



The Nordic Cooperation and the Gulf Cooperation Council: Areas of conjunction and opportunities for cooperation

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Abstract

Objectives: The Nordic Cooperation (NC) experience has not been sufficiently studied in Gulf-European studies. This paper highlights the NC as a model that the Gulf Cooperation Council (GCC) could benefit from. The study raises the following questions: What are the areas of intersection between the Nordic model and the GCC? What lessons can be learned from the Nordic Cooperation experience in the areas of food security and green energy for the GCC? **Method:** A comparative analysis was conducted on the framework of both the NC and the GCC, along with a case evaluation of successful initiatives in the NC related to food security and green energy sectors. This paper provides a descriptive analysis of NC policies to assess the potential for the GCC to apply a similar framework. **Results:** The GCC could benefit from the Nordic Cooperation experience in implementing promising policies that contribute to achieving the strategic goals of the Council, particularly in the areas of sustainable development, food security, and green energy, which could enhance its effective role in maintaining regional stability. **Conclusion:** Enhanced cooperation between the GCC and Nordic countries - through knowledge transfer, technological innovation, and sustainable practices - offers a strategic pathway for food security, energy diversification, and long-term economic resilience.

Keywords: GCC, Nordic Cooperation, food security, energy security, green energy

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التعاون الإسكندنافي ومجلس التعاون الخليجي: مجالات التلاقي وفرص للتعاون

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ملخص

الأهداف: لم تحظ تجربة التعاون الإسكندنافي (Nordic Cooperation) ((NC)) بدراسة كافية في الدراسات الخليجية-الأوروبية. هدفت هذه الدراسة إلى تسليط الضوء على التعاون الإسكندنافي كأ نموذج وتجربة قد يستفيد منها مجلس التعاون الخليجي. وأثارت الدراسة الأسئلة الآتية: ما مناطق التقاطع بين أدوار النموذج الإسكندنافي ومنظمة مجلس التعاون الخليجي؟ وما الدروس المستفادة من تجربة التعاون الإسكندنافي في مجالات الأمن الغذائي والطاقة الخضراء لدول مجلس التعاون الخليجي. **المنهج:** تحليل مقارنة لإطار كل من التعاون الإسكندنافي ((NC)) ومجلس التعاون الخليجي ((GCC))، ودراسة حالة لمبادرات ناجحة من التعاون الإسكندنافي في قطاع الأمن الغذائي والطاقة الخضراء، وتحليل وصفي، لسياسات التعاون الإسكندنافي لمعرفة مدى قدرة مجلس التعاون الخليجي على تطبيق سياسات مشابهة. **النتائج:** يمكن لمجلس التعاون الخليجي أن يستفيد من تجارب التعاون الإسكندنافي في تنفيذ سياسات واعدة، تسهم في تحقيق الأهداف الاستراتيجية للمجلس، وخاصة في مجالات التنمية المستدامة، والأمن الغذائي، والطاقة الخضراء؛ مما ينعكس على فعاليته ودوره في حفظ استقرار الإقليم. **الخاتمة:** تعزيز التعاون بين دول مجلس التعاون الخليجي والدول الإسكندنافية، من خلال نقل المعرفة والابتكار التكنولوجي والممارسات المستدامة، يشكل مساراً استراتيجياً لتحقيق الأمن الغذائي وتنويع مصادر الطاقة وضمان المرونة الاقتصادية على المدى الطويل.

الكلمات المفتاحية: مجلس التعاون الخليجي، التعاون الإسكندنافي، الأمن الغذائي، أمن الطاقة، الطاقة الخضراء

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Introduction

The Gulf Cooperation Council (GCC) and the Nordic countries face distinct, yet equally pressing environmental challenges, which call for innovative, regionally tailored solutions. The GCC faces severe water scarcity, with some of the lowest per capita availability globally, alongside desertification and heavy reliance on non-renewable energy sources (Chattha et al., 2024). By contrast, the Nordic countries are leading in sustainable practices, having recognized early on both the inevitability of global practices on the environment and, in turn, the environment's impact on countries' capacities for sustainable longevity. For example, Denmark has achieved a 70% reduction in carbon emissions from its energy sector compared to 1990 levels, due to its focus on renewable energy and climate adaptation strategies (IEA, n.d). These achievements warrant close evaluation by the GCC, as they present a learning opportunity for tailored adaptation to achieve environmental resilience. As such, this paper argues that the GCC can draw valuable lessons from the Nordic model, which is a globally recognized framework that demonstrates economic competitiveness, robust social welfare systems, and environmental leadership. While the two regions differ in geography and socio-economic conditions, the Nordic model's emphasis on regional cooperation and sustainability offers adaptable strategies for overcoming the GCC's systemic vulnerabilities.

Research Problem

The main argument in this paper is that, by adopting and adapting elements of the Nordic model, such as renewable energy innovations, sustainable food systems, and cooperative governance structures, the GCC can enhance its resilience to environmental and economic challenges, strengthen regional integration, and elevate

its global leadership in sustainable development. The main research questions are: What are the areas of intersection between the Nordic model and the GCC? What lessons can be learned from the Nordic Cooperation experience in the areas of food security and green energy for the GCC? To test this argument and answer the questions, we employ a comparative analysis of GCC and Nordic frameworks, case studies of successful Nordic initiatives, and policy reviews to identify implementable solutions for GCC strategies. Exploring this nexus is crucial, as it highlights actionable strategies that the GCC can leverage to address its pressing challenges while aligning with global best practices and sustainability goals. Finally, this analysis underscores the importance of cross-regional collaboration and knowledge transfer in building adaptive and resilient frameworks that benefit both local and global communities. By exploring these connections, the paper aims to demonstrate the transformative potential of Nordic-inspired strategies for the GCC's sustainable future.

Literature Review

There is a lack of literature on the precise relationship or potential cooperation between the Nordic Cooperation (NC) and the Gulf Cooperation Council (GCC), which points to the novelty of the idea, where there can be potential overlap between the two entities and further exploration for future policy. A few proponents of the NC-GCC nexus have voiced the stark promise that the NC can offer as a model for the GCC, especially with the events of the Saudi-led blockade of Qatar in 2017 (Khorrami, 2019; Mosly, 2023). The overlapping social aspects of shared cultural, historical, and linguistic legacies are ascribed to both entities, as well as their shared regional 'threat' stemming from 'difficult' neighbors (Khorrami, 2019). For the GCC, Iran's actions pose a regional threat, just as Russia does for the NC. Others have argued that the changing geopolitical landscape

is caused by several crises, such as COVID-19, the Ukraine-Russia war, and the subsequent alert of food and water security, and the GCC is similarly at an impasse to redefine and strengthen its cooperation with ‘unlikely’ partners (Mosly, 2023), especially with the uncertainty in the region due to events such as the Hamas-Israeli strife and the Iran-Israel retaliation schemes. More recently, the collapse of the Syrian regime and its subsequent reconstruction, and the victory of Donald Trump’s presidency all call for strategy evaluations on the part of the GCC leadership, as those events can cause a trickle-down effect on alliance formation on a global scale, as well as a reassessment of the face of geopolitics.

Other than the few studies that address the subject above, Hedner et al.’s (2011) study is business-oriented, focuses on benchmarking Nordic incubators against the GCC, and highlights lessons learned from the Nordic model in terms of venture capital–transferable lessons, university support, and regulatory flexibility in the business environment. The study’s focus is beyond this research paper’s scope; however, it adds value to the current scarce literature on the subject of comparison between the two models. Finally, Omeira et al.’s (2008) study on labor governance draws somewhat of a comparison with the lessons learned and provides a policy checklist for the Arab region to implement. This study is further examined below.

There are vital issues at hand that warrant a deep dive into the Nordic model and its potential impact on the GCC. The GCC faces growing environmental and demographic pressures. Such issues include climate change, food security, and energy transitions, which are not only regional but also global in nature. The ongoing water crisis, characterized by limited annual rainfall and overconsumption—often exceeding 500 liters per person per day—has led to the rapid depletion

of already scarce freshwater resources (El-Kogali, 2024). Compounding these challenges is the Gulf's heavy dependence on food imports, with approximately 85% of food needs being met from abroad, including about 93% of cereals (Dang, 2023). This overreliance exacerbates vulnerabilities to global supply chain disruptions, as evidenced during the COVID-19 pandemic, which exposed the fragility of Gulf states' food security systems (Ben Hassen & El Bilali, 2019).

Despite efforts like the UAE's National Food Security Strategy 2051, which aims to position the UAE as the world's top performer in the Global Food Security Index by 2051 (UAE), and Qatar's National Food Security Strategy 2018–2023, which focused on ensuring diversified trade routes and efficient cultivation based on the country's resource base (MME.gov.qa), the GCC has struggled to implement cohesive, regional responses to these shared challenges. Fragmented policies, varying levels of resource dependency, and a lack of robust cooperative frameworks have hindered the development of effective solutions.

In addressing these challenges, the Nordic Cooperation (NC) offers a valuable model. The NC has demonstrated how collective governance, shared innovation, and sustainable development initiatives can overcome resource limitations and foster resilience. For example, the Nordic region, consisting of Norway, Sweden, Finland, Denmark, and Iceland, is a leader in renewable energy, with hydropower accounting for more than half of all electricity generation as of 2020 (Nordic Energy Research, 20204). This points to the global relevance of exploring the synergies between the two cooperation models.

While much has been written about the Nordic model, its applicability to the Gulf region remains underexplored. This article addresses a critical gap by drawing parallels and proposing concrete policy recommendations.

The Nordic Cooperation: An Overview

The Nordic Cooperation (NC) is a transborder cooperation uniting five Nordic countries, namely, Sweden, Norway, Iceland, Denmark, and Finland, along with their associated territories: Greenland, the Faroe Islands, and Åland. The NC operates as a collaborative framework with joint policy promotion and shared governance, promoting regional stability. The national sovereignty of each state is maintained and respected within the cooperation. It is worth noting that most of the NC countries—namely, Denmark, Sweden, and Finland—are also members of the European Union (EU), which has been a pioneer in climate change mitigation, pushing its member states to set stringent standards for environmental policy, inspiring the rest of the Union to follow. Norway and Iceland are not EU members; however, these countries belong to the European Free Trade Association (EFTA), which entails free trade agreements with the EU, as well as belonging to the Schengen Area. These agreements do not come without their share of obligations towards the environment, as trade agreements are largely associated with mitigating CO₂ emissions and sustainable business practices. Hence, it is safe to argue that all Nordic states within the NC have a dual obligation towards mitigating climate change, as both the NC and the EU, impose restrictions, standards, and obligations to abide by. This, in a sense, places the Nordic states in a unique situation to perform better than others.

Labor standards have largely stemmed from successful models from the Nordic countries, and hence, these states are utilized for their successes to onboard others that require reform. Such standards have reflected on the quality of worker compensation and security to name a few (Omeira et al., 2008). Further, the Nordic model, in terms of its market efficiency and welfare standards, has been deemed

one of the most effective models for other countries to adopt (Sapir, 2006). The Nordic model is distinguished by its integration of free-market capitalism with comprehensive public welfare systems, fostering both economic efficiency and high living standards. This approach combines responsible economic policies with universal access to social services, including healthcare and education, ensuring equitable wealth distribution and societal well-being (NFS.net).

Despite their relatively small populations, the Nordic countries collectively occupy a strategically important region in Northern Europe, with access to key maritime routes, Arctic interests, and proximity to both Russia and the EU heartland. Economically, the region is characterized by high innovation capacity, robust welfare systems, and strong global competitiveness in sectors such as green energy, maritime technologies, digital infrastructure, and sustainable manufacturing. Politically, the Nordic bloc is often viewed as a model of stable, transparent governance, high institutional trust, and democratic resilience features that have allowed for effective intergovernmental collaboration and conflict resolution. For the GCC, these attributes are not only instructive but also strategically relevant. As the GCC navigates shifting regional dynamics, energy transitions, and multipolar global alignments, the Nordic model demonstrates how geographically proximate states with shared cultural or historical affinities can build a cooperative framework that enhances collective bargaining power, economic diversification, and geopolitical influence. The Nordic region's ability to maintain national sovereignty while advancing supranational interests, offers a particularly valuable lesson for the GCC as it seeks to balance internal unity with global ambition.

The GCC: An Overview

The Gulf Cooperation Council (GCC) is a political and economic union of six member states: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). Established in 1981, the Council was formed to foster economic integration, political stability, and security cooperation among its members. The Council's main objectives include promoting unified policies in economic matters, enhancing coordination in areas such as trade, energy, and industry, and creating a common market among member states. It also works to strengthen regional security – particularly in response to external threats – through collaborative defense and security efforts. The GCC is a vital player in the region's geopolitical landscape, particularly in the Middle East, influencing decisions on economic diversification, energy, and political stability.

A distinct feature of the Council is its collaborative approach to security. The GCC has developed a unified approach towards security, recognizing the importance of collective defense in maintaining regional stability. One of the most notable components of this security strategy is the GCC Peninsula Shield Force, established in 1982 as a regional military force to protect member states from threats and maintain peace within the Gulf (Aluwaisheg, 2020). This force is designed to ensure a rapid, coordinated response to potential conflicts – such as territorial disputes or military aggression. Additionally, the GCC members engage in regular joint military exercises, intelligence sharing, and coordinated defense strategies to enhance their collective security capabilities. The Council's approach also includes diplomatic efforts, such as mediating regional conflicts and promoting stability through dialogue and collaboration with other international partners. This focus on collective security allows the GCC to present

a united front against common security challenges, including terrorism, regional instability, and external security breaches.

The GCC occupies a geostrategically critical position at the crossroads of Asia, Africa, and Europe, with control over key maritime chokepoints such as the Strait of Hormuz, through which a significant portion of the world's energy supply is transported. This geographical leverage has long positioned the region as a central player in global energy security and maritime trade. Economically, the Council's states command vast hydrocarbon resources, collectively holding some of the world's largest oil and gas reserves, while also undertaking ambitious economic diversification programs through initiatives like Saudi Arabia's Vision 2030 and the UAE's Centennial 2071. The bloc is emerging as a financial and logistical hub, with increasing investments in renewable energy, digital economies, and cross-border infrastructure. Politically, the GCC states are asserting growing influence through diplomatic mediation, regional security coordination, and strategic partnerships with global powers. The region's shared cultural heritage, religious identity, and economic interdependence offer strong foundations for deeper cooperation. As global energy dynamics shift and geopolitical competition intensifies, the GCC's capacity to coordinate its foreign policy, security posture, and economic strategy will be critical not only to its regional relevance but also to its collective global standing.

Current State of Cooperation

Formal cooperation between the GCC and the Nordic countries remains limited, with most engagements occurring on a bilateral basis rather than through structured, multilateral frameworks. However, recent developments indicate a growing interest in establishing more comprehensive ties. Notably, the first joint ministerial meeting be-

tween the GCC states and Northern European countries was held on September 26, 2024, on the sidelines of the 79th session of the United Nations General Assembly in New York. This meeting, attended by foreign ministers from both regions, signaled a mutual desire to expand relations and enhance strategic cooperation across political, economic, and security domains. The discussions highlighted increasing trade volumes and investment flows and trade exchanges, including direct investments from Scandinavian countries to the GCC countries (General Secretariat, 2024).

Beyond this inaugural ministerial dialogue, cooperation has predominantly been characterized by bilateral initiatives. For instance, Sweden and the GCC states have engaged in multifaceted relations encompassing economic, technological, and cultural exchanges. Efforts have been made to foster partnerships among think tanks, universities, research and development centers, and through student exchange programs (Mosly, 2024). While these initiatives reflect a positive trajectory, the absence of a formalized, collective framework akin to the Nordic Council suggests that GCC–Nordic cooperation is still in its infancy, with significant potential for deeper institutional collaboration in the future.

Comparison: Areas of Overlap

Both the GCC and NC resemble regional cooperation, each comprising a group of countries with collaborations in the political, social, and economic sectors, where both Council member states share commonalities in their vision. The GCC, composed of six member states—namely, Saudi Arabia, the United Arab Emirates, Qatar, Kuwait, Oman, and Bahrain—shares a similar geopolitical context. They are situated in the Arabian Peninsula, which is a region notably recognized for its abundance of oil and gas reserves as well as stra-

tegic waterways and faces regional instability due to conflicts. There is a geopolitical context also shared among the NC member states—namely, Denmark, Sweden, Finland, Iceland, Norway, territories of Greenland, Åland, and the Faroe Islands—where these countries are situated within common historical, cultural, and social ties. Although frequent modern conflict or regional instability is not inherent within the Nordic region, the recent Russia–Ukraine war has proven that the region is not without its fair share of geopolitical risks. Both coalitions are abundant in natural resources, where Norway, Iceland, and Finland share large quantities of energy reserves such as gas and oil.

A stark difference between the entities, moreover, is that the GCC shares common cultural, religious, and linguistic homogeneity, where the official language is Arabic with Islam being the dominant religion. With the NC, there is a diverse linguistic spectrum with cultural and historical diversity. Another difference is path dependent, which is their topography and geographical limitations. Although both entities are in differing climates, they share similar concerns in sustainably adapting and dealing with their harsh winters—such as that of the Nordic countries—and harsh summers—such as that of the GCC countries. Environmental sustainability, therefore, becomes a concern for both coalitions, which can be a point of departure for identifying areas of overlap with certain pillars that each model can aid in understanding. For example, Norway has been pioneering fisheries and certain technologies for innovating seafood supply due to their coastal nature. Members of the GCC are mostly coastal and have naturally adapted to marine life. Looking at the technologies that the Nordic countries have implemented to expand their fisheries and sustain the food chain is essential for the GCC, as we see recent steps towards that with Saudi Arabia and the UAE expanding to new expertise to help revitalize as well as sustain their fisheries and seafood supply chains.

The GCC processes and procedures include enacting legislation that serves the overarching goals of the Council in terms of commerce, communications, education, and culture (GCC Charter, Article Four). This is a defining difference when comparing the GCC with the NC in terms of procedures and processes. The NC contains both informal and formal dimensions, whereby the countries entered into an initial cooperation agreement with the Helsinki Treaty signed in 1962 (Nordic Council of Ministers, 2017, p. 4). This suggests structural differences that hinder comparison. Both entities are indeed institutionalized, where the NC has the Nordic Council, which includes parliamentary representation from each member state, and the Nordic Council of Ministers. The GCC structure is a bit more complex and entrenched to resemble a formalized functional body to enact legislation. The GCC is composed of the Supreme Council with a function of settling disputes, the Ministerial Council, and the Secretariat General, each of which includes sub-agencies with specific functions (GCC Charter, Article Six).

Aside from the structures, there are overlapping similarities that each individual member state possesses, which, when engulfed within one council, would provide greater overlap for both coalitions to benefit from. The member states of the entities have seasoned sovereign wealth funds, which serve similar functions to their social welfare structures. Hence, the motivation to excel and learn from one another stems from similar grounds, which speaks to the capability to provide for the citizenry of each member state. Norway, for example, has the largest sovereign wealth fund in the world, and its economic status has been deemed strong with the recent dynamic technological industries (Fouche, 2024). Norway has been able to manage its fund properly to offer wealth distribution and economic security for generations. The wealth funds of the Gulf states are sizeable compared to their per-

capita capacity, and so exchanging knowledge and know-how on innovative ways of managing and future-proofing such funds would be a natural point of departure for cooperation between the entities. This spills over to diversification of the economy, where Norway and Iceland, similarly, have been relying disproportionately on a few resources for their longevity, and dialogue regarding diversification has been at the forefront, especially with other member states that have been experiencing a rather diversified economy longer, such as Sweden. The Gulf states, moreover, being in the same predicament of economic diversification, also share a huge area of overlap for cooperation.

Looking at areas of overlap in environmental projects would henceforth be the topic of discussion between the countries due to the Nordic countries' success streak within environmental achievements and the GCC countries having the current need, capacity, and capability to start enacting sustainable projects for the longevity of their nations.

Methods and Analysis

Lessons Learned

The 2024 presidency of the NC will be held by Sweden. The legacy that Sweden and other Nordic countries have individually built will prove vast. For example, Sweden's renewable energy policy takes on a major role in the country's agenda, which also has a notable spillover on the EU level as well as on the NC. Sweden has perpetuated a sociopolitical culture by spreading an environmental mindset (Uba, 2010). Sweden's environmental efforts began when mercury used in farming was linked to bird illnesses, promoting national bans and long-term ecological policy reforms (Swedish Environmental Protection, 2021). Since around 1996, the use of alkyl

mercury as a seed dressing was banned, and many fish were black-listed from being sold due to the high amount of mercury they contained (Swedish Environmental Protection, 2021). Despite rapid industrialization characterized by the growing automobile industry and the building of hydroelectric power stations, Sweden's government has not hesitated to drastically cut back on such developments when it comes to placing humans and their environment in harm's way. Hence, from an early stage, one can observe the sociopolitical culture evolving in Sweden concerning the country's priorities.

Moreover, some of the milestones that have been established in the NC recently are the Nordic Climate and Air Quality Cooperation (NOSCA), Nordic Energy Research, Nordic Partnership for Sustainable Aviation, Nordic Swan Ecolabel, Nordic Working Group for Sustainable Consumption and Production (SCP), Nordic Waste Prevention Group, and Nordic Nature Conservation Cooperation (NATUR). Some of these initiatives are working groups whereby constant meetings are held to establish goals that translate into actionable plans and hence implementable projects.

The NOSCA, for example, has called for cooperation from different organizations with the same goal. The policies enacted focused on reducing greenhouse gas emissions, where the combined Nordic CO₂ emissions per unit of electricity were one-fifth of the global average in 2016 (Bird, 2017). Not only does the Council have its own goal to reduce emissions by 40% by 2030, but the individual countries have their own goals as well, which portrays the ambition within the regional cooperation (Bird, 2017; Norwegian Ministry of Climate and Environment, 2021). Cutting emissions does not mean undermining economic growth, however, Norway has been keen on transitioning its society to cope and excel in an environmentally friendly

way, without impacting economic growth, which is an aim for the Council as a whole (Bird, 2017). For example, by 2030, Norway is committed to revising environmentally friendly travel (Norwegian Ministry of Climate and Environment, 2021). The Norwegian government is keen on giving the public alternatives that are embedded into more accessible and simpler ways of living without undermining the quality of life.

Food Security: Food Waste

According to the Nordic Council of Ministers policy brief in (2017, p.7) 3.5 million tons of food are wasted in the region annually. More recently, the amount of food wasted in the Nordic region has risen to about 10 million tons per year (Amini, 2021). Reducing waste on a global scale is also under Goal No.12 for the UN Sustainable Development Goals, specifically target 12.3 (sdgs.un.org). Each country has acted within its domestic capabilities towards this goal. Sweden, as a pioneer of environmental culture, has been tackling this issue with innovation, for instance, passing legislation to enforce packaging standards for food and requiring most packaging to be recycled, burned for energy, or used as fertilizer on farms in the case of organic waste (The Local, 2021). The Swedish government has welcomed collaborations and innovations from the private sector and civil society, where many organizations have been leading their own food-waste solutions. For example, Food2Change, a non-profit organization, is dedicated to mediating between supermarkets and low-income families (Nordic Council of Ministers, 2017, p.10). This initiative is inclusive and includes all social classes in society, where reducing emissions and being environmentally conscious are not limited to socio-economically capable groups. A link was found between food aid and lower emissions, as providing food bags to those in need reduced greenhouse gases per kilogram of food (Bergström et al., 2020).

Another substantial initiative that spans across the Nordic countries is date labeling. Due to the interconnectedness of food supply chains and movement between the borders of the Nordic states, date labeling was re-evaluated in unity for ease of interpretation by consumers as well as industry leaders. Policymakers have established that “...a grocery store showed that reducing by 30% the price of products with 1–2 days left of shelf life led to a significant reduction of waste” (Nordic Council of Ministers, 2017, p. 10). Sweden has gone beyond this to add more elaborate labeling information on perishables, such as dairy, to show consumers not only the expiration date but also the timeframe during which the product is safe to be consumed after the expiry date (Swedish Environmental Protection Agency, 2021).

Food waste is substantial in the Nordic countries, where almost 90% of such waste is utilized for energy to replace the heavy dependence on fossil fuels (Amini, 2021). Some of those uses include incineration, animal feed, biogas/biofuel, and composting (*ibid.*). Such initiatives are possible because of being institutionalized and prioritizing the reduction of food waste on government agendas. For example, the Norwegian government established binding agreements with the food sector in 2017 to establish an efficient food security scheme for the country (One Planet, 2021). It is essential to note that the region relies on food imports in substantial amounts (Amini, 2021), while, at the same time, the Nordic region is considered a large food exporter. Therefore, the outlook is unique in the sense that the countries in question are conscious of the importance of food security and diversifying their dependence on this source.

Food waste is also connected to energy consumption and production, as the processes of making food, distributing it, consuming it, and wasting it all require some form of energy, which has its own impact on the environment and on each country’s carbon footprint,

for example, quantifying food waste based on the amount of wasted material that is not edible from edible food, which is ascribed to the primary production and given the term ‘side flow’, has been studied to further understand the intricacies of food waste and energy consumption, where the amount of such a niche food waste category was determined at 800,000 tons a year for four Nordic countries combined—Finland, Sweden, Norway, and Denmark (Hartikainen et al., 2017). This means that each country, and henceforth the cooperation, needs to identify the areas of waste and food consumption they are encountering in their respective countries to inscribe a unified policy as a regional cooperation.

Energy Security: Green Energy

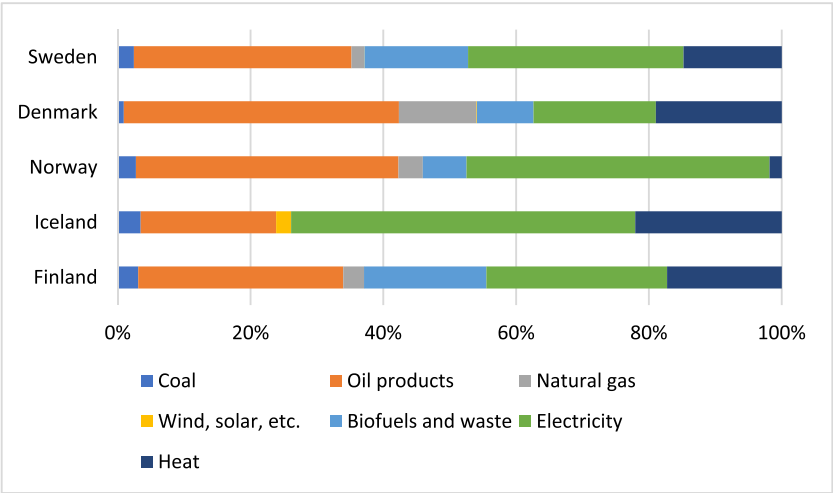
The topic of green energy spans an array of intersecting areas within each country. Most notably within the Nordic region would be their varied energy technology innovations in the production, manufacturing, deployment, and monitoring of potential variable renewable energy (VRE) such as wind and solar. As for the Nordic uniformity of energy, the countries have been largely unified in terms of their electricity regulation. However, we see varied responses to a common heat, gas, and transport regulation as they have been largely dictated by national policy (Skytte & Morthorst, 2018). Following the EU reduction goals for greenhouse gases (GHG) set in 2009 for goals to be achieved by 2020, the three Nordic countries that are members of the EU have achieved their goals and surpassed them by 2018 (Skytte & Morthorst, 2018). This shows a higher capacity for the Nordic model to excel under such strict standards set by the EU and, subsequently, the Paris Agreement.

Within their various strategies, the Nordic countries have developed a common understanding that diversification in energy is a

priority until each country reaches a certain level of supply that is self-sufficient for the demand (Aslani et al., 2012). Norway, a major oil exporter with vast reserves, offers a strong model as it remains self-sufficient and minimally reliant on fossil fuels for domestic energy (Aslani et al., 2013). Energy diversification is a key component in making such economies a model for sustainability as well as for economic growth. Norway, as well as Iceland, are among the top countries to showcase their diversification capacity, where they were classified as among the top 10 producers of electricity generated from renewable energy resources (RER) (EIA, 2012). Moreover, Denmark has excelled in its wind power utilization, which shows the diversity in expertise for the Nordic countries in RERs as well as in knowledge transfer for environmental innovation. Although not highly populated, the Nordic countries are also elevating expectations, as they are among the highest contributors of RERs in the world (Aslani et al., 2013). Figures 1 and 2 provide an illustration of the energy consumption for each of the NC countries to demonstrate the economic diversity and energy dependence on renewable resources.

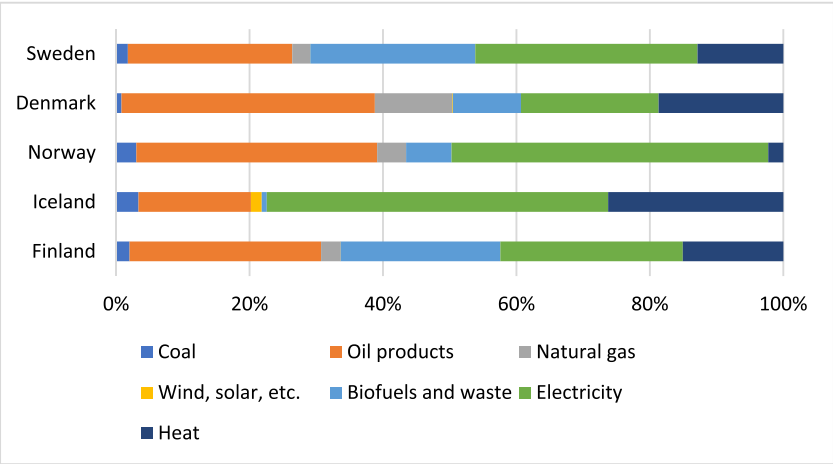
Such figures show a determination to transform dependence into self-sufficiency, where the NC countries are future-proofing their industry and society to withstand any external shocks. This is also a model not only for economic resilience, but also for cultural awareness of the impact people can have on the environment and their staggering role in mitigating such impact and learning to cope with the environment and its needs. Figures 1 and 2 demonstrate the transformation of energy consumption over a period of 10 years. It is essential to observe whether the countries are implementing their stated intentions to reflect actual numbers. We see that, indeed, there has been progress for greener and alternative energy consumption domestically.

Figure 1
Energy Consumption 2010



Source. IEA.org

Figure 2
Energy Consumption 2020



Source. IEA.org

For Sweden, oil dependency has decreased, while the consumption of biofuels and waste has increased from 2010 to 2020. Sweden's coal consumption was slightly reduced in 2020, even though it was below 5% of consumption in 2010 to begin with. Natural gas consumption slightly increased. For Denmark, on the other hand, a difference, although slight, can be seen with an increased consumption value for biofuels and natural gas. Finally, Finland demonstrated an increased commitment to biofuels and waste consumption, where a noticeable difference can be seen in this source of consumption from 2010 to 2020. Denmark, Norway, and Finland's reliance on oil products, however, has not decreased significantly within the 10 years, which begs the question of the actual alternatives to oil and how dependent these countries are on it. Oil consumption for those countries is at least 20% of the domestic total energy consumption. The Nordic countries have been diversifying their domestic energy consumption for more than 10 years; hence, they have been advancing towards this step consciously.

GCC Challenges

It is essential to understand the challenges that the GCC faces in terms of geopolitical limitations that might determine its political outlook and policy formation for abating these challenges. The GCC countries' population growth is steadily increasing with the demographic consisting of younger ages (Alflaiti, 2021). However, the population is expected to decline due to lower fertility rates and fewer marriages (Lasrado, 2022). The GCC member states also sustain a large portion of foreigners or expatriates working to assume certain jobs and subsequent social roles within society. Due to this demographic makeup, policy decisions are made with that in mind, supported by institutional infrastructure capable of withstanding such representation for policy implications.

Food Security

There is a scarcity of data on this topic for the GCC, and there have been some substantive efforts from a limited number of scholars trying to shed some light on quantitative data on the region. Available literature discusses reuse and recycling efforts of food waste, whereas strategies for reduction, prevention, and redistribution are largely ignored (El Bilali & Ben Hassen, 2020). As a point of departure, we rely on the Global Food Security Index (GFSI) to help better understand the bigger picture of the status of the GCC member states in terms of the different variables making up the index. The index combines indicators from four factors: Affordability, Availability, Quality and Safety, and Sustainability and Adaptation. Along with those indicators, the measure consists of dynamic sub-measures consisting of 68 unique variables, such as trade freedom, agriculture producer prices, empowering women farmers, and commitment to innovative technologies (Economist Impact, 2022). The Index is also updated on a yearly basis and provides an overall average for country comparison on a global scale. The first index started in 2012, and throughout the years, the index has been modified to better reflect changes and adaptations. Table 1 demonstrates the current position of the GCC countries in their food security as of 2022.

Table 1

Global Food Security Index GCC 2022

Rank (15 Countries)	Overall Score	Affordability	Availability	Quality and Service	Sustainability and Adaptation
1 st United Arab Emirates	75.2	86.7	73.8	81.3	55.2
3 rd Qatar	72.4	88.6	72.9	71.7	51.0
4 th Oman	71.2	88.6	64.3	73.2	53.6

Cont. Table 1*Global Food Security Index GCC 2022*

Rank (15 Countries)	Overall Score	Affordability	Availability	Quality and Service	Sustainability and Adaptation
5 th Bahrain	70.3	91.3	60.1	76.3	47.3
6 th Saudi Arabia	69.9	83.2	67.2	71.6	53.7
9 th Kuwait	65.2	80.0	62.9	67.8	45.5

Source. Global Food Security index, 2022.

The GFSI Affordability measures price shocks and volatility in terms of how it impacts the ability of consumers to purchase food, whether ingredients or ready-made restaurant food. This also includes whether there are food programs, coupons, and assistance for food purchase available. This variable speaks to the consistency of affordable food in the market, and it indicates how vulnerable the government is in terms of how heavily it relies on the international market to import food and produce as opposed to the country being self-sustaining with a rich agricultural supply. Affordability is measured on a scale from 0 to 100, where 100 is considered ideal or most favorable (Global Food Security Index, 2022).

Availability, on the other hand, measures agricultural production and farm capabilities in terms of machinery, technology, and innovation while assessing how vulnerable the industry is in the face of supply chain disruptions. This measure also includes research and development efforts to make more food available to the public and best practices in distribution channels. Quality and safety measures the nutritional value of the diet in the country in question and evaluates the safety and quality assurance practices. Finally, sustainability and adaptation measures the country's impact on the environment as

well as how the environment and climate change have affected the country's adaptation initiatives and policy.

Table 1 above shows that adaptation and sustainability efforts are low, and the GCC countries are not performing as they should when compared to their financial capability, it shows higher scores on the other variables of the GFSI. This means that the member states are susceptible to climate change shocks and are not yet at a level where they are prepared to withstand shocks and impacts caused by climate change. This also weighs on their environmental impact when compared with the Nordic countries in Table 2.

Table 2

Global Food Security Index Nordic Countries 2022

Rank (41 countries)	Overall Score	Affordability	Availability	Quality and Service	Sustainability and Adaptation
1 st Finland	83.7	91.9	70.5	88.4	82.6
3 rd Norway	80.5	87.2	60.4	86.8	87.4
6 th Sweden	79.1	91.9	68.3	85.0	68.3
11 th Denmark	77.8	92.1	63.2	89.1	63.8

Source. Global Food Security index, 2022.

Moreover, availability is the second variable lagging in the overall performance of the GCC. This speaks to the security of available food in terms of withstanding external shocks. The GCC countries are mostly consumers of food and not producers, whereby a dire need for innovation and technology exists for the countries to start producing food and food products domestically to increase their resilience to external factors such as sanctions, blockades, wars, and other crises. Food prices play a crucial role in affordability, as their volatility poses a real threat to food security within each of the member states,

as price fluctuations are contingent upon the supply chain and import channels. A good example is Qatar's hard hit on food availability and prices during the GCC–Qatar blockade and diplomatic crisis led by Saudi Arabia and the UAE in 2017 (Gengler, 2020). This blockade exposed Qatar's food vulnerability due to its reliance on imports, worsened by blocked maritime and aviation routes (Wright, 2019). Those affected the most were the marginalized migrant workers, who witnessed a hike in food prices during the crisis and were largely impacted in their livelihood (Migrant-Rights.org, 2017).

Another factor that might be impacting the quality of food and nutritional value is the high obesity levels in the GCC (Samara et al., 2019). This coincides with higher food waste since the consumption of food surpasses the production, and the reuse of food products or side-flow is virtually non-existent. For example, in the UAE, it is estimated that 790 square Liters per capita per year of water is wasted as part of the food loss or waste (Berjan et al., 2018). It is estimated that, within this region, food waste and loss is about 34% of the total food supply (Berjan et al., 2018; Gustavsson et al., 2011). This calls for a vast awakening in adopting innovative technologies to optimize the food production channels and ensure that the region can increase efficiency in long-term food availability and quality of life.

The large extent of food loss estimates is attributed to poor farming practices and inefficient infrastructure for food supply chains and record-keeping of production and consumption (Berjan et al., 2018). Although the GCC is deemed as a relatively secure region in terms of food availability in the face of crises such as the 2007-08 global food crisis, we witness the region's struggle to maintain its food security, which is due to high dependence on imports and limitations in food-import policies, while the region struggles with scarce water availability, poor soil and high energy exerted from fossil fuels (Ben

Hassen & El Bilali, 2019). COVID-19 has also demonstrated once more the vulnerability and heavy dependence on imports in the GCC countries, where more innovative food usage policies and procedures are extremely needed. The GCC imports about 85% of its food and food products, where most prevalent numbers are ascribed to cereal imports at about 93%, meat at around 62%, and 56% of vegetables (Dang, 2023). Table 3 shows food import estimates for the GCC.

Table 3

Food Imports - GCC

GCC Member States	GCC Food Imports (USD Billion)		
	2011	2015	2020 (estimate)
Bahrain	0.8	1.1	1.6
Kuwait	2.5	3.6	5.3
Oman	2.1	3.3	4.8
Qatar	1.3	2.1	3.3
Saudi Arabia	17.9	24.5	35.2
United Arab Emirates	3.8	5.5	8.4
GCC Total	28.4	40.1	58.6

Source. (The Economist Intelligence Unit, 2010).

Energy Diversity: Beyond Oil and Gas

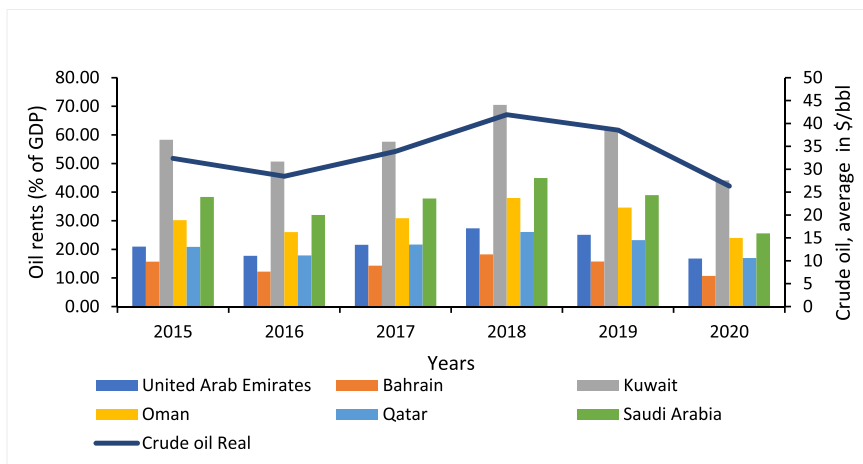
It is a known fact that the GCC is heavily dependent on oil and gas as the primary resources for its economic and social livelihood, where the region is home to the largest global reserves (Shehabi, 2023). The structure of institutions and the way they evolved were primarily determined by this single resource. However, as it is apparent, climate change has pushed governments to assume differing agendas geared towards self-sufficiency and diversification. The

looming long-term and slow impact of the environment was not the only factor for this push, as governments have been seeing instant and short-term events of geopolitical consequence to their longevity. The 2008 recession, COVID-19 pandemic, the Russian–Ukraine war, and the Hamas–Israel aggression have all been branches on the near timeline that have implications spilling over to one another, and for the most part, the consequences are still unfolding today. The GCC’s diversification of energy resources is now inevitable.

Structural changes within policy for energy diversification, coupled with dialogue with experts, have intensified since the sharp decline in oil prices in 2016, when oil prices fell to US\$27 per barrel (Mishref, 2018). Figure 3 shows the price fluctuation of crude oil sales for the GCC from 2015 to 2020.

Figure 3

Crude Oil Prices and Rented Oil per GDP 2015–2020



Source. World Bank Commodity Price Data.

The need for diversification has been, in hindsight, as governments of the GCC have noted the finite capacity of fossil fuels; how-

ever, past diversification efforts have not yielded major results towards sustainability, as this agenda entails a restructuring of the private sector and others to reimagine the GCC's processes and procedures to avoid duplicated economic activities and hindrance to interregional trade (Hvidt, 2013). Such barriers in diversification implementation for the GCC economies are a product of the oil and gas legacy or, in other terms, are a progeny of rentier states. Dominance of natural resources fosters the "oil curse", a concept widely analyzed by scholars (Gelb & Grasmann, 2009; Khanna, 2017; Majumder et al., 2020; Ross, 2013; Schubert, 2006). Heavy reliance on one resource for economic prosperity determines the type of institutions, which are seen as more authoritarian with limited private ownership and hence lower equality (Majumder et al., 2020; Schubert, 2006). Some of the GCC countries also demonstrate symptoms of "Dutch Disease" such as Kuwait when evaluating the job market and women's representation in the country (Ross, 2013). Dutch Disease is an economic term that refers to the increase in one sector's investment within society and the decline in other sectors. This relationship is measured to analyze why, in some societies, the focus on one source of economic development tends to decrease or diminish other productive sectors in society. In Kuwait, for example, the oil sector takes precedence in policy priorities, the shape of institutions, and the creation of jobs, whereas other sectors, such as agriculture, services, and industry, to name a few, are either superficially developed or not at all. This evolution of institutions is ascribed to the impact of oil on society.

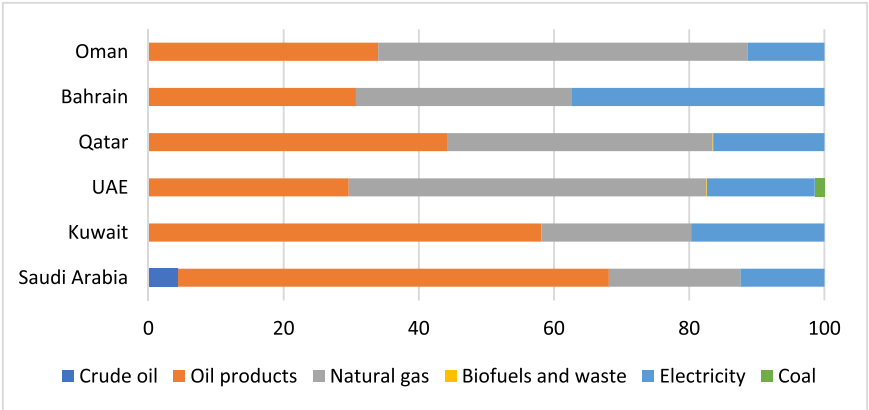
Establishing such a reality, the GCC countries have since acknowledged the need to dismantle the path dependence of the oil and gas industry and the mindset procured by the "Dutch Disease" and establish processes to allow for diversification within the economy. While economic growth and development are usually evaluated in

isolation from climate change issues, it is more beneficial for the GCC states to evaluate the two in tandem to allow for a smoother transition and balance with the costs of transitioning (Al-Sarihi, 2018). Any progress established towards diversification efforts while abiding by obligations through the Paris Agreement has been analyzed through the member states' intended nationally determined contributions (INDCs) and their respective national visions. The oil industry is also indirectly being affected by climate change through the GCC's trade partners' commitment to CO₂ emission reductions. For example, the EU, Japan, India, and China were among the top trade partners for the GCC, where they all have committed to emissions reductions for their INDCs targets, which, in turn, affects trade itself (Ibid). These partners are expected to impose trade restrictions due to fossil fuel-related emissions (Ibid). This trajectory will cause a shift in the trading landscape for the GCC, where the region is not only obliged to mitigate responses by partners but is also necessitated to change policy and economic dependence and consumption patterns domestically.

There are inherent contradictions within the states' targets and inherent production channels. For example, a more common way to obtain clean water is through desalination; however, the process produces high levels of energy, hence increasing the output of GHGs (Al-Sarihi, 2018). Kuwait, for example, has developed plants that utilize reverse osmosis, which produces less wastewater and has been slowly decommissioning older technologies from its more seasoned desalination plants (Al-Abdullah et al., 2023). Further quantitative assessment of diversification efforts domestically will be attempted in this research with the limited data available, obtained not from the member states themselves but through the International Energy Agency (IEA). Figures 4 and 5 show domestic energy consumption for the GCC from 2010 to 2020.

Figure 4

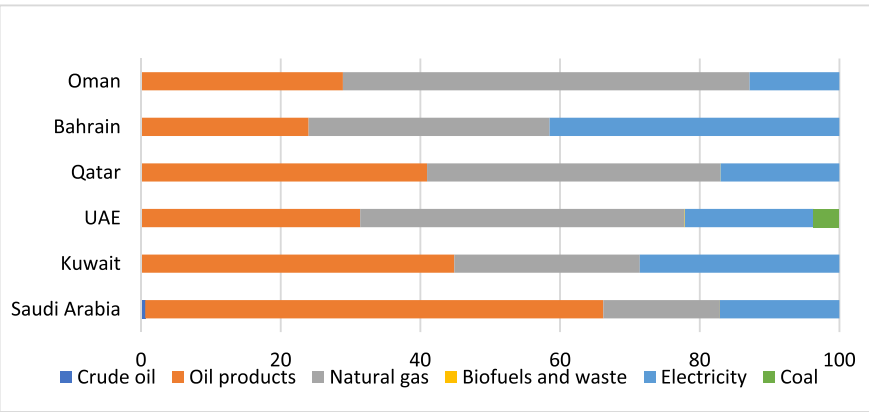
Energy Consumption 2010



Source. (IEA, n.d.).

Figure 5

Energy Consumption 2020



Source. (IEA, n.d.).

Realistically analyzing the capacity and weighing it against national goals is imperative to assess the GCC's perceived target potential.

Analysis Discussion

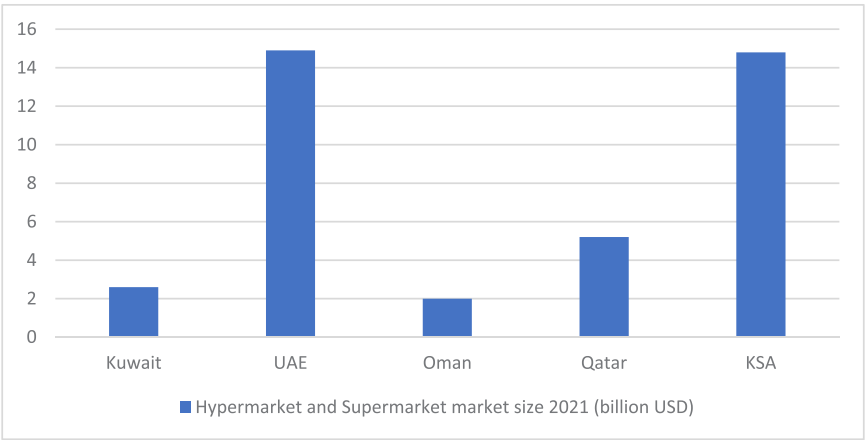
GCC's Potential Adaptation Models

Curbing Food Waste by Labeling "use by" and "best before"

This initiative has largely been implemented in grocery stores around Norway and has been adopted by other Nordic countries as well. We will attempt thereafter to conceptualize this initiative for the GCC and quantify its potential impact on food waste for the region. To start, it is paramount to understand the size of grocery stores in terms of their impact on the market within the GCC. Establishing this will determine whether this project can viably yield impactful results in curbing food waste for the Council. Figure 6 demonstrates the size of hypermarkets and supermarkets, denoting the food and beverage industry in all GCC countries in terms of their market size in 2021, which is the latest statistic obtained.

Figure 6

Hypermarket and Supermarket Market Size 2021

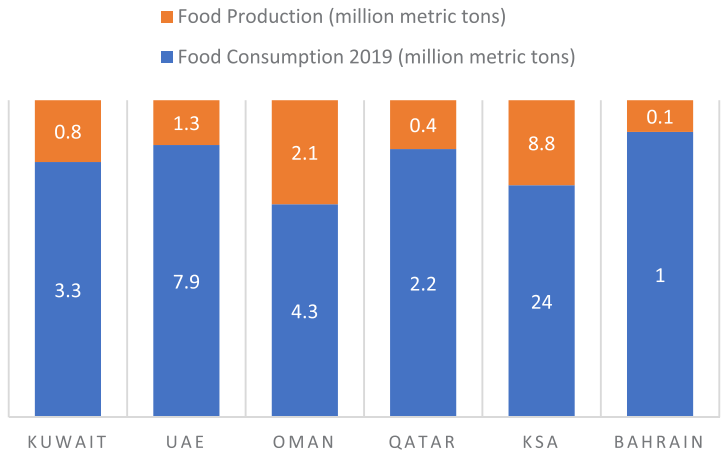


Source. (Statista, 2023).

In Kuwait, for example, there has been an exponential increase in market size for this industry, where the size of hypermarkets and supermarkets grew from USD 1.9 billion in 2016 to USD 2.4 billion in 2020 and USD 2.6 billion in 2021. In Qatar, the market increased from USD 4.9 billion in 2020 to USD 5.2 billion in 2021 (Statista, 2023). This vast market share in each country points to the inescapable fact that food production, and retail play an integral role in the domestic consumer’s livelihood, which, in turn, influences consumption habits and carbon footprint.

Food loss is a term given to items that are deemed unconsumable by humans or inedible due to some spoilage, moisture loss, or any other causes (Buzby et al., 2009). It is estimated that, in an average - sized a supermarket compared to US, there is a 12% food loss for each type of fruit and vegetable, and 7% for each type of meat, seafood, and poultry, noting that an average supermarket contains more than 200 food items (Buzby et al., 2009, p. iii). As Figure 7 shows, GCC countries consume more than they produce domestically.

Figure 7
Food Consumption Vs Food Production 2019



Source. (Statista, 2023).

This is where the new policy approach comes in when keeping in mind the success rate of the Nordic model in labeling items. The GCC countries have the luxury to enjoy fruits and vegetables and other food items year-round, and not have availability limitations based on seasons. This is largely because most food items are imported at around 85% of the total food for the GCC (Dang, 2023; Marmore MENA Intelligence, 2020). For example, as of 2022, around 95% of Kuwait's food needs were imported (Marmore MENA Intelligence, 2020, p. 13).

The high number of imported items, which are considered essential to daily diets, should be a concern for the Council and one of the priorities to address. Such high dependency requires long-term and steady elimination to avoid shocks to society and consumption needs, which will then impact the stability and national security of the countries in question. However, most importantly, it is necessary to acknowledge the dire need to adopt good and efficient labeling systems such as that of the Nordic model to ensure that the imported foods do not contribute to unnecessary waste. One such substantial decision would be to shift the importation strategy to account for companies and countries that abide by this labeling system, whereby the standards will increase, making food of higher quality. Although shifting such policies and choosing countries that are conscious of such labeling might yield higher importation costs, the cost can be offset by reducing the amount of waste resulting from food imported and consumed.

Energy Security through Biofuels and Waste Management

The commonality between the Nordic countries and the GCC in terms of substantial reliance on oil and natural gas means that both entities could have a similar outlook when assessing their energy security. For example, the consumption of biofuels and waste in the Nordic countries has substantiated gains in their energy consumption model.

Biofuels are a clear alternative to fossil fuels, which the GCC produces in large quantities and can therefore consume them. Especially with the current development and economic growth of countries such as Saudi Arabia and Oman, biofuels can support much of the mining and construction industries as well as transportation (Mahroogi et al., 2022). The cost of production is estimated to decrease eventually as more technological advancements target such alternatives, and the market becomes more common in terms of usage within shipping and supply routes. According to recent estimates, “the cost of production for biofuels has been estimated at about USD 0.60-1.10 per liter by the year 2045” (Mahroogi et al., 2022, p. B67).

While solar remains dominant, biofuels are gaining traction in sectors like aviation (Etihad Airways, 2019; Welfle & Alawadhi, 2021). This solution could potentially aid in reducing the waste that has been accumulating in the region as the traditional - landfill waste has been the dominant solution for the countries. The municipal solid waste (MSW) level has been calculated as one of the highest per capita rates for the region at around 50 Mt each year (Welfle & Alawadhi, 2021, p. 3). Since projects to reconcile waste and produce more bio-fuel are a relatively new step within the GCC, there is an inherent lack of real-time data to assess progress and impact. However, Welfle and Alawadhi (2021) attempted to present potential projections for future impact and concluded that Saudi Arabia has the greatest potential, and the UAE comes second. Oman is a close contender as well, as it has been investing in renewable energy and has recently pushed for solar PV usage amounting to around 0.6% of its electricity generation as of 2021 (IEA, n.d.) The GCC has the greatest potential to produce biomass and bioenergy through animal waste and MSW (Welfle & Alawadhi, 2021). With the help of Nordic technology and knowledge transfer, such potential can be realized and exceeded with higher efficiency.

Implementation Challenges for the GCC

Implementing the above Nordic models for food waste reduction and energy diversification in the GCC region presents some challenges. One significant hurdle is the lack of standardized food labeling practices across GCC countries. Inconsistent definitions and applications of "use by" and "best before" dates can lead to consumer confusion and unnecessary food disposal. An awareness campaign should pave the way for reducing confusion and educating consumers on the difference between safety and quality when it comes to what the labels mean. Cultural factors, such as preferences for abundant food offerings during social gatherings, further exacerbate the issue, making it challenging to shift consumer behavior toward more sustainable practices.

In terms of energy diversification, the GCC's heavy reliance on fossil fuels poses a significant barrier to adopting biofuel technologies. The region's bioenergy sector remains underdeveloped, with limited investment and research compared to other renewable energy sources. Moreover, the lack of supportive policies and incentives for bioenergy development further impedes progress. While waste-to-energy initiatives are gaining traction, the transition to a diversified energy portfolio that includes biofuels will require substantial investment, policy reform, and public-private collaboration to overcome these obstacles.

Concluding Remarks

The GCC can certainly benefit from onboarding some of the environmental solutions from the Nordic countries and opening a path of knowledge transfer in terms of training and sharing of technological innovation. We have seen that there is a willingness from various GCC governments to adopt innovative solutions for their food security and energy diversification, whereby there have been

steps toward initiating dialogue with some Nordic entities such as the Norwegian Energy Partners. The speed at which technological advancements have been displayed begs the question of policy formulation and institutional preparedness to cope with real-time changes in such volatile and highly competitive markets. The GCC certainly needs to ride the wave of quicker and more efficient decision-making to account for the gap with market demands and climate change to sustain economic prosperity. This is a ripe time to start exploring the potential caveats of such cooperation and assess its impact on future diplomatic sustainability with the Nordic countries. As for answering the research questions, the areas of intersection between the two blocs are their inherently resource-rich economies, their respective wealth fund sizes, and their shared identity. The GCC can learn from the NC's successful models of decreasing food waste as well as investing in green energy to diversify the heavy dependence on oil and natural gas; both models are essential to the GCC and have a proven track record in the Nordic countries.

References

- Al-Abdullah, Y. M., Al-Ragom, F., Alsayegh, O., Al-Adwani, S. A., Khajah, M., & Sreekanth, K. J. (2023). *Kuwait energy outlook 2023: The security-transition nexus of Kuwait*. Kuwait Institute for Scientific Research.
- Alflaiti, A. (2021). *Demographics of the GCC – Understanding the changes in the local population* [Poster presentation]. 64th ISI World Statistics Congress, Ottawa, Canada. <https://www.isi-next.org/abstracts/submission/746/view/>
- Al-Sarihi, A. (2018). *Prospects for climate change integration into the GCC economic diversification strategies* (LSE Middle East Centre Paper Series No. 20). London School of Economics and Political Science.
- Aluwaisheg, A. (2020, April 16). The founding of the GCC. Arab News. https://www.arabnews.jp/en/45thanniversary/article_21122
- Amini, R. (2021). *Where is food wasted in Nordics?* Cognizant Blog. <https://www.cognizant.com/se/en/insights/blog/articles/where-is-food-wasted-in-nordics>

- Aslani, A., Antila, E., & Wong, K.-F. V. (2012). Comparative analysis of energy security in the Nordic countries: The role of renewable energy resources in diversification. *Journal of Renewable and Sustainable Energy*, 4(6). <https://doi.org/10.1063/1.4765695>
- Aslani, A., Naaranoja, M., & Wong, K.-F. V. (2013). Strategic analysis of diffusion of renewable energy in the Nordic countries. *Renewable and Sustainable Energy Reviews*, 22, 497–505.
- Ben Hassen, T., & El Bilali, H. (2019). Food security in the Gulf Cooperation Council countries: Challenges and prospects. *Journal of Food Security*, 7(5), 159–169. <https://doi.org/10.12691/jfs-7-5-2>
- Bergström, P., Malefors, C., Strid, I., Hanssen, O. J., & Eriksson, M. (2020). Sustainability assessment of food redistribution initiatives in Sweden. *Resources*, 9(3). <https://doi.org/10.3390/resources9030027>
- Berjan, S., Capone, R., Debs, P., & El Bilali, H. (2018). Food losses and waste: A global overview with a focus on Near East and North Africa region. *International Journal of Agricultural Management and Development*, 8(1), 1–16. https://www.researchgate.net/publication/324991985_Food_Losses_and_Waste_A_Global_Overview_with_a_Focus_on_Near_East_and_North_Africa_Region
- Bird, T. (2017). *Nordic action on climate change*. Nordic Council of Ministers.
- Buzby, J. C., Wells, H. F., Axtman, B., & Mickey, J. (2009). *Supermarket loss estimates for fresh fruit, vegetables, meat, poultry, and seafood and their use in the ERS loss-adjusted food availability data* (EIB-44). U.S. Department of Agriculture, Economic Research Service.
- Chattha, M. K., Youssef, H., Ftomova, O., Maseeh, A. N., Wang, X., Bogetić, Ž., Naeher, D., Borja-Vega, C., & Ghosheh, A. (2024). *Gulf economic update, December 2024: Navigating the water challenge in the GCC – Paths to sustainable solutions*. World Bank.
- Dang, H. L. (2023). Food shortages are a bigger threat than food inflation for import-dependent GCC countries – report. *Food Navigator Asia*. <https://www.foodnavigator-asia.com/Article/2023/08/22/Food-shortages-are-a-bigger-threat-than-food-inflation-for-import-dependent-GCC-countries>.
- Economist Impact. (2022). *Global food security index*. <https://impact.economist.com/sustainability/project/food-security-index/>
- El Bilali, H., & Ben Hassen, T. (2020). Food waste in the countries of the Gulf Cooperation Council: A systematic review. *Foods*, 9(4). <https://doi.org/10.3390/foods9040463>

- El-Kogali, S. E. T. (2024). From scarcity to sustainability: The GCC's journey towards water security. *Modern Diplomacy*.
- Etihad Airways. (2019). *Etihad Airways flies the world's first flight using fuel made in the UAE from plants grown in saltwater by Khalifa University*. <https://www.etihad.com/en/news/etihad-airways-flies-the-worlds-first-flight--using-fuel-made-in-the-uae-from-plants-grown-in-saltwater-by-khalifa-university>
- Fouche, G. (2024). Norway wealth fund posts record \$213 bln profit, driven by tech stocks. *Reuters*. <https://www.reuters.com/business/finance/norway-wealth-fund-posts-213-bln-profit-driven-by-tech-stocks-2024-01-30/>
- Gulf Cooperation Council. (n.d.). *Charter of the Gulf Cooperation Council*. GCC Secretariat General. <https://www.gcc-sg.org/en/AboutUs/Pages/PrimaryLaw.aspx>
- Gelb, A., & Grasmann, S. (2009). *Confronting the oil curse*. Development Economics, World Bank.
- General Secretariat. (2024, September 26). *HE GCCSG: 1st joint ministerial meeting between GCC and Northern European countries reflects shared desire to elevate relations and strategic cooperation*. General Secretariat – New York. <https://gcc-sg.org/en/MediaCenter/News/Pages/news2024-9-26-2.aspx>
- Gengler, J. (2020). Society and state in post-blockade Qatar: Lessons for the Arab Gulf region. *Journal of Arabian Studies*, 10(2), 238–255.
- Gustavsson, J., Cederberg, C., Sonesson, U., van Otterdijk, R., & Meybeck, A. (2011). *Global food losses and food waste: Extent, causes and prevention*. Food and Agriculture Organization of the United Nations. <https://www.fao.org/3/i2697e/i2697e.pdf>
- Hartikainen, H., Mogensen, L., Svanes, E., & Franke, U. (2017). Food waste quantification in primary production: The Nordic countries as a case study. *Waste Management*, 71, 502–511. <https://doi.org/10.1016/j.wasman.2017.10.026>
- Hedner, T., Al-Mubarak, H., Busler, M., & Abouzeedan, A. (2011, September). *Business and technology incubators and their role in the Nordic countries in comparison to the GCC countries: An analysis of current affairs* (ERSA Working Paper No. ersa10p1283). European Regional Science Association.
- Hvidt, M. (2013). *Economic diversification in GCC countries: Past record and future trends* (Kuwait Program on Development, Governance and Globalization in the Gulf States, LSE Paper Series No. 27). London School of Economics and Political Science. https://eprints.lse.ac.uk/55252/1/Hvidt%20final%20paper%2020.11.17_v0.2.pdf

- International Energy Agency (IEA). (n.d.). *About*. <https://www.iea.org/about>
- Khanna, A. A. (2017). Revisiting the oil curse: Does ownership matter? *World Development*, 99, 214-229. <https://doi.org/10.1016/j.worlddev.2017.05.026>
- Khorrami, N. (2019). Nordic cooperation: A model for a reformed Gulf Cooperation Council? *Middle East Centre Blog – London School of Economics and Political Science*. <https://blogs.lse.ac.uk/mec/2019/03/28/nordic-cooperation-a-model-for-a-reformed-gulf-cooperation-council/>
- Lasrado, J. (2022). GCC population will be lesser and older by the end of this century. *Marmore MENA Intelligence*. <https://www.marmoremena.com/en/insights/gcc-population-will-be-lesser-and-older-by-the-end-of-this-century/>
- Mahroogi, F. O., Narayan, S., Kaisan, M. U., Aliyu, A., Yahuza, I., Grujic, I., & Stojanovic, N. (2022). A critical review of biofuels as an alternative fuel to diesel in Gulf Cooperation Council (GCC) region: Current market trends and future opportunities. *Communications – Scientific Letters of the University of Zilina*, 24(1), B67–B73.
- Majumder, M. K., Raghavan, M., & Vespignani, J. (2020). Oil curse, economic growth and trade openness. *Energy Economics*, 91(C) <https://ideas.repec.org/a/eee/eneeco/v91y2020ics014098832030236x.html>
- Marmore MENA Intelligence. (2020). *Food shortages in 2020–2022: It is more a question of accessibility than affordability for the GCC countries*. Markaz. <https://www.markaz.com/getmedia/945c4120-90d3-4cf1-a468-70b461b09781/Food-Security-in-the-GCC-Eng-Report.pdf>
- Migrant-Rights.org. (2017). *Qatar crisis: Workers hit hard by rising food prices and job insecurity*. Business & Human Rights Resource Centre. <https://www.business-humanrights.org/en/latest-news/qatar-crisis-workers-hit-hard-by-rising-food-prices-and-job-insecurity/>.
- Mishrif, A. (2018). Challenges of economic diversification in the GCC countries. In A. Mishrif & Y. Al Balushi (Eds.), *Economic diversification in the Gulf Region, Volume II: The political economy of the Middle East*. Gulf Research Centre Cambridge.
- Mosly, A. (2023). *GCC–NB8 relations*. Gulf Research Centre. <https://www.grc.net/documents/64bf8a213ed4bGCCNB82.pdf>
- Mosly, A. (2024). *GCC–Sweden relations*. Gulf Research Centre. <https://www.grc.net/single-commentary/191>
- Nordic Council of Ministers. (2017). *Preventing food waste: Better use of resources* (Policy Brief).

- Nordic Energy Research. (2019). *Food waste to biofuels*. Pöyry Management Consulting.
- Nordic Energy Research. (2024). *On track to achieve decarbonisation goals? Tracking Nordic clean energy progress 2024*. Nordic Council of Ministers. <https://pub.norden.org/nordicenergyresearch2024-05/on-track-to-achieve-decarbonisation-goals.html>
- Norwegian Ministry of Climate and Environment. (2021). *Norway's climate action plan for 2021–2030* (Meld. St. 13 (2020–2021) Report to the Storting white paper.
- Omeira, M., Esim, S., & Alissa, S. (2008). *Labor governance and economic reform in the Middle East and North Africa: Lessons from the Nordic countries* [Working Paper No. 436]. Economic Research Forum.
- One Planet. (2021). *Preventing food waste throughout the value chain: Norway*. <https://www.oneplanetnetwork.org/news-and-events/news/preventing-food-waste-throughout-value-chain-norwa>
- Ross, M. L. (2013). *The oil curse: How petroleum wealth shapes the development of nations*. Princeton University Press.
- Samara, A., Andersen, P. T., & Aro, A. R. (2019). Health promotion and obesity in the Arab Gulf States: Challenges and good practices. *Journal of Obesity*, 2019, 1–6. <https://doi.org/10.1155/2019/4756260>
- Sapir, A. (2006). Globalization and the reform of European social models. *Journal of Common Market Studies*, 44(2), 369–390. <https://doi.org/10.1111/j.1468-5965.2006.00627.x>
- Schubert, S. R. (2006). Revisiting the oil curse: Are oil rich nations really doomed to autocracy and inequality? *Oil and Gas Business*. <https://mpa.ub.uni-muenchen.de/10109/>
- Shehabi, M. (2023). The hurdles of energy transitions in Arab states. In *Disruptions and dynamism in the Arab world*. Carnegie Endowment for International Peace.
- Skytte, K., & Morthorst, E. (2018). A Nordic green flexible energy system: Barriers and opportunities. *Nordic Economic Policy Review*.
- Statista. (2023). *Statistics portal*. <https://www.statista.com>
- Swedish Environmental Protection Agency. (2021). *Good examples from Sweden on reducing food waste*. Swedish Environmental Emission Data.
- The Economist Intelligence Unit. (2010). *The GCC in 2020: Resources for the future*. http://graphics.eiu.com/upload/eb/GCC_in_2020_Resources_WEB.pdf

- The Local. (2021). *How Nordic nations are tackling food waste – and how you can too*. <https://www.thelocal.se/20210104/how-nordic-nations-are-tackling-food-waste-and-how-you-can-too-hellofresh-tlccu>
- Uba, K. (2010). Who formulates renewable-energy policy? A Swedish example. *Energy Policy*, 38(11), 6674–6683.
- U.S. Energy Information Administration. (2012). *International energy data and statistics: Finland*. <https://www.eia.gov/international/overview/world?fips=FI&trk=m>
- Welfle, A., & Alawadhi, A. (2021). Bioenergy opportunities, barriers and challenges in the Arabian Peninsula – Resource modelling, surveys, and interviews. *Bio-mass and Bioenergy*.
- Wright, S. (2019). The political economy of the Gulf divide. In A. Krieg (Ed.), *Divided Gulf: The anatomy of a crisis* (pp. 145–169). Palgrave Macmillan.

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