

Unearthing the Struggle: An Argument Against the Dutch Government’s Nitrogen Reduction Proposal, It’s Impact on Farmers, and Proposed Solutions

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This Note advocates for the elimination or amendment of the current Dutch Nitrogen Policy. The objective is to provide Dutch farmers with more realistic goals and an extended timeframe to effectively reduce nitrogen emissions on their farms, fostering land improvement and promoting sustainable agricultural practices. In the event of government resistance to these changes, this Note also presents alternative proposals aimed at assisting both farmers and the government in addressing the issue of excess manure and ammonia. These proposals involve repurposing excess manure and ammonia for the use in generating alternative green energy, which can enhance self-sufficiency on farms, produce electricity, and serve as a potential fuel source for future vehicles.

I. INTRODUCTION.....	180
II. MODERNIZATION OF DUTCH FARMING: AN EXAMINATION OF DUTCH HISTORY AND INFLUENTIAL CASES CONTRIBUTING TO PARLIAMENT’S GHG EMISSION REDUCTION LEGISLATION.....	183
A. FARM MODERNIZATION PRIOR TO 1950.....	183
1. 1945 – 1950.....	184
B. FARM MODERNIZATION FROM 1950-1975: LAND CONSOLIDATION & RURAL AREA DEVELOPMENT PROGRAM	186
C. FARM MODERNIZATION AFTER 1975.....	187
D. URGENDA CASES.....	188
E. NETHERLANDS NATIONAL CLIMATE AGREEMENT.....	190
F. DEVELOPMENT OF THE NITROGEN LAW AND OBJECTIVES...	192

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III. ELIMINATING NATIONAL PROGRAM'S NITROGEN OBJECTIVE ..	193
A. VIOLATION OF CONSTITUTIONAL RIGHTS.....	194
B. HUMAN RIGHTS VIOLATIONS.....	197
C. LACK OF BEST PRACTICE USE	200
IV. CATALYZING NITROGEN REDUCTION AND ADDRESSING EXCESS MANURE AND AMMONIA: ALTERNATIVE APPROACHES FOR THE DUTCH GOVERNMENT IN LIEU OF THE CURRENT NITROGEN LAW AND OBJECTIVES.....	202
A. COMPLETE REVISION OR AMENDMENT OF THE DUTCH NITROGEN LAW.....	203
B. ENERGY INNOVATION AND CREATION.....	204
1. GASIFICATION.....	205
2. PYROLYSIS.....	206
3. CO-FIRING.....	207
4. DIRECT COMBUSTION.....	208
C. ON-SITE MANURE TO ENERGY CONVERSION SYSTEMS.....	208
V. CONCLUSION.....	210

I. INTRODUCTION

Agriculture stands as one of the most fundamental vocations in society, bearing the collective responsibility of providing sustenance, clothing, and energy for the global population and beyond. Within the European Union (EU), the Netherlands assumes a significant role as the sixth-largest economy, distinguished by its pivotal position as a major European transportation nexus characterized by consistently robust trade surpluses, stable industrial relations, and relatively low unemployment rates.¹

Despite the substantial mechanization within the agricultural sector, which employs a mere two-percent of the Dutch populace, the nation has carved a niche

¹ David Medonald, *How The Netherlands Has Become The World's Second Largest Food Exporter*, MEDIUM (June 27, 2017) <https://medium.com/the-global-millennial/how-the-netherlands-is-the-worlds-second-largest-food-exporter-c411b8fb14dd>.

for itself as an avant-garde leader in food technology.² Moreover, it proudly holds the status of being the world's second-largest agricultural exporter, trailing solely behind the United States.³ As an illustrative example, the Netherlands' agricultural trade in 2015 yielded an impressive total revenue of 82.4 billion euros.⁴ Flowers and plants, meat, dairy, eggs, vegetables, and fruit constitute the Netherlands' top five exporting commodities.⁵ In today's market, these exports have seen substantial growth, with an estimated export earnings projected for 2021 reaching as high as to 104.7 billion euros (110 billion dollars) as reported by Wageningen University.⁶ Nevertheless, despite the country's impressive agricultural success, "the Dutch government is asking the farmer to sacrifice their businesses, lifestyles and often family legacies on the altar of the green agenda, which impacts not only Holland but the rest of the world as well."⁷

In June of 2022, the Dutch government announced that it aimed to cut nitrogen and ammonia emissions by fifty percent by 2030, potentially compelling at least thirty-percent of Dutch farmers to shutter their operations.⁸ The basis of this policy emanates from an EU directive designed primarily to alleviate soil nitrogen levels, preserve soil fertility, and safeguard waters against pollution, principally arising from intensive livestock farming and other industrial enterprises.⁹

The Dutch government, environmentalists, and activists argue that to comply with judicial rulings and enforced EU regulations aligned with environmental and climate objectives, a crucial transformation in agriculture is imperative.¹⁰ While a handful of farms have been able to successfully pivot

² Laura Reiley, *Cutting-Edge Tech Made This Tiny Country a Major Exporter of Food*, THE WASHINGTON POST (last visited Sept. 25, 2023), <https://www.washingtonpost.com/business/interactive/2022/netherlands-agriculture-technology/#>.

³ McDonald, *supra* note 1.

⁴ McDonald, *supra* note 1 (adding that Germany, Belgium, United Kingdom, France, and Italy were The Netherlands' top five agricultural exporting partners).

⁵ *Id.*

⁶ Diederik Baazil, *Dutch No Longer Want to Be One of World's Top Agro Exporters*, BLOOMBERG (Dec. 12, 2022), <https://www.bloomberg.com/news/articles/2022-12-12/dutch-no-longer-want-to-be-one-of-world-s-top-agro-exporters#xj4y7vzkg>.

⁷ Brittany Raymer, *Dutch Farmers Protesting Damaging Climate Change Policies*, JOHN LOCKE FOUNDATION (July 13, 2022), <https://www.johnlocke.org/dutch-farmers-protesting-damaging-climate-change-policies%EF%BF%BC/>.

⁸ *Id.*

⁹ *Id.*; *Report From the Commission to the Council and the European Parliament on the Implementation of Council Directive 91/676/EEC Concerning the Protection of Waters Against Pollution Cause by Nitrates from Agricultural Sources Based on Member State Reports for the Period 2016–2019*, at 1, COM (2001) 1000 final (Oct. 11, 2021); *See also* Council Directive 91/676/EEC of Dec. 12, 1991, Concerning the Protection of Waters Against Pollution Caused by Nitrates from Agricultural Sources, 1990 O.J. (L 375) 1, (EC).

¹⁰ Ciara Nugent, *Dutch Farmer Protests Show How Messy the Climate Transition Will Be*, TIME (July 29, 2022, 10:45 AM), <https://time.com/6201951/dutch-farmers-protests-climate-action/>; Clair Moses, *Dairy Farms in the Netherlands Are Up in Arms Over Emissions Cuts*, N.Y. TIMES (Aug. 20, 2022), <https://www.nytimes.com/2022/08/20/world/europe/netherlands-farmers-protests.html>; *see also* Bartosz Brzezinski & Camille Gijs, *Not easy being green: Rutte's eco-friendly agenda falters amid*

towards sustainable farming practices, a significant majority of farmers, especially those operating livestock and small family farms near Natura-2000 reservation areas, face considerable challenges in making this transition within the government's stipulated timeframe. Consequently, this gave rise to a series of on-and-off Dutch farmer protests which began in October 2019. Ultimately headlining world news outlets in the Summer of 2022, a large-scale demonstration on June 22, 2022, in Stroe, Province of Gelderland, drew more than 60,000 farmers and 20,000 tractors.¹¹ These protests escalated in intensity over the summer, led by independent local initiatives, leading to traffic disruptions, disturbances in food distribution centers, attempts to obstruct airports and runways, ultimately escalating tensions and confrontations between the Dutch agricultural sector, activist, protestors and government authorities.¹²

Despite the divisive discourse and the lack of consensus on new or revised nitrogen policy, there lies a silver-lining in the form of a shared acknowledgment by both farmers and their opposition that the Netherlands indeed faces an excess nitrogen problem, and a collective resolution for nitrogen reduction is essential.¹³

This Note advocates for a comprehensive overhaul, or at the very least, a thorough revision of the existing Dutch nitrogen legislation and objections. The proposed new nitrogen law seeks to utilize current regulations as a framework for formulating measures that achieve a comprehensive reduction in nitrogen emissions within the Dutch agricultural and land use sector. Part II offers historical context by delving into the evolving relationship between farmers and the government during the era of farming modernization. It also underscores the significance of the three Urgenda Cases, the Netherlands National Climate Agreement (Climate Agreement) as it relates to the agriculture and land use and

Dutch farmer backlash, POLITICO (Sept. 6, 2022, 9:19 PM CET), <https://www.politico.eu/article/dutch-farm-crisis-rocky-path-climate-transition-henk-staghouwer/> (explaining that academics and activists agree that drastic measures are needed, due in part to the government's lack of prior involvement in fighting climate change and cutting nitrogen emissions); *see also id.* (quoting Jeroen Candell, an agricultural policy professor at Wageningen University in the Netherlands, stating: "We've known about the [pollution] for at least ten years, but because the government kept ignoring the issue, it [the government] suddenly found itself backed into a corner without a clear idea of how to resolve it").

¹¹ U.S. DEPT OF AGRIC. FOREIGN AGRIC. SERV., NETHERLANDS: 2022 DUTCH FARMER PROTESTS AGAINST NEW NITROGEN GHG EMISSIONS REDUCTIONS POLICIES, 3 (July 27, 2022) <https://www.fas.usda.gov/data/netherlands-2022-dutch-farmer-protests-against-new-nitrogen-ghg-emissions-reductions-policies> [hereinafter *USDA IV*] (explaining that the main initial protest was held in Gelderland, which will be one of the hardest hit provinces in the Netherlands under the nitrogen reduction programs).

¹² *See id.* at 6-10; *see also* Karl Mathiesen, *Protecting Nature, Destroying Lives. The Chemist vs. the Dutch Farmers. Is Johan Vollenbroek saving the Netherlands – or Tearing it Apart?* POLITICO (Mar. 9, 2023, 1:10 PM), <https://www.politico.eu/article/johan-vollenbroek-netherlands-nitrogen-pollution-climate-change-farming/> (providing such examples as, "on one occasion in February, a mob carrying torches confronted Deputy Prime Minister Sigrid Kaag during a campaign stop," death threats letters to Johan Vollenbroek through that also contain fine powder); *see also* Patrick Smith, *How Dutch Farmers Became the Center of a Global Right-Wing Culture War*, NBC NEWS (Dec. 12, 2022, 4:24 AM), <https://www.nbcnews.com/news/world/dutch-farmers-emissions-global-right-wing-culture-war-rena60269> (describing the Farmers Defense Force as a radical far-right group. "But in reality, many Dutch farmers are just trying to make a living").

¹³ *USDA IV*, *supra* note 11, at 11.

presents a chronological timeline that maps out the progression of Dutch nitrogen legislation and its objectives. Part III asserts that the National Program infringes upon farmers' constitutional rights and human rights and criticizes the Dutch government for its failure to employ best practices in making meaningful progress towards reducing nitrogen emissions in the Netherlands. In Part IV, three potential solutions are put forth, each of which merits consideration for incorporation into the new or revised nitrogen policy. Finally, Part V of this Note strongly advocates for the revision of the current nitrogen law to encompass manure and ammonia energy conversion procedures. It emphasizes the manifold benefits of this approach, particularly addressing the surplus manure and ammonia issue, which, if properly implemented, not only resolves a waste problem but also contributes significantly to the Netherlands' pursuit of greener energy sources.

II. MODERNIZATION OF DUTCH FARMING: AN EXAMINATION OF DUTCH HISTORY AND INFLUENTIAL CASES CONTRIBUTING TO PARLIAMENT'S GHG EMISSION REDUCTION LEGISLATION

This Part provides a succinct overview of the historical interaction between the Dutch government and the agricultural sector throughout the era of agricultural modernization. This Part also analyzes three pivotal Dutch environmental cases that serve as a catalyst for legislative actions aimed at combating climate change and mitigating greenhouse gas (GHG) emissions.

A. *Farm Modernization Prior to 1950*

In the era of farm modernization preceding 1950, three significant instances of government intervention played a pivotal role in bolstering the country's agricultural sector.¹⁴

The government's initial intervention occurred during "the Agrarian Depression in the last part of the nineteenth century."¹⁵ Agricultural questions were a concern for the Dutch government, particularly on behalf of the small-scale farmers. These outcomes facilitated the establishment of an enhanced agricultural education, proactive management of agricultural issues, and the development and adoption of innovative agricultural technologies.¹⁶ Notably, this period saw the introduction of artificial fertilizers, the emergence of dairy factors, and the formation of farmer-led rural cooperatives.¹⁷ These developments opened up new opportunities for small farmers, particularly those who relocated their operations to the eastern and southern regions of the

¹⁴ Erwin H. Karel, *Modernization of the Dutch Agriculture System 1950-2010*, INT'L RURAL HIST. CONF. 2010, U.OF SUSSEX, BRIGHTON (U.K.) 13-16 (Sept. 2010), 5 https://pure.rug.nl/ws/portalfiles/portal/10468904/Paper_Brighton_september_2010.pdf.

¹⁵ *Id.* at 4 (lasting from 1879–1896).

¹⁶ *Id.*

¹⁷ *Id.*; see also Haifa Feng, *Agricultural development in the Netherlands: An Analysis of the History of Dutch Agricultural Development and its Importance for China*, 43 (July 1998), <https://edepot.wur.nl/400417>.

Netherlands, where sandy soil prevailed as the predominant soil type.¹⁸ This development ultimately fostered the expansion of small-scale farming, particularly between 1898 and 1914, with a notable emphasis on mixed farming practices, which were the predominant agricultural method during that period.¹⁹

The Dutch government intervened a second time during the First World War, prioritizing the national interest and contributions to the war effort took precedent over individualistic interests and successes.²⁰

Finally, the government's third intervention occurred in 1929, coinciding with the onset of the Global Economic Crisis and the Great Depression.²¹ During this period, the Dutch government devised a strategy to shield small farmers from bankruptcy.²² This strategy encompassed several measures aimed at alleviating the financial burden on most farmers, including the regulation of prices and production, guaranteeing a minimum income for most farmers.²³ These interventions collectively contributed to the recovery of the the agricultural sector by the conclusion of the crisis.²⁴ The Dutch economic rebound experienced a temporary upswing, as farmers benefited from Germany's (pre)war economy.²⁵ This marked a continuation of the trend that had been observed since the end of the nineteenth century, whereby state interventions in agricultural affairs progressively gained significance, a pattern that persisted beyond 1945.²⁶

1. 1945 – 1950

Between 1945 and 1950, Dutch agriculture faced three distinct challenges, each of which necessitated increased government intervention. These problems centered around competition in the international market, inefficient production, and large number of small farmers.²⁷ Initially, Dutch agriculture needed to establish its position within the global market. In the immediate aftermath of

¹⁸ Erwin H. Karel, *Modernization of the Dutch Agriculture System 1950-2010*, INT'L RURAL HIST. CONF.2010, U.OF SUSSEX, BRIGHTON (U.K.) 13-16 (Sept. 2010), 4 https://pure.rug.nl/ws/portalfiles/portal/10468904/Paper_Brighton_september_2010.pdf (claiming that the introduction of artificial fertilizer made it possible, for small farmers living in eastern and southern Netherlands, to start a farm and to cultivate on waste land (i.e., sandy soil). The introduction of rural cooperatives gave farmers a chance to sell and buy products at more profitable prices. Moreover, the addition of dairy factories gave small farmers an opportunity to deliver and earn profit from their small milk surplus, especially when it had never been that way in the past).

¹⁹ *Id.*

²⁰ *Id.*

²¹ *Id.*

²² *Id.*

²³ Erwin H. Karel, *Modernization of the Dutch Agriculture System 1950-2010*, INT'L RURAL HIST. CONF.2010, U.OF SUSSEX, BRIGHTON (U.K.) 13-16 (Sept. 2010) 5-6 n.8, https://pure.rug.nl/ws/portalfiles/portal/10468904/Paper_Brighton_september_2010.pdf.

²⁴ *Id.* at 6.

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.*

World War II, Dutch farmers competed internationally, owing to elevated global prices for their products.²⁸ However, the preference for high international prices by Dutch farmers had adverse effects for the county's own economy.²⁹ For example, higher food prices had the potential to increase labor costs in the industry, which, in turn, could negatively affect the international exportation of industrial products.³⁰ This posed a particular challenge, as, like other European countries Post-World War II, the Dutch economy heavily relied on income generated from exports.³¹ The government's approach to this issue involved "subsidiz[ing] the farmers in order to prevent them from selling their products at the international market," thus resulting in more food staying home.³² Initially, consumers reaped the benefits of these subsidies; however, the government failed to incentivized farmers to reduce their production costs.³³ This disincentive led to a dearth of investments in the agricultural sector. Consequently, when global prices for agricultural goods declined, Dutch farmers found themselves ill-equipped to compete.³⁴ This economic predicament took a toll on the Dutch farming community, deeply rooted in traditional agricultural practices, where essential agricultural knowledge was traditionally transferred from one generation to the next. This tradition acted as a barrier to the adoption of contemporary production techniques, further compounded by banks' reluctance to extend financial support to traditional farmers. The repercussions were most profoundly felt by small farmers whose core mission was to pass down the farm to their eldest son.³⁵

The second issue revolved around the necessity to enhance production conditions.³⁶ The State's answer to this challenge was the implementation of large-scale land consolidation.³⁷ In response to national growth, comprehensive improvements were made in infrastructure and landscapes, encompassing the construction of new roads, canals, and bridges. The State feared that these substantial investments might not yield a commensurate return, especially if traditional farmers remained steadfast in their traditional practices.³⁸ This prompted the creation of the Rural Area Development Program (RADP).³⁹

²⁸ *Id.*

²⁹ Karel, *supra* note 14, at 6.

³⁰ *Id.*

³¹ *Id.*

³² *Id.*

³³ Karel, *supra* note 14, at 6.

³⁴ *Id.* at 6-7.

³⁵ Karel, *supra* note 14, at 7.

³⁶ *Id.*

³⁷ *Id.*

³⁸ *Id.*

³⁹ Karel, *supra* note 14, at 11 (mentioning that traditional working small farms had to be acculturated into the modern world); *see infra* text accompanying note 54.

The third challenge revolved around the prevalence of numerous small farmers grappling with limited land availability, insufficient capital for investment, and relatively modest incomes when measured against their counterparts in industrial occupations.⁴⁰ These small farmers, however, were resolute in their determination to preserve their agricultural heritage, keeping farms within the family.⁴¹ Indeed, their unwavering dedication garnered strong support from farmer unions and confessional political parties.⁴² To reconcile the interests of these groups, the State devised the RADP, particularly to address concerns raised by the unions about significant State intervention in familial affairs.⁴³

B. *Farm Modernization From 1950-1975: Land Consolidation & Rural Area Development Program*

In response to the imperative need for structural reconstruction within the agricultural sector following World War II, the Dutch Parliament introduced two pivotal pieces of legislation to address the problem: Land Consolidation Program (LCP) and Rural Area Development Program (RADP).⁴⁴

The LCP, initiated in 1955 and concluded with the introduction of the Land Reconstruction Act (LRA) in 1985, served as an instrumental means to enhance the overall production structure of the agricultural sector during its thirty-year tenure.⁴⁵ The LCP was underpinned by two primary objectives. First, it aimed to facilitate land rearrangement to enable farmers to work more efficiently.⁴⁶ At the time, this involved providing farmers with the capacity to employ larger machinery and reduce travel time between properties between properties.⁴⁷ Second, the program entailed substantial governmental investment into improving Dutch infrastructure.⁴⁸ The consequences of the LCP were threefold.

⁴⁰ *Id.*; see also Haifa Feng, *Agricultural development in the Netherlands: An Analysis of the History of Dutch Agricultural Development and its Importance for China*, 49 (July 1998), <https://edepot.wur.nl/400417> (emphasizing agricultural mechanization and agricultural workers leaving their jobs for the number of industrialization jobs).

⁴¹ Haifa Feng, *Agricultural development in the Netherlands: An Analysis of the History of Dutch Agricultural Development and its Importance for China*, 55 (July 1998), <https://edepot.wur.nl/400417> (emphasizing that the family farm is the cornerstone of agricultural production. Moreover, the agricultural sector is dominated by private enterprises and one of the main characteristics of all institutional systems in Dutch agriculture).

⁴² Karel, *supra* note 14, at 11.

⁴³ Karel, *supra* note 14, at 7-8.

⁴⁴ Karel, *supra* note 14, at 8-9.

⁴⁵ Karel, *supra* note 14, at 10 (essentially becoming “an instrument to improve the production structure of the whole agriculture section”).

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ Karel, *supra* note 14, at 10; see Henk Leenen, *Land Consolidation in the Netherlands*, INTERNATIONAL FEDERATION OF SURVEYORS (May 19, 2021), https://geodaesie.info/images/zfv/139-jahrgang-2014/downloads/zfv_2014_3_Leenen.pdf (explaining that while the primary focus was the enhancement and construction of Dutch roads, bridges, canals, and locks; these developments also had a substantial impact on the production output of Dutch agriculture).

Firstly, the consequences predominantly manifested in the expansion of agricultural enterprises or an increased emphasis on more intensive production methods.⁴⁹ Secondly, the rationalization of production led to a reduced demand for laborers to execute specific tasks, thereby resulting in a diminished need for farmers to produce and harvest goods.⁵⁰ Consequently, the number of farms in the Netherlands decreased significantly, declining from 400,000 in 1945 to 75,000 in 2010.⁵¹ Thirdly, the LCP spurred farmer specialization with an emphasis on a reduction in the diversification of farm work, such as livestock farmers solely specializing in cattle.⁵²

From 1956 to 1970, the RADP functioned as an advisory program designed from communities and was founded on three fundamental elements: (1) technical and economic advice; (2) housekeeping advice; and (3) social advice.⁵³ The program was not solely directed at improving the management of farm work, but also aimed to bring about social advancement for farming families.⁵⁴ However, despite its initial altruistic intentions, the RADP gradually evolved to prioritize farmers with the most promising prospects.⁵⁵ Consequently, this preference led to decreased viability for small-scale farmers, and expansion of larger (including commercial) farms through the acquisition of smaller holdings, and a rapid decline in the overall number of farmers in the Netherlands.⁵⁶

C. Farm Modernization after 1975

Up until now, the modernization of farm practices has yielded economic efficiency, but it has become evident that this process also has detrimental environmental consequences.⁵⁷ The shift towards modern farming practices had

⁴⁹ Karel, *supra* note 14, at 10 (explaining that a Dutch farmer in 1900 could support his family with one-to-two hectares. In 1945, the Dutch farmer needed at least (4) hectares to support his family. In 1956, at least seven (7) hectares was needed. In 1961, farmers needed at least twelve hectares to support their family. In the 1970's, to be a successful and supportive Dutch farmer, 20 hectares were needed. Currently, to survive as a farmer in the Netherlands, one needs anywhere from 60-to-100 hectares of tillable land).

⁵⁰ Karel, *supra* note 14, at 11; *see also* Haifa Feng, *Agricultural development in the Netherlands: An Analysis of the History of Dutch Agricultural Development and its Importance for China*, 52 (July 1998), <https://edepot.wur.nl/400417>.

⁵¹ Karel, *supra* note 14, at 11; *see also* C. Martijn van der Heide, Huib J. Silvis, & Wim J.M. Heijman, *Agriculture in the Netherlands: Its Recent, Past, Current State and Prospectives*, 26 <https://pdfs.semanticscholar.org/3b23/3b95da4b351ea147d64a04c5c51741196fa9.pdf> (emphasizing the drastic decrease of Dutch farms starting in 1950 where it was estimated that the Netherlands had about 410,000 farms and agricultural businesses. Compared to now where there's are about 54,000 farms and agricultural and horticultural related business combined (20,000 of the 54,000 are farms) in the Netherlands).

⁵² Karel, *supra* note 14, at 11

⁵³ Karel, *supra* note 14, at 13.

⁵⁴ *Id.*

⁵⁵ *Id.* at 13 (explaining briefly that the government promised small farmers a pension in exchange of their farm).

⁵⁶ *See generally* Karel, *supra* note 14, at 11-13.

⁵⁷ *Id.* at 15-16.

a particularly adverse effect on the traditional small-scale landscape.⁵⁸ In 1975, the Dutch government initiated a significant environmental policy known as the “Relation Memorandum,” which aimed to grant farmers the opportunity to manage nature-reserves alongside their farms and agricultural properties.⁵⁹ Despite initial resistance from farmers, the enticing financial incentives proved to be compelling.⁶⁰

In 1985, the Land Consolidation Act was succeeded by the Land Reconstruction Act (LRA),⁶¹ which laid the legal foundation for an integrated and multifunctional approach to land development.⁶² The LRA introduced four primary forms of land development: (1) land consolidation; (2) land redevelopment; (3) land adaption; and (4) land consolidation by agreement.⁶³ This legislative shift not only encouraged land consolidation by offering incentives to farmers but also emphasizes the importance of nature preservation, recreational activities in urban and rural areas, and the expansion of villages.⁶⁴

In its entirety, the history between the government and the agricultural sector in the Netherlands reveals a collaborative relationship characterized by supportive interventions that mutually benefited both parties during the era of farming modernization. The partnership played a pivotal role in transforming the Netherlands into the global agricultural export powerhouse it is today. However, this harmonious relationship began to unravel in 2015.

D. *Urgenda Cases*

The persistent conflict between environmental conservation and agricultural interests persists as a formidable challenge within the Dutch landscape.⁶⁵ Furthermore, the Netherlands’ commitment to addressing climate change and mitigating GHG emissions has not consistently demonstrated a resolute or ambitious stance. What commenced as a simple letter addressed to the Prime Minister, conveying environmental concerns and emphasizing the urgency of tackling climate change, evolved into a three-part legal battle. This legal challenge raised fundamental questions about whether the Dutch government fulfilled its duty of care to its citizens, the environment, and the

⁵⁸ *Id.* at 15.

⁵⁹ *Id.*

⁶⁰ *Id.* (noting that in 1996, “6,000 farmers, which is eight to nine percent of total number of Dutch farmers, managed 43,000 hectares of Relation Memorandum-land.” Overall, this is about two percent of the Dutch agriculture land).

⁶¹ Also known as the “Land Development Act”.

⁶² Henk Leenen, *Land Development in the Netherlands*, INTERNATIONAL FEDERATION OF SURVEYORS, 168 (March 2014) https://geodaesie.info/images/zfv/139-jahrgang-2014/downloads/zfv_2014_3_Leenen.pdf.

⁶³ *See id.*

⁶⁴ Karel, *supra* note 14, at 16; *see also* Leenen, *supra* note 62.

⁶⁵ Karel, *supra* note 14, at 19.

global community in its efforts to reduce GHG emissions and combat climate change.

Urgenda, a Dutch nonprofit foundation, is dedicated to fostering a transition to a sustainable society through initiatives such as implementing “energy-neutral” housing and expediting the adoption of electric mobility, with a focus on a circular economy powered by renewable energy to address climate change and ensure a secure habitat for future generations.⁶⁶

In the spring of 2015, the Urgenda Foundation initiated the first of three legal actions against the Dutch government. The landmark decision by The Hague District Court in *Urgenda Foundation v. Netherlands* shocked governments, activists, and environmentalists around the world.⁶⁷ The District Court issued an injunction, mandating that the Dutch government reduce GHG emissions to a level at least twenty-five percent lower than those in 1990.⁶⁸ The court’s rationale was firmly rooted in that it was imperative for the government to take more substantial action in averting the impending perils of climate change and mitigating GHG emissions.⁶⁹ Furthermore, the court underscored the conviction that any reduction in emissions signifies a significant stride towards preventing catastrophic climate change, urging the Netherlands to assume a leadership role within the EU’s efforts to combat climate change.⁷⁰

In the autumn of 2018, both parties appealed the judgment of the Hague District Court to the Hague Court of Appeals Civil-law Division, leading to the case of *Netherlands v. Urgenda Foundation*.⁷¹ Urgenda’s appeal contended that the State’s procrastination constituted a breach of its Duty of Care under Article 2 and Article 8 of the European Convention on Human Rights (“ECHR”) concerning Dutch citizens.⁷² The State countered by emphasizing its commitment to the EU-wide minimum GHG emission reduction targets for 2030 and 2050.⁷³ Additionally, the State contested the District Court’s judgment in its entirety,⁷⁴ however, the Hague Court of Appeal ultimately affirmed the District Court’s verdict.⁷⁵

⁶⁶ URGENDA, <https://www.urgenda.nl/en/home-en/> (last visited Jan. 18, 2024).

⁶⁷ Marc A. Loth, *Too Big to Trial? Lessons From the Urgenda Case*, 23 UNIF. L. REV. 336, 336 (2018).

⁶⁸ Case C-09/456689, *Urgenda Foundation v. State of the Netherlands* (Ministry of Infrastructure and the Environment), ECLI:NL:RBDHA:2015:7196, 57, (June 24, 2015) [hereinafter *Urgenda v. Netherlands*] (clarifying that this EU document does not have paragraph numbers nor pages. This document uses sections or chapters, so to be as specific as one could be, to find the citation is in section, “5: The Ruling,” more specifically, 5.1); *see also* Loth, *supra* note 67.

⁶⁹ *Urgenda v. Netherlands*, *supra* note 68.

⁷⁰ *Id.*

⁷¹ Case C-200.178.245/01, *State of the Netherlands v. Urgenda Foundation* (Ministry of Infrastructure and the Environment), ECLI:NL:GHDHA:2018:2610, ¶ 29, (Sept. 10, 2018) [hereinafter *Netherlands v. Urgenda I*].

⁷² *Id.*

⁷³ *Id.* ¶ 30.

⁷⁴ *Id.* ¶ 31-33.

⁷⁵ *Id.* ¶ 78, (declaring the judgment provisionally enforceable).

In the winter of 2019, the final judgment in the *Netherlands v. Stichting Urgenda* was adjudicated, but this time by the Supreme Court of the Netherlands.⁷⁶ The State's appeal aimed to annul the decision of the Hague Court of Appeals, however, the Dutch Supreme Court dismissed the State's appeal, confirming that the rulings of both the District Court and the Court of Appeals stand as final orders, therefore obliging the State to achieve a minimum reduction of twenty-five percent in GHG emissions originating from Dutch territory, compared to the levels of 1990.⁷⁷

These three *Urgenda* cases hold profound significance, serving as exemplars where the judiciary held the State accountable for its actions and established a precedent for future legal challenges against the Dutch government.

E. *Netherlands National Climate Agreement*

The Climate Agreement comprises four integral parts, delineating the Dutch government's primary objective of reducing GHG emissions by forty-nine percent compared to 1990 levels by 2023. Furthermore, this comprehensive document incorporates provisions that empower the Dutch Parliament to elevate GHG emissions reduction target from forty-nine percent to fifty-five percent within the same timeframe.⁷⁸ The document's structure encompasses four distinct sections: Part A introduces and provides overview of the document;⁷⁹ Part B briefly outlines the goals and targets of the Climate Agreement and sets out principles for monitoring and governance;⁸⁰ Part C outlines all commitments made from all five sectors;⁸¹ Part D outlines agreements made regarding issues that affect multiple sectors.⁸² This Note specifically addresses two sections within the Climate Agreement, namely, (C4) Agriculture and Land Use and (D2) Biomass.

The Dutch government duly recognizes the efforts made by the agricultural and horticultural sectors in reducing the Netherlands' GHG emissions by seventeen percent since 1990.⁸³ However, as emphasized in the Climate

⁷⁶ Case C-19/00135, *State of the Netherlands (Ministry of Economic Affairs and Climate Policy) v. Stichting Urgenda*, ECLI:NL:HR:2019:2007, ¶¶ 8.3.4-8.3.5 (Dec. 20, 2019) [hereinafter *Netherlands v. Urgenda II*].

⁷⁷ *Id.*

⁷⁸ *Klimaatakkoord* [Netherlands National Climate Agreement]; The Hague, 28 June 2019 *Trb.* 2019, 5 [hereinafter *Climate Agreement*].

⁷⁹ See *Climate Agreement*, *supra* note 78, at 5.

⁸⁰ See *Climate Agreement*, *supra* note 78, at 6-9

⁸¹ See *Climate Agreement*, *supra* note 78, at 16-193 (covering all sector-specific commitments including: Built environment; Mobility; Industry; Agriculture and land use; and Electricity sectors).

⁸² See *Climate Agreement*, *supra* note 78, at 193-246; (covering all cross-sector cohesion including: systems integration; Biomass; Integrated knowledge and innovation agenda; Labor market and training; Creating support in society; Spatial planning; Regional Energy Strategy (RES); Financing by the market; Key principles for the expansion of the SDE+ scheme; and the exemplary role of the national government).

⁸³ *Climate Agreement*, *supra* note 78, at 123.

Agreement, a significant acceleration in emission reduction is required, acknowledging the inherent connection between GHG emissions and natural by-products, such as methane and nitrous oxide from animal husbandry and fertilization.⁸⁴ Simultaneously, there is an expectation for these sectors to intensify their endeavors in carbon capture through soil, forests, and materials, augment their biomass production and enhance renewable energy generation. The Climate Agreement's "Agriculture and Land Use" sector consists of seven subchapters that outlines the Climate Agreement's vision, target, and ambitions for 2030 and 2050. These subchapters also encompass standard criteria, strategies for GHG and nitrogen emission reduction in livestock farming, land usage, greenhouse horticulture, food consumption, and supply chain strategies within the agricultural and land use sector.⁸⁵

Notably, innovation is pivotal in this sector and will play a significant role in shaping the Netherlands as a nation. The Climate Agreement emphasizes that innovative supply chains and businesses are instrumental in formulating the 2050 strategy, but they are equally critical in achieving the stipulated goals for 2030.⁸⁶ To materialize these aspirations, the Climate Agreement's signatories are placing particular emphasis on innovations aiming for: (1) reduction of GHG emissions in the production of food and non-food by 2050; (2) "advancement of the national and regional extent to which activities are land-based, in parallel with the creation of closed cycles"; (3) net production of renewable energy from the agriculture, horticulture, and forestry sectors; (4) organization of land and water to help be used for carbon capture; and (5) cutting the climate impact of purchasing decisions by consumers by 2050.⁸⁷

In the context of the Climate Agreement, the Dutch government has a sanguine outlook on Section D2 "Biomass," anticipating that it will play a pivotal role in fortifying the sustainability of the Dutch economy and aiding the nation in attaining its climate objectives. The primary focus concerning biomass within the Climate Agreement is centered on soil fertility, soil-based carbon capture, and its potential applications as a feedstock.⁸⁸ Ongoing discussions among stakeholders persist regarding the utilization of biomass as a replacement for fossil fuels, energy generation and electricity production, with an overarching aim to reduce GHG emissions, specifically nitrogen.⁸⁹ These two specific sections within the Climate Agreement serve a distinct purpose in the restructuring of the Dutch Agricultural sector. They are designed to champion sustainable and innovative farming practices, aimed at not only curtailing GHG emissions, and enhancing the country's environment, but also upholding the Netherlands' well-

⁸⁴ *Id.*

⁸⁵ See *Climate Agreement*, *supra* note 78, at 123-61.

⁸⁶ *Id.* at 124.

⁸⁷ *Climate Agreement*, *supra* note 78, at 124 (emphasizing explicitly to Dutch citizens into lowering their livestock consumption and substituting that for a more plant-based protein or eating of bugs as supplement to their loss in protein).

⁸⁸ See *Climate Agreement*, *supra* note 78, at 193-246.

⁸⁹ *Id.* at 196.

increased grazing, feed adjustments, and improved feed management.⁹⁷ Furthermore, the Nitrogen Law continues to implement the strategy of voluntary farm buy-outs, applying to any livestock farmer, with the aim of reducing the number of farms and livestock in the Netherlands.⁹⁸

On June 10, 2022, Christianna van der Wal-Zeggelink, Minister for Nature and Nitrogen Policy (MNNP), presented the government's quantitative and qualitative objectives for the Dutch agricultural sector to reduce nitrogen GHG emissions.⁹⁹ The "Starting Memorandum National Program for Rural Areas" (National Program) centers on reducing nitrogen deposition in soils across the Netherlands.¹⁰⁰ The plan put forward by MNNP requires a forty-percent reduction in nitrogen GHG emissions within the agricultural sector, alongside an additional twelve percent reduction in ammonia (NH₃) emissions across all agricultural sectors in the country.¹⁰¹

The National Program encompasses both national and region-specific objectives, with Dutch provinces taking responsibility for developing measures to attain nitrogen reduction goals ranging from twelve-percent to seventy-percent, contingent on the area.¹⁰² Farmers in proximity to Natura-2000 reservations face the obligation to curtail their nitrogen GHG emissions by ninety-five percent.¹⁰³ The National Program stipulates that the overall reduction of Dutch nitrogen emissions should reach fifty-percent by 2030, with farmers near 'Natura-2000' areas mandated to reduce their nitrogen emissions by ninety-five percent.¹⁰⁴

While briefly highlighting the relationship between the government and the agricultural sector, coupled with enforceable case law and current policy developments in the Netherlands, the Nitrogen Law underscores the potential challenges of government expropriation, challenging emission targets, and potential violations of constitutional and human rights, notwithstanding the noble intentions behind its creation.

III. ELIMINATING NATIONAL PROGRAM'S NITROGEN OBJECTIVE

This Part advocates for the replacement of the nitrogen objective-based National Program with nitrogen regulation policies that are more favorable to the agricultural sector and are directed towards achieving nitrogen emissions reductions. The arguments presented in this Part revolve around specific

⁹⁷ *USDA II*, *supra* note 95, at 4 (including temporarily lowering the amount of protein that goes into the feed).

⁹⁸ Hoes & Aramyan, *supra* note 90, at 3.

⁹⁹ U.S. DEP'T OF AGRIC. FOREIGN AGRIC. SERV., NETHERLANDS: GOVERNMENT PRESENTS NATIONAL PROGRAM TO REDUCE NITROGEN GREENHOUSE GAS EMISSIONS IN RURAL AREAS, 2 (June 21, 2022) <https://www.fas.usda.gov/data/netherlands-government-presents-national-program-reduce-nitrogen-greenhouse-gas-emissions> [hereinafter *USDA III*].

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *USDA III*, *supra* note 99, at 5.

constitutional and human rights violations associated with the existing Nitrogen Program. Furthermore, this Part addresses the absence of innovative and best practice measures outlined in the Climate Agreement and the EU Sectoral Reference Document (EUSR),¹⁰⁵ which have yet to be introduced to farmers to assist in reducing nitrogen emissions. While examining potential counterclaims to the arguments put forth, this section offers rebuttals to those counterclaims.

A. *Violation of Constitutional Rights*

The Nitrogen Law, along with its stated objectives, and the government's authority to expropriate, poses challenges to the agricultural sector's autonomy in exercising freedom of choice regarding work. These factors constitute a foundational premise for this argument.

Farmers, by virtue of their close connection with nature, are among the primary beneficiaries of sustainable conservation practices.¹⁰⁶ Nevertheless, the Netherlands' face substantial pressure to implement significant changes to mitigate harmful emissions, a situation that has raised concerns among farmers who fear the potential obliteration of their livelihoods.¹⁰⁷ Prime Minister Rutte, acknowledging this urgency, has emphasized that the Dutch agricultural sector must undergo a transformation, as he indicated that the agricultural sector will "look different," and cautions that "there is not a future for all [Dutch farmers] within this approach."¹⁰⁸ The Dutch Minister of Nature and Nitrogen Policy (MNNP) Christianne van der Wal-Zeggelink, proposed a plan to facilitate the governmental buy-out of 2,000 to 3,000 small farms and farms that the government deem to be "peak emitters."¹⁰⁹ Furthermore, Van der Wal-Zeggelink explicitly stated that this, "[t]his 'one-time buyout plan' . . . will be the 'most generous' arrangement the government will offer, she [Van der Wal-Zeggelink] said 'a more generous arrangement will not follow after this one.'"¹¹⁰ Statements of this nature have raised concerns among farmers like Ben Apeldoorn, Dutch farmer with three decades of experience, located in the province of Utrecht.

¹⁰⁵ See *Climate Agreement*, *supra* note 78; see also Commission Decision (EU) No. 2018/813 of 14 May, 2018 (providing best environmental management practices, sector environmental performance indicators and benchmarks of excellence for the agricultural sector that EU nations or anyone who has access to this document could use to improve agricultural practices).

¹⁰⁶ Judith de Vor, *Dutch Farmers Protest Government Climate, Emissions Mandate*, MICH. FARM NEWS (July 11, 2022), <https://www.michiganfarmnews.com/dutch-farmers-protest-government-climate-emissions-mandate>.

¹⁰⁷ Anna Holligan, *Why Dutch Farmers are Protesting Over Emissions Cuts*, BBC NEWS (July 29, 2022), <https://www.bbc.com/news/world-europe-62335287>.

¹⁰⁸ *USDA IV* *supra* note 11, at 2 (emphasizing that not all Dutch farmers will find a place within this evolving Dutch agricultural landscape).

¹⁰⁹ Baazil, *supra* note 6; see generally Carmel Richardson, *Dutch Freedom Requires Dutch Farmers*, THE AMERICAN CONSERVATIVE (Dec. 2, 2022), <https://www.theamericanconservative.com/dutch-freedom-requires-dutch-farmers/>.

¹¹⁰ Baazil, *supra* note 6; see also *USDA III* *supra* note 99, at 7; see generally Carmel Richardson, *Dutch Freedom Requires Dutch Farmers*, THE AMERICAN CONSERVATIVE (Dec. 2, 2022), <https://www.theamericanconservative.com/dutch-freedom-requires-dutch-farmers/>.

Apeldoorn express his apprehension, saying, “my livelihood and my network is being threatened, . . . You’re just no longer allowed to exist.”¹¹¹

The utilization of nitrogen objectives as a quantifying tool inadequately grants Dutch farmers the requisite latitude to undertake the necessary agricultural transitions aimed at achieving the government’s accelerated nitrogen emission reduction targets. The current nitrogen objectives encroach upon the inherent right of the agricultural sector to exercise its fundamental prerogative of selecting its vocation, a right enshrined under Article 19 of the Dutch Constitution, which states:

- (1) It shall be the concern of the authorities to promote the provision of sufficient employment;
- (2) Rules concerning the legal status and protection of working persons and concerning co-determination shall be laid down by Act of Parliament;
- (3) The right of every Dutch national to a free choice of work shall be recognized, without prejudice to the restrictions laid down by or pursuant to Act of Parliament.¹¹²

While the National Program does indeed set the overarching target of a fifty percent reduction in Dutch nitrogen emissions and a seventy-four percent reduction in “Natura-2000” nature reserves by 2030,¹¹³ it becomes evident that the nitrogen objectives intentionally exert a disproportionate impact on individual farmers, approaching a level that may be deemed discriminatory, especially against small-scale farmers. This raises concerns regarding a potential violation of their constitutional rights, as outlined in Article 1.¹¹⁴

The discriminatory effects are particularly pronounced for livestock farmers, especially those operating in close proximity to Natura-2000 reserves, or a combination of both. Reports indicated that these farmers are confronted with the onerous task of reducing their nitrogen emissions by anywhere from seventy-four to ninety-five percent.¹¹⁵ Given the limited timeframe and the considerable challenges in meeting these nitrogen objectives within the stipulated timeframe, the only viable option often appears to be the voluntary sale of their farms to the government. Furthermore, the Dutch government advocates for the reduction in the overall livestock population by thirty percent.¹¹⁶ This involves halving of the

¹¹¹ Clair Moses, *Dairy Farms in the Netherlands Are Up in Arms Over Emissions Cuts*, N.Y. TIMES (Aug. 20, 2022), <https://www.nytimes.com/2022/08/20/world/europe/netherlands-farmers-protests.html>.

¹¹² GW. [CONSTITUTION] art. 19, sub. 1-3.

¹¹³ *USDA III*, *supra* note 99, at 5.

¹¹⁴ See Gw. [CONSTITUTION] art. 1 (explaining that one could argue that the farmers are being discriminated against under Article 1, due to how broad this Article protects Dutch citizens).

¹¹⁵ *USDA III*, *supra* note 99, at 2.

¹¹⁶ Senay Boztas, *Have we Reached ‘Peak Meat’? Why One Country is Trying to Limit It’s Number of Livestock*, THE GUARDIAN (Jan. 16, 2023), <https://www.theguardian.com/environment/2023/jan/16/netherlands-european-union-regulations-livestock>.

pig population, and substantial decrease in poultry and cattle farming.¹¹⁷ With approximately 118 million farm animals in the Netherlands,¹¹⁸ a thirty percent reduction equates to the removal of 35.4 million farm animals. Such a substantial reduction has far-reaching consequences, not only affecting thousands of farmers who would face the prospect of unemployment but also impacting numerous businesses that rely on these farms to sustain their operations. For instance, individuals like Helma Breunissen, a dairy farmer whose husband operates a veterinarian's office, express their concerns, stating, "[I]f half of the cattle needs to disappear, then my veterinary's office will also end, . . . I don't want a bag of money from the government, I just want to do my job."¹¹⁹

The counterclaim against an alleged Article 19 violation argument hinges on specific provisions outlined in Article(s) 14, 21, and 22 of the Dutch Constitution. Article 14 encompasses three subsections that underscore the government's inherent right to expropriate private property, provided that such actions are accompanied by assurances of full or partial compensation, particularly in specific situations.¹²⁰ These provisions are critical in recognizing the government's authority to take possession of property when circumstances demand it, ensuring fairness to affected parties.

Article 21 of the Dutch Constitution assigns a vital role to the government in preserving the country's habitability, protecting, and enhancing its natural environment.¹²¹ It reflects the government's overarching responsibility to safeguard the ecological well-being of the nation and signifies the need for measures that align with environmental conservation and protection efforts. Furthermore, it reinforces the Netherlands' commitment to aligning with EU legislation and protocols.

Article 22, subsection 1, extends the same authority to the Dutch government, emphasizing the importance of initiatives aimed at promoting the health and welfare of the population.¹²² This provision underscores the government's duty to take steps that enhance public health, setting a foundation for actions that may be deemed necessary to fulfil this responsibility.

In light of these constitutional imperatives, the government's counterclaim can be readily substantiated. The Dutch Constitution entrusts the government with substantial responsibilities for maintaining the country's habitability, fostering the health of the population, and improving the nations' environment. These responsibilities not only grant the government the authority to take action, but also establish the overarching principles upon which the counterclaim is built. Furthermore, it is important to note that the government's

¹¹⁷ *Id.*

¹¹⁸ *Id.*; see also *Agriculture; Crops, Livestock and Land Use by General Farm Type, Region*, STATLINE (Nov. 30, 2022), <https://opendata.cbs.nl/statline/#/CBS/en/dataset/80783eng/table?dl=6B921>.

¹¹⁹ Moses, *supra* note 111.

¹²⁰ See GW. [CONSTITUTION] art. 14. Sub. 1-3.

¹²¹ See GW. [CONSTITUTION] art. 21.

¹²² See GW. [CONSTITUTION] art. 22. Sub. 1.

willingness to offer compensation exceeding fair market value of the property is a testament to its commitment to addressing the concerns of affected parties.¹²³ This signifies a fair and equitable approach to the expropriation process, which aligns with the principles of justice and fairness. Moreover, the Dutch government can argue that, given the broad language employed in Article 19, subsection 1, the government continues to facilitate provisions that enable farmers to engage in agricultural activities claiming that the voluntary “buy-outs” represent an alternative mechanism for farmers to transition their farming operation to different location, ensuring that the government remains supportive of their livelihoods.¹²⁴

Nevertheless, while it is acknowledged that the government holds the authority, as granted by the Dutch Constitution, to expropriate private property, ensure the habitability of the country, protect and enhance the environment, and promote public health,¹²⁵ the counterargument pivots on the assertion that the government’s current mitigation methods fall short of upholding the nation’s habitability, safeguarding and enhancing the environment, and providing ample employment opportunities. The government has earmarked a substantial budget of seven billion euros for the buyout of livestock farms. Given the limited interest expressed by the agricultural sector in participating in these buyout programs,¹²⁶ it should be in the government’s best interest to allocate these funds toward assisting “high-emitting” livestock farms in reducing their nitrogen emissions. For instance, supporting farmers with investments in self-sustainable machinery designed to convert excess manure and ammonia into biofuel or to facilitate the production of alternative form of green energy would be a more effective strategy for addressing the country’s excess manure and ammonia issue.

It is worth noting that while the Climate Agreement delegates specific responsibilities to the Dutch government, charging them with a leadership role, this does not absolve the government from pursuing additional measures. This is especially pertinent when considering the substantial external pressures, including the scrutiny of Dutch courts, environmental advocacy groups, and European Union oversight.

B. *Human Rights Violations*

As previously discussed, The Nitrogen Law and its associated objectives give rise to apprehensions regarding the potential infringement upon farmers’ constitutional rights to exercise free choice in their work. When such constitutional rights of farmers are in question, it is not unexpected for Dutch

¹²³Senay Boztas, *Up to 3,000 ‘Peak Polluters’ Given Last Chance to Close by Dutch Government*, THE GUARDIAN (Nov. 12, 2022, 12:00 PM), <https://www.theguardian.com/environment/2022/nov/30/peak-polluters-last-chance-close-dutch-government> (specifying that the Dutch Nitrogen Minister said that the farmers will be offered more than 100% of the value of their farms to quit).

¹²⁴ *USDA II*, *supra* note 95, at 5.

¹²⁵ See Gw. [CONSTITUTION] art. 14, sub. 1-3; *see also* Gw. [CONSTITUTION] art. 21; *see also* Gw. [CONSTITUTION] art. 22, sub. 1.

¹²⁶ *USDA III*, *supra* note 99, at 7.

courts to prioritize the application of the European Convention on Human Rights (ECHR) over the Dutch Constitution, notwithstanding the resulting challenges or frustrations.¹²⁷ Nevertheless, there is some promising news for the agricultural sector and its stakeholders. There is substantial reason and evidence to support the assertion that the Dutch government's actions concerning the implementation of the nitrogen law and its objectives may infringe upon the human rights of Dutch farmers and stakeholders under the ECHR. Notably, the nitrogen law and its objectives may contravene several articles of the ECHR, including, (1) Article 1: Obligation to Respect Human Rights;¹²⁸ (2) Article 2: Right to Life;¹²⁹ (3) Article 8: Right to Respect for Private and Family Life;¹³⁰ and (4) Article 14: Prohibition of Discrimination.¹³¹ Many of these human rights violations have already been successfully raised and upheld against the Dutch National government in previous court cases. A prime example of ECHR application is evidence in the case of *Netherlands v. Urgenda I and II*. In this legal battle, Urgenda successfully invoked Articles 2 and 8 of the ECHR against the Dutch government, demanding it takes tangible measures to prevent further environmental breaches.¹³² Regrettably, the government's track record suggests that these lessons have gone unheeded, with its response to the nitrogen crisis reflecting the bare minimum of effort. The nitrogen law and its associated objectives represent a nuance response, primarily advocating for voluntary farm buyouts as the primary solution. However, this strategy fails to align with the urgent and imminent threats faced by the agricultural sector, necessitating more robust precautionary measures.¹³³ Additionally, the government's failure to provide a comprehensive roadmap or guidance, either at the national or provincial level, is a glaring oversight. Farmers opting not to sell their farms are left without a viable alternative. This omission represents an unreasonable and inadequate response that falls short of safeguarding the rights to home and private life within the agricultural sector.

¹²⁷ Janneke Gerards, *The Irrelevance of the Netherlands Constitution and the Impossibility of Changing It*, 77 *REVUE INTERDISCIPLINAIRE D'ÉTUDES JURIDIQUES* [INTERDISC. J. OF LEGAL STUD.] 207, 217-18 (2016).

¹²⁸ See European Convention on Human Rights, art. 1, Nov. 4, 1950, E.T.S. No. 005.

¹²⁹ See European Convention on Human Rights, art. 2, Nov. 4, 1950, E.T.S. No. 005.

¹³⁰ See European Convention on Human Rights, art. 8, Nov. 4, 1950, E.T.S. No. 005.

¹³¹ See European Convention on Human Rights, art. 14, Nov. 4, 1950, E.T.S. No. 005.

¹³² See *Netherlands v. Urgenda I*, *supra* note 71, ¶¶ 40-45 (explaining that The Hague Court of Appeals affirmed that class actions of interest groups are protected under Article 2 of the ECHR, which includes environmentally related situations that affect or threaten to affect the right to life. Additionally, Article 8 of the ECHR protects the right to private life, family life, home, and correspondence, which may also apply in environmentally related situations as well. The Hague Court of Appeals further stated that the "government has both positive and negative obligations relating to the interests protected by these articles, including the positive obligation to take concrete actions to prevent a future violation of these interests" (aka there is an established duty of care). The Hague Court of Appeals concluded the National government has a duty of care or protection to its citizens against the real threat of climate change under Articles 2 and 8 of the ECHR. The Hague Court of Appeals decision regarding Article 2 and 8 violations was later affirmed by the Supreme Court of the Netherlands in 2019).

¹³³ *Netherlands v. Urgenda II*, *supra* note 76, ¶ 2.3.2.

The Dutch government holds an extensive budget of over seven billion euros, a resource that could serve multiple purposes beneficial to farmers and agricultural stakeholders. These funds could alleviate farmers' debts, facilitate their exit from existing farming contracts, support the acquisition of innovative machinery from transitioning to sustainable farming, enable the implementation of preventative nitrogen emission measures, and encourage the adoption of innovative strategies for nitrogen pollution absorption within Natura-2000 areas. Importantly, these suggestions do not impose an "impossible or disproportionate burden" on the government. Nevertheless, the Dutch government continues to place undue emphasis on voluntary farm buyouts and the adherence of farmers to the nitrogen reduction objectives.

In addition to Articles 2 and 8 of the ECHR, Article 1 of the ECHR warrants scrutiny. This article obliges contracting parties to secure the rights and freedoms outlined in Section I of the ECHR to all individuals within their jurisdiction, encompassing all Dutch citizens, including farmers and agricultural stakeholders.¹³⁴

Article 14 of the ECHR focuses on the prohibition of discrimination, ensures that "[t]he enjoyment of the rights and freedoms set forth in the Convention shall be secured without discrimination on any ground such as sex, race, color, language . . . association with a national minority, property, birth or other status."¹³⁵ This scope of Article 14 extends to employment in specific cases.¹³⁶ However, the implementation of nitrogen objectives lacks equitable application throughout the farming sector, especially livestock farms that border Natura-2000 reserves facing an unprecedented requirement to reduce nitrogen emissions by ninety-five percent or more.¹³⁷ This nitrogen objective mandate compels these farmers to sell significant portion of their livestock, jeopardizing their livelihoods.¹³⁸ This disparity accentuates the government's lack of initiative in providing adequate support to livestock farmers near Natura-2000

¹³⁴ See European Convention on Human Rights, art. 1, Nov. 4, 1950, E.T.S. No. 005; see also *Netherlands v. Urgenda II*, *supra* note 76, ¶ 5.2.1.

¹³⁵ See European Convention on Human Rights, art. 14, Nov. 4, 1950, E.T.S. No. 005.

¹³⁶ See generally EUROPEAN COURT OF HUMAN RIGHTS: GUIDE ON ARTICLE 14 OF THE EUROPEAN CONVENTION ON HUMAN RIGHTS AND ON ARTICLE 1 OF PROTOCOL NO. 12 TO THE CONVENTION AT 48. (Aug. 31, 2022).

¹³⁷ *USDA IV*, *supra* note 11, at 2; see *USDA III*, *supra* note 99.

¹³⁸ See generally, Chris McCullough, *Food Control: Dutch Farming on the Verge of a Disaster as Government pushes to close 3,000 Farms*, TRI-STATE LIVESTOCK NEWS (Dec. 10, 2022), [https://www.science.org/content/article/nitrogen-crisis-jam-packed-livestock-operations-has-paralyzed-dutch-economy#:~:text=One%20source%20is%20nitrogen%20oxides,hindering%20roots%27%20absorption%20of%20nutrients](https://www.tsln.com/news/food-control-dutch-farming-on-the-verge-of-a-disaster-as-government-pushes-to-close-3000-farms/#:~:text=Ag%20Events%20Calendar,Food%20control%3A%20Dutch%20farming%20on%20the%20verge%20of%20a%20disaster,pushes%20to%20close%203%2000%20farms&text=FARMERS%20in%20the%20Netherlands%20are,Uni on%20plans%20to%20reduce%20emissions; see also Erik Stokstad, Nitrogen Crisis from Jam-Packed Livestock Operations has 'Paralyzed' Dutch Economy, SCIENCE (Dec. 4, 2019), <a href=) (emphasizing the statement, "[t]hat would mean 50% fewer animals,"); see also Boztas, *supra* note 116 (claiming in a government research report that outlined a 30% livestock reduction by 2030).

reserves. This is noteworthy, especially considering Natura-2000 farming guide's explicit emphasis, which clarifies that "[t]he first priority is to address the key threats of abandonment and intensification by ensuring that the farmer can continue (or resume) farming the land."¹³⁹ Furthermore, it underscores the guide's recognition that livestock farmers, in particular, possess significant potential for curbing nitrogen production.

The Dutch government's potential counterarguments in response to alleged violations of Articles 1, 2, 8, or 14 of the ECHR are rooted in several aspects of the new nitrogen law and its objectives. While Articles 2 and 8 of the ECHR require a low threshold for government compliance as emphasized in *Netherlands v. Urgenda II*, "[i]f a state has taken reasonable and suitable measures, the mere fact that those measures were unable to deter the hazard does not mean that the state failed to meet the obligation that it had been imposed on it."¹⁴⁰ This could signify that the government met its obligations by implementing "reasonable" and "suitable measures," even if these actions do not entirely avert the hazard. This legal precedent signifies that the government did not violate human rights under Article 2 and 8 of the ECHR when it undertakes reasonable and suitable measures.

Disproving discrimination under Article 14 of the ECHR may require more in-depth consideration due to the broad scope of this article on its face. The Dutch government could argue that, while discrimination in employment aligns with Article 14, job titles or professions, such as farmers, business owners, veterinarians, or agricultural professions in general, do not fall under Article 14's definition of "other status."¹⁴¹

In conclusion, the disparities within the government's approach to addressing nitrogen emissions may as well raise human rights concerns under the ECHR. The government's reliance on voluntary buyouts and disparities in regulatory measures calls for closer scrutiny to ensure that the rights of farmers and agricultural stakeholders are not being unduly compromised.

C. Lack of Best Practice Use

Before the Dutch government introduced the new nitrogen law and its corresponding objectives, the Climate Agreement and the EUSRD offered government officials a comprehensive roadmap featuring best practices, best instruments, and detailed outlines to guide efforts aimed at reducing nitrogen emissions.¹⁴² However, the newly enacted nitrogen law falls short of providing a

¹³⁹ EUROPEAN COMMISSION, FARMING FOR NATURA 2000: GUIDANCE ON HOW TO SUPPORT NATURA 2000 FARMING SYSTEMS TO ACHIEVE CONSERVATION OBJECTIVES, BASED ON MEMBER STATES GOOD PRACTICE EXPERIENCES iii (2018), <https://ec.europa.eu/environment/nature/natura2000/management/docs/FARMING%20FOR%20NATURA%202000-final%20guidance.pdf> [hereinafter NATURA 2000].

¹⁴⁰ *Netherlands v. Urgenda II*, *supra* note 76, ¶ 5.3.4.

¹⁴¹ See European Convention on Human Rights art. 14, *supra* note 131.

¹⁴² See generally Commission Decision (EU) 2018/813 of 14 May 2018, 2018 O.J. (C 2674) (June 8, 2022) <https://eur-lex.europa.eu/eli/dec/2018/813/oj> (hereinafter "EUSRD"); see also *Climate Agreement*, *supra* note 78.

clear direction for farmers to effectively reduce their nitrogen emissions leaving them with no viable alternatives but to submit to the government's demands and other external pressures.¹⁴³ In particular, farming systems in proximity to or adjacent to Natura-2000 reserves face the looming threat of their livelihoods being jeopardized.

To address this issue, there is a pressing need to develop an integrated support package that assists farmers in transitioning toward more sustainable farming practices, as recommended by both Climate Agreement and in EUSRD.¹⁴⁴ Presently, the current nitrogen legislation fails to promote any additional mitigation practices to help farmers decrease their nitrogen emissions. While the Dutch government continues to heavily emphasize voluntary farm buyouts, there has been limited interest from the agricultural sector in participating in these buy-out programs.¹⁴⁵ Although alternative mitigation methods such as circular agriculture have gained some attention amongst Dutch farmers,¹⁴⁶ it has not alleviated the fears of farmers about the potential loss of their (family or generational) farms.

A counterargument in favor of the Dutch government in response to the absence of the implementation of best practices revolves around the language found inside the nitrogen legislation and the Climate Agreement. Both documents stipulate that either Dutch provinces or industry sectors are responsible for formulating the measures necessary to achieve the nitrogen objectives.¹⁴⁷ For instance, in section C4.4.2(b) of the Climate Agreement, it is stated that “[t]he dairy sector will take responsibility for the development and outline of a farm-specific approach, including development of the packages of technical and other measures to reduce GHG emissions.”¹⁴⁸ Another example is found in section C4.4.2(r) of the Climate Agreement, which asserts that, “the provinces and municipalities will facilitate the implementation of climate measures (such as adjustments to livestock facilities) and the generation of sustainable energy on dairy farms as part of their environmental policy.”¹⁴⁹

In conclusion, irrespective of one's stance on the arguments presented above, there is a prevailing consensus that the Dutch government's current strategy to

¹⁴³ Rob Schmitz, *In the Netherlands, A Farmer's Party Taps into Widespread Discontent with Government*, NPR: Europe (Sept. 21, 2023, 5:13 AM ET) <https://www.npr.org/2023/09/21/1199431374/netherlands-farmer-citizen-movement-bbb-dutch-elections>.

¹⁴⁴ See *Climate Agreement*, *supra* note 78; *EUSRD*, *supra* note 142, art. 3.7 & 3.7.1.

¹⁴⁵ *Netherlands v. Urgenda II*, *supra* note 76.

¹⁴⁶ See Erik Stokstad, *Nitrogen Crisis from Jam-Packed Livestock Operations has 'Paralyzed' Dutch Economy*, SCIENCE (Dec. 4, 2019), <https://www.science.org/content/article/nitrogen-crisis-jam-packed-livestock-operations-has-paralyzed-dutch-economy> (explaining what farming techniques are considered circular agriculture: producing only as much manure as they can use to fertilize nearby fields; cattle should graze instead of being fed nitrogen-rich, imported soy; and pigs and poultry should be eating food waste).

¹⁴⁷ *USDA IV*, *supra* note 11, at 2; see *Climate Agreement*, *supra* note 78, at 135.

¹⁴⁸ *Climate Agreement*, *supra* note 78, at 135.

¹⁴⁹ *Climate Agreement*, *supra* note 78, at 138.

reduce nitrogen emissions is widely deemed as insufficient, inefficient, and potentially detrimental. One could argue that this approach has been formulated by individuals who lack direct farming experience or may have personal interests that do not align with the welfare of the agricultural sector, thus failing to realize the financial and psychological burden that they place on Dutch citizens, particularly those within the farming community.¹⁵⁰ While advocating for government-sponsored buyouts of farms is a valid option, especially for farmers who voluntarily choose this path, the Netherlands boasts a vibrant agricultural community that is not only willing, but also eager to adapt their farming practices for the betterment of their country.¹⁵¹ What they require is support to effect innovative and fundamental changes that may enable them to contribute to a more sustainable and prosperous future for the nation as a whole. In Part IV, we will examine specific solutions and proposals that Dutch government should consider implementing immediately that will promote the reduction of nitrogen emissions, reduce excess manure and ammonia, and will provide an alternative source of green energy that could be used as the Netherlands and the rest of Europe phase out of fossil fuels.

IV. CATALYZING NITROGEN REDUCTION AND ADDRESSING EXCESS MANURE AND AMMONIA: ALTERNATIVE APPROACHES FOR THE DUTCH GOVERNMENT IN LIEU OF THE CURRENT NITROGEN LAW AND OBJECTIVES

Formulating policies that can successfully satisfy divergent interests is an infrequent occurrence, often fraught with challenges.¹⁵² The Netherlands, a nation renowned for its significant contributions to global agriculture including their use for implementing high-tech methods to bolster yields, has distinguished itself as the world's second-largest exporter of agricultural products.¹⁵³ Despite the Netherlands' success, the country now grapples with mounting pressure to institute sweeping policy reform aimed at curtailing environmentally detrimental emissions. Within this conundrum, farmers harbor genuine concerns that government mandates to eliminate nitrogen emissions may jeopardize their longstanding livelihood.¹⁵⁴ Geertjan Kloosterboer, a third-generation dairy farmer, emphasizes the cultural and familial significance of

¹⁵⁰ See generally Karl Mathiesen, *Protecting Nature, Destroying Lives. The Chemist vs. the Dutch Farmers. Is Johan Vollenbroek saving the Netherlands – or Tearing it Apart?* POLITICO (Mar. 9, 2023, 1:10 PM), <https://www.politico.eu/article/johan-vollenbroek-netherlands-nitrogen-pollution-climate-change-farming/> (describing who Johan Vollenbroek is, his occupation, notable work, and why he's so disliked in the agricultural sector).

¹⁵¹ Ashoka Mukpo, *In the Clash Over Dutch Farming, Europe's Future Arrives*, MONGABAY (Sept. 8, 2023), <https://news.mongabay.com/2023/09/in-the-clash-over-dutch-farming-europes-future-arrives/>.

¹⁵² Karel, *supra* note 14, at 19.

¹⁵³ Bartosz Brzezinski & Camille Gijs, *Not Easy Being Green: Rutte's Eco-Friendly Agenda Falters Amid Dutch Farmer Backlash*, POLITICO (Sept. 6, 2022, 9:19 PM CET), <https://www.politico.eu/article/dutch-farm-crisis-rocky-path-climate-transition-henk-staghouwer/>.

¹⁵⁴ Anna Holligan, *Why Dutch Farmers are Protesting Over Emission Cuts*, BBC (July 29, 2022), <https://www.bbc.com/news/world-europe-62335287>.

farming the Netherlands, stating, “[i]t’s in our blood, I want to do this, and if we have to adapt to new situations, I want to, but we have to be fair, it takes time - give me a chance.”¹⁵⁵ Corne de Rooij underscores the deep-rooted passion and commitment shared by many in the Dutch farming community, remarking “it’s [farming] my passion and my life. If we have to stop raising them, it will hurt.”¹⁵⁶ In response to the pressing need for action, Prime Minister Mark Rutte’s new coalition has proposed an expensive and ambitious plan to allocate 25 billion euros (28 billion dollars) by 2035 to facilitate the reduction of land holdings including the acquisition of Dutch farms that produce high levels of nitrogen pollution and mitigate nitrogen emissions.¹⁵⁷

While such buyouts may appear to be the sole course of action for some, a broader perspective, in line with EU Commission Decision 2018/813, suggest that there are multifaceted solutions that not only decrease nitrogen emissions, but also enhance the nation’s energy production capacity. These solutions enable farmers to transition their operations toward greater environmental sustainability and contribute to overall environmental improvement.¹⁵⁸ Given the substantial financial commitment by the government, it is in the government’s best interest to reassess the current National Program. A more judicious approach involves developing a comprehensive, long-term nitrogen reduction plan that capitalizes on the very challenge at hand—excess manure and ammonia—as a solution. Within the broader perspective, three key measures warrant consideration. Section A delves into the obvious, a complete revision of the Dutch nitrogen law. Section B explores innovative methods for harnessing energy from manure and ammonia, and Section C investigates the implementation of an on-site manure-to-energy conversion system.

A. Complete Revision or Amendment of the Dutch Nitrogen Law

The primary proposal within this note advocates for a complete revision or amendment of the current Nitrogen Law and its associated nitrogen objectives. While it is vital to communicate the essential nitrogen reduction goals to Dutch industry sectors and stakeholders, they should not overshadow the core focus of the Nitrogen Law, nor should they be presented as the primary message, as that has been the case. Instead, a new or revised policy should emphasize the application of regulations to formulate measures aimed at achieving an overarching reduction in nitrogen emissions.¹⁵⁹

¹⁵⁵ *Id.*

¹⁵⁶ *Dutch Farmers Face Tough Choices as Cows Clash with Climate Crisis*, DAILY SABAH (Jan. 4, 2022) <https://www.dailysabah.com/life/environment/dutch-farmers-face-tough-choices-as-cows-clash-with-climate-crisis>.

¹⁵⁷ *Id.*

¹⁵⁸ Patrick Smith, *How Dutch Farmers Became the Center of a Global Right-Wing Culture War*, NBC NEWS (Dec. 12, 2022, 4:24 AM), <https://www.nbcnews.com/news/world/dutch-farmers-emissions-global-right-wing-culture-war-rena60269> (stating “Farmers aren’t against nature, we live in nature, we depend on nature, and we want to preserve it”).

¹⁵⁹ *USDA IV*, *supra* note 11, at 11.

Though the Climate Agreement and the EU Sectoral Reference Document (EUSR) do not impose mandatory policies on the Netherlands, EUSR does offer comprehensive guidelines for best environmental management practices, sector-specific environmental performance indicators, and benchmarks of excellence within the agricultural sector, as outlined in Regulation (EC) No. 1221/2009.¹⁶⁰

These guidelines are designed for voluntary adoption as part of a community eco-management of audit scheme.¹⁶¹ For instance, the EUSR provides valuable best practice information for manure management, particularly relevant to livestock farms engaged in intensive cattle, pig, and poultry production farming systems.¹⁶² Furthermore, Section 3.7.4 address optimal practices for effective slurry processing and the use of appropriate storage systems (tanks), which not only reduce ammonia (NH₃) emissions but also maintain the high nutrient value of manure, rendering it suitable for application on agricultural land.¹⁶³ Constructing a nitrogen law with a focus on applying regulations that formulate measures to reduce nitrogen emissions promises to be more beneficial to the agricultural sector than concentrating solely on nitrogen objectives.

In the event that this approach proves unsuccessful, the Dutch government should seriously contemplate the implementation of one or both innovative strategies detailed in the subsequent sections.

B. *Energy Innovation and Creation*

Why the focus on energy innovation and creation, one might ask? The answer is quite straightforward: The EU, including the Netherlands, is currently in the process of transitioning away from fossil fuels in favor of greener and alternative energy sources, such as wind, solar, geothermal, and biofuels. As a testament to this commitment, the EU has reached an agreement to effectively prohibit the sale of new gasoline and diesel cars beginning in 2035.¹⁶⁴ Additionally, in the Netherlands, despite skyrocketing energy prices and the shortage of natural gas supply, “the Dutch government has taken the decision to proceed with the closure of natural gas wells in the Groningen region.”¹⁶⁵

¹⁶⁰ See generally Regulation (EC) No 1221/2009, of the European Parliament and of the Council of 25 November 2009 on the Voluntary Participation by organizations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC, 2009 O.J. (L 342)(providing that the EUSR is added onto the EU Regulatory documentation for voluntary participation by organizations).

¹⁶¹ *Id.*

¹⁶² Commission Decision (EU) 2018/813 of May 14, 2018, art. 3.7 & 3.7.1; see also Commission Decision (EU) 2018/813 of May 14, 2018, art. 3.7.2 – 3.7.7.

¹⁶³ Commission Decision (EU) 2018/813 of May 14, 2018, art. 3.7.4.

¹⁶⁴ Kate Abnett, *EU Approves Effective Ban on New Fossil Fuel Cars from 2035*, REUTERS (Oct. 28, 2022, 2:12AM), <https://www.reuters.com/markets/europe/eu-approves-effective-ban-new-fossil-fuel-cars-2035-2022-10-27/>.

¹⁶⁵ Hans von der Brellie, *Europe's Energy Crisis and the Netherlands 1,000 Billion Buried Treasure*, EURONEWS (Oct. 11, 2022, 10:33 AM) <https://www.euronews.com/2022/09/23/europes-energy-crisis-the-netherlands-1000-billion-buried-treasure>.

What implications does this shift hold for the agricultural and land use sector? Notably, the challenge of managing excess manure and ammonia may now emerge as a pivotal element in not only curbing nitrogen emissions, but also facilitating the production of biofuels and energy. It can additionally contribute to enhancing the self-sufficiency and sustainability of farms. This Section will concentrate its discussion into thermos-chemical energy. Thermos-chemical processes offer four avenues for converting manure and ammonia into energy. These methods include: (i) gasification; (ii) pyrolysis; (iii) co-firing, and (iv) direct combustion.¹⁶⁶

1. Gasification

Gasification involves the transformation of carbonaceous fuel, into usable gaseous products without the need for complete combustion of the fuel.¹⁶⁷ The Netherlands can harness excess manure to produce synthesis gas or a producer gas, which “can be further processed into other fuels or products by chemical conversions or burned to heat a conventional boiler.”¹⁶⁸ According to Mukhtar and Capareda, this syngas can replace natural gas in a gas turbine.¹⁶⁹

Notably, the surplus of manure and ammonia has drawn the attention of industries beyond agriculture. Japan and Toyota, for example, back fuel cells and continue to explore their potential.¹⁷⁰ At its California logistics site, Toyota Motor Corporation has established a hydrogen production facility employing renewable biogas derived from organic waste.¹⁷¹ This facility produces approximately 1.2 tonnes of green hydrogen per day, serving as a sustainable fuel source for Toyota’s Mirai vehicle.¹⁷² Moreover, the hydrogen anticipated to

¹⁶⁶ Saqib Mukhtar & Sergio Capareda, *Manure to Energy: Understanding Processes, Principle and Jargon*, AGRIC. COMMC’NS, TEXAS A&M UNIVERSITY SYST., (July 17, 2017), <https://tammi.tamu.edu/2017/07/17/manure-energy-understanding-processes-principles-jargon/>.

¹⁶⁷ Mukhtar & Capareda, *supra* note 167 (carbonaceous fuel is a fossil or biomass fuel containing carbon).

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*

¹⁷⁰ Phoebe W. Howard, *Toyota to Build Power Plant to Convert Cattle Manure into Electricity, Hydrogen*, USA TODAY (Nov. 30, 2017), <https://www.usatoday.com/story/money/cars/2017/11/30/toyota-cattle-manure/909405001/>; *see also* Robert F. Service, *Ammonia—A Renewable Fuel Made from Sun, Air, and Water—Could Power the Globe Without Carbon*, SCIENCE (July 12, 2018) <https://www.science.org/content/article/ammonia-renewable-fuel-made-sun-air-and-water-could-power-globe-without-carbon>.

¹⁷¹ Haruka Kadooka, *Toyota Builds California Hydrogen Site for Cars and Power*, NIKKEI ASIA (Sept. 9, 2023, 01:40 AM JST), <https://asia.nikkei.com/Business/Automobiles/Toyota-builds-California-hydrogen-site-for-cars-and-power>.

¹⁷² Haruka Kadooka, *Toyota Builds California Hydrogen Site for Cars and Power*, NIKKEI ASIA (Sept. 9, 2023, 01:40 AM JST), <https://asia.nikkei.com/Business/Automobiles/Toyota-builds-California-hydrogen-site-for-cars-and-power> (explaining that it is expected that the facility will be able to produce enough fuel for 200 Toyota Mirai vehicles a day); *see also* Robert F. Service, *Ammonia—A Renewable Fuel Made from Sun, Air, and Water—Could Power the Globe Without Carbon*, SCIENCE (July 12, 2018) <https://www.science.org/content/article/ammonia-renewable-fuel-made-sun-air-and-water-could-power-globe-without-carbon> (discussing Japan has spent more than \$12 billion on hydrogen technology as part of their strategy to reduce fossil fuel imports. The plan is to increase fuel cell vehicles from 2500 to 800,000 by 2023).

be generated from organic waste will also be utilized to produce electricity at the on-site fuel cell power plant.¹⁷³ This electricity will be provided to support the operations of the logistics base, Toyota Logistics Services.¹⁷⁴ The implementation of this system is projected to significantly reduce carbon dioxide emissions from power generation by more than 9,000 tonnes annually.¹⁷⁵

The Netherlands should earnestly explore the implementation of a cooperative scheme, akin to the partnership between Toyota and California, for several compelling reasons. First and foremost, it offers a viable solution to the prevalent issue of excess manure and ammonia, particularly in the agriculture and land use sector. Second, by mitigating the necessity for a drastic reduction in the number or percentage of livestock, the approach enables farmers to retain their animals and, consequently, enhance their profitability. Third, the scheme could potentially serve as an additional revenue stream for both farmers and the government, as they collect and sell manure and ammonia for conversion into energy.¹⁷⁶ It creates incentives for a swifter transition to the generation and production of greener energy and electricity, contributing to an increased availability of clean energy for infrastructure development. Finally, and perhaps most crucially, such a cooperative model offers Dutch farmers the opportunity to attain the nations reduced nitrogen emissions goals, remediate their land, and usher in a new era for Dutch agriculture.

2. Pyrolysis

Pyrolysis is a thermochemical conversion process wherein biomass, encompassing materials such as manure and ammonia, undergoes exposure to exceedingly high temperatures in the total absence of an oxidant, notably oxygen.¹⁷⁷ With manure and ammonia acting as the raw material, this conversion method can yield combustible gas, liquid condensates, and charcoal,¹⁷⁸ all of which have various applications including electricity generation, chemical additives for plastics and other bio-products.¹⁷⁹ For example, Leilah Krounbi, doctoral student at Cornell University, successfully grew crops with nutrient-enhanced manure biochar.¹⁸⁰ A faculty fellow from

¹⁷³ Kadooka, *supra* note 172.

¹⁷⁴ *Id.*

¹⁷⁵ Phoebe W. Howard, *Toyota to Build Power Plant to Convert Cattle Manure into Electricity, Hydrogen*, USA TODAY (Nov. 30, 2017), <https://www.usatoday.com/story/money/cars/2017/11/30/toyota-cattle-manure/909405001/>.

¹⁷⁶ Robert F. Service, *Ammonia—A Renewable Fuel Made from Sun, Air, and Water—Could Power the Globe Without Carbon*, SCIENCE (July 12, 2018) <https://www.science.org/content/article/ammonia-renewable-fuel-made-sun-air-and-water-could-power-globe-without-carbon> (quoting that due to ammonia's rich source of hydrogen, "ammonia fertilizers sell for about \$750 at ton" whereas, "hydrogen fuel cell vehicles can go for more than 10 times that amount.").

¹⁷⁷ Mukhtar & Capareda, *supra* note 167

¹⁷⁸ *Id.*

¹⁷⁹ *Id.*

¹⁸⁰ Blaine Fredlander, *To Sustainably Harness Cow Manure's Usefulness, Fire it Up*, CORNELL CHRON. (Aug. 31, 2021) <https://news.cornell.edu/stories/2021/08/sustainably-harness-cow-manures-usefulness-fire-it>.

Cornell Atkinson Center for Sustainability asserts that “once we make a dry fertilizer out of what was once a liquid problem, it is no longer an issue of disposal.”¹⁸¹

Although pyrolysis presents challenges in terms of efficient execution and demands significant energy for the reaction, this conversion method has garnered attention due to the growing demand for hydrogen as an alternative fuel source. The interest is particularly fueled by its applicability in generators, engines, and hydrogen fuel cells.¹⁸² A notable example is the Qualco Energy project, a collaborative venture with Modern Electron, designed to divert cow manure from salmon streams while converting waste into natural gas for electricity generation.¹⁸³ The objective here is to sequester carbon from the air into the soil.¹⁸⁴ This initiative employs an anaerobic biodigester to process 60,000 gallons of manure and 24,000 gallons of food waste every day, generating natural gas (methane) as fuel for an energy-producing generator that supplies power to the local public utility in Snohomish County.¹⁸⁵ Remarkably, the only emission produced by this process is water vapor.¹⁸⁶ Exploring entrepreneurial innovations and securing funding for their implementation presents an alternative approach that the Netherlands should seriously consider. This contrast with the singular focus advocated by environmentalists and the government, which centers on reducing livestock numbers, promoting reduced meat consumption, and intensifying efforts to enforce farm buyouts.

3. Co-Firing

The co-firing process involves the blending of biomass with traditional fossil fuels in conventional power plants.¹⁸⁷ In particular, this method works extremely well in significantly reducing sulfur dioxide (SO₂) emissions when utilizing coal as the primary source of fuel.¹⁸⁸ Moreover, co-firing manure with coal may also result in decreased emissions of nitrogen oxide (NO_x) from coal.¹⁸⁹

Given that the Netherlands is presently in the process of decommissioning its coal plants, co-firing manure and ammonia with coal could serve as a viable

¹⁸¹ *Id.*

¹⁸² Lisa Stiffler, *Cut the BS: This Startup is Converting Cow Manure into Clean-Burning Hydrogen Fuel*, GEEKWIRE (Apr. 26, 2022, 08:15 AM), <https://www.geekwire.com/2022/cut-the-bs-this-startup-is-converting-cow-manure-into-clean-burning-hydrogen-fuel/>.

¹⁸³ *Id.*

¹⁸⁴ *Id.*

¹⁸⁵ *Id.*

¹⁸⁶ *Id.*

¹⁸⁷ *Id.*

¹⁸⁸ *Id.*; Mukhtar & Capareda, *supra* note 167 (sulfur dioxide is an air pollutant released when coal is burned).

¹⁸⁹ Mukhtar & Capareda, *supra* note 167 (commenting that the idea here is to use manure as a supplemental or “reburn fuel and an organic source of urea and ammonia”. For instance, when “co-firing manure and coal, NH₃ is released from manure and combines with NO_x to produce harmless N and water”).

short-term solution. This approach would help address the dual challenges of excess manure and ammonia in the agriculture sector and Natura-2000 areas, while simultaneously reducing the emission of sulfur dioxide into the environment. It is important to note, however, that this solution is inherently short-term in nature. As each Dutch coal plant is phased out, the utilization of manure and ammonia in this manner will decrease, subsequently bringing the issue of excess manure and ammonia back to the forefront.

4. Direct Combustion

Direct combustion stands as the least practical and efficient among these processes. Direct combustion requires the utilization of manure as a raw material, directly fed into a furnace to produce heat, which subsequently generates steam to power a turbine for electricity generation.¹⁹⁰ This relatively simple approach yields higher ash content than other biomass sources or fossil fuels, resulting in reduced air quality and increased emissions. This outcome contradicts the goal of pursuing greener alternative energy resources.¹⁹¹

In conclusion, notwithstanding the current inclination of the government and environmentalists to heavily favor reducing farm animals as a means of addressing excess manure and ammonia issues, the Dutch should leverage its advanced technological capabilities to transform agricultural waste into a valuable resource. This approach facilitates the generation and innovation of green alternative energy, offering a solution to the excess manure and ammonia dilemma while concurrently diminishing nitrogen emissions. Moreover, it presents opportunities for farmers to retain ownership of their farming property, augment their income, recoup losses, while fostering a sense of accountability among farmers for the well-being of their land. Should the mass production of alternative green energy remain a contentious issue, the government should explore avenues to support and invest in on-site manure and ammonia energy conversion systems for individual farmers, both large and small.

C. *On-site Manure to Energy Conversion Systems*

Facilitating enhanced management and operation autonomy for farmers should consistently align with the national interests of a country. This third approach, holding significant promise in both mitigating GHG emissions and advancing the Netherlands towards their nitrogen reduction objectives, involves providing on-site manure-to-energy conversion systems (OMECS) to farmers. OMECS not only serves as an instrumental tool in aiding farmers but also contribute to acquiring the production of surplus energy, which can be harnessed both on-farm and nationally.¹⁹²

The foremost beneficiaries of such an energy conversion system are livestock farms, given the substantial volume of waste generated by their animals. This waste, in turn, can be effectively converted into energy. Additionally, livestock

¹⁹⁰ *Id.*

¹⁹¹ *Id.*

¹⁹² Mukhtar & Capareda, *supra* note 167.

farmers can acquire proficiency in operating of these systems, potentially adding more units to increase waste or manure processing capacity, leading to higher energy output.¹⁹³ As Mukhtar and Capareda aptly note, “[t]his would provide livestock farmers with totally closed-loop system for waste handling.”¹⁹⁴ An illustrative example of an OMECS is the modular anaerobic digestion system. This apparatus collects cow manure, supplements it with waste vegetables such as lettuce, and then engages in the digestion process.¹⁹⁵ The result is the production of methane, which is subsequently converted into power, thus serving dual purposes: heating homes and generating electricity.¹⁹⁶

Moreover, the sludge generated from the digestion process can be harnessed for running an on-site gasification system.¹⁹⁷ As advanced technologies and other innovations continue to evolve, particularly in the Netherlands, this presents an opportunity for the production of alternative fuels to power future farming equipment.¹⁹⁸ This transition not only aids in the reduction of animal waste but also addresses the imperative reduction of GHG nitrogen emissions from livestock farms, particularly those proximate to Natura-2000 nature reserves.¹⁹⁹

¹⁹³ *Id.*

¹⁹⁴ *Id.*

¹⁹⁵ Michelle Xiao, *Turning Cow Manure into Energy*, (Dec. 17, 2017), <http://large.stanford.edu/courses/2017/ph240/xiao-m2/>.

¹⁹⁶ *Id.*; Mukhtar & Capareda, *supra* note 167.

¹⁹⁷ Mukhtar & Capareda, *supra* note 167.

¹⁹⁸ *See* Mukhtar & Capareda, *supra* note 167 (commenting in general as the information here could assist in nitrogen emissions reduction).

¹⁹⁹ *See* Mukhtar & Capareda, *supra* note 167.

V. CONCLUSION

For the benefit of the Netherlands, a reassessment of the current nitrogen law and objectives imposed on the Dutch agricultural and land use sectors is essential, if not an outright replacement. The existing regulations aim to achieve a fifty-percent reduction in Dutch nitrogen emissions by 2030, with the overarching goal of reducing these emissions by a range of eighty-five to ninety-five percent by 2050. To meet these objectives, the Dutch government should extend support to farmers in their transition toward sustainable and long-term practices.

Moreover, the government should actively promote self-sufficiency among farmers, especially in the livestock sector, by encouraging the on-farm generation of energy. This becomes imperative given the projected surge in electrical energy demand in the county's future. In the event that the government chooses not to pursue new amendments or fixes to nitrogen legislation, an alternative approach would involve assisting "highly vulnerable"²⁰⁰ farmers by implementing the best environmental management practices, as outlined in Part IV.

A strategic overhaul of the National Nitrogen Program to afford farmers the flexibility needed for crucial adjustments, aligning with international and national reduction standards, and enabling the harnessing of energy from excess manure and ammonia, would yield financial benefits for both farmers and the Netherlands as a whole. This approach is poised not only to preserve the country's livability and enhance the environment but also represents a significant accomplishment, particularly when contrasted with the alternative of displacing thousands of farmers from their land.

The Dutch government must act expeditiously and refine its approach, considering the potential ramifications from both farmers and the supportive general public. Collaborating with the agricultural sector, the Dutch government must take proactive measures to address nitrogen level reductions. This comprehensive effort should incorporate a thoughtful strategy encompassing nitrogen emission reduction, the encouragement of innovative farming practices, judicious agricultural adjustments, pragmatic timelines, and attainable objectives. Such an approach is paramount to ensuring the co-existence and sustainability of both agriculture and nature reserves.

²⁰⁰ In this context, "highly vulnerable" refers to farmers who live in Provinces near or next to Natura-2000 nature reserves that require reduction of nitrogen emissions of seventy-four percent or more. This includes any long generational small farmer.