydrogen transition in the Netherlands and in the international context.

Lastly, I reached out to multiple Dutch civil society organisations focussing on socio-environmental wellbeing, of which I got responses from interviewee 6, who is a representative of a Dutch environmental organisation that focuses on translating environmental issues to policy advice. Leo van Kampenhout [i9], researcher and campaigner at FossielvrijNL, in addition to interviewee 6, enlightened me with more critical perspectives against the Dutch (and international) energy transition and green hydrogen developments.

From the South African perspective, I reached out to a variety of stakeholders, amongst which energy organisations and governmental bodies implementing the green hydrogen strategy in the country. Yet, I never received a response from each of the companies, ministries and other governmental bodies, I reached out to. Through personal contact with connections in South Africa, I met Menka Vansant [i5], a PhD researcher from the USA who focuses on the effects

of the enduring coloniality of oil and gas explorations on small-scale fishers in Port Nolloth, Northern Cape, South Africa. On their travels through Europe, we were able to meet in Amsterdam, which laid the groundwork of trust and allowed for valuable insights on the persistence of coloniality in green hydrogen developments in this area as well. This connection proved to be vital for this research, in terms of the secondary data they gathered and shared, that focussed on community participation in green hydrogen developments in Western and Northern Cape. In addition, they helped me to get in contact with members of local environmental justice organisations such as Green Connection and the Northern Cape Economic Development Agency. The EJ Atlas supported me as well, by reaching out through email to their connections at groundWork and the director of the Centre for Social Change in South Africa. However, this appeared not to be as fruitful as a WhatsApp message from Menka Vansant. Through them, I got in contact with Natalie Jane van Wyk [i8], a South African born and raised activist, researcher, advocator and project manager who is based in Saldanha, and works at the Koeksisters project, Greenconnection and H2 Watch SA. Despite the bad internet connection, this meeting gave me in-depth insights on green hydrogen developments in the Western Cape from a personal and professional perspective. Due to both interviewee's specific focus on the South African west coast, in addition to multiple Dutch interviewees mentioning collaborations with Namibia, I decided to focus on the southern African west coast. Still, however, focussing in particular on the relations between the Netherlands and South Africa.

As described in the above, I was unable to come to perceive in-depth information on the construction of Dutch-South Africa green hydrogen relations. To fill in this gap, I used the proposition commissioned by the Ministry of Economic Affairs and Climate (EZK) and written

by members of the organisation ImpactHydrogen referred to in this thesis as Becker et al (2023) for the RVO, called 'Dutch Green Hydrogen proposition for South Africa'.

3.3. Data analysis

Denzin and Lincoln (2008, p.34) point out that 'qualitative research is endlessly creative and interpretive', thus saying that the analysis of (interview) data is a process of writing and interpreting. So, after having collected the data, I transcribed the interviews and coded them through multiple rounds in a software called Atlas.ti to be open for different interpretations. First, I defined geographical locations, people, organisations and years, in order to organise the data for practical reasons. In addition, in this round I decided to build codes based on the interviews themselves. From these codes, I constructed themes that link strongly to answering my research question (Gupta, 2024). These themes, closely connected as well to the data collected from secondary sources, helped me to specify my selection throughout the second round of coding. This process of data reduction helped me select, simplify, abstract and transform data into the core concepts to write down in the discussion section (Miles and Huberman, 1994). In other words, data reduction is the analysis that according to Miles and Huberman (1994, p. 11) sharpens, sorts, focuses, discards and organises data in such a way that 'final' conclusions can be drawn and verified'.

The coding of the data was quite a challenging process since interpreting the narratives was an effort that played out between the lines of the answers from the interviewees. This relates to the 'narrator-listenor relationship', as defined by Denzin and Lincoln (2008, p. 73), where the effort of active listening and interpreting relates to the themes and voices within each narrative. Yet, this also relates to my positionality and reflexivity, on which I will further elaborate in section 3.4.

The overarching themes I found in my second round of coding are listed as follows:

1. Economic developments and financial structures
2. Environmental and Health impacts
3. Political structures, Ambitions and collaborations
4. Social Impact and resistance
5. Main themes / concepts

Theme 5 is defined as the themes and concepts which I based on the literature I read such as 'ecomodernism', 'green washing' and 'green colonialism'. Additionally, I used codes that describe processes, contradictions or character trades, such as 'transparency', 'responsibility' and 'narrative building'.

3.4. Limitations and challenges, positionality and reflexivity

Throughout this research, I faced a number of limitations and challenges. Also, I will elaborate on my positionality as the author of this research and reflect on improvements.

3.4.1. Limitations and challenges

There were multiple limitations and challenges I experienced during this research. First, the green hydrogen market is an emerging one. It means that partnerships are established as we speak, but there are no large scale production facilities yet. Although the foundations of financial and political structures are being or already have been constructed, the complete outcomes of these developments are yet to be decided. Therefore conducting research in this field is challenging, due to the fast-paced developments and quickly changing circumstances

under which these developments are made. For instance, both the Netherlands, South Africa and the EU conducted elections during the writing of this thesis, potentially impacting the course of events. In addition, the urgency of this research was emphasised when in May 2024 the commercial collaboration between the Netherlands, Namibia and South Africa was announced called the Western SADC Green Hydrogen production corridor. Unfortunately, I already conducted my interviews, and was unable to ask stakeholders about this.

Second, I experienced limits due to the available time and location. I believe time will always be insufficient, therefore I will focus mostly on the limitations of the location where I conducted this research. For an internship at the EJ Atlas, connected to Institut de Ciència i Tecnologia Ambientals at Universitat Autònoma de Barcelona (ICTA-UAB), I stayed for four months in Barcelona, Catalunya, Spain. I did so, in order to gain a deeper understanding of conducting research in the field of political ecology and environmental justice. It enabled me to emerge in this field and strengthen my understanding by attending seminars, conferences and speaking to researchers at the faculty itself. However, it posed a challenge in the process of data collection, since I was neither in the Netherlands to attend several events and conferences such as the World Hydrogen Summit or World Energy Conference, both taking place in Rotterdam, nor was I in South Africa to speak to communities in the designated areas, approach government and company officials more easily (by visiting their office for instance), or see green hydrogen development sites myself. I chose not to go to South Africa because the environmental impact of flying would have been too large in comparison to the expected impact of this research. The social impact would have potentially been too large as well; drawing time and therefore other resources away from affected communities for the purpose of a master thesis did not seem right. Additionally, time would have been too limited to build strong relationships of trust amongst potential participants. Through reports and statements by

(members of) environmental justice organisations based in South Africa and through the interviews with Menka Vansant and Natalie Jane van Wyk, I was able to include the concerns of affected communities in my research. Finally, most green hydrogen facilities have not yet been built such as the Boegoebaai project in the Northern Cape, South Africa and the Hyphen project in Lüderitz, Namibia. Saldanha Bay has a port, yet no green hydrogen facilities yet either. In case these facilities would have been constructed and operated, it likely would have been a difficult and lengthy process to gain access to the locations.

Third, since green hydrogen developments are changing quickly, this thesis will be based on the secondary data gathered until spring 2024. It means that some of the estimations of for instance electrolyser capacity, investment sums and employment opportunities might be altered or outdated.

Fourth, in the process of finding participants and conducting the interviews, I experienced multiple challenges and limitations in finding interviewees that could provide insights on relations between the Netherlands and South Africa in terms of green hydrogen. Moreover, since I am new to the field of green hydrogen, I am sure I have missed information and details on these developments. This mostly applies to the interviews with South African stakeholders on the (potential impacts of) green hydrogen developments. I have never visited the country, nor did I manage to speak to government or industry officials, and I only had one native South African stakeholder who could share their insights and experiences. Their time and knowledge is much appreciated, yet the unstable internet connection proved to be a hurdle in the interview. Due to this connection, we had a voice call instead of a video call, therefore missing visual information such as facial expressions that are important in the process of conducting an

interview and interpretation of the information. Moreover, the interviewee mentioned they were nervous, which might have influenced the communication of information.

Lastly, I struggled with finding the non-colonial indigenous names of communities living in the places I am referring to in this thesis. In chapters 2.3. and 4.2. I use different names to refer to communities of similar descent. Through the facebook group 'Busting the Myths of "KhoiSan" and "Bantu"' I learned that 'Khoisan', 'Khoi' and 'San' are not appropriate to use (Nyathi, 2020). I am aware that Facebook is not accounted as a scientific source, however, as I will explain in the following section, I struggled with finding de-colonial sources on these topics in addition to the time limits that restricted this research. Therefore, by lack of knowing better, I quote the groups as referred to in the sources in the specific sections.

3.4.2. Positionality and reflexivity

In this thesis, I speak about the effects of colonial oppression due to the dominance of ecomodernist narratives that persevere in the face of global (green) capitalism. Wekker (2016) argues that historical acts and ideologies of imperialism continue to be present in the white Dutch sense of self. I am both white and Dutch, and grew up in a well-to-do, urban context surrounded by people with similar appearances and socio-economic status. The system of global capitalism was made to benefit people like me, and I quite literally benefitted from this system with family members working for fossil fuel companies when these were on the rise. It is likely that five of my ancestors participated in the beginnings of this history when they sailed on the ships of the VOC, where they most likely have landed at the Cape in the time of Dutch settler-colonialism (Nationaal Archief, n.d.).

When I was younger, I was fascinated by this national history, I later learned these were called the 'golden ages'. However, I was not made aware much to what extent the costs suffered by peoples and ecologies reached because of this imperialism, and if I did these histories were strongly generalised. The contradiction in the white Dutch identity is explained by Wekker (2016, p.1) is that while the imperialist sense of self continues, the group simultaneously regards itself to be 'colour-blind and anti racist, the Netherlands a place of extraordinary hospitality, where there is tolerance toward the racialized/ethnicized other'. It explains why I did not learn much about the costs of Dutch colonialism and how these continue today, but also why at the same time, I failed to ask questions. Being critical of the system I grew up in and felt safe in, continues to require me to unlearn and to take accountability of the context in which I gathered my knowledge. It demands me to address the culture in which I grew up in, to recognise the limits of my knowledge, while understanding and acknowledging that these have been strongly influenced by a colonial mentality. In the process of writing this thesis, I had to reread interviews with Dutch stakeholders multiple times in order to capture the underlying ideology of what these interviewees were saying, because I noticed it was easy for me to go along in the narratives presented to me. Conducting this research was, thus, an effort of reading and rereading, writing and rewriting acknowledging the bias in my personal perspective. Therefore, I know this thesis is incomplete in addressing the costs of green hydrogen developments along the southwestern coastline of Africa, because I am only now beginning to learn what questions to ask. Therefore, it limits me in the sources I can find and thus the perspectives I can include. However, I am aware that I can never understand the perspective of another person or being, of a life that I have not lived. From this research, I take with me the questions of how to ask better questions, how to listen more carefully and to learn from the struggles voiced by those who experience them, how to take responsibility and accountability, and how to become an ally.

4. Discussion

In this chapter, I analyse and discuss the results I gathered from the interviews and the secondary data. I put this data in conversation with the theoretical framework in order to find an answer to the question whether Dutch green hydrogen export ambitions are a recurrence of colonialism in South Africa. First, I explain the motivations of the Dutch green hydrogen import ambitions. In the second section, I explain the negative consequences for communities and the environment in the region. I understand this from the three projects I lay out in the first part of this section, namely the Boegoebaai project, ambitions in Saldanha and the Hyphen project in Namibia. Subsequently, I explain the concerns of the previous three projects following dynamics over land, water and air. In the last section, I explain in two parts the failure of meaningful consultation and neglect of public participation, in addition to the unreliable promises of sustainable development.

4.1. The drive behind green hydrogen ambitions

The production and import ambitions laid out in the Dutch Hydrogen Roadmap (NWP) were based rather on an estimate than a calculated figure, explained a strategic advisor for the Dutch public energy company Energie Beheer Nederland (EBN), who sat at the negotiation tables [i10, 25 April 2024]. This followed a strategic decision to create a credible path for green hydrogen rather than reaching targets. Accordingly, strategic planning for the green energy transition requires acknowledging the political landscape, election outcomes, public sentiment, and the associated costs, in addition to the changing (geo-)political landscape, willingness of the industry and public support. Ignoring these realities will lead to the failure of climate targets as a whole, this representative explained [i10]. Therefore, in the next section I will describe how each of these factors eventually influenced the push to import green hydrogen from abroad, what the achievability is of these targets, how it is intended to overcome hurdles through financial mechanisms and legislation, and what responsibility mechanisms are included in these financial structures and legislation.

4.1.1. Why import?

The initial Dutch climate ambitions are focussed on phasing out fossil fuel from the electricity grid (Becker et al, 2023), as a part of EU ambitions set in the EU Green Deal (European Commission, 2019). Green hydrogen production in the Netherlands, however, cannot create a stable supply of electricity due to the weather conditions, so to guarantee supply, fossil fuels would be needed [i11, 6 May 2024] (Becker et al, 2023). One of the benefits of green hydrogen is that it allows it to be transported over long distances by the use of ammonia most notably (CBN 1, 2022), therefore it is regarded as the missing link in the green energy transition (European Commission, 2022). For this reason, it was expected already in 2021, that the Netherlands would need to import 40-70% of green hydrogen to reach European goals and obligations (NWP, 2021). Consequently, the NWP started to identify 'new energy export

markets' including in southwestern Africa, besides the already existing export markets in the Gulf states, North America and within the EU (NWP, 2021).

The REPowerEU plan, following the Russian invasion in Ukraine in 2022 that destabilised the energy supply of the EU, lays out the strategy to diversify energy supply to create future energy security and thus decrease energy dependencies, incentivise the acceleration of the green energy transition, defend liberal democracy and boost green growth (European Commission, 2022; IEA, 2023; Vezzoni, 2023). Hence the EUs expected annual demand of green hydrogen increased to 20 million tons by 2030, of which 10 million tons (100GW electrolysis capacity) would be imported from places outside of the EU (European Commission, 2022; Bernuy-Lopez, 2023; IEA, 2023).

Import corridors, defined by the EU, include the Mediterranean, the North Sea area and Ukraine (when possible) (European Commission, 2022). For the North Sea area, Marthe Fruytier, business analyst in new energy systems for the Port of Rotterdam (PoR) [i11], calls the PoR the spider in the web of green hydrogen import ambitions of the Netherlands and EU. Instead of the initial 1 million tons, the PoR is working towards contributing 4 million tons of green hydrogen of the 10 million tons target of REPowerEU [i11]. This increase is also seen in the Dutch national production targets, which doubled from 4 GW (±25 million ton of green hydrogen) to 8 GW (±50 million ton of green hydrogen) electrolyser capacity [i3, 17 April 2024] (Lenntech, n.d). The PoR took on the role of initiator by actively looking for locations where solar and wind power 'exceed local demand and thus are suitable for export' as explained by Fruytier [i11]. By signing Memorandums of Understanding, the PoR is laying the groundwork to develop green hydrogen export locations, such as the Boegoebaai and Hyphen project. Through securing future supply through these trade relations, they envision green

hydrogen imports to flow through PoR, much like oil, gas, and LNG currently does [i6, 22 April 2024; i10; i11].

Green hydrogen allows the diversification of supply, because it offers the opportunity to choose from countries as explained by interviewee 2, a representative of the industry association NLHydrogen [i2, 17 April 2024]. 'Many countries have abundant cheap electricity and are keen on exporting hydrogen', they continue, thus securing Dutch energy demands [i2]. A narrative as such, however, allows green extractivism from the idea of export-led growth (Andreucci and Kallis, 2017), where it is assumed that countries are equal in power and therefore benefit equally from these free trade agreements (Muradian and Martínez-Alier, 2001). This overlooks historical developments and inequalities that resulted from the (previous) expansion of energy frontiers.

In the case of South Africa, the narrative of export-led growth overlooks the energy crisis in the country, which has its roots in apartheid when the power grid primarily catered to the white minority which aimed for industrial self-sufficiency amid international sanctions (the Economist, 2022). Although after apartheid, the government prioritised connecting impoverished black communities to the grid leading to a substantial increase in demand, subsequent administrations procrastinated on expanding capacity, coinciding with instances of corruption, depleted Eskom's resources leading to the current issues of load shedding, where energy supply is temporarily stopped to prevent collapse of the entire power grid (this is further explained in section 4.3.2.) [i5] (Essex and de Groot, 2019; the Economist, 2022).

Menka Vansant, Phd researcher on energy extraction and its impacts on small-scale fisheries in Port Nolloth, further explains that it is not likely that South Africa's energy crisis is going to be

resolved soon, since the Just Energy Transition Investment Plan (JET-IP) fails to address issues of energy distribution and access [i5, 18 April 2024]. According to Kalt et al (2023, p. 8), 'almost half of the green hydrogen funding allocated in the South African government's Just Energy Transition Investment Plan is devoted to building port infrastructure and a third is assigned to financing the export commodities green hydrogen and green ammonia'. Although the green hydrogen transition could contribute to the country's economy, without a plan on how to utilise energy domestically, the energy transition will be an economic loss because local businesses suffer from not having (a stable) energy supply while resources are drawn away to benefit wealthy countries [i5].

4.1.2. Achievability of ambitions

Meanwhile, the acceleration of the green energy transition as proposed by the REPowerEU plan, seems to have the opposite effect [i2]. Interviewee 2 and 10 predict that 1.5 to 2 GW (±10 to 13 million tons of green hydrogen) electrolyser capacity will be installed by 2030 in the Netherlands with the remainder being imports [i2; i10]. Also Fruytier states that 'it remains unlikely that we [PoR] will reach this target [4 million tons of green hydrogen imports]' [i11]. The failure of reaching targets is a result of the quick rise in popularity of green hydrogen in the global market. Neither large-scale green hydrogen infrastructure, nor a green hydrogen market exist yet, creating the current dilemma for governments and companies whether to first invest in green hydrogen production or in the infrastructure and applications, internationally known as the chicken-or-egg-problem.

Dennie Kleijweg [i7], business developer for EBN, explains the chicken-or-egg-problem as the gap between production and demand of green hydrogen which results in the situation where green hydrogen producers wait for offtakers before making investment decisions, alongside the

issue that green hydrogen is too expensive to buy or users have no reason yet to move away from gas which is currently significantly cheaper. Richard Wouters, researcher for Wetenschappelijk Bureau GroenLinks argues that in the end, fossil fuels are more profitable than green energy sources and producers want to 'keep milking their fossil reserves for as long as possible regardless of the consequences for the planet' [i1, 16 April 2024]. Annemarie Rullens, senior advisor and program manager of social responsible entrepreneurship at EBN states continues 'for publicly traded companies, the priority is to maximise shareholder value, which is how the (capitalist) system works' [i12, 6 May 2024].

David Bolsman [i13, 8 May 2024] senior advisor on hydrogen policy support for RVO, translates the chicken-or-egg-problem to a higher demand for skilled labourers and an increased competition for rare earth materials which drive-up the prices of the construction of green hydrogen facilities. This creates geopolitical concerns for the Netherlands, as mentioned by Bolsman and interviewee 2, because of intensified dependencies on unstable governments for the import of resources needed for the green hydrogen transition [i2, i13]. In other words, the expansion of the green energy frontier creates issues over geo-economic rivalry among countries, risking conflicts in energy diplomacy. This goes to the extent that developing countries are seen solely as the providers of raw materials, the hydrogen transition justifies green extractivism and the externalisation of socio-environmental costs for the sake of a secure green hydrogen import (Van der Graaf et al, 2020).

Due to the low gas prices, including that the Netherlands has access to offshore gas reserves, it is hard to create incentive businesses to move over to alternative and costly solutions such as green hydrogen for which not even a market exists yet [i7; i13]. So, to make targets more accessible, in-between solutions are reconsidered to smoothen the transition to green hydrogen

through blue hydrogen, which is hydrogen made from gas where the carbon emissions are captured and stored (often underground) (CCS) [i13]. Bolsman [i13] explains that projects that include CCS, energy usage and efficiency, reduced raw material consumption, optimised space-utilisation and reduced nitrogen emissions will soon benefit from financial structures that reduce risks for investors.

So through public financial instruments, green extractivism is justified for the benefit of supposed low-carbon futures (Andreucci and Kallis, 2017). This denies the fact that solutions such as CCS still contribute to global warming since it does not capture all emission (Anderson and Peters, 2016), and that the extraction of resources is inherently unsustainable business. Also, long-term investments made now in blue hydrogen are hard to transit later to green hydrogen because of the additional costs associated with this, therefore this will slow down the energy transition [i13]. Meanwhile, the high prices of green hydrogen production in the Netherlands, create an extra incentive to invest in locations where production is relatively cheap such as South Africa (Becker et al, 2023).

These financial structures that are created for collective benefit, according to the ideas of the green economy and sustainable development, aim to provide public services the public sector is expected to provide by collaborating with the private sector who constructs and operates these infrastructures (Uzuegbunam, 2024). De-risking mechanisms such as these public-private partnerships (PPPs), however, could redefine the policy space for public service provision putting private capital in control (CounterBalance, 2022). It allows powerful investors like Shell to lead the direction of the energy transition, and global North countries like the Netherlands to write new green rules that threaten to further entrench financial and technological

dependencies on for instance fossil fuels, rarely bringing about gains in delivering public services (CounterBalance, 2022; Gabor and Sylla, 2023; Vezzoni, 2024).

Although the Dutch government already finances up to 80% of the costs to construct electrolysers, companies remain reluctant to invest [i13]. Bolsman justifies further subsidies for Shell by saying that Shell 'invests more than anyone else in the Netherlands in the energy transition' and thus we need to 'help them do the things they want or need to do' so the Netherlands can reach its climate targets [i13]. Here, I want to put emphasis on the Netherlands reaching its climate targets, because meanwhile in South Africa they lost two court cases over violating indigenous rights in their oil and gas explorations (Du Toit et al, 2024). Shell greenwashing its image in order to maintain their profits, while continuing business elsewhere as usual. In 2020, Shell had US$311b in sales, contributing 1.6% to the global carbon budget while dedicating less than 1% of its long-term investments in low-carbon energy (ClientEarth, 2021). Leo van Kampenhout, researcher and campaigner for FossielvrijNL argues that 'profit and growth are almost always prioritised over anything else', and still Shell seeks for subsidies for low-carbon hydrogen projects [i9, 25 April 2024]. Bolsman also acknowledges how fossil fuel companies play along with the green energy transition, 'fossil fuel companies sense what is coming their way ... [yet] fossil fuels are their business model' [i13]. Yet, debunks arguments of activists such as van Kampenhout by saying that it is unrealistic to get rid of fossil fuels because 'I don't think we realise how much fossil fuel is part of our daily lives, passing through our hands every day' [i13].

The green capitalist dynamics of market-based solutions benefit the interests of the dominant fossil fuel sector and their shareholders (Croeser, 2021; Yang and Yang, 2022), this becomes visible in the amount of money these companies spent in the lobby for green hydrogen. Fossil

gas companies spend at least over half a billion annually in Brussels, influencing an increase in hydrogen production projects and infrastructure developments, like the EUs 'Hydrogen Backbone' (Balanyá et al, 2020). Here, gas infrastructure is proposed to be repurposed for green hydrogen, but overlooks the already oversized grid built by the gas industry (Balanyá et al, 2020). Developments as such risk to become obsolete without artificial demand, slowing down the green transition, causing a continuation of fossil fuel extraction and applications (Van der Graaf et al, 2020; Balanyá et al, 2020). In the Netherlands, the PoR and NLHydrogen lobby on behalf of the industry, highlighting the current limitations experienced by the industry and steering government investment towards the supposed necessary infrastructure [i2; i11]. Interviewee 6, representative of a Dutch environmental organisation, experienced that there is a significant imbalance in representation of stakeholders at these lobby tables in the Netherlands, where industry representatives dominate the table over environmental organisations raising concerns about fairness and equity [i6, 22 April 2024].

4.1.3. Financial mechanisms

Market-based solutions for the chicken-or-egg-problem in the context of green hydrogen imports from South Africa result in the establishment of international finance mechanisms such as the German H2Global initiative. Since the Netherlands has not yet established a national aggregator mechanism themselves, they have joined H2Global; where demands of different consumers are bundled through PPPs, and translated to long-term supply contracts to de-risk producers and thus boost the international green hydrogen market [i7; i10; i13]. The Netherlands benefits from the further advanced green hydrogen relations of Germany in South Africa, which were enabled by the long presence of almost thirty years in two offices in South Africa, of the German Corporation for International Cooperation (GIZ) on behalf of the German Development Ministry (GIZ, n.d.). The Netherlands, on the other hand, is important

for Germany to secure their energy supply, since the Netherlands re-exports 80% of the imported energy to Germany through mainly the PoR (EBN, 2023) [i10]. Interviewee 10, who works closely with H2Global, defines the relationship as such 'the Netherlands is just a province of Germany' [i10]. Still, the representative of a Dutch environmental organisation is sceptical about how much the position of the Netherlands in the international market will be enhanced by H2Global, since the initiative is still small, unclear and has few Dutch companies involved so it is unlikely that H2Global is going to enhance the Dutch position [i6].

As explained in section 4.1.1., the Port of Rotterdam took on the aggregator role to kick-start green hydrogen production in exporting countries [i11]. Becker et al (2023, p. 20) specifically mark the Boegoebaai project in the Northern Cape to be of interest, since 'the Port of Rotterdam could potentially invest in the development and operations of the port or hydrogen hub'. Green hydrogen hubs as such are located often in Special Economic Zones (SEZs) or Industrial Development Zones (IDZs), to create low rates of corporate tax and indirect subsidies through public financing of large-scale infrastructure in addition to being focussed on international trade markets (DTIC, 2024). This benefits, again, the fossil fuel sector that is often planning to lead the construction and operation of green hydrogen facilities as well as the wealthy capitals that aim to export energy from these locations.

The Boegoebaai green hydrogen hub in South Africa is financed in part by the SA-H2 Fund (SA-H2) of US$1 billion that facilitates and accelerates the development of green hydrogen in South Africa, signed by the Netherlands, Denmark and South Africa (DBSA, 2023). This joins the SDG Namibia One fund, making the SA-H2 fund the second of its kind (Johnstone, 2023). Funds as such are set-up from an sustainable development perspective, yet could increase public debt when targets are not reached (CounterBalance, 2022; Johnstone, 2023; Doig and

Seeger, 2023). Kalt et al (2023) warn that international funding mainly consists of interest-bearing loans instead of grants, prioritising the interests of the investor which is focussed on securing its own green hydrogen imports. In Namibia, the EU promised loans up to US$528m through the European Investment Bank (which has a subdivision dedicated to green hydrogen called the European Hydrogen Bank) for the Hyphen hydrogen production and export project in Lüderitz. Similarly, the Netherlands invested €40m, which allowed the Namibian government to buy a 24% stake in Hyphen, while also collaborating with the PoR for the construction and operation of the port (Grobler et al, 2023; Shihepo and Grynberg, 2024). Although the Dutch investment is regarded as a grant, the investment was made before the feasibility study of the project was completed (Shihepo and Grynberg, 2024). Now, construction and production costs turn out to be higher than predicted, diminishing the profitability of the project (Shihepo and Grynberg, 2024). Including the geographical disadvantage compared to the MENA and Gulf region, which is more closely positioned to the EU and thus creates cheaper transportation, the Hyphen project seems to be directed towards a failure of the initial plan possibly having negative consequences for the Namibian government in relation to the international financing (Shihepo and Grynberg, 2024).

Funding mechanisms, as explained in the above, are motivated by Becker et al (2023, p. 3-4) as a win-win; 'the import of green hydrogen is met with sustainable development in return'. Accordingly, the Netherlands sees opportunity in adopting a similar strategy as the GIZ by setting up a Green Hydrogen Office, initially funded by the Dutch government (Becker et al, 2023, p. 3-4). By doing so, the Netherlands is exercising an increased influence to secure Dutch energy supply, while approaching it from a developmentalist point of view, similar to the German strategy. Written in the proposition, Becker et al (2023, p. 4) see opportunity to 'manage all stakeholders and to facilitate trade relations and exports, develop a national green

hydrogen economy, creating an enabling environment, anchoring a Just Energy Transition, promoting knowledge and innovation, and focusing on education, skills development, and human capital strategies that benefit both the Dutch and South African partners' (Becker et al, 2023, p. 4).

Thus, the narratives of export-led growth open the door for environmental-technological optimism in line with market development [i7, i13], while ignoring the costs attached to these developments (Andreucci and Kallis, 2017; Dunlap, 2023, p. 44). The establishment of Green Hydrogen Offices will materialise Dutch institutional power in South Africa resulting in the control, valorisation and distribution of natural resources through infrastructure as explained in section 2.1. (Escobar, 1996; Robbins, 2012; Dorn et al, 2022).

4.1.4. Responsibility mechanisms

For responsibility mechanisms in green hydrogen import strategies, interviewees refer to EU legislation and regulations to foster a socio-environmentally responsible supply of green hydrogen. However, further understanding of these legislations and regulations expose how these are built to benefit European wellbeing and industries first. For instance, they mention the Carbon Border Adjustment Mechanism (CBAM), which is a European measure designed to create a 'ring' around the EU in order to protect local industries and encourage production within Europe to emit less CO2 to avoid price increase [i9; i11; i12]. The Renewable Energy Directive 3 (RED3) enforces the industry to replace at least 42.5% of its existing hydrogen demand with green hydrogen by 2030 [i2; i13] (European Commission, n.d. [RED3]). Green hydrogen, here, must be according to the rules established in the Renewable Fuels of Non-Biological Origin (RFNBO) legislation that defines under which conditions hydrogen,

hydrogen-based fuels, or other energy carriers (such as ammonia) can be considered green (European Commission, n.d. [RFNBO]) [i13].

Additionally, H2Global 'comes with additional requirements concerning corporate social responsibility, including water usage and local community benefits, to ensure we're not solely depleting their energy resources for our benefit' as explained by David Bolsman [i13]. Annemarie Rullens, explains that the Corporate Sustainability Reporting Directive (CSRD) promotes transparency in the supply chain, where companies need to disclose the environmental and climate impacts of their purchases as well as human rights considerations [i12]. The CSRD on Due Diligence (CSRDDD) further emphasises that human rights need to be respected throughout the operations [i12]. The presumption exists that Dutch diplomacy is very focussed on human rights when making international trade deals [i13]. In the plans to import green hydrogen, there is an aim to avoid signing memorandums of understanding (MoU) with so-called 'questionable regimes', as argued by Bolsman [i13], and to apply what Dennie Kleijweg of EBN calls 'Dutch values' in the production process and for export [i7]. An advantage of the energy transition, as explained by both interviewees, is the reduction of dependencies on questionable regimes and unstable governments as happened with oil and gas [i7; i13]. Still, Bolsman continues that 'it's essential to thoroughly evaluate any potential investments, particularly if they're in regions like Namibia, Morocco, or Saudi Arabia' or other places such as South America, Gulf States or Africa [i13]. Bolsman worries less about countries 'who have a similar society as Europe', such as Australia, since they have a higher level of 'social responsibility, levels of corruption and fair resource distribution' [i13].

Meanwhile, the Netherlands itself has not yet established regulations of International Corporate Social Responsibility (IMVO) for green hydrogen specifically. So, the Netherlands do not

address the risks associated with foreign green hydrogen production for Dutch import through a regulated mechanism [i6]. Interviewee 6 explains that 'companies respond better to economic arguments than humanitarian ones' [i6]. When asking a representative of the NWP and EZK about the burdens and benefits of green hydrogen export for Dutch markets, they say that 'the term neo-colonisation is sometimes mentioned at the ministry [EZK], but this is of course not supposed to happen. We have some criteria we include, but putting (extra) pressure on resources such as water is a bit awkward' [i3]. Although legislation such as the CSRD has increased emphasis on corporate responsibility, the economy will continue to be prioritised over socio-environmental issues in green hydrogen developments. Annemarie Rullens summarises it as follows: 'entrepreneurship is evolving, but we still operate in a capitalist system' [i12]. Increased emphasis on transparency in production processes aims to ensure green industries and decrease negative socio-environmental impacts, however, these legislations and guidelines fail to incorporate resource-use, pollution and waste created in the construction, distribution and end-use of green hydrogen [i13]. This mostly overlooks the vast amount of resources such as land and water that are used in producing countries, externalising the costs to areas outside of the EU, while justifying actions with Western ideas of sustainability [i13]. A representative of EBN questions it as follows' to what extent is one a saint, and to what extent a merchant? The Netherlands is quite often a saint, but when it comes to energy more often a merchant' [i10]. By this, they say, that when it comes to energy import, the Netherlands often prefers energy security over being responsible. This idea is justified in what Bolsman, who says, 'you have to start somewhere by determining how far along the [production] chain you want to go to keep it [responsibility] manageable' [i13].

4.2. Socio-environmental, climate and health concerns and impacts

Communities and environmental justice organisations along southwestern Africa already experience negative consequences and worry about the outcomes of green hydrogen developments on their livelihoods and environments. Although my particular focus for this thesis lays on Dutch-South African green hydrogen relations, the injustices and impacts of Dutch green hydrogen investments are experienced close to the South African border, in the Namibian town of Lüderitz. In order to explain the ways in which socio-environmental impacts are experienced, I provide a quick overview of the plans along this Southwestern coastline. Doing so gives the basis on which I can further elaborate on the socio-environmental risks, in addition to the climate and health concerns.

4.2.1. Explanation of cases

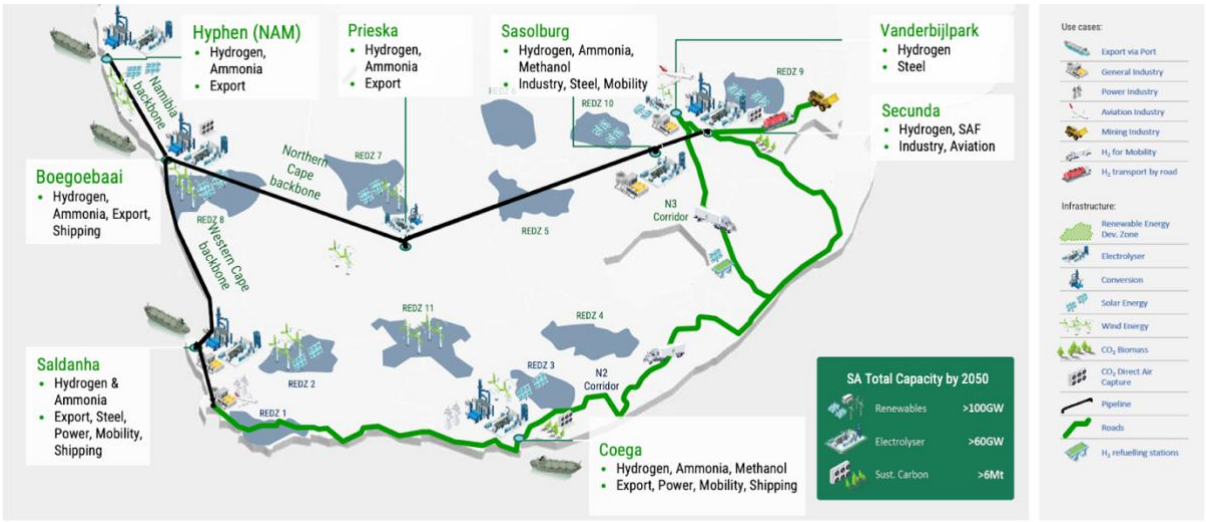

Figure 1, Overview of the plans described in South Africa's green hydrogen roadmap (NCEDA [1], 2023).

South Africa's green hydrogen ambitions according to the roadmap are illustrated in figure 1. Along the west coast there are three notable green hydrogen developments; the Hyphen project in Lüderitz, Namibia; the Boegoebaai project in the Northern Cape, 20km below the Namibian border and 60 km above Port Nolloth; and in Saldanha Bay in the Western Cape which lies about 600 km below the Boegoebaai project and 150 km above Cape Town. Each location is marked as a potential partner for Dutch collaboration and export (Becker et al,

2023). Moreover, the Dutch energy infrastructure company Gasunie and the for-profit investment manager Climate Fund Managers (using PPPs) joined the commercial partnership with South African and Namibian stakeholders to explore the Western SADC Green Hydrogen production corridor to built a green hydrogen pipeline that connects Saldanha Bay, Boegoebaai and Lüderitz (Cape Independent, 2024; Climate Fund Managers, n.d.).

4.2.1.1. Boegoebaai

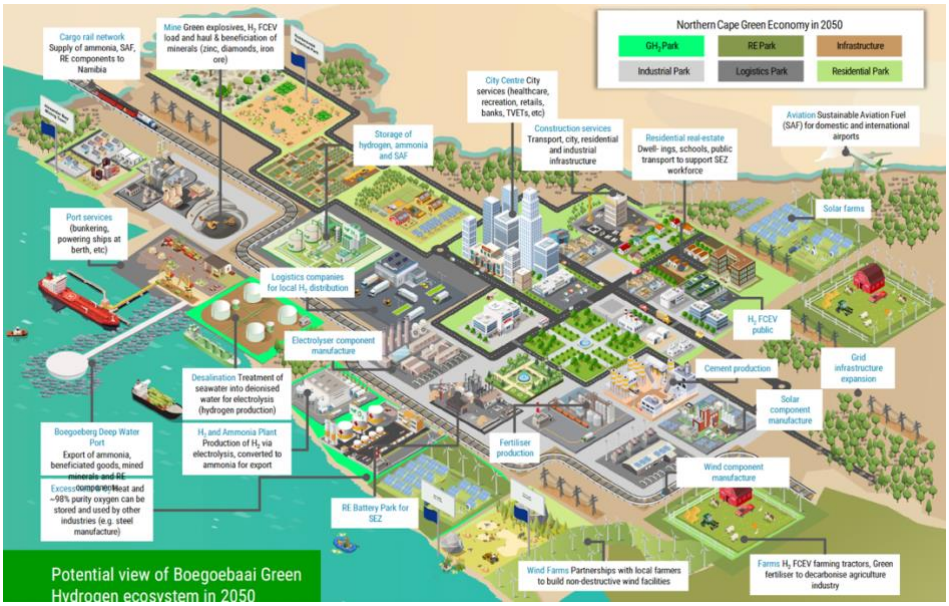

Figure 2, potential view of the Boegoebaai Green Hydrogen System in 2050 (NCEDA, 2023).

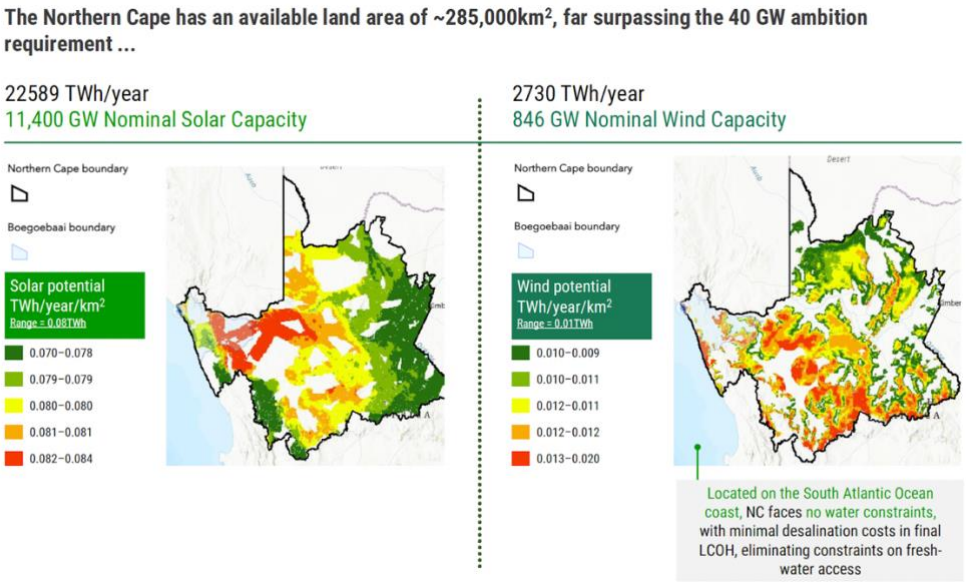

Figure 3, solar and wind potential in the Northern Cape, South Africa (NCEDA, 2023).

Located in the northwest of South Africa (Figure 1), in the municipal district of Richtersveld, the Boegoebaai green hydrogen hub is planned. South Africa's public fossil fuel company Sasol is leading the construction and operation of this project (DSI, 2021). The Green Hydrogen Societal Roadmap of South Africa envisions a 60,000-hectare facility (over 84,000 football fields) with a 30 GW solar and wind farm, 5 GW electrolysis capacity, and various green hydrogen production infrastructures including a deep water port for export (DSI, 2021). To compare, currently the largest green hydrogen electrolyser in operation is 260 MW (Collins, 2023). According to the roadmap, Boegoebaai is aimed to become a key point of storage and transport of green hydrogen to export out of Southern African countries to mainly north-western Europe by means of ammonia (DSI, 2021; NCEDA, 2023). The Boegoebaai project is highlighted as one of the four intended green hydrogen projects that is supposed to lead South Africa's green hydrogen transition and thereby proposing a solution to the country's intersecting crises of unemployment, climate and energy (DSI, 2021). It is overseen by the Northern Cape Economic Development Trade and Investment Promotion Agency (NCEDA) of the provincial government (Sasol, 2021) and located in the Namakwa SEZ (Special Economic Zone), where it will be open to private and public investments due to the tax breaks and favours (DSI, 2021). Initial funding of US$1 billion will be through the SA-H2 Fund, a collaboration between the Dutch Climate Fund Managers and Invest

International B.V., the South African Sanlam Limited and the Industrial Development Corporation of South Africa, and the Development Bank of Southern Africa in addition to other strategic partners (DBSA, 2023). Furthermore, in figure 3 the map of NCEDA visualises the solar and wind potential for energy generation, imagining the potential locations of renewable energy generation for the Boegoebaai project.

4.2.1.2. Saldanha

Figure 4, overview of the Green Hydrogen developments in the SEZ of Saldanha (SBIDZ, 2022).

The Saldanha Green Hydrogen Project is initiated by the Irish Phelan Green Energy Group and its subsidiary Solar Capital. On their website they are motivated by the 'rapid deployment of renewable energy and energy efficiency is resulting in significant energy security, climate change mitigation, and economic benefits' (Solar Capital, n.d.).

Through solar and wind power, the project aims to generate 2.5GW of renewable energy for electrolysis of a green hydrogen ammonia plant (Groenendaal, 2023; Dokso, 2024). No information, however, is provided how much land will be used for the planned renewable energy production and where exactly this will be. The project is aimed at creating 2,500 jobs at the construction phase and 500 permanent jobs, which remain undefined (Groenendaal, 2023). The investment sum is expected to be R47 billion (US$2.54 billion) (Dokso, 2024), and the initial investment sum is estimated at US$367 million (Feltman, 2024). The project will benefit from the already established SEZ at the Freeport Saldanha, in which the largest ore exporting deepwater ports in Africa is located, that is connected to mines in the Northern Cape (SBIDZ, 2022; Feltman, 2024).

4.2.1.3. Hyphen

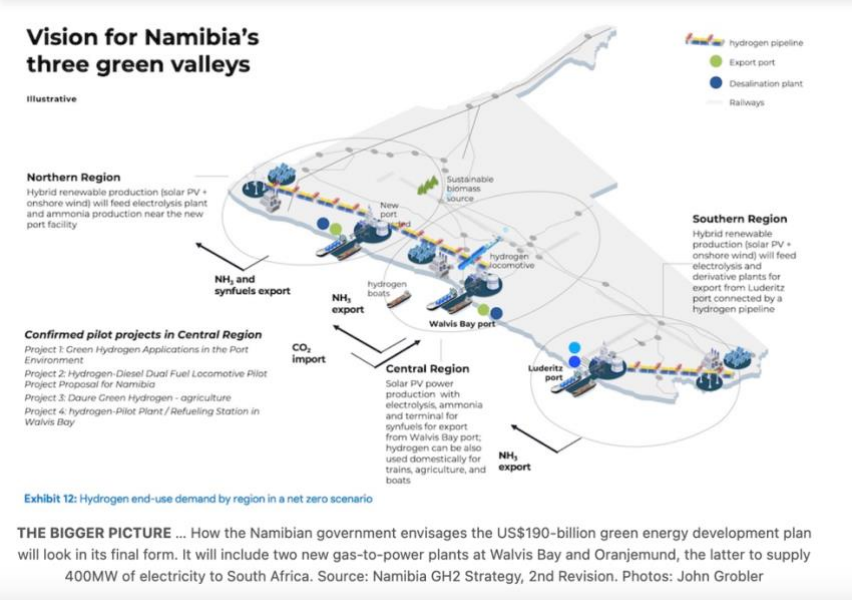

Figure 4, Vision for Namibia's three green valleys (Grobler et al, 2023).

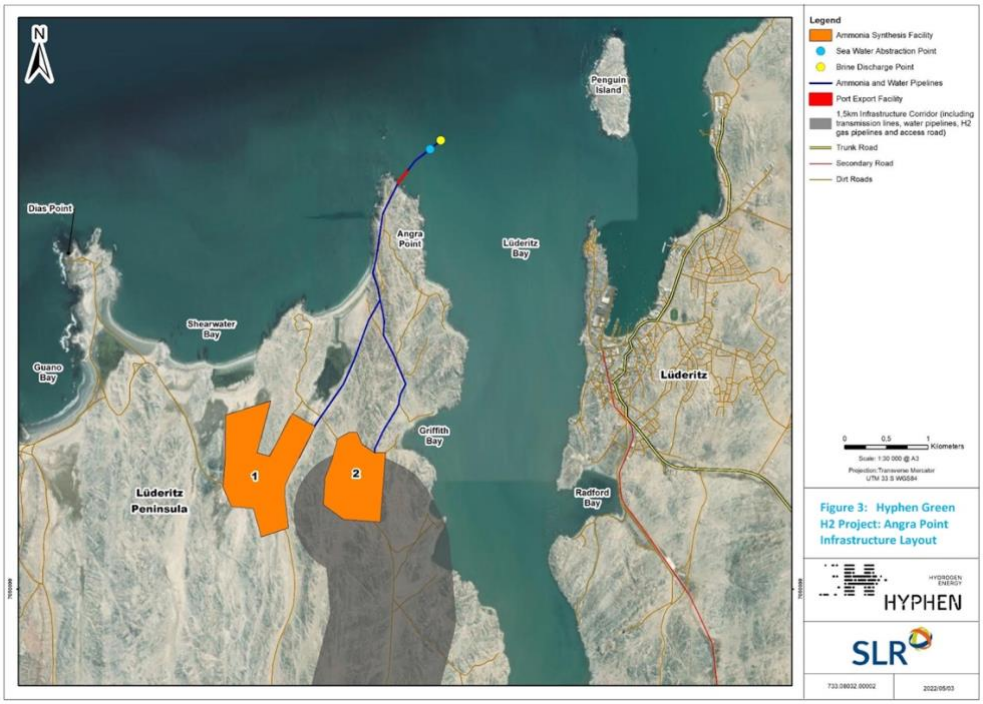

Figure 5, Angra Point infrastructure layout (Grobler et al, 2023).

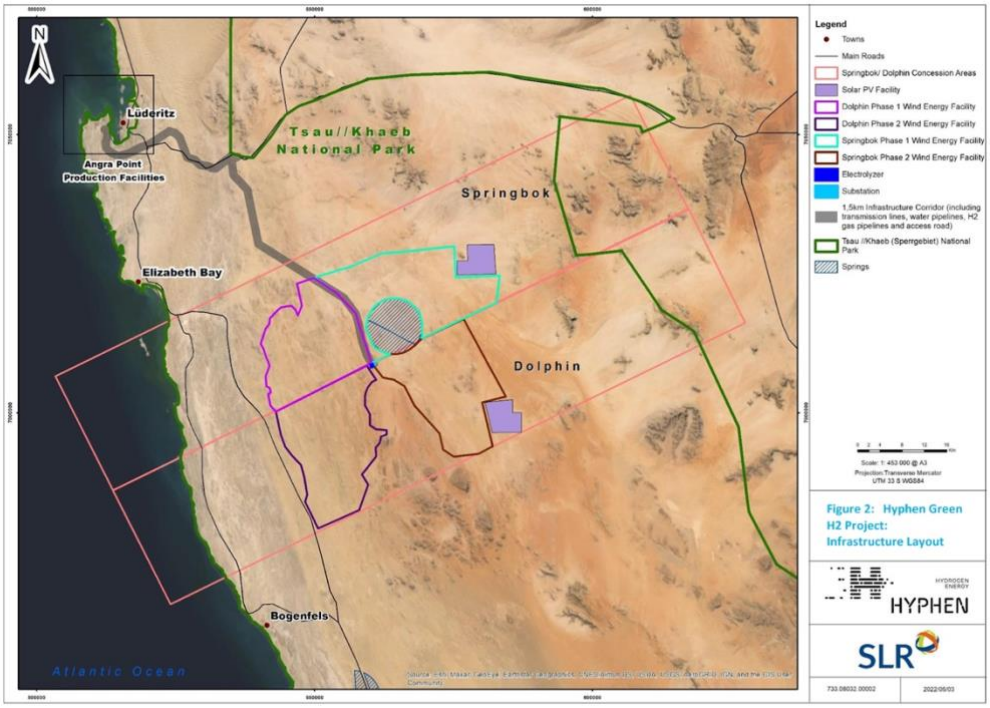

Figure 6, Infrastructure layout (Grobler et al, 2023).

The Namibian government constructed a vision for three green hydrogen valleys as part of the 2022 Green Hydrogen and Derivatives Strategy master plan, as visualised in figure 4 (Grobler,

2024). As a part of this plan, Hyphen is to develop green hydrogen production, infrastructure and transport facilities in Lüderitz, which is part of the Southern Corridor Development Initiative (SCDI) (Hyphen Hydrogen Energy, n.d; Staff Writer, 2023; Grobler, 2024). The project is set to be constructed on an area of ±4,000km2 of land within the Tsau//Khaeb National Park, which is part of the restricted area, also called the Sperrgebiet (figure 6) (Hyphen Hydrogen Energy, n.d). The investment sum is expected to be US$10 billion, however Hyphen CEO Marco Raffinetti already said that this is going to be insufficient (Martin, 2023). At full development, the project is planned to produce 350,000 metric tons of green hydrogen a year, ±7GW of renewable generation capacity and 3 GW of electrolyser capacity (Hyphen Hydrogen Energy, n.d). The deepwater port is planned to export green hydrogen in the form of green ammonia to Europe (figure 5), of which the first million ton is to be expected in 2027 and this is doubled by 2029 (Lucas, 2023). The promise is that Hyphen will employ 3,000 people, with 15,000 construction jobs (for 4-5 years) of which it is said that 90% will be filled by local Namibians, of which 30% is said to go to youth (Hyphen Hydrogen Energy, n.d; Growler et al, 2023). This would roughly double the population of Lüderitz, for which developers aim to build a new town (Grobler et al, 2023).

Hyphen Hydrogen Energy (Pty) Ltd. is a joint venture between Enertrag and Nicholas Holdings Limited, and the CEO of Hyphen is Marco Raffinetti, a South African businessman (Grobler et al, 2023; Hyphen Hydrogen Energy, n.d). Enertrag is a Germany-based renewable energy company that was founded by Jörg Müller, and has projects in Germany, United Kingdom, France, Poland, Bulgaria, Belarus, South Africa, Ghana, Uruguay and Vietnam (Enertrag, n.d.). Nicholas Holding Limited, owned by South African investor Brian Myerson, is registered in the British Virgin Islands which owns its stake in Hyphen through a special purpose vehicle based in Mauritius. (The Marque, n.d.; Grobler et al, 2023).

In 2023, the Dutch Port of Rotterdam, Gasunie, Invest International signed an MoU with Hyphen, and the Namibian organisations Namibian Implementation Authority Office, Namport and Nampower (Port of Rotterdam, 2023). In a statement on this event, the Port of Rotterdam (2023) called it a development 'to expand sustainable and equal collaborations between Namibian and Dutch governments, companies and knowledge institutes'.

4.2.2. Concerns and impacts

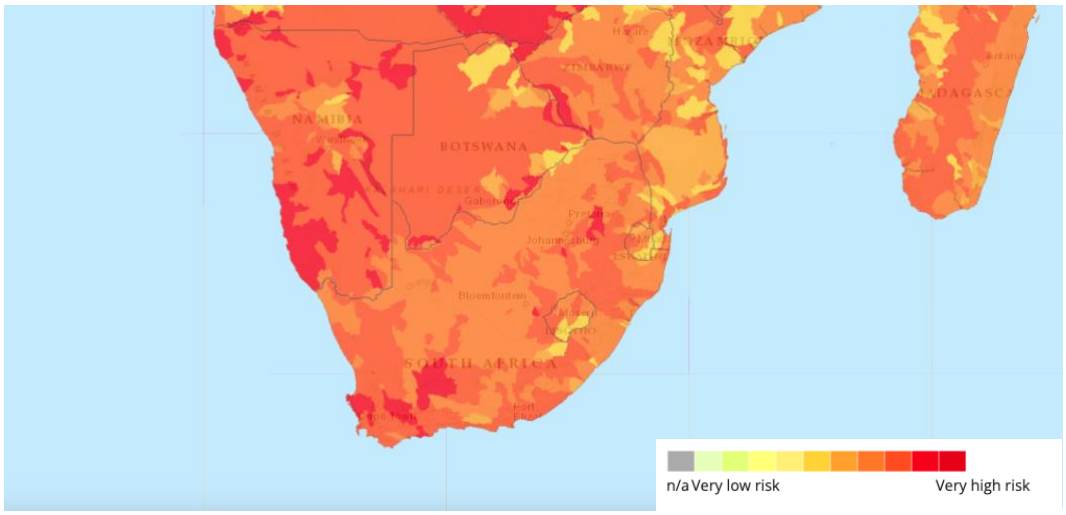

Figure 7, WWF risk filter in Southern Africa: 'Physical Risk is driven by the ways in which a business depends on nature and can be affected by both natural and human-induced conditions of land- and seascapes. It comprises the risk categories: 1) Provisioning Services, 2) Regulating & Supporting Services - Enabling, 3) Regulating Services - Mitigating, 4) Cultural Services and 5) Pressures on Biodiversity. Therefore, physical risks account for the status of the ecosystem services that companies, or their suppliers, rely on'. (WWF 1, 2023).

Especially along the southwestern coast, there is a high risk that ecosystems will be damaged by businesses that rely on natural resources (figure 7) (WWF 1, 2023). Already, Saldanha Bay and

the Hyphen project are marked as areas of very high risk, before any green hydrogen facility or infrastructure exists yet in these places. In the next section, I explain how green hydrogen facilities and infrastructure put further pressure on resources in these areas through the concerns voiced by communities along this coast. Due to the different types of socio-environmental, climate and health concerns, I divided the following section up in the three spaces of land, water and air, due to their specific characteristics of these elements and the different ways in which they impact life.

I will draw from the information provided by the interviewees Menka Vansant, who researches colonialism through energy in Port Nolloth, and Natalie Jane van Wyk, who is an activist and campaigner for the environmental justice organisation called H2Watch and lives in Saldanha. In addition, I fill in the gaps by using information gathered from local news sources and reports of environmental justice organisations. Although my research particularly focuses on South Africa, I consider it of importance to include the Hyphen project due the Dutch involvement in this project, the similarity in struggles voiced by the people living there and its close proximity to South Africa.

4.2.2.1. Land

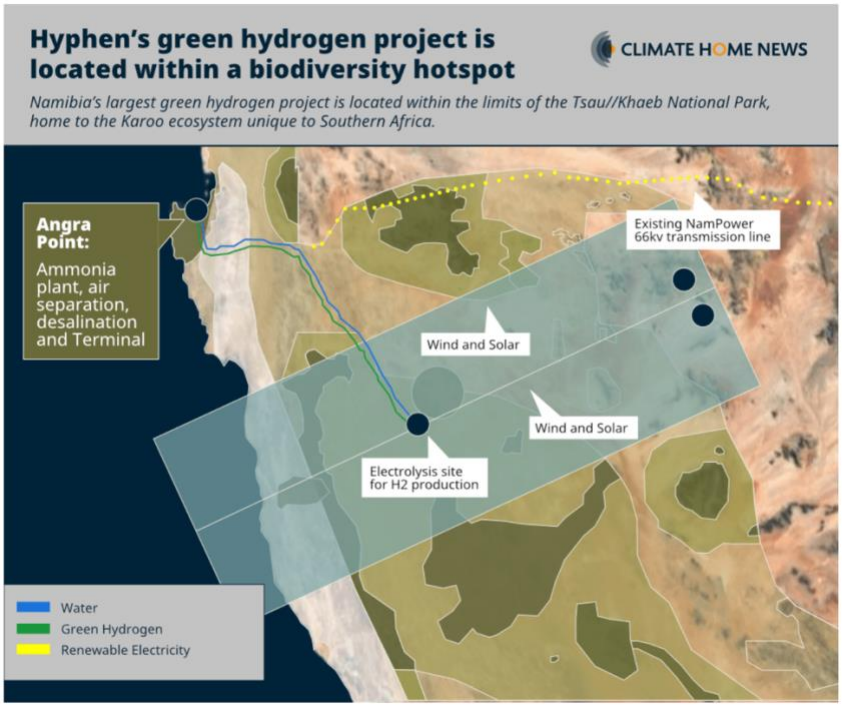

Figure 8, Hyphen's green hydrogen project is located within a biodiversity hotspot (Grobler et al, 2023).

The Boegoebaai project lies directly below the Tsau//Khaeb national park or also known as Sperrgebiet in Namibia, which is a forbidden area for public as a remnant of the diamond rush (Grobler et al, 2023; NCEDA, 2023). The Hyphen deepwater port is planned to be constructed right above this area (figure 5). Hyphen's renewable energy facilities are planned to be constructed largely within this national park (figure 8) (Grobler et al, 2023), in addition to the space used in the already limited public accessible land of which the Lüderitz

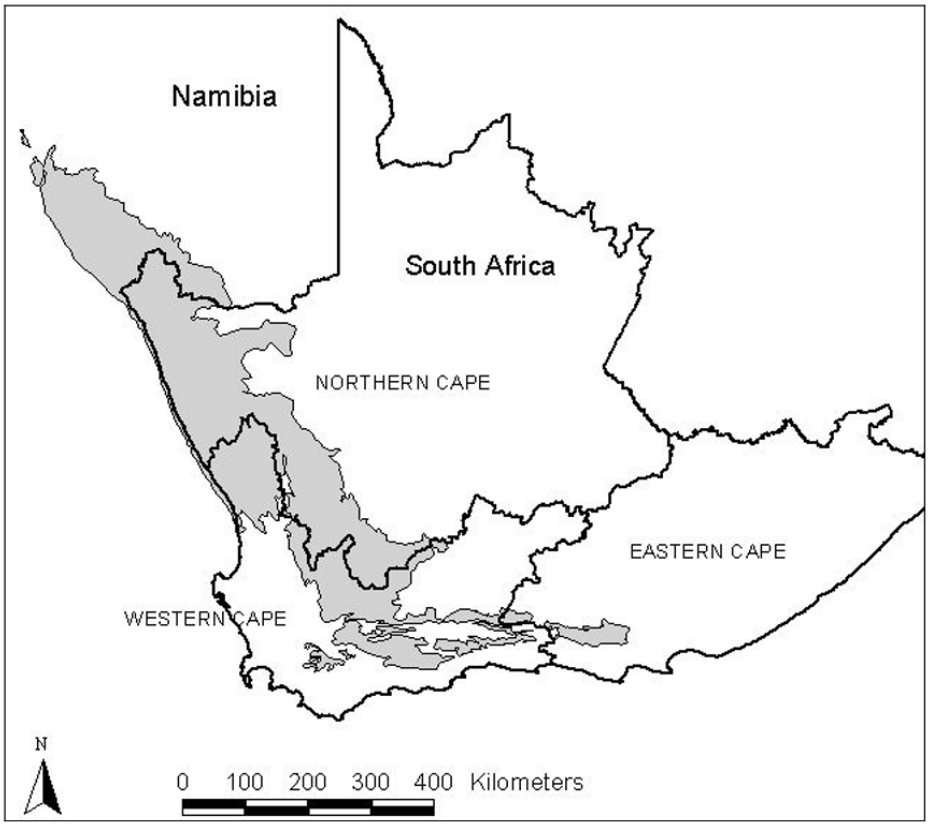

Figure 9, The Succulent Karoo biome (shaded area) in relation to Namibia and three South African provinces, (Rutherford & Westfall, 1997).

community makes use (Grobler et al, 2023). The Tsau//Khaeb national park is part of the larger Succulent Karoo biome (figure 9), which is an internationally recognised unique biodiversity area, home to endemic and endangered flora and fauna (UNESCO, 2016). It becomes visible on figure 9 that the Boegoebaai project is planned in this biome, and lies according to the WWF in between two Key Biodiversity Areas of high importance for species and their habitats (WWF 2, 2023). Already, parts of these areas are under high stress due to the rise in temperature and droughts (WWF 2, 2023). Although it remains unclear where the renewable energy facilities will be placed in case of the Boegoebaai project and the Saldanha Bay plans, it is safe to assume, drawing from figure 7, that the construction and operation green hydrogen projects in each of the three locations might pose threat to surrounding ecologies of the Succulent Karoo biome, such the Tsau//Khaeb national park.

Grobler et al (2023) refer to the presentation of Dr Antje Burke, a veteran botanist who works as a consulted for Hyphen, that the project was 'trying to avoid the most sensitive areas but "one big problem" is that a species of parsley "overlaps almost completely with the concession area".' Grobler et al (2023), also, quote Burke's concerns in Hyphen's future plans for development 'The Hyphen project is developing the service infrastructure really keeping the future developments in mind... That means the entire area will be developed'.

Menka Vansant attended a consultation meeting by NCEDA on the Boegoebaai project, in which project developers stated that 57% of Northern Cape land is available for wind and solar power production, neither mentioning how this will take into account the protected biodiversity areas, nor how to tackle the poverty, inequality and unemployment experienced by communities in this region in addition to questions of land ownership [i5, 18 April 2024].

Land ownership along the southwestern coast of Africa remains concentrated along the lines rooted in the colonial histories of these areas (DRDLR, 2017; groundWork, 2023; Land Links, n.d.). Restoring unjust land ownership over the past decades have not gained large wins yet (South African Human Rights Commission, 2023), since land ownership has been insufficiently documented in South Africa, land is vulnerable to elite capture (DRDLR, 2017). Indigene Corefio, the director of NPO |Kx'am (Non-profit organisation that focuses on Khoe knowledge), was quoted in the Daily Maverick when they said that the interactions between colonial powers and indigenous people 'resulted in the systematisation or institutionalisation of hunting indigenous people', the |Xam have 'faced centuries of genocide, ethnocide, dispossession and marginalisation, and have been perpetuated, and these have been perpetuated by the current state' (Mutsila, 2024). They refer to the racial term 'coloured',

which separated them from their identity as indigenous inhabitants of the land as well as their culture and right to self-determination (Mutsila, 2024). It also impacts the right to own ancestral land, because allegedly the South African government prioritises black people while neglecting the indigenous (Mutsila, 2024). Mutsila (2024) writes that these hardships can be 'traced back to the 17th century when Dutch and British colonial settlers landed in the Cape'.

In what is now called Port Nolloth, the indigenous Namaqua people (similar to the Nama referred to in Lüderitz) have seen their coastline being destroyed by colonialism, which Menka Vansant sees happening again in the now small-scale fisher communities [i5]. Offshore oil and gas, and the more recent green hydrogen developments, causes fear of seeing their land being used once again for the profit of wealthy elites [i5]. Similarly, in Saldanha, Natalie Jane van Wyk explains that parts of the green hydrogen projects are created on land owned by farmers, but that there is inadequate compensation for this land since these farmers not only lose their land but also their livelihoods [i8, 24 April 2024]. These communities, for these reasons, have a deep rooted distrust for government imposed activities, such as green hydrogen [i5].

In Lüderitz, leaders of the indigenous Nama, call green hydrogen developments a new form of colonisation where African resources are extracted for the benefit of European markets (Angula, 2024). They witness how the Hyphen project marks Shark Island as a destination to construct a green hydrogen export facility. Shark Island, however, is of cultural importance for this community, since it is the burial site of the 3000 indigenous Nama and Ovaherero people who were murdered during the genocide in 1904-1908, in which Germany murdered a total of ±80,000 people (Grobler et. al., 2023; Angula, 2024; Nyaungwa, 2024).

The construction of green hydrogen facilities justify green extractivism, yet mining activities are expected to intensify as well due to the operation of green hydrogen infrastructure. The South African green hydrogen roadmap notes that South Africa and green hydrogen developments hold 'important new opportunities in developing rare earth and platinum

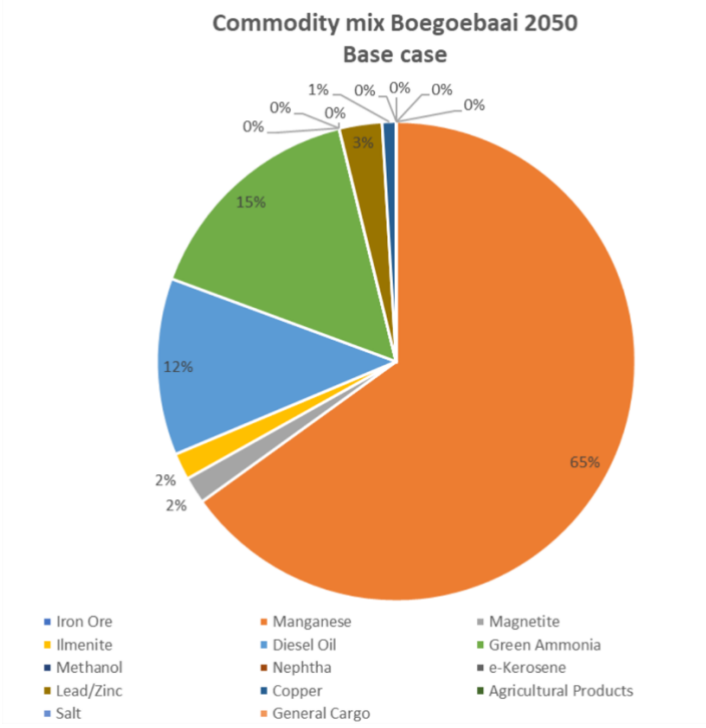

Figure 10, expected commodity mix Boegoebaai 2050, (PRDW, 2022).

group minerals for green manufacturing' (Ramaphosa, 2023). Becker et al (2023) note these resources as one of the benefits of green hydrogen relations with South Africa. The Boegoebaai port supposedly makes it cost-effective to also export minerals such as manganese (of which South Africa serves 25% of global demand), an important mineral for the energy transition, of which mining accounts for more than a quarter of the province's GDP (Salgmann et al, 2023). Figure 10 visualises that only 15% of the Boegoebaai port's export commodities will be green hydrogen, while more than 75% will be raw earth materials (PRDW, 2022). Meanwhile, Saldanha, already known for its ore exports, which are mined in the Northern Cape, could

potentially see an increase due to the green hydrogen developments (SBIDZ, 2022). Together with extractive companies such as Anglo-American Platinum, the Platinum Valley Initiative, is expected to increase green hydrogen demand by 80% by 2030, potentially contributing up to USD 8.8 billion to GDP by 2050 (DSI, 2021).

4.2.2.2. Water

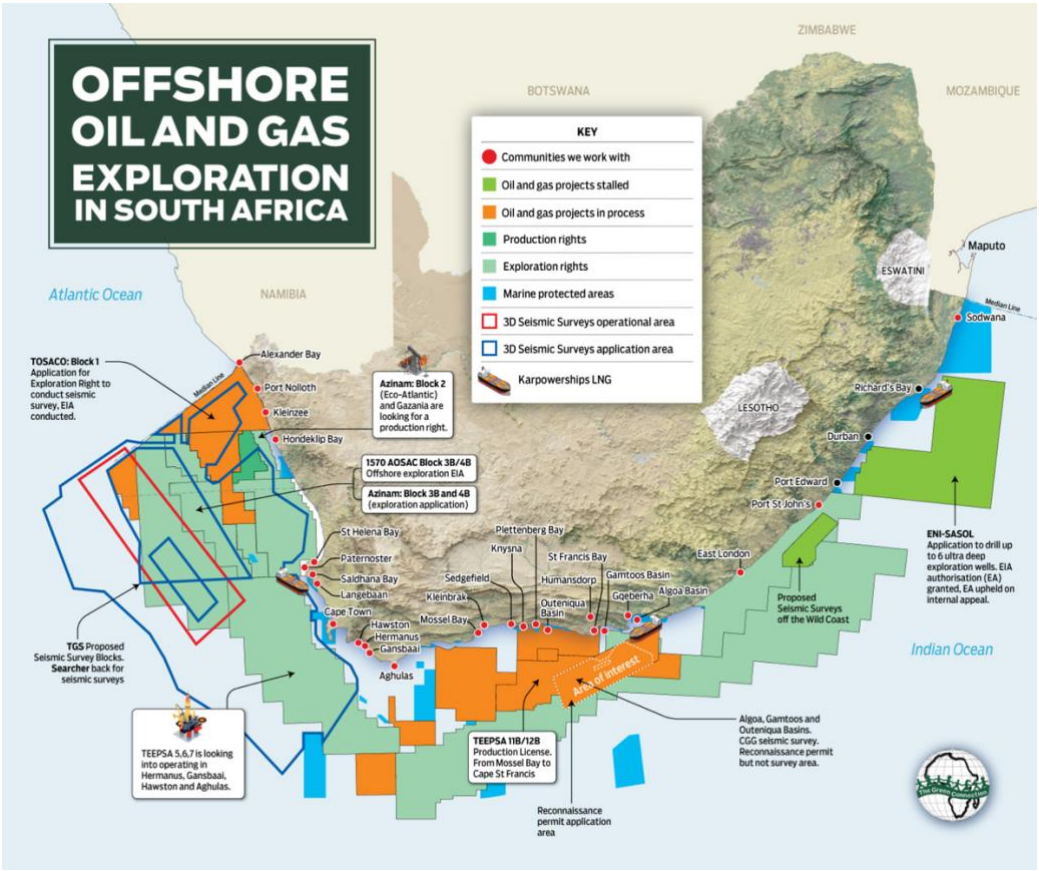

Figure 11, offshore oil and gas exploration in South Africa (The Green Connection, 2021).

In Port Nolloth, 60 km below the expected Boegoebaai project, small-scale fishers have a special and historic connection with the ocean where they believe that their ancestors lie [i5]. To quote Chief !Khaesen Maart, Paramount Chief of the Aikonese Cochoqua Khoi Tribal Council in the Daily Maverick 'As the Khoi and San we trace our ancestry back to the first peoples of the Cape who were fishing along the shores of this region when the colonial settlers established a trading station here. Despite years of dispossession by colonial powers, our

culture is deeply connected to the coast and the ocean that surrounds the Cape' (Maart, 2022). With this quote, Maart connects historical colonial settlements to current day extractive businesses, where he refers to the Dutch by the mention of the trading station.

The colonial boundary and frontier thinking, impacting biodiverse ecosystems such as the Tsau//Khaeb national park, influences the marine space as visualised in figure 11. Forms of green and blue grabbing are justified here through the binary understanding of territories from a Western perspective, overlooking local dynamics and demands (Andreucci and Zografos, 2022). Figure 11 exposes that the entire coast of South Africa is divided up in blocks of offshore oil and gas explorations, construction and extraction, already affecting the marine-based livelihoods of the coastal communities, amongst which communities in Saldanha, Port Nolloth and Lüderitz, that largely rely on fishing for their income [i5]. Each project in each block is legally required to conduct an environmental impact assessment (EIA) of their operations, however, this overlooks that marine-life is transient yet this is not included in these assessments [i5]. Vansant notices that no one is talking about the accumulation of all socio-environmental impacts created by the oil and gas industry, the industrial fishing industry and the green hydrogen industry because it is not required in these EIAs [i5]. Only local communities speak of the cumulative effects of all these industries and impacts because they are most affected by these developments [i5].

The livelihoods of these small-scale fishers are threatened in the competition for the ocean with gas and oil explorations and industrial fishers, causing a militarisation of the water space where fish of small-scale fisheries has been confiscated by the army and police, and boat licences have been taken away. Vansant explains that these small-scale fishers fear that this will increase as green hydrogen facilities will further develop [i5].

Furthermore, 1 kg of green hydrogen requires about 20-30 litres of water, putting pressure on water resources (H2 Watch, 2024). Therefore, desalination plants are installed to desalinate seawater to freshwater for the process of electrolysis, in addition to cooling down renewable energy systems without putting pressure on local water sources (Becker et al, 2023). According to Marthe Fuytier of the PoR, David Bolsman of RVO and the Dutch proposition for South Africa by Becker et al (2023), this could be a benefit for the local community since more water could potentially be desalinated for local (agricultural) use [i11; i13]. However, this line of thinking fails to take into account the use of land, resources and water (to cool down these technologies) in the process. Mostly since there is no significant European regulation yet [i13]. Fishing communities fear that the brine (excess product) of desalination plants will influence the ph-levels in the water, and will harm ocean-life and thus their ocean-based-livelihoods [i5; i8]. Bolsman acknowledged that 'the disposal of the brine byproduct from desalination remains a challenge that requires a viable solution', however Vansant noticed in interviews with local stakeholders who work on establishing green hydrogen in South Africa for European markets, that they were not aware of the consequences of brine resulting from desalination processes [i5]. 'Despite this, many of these projects show promise, especially with European investors involved' Bolsman says [i13]. While van Wyk sees the potential of conflicts over water use resulting from green hydrogen developments [i8].

In addition, Construction of seawalls for deepwater ports, could modify ocean currents that raise concerns amongst the Lüderitz population that it will strip away the local towns beaches (Grobler et al, 2023). Also, the change in currents in the bay area might prevent the brine from disseminating, increasing the concerns over marine-life (Grobler et al, 2023). Residents fear negative impacts on lobster fishing, rock angling and crayfish fisheries, one of the area's tourism

attractions and an informal source of income would also be affected, locals said (Grobler et al, 2023). This fishing industry provides more than 80% of the employment in this region of (Lüderitz Town Council, n.d.). Similar concerns regarding these seawalls have not been raised in communities in Saldanha or around the Boegoebaai port, but this could also be because Saldanha's port lays in a bay, therefore it is largely shielded from the currents, and the Boegoebaai port is planned in a location where there is no town yet. However, Sasol is known to built towns around their industries (such as Sasolburg and Secunda), and in the case of Boegoebaai project, Vansant heard Sasol representatives say at a consultation meeting: 'we can just build a brand new town' [i5]. Whereas in Saldanha, van Wyk says that besides some office spaces being taken up by developers, the local population does not notice much yet of the green hydrogen developments [i8].

4.2.2.3. Air

Hydrogen is considered an indirect greenhouse gas because it interferes with the distribution of methane and ozone, the second and third most important greenhouse gases after carbon dioxide, causing global warming (Derwent et. al., 2006). Thus, though green hydrogen-based energy systems appear to be a solution compared to fossil fuels, the hydrogen economy will still impact climate change negatively (Derwent et. al., 2006).

Also, transportation in South Africa, which is dominated by road freight for the mining sector, is the second largest source of emissions in the country (DSI, 2021). Green hydrogen is planned to transit the (industrial) transportation industry, such as aviation and long-haul trucking, as well as the private mobility sector where green hydrogen powered cars are prioritised in the South African strategy (Van der Graaf et al, 2020; DSI, 2021), which most South Africans will not be able to afford [i8]. Besides that these industries are inherently unsustainable, the tyres of cars and trucks erode over time, adding significantly to air pollution

(Carrington, 2022). Meanwhile, the Netherlands marks a Hydrogen Filling station for long-haul trucking and local transportation as one of the opportunities they see in South Africa (Becker et al, 2023).

Industrial activity, domestic fuel burning, waste burning and mining activities are some of the main contributions to poor air quality (DEA, 2011; Smail, 2022; DFFE, n.d.), of which the largest is the production of energy (DSI, 2021). The coal used for energy production is mined largely in the province of Mpumalanga, where the air quality is particularly concerning as the province is home to 12 Eskom coal-fired power stations, a Sasol plant and a NatRef refinery (Moreoane et al, 2021). In the South African green hydrogen roadmap, particularly in the CoalCO2-X Project, ambitions are to use CCS to produce fertilisers, green ammonia, diesel, and hydrogen (DSI, 2021). Becker et al (2023, p. 3) argue that local climate mitigation can take place by collaborating with (amongst others) Dutch company Proton Ventures that focuses on making coal factories more efficient to reduce emissions, calling it a 'just transition to a green hydrogen economy'. Yet, this idea overlooks the fact that GHG will continue to be emitted and that coal itself is an extractive and polluting business, posing serious risks for miners and surrounding environments and ecologies. Also, technologies such as CCS have never been used on a large-scale and currently it is not expected it will not be able to fulfil the promises to capture all emissions thus still contributing to climate change, while supporting a continuation of fossil fuel extraction (Van de Graaf et al, 2020; Ben-Zeev et al, 2023; Corporate Europe Observatory, 2023). Furthermore, the dust resulting from the production of iron ore for steel creates health concerns for surrounding communities [i8] (Ben-Zeev et al, 2023).

The government suggests transitioning from coal to oil and gas as a cleaner alternative before fully embracing renewables, yet these are only marginally better than coal in terms of emissions

[i5]. Van Wyk summarises that eventually, fossil fuels and resources are going to be burned and extracted to create the infrastructure needed to produce green hydrogen, for the purpose of export [i8]. Inefficient and polluting applications of green hydrogen and technologies such as CCS show how the green energy transition is based on uncertain technologies, in addition to speculative markets, which risks stranded assets and public debts in addition to the continuation of harmful and unsustainable industries under the guise of green growth and sustainable development (Doig and Seeger, 2023).

4.3. The promises and realities of sustainable development

Sustainable development is used to justify the investment and collaboration in green hydrogen export facilities by importing countries in addition to national and local governments of exporting countries. It is a political tool to convince people of their actions, yet a closer look shows how these plans tend to result in empty promises. I discuss these promises on the basis of the lack of meaningful consultation and a neglect of public participation in addition to the unrealistic promises of employment.

4.3.1. Meaningful consultation and public participation

Meaningful consultation should uplift the marginalised and inform the local population carefully on the planned activities according to van Wyk [i8]. Vansant argues in a similar realm, that if environmental impact assessments and social impact assessments would have been conducted correctly, there would have been signs of public uplifting historically marginalised communities, which currently there is not [i5]. However, communities are neglected in decision making processes and at times even deliberately overlooked in green hydrogen developments. This is similar compared to the previous and ongoing (un)meaningful consultation processes in offshore oil and gas developments in South Africa [i5; i8]. People

have to go and search for the information online, or the project happens without local communities knowing anything about it, which happens constantly in South Africa according to van Wyk [i8]. For instance, the community of Saldanha had to discover online that green hydrogen investments of almost €2.5b were going to happen [i8]. Similarly, in Lüderitz, residents found out about Hyphen through social media, and the public consultation meetings were held in the regional capital 350 km away from the planned construction site creating an inaccessible situation for most people (Grobler et al, 2023). Legally companies have to inform people and organise public participation processes [i8]. However, in order to prevent public participation, project developers use shady tactics, for instance in Saldanha, they leapfrog certain developmental stages of their projects in order not to share any information or prevent communities from having a fair chance in participating in the process [i8]. Instead, these developments have only resulted in conflict, poverty and environmental degradation [i5]. In addition to the time and energy that have been taken away from communities, as witnessed by Vansant in Port Nolloth, for the sake of these developments they do not even want in the first place, while these communities might rather spend on ensuring their livelihoods or other activities that benefit their day-to-day lives [i5].

The lack of transparency in the processes of developing green hydrogen facilities become visible in the Dutch proposition for South Africa as well. According to Becker et al (2023, p. 5) 'systemic sustainability' can be reached by close collaboration with local stakeholders and organisations such as GIZ, while it is not specified how this will be done. Further doubts are raised in the methodology section, where the proposition fails to introduce the interviewees (2023, p. 9-10). Yet drawing from the content, it can be assumed that this did not include many environmental justice organisations or activists since it barely addresses any of the concerns that were stated in this thesis. If stakeholder interviews were done from a more holistic approach, it

would be noted that in potential production and export locations concerns over the environment, health, economy, human rights, politics and culture are translated into activism [i8].

Van Wyk argues that a lack of meaningful consultation and public participation will eventually drive local populations to protest because they feel stuck and unheard [i8]. Although, communities in along South Africa's west coast recently won several court cases against oil and gas explorations on the basis of a lack of meaningful consultation (as referred to as well in section 4.1.2.), companies still fail to meaningfully consult local populations where their efforts are not about actually consulting local populations but more a box-ticking effort to get on with business [i5; i8]. Vansant argues that the wealthy markets of the global North look too appealing for the South African government [i5], arguing that the grip of global capitalism on countries such as South Africa in the global South is too tight [i5]. Although technically the current government is democratic, it completely ignores and continues to marginalise these people [i5]. This neglect of the South African government towards its own population, leads van Wyk to guide communities to learn how to be self-sufficient in the form of transition towns, by providing for their basic needs based on the principles of no harm and energy democracy [i8]. Van Wyk concludes that ' the fact of the matter is that they [businesses] don't love it here [in Saldanha], community members do' [i8].

The ecomodernist perspective materialised in green hydrogen developments, causing unequal access to resources while expanding its extractive frontiers, leading to ecological distribution conflicts (Martínez-Alier et al, 2016). Natalie Jane van Wyk argues that 'ensuring transparent decision-making processes, conducting thorough environmental and social impact assessments, promoting equitable distribution of benefits, and actively engaging with affected communities

throughout the transition process is crucial' [i8]. Following the definition of Müller et al (2022), access, ownership and distribution are unequally divided through exploitive financial and unfair political mechanisms. Green hydrogen developments as currently carried out, are not likely to contribute to a genuine just energy transition. Instead livelihoods are taken away for export market profits, as explained by van Wyk, resulting in the deepening of the already large gap in South Africa's society [i8]. 'People will always protest for what they believe is just'; since this is not the first time frontier expansion takes place along Africa's southwestern coastline, Natalie Jane van Wyk states that activism is ingrained in these communities [i8].

Lastly, tender processes go secretly and choices for corporations are not always described by the government as is the case in Lüderitz for the Hyphen project (Grobler et al, 2023). As part of my internship for the EJ Atlas, I tried to retrace ownership for the top hundred largest green hydrogen projects globally based on a database provided by the EIA. However, it appeared to be a time consuming business which was largely due to the green subsidiary companies that mask mainly fossil fuel companies. This misleads the eventual destinations of profits, and thus could be marked as the greenwashing of projects. I want to highlight one situation in particular, which relates to the greenwashing of the weapon industry. In Saldanha Bay, Rheinmetall Denel Munition (Pty) Ltd (RDM) is involved in the plans to create green steel [i8], in order to establish themselves as a producer and exporter on the green hydrogen market (Campell, 2023). This strategic partnership between the German Rheinmetall Defence (51% ownership) and the South African Denel SOC Ltd (49% ownership) 'specialises in the development, design and manufacture of large- and medium-calibre ammunition families and is a world leader in the field of artillery, mortar and infantry systems as well as plant engineering' as stated on their website (Campell, 2021). The company started a 5.06MW solar energy pilot project for the production of green hydrogen at Somerset West in Cape Town (Government Directory

of South Africa, 2022; Campbell, 2023). Meanwhile, Rheinmetall, who owns almost half of RDM, faces charges for supporting apartheid crimes in South Africa (ECCHR, 2024). Rheinmetall (Italy) faces criminal charges for aiding and assisting war crimes in Yemen (Saage-Maaß, 2020). Where, RDM-made artillery was found as well at the scene of civilian attacks in Yemen, that is retraced to the South African arms deal with the Saudi's (Mathe and Dolley, 2020). RDM does not yet face charges for aiding and assisting these war crimes, in addition that they have not faced charges yet for violating legislation established after the end of apartheid in 1994, which was supposed to break with secretive weapon trade and supervise all arms exports from South Africa to prevent the country from supplying to countries where human rights are violated or arms might destabilise regions (Mathe and Dolley, 2020). Using green hydrogen to greenwash the manufacture of weapons, exposes perhaps one of the most poignant examples of how industries greenwash their harmful businesses.

4.3.2. Promises of economic development

Sustainable development is one of the arguments to justify green hydrogen import from these three green hydrogen projects as mentioned in section 4.2.1.. By analysing the promises for job creation, I aim to understand to what extent these ambitions can fulfil promises. Furthermore, by understanding the distribution of energy, particularly in South Africa, I investigate to what extent the green hydrogen developments will be able to foster more equality.

4.3.2.1. Employment

An important selling point of the green hydrogen transition is employment, which is argued to lead South Africa out of its severe unemployment crisis and wealth gap. However, in these promises, questions must be asked what kind of jobs will be created, under what circumstances and for who? (Ben-Zeev et al, 2023) [i5]. According to the country's statistical bureau, the top 10% of the country's population spent 7,9 times more than the bottom 40% in 2015, and

earning distributions depict heavily racialized inequality in the labour market where white South Africans earn on average more than three times as much per month as black South Africans between 2011 and 2015 in addition to having the worst employment outcomes (Stats SA, 2020). Coloured, Indian and Asian South African salaries range in between in this spectrum (Stats SA, 2020). Besides, there is a stark gender gap where women earn on average 30% less than men (Stats SA, 2020).

The Hydrogen Roadmap stated that flagship projects are expected to create at least 20,000 jobs annually by 2030 and a Gross Domestic Product (GDP) contribution of at least US$5b to the economy by 2050 (DSI, 2021; NCEDA, 2023). Becker et al (2023, p. 31-32) state South Africa has the potential to create 1.6 million jobs by 2050 through the renewable energy transition, 'with hydrogen playing a key role'. The Boegoebaai project is expected to create 6,000 jobs initially in operations and maintenance, 6,500 temporary construction and installation jobs for the electrolyser (NCEDA, 2023), while other estimations put this number on 37,500 by 2030-2035 [i5]. Hyphen promises to employ 3,000 people, with 15,000 construction jobs (for 4-5 years) of which 90% will be filled by local Namibians (Hyphen Hydrogen Energy, n.d). Green hydrogen developments in Saldanha promise to create 2,500 jobs in the construction phase and 500 permanent jobs (Groenendaal, 2023).

Concerns are that if the green hydrogen market will not lift-off, the promised jobs will not come into existence or in lesser amounts (Ben-Zeev et al, 2023). Additionally, when Vansant was researching this issue, their interviewees failed to clarify what type of jobs would be created [i5]. It can be assumed, however, that most of these jobs will be in the construction phase of green hydrogen projects, which means that these jobs are temporary and often poorly paid (Ben-Zeev et al, 2023). Moreover, jobs in the construction phase face challenges as well, for instance in

Namibia, local construction capacity has been declining in recent years due to displacement by foreign contractors (Grobler et al, 2023). Also, Namibia has been struggling to complete large-scale infrastructure projects because of corruption charges, resulting in some projects finishing at three times the original price (Grobler et al, 2023). In these instances, the elite in the Namibian Ports Authority, the National Petroleum Corporation of Namibia and (various) ministries (who are also involved in Hyphen) benefitted, from which it is safe to assume according to Grobler et al (2023) that Namibian construction companies are not likely to benefit from the green hydrogen projects.

Additionally, there is a huge skills gap in both South Africa and Namibia (groundWork, 2023; Grobler et al, 2023). Closing this knowledge gap would bear large costs, in time and resources [i8]. Van Wyk explains that people have already grown accustomed to certain lifestyles such as farming or fishing, changing this lifestyle to ensure a job in the green hydrogen sector might cause mental and physical stress [i8]. Promises of employment seem to be unlikely to be fulfilled, while local communities around the project largely struggle financially, and question how to maintain their livelihoods as explained in the previous sections [i5; i8]. During the consultation meeting of the NCEDA on the Boegoebaai project, Vansant heard project developers say they would raise R5.5 trillion (€269.3b) to invest in green hydrogen, in addition stating that 'the investment is not for you. It is for your children and their children, two to three generations further' [i5]. These project developers view the province as 'an investment destination for the next 100 to 200 years' and added that 'we are not doing it for the Northern Cape. We're doing it for the globe and for the country.' [i5]. Meanwhile, jobs on the high-end of the spectrum will likely be located either in the wealthy capitals in South Africa or in the countries of origin of the organisations involved such as the Netherlands.

An example is ammonia, which enables long-distance transportation of green hydrogen, and is already halfway in the production of chemical fertilisers [i9]. South Africa could benefit economically from producing this end product, however, the Netherlands is one of the largest producer and exporter of chemical fertiliser in the world so it would likely be an economical loss to import this product from South Africa instead of making it themselves [i9] (OEC 1, 2024; OEC 2, 2024). Moreover it is important to note that all in all, chemical fertiliser use is not in line with climate agreements nor with a just transition. Besides that ammonia in general is an inefficient carrier: it is expensive, it storage and transportation dangerous do to its toxicity and it diverts green hydrogen away from more efficient applications while it emits most GHG in the field instead of in the production process (van de Graaf et al, 2020; Ben-Zeev et al, 2023; Aguirre-Villegas et al, 2024).

4.3.2.1. Energy

The green hydrogen developments could have enormous economical contributions to the state, yet without a plan on how to utilise energy domestically, all these plans will remain a economic loss because business suffer when load shedding will not be addressed and thus fail to provide businesses with (a stable) energy supply [i5]. To be more specific, the South African government misses US$40 million a day due to load shedding (Maggot et al, 2022). To quote Mohamood (2023) this number is this high because of 'the loss of production, causing damage to equipment, the spoilage of raw materials, and restart costs'. To overcome this, communities are forced to use socio-environmentally unhealthy alternatives such as back-up generators [i5]. However, some small businesses in townships cannot afford such investments, further deepening the wealth gap between businesses in the wealthy urban areas that can afford such investments (Mohamood, 2023).

This energy crisis is due to the deep-rooted issues of mismanagement, fraud, money laundering and corruption at Eskom, South Africa's power producer, which is rooted in apartheid as explained as well in section 4.1.1., t [i5] (Essex and de Groot, 2019; the Economist, 2022; Mohamood, 2023). Energy apartheid, as Mohamood (2023) calls it, is found between the informal urban settlements called townships, where Black South Africans forcefully were relocated to during apartheid, and the wealthy, historically white-only areas. Energy racism, as Maggott et al (2023, p.1) call it, has to do with 'the exploitation of cheap, black labour' who dug coal from the mines, burned to produce electricity, and built the electricity grid which provided a stable supply of energy to 'power the capitalist industrial development in South Africa'.

In these townships, nowadays, in addition to the disproportionate amount of load shedding and economic loss, municipal services and government infrastructure still fail to be provided (Mohamood, 2023). Meanwhile, a disproportionate amount of load shedding in townships has been justified by Eskom to prevent 'theft of electricity by means of illegal connections and vandalism of its infrastructure' as Mohamood (2023) quotes the news article by Makwakwa (2022). In addition to accusations that township residents fail to pay electricity bills without acknowledging that this, too, happens in white neighbourhoods (Mohamood, 2023).

For Eskom, one of the alternatives proposed to overcome this energy crisis is renewable energy, but first, it has to overcome its US$25.2b debt (Mohamood, 2023). Not only standing in the way of creating more equality in the supply of energy and uplifting the historically marginalised, it also stands in the way of lowering South Africa's dependency on coal and other fossil fuels. It also explains why the country collaborates with foreign investors as the Netherlands to achieve their green hydrogen ambitions. Meanwhile in these green hydrogen developments, South African resources are drawn away from a genuine just transition [i8].

5. Conclusion

The drive behind the Dutch green hydrogen import ambitions is motivated by the ecomodernist ideas of green growth. Accelerated by REPowerEU, the Netherlands and the EU push for energy security while following the net-zero targets. This has increased the already high interest in green hydrogen to transit heavy industries. Since green hydrogen allows renewable energy to be transported over long distances, it resolves the Dutch issue of unstable weather conditions and a lack of space to suffice their high energy demands. Additionally, it also promises to resolve energy dependencies the possibility to diversify energy supply by importing it from areas with high renewable energy generation capacities and cheap land. Therefore, the Netherlands has signed a number of agreements, of which I highlight the import

ambitions from the coastline of southwestern Africa. The Port of Rotterdam, in the role of aggregator, has worked on forming partnerships with the project in Lüderitz, Namibia called Hyphen and the Boegoebaai project in South Africa. Additionally, Dutch stakeholders are currently planning with local partners to establish green hydrogen infrastructure from Hyphen, passing Boegoebaai to Saldanha. Because these are the largest planned green hydrogen facilities for export in collaboration with the Netherlands, I focus in this thesis on these three projects.

However, ambitious green hydrogen targets remain elusive due to the quick rise in popularity without there existing a market yet, presenting a chicken-or-egg-problem for investment. To bridge this gap from a technological perspective, a continuation of fossil fuel extraction is proposed, partially through interim solutions as blue hydrogen. Initiating many green hydrogen projects, fossil fuel companies aim to continue their businesses under the guise of supposed low-carbon solutions. This becomes clear from the heavy lobby to maintain their interests, while benefiting the dominant fossil fuel sector and its shareholders. Additionally, economic strategies like the German H2Global aim to resolve the investment dilemma through public-private partnerships (PPPs), but this could risk the redefinition of the policy space for public service provision by putting private capital in control. Still, the Netherlands joined H2Global, where it benefits from German international relations, while Germany benefits from the Netherlands as an energy transfer hub of northwestern Europe.

While domestic responsibility mechanisms have increased in response to gas extraction impacts in Groningen, the Netherlands relies on EU regulations for green hydrogen imports. These are incorporated in H2Global, yet largely prioritise European wellbeing while maintaining economic growth. Meanwhile, imports from southwestern Africa are justified

through the ecomodernist narratives of sustainable development through economic or technological solutions. In reality, sustainable development, as proposed in the Saldanha Bay, Boegoebaai and Hyphen projects, risk becoming an empty promise if projects fail to take local demands into account.

These demands translate to the socio-environmental concerns about green hydrogen projects due to intensified mining activities, environmental degradation and social injustices. In South Africa, restoring unjust land ownership over the past decades have not gained large wins yet, since ownership has been insufficiently documented, land is vulnerable to elite capture. Meanwhile, unique areas of biodiversity along the southwestern coast in Namibia and South Africa are under threat due to the increased pressure on resources in these areas.

For instance, for renewable energy generation, Hyphen uses land in the Tsau//Khaeb national park, while diminishing the already limited public accessible land available. Additionally, Hyphen's port developments are planned on the sacred burial grounds the indigenous people murdered during the genocide committed by Germany in Namibia. Waterscapes might alter due to deepwater port development, risking the beaches from being washed away, threatening the incomes of people reliant on those beaches. The marine-life risks harm due to uncarefully disposed brine from desalination plants, used to cool renewable energy systems and for the process of electrolysis. This poses a threat to the livelihoods of small-scale fishers that already suffer under the gas and oil exploration and extraction along their coast and the effects of climate change. Additionally, air continues to be polluted by inefficient use of green hydrogen for refineries and mining activities, the dust created in certain production processes such as steel, and the erosion of tyres under the heavy freights. Moreover, although in lesser amounts than carbon, excessive emission of hydrogen still contributes to climate change. It can be

concluded from a selection of the ongoing dynamics as stated in the above, that the socio-environmental concerns, climate impacts and health risks of green hydrogen developments are likely to intensify for the people and the nature nearby the three proposed and discussed projects.

Thus, it becomes clear that the nationally imposed green hydrogen transition in South Africa continues along the lines of green capitalism. The promise of green hydrogen as a solution to the intersecting crises of employment, energy and climate is dubious. Employment opportunities are likely overstated, with most jobs being temporary and low-paid. In addition to the skills gap that obstructs the employment promises to be fulfilled soon, project developers in Boegoebaai stated that the developments are for the benefit of future generations and for the world, not for the Northern Cape. This is said while among others, the already historically marginalised, small-scale fisher communities in Port Nolloth largely struggle financially, and question how to maintain their livelihoods.

The energy crisis continues to disadvantage the historically marginalised people, since the South African government fails to define how green hydrogen can be used domestically, continuing the inequalities along the lines of energy apartheid. Load shedding causes local businesses to be sidelined, in addition to poverty preventing these business owners from investing in backup generators. Meanwhile, corruption inflates project costs, benefiting elites, and the use of green hydrogen in industries like mining and refining perpetuates pollution and inequality. These projects often lack transparency, public participation and meaningful consultations processes, driving people to protest.

Genuine justice in energy transitions requires a holistic account of justice, including concepts such as energy democracy and sovereignty, ensuring local control and equitable resource distribution. However, the Dutch expansion of green hydrogen frontiers, mirrors historical patterns of resource exploitation. For instance, the proposition of Dutch Green Hydrogen offices in South Africa, could potentially exert control over local resources, reflecting a form of green colonialism. This expansion risks socio-environmental harm, ignoring historical injustices and local cultures. The Netherlands deepens its influence through both financial and political structures that follow the illusionary path of green growth while simultaneously supporting extractive industries and fossil fuel combustion. This strategy externalises the costs to the communities and already vulnerable ecosystems in these places, while the Netherlands maintains its excessive consumption patterns unquestioned. In conclusion, the Netherlands' involvement in southwestern Africa's green hydrogen projects reflects green colonialism, driven by capitalist interests at the expense of local communities.

Therefore, in order to establish a genuine just transition, questions should be asked about whether the distribution of benefits and burdens is divided fairly, taking into account historical processes that shaped current situations, in addition to the questions regarding ownership of projects and whose interests these bear. With this research, I aimed to fill the gap on green colonialism with regards to the Netherlands, in green hydrogen projects along the coastline of southwestern Africa. However, due to the high pace in which green hydrogen developments take place and change currently, this thesis represents a start from which further research could be conducted. I suggest sharpening further research on the Dutch (green) colonial mindset in relation to international (low-carbon) energy projects. By doing so, knowledge about the context in which green hydrogen developments take place can be expanded in addition to understanding better the role of power distribution amongst the different stakeholders involved

in these projects. Also, questions should be asked about the ways in which the Netherlands can lower their energy demands, in order to decrease importing energy from places where they contribute to vulnerable situations. Moreover, better engagement with local communities and environmental justice organisations can provide deeper insights into the impacts and concerns of green hydrogen developments, in order to improve responsibility mechanisms such as environmental and social impact assessments. Lastly, I was limited in the ecological distribution conflicts I could include in this thesis. Already in South Africa, more conflicts around green hydrogen facilities and export locations occur than I could research. Therefore, further research could update the quickly changing energy landscapes by including environmental distribution conflicts on more places in South Africa and Namibia with regards to green hydrogen and green colonialism.

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Appendices

Table 1: Overview of interviewees.

Ref.	Date	Located in	Name organisation	Name interviewee	role
i1	16 April 2024	NL	Wetenschappelijk Bureau GroenLinks.	Richard Wouters	Researcher for an independent think tank of a Dutch political party.
i2	17 April 2024	NL	NL Hydrogen	Interviewee 2	Expert in energy system design, analysis, and optimization of (smart) energy systems, with focus on hydrogen and sector coupling between energy and mobility. Program Coordinator for System & Infrastructure (Hydrogen, Sector Coupling, Energy Transition) at the hydrogen industry association that connects, strengthens, and represents the Dutch hydrogen sector. Members are active in the production, import, transportation, use, and storage of hydrogen, including related manufacturing industries.
i3	17 April 2024	NL	NWP / EZK	Interviewee 3	Senior policy officer at the Netherlands Ministry of Economic Affairs and program manager at the national hydrogen program.
i4	18 April 2024	NL	NWP / RVO	Leo Brouwer	Senior program advisor for energy and geothermal in urban environments for the national hydrogen program and the Netherlands Enterprise Agency.

i5	18 April 2024	SA	One Ocean Hub / University of Cape Town	Menka Vansant	Doctoral researcher focussing on ocean economy and just energy transitions at an international programme of research for sustainable development and the University of Cape Town. In their research, they focus on the impacts of mega-infrastructure development, including offshore oil and gas and green hydrogen, on small-scale fishers in the Northern Cape. Apply background as an economist, policymaker, and mining conflict researcher to environmental and social impact assessments, ocean economy development plans, just energy transition plans, and decarbonization and climate change goals.
i6	22 April 2024	NL	Dutch environmental organisation	Interviewee 6	Project manager (sustainable) energy at an independent environmental organisation in the Netherlands. They work on subjects as energy infrastructure, and green and blue hydrogen, through research, lobby, project management and relation management.
i7	22 April 2024	NL	EBN	Dennie Kleijweg	Business developer hydrogen for a public energy company in the Netherlands.
i8	24 April 2024	SA	H2Watch / Koek Sisters project / Greenconnection	Natalie Jane van Wyk	Activist, researcher, advocator, project manager at H2 Watch SA in Saldanha bay, South Africa.
i9	25 April 2024	NL	Fossielvrij NL	Leo van Kampenhout	Content specialist and campaigner, focussing on new fossil infrastructure with a focus on Dutch gas exploitation, LNG and future energy systems at an activist network and NGO in the Netherlands.
i10	25 April 2024	NL	EBN	Interviewee 10	Senior advisor strategy and strategic partnerships for a public energy company in the Netherlands.
i11	6 May 2024	NL	Port of Rotterdam	Marthe Fruytier	Business analyst new energy systems at the Port of Rotterdam.
i12	6 May 2024	NL	EBN	Annemarie Rullens	Senior advisor and program manager of social responsible entrepreneurship, stakeholder- and environmental management, participation and public support, strategic partnerships and focus on implementation of CSRD focusing on energy storage, geothermal energy, hydrogen, green gas, CCS and natural gas for a public energy company in the Netherlands.
i13	8 May 2024	NL	RVO	David Bolsman	Senior advisor on hydrogen policy support / independent consultant on strategic issues, change management, supply chain

					assurance, commercial performance. Policy advice for the Ministry of Economic Affairs and Climate.

1. Richard Wouters

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. Could you sketch the political landscape when in terms of importing green hydrogen?
5. What do you think of the Dutch Green Deal, and the consequent NWP and the Hydrogen Roadmap?
6. How are the power balances changing because of the energy transition and through Green Hydrogen?
7. How does justice relate to green hydrogen? And how does import of GH2 emphasise this debate of justice in energy transitions?
8. What is your perspective on investing in production of Green Hydrogen in places outside of Europe / in the Global South?
9. Already different countries are foreseeing the persisting importgap that continues to be, so they are investing in places outside of the EU to meet future demands. How do you view this? With in particular the Netherlands in relation to South Africa?
10. What would be an ethical way to work on green hydrogen in energy transition?
11. What do you think of NLHydrogen? How do you see the role of fossil fuel companies in the energy transition?

2. Representative of NLHydrogen (interviewee 2)

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. Can you explain the energy transition? What motivated it, and how is it going?
5. What are key aspects/actors of this transition?
6. What, in your opinion and according to NLHydrogen, is needed to make the energy transition successful?
7. What is your area of work when it comes to international relations?

8. What is the importance of international relations in the context of hydrogen?
9. Do you see differences in approach between countries? If so, what are they based on?
10. In your role at NLHydrogen supporting companies, how do you see the interaction between politics and businesses?
11. How do you view the transportation of hydrogen over long distances such as between the Netherlands and South Africa?
12. Green hydrogen holds great promises, but still many plans have not become reality. How do you view this?
13. How do you envision the future of hydrogen?
14. How do you view the relationship between the hydrogen ambitions of companies and governments and their feasibility?
15. How does the industry association currently describe the obstacles and benefits of hydrogen?
16. How can it be ensured that hydrogen doesn't fall into the same dependencies we've seen with, for example, Russian gas?
17. NLHydrogen represents many traditional fossil fuel companies. How do you see the role of these fossil fuel companies in the energy transition?
18. An article today in the NRC explained issues between fossil fuel companies and the state around Groningen gas fields and who carries the burdens. How do you look at a struggle like this in the future when it comes to hydrogen? How to make sure that issues like these are foreseen?
19. What is a just energy transition?
20. I see you're a member of the 'Women in Hydrogen' network, can you tell me more about it?

3. Representative of NWP and Ministry of EZK (interviewee 3)

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. What is the NWP?
5. Can you tell me more about what position the NWP takes in relation to politics, the economy and in social terms?

6. How do you and the NWP see the combination of growth and hydrogen? Can there be growth in a changing climate?
7. Who decides on the NWP, and how sustainable is this program in a changing (international) political landscape?
8. Can you explain the energy transition? What motivated it, and how is it going?
9. What are key aspects/actors of this transition? And what is the role of hydrogen amidst this?
10. How do you see the hydrogen ambitions and the feasibility of these ambitions?
11. Your role, as can be read in the article on the NWP, is a connecting factor between projects and sectors. What do you see happening around you?
12. As I read in your interview at NWP, I see you've been working on issues surrounding renewable energy projects, such as environmental management and societal acceptance. Can you tell us more about environmental management of energy projects in which you have contributed?
13. Can you tell us more about your role in promoting 'social acceptance' and how you achieve this? Does social acceptance differ between different population groups, and can you name which groups these are?
14. To what extent does your scope of work reach in terms of societal acceptance? (Could it also include Dutch projects abroad?)
15. How would you compare societal acceptance in the Netherlands compared to other countries? (Germany or South Africa)
16. Do you see what has happened in the past in Dutch history in the field of climate as a factor for contemporary social acceptance of climate policy? To what extent do you take this into account? (e.g. historical emissions from the Netherlands)
17. What is a just energy transition?
18. How does justice relate to green hydrogen?
19. When I look at 'energy in figures' from Energie Beheer Nederland, it is expected that hydrogen/energy will be imported from outside Europe until 2050. How do you view this 'import gap'?

4. Leo Brouwer

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?

4. What are the main political, economic and social challenges facing the NWP? How does the NWP ensure that the interests of all parties involved are taken into account and the pros and cons of the transition are fairly distributed?
5. Who has the most influence on decision-making within the NWP and how is the sustainability of the program assessed?
6. You work at NWP from the RVO, how does this work?
7. How do you see the feasibility of hydrogen compared to the ambitions?
8. What are currently the most important elements that influence decision-making
9. When you work with the urban areas, is that more technical or also social acceptance? How is social acceptance measured? Does this happen through market forces or do you also look outside of that?
10. Which strategies are used to promote social acceptance of hydrogen projects and how effective are they?
11. Are there specific demographic groups that are more or less likely to accept hydrogen technology and what factors influence their attitudes?
12. Do you see differences internationally in social acceptance?
13. How is a just energy transition defined within the context of the NWP and what measures are being taken to achieve this?
14. In what ways are social justice and international solidarity linked to the development and implementation of green hydrogen projects?
15. How do you view green growth?
16. How do you see the role of fossil companies in the green energy transition? And who do you think is responsible for the energy transition?
17. How do you translate an individual's concerns into a policy?
18. How do you view the costs of hydrogen? and the benefits?

5. Menka Vansant

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you explain your research?
4. How is green hydrogen involved in your research?
5. With what organisations do you work together? and what does your collaboration look like?

6. From your perspective, how do you perceive the energy transition and the green hydrogen roadmap South Africa has made and implemented currently?
7. There is a lot of talk about justice and just energy transitions, does this reflect reality?
8. You also work for oil and gas companies and their mega infrastructure projects in South Africa. Can you explain the case for Boegoebaai? and port nolloth?
9. In the Netherlands, oil and gas companies are already saying that gh2 will be too expensive and they need more public subsidies to make it work. It could also mean that more is going to be imported from outside of Europe and places like South Africa. How do you look at this?
10. From your perspective, can you explain the effects of a globalised system, where (in this case) the EU is working on diversifying their energy supply, energy security and climate ambitions, how does it affect South Africa?
11. The energy transition is accelerated due to for instance the war in Ukraine, how does this affect the energy transition in South Africa? A country that is far away, and gets their energy mainly from other resources.
12. What would be a sustainable way to export energy from South Africa? And what needs to happen to get there?
13. At OceanHub work is done on including different knowledge through art or indigenous knowledges. How do they translate that to policy?
14. What do you think of green growth?
15. What does justice mean to you and what does energy justice look like?
16. Who are the main foreign countries that import energy from South africa?
17. I would be interested to speak to someone in the community. Would it be possible to speak to them?

6. Representative of an environmental organisation (interviewee 6)

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. What is the hydrogen coalition?
5. Can you tell me something about the social acceptance of energy projects in the Netherlands?

6. How do you see the relationship between the fossil industry and politics? in relation to the hydrogen transition?
7. How do you view the NWP?
8. What does justice mean for the organisation you work for?
9. How do you view the concept of international solidarity regarding energy transition?
10. How do you view green growth and its feasibility?
11. I spoke to someone from NLHydrogen, the trade association for green hydrogen industries, and he said that because of higher material prices, members such as Shell are already saying they need more public subsidies, what is your view on this?
12. This person also said that this is why the green energy transition is already required, and that fossil fuels should therefore be used for longer. How do you generally view the feasibility of ambitions in the climate agreement, especially with regard to hydrogen?
13. The Netherlands of course has many opportunities for energy generation, but is also dependent on imports from countries outside Europe. How does your organisation view this?
14. How do you view activism in export locations such as in South Africa?
15. How do you view activism in the Netherlands? And how do you see your role in this field?
16. Can you explain something about the network of environmental organisations in the Netherlands?

7. Dennie Kleijweg

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. Can you explain how the EBN has developed itself? Since it was created to invest in gas and oil projects for the Dutch state, is that still the case? In addition to the energy transition?
5. What does the hydrogen transition look like according to EBN?
6. What does the social suitability of hydrogen mean?
7. How do you calculate the benefits and costs of the energy transition in the Netherlands?
8. EBN is also involved in the import of hydrogen (right)?
9. To what extent do you see the feasibility of hydrogen ambitions?

10. Where does the Netherlands position itself in the international hydrogen market so far and where does it want to be?
11. What are the Netherlands' most important international partners in the field of hydrogen?
12. What is the Dutch relationship to Germany?
13. How far is NL currently in achieving its ambitions? Is it on schedule?
14. What are the challenges in achieving hydrogen ambitions?
15. Does this mean that more will have to be imported from abroad/outside Europe?
16. The 'Energy in Figures 2024' report states that an import gap will remain until 2050. Can you say something about this?
17. To reduce the import gap, there are 3 options: Reduce energy consumption, energy efficiency and continue with fossil energy consumption. Can you say something about this regarding the green energy transition?
18. How do you ensure that the benefits and burdens of the energy transition are shared fairly, including with other countries?
19. There is not yet an import organisation for the Netherlands that arranges all practical matters, are you working on this and what will this look like?
20. Is there an CSRD (IMVO) for hydrogen or not? And can you explain what this entails?

8. Natalie Jane van Wyk

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. Since when has hydrogen been on your radar and what has been your first experience with hearing about it?
5. Can you tell a bit about your work at Green connection and H2Watch?
6. How did you get into this work?
7. How do you notice green hydrogen involved in your work and life?
8. With what organisations do you work together? and what does your collaboration look like?
9. What are local communities currently experiencing due to hydrogen?
10. How is gh2 used to keep on using more fossil fuels?

11. Can you connect how gh2 plans are related to mining activities and fossil fuel extraction?
12. Can you tell me something about Free, Prior and Informed Consent? And how does it work?
13. Can you tell me something about justice? What does it mean according to the hydrogen roadmap, what does it mean for you?
14. Ramaphosa marks gh2 as a way to resolve multiple crises in South Africa, such as unemployment, biodiversity and energy crisis. What do you think about this?
15. There is a lot of talk about justice and just energy transitions, does this reflect reality?
16. How do you see the role of international companies and governments?
17. Are there stories of communities who have been able to say no and they were heard?
18. How could communities benefit from gh2 projects? In other words, what could be alternatives?
19. Do you experience support from the DFFE or other governmental bodies?

9. Leo van Kampenhout

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. Can you talk about how you found your way to FossielvrijNL?
5. Where do you start if you want to break the power of the fossil industry?
6. How does this also relate to the power of the state?
7. Can you tell us something about some fossil-free content as a citizen movement?
8. What is climate justice?
9. What do you know about hydrogen and how do you view it?
10. Do you see hydrogen as an actual future? or as a way to hold up the 'false solutions'?
11. How do you see the relationship between the fossil industry and politics? in relation to the hydrogen transition?
12. What does justice mean for fossil-free?
13. How do you view the NWP?
14. How do you view the concept of international solidarity regarding energy transition?
15. How do you view green growth and its feasibility?

16. I spoke to someone from NL Hydrogen, the trade association for green hydrogen industries, and he said that because of higher material prices, members like Shell are already saying they need more public subsidies, what's your view on this?
17. This person also said that this is why the green energy transition is already required, and that fossil fuels should therefore be used for longer. How do you generally view the feasibility of ambitions in the climate agreement, especially with regard to hydrogen?
18. The Netherlands of course has many opportunities for energy generation, but is also dependent on imports from countries outside Europe. How does Fossil Free view this?
19. How do you view and relate to the activism around green energy extraction sites outside of the Netherlands, in which the Netherlands is involved?
20. What do you think is the challenge in communicating the climate crisis?

10. Representative of EBN (interviewee 10)

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. How are strategic partnerships concluded? And what are you paying attention to in establishing these?
5. How do you ensure that different interests are represented?
6. How do you view these partnerships with regard to abroad?
7. How do you look at the import gap and the 3 alternatives given to reduce the import gap?
8. I have looked at the report of the expert team that looks at 2050. How come you do not estimate the amount of energy? And how do you view justice and international solidarity with regard to the climate crisis and the energy transition?
9. How do you view the feasibility of the energy transition?
10. To what extent do you think the Netherlands is responsible for the situation in which they make some purchases from abroad?
11. What is the role of hydrogen in the energy transition?
12. How do you view blue hydrogen and similar solutions as such?
13. How do you view the LNG terminal in Rotterdam?
14. What do you think are priorities in the energy transition?

15. What are the benefits and costs of the hydrogen transition?
16. how do you ensure justice along the entire hydrogen chain
17. How much hydrogen does NL want to get from abroad? And mainly outside Europe?

11. Marthe Fruitier

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. What is the role of the Port of R'dam when it comes to (green) hydrogen?
5. How does the PoR view the purchasing of hydrogen and what role does it play in this? Could it be some kind of intermediary organisation?
6. How do events such as the World Hydrogen Summit or the World Energy Conference contribute to the positioning of Rotterdam?
7. The PoR spends a lot of time positioning yourself on the market, what is the use of this? And what are the results that come from this?
8. How is the port of Rotterdam compared to, for example, Antwerp, Amsterdam, Eemshaven or Germany?
9. What is the port's goal in the field of hydrogen?
10. How do you view the construction of new ports for energy exports, such as in South Africa?
11. There are no IMVO criteria for hydrogen import yet. What do you think could be important criteria?
12. What are some of the risks of the green hydrogen market? Also from an economic perspective?
13. To what extent do you take the non-economic perspective into account?
14. EBN talks about 3 alternatives to reduce the import gap. How do you view the feasibility of a different strategy?
15. How does the port deal with changing political values?
16. How do you view the feasibility of 4GW ambitions in the NWP?
17. How do you see the feasibility of hydrogen? and the green energy transition?
18. Who is responsible for the well-being of the local population around export facilities?
19. you have many different foreign partners, how do you deal with different cultures, perspectives and interests?

20. How do you ensure that the costs and benefits of a new energy market are fairly distributed? Is that even something that is being considered?
21. There are many calls for action in activism and the climate problem is approached from multiple perspectives, how do you view that?
22. How have things changed since REPowerEU?
23. How do you view hydrogen in the overall energy transition?
24. Can you tell me something about the role of the Netherlands as a hydrogen transit country?
25. What is the role of REPowerEU in the Dutch hydrogen ambitions? 4 million tons of hydrogen imports, where does this all come from? How is acceleration achieved?
26. Can you say something about the role of gas in the acceleration of green hydrogen ambitions?
27. What is the role of certification and import of green hydrogen?
28. Green hydrogen is still very expensive, and perhaps increasingly expensive, how can you ensure that this changes?
29. Which countries are realistic to import from?
30. Can you say something about South Africa as an export country?
31. How do you involve the local population in the pre-feasibility and feasibility stage?
32. Who are the most important partners in the field of hydrogen for you?
33. How do you see the feasibility of the transition from grey to green hydrogen?
34. How do you view the achievability of green hydrogen imports?

12. Annemarie Rullens

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. What does the hydrogen transition look like according to EBN?
5. What does the social suitability of hydrogen mean?
6. How do you calculate the benefits and costs of the energy transition in the Netherlands?
7. what could be good ICSR (IMVO) criteria
8. What do you take into account when an investment is made somewhere?

9. How do you view hydrogen imports?
10. To what extent does responsibility lie with Dutch projects abroad?
11. Do you think that should be the case?
12. How do you see the social feasibility of energy transition developing?
13. What is the role of activism?
14. What is the role of the media?
15. How do you include ecological perspectives in social adaptability?
16. What is social adaptability?
17. How has social adaptability changed after REPowerEU and the war?
18. How do you view the effect of international solidarity?
19. How do you interpret justice?
20. How are the burdens and benefits distributed in green hydrogen developments?
21. What are the biggest doubts you hear about hydrogen?
22. How do you view alternatives for the energy market? Are they there?
23. How do you experience the role of activism? and what impact does it have?
24. The portals project encountered many delays due to nitrogen. Now it can continue after all. How does that work, that CO2 emissions are apparently 'worse' than nitrogen emissions? Then it doesn't work, does it?
25. How do you notice that social support responds differently within different parts of the energy transition?
26. There are groups that say: you need to get rid of fossils as quickly as possible, what is your view on that?
27. How do you generally view the feasibility of energy transition and especially the green hydrogen ambitions?

13. David Bolsman

1. Can you introduce yourself?
2. How did your interests in this field develop?
3. Can you describe the organisation you work for, and your role within this organisation?
4. I would mainly like to discuss the procedures surrounding setting up projects abroad and then importing them. Can you take me through the steps that need to be taken to achieve this?

5. Can you tell us more about projects abroad that the Netherlands has focused a lot on? Namibia, South Africa, Chile, Oman?
6. What are the most important laws and regulations that you need to take into account in this process?
7. In particular, I have heard from several sources about CSR, CSRDDD and CBAM, can you tell me more about this? Can you also tell us more about SHIPNL and the future IMVO for hydrogen?
8. I'm curious how criteria are built for these mechanisms? Which sources do you use? Especially when it comes to sensitive points of criticism, such as environmental management.
9. There are still negotiations for when hydrogen is green, can you tell us more about what that depends on?
10. If protests still arise after approval and application of all that certification, because of course not everyone can agree with everything, how do you deal with that?
11. Part of this may of course involve retraining local people to be able to work in production or export facilities. How do you include these types of aspects in the design of a business case abroad?
12. The role of blue hydrogen seems to be increasing again, can you tell us more about this?
13. In connection with subsidy schemes in the EU and I assume also in the Netherlands, it is of course important that the REPowerEU agreements, the climate agreement and the Paris agreements are adhered to, from this perspective) how do you look at LNG as 'transitional' energy and CCS as transition technology?
14. How do you view the role of fossil companies in the green transition?
15. Part of this may of course involve retraining local people to be able to work in production or export facilities. How do you include these types of aspects in the design of a business case abroad?
16. How do you view the role of fossil companies in the green transition?
17. Which international partners does the Netherlands use as export countries?
18. What are the biggest challenges in cooperation with such countries?
19. I know that there are now plans to build an export port in South Africa, can you tell us more about how the Netherlands is involved in this?
20. There is no import organisation in the Netherlands yet, and it is now affiliated with H2 Global, what does this collaboration mean? And how does such an organisation help achieve Dutch climate goals?
21. How do you view the chicken and problem? and the feasibility of the hydrogen ambitions?

22. (In connection with subsidy schemes in the EU and I assume also in the Netherlands, it is of course important that the REPowerEU agreements, the climate agreement and the Paris agreements are adhered to, from this perspective) how do you view LNG as 'transitional' energy and CCS as transition technology?