

The UAE and the Green Façade: Renewable Energy Challenges in a Hyper-Consuming Society

Djames Gornicki

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Christopher D. Jones

Hussein Elkhafaifi

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University of Washington

Abstract

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Djames Gornicki

Chair of the Supervisory Committee:

Associate Professor Dr. Christopher D. Jones

Jackson School of International Relations

The United Arab Emirates (UAE) as a recently formed state has undergone a transition, the speed of which has brought the country to the forefront of promoting a global sustainability discourse. Through the introduction of numerous sustainable development initiatives, a self-contained renewable energy city at Masdar, and a large 5.6GWe nuclear energy program the UAE is pursuing diversification through a number of substantive technologies. Yet despite these programs designed to reduce domestic consumption of oil, the UAE has become addicted to Western cosmopolitan lifestyles that engender support for the ruling regime by tying in consumer subsidies for regime legitimacy. As the UAE is a rentier state, despite its display of exceptionalism in the physical transformation of the land, the rulers bargain with the population will continue to permit consumption at the cost of ushering in an era of sustainable development.

Introduction

The UAE is striving to develop and boost its rich resources and expertise in the international energy markets and enhance its leading role as a world center for renewable energy and development.¹

-His Highness Sheikh Khalifa Bin Zayed Al Nahyan

The United Arab Emirates (UAE) pace of development, as a country often defined in terms of its grandeur and cosmopolitan urban expanses continues to defy the expectations of experts. Consolidating into a singular Federation from several separate Trucial States in 1971, the country's progress into becoming a commercial-economic power has been unprecedented. Propelled by oil revenues that constitute nearly 97% of total GDP, the UAE can be defined wholly within a rentier class of governments. Government revenue from the international petroleum sales helped transformed the landscape of the UAE from desert oases of sparsely populate dispersed communities, to a country defined by the egalitarian city of Dubai and the economic powerhouse of Abu Dhabi.

Yet, for all the economic benefits of the Emirates becoming a regional success story the rate of development largely stripped Emirati culture from some of its core cultural components. Due to a large influx of migrant workers from South East Asian countries, used in the numerous construction projects in the country, and white collared Western professionals, Emirati nationals have become a partially invisible minority within their own country. Comprising only 20 percent

¹ Government of the UAE. *State of Energy Report 2015*. UAE (2015): 3.

of the population, the Emirates has been exposed to a wide variety of Western economic principles, including consumerism. A high degree of cultural blending thus rapidly shifted traditional preferences for tribal lifestyles to more sedentary life within urban cities.

As a result of the massive urbanization project underway in the major population centers of Dubai and Abu Dhabi the country now stands as one of the heaviest users of fossil fuels and highest carbon emitters per capita. The country additionally scores poorly in the global rankings in per capita food consumption and several health indicators. With almost 90 percent of food stuffs imported overseas, food security now represents a serious threat to the stability of the Emirates.² These problems are wholly a result of the country's attempt to modernize and to correct their perceived deficiencies as compared to their Western counterparts.

Yet, despite the negative aspects of the country's rapid development, it has exceeded most expert's expectations for decades. Thomas Friedman, writing on the Dubai model of development, noted that when asked, what their countries should strive for, Arabs across the region responded, "Even if we can't have democracy, why can't we at least have Dubai?"³ Understanding then how the UAE has developed under the auspices of an authoritarian, rent-driven governmental structure, with high levels of consumption, and world-class energy developments, into a country defining regional soft power and prestige requires a further analysis..

This paper therefore seeks to assess the UAE's pace of development through a lens focusing on the country's level of exceptionalism. The paper will ask the question how has the country managed to reach such economic prowess from the sale of oil in a manner of 40 years, yet exist

² Andy Sambidge. "GCC Food Imports Demand Forecast to Hit \$53bn by 2020." *Arabian Business*, (25 Oct. 2014).

³ Thomas L. Friedman. "Did Dubai Do It?" *The New York Times* (18 Nov. 2014).

with some of the highest levels of consumption in the world, typical of more developed Western countries? In this regard how the country developed and formed a united country with a Federal Structure headed by Abu Dhabi, from what were formerly independent sheikhdoms, represent a key component of the UAE's unprecedented development. Additionally, understanding the transformative impact of working in conjunction with Western firms, to not only accelerate the rate of development but also the physical size of the projects remains critical to the UAE story.

While it is certainly true that the open immigration policies permitted a cultural blending to occur with the West, and thus lead to unsustainable consumer practices, it has additionally provided the UAE an outlet to attempt to transcend the worst of its consumer habits and become sustainable. A considerable renewable energy program has emerged parallel to a governmental discourse that is promoting a sustainable living model. Although the program has suffered shortfalls, its scale alone, speaks to the ability of the UAE to rapidly modernize infrastructure.

Nuclear energy, the size of the UAE's future program and the unprecedented amount of international oversight, is offering innovation solutions to the UAE's consumption habits. By combining a large power producing reactor program capable of desalinating water, with numerous technical partnerships with leading international nuclear firms, the UAE's program has been fielded at a remarkable pace. The UAE thus continues to defy expectations, and quiet even its most vocal critics, through a targeted developmental scheme focusing on both the scale and pace of modernization projects.

Methodology

To begin, I will start with a review of the literature on the neo-patrimonial, rentier, governments, and their use of natural wealth to establish a political bargain with the population

that exchanges political acquiescence for large subsidy programs. Following the literature on rentier state theory, key writing highlighting the historical aspects of state consolidation and interactions with the West, will be examined for their role in the development process. From there an in-depth look at the negative aspects of the modern state are to be examined against the soft power initiatives, that include international tourism festivals, sustainable development practices, and a large commercial power nuclear program, all of which the UAE utilizes to help diversify its economy. Lastly an analysis of the country's developmental history will reveal that the UAE is an exceptional case of development through a neo-patrimonial structure, and therefore cannot be relegated to singular predictions regarding the country's future.

Literature Review

In order to understand how a state can be considered a renter, it is important to first define how rent although derived from nature, is always a product of some form of human development. John Locke has famously elaborated on the nature of rent stating that it was, "The labor of (his) body, and the work of his hands, we may say, are properly his. Whatsoever then he removes out of the state that nature hath provided, and left it in, he hath mixed his labor with, and joined to it something that is his own, and thereby makes it his property."⁴ If Locke's contention that rent is the product of a comingling of nature and human output then it is possible to define a renter as someone who manipulates natural endowments for external sale.

Confirming Lockes sentiments, Adam Smith in a celebrated passage argued that rent was, "the price paid for the use of land" and further suggested that it "is frequently no more than a

⁴ John Locke. *Two Treaties of Government*. (Peter Laslett ed., Cambridge Univ. Press 1988) (1690): 127-129.

reasonable profit or interest for the stock laid out by the landlord upon its improvement”⁵ These two definitions suggest rent constitutes a reward for using the land for commercial gains. Douglas A. Yates, who was the first to define the term rent in modern usage, confirms Locke’s and Smith’s definition of rent in that it was the surplus leftover after all the costs of producing it had been paid, and therefore was a derivative of the owner’s use of the natural resources.⁶

Classical rentier state theory attempts to characterize the tendencies of states whose primary income is off the external sale of a natural commodity. This external sale generates large royalties, rent, which is then utilized by the ruling elite who redistribute some of the monetary gains in order to create a bargain with the population for their general exclusion from politics. RST theorists such as Hezam Beblawi defined a rentier economy as having 4 qualifying characteristics. Beblawi noted that these states relied heavily on external rent, engaged only a small proportion of the population in the generation of wealth, but had a majority actively involved in the utilization of it, and existed with governments who were the principal recipients.⁷ Admittedly, he conceded that while no country operates with a pure rentier economy, most economies had elements of rent.⁸ Rentier states can thus be described as using natural endowments to generate large profits from which they then use through redistribution for political purposes.

Michael Ross in an influential article linked the distribution of income earned from rent to political pacification. He demonstrated a rentier effect whereby, “low or no taxation bought off

⁵ Accessed 4 Dec 2013 <http://geolib.com/smith.adam/won1-11.html>

⁶ Douglas A. Yates, “The Rentier State in Africa: Oil Rent Dependency & Neocolonialism in the Republic of Gabon.” *Africa World Press* (1996):15-16.

⁷ Hazem, and Giacomo Luciani. *The Rentier State*. London: Croom Helm, (1987): 88

⁸ *Ibid.*,88

the population and gained the public's political acquiescence or toleration".⁹ He further argued through this form of governance the state would be able to keep repressive state apparatus and institutions while preventing liberalization of the state.¹⁰ Given the nature of state-society interaction, the state becomes autonomous and largely unaccountable to the average citizen. Beblawi in his work suggests if the rentier state maintains an adequate level of rent redistribution within its population, then the remaining majority of rent received by the state is discretionary profit, or surplus.¹¹

Political scientists have long attempted to connect the distribution of wealth in rentier states to the presence of an authoritarian government. Terry Lynn Karl who formulated her analyses within a similar RST economic model as Beblawi and Michael Ross, related the level of taxation to lower levels of political accountability. Karl argues that the low level of taxations given the massive windfall profits of rentier states who ask no more than loyalty from its population in return creates a society less politically demanding for accountability and representation from government.¹² Rent therefore in RST perspective produces a rentier effect which facilitates state control over its population through strategic wealth distribution. However, the assumption rentier economic models create long term political stability, as Gwenn Okruhlik remarked, "no representation without taxation" ignores the systemic problems large redistribution programs with little to no accountability creates.¹³

⁹ Michael Ross, "Does Oil Hinder Democracy?" *World Politics* 53, no. 3 (2001):332.

¹⁰ *Ibid.*,332

¹¹ Mathew Gray. "A Theory of Late "Rentierism" in the Arab States of the Gulf" *Center For International and Regional Studies* (2011): 4.

¹² Karl (2007):668.

¹³ Gwenn Okruhlik. "Rentier Wealth, Unruly Law, and the Rise of Opposition: The Political Economy of Oil States" *Comparative Politics* , Vol. 31, No. 3 (Apr., 1999): 296.

Scholars of the rentier states economies' have long provided a series of economic, social, and institutional problems related to the strategic use of rent. Critics of the RST model such as Okruhlik note the fundamental problems of RST, mainly, "The rentier frame work has proven inadequate in elucidating the rise of dissent because it reifies the state and overemphasizes state resources and autonomy from the social consequences of expenditures."¹⁴ The tendency of the state to hedge rent against the political enfranchisement of its populations leads to massive spending programs which constrain the states long term ability to use its surpluses to maintain stability. Andy Spiess, a leading critic of the rentier state model, argued the negative consent that populations living under a rentier system espoused were in fact long term destabilizers.¹⁵ Speiss viewed the distribution of wealth in terms of domestic consumption programs, mainly highly subsidized goods and monetary payments, as misguided policies aimed at short term stability.¹⁶

The long term impacts of wealth distribution are important in the way they change the physical composition as well as the collective mentality of rentier societies. Massive wealth distribution, has led to a significant increase in the standards of living of many rentier states, particularly those in the Arab Gulf. In effect rentier states create societies who are heavily dependent on the state for employment opportunities, cheap commodities, and high salaries.¹⁷ The massive development of human capital challenges the basic bargain between the state and its population. Rentier states face the dilemma of attempting to meet the demands of their populations, while keeping their discontent linked to purely economic concerns.

¹⁴ Ibid., 297.

¹⁵ Andy Spiess. "Demographic Transitions and Imbalances in the GCC: Security Risks, Constraints and Policy Challenges" Policy Paper presented at the *2010 Exeter Gulf Studies Conference: The 21st-Century Gulf: The Challenge of Identity*, 30 June – 3 July 2010.P:9 Accessed 2 Dec 2013 http://ndrd.org/Demographic_Transitions_and_Imbalances_in_the_GCC.pdf

¹⁶ Ibid., 9

¹⁷ *New York Times* 13 Oct. 2013

Rentierism as a form of governance is thus a major catalyst for the emergence of a weak state. Charlotte Levins sees the weak state as promoting a culture that views those with government jobs as being for the best and brightest.¹⁸ This perspective is not only damaging to private sector growth, and thus a more rounded economy, but also creates social frustrations as the state is unable to meet growing expectations of its citizens.¹⁹

Through the extraction of rent, defined by Douglas A Yates, as the profit generated from the natural wealth of the land once the costs of production have been paid, the various governments of the Gulf have pursued a two part strategy of political cooption and rapid modernization.²⁰ According to Adeel Malik and Bassem Awadallah, these windfall profits from oil and natural gas deals create an adverse political economy and a social pact trading welfare distribution for regime security.²¹ These definitions of rent form a critical component of the ruling elites exchange with the population for political legitimacy, as it bolsters often artificial lineage claims that place ruling regimes in an elevated status.

The social pact while differing in scale of payments, based on the relative size of oil deposits in the various Gulf States, remains constant throughout all of the GCC member countries. Wealth generation, derived from the exploitation of natural resources, has created a massive budget surplus which allows the governments to levy minimal taxes on their population, or none at all.²² In exchange for the legitimization of non-democratically elected leaders through rent redistribution

¹⁸ Charlotte M. Levins, "The Rentier State and the Survival of Arab Absolute Monarchies, *Rutgers Journal of Law & Religion* (2013):396.

¹⁹ Samuel P. Huntington, *Political Order in Changing Societies*. New Haven and London, Yale University Press 1968:48.

²⁰ Douglas A. Yates. *The Rentier State In Africa: Oil Rent Dependency & Neocolonialism In The Republic Of Gabon* (1996): 15-16.

²¹ Adeel Malik and Bassem Awadallah. "The economics of the Arab Spring" *Centre for the Study of African Economies Working Paper WPS/2011 /23 Oxford and Jeddah* (Dec 2011): 5.

²² Terry Lynn Karl. "Oil-Led Development: Social, Political, and Economic Consequences" *Stanford University Stanford* (2007): 668.

the population remains generally disinterested in politics so long as the governments can continue to maintain increasingly costly packages of social welfare programs.²³ While these governments are wholly authoritarian, and largely unaccountable to their population, the subsidy packages being utilized to sustain their rule requires further examination.²⁴

Wealth redistribution via the subsidization of electricity, water, gasoline, and housing, forms a substantial portion of the unspoken social contract between the ruling elite and citizenry in the various Gulf States. Through the use of various pricing controls consumer goods are kept artificially low. For example, the price for a gallon of gasoline in Saudi Arabia remains pegged at US \$0.50 a gallon.²⁵ In Kuwait a single kWh of power cost only \$0.7 cents, while in Qatar natural gas is free for its citizenry.²⁶ Additionally, the subsidization of low cost, lavish housing, for the population, and guaranteed employment in an expanding civil bureaucracy forms the secondary component of wealth redistributions.²⁷ Along with low energy prices and housing subsidies the governments have spent hundreds of billions of dollars in attracting its citizens to develop essential industry and services in sprawling cities that only 40 years ago were empty tracks of desert.

As noted by Richard Youngs, et.al, educated, primarily urban constituencies set higher demands from their governments for the delivery of goods and services.²⁸ The resulting

²³ Ibid., 668.

²⁴ Marina Ottaway and Michele Dunne. "Regimes and the "Kings dilemma" in the Arab World: Promise and Threat of Managed Reform", *Carnegie Papers*, #88 (2007):20.

²⁵ Michael Peel. "Saudi Arabia: Spending Power." *Financial Times*. (29 May 2013) .

²⁶ Leo Benedictus. "Qatar: 12 Things You Need to Know." *The Guardian*[London] (25 June 2013), and Martin Dokoupil, "Gulf Economies Edge towards Reform as Oil Price Slides." *Reuters* (2 Nov. 2014).

²⁷ M. Al-Rasheed. "Sectarianism as Counter-Revolution: Saudi Responses to the Arab Spring". *Studies in Ethnicity and Nationalism*, 11 (2011): 7.

²⁸ Richard Youngs, Jos Boonstra, And Edward Burke. "The Politics of Energy: Comparing Azerbaijan, Nigeria and Saudi Arabia". *Madrid: Fundación para las Relaciones Internacionales y el Diálogo Exterior FRIDE* (2008): 11.

generational effects are placing additionally pressure on the government to both reduce the consumption of oil that threatens to disrupt the amount of exports, and mitigate increasingly adverse socio-health consequences of an urbanized population. Saudi Arabia provides an example of both instances.

With a population of approximately 25 million it consumes nearly 6000 kWhs per year, per person and maintains an annual food consumption rate at 876kg.²⁹ Neighboring Kuwait with a much smaller population, at around one million, consumes double the energy per capita at 16,000 kWh and has a food consumption rate at roughly 634kg per capita.³⁰ Ballooning consumption patterns thus represent a pervasive feature in all Gulf States because of subsidization policies that encourage increased consumption and waste.

These figures present just a small sample of the plethora of the rampant overconsumption in Gulf countries. Yet, these consumer habits remain an intrinsic part of the socio-political bargain, and thus any attempt to renegotiate the terms of this arrangement could be politically destabilizing.³¹ This point represents a possible vulnerability in the rentier system as unlimited domestic consumption will potentially outstrip the supply that the various governments use to maintain their patronage networks.

While, these numbers are staggering, they are not a surprising result within the literature. Stephen Quilley, in an article on consumption habits of cosmopolitan systems, suggested there has never been an observable case in which a modernized urban city has maintained low energy

²⁹ James Conca. "Saudi Arabia Fast-Tracks Nuclear Power" *Forbes* (8 Sept 2014) and Andy Sambidge. "GCC Food Imports Demand Forecast to Hit \$53bn by 2020." *Arabian Business*, (25 Oct. 2014).

³⁰ Bassam Fattouh and Lavan Mahadeva "Price Reform in Kuwait's Electricity and Water Sector: Assessing the Net Benefits in the Presence of Congestion" *Oxford Institute for Energy Studies MEP 9* (April 2014): 7 and Sambidge(2014).

³¹ Stephen Quilley. "Entropy, the anthroposphere and the ecology of civilization: An essay on the problem of "liberalism in one village" in the long view". *The Sociological Review*, 59(2011):76

intensity.³² Despite the noticeable absence of a sustainable urban city, critiques have been quick to point out that this does preclude the future emergence of one.³³ In this regard the UAE's development may be unique as the government has attempted to redefine its rentier structure through the use of a sustainable discourse. It is therefore important to understand how the country's development may allow it to transcend the issue of overconsumption.

A Brief Intro to the UAE's Rentier System and Current Sustainability Crisis

The UAE, history of development has seen the country engaging in a dual tract policy of hyper-modernization and state formation endeavors. Similar to the other GCC states, the UAE's primary mechanism to drive development relies upon the wealth accumulated from the sale of oil on the international market. The country since its consolidation into a single federation, following its independence from the United Kingdom in 1971, continues to seek and expand its rent deriving industries to support state building efforts.

According to Michael Herb, a prominent author on Gulf country economies, the development is based on a neo-patrimonial structure.³⁴ As a result, decisions on the development of the land made from the top leadership are fast tracked through the use of foreign labor, and given an ample investment climate, done in conjunction with foreign partners.³⁵ Through such international partnerships the country's pace of modernization increased relative to its emerging

³² *ibid.*, 76.

³³ Andrew Dobson. "Political Theory in a Closed World: Reflections on William Ophuls, Liberalism and Abundance" *Environmental Values*, Vol. 22, No. 2, special issue: Degrowth (April 2013): 258.

³⁴ Michael Herb, *All in the Family. Absolutism, Revolution, and Democracy in the Middle Eastern Monarchies* (Albany, N.Y.: State University of New York Press, 1999), 15.

³⁵ Martin Hvidt. "The Dubai Model: An Outline of Key Development-Process Elements in Dubai" *International Journal of Middle East Studies*, Vol. 41, No. 3 (Aug., 2009):401.

wealth from the sale of oil which is valued at US \$379 billion annually.³⁶ However, the UAE exists with many of the same issues of hyper consumption that are challenging the rentier model in other countries in the region.

This is particularly true in regards to its high per capita energy consumption and pollutant emissions, of which the country is continually ranked among the top 5 in the world.³⁷ Additionally in order to balance its budget to provide for its large subsidy programs the country now maintains a break even oil price of around US \$90.³⁸ Complicating matters the recent advent of shale oil in the US and weak demand in East Asia have sent international benchmark prices for oil plummeting to around the US \$60. The UAE's subsequent budget deficit is challenging the government's ability to maintain subsidy packages that are a vital component of the political bargain it maintains with the population. As a result the UAE has begun a large scale economic diversification campaign with an emphasis on renewables.

The UAE is thus a unique with regards to its addressing of domestic consumption patterns in a rapidly developing society through the introduction of Green Technology initiatives. The announcement of a compulsory building and landscaping efficiency guideline in 2010 entitled Estidama, along with the construction of the sustainable Masdar City project, Shams 1 Solar Park and a 5.6 GWe Nuclear Program are transforming the energy landscape in the country. However, with such a shift in economic focus from a country in a rentier category, is therefore important to understand how the state formation projects, an authoritarian governmental

³⁶ Organization of Petroleum Exporting Countries. *UAE Facts and Figures Annual Statistics Bulletin* (2014).

³⁷ Simon, Rogers and Lisa Evans. "World Carbon Dioxide Emissions Data by Country: China Speeds Ahead of the Rest." *The Guardian* (31 Jan. 2011).

³⁸ Dr Abhishek Deshpande and Nic Brown. "Fiscal Break-Even Oil Prices For Major Opec Members" *Oil and Gas Journal* (3 April 2014).

structure, and prestige building efforts through international partnerships, have allowed the UAE to make large diversification efforts possible.

State Formation and the Source of Emirate Political Power

Oil as the lubricant of civilization, is second only to food as the most important commodity in the world, the indispensable means of victory in war the principal source of prosperity in peace. In the past century, no nation has been able to become a major power without assured sources of petroleum.³⁹

- Richard O'Connor

Although the federation of the UAE consists of Abu Dhabi, Ajman, Al Fujayrah, Dubai, Ras al Khaymah, Sharjah, and Umm al Qaywayn, only two, Abu Dhabi and Dubai, drive the policy agenda within the country. Following the withdrawal of the British in 1968, the seven Trucial states were brought together into a federal structure. After three years of deliberation, in 1971 a constitution emerged granting Abu Dhabi and Dubai veto powers in the Federal National Council.⁴⁰

Owing their power to a combination of the physical share of oil and natural gas reserves within the country, estimated to be around 97.8 billion barrels and 215 trillion cubic feet (Tcf) respectively the two emirates combined represent the dominating force in political affairs.⁴¹ From the outset however, Article 23 of the constitution, has guaranteed that the natural wealth

³⁹ Richard O'Connor. *The Oil Barons, Men of Greed and Grandeur*. Boston, Little, Brown. 13 January 1971.

⁴⁰ 667

⁴¹ U.S. Energy Information Administration. *UAE Country Brief*. December 5, 2013

within discovered within each Emirate was public property of the respective territory.⁴² While in theory this gave each Emirate a level of sovereignty, it immediately cemented Dubai and Abu Dhabi's position as the principal economies in the federation.

As such the two Emirates have traditionally held both the President and Vice President positions exclusively. Currently the monarch of Abu Dhabi, Khalifa bin Zayed Al Nahyan, currently rules as the President of the UAE and Dubai's patriarch Mohammed bin Rashid Al Maktoum as the current Vice President. With the vast majority of power Abu Dhabi, and to a lesser extent Dubai, led the development of the Emirates. While, early development focused on the implementation of basic infrastructure and services within Abu Dhabi and Dubai, subsequent projects emphasized the need for projects in the poorer emirates. Despite initial predictions from Western observers that the unequal nature of the Emirates would lead to the states collapse

In addition to possessing the vast majority of the natural wealth the two Emirates historically have maintained the largest populations. According to figures from the first population focused country study conducted in 1968 Dubai and Abu Dhabi existed with populations at approximately 59k and 46k respectively.⁴³ By 1985, due in part to increasing immigration of foreign laborers to support modernization efforts, their populations increased to 370,788 and 566,036, and in 2010 the population of the Abu Dhabi Emirate alone was over 2.3 million.⁴⁴

⁴² Asad Rizvi "From Tents to High Rise: Economic Development of the United Arab Emirates" *Middle Eastern Studies*, Vol. 29, No. 4 (Oct., 1993):665.

⁴³ Frauke Heard-Bey "The United Arab Emirates: Statehood and Nation-Building in a Traditional Society" *Middle East Journal*, Vol. 59, No. 3, (Summer 2005): 360.

⁴⁴ Himendra Moham Kuman. "Abu Dhabi's population at 2.33m, with 475,00 Emiratis" *Gulf News* 8 (October 2013).

This number is expected to grow by a third by 2030, and has brought with it a number of additional expectations from the citizenry.⁴⁵

Imagined Communities and the Political Role of Wealth Redistribution

The United Arab Emirates often conjures up images of sprawling high-rises, seven star hotels, luxury shopping outlets, and numerous other first world luxuries.⁴⁶ Fueled by government backed rhetoric, the country touts the speed at which these Westernized projects have been completed. Thomas Friedman noted that self-promotion is a way for the ruling regime in Emirates to underline its generosity and ingenuity in a discourse for the masses.⁴⁷ The question here then is why does the leadership in Abu Dhabi and Dubai feel compelled to write such a narrative? The answer lies in how the UAE's consolidation process in the 1970's superimposed the concept of a state onto a traditional society with no prior experience with the concept of a nation. Coupled with the importation of foreign workers to provide the labor force for the country's development project, nationals have experienced an identity crisis that led to gross consumer habits in the modern era.

⁴⁵ UAE National Media Council. "Abu Dhabi's Population Set To Grow To 3.1 Million By 2030" *UAE Interact* (21 Sep 2007).

⁴⁶ Thomas Friedman, "Dubai and Dunces," *New York Times*, (March 15, 2006).

⁴⁷ Friedman (2006).

Ernest Gellner, famously stated that nationalism was not a concept of individuals self-envisioning the concept of a state but rather, “It invents nations where they do not exist.”⁴⁸

Gellner's comments assume nationalism plays an essential role in the state formation. This point is crucial to understanding the UAE because the country transformed throughout the years of 1968-1971 from independently ruled Sheikdoms to a consolidated federal state. Urbanization of the Bedu tribes, who constituted the majority of the Emirati population in the pre-oil era, meant the population overnight was introduced to the concept of developed cities with modern amenities. For these formerly nomadic people, identity, which had previously been formed around communal ties, was expanded to the concept of being Emirati as a member of a shared nation.

It is then appropriate here to use what Benedict Anderson called imagined communities when describing the UAE. For Anderson, communities larger than a village fall into a category whereby they form a shared unified image of the self as part of a group, without ever meeting one another.⁴⁹ In this sense individuals become attached to national symbols, rhetoric that portrays the solidarity of the nation despite potential differences. Crucial to Anderson's theory was the necessity for a common print language as a means of solidifying state formation.⁵⁰ As the official national language of the UAE is Arabic, with all Emiratis having a proficiency in the language Anderson's point is therefore validated.

Others such as Ahmed Kanna have added to Anderson's and Gellner's comments, acknowledging the UAE has developed strong ethno-cultural nationalism, similar to what Europe

⁴⁸ Ernest Gellner. *Thought and Change* University of Chicago Press (1978): 169.

⁴⁹ Anderson Benedict. *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, London: Verso (1983): 48.

⁵⁰ *ibid.*,49.

exists with today.⁵¹ In his formulation he suggested that the citizens of the UAE share a common culture and maintain a public consciousness that amplifies their status as Emiratis, yet distinguishes them from the surrounding countries⁵² Sharing a national language and common historical narrative compliments the image of a singular state. However, the public's consciousness of a shared political and ethnic culture is due in part to a strategy from the ruling regime to prevent a fracturing of the state.

As is often the case in authoritarian governments national mythmaking plays a significant role in both creating a national consciousness and portraying the leaders in a positive light. In this way a ruling regimes leadership are often shown as benevolent populists.⁵³ For the UAE, national mythmaking was immediately linked to cultural remnants from previous generations. This is significant for the Emirati population considering the pace of development marginalized traditional cultural aspects and posed a threat to the regimes efforts to build popular support around development schemes.

For example as I have stated previously, the Emirates during the British mandate and for many decades prior were dependent on the camel as a means for transportation. With the advent of oil wealth the camel was replaced with range rovers, and Bedu living arrangements with urban development projects.⁵⁴ Additionally, lacking the technical expertise or qualified labor force, a

⁵¹ Ahmed Kanna. *Dubai, The City as A Corporation* University of Minnesota Press (2011):175.

⁵² *ibid.*, 176.

⁵³ Ahmed Kanna and Arang Keshavarzian "The UAE's Space Race: Sheikhs and Starchitects Envision the Future" *Middle East Report*, No. 248, *Waiting: The Politics of Time in Palestine* (Fall, 2008): 36.

⁵⁴ Khalaf Sulayman "Poetics and Politics of Newly Invented Traditions in the Gulf: Camel Racing in the United Arab Emirates" *Ethnology*, Vol. 39, No. 3 (Summer, 2000): 243.

massive influx of foreign workers was utilized that immediately placed the Emirati nationals as a minority within their own country.⁵⁵

Recognizing the need for Western partnerships to develop the country and a political project to elevate the status of Emiratis the leadership began building a cultural revival program along artificial narratives. This is demonstrated best in the camel races that take place in the race tracks outside of Abu Dhabi and Dubai. While camel racing had typically reserved for the elite in pre-oil Emirati society, or during special events thrown for foreign dignitaries, it was made an event that every Emirati could have access too. This is even reflected in the architecture of the stadiums which retain aspects of a Beduin culture long passed. None too surprising during these public spectacles the state run media of the country reminds the citizenry that everything occurring is a direct product of the leaders vision and adherence to preserving Emirati culture.⁵⁶

The previous points I have elaborated on artificial nationalism and mythmaking are important for the UAE, particularly in terms how the regime now maintains a balance between rapid development and traditional aspects of the culture. As the regime leadership always seeks to attract the best architects and designers to create often what are describes as “monumental cities” there exists a consistent need to elevate the populations’ relative status.⁵⁷ Despite the country being wholly authoritarian, the political support of the population, or at least its acquiescence, remains crucial for the development of the country. Therefore ensuring that the national population, who at present represents just 20 percent of the entire population of the UAE, retains

⁵⁵ Ambassador of the UAE to the USA Saeed Ahmed Ghobash “Interdependence and the World Energy Picture” *Natural Resources Lawyer*, Vol. 9, No. 1 (1976): 12.

⁵⁶ Sulayman (2000): 248.

⁵⁷ Kanna (2011): 164.

a sense of entitlement and privilege is essential to keeping the balance of rapid development and cultural awareness.

One of the primary ways the government has struck this balance is through the use of subsidies as part of its redistributive patronage networks it has established since the discovery of oil. Government subsidies have largely targeted the domestic energy and consumer goods markets, rendering electricity artificially low for citizens, with residents of Abu Dhabi paying approximately US 1.4 cents per kWh.⁵⁸ Price fixing for a number of staple food commodities including rice, flour, and cooking oil, along with a compulsory enforcement mandate for nearly 500 stores eliminates arbitrary price increases.⁵⁹

Social subsidies, which constitute an essential part of the ruling regimes bargain with the population, consumed nearly 7 percent of all federal fiscal spending equating roughly to US \$6.56 billion.⁶⁰ Whether through the price fixing of food products, or the granting of land parcels to families for housing development projects, the intent is to co-opt the population to an extent that political acquiescence for most citizens is tolerable.

While I have talked previously about subsidies it is important then to understand how the UAE's approach to state formation comes with a significant financial cost. With the vast majority of government revenue garnered from the sale of petroleum the state is wholly dependent on the sale of oil to finance its patronage networks. As such, the amount of annual revenue available for redistributive programs is based, on the average market price of a barrel of

⁵⁸ Jim Krane. "An Expensive Diversion: Abu Dhabi's Renewable Energy Investments Amid A Context Of Challenging Demand." *Baker Institute for Public Policy* (2014): 14.

⁵⁹ Faisal Masudi. "UAE Fixes Prices of 500 Staple Grocery Items for 2015." *Gulf News* [Dubai] (30 Nov. 2014).

⁶⁰ Reuters News Service, "UAE govt approaches higher federal spending for 2015" *Reuters* (13 Oct 2014).

oil. Since mid-June of 2014, when the average basket price of oil was around US \$115, the market has rapidly diminished in overall price.⁶¹ Largely due to the global oversupply of oil due resulting from both the advent of US shale oil, and weak East Asian demand, the average monthly price for a barrel of oil in April 2015 was US \$60.⁶²

Although most GCC countries have used their massive Sovereign Wealth Funds to supplant traditional revenue streams, oil continues to remain lower than the amount needed to sustain current rentier patronage systems. The UAE, with an estimated break even oil price around US \$90 dollars, lost nearly US\$1.7 billion in 2014 alone.⁶³ In an attempt to assuage market fears, the ruler of Dubai Sheikh Hamdan Bin Mohammed Bin Rashid Al Maktoum, insisted that the economic diversity will be a key component in the country's resiliency to ride out low prices.⁶⁴

The Sheikhs comments however are complicated by British Petroleum CEO Bob Dudley's recent prediction that the volatility in the petroleum markets may last upwards of three years.⁶⁵ Citing low oil prices, the International Monetary Fund, reduced its GDP growth estimates for the country from 4.5 to 3.5 percent in 2015.⁶⁶ Additionally, an internal report from within the UAE government reduced its non-hydrocarbon growth projections for 2015.⁶⁷ The reports follow an announcement from the Ministry of Energy that the state run Abu Dhabi National Oil Company

⁶¹ E.L. "Why the oil price is falling" *The Economist* (8 December 2014).

⁶² OPEC. "OPEC daily basket price stood at \$60.92 a barrel Wednesday, 29 April 2015" *Organization of Petroleum Exporting Countries* (29 April 2015).

⁶³ Elliot Bentley, Pat Minczeski, Jovi Juan. "Which Oil Producers are Breaking Even" *Wall Street Journal* (27 November 2014) and Pipeline Staff. "UAE admits low oil price resulted in \$1.7bn loss" (4 February 2015).

⁶⁴ Neil Halligan. "Oil price won't affect UAE's development, says Abu Dhabi Crown Prince" *Arabian Business Online* (9 February 2015) http://www.arabianbusiness.com/oil-price-won-t-affect-uae-s-development-says-abu-dhabi-crown-prince-581608.html#.VUK7J_IVikr

⁶⁵ BBC Staff. "BP boss Bob Dudley: Oil prices 'low for up to 3 years'" *BBC* (21 January 2015).

⁶⁶ Mary Sophia. "IMF Cuts UAE's 2015 Growth Forecast" *Gulf Business* (22 January 2015).

⁶⁷ *ibid.*,

(ADNOC) would invest US 70 billion in new oil and gas fields as part of a strategy to increase production capacity to 3.5 million bl/d by 2017.⁶⁸

As the subsidy programs represent a fundamental part of the exchange between the government and the population for their political acquiescence, the UAE therefore must draw from its currency reserves until oil rebounds above its break even oil price. Considering then that the ability of the UAE to meet finance its patronage system through conventional oil sales is at present strained, the role of international partnerships as an additional leg of stability becomes essential for the country to foster.

Foreign Partnerships Role in Development

Another significant component of the redistributive features is the establishment of strong business ties with international firms and foreign governments. Foreign relationships serve to amplify the prestige of the country both for its citizens and for the ruling regime who view external legitimacy as an additional leg of domestic stability. Here it is important to note that external legitimacy remains essential to the Emirates, as it is non-democratic and authoritarian in nature. Thus garnering international support both serves to accelerate the sheer physical pace of development of the country by way of foreign direct investment but also lends credence to the ruling regimes legitimacy amidst financial crises, such as those that occurred in 2008-09.

⁶⁸ WAM. "UAE Invested \$70b to Develop and Boost Oil and Gas Output Capacity." *Gulf News* [Dubai] (9 Nov. 2014).

The UAEs' scheme to enhance foreign business ties, and simultaneously attract investment domestically is the aptly named Free Trade Zones (FTZ). The various FTZ's in general have provided lucrative incentives to corporations often providing 100 % import and export tax exemptions, no personal income taxes, and the repatriation of profits earned among others.⁶⁹ Despite a government mandate that companies located within these FTZ's must be 51 percent owned by a UAE national the strategy has not deterred large firms such as Haliburton from relocating to Dubai.⁷⁰ Although numerous investment cities that have arisen under the favorable business climate the Dubai Media city and the Jebil Ali Free Zone located near Abu Dhabi are among the largest.⁷¹

An equally critical project for prestige building efforts to emerge under the FTZ's was the decision from the recently established International Renewable Agency's to establish their headquarters at the country's highly publicized Masdar City. While, it has been alleged that the UAE government spent nearly US \$130 million to guarantee the agencies location, the commitment to bolstering prestige remains paramount.⁷² As an example of the linkages between foreign business partnerships being considered pertinent to the UAE's prestige building efforts, that in the case of Dubai, the Al-Maktoum lead government passed in 2006 the Dubai International Financial Center (DFIC) law allowing foreign companies and individuals to own

⁶⁹ Ahmed Kanna. "The "State Philosophical" in the "Land without Philosophy": Shopping Malls, Interior Cities, and the Image of Utopia in Dubai" *Traditional Dwellings and Settlements Review*, Vol. 16, No. 2 (SPRING 2005): 67.

⁷⁰ Raymond J. Learsy. "\$20 Billion Later Halliburton Moves Headquarters to Dubai." *The Huffington Post* (12 Mar. 2007).

⁷¹ National Staff. "Jebel Ali Free Zone profit up to Dh1 billion" *The National* (Abu Dhabi) 16 March 2015.

⁷² Mari Luomi. "Abu Dhabi's Alternative-Energy Initiatives: Seizing Climate-Change Opportunities" *Middle East Policy*, Vol. XVI, No. 4, (Winter 2009).

property in designated areas within the emirate.⁷³ The move to grant full ownership of land to foreign entities, designed to encourage further businesses to relocate to Dubai, remains an exception in the MENA region.

Krisitan Coates Ulrichsen, a Gulf Studies Fellow at the Baker Institute, noted that the UAE's push for international partnerships is often based on a predilection for forming economic coalitions with similarly emerging powers.⁷⁴ China, and the East Asian markets in particular have been the main targets of the UAE's international relations campaign. The East Asian focus comes from the economic linkages that see nearly 96 percent of all oil exports from the Emirates being sent to Asian markets.⁷⁵

The strategic value of this partnership is further demonstrated by the growing consumption habits of East-Asians countries. China, who only imported 2.9 million b/d from the region in 2011, is expected to increase its imports to 6.7 million b/d by 2035.⁷⁶ The growing dependence of China on the GCC countries comes at a time when imports from the West are decreasing. As a result the Abu Dhabi Investment Authority, the state owned investment body, has attempted to reciprocate the East Asian relationship by placing nearly 35% of its large portfolio in East Asian markets.⁷⁷

⁷³ Neyran Turan. "The Dubai Effect Archipelago": 91 in *The Superlative City, Dubai and the Urban Condition In The Early Twenty-First Century*" Harvard University Press (2013)

⁷⁴ Kristian Coates Ulrichsen, "Small States with a Big Role: Qatar and the United Arab Emirates in the Wake of the Arab Spring" *HH Sheikh Nasser al-Mohammad al-Sabah Publication Series, Durham University*, (October 2012).

⁷⁵ *Ibid.*, 6

⁷⁶ He Qing "Zai mou zhaobiao: Zhongshiyou de Yilake jingji zhang" ("Planning another bid: CNPC's Iraqi balance sheet"), *21st shiji jingji daobao (21st Century Business Herald)* (April 20, 2013) and International Energy Agency, *World Energy Outlook 2012* (Paris: OECD/IEA, 2012).

⁷⁷ Christopher Davidson, 'Diversification in Abu Dhabi and Dubai: The Impact of National Identity and the Ruling Bargain,' in Alanoud Alsharekh & Robert Springborg (eds.), *Popular Culture and Political Identity in the Arab Gulf States* (London: Saqi, 2008):145.

While the significance of the East Asian partnerships cannot be understated, another leg of stability for the Emirates has been in how the country turns international economic soft power into a domestic social stabilizing force. For example, Thomas Friedman when speaking with regards to the growing soft power of the Emirates, noted that the country was more than just a “city of boom and busts, but a place where young Arabs from across the region can come to realize their full potential in arts, business, media, education and technology start-ups”⁷⁸ Arabs, migrant laborers from South-East Asia, and Western business professionals all travel to the Emirates in pursuit of lucrative job opportunities. These working professionals and temporary migrant laborers form a silent majority of support for the regime as they lack political participation, instead focusing on personal financial rather than regime change. This is often frequently utilized by the UAE government and NGO’s to give a definitive explanation as to why the Emirates were spared from the revolutions that swept the region in 2010-11.⁷⁹

The Emirate of Dubai has thus been keen in capitalizing on the emerging cosmopolitanism culture by bolstering its status through the hosting of two world renowned shopping festivals, the Dubai Shopping Festival and Dubai Summer Surprises Festival.⁸⁰ The two festivals which epitomize the Emirates US \$4 billion a year shopping industry play host to a number large fashion demonstrations and conventions.⁸¹ Official government statistics reveal that the Dubai Shopping Festival in 2011 generated an additional US 4 billion in revenue for the Dubai

⁷⁸ Friedman(2014).

⁷⁹ Ibid.,

⁸⁰ Davidson (2008):146.

⁸¹ Saifur Rahman. “Dubai Shopping Festival: A big bag full of records” *Gulf News* (Dubai) (1 February 2012).

government.⁸² The festivals therefore represent a significant part of the soft power that the emirate of Dubai seeks to capitalize upon in order to maintain its prestige.

Emirates airline, a state run corporation, is often seen as a key component in attracting foreign business persons and tourists alike to the country. The role of Emirates airlines in reaching secondary cities, often bypassing traditional European transfer points, has drawn stark criticism from US and European Airlines who claim Emirates operates within a heavily subsidized business climate.⁸³ While accusations of aggressive pricing and unfair partnerships with aviation manufacturers have brought the airline criticism, its ability to make Dubai an international destination speaks to the growing soft power of the country.

The marquee festivals and robust international travel industry are merely just the beginning steps of the UAE's most recent attempts to bolster its international stature. The culmination of its efforts climaxed with Dubai's awarding of the hosting rights for the World Expo 2020. Dubai's receipt of hosting rights makes it the first country in the MENA region to win the title. According to organizers of the event the stated purpose of the coming festivities is to focus on sharing social innovations and introducing new ideas for sustainable development.⁸⁴ The festival, which is expected to draw nearly 25 million visitors to the UAE in the run up to and aftermath of the event, will bring an estimated US \$40 billion into the local economy.⁸⁵

Yet, the business and prestige building strategies I have previously mentioned are placing additional pressure on the government to continue to attract big business and sustain the pressing societal rents that emerge as a result. The penetration of Western business models and consumer

⁸² *ibid.*,

⁸³ Tim Hether. "Emirates airline urges U.S. to ignore subsidy claims" *Reuters* (Paris) (25 February 2015).

⁸⁴ World Expo 2020 Accessed 4 January 2015. http://expo2020dubai.ae/en/world_expos

⁸⁵ Anna Clark. "Smart Growth Takes Root in the Middle East." *Huffington Post* (26 Feb. 2015)

habits onto the local population are producing adverse eco-social effects, which may render the traditional top down structure of the governments rule ineffective at combating. The appearance of the aforementioned byproducts of a globalized world entering the local sphere is facilitating the rapid development society in which hyper consumption is becoming a fundamental cultural trait. The country, wholly dependent on the sale of oil to sustain its patronage networks, now faces growing unsustainable domestic practices. In the following section I will examine how the rapid development of the Emirates has coincided with a patronage system that contributed to the development of largesse consumer habits.

Hyper Development and A New Generation Sustainability Issues

One the greatest attractions to the UAE, in particular the cosmopolitan city of Dubai, are the sprawling expanses of new high-rise developments, the allure of lucrative salaries, and the relaxed social atmosphere as compared to the greater Middle East region. For these reasons Dubai often takes the label of Manhattan of the Middle East.⁸⁶ Dubai, which maintains some of the most intricate urban spaces including large malls, artificial islands, and skyscrapers developed by western designers, represent a direct importation of Western models of urban planning.⁸⁷ Yet, beyond the glamour of an urbanized city, a pervasive addiction to cheap energy is challenging the long term sustainability of such a model. First, to understand this phenomenon adequately it becomes necessary to examine some of the core measures of the urbanization project in Dubai and Abu Dhabi.

In the United Arab Emirates the various measurements of development indicate that the country's transformation from a rural dispersed population in the 1960's to a modernizing

⁸⁶ Friedman (2015).

⁸⁷ Kanna (2005): 64.

country in the 21st century occurred at a staggering pace. This is demonstrated by scoring high in a number of traditional developmental indexes. The country exhibits a number of other impressive statistics with an internet penetration rate in 2013 of 88 percent, 99.6 percent improved water services, a 76 percent computer ownership rate, the highest in the region, a 90 percent literacy rate, and a life expectancy average of 77.⁸⁸

The rapid development has additionally translated into a number of economic measures as well. For example in a report released by the Organization of Islamic Cooperation the UAE ranked third in Islamic growth markets.⁸⁹ Prior to the real estate crash of 2008, it was estimated that 25 percent of all the worlds' cranes were in operation in Dubai.⁹⁰ These figures are in addition to a recent World Economic Forums global competitive ranking that places the UAE at number 19 in the world.⁹¹ However when taken with a recent report from ARCADIS, a country consultant firm, found that Abu Dhabi and Dubai ranked 33rd and 34th in the world in terms of sustainability, the development project remains a work in progress.⁹² The survey classified cities based on a number of societal sub-indexes include energy consumption, renewable energy share, greenhouse gas emissions, health, education rates, income inequality, among others.⁹³ Dubai scored among the bottom 4 of countries surveyed in terms of its environmental policy, and was declared to be "profits over sustainability."⁹⁴

⁸⁸ CIA *World Fact Book* Country Profile: United Arab Emirates. Accessed 14 April 2015 and Zaher Bitar. "ECommerce across GCC to Grow by 40% in 2020." *Gulf News*[Dubai] (16 Feb. 2015).

⁸⁹ ENA. "UAE Gets the Highest Rate in ME In the Investment Index in Islamic Growth Markets." *Emirates News Agency*. Government of the UAE, (3 Mar. 2015).

⁹⁰ *Ibid.*, ENA 3 March 2015.

⁹¹ Ola Salem. "Abu Dhabi ranked No4 in the world's top cities" *The National* (5 September 2013).

⁹² ARCADIS. "Sustainable Cities Index: Balancing the economic and social, and environmental needs of the world's leading cities" *ARCADIS* (2015): 8-10.

⁹³ *ARCADIS*(2015): 10.

⁹⁴ *Ibid.*, 9.

Ahmed Kanna, a leading expert on built environments at Harvard University, proposed that an inherent part of the unsustainability complex in the UAE results from the Emirates obsession with Western models of urban development. Kanna has argued that the lavish building projects such as the Mall of The Emirates, artificial environments, and exclusive Island developments constitute a physical adaptation of an elitist American urban engineering project in the country.⁹⁵ Speaking to the artificial importation of Western modes of development, average occupancy of premium office developments in both Dubai and Abu Dhabi were both under 70 percent.⁹⁶ Complicating sustainability narratives despite an abundance of office space average occupancy rates are expected to plummet by 50 percent as new developments further saturate the market.⁹⁷

Others scholars such as Neyran Turan have suggested that these urban models combining the land-use systems, such as the FTZ zones, with the DIFC scheme I have mentioned previously represent an attempt to attract investment and become a state vehicle for replicating this model abroad.

With a population of around 9 million, only roughly of 2 million of whom are Emirati nationals, the U.A.E is by all standards a small country. Yet, despite the country's small population, their country remains one of the highest per capita energy consumers at 8,271 kilograms of oil equivalent energy (kgoe) annually.⁹⁸ By comparison the United States with a

⁹⁵ Kanna (2005):67

⁹⁶ Zainab Fattah. "Dubai Sees Need for Tallest Office Tower Amid 45% Vacancy" *Bloomberg Business Online* (20 August 2013).

⁹⁷ *ibid.*, ^

⁹⁸ Georgina Enzer. "Going Green" *CPI Financial* (5 March 2015).

much more developed industrial economic sector, and cosmopolitan lifestyle, consumes only 6,794 kgoe annually.⁹⁹

With an average population increase of over 9 percent between the two decades of 1990-2010 the country has expanded rapidly.¹⁰⁰ Even with a recent slowdown in population growth, as a result of the global recession, the population is still projected to reach 12 million by 2030.¹⁰¹ It is not surprising then that despite having the 7th most proven natural gas reserves, used extensively in the countries power production plants, the country has been a net importer since 2008.¹⁰²

Due to the urban sprawl manifesting itself under the westernized building schemes, and created a compound urban growth rate of 10 percent annually, sprawl now represents a blend between western development and rentier largesse.¹⁰³ For example, housing for the Emirati population now remains a fundamental right under the patronage system in the UAE. In 2009 this position was reified by the awarding of nearly 50,000 homes to UAE citizens at a cost of US 6.8 billion dollars.¹⁰⁴ Despite a declared real shortage in the amount of housing options for nationals, low occupancy levels within the urban centers of Abu Dhabi and Dubai, suggest that the related prestige of home ownership may be the most important aspect of future urban development. As one recipient of a home under the new program noted that “Us Emiratis like big

⁹⁹ World Bank. Accessed 17 May 2015.

<http://data.worldbank.org/indicator/EG.USE.PCAP.KG.OE/countries>.

¹⁰⁰ United Nations. “The demographic Profile of the United Arab Emirates” *World Population Policies Report* (2011): 1.

¹⁰¹ *ibid.*,

¹⁰² U.S. Energy Information Administration (5 December 2013)

¹⁰³ Ahmed K. Nassar , G. Alan Blackburn, J. Duncan Whyatt “Developing the desert: The pace and process of urban growth in Dubai” *Computers, Environment and Urban Systems* 45 (2014): 54

¹⁰⁴ Tala al Ramahi. “Emiratis promised 50,000 new homes” *The National* (16 March 2009).

houses, even if we don't have big families, because we always keep in mind if we have extended family staying over.”¹⁰⁵

As a result of the large distances that have opened up between developments, particularly those outside of the urban centers of Dubai and Abu Dhabi, car ownership is around 540 to 1000 residents.¹⁰⁶ It is no surprise then that the country where an average gallon of 95 octane gasoline costs US \$1.77 the country consumed nearly 620,000 bbl/d in 2012., or nearly one fourth of total production.¹⁰⁷ According to a report from the Director of Strategic Transport Planning in the Emirates, the low cost of car ownership led to traffic conditions becoming a significant issue and that peak congestion hours rank just below conditions in major metropolitan U.S. cities in terms of traffic density.¹⁰⁸ Additionally, the report calculated the average annual cost of this congestion stood at US 1.36 billion in wasted fuel and labor productivity.¹⁰⁹ The effects of the urban sprawl, and cheap gasoline, represent an excessive burden for the government who must sustain these subsidies.

In addition to high energy consumption a recent report from the UAE’s Federal Electricity and Water Authority indicated that the average daily per capita water usage was 500 litres, or nearly 82% above the average global consumption.¹¹⁰ Considering the country receives little to no rainfall, desalination technology remains vital to the country’s security. The Fujairah desalination plant represents as example of the massive installed capacity needed to sustain such high demand. The plant, located in Abu Dhabi, boasts a freshwater production capacity of 492

¹⁰⁵ Ibid.,

¹⁰⁶ Shafaat Shahbandari. “For every two Dubai residents, there is one car” *Gulf News* (Dubai) (15 March 2015).

¹⁰⁷ Waheed Abbas. “Petrol prices in the UAE are among world’s lowest” *Emirates 24/7* (3 June 2014). and U.S. Energy Information Administration.(5 December 2013)

¹⁰⁸ Shahbandari. (2015).

¹⁰⁹ *ibid.*, .

¹¹⁰ *Emirates 24/7* Staff. “UAE water consumption highest in the world” *Emirates 24/7* (13 March 2013).

million liters a day, larger than any plant in Western countries.¹¹¹ However, as Ivano Iannelli CEO of the Dubai Carbon Center of Excellence noted, such a large production capacity comes with a significant environmental cost with four tonnes of carbon emissions per one million gallons of potable water produce.¹¹² Compounding this issue, desalination comes with a high salinity and often trace chemicals that can disrupt the surrounding marine environment.

The financial estimates of desalinating represent another potential long term sustainability issue. Costs for operating desalination plants, similar to those in the UAE, run at nearly US 2 dollars per 3700 litres of freshwater produced.¹¹³ Between 35-45 percent of the total cost of desalinating water is due to the high energy inputs required to conduct reverse osmosis processes.¹¹⁴ Concerns over the rising amount of water and energy consumption in the country, represent both an environmental and financial challenge for sustainability as the UAE moves forward with its green discourse.

Another aspect of the growing unsustainable consumer habits in the country remains that the UAE also leads the planet in gross average annual food consumption amount at nearly 1,486kg per person.¹¹⁵ This staggering revelation in 2014 prompted the Government of the UAE to purchase land in Serbia, and secure the supply of foodstuffs through a 400 billion dollar loan to help prop up the Serbian agricultural sector.¹¹⁶ As the UAE lacks an efficient agricultural sector, nearly 90 percent of all food has to be imported from outside the region.¹¹⁷ The near total

¹¹¹ Nick Glass and George Webster. "Counting the carbon cost of bringing water to the desert" *CNN* (20 January 2012).

¹¹² *ibid.*,

¹¹³ Staff Writer. "Water Desalination." *Nuclear Energy Institute*, (2015).

¹¹⁴ Inderscience. "Nuclear Desalination: Fresh Water from Waste Heat of Power Plants." *ScienceDaily*, (13 May 2013).

¹¹⁵ Sambidge(2014).

¹¹⁶ *ibid.*,

¹¹⁷ Sharif M Taha. "Kingdom imports 80% of food products" *Arab News* (Riyadh) (20 April 2014).

dependence on food stuff imports leaves the country subject to the volatility of commodities markets and can place additional pressure on the government to maintain the current price fixing structure in periods of rapid price increases.

The Socioeconomic Costs of Consumption

The UAE's tolerant position towards overconsumption and lax emission standards has led to several socio-economic challenges. First among them, and pertinent for the larger GCC region, is the poor health conditions of the national population that are a result of easy access to cheap staples, and an influx of a variety of Western food chains. The abundance to such food products has created a unique health situation within the UAE. For example, one survey conducted by the International Diabetes Federation, indicated that upwards of 19 percent of the Emirati population had diabetes.¹¹⁸

Doctors have speculated the main cause for the large percentage to be directly related to the overconsumption of high caloric foods in conjunction with low physical activity levels.¹¹⁹ An additional component of the high food consumption problem, and the security issue it can create, has been the increased food waste within the country. According to one official speaking at the World Food Security Summit in Dubai, food waste is an equally important part of national security for the UAE and that waste levels such as those found in the US would not be sustainable in the UAE.¹²⁰ Considering food waste represents a portion of government expenditure then sustaining wasteful habits is equitable to similar largesse in the energy sector.

¹¹⁸ Jennifer Bell. "Diabetes Is 'national Health Emergency', Say UAE Doctors." *The National* [Abu Dhabi] (12 Nov. 2014).

¹¹⁹ *ibid.*,

¹²⁰ Amna E Khaishgi. "Food Wastage a Growing Concern for UAE." *The National*[Abu Dhabi] (9 Feb. 2015).

Second financial instability among the Emirati population exists as a growing threat to the stability of the UAE's future. Although the country made numerous strides to recover from the devastating effects of the 2008-09 global financial crises, the Emirati consumer culture still embraces largesse personal spending. Credit card usage in the country, soaring in recent years, now constitutes a micro financial crisis as Emiratis finance a large majority of their purchases on credit. In a survey conducted by the UAE's state run newspaper *The National*, 69 percent of respondents were found to have no savings for retirement, with some respondents admitting to possessing nearly 8 credit cards.¹²¹

The government on occasion has had to step in to correct the misuse of its citizenry's spending habits by cancelling large debt payments owed to government banks. In 2014 alone, the National Debts Settlement Fund wrote off around US \$544 million dollars of home loans from 3,737 applicants.¹²² Financial misuse represents a significant challenge for the UAE in the long term as excessive consumer waste threatens the ability of the country to invest profits in further infrastructure, or investment schemes. This point is particularly relevant when considering that the UAE government currently runs a deficit because of global oil prices. As these consumer practices represent an additional expenditure the government has begun to introduce a comprehensive sustainability discourse to help to alleviate these problems.

Sustainability Discourses in Abu Dhabi and Dubai

¹²¹ Jennifer Bell. "Some UAE Residents Own Eight Credit Cards, Survey Finds." *The National* [Abu Dhabi] (8 Mar. 2015).

¹²² WAM. "Eight Banks Write off UAE Nationals' Loans." *Gulf News* [Dubai] (26 Nov. 2014).

High profile statements speaking to the active diversification of the UAE economy away from fossil fuels are becoming more commonplace in the country's public discourse. For example the ruler of the UAE, Sheikh Khalifa Bin Zayed Al Nahyan, stated that the UAE is attempting to become a world leader in renewable energy and development.¹²³ The comment from President Nahyan is indicative that the UAE is attempting to extend its soft power into the emerging field of renewable technologies. As a result both Dubai and Abu Dhabi are pursuing a twofold strategy of highlighting the emerging sustainable discourse through the hosting of notable international events, most notably the World Expo 2020, and a number of one off projects designed to reduce the hyper-consumption habits present in the country.

The emerging renewable energy programs are part of a wider program geared towards the advancement of the UAE named Vision 2021. Under the auspices of the Vision 2021 the UAE as a whole is attempting to advance the economy in a number of non-hydrocarbon sectors, as well as to increase the human capital of its citizenry.¹²⁴ The country thus has repeatedly indicated that education, particularly in the science disciplines, will be essential for the country moving forward. Vision 2021 therefore begins to introduce the concept of a knowledge based economy, where in the citizenry of the Emirates possesses the skills required to ensure a stable future.¹²⁵

Ironically this concept had been proposed as early as 1976 by the then ambassador to the US Ashmed Ghobash Saaed, but subsequently overshadowed as other development initiatives took precedent.¹²⁶ As part of the emerging human capital development rhetoric the country announced that by 2030 over 160,000 jobs in green energy sectors would be added to the

¹²³ Government of the UAE (2015): 3

¹²⁴ Government Communications Office Staff. "Key Achievements: Vision 2021" *GCO* (2015).

¹²⁵ Zaher Bitar. "Knowledge, innovation key in UAE's green economy" *Gulf News* (Abu Dhabi) (23 April 2015).

¹²⁶ Saaed (1976): 16.

economy.¹²⁷ The program also gives rise to the concept of a transition away from the traditional hydrocarbon based economy towards a green economy.

Sheikh Mohammed, the ruler of Dubai, has stated that one of Dubai's goals would be to make it one of the "smartest cities" in the world by 2021.¹²⁸ To this end the Department of Water and Energy Administration, DEWA, announced in 2012 that around 50 million dollars would be allocated to research and development of green energy technologies.¹²⁹ This announcement was followed in the subsequent months by the UAEs's attempt to be a global leader in the quality of infrastructure, all based on a green growth plan.¹³⁰

One of the biggest initiatives to result from the UAE's vision 2021 program has been Dubai's efforts to secure the World Expo 2020. The expo which hopes to showcase a variety of the UAE's sustainability projects including the Masdar city. The Expo already achieved a public relations victory with nearly 25 million visitors expected to visit the UAE in the run up to, and subsequent months after the event.¹³¹ The sheer volume of tourism expected prompted a large construction that will see the number of hotels in the Emirate double by the time the event launches.¹³² According to the events webpage the event will serve as a springboard for progressive and sustainable initiatives for the future.¹³³ In the run up to the event the UAE is

¹²⁷ Press Release. "Dubai Carbon Launches the Green Jobs Programme." Dubai Carbon, (18 Dec. 2014). Web. 14 Feb. 2015

¹²⁸ Musaid Al-Zayani. "Dubai Crown Prince: We Aim to Be at the Global Forefront by 2021." *ASHARQ AL-AWSAT*, (28 Dec. 2014).

¹²⁹ *ibid.*,

¹³⁰ Government of the United Arab Emirates. Vision 2021: Sustainable Environment and Infrastructure. Vision 2021 Report. (Accessed 3 March 2015).

¹³¹ Clark (2015).

¹³² Sarah Algethami. "UAE to Spend More than \$300 Billion on Infrastructure Development by 2030." *Gulf News* [Dubai] (3 Apr. 2014).

¹³³ *ibid.*,

seeking actively to promote the multitude of sustainable initiatives aimed at reducing the gross consumer and energy consumption habits in the country.

Some of the programs that will be included in the run up to the Expo, such as the government of Dubai's plan to convert its municipal fleet of vehicles to waste oil power, are done through direct government involvement. Others government programs include a cloud seeding operation managed by the National Centre for Meteorology and Seismology (NCMS) worth around US \$6 million to increase rainfall and a proposed plan from the Emirate of Abu Dhabi to compel owners of SUV's to exchange them for fuel efficient hybrid models.¹³⁴ While, the latter program is likely to fail due to a popular backlash following its announcement, the country remains determined to introduce a sustainability discourse.

The private sector represents another area in which the UAE government promotes its sustainable discourse agenda. As part of the sizeable construction initiatives that are currently in development, the government has attempted to place mandatory building energy efficiency guidelines entitled Estidama. While I will talk in depth about both the pros and cons of the program in a later section, it is important to note that Estidama if executed correctly will place the UAE above any other MENA country in terms of the number of LEED equivalent buildings certified.¹³⁵

This potential development will be critical for the UAE to meet the sustainability objectives under its Vision 2021, as the private sector is a large consumer of energy and raw materials. In the following sections I therefore will examine the UAE's two marquee programs for its

¹³⁴ Caline Malek. "Dh18.3m Programme to Stimulate Rainfall in UAE Is Launched." *The National*, Abu Dhabi (20 Jan. 2015) and Martin Croucher. "UAE to ban SUVs by early 2016" *The National* {Abu Dhabi} (01 April 2015).

¹³⁵ Enzer (2015).

sustainable future, Masdar City and Estidama, within the larger sustainability context the UAE is promoting. While, arguably both programs are still in development, the policy rationale for such large programs is critical for understanding the UAE's economic situation.

Sustainable Energy Developments: The Case of Renewables and Masdar City

Reducing largesse consumption and becoming a global leader in green energy technology comprise two of the most significant sustainability objectives for the UAE as it begins to consider various diversification initiatives.¹³⁶ Speaking on the necessity of the sustainability push Mohammed bin Rashid Al Maktoum, ruler of Dubai, commented that, "We recognize that preserving our energy resources will be one of the greatest challenges in our drive towards sustainable development."¹³⁷ While Al-Maktoum went on to comment about the need for a development of an environmentally conscious society his comments on energy preservation are being manifested in a number of key sustainability projects.

As I have previously elaborated upon the UAE needs renewable energy to help alleviate real shortfalls in terms of sustaining consumer demands despite its vast petroleum reserves. The country due to a 6 percent annual increase in LNG demand has been importing the commodity since 2008, and now needs the price of oil to remain at or above US \$77 to remain solvent, is faced with a looming crisis.¹³⁸

An additional negative aspect of LNG for energy production has been that in recent years the production costs for the domestic market rose from \$6-8/MMBtu for in 2010 to \$10-18/MMBtu

¹³⁶ Government of The UAE (2014): 3.

¹³⁷ *ibid.*,4.

¹³⁸ Enzer (2015).

for current imports.¹³⁹ The tripling of the production price constrains the government's ability to sustain further increases in demand. To avoid an energy crisis that could potentially lead to politically risky subsidies cut, or possibly jeopardize the UAE's ability to bring oil to the international market, the country has begun pursuing large scale renewable energy programs to avoid the worst scenarios.

Marquee Programs and Sustainability in the UAE

Lauren Crot, a scholar of energy politics in the MENA region, noted the country's sustainability plan combines both imitative institution building and the transformation of external influences into opportunities.¹⁴⁰ Gerd Nonneman suggested the aforementioned mixture of domestic green growth plans and marquee programs, gives the UAE additional legitimacy.¹⁴¹ It is no coincidence then that since 2006 with the announcement of its Masdar city in 2006, is beginning to view sustainability, particularly in reducing its nearly 100 percent dependence of energy production from fossil fuels, seriously.¹⁴²

Sustainability goals help the UAE define clear pathways to energy security and diversification. Among the most notable, Abu Dhabis Estiama sustainable building guidelines, Dubais Al-Makoum solar energy park, the Shams series solar power developments, and the Masdar Sustainable City, showcase the country's commitment to establishing its dominance in the sustainability field. The various programs represent a key component in the UAE's vision 2021

¹³⁹ IRENA. "Cost-Breakthroughs Make Solar and Wind the UAE's Most Competitive Energy Sources." *International Renewable Energy Agency Press Release* (8 April 2015).

¹⁴⁰ Laurence Crot. "Planning for Sustainability in Non-democratic Polities: The Case of Masdar City" *Urban Studies* 50(13) (October 2013): 2814.

¹⁴¹ Gerd Nonneman, "Determinants and Patterns of Saudi Foreign Policy: 'Omnibalancing' and 'Relative Autonomy' in Multiple Environments," in *Saudi Arabia in the Balance*, eds. Gerd Nonneman and Paul Aarts (London: Hurst & Co., 2005).

¹⁴² Krane (2014): 20.

national agenda goal to produce 7 percent of its total energy through the use of sustainable production means.¹⁴³ The success of the national agenda which additionally focuses on exploring different pathways to reduce water consumption, improve air quality, and introduce green growth plans, depends largely on whether the sustainability programs will lead to a change in culture within the UAE. It is therefore important to exam each of the three individual programs against the backdrop of the larger sustainability goals which the UAE is currently working to meet.

Estidama

With Abu Dhabi's enactment of the first energy/water performance standards in the MENA region entitled Estidama the country made a strong statement for its commitment to sustainability.¹⁴⁴ Estidama, which planners hope will lead to up to a third reduction in energy/water consumption for commercial and residential building developments, features a comprehensive rating system.¹⁴⁵ According to the Estidama website the Pearl Building Rating System (PBRS) which ranges from one to 5 depending on the efficiency of the development measures a number of criteria. Among these are the extent of water, energy, and waste minimization, the amount of locally sourced products, materials, used in the development, and the sustainability of the supply chains being used.¹⁴⁶ The program, following a decree by the Executive Council of Abu Dhabi in 2010, now requires all buildings to meet at least a 1 Pearl rating, with any building receiving government funds achieving a rating of at least a 2.¹⁴⁷ It should be noted that for an Estidama program to achieve a LEED certification, the project would need to achieve a rating of at least a 3. Therefore, even government subsidized developments

¹⁴³ Government of the United Arab Emirates(2015).

¹⁴⁴ World Energy Council (2014).

¹⁴⁵ Estidama. *Pearl Building Rating System*. Abu Dhabi Urban Planning Council (2015).

¹⁴⁶ *ibid.*,

¹⁴⁷ *ibid.*,

only need to achieve a minimum that is below international sustainability standards in order to receive funding.

Although the rating system is limited in scope, only applying to new project developments within Abu Dhabi, the introduction of a government mandated guideline is having a measurable impact. Abu Dhabi's Urban Planning Council (UPC), the main governmental regulatory body for new project developments, recently announced that since the program's inception in 2007 the program delivered more 454 master plans spanning 97.25 million square meters.¹⁴⁸ UPC additionally noted that under the master plans nearly 12,000 villas and 921 buildings received pearl ratings.¹⁴⁹ The effect of the Estidama program thus provides an effective enforcement mechanism for the governments' policy initiatives. Estidama guidelines remain critical for reducing the sheer volume of energy and water consumption, yet the program itself does not increase the country's base load generation capacity. For this the Governments of Dubai and Abu Dhabi are turning to solar energy to meet the 7 percent of total energy production required to be met via renewable energy sources by 2030.¹⁵⁰

Solar Energy in Dubai and Abu Dhabi

Dubai's Mohammed bin Rashid Al-Maktoum Solar Park named after its current ruler when completed by 2030 will maintain an output capacity of around 1 GWe.¹⁵¹ According to the Dubai Electricity and Water Authority (DEWA) the benefits of the large park will equate to the removal of over 2 thousand cars from the roads, and over 15,000 tonnes of carbon annually.¹⁵²

¹⁴⁸ Samihah Zaman. "Abu Dhabi's urban planning body updates vision" *Gulf News* (Riyadh) (21 April 2015).

¹⁴⁹ *ibid.*,

¹⁵⁰ WEC (2014).

¹⁵¹ Vesela Todorova. "Dubai launched Dh 120m solar power plant" *The National* (22 October 2013).

¹⁵² *ibid.*,

The park whose size is approximately 45.5 km, and utilizes cost efficient solar photovoltaic panels, has been essential for Dubai's energy diversification strategy.

In a report published in 2012 DEWA it was notes that some of the main objectives of the Al-Maktoum Park dealt with increasing sustainability in the field of power generation, and to promote the Dubai brand abroad while introducing a sustainability culture in the Emirate.¹⁵³ The latter objective is important as it demonstrates the Emirates commitment to energy diversification without making politically unstable subsidy reductions. International partnerships thus provide a platform for which the Emirate can establish policy for the mid-term and supplant a sustainability discourse among the local population.

The Al-Maktoum Park operations are also important as the project began contributing energy an initial 13Mw worth of solar power to the electrical grid in 2013.¹⁵⁴ Despite having to overcome a number of obstacles, particularly preventing dust accumulation on photovoltaic cells without using water, bidding already has concluded for the second phase of the project located near Abu Dhabi.¹⁵⁵ Speaking to the regional prestige effects of the projects, the Riyadh based Acwa power, secured the right to develop the next 100 Mw of solar panels at a strikingly low price of 5.98 US center per Kwh.¹⁵⁶ The winning bid and the second lowest bid, also from a Saudi Arabian company, mark the lowest operating costs of a major solar power provider in the world.¹⁵⁷ Although Acwa expects to have the 100 Mw Park in operation as early as 2018, the

¹⁵³ Dubai Electricity and Water Authority. "Solar Energy in Dubai Mohammed Bin Rashid Al Maktoum Solar Park" *Government of Dubai* (2012).

¹⁵⁴ First Solar. *Project Data Sheet for Phase 1, Mohammed bin Rashid Al Maktoum Solar Park*. First Solar (2013).

¹⁵⁵ Todorova (2013)

¹⁵⁶ LeAnne Graves. "Saudi firm outbids rivals for second phase of Mohammed bin Rashid Al Maktoum solar park. *The National* (Abu Dhabi) (3 December 2014).

¹⁵⁷ *ibid.*,

Emirate of Dubai is remaining cautiously optimistic as solar energy in the Emirates faces a number of performance reductions, as is the case currently in Abu Dhabi.¹⁵⁸

Abu Dhabi's solar program, a 100 Mw plant named the Shams 1 Solar Park, is the first in a series of similarly designed solar parks that will help to reduce carbon emissions in the UAE. To meet its Vision 2021, and 2030 development goals, the Emirate selected an ambitious solar technology than the more conventional technology used in the Al-Maktoum Solar Park. In the Shams series a new technology named concentrated solar power (CSP) utilizes hundreds of thousands of parabolic mirrors that reflects light towards a central tower where light energy becomes converted to heat to then boil water and spin a turbine.¹⁵⁹ Built at a cost of around US \$600 million as a joint venture between the Masdar City program and Abengoa, the park displaces nearly 175,000 tonnes of carbon emissions annually equivalent to the removal of 15,000 cars from the road.¹⁶⁰ The CSP design is expected, under optimal conditions, to provide power to approximately 20,000 homes.¹⁶¹ At present, the 1 square mile park, places the UAE third globally in CSP production behind the USA and Spain.¹⁶²

Even with a projected US 1.9 Billion in savings through the utilization of Solar Energy over LNG for energy production, the program has suffered from a number of serious setbacks.¹⁶³ An over concentration of dust in the air, and intermittent dust storms, reduced the Shams 1

¹⁵⁸ *ibid.*,

¹⁵⁹ Darren Quick. "World's largest concentrated solar power plant opens in the UAE" Gizmag (18 March 2013). Accessed 2 February 2015 <http://www.gizmag.com/shams-1-worlds-largest-concentrated-solar-power-plant/26707/>

¹⁶⁰ Shams Power Company. Accessed 8 April 2015 <http://shampower.ae/en/sustainability/overview/>

¹⁶¹ The National Staff. "UAE ranks third in the world for total solar power capacity and investment, says report" *The National* (Abu Dhabi) (5 June 2014).

¹⁶² *ibid.*,

¹⁶³ IRENA (2015).

anticipated power output by 40 percent.¹⁶⁴ A significant reduction in the anticipated power output forced the Emirate of the UAE to reconsider the type of solar technology being used. While CSP has proven successful under better local atmospheric conditions, it is likely the Shams series will make a switch to more conventional solar technologies, such as those used in Dubai's program.

Despite, the setback, the UAE as a whole is continuing to promote its sustainability agenda by way of the larger Masdar program. In the following section I will examine the key components of the Masdar program, and analyze the prestige building objectives the Emirates hop to accomplish through its development.

Masdar

According to the Masdar initiatives corporate website, Masdar the corporation has, "committed more than \$1.7 billion (U.S.) to renewable energy developments, with those investments helping to deliver nearly 1 gigawatt of clean power in the United Arab Emirates and beyond."¹⁶⁵ The corporation, established in 2006, represents the UAE's principal investment vehicle for renewable energy technologies. These projects have included high profile solar developments in Abu Dhabi, such as the Shams 1, and a 120 Mw park in Spain run in conjunction with SENER.¹⁶⁶

Among all of the different sustainability initiatives in the UAE and abroad, the Masdar City program stands alone in terms of how it has attempted to introduce a sustainability discourse into the public's conscious. The city which constitutes a master-planned sustainable city is expected

¹⁶⁴ Crot (2013): 2818.

¹⁶⁵ Masdar. *About Masdar Clean Energy* Masdar Initiative Corporate Website (2015). Accessed 4 January 2015 <http://www.masdar.ae/en/energy/detail/masdar-clean-energy-who-we-are> .

¹⁶⁶ *ibid.*,

to host 47,500 residents, 1500 businesses, within a sprawling 6 kilometer space.¹⁶⁷ The city boasts a minimum of a 3 pearl Estidama rating for all buildings that is equivalent to a LEED certification, a 40 percent reduction of commercial energy and water demands, onsite waste recycling, a zero carbon transportation network , and innovative street designs to keep the streets 20 degrees Celcius cooler than the surrounding desert.¹⁶⁸

To meet these ambitious objectives the city received nearly US \$15 billion in government assistance for the construction and ongoing operating costs.¹⁶⁹ The program has additionally worked in conjunction with a number of foreign partners to help bolster the countries education and energy diversification objectives. An example of this was the inclusion of a research campus for graduate students that is an extension of the Massachusetts Institute of Technology's (MIT) campus in the United States. The partnership resulted in a number of exchange programs with the Masdar providing real time data monitoring and design consultations.¹⁷⁰ As a result of the partnership one prominent member of the MIT development team commented that the UAE was the only “oil state” considering a diverse energy future.¹⁷¹ The message being promoted by the UAE is thus showcasing their commitment to renewable energy technologies.

Masdar, as a result of its heavy emphasis on renewable energy, achieved success in several public relations campaigns that increase the awareness of the program, and the country's sustainability goals. This included a large incentive package, subsidized by the Masdar Co., given to IRENA to fund the corporation's headquarters within the Masdar City complex.¹⁷² The

¹⁶⁷ Crot (2013): 2813.

¹⁶⁸ Masdar (2015) and ArchDaily(2010).

¹⁶⁹ Krane (2014): 20.

¹⁷⁰ ArchDaily "Masdar Institute / Foster + Partners" *ArchDaily* (23 Nov 2010). Accessed 01 January 2015. <<http://www.archdaily.com/?p=91228>>

¹⁷¹ Hassan M Fattah. “ Abu Dhabi Explores Energy Alternatives” *New York Times* (18 March 2007).

¹⁷² Luomi (2009).

developers of Masdar were additionally keen to secure the takeoff and landing rights for the first round the world flight by a solar powered plane. The vehicle whose name is *Solar Impulse* will travel around the world in 12 legs, landing at the IRENA headquarters in Masdar.¹⁷³ While, the publicity garnered does little in terms of energy production, it does bolster the UAE's presence in the green technology field.

Masdar city exists as an example of a complete top down approach to sustainable development. When asked in a press conference why the UAE decided to pursue a broad city complex to highlight their progress towards becoming sustainable, Sultan Al Jaber, CEO of Abu Dhabi Future Energy Co. stated the project represented a, "logical step and a natural extension for our involvement in the energy markets."¹⁷⁴ As the country seeks to increasingly diversify its non-hydrocarbon related energy streams pursuing green energy technology places the UAE in a position to diversify within the energy sector.

However not all of the proposed Masdar initiatives have translated into actionable projects. The effects of global financial crisis of 2008-09, to which both Abu Dhabi and Dubai suffered tremendous financial losses in domestic real estate and overseas holdings, caused the delay or cancelation of several of the most ambitious Masdar projects. Among the most significant was the changing from the City's zero carbon platform to a low carbon one, and the abandonment of on-site power generation.¹⁷⁵ The immediate effect remains that while the Masdar city project is self-contained in terms that the same sustainability guidelines do not apply to the greater UAE, the project is reliant on some power generated from natural gas fed offsite power plants. While,

¹⁷³ Marco Morosini. "Solar Impulse -- the Future Is No Longer What It Used to be" *Huffington Post* (3 April 2015).

¹⁷⁴ Steve Inskeep and Joe Palca. "Oil-Rich Abu Dhabi Builds Renewable-Energy City" *NPR* (5 May 2008) Accessed 1 February 2015 <http://www.npr.org/templates/story/story.php?storyId=90180158>

¹⁷⁵ Krane (2014): 18.

disappointing in that the program abandoned some of the most ambitious goals the program still provides a model for introducing a sustainability narrative into a hyper consuming society.

Although the sustainability narrative in the UAE will need considerable time to both rectify the technical difficulties the marquee programs have encountered, and create an environmentally conscious among a recently modernized population, there is one bright spot for the UAE. Nuclear energy, a technology that conveys strong sentiments of state development, is being developed in the UAE. The scale and speed of development, largely garnered through the use of foreign expertise, has placed the country in a strong position to meet its goal of bringing its first reactor online in 2017, and the other three by 2020. For a country which international experts assumed would collapse following the withdrawal of the British in 1968, the UAE's development of a full scale nuclear program speaks to the exceptionalism it has developed under.

Nuclear Energy & Prestige Building Efforts

On April 20th 2008 the UAE released a policy statement stating its intent to acquire a large scale commercial nuclear energy program for generating power.¹⁷⁶ This followed a decision in late 2006 where the U.A.E., along with 6 additional members of the Gulf Cooperation Council, announced their desire to pursue peaceful nuclear technology for energy production.¹⁷⁷ The declaration was accompanied by an initial report to the International Atomic Energy Association (IAEA) speaking to the precedent for nuclear energy technology in the region based on forecasted energy demand increases. The report noted that the collective installed energy

¹⁷⁶ Government of the UAE. *Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy*, (April 20, 2008). Accessed 23 April 2015. <https://pcs.enec.gov.ae/Content/Home.aspx>.

¹⁷⁷ Staff Writer. "Does the Middle East Really Need Nuclear Power?" *Arabian Buisness*. (25 Mar. 2007).

production capacity of all G.C.C. members stood at 80 Gigawatts', with demand expected to grow by 5-7 percent annually.¹⁷⁸

Taking the issue further, the U.A.E. alone estimated it would require an additional 40 gigawatts' to meet its future energy needs if demand remains at its current rate.¹⁷⁹ Although, the need for increased baseline capacity justifies a single purpose nuclear program in the region, critics remain leery over the potential for rogue proliferation by one state to incite a larger regional nuclear arms race. The U.A.E. has therefore taken a number of proactive measures to demonstrate to the international community its willingness to pursue a strictly peaceful nuclear program.

To begin, the U.A.E. signed the N.P.T. in 1995 and has entered into force its first international safeguard agreement with I.A.E.A. in 2003.¹⁸⁰ The country has additionally publicly declared in its nuclear energy policy that it would pursue the technology through transparent operations, and a close partnership with the I.A.E.A.¹⁸¹ In addition to its cooperation with international organizations, the UAE has been keen on forming strategic partnerships with experienced nuclear powers. As I will discuss in a later section this point is important for both external legitimization of the program and for assisting with developing indigenous technical knowledge.

Despite the UAE's efforts, due to its ample oil reserves, estimated to last 97 years at current production levels and the 7th most proven natural gas deposits, the country's decision is

¹⁷⁸ Mark Hibbs, "Arab Gulf States Await IAEA Report on Nuclear Power Plans Next Month," *Nucleonics Week*, (September 20, 2007).

¹⁷⁹ Tom Ashby. "UAE Signs up for Nuclear Inspections" *The National*, (9 Apr. 2009).

¹⁸⁰ Ellen Tauscher, Under Secretary for Arms Control and International Security, "Agreement for Cooperation Between the Government of the United States of America and the Government of the United Arab Emirates Concerning Peaceful Uses of Nuclear Energy," statement before the House Foreign Affairs Committee, 8 July 2009.

¹⁸¹ ENEC. "Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy." *Government of the United Arab Emirates*, (2007): 1.

potentially called into question.¹⁸² Yet, as I have discussed in the previous section the UAE faces a real shortfall in terms of installed electric production capacity. The shortfall of nearly 20 GW of additional power, due in part to a patronage system that has led to hyper-consumption of commodities, threatens to limit the growth objectives set under the UAEs vision 2021 report.¹⁸³ For this reason the UAE has viewed nuclear power as a viable alternative to traditional natural gas fired production plants. In the following section I will present the technical aspects of the program, and how the technology is being used to both bolster international prestige and help the country meet its sustainable development objectives.

Joint Partnerships in Nuclear Energy

In late 2009 following a series of design proposals by the Korea Electric Power Corporation (KEPCO), the French nuclear powerhouse AREVA, and the US's General Electric, the UAE selected Korean KEPCO consortium to be the main vendor for its proposed nuclear power program. The plan which calls for the construction of four AP-1400 nuclear reactors to produce 5.6 GWe at an initial cost of US \$30 billion.¹⁸⁴ The large scale program is expected to add an additional 20 percent to the baseline production capacity of the UAE. It is also designed to replace a number of older conventional natural gas fired generating stations. For a country which has been importing 50 percent of its Liquid Natural Gas (LNG) demands and who as part of the Vision 2021 is attempting to diversify its fuel sources by 30 percent by 2030, nuclear power for production is critical.¹⁸⁵

¹⁸² José Goldemberg . “ Nuclear Energy in Developing Countries” *Daedalus*, Vol. 138, No. 4, On the Global Nuclear Future, Vol. 1 (Fall, 2009): 73.

¹⁸³ Zawya Dow Jones. “UAE nuke energy push may start deal bonanza”, *Gulf Times*.

¹⁸⁴ Ayesha Daya, and Stefania Bianchi. "U.A.E.'s Nuclear Power Program Said to Cost \$30 Billion." *Bloomberg Business Week*. *Bloomberg*, (28 Nov. 2011).

¹⁸⁵ WAM(2014).

The UAE's choice of nuclear energy, and in particular the selection of a Korean company, is significant. KEPCO's AP line of nuclear reactors offers a number of advantages in terms of both fuel burn up efficiency, passive safety features, and a competitive price point. The program which marks the first time a Korean vendor has licensed its product outside of the country, has unique advantages that helps it compete with traditional LNG sources. It has been equally beneficial for UAE based firms. Mohamed al Hammadi, CEO of the agency supervising the UAE's nuclear program, announced that over 180 companies employing around 17,000 workers are participating in the building of the first of the reactors.¹⁸⁶ As contracts for large construction projects constitute another part of the patronage system, the UAE's is working proactively to ensure the most lucrative of these contracts, gaining domestic support for the project, went to prominent UAE firms. While, the program supports a number of local firms, the real ingenuity of the program rests in its ability to exist among hydrocarbon schemes.

One of the most important factors for the UAE nuclear power remains its cost competitiveness even amidst the recent decline in oil prices. Low oil prices, which according to ADNOC have cost the UAE US 2 billion just from the sale of refined gasoline products, are a serious threat to UAE development endeavors.¹⁸⁷ Volatility in the oil market additionally threatens the UAE because despite LNG being cheaper for use in conventional power prices, an equal share of petroleum products must be brought to sale on in the international market in order to stabilize the global trade. Therefore the UAE must continue to produce oil at below its breakeven price, for a loss, to honor both its fuel and OPEC contracts.

¹⁸⁶ Awad Mustafa. "Abu Dhabi nuclear plant site prepares for 17,000 new arrivals" *The National (Abu Dhabi)* (17 June 2013).

¹⁸⁷ WAM. "UAE oil firms lose Dh38bn" *Arabian Business* 24/7 (4 February 2015).

However, as I have previously noted nuclear is a viable option as the country attempts to hedge its midterm energy options against the introduction of a diverse mix of energy sources. Part of this diversification requires a reduction of LNG's share of power production in the country. The AP 1400 reactors are therefore an attractive option because they provide in addition to the 20 percent baseline power generation in the country, the capability to use latent heat from the reactor to desalinate water.¹⁸⁸ As the UAE desalinates 98 percent of its water, coupled with the anticipated doubling of tourists for the World Expo, the need to increase both short and long term desalination capabilities through less expensive means remains crucial for the UAE's future development.

The UAE's Nuclear Program as the Global Gold Standard of Non Proliferation

In order to move forward with meeting its energy diversification goals the Emirates Nuclear Energy Corporation (ENEC) expects its first reactor at Barakah to be brought online by 2017, with an additional reactor to be completed every year until 2020.¹⁸⁹ The 1.4 GWe reactor at Barakah, nearly 70 percent complete, has achieved rapid progress due to a combination of the UAE's commitment to complying with among the most stringent non-proliferation standards and building complex partnerships with foreign governments.¹⁹⁰ With progress well underway for the second and third reactors the program therefore likely will complete its objectives by bringing all four reactors online by 2020.¹⁹¹

¹⁸⁸ World Nuclear Association Staff. "Advanced Nuclear Power Reactors" *WNA* (29 April 2015).

¹⁸⁹ Stanley Carvalho. "First reactor of UAE nuclear power plant on track for 2017 start" *Reuters* (8 Dec 2014).

¹⁹⁰ *ibid.*,

¹⁹¹ Lucy Barnard. "Reactor dome in place at UAE nuclear plant" *The National* (13 January 2015).

The UAE's commitment to the IAEA safeguards regime, designed to prevent illicit weapons proliferation, has been accomplished through the signing of a number of key agreements. Most prominent among them has been the Non Proliferation Treaty (NPT) and the Additional Protocol. The NPT, often considered the bulwark agreement preventing the spread of nuclear weapons, has been ratified by 188 UN member countries. Within its text are a number of agreed upon articles that allow for the spread of peaceful use of nuclear energy technologies. Most important among them is Article V that grants the legal authority of the IAEA to conduct inspections on domestic energy programs to ensure compliance with non-proliferation objectives.¹⁹² As a signatory to the NPT the UAE therefore is subjected to the routine inspections, and design verification compliance by the IAEA.

With the signing of the Additional Protocol the UAE made a conscious decision to allow for further access from international inspection teams. The UAE however did not merely conduct agreements with the IAEA. Following extensive negotiations with the U.S. that led to the UAE's foregoing of ENR activities, the appropriately name Gold Standard, was succeeded by an additional protocol with IAEA in 2009.¹⁹³ These early indicators have prompted leaders within the U.A.E. , such as the Emirate's permanent ambassador to the I.A.E.A. Hamad al Kaabi to state publicly that, "This is where we see the drive for the UAE to adopt a model system that supports the peaceful use of nuclear energy, prevent nuclear terrorism and any risks or jeopardy to nuclear security,."¹⁹⁴ Additionally, the country has passed a National Law in 2009 that prohibits

¹⁹² United Nations. *2005 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons* Department for Disarmament Affairs, United Nations (2005).

¹⁹³ Tauscher (2009).

¹⁹⁴ Caline Malek. "Praise for UAE's 'gold Standard' Nuclear Power Programme" *The National*, (23 Mar. 2014).

uranium enrichment and spent fuel reprocessing, adding to its already by its strict internal system of control and accountability.¹⁹⁵

Establishing a culture of safety has thus allowed the UAE to rapidly develop, and allow for foreign partnerships that are critical to establishing an indigenous program. Early results of this technical cooperation resulted in numerous contracts for U.S. firms, the largest being, a nearly 2 billion dollar loan from the U.S. Export-Import bank to the UAE government to help finance the construction of the country's first reactor located at Barakah.¹⁹⁶ The UAE additionally engaged in bilateral negotiations with a number of prominent nuclear powers including Russia, France, England, Japan, among others.¹⁹⁷ These negotiations allowed for key international figures to endorse the program including former U.S President George W. Bush, who brokered the 123 agreement with the country, that the program would promote common security in the region.¹⁹⁸

International partnerships thus play a critical role for the development of the UAE's program. As the country lacks the technical expertise, or a related indigenous STEM program, foreign partnerships remain indispensable as they serve to fill a midterm gap in related skills. ENEC projections indicate that the total number of personnel required to work on the program will remain near the 2000 mark. Interestingly, ENEC declared only a small percentage of that number will need advanced nuclear engineering degrees.¹⁹⁹ This point is critical for the domestic

¹⁹⁵ Margaret Coker. "Korean Team to Build UAE Nuclear Plants." *The Wall Street Journal*, (28 Dec. 2009).

¹⁹⁶ David Dalton. "US Government Bank Announces Loan For UAE's Barakah." *The Communications Network for Nuclear Energy and Ionising Radiation*, (10 Sept. 2012).

¹⁹⁷ *ibid.*,

¹⁹⁸ Elaine M. Grossman. "U.S. House Bill Would Set Conditions on UAE Nuclear Deal" *NTI* (10 December 2008).

¹⁹⁹ John Banks, Kevin Massy, and Charless Ebdinger, "Human Resource Development in New Nuclear Energy States: Case Studies from the Middle East", *Brookings Institute*, Policy Brief 12-02 (Nov 2012): 8.

perception of the program, as although the UAE lacks the technical engineering skills, Emirati nationals will still contribute in a significant non-technical role in the program.

Acknowledging the need for Emiratis to be key contributors to the program the UAE recently launched a scholarship program in conjunction with several U.S. universities that will allow graduate and doctoral nuclear engineering students a free education abroad.²⁰⁰ In 2012 alone 75 students received the technical scholarship, with the condition that following their graduation they would return and work for ENEC directly.²⁰¹ The Emiratization program represents an additional step by the UAE to ensure that the UAE will move towards building the capacity to run most aspects of the nuclear program independently.

Cooperating with foreign government raises the prestige of the entire UAE, not only among other MENA region countries, but throughout the world. Having successfully developed and implemented a large scale nuclear program faster than many developed nations can speak to the UAE's decision making institutions to clear a number of the hurdles that stifle development. Additionally, through a large scale nuclear program developed in conjunction foreign partnerships, the possession of which denotes a high level of development.

As, a relatively new, Authoritative state, strategic partnerships with Western powers can be extremely beneficial especially considering the state operates with one of the worst human rights records, and a massive foreign migrant population that lacks any political or social rights. Developing a large scale commercial nuclear energy program in which foreign partnerships will play a long and continued role, the UAE has thus began acquiring the external legitimacy critical to its prestige goals.

²⁰⁰ *ibid.*, 9.

²⁰¹ *ibid.*, 9.

The Exemplary Case of the United Arab Emirates

The sustainability discourse emerging from the United Arab Emirates is both a product of the country's rapid pursuit of modernization along western developmental schemes and a redistributive patronage network with the population that forms the basis of the UAE's political structure. The UAE is therefore an exceptional case as it seemingly defies conventional wisdom with regards to how it continues to operate. Like other rentier governments, the UAE depends on the sale of oil to finance the majority of governmental functions. It distinguishes itself from other countries in the region though, through a commitment to introduce a sustainability discourse into the population.

A strong sustainability narrative from Abu Dhabi and Dubai, however cannot be understood, as a mere coincidence. The ability of the ruling regime to influence the population is thus relevant as it gives credence to the possibility that the government will be able to rein in consumer consumption habits through a targeted environmentally friendly discourse. While certainly this change in conscious will occur over the course of several generations, it will not have been the first time the country experienced a rapid change in societal habits.

Within a period of less than 50 years the country transformed from a collection of dispersed tribes under the rule of independent sheikhdoms into an economic and regional soft power giant. The scale of this transformation indicates the UAE demonstrates a number of exceptional characteristics that allowed it to develop at the rate it did. As the country is wholly authoritarian, with little accountability to its citizenry, its leadership possesses a greater deal of flexibility to engage in large scale projects. Here the rentier structure of the Emirates is important for two reasons. First, the ability of the federal government headed by Abu Dhabi, to directly implement

development programs without political opposition is significant because it allowed the state to pursue interests that were directly reflective of the leaderships goals.

Second the redistribution of wealth led to a dependence of the population towards the state, to such an extent where the benevolence of the country's ruling regime was considered an intrinsic part of societal dynamics. As the country lacked any sense of a unified nationality prior to the Trucial States consolidation into a singular entity in 1971, rent, helped to create the basis of a state under which a strong culture could emerge. While a fair argument has been made in the literature that country is merely an imagined community, it remains critical to understand that it maintains a complete allegiance to the ruling regime. In a region where protests since 2011 toppled some of the most deeply seated authoritarian governments, the UAE's ability to retain the loyalty of its population is remarkable.

There exists in the Emirates a strong correlation between regime stability and the country's historical precedent on development. From the country's inception a pressing need for the installation of basic services served as an early indicator that the wealth generated from the country's natural reserves of petroleum would serve as a catalyst for growth. As the largest population centers existed around Abu Dhabi and Dubai at the time of the state's formation development took an early focus there. Yet the regime was careful not to relegate the other Emirates to a bleak future, rather they concentrated the majority of their efforts on a broad construction project.

However, the lack of technical expertise required cooperation with Western firms. For the UAE partnering with Western corporations, as a means to ensure the timely implementation of development initiatives, is instrumental in the successive state building enterprises that occurred.

Abu Dhabi and Dubai have been the most successful in capitalizing upon these partnerships for the purposes of transforming the physical landscape. The scale of development in the UAE thus directly relates to the country's willingness to allow for state formation endeavors to occur with Western technical assistance. The pervasiveness of Western models is additional aspect of the UAE's exceptionalism.

Although certainly these partnerships proved crucial, easy access to capital and a pro-Western development scheme, had a number of societal impacts. For example, as a consequence of the influx of Western corporations, gross consumption patterns emerge as demonstrated by the emergence of large shopping malls, massive urban sprawl, and a generation dependent on luxury amenities. The cultural blending that occurred worked in tandem with the government's subsidization of most consumer goods. In this way Western modes of consumption and rentier subsidies worked in conjunction to create a precedent for gross overconsumption.

As consumption therefore exists within the context of a governmental development scheme it calls into question the sustainability of the UAE's goals. The literature on rentier governments demonstrated that states can exist with an Authoritarian structure so long as they maintain the subsidy packages. The UAE thus faces a dilemma of sustaining high domestic consumption levels, while continuing to promote a development discourse that will increase consumption rates further. Rising consumption that manifests itself in the form of hotel and luxury resort developments, both of which represent an extension of government subsidies, constrains the UAE's ability to make the country sustainable.

The above dilemma I have described is however not an end all scenario for the UAE. Recognizing the scale of the consumer habits, and their potential to lead to a renegotiation of the

social contract, the government of the UAE has made a clear decision to supplant a sustainability discourse among the population. Its choice to utilize solar and sustainable building standards represents just the beginning of a larger movement. While there remains a potential for these programs to do little in terms of creating a viable sustainability culture, there does exist a bright spot for which the Emirates is becoming a significant model to emulate.

Nuclear Energy, specifically the 5.6 GWe power production program, that the UAE has envisioned to be contributing energy to the grid by 2020, elevates the relative prestige of the UAE's entire state building efforts. The program for several reasons has affirmed the UAE's commitment to building a modern state, and successfully diversifying its energy sector away from fossil fuels.

First envisioned after a joint GCC declaration in 2007 stating a collection of states desire for the development of peaceful nuclear technologies in the region. While, several states have pursued development, only the UAE stands political able to provide the necessary capital and work in conjunction with Western organizations to an extent needed to pacify international concerns over proliferation and safety. Meeting international guidelines, the UAE has taken critics concerns over the possibility of a nuclear arms race emerging in the Middle East and taken additional measures to become a global leader in nuclear non-proliferation adherence. This is best exemplified by the country's signing of a 123 agreement with the US, and a constitutional declaration that forwent any future domestic enrichment program.

Becoming the standard for future nuclear programs across the world speaks tremendously to the UAE's commitment in continuing the development project it began in the early 1970's. With the first reactor expected to be brought online the UAE has made a significant breakthrough. For

the ruling regime in Abu Dhabi, this momentous achievement does far more for the country's stability than merely providing an additional 20 percent of base-load energy. Building a proliferation resistant program with substantial oversight has made the United Arab Emirates a virtual celebrity in the renewable energy field. The project therefore elevated the UAE to a level in renewable technologies on par with major global countries. It is interesting then to analyze the UAE's entire renewable energy program within the aforementioned context.

The country now playing host to major international technology fairs, most notably the much anticipated World Expo 2020, is a significant public relations victory. As I have stated previously, cooperating with foreign firms not only accelerates the pace of development initiatives, but provides additional leg of stability as it legitimizes the regime. It would be easy to forget that the country which holds no public elections, and whose human rights record is dubious at best, has emerged to be at the forefront of renewable energy technologies. However, these less desirable attributes are overshadowed by a sustainability campaign that places the UAE above its peers in terms of how the international community engages with it.

The case of the UAE therefore represents a successful application of rentier wealth in transforming the country's physical landscape and in developing a rapidly modernizing society. While, critics are quick to point out that the Emirates consumer habits constitute a dangerous threat to the long term stability of the rentier system, it is far from a foregone conclusion that the UAE's demise is imminent. Moreover, the UAE's demographic makeup, although growing, is much smaller than most countries and thus allows it to be more resilient to external shocks that threaten its patronage networks. Declaring the UAE to be unsustainable thus is not representative of what the country has accomplished in a short period of time. Predicting the long term

prospects of the UAE is thus a difficult task that, at present, is unlikely to serve a useful purpose in capturing the remarkable developmental history of the UAE.

Conclusion

The UAE's attempt to introduce a sustainable discourse amongst its population represents the culmination of a developmental plan that spanned a period of nearly five decades. Owing the current sustainability narrative to the need to reign in the gross consumer habits that have emerged under a patronage system, the UAE is emerging at the forefront of renewable energy technologies. As I have shown the country is engaging in a dual tract policy of development that both invests heavily in renewable energy projects and sustainable developments, but that also increases the UAE's stability as the regime legitimizes its rule through the use of extensive patronage networks.

Rentier state theory therefore has provided the theoretical framework for this paper. The UAE, with an elaborate system of subsidy programs, provided the funding for its rapid development through the sale of oil on the international market. Lacking the technical ability to develop a large scale urbanized society required that country cooperate with Western corporations. This interaction, over the course of five decades created a precedent for a cosmopolitan culture to permeate the UAE. With the advent of Western cosmopolitanism the UAE has engendered a culture of largesse that has threatened to reduce the long term viability of the state.

The country however, launched a broad platform of sustainability initiatives through the introduction of large scale solar and nuclear programs into the country's energy sector. Working in parallel to the developing renewable energy sector has been a campaign with the goal of creating a societal awareness of the environment. The sustainable energy narrative therefore

represents a persistent example of the UAE's commitment to development. At present the UAE's development remains only partially complete. As the country continues to diversify its economy based on a number of non-oil based sectors, the future of the country is still largely unclear.

Despite this, Dubai's recent awarding of number key events including the World Expo 2020 suggests that the goals the UAE have set in terms of its international prestige building efforts are thoroughly underway. With the country continuing to expand its economic power abroad, and backed by the wealth of a rentier state, the UAE is accelerating its development. Due to the unprecedented growth experienced since its consolidation in 1971, it is likely therefore that the UAE represents an exceptional case, and will continue to be one well into the future.

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